

Wireless LAN + Bluetooth[®] Module
IEEE802.11ac (1x1)+ Bluetooth[®] 4.2
WYSBHV GXG

Data Report

By purchase of any of products described in this document, the customer is deemed to understand and accept contents of this document.

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ATTENTION: This module requires device drivers that are under Japan export control. Depending on the customer's country and application (e.g. weapons), TAIYO YUDEN CO., LTD. may not be able to provide these drivers to all customers. Please contact your local TAIYO YUDEN CO., LTD. sales office for additional information.

To contact your local sales office and for additional product information, please visit www.ty-top.com.

WYSBHV GXG

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Rev. records

26-Feb.2016> Ver.1.0 Release

31-Mar.2016>Ver 1.1 Added descriptions to the 2nd page

14-Sep.2017>Ver 1.2 Update

26-Jun.2020>Ver 1.3 Update

30-Jul.2020>Ver 1.4 Update

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WYSBHVXGXG

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Control No. HD-AG-A140346	Control name General Items
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Scope

This specification ("Specification") applies to the hybrid IC for use Wireless LAN and **Bluetooth®** Smart Ready module ("Product") manufacture by TAIYO YUDEN CO., LTD. ("TAIYO YUDEN")

1. Product Number: WYSBHVXGXG
2. Function: Radio frequency transfer Module. (**IEEE802.11ac/a/b/g/n** and **Bluetooth® 4.2** standard)
3. Application: Smart Phones and Tablets, Ultrabooks, Home audio/Video systems, Mobile routers, Handy Terminal, Game, Audio-visual equipment, Digital home electrical appliance, Mobile printer.
4. This product conforms to RoHS Directive.
5. Outline: 70pin leadless chip carrier.
6. Marking: Part number and Lot number.
7. Features:
 - IEEE802.11ac/a/b/g/n** and **Bluetooth® 4.2** standard
 - Interface: SDIO3.0, PCM
 - Embedded MPU for reducing loads on host processor
8. Security: TKIP, WEP, AES, CCMP, CMAC, WAPI, WPA/WPA2(64bit/128bit)
9. Packing: Packaging method: Reel
 - Packaging unit: 1500pieces/Reel
 - Package Material: PPE/ PET/AL/NY/PE
10. Mount: SMD Type
11. Note
 - a. This Product is not designed for radiation durable and should not be used under the circumstance of radiation.
 - b. 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.
 - c. This Product mentioned in this Specification is manufactured for use in consumer products. 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 at design stage, all at the customer's sole risk.
 - d. i) You are requested to fully check and confirm by the start of mass production of this Product that (1) no bug, defect or other failure is included in firmware incorporated in this Product ("Incorporated Software"), (2) no bug defect or other failure is caused by installation of this Product with Incorporated Software into customer's products, and that Incorporated Software fully meets customer's intended use, although TAIYO YUDEN sufficiently inspects or verifies quality of Incorporated Software.
 - ii) Please note that TAIYO YUDEN is not responsible for any failure arising out of bugs or defects in Incorporated Software.
 - e. Communication between this Product and others might not be established nor maintained depending upon radio environment or operating conditions of this Product and other **ISM band** at 2.4GHz and 5GHz products.

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Control No. HD-AM-A140346	Control name Absolute maximum ratings
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- f. This Product operates in the unlicensed ISM band at 2.4GHz and 5GHz. 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.
- g. Please evaluate adequately our module incorporated to your products before mass production.
- h. Caution for Export Control
This Product may be subject to governmental approvals, consents, licenses, authorizations, declarations, filings, and registrations for export or re-export of the Product, required by *Japanese Foreign Exchange and Foreign Trade Law(including related laws and regulations)* and/or any other country's applicable laws or regulations related to export control.
In case you will export or re-export this Product, you are strongly recommended to check and confirm, before exporting or re-exporting, necessary procedures for export or re-export of this Product which is required by applicable laws and regulations, and if necessary, you have to obtain necessary and appropriate approvals or licenses from governmental authority at your own risk and expense.
- i. WYSBHV GXG is qualified with Component(Tested) category by Bluetooth SIG. The QDID of this module is 76890. The final product needs to get qualification as End product before selling the product. Please contact your Qualification body for details on Qualification.

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Control No. HD-AM-A140346	(1/1)	Control name Absolute maximum ratings
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Absolute maximum ratings

Item	Symbol	Rating			Unit	Remark
		Min.	Typ.	Max.		
Supply voltage 1	VBAT	-	3.3	4.5	V	
Supply voltage 2	VDD33	-	3.3	4.0	V	
Supply voltage 3	VIO	-	1.8	2.2	V	
		-	2.5	3.0	V	
		-	3.3	4.0	V	
Supply voltage 4	VIO_SD	-	1.8	2.2	V	
		-	3.3	4.0	V	
Supply voltage 5	VIO_RF	-	3.3	4.0	V	

Recommendation operating range

Item	Symbol	Rating			Unit	Remark
		Min.	Typ.	Max.		
Supply voltage 1	VBAT	2.7	3.3	4.5	V	
Supply voltage 2	VDD33	3.0	3.3	3.6	V	
Supply voltage 3	VIO	1.62	1.8	1.98	V	
		2.25	2.5	2.75	V	
		3.0	3.3	3.6	V	
Supply voltage 4	VIO_SD	1.62	1.8	1.98	V	
		3.0	3.3	3.6	V	
Supply voltage 5	VIO_RF	3.0	3.3	3.6	V	
Operation temperature range	Taopr	-30	25	85	Degrees C	
Storage temperature range	Tstg	-40		85	Degrees C	

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Control No. HD-AM-A140346 (1/6)	Control name Electrical characteristics
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Power consumption

The Specification applies for Topr.= 25 degrees C, Supply voltage=Typical voltage

No.	Parameter	Condition	Symbol	Min.	Typ.	Max.	Unit	Remark
1	Power consumption1	Tx: 12dBm 11b, 11Mbps	Pc1		488		mW	Duty=46.8%
2	Power consumption2	Rx 11b, 11Mbps	Pc2		201		mW	
3	Power consumption3	Tx: 12dBm 11g, 54Mbps	Pc3		297		mW	Duty=25.4%
4	Power consumption4	Rx 11g, 54Mbps	Pc4		211		mW	
5	Power consumption5	Tx: 10dBm, 40MHz BW 11n, MCS7, 2.4GHz	Pc5		211		mW	Duty=2.2%
6	Power consumption6	Rx, 40MHz BW 11n, MCS7, 2.4GHz	Pc6		251		mW	
7	Power consumption7	Tx: 12dBm 11a, 54Mbps	Pc9		363		mW	Duty=25.4%
8	Power consumption8	Rx 11a, 54Mbps	Pc10		244		mW	
9	Power consumption9	Tx: 10dBm, 40MHz BW 11n, MCS7, 5GHz	Pc11		244		mW	Duty=2.4%
10	Power consumption10	Rx, 40MHz BW 11n, MCS7, 5GHz	Pc12		286		mW	
11	Power consumption11	Tx: 8dBm, 80MHz BW 11ac, MCS9, 5GHz	Pc13		321		mW	Duty=1.4%
12	Power consumption12	Rx, 80MHz BW 11ac, MCS9, 5GHz	Pc14		358		mW	
13	Power consumption13	Power save mode (DTIM=1, Beacon_interval =100ms), BT Sleep mode	Pc15		23.5		mW	
14	Power consumption14	WLAN=Deep Sleep / BT Sleep	Pc16		16.5		mW	

