

Bluetooth Baseband LSI
Panasonic PAN1026
Toshiba TC35661

SPP v1.1
Command Interface Document

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PANASONIC Bluetooth Module PAN1026 CMD(SPP)

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[Revised Note]

| Date | Modification | Note |
|----------------|---|------|
| 24th-June-2013 | 1 st Release Based on TC35661APL_ROM500_SPP_E_12thJune2013. Added the following sections. 2. Status Code List 2.1 Response Status 2.2 Notification Status | |

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1. SPP Command Explanation

1.1 TCU_SPP_SETUP_REQ

To setup SPP device.

ACK Response TCU_SPP_SETUP_RESP is generated, when this command is completed.

Command Format:

| | |
|------------------|---------|
| ServiceID | 1 Byte |
| OpCode | 1 Byte |
| Parameter Length | 2 Bytes |

ServiceID 0xE5
OpCode 0x01
Parameter Length 0x0000

Parameters: -NONE-

1.2 TCU_SPP_SETUP_RESP

ACK Response for TCU_SPP_SETUP_REQ.

Command Format:

| | |
|------------------|---------|
| ServiceID | 1 Byte |
| OpCode | 1 Byte |
| Parameter Length | 2 Bytes |
| Status | 1 Byte |

ServiceID 0xE5
OpCode 0x81
Parameter Length 0x0001

Parameters:

| Parameters | Parameter Description | Value |
|------------|--------------------------|-------|
| Status | TCU_SPP_SETUP_REQ Result | |
| | Successful | 0x00 |
| | Parameter Failure | 0x01 |
| | No Device Initialization | 0x03 |
| | Setup SPP | 0x40 |

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1.3 TCU_SPP_SHUTDOWN_REQ

To shutdown SPP Function.

ACK Response TCU_SPP_SHUTDOWN_RESP is generated, when this command is completed.

(Note)

This command should be issued, when SPP connection is not established.

Command Format:

| | |
|------------------|---------|
| ServiceID | 1 Byte |
| OpCode | 1 Byte |
| Parameter Length | 2 Bytes |

ServiceID 0xE5
OpCode 0x02
Parameter Length 0x0000

Parameters: - NONE -

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1.4 TCU_SPP_SHUTDOWN_RESP

ACK Response for TCU_SPP_SHUTDOWN_REQ.

Command Format:

| | |
|------------------|---------|
| ServiceID | 1 Byte |
| OpCode | 1 Byte |
| Parameter Length | 2 Bytes |
| Status | 1 Byte |

ServiceID 0xE5
OpCode 0x82
Parameter Length 0x0001

Parameters:

| Parameters | Parameter Description | Value |
|------------------|-------------------------------|-------|
| Status | TCU_SPP_SHUTDOWN_REQ Result : | |
| | Successful | 0x00 |
| | Parameter Failure | 0x01 |
| | No device Initialization | 0x03 |
| | No setup SPP | 0x41 |
| | Establish SPP | 0x42 |
| On releasing SPP | 0x43 | |

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1.5 TCU_SPP_CONNECT_REQ

To establish ACL connection and SPP connection with specified remote device.

TCU_ACCPET is generated to notify the command operation start for Host CPU.

When service level connection is established, TCU_SPP_CONNECT_EVENT is generated.

Command Format:

| | |
|-------------------------|----------|
| ServiceID | 1 Byte |
| OpCode | 1 Byte |
| Parameter Length | 2 Bytes |
| BD_ADDR | 6 Bytes |
| BaudRate | 1 Byte |
| DataFormat | 1 Byte |
| FlowControl | 1 Byte |
| XonChar | 1 Byte |
| XoffChar | 1 Byte |
| ParmMask | 2 Byte |
| Server_Channel_Validity | 1 Byte |
| Sever_Channel | 1 Byte |
| Use_of_Link_Key | 1 Byte |
| Link_Key | 16 Bytes |

ServiceID 0xE5
 OpCode 0x03
 Parameter Length 0x000D or 0x000E or 0x000F or 0x0010 or 0x001E or 0x0020

