GSM STK BIP

Application Note

GSM/GPRS Module Series

Rev. GSM_STK_BIP_Application_Note_V3.2

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About the document

History

Revision	Date	Author	Description
3.0	2013-02-03	Vicent GAO	Initial
3.1	2013-11-13	Vicent GAO	Added new chapter: Example of STK BIP Functions
3.2	2015-05-11	Vicent GAO	Added applicable modules

Contents

Table Index

1 Introduction

This document mainly introduces how to develop functions about STK BIP for AP. Note that the GSM module which the AP uses shall support class “e”.

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

2 STK BIP Functions

STK BIP contains four functions for **OPEN CHANNEL**, **CLOSE CHANNEL**, **RECEIVE DATA**, and **SEND DATA**. The SIM uses STK BIP functions to indicate that the ME has been interacted with the network.

This chapter introduces the structure of STK BIP function and gives corresponding example.

2.1. OPEN CHANNEL Related to GPRS

This command is used for SIM to tell AP to activate a PDP context and establish a network connection.

2.1.1. Command Structure

Table 1: Command Structure of OPEN CHANNEL Related to GPRS

Description	Section	M/O	Min	Length
Proactive SIM command tag	13.2	M	Y	1
Length (A+B+C+D+E+F+G+H+I+J)	-	M	Y	1 or 2
Command details	12.6	M	Y	A
Device identities	12.7	M	Y	B
Alpha identifier	12.2	O	N	C
Icon identifier	12.31	O	N	D
Bearer description	12.52	M	Y	E
Buffer size	12.55	M	Y	F
Network Access Name	12.61	O	N	G
Other address (local address)	12.58	O	N	H
SIM/ME interface transport level	12.59	O	N	I

Data destination address	15.58	O	N	J

2.1.2. Example and Analysis

Original octets:

D034**81**03014001**82**02818**205**00**B5**0702010403041F02**39**020200**C7**0E046D326D63087765627472696 16C**BC**03012EE1**BE**0521D47B0A1B

Analysis result:

D0: SIM proactive command tag
34: Length is 52

8103014001: Command detail
- 81: Command detail tag
- 03: Length is 3
- 01: Command number
- 40: Command type, represent for **OPEN CHANNEL**
- 01: Command qualifier

82028182: Device identities
- 82: Device identities tag
- 02: Length is 2
- 81: Source device identity, represent for **SIM**
- 82: Destination device identity, represent for **ME**

0500: Alpha identifier
- 05: Alpha identifier tag
- 00: Length is 00

B50702010403041F02: Bearer description
- B5: Bearer description tag
- 07: Length is 7
- 02: Bearer type, reserved for GSM/3GPP
- 01: Precedence class, <precedence> of **+CGQREQ**
- 04: Delay class, <delay> of **+CGQREQ**
- 03: Reliability class, <reliability> of **+CGQREQ**
- 04: Peak throughput class, <peak> of **+CGQREQ**
- 1F: Mean throughput class, <mean> of **+CGQREQ**
- 02: Packet data protocol type, represent for **IP**, <PDP_type> of **+CGQREQ**

39020200: Buffer size
- 39: Buffer size tag

02: Length is 2
0200: Buffer size is 512 bytes

C70E046D326D63087765627472692616C: Network access name
C7: Network access name tag
0E: Length is 14
04: Length of APN network identifier
6D326D63: APN network identifier, represent for **m2mc**
08: Length of APN operator identifier
776562747269616C: APN operator identifier, represent for **webtrial**

BC03012EE1: SIM/ME interface transport level
BC: SIM/ME interface transport level tag
03: Length is 3
01: **UDP**
2EE1: Port number, represent for **12001**

BE0521D47B0A1B: Data destination
BE: Data destination tag
05: Length is 5
21: Type of address, represent for **IPv4**
D47B0A1B: Address, represent for **212.123.10.27** (IP Address)

NOTE

About how to OPEN CHANNEL with module, please refer to the document "GSM_TCPIP_Application_Note_V1.1.pdf".

2.2. CLOSE CHANNEL

This command is used for SIM to tell AP to close previous opened network connection.

2.2.1. Command Structure

Table 2: Command Structure of CLOSE CHANNEL

Description	Section	M/O	Min	Length
Proactive SIM command tag	13.2	M	Y	1
Length (A+B+C+D)	-	M	Y	1 or 2

Command details	12.6	M	Y	A
Device identities	12.7	M	Y	B
Alpha identifier	12.2	O	N	C
Icon identifier	12.31	O	N	D

2.2.2. Example And Analysis

Original octets:

D00B**81**03014100**82**02812**105**00

Analysis result:

D0: SIM proactive command tag
0B: Length is 11

8103014100: Command detail
- 81: Command detail tag
- 03: Length is 3
- 01: Command number
- 41: Command type, represent for **CLOSE CHANNEL**
- 00: Command qualifier

82028121: Device identities
- 82: Device identities tag
- 02: Length is 2
- 81: Source device identity, represent for **SIM**
- 21: Destination device identity, represent for **CHANNEL 1**

0500: Alpha identifier
- 05: Alpha identifier tag
- 00: Length is 00

NOTE

About how to CLOSE CHANNEL with module, please refer to the document “GSM_TCPIP_Application_Note_V1.1.pdf”.

2.3. RECEIVE DATA

This command is used for SIM to tell AP to receive data from previous established network connection.