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

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

DC Specifications

Digital Pad Ratings (SDIO, PCM, GPIO) (1.8 / 3.3V)

No.	Parameter	Condition	Symbol	Min.	Typ.	Max.	Unit	Remark
1	Input High Voltage		VIH	0.7xVIO		VIO+0.3	V	
2	Input Low Voltage		VIL	-0.3		0.3xVIO	V	
3	Output High Voltage		VOH	VIO-0.4		-	V	
4	Output Low Voltage		VOL	-		0.4	V	

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Control No. HD-AM-A140346	(2/6)	Control name Electrical characteristics
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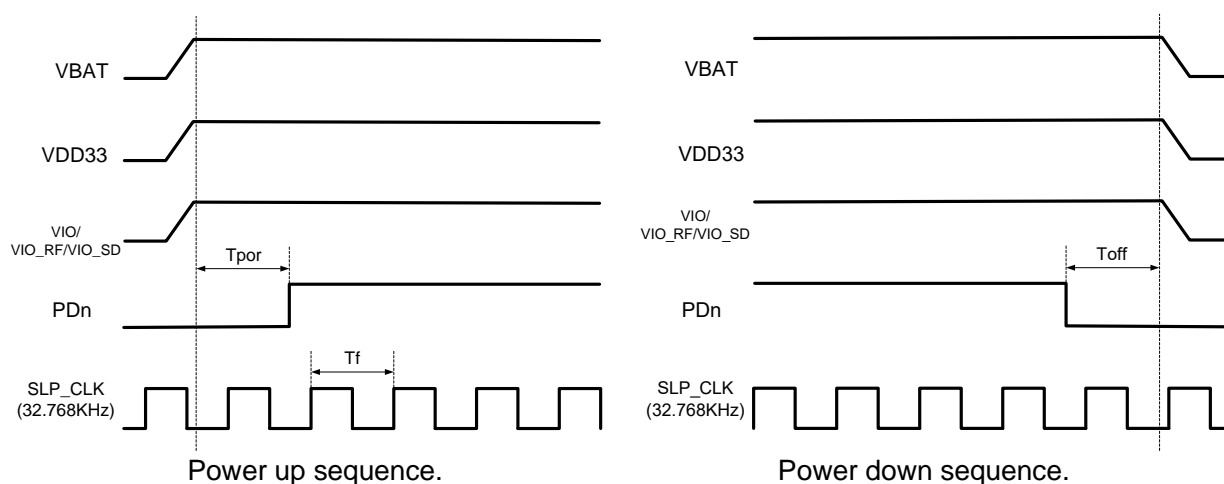
AC Specifications

Power-on timing / External sleep clock [Voltage level for SLP_CLK should be 1.8V]

	Parameter	Condition	Symbol	Min	Typ	Max	Unit	Remark
1	Valid Power/ Clock to PDn de-asserted		Tpor	300			ms	
2	Input SLP_CLK frequency • $\pm 250\text{ppm}$ (Initial, aging, temperature)		Tf	-	32.768	-	KHz	
3	Input SLP_CLK high voltage	V=1.8V	V _{IH}	0.7*V	-	V+0.4	V	
4	Input SLP_CLK low voltage		V _{IL}	-0.4		0.3*V	V	
5	Input SLP_CLK phase noise requirement		PN	-	-125	-	dBc/Hz	@100KHz
6	Input SLP_CLK slew rate limit (10-90%)		SR	-	-	100	ns	
7	Input SLP_CLK duty cycle tolerance		DC	20	-	80	%	
8	PDn down to Power off		Toff	0			ms	

<Power-on sequence>

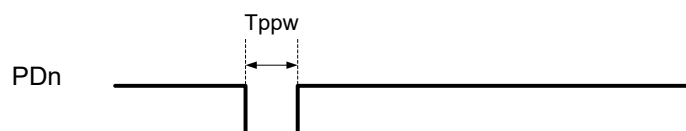
PDn must remain asserted for minimum of Tpor after VBAT/VDD33/VIO/VIO_RF/VIO_SD and SLP_CLK are stable.



External power down(PDn)

	Parameter	Condition	Symbol	Min	Typ	Max	Unit	Remark
1	PDn pulse width		Tppw	300			ms	

1. PDn should be asserted while VBAT/VDD33/VIO/VIO_RF/VIO_SD are stable.



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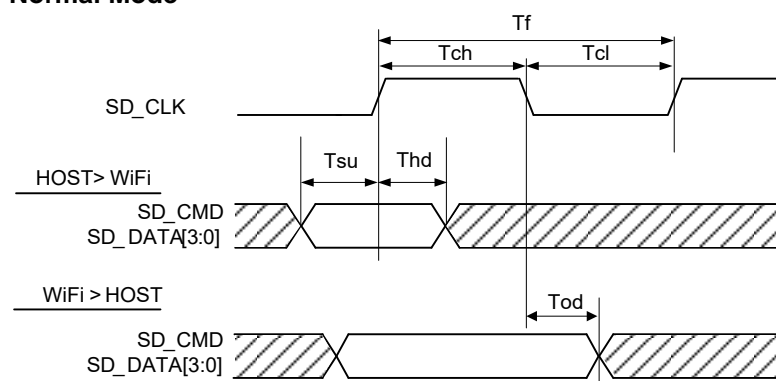
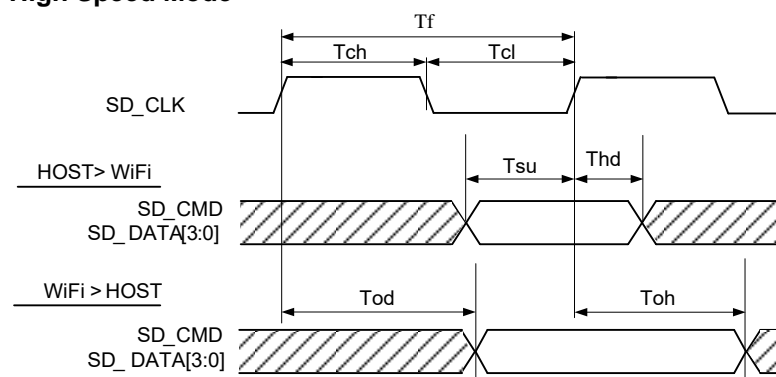
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Control No. HD-AE-A140346	(3/6)	Control name Electrical characteristics
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SDIO Interface Specifications

The Specification applies for Topr.= 25 degrees C , Supply voltage=Typical voltage.

