GSM STK
AT Commands

GSM_STK_ATC_V1.1

Contents

1. Introduction

Module provides AT commands to support STK. This document is a reference guide to all the AT commands and responses defined for STK.

The SIM Application Toolkit (SAT/STK) provides mechanisms which allow applications, existing in the SIM, to interact and operate with any ME which supports the specific mechanism(s) required by the application. Please go to GSM 11.14 for more details about STK. Provides AT commands to support profile download (**+STKPD**), envelope (**+STKENV**), terminal response (**+STKTR**), get STK indication (**+QSTK**) and trigger STK call (**+STKCALL**), SMS (**+STKSMS**), SS (**+STKSS**), USSD (**+STKUSSD**) and DTMF (**+STKDTMF**).

This document is applicable to all GSM modules except for GCxx modules.

1.1. Reference

Table 1: Reference

SN	Document name	Remark
[1]	M10_ATC.pdf	The introduction of AT commands for M10
[2]	GSM 11.14	Specification of the SIM Application Toolkit for the SIM-ME interface
[3]	GSM 11.11	Specification of the SIM-ME interface

1.2. Terms and abbreviations

Table 2: Terms and abbreviations

Abbreviation	Description
SAT/STK	SIM Application Toolkit
SIM	Subscriber Identity Module
ME	Mobile Equipment
SMS	Short Message Service
SS	Supplementary Service
USSD	Unstructured Supplementary Service Data
BER	Basic Encoding Rules of ASN.1
TLV	Tag, Length, Value
&h	Hexadecimal format
&d	Decimal format

2. AT Commands for STK

2.1. Overview of AT Commands for STK support

Command	Description
AT+QSTK	TURN ON/OFF STK FUNCTION
AT+STKPD	STK PROFILE DOWNLOAD
AT+STKENV	STK ENVELOPE COMMAND
AT+STKTR	STK TERMINAL RESPONSE
AT+STKCALL	TRIGGER STK CALL
AT+STKSMS	TRIGGER STK SMS
AT+STKSS	TRIGGER STK SS
AT+STKUSSD	TRIGGER STK USSD
AT+STKDTMF	TRIGGER STK DTMF

2.2. Details for AT Commands for STK support

2.2.1. AT+QSTK STK Turn on/off STK function

AT+QSTK Turn on/off STK function	
Test Command **AT+QSTK=?**	Response **+QSTK: (0-1)** **OK**
Read Command **AT+QSTK?**	Response **+QSTK :<n>** **OK** Parameters See Write Command
Write Command **AT+QSTK=<n>**	Response If format is right, response **OK** Otherwise response **+CME ERROR: <err>** Parameter **<n>** Whether turn on the STK function

	0	Turn off
	1	Turn on
Reference	Note: ● Must restart the module and make sure SIM card is unlocked to use STK commands.	

Example:

AT+QSTK=1

OK

Restart the module, enter PIN code if SIM card is locked. Then the following indication will come up, including the main menu list:

+STKPCI: 0, "D07A8103012500820281828507804E16754C98CE8F0A018070ED70B963A8 83508F0A028065B095FB8D227ECF8F0A0380554665C552A9624B8F0A0480624B673A7406 8D228F0A058081EA52A9670D52A18F0A06806D41884C77ED4FE18F06078070AB94C38F0 A0880624B673A97F34E508F0A09807CBE5F694E0A6D77"

Parsed Data:

Please refer to the appendix in this document for details below.

D0	Proactive SIM command tag				
7A	Length	1. If the length is between 0 and 127 (00 to 7F&h), it's coded onto one byte. For example, "7A" =122&d. 2. If the length is between 128 and 255 (80 to FF&h), it's coded onto two bytes leading with "81". For example, "81BA" = 186&d.			
8103012500	**81**	**03**	**01**	**25**	**00**
	Command details tag	Length	command number	Type of command: Set up menu	Command Qualifier
82028182	**82**	**02**	**81**	**82**	
	Device identity tag	Length	Souce: SIM	Destination: ME	
8507804E16754C98CE	**85**	**07**	**804E16754C98CE**		
	Alpha identifier tag	Length	Alpha identifier: 80: UCS2 coding 4E16754C98CE:世界风		
8F0A018070ED70B963 A88350	**8F**	**0A**	**01**	**8070ED70B963A88350**	
	Item tag	Length	ID of item: 1	Text string of item 80: UCS2 coding 70ED70B963A88350: 热点推荐	
8F0A028065B095FB8D 227ECF	Item 2: 新闻财经				
8F0A0380554665C552A	Item 3: 商旅助手				

