FibOCON\. r oim

完 美 无 线 体 验

AT Command Manual_MBB

V2.3

Disclaimer

Any actions you take in the process of using this document are at your own risk, and the company will not be responsible for any damage or loss of any nature under any circumstances. Due to product version upgrades or other reasons, the company reserves the right to modify any information in this document at any time without prior notice and without assuming any responsibility. Unless otherwise agreed, all statements, information and suggestions in this document do not constitute any express or implied warranty.

This document may contain third-party information, products, services, data or content (collectively, "Third-Party Content"). The Company does not control and assumes no responsibility for Third-Party Content, including but not limited to accuracy, compatibility, reliability, availability, legality, appropriateness, performance, non-infringement, update status, etc., unless otherwise expressly stated in this document. Mention or reference to any Third-Party Content in this document does not represent the Company's endorsement or guarantee of the Third-Party Content. If the user needs third-party permission, he must obtain the third-party permission through legal means, unless otherwise expressly stated in this document.

Copyright Notice

Trademark Notice

Fibocom It is a registered trademark of Shenzhen Fibocom Wireless Co., Ltd.

Other trademarks, product names, service names, and company names appearing in this document are the property of their respective owners.

Contact information

Website : https://www.fibocom.com

6 , Shenzhen International Innovation Valley, Xili Community, Dashi 1st Road, Xili Street, Nanshan District, Shenzhen Seat 10-14 Tel : 0755-26733555

Table of contents

Applicable Model

Serial number	Applicable Model	illustrate
1	FM190 Series & FG190 Series &FG190B Series &FG190W series &FM190W series	Qualcomm SDX75 platform
2	FG131 series	Qualcomm SDX35 platform
3	FG370 series	MTK platform

Revision History

V2.3 (2024-06-25)	Correction + CLCC Qualcomm platform does not support mo alerting
V2.2 (2024-06-14)	Add +MAVOL=? to X75 Added +MAI2SY=? to the project description for X75 Project Description Add +CHLD=? for X75/X12/X62 Project Description Add +VTA=? for X75/X62 Project Description
V2.1 (2024-06-03)	Modify +GTGPSCFG Default parameter X35 For SUPL2.0.4 Delete +GTAUDMODE Modify + COPS Parameter act Return value description
V2.0 (2024-05-10)	Correction AT+CTZU Save for power failure AT + GTGPSCFG Added GQGSV , GQGSA Correction + GTACT Save for power failure Correction + GTCELLSCAN Corrected the parameter description of +GTCCINFO in the instruction function description Modify +GTGPSCFG Default parameter X35 For SUPL2.0.4
V1.9 (2024-03-14)	Note: Add AT+GTCELLLOCK=1 Locking registered cells is not supported Note: Added FM190 Series, FG190 Series, FM190W Series, FG190B Series and FG190W The series does not support MBIM
V1.8 (2024-03-07)	Add to AT+GTGPSCFG Command parameters SUPL2.0.4 Add AT+COPS Command returns parameter mode
V1.7 (2024-01-29)	1. Unsupported AT for X35 projects Command to make a comment and add " X35 Project AT+CHLD The supported parameter range is (0, 1 , 1x , 2, 2x , 3, 4) ." 2. Correction + CESQ Commands <ss-sinr>,<ss-rsrp>,<ss-rsrq>
V1.6 (2024-01-16)	Added +MMAD instruction
V1.5 (2023-12-06)	Update applicable models
V1.4 (2023-11-21)	Revision GTACT , GTRAT , GTUSBMODE , GTGPSCERT Parameter Description

V1.3 (2023-10-08)	Added " MTK Platform AT+CGAUTH The persistence parameter is NO ".
V1.2 (2023-09-25)	Added " MTK Platform AT+GTCELLLOCK No support for SCS and nrband Parameters. "
V1.1 (2023-08-09)	Add AT+GTSENRDTEMP The command returns the parameter sensor_name; sensor_id in parameters explanation of.
V1.0 (2023-04-01)	initial version

1 Preface

1.1 Manual Scope

This manual introduces the **AT command set of Fibocom** series products and describes how users can use these commands to communicate with the devices. It also describes the syntax and parameter specifications of the listed **AT commands.**

1.2 Target Audience

This manual is for users who need to use **AT** Order with **Fibocom** Developers who want to communicate with a series of devices.

2 AT Command Introduction

2.1 AT Command Overview

AT AT commands are the command set used to communicate with the cellular modem. Commands are represented by ASCII characters beginning with the prefix " AT ". Character composition (command A / and +++) . AT The prefix is from the word Attention Derived, it asks the modem to pay attention to the current request (command)

AT Commands are used to request service from a cellular modem, for example:

- Call services: dial, answer and end calls
- Cellular general services: send / receive text messages
- Module configuration file: Autoreply
- Cellular network query: GSM Signal quality

2.2 AT Command Abbreviations

The basic system configuration consists of a module and a terminal.

Fibocom The series is a module, which can be called DCE or TA , such as a telephone, mobile phone or radio. Terminal (PC or MCU) can also be called DTE
or TE .

2.3 AT Command Protocol

AT The command interface is basically a service provided on request.

Communication (almost) always starts from the TE side. This means that any request should start from the TE Therefore, the request is called a " command ".

Each command must be answered by a " result value " from the TA . The result code reports the command status to the TE . Some commands may contain multiple " result values " to send data back to the TE . Some commands may start a mode where "indicator" message data is sent asynchronously when a specified event is generated in the modem . The " indicator " may be called an " unsolicited result value ".

The modem can transmit characters received from TE (commands) back to TE .

Figure 1. Scenario 1

Some commands may include several " result codes " to send data back to the TE .

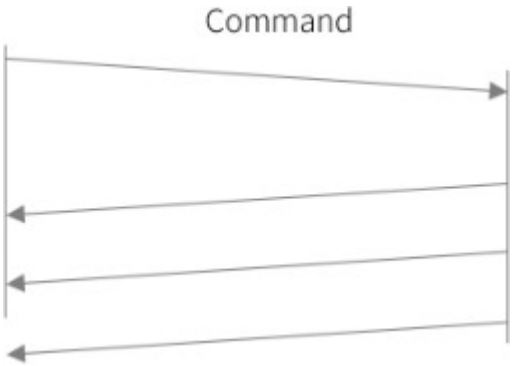

Figure 2. Scenario 2

Some commands may initiate a mode in which the TE Without sending a request, when a specified event is generated in the modem, information will be automatically sent to the TE , which can be called " unsolicited result code " .

Figure 3. Scenario 3

2.4 AT Command Structure

2.4.1 AT Common symbols used in commands

Table 1. Symbol conventions

Syntax	Definition
<CR>	Carriage return character, specified by the value of register s3 .
<LF>	Newline character, specified by the value of register s4 .
<...>	The name enclosed in angle brackets is a syntax element; the brackets themselves do not appear on the command line.
[...]	The square brackets themselves do not appear in the command line. When no subparameter is provided in a parameter-type command, the new value is equal to its previous value. In an operation-type command, the recommended default setting of the subparameter should be used.
//	Indicates a comment and is not included in the command.

2.4.2 Command Structure

Each AT The command has " AT " or " at " prefix string (except commands A / and +++) Each AT command has a suffix <CR> (except commands A/ and +++)

For example :

```
AT+CSQ<CR>
ATE?<CR>
```

AT command line may contain one or more commands. Delimiters are used to separate commands from each other. The delimiter can be a semicolon " ; " or not shown, meaning a space (basic commands)

For example :

```
AT+CIMI=46000123456789<CR>
AT+COPS=3,0;+CNMI=2,1,0,0,0<CR>
```

2.4.3 Return value structure

By default, the module responds with verbose response codes. Result values are prefixed with <CR><LF> .

Result codes are suffixed with <CR><LF> . For example :

```
<CR><LF>+CSQ: 99,99<CR><LF>
<CR><LF>OK<CR><LF>
```

The unsolicited result value is the same as the result value. .

- The <CR> and <LF> characters are not explicitly shown in the response format in this document.
- To reduce printed length, blank lines in the actual response may be removed in the examples .

2.5 Command Syntax

Scenes	form	illustrate
Excuting an order	AT+xxx ATxxx ATxxx;	Excuting an order

Setting Commands	AT+xxx=<Value> ATxxx=<Value>	Set user-defined parameter values <Value> consists of a numeric constant or a string constant. Numeric constants: Numeric constants are expressed in decimal, hexadecimal, or binary form. In the modem, the definition of each command specifies the format to be used for the value associated with that command. String constants: A string constant consists of a sequence of characters, delimited by double quotes (") at the beginning and end.

		<compound_value> consists of multiple parameters separated by commas. Example: <value1>,<value2>,…,<valueN>
Read Command	AT+xxx? ATxxx?	Returns the current command parameter settings
Query Command	AT+xxx=? ATxxx=?	Returns the command parameter list and the corresponding value range

<Value> consists of a numeric constant or a string constant. <compound_value> consists of several <value> parameters separated by commas . Example of compound_value : <value1> , <value2> , ..., <valueN>

- Numeric constants

Numeric constants are expressed in decimal, hexadecimal, or binary form. In the modem, each command definition specifies which form to use for the value associated with that command .

- String constants

A string constant consists of a sequence of characters, delimited at the beginning and end by double quote characters (") .

3 General Information

3.1 General Information

3.1.1 + CGMI， query manufacturer information

describe

This command queries the manufacturer information of the product.

The module will output a string containing the manufacturer information.

类型Format	命令	响应
查询命令	AT+CGMI	<manufacturer> OK
读取当前设置	AT+CGMI?	+CGMI: "<manufacturer >" OK
查询命令参数范围	AT+CGMI=?	OK

parameter

name	describe	Value
manufacturer	Query product manufacturer information	A string containing the manufacturer's name

characteristic

Do I need **a SIM?** Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (**ms**)	1000	**AT** Maximum time for command execution results to be returned (**ms**)	1000

3.1.2 + CGMM， query product name

describe

This command is used to query product name information. **The model** value can be one or more lines of text information, determined by the manufacturer, used to identify the device model, including the product name and any information the manufacturer wants to provide.

Format

type	Order	response
Query Command	AT+CGMM	<model> OK
Read current settings	AT+CGMM?	+CGMM: "<model>","<model abrev>" OK
Query command parameter range	AT+CGMM=?	OK

parameter

name	describe	Value
model	Product name information full name	A string containing the full name of the product
model abrev	Product Name Information Abbreviation	A string containing the abbreviation of the product name

characteristic

Do I need **a SIM?** Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (**ms**)	1000	**AT** Maximum time for command execution results to be returned (**ms**)	1000

3.1.3 + CGMR , query software version number

describe

This command is used to query the software version number. The module outputs a

string containing the version information of the software running in the device. Format

类型	命令	响应
查询命令	AT+CGMR	<revision> OK
读取当前设置	AT+CGMR?	+CGMR: "<revision>" OK
查询命令参数范围	AT+CGMR=?	OK

parameter

name	describe	Value
revision	Version Number Name	A string containing the version number name information

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

3.1.4 + CGSN , query IMEI

describe

the product serial number identification IMEI (International Mobile Equipment Identity) card, it can also be used. Format

类型	命令	响应
查询命令	AT+CGSN[=<snt>]	响应 1: 当<snt>=0 （或被忽略）并且命令成功时: <imei> OK 响应 2: 当<snt>=1 并且命令成功时: +CGSN: <imei> OK 响应 3: 当<snt>=2 并且命令成功时: +CGSN: <imeisv> OK 响应 4: 当<snt>=3 并且命令成功时: +CGSN: <svn> OK 响应 5: +CME ERROR:<err> OK

type	Order	response
Read current settings	AT+CGSN?	+CGSN: "<imei>" OK
Query command parameter range	AT+CGSN=?	+CGSN: (support list <snt>s) OK

parameter

name	describe	Value
snt	The type of serial number being requested	Type: Integer • 0 : Returns IMEI (International Mobile Equipment Identity) • 1 : Returns IMEI (International Mobile Equipment Identity) • 2 : Returns IMEISV (International Mobile Equipment Identity and software version number) • 3 : Return to SVN (software version number)
imei	Indicates IMEI Decimal format	Type: Integer IMEI By Type Assignment Code (TAC) 8 digits) serial number (SN R) 6 bit) and check bit (C D) 1 The character set used is determined by the command elect TE character set +CSCS Specify.
imeisv	Indicates IMEISV Decimal format	Type: Integer IMEISV of 16 Type Assignment TAC) (8 digits) Serial Number (SNR) (6 bits) and software version (S V N) 2 bits) .
svn	Indicates as IMEISV A portion of the current SVN in decimal format; this allows identification of different software versions for a given mobile device.	- -

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands

Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

3.1.5 +CFSN , request production serial number

describe

This command is used to read the production serial number.

Format

type	Order	response
Query Command	AT+CFSN	Response 1 : +CFSN: "<FSN>" OK Respons e 2 : ERROR
Read current settings	AT+CFSN	+CFSN: "<FSN>" OK

parameter

name	describe	Value
FSN	Project serial number	Type: String A string with ten characters, each character can be <AZ> or <0-9> . Example: "1234567890" .

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

3.1.6 +CIMI , check IMSI

describe

This command is used to display the

International Mobile Subscriber Identity.

类型	命令	响应
查询命令	AT+CIMI	<IMSI> OK
读取当前设置	AT+CIMI?	+CIMI: <IMSI> OK

Format

parameter

name	describe	Value
IMSI	International Mobile Subscriber Identity (string without double quotes)	Type: String

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

3.1.7 +CNUM , query MSISDN(s)

describe

This command displays two strings of text information to identify the module. The output string contains double quotes. On a SIM card with an EFmsisdn file , the returned string is MSISDN. Number and its related data. In SIM without EFmsisdn file On the card, the returned string is the MSISDN number and related data stored in ModemNVM .

Format

type	Order	response
Query Command	AT+CNUM	+CNUM:[<alpha1>],<number1>,<type1>[,<speed>,<service>[,<itc>]] [<CR><LF>+CNUM: [<alpha2>],<number2>,<type2>[,<speed>,<service>[,<itc>]] […]] OK
Read current settings	AT+CNUM?	+CNUM:[<alpha1>],<number1>,<type1>[,<speed>,<service>[,<itc>]] [<CR><LF>+CNUM: [<alpha2>],<number2>,<type2>[,<speed>,<service>[,<itc>]] […]] OK

parameter

name	describe	Value

alphax	alphanumeric string associated with <numberx>	Type: String The character set used is AT+CSCS Command selected character set
numberx	A phone number in the format specified by <typex>	Type: String 11 A string of bit numbers, for example: 19912351011
typex	Domestic type or international type	Type: Integer

name	describe	Value
		• 129 : ISDN / phone number plan, national / international unknown • 145 : ISDN / Phone Number Plan, International Number • 161 : ISDN / Phone Number Plan, National Number
speed	Baud rate. With CBST The definition in the command is the same.	Type: Integer See CBST for details Description in
service	Telephone number related services	Type: Integer • 0 : Asynchronous modem • 1 : Synchronous modem • 2 : PAD Access (asynchronous) • 3 : Packet access (synchronous) • 4 : Voice • 5 : Fax
itc	Information transmission function	Type: Integer • 0 : 3,1 kHz • 1 : UDI

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no

AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

3.1.8 + CCID , request integrated circuit card identification code

describe

This command returns the IC

card identification code. Format

type	Order	response
Query Command	AT+CCID	Response 1 : +CCID: <ID> OK Respons e 2 : ERROR
Read current settings	AT+CCID?	+CCID: <ID> OK
Query command parameter range	AT+CCID=?	OK

parameter

name	describe	Value
ID	Integrated Circuit Card Identification Code (string without double quotes)	Type: String

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

3.1.9 I, query identification information

describe

This command is used to query version,

manufacturer, and model information.

Format 类型	命令	响应
读取当前设置	ATI[<n>]	<n> 省略 响应取决于产品 <n>=0 版本构建时间 <n>=1 or 2 or 4 or 5 or 6 保留 <n>=3

type	Order	response
		<n>=7 Product description, such as: " FG101-NA-00" <n>=8 Software version <n>=9 hardware version +CME ERROR： <err>

parameter

name	describe	Value
n	serial number	Type: Integer Range: 0~9

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	yes
AT Command response maximum duration (ms)	500	AT Maximum time for command execution results to be returned (ms)	500

4 Module Control and Status

4.1 Module control commands

4.1.1 E, set echo

describe

This command defines whether input characters are echoed to the output. If so, the characters are echoed at the same rate, parity, and format as they were received. Format

类型	命令	响应
设置命令	ATE<n>	响应 1: OK 响应 2: ERROR
读取当前设置	ATE?	<value> OK

parameter

name	describe	Value
n	Whether to echo the indicated value	Type: Integer 0 : Disable echo 1 : Enable echo
value	Test echo return value	Type: Integer 000 : Disable echo 001 : Enable echo (default value) If no parameter is given, it is equivalent to <value>=0 .

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

4.1.2 +CBC , battery charger connection

describe

This command is used to query

the battery voltage level. Format

类型	命令	响应
设置命令	AT+CBC	+CBC: <bcs>,<bcl> OK

parameter

name	describe	Value
bcs	- -	Type: Integer 0 : MT Powered by battery (default)
bcl	- -	Type: Integer Battery unit: mV

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

4.1.3 +MTSM， temperature sensor measurement

describe

This command measures the current temperature sensor value in degrees Celsius. The temperature is obtained from the internal thermistor.

The module is restarted and the default value is **0** , all parameters are restored to default values.

Format

type	Order	response
Setting Commands	AT+MTSM=<Report>[,<Rate>][,<Low>,<High>]	Response 1 : If <Report>=0 OK If <Report>=1,6,7 +MTSM: <Temp> OK If <Report>=2 or 3 OK +MTSM: <Temp> ... +MTSM: <Temp> Respons e 2 : ERROR
Read current settings	AT+MTSM?	+MTSM: <Report>[,<Rate>][,<Low>,<High>] OK
Query command parameter range	AT+MTSM=?	+MTSM : (Range <Report>), (Range <Rate>),(Range <Low>/<High>) OK

parameter

name	describe	Value
Report	Report Type Represents Value	Type: Integer • 0 : Deactivate unknown reporting • 1 : Report the current temperature once • 2 : Activate unsolicited reporting • 3 : Activate unsolicited reporting only for out-of-bounds events • 6 : Report to BBIC temperature • 7 : Report the temperature of the RF
Rate	Select the time interval between unsolicited reports	Type: Integer Range: 1~255 Unit: Seconds Default value: 1

Low	Minimum boundary level for temperature values in unsolicited reports	Type: integer Range: 1~255 Default value: 0

name	describe	Value
High	The highest boundary level for temperature values in unsolicited reports	Type: integer Range: 1~125 Default value: 0
Temp	Current module temperature	Type: Integer

<Low>,<High> parameters are only available when <Report> = 3 Valid when.

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

4.1.4 +MSMPD , turn SIM off / on Hot swap card

describe

This command can enable / disable SIM Card hot swap function, the default state is to enable this function. This parameter will be saved in NVM and can be restored after a reboot.

Format

type	Order	response

Setting Commands	AT+MSMPD=<status>	Respons e 1 : OK Respons e 2 : ERROR
Read current settings	AT+MSMPD?	+MSMPD: <status> OK
Query command parameter range	AT+MSMPD =?	+MSMPD : (support list <status>s) OK

parameter

name	describe	Value
status	SIM Card hot swap function status	Type: Integer • 0 : Turn off SIM Card hot-swap feature • 1 : Turn on SIM Card hot-swap feature (default)

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	yes	Set whether to save after power off	yes
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

4.1.5 +CPWROFF , turn off MS

describe

This command is used to close

and detach the module. Format

类型	命令	响应
设置命令	AT+CPWROFF	响应 1 : OK 响应 2 : ERROR
读取当前设置	AT+CPWROFF=?	OK

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no

AT Command response maximum duration (ms)	2000	AT Maximum time for command execution results to be returned (ms)	2000

4.1.6 +CFUN , set module function

describe

This command is used to select the

function level in a module. Format

类型	命令	响应
设置命令	AT+CFUN=<fun>[,<rst>]	响应 1： OK 响应 2： ERROR
读取当前设置	AT+CFUN?	响应 1： +CFUN: <fun>,<rst> OK 响应 2： ERROR
查询命令参数范围	AT+CFUN=?	响应 1： +CFUN: (支持列表 <fun>s),(支持列表 <rst>s) OK 响应 2： ERROR

parameter

name	describe	Value
fun	Functional representation value	Type: Integer • **0** : Minimum functionality (disables **MS** and perform the detach process ; the **OK** response may be missed due to race conditions) • **1 : Full functionality. Enables sending and receiving RF signals** for all supported radio access technologies (online mode) • **4** : Disable **MT** Transmit and receive **RF** Signal (Airplane Mode) • **5** : Factory test mode • **15** : Reset (does not support **<rst>** ; may miss **OK** response due to race condition) **<fun>** is saved after power failure also depends on the implementation of the target product.

rst	- -	Type: Integer • 0 : Do not reset MT before setting <fun> power level • 1 : Reset MT before setting <fun> power level

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

4.1.7 +GTDUALSIM , dual SIM card switching

describe

This command is used to switch the operator SIM AT+GTDUALSIM? is used to query the current operator SIM Card information. AT+GTDUALSIM Used to read all available operator SIM Card information. If it is dual-SIM mode, it returns information about two cards. Otherwise, if the device is configured in single-SIM mode, it returns information about one SIM card.

Format

type	Order	response
Setting Commands	AT+GTDUALSIM=<sim_app>	Respons e 1 : OK Response 2 : +ERROR
Read current settings	AT+GTDUALSIM?	Response 1 : +GTDUALSIM: <sim_app>,<sub_app>,<sys_mode> OK Response 2 : +GTDUALSIM: <sim_app>,<sub_app>,<sys_mode>[<CR><LF> +GTDUALSIM: <sim_app>,<sub_app>,<sys_mode>] OK

Query command parameter range	AT+GTDUALSIM=?	+GTDUALSIM: (<sim_app> support list) OK

parameter

name	describe	Value
sim_app	Carrier SIM Card ID	Type: Integer 0 : SIM1 (default) 1 : SIM2
sub_app	Slot ID	Type: Integer SUB1 : Slot 1 SUB2 : Slot 2
sys_mode	Current system mode	Type: String No Service : No service N : NR Service (5G only Project) L : LTE Serve W : WCDMA Serve

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	yes
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

4.2 Sleep Mode Command

4.2.1 +SLPMODE, the control module enters sleep mode

describe

This command is used to control whether

the module enters sleep mode. Format

类型	命令	响应
设置命令	AT+SLPMODE=<mode>	响应 1： OK 响应 2： +ERROR
读取当前设置	AT+SLPMODE?	响应 1： +SLPMODE: <mode> OK

		Respons e 2 : ERROR
Query command parameter range	AT+SLPMODE=?	Response 1 : +SLPMODE: (0- 1) OK Respons e 2 : ERROR

parameter

name	describe	Value
mode	Whether to enter sleep mode	Type: Integer 0 : Do not allow sleep mode (default) 1 : Allow sleep mode

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

5 Call Control

5.1 Voice / data call control commands

5.1.1 +GTECC , emergency call number

describe

This command is used to read

and write emergency call

类型	命令	响应
设置命令	AT+GTECC=<index>,<ecc_num>	响应 1: OK 响应 2: +CME ERROR: <err>
读取当前设置	AT+GTECC?	响应 1: [+GTECC:<index1>,<ecc_num>[<CR><LF>+GTECC: <index2>,<ecc_num>][…]] OK 响应 2: +CME ERROR: <err>
查询命令参数范围	AT+GTECC=?	+GTECC:(支持列表 <index>s),<max_ecc_length> OK

neters. Format

parameter

name	describe	Value
index	Emergency Number Index	Type: Integer Range: **1~5**

ecc_num	Emergency Numbers	Type: String Range: Maximum length 15 For example: 0123456789*#

name	describe	Value
max_ecc_length	Maximum length of <ecc_num>	Type: Integer Range: Maximum length 15

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

5.1.2 D , dial command

describe

/ voice call in the current network .

If DATA If the call is initiated and answered by the remote party, the slave module sends an "OK" notification to the terminal, and it will enter the online data state.
For more information about the call failure, AT+CEER should be used Order.

Format

type	Order	response

Call Command	ATD<number>[;]	For voice calls: OK If the initiated call fails, the following reasons are returned: Connection failed: NO CARRIER or BUSY or NO ANSWER General error: ERROR Security reasons (e.g. no SIM card present) Card) SIM NOT INSERTED Unknown reason: UNKNOWN CALLING ERROR

parameter

name	describe	Value
number	Phone number or special number	Type: String For example: * 99 # or * 99 * * * 1 #

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	yes
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	30000	AT Maximum time for command execution results to be returned (ms)	30000

When making a voice call, the number ends with " ; " ends with a number; for data calls, the number does not end with a ; " N(CSD Call or PS call.

5.1.3 DL，dial the last number

describe

ATDL; (Voice) Dial the exact number of the last dialed number, including the DTMF sent tone.

If ATDL It is sent before any dial command is issued (mainly after power on, when the last digit is a blank field) , the module will return NOCARRIER , such as ITUv.25ter Standards. CCFC (* # 21#) , CCWA (* # 43#) , CLIP (* # 30#) , CLIR (* # 31#),COLP(*# 76#) will be regarded as the calling number and dialed again.

Format

type	Order	response
Dial Command	ATDL;	OK

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	yes
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no

AT Command response maximum duration (ms)	30000	AT Maximum time for command execution results to be returned (ms)	30000

X35 The project does not support this command.

5.1.4 H，hang up the phone

describe

This command hangs up the call. The module terminates all calls, whether it is a data call or a voice call, and whether it is an incoming call, an outgoing call, a waiting call, or a connected call.
Return **OK** Indicates that the command is responded correctly, and

NO CARRIER will be returned after disconnection Message. Format

类型	命令	响应
挂断命令	ATH	响应 1： OK 响应 2： NO CARRIER

characteristic

Do I need **a SIM?** Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (**ms**)	30000	**AT** Maximum time for command execution results to be returned (**ms**)	30000

5.1.5 A，answer the call

describe

This command is used to answer an incoming voice **/** data call after a RING/+CRING indication is sent to the terminal. If **the** incoming call has been answered (**CSD** Linked) the module sends a connection indication to the terminal.
If an **MT** The call fails. Possible responses include:

- **NO CARRIER** : Connection failed
- **ERROR** : General

类型	命令	响应

failure format

	Response 2 : +CME ERROR: <err>

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	2000	AT Maximum time for command execution results to be returned (ms)	2000

5.1.6 +CLIP , calling line identification

describe

the calling line identity (CLI)of the calling party when receiving a mobile terminated call .

The set command enables or disables CLI on the TE . It has no effect on the execution of the supplementary service fragment service CLIP in the network. When = 1 , the presentation of the calling line identity on the TE is enabled and the unsolicited result code is enabled when the calling user allows it +CLIP:<number>,<type>[,<subaddr>,<satype>[,[<alpha>][,<CLI_validity>]]] is returned. If this response is used when answering a normal voice call , it is manufacturer specific. Unsolicited result code +CLIP No SIP support URI The format number. When = 0 At TE Disable unsolicited result code + CLIP The calling line ID of the

Format

type	Order	response
Setting Commands	AT+CLIP=[<n>]	Respons e 1 : OK Response 2 : +CME ERROR: <err>
Read current settings	AT+CLIP?	+CLIP: <n>,<m> OK
Query command parameter range	AT+CLIP=?	+CLIP: (0,1) OK

parameter

name	describe	Value
n	Parameter **setting /** TE Display status of the result code	Type: Integer • **0** : Disable (default)

name	describe	Value
		• 1 : Enable
m	/ OIPs in the network service status	Type: Integer • 0 : No CLIP / OIP provided • 1 : Provide CLIP / OIP • 2 : Unknown (eg: no network)
number	telephone number	Type: String
type	Address Byte Type	Type: Integer See also 3GPP TS 24.008 Terms 10.5.4.7
subaddr	Subaddress	Type: String <satype> specifies the format
satype	Type of subaddress octet	Type: Integer See also 3GPP TS 24.008 Terms 10.5.4.8
alpha	alphanumeric representation of a <name> , corresponding to an entry in the phone book ; the character set used should be that specified using the command Select T E car act er s e t + CSC S The character set of choice .	- -
CLI_validity	Provides details on why <number> does not contain the calling party 's BCD number	Type: Integer • 0 : CLI efficient • 1 : CLI Reserved by the initiator (see 3GPP TS 24.008[8] Table 10.5.135 5a/3GPP TS 24.008 Code " User Denied ") • 2 : CLI cannot be used due to interconnection issues or limitations of the original network (see 3GPP TS 24.008[8] Table 10.5.135a/3GPP TS 24.008 generation code " Interacting with other services ") • 3 : Since the calling party is a public telephone type , CLI is not provided (see 3GPP TS 24.008[8] Table 10.5.135 5a/3GPP TS 24.008 code “ Coin Line / Pay Phone ”)

- 4 : Due to other reasons, CLI unavailable
  (See 3GPP TS 24.008[8] Table 10.5.135a/3GPP TS 24.008 generation code “ Not Available ”)

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

5.1.7 + CCWA , Call Waiting Command

describe

This command controls the supplementary services of call waiting, including the setting and query of the module and network. Parameter <n> presents the unsolicited result code +CCWA to TE when disabling / enabling the call waiting service : <number>,<type>,<class>,[<alpha>][,<CLI_validity> . The unsolicited result code +CCWA does not support numbers in SIP URI format.

