Bluetooth Baseband LSI

Panasonic PAN1026

Toshiba TC35661

Application Note

May.2014

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[Revised Note]

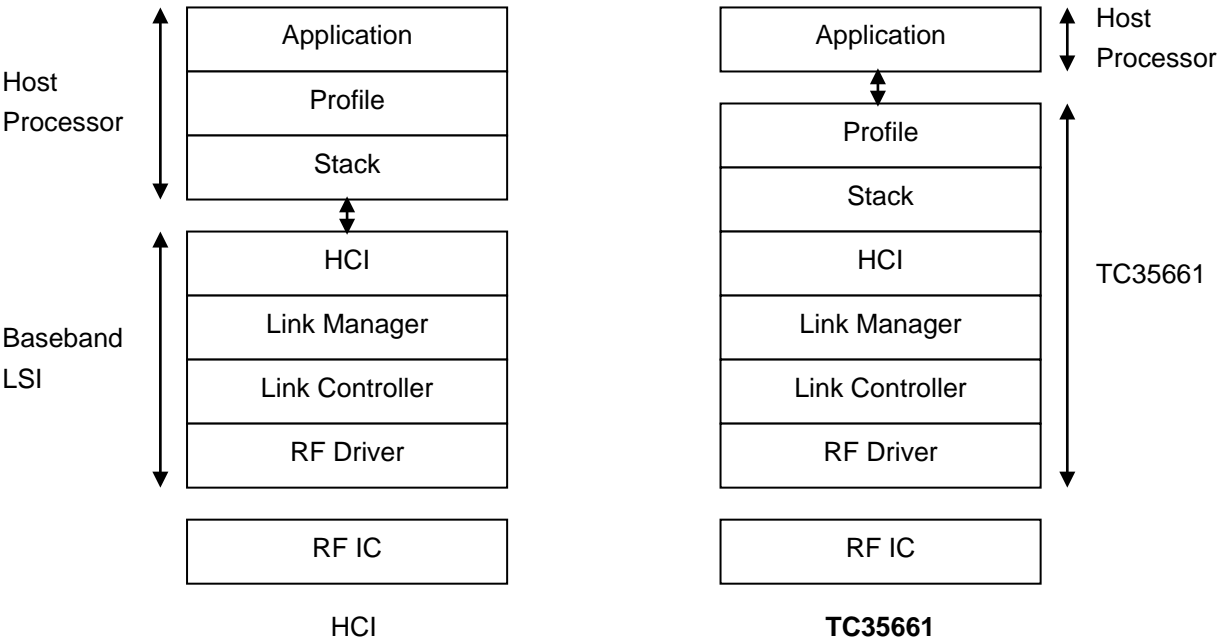| Date	Modification	Note

24th-June-2013	1st Release
	Based on TC35661_SPP_LE_Application_Note.
	Added information on the following sections.
	2.2 Setting up Complete model
	  The part of ATT/GAT on the picture.
	3. General Supported Function
	  Change three "Supported" to " Under consideration".
	4.2.6 Flow chart of initialization
	  In "Flow chart during Complete mode", add the initial setting for BLE.	

26th-July-2013	2.2 and 3 SPP and GATT connection are exclusive. 7.5 TCU_MNG_DEEP_SLEEP_REQ command description. Command description is added.	

6th-August-2013	4.1.3 Communication Timing
	  Interval is changed to 5ms.
	7.3 External clock setting with LOC_WRITE_MEM command
	  Deleted.	

7th-August-2013	4.2.6 Flow chart of initialization
	  Added the attention words of the HCI_DBUS_WRITE command.
	8.2 Characteristic improvement
	  New addition.	

19th-December-2013	4.2.6 Flow chart of initialization
	  Delete LOC_WRITE_MEM command
	  Added description for TCU_MNG_INIT_REQ command.
	7.3.2 Sleep mode procedure by GPIO
	  Delete LOC_WRITE_MEM command.
	  Added TCU_MNG_INIT_REQ command.
	7.3.4 Sleep mode procedure by UART command
	  Delete LOC_WRITE_MEM command.
	  Added TCU_MNG_INIT_REQ command.
	  Added command line example.	

23th-May-2014	7.2 Condition to enter Sleepmode Delete LOC_Write_Mem command. This command is not needed for sleep.	

Contents

1   TC35661 Complete Model

TC35661 can operate, not only Link Management Protocol but also Stack and Profiles.

This system provides with easy development to concentrate the applications for the system.

The following shows the difference between general HCI model and TC35661 Complete model.

Host Processor	Application	Host Processor
	Profile	
	Stack	TC35661
Baseband LSI	HCI	
	Link Manager	
	Link Controller	
	RF Driver	
	RF IC	
HCI		**TC35661**

2   Protocol Layer and Complete model

2.1   Support for Protocol Layer
Following figure shows the supported Bluetooth Protocol and Profile Layer in TC35661.
It is executed RF control, Link Controller, Link Management, HCI, SDP,L2CAP, RFCOMM, SCO,
GAP, SPP Profiles, ATT, GATT and GAP.
The running Bluetooth Protocol / Profile are compliant with the Specification of the Bluetooth
System Version 4.0.

2.2   Setting up Complete model
TC35661 sets HCI mode after to release Reset sequence and is changed to Complete mode by setting
command from Host CPU. The setting value in HCI mode is kept in Complete mode.
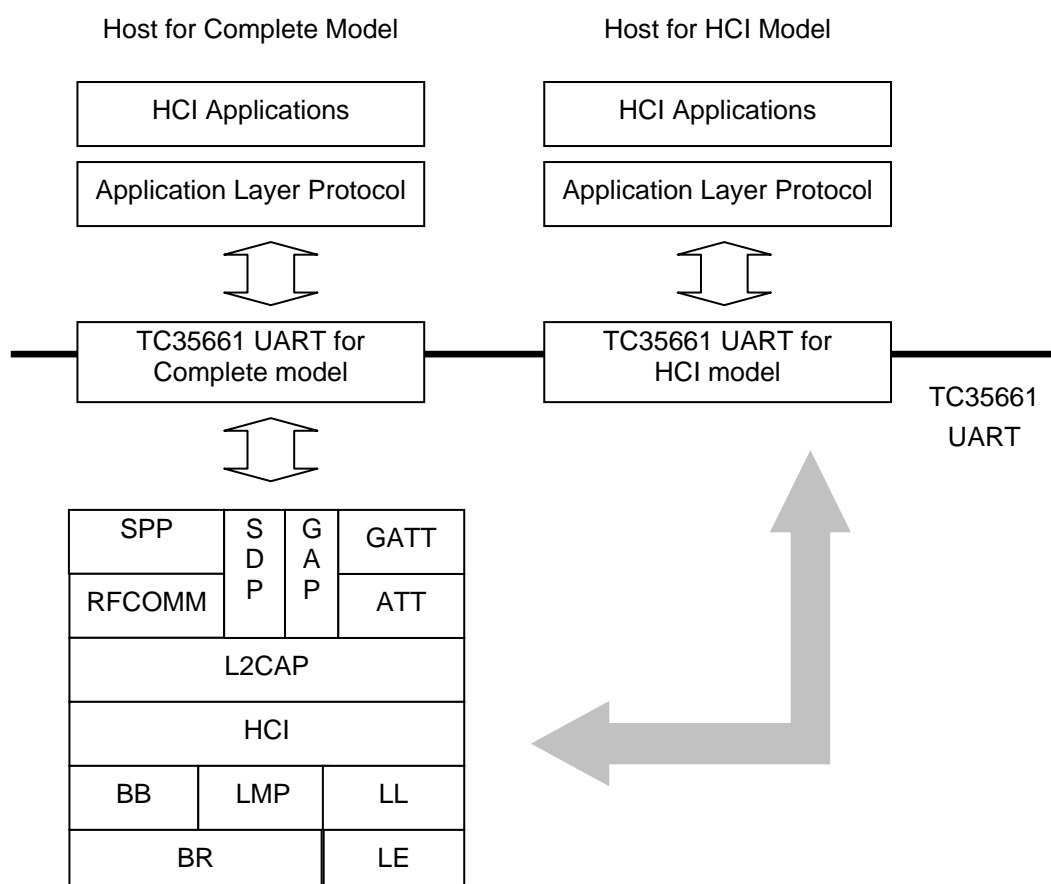
SPP and GATT connection are exclusive.
Inquiry/Page scan and LE advertise can be executable at the same time.
When SPP connection is estblished, GATT connection can not be connecetd without SPP disconnection.
When GATT connection is estblished, SPP connection can not be connecetd without GATT disconnection.
Refer to LE MSC.

3   General Supported Function

Items	Description	Notes
Bluetooth Core	4.0 Power Class 2	Legacy(BR)and LE are both supported. HS are not supported.
Feature (Classic)	Sniff	Supported
	Park	Not Supported
	Hold	Not Supported
	BR- 5slot packet	Supported
	BR- 3slot packet	Supported
	2M-5slot packet	Not supported
	2M-3slot packet	Not supported
	3M-5slot packet	Not supported
	3M-3slot packet	Not supported
	RSSI	Supported
	SecureSimplePairing	Supported
	PowerControl	Supported
	AFH	Supported
	SCO	Not Supported
	eSCO	Not Supported
	CQDDR	Not Supported
	Sniff subrating	Supported
	Secure Simple Pairing	Supported
	UART Baudrate	115.2kbps is default. Sellectable by command.
	UART Protocol	H4 (UART Transport Layer).
	Multi Profile/point	Not supported
	SPP-A	Supported. Other profile is not supported.
	SPP-B	Supported. Other profile is not supported.
	USB	Not Supported
	WIFI Co-Ex	Not Supported
	ScatterNet	Not Supported
Feature (LE)	Central	Not supported
	Peripheral	Supported
	Multi Profile/point	Not supported
	ConnectionUpdate	Supported
	Random Address	Supported
	WhiteList	Supported
	SecurityProperty(JustWork)	Supported
	SecurityProperty(PassKey)	Supported
	SecurityProperty(NumericComparison)	Supported
	GATT-Client	Supported
	GATT-Server	Supported
	Broadcaster	Supported
	Oberver	Not supported
Dual	SPP+GATT connection estblishment simultaneously	Not supported

4   UART Interface

TC35661 has an UART interface to communicate with an external Host CPU.

This chapter explains the hardware functionality of UART interface.

4.1   Hardware Functionality

TC35661 UART interface uses 4 signals, TX/RX pins and RTS/CTS pins have the following functions.

1) Programmable baudrate(Default value is 115200bps)

2) Communication with 4 signals(Tx/Rx/RTS/CTS)

3) DataFormat=Start bit+8bit data+1bit Stop bit without parity bit.