9624B	
8F0A0480624B673A740 68D22	Item 4: 手机理财
8F0A058081EA52A967 0D52A1	Item 5: 自助服务
8F0A06806D41884C77 ED4FE1	Item 6: 流行短信
8F06078070AB94C3	Item 7: 炫铃
8F0A0880624B673A97 F34E50	Item 8: 手机音乐
8F0A09807CBE5F694E 0A6D77	Item 9: 精彩上海

2.2.2. AT+STKPD STK profile download

AT+STKPD STK profile download	
Test Command **AT+STKPD=?**	Response **OK**
Execution Command **AT+STKPD**	Response Do the profile downloading. **OK**
Read Command **AT+STKPD?**	Response Get the terminal profile setting. **+STKPD: <Profile>** **OK** Parameter **<Profile>** HEX string of STK profile.
Reference	Note: ● Profile downloading provides a mechanism for the ME to tell the SIM what it is capable of. ● The structure of profile content is specified in GSM 11.14 subclause 5.2 Structure and coding of TERMINAL PROFILE.

Example:
AT+**STKPD?**
+STKPD: "FFFFFFFF7F1F007FFF00001F230811060700"

OK

2.2.3. AT+STKENV STK Envelope command

AT+STKENV STK Envelope command	
Test Command **AT+STKENV=?**	Response **OK**
Write Command **AT+STKENV=<** **sat_command>**	Response This command is used to send STK Envelope command. **OK** Parameters **<sat_command>** HEX string of STK envelope command
Reference	Note: ● The structure of envelope command is specified in GSM 11.14 clause 7 to clause 11. Below example is to send envelope command for menu selection.

Example:

Select item 4 (Refer to GSM 11.14 subclause 8.2 Structure of ENVELOPE (MENU SELECTION):
AT+STKENV="D30782020181900104"
OK

Parsed Data:

D3	Menu Selection tag			
07	Length			
82020181	82	02	01	81
	Device identity tag	Length	Source device identity: Keypad	Destination device identity: SIM
900104	90	01	04	
	Item identifier tag	Length	ID of item chosen: 04	

2.2.4. AT+STKTR STK terminal response

AT+STKTR STK terminal response	
Test Command **AT+STKTR=?**	Response **OK**
Write Command **AT+STKTR=** **<terminal_respo** **nse>**	Response This command is used to send STK Terminal Response. **OK** Parameter

	<terminal_response> HEX string of STK response
Reference	Note: ● The structure of terminal response is specified in GSM 11.14 clause 6.8.

Example 1: Terminal response of Selecting item

+STKPCI: 0,"**D0**70**81**0301**24**00**82**0281828**5**098081EA52A9670D52A1**8F**100180004F0054004 1670D52A163075357**8F**0A02805BA2670D70ED7EBF**8F**0C0380005600490050540D7247**8F**0 A0480805476DF670D52A1**8F**0A05808BDD8D3967E58BE2**8F**0A068079EF520667E58BE2**8F** 0A07805DF25B9A4E1A52A1"

AT+STKTR="810301**24**00**82**028281**83**0100**90**0105"

OK

Parsed data for SELECT ITEM proactive command:

D0	Proactive SIM command tag
70	Length
810301**24**00	Command details: type of command 24 -- Select Item
82028182	Device identity: source SIM > destination ME
85098081EA52A9670D52A1	Alpha identifier: 自助服务
8F100180004F00540041670D52A163075357	Item 1. OTA 服务指南
8F0A02805BA2670D70ED7EBF	Item 2. 客服热线
8F0C0380005600490050540D7247	Item 3. VIP 名片
8F0A0480805476DF670D52A1	Item 4. 联盟服务
8F0A05808BDD8D3967E58BE2	Item 5. 话费查询
8F0A068079EF520667E58BE2	Item 6. 积分查询
8F0A07805DF25B9A4E1A52A1	Item 7. 已定业务

Parsed data for TERMINAL RESPONSE of SELECT ITEM:

