

Bluetooth[®] Module

EYTFEBS

User Guide

In case you adopt this module and design some appliance, please ask for the latest specifications from the local sales office.

We wish the customer to request the Specification Report when the design for the mass production begins because the content of this Data Report might change without a previous notice to the customer.

The *Bluetooth*[®] word mark and logos are owned by the *Bluetooth* SIG, Inc. and any use of such marks by TAIYO YUDEN CO., LTD. is under license.

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& Tentative**Document constituent list**

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Rev. record

12-Sep.-2007> Ver.0.1 Draft

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Control No. HD-AG-A071113 (1/3)	Control name General Items
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Scope

This specification ("Specification") applies to the hybrid IC "EYTFEBS" for use **Bluetooth**[®] module ("Product") manufacture by TAIYO YUDEN Co., Ltd. ("TAIYO YUDEN")

1. Regulatory Model Name : EYTFEBS
2. Function: Radio frequency transfer Module (power class 2). **Bluetooth**[®] standard Ver 2.1+EDR conformity
3. Application: PC, PC peripheral, Handy terminal
4. Structure: Hybrid IC loaded with silicon monolithic semiconductor
5. Outline: Cable Connector Type
6. Marking: TBD

7. Features:

- Bluetooth**[®] 2.1+EDR conformity
- USB Interface
- Point-to-Multipoint (7 Slaves)
- Encryption
- Hold, Sniff and Park Mode
- Supported Link Type: ACL
- AFH&Co-existence
- EDR(Enhanced Data Rate)

8. Packing:TBD

9. Terminal: Data input-output (10pin Cable Connector)

"J.S.T.Mfg.Co.,Ltd. : SM10B-SSR-H-TB(LF)(SN)"

RF input-output (Antenna)

10. Mount: TBD

11. Notes:

- a. Any question arising from this Specification shall be solved through mutual discussion by the parties hereof.
- b. This Product is not designed for radiation durable and should not be used under the circumstance of radiation.

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- c. The operating conditions of this Product are as shown in this Specification. Please note that TAIYO YUDEN shall not be liable for a failure and/or abnormality which is caused by use under the conditions other than the operating conditions hereof.
- d. This Product mentioned in this Specification is manufactured for use in PC, PC peripheral and Handy terminal. Before using this Product in any special equipment (such as medical equipment, space equipment, air craft, disaster prevention equipment), where higher safety and reliability are duly required, the applicability and suitability of this Product must be fully evaluated by the customer at its sole risk to ensure correct and safety operation of those special equipments. Also, evaluation of the safety function of this Product even for use in general electronics equipment shall be thoroughly made and when necessary, a protective circuit shall be added in design stage, all at the customer's sole risk.
- e. TAIYO YUDEN warrants only that this Product is in conformity with this Specification for one year after purchase and shall in no event give any other warranty.
- f. The warranty period shall be one year.
- g. Communication between this Product and others might not be established nor maintained depending upon radio environment or operating conditions of this Product and other **Bluetooth**[®] products.
- h. This Product is designed for use in products which comply with **Bluetooth**[®] Specifications (Ver 2.1+EDR) ("Bluetooth Specifications"). TAIYO YUDEN disclaims and is not responsible for any liability concerning infringement by this Product under any intellectual property right owned by third party in case the customer uses this Product in any product which does not comply with Bluetooth Specifications (the "non-complying products"). Furthermore, TAIYO YUDEN warrants only that this Product complies with this Specification and does not grant any other warranty including warranty for application of the non-complying products.
- i. TAIYO YUDEN does not render updating or upgrading service for the firmware in the Module.
- j. In order to take tests for getting the certification of each country's Radio Law with a device incorporating this module, it is necessary to make the software in Host to put the module into test condition. Please contact TAIYO YUDEN for farther details.
- k. Please evaluate adequately our module incorporated to your products before mass production.
- l. This Product operates in the unlicensed ISM band at 2.4GHz. In case this Product is used around the other wireless devices which operate in same frequency band of this Product, there is a possibility that interference occurs between this Product and such other devices. If such interference occurs, please stop the operation of other devices or relocate this Product before using this Product or do not use this Product around the other wireless devices.
- m. User's Code Modification Notice (**Bluetooth**[®] Modules)
 User's Code may be modified based on mass production stage, **Bluetooth**[®] logo Qualification stage, or other related stages. Please contact TAIYO YUDEN to confirm whether your User's Code needs to be modified.
 Please see the following examples for cases that User's Code are modified:
 - for specific firmware version (our standard item firmware will be upgraded occasionally)
 - for specific BD address (our standard item BD address is owned by TAIYO YUDEN)
 - for specific PnP (Plug and Play) IDs (our standard item PnP IDs are owned by TAIYO YUDEN or chip manufacture)
 EYTFEBS Setting: USB Product ID: 0x0200, USB Vendor ID: 0x0930
 - for other related cases (specific or different setting, form, sizes, or display etc..)
 In case you have applied for **Bluetooth**[®] Qualification with our standard User's Code without previous notice to TAIYO YUDEN, we shall not be responsible for any expense that will be required to change its name/number.

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Control No. HD-AG-A071113	(3/3)	Control name General Items
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n. Containment of hazardous substance in this Product

* This product conforms to RoHS Directive (2002/95/EC).

p. In addition when this Product is used under environmental conditions such as over voltage which are not guaranteed ,it may be destroyed in short mode. To ensure the security of customer's product, please add an extra fuse or/and a protection circuit for over voltage.

q. In some cases, TAIYO YUDEN may use replacements as component parts of Products. Such replacement shall apply only to component part of Products, which TAIYO YUDEN deems it possible to replace or substitute according to (i) Scope provided in this Specification (e.g. Official Standard (Type Approvals, Bluetooth LOGO etc.)) and (ii) Quality of Products. TAIYO YUDEN also ensures traceability of such replacement on production lot basis.

r. Do not alter Hardware and/or Software of this Product.

Please note that TAIYO YUDEN shall not be liable for any problem if it is caused by customer's alteration of Hardware or/and Software without Taiyo Yuden's prior approvals.

This module is still under development, thus specifications do not guarantee both the quality and reliability at the time of shipment. Since the specifications and mass production of the module are not confirmed either, the contents of the technical notes are subject to change without any prior notice.

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Control No. HD-AM-A 071113 (1/1)	Control name Absolute maximum ratings
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Absolute maximum ratings

Item	Symbol	Rating				Remark
		Min.	Typ.	Max.	Unit	
Supply voltage	VDD_3.3V	-0.3		3.6	V	Ta=25 degrees C, GND reference
Input voltage	Vin	-0.3		VDD_3.3V +0.3	V	I/O terminals except USB interface

Recommendation operating range

Item	Symbol	Rating				Remark
		Min.	Typ.	Max.	Unit	
Supply voltage	VDD_3.3V	3.15	3.3	3.45	V	
Supply voltage ripple and spike noise	VDD_rn			TBD	mVp-p	Note 1
Operation temperature range	Topr	0	25	70	Degrees C	Humidity=40%RH Note 2
Storage temperature range	Tstg	-30	25	85	Degrees C	Humidity=40%RH Note 3

Notes:

1. To fill the standard of "Supply voltage ripple and spike noise", the capacitor, which has the capacity of TBD uF or more, should be put in the terminal VDD_3.3V outside as a bypass capacitor.
2. Operating temperature range is set to satisfy products electrical characteristics in the short term. In terms of product life cycle when it is used in condition of varying from TYP standard in the long term, please refer to the reliability condition.
3. Storage temperature range is the condition for transportation and storage in temporary.

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Control No. HD-AE-A071113	(1/3)	Control name Electrical characteristics
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Electrical characteristic**DC Specifications**

The Specification applies for Topr.= 25 degrees C, VDD_3.3V=3.3V

No.	Parameter	Condition	Symbol	Min.	Typ.	Max.	Unit	Remark
1	Normal supply voltage		VDD_3.3 V	3.15	3.3	3.45	V	
2	Input Low Voltage1	/RESET, PIOX	VIL1	0		0.8	V	
3	Input Low Voltage2	USB_D+, USB_D-	VIL2	-		0.8	V	
4	Input High Voltage1	/RESET, PIOX	VIH1	2.0		VDD_3.3V	V	
5	Input High Voltage2	USB_D+, USB_D-	VIH2	2.0		-	V	
6	Output Low Voltage1	PIOX	VOL1	-		0.4	V	Iout=2mA
7	Output Low Voltage2	USB_D+, USB_D-	VOL2	-		0.3	V	
8	Output High Voltage1	PIOX	VOH1	VDD_3.3V -0.4		-	V	Iout=-2mA
9	Output High voltage2	USB_D+, USB_D-	VOH2	2.8		-	V	
10	Peak current	Continuous Rx	Iccp1		(60)	(180)	mA	Notes 3, 4
11	Average current1	Sniff mode (Slave only)	Icca1		TBD	-	mA	Notes 1, 3, 4
12	Average current2	Standby mode	Icca2		TBD	-	mA	Notes 3, 4
13	Average current3	Send DM1packet (Master)	Icca3		TBD	-	mA	Notes 3, 4
14	Average current4	Receive DM1packet (Slave)	Icca4		TBD	-	mA	Notes 3, 4
15	Average current5	Hold mode (Slave only)	Icca5		TBD	-	mA	Notes 3, 4
16	Average current6	Park mode (Slave only)	Icca6		TBD	-	mA	Notes 2, 3, 4

Notes:

- Sniff mode parameter.
 - Max interval 0050h
 - Min interval 0010h
 - Attempt 0005h
 - Timeout 0005h
- Park mode parameter.
 - Max interval 0100h
 - Min interval 0010h
- The consumption current might fluctuate with the condition of radio communication, host performance and test circuit.
- The value may fluctuate several (mA) depending on Firmware version.