2.3.1. Command Structure

Table 3: Command Structure of RECEIVE DATA

Description	Section	M/O	Min	Length
Proactive SIM command tag	13.2	M	Y	1
Length (A+B+C+D+E)	-	M	Y	1 or 2
Command details	12.6	M	Y	A
Device identities	12.7	M	Y	B
Alpha identifier	12.2	O	N	C
Icon identifier	12.31	O	N	D
Channel data length	12.54	M	Y	E

2.3.2. Example and Analysis

Original octets:

D00E**81**0301420**82**028121**05**00**37**0120

Analysis result:

D0: SIM proactive command tag
0E: Length is 14

8103014200: Command detail
- 81: Command detail tag
- 03: Length is 3
- 01: Command number
- 42: Command type, represent for **RECEIVE DATA**
- 00: Command qualifier

82028121: Device identities
- 82: Device identities tag

02: Length is 2
81: Source device identity, represent for **SIM**
21: Destination device identity, represent for **CHANNEL 1**

0500: Alpha identifier
05: Alpha identifier tag
00: Length is 00

370120: Channel data length
37: Channel data length tag
01: Length is 00
20: Channel data length is 32

NOTE

About how to RECEIVE DATA with module, please refer to the document "GSM_TCPIP_Application_Note_V1.1.pdf".

2.4. SEND DATA

This command is used for SIM to tell AP to send data to previously established network connection.

2.4.1. Command Structure

Table 4: Command Structure of SEND DATA

Description	Section	M/O	Min	Length
Proactive SIM command tag	13.2	M	Y	1
Length (A+B+C+D+E)	-	M	Y	1 or 2
Command details	12.6	M	Y	A
Device identities	12.7	M	Y	B
Alpha identifier	12.2	O	N	C
Icon identifier	12.31	O	N	D
Channel data	12.53	M	Y	E

2.4.2. Example and Analysis

Original octets:

D03D**81**03014301**82**02812**105**00**36**30415234202B33082940808000552995A0102340302F4803514FFFFFFFF7F1F00DFFF00001F43081106000000003E0100

Analysis result:

D0: SIM proactive command tag
3D: Length is 61

8103014301: Command detail
- 81: Command detail tag
- 03: Length is 3
- 01: Command number
- 43: Command type, represent for **SEND DATA**
- 01: Command qualifier

82028121: Device identities
- 82: Device identities tag
- 02: Length is 2
- 81: Source device identity, represent for SIM
- 21: Destination device identity, represent for **CHANNEL 1**

0500: Alpha identifier
- 05: Alpha identifier tag
- 00: Length is 00

3630415234202B33082940808000552995A0102340302F4803514FFFFFFFF7F1F00DFFF00001F43081106000000003E0100: Channel data
- 36: Channel data tag
- 30: Length is 48
- 415234202B33082940808000552995A0102340302F4803514FFFFFFFF7F1F00DFFF00001F43081106000000003E0100: **SDU** (Needed send data)

NOTE

About how to SEND DATA with module, please refer to the document "GSM_TCPIP_Application_Note_V1.1.pdf".

3 STK BIP Functions Procedures

This chapter introduces the procedures for STK BIP functions and corresponding syntax of **TERMINAL RESPONSE**.

3.1. OPEN CHANNEL Related to GPRS

This command is used for SIM to tell AP to activate a PDP context and establish a network connection.

