Title :

Wi-Fi 6 Intelligent wireless LAN module
IM-100-EB

Drawing Type :	製品仕様書 Product specifications
Drawing No.:	JW208990XX
Date :	March 24, 2025

Rev.	Description	Date	Prepared	Checked	Approved
XX	The first release.	Mar. 24, 25	Y.Kuroda	T.Minobe	Y.Shibuya

内容

1. 製品概要 Product information

本書は IM-100-EB について説明するものです。
最新の IM-100 の製品仕様書を合わせてご参照ください。 (JW208210)
This document describes the IM-100-EB.
Please also refer to the latest IM-100 product specification (JW208210)..

特徴 Features

- MCU およびシステムメモリ MCU and system memory
  NXP RW610 (Arm® Cortex®-M33 260MHz)
  1.2MB SRAM, 256kB on-chip ROM + 8MB ROM

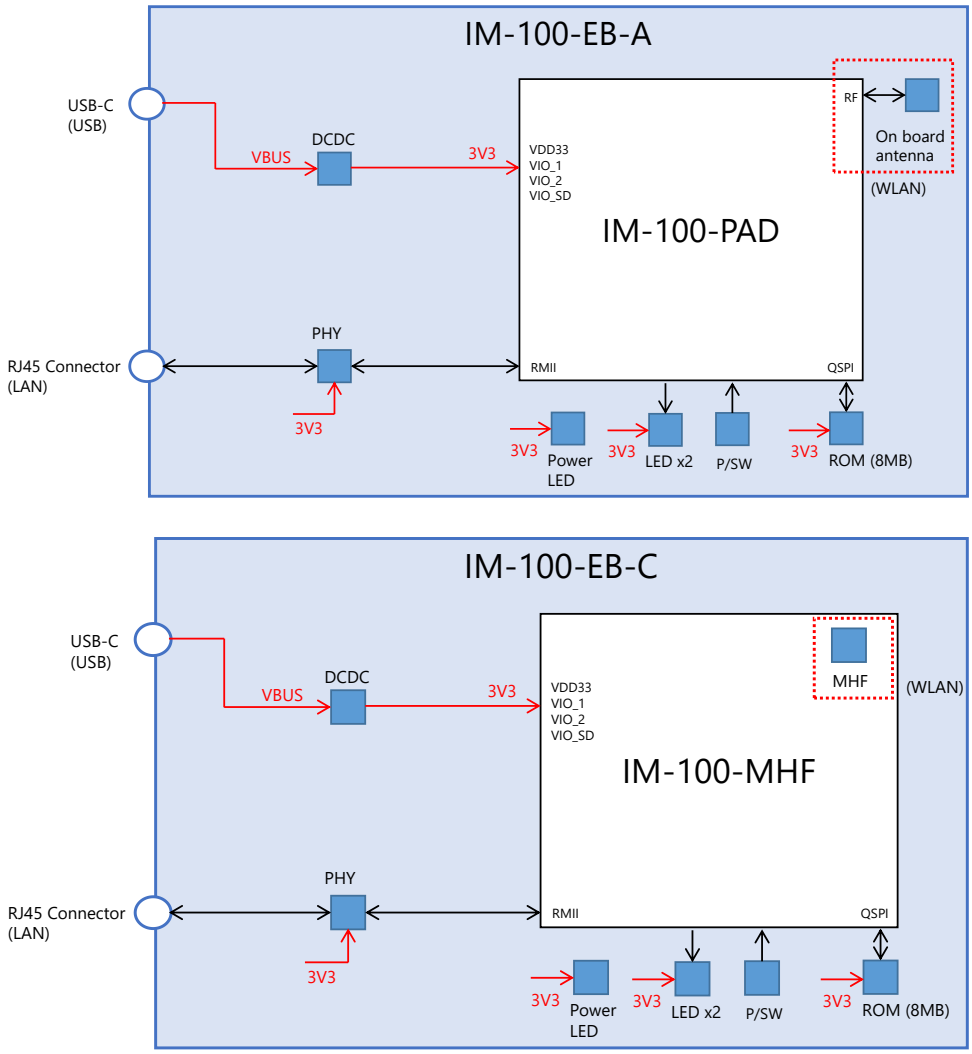
- 無線インターフェイス Wireless LAN interface
  Wi-Fi 6 (802.11ax)
  IEEE802.11a/b/g/n/ac/ax (2.4 GHz, 5 GHz)
  1 ストリーム 1 spatial data stream system (1T1R)
  チャネル幅 20MHz 20MHz channel operation
  アンテナコネクタ(MHF)タイプ(-C)とオンボードアンテナタイプ(-A)の 2 種の SKU
  Two types of SKUs: Antenna Connector (MHF) Type (-C) and Onboard Antenna Type (-A)

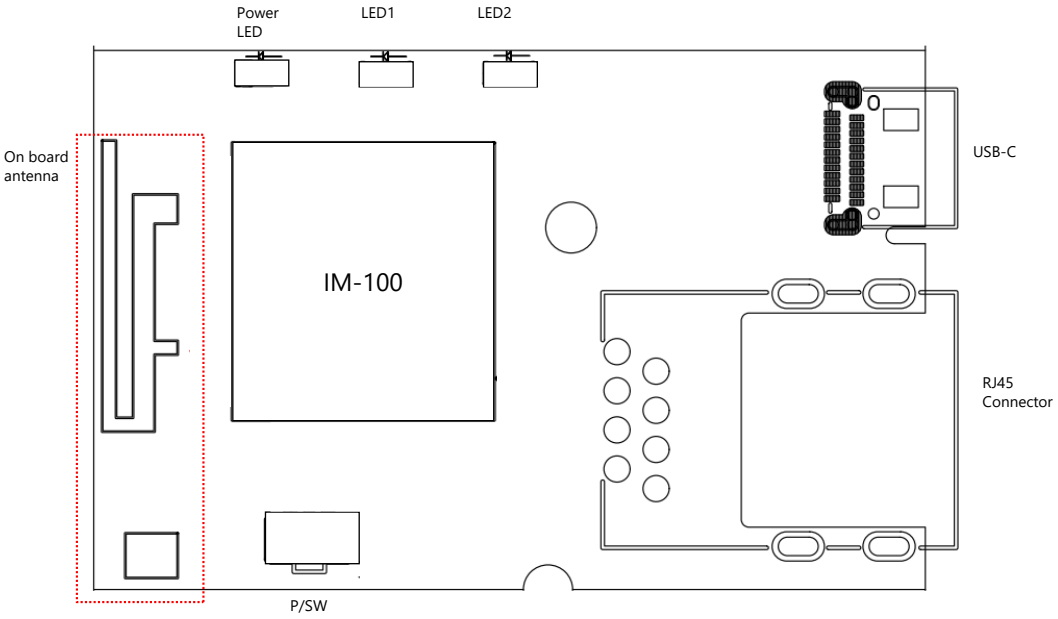
- 有線 LAN ポートインターフェイス IEEE802.3(10BASE-T/100BASE-TX)対応
  An Ethernet LAN port interface, compatible with IEEE802.3 (10BASE-T/100BASE-TX).

- USB-C 給電ポート USB-C power delivery port

- 本製品は 欧州の RoHS 指令 2011/65/EU ,(EU) 2015/863 に準拠しています。
  This product is compliant with the EU's RoHS directive 2011/65/EU and (EU) 2015/863.

2. ハードウェアブロック図 Hardware block diagram





3. 基板仕様 Board specifications

3.1. 一般仕様 General specifications

Items	Specifications	Units	Remarks
ホストボードへの接続方式 Connection with the host board	USB Type-C connector (Power)	–	DX07S024JJ1R1300 (JAE)
	RJ45 connector	–	S51-KA-0003 (UDE Corp.)
アンテナ Antenna	On-board antenna x 1	pcs	IM-100-EB-A
	MHF connector x 1	pcs	IM-100-EB-C
無線接続方式 RF interface	IEEE802.11a/b/g/n/ac/ax	–	IEEE802.11-2020 IEEE802.11ax-2021
重さ Weight	13.5	g	
寸法 Dimensions (See §6)	56 x 35 x 11.2	mm	
MTTF	90,000	h	Min.

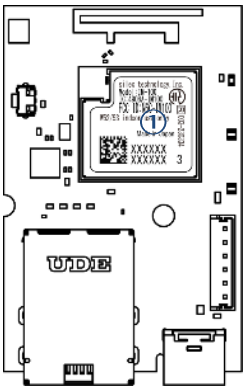
3.2. 環境条件 Environmental specifications

Items	Specifications			Units	Remarks
	Min.	Typ.	Max.		
動作温度 Operating temperature	-40	–	+85	℃	周囲温度 *NOTE 1 Ambient temperature *NOTE 1 実装後電源電圧印加時 When applying power voltage after mounting
動作湿度 Operating humidity	15	–	95	%RH	結露無きこと No condensing 実装後電源電圧印加時 When applying power voltage after mounting
保存温度 Assembled storage temperature	-40	–	+90	℃	実装後電源電圧無印加時 When not applying power after mounting
保存湿度 Assembled storage humidity	10	–	95	%RH	結露無きこと Free from condensation 実装後電源電圧無印加時 When not applying power after mounting

NOTE1

但し次に定義される部品のケース温度(表面接触温度)を超えないこと。
However, do not exceed the case temperature (surface contact temperature) defined for the following components.