810301**24**00	Command details: type of command 24 -- Select Item		
82028281	Device identity: source ME > destination SIM		
830100	**83**	**01**	**00**
	Result tag	Length	General result: 00 command performed successfully
900105	Item identifier: 05		

Example 2: Terminal response of Getting input – input short message content

+STKPCI: 0,"**D0**1E**81**0301**23**03**82**028182**8D**0F08300E8F93516551855BB9003A300F**91**0201 **8C**"

AT+STKTR="810301**23**03**82**028281**83**0100**8D**05**08**4F60597D"

OK

Parsed data for GET INPUT proactive command:

D0	Proactive SIM command tag			
1E	Length			
81**03**01**23**03	Command details: type of command 23 -- Get input			
82**02**8182	Device identity: source SIM > destination ME			
8D0F08300E8F935 16551855BB9003A 300F9102018C	**8D**	**0F**	**08**	300E8F9351655185 5BB9003A300F
	Text string tag	Length	Data coding scheme: it is coded as for SMS Data coding scheme defined in GSM03.38. 08 - UCS2 04 - 8 bit coding	Text string: 『输入 内容:』 It means "input content" in English.
9102018C	**91**	**02**	**01**	**8C**
	Response length tag	Length	Min length: 1	Max length: 8C&h=140&d

Parsed data for TERMINAL RESPONSE of GET INPUT:

81**03**01**23**03	Command details: type of command 23 -- GET INPUT
82**02**8281	Device identity: source ME > destination SIM
83**01**00	Result: 00 command performed successfully
8D**05**08**4F60597D	Text string: UCS2 "你好"

Example 3: Terminal response of Getting input – input target number of short message

+STKPCI: 0,"**D0**1A**81**03**01**23**00**82**02**8182**8D**0B08**8F**93516553F77801FF1A**91**020114"

AT+STKTR="**81**03**01**23**00**82**02**8281**83**0100**8D**0C04**3133373634343132313531"

OK

Parsed data:

+STKPCI: text string: "输入号码：", it means "Input number" in English.

Terminal response: input number "13764412151", 8 bit coding schema.

Note: The terminal response is similar as above example 2: using UCS2 coding to input message content in example 2, while using 8-bit coding to input number here.

Example 4: Go backward to the item at higher level

AT+STKTR="**81**03**01**24**00**82**02**8281**83**01**11"

OK

Example 5: Return to the main menu directly

AT+STKTR="**81**03**01**23**00**82**02**8281**83**01**10"

OK

Parsed data of example 4 and 5:

830111	Result: 11 - Backward move in the proactive SIM session requested by the user
830110	Result: 10 - Proactive SIM session terminated by the user

Note: In example 4 and 5, type of command in terminal response should be the same as that in +STKPCI last time.

2.2.5. AT+STKCALL Trigger STK Call

AT+STKCALL	Trigger STK Call
Test Command **AT+STKCALL=?**	Response **OK**
Write Command **AT+STKCALL=<n>**	Response If format is right, response **OK** Otherwise, response **ERROR** Parameters **<n>** 0 Trigger modem to send STK CALL SETUP 4 Trigger modem to send STK CALL SETUP but icon cannot be displayed 16 Proactive session terminated by user 18 No response from user 32 ME currently unable to process this command 34 User reject setup call 50 Command data not understood by ME
Reference	**Note:** ● Type of command value for Setting up call is "10".

2.2.6. AT+STKSMS Trigger STK SMS

AT+STKSMS	Trigger STK SMS
Test Command **AT+STKSMS=?**	Response **OK**
Write Command **AT+STKSMS=<n>**	Response If format is right, response **OK** Otherwise, response **ERROR**

	Parameters
	\<n\>
	0 Trigger modem to send STK SMS
	4 Trigger modem to send STK SMS but icon cannot be displayed
Reference	Note:
	● Type of command value for sending short message is "13".