3.1.1. Common Procedure

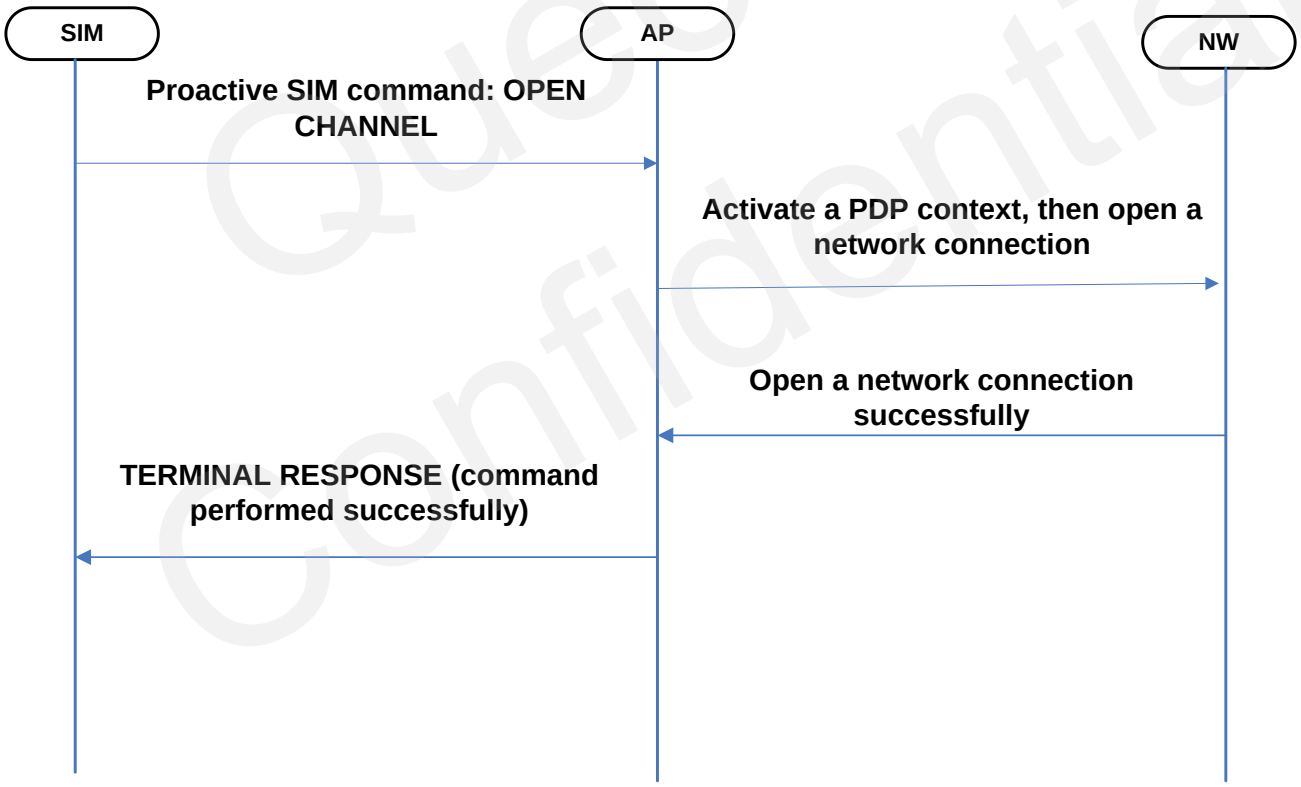

Figure 1: OPEN CHANNEL Related to GPRS

3.1.2. Detailed Procedure

Upon receiving this command, the ME shall decide if it is able to execute the command. Examples are given below, but the list is not exhaustive:

- If immediate PDP context activation is requested and the ME is unable to set-up a channel using the exact parameters provided by the SIM, the ME sets up the channel using the best parameters it can support and informs the SIM of the channel identifier and the modified parameters using TERMINAL RESPONSE (Command performed with modification);
- If immediate PDP context activation is requested and the ME is unable to activate the PDP context with the network using the exact parameters provided by the SIM, the ME informs the SIM using TERMINAL RESPONSE (Network currently unable to process command). The operation is aborted;
- If on demand link establishment is requested and the ME is unable to set-up a channel using the exact parameters provided by the SIM, the ME sets up the channel using the best parameters it can support and informs the SIM of the channel identifier and the modified parameters using TERMINAL RESPONSE (Command performed with modification);
- If the command is rejected because the ME has no channel left with the requested bearer capabilities, the ME informs the SIM using TERMINAL RESPONSE (Bearer independent protocol error). The operation is aborted;
- If the user does not accept the channel set-up, the ME informs the SIM using TERMINAL RESPONSE (User did not accept the proactive command). The operation is aborted;
- If the user has indicated the need to end the proactive SIM session, the ME informs the SIM using TERMINAL RESPONSE (Proactive SIM session terminated by the user). The operation is aborted;
- If the command is rejected because the class B ME is busy on a call, the ME informs the SIM using TERMINAL RESPONSE (ME unable to process command - currently busy on call). The operation is aborted;
- If the command is rejected because the class B ME is busy on a SS transaction, the ME informs the SIM using TERMINAL RESPONSE (ME unable to process command - currently busy on SS transaction). The operation is aborted;

The ME shall inform the SIM that the command has been successfully executed using TERMINAL RESPONSE:

- If immediate PDP context activation is requested, the ME allocates buffers, activates the PDP context and informs the SIM and reports the channel identifier using TERMINAL RESPONSE (Command performed successfully);

- If on demand PDP context activation is requested, the ME allocates buffers, informs the SIM and reports the channel identifier using TERMINAL RESPONSE (Command performed successfully);

3.1.3. TERMINAL RESPONSE

3.1.3.1. TERMINAL RESPONSE (Command Performed Successfully)

Table 5: TERMINAL RESPONSE Structure of OPEN CHANNEL Related to GPRS

Description	Section	M/O	Length (byte)
Command details	12.6	M	A
Device identities	12.7	M	B
Result	12.12	M	C
Channel status	12.56	M	D

Example and analysis

Original octets:

8103014001**82**02828**83**0100**38**028100

Analysis result:

8103014001: Command details
- 81: Command details tag
- 03: Length is 3
- 01: Command number
- 40: Command type, represent for **OPEN CHANNEL**

82028281: Device identities
- 82: Device identities tag
- 02: Length is 2
- 82: Source device identity, represent for **ME**
- 81: Destination device identity, represent for **SIM**

830100: Result
- 83: Result tag
- 01: Length is 1
- 00: Command performed successfully

38028100: Channel status

38: Channel status tag
02: Length is 2
8100: Channel status, represent for channel identifier is 1 and link established or PDP context activated

3.2. CLOSE CHANNEL

This command is used for SIM to tell AP to close previously established network connection.