4) Support of Error detections, time-out/Over-run/Flaming Error

Host	**TC35661(Baseband)**
←	GPIO6(Tx)
→	GPIO7(Rx)
←	GPIO8(RTS)
→	GPIO9(CTS)
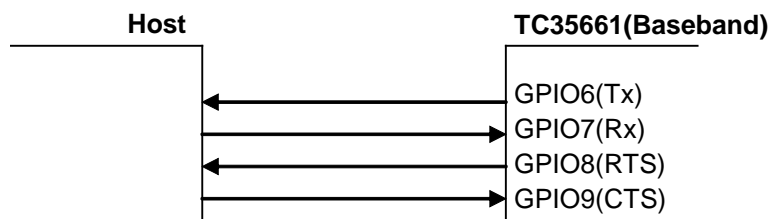
4.1.1   Formula of Programmable Baudrate

TC35661 UART baudrate can be calculated in the following formula.

$$BaudRate[bps] = \frac{InternalBaudrateBaseClockFrequency}{OverSamplingRatio \times DividingRatiofInternalBaudrateBaseClock}$$

InternalBaudrateBaseClockFrequency is 39MHz. *OverSamplingRatio* is the integral value from 1 to 2^{16}, *DividingRatioofInternalBaudrateBaseClock* is the integral value from 12 to 17, and both can be changed with the UART Sampling Control Register value in M2_BTL_SET_BAUDRATE command.

e.g.）

$$BaudRate = \frac{39 \times 10^6}{13 \times 26} = 115.4kbps$$

4.1.2 Communication Timing

The following figure shows the communication timing.
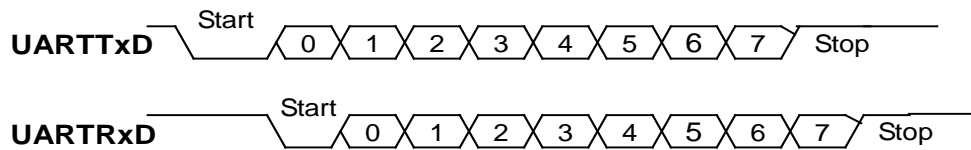
        (Note)Cycle = 7 / setting to baudrate

            Tolerance of transfer clock is less than 1.0%.

4.1.3 Error Detection(time-out/Over-run/Flaming Error)

TC35661 UART has error detection function to get more reliable communications.

When TC35661 detects UART communication errors, TC35661 returns HW_Error_Event with error code to inform host CPU of the communication error.

Refer to TC35661_Extention_HCI_Command_XXXX.pdf HW_Error_Event for more detail.

The maximum transmit interval between each byte is 5ms. If this error code occurs, check for the transmission Byte interval from host CPU.
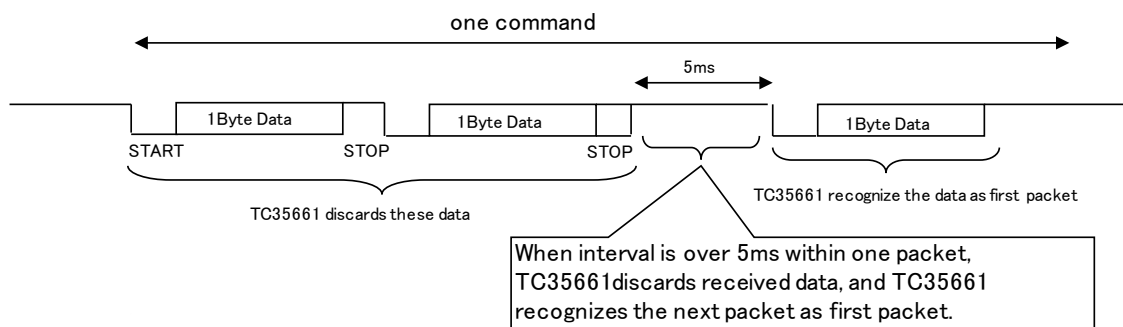
4.2   UART Transport

4.2.1   Packet Format in HCI mode

UART Protocol in HCI mode is based on Bluetooth Core Spec.H4(UART Transport Layer).

The HCI packet indicator shall be sent immediately before the HCI packet.

HCI packet type	HCI packet indicator
HCI Command Packet	0x01
HCI ACL Data Packet	0x02
HCI Synchronous Data Packet	0x03 (No Support)
HCI Event Packet	0x04

4.2.2   Packet Format in Complete mode

UART Protocol in Complete mode is based on TOSHIBA original.

The following table shows the packet format of TC35661 UART Transport packet.

The Packet Length shows all length with Interface data and Packet length.

The maximum Packet length is 1019Bytes.

Packet Length	Interface Data
3bytes	Nbytes

The following table shows the Interface Data Format. Service ID means Bluetooth Protocol Layer for data field. OpCode means the content of data field. Length means the volume of data field. The command is input from host CPU to TC35661 and the event is from TC35661 to host CPU

Service ID	OpCode	Length	Parameter
1 Byte	1 Byte	2 Bytes	N Bytes

The following table shows the type of Service IDs

Service ID	Description
0xE1	Bluetooth Management Interface
0xE5	SPP
0xD1	BLE MNG
0xD2	BLE GATT
0xD3	BLE SMP
Other	Reserved

4.2.3   RTS/CTS Flow Control

This chapter explains the functionality of CTS(Clear to Send)/RTS(Request to Send) signals in UART.

CTS signal is used in GPIO9, and RTS signal is in GPIO8.

CTS/RTS signals are used to get more reliable serial communication and to avoid the loss of communication data.

1) CTS signal

When CTS signal is set to GND, Tc35661 setup the sending data to host CPU.

After CTS signal is set to VCC and TC35661 has sending data, TC35661 stops to output sending data to host.

2) RTS signal

When RTS signal is set to GND, host CPU can send data toTC35661.

If TC35661 can not arrange to receive the data from host CPU, TC35661 is set RTS signal to VCC.

4.2.4   Procedure of initial control

After to release Reset sequence, TC35661 is set to HCI mode, which is used to set RF IC control parameters. To change from HCI mode to Complete mode, host CPU sends HCI_Set_Mode command in HCI Vendor Specific command.
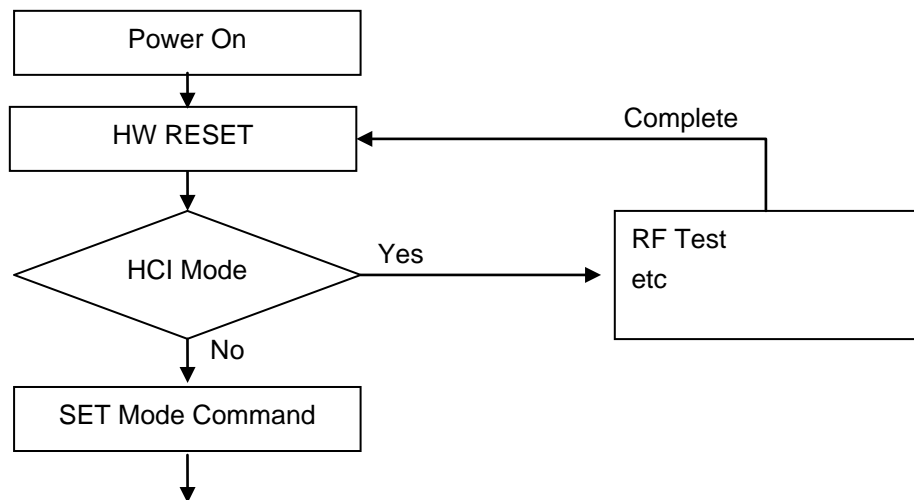
Bluetooth complete mode. TCU command can be used

4.2.5   Command and response for initialization

After Power on, or HW Reset, the TC35661 hardware is initialized for 20ms. RTS signal is set to high during the sequence of hardware initialization. After a RTS signal is set to low, or the HW Reset is input and waits for

20ms.
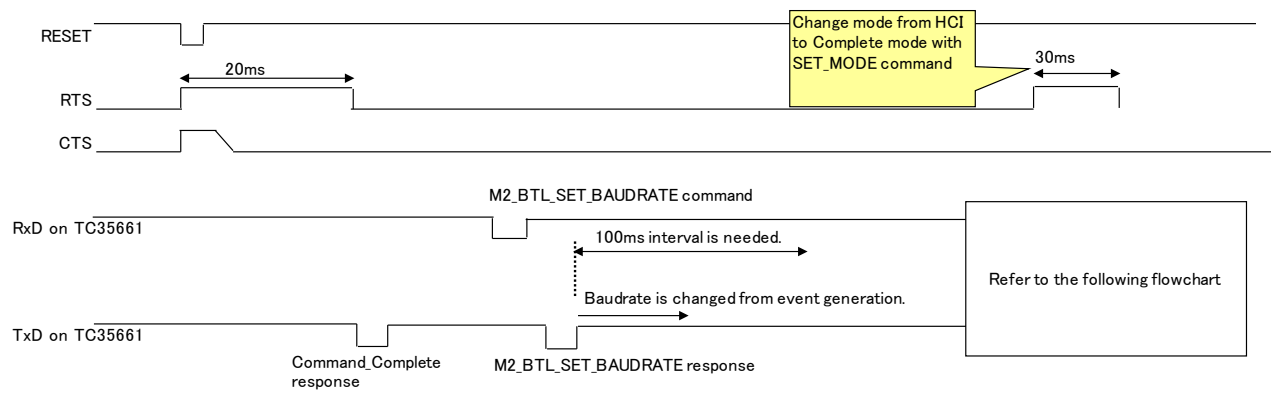
4.2.6   Flow chart of initialization

Flow chart during HCI mode

M2_BTL_SET_PATCH	Apply patch file to modify firmware
M2_BTL_SET_BAUDRAT	Change UART baudrate. Default value is 115200bps.
EEPROM support? — Not supported	
Supported	
M2_BTL_SET_I2C_ENABL	enable I2C interface
M2_GENERAL_READ_E2PROM	Read contents in EEPROM(BD_ADDR, RF parameter etc)
HCI_WRITE_BD_ADDR	Write BD_ADDR on RAM read from EEPROM
HCI_DBUS_WRITE	Set RF parameter read from EEPROM. (NOTE) Refer to section 8 [RF parameter adjustment].
M2_BTL_SET_DEEP_SLEEP	Set following parameters during Sleep mode (1) 32kHz oscillator drift(ppm) on local device (2) Jitter drift(us) on local device (3) Sleep mode interval Note) These parameters depend on Vender

to Complete mode

Flow chart during Complete mode

from HCI mode

Set_Mode

Change from HCI mode to Complete mode

TC35661 sets RTS to high for 30ms, and returns response to host CPU. In this time host CPU needs to stand by for 30ms.

TCU_MNG_INIT_REQ

Set Local Device Name
Set external clock for Sleep mode

TCU_MNG_STANDARD_
HCI_SET_REQ
(Write Class of Device command)

Set Class of Device

TCU_SPP_SETUP_REQ

TCU_MNG_LE_INIT_REQ

Connection initiator?