Point	Tc (Max.)	Unit
①	95	℃



3.3. 電気的仕様 Electrical specifications

絶対最大定格 Absolute maximum ratings

Items	Specifications			Units	Remarks
	Min.	Typ.	Max.		
主電源電圧 Main power supply VBUS	-0.30	–	+6.00	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 Main power supply VBUS	+4.47	+5.00	+5.25	V	

ディジタル論理信号レベル Digital logic signal level

+3.3V operation

Items	Parameters	Specifications			Units	Remarks
		Min.	Typ.	Max.		
V_{IH}	入力 High レベル電圧 Input high voltage	0.7*3.3	–	3.3+0.4	V	
V_{IL}	入力 Low レベル電圧 Input low voltage	-0.4	–	0.3*3.3	V	
V_{HYS}	入力ヒステリシス Input hysteresis	100	–	–	mV	
V_{OH}	出力 High レベル電圧 Output high voltage	3.3-0.4	–	–	V	
V_{OL}	出力 Low レベル電圧 Output low voltage	–	–	0.4	V	

3.4. 消費電流仕様 Current consumption specifications

Mode	VBUS (+5.0V)			Unit
	Mean (Average)	Typ.	Max.	
Initialization				
Driver loading	–	300	350	mA
DPD process NOTE1	–	530	610	mA
Standby NOTE2	–	100	110	mA
WLAN Communication				
5GHz RX standby NOTE3	100	210	240	mA
2.4GHz RX standby NOTE3	100	200	230	mA
5GHz TX NOTE4	–	340	390	mA
2.4GHz TX NOTE4	–	270	310	mA

NOTE1	DPD は IM-100 の信号品質を確保するために必要な処理です。 この処理は IM-100 起動後に一度だけ実行されます。 DPD is a process necessary to ensure the signal quality of the IM-100. This process is executed only once after the IM-100 is started.
NOTE2	IEEE power save 有効時です。 This is when IEEE power save is enabled.
NOTE3	IEEE power save 有効時です。 Typ./Max.は DTIM interval に合わせて対向からのビーコンを IM-100 が受信したとき、 Mean(Average)はこれを受信しないときの値です。 This is when IEEE power save is enabled. The Typ./Max. values are when the IM-100 receives beacons from the counterpart according to the DTIM interval, and the Mean (Average) value is when it does not receive them.
NOTE4	iperf を用いてデータ送信(11ax MCS9 ターゲット送信電力 12.0dBm)しているときの値です。 各コンポーネント(MCU CPU, WLAN CPU および UART インターフェイス)の合算値です。 This is the value when transmitting data using iperf (11ax MCS9 target 12.0dBm). It is the combined value of each component (MCU CPU, WLAN CPU, and UART interface).
NOTE5	Mean(Average) / Typ.は個体ばらつきの平均値です。 Max.は個体ばらつきの最大値にマージンを加えた値です。 Mean (Average) / Typ. is the average value of individual variations. Max. is the value with a margin added to the maximum of individual variations.

4. インターフェイス仕様 Interface specifications

LED 仕様 LED specification

最新の ソフトウェア機能仕様書を合わせてご参照ください。 (SC115090)
LED 制御仕様に記載されています。

Please refer to the latest software feature specification. (SC115090)
It is described in the LED control specification.

Push switch 仕様 Push switch specification

最新の ソフトウェア機能仕様書を合わせてご参照ください。 (SC115090)
スイッチ入力制御仕様に記載されています。

Please refer to the latest software feature specification. (SC115090)
It is described in the switch input control specification.

USB 仕様 USB specification

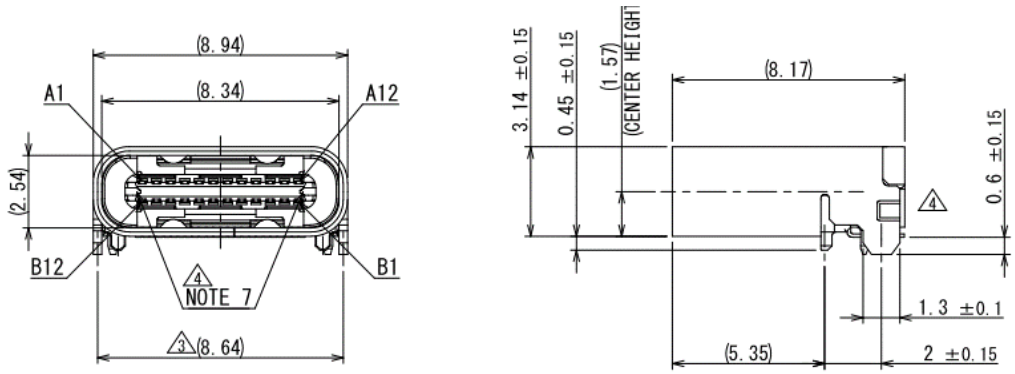
最新の ソフトウェア機能仕様書を合わせてご参照ください。 (SC115090)

USB 仕様に記載されています。

Please refer to the latest software feature specification. (SC115090)
It is described in the USB specification.

USB-C Connector: DX07S024JJ1R1300 (JAE)

Pin	Signal	Pin	Signal
A1 / B1	GND	A7 / B7	NC
A2 / B2	NC	A8 / B8	NC
A3 / B3	NC	A9 / B9	VBUS
A4 / B4	VBUS	A10 / B10	NC
A5 / B5	NC	A11 / B11	NC
A6 / B6	NC	A12 / B12	GND



有線 LAN 仕様 LAN port specification

最新の ソフトウェア機能仕様書を合わせてご参照ください。 (SC115090)

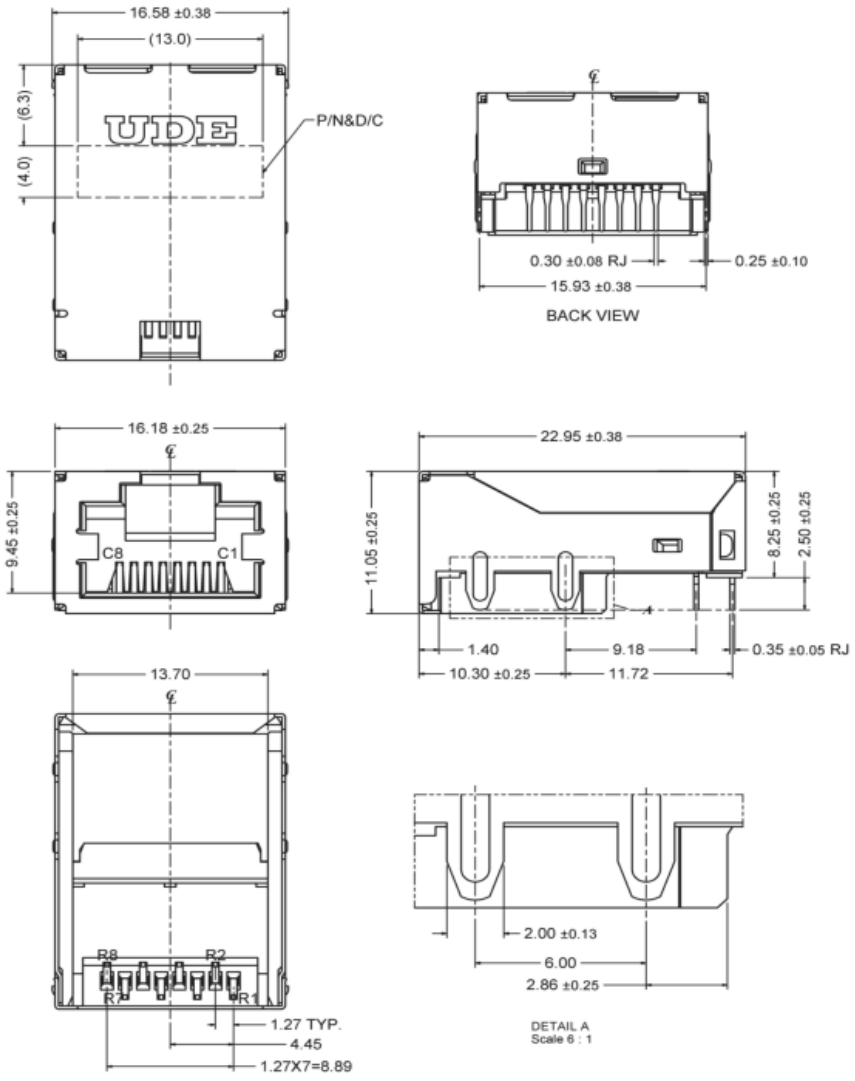
有線 LAN 仕様に記載されています。

Please refer to the latest software feature specification. (SC115090)

It is described in the LAN port specification.

RJ45 Connector: S51-KA-0003 (UDE Corp.)

Pin	Signal	Direction	Description
R1	TD+	Output	IEEE802.3
R2	NC		Not Connected
R3	TD-	Output	IEEE802.3
R4	RD+	Input	IEEE802.3
R5	NC		Not Connected
R6	RD-	Input	IEEE802.3
R7	NC		Not Connected
R8	GND		Ground



無線 LAN 仕様 WLAN port specification

Items	Specifications				Units	Remarks
国/地域コード Country/Region code	JP	IM-100-EB-A(JP), IM-100-EB-A-SP(JP), IM-100-EB-C(JP), IM-100-EB-C-SP(JP)			–	
	US/CA	IM-100-EB-A(NA), IM-100-EB-A-SP(NA), IM-100-EB-C(NA), IM-100-EB-C-SP(NA)				
	EU/UK	IM-100-EB-A(EU), IM-100-EB-A-SP(EU), IM-100-EB-C(EU), IM-100-EB-C-SP(EU)				
動作周波数 Operating frequencies	Band	Modes	Min	Max		
	2.4GHz	11b 20MHz	2412	2472	MHz	
		11g/n/ax 20MHz	2412	2472	MHz	
	5GHz	11a/n/ac/ax 20MHz	5180	5825	MHz	
周波数間隔 Frequency steps	2.4GHz	11b/g/n/ax	5		MHz	
	5GHz	11a/n/ac/ax	20		MHz	
データレート Data rates	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			–	
	11ac/ax	MCS 0,1,2,3,4,5,6,7,8,9			–	
変調型 Modulation types	11b	DSSS(DBPSK,DQPSK,CCK)			–	
	11a/g/n	OFDM(BPSK,QPSK,16QAM,64QAM)			–	
	11ac/ax	OFDM(BPSK,QPSK,16QAM,64QAM,256QAM)			–	
暗号化 Encryptions	RC4	128			bits	
	AES	128, 192			bits	