Example: Send short message

+STKPCI: 1,"D0198103011300820281838B0E010005A10180F600040459454358"

AT+STKSMS=0

OK

Parsed data for Send Short Message proactive command:

D0	Proactive SIM command tag		
19	Length		
8103011300	Command details: type of command 13 - send short message		
82028183	Device identity: source SIM > destination Network		
8B0E010005A1018 0F60004045945435 8	**8B**	**0E**	**010005A10180F600040459454358**
	SMS TPDU tag	Length	SMS TPDU: TA(Target Address): 10086 UD(User Data): "YECX" (china mobile provides this code to check balance)

2.2.7. AT+STKSS Trigger STK SS

AT+STKSS Trigger STK SS	
Test Command AT+STKSS=?	Response **OK**
Write Command AT+STKSS=\<n\>	Response If format is right, response **OK** Otherwise, response **ERROR** Parameters **\<n\>** 0 Trigger modem to send STK SS 4 Trigger modem to send STK SS but icon cannot be displayed 50 Command data not understood by ME
Reference	Note: ● Type of command value for sending SS is "11".

2.2.8. AT+STKUSSD Trigger STK USSD

AT+STKUSSD	Trigger STK USSD
Test Command **AT+STKUSSD=** **?**	Response **OK**
Write Command **AT+STKUSSD=** **<n>**	Response If format is right, response **OK** Otherwise, response **ERROR** Parameters **<n>** 0 Trigger modem to send STK USSD 4 Trigger modem to send STK USSD but icon cannot be displayed 50 Command data not understood by ME
Reference	Note: ● Type of command value for Sending USSD is "12".

2.2.9. AT+STKDTMF Trigger STK DTMF

AT+QSTKDTMF	Trigger STK DTMF
Test Command **AT+STKDTMF=** **?**	Response **OK**
Write Command **AT+STKDTMF=** **<n>**	Response If format is right, response **OK** Otherwise, response **ERROR** Parameters **<n>** 0 Trigger modem to send STK DTMF 4 Trigger modem to send STK DTMF but icon cannot be displayed 32 ME currently unable to process command
Reference	Note: ● Type of command value for sending DTMF is "14".

3. +STKPCI STK Proactive Command Indication

This unsolicited result code is used to indicate Proactive Command Indication.
Format:
+STKPCI: < pci_type > [,<proactive_command>]

< pci_type>
0   The SAT command is handled by TE.
1   The SAT command is handled by ME.
2   No other command (end of session)
<proactive_command>
HEX string of STK proactive command, sent when <pci_type> = 0 or 1

4. Examples

4.1. SET UP MENU Proactive Command

 Description: An example of SET UP MENU proactive command.

4.1.1. Raw data

+**STKPCI:0, "D**081C0**81**030125**00**82028182**85**0B80906050B3670D52D95340**8F**0C02804F86
96FB63A5901A9234**8F**0C0380906050B38CA18A0A901F**8F**0C04805A1B6A02842C82B17B5
2**8F**0A0580571692344E0B8F09**8F**100780003600380038884C52D5523855468**8F**0C0880958B90
4B90544EBA9928**8F**0E0980003600360036 5A1B6A027DB2**8F**100A8090FD670375375973804
A59295BA4**8F**100B8054C862C9540D4EBA804A59295BA4**8F**0E0C800038003000374F344F6
0884C**8F**0E0D80906050B35BA2670D5C087DDA"
<AT>**AT**+**STKTR="81**0301250082028281830100"

4.1.2. Parsed data

4.1.2.1.   Proactive command SET UP MENU

+**STKPCI: 0,"D0**: proactive SIM command Tag

      81C0: length

      8103012500: command details

           81: command details tag

           03: length

           01: command number

           25: type of command: set up menu

           00: command qualifier

      82028182: device id

           82: device id tag

           02: length

           81: source id: SIM

           82: destination id: ME

      850B80906050B3670D52D95340: alpha id

           85: alpha id tag

           0B: length

           80906050B3670D52D95340: alpha id: 遠傳服務區

      8F0C02804F8696FB63A5901A9234: Item

           8F: item tag

           0C: length

           02: item id

804F8696FB63A5901A9234: 來電接通鈴

8F0C0380906050B38CA18A0A901F: 遠傳財訊速
8F0C04805A1B6A02842C82B17B52: 娛樂萬花筒
8F0A0580571692344E0B8F09: 圖鈴下載
8F100780003600380038884C52D552385546: 688行動券商
8F0C0880958B904B90544EBA9928: 開運達人館
8F0E09800036003600365A1B6A027DB2: 666娛樂網
8F100A8090FD670375375973804A59295BA4: 都會男女聊天室
8F100B8054C862C9540D4EBA804A59295BA4: 哈拉名人聊天室
8F0E0C800038003000374F344F60884C: 807伴你行
8F0E0D80906050B35BA2670D5C087DDA": 遠傳客服專線

