

Bluetooth[®] Module

EYBMABA (RF+Baseband (Class 2) UART)

User's Manual

Please note that this users manual should not be provided to end-users.

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Rev. record

Nov.16. 2007> Ver.0.1

Control No. HD-AM- A071044 (1/1)	Control name Absolute maximum ratings 絶対最大定格書	APPROVED	CHECKED	DRAWN	DESIGNED
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1. Maximum rating

Item	Symbol	MIN	TYP	MAX	Unit	Condition
Supply voltage	VDD	-0.3		3.6	V	Ta=25°C, GND reference
Input voltage	Vin	-0.3		VDD+0.3	V	

2. Recommendation operating range

Item	Symbol	MIN	TYP	MAX	Unit	Condition
Operating supply voltage	VDD	3.0	3.30	3.6	V	
Supply voltage ripple and spike noise	VDD_m			(30)	mV/p-p	Note3)
Operating temperature range	Topr	0	25	70	°C	Humidity =40%RH Note1)
Storage temperature range	Tstg	-30	25	85	°C	Humidity =40%RH Note2)

Note1) 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.

動作温度範囲は短期的に製品の電気的特性を満足する温度範囲です。

TYP 規格から大きく外れた条件で、長期ご使用の場合の製品寿命につきましては信頼性条件をご参照願います。

Note2) Storage temperature range is the condition for transportation and storage in temporary.

Please keep it under condition of “reference data” (HQ-BA-**) for long-term storage.

保存温度範囲は、輸送時や短期間の保管時の条件です。

長期保管時は、取扱注意要領の条件に従って保管して下さい。

Note3) The Max. is a reference value. The value may change depending on the evaluation.

Max. 値は参考値となります。今後の検証によって変更になる可能性があります。

Control No. HD - AE - A 0 7 1 0 4 4 (1/4)	Control name Electrical characteristics (Digital) 電気的特性書 (Digital)	APPROVED	CHECKED	DRAWN	DESIGNED
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Electrical characteristics

DC Specifications

The Specification applies for Topr=25 degrees C, VDD=3.3V

No.	Parameter	Condition	Symbol	Min	Typ	Max	Unit	Remark
1	Normal supply voltage		VDD	3.0	3.3	3.6	V	
2	Input low voltage	/RESET, VREG_CTL, UART_RX, UART_CTS	VIL	0		0.8	V	
3	Input High voltage	/RESET, VREG_CTL, UART_RX, UART_CTS	VIH	2.0		VDD	V	
4	Output low voltage	UART_TX, UART_RTS	VOL	-		0.4	V	Iout=-2mA
5	Output High voltage	UART_TX, UART_RTS	VOH	VDD-0.4		-	V	Iout=-2mA
6	Peak current	Continuous Rx	Iccp		(60)	(180)	mA	Note 4
7	Average current 1	Sniff mode (Slave only)	Icca1		TBD		mA	Notes 1,3
8	Average current 2	Standby mode	Icca2		(13)		mA	Notes 3, 4
9	Average current 3	Send DM1packet (Master)	Icca3		TBD		mA	Note 3
10	Average current 4	Receive DM1packet (Slave)	Icca4		TBD		mA	Note 3
11	Average current 5	Hold mode (Slave only)	Icca5		TBD		mA	Note 3
12	Average current 6	Park mode (Slave only)	Icca6		TBD		mA	Notes 2,3
13	Average current 7	/Reset	Icca7		(8)		mA	Note 4
14	Average current 8	VREG_CTL OFF	Icca8		(0.4)		mA	Note 4

Notes:

1. Sniff mode parameter: Max interval 0050h
Min interval 0010h
Attempt 0005h
Timeout 0005h

2. Park mode parameter: Max interval 0100h
Min interval 0010h

3. The consumption current might fluctuate with the condition of radio communication, host performance and test circuit.

4. The Typ. is a reference value. The value may change depending on the evaluation.

3. 消費電流は、通信状況、HOST パフォーマンス、検査回路によって変動する可能性があります。

4. Typ.値は参考値となります。今後の検証によって変更になる可能性があります。

Control No. HD - AE - A 0 7 1 0 4 4 (2/4)	Control name Electrical characteristics (Digital) 電氣的特性書 (Digital)	APPROVED	CHECKED	DRAWN	DESIGNED
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AC Specifications

The Specification applies for Topr=25 degrees C, VDD=3.3V

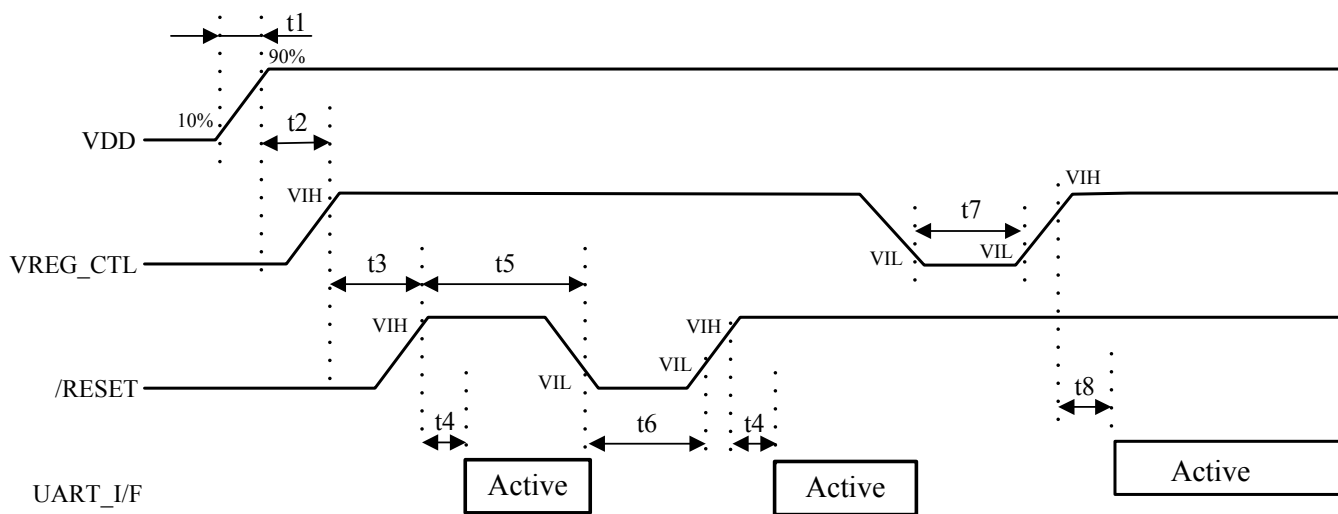
No.	Parameter	Condition	Symbol	Min	Typ	Max	Unit	Remark
1	VDD Rise Time from 0V to 3.0V		t1			(2)	ms	Note 2
2	VDD=3.0V to VREG_CTL High		t2	0			ms	
3	VREG_CTL= 3.0V to /RESET High		t3	0			ms	
4	/RESET High to Module Ready		t4		(2600)		ms	Notes 1, 2
5	/RESET High to /RESET Low		t5	0			ms	
6	/RESET Pulse Width		t6			4	us	
7	VREG_CTL Pulse Width		t7	TBD			ms	
8	VREG_CTL High to Module Ready		t8		(2600)		ms	Notes 1, 2
9	/RESET Low to VDD Off		t9	0			ms	
10	VREG_CTL Low to VDD Off		t10	0			ms	

Notes:

