Date	2015.06.11
Revision	1.0
Page	30

PRODUCT APPROVAL DATASHEET

PRODUCT	MCSLogic Bluetooth 4.1 Smart Device Module
MODEL NAME	WB1NP6
MCSLogic P/N	MB8670C0
LG P/N	EAT63117501
CUSTOMER	LG Electronics

Checked By	Approved By	Company Seal
		

MCSLOGIC

Revision History

Version	Date (YY/MM/DD)	Revision Description
0.9	15/04/30	temporary release
1.0	15/06/11	Initial release

Table of Contents

1. General Description

WB1NP6 is a fully integrated Bluetooth module. It is based on CSR's Bluecore 8670 chip with specific interface design to meet LG Electronics's needs.

WB1NP6 is compatible with Bluetooth specification version 4.1. It integrates RF, Baseband controller, etc., a completed Bluetooth subsystem.

Features :

- Operation Range (Class I)
- Fully Compatible with Bluetooth Specification 4.1
- Dual-mode Bluetooth / Bluetooth low energy
- Operating Temperature Range : -20℃ ~ 70℃
- Operating VDD Range : 3.0 V ~ 3.6V
- Interface : UART/USB
- Internal Antenna
- RoHS Compliant

Applications :

- Consumer Products

2. Quality

Qaulity should meet each condition which mentioned on this specification. However, the items which are not mentioned on this specification follow the inspection agreements and standards which are agree with both companies.

3. Test

Electrical characteristics are tested for every products. However, if there are any objection in judgement, it should be treated with agreements of companies.

No	Pin Name	I/O	Description
1	GND	I	CON CONNECTION FOR AUDIO
2	MIC_LP	I	MIC INPUT POSITIVIE LEFT
3	MIC_LN	I	MIC INPUT NEGATIVE LEFT
4	MIC_BIAS_A	O	MIC BIAS A
5	MIC_BIAS_B	O	MIC BIAS B
6	MIC_RN	I	MIC INPUT NEGATIVE RIGHT
7	MIC_RP	I	MIC INPUT POSITIVIE RIGHT
8	GND	I	GND CONNECTION FOR INTERNAL DIGITAL CIRCUITTRY AND PADS
9	PCM_IN	I/O	SYNCHRONOUS DATA INPUT, Alternative function PIO[17]
10	PCM_CLK	I/O	SYNCHRONOUS DATA CLOCK, Alternative function PIO[20]
11	PCM_OUT	I/O	SYNCHRONOUS DATA OUTPUT, Alternative function PIO[18]
12	PCM_SYNC	I/O	SYNCHRONOUS DATA SYNC, Alternative function PIO[19]
13	SPI_CLK	I	SPI CLOCK
14	SPI_MOSI	I	SPI DATA INPUT
15	SPI_MISO	O	SPI DATA OUTPUT
16	SPI_CS#	I	CHIP SELECT FOR SPI, ACTIVE LOW
17	AIO[0]	I	AIO
18	AIO[1]	I	AIO
19	VDD_USB	I	POSITIVE SUPPLY FOR USB PORT
20	USB_N	I/O	USB DATA MINUS
21	USB_P	I/O	USB DATA PLUS
22	VDD_PADS_1	I	1.7~3.6V SUPPLY INPUT FOR IO PORTS (RST#, UART, PCM, SPI, PIO[3:0]
23	RST#	I	RESET IF LOW (>5ms)
24	LED[0]	O	LED DRIVER
25	LED[2]	O	LED DRIVER
26	LED[1]	O	LED DRIVER
27	GND	I	GND CONNECTION FOR INTERNAL DIGITAL CIRCUITTRY AND PADS
28	UART_RTS	I/O	UART REQUEST TO SEND, ACTIVE LOW, Alternative function PIO[16]
29	UART_RX	I	UART DATA IN
30	UART_CTS	I/O	UART CLEAR TO SEND, ACTIVE LOW
31	UART_TX	O	UART DATA OUT
32	PIO[0]	I/O	GPIO
33	PIO[1]	I/O	GPIO
34	PIO[2]	I/O	GPIO
35	PIO[15]	I/O	GPIO
36	PIO[7]	I/O	GPIO
37	PIO[6]	I/O	GPIO
38	VDD_PADS_2	I	1.7~3.6V SUPPLY INPUT FOR PIO[15:4]
39	PIO[3]	I/O	GPIO