	Parameter	Symbol	Condition	Min	Typ	Max	Unit	Remark
1	Input SDIO_CLK Frequency	Tf	Normal	0	-	25	MHz	VIO_SD =3.3V
			High Speed	0	-	50		
2	Input SDIO_CLK High Time	Tch	Normal	10	-	-	ns	
			High Speed	7	-	-		
3	Input SDIO_CLK Low Time	Tcl	Normal	10	-	-	ns	
			High Speed	7	-	-		
4	Input SDIO_CMD, DATA[3:0] Setup time	Tsu	Normal	5	-	-	ns	
			High Speed	6	-	-		
5	Input SDIO_CMD, DATA[3:0] Hold time	Thd	Normal	5	-	-	ns	
			High Speed	2	-	-		
6	Output SDIO_CMD, DATA[3:0] Delay time	Tod	Normal	-	-	14	ns	CL<40pF (1card)
			High-Speed	-	-	14	ns	
7	Output SDIO_CMD, DATA[3:0] Hold time	Toh	High Speed	2.5	-	-	ns	

Normal Mode**High Speed Mode**

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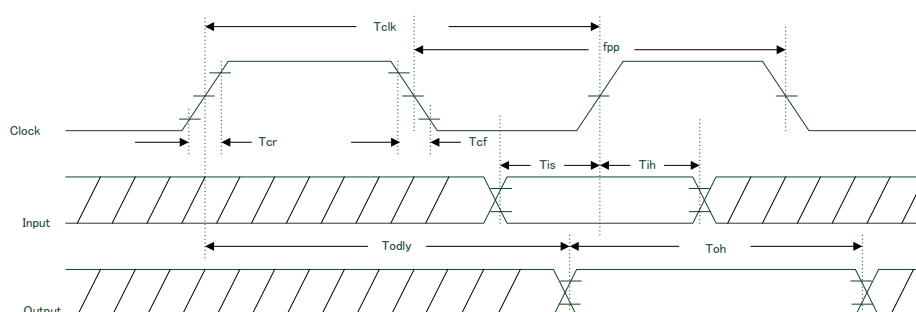
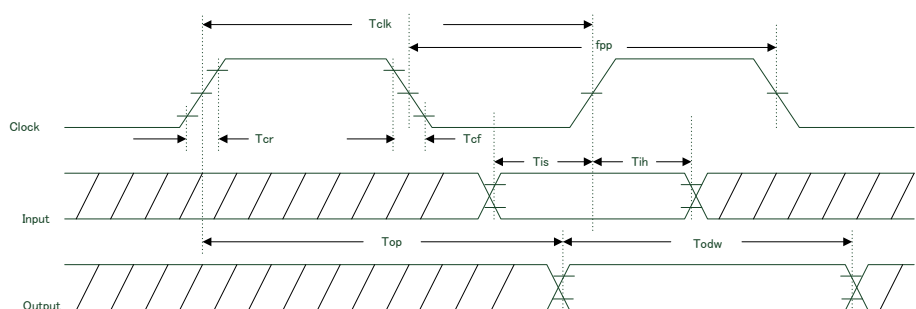
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Control No. HD-AE-A140346	(4/6)	Control name Electrical characteristics
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SDIO Interface Specifications

The Specification applies for Topr.= 25 degrees C , Supply voltage=Typical voltage.

	Parameter	Symbol	Condition	Min	Typ	Max	Unit	Remark
1	Clock Frequency	fpp	SDR12/25/50	25	-	100	MHz	VIO_SD =1.8V
			SDR104	0	-	150		
2	Input setup time	Tis	SDR12/25/50	3	-	-	ns	
			SDR104	1.4	-	-		
3	Input hold time	Tih	SDR12/25/50	0.8	-	-	ns	
			SDR104	0.8	-	-		
4	Clock time	Tclk	SDR12/25/50	10	-	40	ns	
			SDR104	4.8	-	-		
5	Rise time,fall time Tcr,Tcfs < 2ns(max)at100MHz Ccard=10pF	Tcr,Tcf	SDR12/25/50	-	-	0.2*Tclk	ns	
			SDR104	-	-	0.2*Tclk		
6	Output delay time Cl≤30pF	Todly	SDR12/25/50	-	-	7.5	ns	
7	Output hold time Cl=15pF	Toh	SDR12/25/50	1.5	-	-	ns	
8	Card output phase	Top	SDR104	0	-	10	ns	
9	Output timing of variable data window	Todw	SDR104	2.88	-	-	ns	

SDIO Protocol Timing Diagram-SDR12,SDR25,SDR50**SDIO Protocol Timing Diagram-SDR104**

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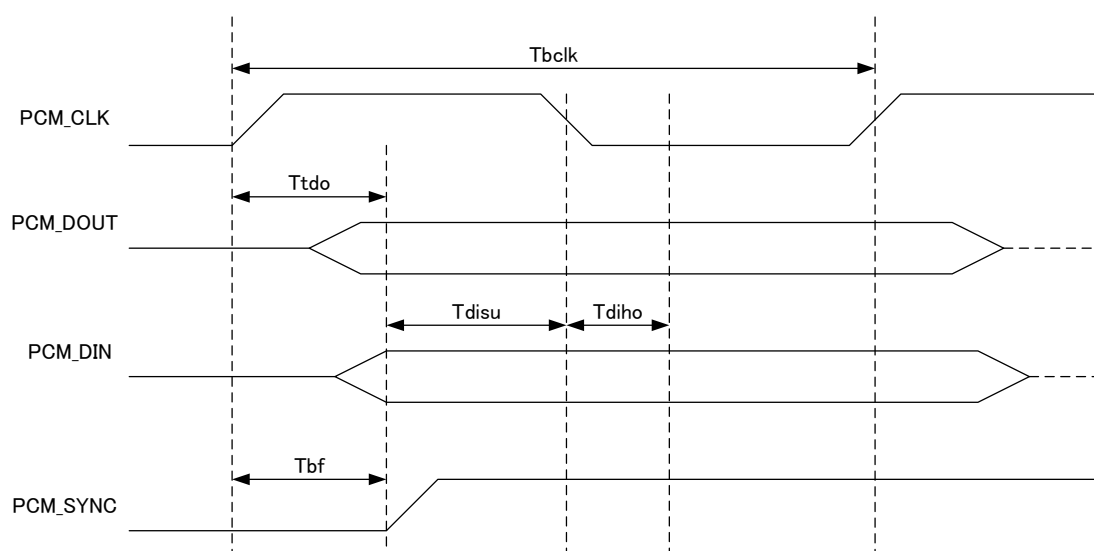
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Control No. HD-AE-A140346	Control name Electrical characteristics
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AC Specifications**PCM Interface**

The Specification applies for Topr.= 25 degrees C, Supply voltage=Typical voltage.

No.	Parameter	Condition	Symbol	Min	Typ	Max	Unit	Remark
1	PCM_CLK Frequency		Tbclk	-	2/2.048	-	MHz	
2	Delay time from PCM_CLK High to valid PCM_OUT		Tdo	-	-	15	ns	
4	Setup time for PCM_IN valid to PCM_CLK Low		Tdisu	20	-	-	ns	
5	Hold time for PCM_CLK Low to PCM_IN valid		Tdiho	15	-	-	ns	
6	Delay time from PCM_CLK High to PCM_SYNC High		Tbf	-	-	15	ns	

Master Mode

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Control No. HD-AE-A140346	(6/6)	Control name Electrical characteristics
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2.4GHz Band RF Specifications

The Specification applies for Topr.= 25 degrees C, Supply voltage=Typical voltage

No.	Parameter	Condition	Symbol	Min	Typ	Max	Unit	Remark
1	TX Power	11Mbps, 11b	Po2-1	10	12	14	dBm	
		54Mbps, 11g	Po2-2	10	12	14		
		MCS7, 20MHz BW, 11n	Po2-3	10	12	14		
		MCS7, 40MHz BW, 11n	Po2-4	8	10	12		
2	Rx sensitivity	11Mbps, 11b	SEN2-1		-87	-76	dBm	
		54Mbps, 11g	SEN2-2		-73	-65		
		MCS7, 20MHz BW, 11n	SEN2-3		-69	-64		
		MCS7, 40MHz BW, 11n	SEN2-4		-66	-61		

5GHz Band RF Specifications

The Specification applies for Topr.= 25 degrees C, Supply voltage=Typical voltage

No.	Parameter	Condition	Symbol	Min	Typ	Max	Unit	Remark
1	TX Power	54Mbps, 11a	Po5-1	10	12	14	dBm	
		MCS7, 20MHz BW, 11n	Po5-2	10	12	14		
		MCS7, 40MHz BW, 11n	Po5-3	8	10	12		
		MCS9, 80MHz BW, 11ac	Po5-4	6	8	10		
2	Rx sensitivity	54Mbps, OFDM	SEN5-1		-71	-65	dBm	
		MCS7, 20MHz BW, OFDM	SEN5-2		-68	-64		
		MCS7, 40MHz BW, OFDM	SEN5-3		-65	-61		
		MCS9, 80MHz BW, OFDM	SEN5-4		-57	-51		

RF Specifications (Bluetooth®)

The Specification applies for Topr.= 25 degrees C, Supply voltage =Typical voltage.