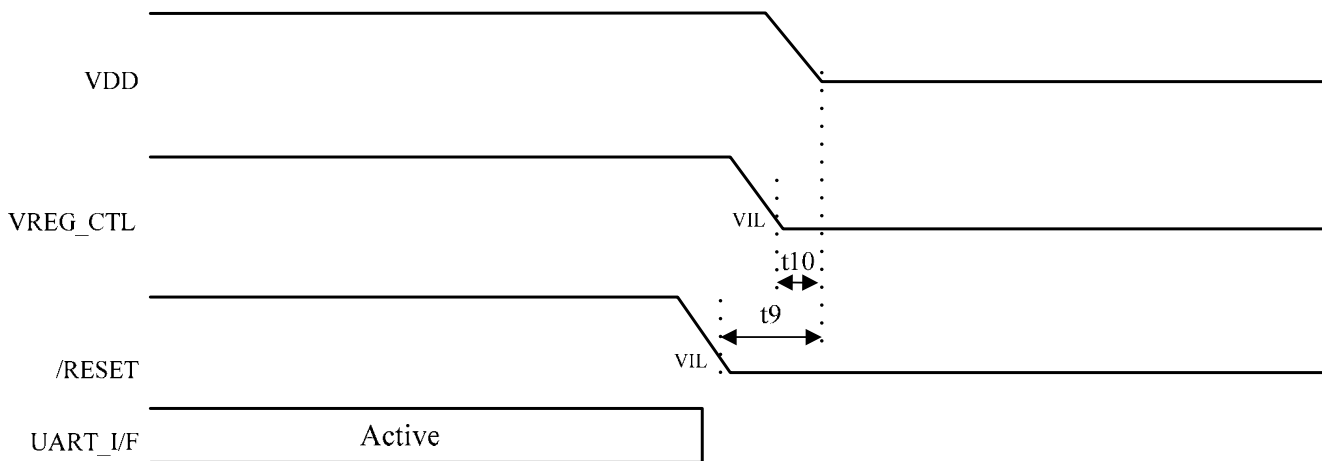
1. It may change due to the firmware version.
2. The Typ. is a reference value. The value may change depending on the evaluation.

1. 値は、firmware version によって変更する可能性があります。
2. Typ.値は参考値となります。今後の検証によって変更になる可能性があります。

Control No. HD - AE - A 0 7 1 0 4 4 (3/4)	Control name Electrical characteristics (Digital) 電気的特性書 (Digital)	APPROVED	CHECKED	DRAWN	DESIGNED
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Timing Diagram for Power Up Sequence



Timing Diagram for Power Down Sequence

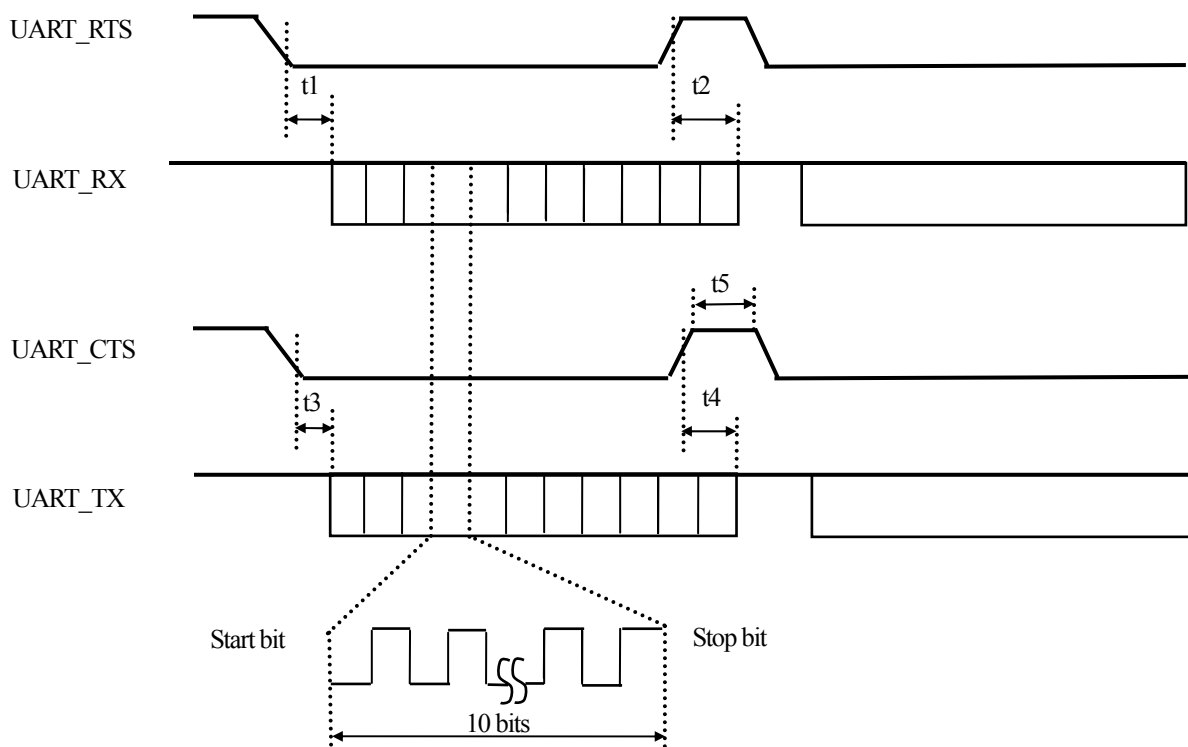
Control No. HD - AE - A 0 7 1 0 4 4 (4/4)	Control name Electrical characteristics (Digital) 電気的特性書 (Digital)	APPROVED	CHECKED	DRAWN	DESIGNED
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UART Interface

AC Specifications

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

No.	Parameter	Condition	Symbol	Min	Typ	Max	Unit	Remark
1	RTS Low to RX Data On		t1	0			ms	
2	RTS High to RX Data Off		t2			5	byte	Firmware controlled.
3	CTS Low to TX Data On		t3	1			us	
4	CTS High to TX Data Off		t4			1	byte	
5	CTS High Pulse Width		t5	0			bit	



Timing Diagram for UART signals

<UART Parameters>

Item	Parameter
Baud Rate	115.2kbps (Typ.)
Date Bits	8bits
Stop Bits	1bit
Parity	None
Flow Control	CTS/RTS

Note:

Control No. HD - AE - B 0 7 1 0 4 4 (1/1)	Control name Electrical characteristics (RF) 電気的特性書 (RF)	APPROVED	CHECKED	DRAWN	DESIGNED
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Electrical characteristics

The Specification applies for Topr = 0to +70°C, VDD=3.00 to 3.60V

RF Specifications

No	Parameter	Symbol	Spec			Unit	Remark
			Min	Typ	Max		
1	Frequency		2402		2480	MHz	0~78ch(1MHz step)
2	Initial Frequency Tolerance	IFT	-48	0	48	kHz	DH5
3	Output Power	POW	-3.5	0	2.5	dBm	Ta=25±2°C @Max Power
			-6	0	4	dBm	@Max Power
4	Modulation Characteristics	MC1	140	160	175	kHz	Payload: 11110000 average
		MC4	115	160		kHz	Payload: 10101010 average
5	Sensitivity	SEN		-83	-75	dBm	BER<0.1%, Ta=25±2°C
				-80	-70	dBm	BER<0.1%

Note:

RF output is suspended within TBD after /RESET Active.

通信中に /RESET Active となった場合、RF 出力は TBD 以下で停止します。

Control No. HD - AE - C 0 7 1 0 4 4 (1/11)	Control name Electrical characteristics (Software A) 電気的特性書 (Software A)	APPROVED	CHECKED	DRAWN	DESIGNED
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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.