40	**PIO[14]**	I/O	GPIO
41	**PIO[5]**	I/O	GPIO
42	**PIO[10]**	I/O	GPIO
43	**PIO[4]**	I/O	GPIO
44	**GND**	I	GND CONNECTION FOR INTERNAL DIGITAL CIRCUITTRY AND PADS
45	**PIO[11]**	I/O	GPIO
46	**PIO[12]**	I/O	GPIO
47	**PIO[13]**	I/O	GPIO
48	**QSPI_FLASH_IO3**	I/O	SERIAL QUAD IO FLASH DATA BIT 3, Alternative function PIO[28]
49	**QSPI_FLASH_CS#**	I/O	SPI FLASH CHIP SELECT, , Alternative function PIO[23]
50	**QSPI_FLASH_CLK**	I/O	SPI FLASH CLOCK, Alternative function PIO[21]
51	**QSPI_FLASH_IO0**	I/O	SERIAL QUAD IO FLASH DATA BIT 0, Alternative function PIO[25]
52	**QSPI_SPAM_CLK**	I/O	SPI RAM CLOCK, Alternative function PIO[22]
53	**QSPI_FLASH_IO1**	I/O	SERIAL QUAD IO FLASH DATA BIT 1, Alternative function PIO[26]
54	**QSPI_FLASH_IO2**	I/O	SERIAL QUAD IO FLASH DATA BIT 2, Alternative function PIO[27]
55	**QSPI_SRAM_CS#**	I/O	SPI RAM CHIP SELECT, Alternative function PIO[24]
56	**1V8_SMPS**	O	1.8V REGULATOR OUTPUT
57	**VBAT_SENSE**	I	BATTERY CHARGER SENSE INPUT
58	**VBATT**	I	BATTERY POSITIVE TERMINAL
59	**VBUS**	I	BATTERY CHARGER INPUT
60	**3V3_OUT**	O	ALTERMATIVE SUPPLY VIA BYPASS REGULATOR FOR 1.8V AND 1.35V REGULATOR INPUTS. MUSET BE THE SAME POTENTIAL AS VBAT.
61	**CHG_EXT**	I	EXTERNAL BATTERY CHARGER CONTROL
62	**GND**	I	GND CONNECTION FOR AUDIO DRIVER
63	**SPKR_LP**	O	SPEAKER OUTPUT POSITIVE LEFT
64	**SPKR_LN**	O	SPEAKER OUTPUT NEGATIVE LEFT
65	**SPKR_RP**	O	SPEAKER OUTPUT POSITIVE RIGHT
66	**SPKR_RN**	O	SPEAKER OUTPUT NEGATIVE RIGHT
67	**GND**	I	1.35V REGULATOR GND
68	**VRGEG_EN**	I	REGULATOR ENABLE INPUT
69	**VDD_PADS_3**	I	1.7V~3.6V SUPPLY INPUT FOR RERIAL QUAD IO FLASH PORT
70	**GND**	I	1.8V REGULATOR GND

7. Electrical Characteristics

Conditions : VDD = 3.3V, Ta = 25 ℃, unless otherwise noted.

Absolute Maximum Ratings

Parameter	Min	Max	Unit
Power Supply Voltage : VDD	-0.4V	3.6V	DCV
Storage Temperature	-40	85	℃

Recommended Operating Conditions

Parameter	Min	Max	Unit
Power Supply Voltage	3.0V	3.6V	DCV
Operation Temperature	-20	70	℃

Current consumption

Parameter	Connection Type	Avg	Peak	Unit
Page scan, Time interval = 1.28s	-	<1	1	mA
Inquiry and Page scan, Time interval = 1.28s	-	<1	1	mA
ACL No data transfer	Master	7	8	mA
ACL data transfer	Master	20	22	mA

Input/Output Characteristics

Parameter	Min	Max	Unit
V_{IL} Input Voltage Low	-0.4	0.8	V
V_{IH} Input Voltage High	0.7*VDD	VDD+0.4	V
V_{OL} Output Voltage Low	-	0.2	V
V_{OH} Output Voltage High	VDD-0.2	-	V