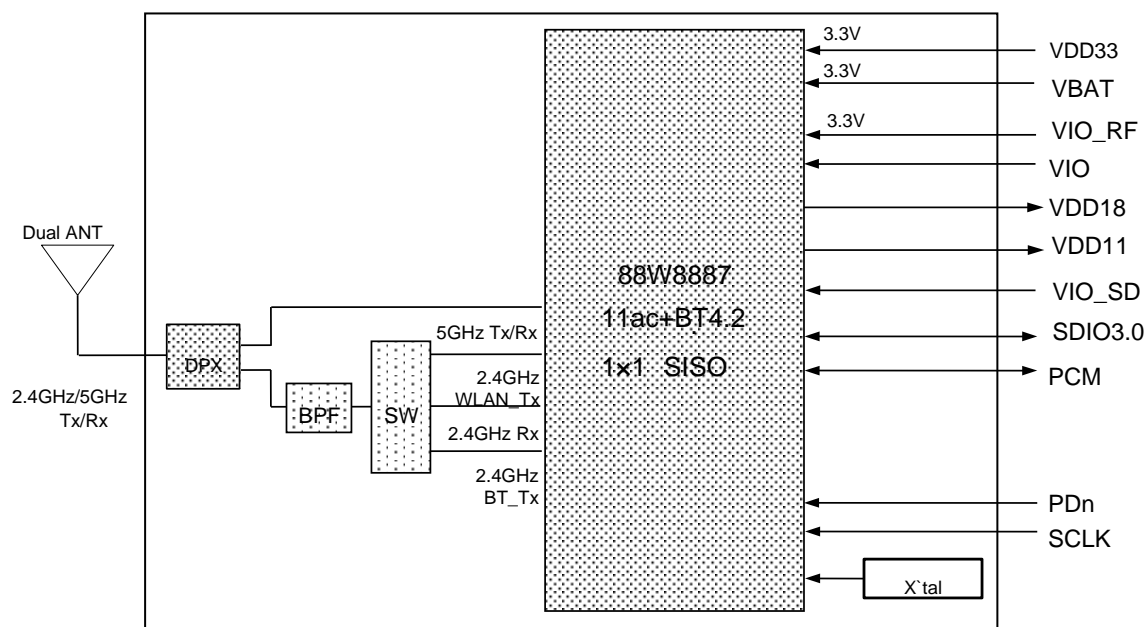
No.	Parameter	Condition	Sym	Min	Typ	Max	Unit	Remark
1	Tx Power	Basic	Pob-2	-6	0	4	dBm	Class2
2	Sensitivity	Basic	SENB		-86	-70	dBm	

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Control No. HD-MC-A140346	Control name Circuit Schematic
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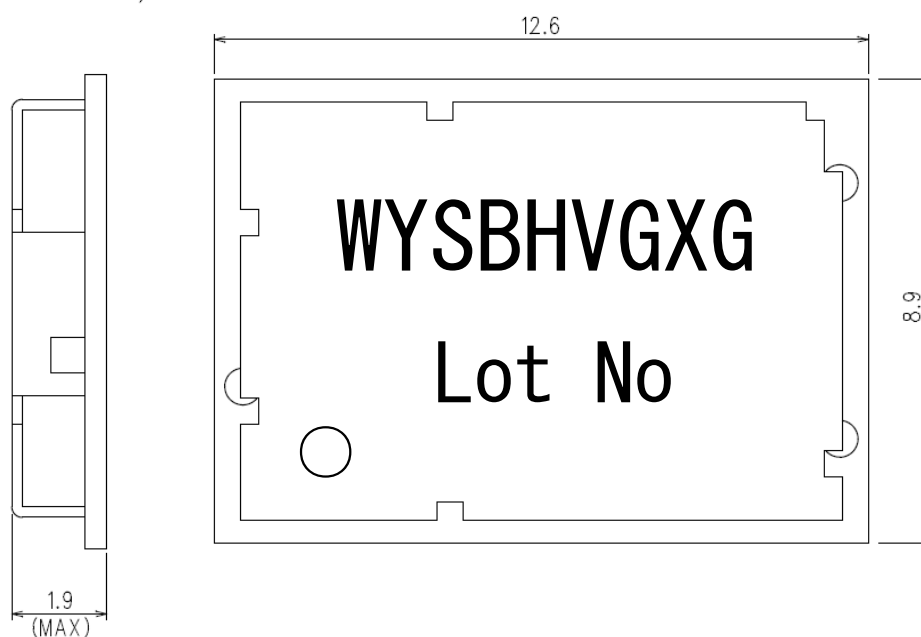
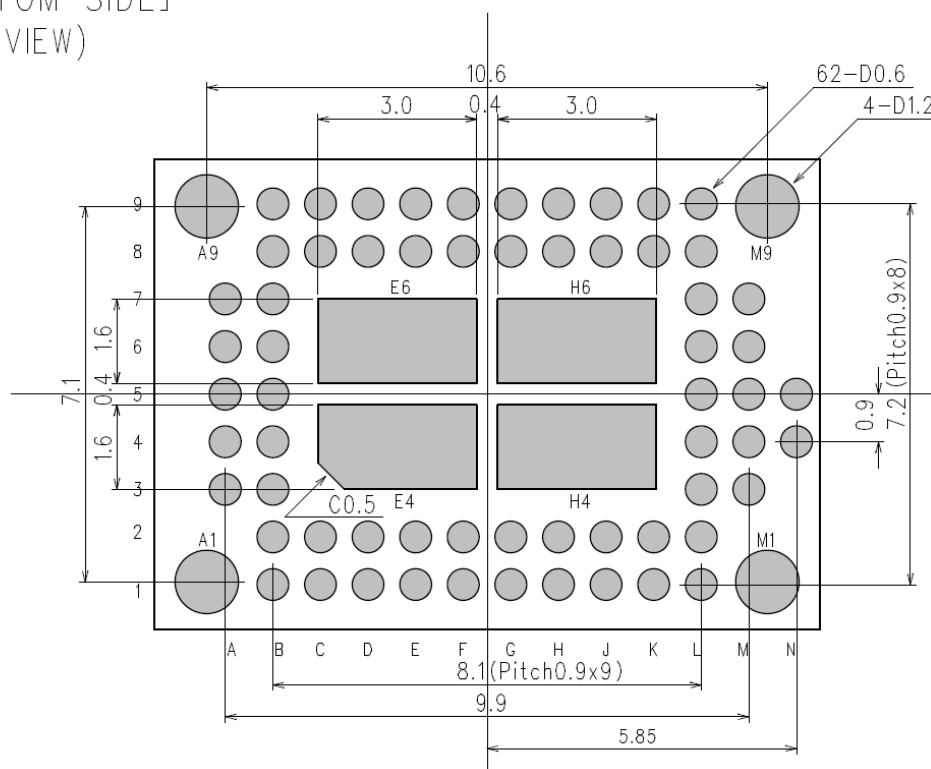
Block Diagram