本モジュールの Bluetooth 機能が PICS に記載されています。Bluetooth 機能はファームウェアバージョンに応じて予告なしで変更されます。

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	a
				Inquiry Length			
				Num Responses			
HCI_Inquiry_Cancel	0x0402	1	2		Status	Yes	b
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	c
HCI_Accept_Connection_Request	0x0409	1	9	BD ADDR		Yes	
				Role			
HCI_Reject_Connection_Request	0x040A	1	A	BD ADDR		Yes	
				Reason			
HCI_Change_Connection_Packet_Type	0x040F	1	F	Connection Handle		Yes	c
				Packet Type			
HCI_Setup_Synchronous_Connection	0x0428	1	28	Connection Handle		Yes	d
				Transmit Bandwidth			
				Receive Bandwidth			
				Max Latency			
				Voice Setting			
				Retransmission Effort			
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	
				Reason			

Control No. HD - AE - C 0 7 1 0 4 4 (2/11)	Control name Electrical characteristics (Software A) 電気的特性書 (Software A)	APPROVED	CHECKED	DRAWN	DESIGNED
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Authentication / Pairing

HCI_Link_Key_Request_Reply	0x040B	1	B	BD ADDR	Status	Yes	
				Link Key	BD ADDR		
HCI_Link_Key_Request_Negative_Reply	0x040C	1	C	BD ADDR	Status	Yes	
					BD ADDR		
HCI_PIN_Code_Request_Reply	0x040D	1	D	BD ADDR	Status	Yes	
				PIN Code Length	BD ADDR		
				PIN Code			
HCI_PIN_Code_Request_Negative_Reply	0x040E	1	E	BD ADDR	Status	Yes	
					BD ADDR		
HCI_Authentication_Requested	0x0411	1	11	Connection Handle		Yes	
HCI_Change_Connection_Link_Key	0x0415	1	15	Connection Handle		Yes	

Encryption

HCI_Set_Connection_Encryption	0x0413	1	13	Connection Handle		Yes	
				Encryption Enable			
HCI_Master_Link_Key	0x0417	1	17	Key Flag		Yes	

Remote Information

HCI_Remote_Name_Request	0x0419	1	19	BD ADDR		Yes	
				Page Scan Repetition Mode			
				Reserved			
				Clock Offset			
HCI_Remote_Name_Request_Cancel	0x041A	1	1A	BD ADDR	Status	Yes	
					BD ADDR		
HCI_Read_Remote_Supported_Features	0x041B	1	1B	Connection Handle		Yes	
HCI_Read_Remote_Extended_Features	0x041C	1	1C	Connection Handle		Yes	
				Page Number			
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		
					Reserved		

Control No. HD - AE - C 0 7 1 0 4 4 (3/11)	Control name Electrical characteristics (Software A) 電気的特性書 (Software A)	APPROVED	CHECKED	DRAWN	DESIGNED
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LINK POLICY

HCI_Hold_Mode	0x0801	2	1	Connection Handle		Yes	
				Hold Mode Max Interval			
				Hold Mode Min Interval			
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	e
				Flags			
				Service Type			
				Token Rate			
				Peak Bandwidth			
				Latency			
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	
					Connection Handle		
HCI_Read_Default_Link_Policy_Settings	0x080E	2	E		Status	Yes	
					Default Link Policy Settings		
HCI_Write_Default_Link_Policy_Settings	0x080F	2	F	Default Link Policy Settings	Status	Yes	
HCI_Flow_Specification	0x0810	2	10	Connection Handle		Yes	f
				Flags			
				Flow direction			
				Service Type			
				Token Rate			
				Token Bucket Size			
				Peak Bandwidth			
				Access Latency			

Control No. HD - AE - C 0 7 1 0 4 4 (4/11)	Control name Electrical characteristics (Software A) 電気的特性書 (Software A)	APPROVED	CHECKED	DRAWN	DESIGNED
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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	g
				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	PIN Type	Yes	
HCI_Create_New_Unit_Key	0x0C0B	3	B		States	Yes	h
HCI_Read_Stored_Link_Key	0x0C0D	3	D	BD ADDR	States	No	i
				Read All Flag	Max Num Keys		
					Num Keys Read		
HCI_Write_Stored_Link_Key	0x0C11	3	11	Num Keys To Write	States	No	i
				BD ADDR [I]	Num Keys Written		
				Link Key [I]			
HCI_Delete_Stored_Link_Key	0x0C12	3	12	BD ADDR	States	No	i
				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	
					Conn Accept Timeout		
HCI_Write_Connection_Accept_Timeout	0x0C16	3	16	Conn Accept Timeout	States	Yes	
HCI_Read_Page_Timeout	0x0C17	3	17		States	Yes	j
					Page Timeout		
HCI_Write_Page_Timeout	0x0C18	3	18	Page Timeout	States	Yes	j
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		
HCI_Write_Inquiry_Scan_Activity	0x0C1E	3	1E	Inquiry Scan Interval	States	Yes	
				Inquiry Scan Window			
HCI_Read_Authentication_Enable	0x0C1F	3	1F		States	Yes	
					Authentication Enable		
HCI_Write_Authentication_Enable	0x0C20	3	20	Authentication Enable	States	Yes	
HCI_Read_Encryption_Mode	0x0C21	3	21		States	Yes	
					Encryption Mode		
HCI_Write_Encryption_Mode	0x0C22	3	22	Encryption Mode	States	Yes	
HCI_Read_Class_of_Device	0x0C23	3	23		States	Yes	
					Class of Device		
HCI_Write_Class_of_Device	0x0C24	3	24	Class of Device	States	Yes	
HCI_Read_Voice_Setting	0x0C25	3	25		States	Yes	
					Voice Setting		
HCI_Write_Voice_Setting	0x0C26	3	26	Voice setting	States	Yes	

Control No. HD - AE - C 0 7 1 0 4 4 (5/11)	Control name Electrical characteristics (Software A) 電気的特性書 (Software A)			APPROVED	CHECKED	DRAWN	DESIGNED
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HCI_Read_Automatic_Flush_Timeout	0x0C27	3	27	Connection Handle	States	Yes	
					Connection Handle		
					Flush Timeout		
HCI_Write_Automatic_Flush_Timeout	0x0C28	3	28	Connection Handle	States	Yes	
				Flash Timeout	Connection Handle		
HCI_Read_Num_Broadcast_Retransmission	0x0C29	3	29		States	Yes	
					Num Broadcast Retransmissions		
HCI_Write_Num_Broadcast_Retransmission	0x0C2A	3	2A	Num Broadcast Retransmission	States	Yes	
HCI_Read_Hold_Mode_Activity	0x0C2B	3	2B		States	Yes	
					Hold Mode Activity		
HCI_Write_Hold_Mode_Activity	0x0C2C	3	2C	Hold Mode Activity	States	Yes	
HCI_Read_Transmit_Power_Level	0x0C2D	3	2D	Connection Handle	States	Yes	k
				Type	Connection Handle		
					Transmit Power Level		
HCI_Read_Synchronous_Flow_Control_Enable	0x0C2E	3	2E		States	Yes	l
					Synchronous Flow Control Enable		
HCI_Write_Synchronous_Flow_Control_Enable	0x0C2F	3	2F	Synchronous Flow Control Enable	States	No	m
HCI_Set_Controller_To_Host_Flow_Control	0x0C31	3	31	Flow Control Enable	States	No	n
HCI_Host_Buffer_Size	0x0C33	3	33	Host ACL Data Packet Length	States	Yes	n
				Host Synchronous Data Packet Length			
				Host Total Num ACL Data Packets			
				Host Total Num Synchronous Data Packets			
HCI_Host_Number_Of_Completed_Packets	0x0C35	3	35	Number of Handles		Yes	n
				Connection Handle [I]			
				Host Num of Completed Packets [I]			
HCI_Read_Link_Supervision_Timeout	0x0C36	3	36	Connection Handle	States	Yes	
					Connection Handle		
					Link Supervision Timeout		
HCI_Write_Link_Supervision_Timeout	0x0C37	3	37	Connection Handle	States	Yes	o
				Link Supervision Timeout	Connection Handle		
HCI_Read_Number_Of_Support_IAC	0x0C38	3	38		States	Yes	
					Num Support IAC		
HCI_Read_Current_IAC_LAP	0x0C39	3	39		States	Yes	
					Num Current IAC		
					IAC LAP [I]		
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	Yes	
					Page Scan Period Mode		
HCI_Write_Page_Scan_Period_Mode	0x0C3C	3	3C	Page Scan Period Mode	States	No	
Set_AFH_Host_Channel_Classification	0x0C3F	3	3F	AFH Host Channel Classification	Status	Yes	