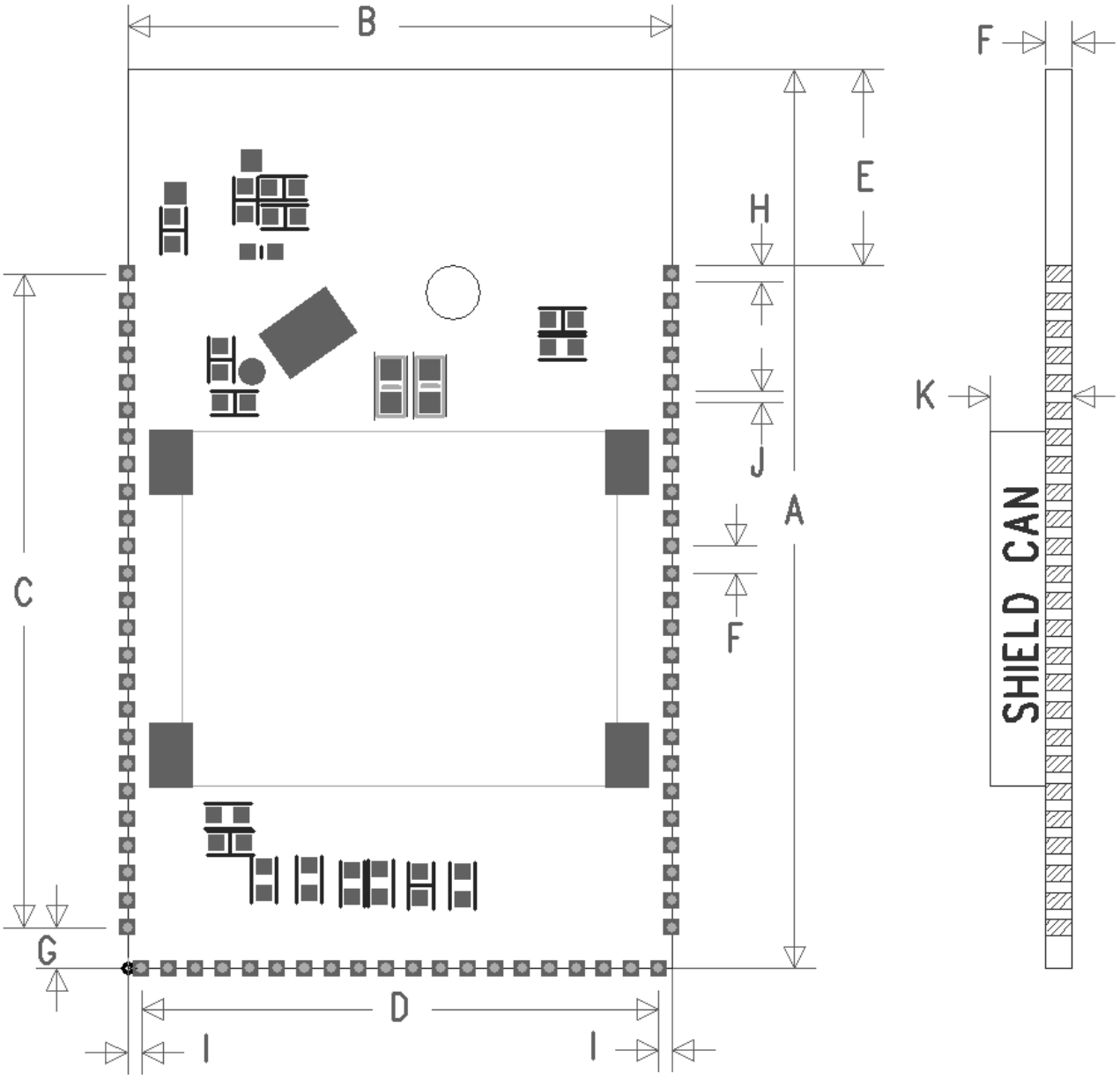
General Performance					
Parameter	**Condition**	**Min**	**Typ**	**Max**	**Unit**
Frequency Range	Normal	2402	-	2480	MHz