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Control No. HD-AD-A140346	Control name Outline/Appearance
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Unit: mm, Tolerances unless otherwise specified: ± 0.2 mm[TOP SIDE]
(TOP VIEW)[BOTTOM SIDE]
(TOP VIEW)

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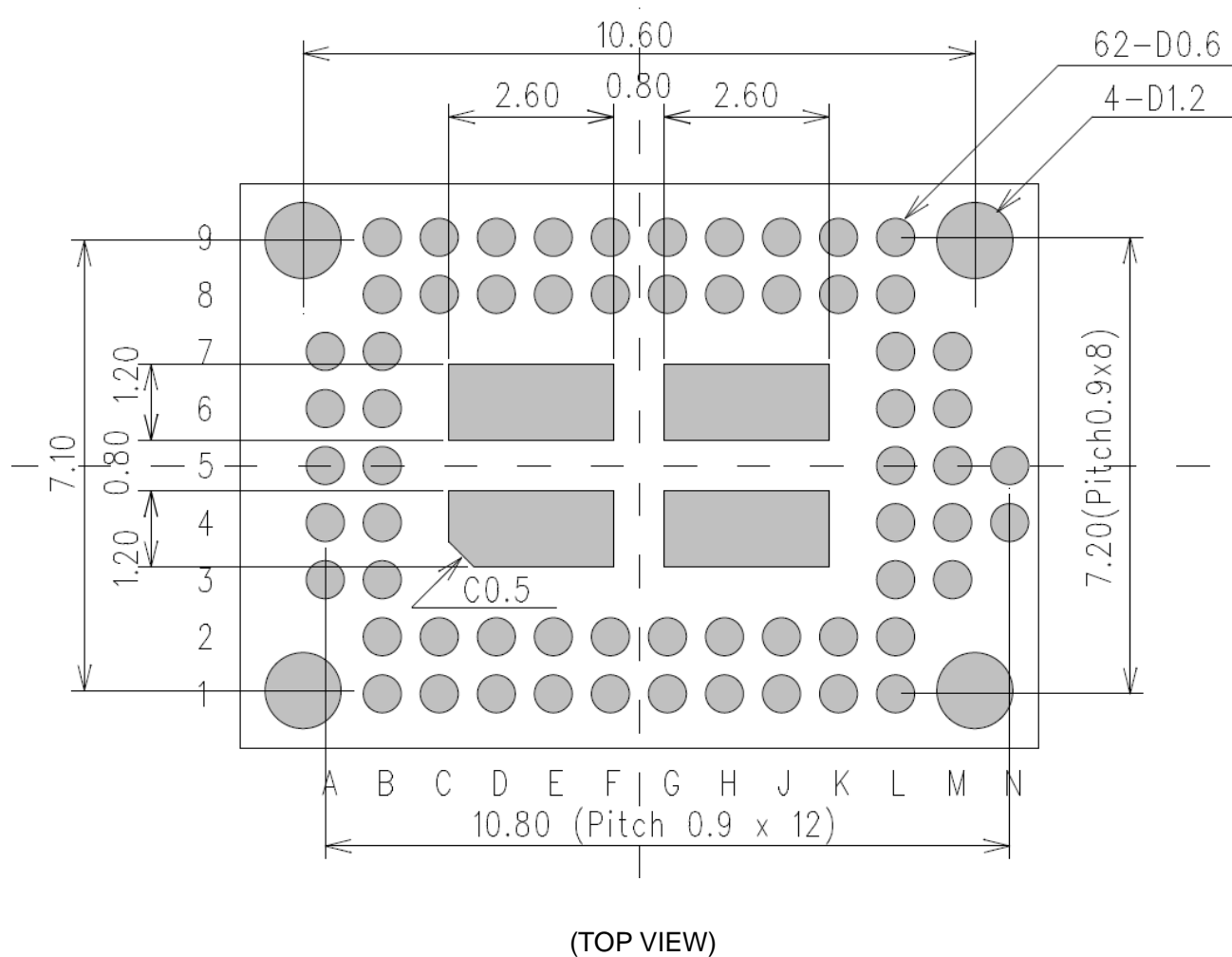
Control No. HD-AD-A140346	Control name Outline/Appearance
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Recommended Land Pattern Dimension

We recommend that pad sizes on mother board and pad sizes on module should be the same.

Recommended Metal Mask (Solder Mask) Conditions

Mask size see below. Thickness of the Metal Mask should be in the range 0.1 mm

Unit: mm

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Control No. HD-BA-A140346	(1/3)	Control name Pin Layout
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Pin Descriptions

Terminal No.	Terminal Name	I/O	Pwr Domain	Description	Function	Internal PU
A1	GND	-	GND	Ground	PWR	-
A3	SD_D3	I/O	VIO_SD	SDIO Data line Bit[3]	SDIO	Enable
A4	VIO_SD	I	VIO_SD	1.8/3.3V Digital SDIO Power Supply.	PWR	-
A5	SD_CLK	I	VIO_SD	SDIO Clock Input	SDIO	Enable
A6	SD_D1	I/O	VIO_SD	SDIO Data line Bit[1]	SDIO	Enable
A7	VBAT	I	VBAT	1.1v buck/1.8v buck/3.3v LDO VBAT input	PWR	-
A9	GND	-	GND	Ground	PWR	-
B1	VIO	I	VIO	1.8/3.3V Digital Power Supply	PWR	-
B2	VDD18_ADC_TBG	I	VDD18	1.8V Analog Power Supply Should be connecting to C9.	PWR	
B3	SD_D2	I/O	VIO_SD	SDIO Data line Bit[2]	SDIO	Enable
B4	SD_CMD	I/O	VIO_SD	SDIO Command/Response	SDIO	Enable
B5	GND	-	GND	Ground	PWR	-
B6	SD_D0	I/O	VIO_SD	SDIO Data line Bit[0]	SDIO	Enable
B7	UART_CTS	I	VIO	UART_CTSN	UART	Enable
B8	UART_RTS	O	VIO	UART_RTSN	UART	Enable
B9	1.1V_INT	O	VDD11	1.1V buck voltage output	PWR	-
C1	PCM_CLK	I/O	VIO	PCM Clock Signal. (Output if PCM master. Input if PCM slave.)	PCM	Enable
C2	PCM_DOUT/PCM_B	O	VIO	PCM Data Output Signal	PCM	Enable
C8	PDN	I	VIO	Power Down (no internal pull-up on this pin) (0: Full Power Down, 1: Normal Operation)	CTRL	None
C9	1.8V_INT	O	VDD18	1.8V buck voltage output	PWR	-
D1	PCM_DIN/PCM_A	I	VIO	PCM Data Input Signal	PCM	Enable
D2	PCM_SYNC	I/O	VIO	PCM Sync Pulse Signal. (Output if PCM master. Input if PCM slave.)	SDIO	Enable
D8	UART_SIN	I	VIO	UART_SIN	UART	Enable
D9	VDD33	I	VDD33	3.3V Analog Power Supply	PWR	-
E1	SLP_CLK	I	VDD18	Sleep Clock Input SLP_CLK is used for reference clock detection and sleep mode. Please input SLP_CLK even when sleep mode is not used.	CLOCK	-
E2	TDO	O	VIO	JTAG Test Data Output	JTAG	Enable
E4	GND	-	GND	Ground	PWR	-