Parameters:

| Parameters | Parameter Description | Value |
|------------|--|--|
| BD_ADDR | Remote BD ADDR | 0XXXXXXXXXXXXX X |
| BaudRate | Baudrate setting – 2400bps – 4800bps – 7200bps – 9600bps – 19200bps – 38400bps – 57600bps – 115200bps – 230400bps | 0x00 0x01 0x02 0x03 0x04 0x05 0x06 0x07 0x08 |
| DataFormat | Data bit length, stop bit length, parity existence, parity type setting Unused This bit is ignored. | BIT0 |

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| | | |
|-------------|---|--|
| | <p>DataBit</p> <ul style="list-style-type: none"> - DataBits5: 0x00 - DataBits7: 0x01 - DataBits6: 0x02 - DataBits8: 0x03 <p>StopBit</p> <ul style="list-style-type: none"> - StopBit1: 0x00 - StopBits1_5: 0x01 <p>Parity</p> <ul style="list-style-type: none"> - NonParity: 0x00 - Parity: 0x01 <p>ParityType</p> <ul style="list-style-type: none"> - OddParity: 0x00 - MarkParity: 0x01 - EvenParity: 0x02 - SpaceParity: 0x03 <p>Unused</p> <p>This bit is ignored.</p> | <p>BIT1-2</p> <p>BIT3</p> <p>BIT4</p> <p>BIT5-6</p> <p>BIT7</p> |
| FlowControl | <p>Flow controll setting</p> <ul style="list-style-type: none"> - NoFlowControl - XFlowInput - XFlowOutput - RTRInput - RTROutput - RTCInput - RTCOutput - Unused <p>This bit is ignored.</p> | <p>0x00</p> <p>BIT1-ON</p> <p>BIT2-ON</p> <p>BIT3-ON</p> <p>BIT4-ON</p> <p>BIT5-ON</p> <p>BIT6-ON</p> <p>BIT7</p> |
| XonChar | <p>Xon Chiropractor setting</p> <ul style="list-style-type: none"> - YES - NO | <p>0x01</p> <p>0x00</p> |
| XoffChar | <p>Xoff Chiropractor setting</p> <ul style="list-style-type: none"> - YES - NO | <p>0x01</p> <p>0x00</p> |
| ParmMask | <p>Field setting</p> <ul style="list-style-type: none"> - RFCOMM_RPN_MASK_BAUD - RFCOMM_RPN_MASK_DATA - RFCOMM_RPN_MASK_STOP - RFCOMM_RPN_MASK_PARITY - RFCOMM_RPN_MASK_PARITY_TYPE - RFCOMM_RPN_MASK_XON_CHAR - RFCOMM_RPN_MASK_XOFF_CHAR - Unuse - RFCOMM_RPN_MASK_FLOW_X_IN - RFCOMM_RPN_MASK_FLOW_X_OUT - RFCOMM_RPN_MASK_FLOW_RTR_IN - RFCOMM_RPN_MASK_FLOW_RTR_OUT | <p>BIT0-ON</p> <p>BIT1-ON</p> <p>BIT2-ON</p> <p>BIT3-ON</p> <p>BIT4-ON</p> <p>BIT5-ON</p> <p>BIT6-ON</p> <p>BIT7-0</p> <p>BIT8-ON</p> <p>BIT9-ON</p> <p>BIT10-ON</p> <p>BIT11-ON</p> |

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| | | |
|-------------------------|--|---|
| | <ul style="list-style-type: none"> - RFCOMM_RPN_MASK_FLOW_RTC_IN - RFCOMM_RPN_MASK_FLOW_RTC_OUT - Unused <p>This bit is ignored</p> | <p>BIT12-ON</p> <p>BIT13-ON</p> <p>BIT14-15</p> |
| Server_Channel_Veracity | <p>Server_Channel validity</p> <ul style="list-style-type: none"> - Server_Channel parameter is not valid - Server_Channel parameter is valid | <p>0x00</p> <p>0x01</p> |
| Server_Channel | <p>Used Server Channel information</p> <p>TCU_MNG_DISCOVER_REMOTE_SERVER_EVENT command can get Server Channel.</p> <p>Even if Select_Server_Channel sets 0x00(This parameter is not valid), Do not omit this parameter.</p> | <p>0x00</p> |
| Use_of_Link_Key | <p>Link_Key setting</p> <p>When TCU_MNG_INIT_REQ / Paired_Information_Stored_Setting is enabled, this parameter can be omitted. Then TC35661 uses LinkKey into EEPROM automatically.</p> <ul style="list-style-type: none"> - Unused <p>Paired information into EEPROM is not used. Pairing is occurred.</p> <ul style="list-style-type: none"> - Use <p>Host needs to send LinkKey.</p> | <p>0x00</p> <p>0x01</p> |
| Link_Key | <p>Link key</p> <p>When Use_of_Link_Key is 0x00, this field is ignored.</p> <p>When TCU_MNG_INIT_REQ / Paired_Information_Stored_Setting is enabled, this parameter should be omitted. Then TC35661 uses LinkKey into EEPROM automatically</p> | <p>0XXXXXXXXXXXXX</p> <p>XXXXXXXXXXXXXX</p> <p>XXXXXXXXXX</p> |