利用可能チャネルリスト Available channel list

2.4GHz

Channel	Fc (MHz)	US/CA	EU/UK	JP
1	2412	Yes	Yes	Yes
2	2417	Yes	Yes	Yes
3	2422	Yes	Yes	Yes
4	2427	Yes	Yes	Yes
5	2432	Yes	Yes	Yes
6	2437	Yes	Yes	Yes
7	2442	Yes	Yes	Yes
8	2447	Yes	Yes	Yes
9	2452	Yes	Yes	Yes
10	2457	Yes	Yes	Yes
11	2462	Yes	Yes	Yes
12	2467	No	Yes	Yes
13	2472	No	Yes	Yes

5GHz

Channel	Fc (MHz)	US/CA	EU/UK	JP
36	5180	Yes	Yes	Yes
40	5200	Yes	Yes	Yes
44	5220	Yes	Yes	Yes
48	5240	Yes	Yes	Yes
52	5260	Yes	Yes	Yes
56	5280	Yes	Yes	Yes
60	5300	Yes	Yes	Yes
64	5320	Yes	Yes	Yes
100	5500	Yes	Yes	Yes
104	5520	Yes	Yes	Yes
108	5540	Yes	Yes	Yes
112	5560	Yes	Yes	Yes
116	5580	Yes	Yes	Yes
120	5600	No	Yes	Yes
124	5620	No	Yes	Yes
128	5640	No	Yes	Yes
132	5660	Yes	Yes	Yes
136	5680	Yes	Yes	Yes
140	5700	Yes	Yes	Yes
144	5720	Yes	No	Yes
149	5745	Yes	Yes	No
153	5765	Yes	Yes	No
157	5785	Yes	Yes	No
161	5805	Yes	Yes	No
165	5825	Yes	Yes	No

5. 適合規格 Standards compliance

5.1. 規格一覧 Standards list

以下適合規格は IM-100 として取得しています。
The following compliance standards have been obtained as IM-100.

適合法規制 Law regulation compliance

- ✧ 日本電波法 (MIC) NOTE
  証明規則第 2 条第 1 項第 19 号 (2.4GHz WLAN)
  証明規則第 2 条第 1 項第 19 号の 3 (W52/W53/W56 WLAN without DFS master)
  Article 2 paragraph 1 item (19) (2.4GHz WLAN)
  Article 2 paragraph 1 item (19)-3 (W52/W53/W56 WLAN without DFS master)
  認証番号 Certification number: **003-230334**

- ✧ FCC Part15
  Subpart C (2.4GHz WLAN)
  Subpart E (U-NII-1/2A/2C/3 WLAN without DFS master)
  ID: **N6C-IM100**

- ✧ ISED
  RSS-247 (2.4GHz WLAN)
  RSS-247 (U-NII-1/2A/2C/3 WLAN without DFS master)
  ID: **4908A-IM100**

- ✧ ETSI
  ETSI EN 300 328 (2.4GHz WLAN)
  ETSI EN 301 893 (5GHz WLAN without DFS master)
  ETSI EN 300 440 (5.8GHz WLAN)

- ✧ Ofcom
  ETSI EN 300 328 (2.4GHz WLAN)
  ETSI EN 301 893 (5GHz WLAN without DFS master)
  VNS 2030/8/3 (5.8GHz WLAN)

- ✧ CE RoHS Directive
- ✧ EN 62311
- ✧ EN 62368-1 : 2014 (EN 62368-1 : 2014 + A11 : 2017)

対応国 Countries

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

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

Japan (MIC)

Antennas	Vendors	Type	2.4GHz (dBi)	5GHz (dBi)			item (19) 2.4GHz	item (19)-3 5GHz
				W52	W53	W56		
AA258 (H2B1PC1A1C) (Include 50mm cable loss)	Unictron	Dipole	+2.67	+3.22	+3.91	+2.77	✓	✓
ANTDC-081A0/B0 (Exclude cable loss)	Sansei-Denki	Dipole	+2.0	+2.0	+2.0	+2.0	✓	✓
ANTDP-027A0 (Exclude cable loss)	Sansei-Denki	Dipole	+1.5	+2.1	+2.1	+2.1	✓	✓
AP02ML27******* (Include 200mm cable loss)	JAE	Dipole	+1.27	+1.88	+1.65	+2.72	✓	✓
SXANTFDB24A55-03	Silex Technology	PCB	+2.75	+1.82	+1.82	+2.82	✓	✓

US, Canada (FCC/ISED)

Antennas	Vendors	Type	2.4GHz (dBi)	5GHz (dBi)				Subpart C RSS-247 2.4GHz	Subpart E RSS-247 5GHz
				U-NII-1	U-NII-2A	U-NII-2C	U-NII-3		
AA258 (H2B1PC1A1C) (Include 50mm cable loss)	Unictron	Dipole	+2.67	+3.22	+3.91	+2.77	+3.92	✓	✓
ANTDC-081A0/B0 (Exclude cable loss)	Sansei-Denki	Dipole	+2.0	+2.0	+2.0	+2.0	+2.0	✓	✓
ANTDP-027A0 (Exclude cable loss)	Sansei-Denki	Dipole	+1.5	+2.1	+2.1	+2.1	+2.1	✓	✓
AP02ML27******* (Include 200mm cable loss)	JAE	Dipole	+1.27	+1.88	+1.65	+2.72	+3.33	✓	✓
SXANTFDB24A55-03	Silex Technology	PCB	+2.75	+1.82	+1.82	+2.82	+2.99	✓	✓

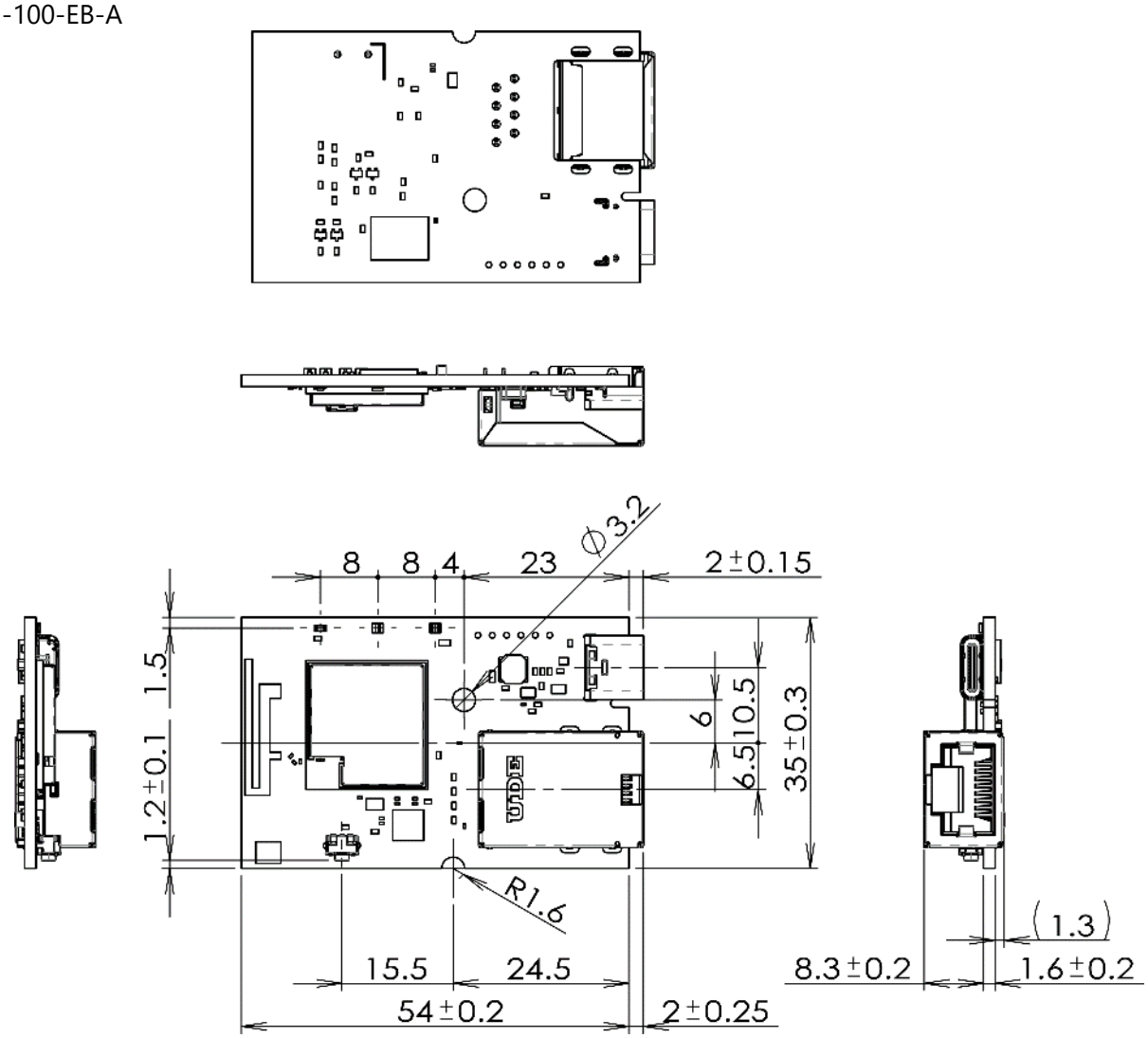
EU, UK (ETSI/Ofcom)