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Control No. HD-AE-A071113 (2/3)	Control name Electrical characteristics
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AC Specifications

The Specification applies for Topr.= 25 degrees C, VDD_3.3V=3.3V

No.	Parameter	Condition	Symbol	Min	Typ	Max	Unit	Remark
1	VDD_3.3V Rise Time from 0V to 3.15V		t1	0		TBD	ms	
2	VDD_3.3V= 3.15V to /RESET High		t2	0			ms	
3	/RESET High to Module Ready		t3		TBD		ms	Note 1
4	/RESET Pulse Width		t4	4			us	
5	Radio_Disable High to USB I/F High-Z		t5			TBD	ms	
6	Radio_Disable Low to USB I/F Active		t6	0		TBD	ms	
7	/RESET Low to USB_I/F High-Z		t7	0		TBD	ms	
8	Module Active to /RESET Low		t8	0			ms	
9	/RESET Low to VDD_3.3V Off		t9	0			ms	
10	Radio_Disable Low to VDD_3.3V Off		t10	0			ms	

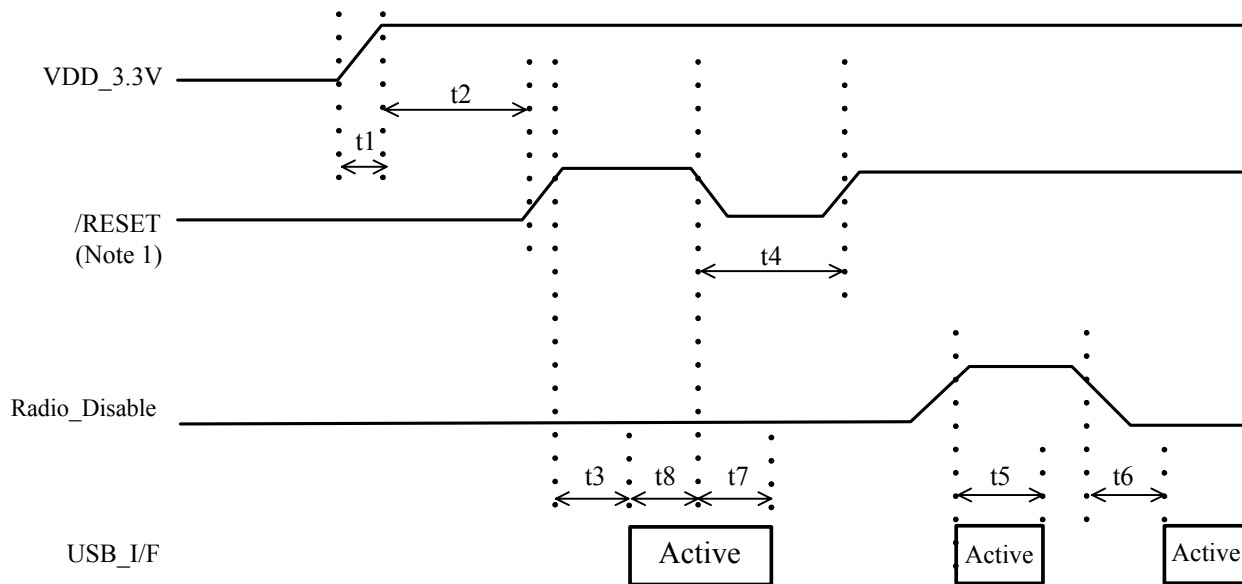
Notes:

1. It may change due to the firmware version.

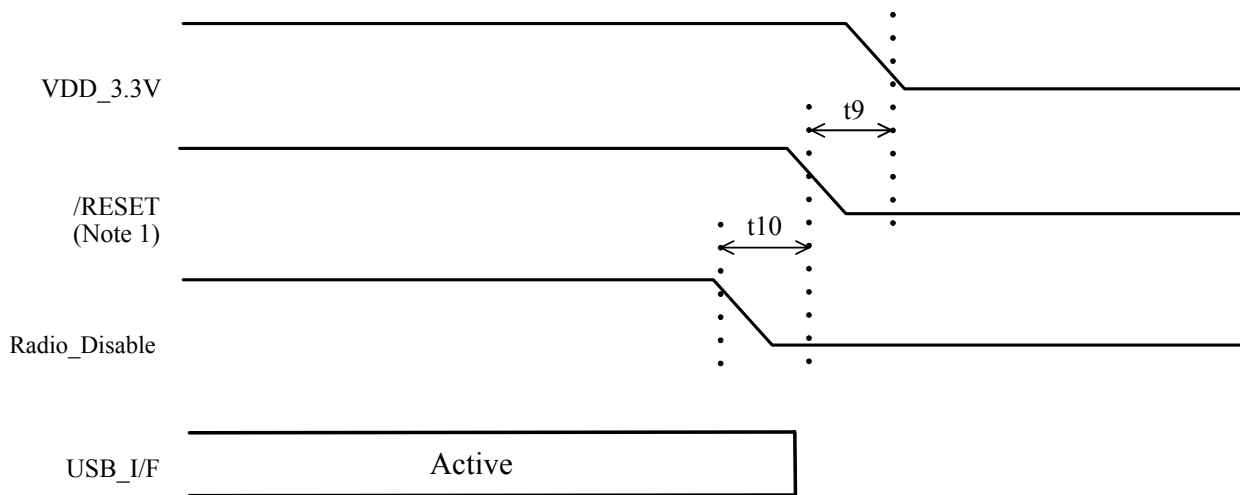
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Control No. HD-AE-A071113 (3/3)	Control name Electrical characteristics
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Timing Diagram for Power Up Sequence



Timing Diagram for Power Down Sequence

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Control No. HD-AE-B071113	(1/2)	Control name Electrical characteristics
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RF Specifications at Basic Rate

The Specification applies for Ta=25 degrees C, VDD_3.3V=3.3V

No.	Parameter	Condition	Symbol	Min	Typ	Max	Unit	Remark
1	Frequency band		FREQ	2400		2483.5	MHz	
2	Tx power		PO	-6	0	+4	dBm	
3	Modulation characteristics 1	dF1: F0(11110000)	M1	140		175	kHz	
4	Modulation characteristics 2	dF2: AA(10101010)	M4	115			kHz	
5	Modulation characteristics 3	dF2/dF1	MC	0.8				
6	In-band spurious emission 2	2MHz(M-N =2)	ISE1			-20	dBm	
7	In-band spurious emission 3	3MHz or greater (M-N >=3)	ISE2			-40	dBm	
8	Initial Carrier Frequency		ICF	-75		+75	kHz	
9	Frequency Drift 1	DH1	FD1	-25		+25	kHz	
10	Frequency Drift 2	DH3,DH5	FD2	-40		+40	kHz	
11	Drift rate	DH1,DH3,DH5	DR			400	Hz/us	
12	C/I co-channel		CIC			11	dB	-60dBm
13	C/I 1MHz		CI1			0	dB	-60dBm
14	C/I 2MHz		CI2			-30	dB	-60dBm
15	C/I >= 3MHz		CI3			-40	dB	-67dBm
16	C/I Image		CI4			-9	dB	-3MHz offset -67dBm
17	C/I Image +/- 1MHz		CI5			-20	dB	-67dBm
18	Out-of-Band Blocking 1	30MHz to 2000MHz f=2460MHz	OBB1			-10	dBm	BER<=0.1 %
19	Out-of-Band Blocking 2	2000 to 2399MHz f=2460MHz	OBB2			-27	dBm	BER<=0.1 %
20	Out-of-Band Blocking 3	2484 to 3000MHz f=2460MHz	OBB3			-27	dBm	BER<=0.1 %
21	Out-of-Band Blocking 4	3000MHz to 12.75GHz f=2460MHz	OBB4			-10	dBm	BER<=0.1 %
22	Maximum Input Level		MAXP	-20			dBm	BER<=0.1 %
23	20dB Bandwidth		B20			1	MHz	
24	Sensitivity-single	DH1	SEN1			-70	dBm	BER<=0.1 %
25	Sensitivity-multi	DH3,DH5	SEN2			-70	dBm	BER<=0.1 %

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Control No. HD-AE-B071113 (2/2)	Control name Electrical characteristics
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RF Specifications at EDR