Format

type	Order	response
Setting Commands	AT+CCWA=[<n>[,<mode>[,<class>]]]	Respons e 1 : OK Response 2 : If <mode>=2 And the command is executed successfully : +CCWA: <status>,<class>[<CR><LF> +CCWA: <status>,<class> […]] OK
Read current settings	AT+CCWA?	+CCWA: <n> OK
Query command parameter range	AT+CCWA=?	+CCWA : (support list <n>s) OK

parameter

name	describe	Value

n	Parameter setting: Display the result status to TE	Type: Integer • 0 : Disable • 1 : Allowed
mode	When the <mode> parameter is not given, the network is not queried.	Type: Integer • 0 : Off

name	describe	Value
		• 1 : Open • 2 : Query status
class	The sum of integers representing a type of information	Type: Integer • 1 : voice （ telephony ） (Telephone) • 2 : Data (refers to all licensed businesses; when <mode> = 2 If TA The values 16 , 32 , 64 , and 128 are not supported , so this value may only apply to certain bearer servers. Service • 4 : Fax (fax service) • 8 : SMS • 16 : Data circuit synchronization • 32 : Data circuit asynchronous • 64 : Access with package • 128 : Dedicated PAD access Default is 7 : Voice, Data and Fax
number	Phone number of the calling address	Type: String Format: The format is specified by <type>
type	Byte address type	Type: Integer See also 3GPP TS 24.008 Terms 10.5.4.7
status	Call waiting status	Type: Integer • 0 : Not activated • 1 : Activate
alpha	Optional string type alphanumeric representation of <number> , corresponding to an entry in the phone book; the character set used should be the one used with the command Select TE character set+CSCS The character set of choice .	--

CLI_validity	Provides why <number> does not contain the calling party BCD Number details	Type: Integer • 0 : CLI efficient • 1 : CLI Reserved by the initiator (see 3GPP TS 24.008[8] Table 10.5.135 5a/3GPP TS 24.008 Code " User Denied ") • 2 : CLI cannot be used due to interconnection issues or limitations of the original network (see 3GPP TS 24.008[8] Table 10.5.135a/3GPP TS 24.008 generation code " Interacting with other services ")

name	describe	Value
		• 3 : Since the calling party is a public telephone type , CLI is not provided (see 3GPP TS 24.008[8] Table 10.5.135 5a/3GPP TS 24.008 Code " Coin Line / Pay Phone ") • 4 : Due to other reasons, CLI unavailable (See 3GPP TS 24.008[8] Table 10.5.135a/3GPP TS 24.008 generation code “ Not Available ”) See also 3GPP TS 24.008 Terms 10.5.4.30

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

5.1.8 +CHLD，call related supplementary service command

describe

This command controls the " Call Hold " and " Multi-party Call " services. This command operates on voice calls only. The setup command allows control of the following call-related services: Call Hold: A call can be temporarily disconnected from the module, but the network retains the connection.
MTPY (Multi-Party) Calling: Telephone conference.
The network will not reserve more than one traffic channel for a mobile station,

therefore the module can only reserve one call at a time. Format

类型	命令	响应
设置命令	AT+CHLD=<n>	响应 1: 如果呼叫终止: OK （批准请求已提交）+ NO CARRIER 响应 2: 如果呼叫状态已更改（链接，拆分，从激活到保留等）： OK （批准请求已完成）

		Response 3 : If the call is terminated, another call is answered OK (Call answered and connected) NO CARRIER
Query command	AT+CHLD=?	+CHLD : (support list <n>s) OK
parameter range		

parameter

name	describe	Value
n	- -	Type: Integer • 0 : Releases all held calls or sets user-defined user busy (UDUB) to waiting calls. For Intel device, it will UDUB Set to both waiting call and incoming call. And if both waiting call and incoming call coexist, only the waiting call will be rejected. • 1 : Release all ongoing calls and accept the held or waiting call. • 1x : Release a specific call (x specific call numbers, as indicated by +CLCC) • 2 : Put all active calls (if any) on hold and accept another call (on hold or waiting). For Intel Device that accepts a held call or a waiting call from an incoming caller. In addition, if only one call exists and is in talk state, put it on hold; if only the held call exists, make it the active call. • 2x : put all active calls into active state, but calls X that should support communication except. • 3 : Add the held call to the conversation. • 4 : Connects the two calls and disconnects the user from both calls (explicit call transfer) • 5 : Activate call completion for busy user requests. • 6 : Put a held call on hold or make a held call active while another call is waiting. • 7 : Disconnect multiple users without accepting incoming calls. • 8 : Release all calls.

characteristic

Do I need a SIM? Card	yes	Do I need to register a network?	no
normal			

Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	5000	AT Maximum time for command execution results to be returned (ms)	5000

X12/X35/X62/X75 The project supports command parameter range (0,1,1x,2,2x,3,4) .

5.1.9 + CCFC , call forwarding numbers and conditions

describe

This command controls the call forwarding auxiliary service. It supports

registration, deletion, activation, deactivation and status query. Format

类型	命令	响应
设置命令	AT+CCFC=<reason>,<mode>[,<number>[,<type>[,<class>[,<subaddr>[,<satype>[,<time>]]]]]]	+CCFC: <status>,<class1>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]] [<CR><LF>+CCFC: <status>,<class2>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]] […]] OK
查询命令参数范围	AT+CCFC=?	+CCFC: (支持列表 <reason>s) OK

parameter

name	describe	Value
reason	Set call forwarding conditions	Type: Integer • 0 : No condition • 1 : Device busy • 2 : No reply • 3 : Unable to reach • 4 : All calls are forwarded (refer to 3GPP TS 22.030 [19]) • 5 : All conditional call forwarding (refer to 3GPP TS 22.030 [19])

mode	Setting Mode	Type: Integer • 0 : Off

name	describe	Value
		• 1 : Open • 2 : Query status • 3 : Register • 4 : Delete
number	Telephone number for forwarding address	Type: String Format: specified by <type>
type	Address byte type	Type: Integer The default is 145 when the dial string contains the international access code character "+" , otherwise it is 129 See 3GPP TS 24.008 Clause 10.5.4.7
subaddr	<satype Specified subaddress >	Type: String
satype	Subaddress octet type	Type: integer Default value: 128 Reference 3GPP TS 24.008 Sub-clause 10.5.4.8
class	The sum of integers representing a type of information	Type: Integer Default: 7 (Voice, Data, and Fax) • 1 : voice （ telephony ） voice (telephone) • 2 : Data (refers to all licensed businesses; when <mode> = 2 , if TA The values 16 , 32 , and 64 are not supported. and 128 , this value may refer only to certain bearer services) • 4 : Fax (fax service) • 8 : SMS • 16 : Data circuit synchronization • 32 : Data circuit asynchronous • 64 : Access with package • 128 : Dedicated PAD access
time	When " No Answer " , " All Call Forwarding " or " All Conditional Call Forwarding " is or has been queried, this gives the time (in seconds) to wait before a call is	Type: integer Range: 1~30 Default value: 20

forwarded.

status	state	Type: Integer • 0 : Not activated • 1 : Activate

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

5.1.10 +CLIR , Calling Line Identification Restriction

describe

This command instructs the module to query or close the MO Display of the CLI (Calling Line ID) for the call . The limitation of CLI (off presentation) depends on the network.

Format

type	Order	response
Setting Commands	AT+CLIR=<n>	Respons e 1 : OK Response 2 : +CME ERROR: <err>
Read current settings	AT+CLIR?	+CLIR: <n>,<m> OK
Query command parameter range	AT+CLIR=?	+CLIR: (support list <n>s) OK

parameter

name	describe	Value
n	Setting adjustments for outgoing calls	Type: Integer • 0 : According to CLIR / OIR Subscription usage indicator for the service • 1 : Call CLIR /OIR • 2 : Suppress CLIR / OIR (default)
m	Display subscribers in the network CLIR/OIR service status	Type: Integer • 0 : CLIR /OIR not configured • 1 : CLIR configured in permanent mode / OIR • 2 : Unknown (eg: no network) • 3 : CLIR / OIR Temporary mode demo is limited • 4 : CLIR / OIR is allowed Temporary Mode Demo

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

5.1.11 +CHUP , hang up the call

describe

This command causes the device to hang

up the current and held call. Format

类型	命令	响应
设置命令	AT+CHUP	响应 1: OK 响应 2: +CME ERROR: <err>

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	30000	AT Maximum time for command execution results to be returned (ms)	30000

5.1.12 +CSTA , select address type

describe

This setup command selects the number type for further dialing (D)

类型	命令	响应

acdthe GSM specification Format

		Response 2 : +CME ERROR: <err>
Read current settings	AT+CSTA?	+CSTA: <type> OK
Query command parameter range	AT+CSTA=?	+CSTA : (support list <type>s) OK

parameter

name	describe	Value
type	Dial string format	Type: Integer • 145 : The dial string should contain the international access code character "+" • 129 : The dial string starts with a number or is a local number

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

5.1.13 +CAVIMS , support the use of IMS Make a voice call

describe

This command notifies MT and UE Is it currently available for IMS? Voice calls (see 3GPP TS 24.229 [89]) MT This information can be used to determine whether 3GPP TS 24.301[83] and 3GPP TS " IMS Voice Unavailable" as defined in 24.501 [161] , for mobility management of IMS voice terminals, see 3GPP TS 24.008[20] .

Format

type	Order	response

Setting Commands	AT+CAVIMS=[<state>]	Respons e 1 : OK Response 2 : +CME ERROR: <err>
Query current settings	AT+ CAVIMS?	+ CAVIMS: <state> OK

Query command parameter range	AT+ CAVIMS =?	+CAVIMS : (support list <state>s) OK

parameter

name	describe	Value
state	IMS switch status	Type: Integer • 0 : Disable IMS • 1 : Open IMS

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	12000

5.2 Call Status Messages

5.2.1 +CLCC , current call list

describe

This command displays a list of all current modem calls and their status, and also enables / disables unsolicited indication of the call list. (If a call is not received, no information response is sent to the terminal.) If the command succeeds, but there are no available calls, no message response is sent to the terminal. The maximum number of simultaneous multi-party calls is 5 + 1 (5 active calls and 1 held)

Format

type	Order	response

Setting Commands	AT+CLCC=<state>	Respons e 1 : OK Response 2 : +CME ERROR: <err>
Read the current call list	AT+CLCC	+CLCC: <idx>,<dir>,<stat>,<mode>,<mpty>,<number>,<type>
		[<CR><LF> +CLCC: <idx>,<dir>,<stat>,<mode>,<mpty>,<number>,<type>[…]] OK
Query current settings	AT+CLCC?	+CLCC: <state> OK
Query command parameter range	AT+CLCC=?	+CLCC: (support list <state>s) OK

parameter

name	describe	Value
state	Close or open +CLCC Active reporting	Type: Integer • 0 : Disable (default) • 1 : Open
idx	3GPP TS 22.030 Clause 6.5.5.1 The call identification number described in the above can be used for the +CHLD command operation	Type: Integer N : The maximum number of simultaneous call control processes is determined by the manufacturer.
dir	Indicates to initiate or terminate a call	Type: Integer • 0 : Initiate a call (MO) • 1 : Terminate the call (MT)
stat	Call Status	Type: Integer • 0 : Activated • 1 : Keep • 2 : Dial (MO call) • 3 : Ringing (MO call) • 4 : Incoming call (MT call) • 5 : Wait (MT call) • 6 : Release

mode	Bearer Telephone Service	Type: Integer • 0 : Voice • 1 : Data • 2 : Fax • 3 : Voice followed by data, voice mode . • 4 : Voice / data alternating, voice mode . • 5 : Alternate voice / fax, voice mode . • 6 : Voice and data, data mode.

name	describe	Value
		• 7 : Voice / data alternation, data mode . • 8 : Alternate voice / fax, fax mode . • 9 : Unknown
mpty	Indicates whether the call is one of multiple parties	Type: Integer • 0 : The call is not part of a multi-party (conference) call • 1 : The call is one of a multi-party (conference) call
number	Telephone number for forwarding address	Type: String Format: specified by <type>
type	Type of address byte	Type: Integer The default value is 145 when the dial string contains the international access code character "+" ,otherwise it is 129. See 3GPP TS 24.008 Terms 10.5.4.7

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no

AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

Qualcomm platform does not support mo alerting

5.3 Supplementary services

5.3.1 +CSSN，Supplementary Service Notification

describe

This command refers to network initiated notifications related to supplementary services. Set command enables / disables the notification from TA To TE The notification result is displayed.

When <n> = 1 When a supplementary service notification is received after a mobile phone originated call is established, the intermediate result +CSSI:<code1> [,[<index>] [,<SS_code>]] will be sent to TE first MO Call establishment result.

When <m> = 1 and when a supplementary service notification is received during the establishment of a mobile terminated call or during a call, the result is provided unsolicited CSSU:<code2> [,<index> [,[<number>],[<type>] [,[<subaddr>],[<satype>]] [, <SS_code>]]]] is sent to TE . Format

类型	命令	响应
设置命令	AT+CSSN=[<n>[,<m>]]	响应 1： OK 响应 2： +CME ERROR: <err>
查询当前设置	AT+CSSN?	+CSSN: <n>,<m> OK
查询命令参数范围	AT+CSSN=?	+CSSN: (支持列表 <n>s),(支持列表 <m>s) OK

parameter

name	describe	Value
n	Settings / Display +CSSI Results display status	Type: Integer • 0 : Disable (default) • 1 : On This value must be specified
m	Settings / Display +CSSU Results display status	Type: Integer • 0 Off (default) • 1 Open This value is optional, but must not be specified without <n> .

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no

AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

5.3.2 +CUSD，unstructured supplementary service data

describe

according to GSM 02.90 This command allows control of Unstructured Supplementary Service 数据 USSD ）. Both network and mobile initiated actions are supported. Parameter <n> is used to disable / enable unsolicited results (USSD from the network +CUSD : <m>[,<str>,<dcs>] is sent to TE for USSD response or network initiated operation . In addition, the value <n> = 2 is used to cancel the ongoing USSD session. When <str> is given , the mobile initiated USSD String or USSD response to a network initiated operation String sent to the network. Response from the network USSD The string will be in the subsequent unsolicited +CUSD Returned in the results.

Format

type	Order	response
Setting Commands	AT+CUSD=[<n>[,<str>[,<dcs>]]]	Respons e 1 : OK Response 2 : +CME ERROR: <err> Unrequested Reports : +CUSD: <m>[,<str>,<dcs>]
Query current settings	AT+CUSD?	+CUSD: <n> OK
Query command parameter range	AT+CUSD=?	+CUSD : (support list <n>s) OK

parameter

name	describe	Value
n	Set / display result code for TE Display status	Type: Integer • 0 : Disable TE Display result value • 1 : Enable presenting result value to TE • 2 : Cancel the session (does not apply to read command responses)

str	USSD String	Type: String • If <dcs> indicates to use 3GPP TS 23.038 [25] 7 Default letter; • If TE Character set is not "HEX" (see command " Select TE Character set + CS CS ") M T / T A According to 3GPP TS 27.005 The rules will be GSM The letters are converted to the current TE character set [24] Annex A ; • If TE Character set is "HEX" : MT/TA Will GSM Each 7 of the alphabet Converts a two-bit character to

name	describe	Value
		IRAs Hexadecimal number of characters long ; (e.g., character II (GSM 23) is represented by 17 (IRA 49 and 55) • If <dcs> indicates to use 8 Bit data encoding Solution: MT/TA Each 8 8-bit byte is converted to two IRA characters long hexadecimal number ; (e.g., the octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) • If <dcs> indicates the use of 16 - bit data coding scheme (UCS2): MT / TA 16 bit split into two 8 Each of these octets Each octet is grouped according to 8 The octet encoding scheme is converted to the most significant octet first (for example, the decimal value 4906 is converted to the four characters 132A (IRA49 , 51 , 50) . and 65) displayed to TE) <dcs> : integer type (shows Cell Broadcast Data Coding Scheme , see 3GPP TS 23.038 [25]). The default value is 15 . <str> parameter is not provided , the network will not be queried.
m	USSD from the network or network initiated operations response	Type: Integer • 0 : No further user action required (network initiated USSD notification, or mobile initiated action without further information) • 1 : Further user action required (network initiated USSD notification, or mobile initiated action without further information) • 2 : USSD is terminated by the network • 3 : Other local clients have responded • 4 : Operation not allowed • 5 : Network timeout
dcs	Displays the cell broadcast data coding scheme	Type: Integer

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

5.3.3 +COLP , cable identification mark

describe

This command is related to the COLP (Connected Line Identity) of the GSM Supplementary service that enables the calling user to The connected line identity (COL) establishing a mobile originated call . For example, after establishing a mobile originated call to a number that is forwarded to another number , the calling party will see the third party's number. When this command is enabled (allowed by the called party), the following intermediate result code will be returned: +COLP : <number> , <type> [, <subaddr> , <satype>] .

Format

类型	命令	响应
设置命令	AT+COLP=[<n>]	响应 1： OK 响应 2： +CME ERROR: <err>
查询当前设置	AT+COLP?	+COLP: <n>,<m> OK
查询命令参数范围	AT+COLP=?	+COLP: (支持列表 <n>s) OK

parameter

name	describe	Value
n	Set / display result code for TE Display status	Type: Integer • 0 : Disable, default value • 1 : On
m	Parameters show subscriptions in the network COLP service status	Type: Integer • 0 : COLP / TIP Not configured (default) • 1 : COLP / TIP Configured • 2 : Unknown (for example: no network, etc.)
number	telephone number	Type: String

type	Address Byte Type	Type: Integer See also 3GPP TS 24.008 Terms 10.5.4.7
subaddr	Subaddress	String Type <satype> specifies the format

name	describe	Value
satype	Type of subaddress octet	Type: Integer See also 3GPP TS 24.008 Terms 10.5.4.8

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

6 System date and time

6.1 General commands

6.1.1 +CCLK, read/set system date and time

describe

This command is used to read and set the module's

current date, time and time zone. Format

类型	命令	响应
设置命令	AT+CCLK=<time>	响应 1: OK 响应 2: ERROR
读取当前设置	AT+CCLK?	响应 1: +CCLK: <time> OK 响应 2: ERROR
查询命令参数范围	AT+CCLK=?	OK

parameter

name	describe	Value

time	Module current date, time and time zone	Type: String • yy/MM/dd,hh: mm: ss zz • yy : 2- digit year [00-99] • MM : 2- digit month [01-12] • dd : 2- digit day [00-31] • hh : 2- digit time [00-23] • mm : 2- digit [00-59] • ss : 2- digit seconds [00-59]

name	describe	Value
		• zz (optional) time zone offset relative to Greenwich Mean Time , expressed in quarter hours [-47 … +48] . If this value is not specified, the time zone offset will be 0 .

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

6.1.2 +CTZU , automatically update time zone

describe

This command is passed by NITZ Enable / disable (turn on /

off) automatic updating of time zone. Format

类型	命令	响应
设置命令	AT+CTZU=<onff>	响应 1: OK 响应 2: ERROR
读取当前设置	AT+CTZU?	+CTZU: <onff> OK
查询命令参数范围	AT+CTZU=?	+CTZU: (0,1) OK

parameter

name	describe	Value
onff	**NITZ** Functional representation value	Type: Integer • **0** : Disable **NITZ** Automatically update time zone function (default value) • **1** : Open through **NITZ** Automatic time zone update function

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	yes
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

6.1.3 +CTZR , time zone reporting

describe

This command enables / disables time zone change event and daylight saving time reporting. If reporting is enabled, MT The unsolicited result code +CTZV will be returned :
<tz> or +CTZE : <tz> , <dst> , [<time>] .

Format

类型	命令	响应
设置命令	AT+CTZR=[<reporting>]	响应 1： OK 响应 2： ERROR
读取当前设置	AT+CTZR?	+CTZR: <reporting> OK
查询命令参数范围	AT+CTZR =?	+GTGPSSET: (支 持 列 表 <reporting>s) OK

parameter

name	describe	Value

reporting	Time zone change event reports represent values	Type: Integer • **0** : Disable time zone change event reporting (default value) • **1** : Through unsolicited results **+CTZV** : **<tz>** Enable time zone change event reporting • **2** : Through unsolicited results **+CTZE** : **<tz>** , **<dst>** , **[<time>]** Enable extended time zone and local time reporting.
tz	Integer value indicating the time zone	- -

name	describe	Value
time	current time	Type: String Format: **"yy/MM/dd,hh:mm:ss"** The characters represent year, month, day, hour, minute, and second.
dst	summer time	Type: Integer • **0** : Do not adjust for daylight saving time • **1** : Adjust to **+1** Daylight saving time hours • **2** : Adjusted to **+2** Daylight saving time hours

characteristic

Do I need **a SIM?** Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (**ms**)	**1000**	**AT** Maximum time for command execution results to be returned (**ms**)	**1000**

7 SMS

7.1 SMS Order

7.1.1 +CSCS, select terminal character set

describe

This command selects the module character set. The module supports the following character sets :

"IRA" , "GSM" , "UCS2" , "HEX" . The default value is "IRA" . Format

类型	命令	响应
设置命令	AT+CSCS=<chset>	响应 1: OK 响应 2: +CME ERROR: <err>
读取当前设置	AT+CSCS?	+CSCS: <chset> OK
查询命令参数范围	AT+CSCS=?	+CSCS: (支持的 <chset>列表) OK

parameter

name	describe	Value
chset	character set	Type: String "IRA": full name, International , reference ence Alphabet （ ITU-T T.50 ） "GSM ": full name, GSM Default alphabet （GSM 03.38 subclause 6.2.1 ） "UCS2": 2-byte , Universal Character Set, Unicode (ISO/IEC 10646 [32]) "HEX": a string consisting of hexadecimal numbers from 00 to FF “8859-1”: ISO-8859-1 , only supported by G5 series products.

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no

Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

7.1.2 +CSMS , select message service

describe

This command handles the selection of a messaging service. It

returns the message types supported by the module.

类型	命令	响应
设置命令	AT+CSMS=<service>	响应 1: +CSMS: <mt>,<mo>,<bm> OK 响应 2: +CMS ERROR: <err>
读取当前设置	AT+CSMS?	+CSMS: <service>,<mt>,<mo>,<bm> OK
查询命令参数范围	AT+CSMS=?	+CSMS: (支持列表 <service>s) OK

parameter

name	describe	Value
service	- -	Type: Integer • 0 : SMS AT Command syntax and GSM Phase 2 compatible • 1 : SMS AT Command syntax and GSM Phase 2+ compatible
mt	MT information	Type: Integer • 0 : Module not supported • 1 : Module support

mo	MO information	Type: Integer • 0 : Module not supported • 1 : Module support
bm	Broadcast message type	Type: Integer • 0 : Module not supported • 1 : Module support

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

7.1.3 +CPMS , message priority storage medium

describe

This command handles the selection of the preferred message storage area. The message

storage area is divided into three parts : mem1 , mem2 and mem3 . Format

类型	命令	响应
设置命令	AT+CPMS=<mem1>[,<mem2>[,<mem3>]]	响应 1: +CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3> OK 响应 2: +CMS ERROR: <err>
读取当前设置	AT+CPMS?	响应 1: +CPMS:<mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3> OK 响应 2: +CMS ERROR: <err>
查询当前参数范围	AT+CPMS=?	响应 1: +CPMS: (支持列表<mem1>s),(支持列表 <mem2>s),(支持列表 <mem3>s) OK 响应 2: +CMS ERROR: <err>

parameter

name	describe	Value
mem1	Reading and deleting message memory	Type: string Range: 0~n "BM" broadcast information storage
mem2	The memory to which the write operation is performed	Type: string Range: 0~n "SM" (U) SIM Card information storage
mem3	Memory for storing received SMS messages (unless forwarded directly to TE)	Type: string Range: 0~n "ME"ME Information Storage
usedx	The number of used SMS messages in the memory <memx>	Type: integer Range: 0~n
totalx	Total SMS capacity of memory <memx>	Type: integer Range: 0~n

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

7.1.4 +CMGF , SMS format

describe

This command is a basic SMS command.

The set command handles the selection of the message format used with the send , list , read , and write commands , and the format of the unsolicited result codes produced by message receipt

The module supports PDU mode (using the entire TP data unit) and text mode (the message body

and its header are given as separate parameters) Format

类型	命令	响应
设置命令	AT+CMGF=<mode>	响应 1: OK 响应 2: +CME ERROR: <err>

parameter

name	describe	Value
mode	SMS format	**0** : **PDU** Mode (default) **1** : **Text** model

characteristic

Do I need **a SIM?** Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (**ms**)	1000	**AT** Maximum time for command execution results to be returned (**ms**)	1000

7.1.5 +CSCA, SMS service center address

describe

This command allows **the SIM** Read and write **SCA** . In SMS text mode, **SCA** Store in **SIM** is added to any stored and sent **SMS messages. In mode, the SIM card** will be stored **SCA** in Added to the stored SMS, only if encoded as **PDU** SCA Address length equals **0** SMS is sent only when

Format

type	Order	response
Setting Commands	AT+CSCA=<sca>[,<tosca>]	Respons e **1** : **OK** Response **2** : +CME ERROR: <err>
Read current settings	AT+CSCA?	+CSCA: <sca>,<tosca> OK
Query the current parameter range	AT+CSCA=?	OK

parameter

name	describe	Value
sca	- -	Type: string Range: 1~20 "" of the service center address is 145. Each character Use half-octal not including "F" character . If an odd number of digits are included

name	describe	Value
		Word, then the last eight bits 4-7 Should be filled with a closing marker encoded as "1111" .
tosca	Service Center Address Type	Range: 0~255 129 Mainly local numbers, 145 It's an international number. Effective value according to : GSM03.40 v7.4.0 Section 9.1.2.5 The section definition is as follows : Bit 7 is 1 Bits 6 5 4 - The current number types are as follows: Bits 6 5 4 0 0 0 : Unknown 0 0 1 : International number 0 1 0 : Country code 0 1 1 : Special network number 1 0 0 : User number 1 0 1 : Alphabetic number (according to GSM TS 03.38 7 Default letter encoding) 1 1 0 : Abbreviated number 1 1 1 : For expansion Number - Plan - Identification (applicable to number type = 000,001,010) Bits 3 2 1 0 0 0 0 0 : Unknown 0 0 0 1 : ISDN/ Telephone Number Plan (E.164/E.163) 0 0 1 1 : Digital numbering plan (X.121) 0 1 0 0 : Telex Numbering Plan 1 0 0 0 : National Numbering Plan 1 0 0 1 : Private Numbering Plan 1 0 1 0 : ERMES numbering plan (ETSI DE / PS3 01-3) 1 1 1 1 : For expansion All other values are reserved.

characteristic

Do I need a SIM? Card	yes	Do I need to register a network?	no

normal			
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

7.1.6 +CSMP , set text mode parameters

describe

This command is a basic command used to send SMS Additional parameter selection values required to be sent to the network or placed in storage when text mode is selected.

Format

type	Order	response
Setting Commands	AT+CSMP=[<fo>[,<vp>[,<pid>[,<dcs>]]]]	Respons e 1 : OK Response 2 : +CME ERROR: <err>
Read current settings	AT+CSMP?	+CSMP: <fo>,<vp>,<pid>,<dcs> OK
Query the current parameter range	AT+CSMP=?	OK

parameter

name	describe	Value
fo	- -	Type: Integer Depends on command or result code
vp	Validity period, depends on SMS - SUBMIT , tp- valid-Period-format bit setting	Type: Integer Depends on command or result code • 0~143 : (TP-VP + 1) x 5 minute (5 Minute interval 12 within hours) • 144~167 : 12 Hours + ((TP-VP - 143) x 30 minute) • 168~196 : (TP-VP - 166) x 1 sky • 197~255 : (TP-VP - 192) x 1 one week
pid	Protocol- Ident	Type: Integer Range: 0~255
dcs	An octet of data encoding scheme, indicating the data encoding scheme of the data	Type: Integer 0 : Default value

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands

Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

7.1.7 +CSDH, display text mode parameters

describe

This command controls whether detailed header information

is displayed in the text mode result code.

类型	命令	响应
设置命令	AT+CSDH=[<show>]	响应 1: OK 响应 2: +CME ERROR: <err>
读取当前设置	AT+CSDH?	+CSDH: <show> OK
查询当前参数范围	AT+CSDH=?	+CSDH: (支持列表 <show>s) OK

parameter

name	describe	Value
show	- -	Type: Integer • 0 : In text CSCA is not displayed in this mode and +CPMS (< sca >, <tosca>, <fo>, <vp> , <pid> and <dcs>) header values are not displayed either . <toda> or <tooa> In +CMT , CMGL, +CMGR SMS-SUBMITs Result code. For +CMGR The result code of the SMS command is not displayed <pid> , <mn> , <da> , <toda> , <length> or < c d ata > (default value) • 1 : Display the value in the result code.

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response	1000	AT Maximum time for command	1000

maximum duration (ms)	execution results to be returned (ms)

7.1.8 +CNMI, new information indication

describe

The module receives SMS This command handles enabling unsolicited notifications to the endpoint. After sending an unsolicited reply to the TE , the module will expect the TE to At 15 +CNMA (New Message Acknowledgement)s given within a predefined timeout of 10 seconds . During the timeout, the module will not send any more messages to TE. Send another unsolicited response unless a previous request is acknowledged. If the module does not receive an acknowledgement within the required time, the CNMI parameters will not be automatically reset and the unsolicited response will be sent to TE again .

Format

type	Order	response
Setting Commands	AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	Respons e 1 : OK Response 2 : +CME ERROR: <err>
Read current settings	AT+CNMI?	+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr> OK
Query the current parameter range	AT+CNMI=?	+CNMI: (Support List <mode>s),(support List Table <mt>s),(branch hold List surface <bm>s),(support list <ds>s),(support list <bfr>s) OK

parameter

name	describe	Value
mode	Control Notification TE The way	Type: Integer • 0 : In TA buffer unsolicited result codes. If the result code buffer is full, the indication can be buffered elsewhere, or the old indication can be discarded and replaced with the newly received indication. <MT> is sent. • 1 : When TA-TE When the link is reserved (eg in online data mode), discard the indication and reject new received messages with unsolicited result codes. Otherwise forward them directly to the TE . • 2 : When TA-TE Buffer unrequested result codes in TA when the link is reserved (e.g. in online data mode) and flush them to TE after the reservation . Otherwise forward them directly to TE .

mt	Set up short message storage and notification TE Content	Type: Integer • 0 : store the received short message to the default memory location (including class 3)without notifying TE • 1 : The received short message is stored in the default memory location and sent to the TE Send notification (including class3) . The notification format is: +CMTI : "SM", <index> • 2 : For class 2 SMS, stored in SIM card, and send it to TE Send a notification; for other classes , directly forward the short message to TE+CMT:

name	describe	Value
		[<alpha>],<length><CR><LF><pdu>(PCU mode); or +CMT:<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca >,<tosca>,<length>]<CR><LF><data> (text model) • 3 : For class3 For short messages, they are forwarded directly to TE , same as <mt>=2; for other classes , same as <mt>=1 .
bm	- -	Type: Integer • 0 : No, CBM Display routing to TE ; • 1 : If CBM Stored in ME/TA, CMB The memory location shown is routed to the TE with an unsolicited result code : + CBMI : <mem> , <index> New CBM Use unsolicited result codes to route directly to TE: • + CBM : < length > < CR > < LF > < pdu > (pdu mode is on) • + CBM : < sn > , < mid >, < dcs >, < page >, < pages > < CR > < LF> <data>(Open in text mode) • 2 : If the ME supports the data coding group and also defines special routing messages in addition to type 3 (for example: USIM Special specification message), ME m The data encoding scheme that may be selected for non-routing messages is TE (storage CBM The instructions can be followed by <bm>=1 Type 3CBM Use <bm>=2 Unsolicited result codes defined in are routed directly to the TE . • 3 : If CBM is supported Storage, other types of messages will generate <BM> = 1 Instructions defined in .
ds	- -	Type: Integer • 0 : No SMS status report routing to TE (default value) • 1 : SMS status reports are routed to TE using unsolicited result codes : • +CDS: < length><CR><LF><pdu > (PDU mode opend); • +CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode Open d) • 2 : If the SMS status report is stored in ME/TA , the memory location is routed to TE with an undefined result code : +CDSI: <mem>,<index>
bfr	- -	Type: Integer • 0 : When the TA of the unrequested result code defined in this command is Buffer flushed to TE When input <mode > 1…3 (responds to OK before refresh code , default value) • 1 : Clear the TA of the unrequested result code defined in this command Buffer as input

<mode> 1…3 .