Transmitter Performance					
Parameter	**Condition**	**Min**	**Avg**	**Max**	**Unit**
Transmit Power	Normal	2	-	8	dBm
Parameter	**Condition**	**Min**	**Typ**	**Max**	**Unit**
Power density	Normal	-	-	8	dBm
20dB bandwidth	Normal			1000	KHz
Adjacent channel power (F_0 = 2441MHz)	$F=F_0 \pm 2MHz$	-	-	-20	dBm
	$F=F_0 \pm 3MHz$	-	-	-40	dBm
	$F=F_0 \pm 4MHz$	-	-	-40	dBm
Out-band Spurious Emission	30MHz ~ 1GHz	-	-	-36	dBm
	1GHz ~ 12.75GHz	-	-	-30	dBm
	1.8GHz ~ 1.9GHz	-	-	-47	dBm
	5.1GHz ~ 5.3GHz	-	-	-47	dBm
Modulation Characteristic	$\Delta F1_{avg}$	140	-	175	KHz
	$\Delta F2_{max}$	115	-	-	KHz
	$\Delta F2_{avg} / \Delta F1_{avg}$	80	-	-	%
Initial Carrier Frequency Tolerance	DH1 packet	-75	-	75	KHz
Carrier Frequency Drift	DH5 packet	-25		25	KHz

Receiver Performance					
Parameter	**Condition**	**Min**	**Type**	**Max**	**Unit**
Sensitivity at 0.1% BER	Single slot (DH1 packet)	-70	-	-	dBm
Sensitivity at 0.1% BER	Multi slot (DH5 packet)	-70	-	-	dBm
Maximum received signal at 0.1% BER		-20	-	-	dBm
Maximum level of intermodulation interferers	f1-f2 = 5 MHz, Pwanted= -64 dBm	-39	-	-	dBm