The Specification applies for Ta=25 degrees C, VDD_3.3V =3.3V

No.	Parameter	Condition	Symbol	Min	Typ	Max	Unit	Remark
1	RMS DEVM 1	Pai/4DQPSK	RDE1			0.20		
2	RMS DEVM 2	8DPSK	RDE2			0.13		
3	Peak DEVM 1	Pai/4DQPSK	PDE1			0.35		
4	Peak DEVM 2	8DPSK	PDE2			0.25		
5	99% DEVM 1	Pai/4DQPSK	D991			0.30		
6	99% DEVM 2	8DPSK	D992			0.20		
7	EDR In-band spurious emission 1	M-N =1	EISE1	26			dB	
8	EDR In-band spurious emission 2	M-N =2	EISE2			-20	dBm	
9	EDR In-band spurious emission 3	M-N =3	EISE3			-40	dBm	
10	EDR Initial Carrier Frequency		EICF	-75		+75	kHz	
11	EDR Drift		ED	-10		+10	kHz	
12	Relative transmit power	PDPSK	RTP	PGFSK -4		PGFSK +1	dB	
13	Actual Sensitivity Level	2-DH5(3-DH5) 16000000bit	ESEN			-70	dBm	BER= 10 ⁻⁴
14	BER Floor Performance	2-DH5(3-DH5) 160000000bit	FSEN			-60	dBm	BER= 10 ⁻⁵
15	C/I co-channel	2-DH5	2CIC			13	dB	-60dBm
16	C/I 1MHz	2-DH5	2CI1			0	dB	-60dBm
17	C/I 2MHz	2-DH5	2CI2			-30	dB	-60dBm
18	C/I >= 3MHz	2-DH5	2CI3			-40	dB	-67dBm
19	C/I Image	2-DH5	2CI4			-7	dB	-67dBm -3MHz offset
20	C/I Image +/- 1MHz	2-DH5	2CI5			-20	dB	-67dBm
21	C/I co-channel	3-DH5	3CIC			21	dB	-60dBm
22	C/I 1MHz	3-DH5	3CI1			5	dB	-60dBm
23	C/I 2MHz	3-DH5	3CI2			-25	dB	-60dBm
24	C/I >= 3MHz	3-DH5	3CI3			-33	dB	-67dBm
25	C/I Image	3-DH5	3CI4			0	dB	-67dBm -3MHz offset
26	C/I Image +/- 1MHz	3-DH5	3CI5			-13	dB	-67dBm
27	Maximum Input Level	2-DH5(3-DH5)	EMAX P	-20			dBm	

Note:

Bluetooth® standard Ver 2.1+EDR conformity

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Control No. HD-AE-C071113 (1/10)	Control name Electrical characteristics
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Supported HCI Commands / HCI Events

The **Bluetooth**® functions of this module are as written in the attached PICS. Depending on firmware version Upgrade, the **Bluetooth**® functions are subject to change without notice.

HCI COMMAND LIST

Command Description	OpCode	Group (Hex)	Command (Hex)	Parameters	Returns	Status	Notes
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LINK CONTROL**Inquiry**

HCI_Inquiry	0x0401	1	1	LAP		Yes	
				Inquiry Length			
				Num Responses			
HCI_Inquiry_Cancel	0x0402	1	2		Status	Yes	
HCI_Periodic_Inquiry_Mode	0x0403	1	3	Max Period Length	Status	Yes	
				Min Period Length			
				LAP			
				Inquiry Length			
HCI_Exit_Periodic_Inquiry_Mode	0x0404	1	4		Status	Yes	

Connection Management

HCI_Create_Connection	0x0405	1	5	BD ADDR		Yes	
				Packet Type			
				Page Scan Repetition Mode			
				Reserved			
				Clock Offset			
				Allow Role Switch			
HCI_Disconnect	0x0406	1	6	Connection Handle		Yes	
				Reason			
				Packet Type			
HCI_Create_Connection_Cancel	0x0408	1	8	BD ADDR	Status BD ADDR	Yes	
HCI_Accept_Connection_Request	0x0409	1	9	BD ADDR Role		Yes	
HCI_Reject_Connection_Request	0x040A	1	A	BD ADDR Reason		Yes	
HCI_Change_Connection_Packet_Type	0x040F	1	F	Connection Handle Packet Type		Yes	
HCI_Setup_Synchronous_Connection	0x0428	1	28	Connection Handle		Yes	
				Transmit Bandwidth			
				Receive Bandwidth			
				Max Latency			
				Voice Setting			
				Retransmission Effort			
				Packet Type			
HCI_Accept_Synchronous_Connection_Request	0x0429	1	29	BD ADDR		Yes	
				Transmit Bandwidth			
				Receive Bandwidth			
				Max Latency			
				Content Format			
				Retransmission Effort			
HCI_Reject_Synchronous_Connection_Request	0x042A	1	2A	BD ADDR		Yes	

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Control No. HD-AE-C071113	(2/10)	Control name Electrical characteristics
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HCI_Write_Default_Erroneous_Data_Reporting	0x0C5B	3	5B	Erroneous_Data_Reporting	Status	Yes	
HCI_Read_Default_Erroneous_Data_Reporting	0x0C5A	3	5A		Status Erroneous_Data_Reporting	Yes	

Authentication / Pairing

HCI_Link_Key_Request_Reply	0x040B	1	B	BD ADDR Link Key	Status BD ADDR	Yes	
HCI_Link_Key_Request_Negative_Reply	0x040C	1	C	BD ADDR	Status BD ADDR	Yes	
HCI_PIN_Code_Request_Reply	0x040D	1	D	BD ADDR PIN Code Length PIN Code	Status BD ADDR	Yes	
HCI_PIN_Code_Request_Negative_Reply	0x040E	1	E	BD ADDR	Status BD ADDR	Yes	
HCI_Authentication_Requested	0x0411	1	11	Connection Handle		Yes	
HCI_Change_Connection_Link_Key	0x0415	1	15	Connection Handle		Yes	
HCI_IO_Capability_Request_Reply	0x042B	1	2B	BD ADDR IO_Capability OOB_Data_Present Authentication_Requirements	Status BD ADDR	Yes	
HCI_User_Confirmation_Request_Reply	0x042C	1	2C	BD ADDR	Status BD ADDR	Yes	
HCI_User_Confirmation_Request_Negative_Reply	0x042D	1	2D	BD ADDR	Status BD ADDR	Yes	
HCI_User_Passkey_Request_Reply	0x042E	1	2E	BD ADDR Numeric_Value	Status BD ADDR	Yes	
HCI_User_Passkey_Request_Negative_Reply	0x042F	1	2F	BD ADDR	Status BD ADDR BD ADDR	Yes	
HCI_Read_Local_OOB_Data	0x0C57	3	57		Status C (Hash C) R (Randomizer R)	Yes	
HCI_Write_Simple_Pairing_mode	0x0C56	3	56	Simple_Pairing_Mode	Status	Yes	
HCI_Read_Simple_Pairing_mode	0x0C55	3	55		Status Simple_Pairing_Mode	Yes	
HCI_Refresh_Encryption_Key	0x0C53	3	53	Connection_Handle	Status	Yes	

Encryption

HCI_Set_Connection_Encryption	0x0413	1	13	Connection_Handle Encryption_Enable		Yes	
HCI_Master_Link_Key	0x0417	1	17	Key_Flag		Yes	

Remote Information

HCI_Remote_Name_Request	0x0419	1	19	BD_ADDR Page_Scan_Repetition_Mode Page_Scan_Mode Clock_Offset		Yes	
HCI_Remote_Name_Request_Cancel	0x041A	1	1A	BD_ADDR	Status BD_ADDR	Yes	
HCI_Read_Remote_Supported_Features	0x041B	1	1B	Connection_Handle		Yes	
HCI_Read_Remote_Extended_Features	0x041C	1	1C	Connection_Handle Page_Number		Yes	

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HCI_Read_Remote_Version_Information	0x041D	1	1D	Connection Handle		Yes	
HCI_Read_Clock_Offset	0x041F	1	1F	Connection Handle		Yes	
HCI_Read_LMP_Handle	0x0420	1	20	Connection Handle	Status	Yes	
					Connection Handle		
					LMP_Handle		
					Reseved		
HCI_Remote_OOB_Data_Request_Reply	0x0430	1	30	BD ADDR	Status	Yes	
				C (Hash C)	BD ADDR		
				R (Randomizer R)			
HCI_Remote_OOB_Data_Request_Negative_Reply	0x0433	1	33	BD ADDR	Status	Yes	

LINK POLICY

HCI_Hold_Mode	0x0801	2	1	Connection Handle		Yes	
				Hold Mode Max Interval			
				Hold Mode Min Internal			
HCI_Sniff_Mode	0x0803	2	3	Connection Handle		Yes	
				Sniff Max Interval			
				Sniff Min Interval			
				Sniff Attempt			
				Sniff Timeout			
HCI_Exit_Sniff_Mode	0x0804	2	4	Connection Handle		Yes	
HCI_Park_State	0x0805	2	5	Connection Handle		Yes	
				Beacon Max Interval			
				Beacon Min Interval			
HCI_Exit_Park_State	0x0806	2	6	Connection Handle		Yes	
HCI_QoS_Setup	0x0807	2	7	Connection Handle		Yes	
				Flags			
				Service Type			
				Token Rate			
				Peak Bandwidth			
				Latency			
Delay Variation							
HCI_Role_Discovery	0x0809	2	9	Connection Handle	Status	Yes	
				Connection Handle			
				Current Role			
HCI_Switch_Role	0x080B	2	B	BD ADDR		Yes	
				Role			
HCI_Read_Link_Policy_Settings	0x080C	2	C	Connection Handle	States	Yes	
				Connection Handle			
				Link Policy Settings			
HCI_Write_Link_Policy_Settings	0x080D	2	D	Connection Handle	States	Yes	
				Link Policy settings	Connection Handle		
HCI_Read_Default_Link_Policy_Settings	0x080E	2	E		Status	Yes	
HCI_Write_Default_Link_Policy_Settings	0x080F	2	F	Default Link Policy Settings	Status	Yes	

