
Title : SX-PCEAC2-SMT
 SX-PCEAC2-HMC
 SX-PCEAC2-M2

Drawing Type : 製品仕様書 Product specifications

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XX	The first release	Aug. 01, 18	Y.Kuroda	K.Hamada	Y.Shibuya
XA	§ 1, § 3.1, § 3.8 Supports Bluetooth v4.2. § 6.1 Change DID according to Bluetooth v4.2.	Sep. 26, 18	Y.Kuroda	K.Hamada	Y.Shibuya
XB	§ 10 Add packing spec of ZXE04010, ZXE03972 and ZXE04011.	Oct. 25, 18	Y.Kuroda	K.Hamada	Y.Shibuya
XC	§ 3.2 Updated low temperature from 0°C to -20°C.	Jul. 31, 19	Y.Kuroda	K.Hamada	Y.Shibuya
XD	§ 1, § 3.1, § 3.8 Supports Bluetooth v5.0. § 6.1 Change DID according to Bluetooth v5.0.	Oct. 17, 19	Y.Kuroda	K.Hamada	Y.Shibuya
XE	§ 3.5, 3.6, 6.1, 6.2 Add EN 300 440.	Nov. 14, 19	Y.Kuroda	K.Hamada	Y.Shibuya
XF	§ 7 Updated connector angle and dimension. § 4.1 Added 45pin(SMT)	Jan. 13, 20	K.Hamada	Y.Shibuya	T.Kometa ni
XG	§ 10.1 Added the reel specification. § 13 Updated the recommended land pattern.	Feb. 25, 20	Y.Kuroda	K.Hamada	Y.Shibuya
XH	§ 6.1 Corrected the description of Law regulation compliance.	Mar. 12, 20	Y.Kuroda	K.Hamada	Y.Shibuya
XJ	§ 3.5, 3.6 Add WLAN CH#144 for FCC. § 4.1, 4.2 SX-PCEAC2-SMT Correct pins name to match platform side pinout. Correspond pin names in § 4.2 with § 4.1. SX-PCEAC2-HMC Correct signal type of PER and PET.	May. 13, 20	Y.Kuroda	K.Hamada	Y.Shibuya
XK	§ 10.1, 10.3 Added the gross weight.	Jun. 29, 20	H.Nagahama	K.Hamada	Y.Shibuya
XL	§ 3.6 Change 11b Transmit Power Specification for US/CA	Aug. 28, 20	Y.Kuroda	K.Hamada	T.Hira
XM	§ 1 Deleted Bluetooth HS mode. § 3.5 Add WLAN CH#144 for IC. § 6.1 Add EN300440. § 6.2 Delete VSO ANT. § 9、10 Added SX-PCEAC2-HMC(56)	Oct. 08, 20	T.Minobe	K.Hamada	Y.Shibuya
XN	欠番(Missing number)	-	-	-	-
XP	§ 9、10 Deleted SX-PCEAC2-HMC(56) Changed SX-PCEAC2-HMC	Nov. 26, 20	T.Minobe	K.Hamada	Y.Shibuya
XR	§ 1, 3.1, 4.1, 4.2, 7, 9, 10 Add M2 model § 3.5, 3.6, 3.7 Deleted 2.4GHz 11ac § 9, 10 Deleted EVK model § 10 Updated SX-PCEAC2-SMT-SP and SX-PCEAC2-HMC-SP	Feb. 15, 21	H.Nagahama	Y.Kuroda	Y.Shibuya

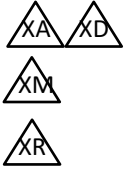
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1. 製品概要 / Product information

本書は SX-PCEAC2 について説明するものです。



SX-PCEAC2 は、QCA6174A-5 (Qualcomm Atheros 社) SoC を採用した、2.4GHz/5GHz Dual Band IEEE 802.11 a/b/g/n/ac、Bluetooth 5.0 BR/EDR/LE 準拠、Low power PCI express(w/ L1 sub-state)対応の無線モジュールです。本モジュールは、MAC/BBP/RF/RF フロントエンド及び各種電源/クロックなどの外部回路を内蔵しています。SX-PCEAC2 の製品形状は、表面実装型 (SMT) の SX-PCEAC2-SMT と Half Mini PCI-E Card 型の SX-PCEAC2-HMC と、M.2 Card Type 1630-S1-A-E 型の SX-PCEAC2-M2 があります。

This document describes SX-PCEAC2.

SX-PCEAC2 is a 2.4 GHz / 5GHz dual band IEEE802.11 a/b/g/n/ac WLAN, Bluetooth 5.0 BR/EDR/LE module based and Low power PCI express (w/ L1 sub-state) interface on Qualcomm QCA6174A-5 chipset. The SX-PCEAC2 highly integrates MAC, Base band, RF, RF front end and peripheral circuitry like power unit, reference clock, etc. There are surface mount type (SMT) SX-PCEAC2-SMT, Mini PCI-E Card type SX-PCEAC2-HMC and M.2 Card Type 1630-S1-A-E type SX-PCEAC2-M2.



SX-PCEAC2-SMT



SX-PCEAC2-HMC



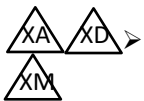
SX-PCEAC2-M2

特徴 (Features)

- IEEE802.11a/b/g/n/ac 準拠(2.4 GHz, 5 GHz)
IEEE802.11a/b/g/n/ac compatible (2.4 GHz, 5 GHz)
- 2 スペーシャルデータストリームシステム (2T2R)
2 spatial data stream system (2T2R)
- 5 GHz : 20/40/80 MHz 帯域幅モード対応 (PHY データレート 867Mbps)
2.4 GHz : 20/40 MHz 帯域幅モード対応 (PHY データレート 300Mbps, 拡張 PHY データレート 400Mbps)
5 GHz: Support 20/40/80 MHz bandwidth mode (PHY Data rate 867Mbps)
2.4 GHz: Support 20/40 MHz bandwidth mode (PHY Data rate 300Mbps, Extra PHY Data rate 400Mbps)

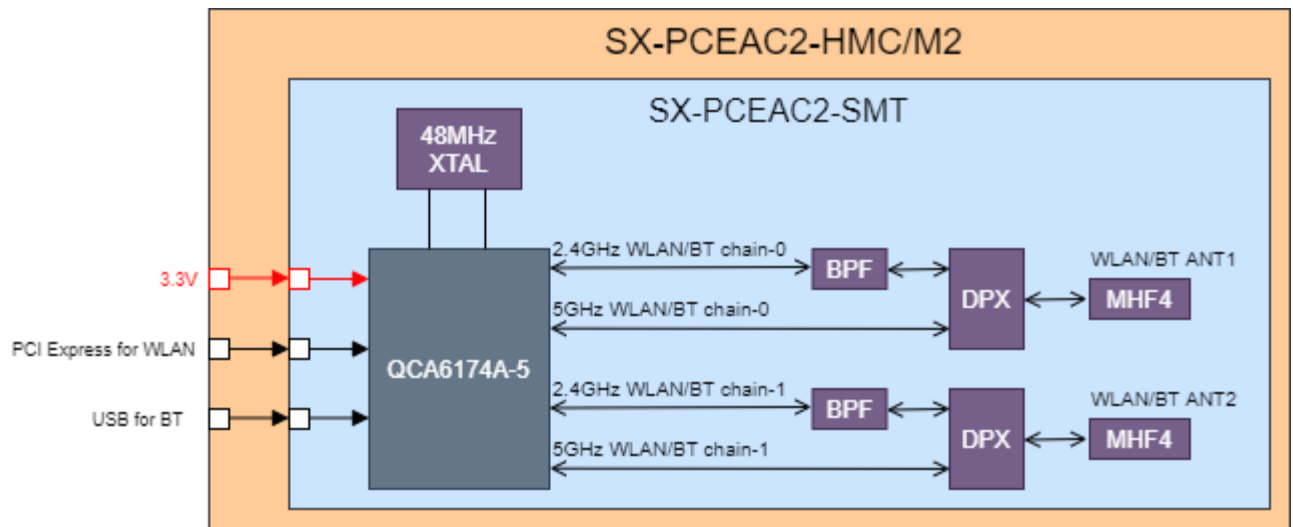
PHY Data Rate

- 802.11b/g 1-54 Mbps
- 802.11a 6-54 Mbps
- 802.11n 1Stream MCS0-7
- 802.11n 2Stream MCS8-15
- 802.11ac MCS0-9



- Bluetooth 5.0 BR/EDR/LE 準拠。Bluetooth 1.x, 2.x, 3.0, 4.0, 4.1, 4.2 後方互換
Bluetooth 5.0 BR/EDR/LE compatible. Backward-compatible to Bluetooth 1.x, 2.x, 3.0, 4.0, 4.1, 4.2
- Wireless LAN ホストインターフェイスとして Low power PCI express(w/ L1 sub-state)対応
Low power PCI express (w/ L1 sub-state) as the Wireless LAN host interface
- Bluetooth ホストインターフェイスとして USB 1.1 対応
USB 1.1 as the Bluetooth host interface
- 主電源+3.3V
+3.3V main power supply
- EU RoHS 指令 2011/65/EC (Lead Free)適合
EU RoHS directive 2011/65/EC (Lead Free) compliant

2. ハードウェアブロック図 / Hardware block diagram



略語 (Acronyms)

XTAL	Crystal resonator
BPF	Band-pass filter
DPX	Diplexer
MHF4	RF Coax connector manufactured by I-PEX

3. 基板仕様 / Board specifications

3.1. 一般仕様 / General specifications

XR

XA XD

Items	Specifications	Units	Remarks
パッケージタイプ Package Type	M.2 LGA Type 1216	—	SX-PCEAC2-SMT
	Half Mini PCI Express Card	—	SX-PCEAC2-HMC
	M.2 Card type 1630-S1-A-E	—	SX-PCEAC2-M2
アンテナポート Antenna port	MHF4 connector x2	pcs	
アンテナポートインピーダンス Antenna port impedance	50	Ω	Nominal value
インターフェイス Device Interfaces	Low power PCI express (w/ L1 sub-state)	—	For Wireless LAN
	USB 1.1	—	For Bluetooth
無線接続方式 RF Interface	IEEE802.11a/b/g/n/ac	—	IEEE802.11-2012 IEEE802.11ac-2013
	Bluetooth 5.0 BR/EDR/LE	—	
寸法 Dimensions	12.0 x 16.0 x 1.44	mm	SX-PCEAC2-SMT
	30.0 x 26.8 x 2.54		SX-PCEAC2-HMC
	16.5 x 30.0 x 2.34		SX-PCEAC2-M2
リフロー回数 Reflow Number	1	Time	Max.

3.2. 環境条件 Environmental specifications



Items	Specifications			Units	Remarks
	Min.	Typ.	Max.		
動作温度 Operating Temperature	-20	—	+70	°C	周囲温度 Ambient temperature 実装後電源電圧印加時 After assembled with powered *NOTE 3
動作湿度 Operating humidity	5	—	90	%RH	結露無きこと Non condensing 実装後電源電圧印加時 After assembled with powered
保存温度 Assembled storage temperature	-40	—	+80	°C	実装後電源電圧無印加時 After assembled with no-powered
保存湿度 Assembled storage humidity	5	—	95	%RH	結露無きこと Non condensing 実装後電源電圧無印加時 After assembled with no-powered
保管温度 Storage temperature	+5	—	+35	°C	梱包時。開封後は MSL に従う。 Packaged. Apply MSL after unpackaged.
保管湿度 Storage humidity	20	—	60	%RH	結露無きこと Non condensing 梱包時。開封後は MSL に従う。 Packaged. Apply MSL after unpackaged.
Moisture Sensitivity Level	3			—	IPC/JEDEC J-STD-020D 取り扱いについては下記を参照。 See below standard for handling. IPC/JEDEC J-STD-033C *NOTE 1

NOTE1	部品倉庫などで長期間 (弊社出荷後 1 年間)保管する際の推奨条件です。ドライパック未開封状態の場合、この条件下でドライパック内の湿度が 10%RH 未満に保たれます。ドライパック内の湿度が 10%RH 以上となったかどうかの判断は、保管期間に関わらず、§ 10 に示す湿度表示シートでご確認ください。保管期間 1 年以上経過後や輸送時に保管条件を超えた可能性があった場合は、製造前に湿度表示シートの確認やハンダ濡れ性の確認を実施することを推奨いたします。 This is condition to keep the product in the warehouse for long term (1 year after shipping from Silex). In case of Unpacked of the dry pack, humidity of inside shall be keep less than 10%RH. To know whether humidity in the dry pack is exceed 10%RH or not, please check out the humidity indication card (HIC). After 1 year from shipping or in case it might be exceeded this condition due to transportation, checking HIC or checking solder ability before production is strongly recommended.
NOTE2	推奨ベーキング条件 (Recommended baking conditions) 基板単独 (Board only) : 125°C+10/-0°C 24 hours リール状態 (With reel) : 40°C+5/-0°C ≤5%RH 13 days ドライパック開封後 JEDEC J-STD-033 の取扱い条件下で ≤30°C/60%RH でのフロアタイムが 168 時間を超えた場合ベーキングが必要です。ドライパック未開封時でも、§ 10 に示す湿度表示シートが 10%RH 以上の色に変色している場合ベーキングが必要です。 In case ≤30°C/60%RH with handling rule of JEDEC-STD-033 and floor time is exceeded 168hrs, baking must be necessary. Even before unpacking the dry pack, baking must be necessary if color of HIC is changed to color of 10%RH or more.
NOTE3	周囲温度 -20°C ~ 0°C で使用する際には、EVM 特性の劣化により WLAN 5GHz における送信スループットが 0°C ~ +70°C 使用に比べて低下する可能性があります。 When this product is used at -20°C to 0°C operating temperature, WLAN TX 5GHz through put sometimes decreases because of EVM degradation rather than what used at 0°C to +70°C.