3.2.1. Common Procedure

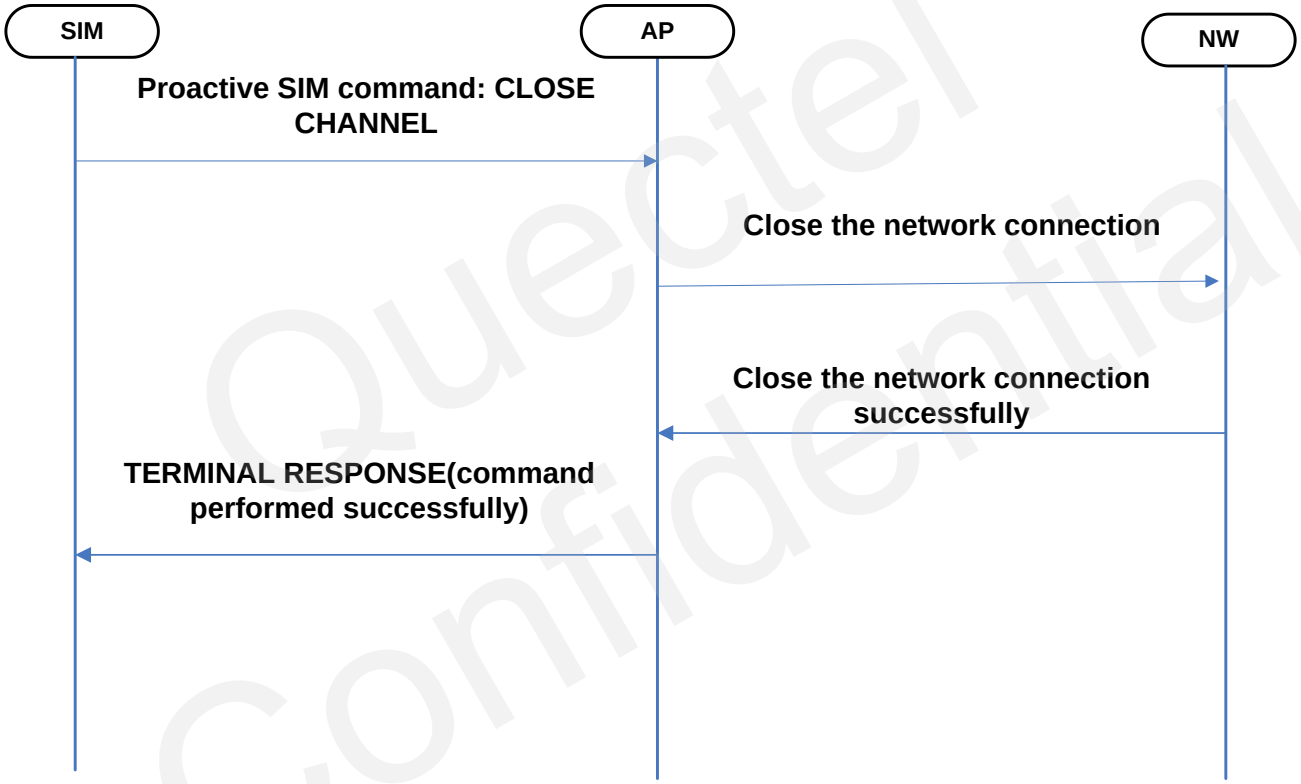

Figure 2: CLOSE CHANNEL

3.2.2. Detailed Procedure

Upon receiving this command, the ME shall decide if it is able to execute the command:

- If the command is rejected because the channel identifier is not valid, the ME informs the SIM using TERMINAL RESPONSE (Bearer independent protocol error);

- If the command is rejected because the requested channel is in error, the ME informs the SIM using TERMINAL RESPONSE (Bearer independent protocol error);
- If the ME is able to process the command:
- ME shall release the data transfer, discard the remaining data and inform the SIM that the command has been successfully executed, using TERMINAL RESPONSE;

3.2.3. TERMINAL RESPONSE

3.2.3.1. TERMINAL RESPONSE (Command Performed Successfully)

Table 6: TERMINAL RESPONSE Structure of CLOSE CHANNEL

Description	Section	M/O	Length (byte)
Command details	12.6	M	A
Device identities	12.7	M	B
Result	12.12	M	C

Example and analysis

Original octets:

8103014101**82**02828**83**0100**38**028100

Analysis result:

8103014101: Command details
- 81: Command details tag
- 03: Length is 3
- 01: Command number
- 41: Command type, represent for **CLOSE CHANNEL**

82028281: Device identities
- 82: Device identities tag
- 02: Length is 2
- 82: Source device identity, represent for **ME**
- 81: Destination device identity, represent for **SIM**

830100: Result
- 83: Result tag
- 01: Length is 1

00: Command performed successfully

3.3. RECEIVE DATA

This command is used for SIM to tell AP to receive data from previously established network connection.