Mobile phone initiator

TC35661 initiator

Make Database

TCU_SPP_CONNECT_REQ

TCU_MNG_SET_SCAN_REQ or
TCU_MNG_LE_START_ADVERTISE_REQ

4.2.7   Command sequence for Complete mode
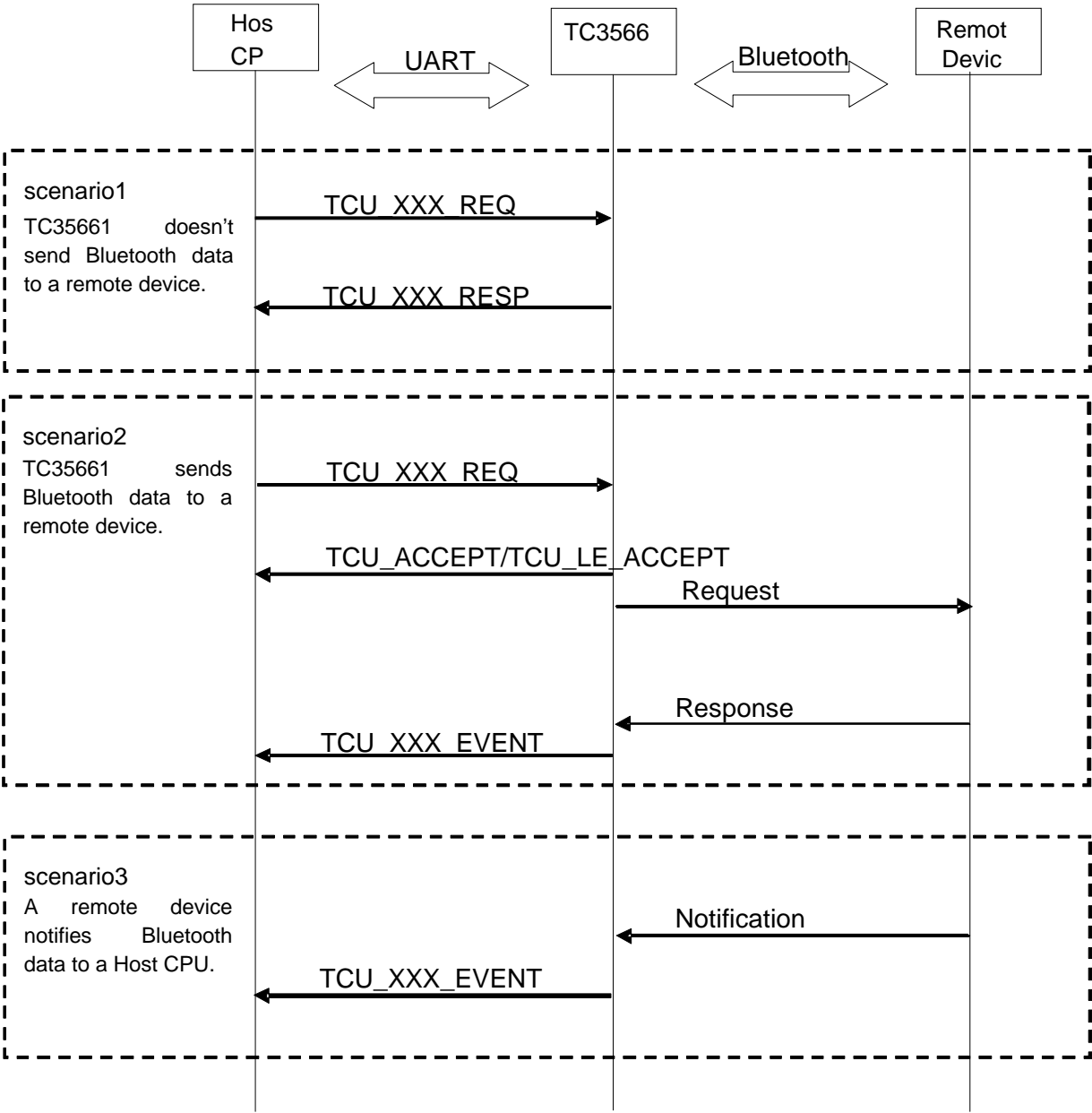
5   EEPROM control

5.1   EEPROM data format

TC35661 can use an eternal EEPROM via an I2C. BD_ADDR, RF parameter, paired device information and user data can be stored into an EEPROM. Following table shows EEPROM fields.

EEPROM

Name	Word Addr	Contents
System field	0x00,0x01	System field
Data field	0x02 - 0x07	BD ADDR
	0x08 - 0x11	Module basic parameters(*Reserved)
	0x12 - 0x2D	System field
	0x2E - 0x37	RF parameter Oscillator tuning.
	0x38 - 0x6F	Paired device information Host CPU can use freely
	0x70 - 0x7F	Host CPU can use freely
System field	0x80 - 0xFF	System field
User field	0x100〜	Host CPU can use freely

5.2   EEPROM devices information

The following table shows tested EEPROM in Toshiba.

Vender	type	size
ROHM	BR24T01NUX-WTR	1kByte
Seiko Instruments Inc.	S-24C02CI-I8T1U	2kByte
ATMEL	ATMEL52424C256PU18	32kByte
STMicroelectronics	M24C32	4kByte
STMicroelectronics	M24C64	8kByte
STMicroelectronics	M24256	32kByte

5.3   Control command for data writing

(1) Host CPU enable I2C interface with M2_BTL_SET_I2C_ENABLE command.

(2)Host CPU enable EEPROM write access with

    M2_BTL_E2PROM_WRITE_PROTECTION_ENABLE command

(3) Host CPU writes data with M2_GENERAL_WRITE_E2PROM command

(4)Host CPU read data with M2_GENERAL_READ_E2PROM command

Refer to TC35661_Extention_HCI_Command_XXXX.pdf for more detail.

6 Pin Specification

Pin	During Reset	After Reset	Function change by command	
GPIO0	GPIO	GPIO	RequestWakeUp	M2_BTL_SET_DEEP_SLEEP command enables to receive RequestWakeUp signal from host CPU.
	Input(HZ)	Input(HZ)	Input(HZ)	
GPIO1	GPIO	GPIO	Status	M2_BTL_SET_DEEP_SLEEP command enables to indicate Sleep mode to host CPU.
	Input(Pull up)	Input(Pull up)	Output(No Pull)	
GPIO2	GPIO	GPIO	PulseOut2	TCU_VEN_SET_GPIO_PULSE_REQ command enables to set a periodic signal output.
	Input(Pull up)	Input(Pull up)	Output(No Pull)	
GPIO3	GPIO	GPIO	PulseOut3	TCU_VEN_SET_GPIO_PULSE_REQ command enables to set a periodic signal output.
	Input(Pull up)	Input(Pull up)	Output(No Pull)	
GPIO4	GPIO	GPIO	HostWakeUp	TCU_VEN_SET_HOST_WAKEUP_NOTIFICATION_REQ command enables to use to make host CPU wake up.
	Input(Pull up)	Input(Pull up)	Output(No Pull)	
GPIO5	GPIO	GPIO	GPIO	-
	Input(Pull up)	Input(Pull up)	Input(Pull up)	
GPIO6	GPIO	UART TX	UART TX	-
	Input(Pull up)	Output(No Pull)	Output(No Pull)	
GPIO7	GPIO	UART RX	UART RX	-
	Input(Pull up)	Input(HZ)	Input(No Pull up)	
GPIO8	GPIO	UART RTS	UART RTS	-
	Input(Pull up)	Output(No Pull)	Output(No Pull)	
GPIO9	GPIO	UART CTS	UART CTS	-
	Input(Pull up)	Input(HZ)	Input(No Pull up)	
GPIO10	GPIO	GPIO	GPIO	-
	Input(Pull up)	Input(Pull up)	Input(Pull up)	
GPIO11	GPIO	GPIO	GPIO	-
	Input(Pull up)	Input(Pull up)	Input(Pull up)	
GPIO12	GPIO	GPIO	GPIO	-
	Input(Pull up)	Input(Pull up)	Input(Pull up)	
GPIO13	GPIO	GPIO	GPIO	-
	Input(Pull up)	Input(Pull up)	Input(Pull up)	
GPIO14	GPIO	GPIO	I2C CLK / SPI CLK	M2_BTL_SET_I2C_ENABLE command enables to use as an I2C interface.
	Input(Pull up)	Input(Pull up)	Output(No Pull)	
GPIO15	GPIO	GPIO	I2C DATA / SPI DOUT	M2_BTL_SET_I2C_ENABLE command enables to use as an I2C interface.
	Input(Pull up)	Input(Pull up)	Output(No Pull)	
GPIO16	GPIO	GPIO	GPIO	-
	Input(Pull up)	Input(Pull up)	Input(Pull up)	
GPIO17	GPIO	GPIO	GPIO	-
	Input(Pull up)	Input(Pull up)	Input(Pull up)	
GPIO18	GPIO	GPIO	GPIO	-
	Input(Pull up)	Input(Pull up)	Input(Pull up)	

7 Sleep function

7.1 General description
Sleep function decreases consumption.   Host CPU controls the following two methods.
1) GPIO0(RequestWakeUp)
2) UART command

7.2 Condition to enter Sleep mode
1) Set Sleep mode with M2 _BTL_SET_DEEP_SLEEP command.
2) Bluetooth link is not existed or indicated Sniff mode with TCU_MNG_CONNECTION_STATUS_
EVENT.

7.2.1 Setting with M2_BTL_SET_DEEP_SLEEP command
M2_BTL_SET_DEEP_SLEEP command controls sleep clock, drift and jitter.
The jitter and drift are used to sync window length for RF receiving. So when the setting value is smaller than
actual value, Sniff link might be disconnected. When the setting value is bigger than actual value,
sync window for RF receiving opens widely, as the result consumption is increased.

7.2.2 TCU_MNG_DEEP_SLEEP_REQ command description
This command is used to enter/exit deep sleep mode in complete mode.
After Host sends TCU_MNG_DEEP_SLEEP_REQ(Enable),
Host shall send TCU_MNG_DEEP_SLEEP_REQ(Disable) before sending other commands.
TC35661 enters deep sleep mode after receiving TCU_MNG_DEEP_SLEEP_REQ(Enable).
Then TC35661 recognizes all commands as TCU_MNG_DEEP_SLEEP_REQ(Disable) command during deep
sleep mode.

7.3   Function in Sleep mode

7.3.1   Sleep mode control by GPIO

Host CPU controls GPIO0. TC35661 notify sleep status with GPIO1.

M2_BTL_SET_DEEP_SLEEP command(Deep-sleep instructions/Set Notify specific interface)sets method.

Select Bit0：GPIO (0=No notification / 1=Notification).

GPIO0=H: Sleep is not available.

GPIO0=L: Sleep is available.

GPIO1=H: Sleep mode. Host can not send UART command.

GPIO1=L: Active mode. Host can send UART command.

These following figures show control Sleep mode by using GPIOs.

During no Bluetooth link

GPIO0(RequestWakeUp) MCU->TC356561
High level (Sleep mode is not available)
Host CPU can transmit UART commands.

Low level (Request Sleep mode)
Host CPU cannot transmit UART commands.

Status is changed from Sleep mode to Active mode after 1ms.

Status is changed from Active mode to Sleep mode after 4ms.