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Control No. HD-BA-A140346	Control name Pin Layout
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Terminal No.	Terminal Name	I/O	Pwr Domain	Description	Function	Internal PU
E6	GND	-	GND	Ground	PWR	-
E8	UART_SOUT	O	VIO	UART_SOUT	UART	Enable
E9	GND	-	GND	Ground	PWR	-
F1	GND	-	GND	Ground	PWR	-
F2	TMS	I	VIO	JTAG Controller Select	JTAG	Enable
F8	GND	-	GND	Ground	PWR	-
F9	RES	-	-	(Reserved) Should be left open	-	-
G1	RES	-	-	-	-	-
G2	TDI	I	VIO	JTAG Test Data Input	JTAG	Enable
G8	GND	-	GND	Ground	PWR	-
G9	RES	-	-	(Reserved) Should be left open	-	-
H1	RES	-	-	(Reserved) Should be left open	-	-
H2	RES	-	-	(Reserved) Should be left open	-	-
H4	GND	-	GND	Ground	PWR	-
H6	GND	-	GND	Ground	PWR	-
H8	RES	-	-	(Reserved) Should be left open	-	-
H9	GND	-	GND	Ground	PWR	-
J1	RES	-	-	(Reserved) Should be left open	-	-
J2	GPIO13/BT_WAKEUP_BT_HOST	O	VIO	Bluetooth wakeup host (Output).	CTRL	
J8	RES	-	-	(Reserved) Should be left open	-	-
J9	VDD18_NFC	I	VDD18	1.8V Analog Power Supply Should be connecting to C9.	PWR	
K1	RES	-	-	(Reserved) Should be left open	-	-
K2	TCK	I	VIO	JTAG Test Clock Input	JTAG	Enable
K8	RES	-	-	(Reserved) Should be left open	-	-
K9	RES	-	-	(Reserved) Should be left open	-	-

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Control No. HD-BA-A140346	Control name Pin Layout
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Terminal No.	Terminal Name	I/O	Pwr Domain	Description	Function	Internal PU
L1	VDD18_WLAN	I	VDD18	1.8V Analog Power Supply Should be connecting to C9.	PWR	
L2	GPIO1/WL_HOST_WAKE	O	VIO	WLAN wakeup HOST (Output)	CTRL	
L3	GPIO3, CON[1]	I	VIO_RF	Configuration Mode: CON[1], See Table-1	CTRL	Enable
L4	RES	-	-	(Reserved) Should be left open	-	-
L5	RES	-	-	(Reserved) Should be left open	-	-
L6	RES	-	-	(Reserved) Should be left open	-	-
L7	RES	-	-	(Reserved) Should be left open	-	-
L8	GPIO2, CON[0]	I	VIO_RF	Configuration Mode: CON[0], See Table-1	CTRL	Enable
L9	VDD18_BT	I	VDD18	1.8V Analog Power Supply Should be connecting to C9.	PWR	-
M1	GND	-	GND	Ground	PWR	-
M3	GND	-	GND	Ground	PWR	-
M4	GND	-	GND	Ground	PWR	-
M5	GND	-	GND	Ground	PWR	-
M6	VIO_RF	I	VIO	3.3V Analog I/O RF Power Supply	PWR	
M7	RES	-	-	(Reserved) Should be left open	-	-
M9	GND	-	GND	Ground	PWR	-
N4	ANT1	I/O	-	2.4G/5G RF (IEEE802.11ac/a/b/g/n) Antenna		
N5	GND	-	GND	Ground	PWR	-

Table-1 HOST Interface / FW down load select

CON[1]	CON[0]	WLAN	BT/BLE
0	0	00,01	
0	1	reserved	
1	0	SDIO	UART
1	1	SDIO	SDIO

Note) SDIO interface is recommended to use for BT control, instead of the UART. Because, 8887 firmware and driver for the UART is not supported or qualified by NXP, any more.
Default CON [1]:1 CON [0]:1

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Control No. HQ-BA-523	(1/2)	Control name Handling Precaution
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This specification describes desire and conditions especially for mounting.

Desire/Conditions

(1) Environment conditions for use and storage

1. Store the components in an environment of < **40deg-C/90%RH** if they are in a moisture barrier bag packed by TAIYO YUDEN.
2. Keep the factory ambient conditions at < **30deg-C/60%RH**.
3. Store the components in an environment of < **25±5deg-C/10%RH** after the bag is opened.
(The condition is also applied to a stay in the manufacture process).

(2) Conditions for handling of products

Make sure all of the moisture barrier bags have no holes, cracks or damages at receiving. If an abnormality is found on the bag, its moisture level must be checked in accordance with 2 in (2). Refer to the label on the bag.

1. All of the surface mounting process (reflow process) must be completed **in 12 months** from the bag sea date.
2. Make sure humidity in the bag is less than **10%RH** immediately after open, using a humidity indicator card sealed with the components.
3. **All** of the surface mounting process (reflow process including rework process) must be completed in **168 hours** after the bag is opened (inclusive of any other processes).
4. If any conditions in (1) or condition 2 and 3 in (2) are not met, bake the components in accordance with the conditions at **125deg-C 24hours**
5. As a rule, baking the components in accordance with conditions 4 in (2) shall be once.
6. Since semi-conductors are inside of the components, they must be free from static electricity while handled.(<100V) Use ESD protective floor mats, wrist straps, ESD protective footwear, air ionizers etc. , if necessary.
7. Please make sure that there are lessen mechanical vibration and shock for this module, and do not drop it.