Antennas	Vendors	Type	2.4GHz (dBi)	5GHz (dBi)				EN 300 328 2.4GHz	EN 301 893 5GHz	EN 300 440 VNS 2030/8/3 5.8GHz
				U-NII-1	U-NII-2A	U-NII-2C	U-NII-3			
AA258 (H2B1PC1A1C) (Include 50mm cable loss)	Unictron	Dipole	+2.67	+3.22	+3.91	+2.77	+3.92	✓	✓	✓
ANTDC-081A0/B0 (Exclude cable loss)	Sansei-Denki	Dipole	+2.0	+2.0	+2.0	+2.0	+2.0	✓	✓	✓
ANTDP-027A0 (Exclude cable loss)	Sansei-Denki	Dipole	+1.5	+2.1	+2.1	+2.1	+2.1	✓	✓	✓
AP02ML27******* (Include 200mm cable loss)	JAE	Dipole	+1.27	+1.88	+1.65	+2.72	+3.33	✓	✓	✓
SXANTFDB24A55-03	Silex Technology	PCB	+2.75	+1.82	+1.82	+2.82	+2.99	✓	✓	✓

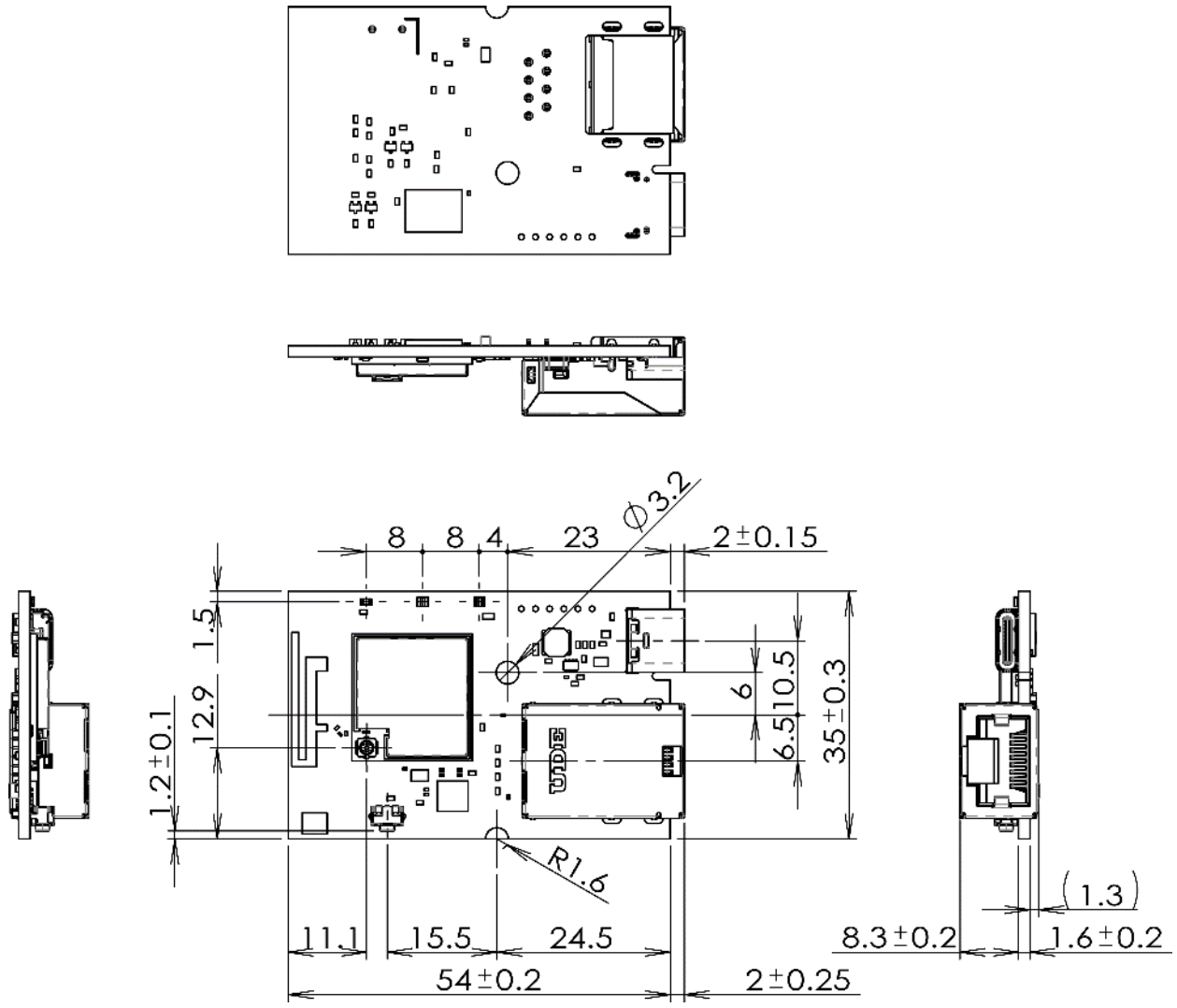
NOTE1	本製品は上記の法規制に適合していますが、認可内容の詳細や制限事項については認可証/認可レポートを十分にご確認ください。 This product complies with the above regulations, but for detailed information on authorization content and restrictions, please thoroughly review the authorization certificate/report.
NOTE2	これらの認証は silex 推奨アンテナ、silex 製ボードデータファイルと silex 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。 These certifications are valid only when using silex recommended antennas, silex board data files, and silex manufactured drivers. However, if the final product form differs or if drivers other than those made by silex are used, there may be a need for re-certification testing, even when utilizing silex recommended antennas.
NOTE3	各国の EMC 認証は最終製品形態での試験が必要です。 EMC certifications for each country require testing in the final product form.
NOTE4	Japan、Canada、EU、UK では法令により 5.15-5.35GHz 帯域（W52, W53）を屋外で利用することは禁止されています。本製品を屋外で利用される場合は予め該当の電波を出さない様に設定してください。 In Japan, Canada, the EU, and the UK, the use of the 5.15-5.35GHz band (W52, W53) outdoors is prohibited by regulations. If you intend to use this product outdoors, please ensure that it is configured not to emit signals in the specified radio frequency range.

6. 機械的仕様 Mechanical specifications

IM-100-EB-A



IM-100-EB-C



製品厚み **Product thickness**

Items	Thickness	Remarks
IM-100-EB	11.8mm+/- 0.755 mm	

PCB 厚 **PCB thickness**

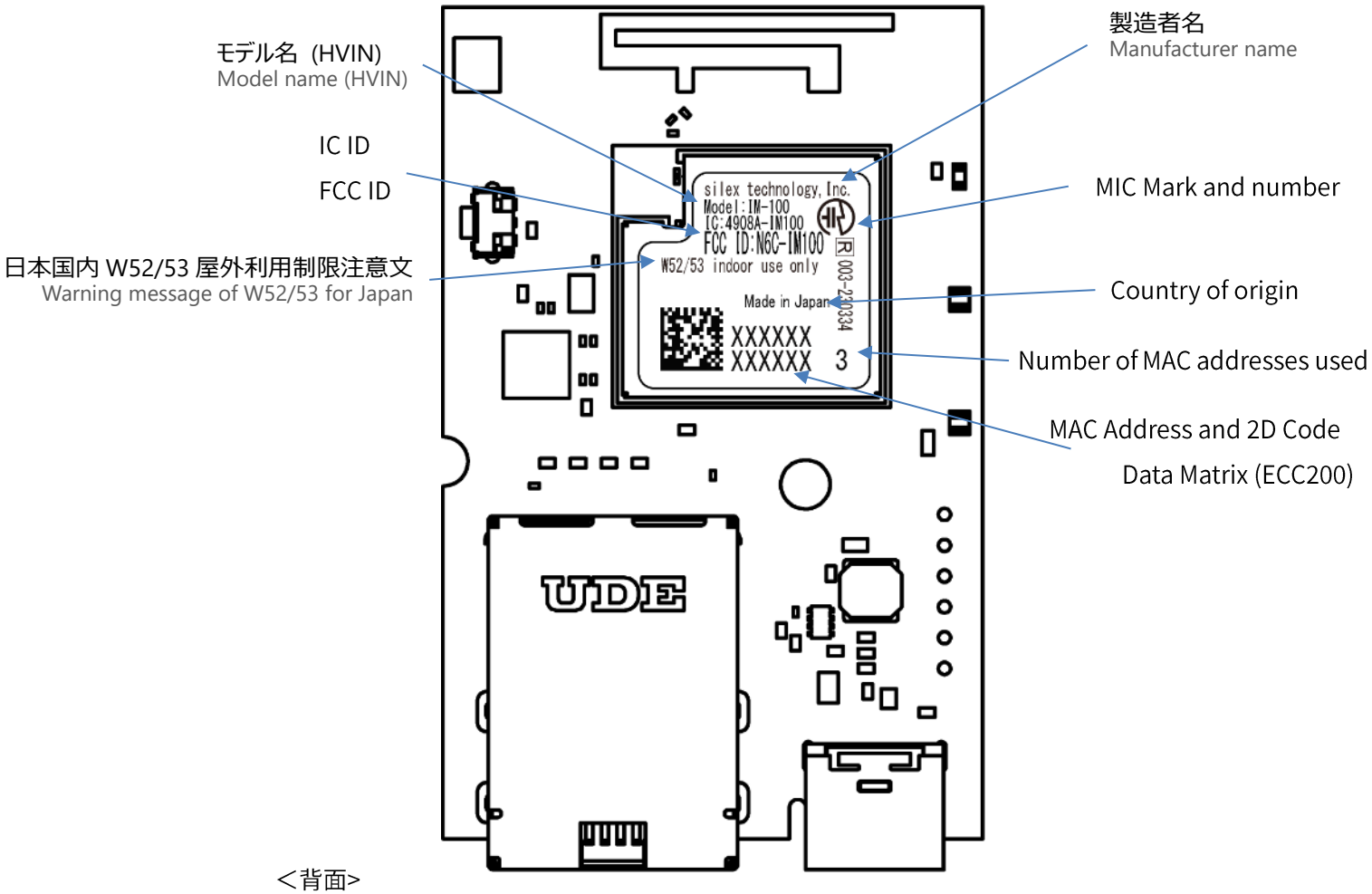
Items	Thickness	Remark
IM-100-EB IM-100-PAD(MHF)	1.6mm +/- 0.2 mm 1.0mm +/- 0.15 mm	

ラベルの厚み(0.05mm)は含まない。

The label thickness (0.05 mm) is not included.