GPIO1(Status) TC35661->MCU Low level

Active mode	Sleep mode	Active mode

time →
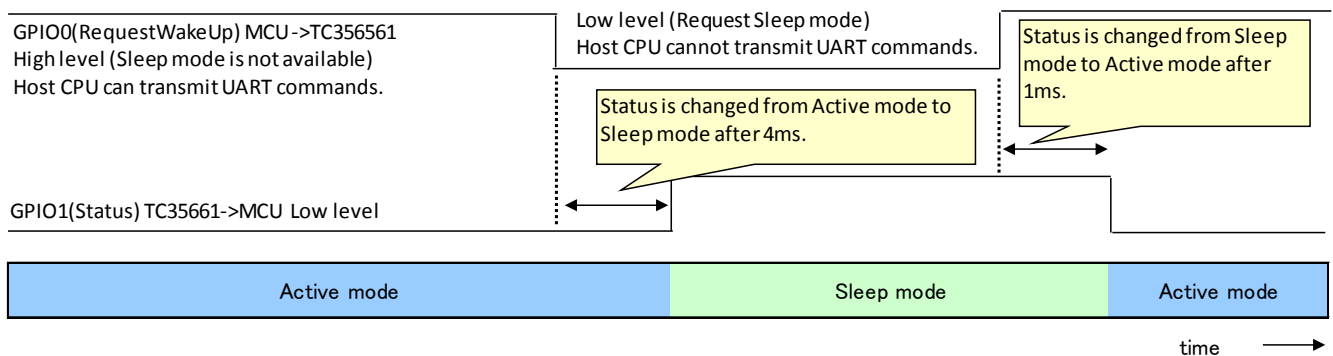
During no Bluetooth link / Running Scan mode

GPIO0 (RequestWakeUp) MCU->TC35661
Low level(Sleep mode is available)
Host CPU cannot transmit UART commands

Shift to Active mode during Scan Window

GPIO1(Status) TC35661->MCU
High level (Sleep mode)

Sleep mode		Sleep mode		Sleep mode

time →

Active mode (Scan Window)   Scan Inteval   Active mode (Scan Window)

<u>During Bluetooth link / Sniff mode</u>

GPIO0 (RequestWakeUp)
Low level(Sleep mode is available)

When Host CPU sends UART data during this timing, the data cannot be sent during this sniff attempt. TC35661 sends the data on the next Sniff Attempt.
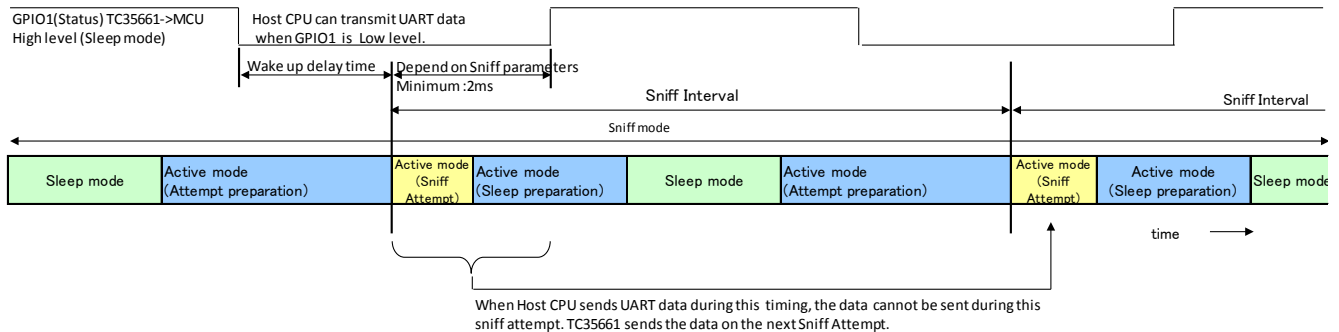
7.3.2   Sleep mode procedure by GPIO
1) Send M2_BTL_SET_DEEP_SLEEP command during HCI mode.
   This command can set to Sleep mode and change Sleep clock jitter and drift with this command.
2) TCU_MNG_INIT_REQ command during complete mode to use external sleep clock.
3) Input high to GPIO0 (No Sleep mode).
4) Connect SPP.
5) Set to sniff mode with TCU_MNG_SNIFF_MODE_CONTROL_REQ command.
6) Input GPIO0 to lowto enter Sleep mode.

7.3.3   Sleep mode control by UART command

M2_BTL_SET_DEEP_SLEEP command (Deep-sleep instructions/Set Notify specific interface) sets control method. Select Bit1：UART (0=No notification / 1=Notification).
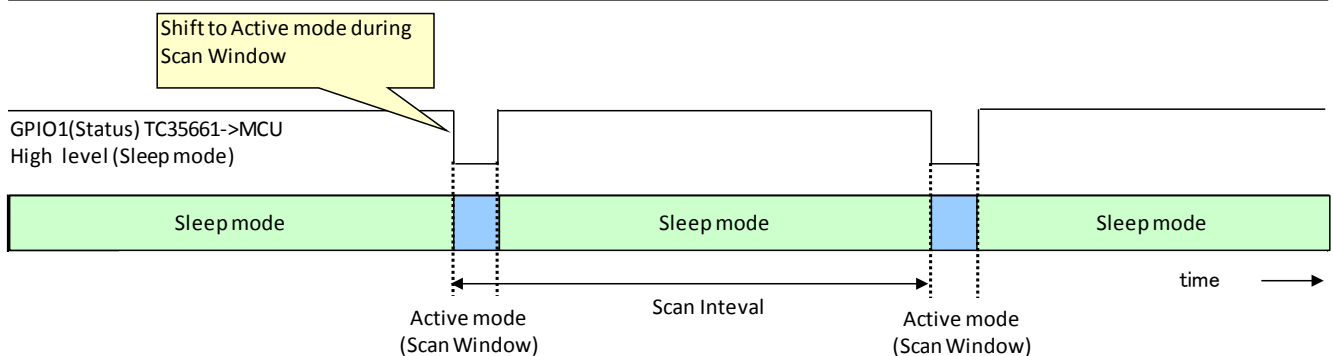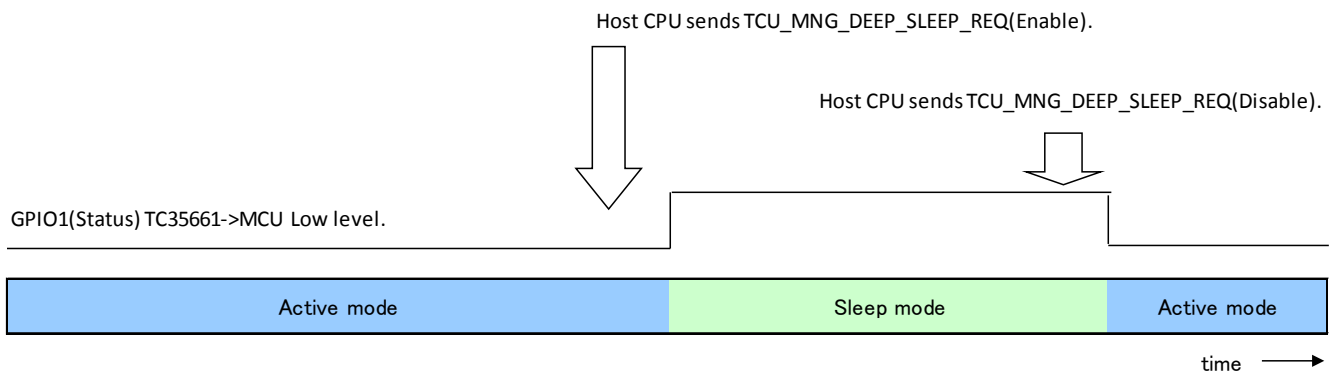
When UART is selected, TCU_MNG_DEEP_SLEEP_REQ（TC35661APL_MNG_E_XXXX.pdf) controls sleep mode. SPP firmware does not support USB.

The figure shows relationship between TCU_MNG_DEEP_SLEEP_REQ/parameter and GPIO1 notify.

During no Bluetooth link

GPIO0 (RequestWakeUp)

Host CPU sends TCU_MNG_DEEP_SLEEP_REQ(Enable).

Host CPU sends TCU_MNG_DEEP_SLEEP_REQ(Disable).

GPIO1(Status) TC35661->MCU Low level.

| Active mode | Sleep mode | Active mode |

time →

During Bluetooth link / Running Scan mode

GPIO0 (RequestWakeUp)

Host CPU sends TCU_MNG_DEEP_SLEEP_REQ(Enable).

Host CPU sends TCU_MNG_DEEP_SLEEP_REQ(Disable).

GPIO1(Status) TC35661->MCU High level (Sleep mode)

Host CPU can transmit UART data when GPIO1 is Low level

Host CPU can transmit UART data when GPIO1 is Low level

Wake up dlay time

Depend on Sniff parameters Minimum :2ms

Sniff Interval

Sniff Interval

Sniff mode

| Sleep mode | Active mode (Attempt preparation) | Active mode (Sniff Attempt) | Active mode (Sleep preparation) | Sleep mode | Active mode (Attempt preparation) | Active mode (Sniff Attempt) | Active mode |

time →

When Host CPU sends UART data during this timing, the data cannot be sent during this sniff attempt. TC35661 sends the data on the next Sniff Attempt.

7.3.4   Sleep mode procedure by UART command

1) Send M2_BTL_SET_DEEP_SLEEP command during HCI mode.

   This command can set to Sleep mode and change Sleep clock jitter and drift with this command.

2) TCU_MNG_INIT_REQ command during complete mode to use external sleep clock.

3) Connect SPP.

4) Set to sniff mode with TCU_MNG_SNIFF_MODE_CONTROL_REQ command.

5) Send TCU_MNG_DEEP_SLEEP_REQ command to set to Sleep mode.

Command line is as follows.

* Master

<10:48:36.666>   RcvData   = 04 0e 04 04 00 00 00

<10:48:36.666>   SendData = 01 03 0c 00

<10:48:36.791>   RcvData   = 04 0e 04 04 03 0c 00

<10:48:36.791>   SendData = 01 08 fc 09 00 a1 00 00 00 14 0d ff 00

<10:48:36.807>   RcvData   = 04 ff 20 08 00 a1 00 00 00 14 0d 00 0f 38 2e 30 30 2e 37 32 42 2d 30 36 20 46 6c 61 73 68 3d 35 30 31 00

<10:48:36.822>   BT Core SW Version = 8.00.72B-06

<10:48:36.822>   SendData = 01 13 10 06 ab 10 32 54 76 98

<10:48:36.822>   RcvData   = 04 0e 04 04 13 10 00

<10:48:36.838>   SendData = 01 08 fc 1c 00 a0 00 00 00 14 68 00 10 12 00 b8 0b 00 00 02 fa 00 0a 00 02 00 00 00 00 00 00 00

<10:48:36.853>   RcvData   = 04 ff 0a 08 00 a0 00 00 00 14 68 00 00

<10:48:36.853>   SendData = 01 08 fc 03 00 99 01

<10:48:37.883>   RcvData   = 04 ff 05 08 00 99 00 01

<10:48:37.899>   TCU_MNG_INIT_REQ:

> M2_BTL_SET_DEEP_SLEEP command.
> This command is used to Deep Sleep configuration setting.
> Refer to TC35661APL_ROM501_ Extension_HCI_E_XXX

> To use external sleep clock

      Supported_Profiles = 0x04

      Linkkey_Stored_Setting = 0x00

      Length_of_Device_Name = 0x0c

      Device_Name = XXXXXXXXXXXX

<10:48:37.899>   SendData = 16 00 00 e1 01 0f 00 04 00 0c XX XX XX XX XX XX XX XX XX XX XX XX

<10:48:37.945>   RcvData   = 0e 00 00 e1 81 07 00 00 ab 10 32 54 76 98

<10:48:37.961>   TCU_MNG_INIT_RESP:

      Status = 0x00(Success)

      BD_ADDR = 0x9876543210ab

<10:49:19.046>   TCU_SPP_A_SETUP_REQ:

<10:49:19.061>   SendData = 07 00 00 e5 01 00 00

<10:49:19.093>   RcvData   = 08 00 00 e5 81 01 00 00

<10:49:19.108>   TCU_SPP_A_SETUP_RESP:

      Status = 0x00(Success)

<10:49:23.648>   TCU_MNG_SET_SCAN_REQ:

      Scan_Mode = 03 (Inquiry Enable, Page Scan Enable)

<10:49:23.663>   SendData = 08 00 00 e1 0c 01 00 03

<10:49:23.663>   RcvData   = 08 00 00 e1 8c 01 00 00

<10:49:23.679>   TCU_MNG_SET_SCAN_RESP:

Status = 0x00(Success)

<10:50:14.224>   TCU_MNG_DISCOVER_REMOTE_DEVICE_REQ:
                  Max_Number_of_Reports = 0x10