4.1.2.2. Terminal response of SET UP MENU

\<AT> **AT+STKTR=**

"8103012500: <u>command details</u> (just same as the one in the proactive SIM)

  81: command details tag

  03: length

  01: command number

  25: type of command: set up menu

  00: command qualifier

82028281: <u>device id</u> (source id: ME, destination id: SIM)

  82: device id tag

  02: length

  82: source id: ME

  81: destination id: SIM

830100": <u>result</u>

  83: result tag

  01: length

  00: Command perform successfully

4.2. Menu Selection and Set Up Call

Description: An example of selecting item 1 and being notified by MENU SELECTION envelope command after SET UP MENU proactive command.

4.2.1. Row Data

[STK] option: 1, menu item: [0x02] 來電接通鈴
\<AT> **AT+STKENV="D30782020181900102"**
+STKPCI:1,"D025810301100082028183051580003900300030064A5865F4E2D002E002E0020002E86038109F0"

<AT> **AT+STKCALL=0**

4.2.2. Parsed Data

4.2.2.1. MENU SELECTION envelope: select item 2 - 來電接通鈴

<AT> **AT+STKENV="**

> **D3**: menu selection tag
>
> **07**: length
>
> **82020181:** device id
>
> > **82:** device id tag
> >
> > **02:** length
> >
> > **0181**: source: Keypad, destination: SIM
>
> **900102":** Item id
>
> > **90**: item id tag
> >
> > **01**: length
> >
> > **02"**: item id: 2

4.2.2.2. SET UP CALL proactive command

+STKPCI:1,"D0: proactive SIM command Tag

> **25**: length
>
> **8103011000:** command details
>
> > **81**: command detail tag
> >
> > **03**: length
> >
> > **01**: command number
> >
> > **1000**: type of command: SET UP CALL, only if not currently busy on another call
>
> **82028183**: device id
>
> > **82**: device id tag
> >
> > **02**: length
> >
> > **8183**: source: SIM, destination: network
>
> **05158000390030003064A5865F4E2D002E002E0020002E:** alpha id
>
> > **05**: alpha id tag
> >
> > **15**: length
> >
> > **8000390030003064A5865F4E2D002E002E0020002E**: 900撥號中...
>
> **86038109F0":** address
>
> > **86**: address tag
> >
> > **03:** length
> >
> > **81:** TON: Unknown NPI: ISDN/telephony numbering plan
> >
> > **09F0"**: Dialing number string: 900

4.3. Menu Selection, Get input and Send Short Message

Description: An example of selecting item 2 and being notified by MENU SELECTION

envelope command after SET UP MENU proactive command.

4.3.1. Row Data

[STK] option: 1, menu item: [0x03] 遠傳財訊速

1. \<AT\> **AT+STKENV="D30782020181900103"**
2. **+STKPCI:0,"D052810301240082028182050B80906050B38CA18A0A901F8F0A018053F 0706380A15E028F0A0280570B969B80A15E028F0A038059165E63532F73878F0A04806 71F8CA86307657888F0A05804ECA65E565B0805E"**

[STK] option: 1, menu item: [0x01] 台灣股市

3. \<AT\> **AT+STKTR="810301240082028281830100900101"**
4. **+STKPCI:0,"D03881030124008202818205098053F0706380A15E028F0A018052A06B0A 6307657888F0A02804E0A6AC36307657888F0A0380500B80A1884C60C5"**

[STK] option: 1, menu item: [0x03] 個股行情

5. \<AT\> **AT+STKTR="810301240082028281830100900103"**
6. **+STKPCI: 0,"D01E8103012300820281828D0F088F38516580A179680031865F78BC910 20004"**
7. \<AT\> **AT+STKTR="8103012300820282818301008D050432343534"**
8. **+STKPCI: 0,"D01E8103012300820281828D0F088F38516580A179680032865F78BC910 20004"**
9. \<AT\> **AT+STKTR="8103012300820282818301008D0104"**
10. **+STKPCI:1,"D043810301130082028183051180865574064E2D002C00208ACB7A0D5019 0607918896130000998B1C1100148110210890630000990000004A70A2A3132382A32343 53423"**
11. \<AT\> **AT+STKSMS=0**