Control No. HD - AE - C 0 7 1 0 4 4 (6/11)	Control name Electrical characteristics (Software A) 電気的特性書 (Software A)	APPROVED	CHECKED	DRAWN	DESIGNED
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HCI_Read_Inquiry_Scan_Type	0x0C42	3	42		Status	Yes	
					Scan Type		
HCI_Write_Inquiry_Scan_Type	0x0C43	3	43	Scan Type	Status	Yes	
HCI_Read_Inquiry_Mode	0x0C44	3	44		Status	Yes	
					Inquiry Mode		
HCI_Write_Inquiry_Mode	0x0C45	3	45	Inquiry Mode	Status	Yes	
HCI_Read_Page_Scan_Type	0x0C46	3	46		Status	Yes	
					Page Scan Type		
HCI_Write_Page_Scan_Type	0x0C47	3	47	Page Scan Type	Status	Yes	
HCI_Read_AFH_Channel_Assessment_Mode	0x0C48	3	48		Status	Yes	
					AFH Channel Assessment Mode		
HCI_Write_AFH_Channel_Assessment_Mode	0x0C49	3	49	AFH Channel Assessment Mode	Status	Yes	

INFORMATIONAL PARAMETERS

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

Control No. HD - AE - C 0 7 1 0 4 4 (7/11)	Control name Electrical characteristics (Software A) 電気的特性書 (Software A)	APPROVED	CHECKED	DRAWN	DESIGNED
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STAUS 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	p
					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		States	Yes	
					Loopback Mode		
HCI_Write_Loopback_Mode	0x1802	6	2	Loopback Mode	States	Yes	
HCI_Enable_Device_Under_Test_Mode	0x1803	6	3		States	Yes	

Notes:

- Note that for testing purposes, this command may be issued with an Inquiry Length of 0 to program an infinite inquiry length.
- Does not cancel an inquiry that resulted from a periodic inquiry command.
- The packet type field has been expanded for EDR support. It is totally compatible to 2.0+EDR and earlier specifications.
- Can support up to 3 links of SCO or eSCO or a combination of SCO + eSCO.
- Firmware will try to ensure the throughput is guaranteed by deducing a correlated Tpoll value from the Token Rate parameter together with the packet type that is enabled at the time this command is issued. Once a desirable token rate is deduced, the firmware will send LMP_QUALITY_OF_SERVICE_REQ_PDU to the remote device. If the remote device accepts the Tpoll, the firmware will send a QoS_SETUP_COMPLETE event to the host.
When the firmware receives a LMP_QUALITY_OF_SERVICE_REQ_PDU, it will send accept as long as the Tpoll is larger than 2 slots in single connection scenario, or Tpoll is larger than 4 slots in a multiple connection scenario.
- Currently only support symmetric flow specification. Asymmetric flow specification support will be available in B0 and after products.
- BD_ADDR filter condition is not supported.
- Does not support local unit key since unit key is less secure, but will accept if peer sends unit key.
- No Link Key database.
- Note that for testing purposes, a Page Timeout of 0 can be issued to denote an infinite Page Timeout value.
- The requested transmit power returned as a signed char in the range of 0 to -28 in 4 dBm steps.
- Called HCI_READ_SCO_FLOW_CONTROL_ENABLE in and earlier specs.
- Called HCI_WRITE_SCO_FLOW_CONTROL_ENABLE in and earlier specs.
- ACL only.
- Only master role will take effect.
- Current golden range is -52 to -72 dBm. Note that this command will return the RSSI associated with the last received packet.

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- a) テスト目的で、無限の Inquiry Length プログラムのため Inquiry Length=0 で発行することができる。
- b) Periodic Inquiry コマンドはキャンセルしません。
- c) EDR 対応のためパケットタイプフィルタを広げています。それは 2.0+EDR と以前の仕様と完全互換性があります。
- d) SCO か eSCO は最大 3 個のリンク、または SCO+eSCO の組み合わせを対応することができます。
- e) このコマンドを発行するときに有効にするパケットタイプと共に、Token Rate パラメータから関連する Tpoll 値を推論することにより、ファームウェアはスループットが保証されるのを確実にしようとする。
望ましい Token Rate がいったん推論されると、ファームウェアは LMP_QUALITY_OF_SERVICE_REQ_PDU をリモートデバイスに送る。
もしリモートデバイスが Tpoll を受け入れると、ファームウェアは Qos_SETUP_COMPLETE イベントを HOST へ送る。
ファームウェアは LMP_QUALITY_OF_SERVICE_REQ_PDU を受けるとき、シングル接続での 2 スロットより Tpoll が大きければ、または複数接続での 4 スロットより Tpoll が大きいなら ACCEPT を送る。
- f) 現在 Symmetric Flow のみ対応しています。Asymmetric Flow は B0 と以降の製品で利用可能になる。
- g) BD_ADDR フィルタコンテションは対応されません。
- h) Unit key が安全でないので Local unit key を対応していないが、相手が Unit key を送ると受け入れる。
- i) リンクキーテーブルはありません。
- j) テスト用に無限の Page Timeout 値を指定するために Page Timeout=0 を発行することができます。
- k) 送信パワー要求の戻り値は signed char 型の 0~-28 範囲で 4dBm ステップです。
- l) 以前の仕様では HCI_READ_SCO_FLOW_CONTROL_ENABLE でした。
- m) 以前の仕様では HCI_WRITE_SCO_FLOW_CONTROL_ENABLE でした。
- n) ACL だけです。
- o) マスターだけ効果あります。
- p) 現在の Golden Range は -52 から -72dBm です。このコマンドは最後の受信パケットの関連した RSSI を返すでしょう。

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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]		
		Reserved[I]		
		Reserved[I]		
		Class of Device [I]		
Inquiry_Result_with_RSSI	0x22	Clock Offset [I]	Yes	
		Num responses		
		BD ADDR [I]		
		Page Scan Repetition Mode [I]		
		Reserved [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				
Synchronous_Connection_Changed	0x2D	Air Mode	Yes	
		Status		
		Connection Handle		
		Transmission Interval		
		Retransmission Window		
		Rx Packet Length		
		Tx Packet Length		

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		

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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	Status	Yes	
		Connection Handle		
		Page Number		
		Maximum page number		
		Extended LMP Features		

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		
Flow_Specification_Complete	0x21	Status	Yes	
		Connection Handle		
		Flags		
		Flow direction		
		Service Type		
		Token Rate		
		Token Bucket Size		
		Peak Bandwidth		
Access Latency				

Control No. HD - AE - C 0 7 1 0 4 4 (11/11)	Control name Electrical characteristics (Software A) 電気的特性書 (Software A)	APPROVED	CHECKED	DRAWN	DESIGNED
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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	b
		Connection Handle [I]		
		HC Num Of Completed 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 _Changed	0x1D	Status	Yes	
		Connection Handle		
		Packet Type		
QoS _Violation	0x1E	Connection Handle	No	
Page _Scan _Repetition Mode Change	0x20	BD ADDR	No	
		Page Scan Repetition Mode		

Notes:

- a) No Link Key database.
- b) ACL only. The generation of this event is based on buffer thresholds within the BCM2045. This event will however, be returned periodically during periods of inactivity when credits are outstanding.
- a) リンクキーのデータベースはありません。
- b) ACL だけです。このイベントの発生は BCM2045 の中でバッファ閾値に基づいています。しかしながらこのイベントは、クレジットが未解決である無活動の期間の間、定期的に返される。

Control No. HD – AE – D 0 7 1 0 4 4 (1/9)	Control name Electrical characteristics (Software B) 電気的特性書 (Software B)	APPROVED	CHECKED	DRAWN	DESIGNED
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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

RF Capabilities (based on PICS proforma for Radio):

Table A.1: RF Capabilities

Item	Capability	Status	Support
1	Power Class (1,2 or 3)	M	Yes
2	Power Control	C.1	Yes
3	1-slot packets supported	M	Yes
4	3-slot packets supported	O	Yes
5	5-slot packets supported	O	Yes
6	79 Channels	M	Yes
7	Support for GFSK modulation	M	Yes
8	Support for $\pi/4$ -DQPSK modulation	C.2	Yes
9	Support for BDPSK modulation	C.3	Yes

C.1 : Mandatory to support if Power Class 1 is supported, optional to support if Power Class 2 or 3 is supported.