9. Mechanical Dimension

TOP VIEW

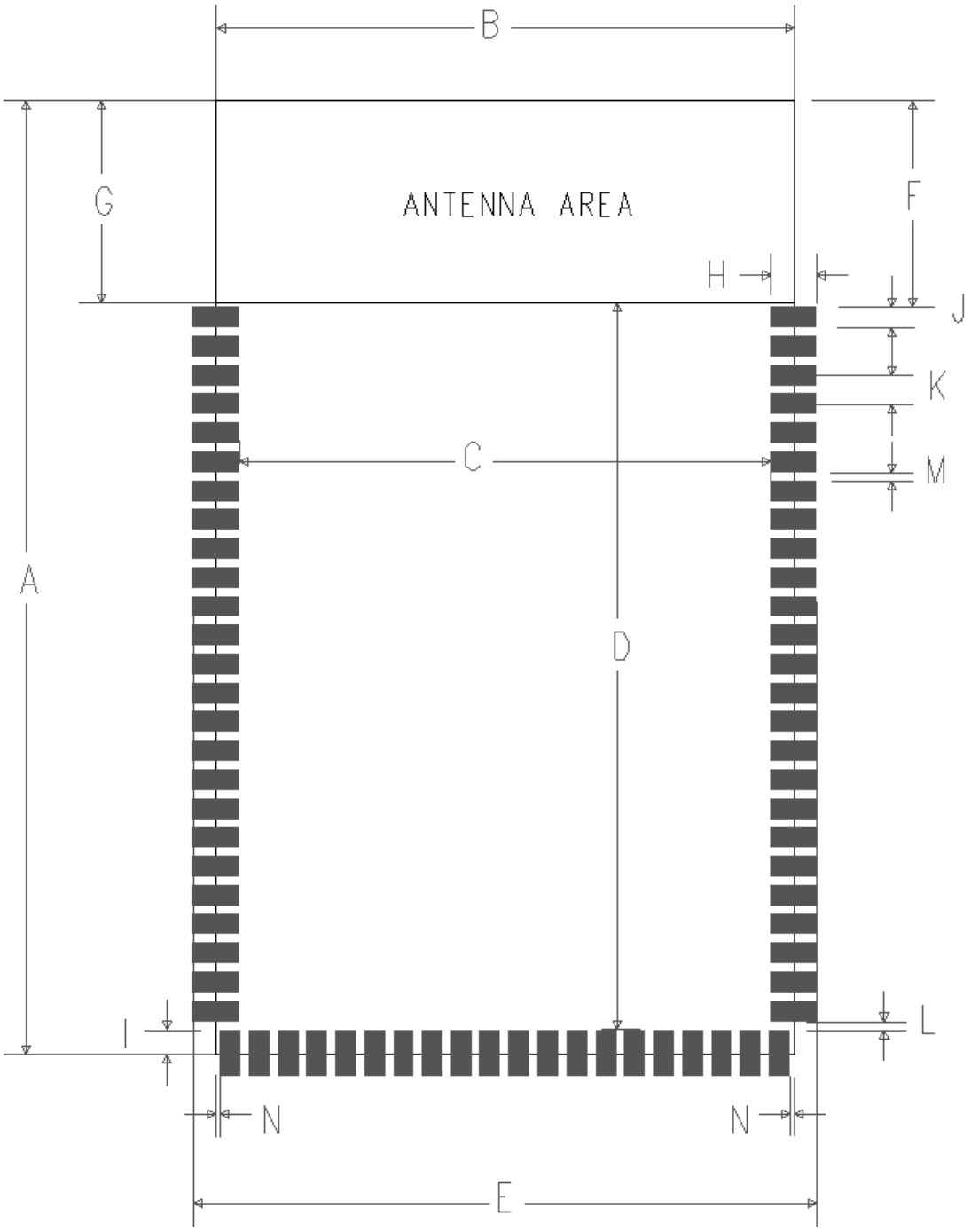


Mark	Dimension	Mark	Dimension	Mark	Dimension	Mark	Dimension
A	33.0±0.3	D	19.0±0.3	G	1.5±0.2	J	0.4±0.1
B	20.0±0.6	E	7.2±0.2	H	0.6±0.2	K	3±0.3
C	24.0±0.3	F	1.0±0.3	I	0.5±0.1		

(Unit : mm)

10. PCB SMT Guide

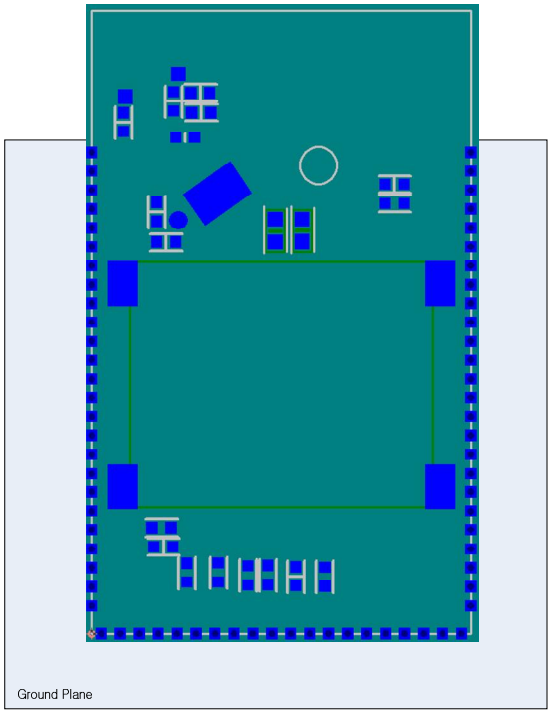
LAYOUT DIMENSION(TOP VIEW)



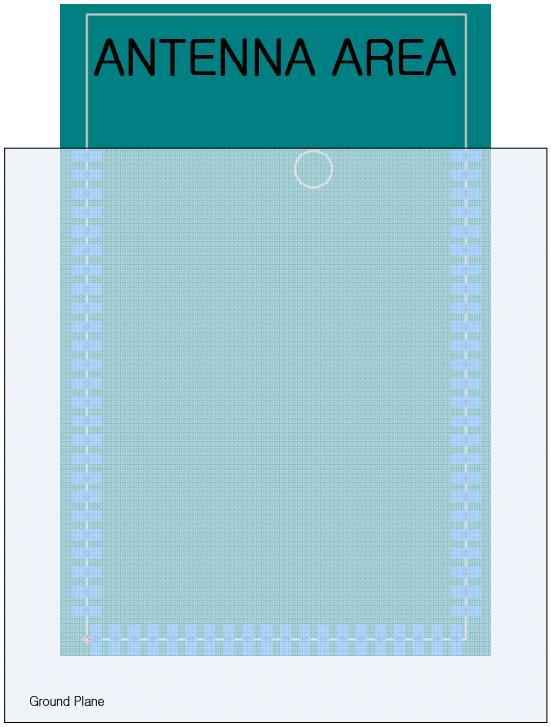
Mark	Dimension	Mark	Dimension	Mark	Dimension	Mark	Dimension	Mark	Dimension
A	33.0	D	25.15	G	7.0	J	0.72	M	0.28
B	20.0	E	21.6	H	1.6	K	1.0	N	0.14
C	18.4	F	7.15	I	0.8	L	0.29		