The following response is notified with TCU_ACCEPT

| Parameters | Parameter Description | Value |
|------------|---|-------|
| Status | Success | 0x00 |
| | Parameter Failure | 0x01 |
| | No Device Initialization | 0x03 |
| | On searching device | 0x04 |
| | On searching service | 0x05 |
| | Under Connection Setup of other Profile | 0x0E |
| | No setup SPP | 0x41 |
| | On progress SPP connection or Establish SPP | 0x42 |
| | Releasing SPP | 0x43 |

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1.6 TCU_SPP_CONNECT_EVENT

This event is generated, when SPP connection is established.

Command Format:

| | |
|-----------------------|--------------|
| ServiceID | 1 Byte |
| OpCode | 1 Byte |
| Parameter Length | 2 Bytes |
| Status | 1 Byte |
| BD_ADDR | 6 Bytes |
| Negotiated_Frame_Size | 2 Bytes |
| Length_of_Device_Name | 1 Byte |
| Device_Name | MAX 248Bytes |

ServiceID 0xE5
 OpCode 0x43
 Parameter Length 0x000A-0x0022

Parameters:

| Parameters | Parameter Description | Value |
|-----------------------|---|------------------------------|
| Status | TCU_SPP_SERVICELEVEL_CONNECT_REQ Result : Successful No SDP service supported SPP connection timer-out SPP connection failure | 0x00 0x8D 0xD0 0xD3 |
| BD_ADDR | Remote Device BD_ADDR | 0XXXXXXXX XXXXX |
| Negotiated_Frame_Size | Max Frame size between RFCOMM entity (Note) information field size is equal to the following condition. Negotiated_Frame_Size When RFCOMM credit base flow control is active, Negotiated_Frame_Size-1 (Credits Field) byte RFCOMM entry depends on Credit filed status or flow control status during RFCOMM connection. When Status is failed, 0xFFFF is used. | Max 0x03F4 |
| Length_of_Device_Name | Remote Device User-friendly name Length When no User-friendly name is setting, This value is 0x00. | 0x00 - 0x18 |
| Device_Name | Remote device UTF-8 encoded User-friendly name If Length_of_Device_Name is 0x00, This data is ignored. (MAX:24Bytes) | |

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1.7 TCU_SPP_DISCONNECT_REQ

To disconnect SPP connection.

TCU_ACCEPT is generated to notify the start of this command operation.

When the connection is disconnected, TCU_SPP__DISCONNECT_EVENT is generated.

(Note1)

SPP release timer is 5sec.

When this timer is expired, all internal SPP resource is released.

TCU_MNG_CONNECTION_STATUS_EVENT and TCU_SPP__DISCONNECT_EVENT are notified.

Command Format:

| | |
|------------------|---------|
| ServiceID | 1 Byte |
| OpCode | 1 Byte |
| Parameter Length | 2 Bytes |

ServiceID 0xE5
OpCode 0x04
Parameter Length 0x0000

Parameters: - NONE -

The following response is notified with TCU_ACCEPT

| Parameters | Parameter Description | Value |
|------------|---|-------|
| Status | Success | 0x00 |
| | Parameter Failure | 0x01 |
| | No Device Initialization | 0x03 |
| | Under Connection Setup of other Profile | 0x0E |
| | No setup SPP | 0x41 |

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1.8 TCU_SPP_DISCONNECT_EVENT

This event is generated, when SPP disconnection is completed.