3.3. 電氣的仕様 / Electrical specifications

絶対最大定格 Absolute Maximum Ratings

Items	Specifications			Units	Remarks
	Min.	Typ.	Max.		
主電源電圧 (3.3V) Main power supply voltage	-0.30	—	+3.63	V	

推奨動作条件 Recommended Operating Conditions

主電源 Main power supply

Items	Specifications			Units	Remarks
	Min.	Typ.	Max.		
主電源電圧 (3.3V) Main Power supply voltage	+3.135	+3.300	+3.465	V	

3.4. 消費電流仕様 / Current consumption specifications

VDD (WLAN operating)

Items	Specifications					Units	Remarks
	Modes	Stream	Standards	Typ.	Max.		
消費電流 Current consumption 2.4GHz	Tx	1T1R	11b	390	510	mA	
			11g	380	500	mA	
			11ng HT20	370	490	mA	
			11ng HT40	360	410	mA	
		2T2R	11ng HT20	680	970	mA	
			11ng HT40	660	880	mA	
	Rx	1T1R	All mode	80	150	mA	
		2T2R		90	150	mA	
消費電流 Current consumption 5GHz	Tx	1T1R	11a	440	660	mA	
			11na HT20/11ac VHT20	450	590	mA	
			11na HT40/11ac VHT40	420	600	mA	
			11ac VHT80	420	580	mA	
		2T2R	11na HT20/11ac VHT20	810	940	mA	
			11na HT40/11ac VHT40	790	910	mA	
			11ac VHT80	780	910	mA	
	Rx	1T1R	All mode	110	170	mA	
		2T2R		130	210	mA	

通常動作時(Production Driver operating)

Items	Specifications					Units	Remarks
	Modes	Stream	Standards	Typ.	Max.		
消費電流 Current consumption 2.4GHz	Tx	2T2R	11ng HT40, MCS15 Throughput > 600Mbps	530	580	mA	
	Rx	2T2R	11ng HT40, MCS15 Throughput > 670Mbps	460	540	mA	
消費電流 Current consumption 5GHz	Tx	2T2R	11ac VHT80, MCS9 Throughput > 220Mbps	760	800	mA	
	Rx	2T2R	11ac VHT80, MCS9 Throughput > 220Mbps	560	690	mA	
消費電流 Current consumption	Idle when associated with 5GHz			110	NA	mA	
	Idle when associated with 2.4GHz			80	NA	mA	
	Idle when unassociated			10	NA	mA	

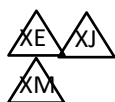
VDD (BT operating)

Items	Specifications			Units	Remarks
	Modes	Typ.	Max.		
消費電流	Tx	130	170	mA	
Current consumption	Rx	110	160	mA	

NOTE1:	Typ.: テストツールの連続送信/受信時における平均電流の個体バラツキの平均値。 Average value of unevenness of average current per unit with continuous transmit/receive mode of the test tool. Max.: テストツールの連続送信/受信時におけるピーク電流の個体バラツキの最大値。 Maximum value of unevenness of peak current per unit with continuous transmit/receive mode of the test tool.
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3.5. 無線 LAN 一般仕様 / Wireless LAN general specifications

Items	Specifications				Units	Remarks
チップセット Chipset	QCA6174A-5(Qualcomm Atheros)				—	
国/地域コード Country/Domain code	0x006C				—	
XR XE 動作周波数 Operating Frequency range	Band	Modes	Min	Max		
	2.4GHz	11b	2412	2472	MHz	
		11g/n 20MHz	2412	2472	MHz	
		11n 40MHz	2422	2462	MHz	
	5GHz	11a/n/ac 20MHz	5180	5825	MHz	
		11n/ac 40MHz	5190	5795	MHz	
		11ac 80MHz	5210	5775	MHz	
	周波数間隔 Frequency step	2.4GHz	11b/g/n	5	MHz	
		5GHz	11a/n/ac 20MHz	20	MHz	
リンクデータレート Link Data Rate	11b	1,2,5.5L,5.5S,11L,11S			Mbps	
	11a/g	6,9,12,18,24,36,48,54			Mbps	
	11n	MCS 0,1,2,3,4,5,6,7			—	1Stream
	11n	MCS 8,9,10,11,12,13,14,15			—	2Stream
	11ac	MCS 0,1,2,3,4,5,6,7,8,9			—	
変調型 Modulation type	11b	DSSS(DBPSK,DQPSK,CCK)			—	
	11a/g/n	OFDM(BPSK,QPSK,16QAM,64QAM)			—	
	11ac	OFDM(BPSK,QPSK,16QAM,64QAM,256QAM)			—	
暗号化 Encryption	RC4	128			bits	
	AES	128			bits	



利用可能チャネルリスト (Available channel list)

2.4GHz	US/CA	20MHz	Ch.1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
		40MHz	Ch.3, 4, 5, 6, 7, 8, 9
	EU	20MHz	Ch.1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
		40MHz	Ch.3, 4, 5, 6, 7, 8, 9, 10, 11
	JP	20MHz	Ch.1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
		40MHz	Ch.3, 4, 5, 6, 7, 8, 9, 10, 11
5GHz	US	20MHz	Ch.36,40,44,48,52,56,60,64,100,104,108,112,116,120,124,128,132,136,140,144,149,153,157,161,165
		40MHz	Ch.38,46,54,62,102,110,118,126,134,142,151,159
		80MHz	Ch.42,58,106,122,138,155
	EU	20MHz	Ch.36,40,44,48,52,56,60,64,100,104,108,112,116,120,124,128,132,136,140,149,153,157,161,165
		40MHz	Ch.38,46,54,62,102,110,118,126,134,151,159
		80MHz	Ch.42,58,106,122,155
	CA	20MHz	Ch.36,40,44,48,52,56,60,64,100,104,108,112,116,132,136,140,144,149,153,157,161,165
		40MHz	Ch.38,46,54,62,102,110,134,142,151,159
		80MHz	Ch.42,58,106,155
	JP	20MHz	Ch.36,40,44,48,52,56,60,64,100,104,108,112,116,120,124,128,132,136,140
		40MHz	Ch.38,46,54,62,102,110,118,126,134
		80MHz	Ch.42,58,106,122

NOTE1

カナダでは 5590-5650MHz を使用することができません。
5590-5650MHz is disabled in Canada.

3.6. 無線 LAN 送信仕様 / Wireless LAN transmitter specifications

2.4GHz (+25°C)

	Mode	Rate	Transmit Power Specification Typ. (dBm)						Remarks
			JP		US/CA		EU		
	11b	1-11Mbps	Ch.1-Ch.13	12.0	Ch.1-Ch.11	9.0	Ch.1	11.0	
							Ch.2-Ch.13	11.5	
	11g	6-24Mbps	Ch.1-Ch.13	16.5	CH.1	14.0	Ch.1-Ch.13	12.0	
					Ch2.-Ch.10	18.0			
					Ch.11	14.0			
		36Mbps	Ch.1-Ch.13	16.5	CH.1	14.0	Ch.1-Ch.13	12.0	
					Ch2.-Ch.10	17.0			
					Ch.11	14.0			
		48-54Mbps	Ch.1-Ch.13	16.0	CH.1	14.0	Ch.1-Ch.13	12.0	
					Ch2.-Ch.10	16.0			
					Ch.11	14.0			
	11n 20MHz	MCS0-2	Ch.1-Ch.13	16.5	CH.1	13.0	Ch.1-Ch.13	12.5	
					Ch2.-Ch.10	18.0			
					Ch.11	13.0			
		MCS3-4	Ch.1-Ch.13	16.5	CH.1	13.0	Ch.1-Ch.13	12.5	
					Ch2.-Ch.10	17.0			
					Ch.11	13.0			
MCS5-7		Ch.1-Ch.13	16.0	CH.1	13.0	Ch.1-Ch.13	12.5		
				Ch2.-Ch.10	16.0				
				Ch.11	13.0				
11n 40MHz	MCS0-2	Ch.3-Ch.11	16.5	Ch.3	11.0	Ch.3-Ch.11	11.0		
				Ch.4-Ch.8	15.0				
				Ch.9	8.5				
	MCS3-7	Ch.3-Ch.11	16.0	2422	11.0	Ch.3-Ch.11	11.0		
				2437	15.0				
				2452	8.5				


5GHz (+25°C)

Mode	Rate	Transmit Power Specification Typ. (dBm)						Remarks	
		JP		US/CA		EU			
11a	6-36M	Ch.36-Ch.48	12.5	Ch.36-Ch.165	13.0	Ch.36-Ch.140	13.0		
		Ch.52-Ch.64	12.0			Ch.149-Ch.165	6.5		
		Ch.100-Ch.140	13.0						
	48M	Ch.36-Ch.140	12.0	Ch.36-Ch.165	12.0	Ch.36-Ch.140	12.0		
						Ch.149-Ch.165	6.5		
	54M	Ch.36-Ch.140	10.5	Ch.36-Ch.165	10.5	Ch.36-Ch.140	10.5		
Ch.149-Ch.165						6.5			
11n/ac 20MHz	MCS0-4	Ch.36-Ch.140	12.5	Ch.36-Ch.165	12.5	Ch.36-Ch.140	12.5	HT/VHT	
						Ch.149-Ch.165	6.5		
	MCS5	Ch.36-Ch.140	12.0	Ch.36-Ch.165	12.0	Ch.36-Ch.140	12.0	HT/VHT	
						Ch.149-Ch.165	6.5		
	MCS6	Ch.36-Ch.140	11.0	Ch.36-Ch.165	11.0	Ch.36-Ch.140	11.0	HT/VHT	
						Ch.149-Ch.165	6.5		
	MCS7	Ch.36-Ch.140	10.0	Ch.36-Ch.165	10.0	Ch.36-Ch.140	10.0	HT/VHT	
						Ch.149-Ch.165	6.5		
	MCS8	Ch.36-Ch.140	9.0	Ch.36-Ch.165	9.0	Ch.36-Ch.140	9.0	VHT	
						Ch.149-Ch.165	6.5		
11n/ac 40MHz	MCS0-4	Ch.38-Ch.134	11.5	Ch.38	10.5	Ch.38-Ch.134	11.5	HT/VHT	
				Ch.46-Ch.54	11.5		Ch.151-Ch.159		6.5
				Ch.62	11.0				
				Ch.102-Ch.159	11.5				
	MCS5-6	Ch.38-Ch.134	11.0	Ch.38	10.5	Ch.38-Ch.134	11.0	HT/VHT	
				Ch.46-Ch.159	11.0	Ch.151-Ch.159	6.5		
	MCS7	Ch.38-Ch.134	10.0	Ch.38-Ch.159	10.0	Ch.38-Ch.134	10.0	HT/VHT	
						Ch.151-Ch.159	6.5		
	MCS8	Ch.38-Ch.134	8.0	Ch.38-Ch.159	8.0	Ch.38-Ch.134	8.0	VHT	
						Ch.151-Ch.159	6.5		
	MCS9	Ch.38-Ch.134	7.0	Ch.38-Ch.159	7.0	Ch.38-Ch.134	7.0	VHT	
						Ch.151-Ch.159	6.5		

Mode	Rate	Transmit Power Specification Typ. (dBm)						Remarks
		JP		US/CA		EU		
11ac 80MHz	MCS0-4	Ch.42-Ch.122	10.5	Ch.42	10.5	Ch.42-Ch.122	10.5	
				Ch.58	9.5	Ch.155	6.5	
				Ch.106-Ch.155	10.5			
	MCS5-6	Ch.42-Ch.122	10.0	Ch.42	10.0	Ch.42-Ch.122	10.0	
				Ch.58	9.5	Ch.155	6.5	
				Ch.106-Ch.155	10.0			
	MCS7	Ch.42-Ch.122	8.0	Ch.42-Ch.155	8.0	Ch.42-Ch.122	8.0	
						Ch.155	6.5	
	MCS8	Ch.42-Ch.122	7.0	Ch.42-Ch.155	7.0	Ch.42-Ch.122	7.0	
						Ch.155	6.5	
	MCS9	Ch.42-Ch.122	6.0	Ch.42-Ch.155	6.0	Ch.42-Ch.155	6.0	

NOTE1:	送信電力は各アンテナ Chain 単独の値です。2 Data stream 時の総電力は+3.0dB されます。 Transmit power is the value from each single chain. When the device transmits 2 streams of data, total power can be +3.0dB.
NOTE2:	送信電力表は Typ.値を示します。Max. = Typ. +2.5dB, Min. = Typ. -2.5dB になります。 Transmit power table indicates Typ. Value. Max. = Typ. +2.5dB, Min. = Typ. -2.5dB

Frequency accuracy (Operating temperature)

Items	Specifications				Units	Remarks
	Standards	Min.	Typ.	Max.		
周波数精度 Frequency accuracy	11a/11b/11g/11n/11ac	-20	0	+20	ppm	

3.7. 無線 LAN 受信仕様 / Wireless LAN receiver specifications



2.4GHz (Operating temperature)

Items	Specifications					Units	Remarks
	Modes		Min.	Typ.	Max.		
最小受信感度 Receiver minimum Sensitivity	11b (FER<8%)	1Mbps	—	-96	-80	dBm	
		11Mbps	—	-93	-76	dBm	
	11g (PER<10%)	6Mbps	—	-90	-82	dBm	
		54Mbps	—	-79	-65	dBm	
	11n 20MHz (PER<10%)	MCS0	—	-90	-82	dBm	
		MCS7	—	-75	-64	dBm	
	11n 40MHz (PER<10%)	MCS0	—	-87	-79	dBm	
		MCS7	—	-73	-61	dBm	

5GHz (Operating temperature)

Items	Specifications					Units	Remarks
	Modes		Min.	Typ.	Max.		
最小受信感度 Receiver minimum Sensitivity	11a (PER<10%)	6Mbps	—	-91	-82	dBm	
		54Mbps	—	-79	-65	dBm	
	11n/ac 20MHz (PER<10%)	MCS0	—	-91	-82	dBm	HT/VHT
		MCS7	—	-76	-64	dBm	HT/VHT
		MCS8	—	-71	-59	dBm	VHT
	11n/ac 40MHz (PER<10%)	MCS0	—	-88	-79	dBm	HT/VHT
		MCS7	—	-73	-61	dBm	HT/VHT
		MCS9	—	-67	-54	dBm	VHT
	11ac 80MHz (PER<10%)	MCS0	—	-85	-76	dBm	VHT
		MCS9	—	-65	-51	dBm	VHT

3.8. Bluetooth 一般仕様 / Bluetooth general specifications



Items	Specifications			Units	Remarks
チップセット Chipset	QCA6174A-5(Qualcomm Atheros)			—	
コア仕様 Core specification	Bluetooth 5.0			—	
動作周波数 Operating Frequency range	Mode	Min	Max		
	BR/EDR/LE	2402	2480	MHz	
周波数間隔 Frequency step	BR/EDR	1		MHz	Ch.1-Ch.79
	LE	2		MHz	Ch.0-Ch.39
変調方式 Modulation type	GFSK(1Mbps), $\pi/4$ DQPSK(2Mbps),8DPSK(3Mbps)			—	
パケットタイプ Packet type	Common	NULL,POLL,FHS		—	
	ACL	DM1,DM3,DM5,AUX1, DH1,DH3,DH5,2DH1,2DH3,2DH5 3DH1,3DH3,3DH5		—	
	SCO	HV1,HV2,HV3,DV,EV3,2EV3		—	
暗号化 Encryption	E0	128		bits	BR/EDR
	AES	128		bits	LE

NOTE1	モジュール内に個別 BD アドレスデータを保持していません。ユーザーアプリケーションで設定が必要です。 Individual unique BD address is not written in the module. User must set MAC address by the user application.
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3.9. Bluetooth 送信仕様 / Bluetooth transmitter specifications

Bluetooth BR / EDR / LE (+25°C)

Items	Specifications						Units	Remarks
	Standards			Min.	Typ.	Max.		
最大送信電力 Maximum TX power	BR	Class 1	Ch.1-Ch.79	+5.0	+7.0	+9.0	dBm	
	EDR	Class 1	Ch.1-Ch.79	+4.5	+6.5	+8.0	dBm	
	LE		Ch.0-Ch.39	+1.5	+3.0	+4.5	dBm	

Frequency accuracy (Operating temperature)

Items	Specifications				Units	Remarks
	Standards	Min.	Typ.	Max.		
中心周波数精度 Center frequency accuracy	BR/EDR/LE	-20	—	+20	ppm	

3.10. Bluetooth 受信仕様 / Bluetooth Receiver specifications

Bluetooth BR / EDR / LE (Operating temperature)