7. 表示仕様 Indication specifications

IM-100-EB-A



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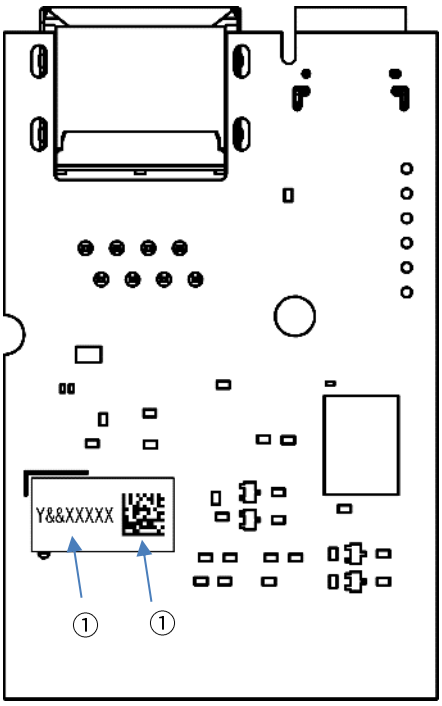
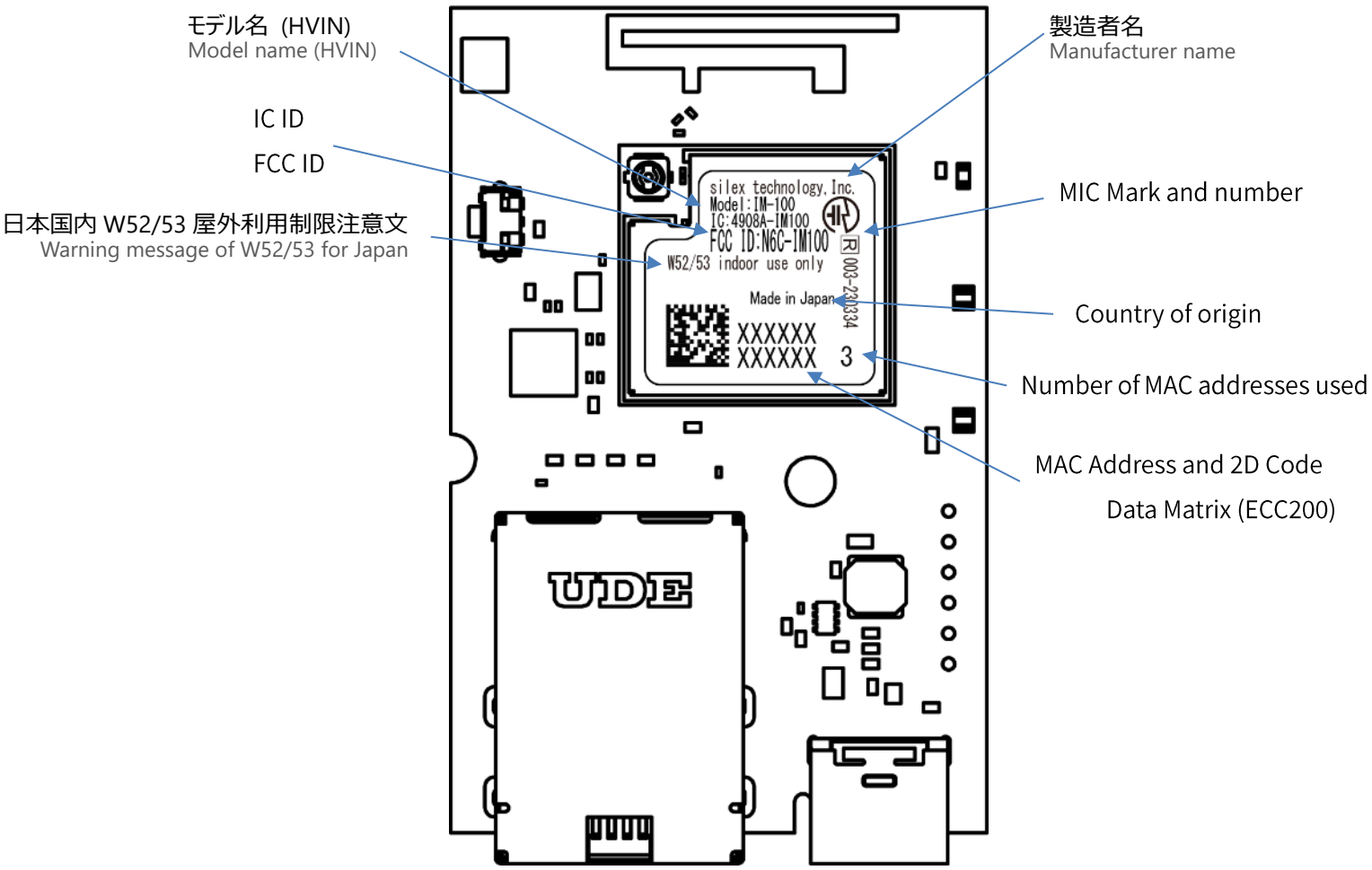


No	Print contents	Note
①	Serial No	Y：Year　No：K 2025, L 2026/M/N/P &&：Model identification number(fixed) JP: W0 / NA: W6 / EU/UK: W7 XXXXX：Serial number from 00001
②	QR Code	Format：Datamatrix(ECC200)

IM-100-EB-C



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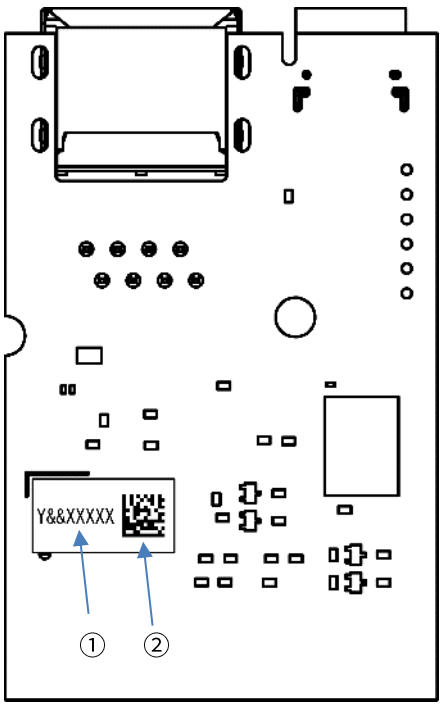


No	Print contents	Note
①	Serial No	Y：Year　No：K 2025, L 2026/M/N/P &&：Model identification number(fixed) JP: W1 / NA: W8 / EU/UK: W9 XXXXX：Serial number from 00001
②	QR Code	Format：Datamatrix(ECC200)

8. 構成リスト Components composition list

JP model

Categories	Items	Qty.				Units	Remarks
		ZXE04791	ZXE04792	ZXE04793	ZXE04794		
		IM-100-EB-A(JP)	IM-100-EB-A-SP(JP)	IM-100-EB-C(JP)	IM-100-EB-C-SP(JP)		
基板 Board	主基板 Main board	1	1	1	1	pcs	
ラベル Label	製品ラベル Product Label	1	1	1	1	pcs	
	個装ラベル Packing Label		1		1	pcs	
	集合ラベル Carton Label	1/50	1/20	1/50	1/20	pcs	
付属品 Accessory	アンテナ Antenna				1	pcs	
梱包 Packing	エアキャップ袋 Bubble Bag	1	1	1	2	pcs	
	個装箱 Packing Box		1		1	pcs	
	集合箱 Carton Box	1/50	1/20	1/50	1/20	pcs	

US/CA model

Categories	Items	Qty.				Units	Remarks
		ZXE04861	ZXE04865	ZXE04863	ZXE04867		
		IM-100-EB-A(NA)	IM-100-EB-A-SP(NA)	IM-100-EB-C(NA)	IM-100-EB-C-SP(NA)		
基板 Board	主基板 Main board	1	1	1	1	pcs	
ラベル Label	製品ラベル Product Label	1	1	1	1	pcs	
	個装ラベル Packing Label		1		1	pcs	
	集合ラベル Carton Label	1/50	1/20	1/50	1/20	pcs	
付属品 Accessory	アンテナ Antenna				1	pcs	
梱包 Packing	エアキャップ袋 Bubble Bag	1	1	1	2	pcs	
	個装箱 Packing Box		1		1	pcs	
	集合箱 Carton Box	1/50	1/20	1/50	1/20	pcs	