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HCI_Flow_Specification	0x0810	2	10	Connection Handle		Yes	
				Flags			
				Flow direction			
				Service Type			
				Token Rate			
				Token Bucket Size			
				Peak Bandwidth			
				Access Latency			
HCI_Sniff_Subrating	0x0811	2	11	Connection_Handle	Status	Yes	
				Maximum_Latency	Connection_Handle		
				Minimum_Remote_Timeout			
				Minimum_Local_Timeout			

HOST CONTROLLER & BASEBAND

HCI_Set_Event_Mask	0x0C01	3	1	Event Mask	States	Yes	
HCI_Reset	0x0C03	3	3		States	Yes	
HCI_Set_Event_Filter	0x0C05	3	5	Filter Type	States	Yes	
				Filter Condition Type			
				Condition			
HCI_Flush	0x0C08	3	8	Connection Handle	States	Yes	
					Connection Handle		
HCI_Read_PIN_Type	0x0C09	3	9		States	Yes	
HCI_Write_PIN_Type	0x0C0A	3	A	PIN Type	States	Yes	
HCI_Create_New_Unit_Key	0x0C0B	3	B		States	Yes	
HCI_Read_Stored_Link_Key	0x0C0D	3	D	BD ADDR	States	No	
				Read All Flag	Max Num Keys		
					Num Keys Read		
HCI_Write_Stored_Link_Key	0x0C11	3	11	Num Keys To Write	States	No	
				BD ADDR [I]	Num Keys Written		
				Link Key [I]			
HCI_Delete_Stored_Link_Key	0x0C12	3	12	BD ADDR	States	No	
				Delete All Flag	Num Keys Deleted		
HCI_Write_Local_Name	0x0C13	3	13	Local Name	States	Yes	
HCI_Read_Local_Name	0x0C14	3	14		States	Yes	
					Local Name		
HCI_Read_Connection_Accept_Timeout	0x0C15	3	15		States	Yes	
HCI_Write_Connection_Accept_Timeout	0x0C16	3	16	Conn Accept Timeout	States	Yes	
HCI_Read_Page_Timeout	0x0C17	3	17		States	Yes	
					Page Timeout		
HCI_Write_Page_Timeout	0x0C18	3	18	Page Timeout	States	Yes	
HCI_Read_Scan_Enable	0x0C19	3	19		States	Yes	
					Scan Enable		
HCI_Write_Scan_Enable	0x0C1A	3	1A	Scan Enable	States	Yes	
HCI_Read_Page_Scan_Activity	0x0C1B	3	1B		States	Yes	
					Page Scan Interval		
					Page Scan Window		
HCI_Write_Page_Scan_Activity	0x0C1C	3	1C	Page Scan Interval	States	Yes	
				Page Scan Window			
HCI_Read_Inquiry_Scan_Activity	0x0C1D	3	1D		States	Yes	
					Inquiry Scan Interval		
					Inquiry Scan Window		

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HCI_Write_Inquiry_Scan_Activity	0x0C1E	3	1E	Inquiry Scan Interval Inquiry Scan Window	States	Yes	
HCI_Read_Authentication_Enable	0x0C1F	3	1F		States Authentication Enable	Yes	
HCI_Write_Authentication_Enable	0x0C20	3	20	Authentication Enable	States	Yes	
HCI_Read_Encryption_Mode	0x0C21	3	21		States Encryption Mode	Yes	
HCI_Write_Encryption_Mode	0x0C22	3	22	Encryption Mode	States	Yes	
HCI_Read_Class_of_Device	0x0C23	3	23		States Class of Device	Yes	
HCI_Write_Class_of_Device	0x0C24	3	24	Class of Device	States	Yes	
HCI_Read_Voice_Setting	0x0C25	3	25		States Voice Setting	Yes	
HCI_Write_Voice_Setting	0x0C26	3	26	Voice setting	States	Yes	
HCI_Read_Automatic_Flush_Timeout	0x0C27	3	27	Connection Handle	States Connection Handle Flush Timeout	Yes	
HCI_Write_Automatic_Flush_Timeout	0x0C28	3	28	Connection Handle Flush Timeout	States Connection Handle	Yes	
HCI_Read_Num_Broadcast_Retransmission	0x0C29	3	29		States	Yes	
HCI_Write_Num_Broadcast_Retransmission	0x0C2A	3	2A	Num Broadcast Retransmission	States	Yes	
HCI_Read_Hold_Mode_Activity	0x0C2B	3	2B		States Hold Mode Activity	Yes	
HCI_Write_Hold_Mode_Activity	0x0C2C	3	2C	Hold Mode Activity	States	Yes	
HCI_Read_Transmit_Power_Level	0x0C2D	3	2D	Connection Handle Type	States Connection Handle Power Level	Yes	
HCI_Read_Synchronous_Flow_Control_Enable	0x0C2E	3	2E		States Synchronous Flow Control Enable	No	
HCI_Write_Synchronous_Flow_Control_Enable	0x0C2F	3	2F	Synchronous Flow Control Enable	States	No	
HCI_Set_Controller_To_Host_Flow_Control	0x0C31	3	31	Flow Control Enable	States	Yes	
HCI_Host_Buffer_Size	0x0C33	3	33	Host ACL Data Packet Length Host SCO Data Packet Length Host Total Num ACL Data Packets Host Total Num SCO Data Packets	States	Yes	
HCI_Host_Number_Of_Completed_Packets	0x0C35	3	35	Number of Handles Connection handle [I] Host Num of Completed Packets [I]		Yes	
HCI_Read_Link_Supervision_Timeout	0x0C36	3	36	Connection Handle	States Connection Handle Link Supervision Timeout	Yes	
HCI_Write_Link_Supervision_Timeout	0x0C37	3	37	Connection Handle Link Supervision Timeout	States Connection Handle	Yes	
HCI_Read_Number_Of_Support_IAC	0x0C38	3	38		States Num Support IAC	Yes	
HCI_Read_Current_IAC_LAP	0x0C39	3	39		States Num Current IAC IAC LAP [I]	Yes	

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HCI_Write_Current_IAC_LAP	0x0C3A	3	3A	Num Current IAC IAC LAP [I]	States	Yes	
HCI_Read_Page_Scan_Period_Mode	0x0C3B	3	3B		States Page Scan Period Mode	Yes	
HCI_Write_Page_Scan_Period_Mode	0x0C3C	3	3C	Page Scan Period Mode	States	Yes	
HCI_Read_Page_Scan_Mode	0x0C3D	3	3D		States Page Scan Mode	Yes	
HCI_Write_Page_Scan_Mode	0x0C3E	3	3E	Page Scan Mode	States	No	
HCI_Set_AFH_Host_Channel_Classification	0x0C3F	3	3F	AH Host Channel Classification	Status	Yes	
HCI_Read_Inquiry_Scan_Type	0x0C42	3	42		Status Scan Type	Yes	
HCI_Write_Inquiry_Scan_Type	0x0C43	3	43	Scan Type	Status	Yes	
HCI_Read_Inquiry_Mode	0x0C44	3	44		Status Inquiry Mode	Yes	
HCI_Write_Inquiry_Mode	0x0C45	3	45	Inquiry Mode	Status	Yes	
HCI_Read_Page_Scan_Type	0x0C46	3	46		Status Page Scan Type	Yes	
HCI_Write_Page_Scan_Type	0x0C47	3	47	Page Scan Type	Status	Yes	
HCI_Read_AFH_Channel_Assessment_Mode	0x0C48	3	48		Status AFH Channel Assessment Mode	Yes	
HCI_Write_AFH_Channel_Assessment_Mode	0x0C49	3	49	AFH Channel Assessment Mode	Status	Yes	
HCI_Read_Extended_Inquiry_Response	0x0C51	3	51		Status FEC Required Extended Inquiry Response	Yes	
HCI_Write_Extended_Inquiry_Response	0x0C52	3	52	FEC Required Extended Inquiry Response	Status	Yes	
HCI_Enhanced_Flush	0x0C5F	3	5F	Connection Handle Packet Type	(None)	Yes	

INFORMATIONAL PARAMETERS

HCI_Read_Local_Version_Information	0x1001	4	1		Status HCI Version HCI Revision LMP Version Manufacturer Name LMP Subversion	Yes	
HCI_Read_Local_Supported_Commands	0x1002	4	2		Status Supported Commands	Yes	
HCI_Read_Local_Supported_Features	0x1003	4	3		Status LMP Features	Yes	
HCI_Read_Local_Extended_Features	0x1004	4	4	Page number	Status Page number Maximum Page Number Extended LMP Features	Yes	

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HCI_Read_Buffer_Size	0x1005	4	5		Status	Yes	
					HC ACL Data Packet Length		
					HC Synchronous Data Packet Length		
					HC Total Num ACL Data Packets		
HCI_Read_BD_ADDR	0x1009	4	9		HC Total Num Synchronous Data Packets	Yes	
					Status		
					BD ADDR		