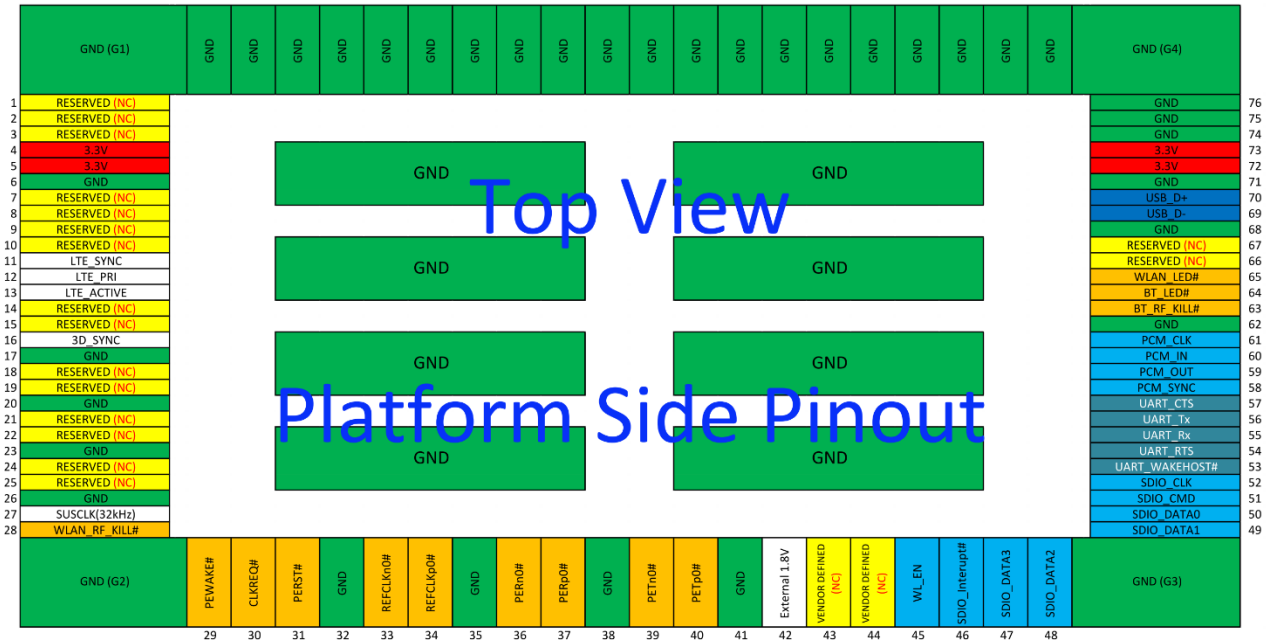
Items	Specifications					Units	Remarks
最小受信感度 Receiver minimum Sensitivity	Standards	Packet Types	Min.	Typ.	Max.		
	BR (BER<0.1%)	GFSK (1Mbps)	—	-93.0	-70	dBm	
	EDR (BER<0.01%)	π/4 DQPSK (2Mbps)	—	-92.0	-70	dBm	
		8DPSK (3Mbps)	—	-86.0	-70	dBm	
	LE (PER<30%)	GFSK (1Mbps)	—	-97.0	-70	dBm	

4. 信号仕様 / Signal pins specifications

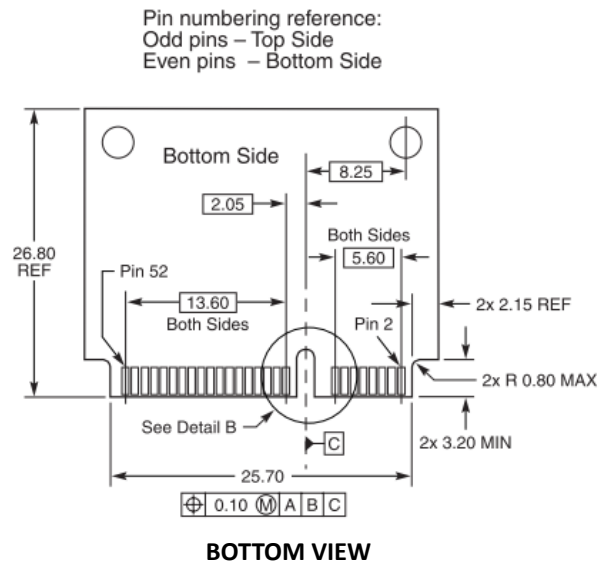
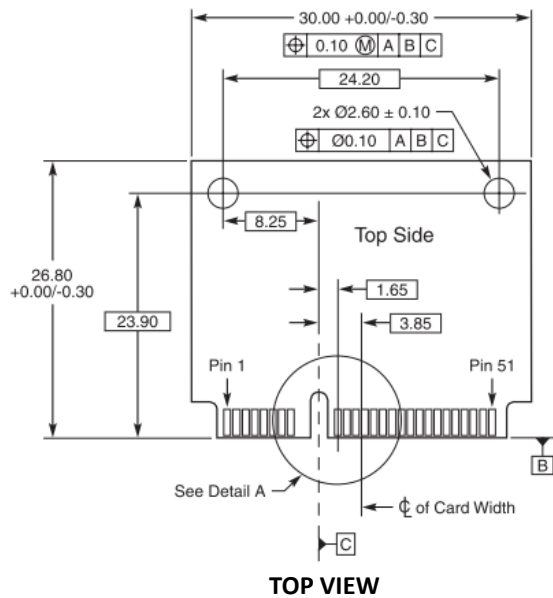
4.1. ピン配置 / Pin locations



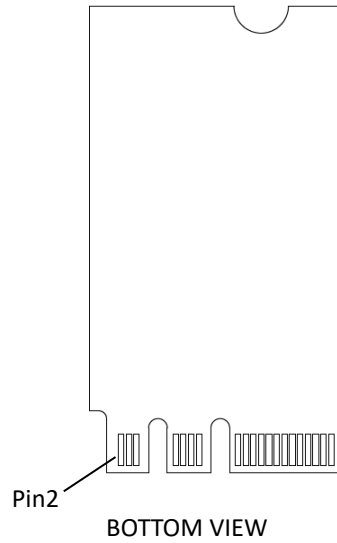
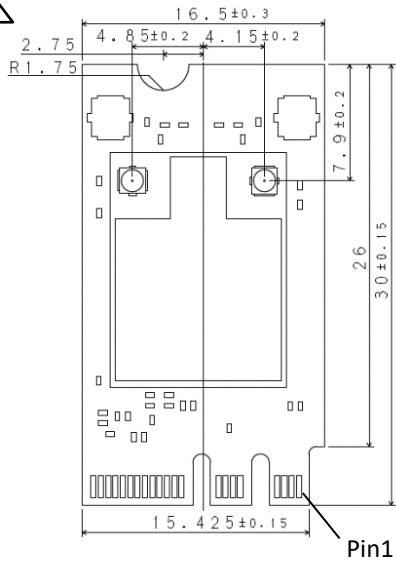
● SX-PCEAC2-SMT



● SX-PCEAC2-HMC



● **SX-PCEAC2-M2**



4.2. 信号仕様 / Signal descriptions



● SX-PCEAC2-SMT



Pin	Pin Name	Type	VDDIO or Pad Voltage	Description
	WLAN PCIe Interface			
31	PERST#	PD	3.3V	PCI Express reset with weak pull-down
29	PEWAKE#	OD	3.3V	Request to service a function- initiated wake event. An external pull-up resistor to 3.3V is required.
30	CLKREQ#	OD	3.3V	Reference clock request. An external pull-up resistor to VDDIO_AO_PM is required.
34	REFCLKp0#	AI	1.1V	Differential reference clock (100MHz)
33	REFCLKn0#	AI	1.1V	Differential reference clock (100MHz)
37	PERp0#	AO	1.1V	Differential transmit from module
36	PERn0#	AO	1.1V	Differential transmit from module
40	PETp0#	AI	1.1V	Differential receive from module
39	PETn0#	AI	1.1V	Differential receive from module
	BT USB1.1 Interface			
70	USB_D+	AI/AO	—	Bluetooth USB 1.1 differential pair
69	USB_D-	AI/AO	—	Bluetooth USB 1.1 differential pair
	Control Signals			
28	WLAN_RF_KILL#	PU	3.3V	Turn-off WLAN RF analog and front-end. Active low.
63	BT_RF_KILL#	PU	3.3V	Turn-off BT RF analog and front-end. Active low.
65	WLAN_LED#	OD	3.3V	WLAN LED
64	BT_LED#	OD	3.3V	BT LED
	POWER			
4,5,72,73	3.3V	POWER	3.3V	3.3V input voltage
	NC			
11	LTE_SYNC	PD		NC
12	LTE_PRI	DO		NC
13	LTE_ACTIVE	PD		NC
16	3D_SYNC	PD		NC
27	SUSCLK(32kHz)	PD		NC
42	External 1.8V	POWER		NC
45	WL_EN	PD		NC
46	SDIO_Interupt#	DO		NC
47	SDIO_DATA3	B		NC
48	SDIO_DATA2	B		NC
49	SDIO_DATA1	B		NC
50	SDIO_DATA0	B		NC
51	SDIO_CMD	DI		NC
52	SDIO_CLK	DI		NC

	Pin	Pin Name	Type	VDDIO or Pad Voltage	Description
	53	UART_WAKEHOST#	DO		NC
XJ	54	UART_RTS	DI		NC
	55	UART_Rx	DO		NC
	56	UART_Tx	DI		NC
	57	UART_CTS	DO		NC
	58	PCM_SYNC	B		NC
	59	PCM_OUT	PD		NC
	60	PCM_IN	DO		NC
	61	PCM_CLK	PD		NC
XJ	1,2,3,7,8,9,10,14,15,18,19, 21,22,24,25,43,44,66,67	NC	-		NC
GROUND					
6,17,20,23,26,32,35,38,41,62,68,71,74,75,76					

● SX-PCEAC2-HMC

Pin	Pin Name	Type	VDDIO or Pad Voltage	Description
1	WAKE_L	OD	3.3V	PCIe Request to service a function- initiated wake event. An external pull-up resistor to 3.3V is required.
3	RESERVED (NC)	NC	NA	NC
5	RESERVED (NC)	NC	NA	NC
7	CLKREQ_L	OD		PCIe Reference clock request. An external pull-up resistor to VDDIO_AO_PM is required.
9	GND	GND		
11	REFCLK-	AI	1.1V	PCIe Differential reference clock (100MHz)
13	REFCLK+	AI	1.1V	PCIe Differential reference clock (100MHz)
15	GND	GND		
17	UIM_C8	NC	NA	NC
19	UIM_C4	NC	NA	NC
21	GND	GND		
23	PERn0	AO	1.1V	PCIe Differential transmit
25	PERp0	AO	1.1V	PCIe Differential transmit
27	GND	GND		
29	GND	GND		
31	PETn0	AI	1.1V	PCIe Differential receive
33	PETp0	AI	1.1V	PCIe Differential receive
35	GND	GND		
37	RESERVED (NC)	NC	NA	NC
39	RESERVED (NC)	NC	NA	NC
41	RESERVED (NC)	NC	NA	NC
43	GND	GND		
45	RESERVED (NC)	NC	NA	NC
47	RESERVED (NC)	NC	NA	NC
49	RESERVED (NC)	NC	NA	NC
51	BT_DISABLE_L	PU	3.3V	Turn-off BT RF analog and front-end. Active low.

Pin	Pin Name	Type	VDDIO or Pad Voltage	Description
2	3.3V	POWER	3.3V	3.3V input voltage
4	GND	GND		
6	UIM_PWR	NC	NA	NC
8	UIM_DATA	NC	NA	NC
10	UIM_CLK	NC	NA	NC
12	UIM_CLK	NC	NA	NC
14	UIM_RESET	NC	NA	NC
16	UIM_VPP	NC	NA	NC
18	GND	GND		
20	W_DISABLE_L	PU	3.3V	Turn-off WLAN RF analog and front-end. Active low.
22	PERST_L	PD	3.3V	PCIe reset with weak pull-down
24	3.3VAUX	NA	NA	NC
26	GND	GND		
28	+1.5V	NC	NA	NC
30	SMB_CLK	NC	NA	NC
32	SMB_DATA	NC	NA	NC
34	GND	GND		
36	USB_D-	AI/AO	—	Bluetooth USB 1.1 differential pair
38	USB_D+	AI/AO	—	Bluetooth USB 1.1 differential pair
40	GND	NC	NA	NC
42	LED_WWAN_L	NC	NA	NC
44	LED_WLAN_L	OD	3.3V	WLAN LED
46	LED_WPAN_L	OD	3.3V	BT LED
48	+1.5V	NC	NA	NC
50	GND	GND		
52	3.3V	POWER	3.3V	3.3V input voltage

● SX-PCEAC2-M2



Pin	Pin Name	Type	VDDIO or Pad Voltage	Description
1	GND	GND		
3	USB_D+	AI/AO	—	Bluetooth USB 1.1 differential pair
5	USB_D-	AI/AO	—	Bluetooth USB 1.1 differential pair
7	GND	GND		
17	RESERVED (NC)	NC	NA	NC
19	RESERVED (NC)	NC	NA	NC
21	RESERVED (NC)	NC	NA	NC
23	RESERVED (NC)	NC	NA	NC
33	GND	GND		
35	PETp0#	AI	1.1V	Differential receive from module
37	PETn0#	AI	1.1V	Differential receive from module
39	GND	GND		
41	PERp0#	AO	1.1V	Differential transmit from module
43	PERn0#	AO	1.1V	Differential transmit from module
45	GND	GND		
47	REFCLK+	AI	1.1V	PCIe Differential reference clock (100MHz)
49	REFCLK-	AI	1.1V	PCIe Differential reference clock (100MHz)
51	GND	GND		
53	CLKREQ_L	OD		PCIe Reference clock request. An external pull-up resistor to VDDIO_AO_PM is required.
55	WAKE_L	OD	3.3V	PCIe Request to service a function- initiated wake event. An external pull-up resistor to 3.3V is required.
57	GND	GND		

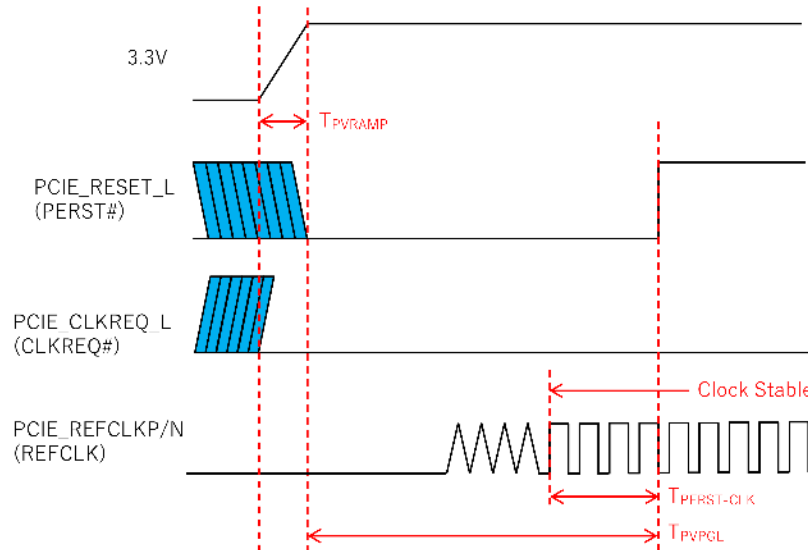
Pin	Pin Name	Type	VDDIO or Pad Voltage	Description
2	3.3V	POWER	3.3V	3.3V input voltage
4	3.3V	POWER	3.3V	3.3V input voltage
6	RESERVED (NC)	NC	NA	NC
16	RESERVED (NC)	NC	NA	NC
18	GND	GND		
20	RESERVED (NC)	NC	NA	NC
22	RESERVED (NC)	NC	NA	NC
32	RESERVED (NC)	NC	NA	NC
34	RESERVED (NC)	NC	NA	NC
36	RESERVED (NC)	NC	NA	NC
38	RESERVED (NC)	NC	NA	NC
40	RESERVED (NC)	NC	NA	NC
42	RESERVED (NC)	NC	NA	NC
44	RESERVED (NC)	NC	NA	NC
46	RESERVED (NC)	NC	NA	NC
48	RESERVED (NC)	NC	NA	NC
50	RESERVED (NC)	NC	NA	NC
52	PERST_L	PD	3.3V	PCIe reset with weak pull-down
54	RESERVED (NC)	NC	NA	NC
56	RESERVED (NC)	NC	NA	NC

4.3. 信号定義 / Signal definitions

Symbols	Descriptions
AI	モジュールへのアナログインプット Analog input to module
AO	モジュールからのアナログアウトプット Analog output from module
DI	モジュールへのデジタルインプット Digital input to module
DO	モジュールからのデジタルアウトプット Digital output from module
B	双方向信号 Bidirectional signal
OD	オープンドレインの出力信号 An output signal with open drain
PU	ウィークプルアップインプット信号 Input signal with weak pull-up.
PD	ウィークプルダウンインプット信号 Input signal with weak pull-down.
POWER	電源 Voltage supply
GND	グラウンド Ground
NC	未接続 No connection

5. インターフェイス・タイミング仕様 / Interface and timing specifications

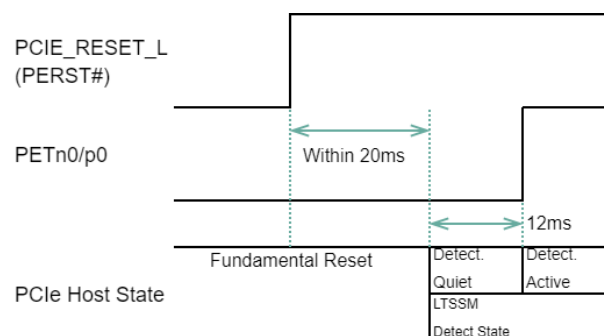
5.1. PCIe 起動シーケンスタイミング / PCIe power up sequence timing



Symbols	Items	Specifications		Units
		Min.	Max.	
T_{PVRAMP}	Power Supply Ramp on 3.3V	—	100	msec
T_{PVPGL}	Power(3.3V) valid to PERST# Input inactive	10	—	msec
$T_{PERST-CLK}$	REFCLK stable before PERST# inactive	100	—	μ sec

*PCI ホストは PCIE_RESET_L リリース時 (Fundamental Reset リリース時)、PCI ホストは 20msec 以内に LTSSM の Detect State に遷移しなければなりません。PCI ホストステートの詳細は PCI Express v1.1 規格を参照ください。

*When a PCI host de-assert PCIE_RESET_L (Fundamental Reset is de-asserted), a PCI host must be in the LTSSM Detect State within 20msec. Refer to PCI Express v1.1 standard for detail about a PCI host state.