3.3.1. Common Procedure

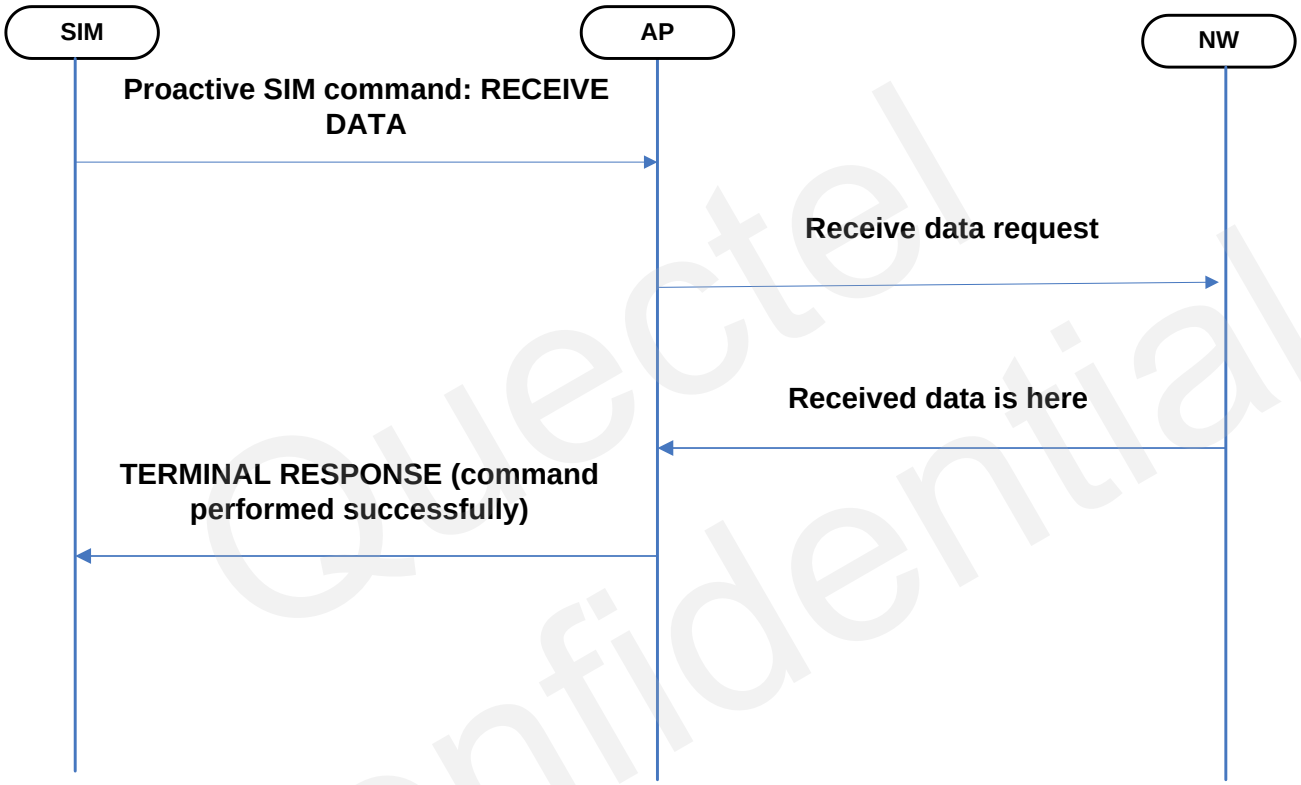

Figure 3: RECEIVE DATA

3.3.2. Detailed Procedure

Upon receiving this command, the ME shall return the data available in the Rx buffer corresponding to the Channel identifier. Examples are given below, but the list is not exhaustive:

If the ME is unable to process the command:

- If the command is rejected because the requested channel is already closed the ME informs the SIM using TERMINAL RESPONSE (Bearer independent protocol error);

- If the user has indicated the need to end the proactive SIM session, the ME informs the SIM using TERMINAL RESPONSE (Proactive SIM session terminated by the user).

If the ME is able to process the command:

- If the requested number of bytes is available in the buffer, the ME shall inform the SIM that the command has been successfully executed, using TERMINAL RESPONSE and return the requested data and the number of bytes remaining in the channel buffer (or FF if more than the maximum bytes remains).

- If the requested number of bytes is available in the buffer but the whole requested data cannot be included in the TERMINAL RESPONSE because of APDU size limits, the ME shall return the maximum number of bytes possible according to the length of other TLVs. The ME shall inform the SIM that the command has been successfully executed, using TERMINAL RESPONSE and shall indicate the number of bytes remaining in the channel buffer (or FF if more than the maximum bytes remains).

- If the requested number of bytes is not yet available in the buffer, the ME shall NOT wait for the requested number of bytes to arrive. The ME shall inform the SIM, using TERMINAL RESPONSE (Command performed with missing information) and returns the data currently available in the channel buffer.

- In the case of packet/datagram transmission, the ME shall put in the Rx buffer a complete packet SDU and only one at one time. For example, if UDP datagrams are received by the ME, the latter shall insert only the SDU of each UDP packet received in the Rx buffer. After one SDU has been downloaded by the SIM (using one or several RECEIVE DATA commands), the ME shall insert the next SDU of UDP datagram, and so on.

- If the alpha identifier is provided by the SIM, the ME shall use it to inform the user. The ME may also use it to inform the user during data transfer. If an icon is provided by the SIM, the icon indicated in the command may be used by the ME to inform the user, in addition to, or instead of the alpha identifier, as indicated with the icon qualifier (see sub-clause 6.5.4).

3.3.3. TERMINAL RESPONSE

3.3.3.1. TERMINAL RESPONSE (Command Performed Successfully)

Table 7: TERMINAL RESPONSE Structure of RECEIVE DATA

Description	Section	M/O	Length (byte)
Command details	12.6	M	A

Device identities	12.7	M	B
Result	12.12	M	C
Channel data	12.53	M	D
Channel data length	12.54	M	E

Example and analysis

Original octets:

8103014201**82**02828**83**0100**36**0631323334353637**0**0100

Analysis result:

8103014201: Command details
- 81: Command details tag
- 03: Length is 3
- 01: Command number
- 42: Command type, represent for **RECEIVE DATA**

82028281: Device identities
- 82: Device identities tag
- 02: Length is 2
- 82: Source device identity, represent for **ME**
- 81: Destination device identity, represent for **SIM**

830100: Result
- 83: Result tag
- 01: Length is 1
- 00: Command performed successfully

3606313233343536: Channel data
- 36: Channel data tag
- 06: Length is 6
- 313233343536: **Channel data**

370100: Channel data length
- 37: Channel data length tag
- 01: Length is 1
- 00: Channel data length is 0, represent for remain byte in received channel data buffer is 0

3.4. SEND DATA

This command is used for SIM to tell AP to send data to previously established network connection.