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

7.1.9 +CNMA , new message confirmation response

describe

the +CMT command from the terminal to the module. + CDS Response. A +CMT Response to receive confirmation of a new SMS The sent message is correctly received and the message is routed directly to the terminal. A +CDS Response to receive confirmation that the new SMS has been received correctly Status report messages are routed directly to the endpoint.
When the module sends a +CDS The response is sent to the terminal, which waits for a predefined timeout of 15 seconds Seconds is +CNMA The module will not send another
+CDS The result code is sent to the terminal until the previous confirmation or timeout.
When the module sends a +CMT The response is sent to the terminal, which waits for a predefined timeout of 15 seconds Seconds is +CNMA The module will not send another
+CMT result code is sent to the terminal until the previous one is confirmed or timed out. After receiving the +CNMA command, the module sends RP-ACK to the network. Confirmed SMS will not be saved in the message storage. If the command is executed but no confirmation is required, or other module-related errors occur, the final result code +CMS error : is returned .

Format

type	Order	response

Setting Commands	For text mode (+CMGF=1) AT+CNMA For PDU mode (+CMGF=0) AT+CNMA[=<n>[,<length>[<CR>PDU<ctrl-Z/ESC>]]]	Respons e 1 : OK Response 2 : +CME ERROR: <err>
Query command parameter range	AT+CNMA=?	Response 1 : OK in text mode Response 2 : +CNMA : (support list <n>s) in PDU mode

parameter

name	describe	Value
n	- -	Type: Integer • 0 : The command operates similarly to that defined for text mode • 1 : Send RP -ACK • 2 : Send RP- ERROR
length	PDU PDU packet length of mode	Type: Integer

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	500	AT Maximum time for command execution results to be returned (ms)	500

7.1.10 +CMGL , SMS list

describe

This command shows that it comes from the Modem The stored SMS status value (the storage location of the SMS is selected with +CPMS . This command returns a series of responses, each containing index, status and data. If the status of a message is "RECEIVED Executing the +CMGL command can change the status of this message to "RECEIVED READ" (received and read)

Format

type	Order	response
Setting Commands	AT+CMGL[=<stat>]	Response 1 : If the command is in text mode (+ C M G F = 1) the command succeeds and the status is SMS-SUBMITS and/or SMS-DELIVERs: +CMGL: <index>,<stat>,<oa/da>,[<alpha>],[<scts>][,<tooa/toda>,<length>]<CR><LF><data>[<CR><LF> +CMGL: <index>,<stat>,<da/oa>,[<alpha>],[<scts>][,<tooa/toda>,<length>]<CR><LF><data>[…]] Response 2 : If the command is in text mode (+ C M G F = 1) the command succeeds and the status is SMS- SUBMITs and/or SMS-DELIVERs: +CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> [<CR><LF> +CMGL:

		<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[…]]
Setting Commands	AT+CMGL[=<stat>]	Response 1 : If the command is in text mode (+ C M G F = 1) the command succeeds and the status is SMS- Commands +CMGL: <index>,<stat>,<fo>,<ct>[<CR><LF> +CMGL: <index>,<stat>,<fo>,<ct>[…]]

type	Order	response
		Response 2 : the command is successful in text mode (+ C M G F = 1) CBM storage : +CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages> <CR><LF><data>[<CR><LF> +CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages> <CR><LF><data>[…]] Respons e 3 : Other : +CMS ERROR: <err>
Query command parameter range	AT+CMGL=?	+CMGL : (list of supported command <stat>s)

parameter

name	describe	Value
stat	The state of the message in memory	In order to be compatible, the two modes can be used alternately • 0 : "REC UNREAD" : Receive unread messages (default value) • 1 : "REC READ" : Received read messages • 2 : "STO UNSENT" : Stores unsent messages • 3 : "STO SENT" : Stores sent messages • 4 : "ALL" : All messages
index	1-352 Index of stored messages	- -
oa/da	Source address / destination address	- -
data	Message content in text mode	- -
length	In PDU Mode: Contains the size of the message, in octal, excluding the SMSC Data. In text mode: the number of characters in data.	- -
PDU	The message header and content are in PDU format. See "+CMGR, Read Message" .	- -
Tooa/toda	Source / destination address type	- -
fo	SMS The first eight	- -
mr	Message Index	- -
ra	receiver's address	- -
tora	Recipient address type	- -

name	describe	Value
scts	SMS service center timestamp	- -
ct	Command Type	- -
s	Source / destination address type	- -
mid	Message ID	- -
page	Current page number	- -
pages	total pages	- -
st	state	- -
dt	Release time	- -

alpha	optional alphanumeric string associated with <numberx>	Type: String The character set used is AT+CSCS Command selected character set

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	3000	AT Maximum time for command execution results to be returned (ms)	3000

7.1.11 +CMGR , read message

describe

These commands are used to read SMS This command displays the preferred message store <index> (use +CPMS command select) at location <mem1> . If the status of the message is "RECEIVED UNREAD" , +CMGR The command changes the status to "RECEIVED READ" .

Format

type	Order	response
Setting Commands	AT+CMGR=<index>	Response 1 : If in text mode (+ C M G F = 1) the command is sent successfully and the status is SMS- DELIVER: +CMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data> Response 2 : If text mode (+ C M G F = 1) the command is sent successfully and the status is SMS- SUBMIT: +CMGR:

type	Order	response

		<stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data> Response 3 : If in text mode (+ C M G F = 1) the command is sent successfully and the status is SMS- REPORT: +CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> Response 4 : If in text mode (+ C M G F = 1) the command is sent successfully and the status is SMS- Commands : +CMGR: <stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length> <CR><LF><data>] Response 5 : the command is successful in text mode (+ C M G F = 1) CBM Storage :+CMGR: <stat>,<sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> otherwise: +CMS ERROR: <err>
Query command parameter range	AT+CMGR=?	OK

parameter

name	describe	Value
stat	The state of the message in memory	In order to be compatible, the two modes can be used alternately • 0 : "REC UNREAD" : Receive unread messages (default value) • 1 : "REC READ" : Received read messages • 2 : "STO UNSENT" : Stores unsent messages • 3 : "STO SENT" : Stores sent messages • 4 : "ALL" : All messages
index	Create an index in the store for the message to be retrieved	Type: Integer The sum value starts from 1 start

oa/da	Source address / destination address	- -
alpha	Alpha of message ID(does not exist)	- -
data	Message content in text mode	- -

name	describe	Value
length	In PDU mode : contains the size of the message, in octal , excluding the SMSC Data. In text mode : the number of characters in the data	- -
PDU	The message header and content use PDU Format. See "+CMGR, Read Interface description in "Message"	- -
tooa/toda	Source / destination address type	- -
fo	SMS The first eight	- -
mr	Message Index	- -
ra	receiver's address	- -
tora	Recipient address type	- -
scts	SMS service center timestamp	- -
ct	Command Type	- -
s	Source / destination address type	- -
mid	Message ID	- -
page	Current page number	- -
pages	total pages	- -
st	state	- -
dt	Release time	- -
pid	The protocol identifier of the message	
dcs	Data encoding scheme for messages	
sca	The SMS service center address of the message	
tosca	Type of SMS service center address	
vp	Validity period of SMS messages	
mn	Mobile phone number parameters	

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	2000	AT Maximum time for command execution results to be returned (ms)	2000

7.1.12 +CMSS, send message from memory

describe

This command sends a pre-stored message, which was previously written using the **+CMGW command. The <da>,<toda>** parameters are optional. If a destination address **DA is given** , the message is sent to that address. Otherwise, the message is sent to the destination address where it is stored (if any message was entered) If the destination address is not found, an error occurs.
When the given index is an incoming message index, the headers are set as follows **:**

- **<first-octet>** is **SMS-SUBMIT** and **VPF** .
- **TP-RP** and **TP-UDHI** Settings will be extracted from the first octet of the incoming message.
- **<vp> -** will be set to default value **- 167 - 03.40** Defined in.
- **<sca>, <tosca> , <pid> and** <dcs> **will** be set according to the incoming message parameters.
- If **<da>** or **<toda>** is not sent in the command, **<oa>** and **<tooa> will be** used instead.

type	Order	response
Setting Commands	**AT+CMSS=<index>[,<da>[,<toda>]]**	Response **1** : **+CMSS: <mr>** Response **2** : **+CMS ERROR: <err>**
Query command parameter range	**AT+CMSS=?**	**OK**

parameter

name	describe	Value
index	Create an index in the store for the message to be retrieved	Type: Integer
da	Source Address **/** Destination Address, this field contains a single phone number	Type: String
toda	**DA** type	Type: String The value is between **128-255 If this field is not** given and **the first character is ' + ' ,** **<toda>** will be **145** otherwise it will be **129** .
mr	Message Index	Type: Integer

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	3000	AT Maximum time for command execution results to be returned (ms)	3000

7.1.13 +CMGW , write message in memory

describe

This command sends a pre-stored message, which was previously written using the +CMGW command. The <da>,<toda> parameters are optional. If a destination address DA is given , the message is sent to that address. Otherwise, the message is sent to the destination address where it is stored (if any message was entered) . If the destination address is not found, an error occurs.
When the given index is an incoming message index, the headers are set as follows :

- <first-octet> is SMS-SUBMIT and VPF .
- TP-RP and TP-UDHI Settings will be extracted from the first octet of the incoming message.
- <vp> - will be set to default value - 167 - 03.40 Defined in.
- <sca>, <tosca> , <pid> and <dcs> will be set according to the incoming message parameters.
- If <da> or <toda> is not sent in the command, <oa> and <tooa> will be used

instead.

type	Order	response
Setting Commands	Command 1 : If the current mode is text mode (+CMGF=1): AT+CMGW[=<da>[,<toda>[,<stat>]]]<CR> Text Input <ctrl- Z/ESC> Command 2 : If the current mode is PDU (+CMGF=0): AT+CMGW=<length>[,<stat>]<CR > PDU Given <ctrl- Z/ESC>	Response 1 : +CMGW: <index> Response 2 : +CMS ERROR: <err>

parameter

name	describe	Value

da	target address	Type: String The type of string represented in the currently selected character set
toda	Destination address type	Type: Integer 129 Number 145 in domestic format International format number (including "+")
stat	Message Status	Type: Integer • "REC UNREAD" : Newly received unread short messages (default value) • "REC READ" : Received read messages
		• "STO UNSENT" : Messages that have been stored but not sent (uncommitted messages by default) • "STO SENT" : stored and sent message
Index	Index number of the short message	
length	Short message to be sent PDU Data length	

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	2000	AT Maximum time for command execution results to be returned (ms)	2000

7.1.14 +CMGD , delete message

describe

This command deletes a message from the memory location <index> , or deletes multiple messages according to <delflag> . If the optional parameter <delflag> is entered and is greater than 0 , the <index> parameter will be ignored. If the deletion fails, the result +CMS is returned ERROR : .

Format

type	Order	response

Setting Commands	AT+CMGD=<index>[,<delflag>]	Respons e 1 : OK Response 2 : +CME ERROR: <err>
Query command parameter range	AT+CMGD=?	+CMGD : (valid value <index>s), (valid value <delflag>s) OK

parameter

name	describe	Value
index	In SMS The message to be deleted in the memory index	Type: Integer
delflag	Indicates multiple message deletion requests	Type: Integer • 0 : Delete the message specified in <index> .

name	describe	Value
		• 1 : Delete all read messages in the preferred message storage location, unread messages and stored mobile original messages (whether sent or not) are not deleted. Change. • 2 : Delete all read messages from the preferred storage location and the original messages sent, leaving the unread messages and the unsent mobile original messages unchanged . • 3 : Delete all read messages from the preferred message storage, keeping the original sent and unsent messages. • 4 : Delete all messages in the preferred storage location, including unread messages .

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no

AT Command response maximum duration (ms)	2000	AT Maximum time for command execution results to be returned (ms)	2000

7.1.15 + CGSMS , select MO SMS service

describe

This command is used to process SMS message services or

service preferences initiated by the module. Format

类型	命令	响应
设置命令	AT+CGSMS=[<service>]	响应 1 : OK 响应 2 : +CME ERROR: <err>
读取当前设置	AT+CGSMS?	+CGSMS: <service> OK
查询命令参数范围	AT+CGSMS=?	+CGSMS: (当前可用列表 <service>s) OK

parameter

name	describe	Value
service	Indicates the service or service preference to use	Type: Integer • 0 : Grouping domain • 1 : Circuit domain; (recommended to use this as the default setting) • 2 : Data domain priority (if GPRS If not available, use circuit domain) • 3 : CS domain first (if CS domain is not available, data domain is used)

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	500	AT Maximum time for command execution results to be returned (ms)	500

X35 The project does not support this command.

7.1.16 +CMGS , send SMS

describe

This command is used by the module to send a short message to the network. After the short message is successfully sent, the message reference value <mr> is returned to the module. The valid value range is 128-255 . The header parameters in text mode will be based on the CSMP command to set it.

Format

type	Order	response

Setting Commands	Command 1 : If the current mode is text mode (+CMGF=1): AT+CMGS=<da>[,<toda>]<CR> text input <ctrl- Z/ESC>	Response 1 : If the current mode is text mode (+CMGF=1) and the sending is successful: +CMGS: <mr>[,<scts>] OK
	Command 2 : If the current PDU Mode (+CMGF=0): AT+CMGS=<length><CR> PDU input <ctrl-Z/ESC>	Response 2 : If the current PDU Mode (+CMGF=0) and sent successfully : +CMGS: <mr> OK
		Response 3 : If the send fails : +CMS ERROR: <err>
Query command parameter range	AT+CMGS=?	OK

parameter

name	describe	Value
da	Destination address	Type: String The destination address needs to be enclosed in quotes. This field contains a single minimum value.
toda	Destination address type	Type: Integer The value is between 128-255 Between (according to GSM 03.40 , 9 . 1 . 2 . 5). If this field is not given and the first character of <da> is '+' , then <toda> will be 145 , otherwise it will be 129
length	- -	Type: Integer PDU Message Size in Mode Format This field contains a single minimum value, in octets, excluding SMSC data.
mr	The sent message reference sequence number.	Type: Integer
scts	SMS submission timestamp	

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no

Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	3000	AT Maximum time for command execution results to be returned (ms)	3000

7.1.17 +CSCB , cell broadcast message

describe

This command processes the type of cell broadcast message

received by the module and the selection of the data encoding

scheme. Format

type	Order	response
Setting Commands	AT+CSCB=[<mode>[,<mids>[,<dcss>]]]	if mode=0 and <mids> value is not specified , no message channel is accepted, and the module channel / mid list is cleared Respons e 1 : OK Response 2 : +CMS ERROR: <err>
Read current settings	AT+CSCB?	+CSCB: <mode>,<mids>,<dcss> OK
Query command parameter range	AT+CSCB=?	+CSCB : (support list <mode>s) OK

parameter

name	describe	Value
mode	- -	Type: Integer • 0 : The message types specified in <mids> and <dcss> are acceptable • 1 : The message type specified in <mids> and <dcss> is unacceptable (default)
mids	CBM Message identifiers contain all possible combinations (reference)	Type: String Defaults to an empty string
dcss	All possible CBMs Data encoding scheme combination	Type: String Range: 0~255 Defaults to an empty string

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	yes
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	500	AT Maximum time for command execution results to be returned (ms)	500

7.1.18 +SMMFULL , set active response (SMS Storage space is full

describe

This command is available in SMS Handle unsolicited responses when storage is full. If unsolicited responses are enabled, we will receive an SMS When receiving the message about storage space

Time is full

message.

类型	命令	响应
设置命令	AT+SMMFULL=<report_flag>	响应 1： OK 响应 2： +CME ERROR: <err>
读取当前设置	AT+SMMFULL?	+SMMFULL: <report_flag> OK
查询命令参数范围	AT+SMMFULL=?	+SMMFULL: (支持列表<report_flag>s) OK

parameter

name	describe	Value
report_flag	- -	Type: String • 0 : Disable unsolicited responses (default) • 1 : Enable unsolicited responses This command is not applicable to SG-9600-00 .

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	500	AT Maximum time for command execution results to be returned (ms)	500

8 Access and Security

8.1 Access and Security Instructions

8.1.1 AT , detect AT connection

describe

This command will only

return ok after it is **sent** .

类型	命令	响应
设置命令	AT	OK

characteristic

Do I need **a SIM?** Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (**ms**)	1000	**AT** Maximum time for command execution results to be returned (**ms**)	1000

8.1.2 +CPIN , enter PIN Unlock SIM card PIN , enter PUK Unlock SIM card PUK

describe

If the terminal has been set up before (**SIM PIN, SIM PUK , PH SIM PIN,** code) you need to send the unlock code to the terminal, if **PIN** The code was entered twice.

PIN No change. If no **PIN has been set** code, when unlocked it will return **+CME ERROR** .

SIM PIN , SIM PUK , PH-SIM PIN , PH-FSIM PIN , PH-FSIM PUK , SIM PIN2 , SIM PUK2 For UICC PIN for the selected application .

For example, in a UTRAN context, the selected application on the currently selected UICC should be a USIM , and the SIM PIN then represents the PIN of the selected USIM . For further details on application selection on the UICC , see 3GPP TS 31.101[65] .

If PIN The code required is SIM PUK Or SIMPUK2 , you need a second PIN Code, second PIN code,

This is the new **PIN**. The code will replace the old **PIN** code.

Format

type	Order	response
Setting Commands	**AT+CPIN=<pin>[,<newpin>]**	Respons e 1 : **OK** Response 2 : **+CME ERROR: <err>**
Read current settings	**AT+CPIN?**	Response 1 : **+CPIN: <code>** **OK** Response 2 : **+CME ERROR: <err>**
Query command parameter range	**AT+CPIN=?**	**OK**

parameter

name	describe	Value
pin ， **newpin**	**PIN** code	Type: String
code	**PIN** Code data type	• **READY** : **MT No PIN** is preset code • **SIM PIN** : **MT Waiting for PIN** entry code • **SIM PUK** : **MT Waiting for PUK** input code • **PH-SIM PIN** : **MT** Waiting for the phone to give **SIM** Card password • **PH-FSIM PIN** : **MT** Waiting for the phone to the first **SIM** Card Entry **PIN** code • **PH-FSIM PUK** : **MT** Waiting for the phone to the first **SIM** Card input **PUK** code • **SIM PIN2** : **MT** Waiting for **PIN2** Code, if **PIN2** Code input failed, for example, return **+CME ERROR** : **17** , it is recommended that **MT** not block its operation. • **SIM PUK2** : **MT** Waiting for **PUK2** If the **PUK2** code input fails, for example, **+CME ERROR:18 is returned** , it is

recommended that the MT do not block its operation.

- PH-NET PIN : MT Waiting for network settings to be entered
  PIN Code Input

name	describe	Value
		• PH-NET PUK : MT Waiting for network settings to be entered PUK Code Input • PH-NETSUB PIN : MT Waiting for sub- PIN code input for network settings • PH-NETSUB PUK : MT Waiting for sub - PUK code input for network settings • PH-SP PIN : MT Waiting for PIN from service provider Code Input • PH-SP PUK : MT Waiting for PUK from service provider Code Input • PH-CORP PIN : MT Waiting for operator customization PIN Code Input • PH-CORP PUK : MT Waiting for operator customization PUK Code Input

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

8.1.3 +TPIN , check the remaining SIM PIN/PUK input times

describe

This command returns the SIM card that is currently being used. Card PIN and PUK The command returns the remaining number of attempts for PIN1 (CHV1) ,PIN2 (CHV2) , PUK1 (unblock CHV1) and PUK2 (unblock The number of attempts remaining for CHV2) . The number of available attempts depends on the vendor. Usually 3 Secondary PIN Try, 10 PUK Try. If no SIM is inserted , this command will return an error.

Format

type	Order	response
Setting Commands	AT+TPIN?	Response 1 : +TPIN: <chv1>,<unb1_chv1>,<chv2>,<unb1_chv2> Response 2 : +CME ERROR: <err>

parameter

name	describe	Value
chv1	Remaining PINs Number of attempts	Type: Integer
chv2	Remaining PIN2 Number of attempts	Type: Integer
unb1_chv1	Remaining PUK Number of attempts	Type: Integer
unb1_chv2	Remaining PUK2 Number of attempts	Type: Integer

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

8.1.4 +CPWD， change password

describe

This command sets a new password for the device. The password can only be changed after the desired functionality has been enabled by the +CLCK command. The password can only be modified after the supplied password has been verified.
The password you enter must also comply with the password encoding rules. The facility value

is not case sensitive. Letters are not allowed in the password value. Format

类型	命令	响应
设置命令	AT+CPWD=<fac>,<oldpwd>,<newpwd>	响应 1： OK 响应 2： +CME ERROR: <err>
查询命令当前范围	AT+CPWD=?	响应 1： +CPWD: 支持列表(<fac>,<pwdlength>)s OK 响应 2： +CME ERROR: <err>

parameter

name	describe	Value
fac	- -	Type: String • "SC" : Lock SIM Card, when locked SIM After the card is inserted, the password will be asked when the phone is turned on. • "AO" : BAOC (All external calls are prohibited) (See 3GPP TS 22.088 [6] clause 1) • "OI" : BOIC (All international calls are prohibited) (See 3GPP TS 22.088 [6] clause 1) • "OX" : BOIC exHC (all international calls are prohibited except for the home country) (see 3GPP TS 22.088 clause 1) . • "AI" : BAIC (Block all incoming calls) (See 3GPP TS 22.088 [6] clause 2) • "IR" : BIC Roam (When roaming, all incoming calls are blocked) (See 3GPP TS 22.088 clause 2) • "AB" : Disable all services (see 3GPP TS 22.030 [19]) (Applicable only when <mode>=0) • "AG" : Disable all call services (refer to 3GPP TS 22.030 [19]) (Applicable only when <mode>=0) • "AC" : Disable all incoming call services (refer to 3GPP TS 22.030 [19]) (Applicable only when <mode>=0) • "P2" : SIM PIN2
oldpwd	Should be the same as the password set by the user , or use +CPWD command to change the password .	Type: String
newpwd	Should be the same as the password set by the user , or use +CPWD command changes the password . The maximum length of the password can be set by	Type: String

<pwdlength> .

pwdlength	Maximum password length	Type: Integer

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

8.1.5 +CLCK，device lock

describe

This command locks, unlocks or interrogates a module or network facility (any type of call restriction procedure)
A password is required for locking and unlocking operations, but not for querying. When querying a single call limit program **<mode>=2** status
<status> will be returned for each

call type. Format

类型	命令	响应
设置命令	AT+CLCK=<fac>,<mode>[,<passwd>[,<classx>]]	响应 1： +CME ERROR: <err> 响应 2： （当模式 <mode>=2 并且命令发送成功）： +CLCK: <status>[,<class1> [<CR><LF>+CLCK: <status>,<class2> […]] OK
查询命令参数范围	AT+CLCK=?	+CLCK: (支持列表<fac>s) OK

parameter

name	describe	Value

fac	- -	Type: String • "SC" : Lock SIM Card, when locked SIM After the card is inserted, the password will be asked when the phone is turned on. • "AO" : BAOC (All external calls are prohibited) (See 3GPP TS 22.088 [6] clause 1) • "OI" : BOIC (All international calls are prohibited) (See 3GPP TS 22.088 [6] clause 1) • "OX" : BOIC exHC (Except local countries, all international calls are prohibited) (See 3GPP TS 22.08 8 clause 1) • "AI" : BAIC (Block all incoming calls) (See 3GPP TS 22.088 [6] clause 2) • "IR" : BIC Roam (When roaming, all incoming calls are blocked) (See 3GPP TS 22.088 clause 2) • "AB" : Disable all services (see 3GPP TS 22.030 [19]) (Applicable only when <mode>=0)

name	describe	Value
fac	- -	The values are as follows: • "AG" : Disable all call services (refer to 3GPP TS 22.030 [19]) (Applicable only when <mode>=0) • "AC" : Disable all incoming call services (refer to 3GPP TS 22.030 [19]) (Applicable only when <mode>=0) • "PS" : PH SIM (Lock the phone to the SIM/UICC card installed in the currently selected slot) M T Ask for a password in addition to inserting the current SIM/UICC card; MT can remember a certain number of previously used cards, so no password is required when inserting) "FD" : SIM Card or UICC To activate the fixed dial memory feature in the application, if PIN2 authentication is not currently performed , you need to use PIN2 as <passwd> . • "PN" : Network-specific (see 3GPP TS 22.022 [33]) • "PU" : Subnet customization (see 3GPP TS 22.022 [33]) • "PP" : Vendor-Specific (see 3GPP TS 22.022 [33]) • "PC" : Operator-customized (see 3GPP TS 22.022 [33])
mode	Unlock	Type: Integer • 0 : Unlock • 1 : Lock • 2 : Query status

status	Activate now	Type: Integer • 0 : Not activated • 1 : Activate
passwd	Must be with MT The facility password specified in the user interface is the same as the one specified in the facility password, or the password is changed using the command	Type: String
classx	representing a type of information (default is 7 - Voice, Data and Fax)	Type: Integer • 1 : Voice • 2 : Data (refers to all bearer services ; when <mode>=2 If TA The values 16 , 32 , 64 and 128 are not supported , so this value may only apply to certain bearer services) • 4 : Fax (fax service) • 8 : Short Message Service • 16 : Data domain circuit domain synchronization • 32 : Data domain circuit domain asynchronous • 64 : Proprietary packet access • 128 : Proprietary PAD Access

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

8.1.6 +CPINR , remaining PINs Retry

describe

When this command is set, MT will return the remaining PIN retries + CPINR:

类型	命令	响应
设置命令	AT+CPINR[=<sel_code>]	响应 1：

<code>,<retries>[,<default_retries>] . Format

parameter

name	describe	Value
retries	**PIN** The remaining number of retries for the code	Type: Integer
default_retries	**PIN** The default and initial remaining times of the code	Type: Integer
code	**PIN** Code data type	Type: String In addition to **'READY'** , **the <code>** parameters are included in **AT+CPIN All values listed under** Command Parameters Interface Description.
ext_code	Manufacturer Specific Extensions	Type: String
sel_code	**- -**	Type: String The values are strings and should be enclosed in double quotes; wildcard matching is optional via ' ***'** , meaning match any (sub)character.

characteristic

Do I need **a SIM?** Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (**ms**)	1000	**AT** Maximum time for command execution results to be returned (**ms**)	1000

8.1.7 +CSIM , Universal SIM access

describe

This command allows TE Direct access to

SIM card by apps Card. Format

类型	命令	响应
设置命令	AT+CSIM=<length>,<命令>	响应 1: +CSIM: <length>,<response> OK 响应 2: +CME ERROR: <err>
查询命令参数范围	AT+CSIM=?	OK

parameter

name	describe	Value
length	Send to TE in <command> or <response> Character length	Type: Integer
Order	MT GPP TS 51.011 (hexadecimal, see command +CSCS) The format of the interface description is passed to the SIM card	Type: String
response	According to 3GPP TS 51.011 (hexadecimal character format) in the interface description format , responding to the command passed by the SIM to the MT (command + CSCS)	Type: String

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	2000	AT Maximum time for command execution results to be returned (ms)	2000

8.1.8 +CRSM , limit SIM access

describe

This command provides limited access to basic files on the SIM card. Access to the SIM database is limited to the commands listed in. All parameters of AT+CRSM are in accordance with 3GPP TS 51.011 (2G) and TS31.101 (3G) . As a response to the command, the module sends the actual SIM information parameters and the response data. If the command cannot be transmitted to the SIM , an error result code "+CMEError" may be returned , for example: if the SIM No insertion,

Either **PIN1/PUK needs to be entered** , or the required input parameters do not appear. The **<sw1><sw2> parameters** reported by **the SIM card** show that the command execution failed.

AT+CRSM Command requires

PIN/PIN2 Validation. Format

类型	命令	响应
设置命令	AT+CRSM=<命令>[,<file_id>[,<P1>,<P2>,<P3>[,<data>[,<pathid>]]]]	响应 1： +CRSM: <sw1>,<sw2>[,<response>] OK 响应 2： +CME ERROR: <err>
查询命令参数范围	AT+CRSM=?	OK

parameter

name	describe	Value
Order	Command by **MT** Passed to **SIM** (see **3GPP TS 51.011 [28]**)	Type: Integer • **176** : READ BINARY • **178** : READ RECORD • **192** : GET RESPONSE • **214** : UPDATE BINARY • **220** : UPDATE RECORD • **242** : STATUS • **203** : RETRIEVE DATA • **219** : SET DATA All other values are reserved
file_id	This is the identifier of the basic data file on **the SIM** . All commands except the status command must be executed.	Type: Integer The range of valid file identifiers depends on the actual **SIM** . **3GPP TS As defined in 51.011[28]** , the selected file may not exist at all.
P1 , **P2** , **P3**	By **MT** Pass to **SIM** These parameters are required for each command except **GET RESOPNSE** and **STATUS** . **The specific interface** description is in **3GPP TS 51.011[28]** .	Type: Integer
data	Must be written to **SIM** Card information (hexadecimal character format; see **+CSCS**)	Type: String

pathid	Contains in hexadecimal format SIM/UICC The basic file path on the ETSI protocol TS 102 221 [60] There are interface instructions (for example	Type: String

name	describe	Value
	Such as : F205F70 " in SIM and UICC Example <pathid> can only be used in the " path from "MF Used in " Select " mode.	
sw1 , sw2	From SIM For information about the actual command execution , please refer to TS102.221 .	Type: Integer
response	Response to successful completion of a previously issued command (in hexadecimal character format, see +CSCS)	Type: String STATUS and GET RESPONSE Data that provides information about the current basic data field. This information includes the type of file and its size (see 3GPP TS 51.011 [28]) After reading a binary, read record or retrieve data command the data requested will be returned. This parameter is not returned after a successful execution of an update binary file, update record or set data command .

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	2000	AT Maximum time for command execution results to be returned (ms)	2000

8.1.9 + CCHO , open UICC Logical Channel

describe

This command enables the module to return a <sessionid> assigned by UICC , which is used

for CRLA and CGLA commands to access UICC . Format

类型	命令	响应
设置命令	AT+CCHO=<dfname>	响应 1 : <sessionid> OK 响应 2 : +CME ERROR: <err>
读取当前设置	- -	- -

parameter

name	describe	Value
dfname	UICC DF in Name, 16 Binary string	Type: String DF Then the maximum length is 16 Bytes, the converted parameter is up to 32 bytes byte. 0xA0 , 0x00 , 0x03 , 0xEF This way 4 bytes, needs to be converted into an 8 -byte string of "A00003EF" . Detailed reference: 3GPP TS 27.007
sessionid	SIM Card-assigned Session ID	Type: Integer Detailed reference: 3GPP TS 27.007

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

8.1.10 +CCHC , turn off UICC Logical Channel

describe

This command closes the previously opened UICC Logical channel,

closed will not be able to access UICC . Format

类型	命令	响应
设置命令	AT+CCHC=<sessionid>	响应 1: +CCHC OK 响应 2: +CME ERROR: <err>
读取当前设置	--	--
查询命令参数范围	--	--

parameter

name	describe	Value
sessionid	Previous SIM Card-assigned Session ID	Type: Integer Detailed reference: 3GPP TS 27.007

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

8.1.11 + CGLA , Generic UICC Logical channel access

describe

This command is passed through the previously opened UICC The logical channel sends

a command to the UICC . Returns the execution result of the command. Format

类型	命令	响应
设置命令	AT+CGLA=<sessionid>,<length>,<command>	响应 1: +CGLA: <length>,<response> OK 响应 2: +CME ERROR: <err>
读取当前设置	--	--
查询命令参数范围	--	--

parameter

name	describe	Value
sessionid	Previous SIM Card-assigned Session ID	Type: Integer Detailed reference: 3GPP TS 27.007
length	The length of the command sent or the response received	Type: Integer twice the actual bytes of the command or response . For example, if the command is 0xB0 and 0x3C , the command string is

"B03C" and the length is 4 .

command	Send to UICC The command string	Type: String The command byte is converted into a string of 0xA0 , 0x00 , 0x03 , 0xEF This way 4 The command of 8 bytes needs to be converted into "A00003EF", an 8 -byte string.

name	describe	Value
response	UICC response	Type: String For details on the string converted from the response bytes, please refer to: 3GPP TS 27.007

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

9 network

9.1 Network Commands

9.1.1 +CSQ，signal strength

describe

<rssi> and the channel bit error rate **<ber>** received by the module .

