Application

SIM7020 Series TCPIP Application Note

Version: 1.1

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About Document

Document Information

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Revision History

Revision	Date	Owner	Status / Comments
1.0	April 10, 2018	Xiaolun Wang	First Release.
1.1	April 18, 2018	Albert Meng	Revised

Related Documents

[1] SIM7020 Series AT Command Manual V1.0.pdf

This document applies to the following products:

Name	Type	Size (mm)	Comments
SIM7020C	NB1	17.6*15.7	Band 1/3/5/8
SIM7020E	NB1	17.6*15.7	Band 1/3/5/8/20/28

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Contents

1 Purpose of this document

Based on module AT command manual, this document will give an entire and complete concept and TCPIP architecture introduction.

Developers could understand and develop application quickly and efficiently based on this document.

2 PDP Context activation and deactivation

2.1 Auto-activation

AT Command	Response	Description
AT+CPIN?	+CPIN:READY OK	Check SIM card status
AT+CSQ	+CSQ: 20,0 OK	Check RF signal
AT+CGREG?	+CGREG: 0,1 OK	Check PS service
AT+CGACT?	+CGACT: 1,1 OK	Activated automatically
AT+COPS?	+COPS: 0,0,"CHN-UNICOM",9 OK	Check operator info CHN-UNICOM is operator's name 9 is NB-IOT network
AT+CGCONTRDP	+CGCONTRDP: 1,5,"shnbiot","10.250.0.213.255.255.255.0" OK	Get APN and IP address from network

2.2 APN Manual configuration

AT Command	Response	Description
AT+CFUN=0	+CPIN: NOT READY OK	Disable RF
AT*MCGDEFCONT="IP","3GNET"	OK	Configure new APN
AT+CFUN=1	OK +CPIN: READY	Enable RF
AT+CGREG?	+CGREG: 0,1 OK	Inquiry PS service
AT+CGCONTRDP	+CGCONTRDP: 1,5,"3GNET","10.250.0.253.255.255.255.0" OK	Attached PS domain and got IP address automatically

2.3 DNS Parser and Ping

AT Command	Response	Description
AT+CDNSGIP="www.baidu.com"	+CDNSGIP: 61.135.169.121 OK	Got Baidu host name's IP address using DNS parser
AT+CIPPING="61.135.169.121"	OK +CIPPING: 1,61.135.169.121,11,52 +CIPPING: 2,61.135.169.121,2,52 +CIPPING: 3,61.135.169.121,3,52 +CIPPING: 4,61.135.169.121,2,52	Ping this IP address

2.4 Deactivation

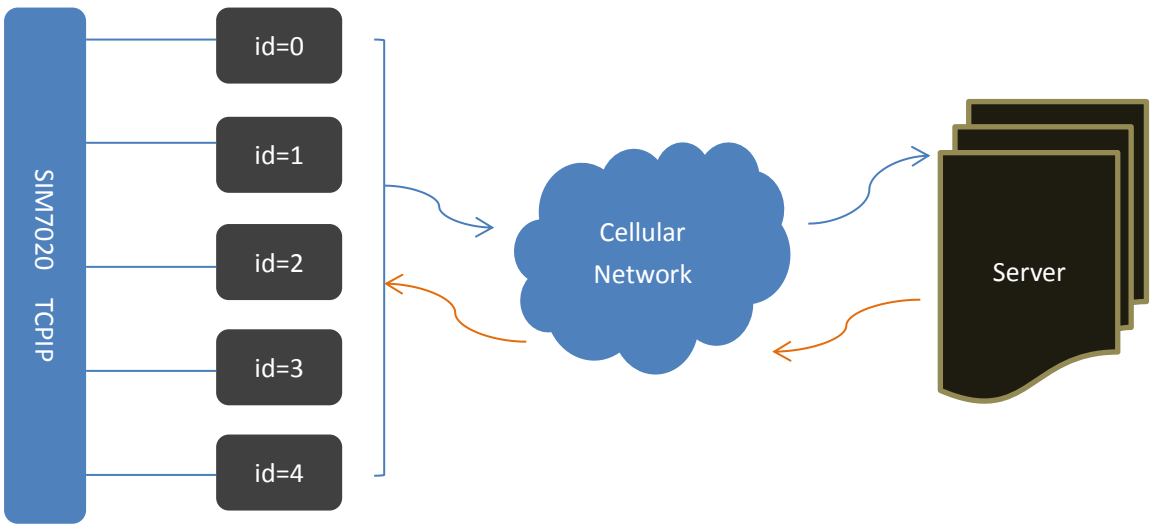
AT Command	Response	Description
AT+CGACT=0,1	OK	Deactivate <cid> #1
AT+CGACT?	+CGACT: 1,0 OK	Inquiry <cid> #1 status, it's deactivated already
AT+CGCONTRDP	OK	IP address is released