3.4.1. Common Procedure

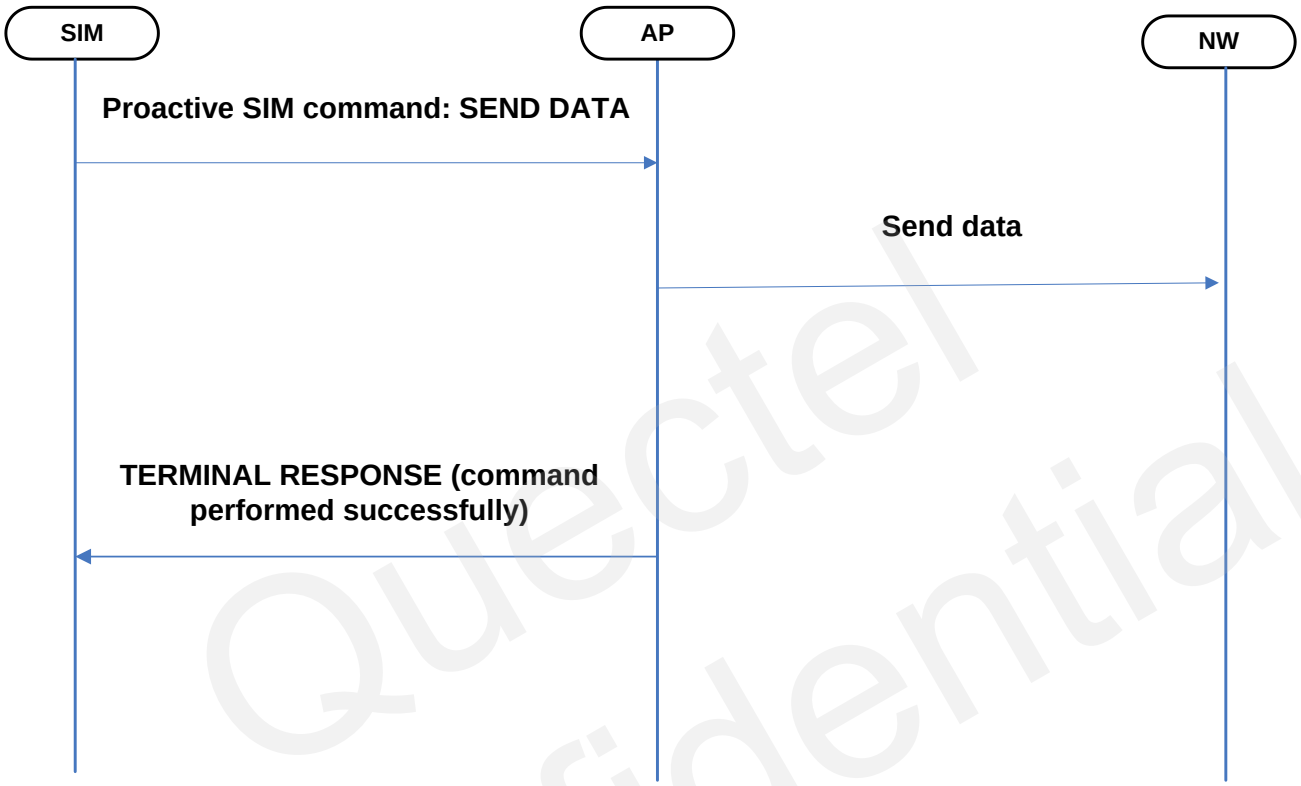

Figure 4: SEND DATA

3.4.2. Detailed Procedure

Upon receiving this command, the ME shall either immediately send data or store provided data into the Tx buffer corresponding to the Channel identifier. Examples as given below, but the list is not exhaustive:

If the ME is unable to process the command:

- If the command is rejected because the requested channel is already closed the ME informs the SIM using TERMINAL RESPONSE (Bearer Independent Protocol error – channel identifier not valid);
- If the command is rejected because the ME could not establish the link (after OPEN CHANNEL (on demand)) or the link was dropped, the ME informs the SIM using TERMINAL RESPONSE (Bearer Independent Protocol error – channel closed);

- If the command is rejected because the channel is temporarily unavailable the ME informs the SIM using TERMINAL RESPONSE (ME currently unable to process command);
- If the requested number of bytes of empty space is not yet available in the buffer the ME informs the SIM using TERMINAL RESPONSE (Bearer Independent Protocol error);
- If the user has indicated the need to end the proactive SIM session, the ME informs the SIM using TERMINAL RESPONSE (Proactive SIM session terminated by the user).

If the ME is able to process the command:

- if the requested number of bytes of empty space is available in the buffer the ME shall inform the SIM that the command has been successfully executed, using TERMINAL RESPONSE and return the number of bytes of empty space available in the Tx buffer (or FF if more then 255 bytes are available);
- In the case of packet/datagram transmission, the structure of the SDU sent by the SIM to the ME shall be fully respected while sending to the ME external interface. The size of the SDU is therefore limited by the size of the packet PDU sent over the ME external interface. In order to send one complete SDU, the SAT application may fill the Tx buffer with several SEND DATA commands, if necessary. Then the ME shall send the complete SDU in one packet PDU;
- If the alpha identifier is provided by the SIM, the ME shall use it to inform the user. The ME may also use it to inform the user during data transfer. If an icon is provided by the SIM, the icon indicated in the command may be used by the ME to inform the user, in addition to, or instead of the alpha identifier, as indicated with the icon qualifier (see sub-clause 6.5.4).