C.2 : Mandatory if SUMMARY, 2-1/4 is claimed;

Optional if SUMMARY, 2-1/3 is claimed;

Excluded otherwise.

C.3 : Mandatory if SUMMARY, 2-1/4 is claimed;

Else Optional if (RF, 1/8 AND SUMMARY, 2-1/3) is claimed;

Baseband

Baseband Capabilities (based on PICS proforma for Baseband)

Table B.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 B.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, 2-1/4) is claimed;

Optional if (SUMMARY, 2-1/3) is claimed;

Excluded otherwise.

C.2: Mandatory if (SUMMARY, 2-1/4) is claimed;

Optional if (BB, 1a/2 AND SUMMARY, 2-1/3) is claimed;

Excluded otherwise.

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Table B.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, 2-2/1 OR SUMMARY, 2-2/2) is claimed;
ELSE Optional IF (SUMMARY, 2-1/3 OR SUMMARY, 2-1/4) is claimed;
Excluded otherwise.

C.2: Mandatory IF SUMMARY, 2-2/3 is claimed;
ELSE Optional IF (SUMMARY, 2-1/3 OR SUMMARY, 2-1/4) is claimed;
Excluded otherwise.

Table B.3: SCO Link support

Prerequisite: 2/2 (Support of SCO link)

Item	Capability	Status	Support
1	SCO links to same Slave	C.1	Yes (3 SCO)
2	SCO links to different Slaves	O	Yes (3 SCO)
3	SCO links from same Master	C.1	Yes (3 SCO)
4	SCO links from different Masters	O	No

C.1: Mandatory to support at least 1 link.

Prerequisite: 2/3 (Support of eSCO link)

Item	Capability	Status	Support
5	eSCO links to same Slave	C.2	Yes (6 SCO)
6	eSCO links to different Slaves	O	Yes (5 SCO)
7	eSCO links from same Master	C.2	Yes (6 SCO)
8	eSCO links from different Masters	O	No

C.2: Mandatory to support at least 1 link.

Table B.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 B.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

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Table B.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, 2-2/1 OR SUMMARY, 2-2/2) is claimed;

ELSE Optional IF BB, 1a/2 is claimed;

Excluded otherwise.

C.2: Mandatory IF SUMMARY, 2-2/2 is claimed;

ELSE Optional IF BB, 1a/2 is claimed;

Excluded otherwise.

C.3: Mandatory IF (SUMMARY, 2-2/1 OR SUMMARY, 2-2/2) is claimed;

ELSE Optional IF BB, 1a/3 is claimed;

Excluded otherwise.

C.4: Mandatory IF SUMMARY, 2-2/2 is claimed;

ELSE Optional IF (BB, 5a/2 AND BB, 5a/4) is claimed;

Excluded otherwise.

C.5: Mandatory IF SUMMARY, 2-2/2 is claimed;

ELSE Optional IF (BB, 5a/3 AND BB, 5a/4) is claimed;

Excluded otherwise.

Table B.6: SCO and eSCO packet types

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

Item	Capability	Status	Support
1	Support of HV1 packet type	M	Yes
2	Support of HV2 packet type	O	Yes
3	Support of HV3 packet type	O	Yes
4	Support of DV packet type	M	Yes

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

Item	Capability	Status	Support
5	Support of EV3 packet type	M	Yes
6	Support of EV4 packet type	O	Yes
7	Support of EV5 packet type	O	Yes

Table B.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, 2-2/3 is claimed;

ELSE Optional IF BB, 1a/2 is claimed;

Excluded otherwise.

C.2: Optional IF BB, 1a/2 is claimed;

Excluded otherwise.

C.3: Mandatory IF SUMMARY, 2-2/3 is claimed;

ELSE Optional IF BB, 1a/3 is claimed;

Excluded otherwise.

C.4: Optional IF BB, 1a/3 is claimed;

Excluded otherwise.

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Table B.7: Page procedures

Item	Capability	Status	Support
1	Support paging	M	Yes
2	Support page scan	M	Yes
3			
4			
5	Supports Interlaced Scan during page scan	O	Yes

Table B.8: Paging schemes

Item	Capability	Status	Support
1	Supports mandatory scan mode	M	Yes

Table B.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 B.9 (b): 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 B.10: Inquiry procedures

Item	Capability	Status	Support
1	Support inquiry	O	Yes
2	Inquiry scan with first FHS	O	Yes
3			
4			
5	Supports the dedicated inquiry access code	O	Yes
6	Supports Interlaced Scan during inquiry scan	O	Yes

Table B.11: Piconet capabilities

Item	Capability	Status	Support
1	Broadcast messages	O	Yes
2	Point-to-multipoint connections	O	Yes (7)

Table B.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

Table B.13: Synchronous Coding Schemes

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

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Link Manager

Link Manager Capabilities (based on PICS proforma for Link Manager)

Table C.1: Response Messages

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

Table C.2: Supported Features

Item	Capability	Status	Support
1	3-slot packets	O	Yes
2	5-slot packets	O	Yes
3	Encryption	O	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	Yes

C.1: If Power Class 1 is supported (RF, 1/1=1) then Mandatory, else Optional.

C.2: Mandatory IF (SUMMARY 2-2/1 OR SUMMARY 2-2/2) is claimed;
ELSE Optional IF (SUMMARY 2-1/3 OR SUMMARY 2-1/4) is claimed;
Excluded otherwise.

C.3: Mandatory IF SUMMARY 2-2/3 is claimed;
ELSE Optional IF (SUMMARY 2-1/3 OR SUMMARY 2-1/4) is claimed;
Excluded otherwise.

Table C.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 C.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 of Pairing/ 4 and Pairing/5.

C.2: Mandatory to support if Pairing/5 and (Pairing/1 or Pairing/2) is supported.

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Table C. 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			
6			
7	Accept pairing with Unit Key	O	Yes

C.1: Mandatory to support at least one of the key types.

Table C.6: Encryption

Prerequisite: 2/3(Encryption supported)

Item	Capability	Status	Support
1	Initiate encryption	O	Yes
2	Accept encryption requests	M	Yes
3			
4			
5	Key size negotiation	M	Yes
6	Start encryption, as master	M	Yes
7	Accept start of encryption	M	Yes
8	Stop encryption, as master	M	Yes
9	Accept stop of encryption	M	Yes

Table C.7: Clock offset information

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

Table C.8: Slot offset information

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

C.1: Mandatory to support if support if support if Role Switch/1 (Master/Slave switch) otherwise optional.

Table C.9: Timing accuracy information

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

Table C.10: LM version information

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

Table C.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 to support if any of the optional features in Supported Features/1-3, Supported Features /5, Supported Features /7-12, Supported Features /14-16, Adaptive Frequency Hopping/1 is requested by the IUT otherwise optional.