(Note)

If there is no BD_ADDR to notify, BD_ADDRD is set as 0xFFFFFFFFFFFF.

Command Format:

| | |
|------------------|---------|
| ServiceID | 1 Byte |
| OpCode | 1 Byte |
| Parameter Length | 2 Bytes |
| Status | 1 Byte |
| BD_ADDR | 6 Bytes |
| Reason | 1 Byte |

ServiceID 0xE5
OpCode 0x44
Parameter Length 0x0008

Parameters:

| Parameters | Parameter Description | Value |
|------------|---------------------------------------|--------------------|
| Status | TCU_SPP_SERVICELEVEL_DISCONNECT_REQ | |
| | Result : | |
| | Successful | 0x00 |
| | SPP releasing timer-out | 0xD2 |
| BD_ADDR | BD_ADDR of remote device | 0XXXXXXXXX XXXX |
| Reason | Reason for Disconnection | |
| | Releasing required from local host | 0x01 |
| | Releasing required from remote device | 0x02 |
| | Disconnection error | 0x03 |
| | Link loss | 0x04 |

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1.9 TCU_SPP_LINE_NOTIFY_EVENT

To notify line status, which is received from B-Party.

Command Format:

| | |
|------------------|---------|
| ServiceID | 1 Byte |
| OpCode | 1 Byte |
| Parameter Length | 2 Bytes |

ServiceID 0xE5
OpCode 0x47
Parameter Length 0x0001

Parameters:

| Parameters | Parameter Description | Value |
|-------------|--------------------------------------|-------|
| Line_Status | Line Ststus is specified on TS 07.10 | 0xXX |

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1.10 TCU_SPP_DATA_TRANSFER_REQ

To send SPP data to remote device.

TCU_ACCEPT is generated to notify the start of this command operation.

TCU_SPP_DATA_SEND_EVENT is generated, when this command is completed.

Command Format:

| | |
|------------------|--------------|
| ServiceID | 1 Byte |
| OpCode | 1 Byte |
| Parameter Length | 2 Bytes |
| Length_of_Data | 2 Bytes |
| Data | MAX 543Bytes |

ServiceID: 0xE5
OpCode: 0x08
Parameter Length: 0x0003 - 0x0221

Parameters:

| Parameters | Parameter Description | Value |
|----------------|-----------------------------|-------------|
| Length_of_Data | SPP Data Length | Max. 0x021f |
| Data | SPP Data (1Byte - 543Bytes) | |

The following response is notified with TCU_ACCEPT

| Parameters | Parameter Description | Value |
|------------|--------------------------|-------|
| Status | Success | 0x00 |
| | Parameter Failure | 0x01 |
| | No Device Initialization | 0x03 |
| | No setup SPP | 0x41 |
| | Releasing SPP | 0x43 |
| | No SPP connection | 0x44 |
| | On transferring SPP data | 0x46 |

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1.11 TCU_SPP_DATA_RECEIVE_EVENT

To notify SPP Data, which is received from B-Party

Command Format:

| | |
|------------------|--------------|
| ServiceID | 1 Byte |
| OpCode | 1 Byte |
| Parameter Length | 2 Bytes |
| Length_of_Data | 2 Bytes |
| Data | MAX 543Bytes |

ServiceID: 0xE5
OpCode: 0x48
Parameter Length: 0x0003 - 0x0221

Parameters:

| Parameters | Parameter Description | Value |
|----------------|----------------------------------|-------------|
| Length_of_Data | Received data length | Max. 0x03F4 |
| Data | Received Data (1Byte - 543Bytes) | |

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1.12 TCU_SPP_DATA_SEND_EVENT

This event is generated, SPP Data Transfer : TCU_SPP_DATA_TRANSFER_REQ is completed to send SPP data to B-Party.

Command Format:

| | |
|------------------|---------|
| ServiceID | 1 Byte |
| OpCode | 1 Byte |
| Parameter Length | 2 Bytes |

ServiceID 0xE5
OpCode 0xF1
Parameter Length 0x0000
Parameter -NONE-

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1.13 TCU_SPP_UUID_ASSIGN_REQ

This command sets Service Class ID (UUID) on SDP for SPP.