3.4.3. TERMINAL RESPONSE

3.4.3.1. TERMINAL RESPONSE (Command Performed Successfully)

Table 8: TERMINAL RESPONSE Structure of SEND DATA

Description	Section	M/O	Length (byte)
Command details	12.6	M	A
Device identities	12.7	M	B
Result	12.12	M	C
Channel data length	12.54	M	E

Example and analysis

Original octets:

8103014301**82**02828**83**0100**37**01FF

Analysis result:

8103014301: Command details
- 81: Command details tag
- 03: Length is 3
- 01: Command number
- 43: Command type, represent for **SEND DATA**

82028281: Device identities
- 82: Device identities tag
- 02: Length is 2
- 82: Source device identity, represent for **ME**
- 81: Destination device identity, represent for **SIM**

830100: Result
- 83: Result tag
- 01: Length is 1
- 00: Command performed successfully

3701FF: Channel data length
- 37: Channel data length tag
- 01: Length is 1
- 00: Channel data length is 255, represent for bytes of empty send channel data buffer is more than 255

4 Example of STK BIP Functions

This clause only gives a simple example for using STK BIP functions. It may be different from the actual way.

```
// After selecting STK BIP menu item, STK BIP functions begin to run.

+STKPCI:
0,"D034810301400182028182050OB50702010403041F0239020200C70E046D326D630877656274726
9616CBC03012EE1BE0521D47B0A1B"          // OPEN CHANNEL of STK BIP functions
AT+QIOPEN="UDP","212.123.10.27",12001   // Visit the remote UDP server specified in OPEN
                                           CHANNEL
OK

CONNECT OK
AT+QINDI=1                              // Set the mode to handle the received data
OK
AT+STKTR="810301400182028281830100380281OO"
                                        // OPEN CHANNEL is ready
OK

+STKPCI: 1,"D03D810301430182028121050O360431323334"
                                        // SEND DATA of STK BIP functions
AT+QISEND=4                             // Send 4 bytes data specified in SEND DATA to the
                                           remote server
>1234
SEND OK
AT+STKTR="810301430182028281830100370lFF"
                                        // SEND DATA is ready
OK

+STKPCI: 1,"D00E810301420082028121050037012O"
                                        // RECEIVE DATA of STK BIP functions
+QIRDI: 0,1,0
AT+QIRD=0,1,0,1500                      // Received data in the buffer of the connection
+QIRD: 212.123.10.27:12001,UDP,4
1234
OK
AT+STKTR="810301420182028281830100360631323334353637O100"
```

```
                                                    // RECEIVE DATA is ready
OK

+STKPCI: 1," D00B810301410082028121050 0 "
                                                    // CLOSE CHANNEL of STK BIP functions
AT+QICLOSE                                          // Close the session with the remote server
CLOSE OK
AT+STKTR="8103014101820282818301003802810 0"
                                                    // CLOSE CHANNEL is ready
OK

// Example of STK BIP functions end
```

NOTE

About how to OPEN CHANNEL, CLOSE CHANNEL, RECEIVE DATA, SEND DATA, please refer to the document “GSM_TCPIP_Application_Note_V1.1.pdf”.

5 SIMPLE-TLV Data Objects

This chapter only lists data objects related to STK BIP functions.

5.1. Bearer Description

This sub-clause applies only if class "e" is supported.

Table 9: Structure of Bearer Description

Byte(s)	Description	Length
1	Bearer description tag	1
2	Length (X+1)	1
3	Bearer type	1
4 to (3+X)	Bearer parameters	X

Coding:
00 = User Termination.
01 = Error Termination.

5.1.1. Bearer Parameters For GPRS/Packet Service

Contents: parameters describing the Quality of Service (QoS) and the type of PDP. This is an element of the PDP context.

The default values of the sub-parameters are manufacturer specific since they depend on the purpose of the device and data services provided by it. Not all combinations and values of these sub-parameters are supported by GSM (refer TS 22.002 [30]).

X (length of parameters) = 6.

Coding: The following values are as defined in TS 27.007 [27], for the quality of Service profile requested "**+CGQREQ**" extended command. They are coded in hexadecimal.

- Coding of Byte 4 - Precedence class: same as the "precedence" subparameter, defined in TS 27.007 [27].
- Coding of Byte 5 - Delay class: same as the "delay" subparameter, defined in TS 27.007 [27].
- Coding of Byte 6 - Reliability class: same as the "reliability" subparameter, defined in TS 27.007 [27].
- Coding of Byte 7 - Peak throughput class: same as the "peak" subparameter, defined in TS 27.007 [27].
- Coding of Byte 8 - Mean throughput class: same as the "mean" subparameter, defined in TS 27.007 [27].
- Coding of Byte 9 - Packet data protocol type:
  '02' = IP (Internet Protocol, IETF STD 5);
  All other values are reserved.

5.2. Buffer Size

This sub-clause applies only if class "e" is supported.