6. 適合規格 / Standards compliance

6.1. 規格一覧 / Standards list

適合規格 (Standards conformity)

- IEEE802.11-2012 (a/b/g/n)
- IEEE802.11ac-2013
- Bluetooth 5.0 BR/EDR/LE (DID: **D043255**)
- Low power PCI express (w/ L1 sub-state)



適合法規制 (Law regulation compliance)

- ◇ 日本電波法 (MIC)
 - 証明規則第 2 項第 1 条 第 19 号 (Infra 親機/子機, Wi-Fi Direct, Bluetooth)
 - 証明規則第 2 項第 1 条 第 19 号の 3 (W52 Infra 親機/子機、W53 Infra 子機)
 - 証明規則第 2 項第 1 条 第 19 号の 3 の 2 (Infra 子機)
 - Article 2 paragraph 1 item (19) (Infra Master/Slave mode, Wi-Fi Direct, Bluetooth)
 - Article 2 paragraph 1 item (19)-3 (W52 Infra Master/Slave mode、W53 Infra Slave mode)
 - Article 2 paragraph 1 item (19)-3-2 (Infra Slave mode)
 - 認証番号 (Certification number): **003-170303**
- ◇ FCC Part15 (Subpart C, Subpart E)
 - Subpart C (2.4GHz Master device & Client device, Wi-Fi Direct, Bluetooth.)
 - Subpart E (W52 Master mode and Slave mode, Wi-Fi Direct W53/W56 Slave mode, W58 Master mode and Slave mode.)
 - ID: **N6C-SXPCEAC2**
- ◇ ISSED RSS-247
 - Subpart C (2.4GHz Master device & Client device, Wi-Fi Direct, Bluetooth.)
 - Subpart E (W52 Master mode and Slave mode, Wi-Fi Direct W53/W56 Slave mode, W58 Master mode and Slave mode.)
 - ID: **4908A-SXPCEAC2**
- ◇ ETSI (EN 300 328, EN 301 893, EN300440)
 - EN 300 328 (2.4GHz Master & Slave, Wi-Fi Direct, Bluetooth.)
 - EN 301 893 (W52 Master & Slave, Wi-Fi Direct W53/W56 Slave.)
 - EN300440 (W58 Master & Slave)



- CE RoHS Directive

対応国 (Countries)

- Asia
 - ・ Japan
- North America
 - ・ US
 - ・ Canada
- EU

6.2. 推奨アンテナリスト / Recommended antenna list



日本 (Japan) MIC

Antennas	Vendors	Antenna Type	2.4GHz Gain	5GHz Gain	No.19 2.4GHz	No.19-2 2.484GHz	No.19-3 W52/53	No.19-3-2 W56
AA258 (H2B1PC1A1C) (Exclude cable loss)	Unictron	PCB	+2.9dBi	+4.4dBi	✓	✓	✓	✓
AA222 (H2B1PD1A1C) (Exclude cable loss)	Unictron	PCB	+2.8dBi	+4.2dBi	✓	✓	✓	✓
1019-012A/-013A /-014A/-015A (Exclude cable loss)	STAF	Rod	+2.14dBi	+4.0dBi	✓	✓	✓	✓
ANTDC-108A0/B0 (Exclude cable loss)	Sansei-Denki	Rod	+2.0dBi	+2.0dBi	✓	✓	✓	✓
ANTDP-027A0/-039A0 (Exclude cable loss)	Sansei-Denki	Rod	+1.5dBi	+2.1dBi	✓	✓	✓	✓



アメリカ・カナダ・ヨーロッパ (USA・Canada・Europe) FCC/IC/ETSI

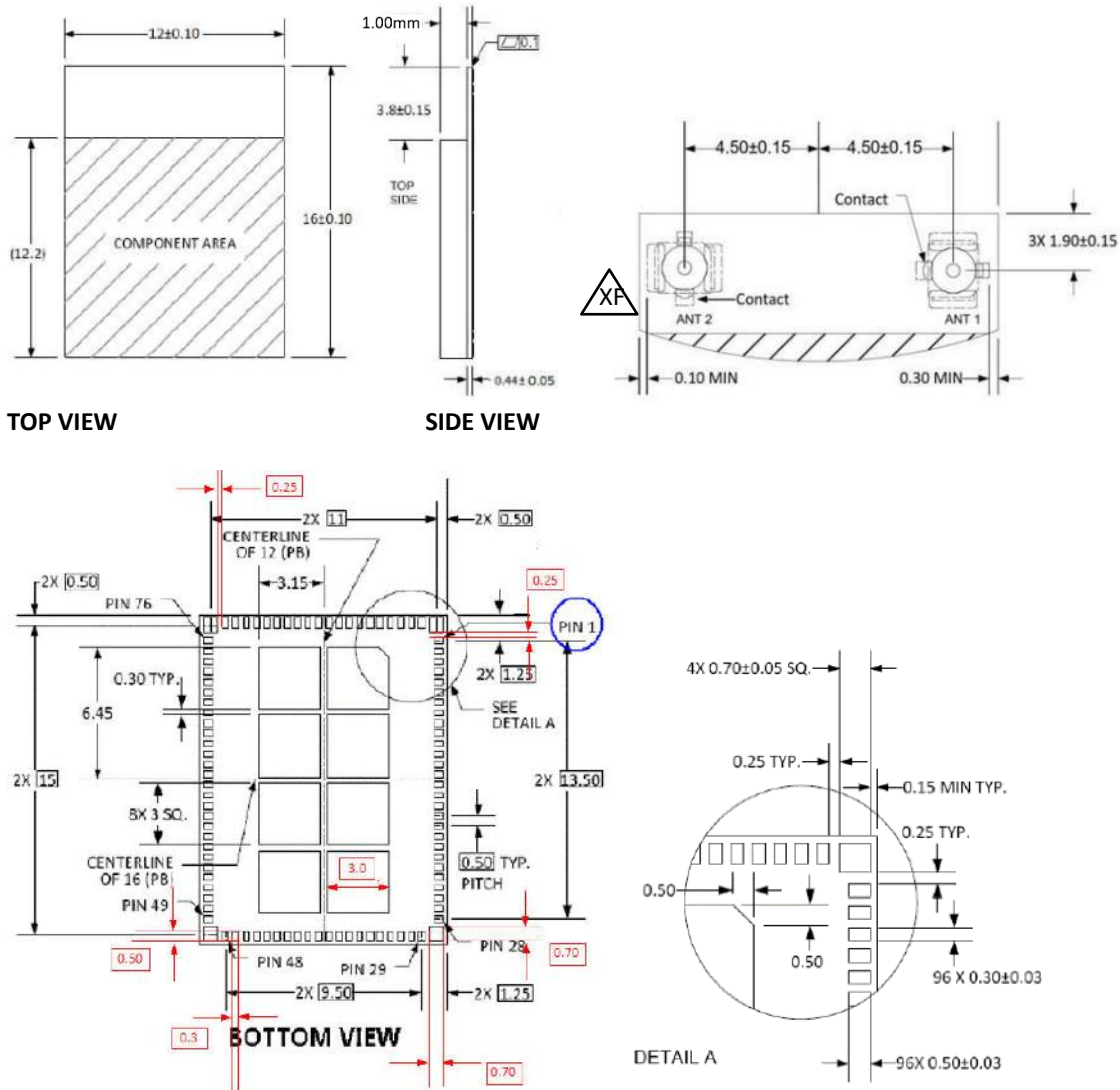
Antennas	Vendors	Antenna Type	2.4GHz Gain	5GHz Gain	FCC Subpart-C 2.4GHz)	FCC Subpart-E W52/53/56/58	ETSI EN300329 2.4GHz	ETSI EN301893 W52/53/56	ETSI EN300440 W58
AA258 (H2B1PC1A1C) (Include cable loss)	Unictron	PCB	+2.58dBi	+3.2dBi	✓	✓	✓	✓	✓
AA222 (H2B1PD1A1C) (Include cable loss)	Unictron	PCB	+2.48dBi	+3.0dBi	✓	✓	✓	✓	✓
1019-013A (Exclude cable loss)	STAF	Rod	+2.14dBi	+4.0dBi	✓	✓	✓	✓	✓
ANTDC-108A0/B0 (Exclude cable loss)	Sansei-Denki	Rod	+2.0dBi	+2.0dBi	✓	✓	✓	✓	✓
ANTDP-027A0/-039A0 (Exclude cable loss)	Sansei-Denki	Rod	+1.5dBi	+2.1dBi	✓	✓	✓	✓	✓

NOTE1	これらの認証は silex 推奨アンテナ、silex 製ボードデータファイルと silex 製ドライバでのみ有効です。但し、silex の推奨アンテナを使用していたとしても最終製品の形態、または silex 製ドライバ以外を使う場合は再認証試験が必要になる可能性があります。 The above certification is effective only with the silex recommended antennas, silex recommended board data file and driver. However, the re-certification might be required in the case of the final product form even if the silex recommended antennas are used or no use of the silex driver.
NOTE2	各国の EMC 認証は最終製品形態での試験が必要です。 <u>EMC certification of each country might be required as the final product.</u>

7. 機械的仕様 / Mechanical specifications

● SX-PCEAC2-SMT

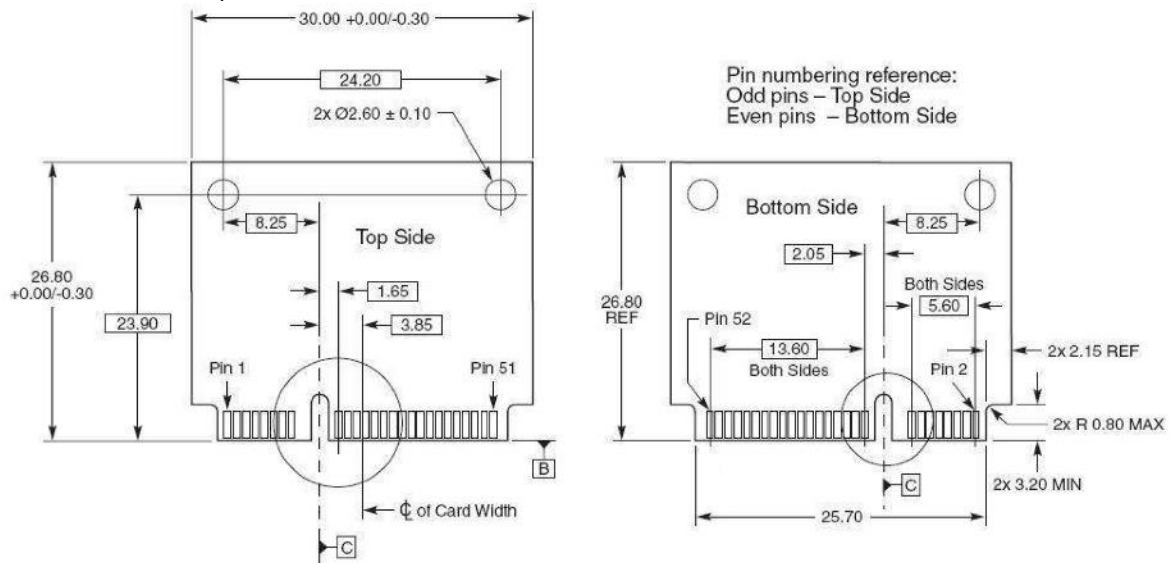
M.2(NGFF) LGA Type 1216



(mm)

- **SX-PCEAC2-HMC**

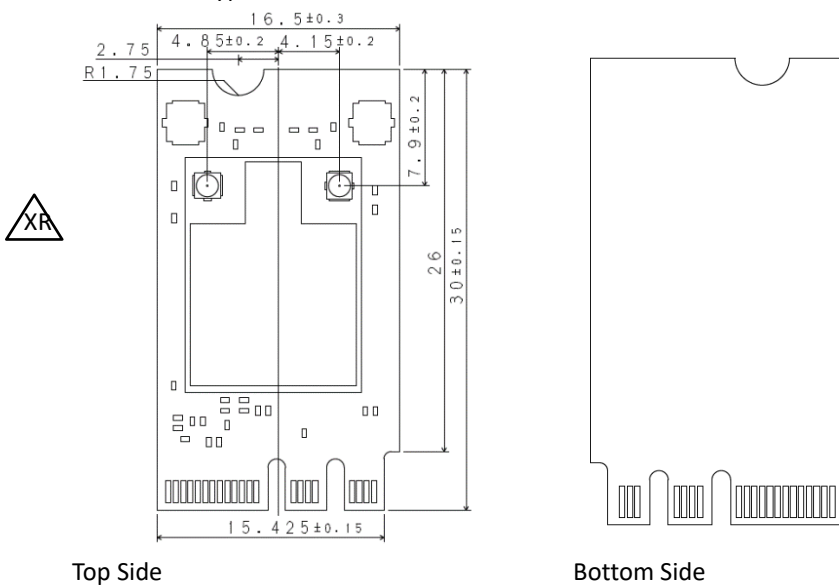
Half-Sized PCI Express Card



(mm)

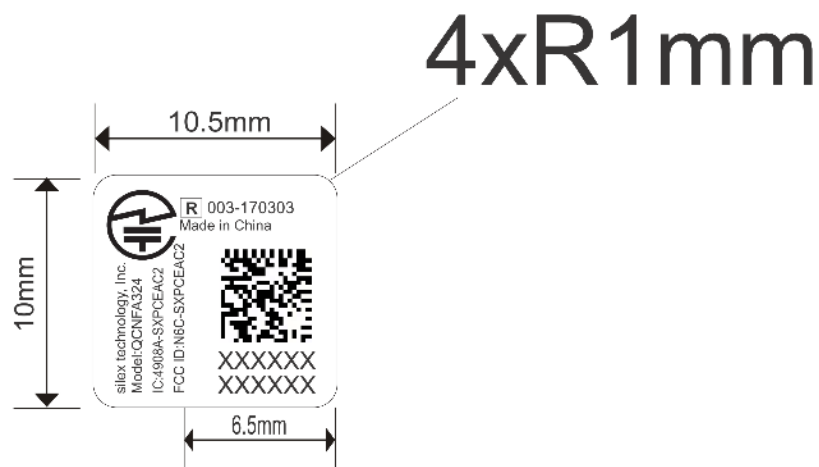
- **SX-PCEAC2-M2**

M.2 Card Type 1630-S1-A-E



(mm)

8. 表示仕様 / Indication specification



2次元バーコード EC200 (2D Data Matrix EC200): WiFi MAC Address

内容表示 Contents: XXXXXXXXXXXX (WiFi MAC Address)

BD Address = WiFi MAC Address + 1

9. 構成リスト / Components composition list

9.1. SX-PCEAC2-SMT (ZXE03924)

Categories	Items	Qty.	Units	ITEM # See § 10.	Remarks
Board	Product SX-PCEAC2-SMT	1	pcs	1	SX-PCEAC2-SMT Reel 1500 pcs/reel
Label	Reel Bag Label	3/1500	pcs	6	
	Caution Label	1/1500	pcs	11	
	ESD Caveat	1/1500	pcs	12	
	Carton Label	1/6000	pcs	15	
Accessory	Humidity Indicator Card	1/1500	pcs	8	
Packing	Reel	27.6/1500	m	2	
	Reel Cover	500/27000	m	3	
	Reel Disk 15	2/1500	pcs	4	
	Reel Axes	1/1500	pcs	5	
	Dryer (Desiccants)	1/1500	pcs	7	
	Plastic Strip	1/1500	pcs	9	
	AL Bag Anti-Static	1/1500	pcs	10	
	Pizza Box	1/1500	pcs	13	
	Carton	1/6000	pcs	14	

※1 台当たり数量。Amount per 1 unit (1 module).