This command is used to connect to the service with the UUID Bluetooth SIG dose not specify.

This command sets both UUID for initiator and acceptor.

TC35661 use the UUID to initiate SPP connection and to respond SPP connection.

TCU_SPP_UUID_ASSIGN_RESP is generated, when this command is completed.

(NOTE)

This command is enabled when SPP is not started.

Command Format:

| | |
|-------------------------|------------------------------|
| ServiceID | 1 Byte |
| OpCode | 1 Byte |
| Parameter Length | 2 Bytes |
| Initiate_UUID_Data_Type | 1 Byte |
| Initiate_UUID_Value | 2 Bytes / 4 Bytes / 16 Bytes |
| Accept_UUID_Data_Type | 1 Byte |
| Accept_UUID_Value | 2 Bytes / 4 Bytes / 16 Bytes |

ServiceID: 0xE5
OpCode: 0x20
Parameter Length: 0x0006 - 0x0022

Parameters:

| Parameters | Parameter Description | Value |
|-------------------------|---|----------------------|
| Initiate_UUID_Data_Type | UUID data type for initiation. – UUID16 – UUID32 – UUID128 | 0x19 0x1A 0x1C |
| Initiate_UUID_Value | UUID value for initiate connection. | (Note) |
| Accept_UUID_Data_Type | UUID data type for acceptance. – UUID16 – UUID32 – UUID128 | 0x19 0x1A 0x1C |
| Accept_UUID_Value | UUID value for accept connection | (Note) |

(Note)The UUID_Value should be enter with big-endian.

For example 0x12345678 (UUID32): 0x12, 0x34, 0x56, 0x78

1.14 TCU_SPP_UUID_ASSIGN_RESP

This response is generated when UUID setting is complete by TCU_SPP_UUID_ASSIGN_REQ command.

Command Format:

| | |
|------------------|---------|
| ServiceID | 1 Byte |
| OpCode | 1 Byte |
| Parameter Length | 2 Bytes |
| Status | 1 Byte |

ServiceID: 0xE5
OpCode: 0xA0
Parameter Length: 0x0001

Parameters:

| Parameters | Parameter Description | Value |
|------------|----------------------------|-------|
| Status | Result | |
| | - Success | 0x00 |
| | - Parameter Failure | 0x01 |
| | - No Device Initialization | 0x03 |
| | - Setup SPP | 0x40 |

2. Status Code List

2.1 Response Status

The status for Response command is shown in the next table.

Table. Response Status

| Status Code | Status | Description | Expected Operation of Host |
|-------------|--|--|---|
| 0x00 | Successful | Command operation is complete | Go to next procedure |
| 0x01 | Parameter Failure | Attached parameter in REQ command is failed. | Re-send REQ command with correct parameter. |
| 0x02 | Device Initialization | The firmware initialization of Automotive Model has already been completed. | Only the 1 st Device Initialization is valid. Delete the 2 nd Device Initialization and all after the 2 nd . |
| 0x03 | No Device initialization | The firmware initialization of Automotive Model isn't done yet. | Device initialization should be done. |
| 0x04 | On Searching device | Searching device is on progress. | Wait the complete of device search. Or cancel device searching. |
| 0x05 | On Searching service | Searching device service or getting profile version is on process. | Wait the complete of device search. Or cancel device searching. |
| 0x06 | No connection | No Bluetooth link | Set Correct BD_ADDR device |
| 0x07 | No pairing sequence | Set a not paired Bluetooth device | Set correct paired device |
| 0x08 | No setup profile | No profile is setup | Setup a profile |
| 0x09 | Scan mode enable | Inquiry scan or page scan is enable | Scan mode should be disable. |
| 0x0B | No ACL connection | Specify a BD_ADDR of a device. The device isn't connected the ACL link. | Specify the BD_ADDR of a device. The device completed a service level connection or a virtual serial connection |
| 0x0C | No connection Established yet | Connection processing is not begun from remote device or profile connection processing is completed. | If there is a Connection Cancel request, it means disconnected already. No need action. |
| 0x0E | On process of other profile connection | Remote device has started the connection request. | Wait for SPP connecting completion. |
| 0x40 | Setup SPP | SPP has been setupped | Shutdown SPP and wait for the response. If this status is notified by SPP setup command, no need action. |