Table 10: Structure of Buffer Size

Byte(s)	Description	Length
1	Buffer size tag	1
2	Length (2)	1
3 to 4	Buffer size	2

The Buffer size codes the number of bytes requested by the SIM in an OPEN CHANNEL command or what the ME can offer the SIM (placed in TERMINAL RESPONSE).

5.3. Network Access Name

Table 11: Structure of Network Access Name

Byte(s)	Description	Length
1	Network Access Name tag	1

2	Length (X)	1
3 to 3+X-1	Network Access Name	X

Content: The Network Access Name is used to identify the Gateway entity, which provides interworking with an external packet data network. For GPRS, the Network Access Name is an APN.

Coding: As defined in TS 23.003 [36].

5.4. SIM/ME Interface Transport Level

This sub-clause applies only if class "e" is supported.

Table 12: Structure of SIM/ME Interface Transport Level

Byte(s)	Description	Length
1	SIM/ME interface transport level tag	1
2	Length (X)	1
3	Transport protocol type	1
4 to 5	Port number	2

Transport protocol type coding:

01' : UDP (as defined in RFC 768 [33])
02' : TCP (as defined in RFC 793 [34])
All other value are reserved

Port number coding: integer

5.5. Other Address

Table 13: Structure of Other Address

Byte(s)	Description	Length
1	Other address tag	1

2	Length (X)	1
3	Type of address	1
4 to (X+2)	Address	X-1

A null Local address shall be coded with Length = '00', and no Value part. In that case, the ME shall request a dynamic address.

Coding of Type of address: according to packet data protocol address in TS 04.08 [8].
'21' = IPv4 address
'57' = IPv6 address
'others' = reserved

Coding of address: according to packet data protocol address in TS 04.08 [8].

If type of address indicates IPv4, the Address information in octet 4 to octet 7 contains the IPv4 address. Bit 8 of octet 4 represents the most significant bit of the IP address and bit 1 of octet 7 the least significant bit .

If type of address indicates IPv6, the Address information in octet 4 to octet 19 contains the IPv6 address. Bit 8 of octet 4 represents the most significant bit of the IP address and bit 1 of octet 19 the least significant bit.

5.6. Channel Data Length

This sub-clause applies only if class "e" is supported.

Table 14: Structure of Channel Data Length

Byte(s)	Description	Length
1	Channel data length tag	1
2	Length (1)	1
3	Channel data length	1

The Channel data length codes:

Either the number of bytes that are available in a channel buffer (Tx or Rx buffers negotiated during

OPEN CHANNEL) using TERMINAL RESPONSE. Since the Tx or Rx buffer size can be larger than 255 bytes, 'FF' means "more than 255 bytes are available".

Or the number of bytes that are requested in a RECEIVE DATA command.

5.7. Channel Data

This sub-clause applies only if class "e" is supported.

Table 15: Structure of Channel Data

Byte(s)	Description	Length
1	Channel data tag	1
2 to Y+1	Length (X)	Y
(Y+2) to (Y+X+1)	Channel data string	X

Contents:
The Channel data object contains application data read from or written to a specific channel buffer in the ME.
Coding:
The Channel data string shall be considered by the ME as binary coded on 8 bits.

6 Tag Values

This chapter only lists data objects related to STK BIP functions.

6.1. SIMPLE-TLV Tags In Both Directions

Table 16: Structure of CR

8	7	6	5	4	3	2	1
CR	Tag Value						

CR: Comprehension required for this object.

Unless otherwise stated, for SIMPLE-TLV data objects it is the responsibility of the SIM application and the ME to decide the value of the CR flag for each data object in a given command.

Handling of the CR flag at the receiving entity is described in sub-clause 6.10.

Table 17: Value of CR

CR	Value
Comprehension required	1
Comprehension not required	0

Table 18: List of Tag Value

Description	Length of tag	Tag value, bits 1-7 (Range: '01' - '7E')	Tag (CR and Tag value)
Bearer description tag	1	'35'	'35' or 'B5'
Channel data tag	1	'36'	'36' or 'B6'

Channel data length tag	1	'37'	'37' or 'B7'
Buffer size tag	1	'39'	'39' or 'B9'
SIM/ME interface transport level	1	'3C'	'3C' or 'BC'
Other address (data destination address)	1	'3E'	'3E' or 'BE'
Network Access Name	1	'47'	'47' or 'C7'

6.2. Type of Command and Next Action Indication

The table below shows the values which shall be used for Type of Command coding (see sub-clause 12.6) and Next Action Indicator coding (see sub-clause 12.24).

Table 19: Type of Command

Value	Name	Used for Type of Command coding	Used for Next Action Indicator coding
'40'	OPEN CHANNEL	X	X
'41'	CLOSE CHANNEL	X	X
'42'	RECEIVE DATA	X	X
'43'	SEND DATA	X	X

7 Appendix A Reference

Table 20: Related Documents

SN	Document name	Remark
[1]	ETSI TS 101 267 V8.9.0 (2001-12)	Digital cellular telecommunications system (Phase 2+); Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment (SIM-ME) interface (3GPP TS 11.14 version 8.9.0 Release 1999)
[2]	3GPP TS 27.007 V9.5.0 (2010-09)	3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; AT command set for User Equipment (UE) (Release 9)

Table 21: Terms and Abbreviations

Abbreviation	Description
ME	Mobile Equipment
SIM	Subscriber Identity Module
BIP	Bearer Independent Protocol
AP	Application
NW	Network
TLV	Tag Length Value