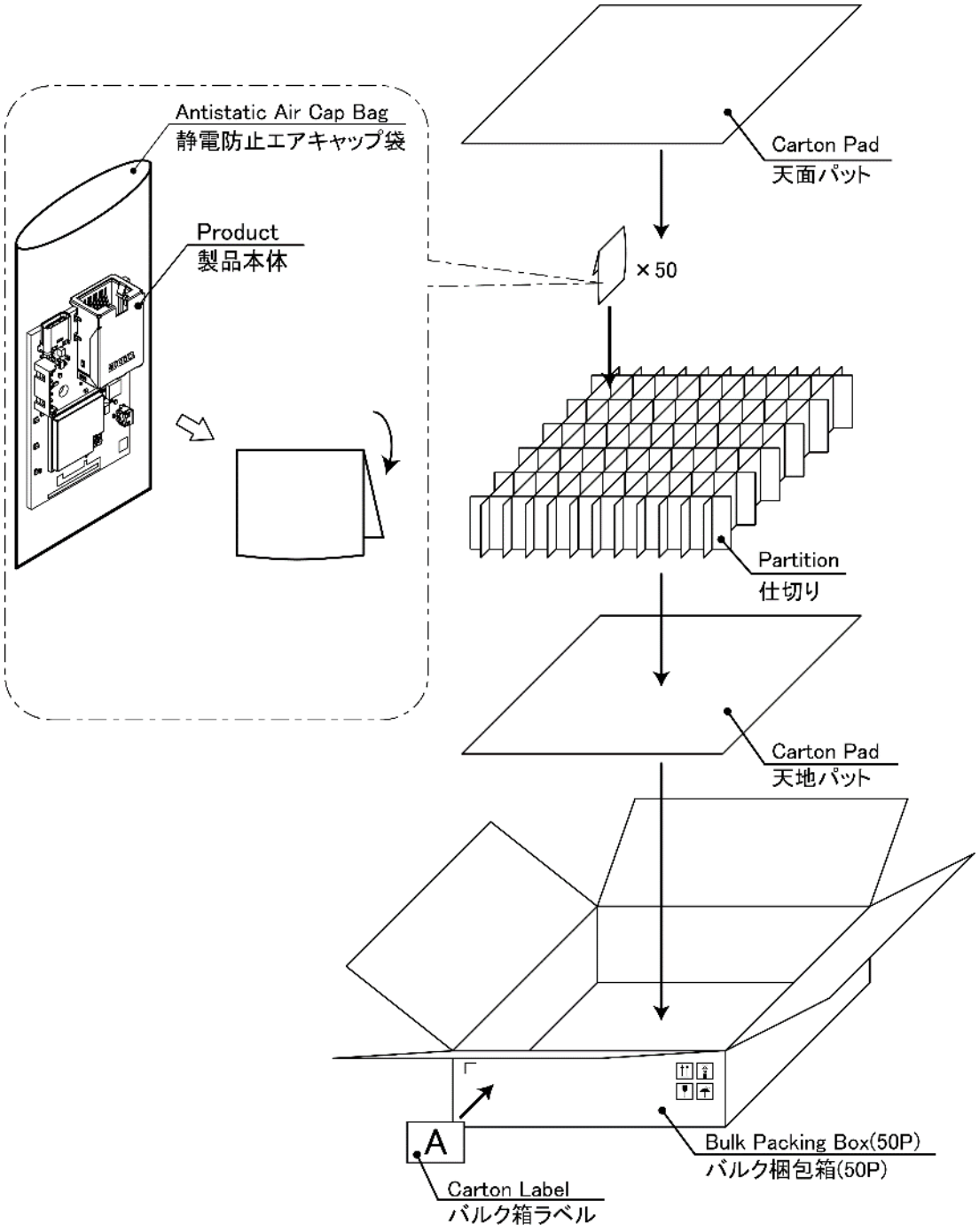
EU/UK model

Categories	Items	Qty.				Units	Remarks
		ZXE04862	ZXE04866	ZXE04864	ZXE04868		
		IM-100-EB-A(EU/UK)	IM-100-EB-A-SP(EU/UK)	IM-100-EB-C(EU/UK)	IM-100-EB-C-SP(EU/UK)		
基板 Board	主基板 Main board	1	1	1	1	pcs	
ラベル Label	製品ラベル Product Label	1	1	1	1	pcs	
	個装ラベル Packing Label		1		1	pcs	
	集合ラベル Carton Label	1/50	1/20	1/50	1/20	pcs	
付属品 Accessory	アンテナ Antenna				1	pcs	
梱包 Packing	エアキャップ袋 Bubble Bag	1	1	1	2	pcs	
	個装箱 Packing Box		1		1	pcs	
	集合箱 Carton Box	1/50	1/20	1/50	1/20	pcs	

9. 梱包仕様 Packing specifications

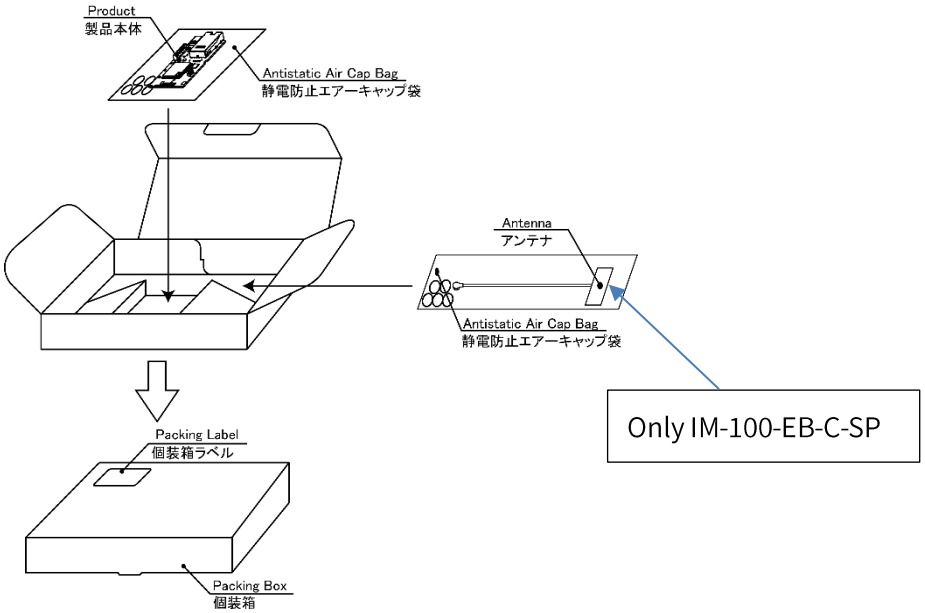
9.1. IM-100-EB-A、IM-100-EB-C

箱寸法 / Box size ： 405mm x 130mm x 540mm (W x H x D ±10mm)
重さ weight ： About 675 g (Net)
： About 2.0 kg (Gross)

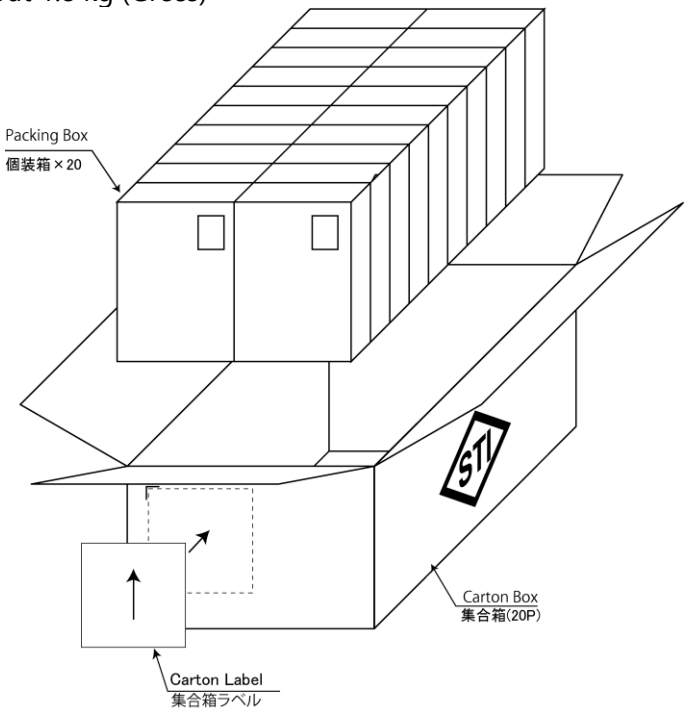


9.2. IM-100-EB-A-SP、IM-100-EB-C-SP

個装箱 Packing Box
箱寸法 Box size : About W:139mm×D:173mm×H:33mm
重さ weight : About 17.7 g (Net)
: About 72.5 g (Gross)

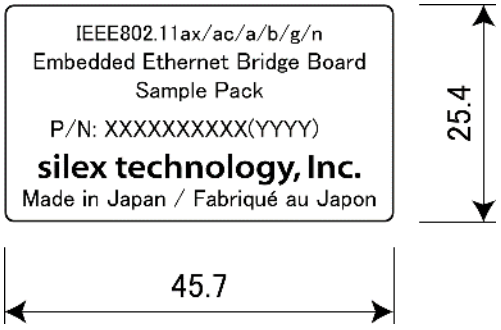


集合箱 Carton Box
箱寸法 Box size : About W:300mm×D:350mm×H:205mm
重さ weight : About 354 g (Net)
: About 1.8 kg (Gross)



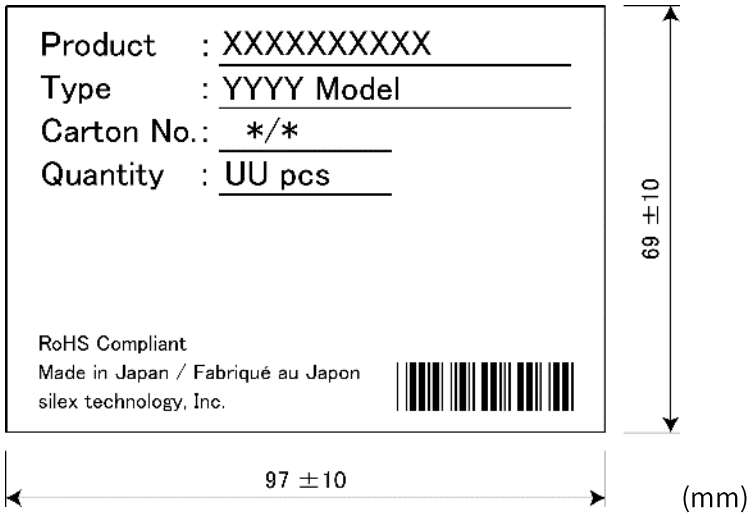
9.3. 梱包ラベル仕様 Label specifications

個装箱ラベル Packing Label



XXXXXXXXXX	(YYYY)
IM-100-EB-A-SP	JP NA EU/UK
IM-100-EB-C-SP	JP NA EU/UK

集合箱ラベル Carton Label



Product(XXXXXXXXX)	Type(YYYY)	Quantity(UU)
IM-100-EB-A	JP NA EU/UK	50
IM-100-EB-A-SP	JP NA EU/UK	20
IM-100-EB-C	JP NA EU/UK	50
IM-100-EB-C-SP	JP NA EU/UK	20