9.2. SX-PCEAC2-SMT-SP (ZXE04010)

Categories	Items	Qty.	Units	Remarks
Board	Product SX-PCEAC2-SMT	1	pcs	10 pcs /tape cut
Label	Label	1/10	pcs	
Packing	Vacuum Bag	1/10.	pcs	
	Dryer (Desiccants)	1/10.	pcs	

※1 台当たり数量。Amount per 1 unit (1 module).

9.3. SX-PCEAC2-HMC (ZXE03925)

Categories	Items	Qty.	Units	Remarks
Board	Product SX-PCEAC2-HMC	1	pcs	
Label	MAC ID & Safety Label	1	pcs	See § 8
	Carton Label	1/100	pcs	
Packing	Carton Sheet	1/100	pcs	
	Clamshell cover	1/100	pcs	
	Clamshell	11/100	pcs	
	Carton	1/100	pcs	

※1 台当たり数量。Amount per 1 unit (1 module).

9.4. SX-PCEAC2-HMC-SP (ZXE03972)



Categories	Items	Qty.	Units	Remarks
Board	Product SX-PCEAC2-HMC	1	pcs	
Accessory	Antenna	2	pcs	AA258 (H2B1PC1A1C)
Label	MAC ID & Safety Label	1	pcs	See § 8
	Box Label	1	pcs	
Packing	Bubble Bag	2	pcs	For Product and antennas.
	Box	1	pcs	

9.5. SX-PCEAC2-M2 (ZXEO4330)



Categories	Items	Qty.	Units	Remarks
Board	Product SX-PCEAC2-M2	1	pcs	
Label	MAC ID & Safety Label	1	pcs	See § 8
	Carton Label	1/100	pcs	
Packing	Carton Sheet	1/100	pcs	
	Antistatic bag	1/100	pcs	
	Clamshell	11/100	pcs	
	Carton	1/100	pcs	

※1 台当たり数量。Amount per 1 unit (1 module).

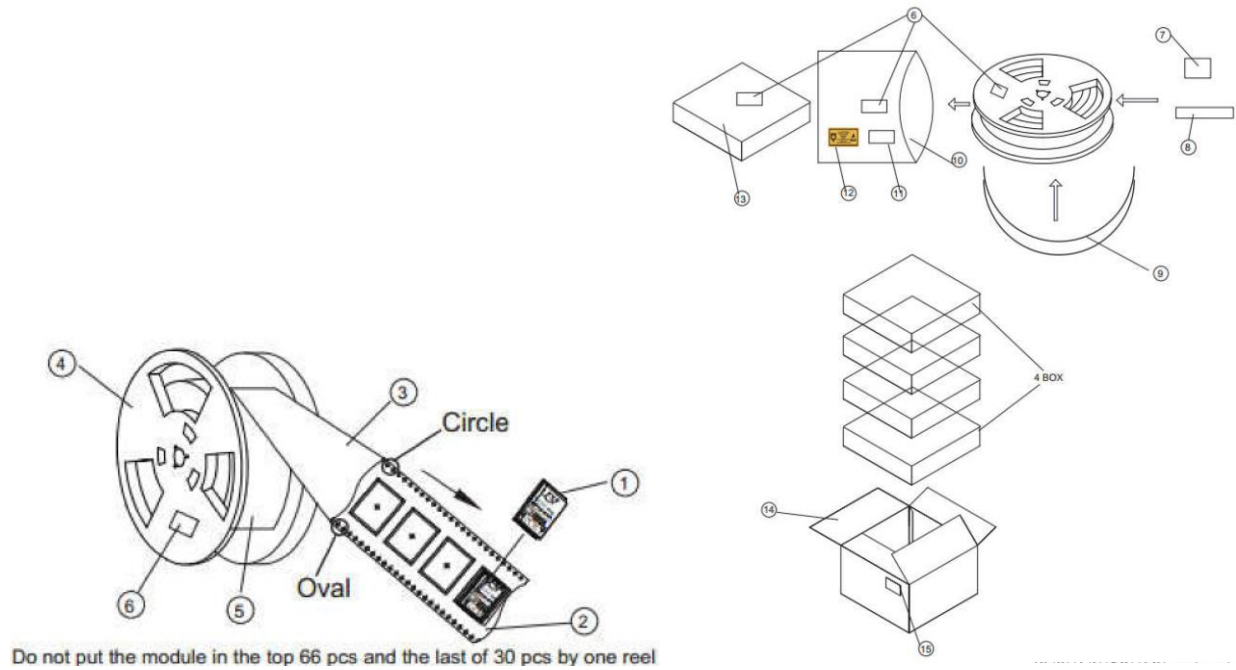
9.6. SX-PCEAC2-M2-SP (ZXEO4331)



Categories	Items	Qty.	Units	Remarks
Board	Product SX-PCEAC2-M2	1	pcs	
Accessory	Antenna	2	pcs	AA258 (H2B1PC1A1C)
Label	MAC ID & Safety Label	1	pcs	See § 8
	Box Label	1	pcs	
Packing	Bubble Bag	2	pcs	For Product and antennas.
	Box	1	pcs	

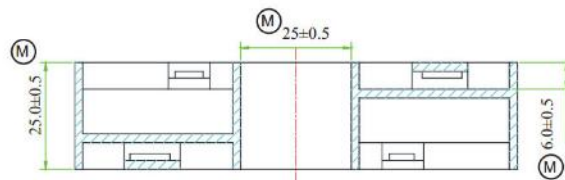
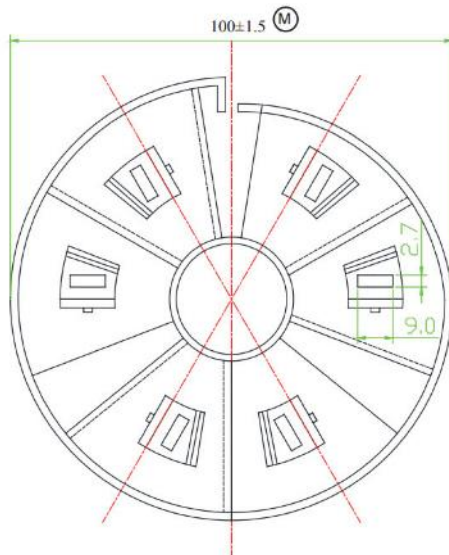
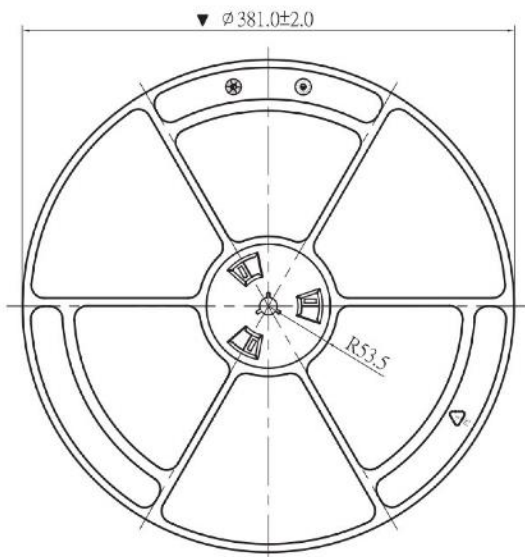
10. 梱包仕様 / Packing specifications

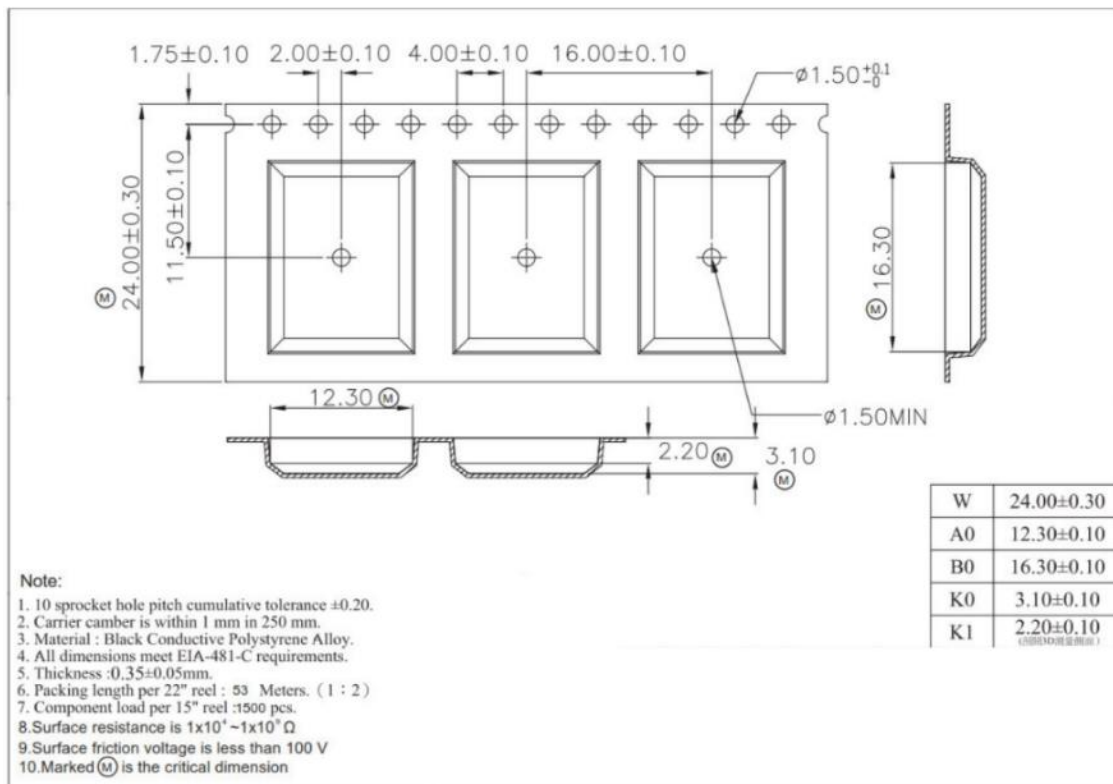
10.1. SX-PCEAC2-SMT (ZXE03924)





Reel





REEL BAG LABEL (#6)



3507AS9 YY WW XXXX

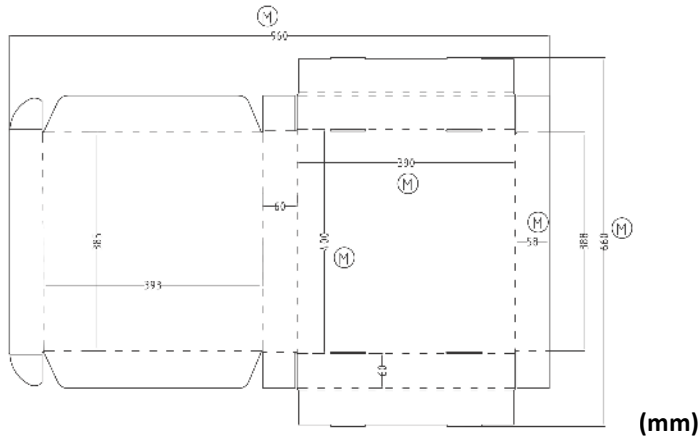
Fixed code The 2 lower digits Of year Serial No. 0001-9999 (Decimal)

01-52

CARTON LABEL (#15)

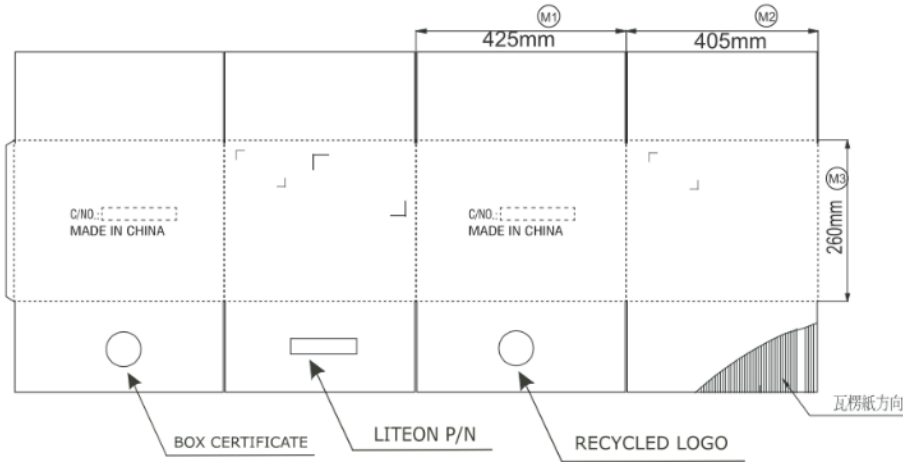


PIZZA BOX (#13)



M is the critical dimension.

CARTON (#14)

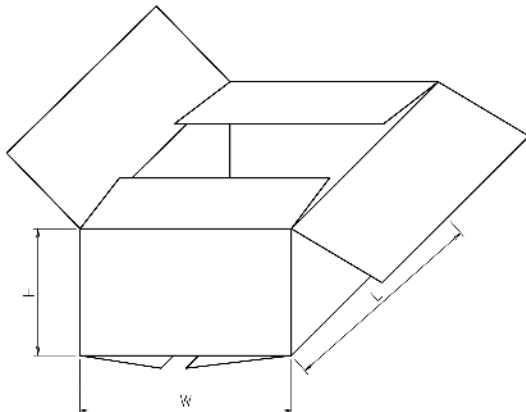


M# is the critical dimension.