STATUS PARAMETERS

HCI_Read_Failed_Contact_Counter	0x1401	5	1	Connection Handle	Status	Yes	
					Connection Handle		
					Failed Contact Counter		
HCI_Reset_Failed_Contact_Counter	0x1402	5	2	Connection Handle	Status	Yes	
					Connection Handle		
HCI_Read_Link_Quality	0x1403	5	3	Connection Handle	Status	No	
					Connection Handle		
					Link Quality		
HCI_Read_RSSI	0x1405	5	5	Connection Handle	Status	Yes	
					Connection Handle		
					RSSI		
HCI_Read_AFH_Channel_Map	0x1406	5	6	Connection Handle	Status	Yes	
					Connection Handle		
					AFH Mode		
					AFH Channel Map		
HCI_Read_Clock	0x1407	5	7	Connection Handle	Status	Yes	
				Which Clock	Connection Handle		
					Clock		
					Accuracy		

TESTING

HCI_Read_Loopback_Mode	0x1801	6	1		Status	Yes	
					Loopback Mode		
HCI_Write_Loopback_Mode	0x1802	6	2	Loopback Mode	Status	Yes	
HCI_Enable_Device_Under_Test_Mode	0x1803	6	3		Status	Yes	
HCI_Write_Simple_Pairing_Debug_mode	0x1804	6	4	Simple_Pairing_Debug_Mode	Status	Yes	

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HCI EVENT LIST

Event Description	OpCode	Parameters	Status	Notes
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Inquiry

Inquiry_Complete	0x01	Status	Yes	
Inquiry_Result	0x02	Num Responses	Yes	
		BD ADDR [I]		
		Page Scan Repetition Mode [I]		
		Page Scan Period Mode [I]		
		Page Scan Mode [I]		
		Class of Device [I]		
Inquiry_Result_with_RSSI	0x22	Clock Offset [I]	Yes	B
		Num Responses		
		BD ADDR [I]		
		Page Scan Repetition Mode [I]		
		Page Scan Period Mode [I]		
		Page Scan Mode [I]		
		Class of Device [I]		
Clock Offset [I]				
		RSSI [I]		

Connection Management

Connection_Complete	0x03	Status	Yes	
		Connection Handle		
		BD ADDR		
		Link Type		
Connection_Request	0x04	Encryption Mode	Yes	
		BD ADDR		
		Class of Device		
Disconnection_Complete	0x05	Link Type	Yes	
		Status		
		Connection Handle		
Synchronous_Connection_Complete	0x2C	Reason	Yes	
		Status		
		Connection Handle		
		BD ADDR		
		Link Type		
		Transmission Interval		
		Retransmission Window		
		Rx Packet Length		
		Tx Packet Length		
Air Mode				
Synchronous_Connection_Changed	0x2D	Status	Yes	
		Connection Handle		
		Transmission Interval		
		Retransmission Window		
		Rx Packet Length		
		Tx Packet Length		

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Control No. HD-AE-C071113	(9/10)	Control name Electrical characteristics
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Authentication / Pairing

Authentication_Complete	0x06	Status	Yes	
		Connection Handle		
Return_Link_Keys	0x15	Num Keys	No	a
		BD ADDR [I]		
		Link Key [I]		
PIN_Code_Request	0x16	BD ADDR	Yes	
Link_Key_Request	0x17	BD ADDR	Yes	
Link_Key_Notification	0x18	BD ADDR	Yes	
		Link Key		
		Key Type		

Encryption

Encryption_Change	0x08	Status	Yes	
		Connection Handle		
		Encryption Enable		
Change_Connection_Link_Key_Complete	0x09	Status	Yes	
		Connection Handle		
Master_Link_Key_Complete	0x0A	Status	Yes	
		Connection Handle		
		Key Flag		

Remote Information

Remote_Name_Request_Complete	0x07	Status	Yes	
		BD ADDR		
		Remote Name		
Read_Remote_Supported_Features_Complete	0x0B	Status	Yes	
		Connection Handle		
		LMP Features		
Read_Remote_Version_Information_Complete	0x0C	Status	Yes	
		Connection Handle		
		LMP Version		
		Manufacture Name		
Read_Remote_Extended_Features_Complete	0x23	LMP Subversion	Yes	
		Status		
		Connection Handle		
		Page Number		
		Maximum page number		
Extended LMP Features				

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Control No. HD-AE-C071113	(10/10)	Control name Electrical characteristics
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Link Policy

QoS_Setup_Complete	0x0D	Status	Yes	
		Connection Handle		
		Flags		
		Service Type		
		Token Rate		
		Peak Bandwidth		
		Latency		
Role_Change	0x12	Status	Yes	
		BD ADDR		
		New Role		
Mode_Change	0x14	Status	Yes	
		Connection Handle		
		Current Mode		
		Interval		
Flow_Specification_Complete	0x21	Status	Yes	
		Connection Handle		
		Flags		
		Flow direction		
		Service Type		
		Token Rate		
		Token Bucket Size		
		Peak Bandwidth		
Access Latency				
Sniff_Subrating	0x2E	Status	Yes	
		Connection Handle		
		Maximum Transmit Latency		
		Maximum Receive Latency		
		Minimum Remote Timeout		
		Minimum Local Timeout		

General

Command_Complete	0x0E	Num HCI Command Packets	Yes	
		Command Opcode		
		Return Parameters		
Command_Status	0x0F	Status	Yes	
		Num HCI Command Packets		
		Command Opcode		
Hardware_Error	0x10	Hardware Code	Yes	
Number_Of_Completed_Packets	0x13	Number of Handles	Yes	
		Connection Handle [I]		
		HC Num HCI Data Packets [I]		
Data_Buffer_Overflow	0x1A	Link Type	No	
Max_Slots_Change	0x1B	Connection Handle	Yes	
		LMP Max Slots		
Read_Clock_Offset_Complete	0x1C	Status	Yes	
		Connection Handle		
		Clock Offset		

Host Controller & Baseband

Flush_Occurred	0x11	Connection Handle	Yes	
Loopback_Command	0x19	HCI Command Packet	Yes	
Connection_Packet_Type_Change	0x1D	Status	Yes	
		Connection Handle		
		Packet Type		
QoS_Violation	0x1E	Connection Handle	No	

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PICS for Firmware Version XX.XX.XX

The **Bluetooth**[®] functions of this module are as below. Depending on firmware version upgrade, the **Bluetooth**[®] functions are subject to change without notice.

RF Capabilities (based on PICS proforma for Radio):**Table 1: RF Capabilities**

Item	Capability	Status	Support
1	Power Class =1	M.1	No
2	Power Class =2	M.1	Yes
3	Power Class=3	M.1	No
4	Power Control	C.1	Yes
5	1-slot packets supported	M	Yes
6	3-slot packets supported	O	Yes
7	5-slot packets supported	O	Yes
8	79 Channels	M	Yes
9	Support for GFSK modulation	M	Yes
10	Support for $\pi/4$ -DQPSK modulation	C.2	Yes
11	Support for BDPSK modulation	C.3	Yes

M.1: Must choose One and only One Power Class

C.1: Mandatory to support IF Power Class 1 is supported, ELSE Optional

C.2: Mandatory IF SUM (21/4) OR SUM (21/6) is claimed, Optional IF SUM (21/3) OR SUM (21/5) is claimed, Excluded otherwise.

C.3: Mandatory IF SUM (21/4) OR SUM (21/6) is claimed, Optional IF RF(1/8) AND (SUM (21/3) OR SUM (21/5)) are claimed

Baseband Capabilities (based on PICS proforma for Baseband)**Table 1: Physical Channel**

Item	Capability	Status	Support
1	Support frequency band and 79 RF channels	M	Yes
2	Adaptive Frequency Hopping Kernel	M	Yes

Table 1a: Modulation schemes

Item	Capability	Status	Support
1	Basic Data Rate, 1 Mbps payload data rate	M	Yes
2	Enhanced Data Rate, 2 Mbps payload data rate	C.1	Yes
3	Enhanced Data Rate, 3 Mbps payload data rate	C.2	Yes

C.1 Mandatory IF SUMMARY(21/6) is claimed, Optional IF SUMMARY(21/5) is claimed

C.2 Mandatory IF SUMMARY(21/6) is claimed, Optional IF BB(1a/2) AND SUMMARY(21/5) are claimed

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Control No. HD-AE-D071113	(2/11)	Control name Electrical characteristics
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Table 2: Link Types

Item	Capability	Status	Support
1	Support of ACL link	M	Yes
2	Support of SCO link	O	Yes
3	Support of eSCO link	O	Yes
4	Support of Enhanced Data Rate ACL links	C.1	Yes
5	Support of Enhanced Data Rate eSCO links	C.2	Yes

C.1 Mandatory IF SUMMARY(22/1) OR SUMMARY(22/2) is claimed, Optional IF SUMMARY(21/5) OR SUMMARY(21/6) is claimed

C.2 Mandatory IF SUMMARY(22/3) is claimed, Optional IF SUMMARY(21/5) OR SUMMARY(21/6) is claimed

C.2 Mandatory IF SUMMARY(22/3) is claimed, Optional IF SUMMARY(21/5) OR SUMMARY(21/6) is claimed