4.3.2. Parsed Data

4.3.2.1.   MENU SELECTION envelope: select item 3 - 遠傳財訊速

\<AT\> **AT+STKENV="**

        D3: menu selection tag

        07: length

        82020181: device id

           82: device id tag

           02: length

           0181: source: Keypad, destination: SIM

        900103": item id

           90: item id tag

           01: length

           03: item id

4.3.2.2.   SELECT ITEM proactive command

+STKPCI:0,"D0: Proactive SIM command tag

52: length

8103012400: <u>command details</u>

 81: command details tag

 03: length

 01: command number

 2400: SELECT ITEM, no help information available, no selection preference, presentation type is not specified

82028182: <u>device id</u>

 82: device id tag

 02: length

 8182: source: SIM, destination: ME

050B80906050B38CA18A0A901F: <u>alpha id</u>

 05: alpha id tag

 0B: length

 80906050B38CA18A0A901F: 遠傳財訊速

8F0A018053F0706380A15E02: <u>Item</u>

 8F: item tag

 0A: length

 01: item id: 1

 8053F0706380A15E02: 台灣股市

8F0A0280570B969B80A15E02: item 2: 國際股市

8F0A038059165E63532F7387: item 3: 外幣匯率

8F0A0480671F8CA863076578: item 4: 期貨指數

8F0A05804ECA65E565B0805E": item 5: 今日新聞

4.3.2.3. Terminal response of SELECT ITEM: select item 1 -台灣股市

<AT> **AT+STKTR="**

8103012400: <u>command details</u>

 81: command details tag

 03: length

 01: command number

 2400: SELECT ITEM, no help information available, no selection preference, presentation type is not specified

82028281: <u>device id</u>

 82: device id tag

 02: length

 8281: source: ME, destination: SIM

830100: <u>result</u>

 83: result tag

 01: length

 00: command performed successfully

900101": <u>item id</u>

 90: item id tag

 01: length

01: item id

4.3.2.4. SELECT ITEM proactive command

+**STKPCI:0, "D0:** proactive SIM command tag

  38: length

  8103012400: command details

    81: command details tag

    03: length

    01: command number

    2400: SELECT ITEM, no help information available, no selection preference,
      presentation type is not specified

  82028182: device id

    82: device id tag

    02: length

    8182: source: SIM, destination: ME

  05098053F0706380A15E02: alpha id

    05: alpha id tag

    09: length

    8053F0706380A15E02: 台灣股市

  8F0A018052A06B0A63076578: item

    8F: item tag

    0A: length

    01: item 1

    8052A06B0A63076578: 加權指數

  8F0A02804E0A6AC363076578: item 2: 上櫃指數

  8F0A0380500B80A1884C60C5": item 3: 個股行情

4.3.2.5. Terminal response of SELECT ITEM: select item 3 -個股行情

<AT> **AT+STKTR="**

  8103012400: command details

    81: command details tag

    03: length

    01: command number

    2400: SELECT ITEM, no help information available, no selection preference,
      presentation type is not specified

  82028281: device id

    82: device id tag

    02: length

    8281: source: ME, destination: SIM

  830100: result

    83: result tag

    01: length

    00: command performed successfully

  900103": item id

90: item id tag

01: length

03: item id

4.3.2.6.   GET INPUT proactive command

+**STKPCI: 0, ''D0:** proactive SIM command tag

1E: length

8103012300: command details

81: command details tag

03: length

01: command number

2300: GET INPUT, no help information, user input to be unpacked format, ME may echo user input on the display, SMS default alphabet, digits (0 to 9, *, # and +) only

82028182: device id

82: device id tag

02: length

8182: source: SIM, destination: ME

8D0F088F38516580A179680031865F78BC: test string

8D: text string tag

0F: length

08: data coding scheme: UCS2

8F38516580A179680031865F78BC: 輸入股票 1 號碼

91020004'': response length

91: response length tag

02: length

00: min length = 0

04: max length = 4

4.3.2.7.   Terminal response of GET INPUT: 輸入股票 1 號碼

<AT> **AT+STKTR=''**

8103012300: command details

81: command details tag

03: length

01: command number

2300: GET INPUT, no help information, user input to be unpacked format, ME may echo user input on the display, SMS default alphabet, digits (0 to 9, *, # and +) only