10. 信頼性試験 Reliability test

<table>
<tr><th rowspan="2">Test items</th><th rowspan="2">Standards</th><th rowspan="2">Description</th><th colspan="2">Requirements</th></tr>
<tr><th>Electricity</th><th>Appearance</th></tr>
<tr><td>DC 電圧試験
DC voltage test</td><td>–</td><td>電源電圧を以下の範囲で変動させて動作確認を行う。
VBUS: +4.47V ~ +5.25V
・通信の停止や通信速度の異常が起こらないことを確認する。
Verify the operation by testing the power supply voltage within the below range:
VBUS: +4.47V ~ +5.25V
Confirm that there is no interruption in communication or abnormal communication speed.</td><td>動作可能
Workable</td><td>NA</td></tr>
<tr><td>温湿度電圧サイクル試験
Temperature/ Humidity cycle test</td><td>–</td><td>下記条件で動作確認を行う。
・通信の停止や通信速度の異常が起こらないことを確認する。
Perform operational verification under the following conditions:
Confirm that there is no interruption in communication or abnormal communication speed.
Standard test[⇨: Ramp] (Hr:Min)
<table>
<tr><td>Step</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td></tr>
<tr><td>℃</td><td>+25</td><td>⇨</td><td>-40</td><td>⇨</td><td>+90</td><td>⇨</td><td>-40</td><td>⇨</td><td>+90</td><td>+85</td><td>⇨</td><td>+85</td><td>⇨</td><td>25</td></tr>
<tr><td>%RH</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>15</td><td>⇨</td><td>95</td><td>⇨</td><td>30</td></tr>
<tr><td>Time</td><td>0:05</td><td>0:30</td><td>4:00</td><td>1:00</td><td>2:00</td><td>1:00</td><td>2:00</td><td>1:00</td><td>2:00</td><td>6:00</td><td>1:00</td><td>6:00</td><td>1:00</td><td>0:05</td></tr>
</table></td><td>動作可能
Workable</td><td>NA</td></tr>
<tr><td>電源投入切断試験
Power ON OFF cycle test</td><td>–</td><td>下記条件で電源投入切断を2000回繰り返し、起動することを確認する。
電源遮断時間は、1,2,3,4,5,10,20,30,40,50秒とし、各200回実施する。
電源投入時間は、装置立ち上がりまでの時間とする。
Repeatedly perform power supply on/off cycles 2000 times under the following conditions and confirm successful startup:
Power interruption times: 1, 2, 3, 4, 5, 10, 20, 30, 40, 50 seconds, each tested 200 times.
The power-on time is defined as the time until the device is fully operational.</td><td>動作可能
Workable</td><td>NA</td></tr>
<tr><td>高温起動試験
High temperature boot-up test</td><td>–</td><td>高温状態での起動を確認する。
・1回目は+90℃で2時間放置後に電源をONにし、起動することを確認する。
・2回目以降は30分放置し電源をONとし、起動することを確認する。
・試行回数計5回。
Confirm startup under high-temperature conditions:
For the first attempt, leave the device at +90°C for 2 hours, then power it on and confirm startup.
For subsequent attempts (2nd and onwards), leave the device for 30 minutes, power it on, and confirm startup.
Repeat this process a total of 5 times.</td><td>動作可能
Workable</td><td>NA</td></tr>
<tr><td>低温起動試験
Low temperature boot-up test</td><td>–</td><td>低温状態での起動を確認する。
・1回目は-40℃で2時間放置後に電源をONにし、起動することを確認する。
・2回目以降は30分放置し電源をONとし、起動することを確認する。
・試行回数5回。
Confirm startup under high-temperature conditions:
For the first attempt, leave the device at -40°C for 2 hours, then power it on and confirm startup.
For subsequent attempts (2nd and onwards), leave the device for 30 minutes, power it on, and confirm startup.
Repeat this process a total of 5 times.</td><td>動作可能
Workable</td><td>NA</td></tr>
</table>

<table>
<tr><th rowspan="2">Test items</th><th rowspan="2">Standards</th><th rowspan="2">Description</th><th colspan="2">Requirements</th></tr>
<tr><th>Electricity</th><th>Appearance</th></tr>
<tr><td>衝撃試験
Mechanical shock test</td><td>JIS C60068-2-27</td><td>衝撃波形 / Shock waveform ：正弦半波/ Half sine wave
衝撃方向 / Impact direction ：6 方向/6 directions
時間 / Time ：11msec
加速度 / Acceleration ：490m/s² (50G)
回数 / Number of times ：3 times/direction (Total 18 times)</td><td>検査仕様適合
Test spec in</td><td>損傷無し
No damage</td></tr>
<tr><td>振動試験
Mechanical vibration test</td><td>JEDEC JESD-22-B103</td><td>振動波形 / Vibration waveform：正弦波 / Sine wave
振動方向 / Vibration direction ：X,Y,Z
周波数 / Frequency ：20～2000Hz
加速度 / Acceleration ：196m/s²(20G)
時間 / Time ：96 minute total for 3 axes</td><td>検査仕様適合
Test spec in</td><td>損傷無し
No damage</td></tr>
<tr><td>梱包落下試験
Drop with package</td><td>ISO 4180
(JIS Z0200 Level I)</td><td>Carton Box
落下高さ / Drop height ：100cm
落下回数 / Number of drops ：10 times (6 faces, 3 edges, 1 corner)</td><td>動作可能
Workable</td><td>損傷無し
No damage</td></tr>
<tr><td>梱包振動試験
Vibration with package</td><td>ISO 4180
(JIS Z0200 Level I)</td><td>ランダム振動試験 / Random Vibration
垂直方向/ Vertical
<table>
<tr><td>Profile</td><td>A</td><td>B</td></tr>
<tr><td>Time(min)</td><td>100</td><td>20</td></tr>
<tr><td colspan="3">加速度パワースペクトル密度/PSD</td></tr>
<tr><td>周波数 Hz</td><td colspan="2">Level (m/s2)2/Hz , (g2/Hz)a</td></tr>
<tr><td>2</td><td>0.012[0.000125]</td><td>0.048[0.0005]</td></tr>
<tr><td>4</td><td>0.288[0.003]</td><td>1.15[0.012]</td></tr>
<tr><td>18</td><td>0.288[0.003]</td><td>1.15[0.012]</td></tr>
<tr><td>40</td><td>0.024[0.0025]</td><td>0.096[0.001]</td></tr>
<tr><td>200</td><td>0.012[0.000125]</td><td>0.048[0.0005]</td></tr>
<tr><td>加速度</td><td>2.97 m/s² {0.303G}</td><td>5.926m/s² {0.604G}</td></tr>
</table></td><td>動作可能
Workable</td><td>損傷無し
No damage</td></tr>
<tr><td>温度衝撃試験
Thermal shock test</td><td>JEDEC
JESD22-A106B
Test Condition A
(Fluid Air)
*Only test procedure compliant</td><td>本製品をL x W x T = 35 x 54 x 1.6 mmの基板に実装後に試験を実施する。
熱衝撃を加えた後、動作確認を行う。
・Step 1 (高温) / Step 3 (低温)を繰り返す。
・500 Cycleで動作確認を実施する。
Conduct testing after installing this product on a board with dimensions L x W x T = 35 x 54 x 1.6 mm.
Perform operational verification after applying thermal shock.
Repeat Step 1 (high temperature) / Step 3 (low temperature).
Perform operational verification for 500 cycles.

Steps per 1 Cycle [⇨: Ramp]
<table>
<tr><td>Steps</td><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>Temperature</td><td>+100
+10/-0℃</td><td>⇨</td><td>-20
+0/-10℃</td><td>⇨</td></tr>
<tr><td>Time</td><td>5min</td><td>< 10sec</td><td>5min</td><td>< 10sec</td></tr>
<tr><td>Power</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
</table></td><td>検査仕様適合
Test spec in</td><td>損傷無し
No damage</td></tr>
</table>

Test items	Standards	Description	Requirements	
			Electricity	Appearance
静電気試験 ESD test	JEDEC JESD22-A114F	アンテナ芯線へのESD印加試験を行う。 ・放電容量＝100pF/放電抵抗=1.5kΩ ・アンテナコネクタ芯線：+/-8kV ・正極、負極各3回ずつの印加。 ・印加した後も故障/RF性能が劣化しないことを確認する。 Conduct ESD (Electrostatic Discharge) testing on the antenna core wire. Discharge parameters: Capacitance = 100pF / Discharge resistance = 1.5kΩ Antenna connector core wire: +/-8kV Apply positive and negative charges three times each. Confirm that there is no malfunction or degradation in RF performance after applying the discharge.	動作可能 Workable	NA
静電気試験 ESD test	IEC61000-4-2	下記条件で試験実施中あるいは実施後、性能基準Bを満たすことを確認する。 但しUSB-C ConnectorおよびRJ45 Connectorへの印加に限る。 Confirm that the performance standard B is satisfied during or after the test under the following conditions. However, this applies only to the USB-C Connector and RJ45 Connector. Discharge capacitance：150pF , Discharging resistance：330Ω Indirect discharge：4kV以上 Contact discharge：4kV以上 Air discharge：8kV以上	性能基準 B Criteria B	NA
絶縁耐電圧・抵抗試験 Insulation withstand voltage/resistance test	IEEE802.3 準拠	信号線一括－GND間 AC1500V/1分間印加し絶縁破壊しないことを確認する 抵抗値が DC500V計を用いて 2MΩ以上有ることを確認する Between 10BaseT signal line and GND Apply AC1500V/1 minute without dielectric breakdown The resistance value must be 2MΩ or more using a DC500V meter.	Resistance value 2MΩ or more	NA

Criteria	Description
損傷無し No damage	試験後外観に損傷が無いこと。 No damage on the appearance after test.
検査仕様適合 Test spec in	RF 検査仕様を満たすこと。 Meet to RF test specifications
動作可能 Workable	試験中動作が確認できること。 Can confirm to work during test.