3 TCPIP connection

3.1 TCPIP architecture

SIM7020 series modules do not support transparent mode.

SIM7020 series modules support TCP client only. And the default socket interface is designed for multiple sockets with total different 5 <socket_id>s, which could be TCP or UDP socket.



(Figure1 TCPIP Architecture)

3.2 TCP client

AT Command	Response	Description
AT+CSOC=1,1,1	+CSOC:0 OK	Created one TCP socket, <socket_id>=0
AT+CSOCON=0,5245,"116.247.119.165"	OK	Connected remote TCP server
AT+CSOSEND=0,0,”Hello World”	OK	Send TCP data out
AT+CSOCL=0	OK	Close socket

3.3 UDP connection

AT Command	Response	Description
AT+CSOC=1,2,1	+CSOC:0 OK	Created one UDP socket, <socket_id>=0
AT+CSOCON=0,5246,"116.247.119.165"	OK	Connected remote UDP peer
AT+CSOSEND=0,0,”Hello World”	OK	Send UDP data out
AT+CSOCL=0	OK	Close socket

3.4 Multiple sockets

AT Command	Response	Description
AT+CSOC=1,1,1	+CSOC:0 OK	Created one TCP socket, <socket_id>=0
AT+CSOC=1,2,1	+CSOC:1 OK	Created one UDP socket, <socket_id>=1
AT+CSOCON=0,5245,"116.247.119.165"	OK	Connected remote TCP server
AT+CSOCON=1,5246,"116.247.119.165"	OK	Connected remote UDP peer

AT+CSOSEND=0,0,”Hello World”	OK	Send TCP data out
AT+CSOSEND=1,10,”3132333435”	OK	Send UDP data
AT+CSOCL=0	OK	Close socket 0
AT+CSOCL=1	OK	Close socket 1

3.5 Hex and ASCII message

Command AT+CSOSEND=<socket_id>,<len>,<data> supports both Hex and Ascii code message. If <data> is pure hex, the <len> parameter must be configured correct bytes and must be even number.

Also Incoming message from remote socket are printed in Hex code.

3.6 TCP ACK

AT Command	Response	Description
AT+CSOC=1,1,1	+CSOC:0 OK	Created one TCP socket, <socket_id>=0
AT+CSOSENDFLAG=1	OK	Configure TCP ACK report
AT+CSOCON=0,5245,"116.247.119.165"	OK	Connected remote TCP server
AT+CSOSEND=0,0,”Hello World”	OK **SEND: 0,11**	Send TCP data out 11 bytes had been sent out successfully
AT+CSOCL=0	OK	Close socket

3.7 Incoming message indication

AT Command	Response	Description
	+CSONMI: 0,6,313233	Incoming data “123” from remote side

3.8 AT Command and Response in Hex mode

AT Command	Response	Description
AT+CFUN?	+CFUN: 1 OK	Inquiry RF switch status
41 54 2B 43 46 55 4E 3F 0D 0D 0A	0D 0A 2B 43 46 55 4E 3A 20 31 0D 0A 0D 0A 4F 4B 0D 0A	Hex mode

All command response is controlled by **ATE0** in this application note.