#14 Carton box: 425 * 405 * 260 mm
Gross weight: 9.58 Kg

The Alternative (ND200770XX) to CARTON (#14)



Dimension of each part. (各部寸法) (Inner dimension (内面寸法))
(Dimensional tolerances (寸法公差) ±5mm)

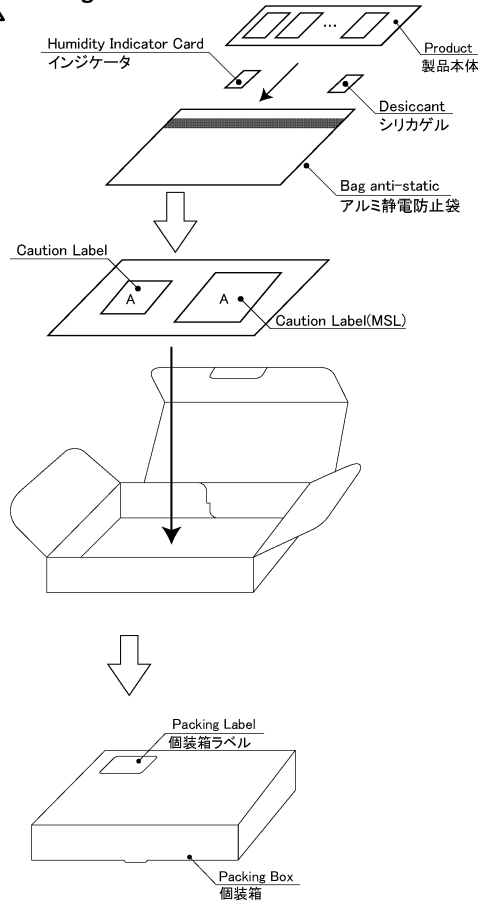
L : 505 mm (Reference outside dimension (参考外寸) 520 mm)
W : 425 mm (Reference outside dimension (参考外寸) 440 mm)
H : 280 mm (Reference outside dimension (参考外寸) 305 mm)

JIS Z 1507 0201 Type

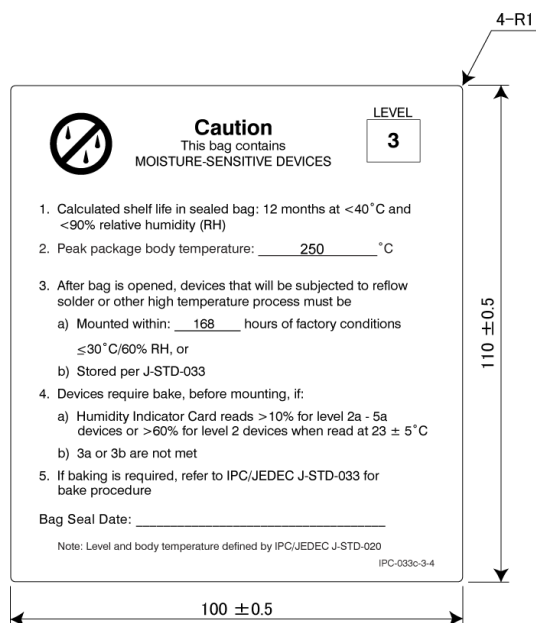


10.2. SX-PCEAC2-SMT-SP (ZXE04010)

Packing



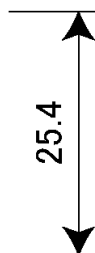
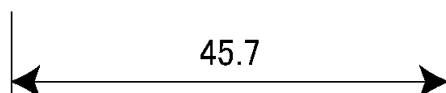
MSL Label



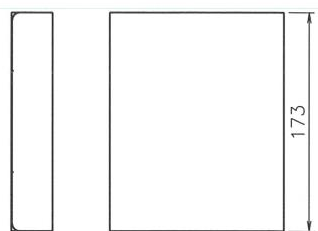
Caution Label



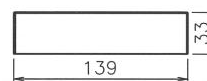
Packing Label



Box

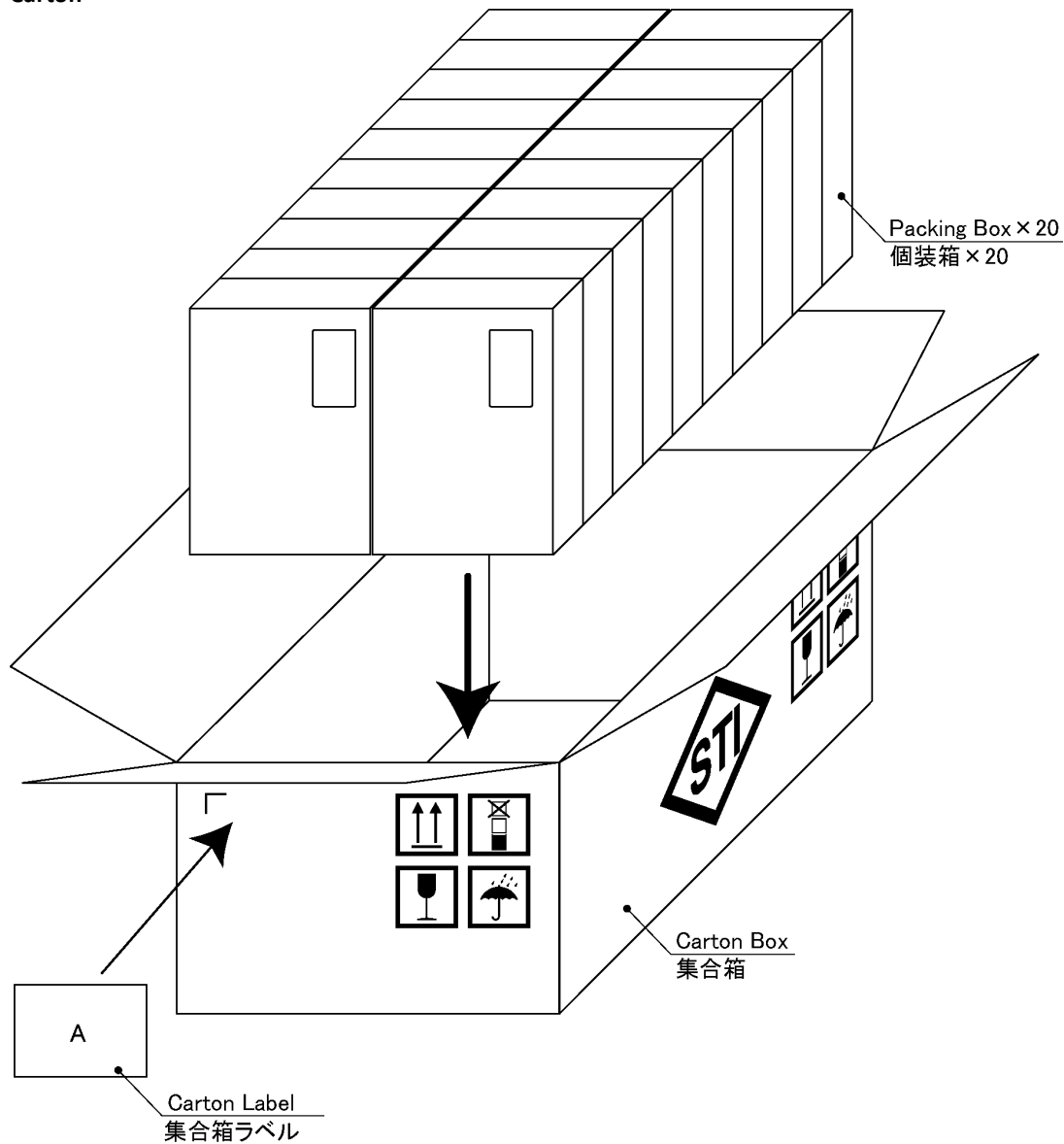


参考 組み立て図
(SCALE 1/4)



(mm)

Carton



Label

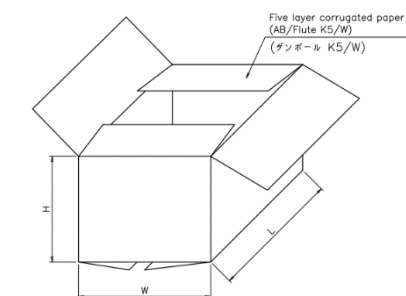
Product	: SX-PCEAC2-SMT-SP
Type	: _____
Carton No.:	: */*
Quantity	: 200 pcs

W52/W53 は法令により屋外での利用は禁止されています。
RoHS Compliant
Made in Japan / Fabriqué au Japon
silex technology, Inc.

97 ± 10

69 ± 10

Box

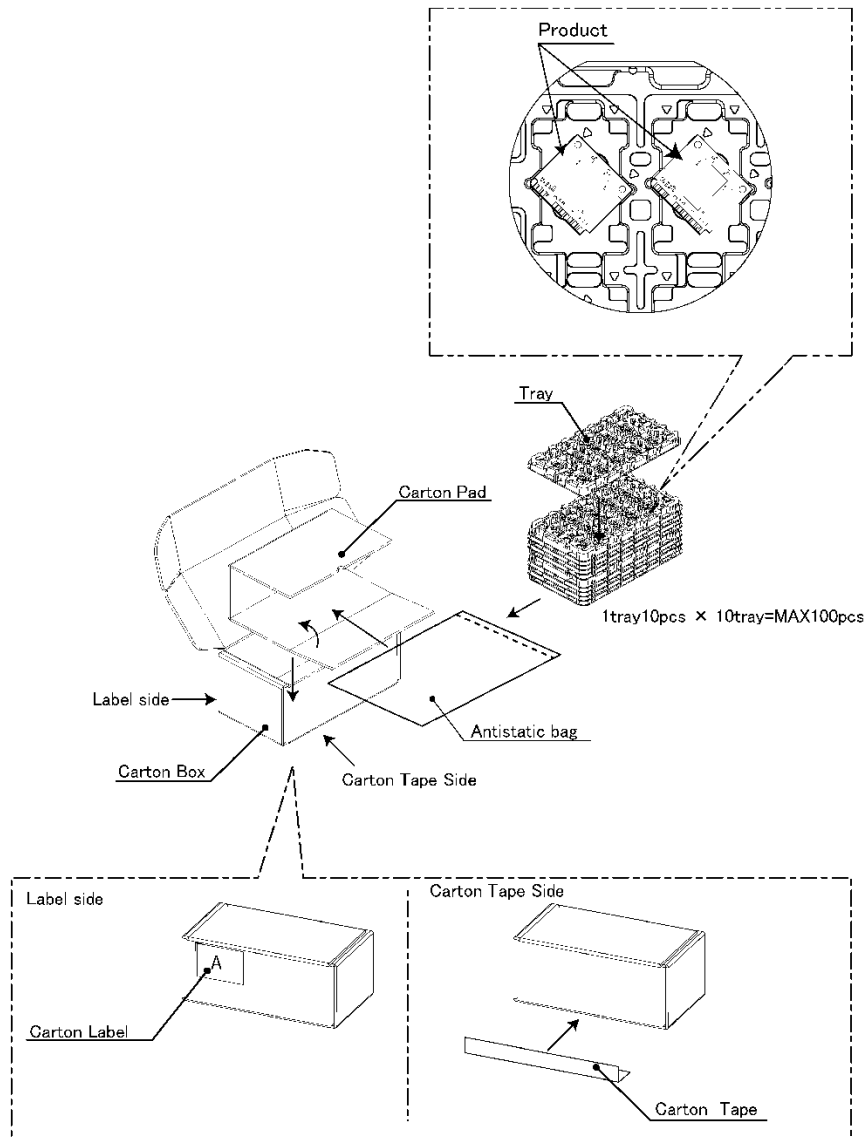


Dimension of each part.(各部分寸法)(Inner dimension(内面寸法))
(Dimensional tolerances(寸法公差) ± 10mm)

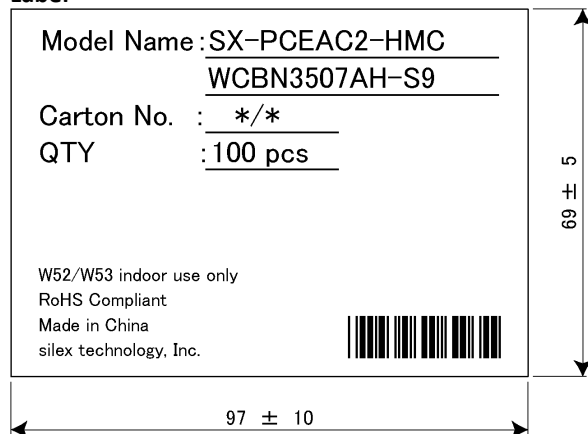
L : 335 mm (Reference outside dimension(参考外寸) 350 mm)
W : 285 mm (Reference outside dimension(参考外寸) 300 mm)
H : 180 mm (Reference outside dimension(参考外寸) 205 mm)



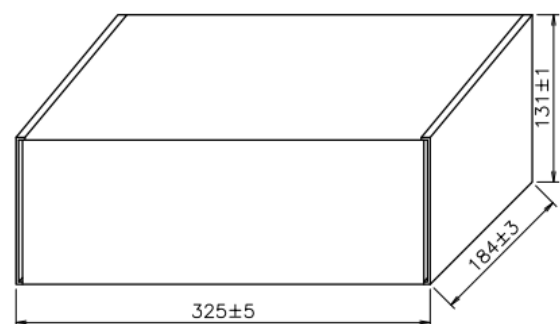
10.3. SX-PCEAC2-HMC (ZXE03925)