<10:50:14.224>   SendData = 08 00 00 e1 03 01 00 10
<10:50:14.240>   RcvData   = 0a 00 00 e1 f1 03 00 00 e1 03
<10:50:14.256>   TCU_ACCEPT:
                  Status = 0x00(Success)
                  Command_ServiceID = e1
                  Command_OpCode = 03

<10:50:27.188>   RcvData   = 17 00 00 e1 7d 10 00 3d 0e ab 89 67 45 23 01 01 00 00 00 00 00 00 00
<10:50:27.204>   TCU_MNG_SSP_INFO_EVENT:
                  OPCode = 0x3d(Remote_Host_Supported_Features_Notification)
                  Parameter_Length = 0x0e
                  Parameter1～Parameter6(BD_ADDR) = 0x0123456789ab
                  Parameter7～Parameter14(Host Supported Features) = 0x0000000000000001

<10:50:27.297>   RcvData   = 1d 00 00 e1 44 16 00 ab 89 67 45 23 01 00 00 00 0c XX XX XX XX XX XX XX
XX XX XX XX XX
<10:50:27.297>   TCU_MNG_DISCOVER_REMOTE_DEVICE_RESULT_EVENT:
                  BD_ADDR = 0x0123456789ab
                  Class_of_Device = 0x000000
                  Length_of_Device_Name = 0x0c
                  Device_Name = XXXXXXXXXXX

<10:50:33.506>   RcvData   = 07 00 00 e1 43 00 00
<10:50:33.522>   TCU_MNG_DISCOVER_REMOTE_DEVICE_COMPLETE_EVENT:
<10:50:36.642>   TCU_MNG_DISCOVER_REMOTE_DEVICE_CANCEL_REQ:
<10:50:36.642>   SendData = 07 00 00 e1 06 00 00
<10:50:36.658>   RcvData   = 0a 00 00 e1 f1 03 00 00 e1 06
<10:50:36.673>   TCU_ACCEPT:
                  Status = 0x00(Success)
                  Command_ServiceID = e1
                  Command_OpCode = 06

<10:50:36.689>   RcvData   = 07 00 00 e1 46 00 00
<10:50:36.705>   TCU_MNG_DISCOVER_REMOTE_DEVICE_CANCEL_EVENT:
<10:52:11.321>   TCU_SPP_A_CONNECT_REQ:
                  BD_ADDR = 0x0123456789ab   Connect SPP
                  Baudrate = 0x07(115200bps)
                  DataFormat = 0x16(DataBit 8 StopBit 1 OddParity)
                  FlowControl = 0x06(XFlowInput XFlowOutput)
                  XonChar = 0x01(YES)
                  XoffChar = 0x01(YES)

ParamMask = 0x0000( )
Server_Channel_Validity = 0x01
Server_Channel = 0x05
Use_of_Link_Key = 0x00

<10:52:11.337> SendData = 17 00 00 e5 03 10 00 ab 89 67 45 23 01 07 16 06 01 01 00 00 01 05 00
<10:52:11.352> RcvData   = 0a 00 00 e1 f1 03 00 00 e5 03
<10:52:11.415> TCU_ACCEPT:
                Status = 0x00(Success)
                Command_ServiceID = e5
                Command_OpCode = 03

<10:52:14.847> RcvData   = 0f 00 00 e1 47 08 00 00 ab 89 67 45 23 01 00
<10:52:14.862> TCU_MNG_CONNECTION_STATUS_EVENT:
                Status = 0x00(Success)
                BD_ADDR = 0x0123456789ab
                Connection_Status = 0x00(Connected)

<10:52:14.893> RcvData   = 1a 00 00 e1 6e 13 00 ab 89 67 45 23 01 0c XX XX XX XX XX XX XX XX XX XX XX XX
<10:52:14.909> TCU_MNG_REMOTE_DEVICE_NAME_AUTO_NOTIFY_EVENT:
                BD_ADDR = 0x0123456789ab
                Length_of_Device_Name = 0x0c
                Device_Name = XXXXXXXXXXXX

<10:52:14.925> RcvData   = 0f 00 00 e1 7d 08 00 31 06 ab 89 67 45 23 01
<10:52:14.925> TCU_MNG_SSP_INFO_EVENT:
                OPCode = 0x31(IO_Capability_Request)
                Parameter_Length = 0x06
                Parameter1〜Parameter6(BD_ADDR) = 0x0123456789ab

<10:52:20.151> TCU_MNG_SSP_SET_REQ:
                OPCode = 0x042b(HCI_IO_Capability_Request_Reply)
                Parameter_Length = 0x09
                Parameter1〜Parameter6(BD_ADDR) = 0x0123456789ab
                Parameter7(IOCapabirity) = 0x03 (NoinputNoOutput)
                Parameter8(OOB_Data_Present) = 0x00 (OOB authentication data not present)
                Parameter9(Auhtntication_Requirement) = 0x04 (MITM Protection Not Required)
<10:52:20.182> SendData = 13 00 00 e1 3d 0c 00 2b 04 09 ab 89 67 45 23 01 03 00 04
<10:52:20.213> RcvData   = 15 00 00 e1 bd 0e 00 00 0c 0e 0a 01 2b 04 00 ab 89 67 45 23 01
<10:52:20.229> TCU_MNG_SSP_SET_RESP:
                Status = 0x00(Success)
                Parameter_Length = 0x0c
                Parameter1 = 0x0e(Command_Complete)
                Parameter2(Event_Length) = 0x0a
                Parameter3(Num_HCI_Command_Packet) = 0x01

        Parameter4,5(OPCode) = 0x042b(HCI_IO_Capability_Request_Reply)
        Parameter6(Status) = 0x00(Success)
        Parameter7～Parameter11(BD_ADDR) = 0x0123456789ab

<10:52:23.957>   RcvData   = 12 00 00 e1 7d 0b 00 32 09 ab 89 67 45 23 01 03 00 04
<10:52:23.973>   TCU_MNG_SSP_INFO_EVENT:
        OPCode = 0x32(IO_Capability_Response)
        Parameter_Length = 0x09
        Parameter1～Parameter6(BD_ADDR) = 0x0123456789ab
        Parameter7(IOCapabirity) = 0x03 (NoinputNoOutput)
        Parameter8(OOB_Data_Present) = 0x00 (OOB authentication data not present)
        Parameter9(Auhtntication_Requirement) = 0x04 (MITM Protection Not Required)

<10:52:24.051>   RcvData   = 13 00 00 e1 7d 0c 00 33 0a ab 89 67 45 23 01 92 80 07 00
<10:52:24.082>   TCU_MNG_SSP_INFO_EVENT:
        OPCode = 0x33(User_Confirmation_Request)
        Parameter_Length = 0x0a
        Parameter1～Parameter6(BD_ADDR) = 0x0123456789ab
        Parameter7～Parameter10(Numeric Value) = 0x00078092

<10:52:26.063>   TCU_MNG_SSP_SET_REQ:
         OPCode = 0x042c(HCI_User_Confirmation_Request_Reply)
        Parameter_Length = 0x06
        Parameter1～Parameter6(BD_ADDR) = 0x0123456789ab

<10:52:26.079>   SendData = 10 00 00 e1 3d 09 00 2c 04 06 ab 89 67 45 23 01
<10:52:26.094>   RcvData   = 15 00 00 e1 bd 0e 00 00 0c 0e 0a 01 2c 04 00 ab 89 67 45 23 01
<10:52:26.110>   TCU_MNG_SSP_SET_RESP:
        Status = 0x00(Success)
        Parameter_Length = 0x0c
        Parameter1 = 0x0e(Command_Complete)
        Parameter2(Event_Length) = 0x0a
        Parameter3(Num_HCI_Command_Packet) = 0x01
        Parameter4,5(OPCode) = 0x042c(HCI_User_Confirmation_Request_Reply)
        Parameter6(Status) = 0x00(Success)
        Parameter7～Parameter11(BD_ADDR) = 0x0123456789ab
<10:52:27.311>   RcvData   = 10 00 00 e1 7d 09 00 36 07 00 ab 89 67 45 23 01
<10:52:27.327>   TCU_MNG_SSP_INFO_EVENT:
        OPCode = 0x36(Simple_Pairing_Complete)
        Parameter_Length = 0x07
        Parameter1(Status) = 0x00(Success)
        Parameter2～Parameter7(BD_ADDR) = 0x0123456789ab

<10:52:27.405>   RcvData   = 20 00 00 e1 47 19 00 00 ab 89 67 45 23 01 03 0f 4f f3 13 a6 0f c3 ee 92 40 75
18 7a 97 75 42 04
<10:52:27.420>   TCU_MNG_CONNECTION_STATUS_EVENT:
        Status = 0x00(Success)

            BD_ADDR = 0x0123456789ab

            Connection_Status = 0x03(Link Key)

            Link_Key = 42 75 97 7a 18 75 40 92 ee c3 0f a6 13 f3 4f 0f

            Link_Key_Type = 0x04(Unauthenticated Combination Key)

<10:52:27.841>   RcvData   = 1d 00 00 e5 43 16 00 00 ab 89 67 45 23 01 1f 02 0c XX XX XX XX XX XX XX XX XX XX XX XX

<10:52:27.857>   TCU_SPP_A_CONNECT_EVENT:

            Status = 0x00(Success)

            BD_ADDR = 0x0123456789ab

            Negotiated_Frame_Size = 0x021f

            Length_of_Device_Name = 0x0c

            Device_Name = XXXXXXXXXXX

<10:53:47.839>   TCU_MNG_SNIFF_MODE_CONTROL_REQ:

            BD_ADDR = 0x0123456789ab

            Max = 0x0100(160.000 ms)

            Min = 0x0100(160.000 ms)   This command is used to enter Sniff mode.

            Attempt = 0x0008(10.000 ms)   Refer to TC35661APL_ROM501_ MNG_E_XXX

            Timeout = 0x0004(5.000 ms)

<10:53:47.854>   SendData = 15 00 00 e1 cb 0e 00 ab 89 67 45 23 01 00 01 00 01 08 00 04 00

<10:53:47.870>   RcvData   = 08 00 00 e1 cd 01 00 00

<10:53:47.886>   TCU_MNG_SNIFF_MODE_CONTROL_RESP:

            Status = 0x00(Success)

<10:53:47.901>   RcvData   = 0f 00 00 e1 47 08 00 00 ab 89 67 45 23 01 06

<10:53:47.932>   TCU_MNG_CONNECTION_STATUS_EVENT:

            Status = 0x00(Success)

            BD_ADDR = 0x0123456789ab

            Connection_Status = 0x06(Mode Change Sniff)

<10:55:23.561>   TCU_MNG_DEEP_SLEEP_REQ: This command is used to enter Deep Sleep mode.