Format

类型	命令	响应
设置命令	AT+CSQ	+CSQ: <rssi>,<ber> OK
读取当前命令	AT+CSQ?	+CSQ: <rssi>,<ber> OK
查询命令参数范围	AT+CSQ=?	+CSQ: (list of supported <rssi>s),(list of supported <ber>s) OK

parameter

name	describe	Value
rssi	Signal strength received by the module	Type: Integer • 0 : -113 dBm or lower • 1 : -111 dBm • 2~30 : -109 ~ -53 dBm • 31 : -51 dBm or greater • 99 : Unknown or not detected
ber	Channel bit error rate (unit : percentage)	Type: Integer • 0~7 : such as 3GPP TS 45.008 Section 8.2.4 RXQUAL in the table value • 99 : Unknown or not detected

characteristic

Do I need a SIM? Card	no	Do I need to register a	no

normal		network?	
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

9.1.2 +CESQ , Extended Signal Quality

describe

Executing this command returns the signal quality parameters received by the device.

- If the current serving cell is not GERAN cell, <rxlev> and <ber> are set to the value 99 ;
- If the current serving cell is not UTRA FDD or UTRA TDD If it is a cell, <rscp> is set to 255 ;
- If the current serving cell is not UTRA FDD If it is a cell, <ecno> is set to 255 ;
- If the current serving cell is not E-UTRA If the cell is a 4-bit cell, <rsrp> and <rsrq> are set to 255 ;
- If the current serving cell is not NR If the cell is a 10-100 cell, <ss-rsrp> , <ss-rsrq> , and <ss-sinr> are set to 255. Format

type	Order	response
Setting Commands	AT+CESQ	+CESQ: <rxlev>,<ber>,<rscp>,<ecno>, <rsrq>,<rsrp>,<ss_rsrq>,<ss_rsrp>,<ss_sinr> OK or +CME ERROR: <error>

Query command parameter range	AT+CESQ=?	+CESQ: (list of supported <rxlev>s),(list of supported <ber>s),(list of supported <rscp>s),(list of supported <ecno>s),(list of supported <rsrq>s),(list of supported <rsrp>s,(list of supported <ss_rsrq>s),(list of supported <ss_rsrp>s),(list of supported <ss_sinr>s) OK

参数

名称	描述	取值
rxlev	Received signal strength (see 3GPP TS 45.008 subclause 8.1.4)	Type: Integer • 0 : rssi < -110 dBm • 1 : -110 dBm ≤ rssi < -109 dBm • 2 : -109 dBm ≤ rssi < -108 dBm ... • 61 : -50 dBm ≤ rssi < -49 dBm • 62 : -49 dBm ≤ rssi < -48 dBm • 63 : -48 dBm ≤ rssi • 99 : unknown or undefined
ber	Channel bit error rate (unit : percentage)	Type: Integer • 0~7 : such as 3GPP TS 45.008 Section 8.2.4 RXQUAL in the table value • 99 : Unknown or not detected
rscp	Received signal coding strength (see 3GPP TS 25.133 subclause 9.1.1.3 and 3GPP TS 25.123 subclause 9.1.1.1.3)	Type: Integer • 0 : rscp < -120 dBm • 1 : -120 dBm ≤ rscp < -119 dBm • 2 : -119 dBm ≤ rscp < -118 dBm ... • 94 : -27 dBm ≤ rscp < -26 dBm • 95 : -26 dBm ≤ rscp < -25 dBm • 96 : -25 dBm ≤ rscp • 255 : unknown or undefined
ecno	Each PN The ratio of the energy received by the chip to the total received power (see 3GPP TS 25.133 subclause)	Type: Integer • 0 : Ec/Io < -twenty four dB • 1 : -24 dB ≤ Ec/Io < -23.5 dB • 2 : -23.5 dB ≤ Ec/Io < -23 dB ... • 47 : -1 dB ≤ Ec/Io < -0.5 dB • 48 : -0.5 dB ≤ Ec/Io < 0 dB • 49 : 0 dB ≤ Ec/Io • 255 : unknown or undefined

rsrp	Received signal power (see 3GPP TS 36.133 subclause 9.1.4)	Type: Integer • 0 : rsrp < -140 dBm • 1 : -140 dBm ≤ rsrp < -139 dBm • 2 : -139 dBm ≤ rsrp < -138 dBm ... • 95 : -46 dBm ≤ rsrp < -45 dBm • 96 : -45 dBm ≤ rsrp < -44 dBm • 97 : -44 dBm ≤ rsrp
rsrq	Received signal quality (see 3GPP TS 36.133 subclause 9.1.7)	Type: Integer • 0 : rsrq < -19.5 dB • 1 : -19.5 dB rsrq < -19 dB • 2 : -19 dB rsrq < -18.5 dB ... • 32 : -4 dB ≤ rsrq < -3.5 dB • 33 : -3.5 dB ≤ rsrq < -3 dB • 34 : -3 dB ≤ rsrq • 255 : unknown or undefined
ss_rsrq	Based on the reference signal reception quality of the synchronization signal (see 3GPP TS 38.133 [169] Section 10.1.11 Section)	Type: Integer • 0 ss_rsrq < −43 dB • 1 −43 dB ≤ ss_rsrq < −42. 5 dB • 2 −42. 5 dB ≤ ss_rsrq < −42 dB ... • 124 18. 5 dB ≤ ss_rsrq < 19 dB • 125 19 dB ≤ ss_rsrq < 19. 5 dB • 126 19. 5 dB ≤ ss_rsrq < 20 dB • 255 : unknown or undefined

ss_rsrp	Based on the reference signal received power of the synchronization signal (see 3GPP TS 38.133 [169] Section 10.1.6 section)	Type: Integer • 0 ss_rsrp < -156 dBm • 1 -156 dBm ≤ ss_rsrp <- 155 dBm • 2 -155 dBm ≤ ss_rsrp <- 154 dBm ...

name	describe	Value
		• 125 -32 dBm ≤ ss_rsrp <-31 dBm • 126 -31 dBm ≤ ss_rsrp • 255 unknown or undefined
ss_sinr	Based on the signal-to-noise and interference ratio of the synchronization signal (see 3GPP TS 38.133 [169] Section 10.1.16 section)	Type: Integer • 0 ss_sinr < -twenty three dB • 1 -twenty three dB ≤ ss_sinr <-22.5 dB • 2 -22.5 dB≤ ss_sinr <-22 dB ... • 125 39 dB≤ ss_sinr < 39.5 dBm • 126 39.5 dB≤ ss_sinr < 40 dB • 127 40 dB ≤ ss_sinr • 255 unknown or undefined

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands

Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

9.1.3 +CREG , network registration status

describe

The command is as follows:

- +CREG : < stat> when <n > = 1 And MT CS Domain registration status in GERAN/UTRAN/E-UTRAN When a change occurs in the data, the change value will be reported.
- + CREG : when <n> = 2 And GERAN/UTRAN/E-UTRAN When the cell in <stat>[, [<lac>] , [<ci>] , [<AcT>]] and other parameters will be sent only when they are available.

- + CREG : When <n> = 3 , the value of <stat> occurs, and the values of [,<lac>,<ci>[,<AcT>[,<cause_type>[,<reject_cause>]]]] will be reported.

This command reads the command MT Register the network status and display the integer <stat> , which shows whether the network has currently indicated MT Only the location information parameters <lac> , <ci> and <AcT> (if available) When <n>=2 and the MT is registered in the network. If <n>=3 , the parameters [, <cause_type> , <reject_cause>] (if available)

Format

type	Order	response
Setting Commands	AT+CREG=[<n>]	Respons e 1 : OK Response 2 : ERROR : <error>
Read current settings	AT+CREG?	+CREG: <n>,<stat> [,<lac>,<ci>[,<AcT>[,<cause_type>[,<reject_cause>]]]] OK
Query command parameter range	AT+CREG=?	+CREG: (list of supported <n>s) OK

parameter

name	describe	Value
n	the return value when reading commands	Type: Integer • 0 : Disable unsolicited result returns when registering to a network (default value) • 1 : Enable unsolicited result returns when registering a network +CREG: <stat> . • 2 : Enable network registration and location information, + CREG : <stat> [, [<lac>] , [<ci>] , [<AcT>]] . • 3 : Enable network registration, location information and cause value information, +CREG : <stat>[, [<lac>] , [<ci>] , [<AcT>][, <cause_type> , <reject_cause>]] .

stat	Registration Status	Type: Integer • 0 : Unregistered, MT Currently there is no search for new operators or cells to register. • 1 : Registered, local network. • 2 : Unregistered, MT Currently searching for a new operator or cell to register.

name	describe	Value
		• 3 : Registration rejected. • 4 : Unknown (e.g., beyond GERAN/UTRAN/E- UTRAN Network coverage) • 5 : Registered, roaming network. • 6 : SMS registered only local network (only if <AcT> indicates E-UTRAN Applicable when applicable) • 7 : SMS registered only roaming network (only if <AcT> indicates E-UTRAN Applicable when applicable) • 8 : For emergency bearer service only (see Note 2) Not applicable) • 9 : Register "CSFB The local network is not preferred only when <AcT> indicates E-UTRAN Applicable when. • 10 : Register "CSFB The "non-preferred " roaming network is only available when <AcT> indicates E-UTRAN Applicable when.
lac	Two-byte location area code (<AcT> indicates a value of 0 to 6) or the tracking area code (<AcT> indicates a value of 7). Displayed in hexadecimal format (for example, " 00C3" equals decimal 195)	Type: String
ci	GERAN / UTRAN/E-UTRAN cell ID in hexadecimal format	Type: String

ATT	Type of access technology	Type: Integer • 0 : GSM • 1 : GSM Compact • 2 : UTRAN • 3 : GSM w/EGPRS (see note 1) • 4 : UTRAN w/HSDPA (see Note 2) • 5 : UTRAN w/HSUPA (see note 2) • 6 : UTRAN w/HSDPA and HSUPA (see Note 2) • 7 : E- UTRAN 3GPP TS 44.060 [71] specifies a system information message which gives information on whether a serving cell supports EGPRS . 3GPP TS 25.331 [74] specifies a system information block that provides information about whether the serving cell supports HSDPA. or HSUPA information.
cause_type	The specific type of the <reject_cause> value	Type: Integer • 0 : Indicates that <reject_cause> contains MM Cause value, see 3GPP TS 24.008 [8] Annex G.

name	describe	Value
		• 1 : Indicates that <reject_cause> contains the reason value specified by the manufacturer .
reject_cause	Contains the reason why the registration failed. The value is of type defined by <cause_type> .	Type: Integer

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

9.1.4 + CGREG , GPRS Network Registration

describe

When **<n> = 1** And in **GERAN / UTRAN** Medium **MT** GPRS **This command controls the active result + CGREG** when the network registration status changes :
<stat> .
+ CGREG : **<stat> [** , **[<lac>]** , **[<ci>]** , **[<AcT>]** , **[<rac>]]** , when **<n> = 2** and the cell of the terminal in **GERAN/UTRAN** changes. Parameters such as **<AcT>** , **<lac>** , **<rac>** and **<ci>** are reported only when they are available. **+** When the value of **<stat>** changes, and the value
<n>=3 In the case of **[** , **<cause_type>** , **<reject_cause>]** the value will be displayed.
The read command returns the status indicated by the result code and an integer **<stat>** indicating whether the network has currently instructed **the MT** Registration.
Position information elements **<lac>** , **<ci>** , **<AcT>** and **<rac>** , if and only if **<n> = 2** And **MT** The command returns available only when the terminal is registered in the network. The command return value is affected by the range of network registration modes supported by the terminal (i.e. the value of **<n>**)

Format

type	Order	response
Setting Commands	AT+CGREG=[<n>]	Respons e 1 : OK Response 2 : CME ERROR: <error>
Read current settings	AT+CGREG?	+CGREG: <n>,<stat>[,[<lac>],[<ci>],[<AcT>],[<rac>][,<cause_type>,<reject_cause>]] OK
Query command parameter range	AT+CGREG=?	+CGREG: (list of supported <n>s) OK

parameter

name	describe	Value
n	Used to set commands and set the return value when reading commands	Type: Integer • 0 : Disable unsolicited result returns when registering to a network (default) • 1 : Enable unsolicited result returns when registering a network +CREG: <stat> . • 2 : Enable network registration and location information, + CREG : <stat> [, [<lac>] , [<ci>] , [<AcT>]] . • 3 : Enable network registration, location information and reason value information, +CREG : <stat>[, [<lac>] , [<ci>] , [<AcT>][, <cause_type> , <reject_cause>]] .
stat	Display GPRS Registration Status	Type: Integer • 0 : Unregistered, MT Currently not searching for new operators or communities to register • 1 : Registered, local network • 2 : Unregistered, MT Currently searching for a new operator or community to register • 3 : Registration rejected • 4 : Unknown (e.g., beyond GERAN/UTRAN/E- UTRAN Network coverage) • 5 : Registered, roaming network • 6 : SMS registered only Local network (applicable only when <AcT> indicates E-UTRAN) • 7 : SMS registered only Roaming network (applicable only when <AcT> indicates E-UTRAN) • 8 : For emergency bearer service only (not applicable) • 9 : Registering the local network with "CSFB not preferred " is applicable only when <AcT> indicates E-UTRAN • 10 : Registering a roaming network with "CSFB not preferred " is applicable only when <AcT> indicates E-UTRAN

lac	Two-byte location area code (<AcT> indicates a value of 0 to 6) or the tracking area code (<AcT> indicates a value of 7) and is displayed in hexadecimal format (for example, "00C3" equals decimal 195)	Type: String
ci	GERAN / UTRAN/E-UTRAN cell ID in hexadecimal format	Type: String
ATT	Type of access technology	Type: Integer • 0 : GSM

name	describe	Value
		• 1 : GSM Compact • 2 : UTRAN • 3 (1) : GSM w/EGPRS • 4 (2) : UTRAN w/HSDPA • 5 (2) : UTRAN w/HSUPA • 6 (2) : UTRAN w/HSDPA and HSUPA • 7 : E- UTRAN (1) : 3GPP TS 44.060 [71] specifies a system information message which gives information on whether a serving cell supports EGPRS . (2) : 3GPP TS 25.331 [74] specifies a system information block that provides information on whether a serving cell supports HSDPA or HSUPA .
cause_type	The specific type of the <reject_cause> value	Type: Integer • 0 : Indicates that <reject_cause> contains MM Cause value, see 3GPP TS 24.008 [8] Annex G ; • 1 : Indicates that <reject_cause> contains the reason value specified by the manufacturer .
reject_cause	Contains the reason why the registration failed.	Type: Integer The type of this value is defined by <cause_type>
rac	Current routing area code	

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands

Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

9.1.5 +CEREG , EPS Network registration status

describe

When <n> = 1 And MT Register EPS When the network status changes, this command controls +CEREG : <stat>, or +CEREG :
Display of <stat>[,<tac>,<ci>[,<AcT>]]] .
When <n> = 2 and the network cell changes, +CEREG : <stat>[,<tac>[,<ci>[,<AcT>[, and <n>=3 hour, <cause_type>[,<reject_cause>]]]]]]] The response of this

command may also change. Format

type	Order	response
Setting Commands	AT+CEREG=[<n>]	Respons e 1 : OK Response 2 : CME ERROR: <error>
Read current settings	AT+CEREG?	+CEREG: <n>,<stat>[,[<tac>],[<ci>],[<AcT>[,<cause_type>,<reject_cause>]]] OK
Query command parameter range	AT+CEREG=?	+CEREG: (list of supported <n>s) OK

parameter

name	describe	Value
n	Used to set commands and set the return value when reading commands	Type: Integer • 0 : Disable unsolicited result returns when registering to a network (default) • 1 : Enable unsolicited result return of +CEREG :<stat> when registering to the network . • 2 : Enable network registration and location information, +CEREG : <stat> [, [<lac>] , [<ci>] , [<AcT>]] . • 3 : Enable network registration, location information and reason value information, +CEREG : <stat>[, [<lac>] , [<ci>] , [<AcT>][, <cause_type> , <reject_cause>]] . • 4 : For PSM to be applied UE , enable network registration and unsolicited location information +CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,,[,[<Active-Time>],[<Periodic-TAU>]]]] • 5 : For PSM to be applied UE , enabling network registration, location information and EMM Reason value information +CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,[<cause_type>],[<reject_cause>][,[<Active-Time>],[<Periodic-TAU>]]]]

stat	Registration Status	Type: Integer • 0 : Unregistered, MT Currently there is no search for new operators or cells to register. • 1 : Registered, local network. • 2 : Unregistered, MT Currently searching for a new operator or cell to register. • 3 : Registration rejected. • 4 : Unknown (e.g., outside GERAN/UTRAN/E-UTRAN Network coverage) • 5 : Registered, roaming network. • 6 : SMS registered only Local network (only when <AcT> indicates E-UTRAN Applicable when applicable)

name	describe	Value
		• 7 : SMS registered only Roaming network (only when <AcT> indicates E-UTRAN Applicable when applicable) • 8 : For emergency bearing service only (see note) (not applicable) • 9 : Register "CSFB The local network that is not preferred is only used when <AcT> indicates that E-UTRAN Applicable when. • 10 : Register "CSFB The roaming network that is not preferred is only available when <AcT> indicates that E-UTRAN Applicable when.
lac	Two-byte location area code (<AcT> instructions Value 0 to 6)or the tracking area code (<AcT> indicates the value 7) . Displayed in hexadecimal format (For example, " 00C3" equals decimal 195)	Type: String
ci	In hexadecimal format Four Character Festival GERAN /	Type: String

	UTRAN / E-UTRAN Community ID	
ATT	Type of access technology	Type: Integer • 0 : GSM • 1 : GSM Compact • 2 : UTRAN • 3 (1) : GSM w/EGPRS • 4 (2) : UTRAN w/HSDPA • 5 (2) : UTRAN w/HSUPA • 6 (2) : UTRAN w/HSDPA 和 HSUPA • 7: E-UTRAN (1): 3GPP TS 44.060 [71] specifies a system information message that gives information on whether a serving cell supports EGPRS . (2): 3GPP TS 25.331 [74] specifies a system information block that provides information about whether the serving cell supports HSDPA. or HSUPA Information.
cause_type	<reject_cause >The specific type of the value	Type: Integer • 0 : Indicates that <reject_cause> contains MM Cause value, see 3GPP TS 24.008 [8] Annex G . • 1 : Indicates that <reject_cause> contains the reason value specified by the manufacturer.

name	describe	Value
reject_cause	Contains the reason for the registration failure. kind type Depend on <cause_type> definition.	Type: Integer
tac	Current tracking area code	

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

9.1.6 +C5GREG , NR Network registration status

describe

Set command control unsolicited result code

+C5GREG Reporting format

类型	命令	响应
设置命令	AT+C5GREG=[<n>]	响应 1 : OK 响应 2 : +CME ERROR: <err>
读取当前设置	AT+C5GREG?	+C5GREG: <n>,<stat>[,[<tac>],[<ci>],[<AcT>],[<Allowed_NSSAI_length>] ,[<Allowed_NSSAI>][,<cause_type>,<reject_cause>]] OK
查询命令参数范围	AT+C5GREG=?	+C5GREG: (<n>s 支持列表) OK

parameter

name	describe	Value
n	C5GREG Parameter return result type or reporting method	Type: Integer 0 : Disable unsolicited result returns when registering to a network (default) 1 : Enable network registration status unsolicited result code reporting +C5GREG : <stat> 2 : Network registration and location information reporting, + C5 G R E G : < s tat> [[< l ac >] [< c i >] , [<AcT>][<Allowed_NSSAI_length>],[<Allowed_NSSAI>]] 3 : Network registration, location information and 5GMM Reason value information, +C5GREG : <stat>[,[<Tac>],[<ci>],[<AcT>][<Allowed_NSSAI_length>],[<Allowed_NSSAI>]][, <cause_type> , <reject_cause>]];
stat	Registration Status	Type: Integer 0 : Unregistered, MT Currently not searching for new operators or communities to register 1 : Registered, local network 2 : Unregistered, MT Currently searching for a new operator or community to register 3 : Registration rejected 4 : Unknown (for example, beyond NR Network coverage) 5 : Registered, roaming network 6 : SMS registered only Local network (not applicable) 7 : SMS registered only Roaming network (not applicable) 8 : For emergency load-bearing services only 9 : Register "CSFB Local network not preferred (not applicable) 10 : Register "CSFB "Non-priority " roaming network (not applicable) 11 : Register to RLOS (Not applicable)
tac	Three-byte location region code, displayed in hexadecimal format (for example, " 00C3" equals decimal 195)	Type: String
ci	Five bytes in hexadecimal format NR Cell ID	Type: String
Allowed_NSSAI_length	Indicates < Allowed_NSSAI > Number of octets in the information element	Type: Integer

Allowed_NSSAI	Depending on the format, the string can be separated by dots, semicolons, and colons. This parameter indicates the allowed S-NSSAIs received from the network. list. < Allowed_NSSAI > is edited The code is a colon-separated list of <S-NSSAI> . <S-NSSAI> Refer to Section 10.1.1 This parameter should not be +CSCS Performs general character conversion .	Type: Hexadecimal string
ATT	Type of access technology	Type: Integer 0 : GSM (unavailable)

name	describe	Value
		1 : GSM Compact (not available) 2 : UTRAN (not available) 3 : GSM w/EGPRS (Not available) 4 : UTRAN w/HSDPA (not available) 5 : UTRAN w/HSUPA (Not available) 6 : UTRAN w/HSDPA and HSUPA (Not available) 7 : E-UTRAN (Not available) 8 : EC-GSM-IoT (A/Gb mode) (unavailable) 9 : E-UTRAN (NB-S1 mode) (unavailable) 10 : E-UTRA connected to a 5GCN (Not available) 11 : NR connected to a 5GCN (Not available) 12 : NG-RAN 13 : E-UTRA-NR Dual connection (see note 8) Note: This command is only applicable to terminals that support 5GS
cause_type	specific type of the <reject_cause> value	Type: Integer 0 : Indicates that <reject_cause> contains MM Cause value , 3GPP TS 24.008 [8] Annex G. 1 : Indicates that <reject_cause> contains the reason value specified by the manufacturer.
reject_cause	Contains the reason why the registration failed. This value is	Type: Integer

of type
<cause_type> definition

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

9.1.7 + COPS , operator selection

describe

This command can access network registration information, as well as GSM/UMTS Network operator selection and registration. The module has registered with the local network and obtained the SIM
Card ICCID .
This feature allows the SIM card to store a mapping of MCC/MNC code pairs to displayed operator names. Several operators can share a network while having their phones display their own names as the network operator.
To test the enhanced ONS function, you need to use "

SIM ONS " SIM Card. Format

type	Order	response
Setting Commands	AT+COPS=[<mode>[,<format>[,<oper>[,<AcT>]]]]	Respons e 1 : OK Response 2 : CME ERROR: <error>
Read current settings	AT+COPS?	Response 1 : +COPS: <mode>[,<format>,<oper>[,<AcT>]] OK Response 2 : +CME ERROR: <err>
Query command parameter range	AT+COPS=?	+COPS: [list of supported (<stat>,long alphanumeric <oper>, short alphanumeric <oper>,numeric <oper>[,<AcT>])s][,,(list of supported <mode>s),(list of supported <format>s)] OK

parameter

name	describe	Value
mode	Used to set command parameters and select the mode of registering the network	Type: Integer • 0 : Automatic mode (ignore the <oper> field (default) • 1 : Manual mode (the <oper> field should appear and <AcT> can be selected) . • 2 : Register online. • 3 : Only for setting <format> (for read commands +COPS?) do not attempt to register / unregister (ignore <oper> and <AcT> fields) this value does not apply to read command responses. • 4 : Manual / Automatic mode (the word <oper> should appear If the manual selection fails, it will enter the a

		mode (<mode> = 0) • 5 : Network scanning and manual registration asynchronous mode

format	Used to set the display format of the operator name	Type: Integer

name	describe	Value
		• 0 : Long format alphanumeric <oper> ; default value (for example: China Unicom's full name is "CHINA UNICOM") • 1 : Short alphanumeric format <oper> (for example: China Mobile is abbreviated as "CMCC") • 2 : Number <oper>
Opera	The format is letter format or numeric format ; the long letter format can be up to 16 Words character, the short letter format can be up to 8 characters (refer to GSM MoU SE.13 [9]); number The word format is GSM Location Area Identification Number (See 3GPP TS 24.008 Section 10.5.1.3 Section) , including three BCD digit mobile country code , plus two BCD The mobile network code is management-specific ; the returned <oper> should not be BCD format, but should be from BCD	Type: String

	Converted IRA characters; therefore, the number has the following structure: (country code number 3)(country code number 2)(country code number 1) (network code number 3) (Network code number 2) (Network code number 1)	

stat	Is the currently searched network available?	Type: Integer • 0 : Unknown • 1 : Available • 2 : Current • 3 : Prohibited use
ATT	Access technology selection	Type: Integer • 0 : GSM • 1 : GSM Compact • 2: UTRAN • 3 (1) : GSM w/EGPRS • 4 (2) : UTRAN w/HSDPA • 5 (2) : UTRAN w/HSUPA • 6 (2) : UTRAN w/HSDPA 和 HSUPA • 7: E-UTRAN • 8 : EC-GSM-IoT (A/Gb mode) • 9 : E-UTRAN (NB-S1 mode) • 10 : E-UTRA connected to a 5GCN • 11 : NR connected to a 5GCN

name	describe	Value

	• 12 : NG -RAN • 13 : E-UTRA-NR dual connectivity (1): 3GPP TS 44.060 [71] specifies a system information message that gives information on whether a serving cell supports EGPRS . (2): 3GPP TS 25.331 [74] specifies a system information block that provides information about whether the serving cell supports HSDPA. or HSUPA information.

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	180000	AT Maximum time for command execution results to be returned (ms)	180000

9.1.8 +CPLS , select the preferred PLMN List

describe

This command is used to Select a PLMN with an access list in the card , or in the UICC (GSM or USIM) by selecting a PLMN to be used by the +CPOL command .

Format

type	Order	response
Setting Commands	AT+CPLS=[<list>]	Respons e 1 : OK Response 2 : CME ERROR: <error>
Read current settings	AT+CPLS?	+CPLS: <list> OK

parameter

name	describe	Value

list	PLMN with access list document	Type: Integer • 0 : User controlled with access technology EFPLMNwAcT PLMN Select, if not in SIM/UICC If found in Preferred columns

name	describe	Value
		Table EFPLMNsel (This file is only available in UICC Select the SIM card in card or GSM application available) • 1 : Operator-controlled PLMN Select a document EFOPLMNwAcT . • 3 : PLMN Controlled EFHPLMNwAcT document.

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

9.1.9 +CPOL , operator preferred

describe

This command is used to edit the PLMN in the active application in the SIM card or UICC (GSM or USIM) Select a list. If no list has been previously selected, EFPLMNwAcT is selected by default .

Format

type	Order	response
Setting Commands	AT+CPOL=[<index>][,<format>[,<oper>[,<GSM_AcT>,<GSM_Compact_AcT>,<UTRAN_AcT>,<EUTRAN_AcT>]]]	Respons e 1 : OK Response 2 : CME ERROR: <error>

Read current settings	AT+CPOL?	Response 1 : +CPOL: <index1>,<format>,<oper1>[,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<E-UTRAN_AcT1>] [<CR><LF>+CPOL: <index2>,<format>,<oper2>[,<GSM_AcT2>,<GSM_Compact_AcT2>,<UTRAN_AcT2>,<E-UTRAN_AcT2>] […] OK

type	Order	response
		Response 2 : +CME ERROR: <err>
Query command parameter range	AT+CPOL=?	Response 1 : +CPOL: (list of supported <index>s),(list of supported <format>s) OK Response 2 : +CME ERROR: <err>

parameter

name	describe	Value
index	**SIM / USIM** Index into the list of preferred operators	Type: Integer
format	Indicates whether the format is alphanumeric or numeric	Type: Integer • **0** : Long format alphanumeric **<oper>** , default value (for example: China Unicom's full name is **"CHINA UNICOM"**) • **1** : Short alphanumeric format **<oper> (** for example : China Mobile is abbreviated as **"CMCC"**) • **2** : Number **<oper>** .
Operan	Operator Name	Type: String

GSM_AcTn	GSM Access Technology	Type: Integer • 0 : No access technology selected • 1 : Access technology selected
GSM_Compact_AcTn	GSM Compact Access Technology	Type: String • 0 : No access technology selected • 1 : Access technology selected
UTRAN_AcTn	Access Technology	Type: Integer • 0 : No access technology selected • 1 : Access technology selected
E- UTRAN_AcTn	E-UTRAN Access Technology	Type: Integer • 0 : No access technology selected • 1 : Access technology selected

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

X35 The project does not support this command.

9.1.10 +CEMODE , UE EPS Operation Mode

describe

This command is used to MT Set to EPS The specified

operation mode is used for operation. Format

类型	命令	响应
设置命令	AT+CEMODE=[<mode>]	响应 1： OK 响应 2：

parameter

name	describe	Value
mode	Indicates the operating mode, the default value depends on the target product	Type: Integer • 0 : PS Mode 2 • 1 : CS / PS Operation mode 1 . • 2 : CS / PS Operation mode 2 . • 3 : PS Mode 1 UE The definition of the operating modes can be found in 3GPP TS 24.301 [83] .

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

9.1.11 +GTRAT , select wireless access technology

describe

This command is used to manually select the radio access technology (RAT) to register the network. After entering this command, the execution result will be returned immediately, and then the device will try to register the specified RAT . If it is GSM/UMTS , select GSM/LTE Or UMTS/LTE Dual-Mode , you can also configure the preferred RAT , stored in NVRAM , select which RAT should be connected first .

GSM / UMTS / LTE is selected In triple mode, the first preferred RAT and the second preferred RAT Configure to set available RATs The search order.

TDS / WCDMA is selected Dual mode, you can configure the preferred URAT , which Stored in NVRAM , select which URAT should be connected first .

The setup command is used to set the RAT and the preferred RAT for further network registration The (at+cops=0) read command returns the previous <Act> and <PreferenceredAct> values .