Label



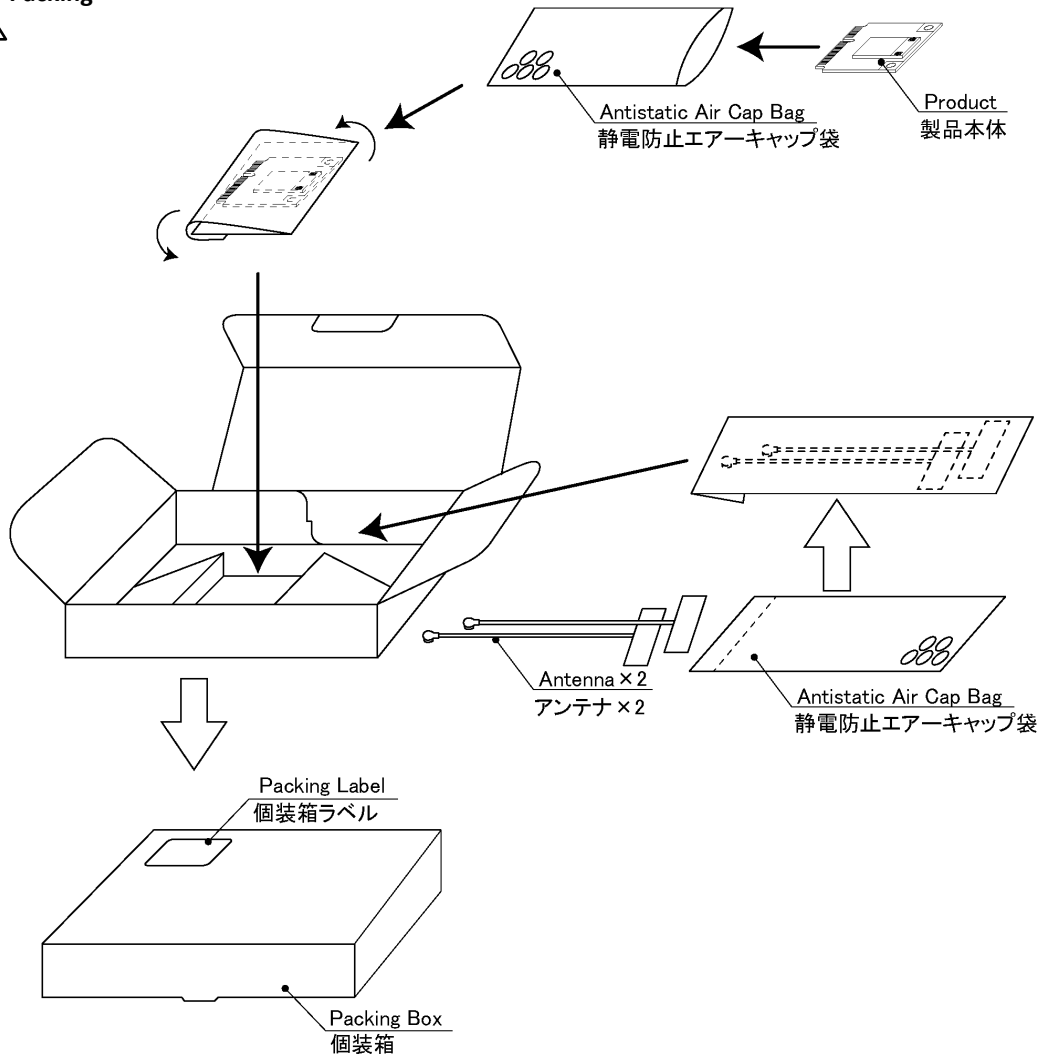
Box



10.4. SX-PCEAC2-HMC-SP (ZXE03972)



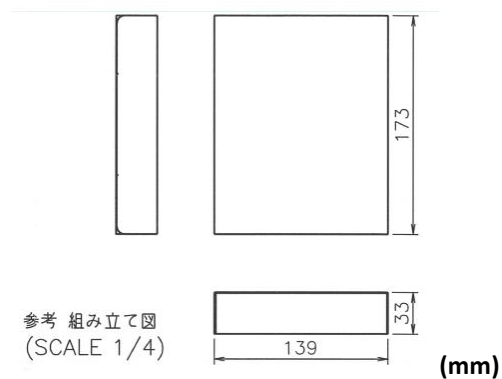
Packing



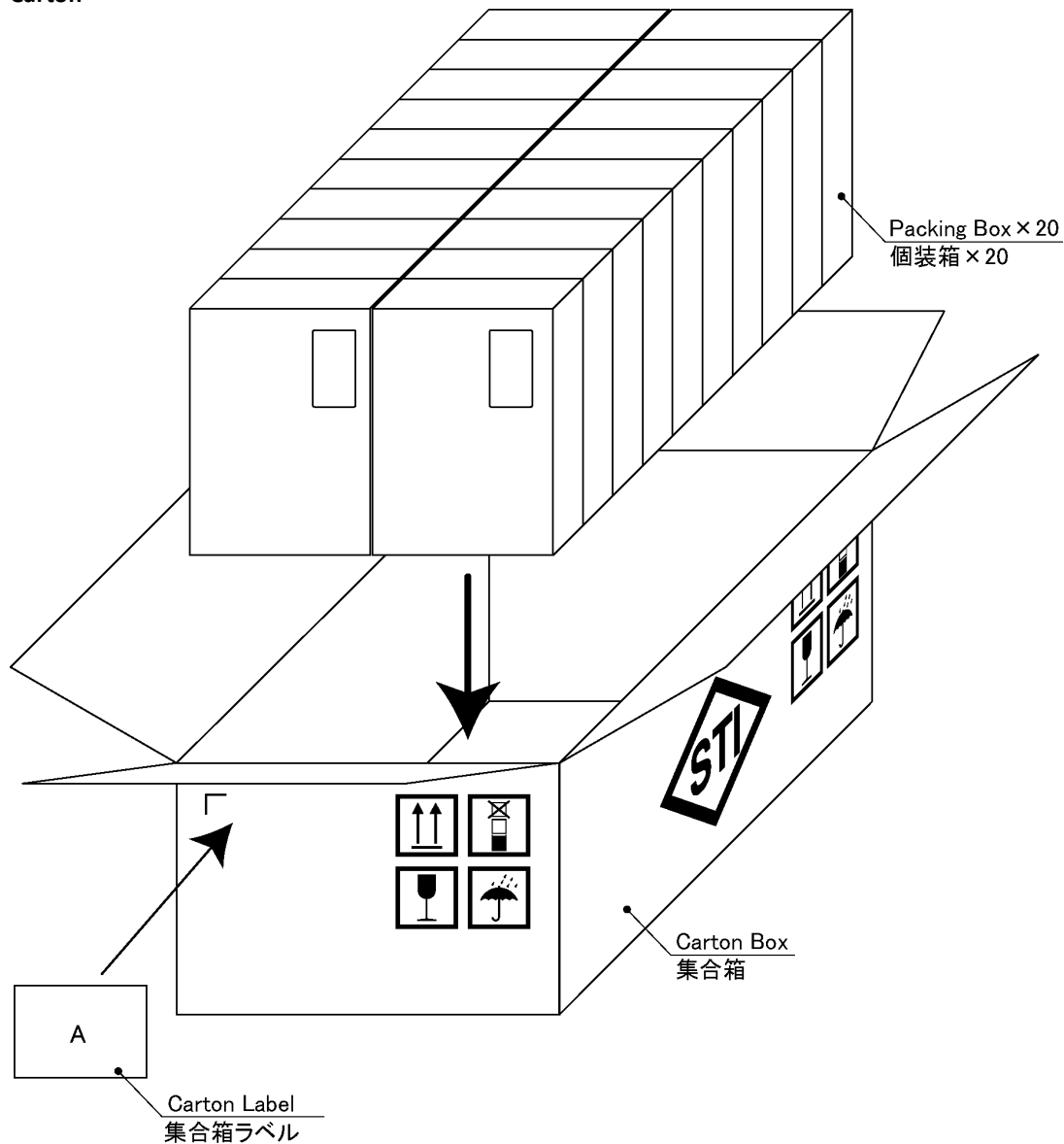
Label



Box



Carton



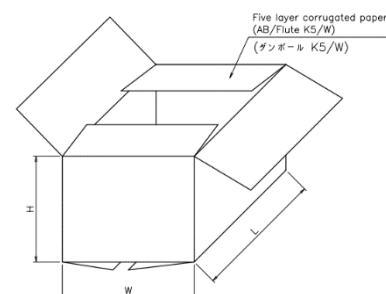
Label

Product	: SX-PCEAC2-HMC-SP
Type	: _____
Carton No.:	*/* _____ _____
W52/W53 は法令により屋外での利用は禁止されています。 RoHS Compliant Made in Japan / Fabriqué au Japon silex technology, Inc. 	

97 ± 10

69 ± 10

Box

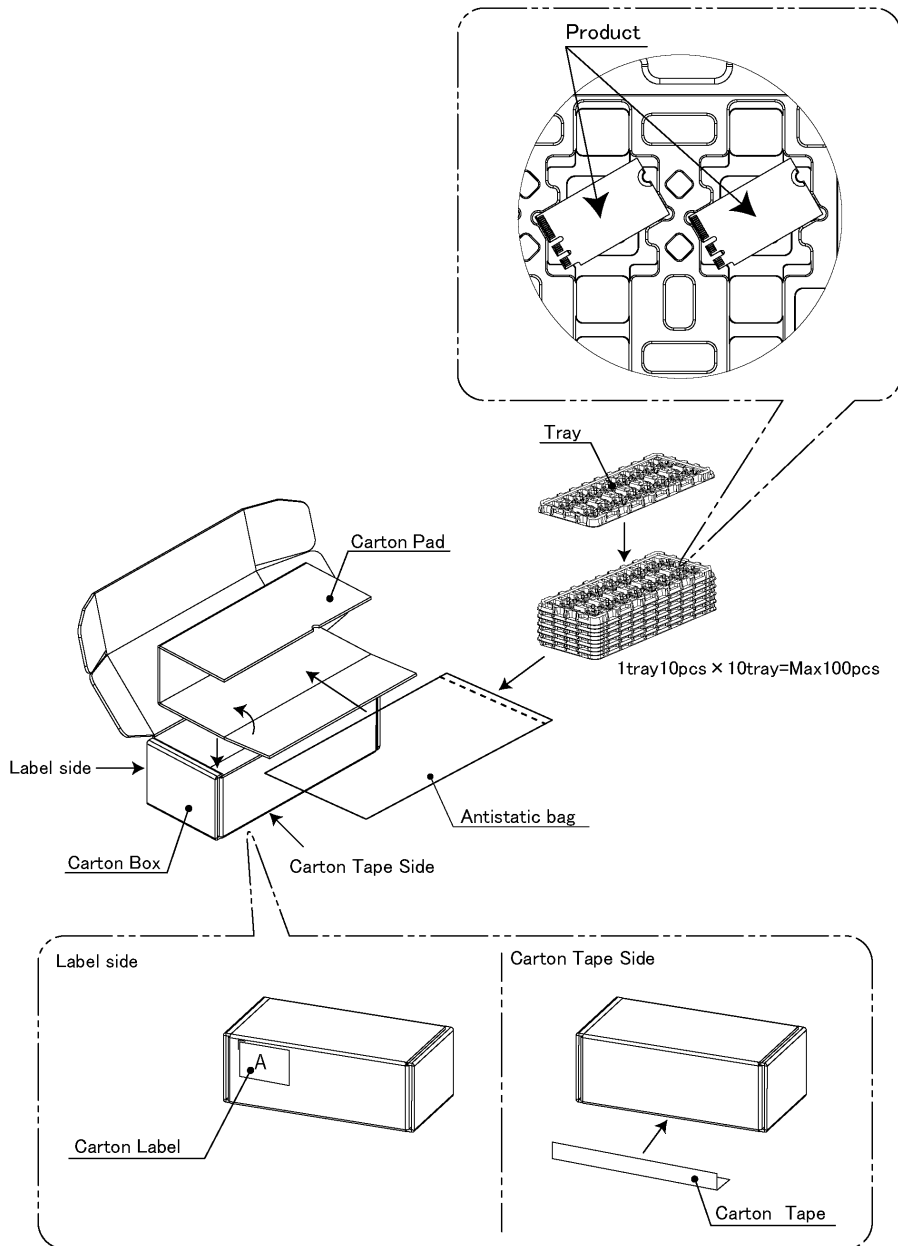


Dimension of each part.(各部分法)(Inner dimension(内面寸法))
(Dimensional tolerances(寸法公差) ± 10mm)

L : 335 mm	(Reference outside dimension(参考外寸)	350 mm)
W : 285 mm	(Reference outside dimension(参考外寸)	300 mm)
H : 180 mm	(Reference outside dimension(参考外寸)	205 mm)



10.5. SX-PCEAC2-M2 (ZXE04330)



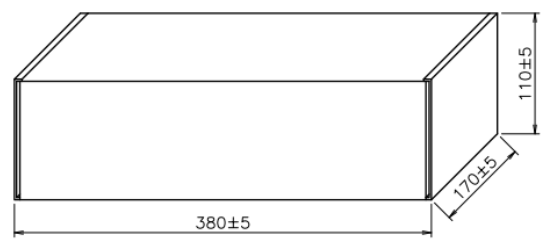
Label

Product	: SX-PCEAC2-M2
Type	: _____
Carton No.:	: */*
Quantity	: 100 pcs

W52/W53 は法令により屋外での利用は禁止されています。
RoHS Compliant
Made in Japan / Fabriqué au Japon
silex technology, Inc.

97 ± 10

Box

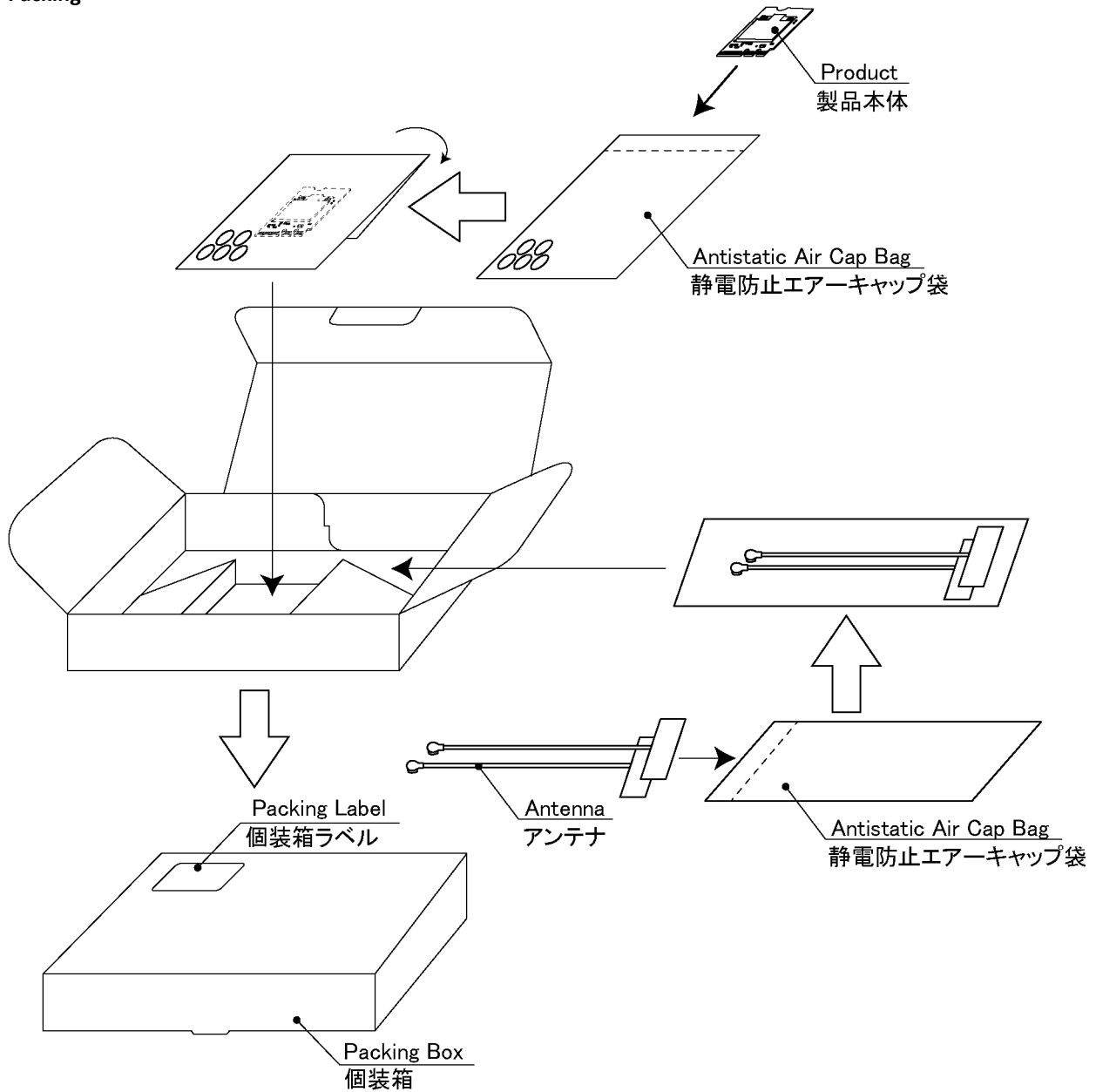


(mm)