82028281: device id

82: device id tag

02: length

8281: source: ME, destination: SIM

830100: result

83: result tag

01: length

00: command performed successfully

8D050432343534": <u>text string</u>

8D: text string tag

05: length

04: data coding scheme: GSM default alphabet 8 bits

32343534: 2454

4.3.2.8. GET INPUT proactive command

+STKPCI: 0, "D0: proactive SIM command tag

1E: length

8103012300: <u>command details</u>

81: command details tag

03: length

01: command number

2300: GET INPUT, no help information, user input to be unpacked format, ME may echo user input on the display, SMS default alphabet, digits (0 to 9, *, # and +) only

82028182: <u>device id</u>

82: device id tag

02: length

8182: source: SIM, destination: ME

8D0F088F38516580A179680032865F78BC: <u>text string</u>

8D: text string tag

0F: length

08: data coding scheme: UCS2

8F38516580A179680032865F78BC: 輸入股票 2 號碼

91020004": <u>response length</u>

91: response length tag

02: length

00: min length = 0

04: max length = 4

4.3.2.9. Terminal response of GET INPUT: 輸入股票 2 號碼

<AT> **AT+STKTR="**

8103012300: <u>command details</u>

81: command details tag

03: length

01: command number

2300: GET INPUT, no help information, user input to be unpacked format, ME may echo user input on the display, SMS default alphabet, digits (0 to 9, *, # and +) only

82028281: <u>device id</u>

   82: device id tag

   02: length

   8281: source: ME, destination: SIM

830100: <u>result</u>

   83: result tag

   01: length

   00: command performed successfully

8D0104": <u>text string</u>

   8D: text string tag

   01: length

   04: data coding scheme: GSM default alphabet 8 bits

4.3.2.10. SEND SHORT MESSAGE proactive command

+STKPCI: 1, "D0: proacitve SIM command tag

   43: length

   8103011300: <u>command details</u>

   81: command details tag

   03: length

   01: command number

   1300: SEND SHORT MESSAGE, packing not required

82028183: <u>device id</u>

   82: device id tag

   02: length

   8183: source: SIM destination: Network

051180865574064E2D002C00208ACB7A0D5019: <u>alpha id</u>

   05: alpha id tag

   11: length

   80865574064E2D002C00208ACB7A0D5019: 處理中, 請稍候

060791889613000099: <u>address</u>

   06: address tag

   07: length

   91: TON: international number, NPI: ISDN/telephony numbering plan

   889613000099: dialing number string

8B1C11001481102108906300009900000004A70A2A3132382A3234353423":

   <u>SMS TPDU</u>

   8B: SMS TPDU tag

   1C: length

   11001481102108906300009900000004A70A2A3132382A3234353423: SMS
   TPDU

4.4. Menu Selection, Send USSD and SD

Description: An example of user selecting item 2 and being notified by MENU SELECTION envelope command after SET UP MENU proactive command.

4.4.1. Row Data

[STK] option: 1, menu item: [0x05] 圖鈴下載
<AT> **AT+STKENV="D30782020181900105"**
+STKPCI: 1,"D024810301120082028183051180865574064E2D002C00208ACB7A0D50198**A0640AA182D3702"**
<AT> **AT+STKUSSD=0**
+STKPCI: 1,"D022810301110082028183051180865574064E2D002C00208ACB7A0D5019**8904811A94FB"**
<AT> **AT+STKSS=0**

4.4.2. Parsed Data

4.4.2.1. MENU SELECTION envelope: select item 5 -圖鈴下載

<AT> **AT+STKENV="**
    D3: menu selection tag
    07: length
    82020181: device id
        82: device id tag
        02: length
        0181: source: Keypad, destination: SIM
    900105": item id
        90: item id tag
        01: length
        05: item id

4.4.2.2. SEND USSD proactive command

+STKPCI: 1,"D0: proactive SIM command tag
    24: length
    8103011200: command details
        81: command details tag
        03: length
        01: command number
        1200: SEND USSD
    82028183: device id
        82: device id tag
        02: length
        8183: source: SIM destination: Network

051180865574064E2D002C00208ACB7A0D5019: alpha id

> **05**: alpha id tag
>
> **11**: length
>
> **80865574064E2D002C00208ACB7A0D5019:** 處理中，請稍候