The test command returns the supported <Act> and <P Refer

to redAct> for the range of values affected. Format

类型	命令	响应
设置命令	AT+GTRAT=<AcT>[,<PreferredAct1>[,<PreferredAct2>]]	响应 1 : OK 响应 2 : CME ERROR: <error>
读取当前设置	AT+GTRAT?	+GTRAT : <Act>[,<PreferredAct1>[,<PreferredAct2 >]] OK
查询命令参数范围	AT+GTRAT=?	+GTRAT: (list of supported <AcT>s),(list of supported < PreferredAct1>s),(list of supported < PreferredAct2>s) OK

parameter

name	describe	Value
Act	Access technology type	Type: Integer • 2 UMTS • 3 LTE • 4 LTE/UMTS • 10 Automatic • 14 NR -RAN • 16 NR-RAN/WCDMA • 17 NR-RAN/LTE • 20 NR-RAN/WCDMA/LTE
PreferredAct1	The selected parameter must be part of <Act>	Type: Integer • 2 WCDMA is preferred • 3 LTE is preferred • 6 NR-RAN is preferred
PreferredAct2	The selected parameter must be part of <Act>	Type: Integer • 2 WCDMA is secondary preferred • 3 LTE is secondary preferred • 6 NR-RAN is preferred

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	yes
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

9.1.12 +GTACT , select RAT and BAND

describe

This command allows the and BAND After entering this setting command, the execution result will be returned immediately , and then the device will try to register the specified RAT and frequency band.

This command is used to configure RAT / preferred RAT / BAND Provides flexibility. Therefore, users can only configure RAT or Band .

If only the frequency band needs to be configured, the first three parameters must be empty. Therefore, the command is as follows: AT+GTACT=,,,101,103 (e Example: Configuring LTE Band 1 and LTE Frequency band 3) .

If RAT is not provided information, the second and third parameters are ignored because it belongs to the preferred RAT .

In this case, only one parameter (the second parameter) is valid, and the third parameter will be ignored. For example: AT+GTACT=3,0,1 (here 1 will be ignored)

act1 is used as described in the following table and act2 . All other combinations except these will be rejected.

LTE Parameter should only be used for LTE platform. In

other cases, the behavior is undefined. A specific RAT

Frequency band changes will not affect other RATs

Configuration.

Example: Setting up LTE Frequency band does not change GSM / UMTS Frequency band.

Format

type	Order	response
Setting Commands	AT+GTACT=[<rat>[,[<PreferredAct1>],[<PreferredAct2>][,<band_1>[,<band_2>[,…….[,<band_n>]]]]]]	Respons e 1 : OK Response 2 : CME ERROR: <error>
Read current settings	AT+GTACT?	+GTACT:[<rat>[,[<PreferredAct1>],[<PreferredAct2>][,<band_1>[,<band_2>[,……[,<band_n>]]]]]]
Query command parameter range	AT+GTACT=?	+GTACT: (list of supported <Rat>s),(list of supported <PreferredAct1>s),(list of supported <PreferredAct2>s),(list of supported <gsm_band>s),(list of supported <umts_band>s),(list of supported <lte_band>s),(list of supported <cdma_band>s),(list of supported <evdo_band>s) OK

参数

名称	描述	取值

rat	Access technology type	Type: Integer • 1 UMTS • 2 LTE • 4 LTE/UMTS • 10 Auto • 14 NR -RAN

name	describe	Value
		• 16 NR-RAN/WCDMA • 17 NR-RAN/LTE • 20 NR-RAN/WCDMA/LTE
PreferredAct1	The selected parameter must be part of <Act>	Type: Integer • 2 WCDMA is preferred • 3 LTE is preferred • 6 NR-RAN is preferred
PreferredAct2	The selected parameter must be part of <Act>	Type: Integer • 2 WCDMA is secondary preferred • 3 LTE is secondary preferred • 6 NR-RAN is preferred
Band_1 , Band_2 , ...Band_n	Frequency band	Type: Integer 0 Automatically select the frequency band for <rat> as specified in the command . If no value is set for <rat> , all supported RATs are automatically selected.
cdma_band	Cdma Frequency band	Type: Integer
evdo_band	Evdo Frequency band	Type: Integer
gsm_band	GSM Frequency band	Type: Integer • 900 : selection of 900 MHz band • 850 : selection of 850 MHz band • 450 : selection of 450 MHz band • 480 : selection of 480 MHz band • 750 : selection of 750 MHz band • 380 : selection of 380 MHz band • 410 : selection of 410 MHz band • 710 : selection of 710 MHz band • 810 : selection of 810 MHz band • 1800 : selection of 1800 MHz band • 1900 : selection of 1900 MHz band

umts_band	UMTS Frequency band	Type: Integer • 1 : BAND_UMTS_I • 2: BAND_UMTS_II • 3: BAND_UMTS_III • 4: BAND_UMTS_IV • 5: BAND_UMTS_V • 6: BAND_UMTS_VI

名称	描述	取值
		• 7: BAND_UMTS_VII • 8: BAND_UMTS_VIII • 9: BAND_UMTS_IX • 10: BAND_UMTS_X • 11: BAND_UMTS_XI • 12: BAND_UMTS_XII
umts_band	UMTS 频段	类型: 整数 • 13: BAND_UMTS_XIII • 14: BAND_UMTS_XIV • 15: BAND_UMTS_XV • 16: BAND_UMTS_XVI • 17: BAND_UMTS_XVII • 18: BAND_UMTS_XVIII • 19: BAND_UMTS_XIX • 20: BAND_UMTS_XX • 21: BAND_UMTS_XXI • 22: BAND_UMTS_XXII • 25 : BAND_UMTS_XXV
For umts_tdd(TD-SCDMA)	TDD-SCDMA Frequency band	Type: Integer • 201 : BAND_UMTS_TDD_A • 202 : BAND_UMTS_TDD_B • 203 : BAND_UMTS_TDD_C • 204 : BAND_UMTS_TDD_D • 205 : BAND_UMTS_TDD_E • 206 : BAND_UMTS_TDD_F

lte_band	LTE Frequency band	Type: Integer • 101 : BAND_LTE_1 • 102 : BAND_LTE_2 • 103 : BAND_LTE_3 • 104 : BAND_LTE_4 • 105 : BAND_LTE_5 • 106 : BAND_LTE_6 • 107 : BAND_LTE_7 • 108 : BAND_LTE_8 • 109 : BAND_LTE_9 • 110 : BAND_LTE_10

name	describe	Value
lte_band	LTE 频段	类型：整数 • 111：BAND_LTE_11 • 112：BAND_LTE_12 • 113：BAND_LTE_13 • 114：BAND_LTE_14 • 115：BAND_LTE_15 • 116：BAND_LTE_16 • 117：BAND_LTE_17 • 118：BAND_LTE_18 • 119：BAND_LTE_19 • 120：BAND_LTE_20
lte_band	LTE 频段	类型：整数 • 121：BAND_LTE_21 • 122：BAND_LTE_22 • 123：BAND_LTE_23 • 124：BAND_LTE_24 • 125：BAND_LTE_25 • 126：BAND_LTE_26 • 127：BAND_LTE_27 • 128：BAND_LTE_28 • 129：BAND_LTE_29 • 130：BAND_LTE_30

lte_band	LTE 频段	类型：整数 • 131：BAND_LTE_31 • 132：BAND_LTE_32 • 133：BAND_LTE_33 • 134：BAND_LTE_34 • 135：BAND_LTE_35 • 136：BAND_LTE_36 • 137：BAND_LTE_37 • 138：BAND_LTE_38 • 139：BAND_LTE_39 • 140：BAND_LTE_40
lte_band	LTE Frequency band	Type: Integer • 141 : BAND_LTE_41 • 142 : BAND_LTE_42

name	describe	Value
		• 143 : BAND_LTE_43 • 144 : BAND_LTE_44 • 145 : BAND_LTE_45 • 146 : BAND_LTE_46 • 147 : BAND_LTE_47 • 148 : BAND_LTE_48 • 149 : BAND_LTE_49 • 150：BAND_LTE_50 • 151：BAND_LTE_51 • 152：BAND_LTE_52

lte_band	LTE 频段	类型：整数 • 153：BAND_LTE_53 • 154：BAND_LTE_54 • 155：BAND_LTE_55 • 156：BAND_LTE_56 • 157：BAND_LTE_57 • 158：BAND_LTE_58 • 159：BAND_LTE_59 • 160 ： BAND_LTE_60 • 161 : BAND_LTE_61 • 162 : BAND_LTE_62 • 163 : BAND_LTE_63 • 164 : BAND_LTE_64
<nr_band>	NR Frequency band	Type: Integer • 501 : BAND_NR_1 • 502 : BAND_NR_2 • ... • 509 : BAND_NR_9 • 510 : BAND_NR_10 • ... • 50512 : BAND_NR_512

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	yes
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

Table 2. Triple - mode RATs Combination table

Preferred Act1	Preferred Act2	RAT Combination List		
Undeclared	Undeclared	RAT_LTE	RAT_UMTS	RAT_GSM
0	Undeclared	RAT_GSM	RAT_UMTS	RAT_UMTS

1	Undeclared	RAT_UMTS	RAT_LTE	RAT_GSM
2	未声明	RAT_LTE	RAT_LTE	RAT_GSM
0	1	RAT_GSM	RAT_UMTS	RAT_LTE
0	2	RAT_GSM	RAT_LTE	RAT_UMTS
1	0	RAT_UMTS	RAT_GSM	RAT_LTE
1	2	RAT_UMTS	RAT_LTE	RAT_GSM
2	0	RAT_LTE	RAT_GSM	RAT_UMTS
2	1	RAT_LTE	RAT_UMTS	RAT_GSM

9.1.13 +GTCCINFO， get the current cell information

describe

This command is used to obtain the current cell information.

+ GTSCANSTAT first command, and then execute this command to obtain valid information.

Format

type	Order	response
Setting Commands	AT+GTCCINFO?	+GTCCINFO: • UMTS（a maximum of ten UMTS cells are supported） ◦ UMTS service cell: <IsServiceCell>,<rat>,<mcc>,<mnc>,<lac>,<cellid>,<uarfcn>,<psc>,<band>,<ecno>,<rscp>,<rac>,<rxlev>,<reserved>,<Ec/Io_lev> ◦ UMTS neighbor cell: <IsServiceCell>,<rat>,<mcc>,<mnc>,<lac>,<cellid>,<uarfcn>,<psc>,<cell_type>,<rank_pos>,<ranking_status>,<ecno>,<pathloss>,<rxlev>,<rscp> OK

type	Order	response

Setting Commands	AT+GTCCINFO?	+GTCCINFO: • LTE/eMTC/NB-IoT (a maximum of ten LTE cells are supported) ○ LTE/eMTC/NB-IoT service cell: <IsServiceCell>,<rat>,<mcc>,<mnc>,<tac>,<cellid>,<earfcn>,<physicalcellId>,<band>,<bandwidth>,<rssnr_value>,<rxlev>,<rsrp>,<rsrq> ○ LTE/eMTC/NB-IoT neighbor cell: <IsServiceCell>,<rat>,<mcc>,<mnc>,<tac>,<cellid>,<earfcn>,<physicalcellId>,<bandwidth>,<rxlev>,<rsrp>,<rsrq> OK
设置命令	AT+GTCCINFO?	+GTCCINFO: • NR Cell（a maximum of ten NR cells are supported） ○ NR service cell: <IsServiceCell>,<rat>,<mcc>,<mnc>,<tac>,<cellid>,<narfcn>,<physicalcellId>,<band>,<bandwidth>,<ss-sinr>,<rxlev>,<ss-rsrp>,<ss-rsrq> ○ NR neighbor cell: <IsServiceCell>,<rat>,<mcc>,<mnc>,<tac>,<cellid>,<narfcn>,<physicalcellId>,<ss-sinr>,<rxlev>,<ss-rsrp>,<ss-rsrq> OK
设置命令	AT+GTCCINFO?	+GTCCINFO: • LTE-NR ENDC（a maximum of ten LTE cells are supported） ○ LTE-NR EN-DC service cell: <IsServiceCell>,<rat>,<mcc>,<mnc>,<tac>,<cellid>,<earfcn>,<physicalcellId>,<band>,<bandwidth>,<rssnr_value>,<rxlev>,<rsrp>,<rsrq> <IsServiceCell>,<rat>,<mcc>,<mnc>,<tac>,<cellid>,<narfcn>,<physicalcellId>,<band>,<bandwidth>,<ss-sinr>,<rxlev>,<ss-rsrp>,<ss-rsrq> ○ LTE neighbor cell: <IsServiceCell>,<rat>,<mcc>,<mnc>,<tac>,<cellid>,<earfcn>,<physicalcellId>,<bandwidth>,<rxlev>,<rsrp>,<rsrq> OK

参数

名称	描述	取值
IsServiceCell	Determine whether there is a service cell	Type: Integer • 1 : Serving cell • 2 : No service cell
rat	Access Technology	Type: Integer

name	describe	Value

		• 0 : Invalid network • 2 : WCDMA • 4 : LTE • 9 NR -RAN
cellid	No current cell ID	Type: Integer Range: 0~0xFFFFFFFFF
mcc	Country Code	Type: Integer
mnc	Operator Network Code	Type: Integer
lac	Location Area Code	Type: Integer Range: 0~0xFFFF
arfcn	Absolute RF channel number	Type: Integer Range: 0~65535
uarfcn	UMTS Absolute RF channel number	Type: Integer
narfcn	NR Absolute RF channel number	
basic	Base station identification code	Type: Integer

band	When registered with GSM	Type: Integer • 900 : 900 MHz band • 1800 : 1800 MHz band • 1900 : 1900 MHz band • 850 : 850 MHz band • 450 : 450 MHz band • 480 : 480 MHz band • 380 : 380 MHz band • 410 : 410 MHz band • 710 : 710 MHz band • 810 : 810 MHz band • 750 : 750 MHz band If not registered to the network: <band>= BAND_INVALID When registering WCDMA: BAND_UMTS_I - BAND_UMTS_XXII When registering TDSCDMA : BAND_UMTS_TDD_A - BAND_UMTS_TDD_F When registering LTE : BAND_LTE_1 - BAND_LTE_43

name	describe	Value
rxlev	When registered with GSM When the network signal range	Type: Integer Range: 0~255 • 0 : less than 110 dBm • 1 : 110 dBm to 109 dBm • 2 : 109 dBm to 108 dBm ... • 62 : 49 dBm to 48 dBm • 63 : greater than 48 dBm • 99 : Unknown or not detected
rxlev	When registering to WCDMA When the network signal range	Type: Integer Range: 0~255 • 0 : Rscp < -120dbm • 1 : -120dbm ≤ Rscp < - 119dbm ... • 96 : -25dbm ≤ Rscp

rxlev	When registering to LTE When the network signal range	Type: Integer Range: 0~255 • 0: RSRP < -140dbm • 1: -140dbm ≤ RSRP < -139dbm • ... • 96: - 45dbm ≤ RSRP < -44dbm • 97: -44dbm ≤ RSRP
rxlev	When registering to NR When the network signal range	• SS-RSRP < -156 dBm • 1 -156 dBm ≤ SS-RSRP<-155 dBm • 2 -155 dBm ≤ SS-RSRP<-154 dBm • ... ... • 125 -32 dBm ≤ SS-RSRP<-31 dBm • 126 -31 dBm ≤ SS- RSRP • 255 Unknown or undetectable
txpwr	TX power	Type: Integer Range: 0~255
DrxUsed , c1 , c2	Auxiliary reception	Type: Integer Range: 0~255
access_tech	Access technology	Type: Integer Range: 0~255 • 5 : UMTS • 8 : LTE

name	describe	Value
		• 9 : NR • 10 Undefined
Maio	Move allocation index offset	Type: Integer Range: 0~63
amr_acs	AMR Activation Code	Type: Integer Range: 0~255
hsn	Number of frequency hopping sequences	Type: Integer Range: 0~63
RxlevSub , RxlevFull , RxqualSub , RxqualFull	GPS Switch state value	Type: Integer Range: 0~255

AmrActive Codec	Amr Activation Code	Type: Integer Range: 0~255 • 1 : 4.75 kbit/s Coding rate • 2 : 5.15 kbit/s Coding rate • 3 : 5.90 kbit/s Coding rate • 4 : 6.70 kbit/s Coding rate • 5 : 7.40 kbit/s Coding rate • 6 : 7.95 kbit/s Coding rate • 7 : 10.2 kbit/s Coding rate • 8 : 12.2 kbit/s Coding rate
c31 , c32 , ecno , bandwidth	Frequency band wide	Type: Integer Range: 0~255
dl_uarfcn	Downlink uarfcn	Type: Integer Range: 0~0xFFFF
psc	Primary scrambling code	Type: Integer Range: 0~0xFFFF
rac	Routing Area Code	Type: Integer Range: 0~255
service_qual	Routing Area Code	Type: Integer Range: 0~0xFFFF
cell_type	Routing Area Code	Type: Integer Range: 0~255 • 0 : The cell is activated (CELL_DCH) • 1 : Virtual activation of cell (CELL_DCH) • 2 : Cells In SIB 11/12 " BA" -List • 3 : The cell is a detected UMTS Community (CELL_DCH)

name	describe	Value
		• 4 : The cell is GSM UMTS in mode Neighborhood • 5 : The cell is UMTS Neighborhood (except CELL_DCH All states except • 6 : The cell is UMTS Neighborhood (except CELL_DCH All states except

rank_pos	Cell reselection priority (0 for the best cell) , this value is used for UMTS and GSM cells are sorted	Type: Integer Range: 0~255
ranking_value	Reasons why the cells are not sorted	Type: Integer Range: 0~255 • 0 : The cell is available • 1 : No measurement results • 2 : The community is banned • 3 : Wrong PLMN • 4 : Due to H Standard priority and deleted (HCS is active) • 5 : Due to HCS Deleted due to priority • 6 : Deleted due to cell selection criteria
pathloss	Reasons why the cells are not sorted	Type: Integer Range: 0~0xFF and 0xF If not available
tac	Tracking area code	Type: Integer Range: 0~0xFFFFFF
earfcn	EUTRA Absolute RF channel number	Type: Integer Range: 0~0xFFFFFFFF
physicalcellId	Physical cell ID	Type: Integer Range: 0~0xFFFFFFFF
rssnr_value	Radio signal strength to noise ratio	• Type: Integer Range: -100~100 • -100 : RSSNR ≤ -50dB; • -99 : -50dB < RSSNR ≤ -49.5dB; • -98 : 49.5dB < RSSNR ≤ -49dB; ... • -1 : -1dB < RSSNR ≤ -0.5dB; • 0 : -0.5dB < RSSNR ≤ 0dB; • 1 : 0dB < SSNR ≤ 0.5dB; ...

name	describe	Value

		• 98 49dB < RSSNR ≤ 49.5 dB; • 99 49.5dB < RSSNR ≤ 50 dB; • 100 50dB < RSSNR; • 255 Unknown or undetectable
rsrp	Signal receiving power	Type: Integer Range: 0~255 0 Indicates below -140 dBm or undetectable • 0: rsrp < -140 dBm • 1: -140 dBm ≤ rsrp < -139 dBm • 2: -139 dBm ≤ rsrp < -138 dBm ... • 95 : -46 dBm ≤ rsrp < -45 dBm • 96 : -45 dBm ≤ rsrp < -44 dBm • 97 : -44 dBm ≤ rsrp
rsrq	Signal reception quality	Type: Integer Range: 0~255 • 0: RSRQ < -19.5dB • 1: -19.5dB ≤ RSRQ < -19.0dB ... • 33: -3.5dB ≤ RSRQ < -3.0dB • 34: -3.0dB ≤ RSRQ
ss-rsrp	Reference signal receiving power of synchronization signal	Type: Integer Range: 0~255 • 0 ss_rsrp < -156 dBm • 1 -156 dBm ≤ ss_rsrp <-155 dBm • 2 -155 dBm ≤ ss_rsrp <-154 dBm ... • 125 -32 dBm ≤ ss_rsrp <-31 dBm • 126 -31 dBm ≤ ss_rsrp • 255 Unknown or not detected
ss- rsrq	Reference signal reception quality of synchronization signal	Type: Integer Range: 0~255 • 0 ss_rsrq < -43 dB

name	describe	Value
		• 1 -43 dB≤ ss_rsrq <-42.5 dB • 2 -42.5 dB≤ ss_rsrq <-42 dB ... • 124 18.5 dB≤ ss_rsrq < 19 dB • 125 19 dB ≤ ss_rsrq < 19.5 dB • 126 19.5 dB ≤ ss_rsrq <20 dB • 255 Unknown or not detected
rssi	Signal reception indication	Type: Integer Range: 0~255 0 Indicates below -140 dBm or undetectable
rscp	Signal coding power	Type: Integer Range: 0~255
ber_lev	Bit Error Rate	Type: Integer Range: 0~255 • 0 : BER < 0,2 % • 1 : 0.2% < BER < 0,4 % • 2 : 0.4%< BER < 0.8 % • 3 : 0.8%< BER < 1.6 % • 4 : 1.6%< BER < 3.2 % • 5 : 3.2%< BER < 6.4 % • 6 : 6,4 % < BER < 12,8 % • 7 : 12,8 % < BER
Ec/Io_lev	CPICH Ec/Io	Type: Integer Range: 0~49 • 0 : CPICH Ec/Io < -24dB; • 1 : -24dB ≤ CPICH Ec/Io < - 23.5dB; ... • 49 : 0dB ≤ CPICH Ec/Io dB;
SystemID,NetworkID, BaseID,ZONE_ID,Pilot_PN,Pilot_Strength, Channel	System and network ID	Type: Integer Range: 0~65535
Longitude	- -	Type: Integer Range: -648000 seconds ~ 648000 Second

mode	- -	Type: Integer Range: -324000 sec ~324000 Second
reserved	Reserved fields (may be empty fields or reserved tags)	

name	describe	Value
ranking_status	The ranking status of the neighboring cell (may indicate the status of the neighboring cell in the ranking, such as high priority, low priority, etc.)	
ecno	of energy received by each PN chip to total received power	
ss- sinr	Synchronous signal signal-to-noise ratio	Type: Integer Range: 0~255 • 0 ss_sinr < -twenty three dB • 1 -23 dB ≤ ss_sinr <-22.5 dB • 2 -22.5 dB≤ss_sinr <-22 dB • : : : : • 125 39 dB ≤ ss_sinr < 39.5 dBm • 126 39.5 dB≤ss_sinr < 40 dB • 127 40 dB ≤ ss_sinr • 255 Unknown or undetectable

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no

AT Command response maximum duration (ms)	15000	AT Maximum time for command execution results to be returned (ms)	15000

9.1.14 +GTCELLLOCK, Lock cell information configuration

describe

This command is used to force the UE to register a specific

cell (fixed cell and frequency) Format

type	Order	response
Setting Commands	AT+GTCELLLOCK=<mode>[,<rat>,<type>,<earfcn>[,<PCI>][,<scs>][,<nrband>]]	Respons e 1 : OK Respons e 2 : ERROR
Read current settings	AT+ GTCELLLOCK?	+GTCELLLOCK:<mode>[,<rat>,<type>,<earfcn>[,<PCI>][,<scs>][,<nrband>]]
Query command parameter range	AT+ GTCELLLOCK =?	+GTCELLLOCK :(< mode>s Support list), (<rat>s Support list),(<type>s Support list), (<earfcn>s Support list), (<PCI>s support list), (<scs>s support list), (<nrband>s support list) OK

parameter

name	describe	Value
mode	Function switch	Type: Integer 0 : Disable this feature 1 : Turn on this feature
rat	Standard	Type: Integer 0 : LTE 1 : NR
type	Lock type	Type: Integer 0 : Lock PCI 1 : Lock frequency point
earfcn	Frequency	Type: Integer Range: 0~4294967295
PCI	Physical cell ID	Type: Integer RAT=0 0-503 Corresponding LTE RAT=1 0-1007 Corresponding to NR
scs	Subcarrier spacing	Type: Integer 0 : 15kHz 1 : 30kHz
nrband	NR Frequency band	Type: Integer 501 BAND_NR_1 502 BAND_NR_2 ... 509 BAND_NR_9 5010 BAND_NR_10 ... 50512 BAND_NR_512

Do I need a SIM? Card normal	yes	Do I need to register a network?	yes
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	yes	Set whether to save after power off	yes
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

For specific frequency bands, please refer to the hardware manual of the corresponding model.

If the user wants to lock the registered LTE/SA before shutting down PCI , please enter AT+GTCELLLOCK=1

If the user wants to change to a different SIM card, please disable this function first.

After entering this command, the user must reset the UE because EFS File after restarting UE It will take effect when

the cell by entering this command, the user should then Command to change RAT Please

do not use GTFREQLOCK/COPS/GTACT/GTCELLLOCK/GTRAT before disabling this

feature. Instructions are used together.

Using GTCELLLOCK Do not switch SIMs after locking the frequency Card .

GTCELLLOCK No 3G support Locked PCI.

<PCI> For NR , set the parameter AT+GTCELLLOCK=? (supported s List) is set to 1007 as the default value. However, for LTE , it ranges from 0 to 503.

<nrband>AT+GTCELLLOCK=? parameter (supported by s List) represents NR Supported frequency bands, not the ones supported by the module .

MTK The platform does not support

scs and nrband Parameter . This

command does not support

locking the registered cell.

9.1.15 +GTCAINFO , query CA information

describe

This command is used to query and return the current PCC frequency band, SCC frequency

类型	命令	响应

band, secondary cell active status, bandwidth, frequency and other information. Format

type	Order	response
		d>,<earfcn>,<dl_bandwidth>,<ul_bandwidth>,<dl_mimo>,<ul_mimo>,<dl_modulation>,<ul_modulation>,<rsrp> SCC2:<scell_state>,<ul_configured>,<band>,<physicalcellId>,<earfcn>,<dl_bandwidth>,<ul_bandwidth>,<dl_mimo>,<ul_mimo>,<dl_modulation>,<ul_modulation>,<rsrp> …] NR PCC:<band>,<physicalcellId>,<narfcn>,<nr_dl_bandwidth>,<dl_mimo>,<ul_mimo>,<dl_modulation>,<ul_modulation>,<nr_rsrp> [SCC1:<scell_state>,<ul_configured>,<band>,<physicalcellId>,<narfcn>,<nr_dl_bandwidth>,<nr_ul_bandwidth>,<dl_mimo>,<ul_mimo>,<dl_modulation>,<ul_modulation >,<nr_rsrp> SCC2:<scell_state>,<ul_configured>,<band>,<physicalcellId>,<narfcn>,<nr_dl_bandwidth>,<nr_ul_bandwidth>,<dl_mimo>,<ul_mimo>,<dl_modulation>,<ul_modulation>,<nr_rsrp> …] other OK
Query command parameter range	AT+GTCAINFO=?	OK

parameter

name	describe	Value
band	LTE/NR frequency band	Type: Integer Range: 0~50512 When registering LTE : 101 : BAND_LTE_1 102 : BAND_LTE_2 103 : BAND_LTE_3 … 171 : BAND_LTE_71 When registering NR : 501 : BAND_NR_1 502 : BAND_NR_2 … 509 : BAND_NR_9 5010 : BAND_NR_10 … 50512 : BAND_NR_512

scell_state	Status of the secondary cell	Type: Integer 1 : Configuration not released 2 : Configure and activate

name	describe	Value
physicalcellId	Physical cell ID	Type: Integer Range: 0~50512
earfcn	LTE Frequency information	Type: Integer Range: 0~65535
narfcn	NR Frequency information	Type: Integer Range: 0~2229167
dl_bandwidth , ul_bandwidth	LTE bandwidth	Type: Integer Range: 0~255 6 : 1.4 MHz bandwidth 15 : 3 MHz bandwidth 25 : 5 MHz bandwidth 50 : 10 MHz bandwidth 75 : 15 MHz bandwidth 100 : 20 MHz bandwidth
nr_dl_bandwidth , nr_ul_bandwidth	NR bandwidth	Type: Integer Range: 0~2000 25 : 5 MHz bandwidth 50 : 10 MHz bandwidth 75 : 15 MHz bandwidth 100 : 20 MHz bandwidth 125 : 25 MHz bandwidth 150 : 30 MHz bandwidth 200 : 40 MHz bandwidth 250 : 50 MHz bandwidth 300 : 60 MHz bandwidth 400 : 80 MHz bandwidth 450 : 90 MHz bandwidth 500 : 100 MHz bandwidth 1000 : 200 MHz bandwidth 2000 : 400 MHz bandwidth
ul_mimo , dl_mimo	MIMO Number of layers	Type: Integer Range: 1~4
ul_configured	Indicates whether this cell supports UL CA	Type: Integer 0 : Not supported 1 : Support

dl_modulation , ul_modulation	Modulation	Type: Integer 0 : BPSK 1 : QPSK 2 : 16QAM 3 : 64QAM 4 : 256QAM 5 : 1024QAM 6 : Unknown

name	describe	Value
rsrp , nr_rsrp	Reference signal received power	Type: Integer Range: 0~255

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

9.1.16 +GTPLMNLOCK, Lock PLMN Information configuration

describe

GTPLMNLOCK Command is used to force UE In the

specified PLMN Register on Format

类型	命令	响应
设置命令	AT+GTPLMNLOCK=<mode>[,<PLMN List>]	响应 1 : OK 响应 2 : +CME ERROR: <err>
读取当前设置	AT+GTPLMNLOCK?	+GTPLMNLOCK: <mode>[,<PLMN List>]
查询命令参数范围	AT+GTPLMNLOCK=?	+GTPLMNLOCK: (list of supported <mode>s) OK

parameter

name	describe	Value
mode	Function switch	Type: Integer **0** : Disable this feature (default) **1** : Turn on this feature
< PLMN List >	**PLMN** List	Type: Integer Note **1** : If Mode is **1** , then **the PLMN** List is a required parameter ;

name	describe	Value
		Note **2**: if **PLMN** Locked, **+COPS** There will be no change to **PLMN** set up .

characteristic

Do I need **a SIM?** Card normal	yes	Do I need to register a network?	yes
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	yes
AT Command response maximum duration (**ms**)	1000	**AT** Maximum time for command execution results to be returned (**ms**)	1000

9.1.17 +GTCELLSCAN , scan the complete set of cell information in the current environment

describe

Scan the cell information of the

current environment. Format

类型	命令	响应
设置命令	AT+GTCELLSCAN[=<rat>]	响应 1: • 当<rat>=0 时, +GTCELLSCAN: 3,<mcc>,<mnc>,<freq>,<psc>,<lac>,<cellid>,<rscp>,<ecno><CR><LF> +GTCELLSCAN: 3,<mcc>,<mnc>,<freq>,<psc>,<lac>,<cellid>,<rscp>,<ecno><CR><LF> ..... +GTCELLSCAN:

		srp>,<ss_rsrq>,<band_NR>,<srxlev>,<squal><CR><LF> ... OK • When <rat>=3 , +GTCELLSCAN: 3,<mcc>,<mnc>,<freq>,<psc>,<lac>,<cellid>,<rscp>,<ecno><CR><LF> +GTCELLSCAN: 3,<mcc>,<mnc>,<freq>,<psc>,<lac>,<cellid>,<rscp>,<ecno><CR><LF> ..... OK • 当<rat>=4 时, +GTCELLSCAN: 4,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<rsrp>,<rsrq>,<band_LTE>,<srxlev>,<squal><CR><LF> +GTCELLSCAN: 4,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<rsrp>,<rsrq>,<band_LTE>,<srxlev>,<squal><CR><LF> ... OK • When <rat>=5 , +GTCELLSCAN: 5,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<ss_rsrp>,<ss_rsrq>,<band_NR>,<srxlev>,<squal><CR><LF> +GTCELLSCAN: 5,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<ss_rsrp>,<ss_rsrq>,<band_NR>,<srxlev>,<squal><CR><LF> ... OK Respons e 2 : ERROR
Excuting an order	AT+GTCELLSCAN	响应 1: +GTCELLSCAN: 3,<mcc>,<mnc>,<freq>,<psc>,<lac>,<cellid>,<rscp>,<ecno><CR><LF>

	+GTCELLSCAN: 3,<mcc>,<mnc>,<freq>,<psc>,<lac>,<cellid>,<rscp>,<ecno><CR><LF> ..... +GTCELLSCAN: 4,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<rsrp>,<rsrq>,<band_LTE>,<srxlev>,<squal><CR><LF> +GTCELLSCAN: 4,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<rsrp>,<rsrq>,<band_LTE>,<srxlev>,<squal><CR><LF> ... +GTCELLSCAN: 5,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<ss_rsrp>,<ss_rsrq>,<band_NR>,<srxlev>,<squal><CR>< LF> +GTCELLSCAN: 5,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<ss_rsrp>,<ss_rsrq>,<band_NR>,<srxlev>,<squal><CR>< LF> ... OK
	Response 2 : ERROR

parameter

name	describe	Value
rat	Network Mode	Type: Integer 3 : 3G network 4 : 4G network 5 : 5G network 0 : Default value. By default, all networks supported by the product are searched .
mcc	Mobile Country Code	Type: Integer Value range: 000~999 must be 3 Decimal number
mnc	Mobile Network Code	Type: Integer Value range: 00~99 Must be 2 Decimal number

freq	Uarfcn or Earfcn or Narf	Type: Integer Value range: 0~4294967295
pci	Physical cell ID	Type: Integer Value range: 0~503 or 0~1007

name	describe	Value
		0503 Yes LTE PCI Range, 01007 is the PCI range of NR .
psc	Primary scrambling code	Type: Integer Value range: 0~511
tac	Tracking area code	Type: Integer Value range: 0~65535 or 0~16777215 065535 Yes LTE tac scope, 016777215 YesNR tac scope.
lac	Location Area Code	Type: Integer Value range: 1~65534
cellid	Cell ID	Type: Integer Value range: 0268435455 or 068719476735 0268435455 is the cellid range of LTE , 068719476735 YesNR of cellid scope.
rsrp	Reference signal received power (LTE)	Type: Integer Value range: -140~-44 Unit: dBm
rsrq	Reference Signal Received Quality (LTE)	Type: Integer Value range: -19.5~-3 Unit: dBm
rscp	Received signal code power	Type: Integer
ecno	Ratio of chip energy to total interference energy density	Type: Integer Value range: -24 ~0
ss_rsrq	Reference signal reception quality (SA)	Type: Integer Value range: -43~20 Unit: dB
ss_rsrp	Reference signal received power (SA)	Type: Integer Value range: -156~31 Unit: dBm
band_LTE	LTE Frequency band information, only applicable to	Type: Integer Value range: 1~64

	FM150 project	
band_NR	NR Frequency band information, only applicable to FM150 project	Type: Integer Value range: 1~1024
srxlev	Cell selection rx The level value is only applicable to FM150 project	Type: Integer Value range: 0~511 Unit: dBm

name	describe	Value
squal	Cell selection quality, only applicable to FM150 project	Type: Integer Value range: 0~511 Unit: dBm

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	180000	AT Maximum time for command execution results to be returned (ms)	180000

10 Data Packet Field

10.1 GPRS Function

GSM 07.07 Defined TE Can be used to control GPRS via a non-multiplexed character stream interface ME This imposes certain restrictions on the functionality of the interface. For example, when the interface is in the online data state, ME Unable to TE Send control information or TE To ME Send command, unless the 2nd The layer protocol itself supports this function (GSM 07.60- 12).However, a modem-specific escape mechanism (D T R)provided to allow TE Ability to switch the modem to a restricted online command state.