Table 3: SCO Link support

Prerequisite for Items (3/5-8):(2/3) (Support of eSCO link)

Prerequisite for Items (3/1-4):(2/2) (Support of SCO link)

Item	Capability	Status	Support
1	SCO links to same Slave	C.1	Yes
2	SCO links to different Slaves	O	Yes
3	SCO links from same Master	C.1	Yes
4	SCO links from different Masters	O	Yes
5	eSCO links to same Slave	C.2	Yes
6	eSCO links to different Slaves	O	Yes
7	eSCO links from same Master	C.2	Yes
8	eSCO links from different Masters	O	Yes

C.2: Mandatory to support at least One link (3/5 or 3/7)

C.1: Mandatory to support at least One link (3/1 3/3)

Table 4: Common packet types

Item	Capability	Status	Support
1	Support of ID packet type	M	Yes
2	Support of NULL packet type	M	Yes
3	Support of POLL packet type	M	Yes
4	Support of FHS packet type	M	Yes
5	Support of DM1 packet type	M	Yes

Table 5: ACL packet types

Item	Capability	Status	Support
1	Support of DH1 packet type	M	Yes
2	Support of DM3 packet type	O	Yes
3	Support of DH3 packet type	O	Yes
4	Support of DM5 packet type	O	Yes
5	Support of DH5 packet type	O	Yes
6	Support of AUX1 packet type	O	Yes

Control No. HD-AE-D071113	(3/11)	Control name Electrical characteristics
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Table 5a: Enhanced Data Rate ACL Packet Types

Prerequisite: 2/4 (Support of Enhanced Data Rate ACL links)

Item	Capability	Status	Support
1	Support 2-DH1 packet type	C.1	Yes
2	Support 2-DH3 packet type	C.2	Yes
3	Support 2-DH5 packet type	C.2	Yes
4	Support 3-DH1 packet type	C.3	Yes
5	Support 3-DH3 packet type	C.4	Yes
6	Support 3-DH5 packet type	C.5	Yes

C.1 Mandatory IF SUMMARY(22/1) OR SUMMARY(22/2) is claimed, Optional IF BB(1a/2) is claimed

C.2 Mandatory IF SUMMARY(22/2) is claimed, Optional IF BB(1a/2) is claimed

C.3 Mandatory IF SUMMARY(22/1) OR SUMMARY(22/2) is claimed, Optional IF BB(1a/3) is claimed

C.4 Mandatory IF SUMMARY(22/2) is claimed, Optional IF BB(5a/2) AND BB(5a/4) are claimed

C.5 Mandatory IF SUMMARY(22/2) is claimed, Optional IF BB(5a/3) AND BB(5a/4) are claimed

Table 6: SCO and eSCO packet types

Prerequisite for Items (6/1-4):(2/2) (Support of SCO link)

Prerequisite for Items (6/5-7):(2/3) (Support of eSCO link)

Item	Capability	Status	Support
1	Support of HV1 packet type	C.1	Yes
2	Support of HV2 packet type	O	Yes
3	Support of HV3 packet type	O	Yes
4	Support of DV packet type	C.1	Yes
5	Support of EV3 packet type	C.2	Yes
6	Support of EV4 packet type	O	Yes
7	Support of EV5 packet type	O	Yes

C.1 Mandatory IF only (2/2) SCO link is supported

C.2 Mandatory IF only (2/3) eSCO link is supported

Table 6a: Enhanced Data Rate eSCO packet types

Prerequisite: 2/5 (Support Enhanced Data Rate eSCO links)

Item	Capability	Status	Support
1	Support 2 –EV3 packet type	C.1	Yes
2	Support 2 –EV5 packet type	C.2	Yes
3	Support 3 –EV3 packet type	C.3	Yes
4	Support 3 –EV5 packet type	C.4	Yes

C.1 Mandatory IF SUMMARY(22/3) is claimed, Optional IF BB(1a/2) is claimed

C.2 Optional IF BB(1a/2) is claimed

C.3 Mandatory IF SUMMARY(22/3) is claimed Optional IF BB(1a/3) is claimed

C.4 Optional IF BB(1a/3) is claimed

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Table 7: Page procedures

Item	Capability	Status	Support
1	Support paging	M	Yes
2	Support page scan	M	Yes
3	(Intentionally left blank)		No
4	(Intentionally left blank)		No
5	Supports Interlaced Scan during page scan	O	Yes

Table 8: Paging schemes

Item	Capability	Status	Support
1	Supports mandatory scan mode	M	Yes

Table 9: Paging modes

Item	Capability	Status	Support
1	Supports paging mode R0	C.1	Yes
2	Supports paging mode R1	C.1	Yes
3	Supports paging mode R2	C.1	Yes

C.1: At least one of the paging scan modes must be supported.

Table 9b: Paging train repetition

Item	Capability	Status	Support
1	Supports Npage ≥ 1	O	Yes
2	Supports Npage ≥ 128	O	Yes
3	Supports Npage ≥ 256	M	Yes

Note: The master should use Npage ≥ 256 unless it knows what SR mode the slave uses.

Table 10: Inquiry procedures

Item	Capability	Status	Support
1	Support inquiry	O	Yes
2	Inquiry scan with first FHS	O	Yes
3	(Intentionally left blank)		No
4	(Intentionally left blank)		No
5	Supports the dedicated inquiry access code	O	Yes
6	Supports Interlaced Scan during inquiry scan	O	Yes
7	Extended Inquiry Response	O	Yes

Table 11: Piconet capabilities

Item	Capability	Status	Support
1	Broadcast messages	O	Yes
2	Point-to-multipoint connections	O	Yes

Table 12: Scatternet capabilities

Item	Capability	Status	Support
1	Act as Master in one piconet and as Slave in another piconet	O	Yes
2	Act as Slave in more than one piconet	O	Yes

Control No. HD-AE-D071113	(5/11)	Control name Electrical characteristics
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Table 13: Synchronous Coding Schemes

Prerequisite: 2/2 (SCO link support)

Item	Capability	Status	Support
1	A-law	O	Yes
2	u-law	O	Yes
3	CVSD	O	Yes
4	Transparent Synchronous Data	O	Yes

Table 14: Erroneous Data Reporting

Item	Capability	Status	Support
1	Erroneous Data Reporting for SCO	C.1	Yes
2	Erroneous Data Reporting for eSCO	C.2	Yes

C.1: Optional IF ((SUM ICS: 21/5 OR SUM ICS: 21/6) AND HCI: 9/6) is supported, ELSE excluded.

C.2: Optional IF ((SUM ICS: 21/5 OR SUM ICS: 21/6) AND HCI: 9/7) is supported, ELSE excluded.

Table 15: This table is intentionally left blank: DO NOT USE

Item	Capability	Status	Support
1	(Intentionally left blank)		No

Table 16: Non-flushable Packet Boundary Flag

Item	Capability	Status	Support
1	Support Non-flushable Packet Boundary Flag	C.1	Yes

C.1 MANDATORY IF ((SUM ICS: 21/5 OR SUM ICS 21/6) AND HCI: 12/10) is supported, ELSE OPTIONAL IF (SUM ICS: 21/5 OR SUM ICS: 21/6) is supported, ELSE excluded.

Table 17: Connection States

Item	Capability	Status	Support
1	Sniff Subrating Mode	C.1	Yes

C.1 MANDATORY IF ((SUM ICS: 21/5 OR SUM ICS 21/6) AND LMP: 2/8) is supported, ELSE OPTIONAL IF (SUM ICS: 21/5 OR SUM ICS: 21/6) is supported, ELSE excluded.

Control No. HD-AE-D071113	(6/11)	Control name Electrical characteristics
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Link Manager Capabilities (based on PICS proforma for Link Manager)**Table 1: Response Messages**

Item	Capability	Status	Support
1	Accept message	M	Yes
2	Reject message	M	Yes

Table 2: Supported Features

Item	Capability	Status	Support
1	3-slot packets	O	No
2	5-slot packets	O	Yes
3	Encryption	C.5	Yes
4	Slot offset	O	Yes
5	Timing accuracy	O	Yes
6	Role switch (Master/Slave)	O	Yes
7	Hold mode	O	Yes
8	Sniff mode	O	Yes
9	Park mode	O	Yes
10	Power Control	C.1	Yes
11	Channel quality driven data rate	O	Yes
12	SCO link	O	Yes
13	RSSI	O	Yes
14	Broadcast encryption	O	Yes
15	eSCO link	O	Yes
16	Adaptive frequency hopping	M	Yes
17	Enhanced Data Rate ACL	C.2	Yes
18	Enhanced Data Rate eSCO	C.3	
19	Simple Pairing	C.4	Yes

C.1: Mandatory IF (RF:1/1) supported, ELSE Optional

C.2 Mandatory IF (SUMMARY:22/1) OR (SUMMARY:22/2) is claimed, Optional IF (SUMMARY:21/5) OR (SUMMARY:21/6) is claimed

C.3 Mandatory IF (SUMMARY:22/3) is claimed, Optional IF (SUMMARY:21/5) OR (SUMMARY:21/6) is claimed

C.4 Mandatory IF (SUMMARY 2-1/5 OR SUMMARY 2-1/6) is claimed, ELSE Excluded.