| Status Code | Status | Description | Expected Operation of Host |
|-------------|--|---|--|
| 0x41 | No setup SPP | SPP is not setup yet | Setup SPP and wait for the response. If this status is notified by SPP shutdown command, no need action. |
| 0x42 | On process SPP connection | Under SPP connection or under establishment of connection | Cancel SPP connection and wait for the connection cancel notification. |
| 0x43 | On releasing SPP connection | Under SPP disconnection operation. | Wait the response of SPP disconnection. Maximum waiting time is 5sec(SPP releasing time(5sec)). |
| 0x44 | No SPP connection | SPP connection is not connected yet | SPP connection request and wait for the SPP connecting notification. If this status is notified by SPP disconnection command, no need action. |
| 0x46 | On transferring SPP data | Under SPP data transfer | Re-transfer SPP data |
| 0x95 | On getting device name | On process of getting remote device name. | Wait for the notification of getting remote device name. Or send Remote Device Name Release command, and wait for the notification of getting remote device name. |
| 0x96 | On sniff mode setting(or releasing) request failed | Sniff mode setting failed. | Resend. If failed, control unable. Release SPP link. |
| 0xF8 | Not Support | Requested function is not support or unable to use. Or a mistake when using the command. | Check the specification. |

2.2 Notification Status

The status for Notification Command is shown in the next table.

Table. Notification Status

| Status Code | Status | Description | Expected Operation of Host |
|-------------|--|--|--|
| 0x00 | Successful | Command operation is complete | Go to next procedure |
| 0x80 | Page Time-out | Fail the connection. Remote device didn't scan. | Try again. Set remote device to scan. Check remote device. |
| 0x81 | Reject connection from local device | Local device reject ACL connection. | No need action |
| 0x82 | Link loss | Link loss happens before connection complete. | Try again. Check remote device. |
| 0x83 | PIN code input timer-out | Host does not input PIN code during specified period | Input PIN code during specified period. |
| 0x84 | PIN code failure | Different PIN code from Remote device | Input correct PIN code |
| 0x85 | Reject PIN code input from local Host | Local host rejects to input PIN code. | No need action. |
| 0x86 | Reject PIN code input from remote device | Remote device rejects to input PIN code | Try pairing again |
| 0x87 | Link key failure | Link key in local device is different from remote one. | Delete link key and re-generate link key to try again. |
| 0x8D | No supported SDP service | Not get supported SDP service information from Remote device | Check SDP service in remote device and try again. |
| 0x8E | Slave connection Successful | Connection Successful. This device is connected as slave. | No need action. |
| 0xD0 | SPP connection timer-out | SPP is not established the connection | Retry. |
| 0xD2 | SPP disconnection timer-out | SPP disconnection is not done. | None. |
| 0xD3 | SPP connection failure | SPP connection is failed | Retry. |

3. Maximum response time

3.1 Response time from command to response

| Command | msec |
|----------------------|------|
| TCU_SPP_SETUP_REQ | 100 |
| TCU_SPP_SHUTDOWN_REQ | 100 |

3.2 Response time from command to Event

| Command (TCU_SPP_XXX) | Description | Maximum respond time(s) |
|--|--|-------------------------|
| CONNECT_REQ | UnSniff/UnPark time | 4 |
| TCU_MNG_CONNECTION _STATUS_EVENT(Connected) | Complete ACL connection | 35 |
| | SUM | 39 |
| CONNECT_REQ | SPP connection timer (including unSniff/UnPark time) | 70 |
| CONNECT_EVENT | SUM | 70 |
| DISCONNECT_REQ | SPP disconnection timer (including unSniff/UnPark time) | 5 |
| DISCONNECT_EVENT | SUM | 5 |
| DATA_SEND_REQ DATA_SEND_EVENT | UnSniff/UnPark time left: normal maximum time Right unSniff/Park timer | 4 |
| | SUM | 4 |

3.3 Recommendation for HOST CPU

When TC35661 dose not notify event within above time, TC35661 is under unusual operation.
Then HOST CPU should reset TC35661 with HW-RESET. It is recommended for HOST to consider extra time from above time.

End of document.