            Sleep Mode = 0x01(Enable)   Refer to TC35661APL_ROM501_ MNG_E_XXX

<10:55:23.577>   SendData = 08 00 00 e1 b6 01 00 01

<10:55:23.577>   RcvData   = 08 00 00 e1 b7 01 00 00

<10:55:23.592>   TCU_MNG_DEEP_SLEEP_RESP:

            Status = 0x00(Success)

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* Slave

<10:49:06.394>   RcvData   = 04 0e 04 04 00 00 00

<10:49:06.394>   SendData = 01 03 0c 00

<10:49:06.519>   RcvData   = 04 0e 04 04 03 0c 00

<10:49:06.519>   SendData = 01 08 fc 09 00 a1 00 00 00 14 0d ff 00

<10:49:06.534>   RcvData   = 04 ff 20 08 00 a1 00 00 00 14 0d 00 0f 38 2e 30 30 2e 37 32 42 2d 30 36 20 46 6c 61 73 68 3d 35 30 31 00

<10:49:06.550>   BT Core SW Version = 8.00.72B-06

<10:49:06.550>   SendData = 01 13 10 06 ab 89 67 45 23 01

<10:49:06.550>   RcvData   = 04 0e 04 04 13 10 00

<10:49:06.565>   SendData = 01 08 fc 1c 00 a0 00 00 00 14 68 00 10 12 00 b8 0b 00 00 02 fa 00 0a 00 02 00 00 00 00 00 00 00

<10:49:06.597>   RcvData   = 04 ff 0a 08 00 a0 00 00 00 14 68 00 00

<10:49:06.597>   SendData = 01 08 fc 03 00 99 01

<10:49:07.626>   RcvData   = 04 ff 05 08 00 99 00 01

<10:49:07.642>   TCU_MNG_INIT_REQ:
        Supported_Profiles = 0x04
        Linkkey_Stored_Setting = 0x00
        Length_of_Device_Name = 0x0c
        Device_Name = XXXXXXXXXXXX

<10:49:07.642>   SendData = 16 00 00 e1 01 0f 00 04 00 0c XX XX XX XX XX XX XX XX XX XX XX XX

> M2_BTL_SET_DEEP_SLEEP command.
> This command is used to Deep Sleep configuration setting.
> Refer to TC35661APL_ROM501_ Extension_HCI_E_XXX

> To use external sleep clock

<10:49:07.689>   RcvData   = 0e 00 00 e1 81 07 00 00 ab 89 67 45 23 01

<10:49:07.704>   TCU_MNG_INIT_RESP:
        Status = 0x00(Success)
        BD_ADDR = 0x0123456789ab

<10:49:42.010>   TCU_SPP_A_SETUP_REQ:

<10:49:42.010>   SendData = 07 00 00 e5 01 00 00

<10:49:42.056>   RcvData   = 08 00 00 e5 81 01 00 00

<10:49:42.056>   TCU_SPP_A_SETUP_RESP:
        Status = 0x00(Success)

<10:49:52.602>   TCU_MNG_SET_SCAN_REQ:
        Scan_Mode = 03 (Inquiry Enable, Page Scan Enable)

<10:49:52.602>   SendData = 08 00 00 e1 0c 01 00 03

<10:49:52.618>   RcvData   = 08 00 00 e1 8c 01 00 00

<10:49:52.618>   TCU_MNG_SET_SCAN_RESP:
        Status = 0x00(Success)

<10:52:12.148>   RcvData   = 10 00 00 e1 55 09 00 ab 10 32 54 76 98 00 00 00

<10:52:12.163>   TCU_MNG_CONNECTION_REQUEST_EVENT:
        BD_ADDR = 0x9876543210ab
        Class_of_Device = 0x000000

> SPP connect request from master.

<10:52:14.800>   TCU_MNG_CONNECTION_ACCEPT_REQ:
        Response_Type = 0x00
        BD_ADDR = 0x9876543210ab
        Use_of_Link_Key = 0x00

<10:52:14.800>   SendData = 0f 00 00 e1 13 08 00 00 ab 10 32 54 76 98 00

<10:52:14.815>   RcvData   = 08 00 00 e1 93 01 00 00

<10:52:14.847>   TCU_MNG_CONNECTION_ACCEPT_RESP:

Status = 0x00(Success)

<10:52:14.862> RcvData = 0f 00 00 e1 47 08 00 00 ab 10 32 54 76 98 00

<10:52:14.878> TCU_MNG_CONNECTION_STATUS_EVENT:
Status = 0x00(Success)
BD_ADDR = 0x9876543210ab
Connection_Status = 0x00(Connected)

<10:52:20.182> RcvData = 12 00 00 e1 7d 0b 00 32 09 ab 10 32 54 76 98 03 00 04

<10:52:20.197> TCU_MNG_SSP_INFO_EVENT:
OPCode = 0x32(IO_Capability_Response)
Parameter_Length = 0x09
Parameter1～Parameter6(BD_ADDR) = 0x9876543210ab
Parameter7(IOCapabirity) = 0x03 (NoinputNoOutput)
Parameter8(OOB_Data_Present) = 0x00 (OOB authentication data not present)
Parameter9(Auhtntication_Requirement) = 0x04 (MITM Protection Not Required)

<10:52:20.213> RcvData = 1a 00 00 e1 6e 13 00 ab 10 32 54 76 98 0c XX XX XX XX XX XX XX XX XX XX XX XX

<10:52:20.229> TCU_MNG_REMOTE_DEVICE_NAME_AUTO_NOTIFY_EVENT:
BD_ADDR = 0x9876543210ab
Length_of_Device_Name = 0x0c
Device_Name = XXXXXXXXXXXX

<10:52:20.244> RcvData = 0f 00 00 e1 7d 08 00 31 06 ab 10 32 54 76 98

<10:52:20.260> TCU_MNG_SSP_INFO_EVENT:
OPCode = 0x31(IO_Capability_Request)
Parameter_Length = 0x06
Parameter1～Parameter6(BD_ADDR) = 0x9876543210ab

<10:52:23.910> TCU_MNG_SSP_SET_REQ:
OPCode = 0x042b(HCI_IO_Capability_Request_Reply)
Parameter_Length = 0x09
Parameter1～Parameter6(BD_ADDR) = 0x9876543210ab
Parameter7(IOCapabirity) = 0x03 (NoinputNoOutput)
Parameter8(OOB_Data_Present) = 0x00 (OOB authentication data not present)
Parameter9(Auhtntication_Requirement) = 0x04 (MITM Protection Not Required)

<10:52:23.926> SendData = 13 00 00 e1 3d 0c 00 2b 04 09 ab 10 32 54 76 98 03 00 04

<10:52:23.941> RcvData = 15 00 00 e1 bd 0e 00 00 0c 0e 0a 01 2b 04 00 ab 10 32 54 76 98

<10:52:23.941> TCU_MNG_SSP_SET_RESP:
Status = 0x00(Success)
Parameter_Length = 0x0c
Parameter1 = 0x0e(Command_Complete)
Parameter2(Event_Length) = 0x0a
Parameter3(Num_HCI_Command_Packet) = 0x01
Parameter4,5(OPCode) = 0x042b(HCI_IO_Capability_Request_Reply)

        Parameter6(Status) = 0x00(Success)

        Parameter7～Parameter11(BD_ADDR) = 0x9876543210ab

<10:52:24.051>   RcvData   = 13 00 00 e1 7d 0c 00 33 0a ab 10 32 54 76 98 92 80 07 00

<10:52:24.082>   TCU_MNG_SSP_INFO_EVENT:

        OPCode = 0x33(User_Confirmation_Request)

        Parameter_Length = 0x0a

        Parameter1～Parameter6(BD_ADDR) = 0x9876543210ab

        Parameter7～Parameter10(Numeric Value) = 0x00078092

<10:52:25.158>   TCU_MNG_SSP_SET_REQ:

         OPCode = 0x042c(HCI_User_Confirmation_Request_Reply)

        Parameter_Length = 0x06

        Parameter1～Parameter6(BD_ADDR) = 0x9876543210ab

<10:52:25.158>   SendData = 10 00 00 e1 3d 09 00 2c 04 06 ab 10 32 54 76 98

<10:52:25.174>   RcvData   = 15 00 00 e1 bd 0e 00 00 0c 0e 0a 01 2c 04 00 ab 10 32 54 76 98

<10:52:25.189>   TCU_MNG_SSP_SET_RESP:

        Status = 0x00(Success)

        Parameter_Length = 0x0c

        Parameter1 = 0x0e(Command_Complete)

        Parameter2(Event_Length) = 0x0a

        Parameter3(Num_HCI_Command_Packet) = 0x01

        Parameter4,5(OPCode) = 0x042c(HCI_User_Confirmation_Request_Reply)

        Parameter6(Status) = 0x00(Success)

        Parameter7～Parameter11(BD_ADDR) = 0x9876543210ab

<10:52:27.295>   RcvData   = 10 00 00 e1 7d 09 00 36 07 00 ab 10 32 54 76 98

<10:52:27.295>   TCU_MNG_SSP_INFO_EVENT:

        OPCode = 0x36(Simple_Pairing_Complete)

        Parameter_Length = 0x07

        Parameter1(Status) = 0x00(Success)

        Parameter2～Parameter7(BD_ADDR) = 0x9876543210ab

<10:52:27.436>   RcvData   = 20 00 00 e1 47 19 00 00 ab 10 32 54 76 98 03 0f 4f f3 13 a6 0f c3 ee 92 40 75
18 7a 97 75 42 04

<10:52:27.451>   TCU_MNG_CONNECTION_STATUS_EVENT:

        Status = 0x00(Success)

        BD_ADDR = 0x9876543210ab

        Connection_Status = 0x03(Link Key)

        Link_Key = 42 75 97 7a 18 75 40 92 ee c3 0f a6 13 f3 4f 0f

        Link_Key_Type = 0x04(Unauthenticated Combination Key)

<10:52:27.810>   RcvData   = 1d 00 00 e5 43 16 00 00 ab 10 32 54 76 98 1f 02 0c XX XX XX XX XX XX XX
XX XX XX XX XX

<10:52:27.826>   TCU_SPP_A_CONNECT_EVENT:

        Status = 0x00(Success)

        BD_ADDR = 0x9876543210ab

        Negotiated_Frame_Size = 0x021f

Length_of_Device_Name = 0x0c
Device_Name = XXXXXXXXXXXX

<10:53:47.870>   RcvData   = 0f 00 00 e1 47 08 00 00 ab 10 32 54 76 98 06
<10:53:47.901>   TCU_MNG_CONNECTION_STATUS_EVENT:
    Status = 0x00(Success)
    BD_ADDR = 0x9876543210ab
    Connection_Status = 0x06(Mode Change Sniff)

> Sniff request from master.
> Refer to TC35661APL_ROM501_ MNG_E_XXX

<10:55:46.431>   TCU_MNG_DEEP_SLEEP_REQ:
    Sleep Mode = 0x01(Enable)

> This command is used to enter Deep Sleep mode.
> Refer to TC35661APL_ROM501_ MNG_E_XXX

<10:55:46.446>   SendData = 08 00 00 e1 b6 01 00 01
<10:55:46.446>   RcvData   = 08 00 00 e1 b7 01 00 00
<10:55:46.462>   TCU_MNG_DEEP_SLEEP_RESP:
    Status = 0x00(Success)

7.4   HostWakeup signal

7.4.1   HostWakeUp Description

TCU_VEN_SET_HOST_WAKEUP_NOTIFICATION_REQ command enables HostWakeUp signal with GPIO4, HostWakeUp signal wakes up host CPU from Sleep mode.

Both host CPU and TC35661 can be entered Sleep mode to reduce the system power consumption.

7.4.2   The example of sequence using HostWakeUp signal

1) Send TCU_VEN_SET_HOST_WAKEUP_NOTIFICATION_REQ command (Enable) from host CPU.

2) TC35661 starts to control a HostWakeUp signal simultaneously with
   TCU_VEN_SET_HOST_WAKEUP_NOTIFICATION_RESP from host CPU.

3) Host CPU needs to turn a BT_CTS to high before sleep mode.