C.5 Optional IF (SUMMARY 2-1/1 OR SUMMARY 2-1/2 OR SUMMARY 2-1/3 OR SUMMARY 2-1/4) ELSE Mandatory

Table 3: Authentication

Item	Capability	Status	Support
1	Initiate authentication before connection completed	O	Yes
2	Initiate authentication after connection completed	O	Yes
3	Respond to authentication request	M	Yes

Table 4: Pairing

Item	Capability	Status	Support
1	Initiate pairing before connection completed	O	Yes
2	Initiate pairing after connection completed	O	Yes
3	Respond to pairing request	M	Yes
4	Use fixed PIN and request responder to initiator switch	C.1	Yes
5	Use variable PIN	C.1	Yes
6	Accept initiator to responder switch	C.2	Yes

C.1: Mandatory to support at least One, (LMP:4/4) OR (LMP:4/5) OR both

C.2: Mandatory IF (LMP: 4/5) AND (LMP:4/1), OR (LMP: 4/5) AND (LMP:4/2)) is supported.

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Control No. HD-AE-D071113	(7/11)	Control name Electrical characteristics
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Table 5: Link Keys

Item	Capability	Status	Support
1	Creation of link key - Unit Key	C.1	No
2	Creation of link key - Combination Key	C.1	Yes
3	Initiate change of link key	O	Yes
4	Accept change of link key	M	Yes
5	(Intentionally left blank)		No
6	(Intentionally left blank)		No
7	Accept pairing with Unit Key	O	Yes

C.1: Mandatory to support at least One - either (LMP:5/1) OR (LMP:5/2).

Table 6: Encryption

Prerequisite: 2/3(Encryption supported)

Item	Capability	Status	Support
1	Initiate encryption	C.1	Yes
2	Accept encryption requests	M.1	Yes
3	(Intentionally left blank)		No
4	(Intentionally left blank)		No
5	Key size negotiation	M.1	Yes
6	Start encryption, as master	M.1	Yes
7	Accept start of encryption	M.1	Yes
8	Stop encryption, as master	M.1	Yes
9	Accept stop of encryption	M.1	Yes

M.1: Mandatory IF (LMP:2/3) - (Encryption) is supported.

C.1: Mandatory IF (SUMMARY 2-1/5 OR SUMMARY 2-1/6) is claimed, ELSE Optional.

Table 7: Clock offset information

Item	Capability	Status	Support
1	Request clock offset information	O	Yes
2	Respond to clock offset requests	M	Yes

Table 8: Slot offset information

Prerequisite: 2/4 (Slot offset)

Item	Capability	Status	Support
1	Send slot offset information	C.1	Yes

C.1: Mandatory IF (LMP:13/1) - (Master/Slave switch) supported, ELSE Optional.

Table 9: Timing accuracy information

Prerequisite: 2/5 (Timing accuracy)

Item	Capability	Status	Support
1	Request timing accuracy information	O	Yes
2	Respond to timing accuracy information requests	M.1	Yes

M.1: Mandatory IF (LMP:2/5) - (Timing Accuracy) supported

Table 10: LM version information

Item	Capability	Status	Support
1	Request LM version information	O	Yes
2	Respond to LM version information requests	M	Yes

Control No. HD-AE-D071113	(8/11)	Control name Electrical characteristics
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Table 11: Feature support

Item	Capability	Status	Support
1	Request supported features	C.1	Yes
2	Respond to supported features requests	M	Yes
3	Request extended features mask	C.2	Yes
4	Respond to extended features Request	C.2	Yes

C.1: Mandatory IF any of the Optional features in (LMP:2/1-3), (LMP:2/5), (LMP:2/7-12), (LMP:2/14-16), (LMP:26/1) is requested by the IUT, ELSE Optional.

C.2 Mandatory IF a feature requiring another features page is supported, ELSE Optional.

Table 12: Name information

Item	Capability	Status	Support
1	Request name information	O	Yes
2	Respond to name requests	M	Yes

Table 13: Role Switch

Prerequisite: 2/6(Role switch)

Item	Capability	Status	Support
1	Request Master Slave switch	O	Yes
2	Accept Master Slave switch requests	M.1	Yes

M.1 Mandatory IF LMP:(2/6) - (Role Switch) supported

Table 14: Detach

Item	Capability	Status	Support
1	Detach connection	M	Yes

Table 14a: Setting up and Removing Enhanced Data Rate ACL Connection

Item	Capability	Status	Support
1	Enter Enhanced Data Rate	C.1	Yes
2	Exit Enhanced Data Rate	C.1	Yes

C.1 Mandatory IF (LMP:2/17) supported, ELSE Excluded.

Table 14b: Setting up and Removing Enhanced Data Rate eSCO Connection

Item	Capability	Status	Support
1	Enter and exit eSCO using Enhanced Data Rate Packets	C.1	Yes

C.1 Mandatory IF (LMP:2/18) supported, ELSE Excluded.

Table 15: Hold mode

Prerequisite: 2/7 (Hold mode)

Item	Capability	Status	Support
1	Force hold mode	O	Yes
2	Request hold mode	C.1	Yes
3	Respond to hold mode requests	M	Yes
4	Accept forced hold mode	M	Yes

C.1: Mandatory IF (LMP:15/1) - (Force hold mode) is supported, ELSE Optional.

Control No. HD-AE-D071113	(9/11)	Control name Electrical characteristics
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Table 16: Sniff mode

Item	Capability	Status	Support
1			No
2	Request sniff mode	O	Yes
3	Respond to sniff mode requests (renegotiate or reject)	M.1	Yes
4			No
5	Request un-sniff	C.1	Yes
6	Accept un-sniff requests	M.1	Yes
7	Sniff Subrating Mode	C2	Yes

C.1: Mandatory IF (LMP:16/2) - (Request sniff mode) is supported, ELSE Optional.

M.1: Mandatory IF (LMP:2/8) - (Sniff Mode) is supported.

C.2 Mandatory IF (SUMMARY 2-1/5 OR SUMMARY 2-1/6) is claimed, ELSE Excluded

Table 17: Park mode

Item	Capability	Status	Support
1			
2	Request park mode	O	Yes
3	Respond to park mode requests	M.1	Yes
4			
5	Set up broadcast scan window	O	Yes
6	Accept changes to the broadcast scan window	M.1	Yes
7	Modify beacon parameters	O	Yes
8	Accept modification of beacon parameters	M.1	Yes
9	Request Unpark using PM_ADDR	C.1	Yes
10	Request Unpark using BD_ADDR	C.1	Yes
11	Slave requested Unpark	O	Yes
12	Accept Unpark using PM_ADDR	M.1	Yes
13	Accept Unpark using BD_ADDR	M.1	Yes

M.1: Mandatory IF (LMP:2/9) - (Park Mode) is supported

C.1: IF (LMP:17/3) - (Respond to park mode requests) is supported, THEN at least One of (LMP:17/9) - (Unpark using PM_ADDR) OR (LMP:17/10) - (Unpark using BD_ADDR) is Mandatory, ELSE Optional.

Table 18: Power Control

Prerequisite: 2/13 (RSSI)

Prerequisite: 2/10(Power control)

Item	Capability	Status	Support
1	Request to increase power	M.1	Yes
2	Request to decrease power	M.1	Yes
3	Respond when max power reached	M.2	Yes
4	Respond when min power reached	M.2	Yes

M.1: Mandatory IF (LMP:2/13) - (RSSI) is supported

M.2: Mandatory IF (LMP:2/10) - (Power Control) is supported

Table 19: Link supervision timeout

Item	Capability	Status	Support
1	Set link supervision timeout value	O	Yes
2	Accept link supervision timeout setting	M	Yes

Table 20: Quality of Service

Item	Capability	Status	Support
1	Channel quality driven change between DM and DH packet types	C.1	Yes
2	Force/Request change of Quality of Service	M	Yes
3	Request change of Quality of Service	M	Yes

C.1: Mandatory IF support of (LMP:2/11) is stated in the feature request, ELSE Optional.

Control No. HD-AE-D071113	(10/11)	Control name Electrical characteristics
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Table 21: SCO Links

Prerequisite: 2/12 (SCO links)

Item	Capability	Status	Support
1	Initiate SCO links, as Master	O	Yes
2	Initiate SCO links, as Slave	O	Yes
3	Accept SCO links	O	Yes
4	Remove SCO links, as Master	C.1	Yes
5	Remove SCO links, as Slave	C.2	Yes
6	Negotiate SCO link parameters, as Master	C.3	Yes
7	Negotiate SCO link parameters, as Slave	C.4	Yes

C.1: Mandatory IF (LMP:21/1) - (Initiating SCO links, as Master) is supported, ELSE Optional.

C.2: Mandatory IF (LMP:21/2) - (Initiating SCO links, as Slave) is supported, ELSE Optional.

C.3: Mandatory IF (LMP:21/1) - (Initiating SCO links, as Master) OR (LMP:21/3) - (Accept SCO links) is supported, ELSE Optional.

C.4: Mandatory IF (LMP:21/2) - (Initiating SCO links, as Slave) OR (LMP:21/3) - (Accept SCO links) is supported, ELSE Optional.