11. 使用上の注意 Notifications

✧ 本製品の仕様は、§5. に掲げる法規制に適合していますが、以下の場合は仕様が変更になる可能性があります。
The specifications of this product comply with the regulations listed in §5. However, there is a possibility of specification changes in the following cases:

1) §5.1 に掲げる国以外で使う場合。
When used in countries not listed in §5.1.
2) §5.2 に掲げるアンテナ以外を使う場合。
When using antennas other than those listed in §5.2.
3) 認可の更新が必要な場合。
When an update of the authorization is required.

✧ 本製品は 2.4GHz 帯と 5GHz 帯の電波を媒体とする無線通信機です。
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。
This product is a wireless communication device operating in the 2.4GHz and 5GHz bands. It is prohibited by regulations to use the 5.15-5.35GHz band (W52, W53) outdoors. If you intend to use this product outdoors, please ensure that it is configured not to emit signals in the W52/W53 frequency bands.

✧ 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 product is designed for integration into general electronic devices and is not intended for integration into equipment that requires an extremely high level of reliability and quality, such as aircraft, nuclear control systems, highly reliable medical devices, high-reliability security devices, etc. **If you intend to integrate it into medical devices, please contact our sales department regardless of the medical device 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.

✧ 本製品は組込みを意図した無線装置です。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。
This product is an intended wireless device for integration. We request that you evaluate the functionality and characteristics of this product before incorporating it into the final product. Additionally, EMC measurements have not been conducted solely on this wireless device. Therefore, it is necessary to perform EMC testing and submit certification applications for the product form that includes this wireless device.

✧ 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。
In the wireless frequency band used by this product, there may be potential interference from or to devices utilizing the same frequency band. Prior to installation, please conduct an environmental survey to assess the impact.

✧ 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。
Disassembling or modifying this product may result in penalties based on radio wave regulations.

✧ 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。
This product is an embedded module with exposed terminals and components. During product integration, please exercise caution regarding electrostatic discharge (this product incorporates high-frequency devices sensitive to electrostatic electricity), water droplets, and other dust particles.

✧ 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, IEEE802.11ac-2013 及び IEEE802.11ax 参照)
When using other wireless devices in the vicinity that operate in the same frequency band, please pay special attention to the following:
(Refer to IEEE 802.11-2012, IEEE 802.11ac-2013, and IEEE 802.11ax.)

1) 2.4GHz 帯では、本モジュールの中心周波数から+/-25MHz (5Ch) 以上の間隔をあけて使用することが推奨されます。
In the 2.4GHz band, it is recommended to use frequencies with a separation of more than +/-25MHz (5 channels) from the central frequency of this module.
2) 隣接チャネル及び非隣接チャ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。
Exercise caution with adjacent and non-adjacent channel signal inputs, and set up an environment to avoid interference.

▢ 2.4GHz 隣接チャネル ： 中心周波数+/-25MHz(5Ch), 非隣接チャネル ： 中心周波数 +/-30MHz(6Ch)以上
Adjacent channels in the 2.4GHz band: Central frequency +/- 25MHz (5 channels), Non-adjacent channels: Central frequency +/- 30MHz (6 channels) or more.
▢ 5GHz 隣接チャネル ： 中心周波数+/-20MHz(4Ch), 非隣接チャネル ： 中心周波数 +/-40MHz(8Ch)以上
Adjacent channels in the 5GHz band: Central frequency +/- 20MHz (4 channels), Non-adjacent channels: Central frequency +/- 40MHz (8 channels) or more.

※上記の条件外であっても、強い電波入力が有る場合は混信する可能性が有るため、周辺の無線機器は十分距離を離してご使用ください。
Even outside the specified conditions, there is a potential for interference in the presence of strong radio signals. Therefore, please use surrounding wireless devices at a sufficient distance.

✧ 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 from the opposing device should be considered, including antenna gain, and be -20dBm or less for the 2.4GHz band and -30dBm or less for the 5GHz band.

Federal Communication Commission Interference Statement
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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Operations in the 5.15-5.25GHz band are restricted to indoor usage only.
This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

Radiation Exposure Statement:
The product comply with the FCC portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

FCC Notice;
This module is intended for OEM integrators only. Per FCC KDB 996369 D03 OEM Manual v01 guidance, the following conditions must be strictly followed when using this certified module:

KDB 996369 D03 OEM Manual v01 rule sections:

2.2 List of applicable FCC rules
This module has been tested for compliance to FCC Part 15

2.3 Summarize the specific operational use conditions
The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co-location with other transmitter(s) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

2.4 Limited module procedures
Not applicable.

2.5 Trace antenna designs
Not applicable.

2.6 RF exposure considerations
This equipment complies with FCC mobile radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. If the module is installed in a portable host, a separate SAR evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.

2.7 Antennas
The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module. The antenna must be installed such that 20 cm can be maintained between the antenna and users.

Antenna Type	Antenna Gain				
	2.4-2.5GHz	5.15-5.25GHz	5.25-5.35GHz	5.47-5.725GHz	5.725-5.85GHz
Dipole(146153)	+3.175dBi	+3.175dBi	+2.975dBi	+4.275dBi	+3.775dBi
Dipole(AA258)	+2.67dBi	+3.22dBi	+3.91dBi	+2.77dBi	+3.92dBi
PCB(SXANTFDB24A55-03)	+2.75dBi	+1.82dBi	+1.82dBi	+2.82dBi	+2.99dBi

2.8 Label and compliance information
The final end product must be labeled in a visible area with the following: "Contains FCC ID: **N6C-IM100**".
The grantee's FCC ID can be used only when all FCC compliance requirements are met.

FCC CAUTION
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
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, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

2.9 Information on test modes and additional testing requirements
This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) or portable use will require a separate class II permissive change re-evaluation or new certification.

2.10 Additional testing, Part 15 Subpart B disclaimer
This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

2.11 Note EMI Considerations
We recommend to use "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties. The host manufacturer is responsible for ensuring compliance with the applicable FCC rules for the transmitters operating individually and simultaneously. This includes compliance for the summation of all emissions from all outputs occupying the same or overlapping frequency ranges, as defined by the applicable rules.

2.12 How to make changes
Only the grantee is permitted to make permissive changes. Please contact us at Silex Technology, Inc.

As long as all conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Manual Information To the End User
The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.
The end user manual shall include all required regulatory information/warning as show in this manual.

OEM/Host manufacturer responsibilities
OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment

Prohibited for control of or communications with unmanned aircraft systems, including drones.

Innovation, Science and Economic Development Canada statement:

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation,
Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation
est autorisée aux deux conditions suivantes :
1. L'appareil ne doit pas produire de brouillage
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Label and compliance information
The following information must be indicated on the host device of this module.

Les informations suivantes doivent être indiquées sur le périphérique hôte de ce module.

Contains Transmitter Module IC: 4908A-IM100

or

Contains IC: 4908A-IM100

Operation in the band 5150-5350 MHz
Operation in the band 5150-5350 MHz is only for indoor use to reduce the potential for harmful interference to cochannel mobile satellite systems.

La bande 5150-5350 MHz est réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

Data transmission
Data transmission is always initiated by software, which is the passed down through the MAC, through the digital and analog baseband, and finally to the RF chip. Several special packets are initiated by the MAC. These are the only ways the digital baseband portion will turn on the RF transmitter, which it then turns off at the end of the packet.
Therefore, the transmitter will be on only while one of the aforementioned packets is being transmitted. In other words, this device automatically discontinue transmission in case of either absence of information to transmit or operational failure.

La transmission des données est toujours initiée par le logiciel, puis les données sont transmises par l'intermédiaire du MAC, par la bande de base numérique et analogique et, enfin, à la puce RF. Plusieurs paquets spéciaux sont initiés par le MAC. Ce sont les seuls moyens pour qu'une partie de la bande de base numérique active l'émetteur RF, puis désactive celui-ci à la fin du paquet. En conséquence, l'émetteur reste uniquement activé lors de la transmission d'un des paquets susmentionnés. En d'autres termes, ce dispositif interrompt automatiquement toute transmission en cas d'absence d'information à transmettre ou de défaillance.

RF exposure considerations
This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the ISED radio frequency (RF) Exposure rules. This equipment should be installed and operated keeping the radiator at least 20cm or more away from person's body.

Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'ISDE. Cet équipement doit être installé et utilisé en gardant une distance de 20 cm ou plus entre le radiateur et le corps humain.

Antenna Type

This radio transmitter (4908A-IM100) has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Antenna Type	Antenna Gain					Impedance
	2.4-2.5GHz	5.15-5.25GHz	5.25-5.35GHz	5.47-5.725GHz	5.725-5.85GHz	
Dipole(146153)	+3.175dBi	+3.175dBi	+2.975dBi	+4.275dBi	+3.775dBi	50ohms
Dipole(AA258)	+2.67dBi	+3.22dBi	+3.91dBi	+2.77dBi	+3.92dBi	50ohms
PCB(SXANTFDB24A55-03)	+2.75dBi	+1.82dBi	+1.82dBi	+2.82dBi	+2.99dBi	50ohms

Le présent émetteur radio (4908A-IM100) a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur.

Antenna Type	Antenna Gain					Impedance
	2.4-2.5GHz	5.15-5.25GHz	5.25-5.35GHz	5.47-5.725GHz	5.725-5.85GHz	
Dipole(146153)	+3.175dBi	+3.175dBi	+2.975dBi	+4.275dBi	+3.775dBi	50ohms
Dipole(AA258)	+2.67dBi	+3.22dBi	+3.91dBi	+2.77dBi	+3.92dBi	50ohms
PCB(SXANTFDB24A55-03)	+2.75dBi	+1.82dBi	+1.82dBi	+2.82dBi	+2.99dBi	50ohms