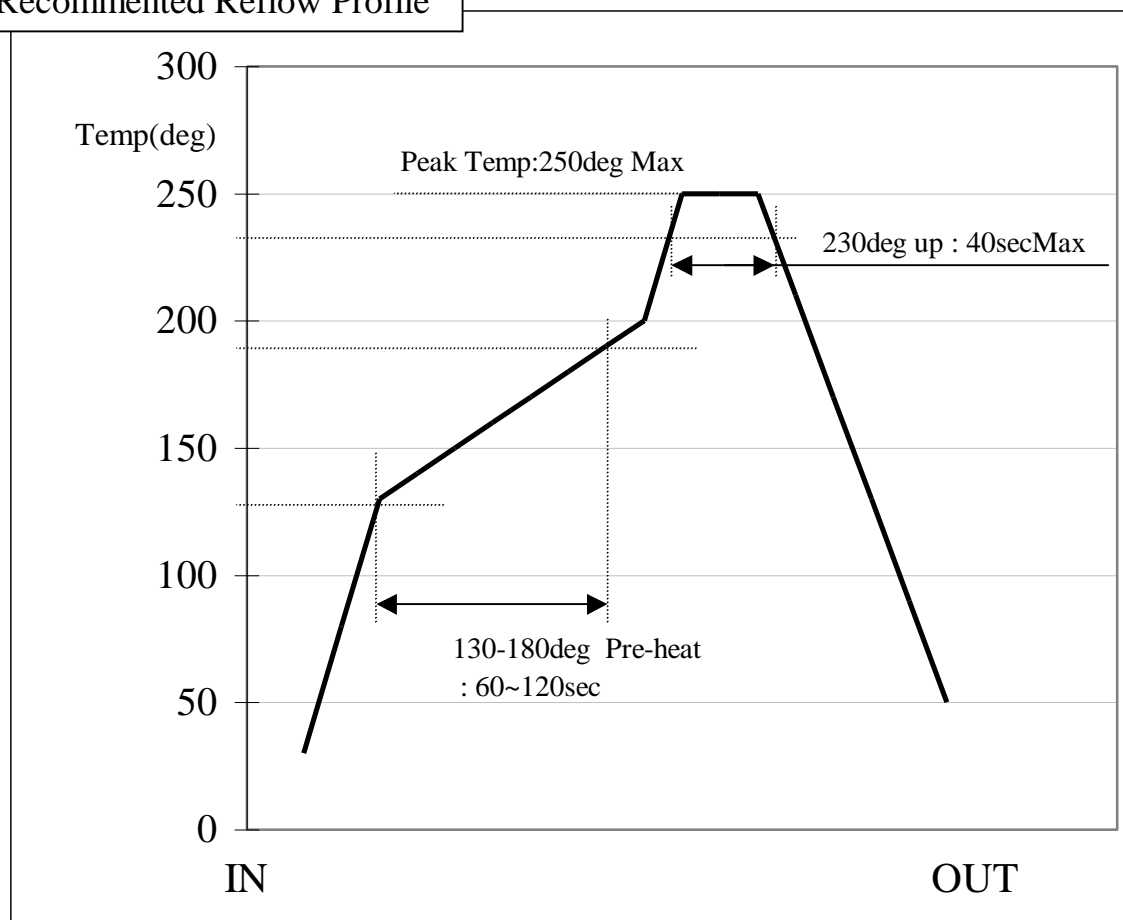
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Control No. HQ-BA-523	(2/2)	Control name Handling Precaution
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8. Please recognize pads of back side at surface mount.
9. Please do not wash this module.
10. Please perform temperature conditions of module at reflow within the limits of the following.
Please give the number of times of reflow as a maximum of 2 times.

Recommended Reflow Profile

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Control No. HD-BB-A140346 (1/3)	Control name Taping Specification
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Packaging Specification

(1) Packaging Material

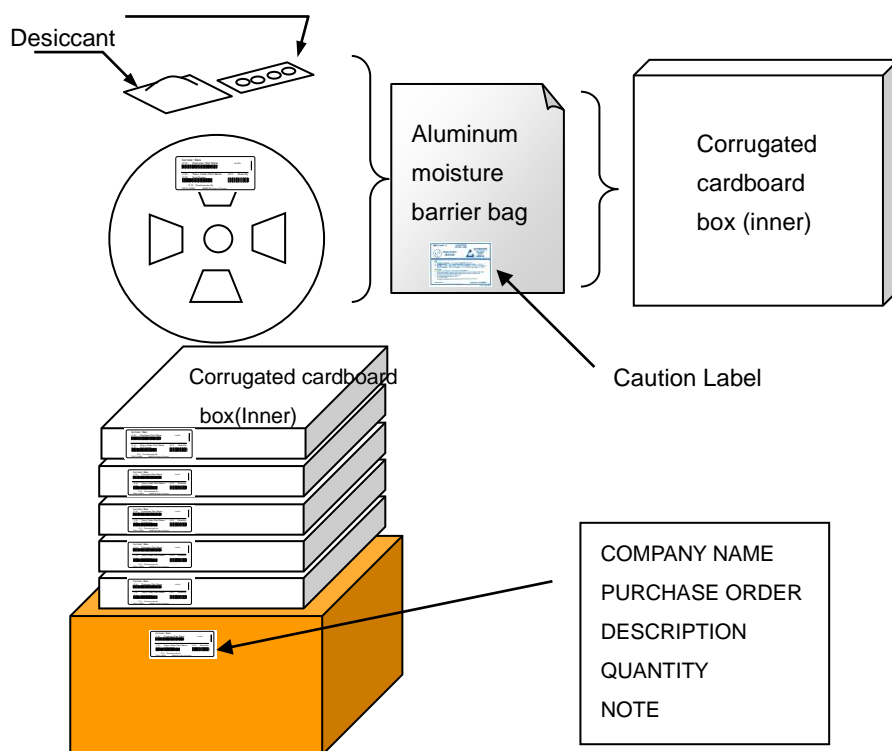
Name	Outline	Materials	Note
Emboss	24mm wide-12mmPitch	Conductive PS	
Cover Tape			
Reel	φ330mm	Conductive PS	
Desiccant	30g x 1		
Humidity indicator card			
Aluminum moisture barrier bag	420 x 460(mm)	(AS)Polyester/AL/Nylon /Polyethylene(AS)	
Label			
Corrugated cardboard Box(Inner)	376x 376 x52(mm)		
Corrugated cardboard Box(Outer)	400 x 390 x290(mm)		

(2) Packaging Unit

Max 1500 pieces/Reel

Max 7500 pieces/Box (Outer)