8A0640AA182D3702'': USSD string

> **8A**: USSD string tag
>
> **06**: length
>
> **40:** GSM 7 bit default alphabet, the text is uncompressed,
>
> **AA182D3702**: USSD string content

4.4.2.3. SEND SS proactive command:

+STKPCI: 1,''D0: proactive SIM command

> **22**: length
>
> **8103011100**: command details
>
> > **81**: command details tag
> >
> > **03:** length
> >
> > **01**: command number
> >
> > **1100**: SEND SS
>
> **82028183**: device id
>
> > **82**: device id tag
> >
> > **02:** length
> >
> > **8183**: source: SIM destination: Network
>
> **051180865574064E2D002C00208ACB7A0D5019:** alpha id
>
> > **05**: alpha id tag
> >
> > **11**: length
> >
> > **80865574064E2D002C00208ACB7A0D5019:** 處理中，請稍候
>
> **8904811A94FB'':** SS string
>
> > **89**: SS string tag
> >
> > **04:** length
> >
> > **81:** TON: Unknown, NPI: ISDN/telephony numbering plan
> >
> > **1A94FB**: SS or USSD string content

5. Appendix: STK protocol structure

Here list some structures which have been used in this document for better understanding. More details please refer to GSM 11.14.

5.1. Structure of SIM Application Toolkit communications

Please refer to GSM 11.14 Annex D.

BER-TLV data object:

Tag	Length	Value	1..n SIMPLE TLV objects

SIMPLE-TLV data object:

Tag	Length	Value	1..m elements

5.2. BER_TLV tag in SIM to ME direction

Please refer to GSM 11.14 subclause 13.2.

Description	Length	Value
Proactive SIM command tag	1	D0

5.3. BER_TLV tag in ME to SIM direction

Please refer to GSM 11.14 subclause 13.1.

Description	Length	Value
SMS-PP download tag	1	D1
Cell Broadcast download tag	1	D2
Menu Selection tag	1	D3
Call control tag	1	D4
MO Short message control tag	1	D5
Event download tag	1	D6
Timer expiration	1	D7

5.4. Simple TLV objects

Please refer to GSM 11.14 subclause 13.3 for Simple TLV tag value in both directions.

The structure of simple TLV data object is Tag, Length, Value elements. Below table lists tag value and elements.

Tag		Value	
Description	Value	Elements	Reference in

			GSM 11.14
Command details tag	01 or 81	Command number	12.6
		Type of command	
		Command Qualifier	
Device identity tag	02 or 82	Source device identity	12.7
		Destination device identity	
Result tag	03 or 83	General result	12.12
Alpha identifier tag	05 or 85	Alpha identifier (If the first byte is "80", it means UCS2 coding schema)	12.2
Address tag	06 or 86	TON and NPI	12.1
		Dialing number string	
SS string tag	09 or 89	TON and NPI	12.14
		SS or USSD string	
USSD string tag	0A or 8A	Data coding scheme	12.17
		USSD string	
SMS TPDU tag	0B or 8B	SMS TPDU	12.13
Text string tag	0D or 8D	Data coding scheme	12.15
		Text string	
Item tag	0F or 8F	Identifier of item	12.9
		Text string of item (If the first byte is "80", it means UCS2 coding schema)	
Item identifier tag	10 or 90	Identifier of item chosen	12.10
Response length tag	11 or 91	Minimum length of response	12.11
		Maximum length of response	

Type of Command: (Refer to GSM 11.14 subclause 13.4)

Value	Name
10	Set up Call
11	Send SS
12	Send USSD
13	Send short message
14	Send DTMF
21	Display text
23	Get input
24	Select item
25	Set up menu

Device identity

Value	Name
01	Keypad
02	Display
81	SIM

82	ME
83	Network

General result:

Value	Meaning
00	Command performed successfully
10	Proactive SIM session terminated by the user;
11	Backward move in the proactive SIM session requested by the user

5.5. Structure of terminal response

Please refer to GSM 11.14 subclause 6.8.

Description	M/O
Command details	M
Device identities	M
Result	M
Text string	M/O
Item identifier	M/O

5.6. Structure of envelope for menu selection

Please refer to GSM 11.14 subclause 8.2.

Description	M/O
Menu selection tag="D3"	M
Length	M
Device identities	M
Item identifier	M
Help request	O