C.2: Mandatory if a feature requiring another features page is supported, otherwise optional.

Control No. HD - AE - D 0 7 1 0 4 4 (7/9)	Control name Electrical characteristics (Software B) 電気的特性書 (Software B)	APPROVED	CHECKED	DRAWN	DESIGNED
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Table C.12: Name information

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

Table C.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	Yes

Table C.14: Detach

Item	Capability	Status	Support
1	Detach connection	M	Yes

Table C.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 , otherwise excluded.

Table C.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, 2/18supported , otherwise excluded.

Table C.15: Hold mode

Prerequisite: 2/7 (Hold mode)

Item	Capability	Status	Support
1	Force hold mode	O	No
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 to support if LMP, 15/1 (Force hold mode) is supported, otherwise optional.

Table C.16: Sniff mode

Item	Capability	Status	Support
1			
2	Request sniff mode	O	Yes
3	Respond to sniff mode requests (renegotiate or reject)	M	Yes
4			
5	Request un-sniff	C.1	Yes
6	Accept un-sniff requests	M	Yes

C.1: If LMP, 16/2 (Request sniff mode) is supported then mandatory to support, otherwise optional.

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Table C.17: Park mode

Item	Capability	Status	Support
1			
2	Request park mode	O	Yes
3	Respond to park mode requests	M	Yes
4			
5	Set up broadcast scan window	O	No
6	Accept changes to the broadcast scan window	M	Yes
7	Modify beacon parameters	O	No
8	Accept modification of beacon parameters	M	Yes
9	Request Unpark using PM_ADDR	C.1	No
10	Request Unpark using BD_ADDR	C.1	Yes
11	Slave requested Unpark	O	Yes
12	Accept Unpark using PM_ADDR	M	Yes
13	Accept Unpark using BD_ADDR	M	Yes

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 to support, otherwise optional.

Table C.18: Power Control

Prerequisite: 2/13 (RSSI)

Item	Capability	Status	Support
1	Request to increase power	M	Yes
2	Request to decrease power	M	Yes

Prerequisite: 2/10(Power control)

Item	Capability	Status	Support
3	Respond when max power reached	M	Yes
4	Respond when min power reached	M	Yes

Table C.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 C.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 to support if support of LMP, 2/11 is stated in the feature request, otherwise optional.

Table C.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 to support if LMP, 21/1 (Initiating SCO links, as Master) is supported, otherwise optional.

C.2: Mandatory to support if LMP, 21/2 (Initiating SCO links, as Slave) is supported, otherwise optional.

C.3: Mandatory to support if LMP, 21/1 (Initiating SCO links, as Master) or LMP, 21/3 (Accept SCO links) is supported, otherwise optional.

C.4: Mandatory to support if LMP, 21/2 (Initiating SCO links, as Slave) or LMP, 21/3 (Accept SCO links) is supported, otherwise optional. Comments:

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Table C.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 to support if LMP, 2/1 and/or LMP, 2/2 is supported in the feature request, otherwise optional.

Table C.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 C.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 C.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

Table C.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

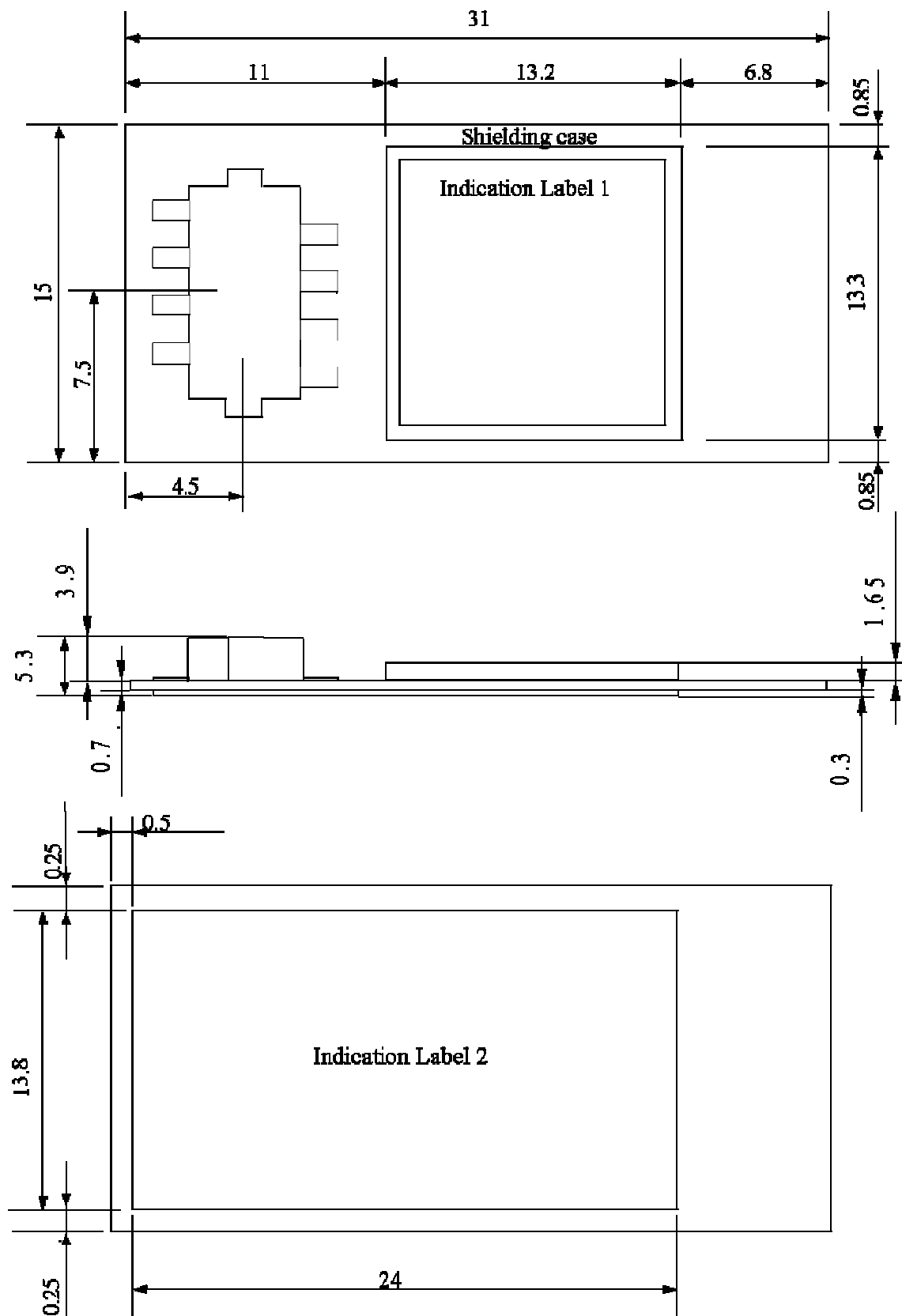
C.1: Optional if LMP, 26/6 is supported, otherwise excluded.

C.2: Mandatory if LMP, 26/6 is supported, otherwise excluded.

C.3: Mandatory if LMP, 26/1 or LMP, 26/4 is supported, otherwise optional.