4) TC35661 is waked up by receiving the data from remote device.

5) TC35661 outputs a HostWakeUp signal to host CPU.

6) Host CPU shifts to Active mode by receiving the HostWakeUp signal.

7) After host CPU is weaked up from sleep mode, host CPU turns BT_CTS signal to low.
   Then TC35661 generates data.
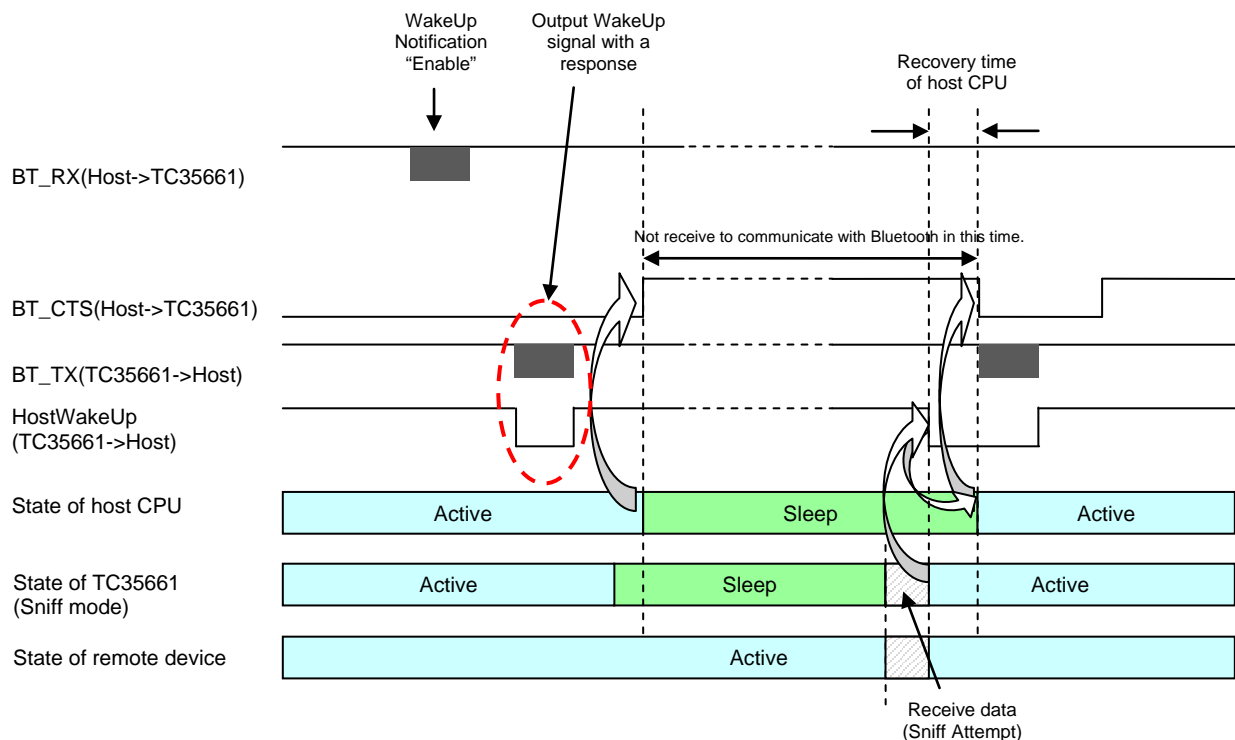
8   RF parameter adjustment

The X'tal frequency parameter can be adjusted by DBUS_WRITE_MEM command.

The default value is 0x0100.

8.1   RF parameters adjustment method

HCI_DBUS_WRITE command line is 03 fc 05 00 c2 a6 xx xx, and xx xx is value to set X'tal frequency.

The 0xa6 means that the most significant 3bits are the device address, and the least significant 5bits are the RF parameter address.

HCI_DBUS_READ command reads RF parameters. This command line is 03 fc 03 00 c3 a6.

Refer to TC35661_Extenstion_HCI_Command_E_XXXX.pdf for more detail.

X'tal frequency parameter is 1-2kHz per 1step.

Refer to Datasheet in order to get some exact information.

(Note)

Evaluate frequency after the parameter changes in each environment.

8.2   Characteristic improvement

ROM501 needs additional command to improve RF characteristics.

Script file name is tc35661v5_RM501_130725LEdual_power_con_enable.txt

Command line is as follows.

When this command line is not implemented, RF for low energy characteristic might be not enough.

ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0xae(dev:0x5,reg:0x0e) value=0xcd18

L:(CMD) 01 03 fc 05 00 c2 ae 18 cd

B:(EVT) 04 0f 04 00 04 03 fc

B:(EVT) 04 ff 04 03 00 c2 00

Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)

Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 ee 00 d9

ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0xee(dev:0x7,reg:0x0e) value=0xd900

B:(EVT) 04 0f 04 00 04 03 fc

Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)

B:(EVT) 04 ff 04 03 00 c2 00

Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 fa a4 a4

ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0xfa(dev:0x7,reg:0x1a) value=0xa4a4

B:(EVT) 04 0f 04 00 04 03 fc

Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)

B:(EVT) 04 ff 04 03 00 c2 00

Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 81 f3 c7
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x81(dev:0x4,reg:0x01) value=0xc7f3
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 63 f4 04
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x63(dev:0x3,reg:0x03) value=0x04f4
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 83 00 e6
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x83(dev:0x4,reg:0x03)
value=0xe600
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 64 af 00
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x64(dev:0x3,reg:0x04) value=0x00af
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 84 ff 80
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x84(dev:0x4,reg:0x04) value=0x80ff
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 65 b0 00
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x65(dev:0x3,reg:0x05)
value=0x00b0
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 85 1b 60
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x85(dev:0x4,reg:0x05)
value=0x601b
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 66 ed 00
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x66(dev:0x3,reg:0x06)
value=0x00ed
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 86 6e 00
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x86(dev:0x4,reg:0x06)
value=0x006e
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 67 ea 0e
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x67(dev:0x3,reg:0x07)
value=0x0eea
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 87 80 80
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x87(dev:0x4,reg:0x07)
value=0x8080
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 68 f4 49
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x68(dev:0x3,reg:0x08) value=0x49f4
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00

Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 88 00 ee
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x88(dev:0x4,reg:0x08)
value=0xee00
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 69 f4 27
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x69(dev:0x3,reg:0x09) value=0x27f4
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 89 00 fe
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x89(dev:0x4,reg:0x09) value=0xfe00
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 6a 00 ff
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x6a(dev:0x3,reg:0x0a) value=0xff00
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 8a 00 00
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x8a(dev:0x4,reg:0x0a)
value=0x0000
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 6b ea 09
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x6b(dev:0x3,reg:0x0b)
value=0x09ea
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 8b 80 00

ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x8b(dev:0x4,reg:0x0b)
value=0x0080

B:(EVT) 04 0f 04 00 04 03 fc

Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)

B:(EVT) 04 ff 04 03 00 c2 00

Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 6c f4 01
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x6c(dev:0x3,reg:0x0c) value=0x01f4
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 8c 00 80
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x8c(dev:0x4,reg:0x0c)
value=0x8000
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 6d e2 01
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x6d(dev:0x3,reg:0x0d)
value=0x01e2
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 8d 08 00
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x8d(dev:0x4,reg:0x0d)
value=0x0008
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 6e a4 01
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x6e(dev:0x3,reg:0x0e)
value=0x01a4
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 8e 80 00
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x8e(dev:0x4,reg:0x0e)
value=0x0080
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00

Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 6f 00 ff
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x6f(dev:0x3,reg:0x0f) value=0xff00
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 8f 00 00
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x8f(dev:0x4,reg:0x0f) value=0x0000
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 a0 21 10
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0xa0(dev:0x5,reg:0x00)
value=0x1021
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 81 d3 c7
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x81(dev:0x4,reg:0x01)
value=0xc7d3
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 82 a8 00
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x82(dev:0x4,reg:0x02)
value=0x00a8
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 63 f4 04
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x63(dev:0x3,reg:0x03) value=0x04f4
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 83 00 e2
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x83(dev:0x4,reg:0x03)
value=0xe200
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 64 af 00
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x64(dev:0x3,reg:0x04) value=0x00af
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 84 f8 80
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x84(dev:0x4,reg:0x04) value=0x80f8
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 65 b0 00
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x65(dev:0x3,reg:0x05)
value=0x00b0
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 85 18 60
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x85(dev:0x4,reg:0x05)
value=0x6018
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 66 ed 00
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x66(dev:0x3,reg:0x06)
value=0x00ed
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 86 6e 70
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x86(dev:0x4,reg:0x06)
value=0x706e
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 67 ea 0e
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x67(dev:0x3,reg:0x07)
value=0x0eea
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 87 80 80
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x87(dev:0x4,reg:0x07)
value=0x8080
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 68 f4 14
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x68(dev:0x3,reg:0x08) value=0x14f4
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 88 00 e6
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x88(dev:0x4,reg:0x08)
value=0xe600
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 69 f4 04
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x69(dev:0x3,reg:0x09) value=0x04f4
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 89 00 fe
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x89(dev:0x4,reg:0x09) value=0xfe00
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 6a 00 ff
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x6a(dev:0x3,reg:0x0a) value=0xff00
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 8a 00 00
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x8a(dev:0x4,reg:0x0a)
value=0x0000
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 6b ea 02
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x6b(dev:0x3,reg:0x0b)
value=0x02ea
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 8b 80 00
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x8b(dev:0x4,reg:0x0b)
value=0x0080
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 6c f4 01
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x6c(dev:0x3,reg:0x0c) value=0x01f4
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 8c 00 80

ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x8c(dev:0x4,reg:0x0c)
value=0x8000

B:(EVT) 04 0f 04 00 04 03 fc

Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)

B:(EVT) 04 ff 04 03 00 c2 00

Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 6d e2 01
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x6d(dev:0x3,reg:0x0d)
value=0x01e2
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 8d 08 00
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x8d(dev:0x4,reg:0x0d)
value=0x0008
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 6e a4 01
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x6e(dev:0x3,reg:0x0e)
value=0x01a4
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 8e 80 00
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0x8e(dev:0x4,reg:0x0e)
value=0x0080
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 6f 00 ff
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x6f(dev:0x3,reg:0x0f) value=0xff00
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 8f 00 00
ExCh3- Op=0xfc03 len=0x05 mesgID=0xc2(LOC_DBUS_WRITE) addr=0x8f(dev:0x4,reg:0x0f) value=0x0000
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 03 fc 05 00 c2 a0 21 00
ExCh3-   Op=0xfc03   len=0x05   mesgID=0xc2(LOC_DBUS_WRITE)   addr=0xa0(dev:0x5,reg:0x00)
value=0x0021
B:(EVT) 04 0f 04 00 04 03 fc
Command_Status- st=0x00(SUCCESS) NHCP=0x04 Op=0xfc03(ExCh3)
B:(EVT) 04 ff 04 03 00 c2 00
Ext_Event-ExCh3(LCI) MesgID=0xc2(LOC_DBUS_WRITE) st=0x00(LOC_OK)