The use of multiplexed interfaces (GSM 0 7 . 1 0)(see "Multiplexer Functionality"). The modem specific escape mechanism uses DTR as an escape signal (following the &D parameter)and is designed for limited non-network related commands. This specific mechanism is intended to provide the user with a way to retrieve the signal strength. The time limit for consecutive DTR toggles is at least 90 seconds. The modem specific design is not to support both the online command and the data state at the same time, so any mistake or extreme use may result in unexpected behavior. The basic concept of GPRS is " always connected "and there is no charge for the connection (only per actual data transmitted)

10.2 GPRS instruction

10.2.1 + CGCLASS , set up GPRS Mobile Station

describe

This command is used to set the module to follow the specified GPRS Move the class to operate. If the requested class is not supported, ERROR is returned or +CME ERROR Response. Extended error response by +CMEE Command enabled.

Format

type	Order	response
Setting Commands	AT+CGCLASS=<class>	Respons e 1 : OK Response 2 : CME ERROR: <err>

Read current settings	AT+CGCLASS?	+CGCLASS: <class> OK
Query command parameter range	AT+CGCLASS=?	+CGCLASS: (list of supported <class>s) OK

parameter

name	describe	Value
class	Indicates the operating mode	Type: String • A : A Class operating mode (A / Gb mode) or CS / PS Operation Mode (Iu model) (Highest operating mode) • B : B Class operating mode (A / Gb mode) or CS / PS Operation Mode (Iu model) • CG : PS only Mode (A / Gb mode) or PS Working mode (Iu Mode) in C Class Operation Mode • CC : CS only Mode (A / Gb mode) or CS (Iu Mode)(minimum operating mode) Class C operating mode If you issue a set command and specify <class>=CC MT Connect to PS domain, the MT shall perform PS detachment.

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	yes	Set whether to save after power off	yes
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

10.2.2 + CGDCONT , define PDP Context

describe

This command is for the PDP identified by the (local) context identification parameter (<cid>) Context-Specific PDP context parameter value and allows TE Specifies whether security protection is required for ESM message transmission.

Format

type	Order	response

Setting Commands	AT+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>]]]]]]]]	Respone 1 : OK Response 2 : CME ERROR: <err>
Read current settings	AT+CGDCONT?	+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_In

类型	命令	响应
		d>]]]][<CR><LF>CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>]]]] […]]
查询命令参数范围	AT+CGDCONT=?	+CGDCONT: (range of supported<cid>s),<PDP_type>,,,(list of supported<d_comp>s),(list of supported <h_comp>s),(list of supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <P-CSCF_discovery>s),(list of supported<IM_CN_Signalling_Flag_Ind>s)[<CR><LF> +CGDCONT: (range of supported<cid>s),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <P-CSCF_discovery>s),(list of supported <IM_CN_Signalling_Flag_Ind>s)

parameter

name	describe	Value
cid	Specify a specific **PDP** Context Definition	Type: Integer This parameter is **TE-MT** A local parameter of the interface and is used in other **PDP** context related commands. The range of allowed values is returned by the test form of the command. Network-Initiated **PDP** The context's **<cid>** value will exceed the value of the command **+CGDCONT** and **+CGDSCONT** In the test form **<cid>** is the range shown.

PDP_type	Specifies the type of packet data protocol	Type: String • X.25 : ITU-T/CCITT X.25 Layer 3 (Obsolute) • IP : Internet Protocol (IETF STD 5 [103]) • IPV6 : Internet Protocol 6 (see RFC 2460 [106]) • IPV4V6 : introduced virtual <PDP_type> to handle dual IP StackUE Function • Internet : Hosted Octet Stream Protocol (obsolete) • PPP : Point-to-Point Protocol (IETF STD 51 [104]) EPS The service only supports IP , IPV6 and IPV4V6 value.

name	describe	Value
APN	Used to select GGSN or the logical name of the external packet data network	Type: String If the value is null or omitted, the subscription value will be requested.
PDP_addr	In the application of PDP Identified in the address space MT	Type: String If + CGPIAF is supported , its setting will affect the CGDCONT The read form of this parameter returns the format. The value of this parameter is ignored by setup commands and is included in setup commands only for backward compatibility reasons.
d_comp	Control PDP data compression	Type: Integer • 0 : Off • 1 : On • 2 : V.42bis • 3 : V.44
h_comp	Control PDP Header Compression	Type: Integer • 0 : Off • 1 : On • 2 : RFC 1144 [105] (Applicable only to SNDCP) • 3 : RFC 2507 [107] • 4 : RFC 3095 [108] (Applicable only to PDCP)
h_comp		

IPv4AddrAlloc	Control MT / TA How to request IPv4 Address information	Type: Integer • 0 : Via NAS Signaling distribution IPv4 address • 1 : DHCP Allocate IPv4 address
request_type	Indicates the type of PDP context activation request used for the PDP context	Type: Integer • 0 : PDP Context is used to establish a new PDP Context or handover from non- 3GPP access network • 1 : Emergency Services PDP Context • 2 : New PDP Context Reconstruction • 3 : PDP for access network switching Context the PDP is used for emergency bearer services If the context is the only active context, only emergency calls are allowed, see 3GPP TS 23.401 Clause 4.3.12.9 .
P-CSCF_discovery	Setting MT / TA Request to obtain P-CSCF Address method	Type: Integer • 0 : P-CSCF not affected by +CGDCONT Address discovery preferences • 1 : Through NAS Signaling prefers P-CSCF address • 2 : Via DHCP P-CSCF is preferred address
IM_CN_Signalling_Flag_Ind	PDP to the network Is it only used for signaling related to the IM CN subsystem?	Type: Integer

name	describe	Value
		• 0 : UE Indicate PDP Not just for IM CN Subsystem related signaling • 2 : UE Indicate PDP For IM only CN Subsystem related signaling

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	yes
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

describe

10.2.3 + CGQMIN , set the quality of service profile (minimum acceptable)

This command enables the terminal to specify the minimum acceptable profile, which the ME checks against the negotiated profile returned in the Activate PDP Context Accept message .

Format

type	Order	response
Setting Commands	AT+CGQMIN=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]	Respons e 1 : OK Response 2 : CME ERROR: <err>
Read current settings	AT+CGQMIN?	Response 1 : +CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[<CR><LF> +CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[…]] OK Response 2 : +CME ERROR: <err>
Query command parameter range	AT+CGQMIN=?	+CGQMIN:<PDP_type>,(list of supported <precedence>s),(list of supported <delay>s),(list of supported

type	Order	response
		<reliability>s),(list of supported <peak>s),(list of supported <mean>s) OK +CME ERROR: <err>

parameter

name	describe	Value
cid	Specify a specific PDP Context Definition	Type: Integer This parameter is TE-MT A local parameter of the interface and is used in other PDP context related commands. The range of allowed values is returned by the test form of the command. <cid> value of the network initiated PDP context will exceed the value of command +

		CGDCONT and + CGDSCONT The range shown in <cid> in the test form .
PDP_type	Specifies the type of packet data protocol	Type: String • X.25 : ITU-T/CCITT X.25 Layer 3 (Obsolute) • IP : Internet Protocol (IETF STD 5 [103]) • IPV6 : Internet Protocol 6 (see RFC 2460 [106]) • IPV4V6 : introduced virtual <PDP_type> to handle dual IP StackUE Function • Internet : Hosted Octet Stream Protocol (obsolete) • PPP : Point-to-Point Protocol (IETF STD 51 [104]) EPS The service only supports IP , IPV6 and IPV4V6 value.
precedence	Specifying Priorities	Type: Integer
delay	Specifying the delay level	Type: Integer
reliability	Specify reliability level	Type: Integer
peak	Specify peak throughput level	Type: Integer
mean	Specify the average throughput level	Type: Integer

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

X35 The project does not support this command.

10.2.4 + CGQREQ , specifying a quality of service profile

describe

This command is used to specify a

quality of service profile. Format

类型	命令	响应
设置命令	AT+CGQREQ=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]	响应 1： OK 响应 2： CME ERROR: <err>
读取当前设置	AT+CGQREQ?	+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>
查询命令参数范围	AT+CGQREQ=?	+CGQREQ: <PDP_type>,(list of supported <precedence>s),(list of supported <delay>s),(list of supported <reliability>s),(list of supported <peak>s),(list of supported <mean>s) OK

parameter

name	describe	Value
cid	Specify a specific PDP Context Definition	Type: Integer This parameter is TE-MT A local parameter of the interface and is used in other PDP context related commands. The range of allowed values is returned by the test form of the command. Network-Initiated PDP The <cid> value of the context will be beyond the command + CGDCONT and + CGDSCONT In the test form <cid> is the range shown.

PDP_type	Specifies the type of packet data protocol	Type: String • X.25 : ITU-T/CCITT X.25 Layer 3 (Obsolete) • IP : Internet Protocol (IETF STD 5 [103]) • IPV6 : Internet Protocol 6 (see RFC 2460 [106]) • IPV4V6 : introduced virtual <PDP_type> to handle dual IP StackUE Function • Internet : Hosted Octet Stream Protocol (obsolete) • PPP : Point-to-Point Protocol (IETF STD 51 [104]) EPS The service only supports IP , IPV6 and IPV4V6 value.
precedence	Specifying Priorities	Type: Integer
delay	Specifying the delay level	Type: Integer
reliability	Specify reliability level	Integer Types
peak	Specify peak throughput level	Type: Integer
mean	Specify the average throughput level	Type: Integer

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

X35 The project does not support this command.

10.2.5 +CGATT, set the packet domain Attach or Detach

describe

This command is used to mount or unmount **PS MT** on the domain service . After the command is executed, **MT** Keep **V.250** Command status. If **MT If the request** is already in progress, the command will be ignored and **OK will be returned.** Response. If the requested status cannot be achieved, **ERROR is returned** or **+CMEERROR** Response. Extended error response by **+CMEE** Command enabled.

Format

type	Order	response
Setting Commands	AT+CGATT=<state>	Respons e 1 : OK Response 2 : CME ERROR: <err> OK
Read current settings	AT+CGATT?	+CGATT: <state> OK
Query command parameter range	AT+CGATT=?	+CGATT: (list of supported <state>s) OK

parameter

name	describe	Value
state	PS Domain Status	Type: Integer • 0 : De-attach • 1 : Attachment

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	3000	AT Maximum time for command execution results to be returned (ms)	3000

10.2.6 + CGACT , Activate or Deactivate PDP Context

describe

This command is used to activate or deactivate the specified PDP (multiple) After the command is executed, the MT Keep V.250 Command status. If any PDP If the context is already in the requested state, the state of that context will remain unchanged. If the requested state cannot be achieved for any of the specified contexts , ERROR is returned. or +CME ERROR Response. Extended error response by +CMEE Command Enable. If the activation form of the command is executed, MT If no PS is attached , MT First execute PS Attaches and then attempts to activate the specified context. If the attach fails, the MT Will return, and if extended error responses are

enabled , an appropriate attach failure error message will be responded to.

For **EPS** , if you try to disconnect the last **PDN** Connection, then **MT** Returns **ERROR** or, if extended error responses are enabled, an
+CME ERROR .

Format

type	Order	response
Setting Commands	AT+CGACT=[<state>[,<cid>[,<cid>[,]]]]	Respons e 1 : OK Response 2 : NO CARRIER Response 3 : +CME ERROR: <err> OK
Read current settings	AT+CGACT?	+CGACT: <cid>,<state><CR><LF> +CGACT: <cid>,<state><CR><LF> +CGACT: <cid>,<state> OK
Query command parameter range	AT+CGACT=?	+CGACT: (list of supported <state>s) OK

parameter

name	describe	Value
state	Indicate PDP Activated state	0 : Deactivate 1 : Activate
cid	Specify a specific PDP Context Definition (See " + CGDCONT , Definition PDP Context ")	- -

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	30000	AT Maximum time for command execution results to be returned (ms)	30000

10.2.7 + CGPADDR , return PDP address

describe

This command is used to return **the PDP of the specified context identifier.** A list of addresses. If **<cid> is not specified** , all defined context addresses are returned. Format

type	Order	response
Setting Commands	AT+CGPADDR[=<cid>[,<cid>[,]]]	+CGPADDR: <cid>[,<PDP_addr_1>[,<PDP_addr_2>]] [<CR><LF>+CGPADDR: <cid>[,<PDP_addr_1>[,<PDP_addr_2>]]][…]] OK
Query command parameter range	AT+CGPADDR=?	+CGPADDR: (list of defined <cid>s) OK

parameter

name	describe	Value
PDP_addr_1 , PDP_addr_2	Used to identify the application of PDP in the address space of MT	Type: String For static addresses, it is defined by + CGDCONT when the context is defined. and + CGDSCONT command. For a dynamic address, it will be the address assigned during the last PDP activation using the context definition referenced by <cid> . and IPv6 Address, where <PDP_addr_1> Bag IPv4 address site , and <PDP_addr_2> contains IPv6 address.
cid	Specify a specific PDP Context definition (see " + CGDCONT , Defining PDP Context ")	- -

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

10.2.8 + CGEQMIN , 3G Quality of Service Configuration Parameters (Minimum Acceptable)

describe

This command is used for TE Specifies the

类型	命令	响应

minimum acceptable configuration

parameters. Format

type	Order	response
	UL>[,<Guaranteed bitrate DL>[,<Delivery order>[,<Maximum SDU size>[,<SDU UL>[,<Guaranteed bitrate DL>[,<Delivery order>[,<Maximum SDU size>[,<SDU error ratio>[,<Residual bit error ratio>[,<Delivery of erroneous SDUs>[,<Transfer delay>[,<Traffic handling priority>[,<Source statistics descriptor>[,<Signaling indication>]]]]]]]]]]]]]	Response 2 : +CME ERROR: <err>
Read current settings	AT+CGEQMIN?	+CGEQMIN: <cid>,<Traffic_class >,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority> [,<Source statistics descriptor>,<Signaling indication>] [<CR><LF>+CGEQMIN: <cid>,<Traffic_class >,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority> [,<Source statistics descriptor>,<Signaling indication>] […]]
查询命令参数范围	AT+CGEQMIN=?	+CGEQMIN: <PDP_type>,(list of supported < Traffic_class >s),(list of supported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL>s),(list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported <Maximum SDU size>s),(list of supported <SDU error ratio>s),(list of supported <Residual bit error ratio>s),(list of supported<Delivery of erroneous SDUs>s),(list of supported<Transfer delay>s),(list of

类型	命令	响应
		supported <Traffic handling priority>s)[,(list of supported <Source statistics descriptor>s),(list of supported <Signaling indication>s)] [<CR><LF>+CGEQMIN: <PDP_type>,(list of supported <Traffic_class>s),(list ofsupported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL >s),(list of supported<Guaranteed bitrate DL >s),(list of supported <Delivery order>s),(list of supported <Maximum SDU size>s),(list of supported <SDU error ratio>s),(list of supported <Residual bit error ratio>s),(list of supported<Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported <Traffic handling priority>s)[,(list of supported<Source statistics descriptor>s),(list of supported <Signaling indication>s)] […]]

参数

名称	描述	取值
cid	Specify a specific PDP Definition (see + CGDCONT and + CGDSCONT Order)	Type: Integer
PDP_type	Specifies the type of packet data protocol (see the +CGDCONT command)	Type: String
Traffic_class	Data format represents value	Type: Integer • 0 : Session • 1 : Flow • 2 : Interaction • 3 : Background
Maximum bitrate UL	Instructions in SAP Maximum kbit / s for UMTS (uplink traffic) Number (see 3GPP TS 24.008 Subclause 10.5.6.5)	Type: Integer

Maximum bitrate DL	Instructions in SAP Maximum kbit / s for UMTS (downlink traffic) Number (see 3GPP TS 24.008 Subclause 10.5.6.5)	Type: Integer

name	describe	Value
Guaranteed bitrate UL	Instructions in SAP Average kbit / s for UMTS (uplink traffic) Number (see 3GPP TS 24.008 Subclause 10.5.6.5)	Type: Integer
Guaranteed bitrate DL	Instructions in SAP Average kbit / s for UMTS (downlink traffic) Number (see 3GPP TS 24.008 Subclause 10.5.6.5)	Type: Integer
Maximum SDU size	Maximum Service Data Unit (SDU) size	Type: Integer
SDU UL	Uplink Service Data Unit	
Delivery order	Indicates UMTS Should the bearer provide in-order SDUs? transfer	Type: Integer • 0 : No • 1 : Yes
SDU error ratio	SDUs that are lost or detected as erroneous (see 3GPP TS 24.008 Subclause 10.5.6.5)	The value is specified as " mEe " . Error rate 5•10-3 Will be designated as " 5E3"
Residual bit error ratio	Indicates the delivered SDU The target value of the undetected bit error rate	Type: String If error detection is not required, the residual bit error rate represents the delivered SDU The value is specified as "mEe" . 5•10-3 Will be designated as "5E3 " (refer to 3GPP TS 24.008 subclause 10.5.6.5)
Delivery of erroneous SDUs	Designated for PDP Committed SDUs for the context Characteristics of the source	Type: Integer • 0 : No • 1 : Yes • 2 : Not found
Transfer delay	Instructions from a SAP Transmitting an SDU To another SAP The target time between transmitting a request (ms) (Refer to 3GPP TS24.008 No. 10.5.6.5 Festival)	Type: Integer
Traffic handling priority	Specifies the SDU to be carried with other In comparison, processing belongs to UMTS All SDUs carried The relative importance of (refer to 3GPP TS	Type: Integer

24.008 subclause 10.5.6.5)

Signaling Indication	committed SDUs for the PDP context when the traffic class is specified as interactive Signaling content (see 3GPP TS 24.008 Sub-clause 10.5.6.5)	Type: Integer • 0 : PDP Context is not optimized for signaling • 1 : PDP Context optimized for signaling
Source Statistics Descriptor	When the traffic class is specified as conversational or streaming, it is specified for PDP Committed SDUs for the context Source	Type: Integer • 0 : SDU Unknown characteristics

name	describe	Value
	Features (reference 3GPP TS 24.008 Sub-clauses 10.5.6.5)	• 1 : SDU The features correspond to the speech source

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

X35 The project does not support this command.

10.2.9 + CGEQREQ , request 3G Quality of Service Configuration Parameters

describe

This command is used for TE In MT Activate PDP When requesting

UMTS Quality of service configuration parameters. Format

类型	命令	响应
设置命令	AT+CGEQREQ=[<cid>[,< traffic class >[,<Maximum bitrate UL>[,<Maximum bitrate DL>[,<Guaranteed bitrate DL>[,<Delivery order>[,<Maximum SDU size>[,<SDU error ratio>[,<Residual bit error ratio>[,<Delivery of erroneous SDUs>[,<Transfer delay>[,<Traffic handling priority>[,<Source statistics descriptor>[,<Signaling indication>]]]]]]]]]]]]]	响应 1： OK 响应 2： +CME ERROR: <err>
读取当前设置	AT+CGEQREQ?	+CGEQREQ: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate

type	Order	response
		DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>[,<Source statistics descriptor>,<Signaling indication>] [<CR><LF>+CGEQREQ: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>[,<Source Statistics Descriptor>,<Signaling Indication>] […]]
查询命令参数范围	AT+CGEQREQ=?	+CGEQREQ: <PDP_type>,(list of supported <Traffic class>s),(list of supported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL>s),(list of supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported <Maximum SDU size>s),(list of supported <SDU error ratio>s),(list of supported <Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported<Transfer delay>s),(list of supported <Traffic handling priority>s) [,(list of supported <Source statistics descriptor>s),(list of supported <Signaling indication>s)] [<CR><LF>+CGEQREQ: <PDP_type>,(list of supported <Traffic class>s),(list ofsupported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL>s),(list of

类型	命令	响应
		supported <Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported <Maximum SDU size>s),(list of supported <SDU error ratio>s),(list of supported <Residual bit error ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of supported <Transfer delay>s),(list of supported <Traffic handling priority>s)] [,(list ofsupported <Source statistics descriptor>s),(list of supported <Signaling indication>s)]

参数

名称	描述	取值
cid	Specify a specific PDP Definition (see + CGDCONT and + CGDSCONT Life make)	Type: Integer
PDP_type	Specifies the type of packet data protocol (see the + CGDCONT command)	Type: String
traffic class	Data format represents value	Type: Integer • 0 : Session • 1 : Flow • 2 : Interaction • 3 : Background
Maximum bitrate UL	Instructions in SAP Maximum kbit/s for UMTS (uplink traffic) (see 3GPP TS 24.008 subclause 10.5.6.5)	Type: Integer
Maximum bitrate DL	Instructions in SAP Maximum kbit/s for UMTS (downlink traffic) (see 3GPP TS 24.008 subclause 10.5.6.5)	Type: Integer
Guaranteed bitrate UL	Instructions in SAP Average kbit/s for UMTS (uplink traffic) (see 3GPP TS 24.008 subclause 10.5.6.5)	Type: Integer

Guaranteed bitrate DL	Instructions in SAP Average kbit/s for UMTS (downlink traffic) (see 3GPP TS 24.008 subclause 10.5.6.5)	Type: Integer
Delivery order	Indicates UMTS Should the bearer provide order SDU transfer	Type: Integer

name	describe	Value
		• 0 : No • 1 : Yes
Maximum SDU size	Indicates the maximum allowed SDU Size in octets (see 3GPP TS 24.008 Sub-clause 10.5.6.5)	Type: Integer
SDU error ratio	Indicates a lost or erroneous SDU Target value of the score (see 3GPP TS 24.008 Sub-clause 10.5.6.5)	The value is specified as " mEe " . Error rate 5•10-3 Will be designated as " 5E3"
Residual bit error ratio	Indicates the delivered SDU The target value of the undetected bit error rate	Type: Integer If error detection is not required, the residual bit error rate represents the delivered SDU The value is specified as "mEe" . 5•10-3 will be designated as "5E3 " (ref. 3GPP TS 24.008 subclause 10.5.6.5)
Delivery of erroneous SDUs	Designated for PDP Context Submitted SDU Characteristics of the source	Type: Integer • 0 : No • 1 : Yes • 2 : Not found
Transfer delay	Instructions from a SAP Transmitting an SDU To another SAP The target time between transmitting a request (ms) (Refer to 3GPP TS24.008 Section 10.5.6.5)	Type: Integer
Traffic handling priority	Specifies the SDU to be carried with other In comparison, processing belongs to UMTS The relative importance of all SDUs carried (refer to 3GPP TS 24.008 Sub-clause 10.5.6.5)	Type: Integer

Signaling Indication	PDP when it is specified as interactive Committed SDUs for the context Signaling content (see 3GPP TS 24.008 Sub- clause 10.5.6.5)	Type: Integer • 0 : PDP Context is not optimized for signaling • 1 : PDP Context optimized for signaling
Source Statistics Descriptor	submitted SDUs for the PDP context when the traffic class is specified as conversational or streaming Characteristics of the source (refer to 3GPP TS 24.008 subclause 10.5.6.5)	Type: Integer • 0 : SDU Unknown characteristics • 1 : SDU The features correspond to the speech source

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands

Do you need to restart to take effect?	no	Set whether to save after power off	yes
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

X35 The project does not support this command.

10.2.10 + CGCMOD , modify PDP Context

describe

This command is used to target QoS Configuration Files and TFT

Modify the specified PDP Context content. Format

类型	命令	响应
设置命令	AT+CGCMOD=[<cid>[,<cid>[,…]]]	响应 1 : OK 响应 2 : +CME ERROR: <err>
查询命令参数范围	AT+CGCMOD=?	+CGCMOD: (list of <cid>s associated with active contexts)

parameter

name	describe	Value
cid	Specify a specific PDP Definition (see + CGDCONT and + CGDSCONT Order)	Type: Integer

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

X35 The project does not support this command.

10.2.11 + CGDSCONT , define auxiliary PDP Context

describe

This command is used to define a

secondary PDP. Context. Format

类型	命令	响应
设置命令	AT+CGDSCONT=[<cid>,<p_cid>[,<d_comp>[,<h_comp>[,<IM_CN_Signalling_Flag_Ind>]]]	响应 1 : OK

parameter

name	describe	Value
p_cid	UMTS is optimized for The application type of the bearer service, specifying a specific PDP definition specified using the +CGDCONT command .	- -
cid	Specify a specific PDP Definition (see + CGDCONT and + CGDSCONT command)	Type: Integer

name	describe	Value
d_comp	Control PDP Data compression (SNDCP only)	Type: Integer • 0 : Off • 1 : On • 2 : V.42bis • 3 : V.44
h_comp	Control PDP Header compression (reference 3GPP TS 44.065 [61] and 3GPP TS 25.323 [62])	Type: Integer • 0 : Off • 1 : On • 2 : RFC 1144 [105] (only Applicable to SNDCP) • 3 : RFC 2507 [107] • 4 : RFC 3095 [108] (only Applicable to PDCP)

IM_CN_Signalling_Flag_Ind	PDP to the network Is it for IM only? CN Subsystem related signaling	Type: Integer • 0 : UE Indicate PDP Not just for IM CN Subsystem related signaling • 1 : UE Indicate PDP Only IM CN Subsystem related signaling

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

X35 The project does not support this command.

10.2.12 + CGEREP , PS Domain event reporting

describe

This command is used to enable or disable MT when an event occurs in the PS domain. To

TE Send unsolicited result code + CGEV : XXX . Format

类型	命令	响应
设置命令	AT+CGEREP=[<mode>[,<bfr>]]	OK
读取当前设置	AT+CGEREP?	+CGEREP: <mode>,<bfr> OK
查询命令参数范围	AT+CGEREP=?	+CGEREP: (list of supported <mode>s),(list of supported <bfr>s) OK

parameter

name	describe	Value
mode	- -	Type: Integer • 0 : Cache unsolicited result codes in MT If MT If the result code buffer is full , the oldest buffer may be discarded without forwarding the result to the TE . • 1 : Keep MT TE When linking (ie, online data mode) unsolicited result codes are discarded ; otherwise they are forwarded directly to the TE . • 2 : When retaining MT TE When linking (i.e., online data mode) the MT Cache unsolicited result codes in MT TE Links are flushed to TE when available , otherwise they are forwarded directly to TE .
bfr	- -	Type: Integer • 0 : Input <mode > 1 or 2 When the non-request result code MT buffer defined in this command is cleared • 1 : When <mode> 1 or 2 is entered, the MT of the non-request result code defined in this command will be Buffer flushed to TE (should give OK before flushing code response)

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

10.2.13 + CGTFT， Transport Stream Template

describe

This command is used to allow **TE** Specify a Packet Filter **-** Traffic Flow Template **PF-TFT** .