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Unit : mm, Tolerances unless otherwise specified : $\pm 0.2\text{mm}$
 単位 : mm, 指示無き公差 : $\pm 0.2\text{mm}$

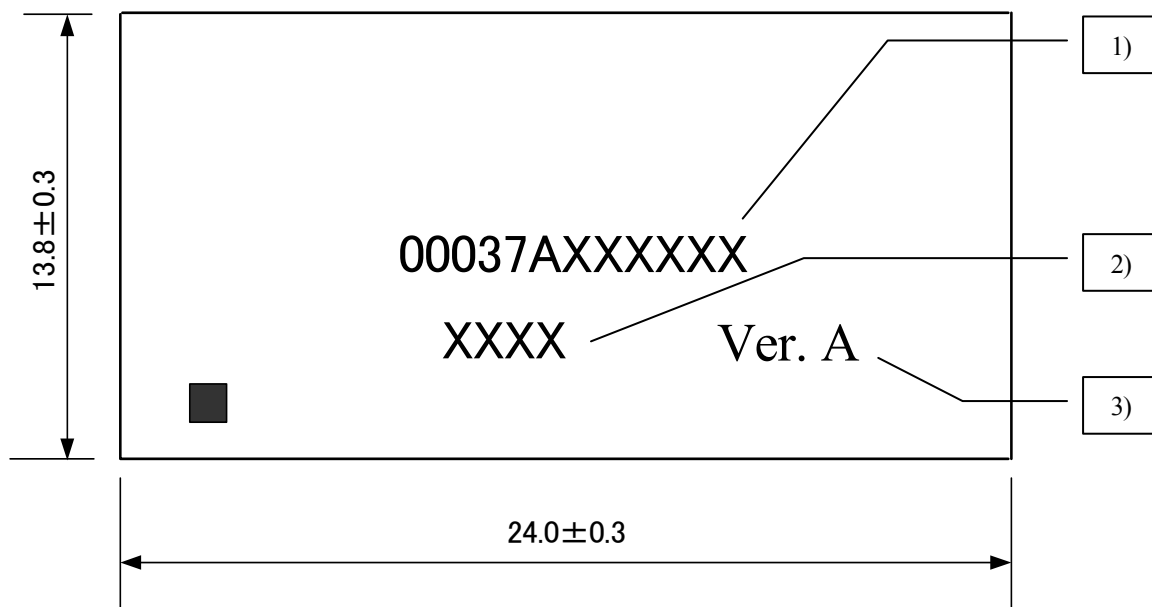


Control No. HD-AD- B071044 (1/3)	Control name Outline・Appearance 外形・外観図	APPROVED	CHECKED	DRAWN	DESIGNED
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1. Indication Label 1 description (back-side)

ラベル1 表示内容 (基板側)

- 1) BD address number : 00037A◇◇◇◇◇◇ (Refer to 「Instruction for lot number」)
BD アドレス番号 : 00037A◇◇◇◇◇◇ (ロット番号解説書参照)
- 2) Product Lot number : Four digits (Refer to 「Instruction for lot number」)
製造 Lot 番号 : 4桁 (ロット番号解説表参照)
- 3) Version ID : Ver. A
Version ID : Ver. A



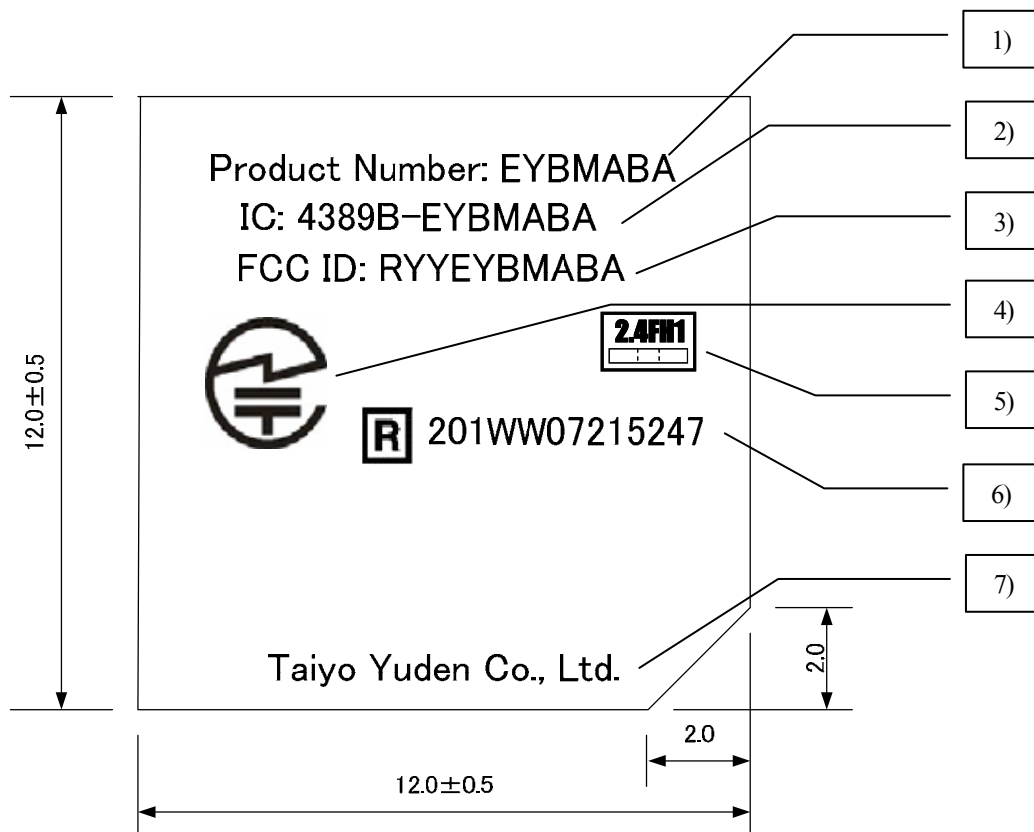
Material : PET (UL969) / Label color : White / Printing : Black
 材質 : PET (UL969) / ラベル色 : 白 / 印字 : 黒

Control No. HD-AD- B071044 (2/3)	Control name Outline・Appearance 外形・外観図	APPROVED	CHECKED	DRAWN	DESIGNED
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2. Indication Label 2-1description (front-side, Two-Layer Label, Upper Layer)

ラベル2 表示内容 (ケース側2層ラベル 1枚目表面)

- 1) Product Number : EYBMABA
認証型式 : EYBMABA
- 2) Industry Canada ID : 4389B-EYBMABA
- 3) FCC ID : RYYEYBMABA
- 4) JAPAN logo mark : Specified logo mark
日本電波法ロゴマーク : 規定ロゴマーク
- 5) ARIB, Actual indication : Indicates that this device is "Second Generation Low Power Data Communication System"
ARIB 現品表示 : 「第二世代小電力データ通信システム」であることを表記
- 6) JAPAN qualification number : 201WW07215247
日本電波法認証番号 : 201WW07215247
- 7) Manufacture (English) : Taiyo Yuden Co., Ltd.
製造 : 太陽誘電株式会社



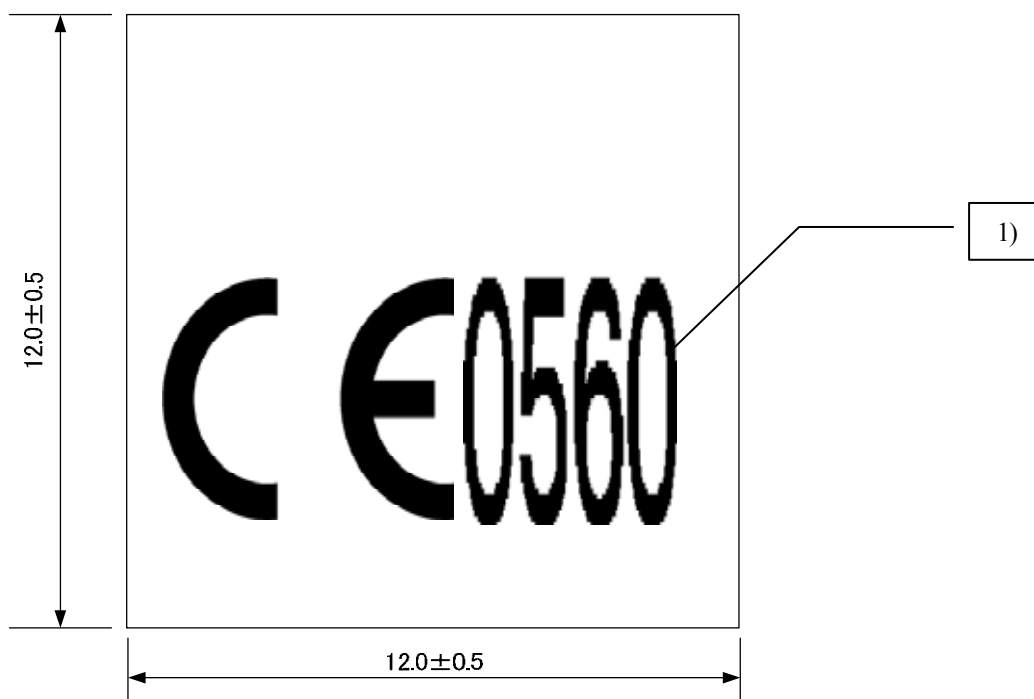
Material : PET (UL969) / Label color : White / Printing : Black
材質 : PET (UL969) / ラベル色 : 白 / 印字 : 黒