10.6. SX-PCEAC2-M2-SP (ZXE04331)



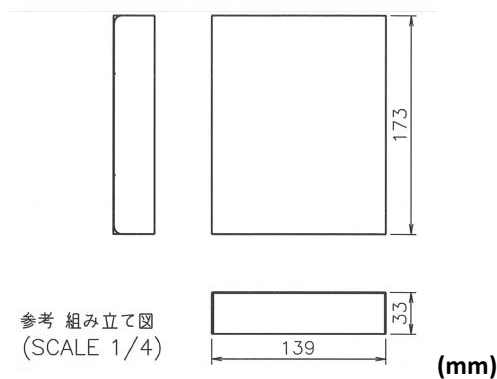
Packing



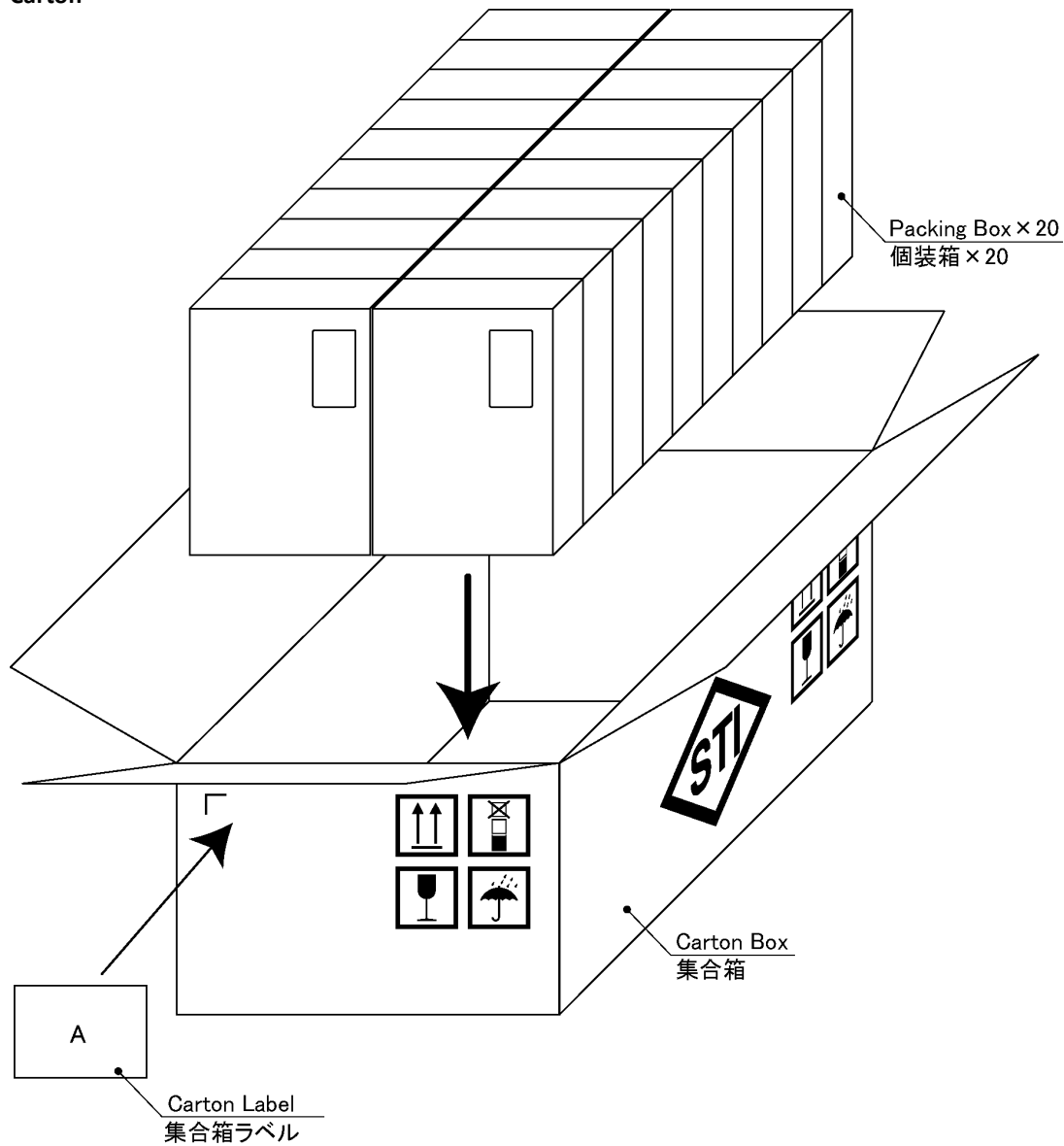
Label



Box



Carton



Label

Product	: SX-PCEAC2-M2-SP
Type	: _____
Carton No.:	*/*
Quantity	: 20 pcs

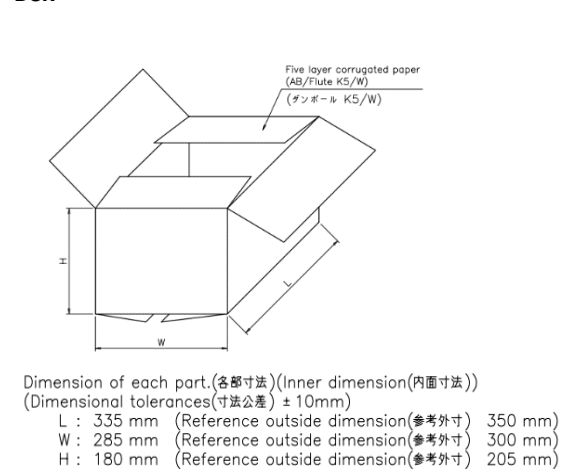
W52/W53 は法令により屋外での利用は禁止されています。
RoHS Compliant
Made in Japan / Fabriqué au Japon
silex technology, Inc.



97 ± 10

69 ± 10

Box



11. 使用上の注意 / Notifications

- ◇ 本製品の仕様は、§ 6. に掲げる法規制に適合していますが、
以下の場合には仕様が変更になる可能性があります。
This module is compliant to the law regulations mentioning § 6. But the contents may change at below conditions.
 - 1) § 6.1 に掲げる国以外で使う場合。
In case this module is used in the different country from the list of § 6.1
 - 2) § 6.2 に掲げるアンテナ以外を使う場合。
In case this module is used with different antenna from the antenna list of § 6.2
 - 3) 認可の更新が必要な場合。
In case the certification must be renewed.
- ◇ 法令により 5.15-5.35GHz 帯域 (W52, W53) を屋外で利用する事は禁止されております。
本製品を屋外で利用される場合は予め W52 / W53 帯域の電波を出さない様に設定してください。
Do not use 5.15-5.35GHz band (W52, W53) outdoors due to the law restriction.
When use this modules outdoors, need to disable it from using such band in advance.
- ◇ 本製品は一般電子機器への組込みを目的に設計された物であり、航空機器、原子力制御、高信頼性医療器、高信頼性セキュリティ器等、極めて高い水準の信頼性・品質を要求される機器への組込みを意図した物ではありません。**医療機器に組込む際は医療機器クラスに関係なく弊社営業までお問い合わせください。**
This module has been designed for being embedded in the general electric devices, not in the extremely reliable demands like aircraft instruments, nuclear control instruments, high reliable medical instruments (Class III, IV), high reliable security instruments or any other such devices.
In the case of being embedded in the medical instruments, please ask our sales reps regardless of the medical class.
- ◇ 本製品は電波を媒体として通信を行いますので、第三者への情報漏洩を防ぐ為にセキュリティに関する設定を実施いただく事を強く推奨します。
Because this module communicates through radio waves, it is highly recommended to set security system in order to prevent the information leak to third parties.
- ◇ 本製品の機能、特性をご理解の上、組込み最終製品での評価をお願いいたします。又、本無線装置単品での EMC 測定は実施しておりませんので、本無線装置を組み込んだ製品形態での EMC 試験の実施、及び認可申請を行う必要があります。
Should be familiar with the features and characteristics of this module. And then please evaluate with your end products. Because EMC measurements has not been tested, the end products should test EMC conformity and apply to certification.
- ◇ 本製品が使用する無線帯域において、同一周波数帯を利用する装置への影響又は装置からの影響を受ける場合があります。設置においては事前に環境の調査を実施してください。
The wireless bands this module is using may affect the peripheral devices which use same bands and vice versa.
When install them, please check the use environment in advance.
- ◇ 本製品について分解や改造を行うと電波法に基づいた処罰を受ける事があります。
There are cases in which you will be punished by the radio law if this module is disassembled or modified.
- ◇ 本製品は端子や部品が露出した組込み用モジュールです。製品組込み時には静電気（本製品には静電気に弱い高周波デバイスを使用しております）や水滴、その他粉塵等には十分注意願います。
Some terminals and electric parts of this module are exposed. When embed this module in your products, should attract attention to ESD, condensing, and other dusts.

- ☆ 周辺で同一周波数帯を使う他の無線機器を使う場合、以下に特に注意してください。

(IEEE802.11-2012 及び IEEE802.11ac-2013 参照)

In the case using the other wireless devices using same frequency band around this product, please take care below. (See IEEE802.11-2012 and IEEE802.11ac-2013)

- 1) 2.4GHz 帯では、本モジュールの中心周波数から $\pm 25\text{MHz}$ (5Ch) 以上の間隔をあけて使用することが推奨されます。
 $\pm 25\text{MHz}$ ($\pm 25\text{MHz}$) or more frequency separation from the center frequency of this module is recommended in 2.4GHz.

- 2) 隣接チャンネル及び非隣接チャンネルの信号入力には十分注意して、混信を避ける環境を設定してください。

Appropriate environment to avoid interference from the adjacent channels or the non-adjacent channels is necessary.

☐ 2.4GHz 隣接チャンネル：中心周波数 $\pm 25\text{MHz}$ (5Ch), 非隣接チャンネル：中心周波数 $\pm 30\text{MHz}$ (6Ch)以上

2.4GHz: Center frequency $\pm 25\text{MHz}$ (5Ch), Non Adjacent channel: Further than Center frequency $\pm 30\text{MHz}$ (6Ch)

☐ 5GHz HT20 隣接チャンネル：中心周波数 $\pm 20\text{MHz}$ (4Ch), 非隣接チャンネル：中心周波数 $\pm 40\text{MHz}$ (8Ch)以

5GHz HT20: Center frequency $\pm 20\text{MHz}$ (4Ch), Non Adjacent channel: Further than Center frequency $\pm 40\text{MHz}$ (8Ch)

☐ 5GHz HT40 隣接チャンネル：中心周波数 $\pm 40\text{MHz}$ (8Ch), 非隣接チャンネル：中心周波数 $\pm 80\text{MHz}$ (16Ch)以上

5GHz HT40 Adjacent channel: Center frequency $\pm 40\text{MHz}$ (8Ch), Non Adjacent channel: Further than Center frequency $\pm 80\text{MHz}$ (16Ch)

☐ 5GHz HT80 隣接チャンネル：中心周波数 $\pm 80\text{MHz}$ (16Ch), 非隣接チャンネル：中心周波数 $\pm 160\text{MHz}$ (32Ch)以上

5GHz HT80 Adjacent channel: Center frequency $\pm 80\text{MHz}$ (16Ch), Non Adjacent channel: Further than Center frequency $\pm 160\text{MHz}$ (32Ch)

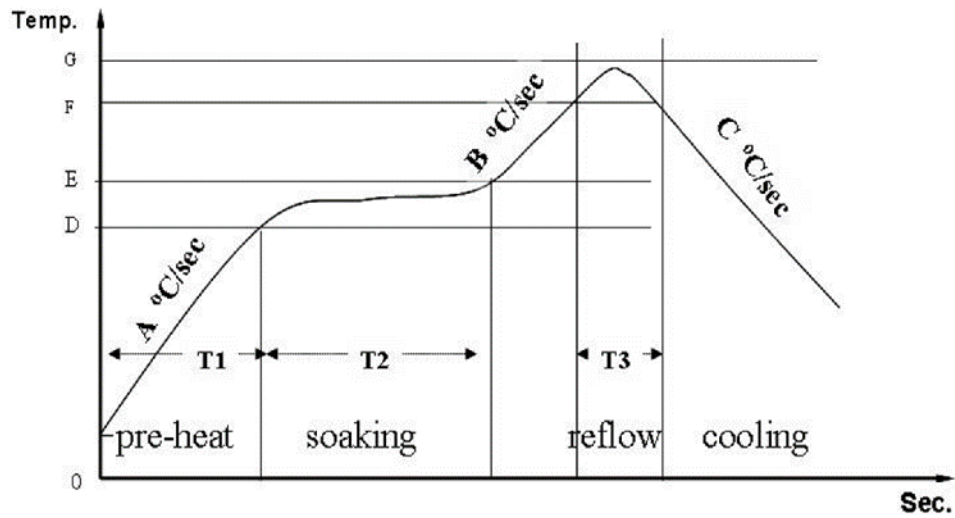
※上記の条件外であっても、強い電波入力がある場合は混信する可能性があるので、周辺の無線機器は十分距離を離してご使用ください。

Even if these conditions is satisfied, the module is possibly interfered when strong signal is input. The other wireless system should be enough far from this module

- ☆ 対向機からの入力は、アンテナゲインを含み 2.4GHz 帯で -20dBm 以下、5GHz 帯で -30dBm 以下としてください。
The input level from the opponent device must be -20dBm or less at 2.4GHz, -30dBm or less at GHz with including antenna gain.

12. 付録 A SMT リフロー条件 / Appendix A SMT reflow profiles

● SX-PCEAC2-SMT



Standard conditions for reflow soldering:

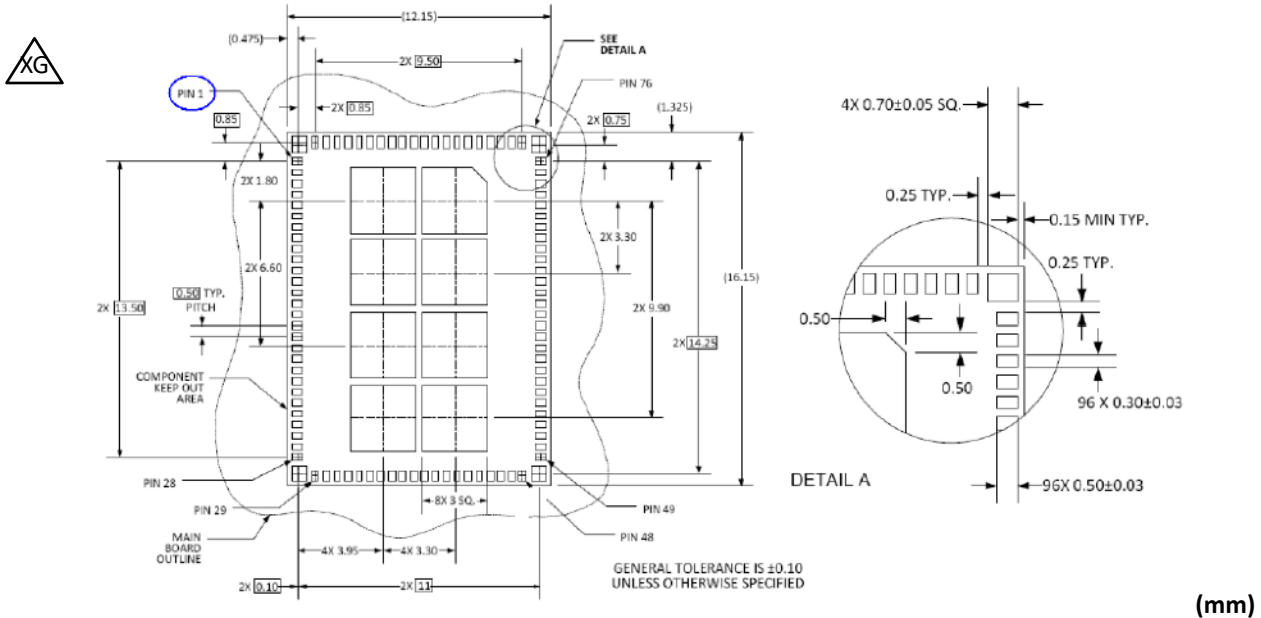
- a. Pre-heating Ramp (A) (Initial temperature: 150°C): 1~2.5°C/sec;
- b. Soaking Time (T2) (150°C~180°C): 60sec~100sec;
- c. Peak Temperature (G): 230~250°C;
- d. Reflow Time (T3) (>220°C): 30~60 sec;
- e. Ramp-up Rate (B): 0~2.5°C/ sec;
- f. Ramp-down Rate (C): 1~3°C/ sec.

13. 付録 B 参考ランド設計 / Appendix B Recommended land pattern

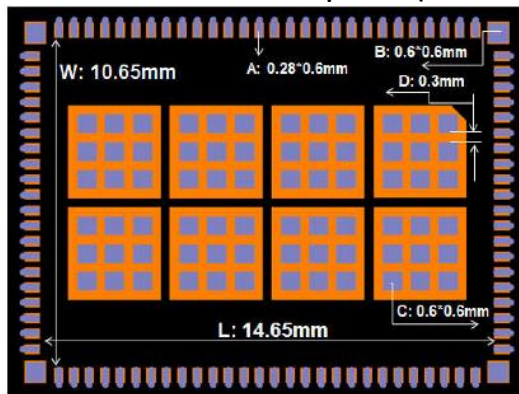
SX-PCEAC2-SMT BTC (Bottom Thermal Chip) PAD Design

Recommendation:

Mainboard PAD VS Module PAD = 1 : 1



SX-PCEAC2-SMT BTC Stencil Aperture (Recommendation)



Remark:

- Orange area: PCB PAD
- Light-blue area: Stencil aperture
- Stencil thickness: 0.1~0.12mm

Recommendation:

- 0.5mm pitch functional pin stencil aperture size (A): 0.28*0.6mm, The pin hole internal spur: Width (W) =10.65mm, Length (L) =14.65mm.
- Four corners' stencil aperture size (B): 0.6*0.6mm, they should be center located of PAD.
- 9 square apertures on each GND PAD, each size (C): 0.6* 0.6mm, interval(D): 0.3mm