Format

type	Order	response
Setting Commands	AT+CGTFT=[<cid>,[<packet filter identifier>,<evaluation precedence index> [,<source address and subnet mask> [,<protocol number (ipv4) / next header (ipv6)> [,<destination port range> [,<source port range> [,<ipsec security parameter index (spi)> [,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask> [,<flow label (ipv6)> [,<direction>]]]]]]]]]	响应 1： OK 响应 2： ERROR
读取当前设置	AT+CGTFT?	+CGTFT: <cid>,<packet filter identifier>,<evaluation precedence index>,<source address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<destination port range>,<source port range>,<ipsec security parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label (ipv6)> ,<direction> [<CR><LF>+CGTFT: <cid>,<packet filter identifier>,<evaluation precedence index>,<source address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<destination port range>,<source port range>,<ipsec security parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label (ipv6)> ,<direction> […]]
查询命令参数范围	AT+CGTFT=?	+CGTFT: <PDP_type>,(list of supported <packet filter identifier>s),(list of supported <evaluation precedence index>s),(list of supported <source address and subnet mask>s),(list of supported <protocol number (ipv4) / next header (ipv6)>s),(list of(ipv6)>s),(list of supported <direction>s) [<CR><LF>+CGTFT: <PDP_type>,(list of supported <packet filter identifier>s),(list of supported

类型	命令	响应
		<evaluation precedence index>s),(list of supported <source address and subnet mask>s),(list of supported <protocol number (ipv4) / next header(ipv6)>s),(list of supported <destination port range>s),(list of supported <source port range>s),(list of supported <ipsec security parameter index (spi)>s),(list of supported<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s),(list of supported <flow label (ipv6)>s),(list of sup-ported <direction>s) […]

parameter

name	describe	Value
cid	Specify a specific PDP Context definition (see "+CGDCONT , Define PDP Context ")	Type: Integer (See " + CGDCONT , Definition PDP Context ")
PDP_type	Packet protocol type (see the +CGDCONT Order)	Type: String
evaluation precedence index	Evaluation Priority Index	Type: Integer Range: 1~255
remote address and subnetmask	Remote address and subnet mask	Type: String
protocol number (ipv4) / next header (ipv6)	ipv4 Protocol number /ipv6 Header protocol number	Type: Integer Range: 0~255 is given as a dot-separated number (0 to 255)
local port range	Local port range	Type: Integer The string consists of dot-separated numbers (0~65535) The parameter form is given as " ft" .

remote port range	Remote port range	Type: String The string consists of dot-separated numbers (0-65535) parameter form "ft" gives
ipsec security parameter index (spi)	ipsec Security Parameter Index	Hexadecimal, 00000000~FFFFFFFF, the string is separated by dots

name	describe	Value
		A numeric (0-65535) parameter of the form "ft" is given.
type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask	Service Type (ipv4) and mask / transport class (ipv6) and mask	Type: Integer is given as a period-separated number (0-255) parameter of the form "tm"
flow label (ipv6)	Flow label (ipv6)	Type: Number in hexadecimal format Value range: 00000~FFFFF IPv6 only efficient
direction	Specify the transmission direction of the packet filter	Type: Integer • 0 : Pre-Release 7 TFT filter (See 3GPP TS 24.008 [8], Table 10.5.162) • 1 : Uplink • 2 : Downward • 3 : Birectional (Up & Downlink) if not set to default
packet filter identifier	Packet filter identifier, used to identify different packet filters	Type: Integer
source address and subnet mask	address and subnet mask of the data packet	
destination port range	Destination port range, used to specify the range of destination ports	
source port range	Source port range, used to specify the source port range	
next header(ipv6)	Next Header Field (IPv6)	

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

X35 The project does not support this command.

10.2.14 + CGPIAF , set IP Address output format

describe

This command is used to set the output of other AT

Command IPV6 The format of the address parameter.

类型	命令	响应
设置命令	AT+CGPIAF=[<IPv6_AddressFormat>[,<IPv6_SubnetNotation>[,<IPv6_LeadingZeros>[,<IPv6_CompressZeros>]]]]	响应 1： OK 响应 2： +CME ERROR: <err>
读取当前设置	AT+CGPIAF?	+CGPIAF: <IPv6_AddressFormat>,<IPv6_SubnetNotation>,<IPv6_LeadingZeros>,<IPv6_CompressZeros>
查询命令参数范围	AT+CGPIAF=?	+CGPIAF: (list of supported <IPv6_AddressFormat>s),(list of supported <IPv6_SubnetNotation>s),(list of supported <IPv6_LeadingZeros>s),(list of supported<IPv6_CompressZeros>s)

parameter

name	describe	Value
IPv6_AddressFormat	Deciding on IPv6 Address format	Type: Integer • 0 : Use IPv4 -like Point symbol • 1 : Use IPv6 -like Colon
IPv6_SubnetNotation	Subnet flag for remote address and subnet mask	Type: Integer • 0 : IP The address and subnet mask are separated by spaces . • 1 : CIDR Indication method: IP Number of bits in the address / network ID

IPv6_LeadingZeros	Determines whether leading zeros should be omitted	Type: Integer

name	describe	Value
		• 0 : IP The address and subnet mask are separated by spaces . • 1 : CIDR Indication method: IP Number of bits in the address / network ID
IPv6_CompressZeros	Decide whether to replace 16 with only '::' 1- n bits with zero value Examples	Type: Integer • 0 : No zero compression, example: "2001: DB8: 0:CD30: 0:0:0:0" • 1 : Use zero compression, for example: "2001: DB8: 0:CD30::" Only applies once . <IPv6_AddressFormat> = 0 , the setting does not apply.

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

10.2.15 + CGCONTRDP , PDP Context read dynamic parameters

describe

This execute command is used to return to

PDP Context dynamic parameters. Format

类型	命令	响应
设置命令	AT+CGCONTRDP=[<cid>]	+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<source_addr and subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P_CSCF_prim_addr>[,<P_CSCF_sec_addr>[,<IM_CN_Signalling_Flag>]]]]]] [<CR><LF>+CGCONTRDP:

type	Order	response
Query command parameter range	AT+CGCONTRDP=?	+CGCONTRDP: (list of <cid>s associated with active contexts)

parameter

name	describe	Value
cid	Specify a specific PDP Context Definition (See " + CGDCONT, Definition PDP Context ")	Type: Integer (See " + CGDCONT, Definition PDP Context ")
bearer_id	Bearer ID, i.e. EPS in EPS Bearer and UMTS / GPRS NSAPI in .	Type: Integer
apn	Access Point Name	Type: String
local_addr and Subnet_mask	MT IP Address and subnet mask	Type: String The string is given as a dot-separated number (0-255) If + CGPIAF is supported , its setting is + CGCONTRDP The execution form returns the parameter format
gw_addr	MT Gateway address	Type: String The string is given as a dot-separated number (0-255) If + CGPIAF is supported , its setting is + CGCONTRDP The execution form returns the parameter format
DNS_prim_addr	Primary DNS address	String Type If + CGPIAF is supported , its setting is + CGCONTRDP The execution form returns the parameter format.
DNS_sec_addr	Secondary DNS address	Type: String If + CGPIAF is supported , its setting is + CGCONTRDP The execution form returns the parameter format.

P_CSCF_prim_addr	Primary P-CSCF Server IP address	String Type If + CGPIAF is supported , its setting is + CGCONTRDP The execution form returns the parameter format.
P_CSCF_sec_addr	Secondary P-CSCF Server IP address	Type: String If + CGPIAF is supported , its setting is + CGCONTRDP The execution form returns the parameter format.

name	describe	Value
IM_CN_Signalling_Flag	Indicates whether the PDP context is used only for IM CN subsystem related signaling	Type: String • 0 : PDP Context is not used for IM CN Subsystem related signaling • 1 : PDP Context is only for IM CN Subsystem related signaling
source_addr and subnet_mask	Source address and subnet mask	Type: String

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

10.2.16 + CGSCONTRDP , read auxiliary PDP Contextual dynamic parameters

describe

This command is used to read the auxiliary

PDP Context dynamic parameters. Format

类型	命令	响应
设置命令	AT+CGSCONTRDP=[<cid>]	+CGSCONTRDP: <cid>,<p_cid>,<bearer_id>[,<IM_CN_Signalling_Flag>][<CR><LF>+CGSCONTRDP: <cid>,<p_cid>,<bearer_id>[,<IM_CN_Signalling_Flag>][…]]

parameter

name	describe	Value
cid	Specify a specific PDP Context definition (see " + CGDCONT , Defining PDP Context ")	Type: Integer (See " + CGDCONT, Definition PDP Context ")
p_cid	Designated specific PDP Context defined or default EPS Context Identifier	Type: Integer

name	describe	Value
bearer_id	Identify bearer, i.e. UMTS / GPRS EPS and NSAPI EPS Loading	Type: Integer
IM_CN_Signalling_Flag	Shows PDP Is it for IM only? CN Subsystem related signaling	Type : Integer • 0 : PDP Context is not used for IM CN Subsystem related signaling • 1 : PDP Context is only for IM CN Subsystem related signaling

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

X35 The project does not support this command.

10.2.17 + CGTFTRDP， transport stream read dynamic parameters

describe

This command is used to return information about the **<cid>** traffic flow template, as

well as other network-assigned values established by the network. Format

类型	命令	响应
设置命令	AT+CGTFTRDP=[<cid>]	+CGTFTRDP: <cid>,<packet filter identifier>,<evaluation vailable index>,<source address and vaila mask>,<protocol vaila (ipv4) / next header (ipv6)>,<destination port range>,<source port range>,<ipsec security parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label (ipv6)>, <direction>,<NW packet filter Identifier>[<CR><LF>+CGTFTRDP:<cid>,<packet filter identifier>,<evaluation vailable index>,<source address and vaila mask>, <protocol vaila (ipv4) / next

type	Order	response
		header (ipv6)>,<destination port range>,<source port range>,<ipsec security parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label (ipv6)>,<direction>,<NW p acket filter Identifier> […]]
Query command parameter range	AT+CGTFTRDP=?	+CGTFTRDP: (list of <cid>s associated with active contexts

parameter

name	describe	Value
cid	Specify a specific PDP Context Definition (See " + CGDCONT , Definition PDP Context ")	Type: Integer (See " + CGDCONT , Defining PDP Context ")
packet filter identifier	Packet Filter	Type: Integer Range: 1~16
evaluation available index	Evaluation Priority Index	Type: Integer Range: 1~255
source address and vaila mask	Remote address and subnet mask	Type: String
protocol vaila (ipv4) / next header (ipv6)	ipv4 Protocol number /ipv6 Header protocol number	Type: Integer Range: 0~255 The string is given as dot-separated numbers (0-255) .
local port range	Local port range	Type: String The string consists of dot-separated numbers (0-65535) is given as parameter of the form "ft" .
ipsec security parameter index (spi)	ipsec Security Parameter Index	Format: Hexadecimal Range: 00000000 ~ FFFFFFFF The string consists of dot-separated numbers (0-65535) is given as parameter of the form "ft" .

type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask	Service Type (ipv4) and mask / transmission class (ipv6) and mask	Type: String The string is given as a dot-separated number (0-255) parameter of the form "tm" .
flow label (ipv6)	Flow label (ipv6)	Format: Hexadecimal Range: 00000~FFFFF IPv6 only efficient
direction	Specify the transmission direction of the packet filter	Type: Integer

name	describe	Value
		• 0 : Pre-Release 7 TFT filter (see 3GPP TS 24.008 [8], Table 10.5.162) • 1 : Uplink • 2 : Downward • 3 : Birectional (Up&Downlink) if not set to default value
NW packet filter Identifier	Network-assigned EPS value	Type: Integer Range: 1~16
destination port range	Destination port range, used to specify the range of destination ports	
source port range	Source port range, used to specify the source port range	

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

X35 The project does not support this command.

10.2.18 + CGEQOS , define EPS service quality

describe

This command is used for TE For PDP Or business flow

definition EPS Quality of service parameters. Format

类型	命令	响应
设置命令	AT+CGEQOS=[<cid>[,<QCI>[,<DL_GBR>,<UL_GBR>[,<DL_MBR>,<UL_MBR]]]]	响应 1 : OK

type	Order	response
		Response 2 : +CME ERROR: <err>
Read current settings	AT+CGEQOS?	+CSCON: <n>,<mode>[,<state>] OK
Query command parameter range	AT+CGEQOS=?	+CGEQOS: <cid>,<QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>] [<CR>>LF>+CGEQOS: <cid>,<QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>] […]]

parameter

name	describe	Value
cid	Specify a specific PDP Context definition (see " + CGDCONT , define the PDP context ")	Type: Integer (See " + CGDCONT , Defining PDP Context ")
n	currently registered PLMN (Public Land Mobile Network) number	Type: Integer
mode	Current network mode	Type: Integer
state	Current base station status	Type: Integer
QCI	EPS QoS (see 3GPP TS 23.203 [85] and 3GPP TS 24.301 [83])	Type: Integer • 0 : QCI Selected by the network • 1~4 : Maximum value range of the confirmed bit rate flow • 5~9 : Maximum value range of unconfirmed bit rate traffic • 128~254 : Operator confirms QCI Value • UE QCI not allowed Values 65 , 66 , 69 and 70 .
DL_GBR	If it is GBR QCI means DL GBR . The unit is kbit/s .	Type: Integer For non -GBR QCI (see 3GPP TS 24.301 [83]) this parameter is omitted.

UL_GBR	If it is GBR QCI means UL GBR . The unit is kbit/s .	Type: Integer For non -GBR QCI (see 3GPP TS 24.301 [83]) this parameter is omitted.

name	describe	Value
DL_MBR	If it is GBR QCI means DL MBR . The unit is kbit/s .	Type: Integer For non -GBR QCI (see 3GPP TS 24.301 [83]) this parameter is omitted.
UL_MBR	If it is GBR QCI means UL MBR . The unit is kbit/s .	Type: Integer For non -GBR QCI (see 3GPP TS 24.301 [83]) this parameter is omitted.

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

X35 The project does not support this command.

10.2.19 + CGAUTH , set PDP Authentication parameters

describe

set the authentication type (PAP / CHAP) and the user name and password for the specified PDP context . The difference from MGAUTH is that the set user name and password can be returned when reading the current settings. MTK Platform AT+CGAUTH The persistence parameter is No.

Format

type	Order	response
Setting Commands	AT+CGAUTH=<cid>,<auth>[,<name>,<pwd>]	Respons e 1 : OK Response 2 : +CME ERROR: <err>
Read current settings	AT+CGAUTH?	+CGAUTH: <cid>,<auth>,<name>,<pwd>

type	Order	response
		[<CR><LF>+CGAUTH: <cid>,<auth>,<name>,<pwd>[…]] OK
Query command parameter range	AT+CGAUTH=?	+CGAUTH: (list of supported <cid>s),(list of supported <auth>s),(max length of supported <name>),(max length of supported <pwd>) OK

parameter

name	describe	Value
cid	specific PDP context ID (see "+ CGDCONT , Define PDP Context ")	Type: Integer Same as CGDCONT Medium cid The value range of
auth	Authentication Type	Type: Integer 0 : No authentication protocol required (NONE) 1 : Password Authentication Protocol (PAP) 2 : Challenge - Handshake Authentication Protocol (CHAP) 3 : PAP and CHAP
name	Authentication Username	Type: string, maximum length 64 bytes
pwd	Authentication password	Type: string, maximum

		length 64 bytes	

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

10.2.20 +GTSTATIS, Query the current rate and total data volume

describe

This command is used to query the current UE sending and receiving rate and the total number of bytes sent and received during this dialing period. When the dialing stops, the total number of bytes received and sent is cleared to 0 .

Format

type	Order	response
Read current settings	AT+GTSTATIS?	+GTSTATIS: <rx_rate>,<tx_rate>,<rx_bytes>,<tx_bytes> OK
Query command parameter range	AT+GTSTATIS=?	OK

parameter

name	describe	Value
rx_rate	Current download rate	Type: Integer The unit is byte (byte) . When no dial is performed, the return value is 0 .
tx_rate	Current upload rate	Type: Integer The unit is byte (byte) . When no dial is performed, the return value is 0 .
rx_bytes	The current total amount of dial-up download data	Type: Integer The unit is byte (byte) . When no dial is performed, the return value is 0 .
tx_bytes	The total amount of data currently uploaded by dial-up	Type: Integer The unit is byte (byte) . When no dial is performed, the return value is 0 .

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	yes
Is a data connection required?	yes	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

11 Setting up the profile

11.1 Setting the configuration file directive

11.1.1 +GTUSBMODE，set USB Configuration parameters

describe

This command changes the module's **USB** Configuration parameters. There are two main configuration parameters: **AT+NCM** configuration parameters for traditional **AT** commands and AT+NCM configuration parameters for **Windows 8.1 / Windows 10** Supported **MBIM** Configuration parameters. After reset or restart,

the new configuration parameters will be activated. Format

类型	命令	响应
设置命令	AT+GTUSBMODE=<mode>	响应 1： OK 响应 2： ERROR
读取当前设置	AT+GTUSBMODE?	+GTUSBMODE: <mode> OK
查询命令参数范围	AT+GTUSBMODE=?	+GTUSBMODE: (list of supported <mode>s)

parameter

name	describe	Value

mode	USB Functional Mode	Type: Integer • 17 DIAG + MODEM + AT + PIPE + RMNET + ADB • 18 DIAG + MODEM + AT + PIPE + ECM + ADB • 20 MODEM • twenty one MODEM + AT

name	describe	Value
		• 24 RNDIS + MODEM + DIAG + ADB • 29 MBIM+AT+ DIAG • 30 MBIM + MODEM + DIAG + AT • 31 DIAG + MODEM + RMNET + DPL + QDSS + ADB • 32 DIAG + MODEM + AT + PIPE + RMNET • 33 DIAG + MODEM + AT + PIPE + ECM

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	yes
Is a data connection required?	yes	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

<mode> value is 31 , which is Qualcomm native USB model

FM190 Series, FG190 Series, FM190W Series, FG190B Series and FG190W The series does not support MBIM

11.1.2 +GTAUTOCONNECT，automatically activate PDP

describe

Based on **usbmode Automatically activate the default cid** during startup ECM

/RMNET Function. Format

类型	命令	响应
设置命令	AT+GTAUTOCONNECT=<n>	响应 1： OK 响应 2： ERROR

type	Order	response
Read current settings	AT+GTAUTOCONNECT?	+GTAUTOCONNECT: <n> OK
Query command parameter range	AT+GTAUTOCONNECT=?	+GTAUTOCONNECT: (list of supported <n>s) OK

parameter

name	describe	Value
n	Auto dial switch	0 : Disable auto dialing 1 : Enable auto dial

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

11.1.3 +GTIPPASS , enable IP Direct

describe

Used to enable the IP direct access function of all data dial-ups. Set before enabling data dial-ups. All addresses assigned by ECM are public IP addresses.

类型	命令	响应
设置命令	AT+GTIPPASS=<state>[,<type>,<mac>]	响应 1 : OK 响应 2 : ERROR
读取当前设置	AT+GTIPPASS?	+GTIPPASS: <state>[<type>[,<mac>]] OK
查询命令参数范围	AT+GTIPPASS =?	+GTIPPASS: (list of supported <state>s),(list of supported <type>s),(max length of supported <mac>) OK

parameter

name	describe	Value
state	IP Pass-through switch	Type: Integer 0 : Ban IP Pass-through (default) 1 : Enable IP Direct
type	type	Type: Integer 1 : USB (default) 2 : Ethernet
Mac	MAC address	Type: String Mac The address is the mac of the host client ethernet port The address corresponds to the address. It is only required when <type> is 2 . If the wrong mac is configured address, data transmission may not be possible.

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	yes
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

11.1.4 +GTMAPVLAN , map VLAN ID

describe

Used to map the specified cid VLAN ID . Should be set before

setting data dial. Format

类型	命令	响应
设置命令	AT+GTMAPVLAN=<cid>,<vlan_id>	响应 1： OK 响应 2： ERROR
读取当前设置	AT+GTMAPVLAN?	响应 1： +GTMAPVLAN: <cid>,<vlan_id> OK 响应 2：

type	Order	response
Query command parameter range	AT+GTMAPVLAN=?	+GTMAPVLAN: (list of supported <cid>s), (list of supported <vlan_id>s) OK

parameter

name	describe	Value
cid	Configuration file id	Type: Integer Range: 1~42 AT+CGDCONT The specified configuration file id is used to specify a specific PDP Context Definition
vlan_id	vlan id	Type: Integer Range: 0~4094 If vlan_id Set to 0 to cancel the fixed vlan_id

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

11.1.5 +GTMPDN , enable VLAN Multiple PDN

describe

PDNs in all data dials With VLAN Format

类型	命令	响应
设置命令	AT+GTMPDN=<state>	响应 1 : OK 响应 2 : ERROR
读取当前设置	AT+GTMPDN?	+GTMPDN: <state> OK
查询命令参数范围	AT+GTMPDN=?	+GTMPDN: (list of supported <state>s)

parameter

name	describe	Value
state	Multiple PDN Enable switch	Type: Integer 0 : Disable VLAN MDN Connect (default) 1 : Enable VLAN MDN connect

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	yes
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

11.1.6 +GTDNS , request DNS address

describe

the PDP specified by the profile ID . Context, request the primary DNS and secondary

DNS Address. Format

类型	命令	响应
设置命令	AT+GTDNS=<cid>	+GTDNS: <cid>,<Primary_DNS_addr>,<Secondary_DNS_addr> OK
读取当前设置	AT+GTDNS?	+GTDNS: <cid1>,<Primary_DNS_addr1>,<Secondary_DNS_addr1> +GTDNS: <cid2>,<Primary_DNS_addr2>,<Secondary_DNS_addr2> ... +GTDNS: <cidn>,<Primary_DNS_addrn>,<Secondary_DNS_addrn> OK
查询命令参数范围	AT+GTDNS=?	+GTDNS: (list of defined <cid>s) OK

parameter

name	describe	Value
Primary_DNS_addr	Primary DNS address	Type: String
Secondary_DNS_addr	Secondary DNS address	Type: String
cid	Specify a specific PDP Context Definition (See " + CGDCONT, Definition PDP Context ")	Type: Integer (See " + CGDCONT, Definition PDP Context ")

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

11.1.7 +GTROAMCFG , roaming dial control

describe

ECM/RMNET in roaming situation. Dial. Format

类型	命令	响应
设置命令	AT+GTROAMCFG=<n>	响应 1: OK 响应 2: +CME ERROR: <err>
读取当前设置	AT+GTROAMCFG?	+GTROAMCFG: <n>,< roaming_status> OK
查询命令参数范围	AT+GTROAMCFG=?	+GTROAMCFG: (<n>s 支持列表) OK

parameter

name	describe	Value
n	Function switch, if n The value of is 0 , UE Cannot dial in roaming state. If the value is 1, UE can dial in roaming state .	Type: Integer 0 : Disable this feature 1 : Enable this function (default value)
roaming_status	UE Register to HPLMN/EHPMN (non-roam) or non-HPLMN (roam)	Type: integer 0 : non-roam 1 : roam

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

11.1.8 + GTURCMODE , set Urc Report Mode

describe

the urc in the module Report mode. This command allows the module not to report the specified urc Message. Up to ten URCs can be specified. Not
TE report

format

类型	命令	响应
设置命令	AT+GTURCMODE=<report_flag>,[URC]	响应 1 : OK 响应 2 : ERROR
读取当前设置	AT+GTURCMODE?	+GTURCMODE: <report_flag>,[URC]>[<CR><LF>+GTURCMODE:<report_flag >,[URC]>][...]] OK
查询命令参数范围	AT+GTURCMODE=?	+GTAUTODHCP: (list of supported <n>s) OK

parameter

name	describe	Value
< report_flag >	Switch URC	Type: Integer 0 : Do not report to URC 1 : Report to URC

< URC >	Specify what to report or not report **urc** matches the **urc** substring. The maximum length of **URC** is **10** .	Type: Integer

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	yes	Set whether to save after power off	yes
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

X35 The project does not support this command.

11.1.9 +GTAUTODHCP , ECM Automatic DHCP

describe

ECM during startup Automatic DHCP when

activated Function. Format

类型	命令	响应
设置命令	AT+GTAUTODHCP=<n>	响应 1 : OK 响应 2 : ERROR
读取当前设置	AT+GTAUTODHCP?	+GTAUTODHCP: <n> OK
查询命令参数范围	AT+GTAUTODHCP=?	+GTAUTODHCP: (list of supported <n>s) OK

parameter

name	describe	Value
n	Automatic DHCP switch	0 : Disable automatic DHCP 1 : Enable automatic DHCP

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	yes	Set whether to save after power off	yes
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

11.1.10 +GTPREDNSCFG , pre-configure DNS address

describe

DNS to the terminal When the primary DNS address is set, the user

pre-configures the primary DNS and secondary DNS Address. Format

类型	命令	响应
设置命令	AT+GTPREDNSCFG=<mode>[,<pri_dns_server>[,<sec_dns_server>]]	响应 1： OK 响应 2： +CME ERROR: <err>
读取当前设置	AT+GTPREDNSCFG?	+GTPREDNSCFG: <mode>[,<pri_dns_server>[,<sec_dns_server>]] OK
查询命令参数范围	AT+GTPREDNSCFG=?	+GTPREDNSCFG: (list of supported<mode>s),(list of supported <pri_dns_server>s),(list of supported <sec_dns_server>s) OK

parameter

name	describe	Value
mode	model	Type: Integer 0 : Disable the pre-configuration feature 1 : Enable the pre-configuration function

pri_dns_server	Primary DNS	Type: String Pre-configured primary DNS server
sec_dns_server	Secondary DNS	Type: String Pre-configured secondary DNS server

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	yes	Set whether to save after power off	yes
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

11.1.11 +GTWWAN， ECM/RMNET Configuration

describe

Enable / disable the specified cid based on the current usbmode ECM /RMNET When ECM/RMNET is enabled Before calling this function, make sure that a PDP context with the specified CID has been defined .

Format

type	Order	response
Setting Commands	AT+GTWWAN=<state>,<cid>[,force_option]	Respons e 1 : OK Respons e 2 : ERROR
Read current settings	AT+GTWWAN?	Response 1 : +GTWWAN: <state>,<cid>,<ip>,<pdns>,<sdns> OK Response 2 : +GTWWAN: 0 OK

Query command parameter range	AT+GTWWAN=?	+GTWWAN: (list of supported <state>s), (list of supported <cid>s)[,(list of supported <force_option>s)] OK

parameter

name	describe	Value
state	ECM/RMNET switch	0 : Disable ECM/RMNET (default) 1 : Activate ECM/RMNET Data dialing
cid	Configuration file id	Type: Integer Range: 1~42 AT+CGDCONT The specified profile id is used to specify a specific PDP context definition.

name	describe	Value
ip	IP address	Type: String Assigned by the network to ECM/RMNET IP address of the device Address, by PDP Context activation accept.
pdns	Primary DNS	Type: String DNS assigned by the network , via PDP Context allocation activation.
sdns	Secondary DNS	Type: String Network assigned secondary DNS , via PDP Context allocation activation.
force_option	Mandatory options	Type: Integer 0 : According to usbmode Activate / deactivate ECM Dial (default) 1 : Force activation / deactivation of ECM Data dialing

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	yes
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response	1000	AT Maximum time for command	1000

maximum duration (ms)	execution results to be returned (ms)

11.1.12 +GTRMNETMAP, set RMNET NIC Mapping Mode

describe

This command is used to set the mapping RMNET Mode for indexing network interface cards (NICs) and configuration files. Index in order or randomly assign RMNET

Netwo

rk card.

Fe类型 t	命令	响应
设置命令	+GTRMNETMAP= <state>	响应 1： OK 响应 2： ERROR
读取当前设置	+GTRMNETMAP?	响应 1： +GTRMNETMAP: <state> OK 响应 2： ERROR

type	Order	response
Query command parameter range	+GTRMNETMAP=?	+GTRMNETMAP: (list of supported <state>) OK

parameter

name	describe	Value
state	Allocate RMNET Network card mode	Type: Integer 0 : Random 1 : Index order

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	yes
Is a data connection required?	yes	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

11.1.13 +GTPING , check data service connection status

describe

Used to determine the

connection status of data

类型	命令	响应
设置命令	AT+GTPING=<mode>[,<”ip/hostname”>]	响应 1： +GTPING: <state> OK 响应 2： ERROR
读取当前设置	- -	- -
查询命令参数范围	AT+GTPING=?	+GTPING: (list of supported <mode>s),(list of supported <ip/hostname>s) OK

参数

name	describe	Value
mode	model	Type: Integer 0 : indicates that the ip/ host name is IPV4 address 1 : indicates that the IP/ host name is IPV6 address When input AT+GTPING=0 When the module pings Default IPV4 Address (1 1 4 . 1 1 4 . 1 1 4 . 1 1 4) When input AT+GTPING=1 The module will directly return ERROR .
ip/hostname	IP/ Hostname	Type: String Will ping IP Address or host name string length: 0~64
state	network status	Type: Integer 0 : Network not connected 1 : Network connected

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	yes	Set whether to save after power off	no
AT Command response maximum duration (ms)	10000	AT Maximum time for command execution results to be returned (ms)	10000

11.1.14 + GTMAPCFG, Get MAP Configuration

describe

This command is used to obtain the current mapping configuration. Including channel ID , rmnet

Network interface card name, network mask, gateway, IP and DNS . Format

类型	命令	响应
读取当前设置	+GTMAPCFG?	响应 1: GTMAPCFG: <channel>,<rmnet_name>,<net_maske>, <gateway>,<ip>,<dns1,dns2>OK 响应 2: +GTRMNETMAP:0 响应 3: ERROR

参数

name	describe	Value
<Channel>		Type: Integer Range: 1- 42
<rmnet_name>	rmnet Network interface card name	Type: Integer
<net_maske>	Network mask information	Type: Integer
<gateway>		Type: Integer
<ip>	IP Information, including ipv4 IP and IPv6 IP	Type: Integer
<dns1,dns2>	DNS information	Type: Integer

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	yes
Is a data connection required?	yes	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

11.1.15 +MMAD , query ADC Channel detection voltage value

describe

This command is used to query the voltage value detected by the

ADC channel, in millivolts (mV) Format

类型	命令	响应
执行命令	AT+MMAD	响应 1： +MMAD: <channel>,<value> OK

type	Order	response
		Respons e 2 : ERROR
Read current settings	AT+MMAD?	Response 1 : +MMAD: <channel>,<value> OK Respons e 2 : ERROR

parameter

name	describe	Value
channel	ADC Channel number, usually two channels	Range: 0~1 (The range varies by platform) Unsigned Type, decimal number
value	The detected voltage value, in millivolts (mV)	Range: 0~2000 (The maximum value may vary depending on the platform) Unsigned Type, decimal number

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	2000	AT Maximum time for command execution results to be returned (ms)	2000

12 Audio

12.1 Audio Introduction

This section introduces the audio

function, including the following

configuration items: Gain: Controls the

volume of the voice

Transmission mode: I2S or PCM

DTMF Tones: transmission, playback, duration, detection

12.2 Audio instructions

12.2.1 +CLVL, speaker volume

describe

This command sets the volume of the module's internal speaker.
In this command, the new value will be retained after power cycle. Even if no SIM card

is inserted Card, you can also use +CLVL Command. Format

类型	命令	响应
设置命令	AT+CLVL=<level>	响应 1: OK 响应 2: +CME ERROR:<err>
读取当前设置	AT+CLVL?	+CLVL: <level> OK
查询命令参数范围	AT+CLVL=?	+CLVL: (list of supported <level>s) OK

parameter

name	describe	Value
level	Volume Level	Range: 0~7 • 0 : Low volume level (not muted) • 4 : Default value

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	yes
AT Command response maximum duration (ms)	500	AT Maximum time for command execution results to be returned (ms)	500

12.2.2 +CMUT , mute / unmute microphone / speaker path

describe

/ unmute the currently active microphone and speaker paths by overriding the current mute status . Once the command setting is typed in idle mode , CMUT The setting should be valid only for the current call or the next call.