Control No. HD-AD- B071044 (3/3)	Control name Outline・Appearance 外形・外観図	APPROVED	CHECKED	DRAWN	DESIGNED
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3. Indication Label 2 description (front-side ,Two-Layer Label ,Lower Layer)

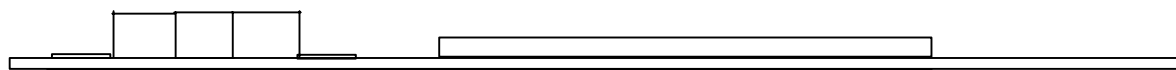
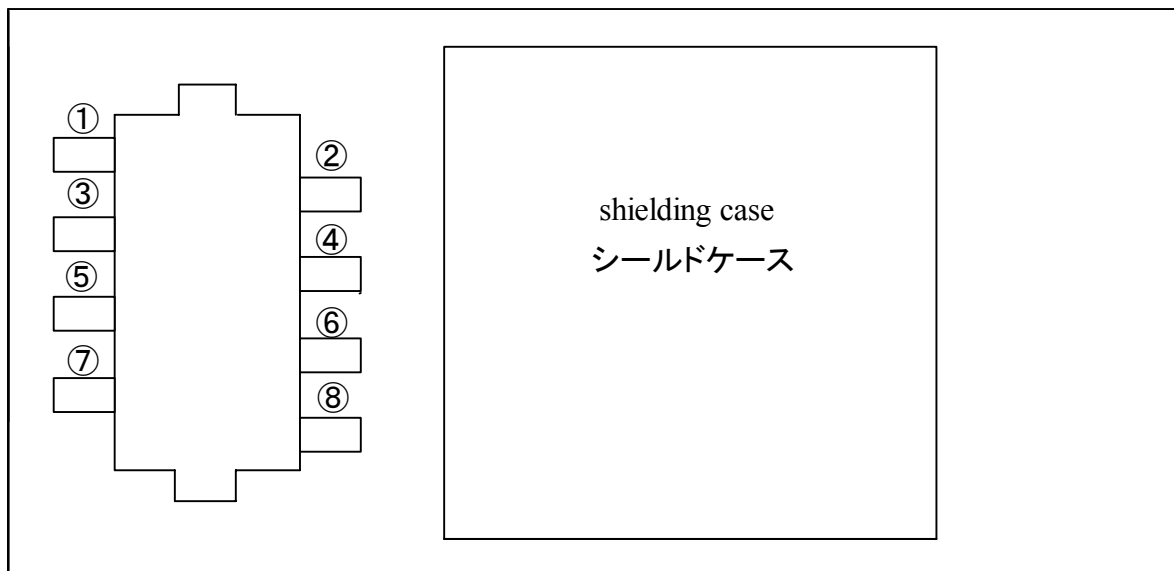
ラベル2 表示内容 (ケース側2層ラベル2枚目表面)

- 1) R&TTE CE mark : Specified CE mark
R&TTE CE 表示 : CE0560



Control No. HD-B A- A 0 7 1 0 4 4 -A (1/2)	Control name Pin layout ピンレイアウト図	APPROVED	CHECKED	DRAWN	DESIGNED
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(1) Terminal layout drawing
端子配置図



Control No. HD - B A - A 0 7 1 0 4 4 - A (2/2)	Control name Pin layout ピンレイアウト図	APPROVED	CHECKED	DRAWN	DESIGNED
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CN1

Terminal No.	Terminal name	Input/Output	Description	Terminal States on RESET	Remark
1	VDD	Input	DC3.3V Power supply		Note 1
2	UART_CTS	Input	UART clear to send active low -with internal pull-up resistor that ranges in value from 20k to 100k depending on process. (flow control signal from host)	With internal pull-up	
3	GND	-	Ground		
4	UART_RTS	Output	UART request to send active low -with internal pull-up resistor that ranges in value from 20k to 100k depending on process. (flow control signal to host)	With internal pull-up	
5	/RESET	Input	Active low RESET signal -with internal pull-up resistor that ranges in value from 25k to 100k depending on process.	With internal pull-up	
6	UART_TX	Output	TX data to host -with internal pull-up resistor that ranges in value from 20k to 100k depending on process.	With internal pull-up	
7	VREG_CTL	Input	VREG1 enable/disable control signal. (Active low)		
8	UART_RX	Input	RX data from host -with internal pull-up resistor that ranges in value from 20k to 100k depending on process.	With internal pull-up	

Notes:

1. Pin1 is used for power supply of BT module. (MAX 1A).

To fill the standard of "Supply voltage ripple and spike noise", the capacitor, which has the capacity of TBD μ F or more, should be pin the terminal VDD outside as a bypass capacitor.

FCC Regulatory Information

CAUTION: To maintain compliance with FCC's RF exposure guidelines, use only the supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may Cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canada Regulatory Information

Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

L'utilisation de ce dispositif est autorisée seulement aux conditions suivantes :

- (1) il ne doit pas produire de brouillage et
- (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

R&TTE Directive Information

C E 0560

Hereby Taiyo Yuden Co., Ltd., declares that this Complete Class2 Bluetooth Module (Model No.: EYBMABA) is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

The declaration of Conformity may be obtained at;

Taiyo Yuden Co., Ltd.
8-1 Sakae-Cho, Takasaki-Shi Gunma, JAPAN 370-8522
Telephone No.) 81-27-324-2313; Fax No.)81-27-324-2314.

CAUTION

- Please note that this users manual should not be provided to end-users.
- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the requirement.

Notice

- At the installation of our Complete Class2 Bluetooth Module (Model No.: EYBMABA) into the device, following information should be provided with end-user under the responsibility of the manufacture who integrates it into their device.

The following sentence has to be displayed on the outside of the device in which the module is installed:

"Contains Transmitter Module FCC ID: RYYEYBMABA/ IC ID: 4389B-EYBMABA", or
"Contains FCC ID: RYYEYBMABA/ IC ID: 4389B-EYBMABA "

FCC Regulatory information

CAUTION: To maintain compliance with FCC's RF exposure guidelines, use only the supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may Cause undesired operation.

Canada Regulatory information

Operation is subject to the following two conditions:

- (3) this device may not cause interference, and
- (4) this device must accept any interference, including interference that may cause undesired operation of the device.

L'utilisation de ce dispositif est autorisée seulement aux conditions suivantes :

- (3) il ne doit pas produire de brouillage et l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

R&TTE Directive information

C E 0560

Hereby [Name of manufacture(*)], declares that this [type of equipment(*)] is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC

(*) Note: Please write in your company name and type of equipment into [].