L:(CMD) 01 08 fc 2f 00 a0 00 00 00 14 55 ff 10 25 03 9c ad 09 00 e0 7b 00 28 01 d0 02 21 38 e0 bb f7 ab fe 4a e1 01 d0 e5 f7 7e ff 01 2e 00 d0 00 27 20 7c 04 28
ExCh8- Op=0xfc08 len=0x2f ExOp=0xa0(M2_Set) Initiator=0x04(Host) Accepter=0x01(BT_Core_lower)
InformationID=0x55(PATCH_SWAP_BASE)
        - Result=0xff(Result_Reserved) DataType=0x10(Bytes) DataLength=0x25
Data=0x039cad0900e07b002801d0022138e0bbf7abfe4ae101d0e5f77eff012e00d00027207c0428
B:(EVT) 04 ff 0a 08 00 a0 00 00 00 14 55 00 00
Ext_Event-ExCh8(Toshiba) M2_Set   Initiator=0x04(Host) Accepter=0x01(BT_Core_lower)
InformationID=0x55(PATCH_SWAP_BASE)
        - Result=0x00(OK) DataType=0x00(Data_None)

L:(CMD) 01 08 fc ee 00 a0 00 00 00 14 56 ff 10 e4 00 6b 05 00 26 4a 05 20 30 b4 10 80 26 48 25 49 88 82 ff 20 c8 82 c8 8a c0 07 fc d1 01 20 80 03 88 82 48 8b 00 09 00 01 08 21 01 43 51 83 ff 21 ff 31 91 83 1d 4c 00 22 a2 80 ff 23 e4 33 e3 80 0c 24 04 43 1a 48 84 81 c1 81 82 82 c3 82 19 49 08 88 01 23 02 1c 9a 43 0a 80 17
4a 03 23 5b 04 5a 62 60 32 da 62 16 4a 14 4d 5a 66 15 4a 17 4c 9a 66 15 4a 5a 67 da 1d f9 32 9d 62 54 62 08 34 d4 62 95 62 13 4a 12 4c 54 62 13 4c 94 62 13 4c d4 62 1b 68 12 4a 93 42 fd d1 08 80 30 bc 70 47 20 02 06 00 c0 08 06 00 be 2f 00 00 60 03 06 00 60 0b 06 00 a0 02 06 00 0b 20 00 20 00 20 18 20 07 a0 01 21 00 a0 1d 21 0c a0 01 21 0f 20 00 20 01 20 01 20 40 01 06 00 00 20 1d 20 03 20 01 20 ff 0f 00 00
ExCh8- Op=0xfc08 len=0xee ExOp=0xa0(M2_Set) Initiator=0x04(Host) Accepter=0x01(BT_Core_lower)
InformationID=0x56(PATCH_SWAP_PROG_WRITE)
        - Result=0xff(Result_Reserved) DataType=0x10(Bytes) DataLength=0xe4
Data=0x006b0500264a052030b41080264825498882ff20c882c88ac007fcd1012080038882488b0009000108
2
101435183ff21ff3191831d4c0022a280ff23e433e3800c2404431a488481c1818282c382194908880123021c9a
430a80174a03235b045a626032da62164a144d5a66154a174c9a66154a5a67da1df9329d6254620834d46295
6
2134a124c5462134c9462134cd4621b68124a9342fdd1088030bc704720020600c0080600be2f000060030600
600b0600a00206000b2000200020182007a0012100a01d210ca001210f20002001200120400106000020 1d 20
0
3200120ff0f0000
B:(EVT) 04 ff 0a 08 00 a0 00 00 00 14 56 00 00
Ext_Event-ExCh8(Toshiba) M2_Set   Initiator=0x04(Host) Accepter=0x01(BT_Core_lower)
InformationID=0x56(PATCH_SWAP_PROG_WRITE)
        - Result=0x00(OK) DataType=0x00(Data_None)

L:(CMD) 01 08 fc 0b 00 a0 00 00 00 14 57 ff 02 03 01
ExCh8- Op=0xfc08 len=0x0b ExOp=0xa0(M2_Set) Initiator=0x04(Host) Accepter=0x01(BT_Core_lower)
InformationID=0x57(PATCH_CONTROL)
        - Result=0xff(Result_Reserved) DataType=0x02(Uint16) Data=0x0103
B:(EVT) 04 ff 0a 08 00 a0 00 00 00 14 57 00 00
Ext_Event-ExCh8(Toshiba) M2_Set   Initiator=0x04(Host) Accepter=0x01(BT_Core_lower)
InformationID=0x57(PATCH_CONTROL)
        - Result=0x00(OK) DataType=0x00(Data_None)

L:(CMD) 01 08 fc 09 00 a0 00 00 00 14 01 ff 00

ExCh8- Op=0xfc08 len=0x09 ExOp=0xa0(M2_Set) Initiator=0x04(Host) Accepter=0x01(BT_Core_lower)

InformationID=0x01(TRACE_START)

       -   Result=0xff(Result_Reserved) DataType=0x00(Data_None)

B:(EVT) 04 ff 0a 08 00 a0 00 00 00 14 01 02 00

Ext_Event-ExCh8(Toshiba) M2_Set   Initiator=0x04(Host) Accepter=0x01(BT_Core_lower)

InformationID=0x01(TRACE_START)

       -   Result=0x02(Unknown_Data_Type) DataType=0x00(Data_None)
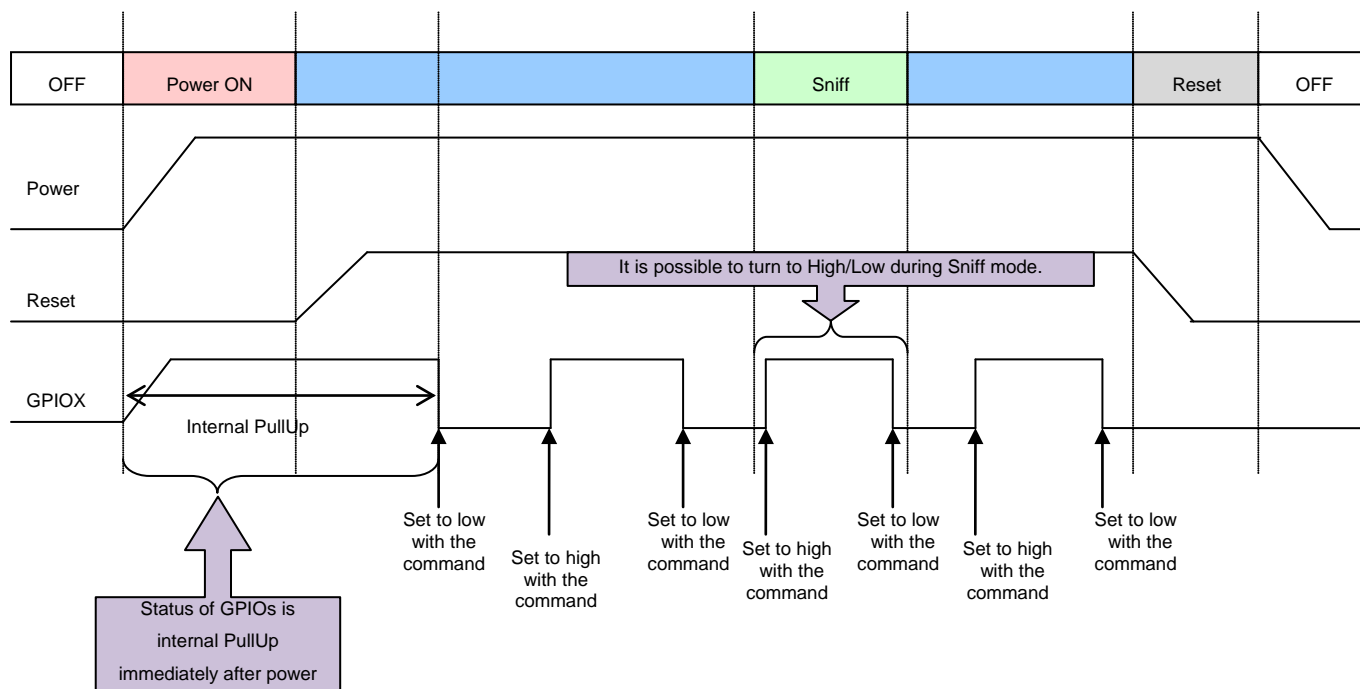
9   Control GPIOs output

9.1   GPIOs output control command

GPIOs are set to input ports (Internal PullUp) after resets. Only GPIO0 is no internal register.

TCU_VEN_SET_GPIO_WRITE_REQ command enables GPIOs to output ports.

This command is available on both active and Sniff mode.

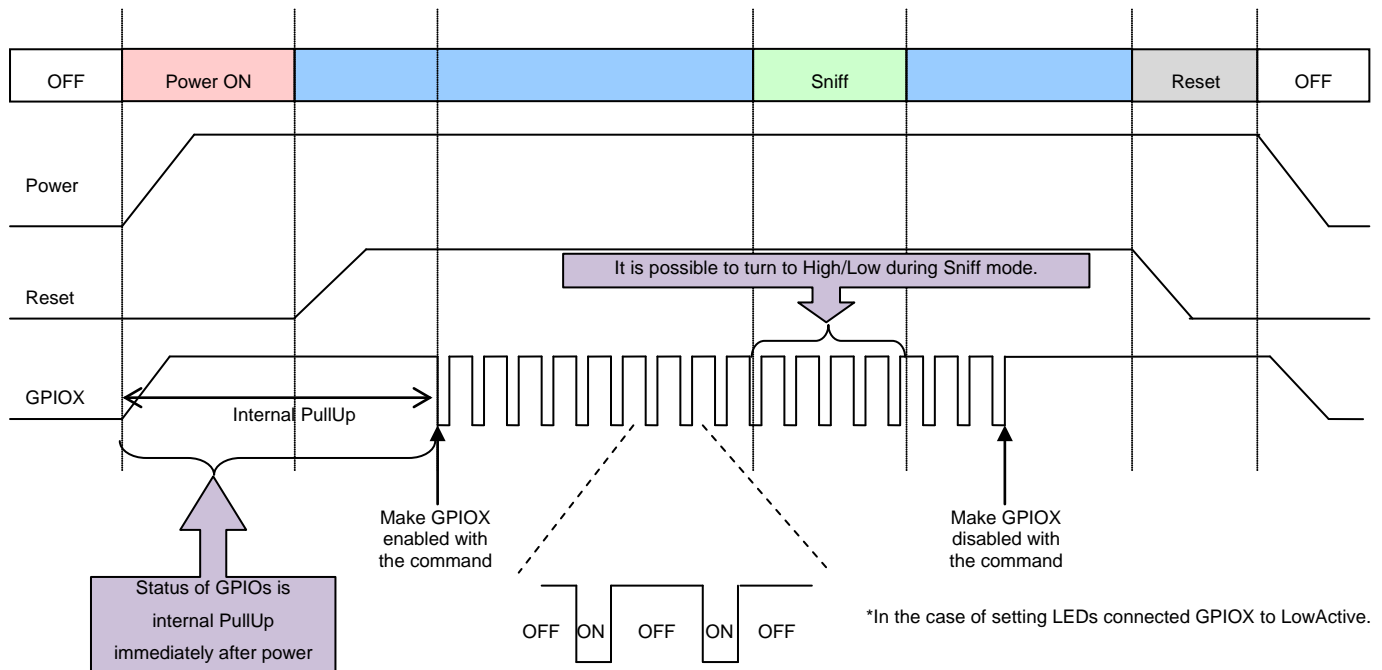The following figure shows the sequence.

9.2   GPIOs pulse mode control command

TCU_VEN_SET_GPIO_PULSE_REQ command repeats GPIO2 and GPIO3 to high and low output periodically.

This command is used for LEDs blink.

GPIOs blink is kept during Sleep mode.

The following figure shows the sequence.

End of document