Table 22: Multi-Slot packages

Item	Capability	Status	Support
1	Accept maximum allowed number of slots to be used	C.1	Yes
2	Request maximum number of slots to be used	C.1	Yes
3	Accept request of maximum number of slots to be used	C.1	Yes

C.1: Mandatory IF (LMP:2/1) AND/OR (LMP:2/2) is supported in the feature request, ELSE Optional.

Table 23: Paging scheme

Item	Capability	Status	Support
1	Request page mode to use	O	No
2	Accept suggested page mode	O	No
3	Request page scan mode to use	O	No
4	Accept suggested page scan mode	O	No

Table 24: Connection Establishment

Item	Capability	Status	Support
1	Create connection for higher layers	M	Yes
2	Respond to requests to establish connections for higher layers	M	Yes
3	Indicate that link set-up is completed	M	Yes

Table 25: Test Mode

Item	Capability	Status	Support
1	Activate test mode	O	Yes
2	Ability to reject activation of test mode if test mode is disabled	M	Yes
3	Control test mode	O	Yes
4	Ability to reject test mode control commands if test mode is disabled.	M	Yes

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Control No. HD-AE-D071113	(11/11)	Control name Electrical characteristics
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Table 26: Adaptive Frequency Hopping

Prerequisite: 2/20(AFH)

Item	Capability	Status	Support
1	Support of AFH switch as master	O	Yes
2	Support of AFH switch as slave	M	Yes
3	Support of Channel Classification reporting as master	C.1	Yes
4	Support of Channel Classification reporting as slave	C.2	Yes
5	Support channel classification from host	C.3	Yes
6	Support of Channel Classification	O	Yes

C.1: Optional IF (LMP:26/6) is supported, ELSE Excluded.

C.2: Mandatory IF (LMP:26/6) is supported, ELSE Excluded.

C.3: Mandatory IF (LMP:26/1) OR (LMP:26/4) is supported, ELSE Optional.

M.1: Mandatory IF (LMP:2/20) - (AFH) supported

Table 27: This Table is intentionally left blank

Item	Capability	Status	Support
1	This line is intentionally blank.	O	No
2	This line is intentionally blank.	O	No
3	N/A	O	No
4	N/A	O	No

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Control No. HD-MC-A071113	(1/1)	Control name Circuit Schematic
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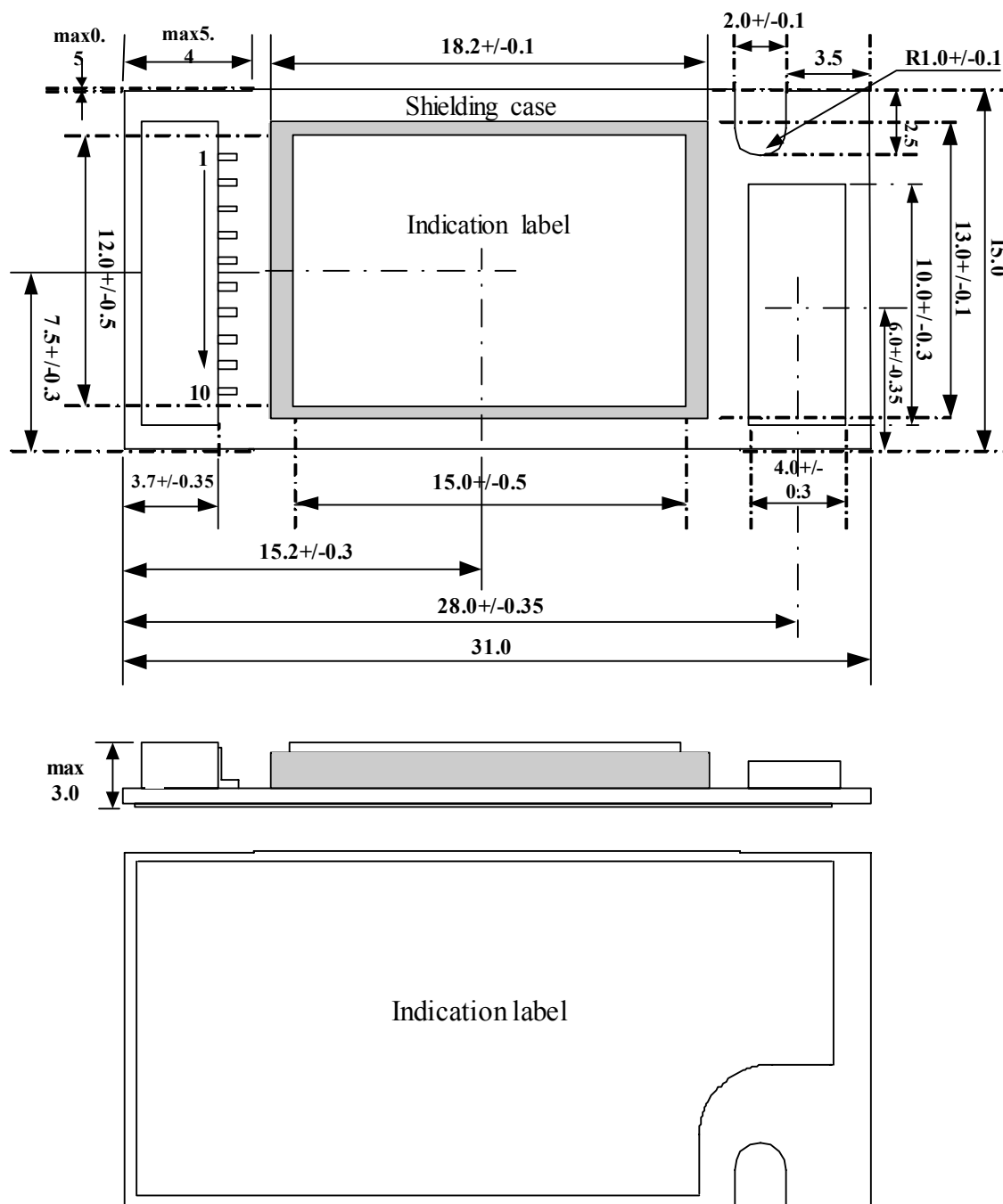
Block Diagram

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Control No. HD-AD-A071113	(1/1)	Control name Outline/Appearance
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Unit: mm, Tolerances unless otherwise specified: +/-0.2mm



Note:

Outline/Appearance data is PRELIMINARY, not guaranteed and subject to change without notice.

Please contact Taiyo Yuden for the details of module mountings.

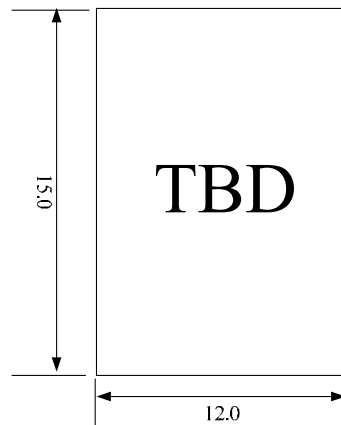
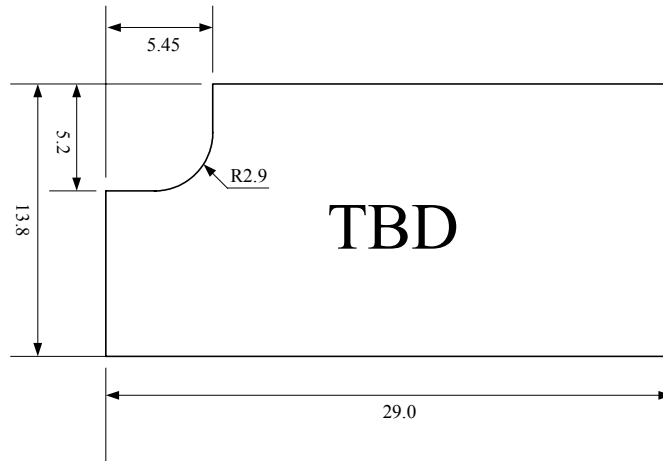
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Control No. HD-AD-B071113	(1/1)	Control name Outline/Appearance
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Indication label

Unit: mm



Material: PET (UL969) / Label color : White

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Control No. HD-BA-A071113	(1/1)	Control name Pin Layout
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Pin Descriptions

Terminal No.	Terminal name	Input/Output	Description	Remark
1	GND	-	Ground	
2	USB_D+	Input/Output	USB data (Positive) input-output	
3	USB_D-	Input/Output	USB data (Negative) input-output	
4	PIO4/ (BT_PRIORITY/ CH_CLK)	Output	BT_Priority/CH_CLK output for Co-existence signaling	
5	GND(DETECT)	-	DETECT	
6	/RESET	Input	Active low RESET signal with internal weak pull-up	
7	PIO2/ (WLAN_ACTIVE/ CH_DATA)	Input	WLAN_Active/CH_Data input for Co-existence signaling	
8	VDD_3.3V	Input	DC3.3V Power supply	Note 1
9	PIO0/ RADIO_DISABLE	Input	Radio Disable signal input Low RF ON High RF OFF	
10	GND	-	Ground	

Notes:

- Pin8 (VDD_3.3V) is used for power supply of BT module. (MAX 200mA).
To fill the standard of "Supply voltage ripple and spike noise", the capacitor, which has the capacity of TBD uF or more , should be put in the terminal VDD_3.3V outside as a bypass capacitor .