3.9 Summary of Socket Error codes

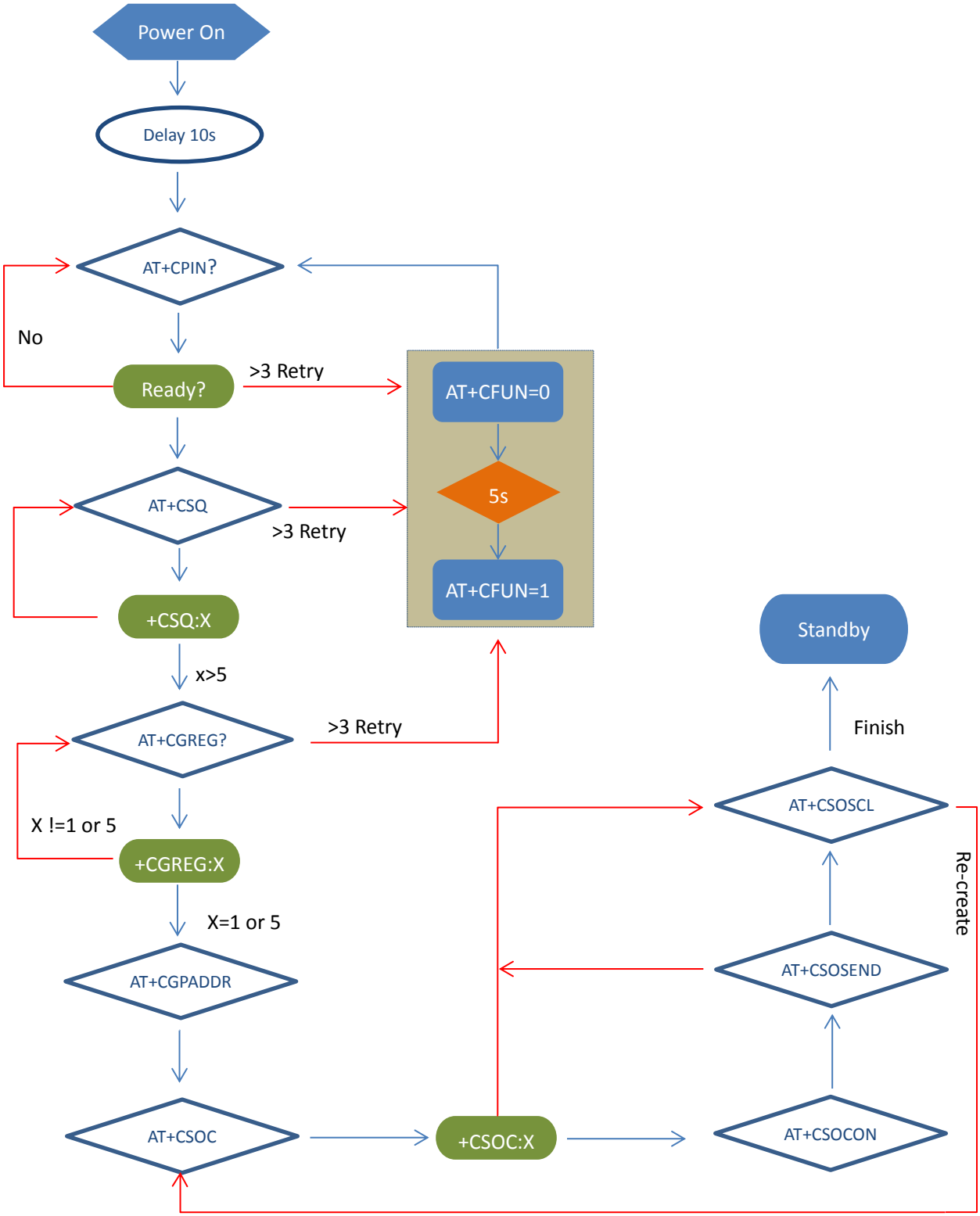
AT Command	Response	Description
	+CSOERR: 0,2	<socket id>, <error code>

Below is error code explanation list.

Code	Description
-1	Common error
1	Route error (host unreachable)
2	Connection abort error
3	Connection Reset error
4	Connected error
5	Illegal error
6	Buffer error
7	Block error
8	Address in use error
9	Already connecting error
10	Already connected error
11	Bearer error

4 TCPIP Connection flow chart

Suggest developer follows below common flow chart.



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