Format

type	Order	response
Setting Commands	AT+CMUT=<state>	Respons e 1 : OK Response 2 : +CME ERROR:<err>
Read current settings	AT+CMUT?	+ CMUT: <state> OK
Query command parameter range	AT+CMUT=?	+CMUT: (list of supported <state>s) OK

parameter

name	describe	Value

state	Mute state	0 : Unmute both microphone and speaker paths (default) 1 : Mic path muted, speaker path unmuted 2 : Mic muted, speaker path muted 3 : Mic path muted, speaker path muted

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	500	AT Maximum time for command execution results to be returned (ms)	500

12.2.3 +GTDTMF , software decoding

describe

This command enables / disables DTMF Software decoding. If DTMF is detected in voice mode If the module fails to respond, it will return an unsolicited result code
+ GTDTMF : <x> .

Format

type	Order	response
Setting Commands	AT+GTDTMF=<n>	Respons e 1 : OK Response 2 : +CME ERROR:<err>
Read current settings	AT+GTDTMF?	+GTDTMF: <n> OK
Query command parameter range	AT+GTDTMF=?	+GTDTMF: (0,1) OK

parameter

name	describe	Value
n	state	Type: String Range: 0-9 , A-D , * , # • 0 : Disable DTMF Decode (default) • 1 : Enable DTMF Decoding unsolicited result codes + GTDTMF

characteristic

Do I need a SIM? Card	no	Do I need to register a network?	no

normal			
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	500	AT Maximum time for command execution results to be returned (ms)	500

12.2.4 +MAVOL , volume setting

describe

This command allows you to determine the volume of a specific function through a specific accessory. The gain level is saved in **NVM.** In order to achieve power-off preservation. Format

类型	命令	响应
设置命令	AT+MAVOL=<accy>,<feature>,<vol>	响应 1： OK 响应 2： +CME ERROR: <err>
读取当前设置	AT+MAVOL?	（当前设置路径） +MAVOL: <accy>,<feature>,<vol> OK
查询命令参数范围	AT+MAVOL=?	+MAVOL: (list of supported <accy>s),(list of supported <feature>s),(list of supported <vol>s) OK

parameter

name	describe	Value
accy	Output Selection	1 : SPK+/SPK- 2 : AUXO+/AUXO- 3 : 1 and 2
feature	Adjustment Category	Adjustment category in **bit** Mask value storage, combined result range (**1-15**) 1 ： Voice （ bit1 ） 2 ： Tone （ bit2 ） 4 : MIDI (bit3) 8 : TTS (bit4)
vol	Volume Level	Range: **0~7**

characteristic

Do I need **a SIM?** Card normal	no	Do I need to register a network?	no

Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	yes
AT Command response maximum duration (ms)	500	AT Maximum time for command execution results to be returned (ms)	500

X75 The project supports command parameter ranges of (1), (1), (0-7) .

12.2.5 +MMICG , microphone gain value

describe

This command processes the MIC The microphone

gain value is selected. Saved when power is off.

Format 类型	命令	响应
设置命令	AT+MMICG=<gain>	响应 1 : OK 响应 2 : +CME ERROR:<err>
读取当前设置	AT+MMICG?	+MMICG: <gain> OK
查询命令参数范围	AT+MMICG=?	+MMICG: (list of supported <gain>s) OK

parameter

name	describe	Value
gain	Microphone gain value	Range: 0~15 0 : Lowest gain value (non-mute) default value is 10

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	500	AT Maximum time for command execution results to be returned (ms)	500

12.2.6 +MAI2SY，set digital audio transmission parameters

describe

This command is used to set the transmission parameters of digital audio, including

master mode and slave mode, transmission mode, sampling rate and word width. Format

类型	命令	响应
设置命令	AT+MAI2SY=<master>,<tran_mode>,<sample>,<width>	响应 1： OK 响应 2： +CME ERROR:<err>
读取当前设置	AT+MAI2SY?	+MAI2SY: <master>,<tran_mode>,<sample>,<width> OK
查询命令参数范围	AT+MAI2SY=?	+MAI2SY: (range of <master>s),(range of <tran_mode>s),(range of <sample>s),(range of <width>s) OK

parameter

name	describe	Value
master	Set data transfer to master or slave mode	**0** : The module is in master mode and the external codec is in slave mode **1** : The module is in slave mode and the external codec is in master mode
tran_mode	Data transmission method	**0** : **I2S mode** **1** : **PCM mode**
sample	Sampling Rate	**0** : **8k** **1** : **16k** **2** : **24k** **3** : **32k** **4** : **44.1k**
width	Font width	**0** : **16** Bit **1** : **24** Bit **2:32** Bit

characteristic

Do I need **a SIM?** Card	no	Do I need to register a	no

normal		network?	
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	yes
AT Command response maximum duration (ms)	500	AT Maximum time for command execution results to be returned (ms)	500

X75 The project supports command parameter ranges of (0),(0,1),(0,1),(0) .

12.2.7 +MAPATH , audio path

describe

This command sets / requests active inputs and outputs for each function. On power-up, the default paths for microphone, speaker and alarm speaker are restored. Format

类型	命令	响应
设置命令	AT+MAPATH= <direct>,<accy>	响应 1 : OK 响应 2 : +CME ERROR:<err>
读取当前设置	AT+ MAPATH?	响应 1 : 如果 + GTCODECN 选择了 ALC5621 将返回 +MAPATH: 1(mode in and out),<accy> 响应 2 : 如果 +GTCODECN 选择了 CS42L73 将返回 +MAPATH: 1(mode in),<accy> +MAPATH: 2(mode out),<accy> OK
查询命令参数范围	AT+MAPATH=?	+MAPATH: (list of supported <direct>s),(list of supported <accy>s) OK

parameter

name	describe	Value
direct	Input and output status	If using ALC5621 Audio channel input and output Module (default) If using CS42L73 Audio channel input Module Audio channel output from Module

name	describe	Value
accy	Audio channel output module	If using ALC5621 • 1st channel MIC+/MIC- and AUXI+/AUXI- (Default) 2nd channel MIC+/MIC- and AUXI+/AUXI- • 1st channel SPK+/SPK- (Default) 2nd channel AUXO+/AUXO- Both 1st and 2nd

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	500	AT Maximum time for command execution results to be returned (ms)	500

12.2.8 +VTD， tone duration

describe

This command handles the selection of the tone duration. Integer <n> defines + VTS The length of the tone that is commanded. In GSM , the tone duration value can be modified according to the specific network.
In GSM / UMTS , the value of the audio duration is preset and cannot be

changed (27.007 - e50)Format

类型	命令	响应
设置命令	AT+VTD=<n>	响应 1： OK 响应 2： +CME ERROR:<err>
读取当前设置	AT+VTD?	+VTD: <n> OK
查询命令参数范围	AT+VTD=?	+VTD: (list of supported <n>s)

parameter

name	describe	Value
n	Definition + VTS The length of the tone issued by the command	Range: 0~10 1 ~ 10 : 100ms~1s Adjustable

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	yes
AT Command response maximum duration (ms)	500	AT Maximum time for command execution results to be returned (ms)	500

12.2.9 +VTS， specific command tone duration

describe

When a voice call is active, this command will send the DTMF Audio string. For example, when announcing the start of a recording cycle, you can use DTMF
Tone. Duration does not eliminate VTD Duration n .
In GSM The audio duration value can be modified according to the specific network.
If you are playing DTMF If an active call is interrupted during the audio process, the following unsolicited message will be transmitted to TE:VTS : " Call termination has stopped DTMF audio transmission " .
+ VTS The defined duration is specific only to the DTMF in this command string. It will not erase + VTD The duration is defined by the command and is erased when the module is powered down. If <duration> is not defined , the +VTD value is used.

Format

type	Order	response
Setting Commands	AT+VTS=<DTMF>[,<durations>]	Respons e 1 : OK Response 2 : +CME ERROR:<err>
Read current settings	AT+ VTS?	- -
Query command parameter range	AT+VTS=?	+VTD:+VTS: (list of supported <DTMF>s),(list of supported <durations>s) OK

parameter

name	describe	Value
DTMF	ASCII String	Type: String Range: 0~9 , # , * , A D Length: Maximum 32 Characters

name	describe	Value
durations	The duration of the DTMF tone is different from the duration set by the + VTD command. If not set, the module will use VTD The value in	Range: 1~10 100ms~1s Adjustable

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	yes
AT Command response maximum duration (ms)	500	AT Maximum time for command execution results to be returned (ms)	500

12.2.10 +VTA , set to play DTMF type

describe

Via VTS DTMF When sent to the network, this command enables /

disables local playback of DTMF Sound. Format

类型	命令	响应
设置命令	AT+VTA=<para>	响应 1: OK 响应 2: +CME ERROR:<err>
读取当前设置	AT+VTA?	- -
查询命令参数范围	AT+VTA=?	+VTA: (list of supported <para>s) OK

parameter

name	describe	Value
para	state	0 : Disable playing DTMF locally sound 1 : Enable playing DTMF locally Tone (default)

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	500	AT Maximum time for command execution results to be returned (ms)	500

X62/X75 The project supports command parameter range of (0) .

13 FOTA

13.1 FOTA Upgrade Command

13.1.1 +GTOTA， FOTA upgrade

describe

This command is used to start FOTA Upgrade process. Firmware data can be

downloaded via FTP or HTTP Download the protocol. Format

类型	命令	响应
设置命令	AT+GTOTA=<type>,<"url">[,<"filename">,<"username">,<"password">]	响应 1： OK GTOTA DOWNLOAD START GTOTA DOWNLOADING: <percent>% 下载成功： GTOTA DOWNLOAD COMPLETE 下载失败： GTOTA DOWNLOAD FAILED 升级成功： FOTA_UPDATE_SUCCESS 升级失败： FOTA_UPDATE_FAILED 响应 2： +CME ERROR: <err>
查询命令参数范围	AT+GTOTA=?	AT+GTOTA: <type>,<"url">[,<"filename">,<"username">,<"password">] OK

parameter

name	describe	Value
type	Download method	Type: Integer • 0 : via HTTP Conduct FOTA upgrade

name	describe	Value
		• 1 : Via FTP Conduct FOTA upgrade When <type> is 0 , the parameters <"filename"> , <"username">, and <"password"> cannot be used ; When <type> is 1 The parameters <"filename"> , <"username"> , and <"filename"> must be given . Using HTTP When OTA The package's file name and path must be contained in <"URL"> ; Using FTP When <"URL"> is just FTP The address of the server, and filename given by the parameter <"filename"> . If necessary, the file path can be included in <“filename”> .
url	server address	Type: String Length: Maximum 255 byte
filename	OTA The file name of the package	Type: String Length: Maximum 255 byte
username	FTP Server username	Type: String Length: Maximum 255 byte
password	FTP The password of the corresponding user name	Type: String Length: Maximum 255 byte

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	yes
Is a data connection required?	yes	Asynchronous or synchronous commands	Asynchronous commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	- -	AT Maximum time for command execution results to be returned (ms)	- -

14 GPS

14.1 GPS instruction

14.1.1 +GTGPSPOWER, Controlling GNSS power supply

describe

This command is used to control

GNSS Module power supply.

Format 类型	命令	响应
设置命令	AT+GTGPSPOWER=<mode>	响应 1: OK 响应 2: +CME ERROR: <err>
读取当前设置	AT+GTGPSPOWER?	+GTGPSPOWER: <mode> OK
查询命令参数范围	AT+GTGPSPOWER=?	+GTGPSPOWER: (list of supported <mode>s) OK

parameter

name	describe	Value
<mode>	Disable or enable GNSS Power supply of the module	Type: Integer • 0 : Disable GNSS Power supply for the module (default) • 1 : Turn on GNSS Power supply of the module

characteristic

Do I need a SIM? Card	no	Do I need to register a	no

normal		network?	
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

14.1.2 +GTGPS，read GNSS Navigation information

describe

This command is used to read

GNSS Navigation information.

Format 类型	命令	响应
设置命令	AT+GTGPS[=<item>]	响应 1： +GTGPS: 全球导航卫星系统导航信息 <item> OK 响应 2： +GTGPS:所有全球导航卫星系统导航信息 响应 3： +CME ERROR: <err>
读取当前设置	AT+GTGPS？	响应 1： + GTGPS:所有全球导航卫星系统导航信息 OK 响应 2： +CME ERROR: <err>
查询命令参数范围	AT+GTGPS=？	+GTGPS: (list of supported <item>s) OK

parameter

name	describe	Value

<item>	Type: Integer • " RMC " : Get RMC sentence • " GGA " : Get GGA sentence • ″ GSA ″ : Get GSA sentence • " GSV " : Get GSV sentence

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

Note 1 : The output of navigation information is controlled by <value>AT+GTGPSCFG Satellite configuration in command (when x = 2 Note 2 : When his " RMC " statement contains GPRMC (select GPS) and GARMC (select Galileo The " GGA " sentence includes GPGGA (when GPS is selected) and GAGGA (when Galileo is selected)

" GSA " statement contains GPGSA (select GPS), GAGSA (select Galileo Hours) and PQGSA (select QZS hour).

" GSV " sentence contains GPGSV (select GPS), GAGSV (select GALILEO), GLGSV (select GLONASS) and PQGSA (select QZSS hour).

14.1.3 +GTGPSEPO , set GPS Operation Mode

describe

This command is used to set the

GPS The operation mode. Format

类型	命令	响应
设置命令	AT+GTGPSEPO=<mode>	响应 1: OK 响应 2: +CME ERROR: <err>
读取当前设置	AT+GTGPSEPO?	响应 1: +GTGPSEPO:<mode> OK 响应 2:

type	Order	response
		+CME ERROR: <err>
Query command parameter range	AT+GTGPSEPO= ?	+GTGPSEPO:(list of supported <mode>s) OK

parameter

name	describe	Value
<mode>	Enable or disable AGPs Function	Type: Integer • 0: Disable AGPs Function (default) • 1: Enable AGPs MSB Mode function. • 2: Enable AGPs MSA Mode function.

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

14.1.4 +GTAGPSSERV , set AGPS server

describe

This command is used to set

agps Server. Format

类型	命令	响应
设置命令	AT+GTAGPSSERV=<IP/URL>,<port>	响应 1: OK 响应 2: +CME ERROR: <err>
读取当前设置	AT+GTAGPSSERV?	响应 1:

type	Order	response
		+ GTGPSEPO:<mode> OK Response 2 : +CME ERROR: <err>
Query command parameter range	AT+GTAGPSSERV=?	+GTGPSEPO:(list of supported <mode>s) OK

parameter

name	describe	Value
<IP/URL>	Indicates GPS Server IP Address or URL	Type: String
<port>	Indicates GPS The server's port number	Type: Integer
<mode>	Enable or disable AGPs Function	Type: Integer • 0: Disable AGPs Function (default) • 1: Enable AGPs MSB Mode function. • 2: Enable AGPs MSA Mode function.

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

14.1.5 +GTGPSCFG , GNSS/A-GNSS Configuration

describe

This command is used to configure

GNSS/A-GNSS Parameters of Format

type	Order	response
Setting Commands	AT+GTGPSCFG=<x>,<value>	Respons e 1 : OK Response 2 : +CME ERROR: <err>
Read current settings	AT+GTGPSCFG?	Response 1: +GTGPSCFG: 0,<value> 1,<value> 2,<value> 3,<value> OK Response 2 : +CME ERROR: <err>
Query command parameter range	AT+GTGPSCFG= ?	+GTGPSCFG: (x),(list of supported < value >s) OK

parameter

name	describe	Value
<x>		Type: Integer • 0: supl version. • 1: Xtra Enable / dsable.(Currently not supported) • 2: Satellite selection . • 3: Enable / Disable SUPL Certificate
<value>		supl version: • 0: SUPL1.0. • 1: SUPL2.0 (default). • 2: SUPL2.0.4 (X35/X72/X75 Platform default). Xtra Enable / Disable: • 0: Disable XTRA Functionality . (Default). • 1: Enable XTRA Function . Satellite

switch:

- 0: Satellite positioning combination GPS + GLONASS .

name	describe	Value

NMEA Contains：GPRMC, GPGSV , GPGSA , GPGGA, GLGSV.

- 1: Satellite positioning combination GPS+ BeiDou .

NMEA output contains: GPRMC, GPGSV, GPGSA, GPGGA, BDGSV, BDGSA.

- 2: Satellite positioning combination GPS+ GALILEO.

NMEA output contains: GPRMC, GPGSV, GPGSA, GPGGA, GARMC, GAGSV, GAGSA, GAGGA.

- 3: 卫星定位组合 GPS + QZSS。

NMEA output contains: GPRMC, GPGSV, GPGSA, GPGGA, PQGSV, PQGSA.

- 4：Satellite positioning combination GPS+ BeiDou + GALILEO.NMEA output contains: GPRMC, GPGSV, GPGSA, GPGGA, BDGSV, BDGSA, GARMC, GAGSV, GAGSA, GAGGA.

- 5: Satellite positioning combination GPS+ BeiDou + GLONASS . NMEA output contains: GPRMC, GPGSV, GPGSA, GPGGA , BDGSV , BDGSA , GLGSV.

- 6: Satellite positioning combination GPS+ BeiDou + QZSS .

NMEA output contains: GPRMC, GPGSV, GPGSA, GPGGA, BDGSV, BDGSA, PQGSV, PQGSA.

- 7: Satellite positioning combination GPS+ GLONASS + GALILEO.

NMEA output contains: GPRMC, GPGSV, GPGSA, GPGGA, GLGSV, GARMC, GAGSV, GAGSA, GAGGA.

- 8: Satellite positioning combination GPS + GALILEO + QZSS.

NMEA output contains: GPRMC, GPGSV, GPGSA, GPGGA, GARMC, GAGSV, GAGSA, GAGGA, PQGSV, PQGSA.

- 9: Satellite positioning combination GPS + GLONASS + QZSS.

NMEA output contains: GPRMC, GPGSV, GPGSA, GPGGA, GLGSV, PQGSV, PQGSA.

- 10：Satellite positioning combination GPS + BeiDou + GALILEO + GLONASS.

NMEA output contains: GPRMC, GPGSV, GPGSA,

GPGGA, BDGSV, BDGSA, GARMC, GAGSV, GAGSA, GAGGA, GLGSV.

- 11 : Satellite positioning combination GPS + BeiDou + GLONASS + QZSS.

name	describe	Value

NMEA output contains: GPRMC, GPGSV, GPGSA, GPGGA, BDGSV, BDGSA, GLGSV, PQGSV, PQGSA.

- 12 : Satellite positioning combination GPS + BeiDou + GALILEO + QZSS.

NMEA output contains: GPRMC, GPGSV, GPGSA, GPGGA, BDGSV, BDGSA, GARMC, GAGSV, GAGSA, GAGGA , PQGSV, PQGSA.

- 13 : Satellite positioning combination GPS + GALILEO + GLONASS + QZSS.

NMEA output contains: GPRMC, GPGSV, GPGSA, GPGGA, GARMC, GAGSV, GAGSA, GAGGA , GLGSV , PQGSV, PQGSA.

- 14 : Satellite positioning combination GPS + BeiDou + GALILEO + GLONASS + QZSS. (default)

NMEA output contains: GPRMC, GPGSV, GPGSA, GPGGA, BDGSV, BDGSA, GARMC, GAGSV, GAGSA, GAGGA , GLGSV , PQGSV, PQGSA.

- 15: 卫星定位组合 GPS.

NMEA output contains: GPRMC, GPGSV, GPGSA, GPGGA.

- Enable / Disable SUPL Certificate

0: Disable supl Certificate . (Default).

1: Enable supl Certificate

characteristic

Do I need a SIM? Card normal	yes	Do I need to register a network?	yes
Is a data connection required?	yes	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

Qualcomm X72/X75 Platform QZSS NMEA messages :
GQGSV , SQGSA

14.1.6 +GTGPSCERT , A-GNSS Support certificate configuration

describe

This command is used to configure A-

GNSS Supplementary certificate.

Format 类型	命令	响应
设置命令	AT+GTGPSCERT=<type>,<serial_num>,<length>,"<cert_data>"	响应 1: OK 响应 2: +CME ERROR: <err>
读取当前设置	AT+ GTGPSCERT?	响应 1: + GTGPSCERT: <serial_num> OK 响应 2: +CME ERROR: <err>
查询命令参数范围	AT+ GTGPSCERT =?	+GTGPSCERT:(list of supported<type>s),(list of supported <serial_num>s)[,(list of supported <length>s)] [,<cert_data>] OK

parameter

name	describe	Value
<type>	Enable or disable AGPs Function	Type: Integer • 0: Delete the supplementary certificate. • 1: Setting up supplementary certificates
<serial_num>	SUPL The serial number of the certificate	1-9 : SUPL The serial number of the certificate.
<length>	Length of the supplementary certificate	1-2000 : Length of the supplementary certificate.

<cert_data>	If the certificate exceeds 1000 characters , the certificate data in PEM format (Base64) is limited to 2000 characters. Characters char , it should be split into multiple AT with sequence numbers Order	String

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

15 temperature

15.1 Temperature command

15.1.1 +GTSENRDTEMP，read the current temperature of the thermal sensor

describe

This command is used to read the

current temperature of the thermal

类型 Format	命令	响应
设置命令	AT+GTSENRDTEMP=<sensor_id>	响应 1： OK 响应 2： +CME ERROR: <err> 如果发生以下情况，则不更改原始设置: AT+CMEE=
查询命令参数范围	AT+GTSENRDTEMP=?	+GTSENRDTEMP: (支持列表<sensor_id>，<current_temperature>，<sensor_name> s) OK

parameter

name	describe	Value
<sensor_id>	Sensor No.	Type: Integer Range : 1- 23 0 : Respond to the current temperature of all sensors

<current_temperature>	Current sensor current temperature.	Type: Integer
<sensor_name>	Current sensor name	Type: String

There are differences between different modules. You can use the AT + GTSENRDTEMP =? command to query the specific value range. The following table uses FG360

For example, the corresponding sensor numbers are (1 - 23)

Sensor ID	Sensor name	Sensor id	Sensor name	Sensor id	Sensor name	Sensor id	Sensor name
1	soc_max	7	gpu1	13	soc_dram_ntc	19	pmic
2	cpu_little0	8	dramc	14	ltepa_ntc	20	pmic_vcore
3	cpu_little1	9	mmsys	15	nrpa_ntc	21	pmic_vproc
4	cpu_little2	10	md_5g	16	rf_ntc	22	pmic_vgpu
5	cpu_little3	11	md_4g	17	md_rf	23	crystal
6	gpu0	12	md_3g	18	conn_gps		

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

16 Error code table

16.1 Error handling commands

16.1.1 +CMEE，reporting mobile device errors

describe

This command is used to report

mobile device errors. Format

类型	命令	响应
设置命令	AT+CMEE=[<n>]	响应 1： OK 响应 2： +CME ERROR: <err> 如果发生以下情况，则不更改原始设置: AT+CMEE=
读取当前设置	AT+CMEE?	+CMEE: <n> OK
查询命令参数范围	AT+CMEE=?	+CMEE: (支持列表 <n>s) OK

parameter

name	describe	Value
n	Disable or enable +CME	Type: Integer • 0 : Disable +CME ERROR: <err> and CMS ERROR<err> reporting function (default value) • 1 : Enable +CME ERROR: <err> +CMS ERROR: <err> result is reported, and a numerical value or +STK<err>: result code is used. • 2 : Enable +CME ERROR: <err> +CMS ERROR: <err> result is reported, and the detailed value or +STK<err>: result code is used.

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

16.1.2 +CEER , extended error reporting

describe

This execute command returns an extended error report containing one or more lines of information text <report> determined by the manufacturer and providing the cause of the error as follows :

- The last call setting was unsuccessful (initiating or answering) or the modification during the call failed.
- The last call failed.

Typically the text consists of a single line containing the cause of the error, presented in text

format according to the information provided by the GSM network.

类型	命令	响应
设置命令	AT+CEER	+CEER: <category>[,<cause>,< description >] OK
查询命令参数范围	AT+CEER=?	OK

parameter

name	describe	Value

category	Error Category	Type: String • No report available • CC : Setting error • CC : Fix Error • CC : Release • SM : Attachment error • SM : De-Attachment • SM : Activation Error • SM : Deactivate • SS : Network error reason • SS : Network rejection reason

name	describe	Value
		• SS : GSM Network reasons
cause	Indicates the reason for the error sent by the network or internally	- -
description	Contains a textual representation of the reason	Type: String

characteristic

Do I need a SIM? Card normal	no	Do I need to register a network?	no
Is a data connection required?	no	Asynchronous or synchronous commands	Synchronous Commands
Do you need to restart to take effect?	no	Set whether to save after power off	no
AT Command response maximum duration (ms)	1000	AT Maximum time for command execution results to be returned (ms)	1000

16.2 CME error code

error code	illustrate
0	phone failure
1	no connection to phone
2	phone-adapter link reserved
3	operation not allowed
4	operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy

15	SIM wrong
16	incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
19	incorrect PUK1

error code	illustrate
20	memory full
21	invalid index
22	not found
23	memory failure
24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string
30	no network service
31	network timeout
32	network not allowed - emergency calls only
40	network personalization PIN required
41	network personalization PUK required
42	network subset personalization PIN required
43	network subset personalization PUK required
44	service provider personalization PIN required
45	service provider personalization PUK required
46	corporate personalization PIN required
47	corporate personalization PUK required
48	hidden key required
49	EAP method not supported
50	Incorrect parameters
100	unknown
103	Illegal MS
106	Illegal ME
107	GPRS services not allowed

111	PLMN not allowed
112	location area not allowed
113	roaming not allowed in this location area
114	GPRS services not allowed in this PLMN
116	MSC temporarily not reachable

错误码	说明
117	Network failure
132	Service not supported
133	Service not subscribed
134	service option temporarily out of order
135	NS-api already used
148	Unspecified GPRS error
149	PDP authentication error
150	invalid mobile class
244	Attach failure
257	Invalid error mapping
258	APN not listed in APN Control List (ACL)
701	incorrect security code
702	max attempts reached
1001	Unassigned (unallocated) number
1003	No route to destination
1006	Channel unacceptable
1008	Operator determined barring
1016	Normal call clearing
1017	User busy
1018	No user responding
1019	User alerting no answer
1021	Call rejected
1022	Number changed
1026	Non selected user clearing
1027	Destination out of order
1028	Invalid number format (incomplete number)

1029	Facility rejected
1030	Response to STATUS ENQUIRY
1031	Normal unspecified
1034	No circuit/channel available
1038	Network out of order

错误码	说明
1041	Temporary failure
1042	Switching equipment congestion
1043	Access information discarded
1044	requested circuit/channel not available
1047	Resources unavailable unspecified
1049	Quality of service unavailable
1050	Requested facility not subscribed
1055	Incoming calls barred within the CUG
1057	Bearer capability not authorized
1058	Bearer capability not presently available
1063	Service or option not available unspecified
1065	Bearer service not implemented
1068	ACM equal to or greater than ACMmax
1069	Requested facility not implemented
1070	Only restr. digital information bearer capability
1079	Service or option not implemented unspecified
1081	Invalid transaction identifier value
1087	User not member of CUG
1088	Incompatible destination
1091	Invalid transit network selection
1095	Semantically incorrect message
1096	Invalid mandatory information
1097	Message type non-existent or not implemented
1098	Message type not compatible with protocol state
1099	Information element non-existent or not implemented
1100	Conditional IE error

1101	Message not compatible with protocol state
1102	Recovery on timer expiry
1111	Protocol error unspecified
1127	Interworking unspecified
1279	Number not allowed

error code	illustrate
1283	CCBS possible

16.3 CMS error code

error code	illustrate
1	Unassigned (unallocated) number
8	Operator determined barring
10	Call barred
17	Network failure
21	Short message transfer rejected
22	Memory capacity exceeded
27	Destination out of service
28	Unidentified subscriber
29	Facility rejected
30	Unknown Subscriber
38	Network out of order
41	Temporary failure
42	Congestion
47	Resources unavailable unspecified
50	Requested facility not subscribed
69	Requested facility not implemented
81	Invalid short message reference value
95	Invalid message unspecified
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message not compatible with short message protocol state

99	Information element non-existent or not implemented
111	Protocol error unspecified
127	Interworking unspecified
128	Telematic interworking not supported
129	Short message type 0 not supported

错误码	说明
130	Cannot replace short message
143	Unspecified TP-PID error
144	Data coding scheme (alphabet) not supported
145	Message class not supported
159	Unspecified TP-DCS error
160	Command cannot be action
161	Command unsupported
175	Unspecified TP-Command error
176	TPDU not supported
192	SC busy
193	No SC subscription
194	SC system failure
195	Invalid SME address
196	Destination SME barred
197	SM Rejected-Duplicate SM
198	TP-VPF not supported
199	TP-VP not supported
208	SIM SMS storage full
209	No SMS storage capability in SIM
210	Error in MS
211	Memory Capacity Exceeded
212	SIM Application Toolkit Busy
213	SIM data download error
224	TP_FCS_APPL_ERR_START
254	TP_FCS_APPL_ERR_STOP
255	TP_FCS_UNSPECIFIED

300	ME failure
301	SMS service of ME reserved
302	operation not allowed
303	operation not supported
304	Invalid PDU mode param

错误码	说明
305	invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN necessary
313	SIM failure
314	SIM busy
315	SIM wrong
317	SIM PIN2 required
318	SIM PUK2 required
319	incorrect PUK1
320	memory failure
321	invalid memory index
322	memory full
330	SMSC address unknown
331	no network service
332	network timeout
340	no +CNMA acknowledgement expected
512	MN_SMS_RP_ACK
513	MN_SMS_TIMER_EXPIRED
514	MN_SMS_FORW_AVAIL_FAILED
515	MN_SMS_FORW_AVAIL_ABORTED
516	MS invalid TP-Message-Type-Indicator
517	MS no TP-Status-Report in Phase 1
518	MS no TP-Reject-Duplicate in Phase 1
519	MS no TP-Reply-Path in Phase 1
520	MS no TP-User-Data-Header in Phase 1

521	MS missing TP-Validity-Period
522	MS invalid TP-Service-Centre-Time-Stamp
523	MS missing TP-Destination-Address
524	MS invalid TP-Destination-Address
525	MS missing Service-Centre-Address

错误码	说明
526	MS invalid Service-Centre-Address
527	MS invalid alphabet
528	MS invalid TP-User-Data-Length
529	MS missing TP-User-Data
530	MS TP-User-Data too long
531	MS no Command-Request in Phase 1
532	MS Cmd-Req invalid TP-Destination-Address
533	MS Cmd-Req invalid TP-User-Data-Length
534	MS Cmd-Req invalid TP-User-Data
535	MS Cmd-Req invalid TP-Command-Type
536	MN MNR creation failed
537	MS CMM creation failed
538	MS network connection lost
539	MS pending MO SM transfer
540	RP-Error OK
541	RP-Error OK no icon display
542	SMS-PP Unspecified
543	SMS rejected By SMS CONTROL