(3)Packaging Figure



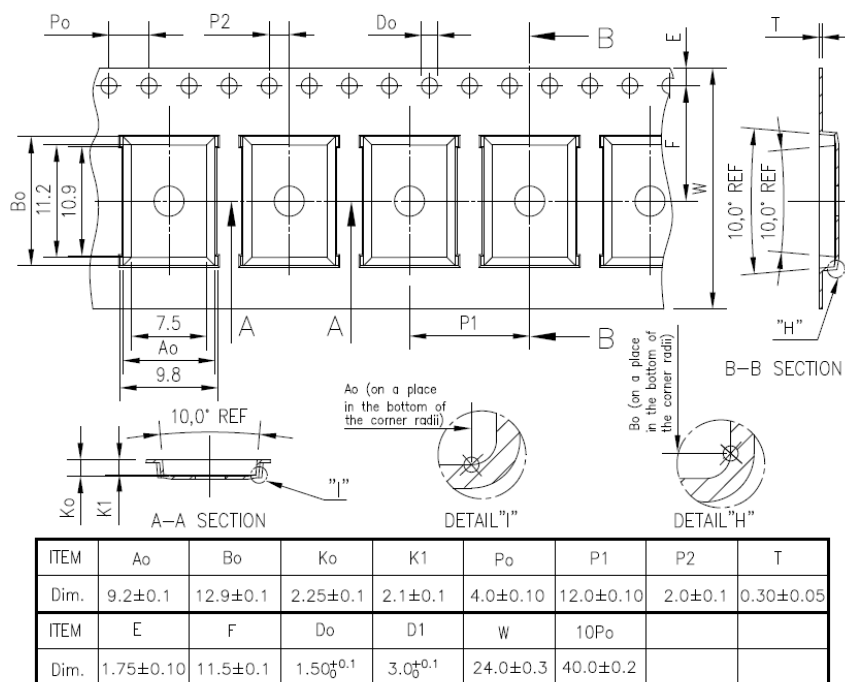
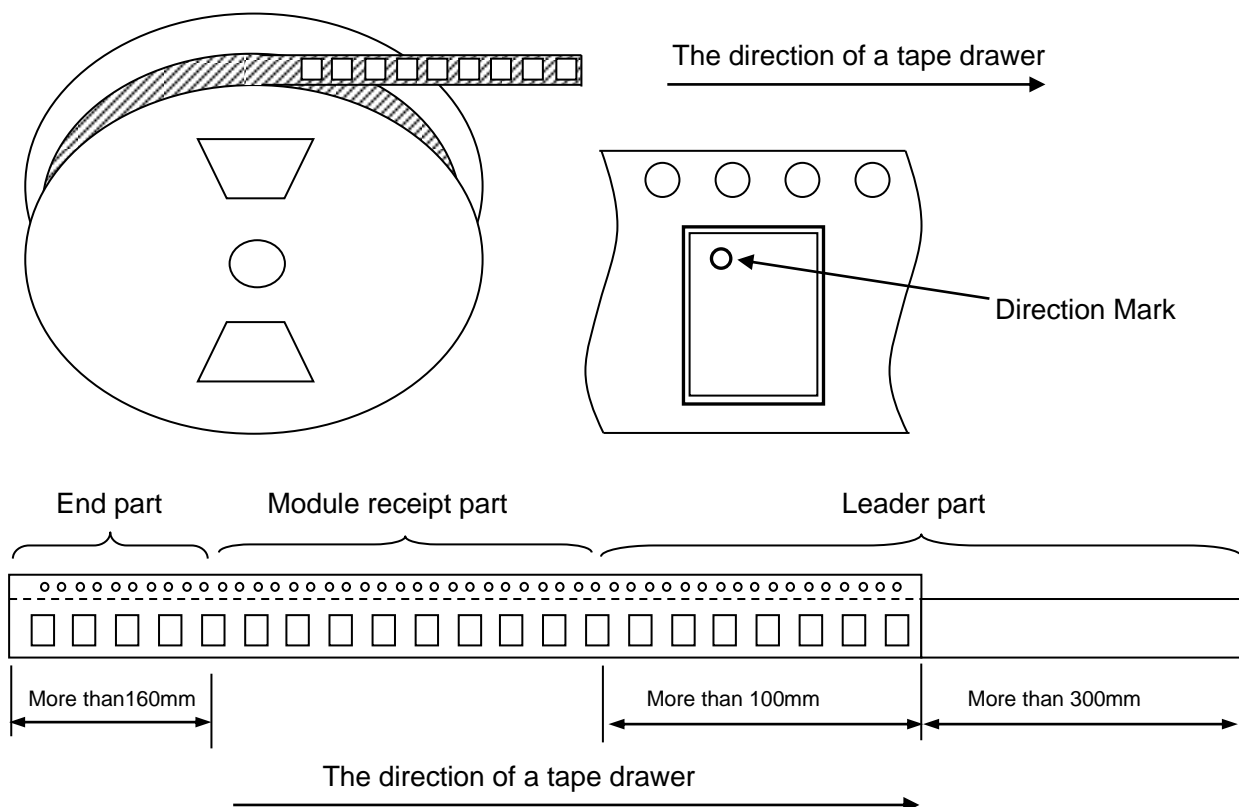
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Control No. HD-BB-A140346	(2/3)	Control name Taping Specification
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(5)Tape specification



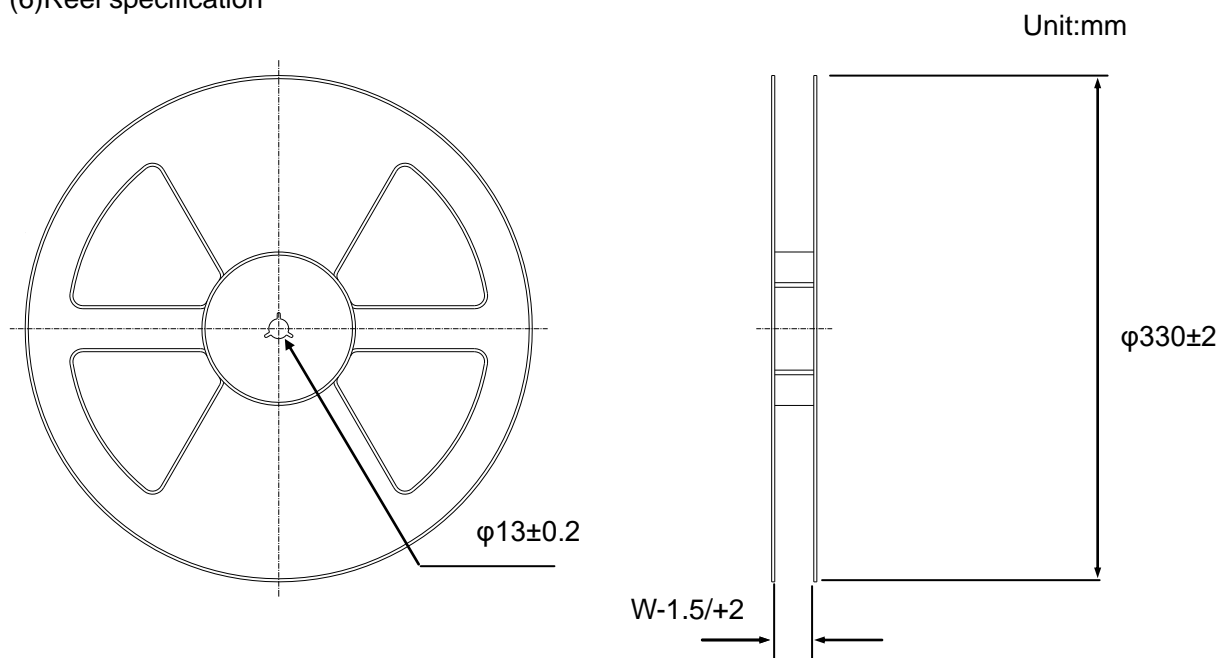
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Control No. HD-BB-A140346	(3/3)	Control name Taping Specification
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(6) Reel specification



Tape wide	8mm	12mm	16mm	24mm	32mm	44mm
W	9.4mm	13.4mm	17.4mm	25.4mm	33.4mm	45.4mm

(7) Taping performance

Both of an embossing tape top cover tape bear this, when the power of 10N is applied in the direction of a drawer.

The exfoliation adhesion of a top cover tape is the intensity of 0.1~1.3N.
(The angle to pull is 165~180 deg-C. The speed to pull is 300 mm/min.)

(8) Note

Lack of the parts in 1 reel is with two or less pieces.

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その他、注意事項について (Precautions)

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- The products listed in this specification are intended for use in general electronic equipment (e.g., AV equipment, OA equipment, home electric appliances, office equipment, information and communication equipment including, without limitation, mobile phone, and PC). Please be sure to contact TAIYO YUDEN for further information before using the products for any equipment which may directly cause loss of human life or bodily injury (e.g., transportation equipment including, without limitation, automotive powertrain control system, train control system, and ship control system, traffic signal equipment, disaster prevention equipment, medical equipment classified as Class I, II or III by IMDRF, highly public information network equipment including, without limitation, telephone exchange, and base station). Please do not incorporate our products into any equipment requiring high levels of safety and/or reliability (e.g., aerospace equipment, aviation equipment, medical equipment classified as Class IV by IMDRF, nuclear control equipment, undersea equipment, military equipment).
When our products are used even for high safety and/or reliability-required devices or circuits of general electronic equipment, it is strongly recommended to perform a thorough safety evaluation prior to use of our products and to install a protection circuit as necessary.
Please note that unless you obtain prior written consent of TAIYO YUDEN, TAIYO YUDEN shall not be in any way responsible for any damages incurred by you or third parties arising from use of the products listed in this specification for any equipment requiring inquiry to TAIYO YUDEN or prohibited for use by TAIYO YUDEN as described above.
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