(Unit : mm)

SMT Module Position



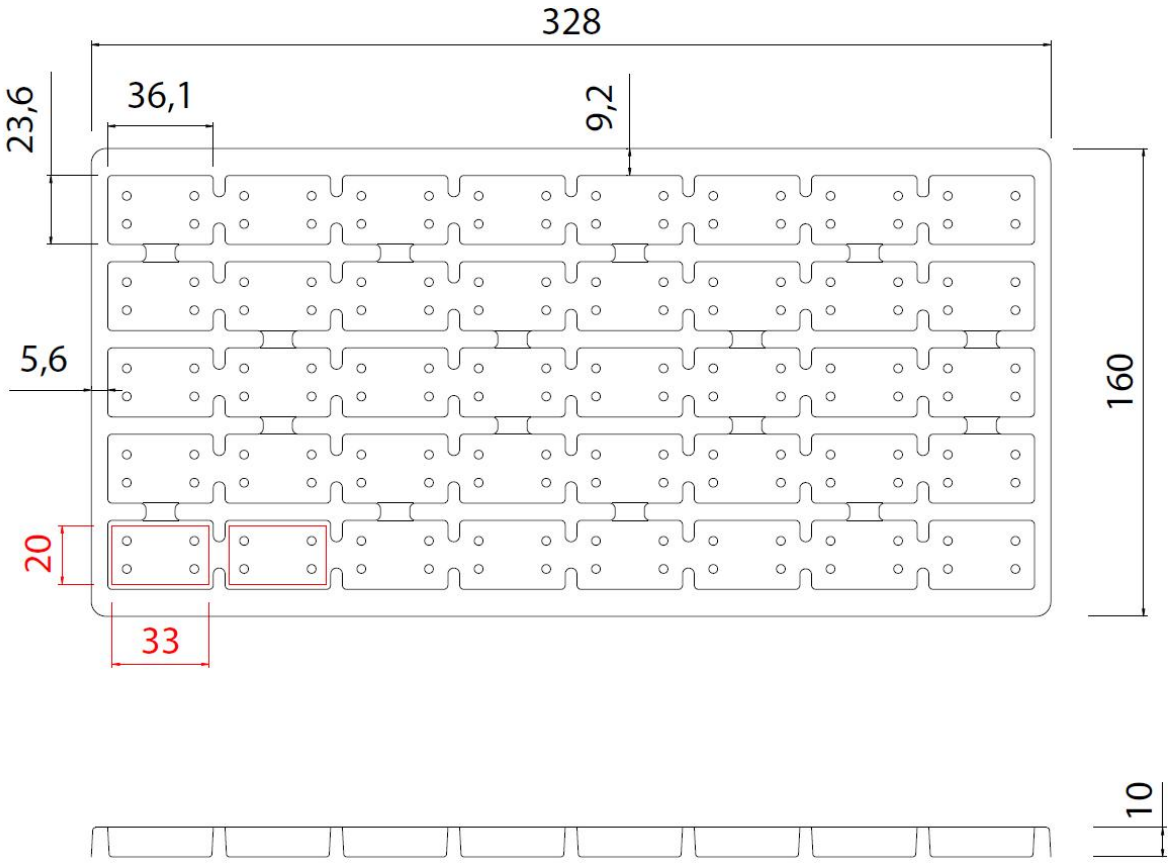
[TOP VIEW]



[BOTTOM VIEW]

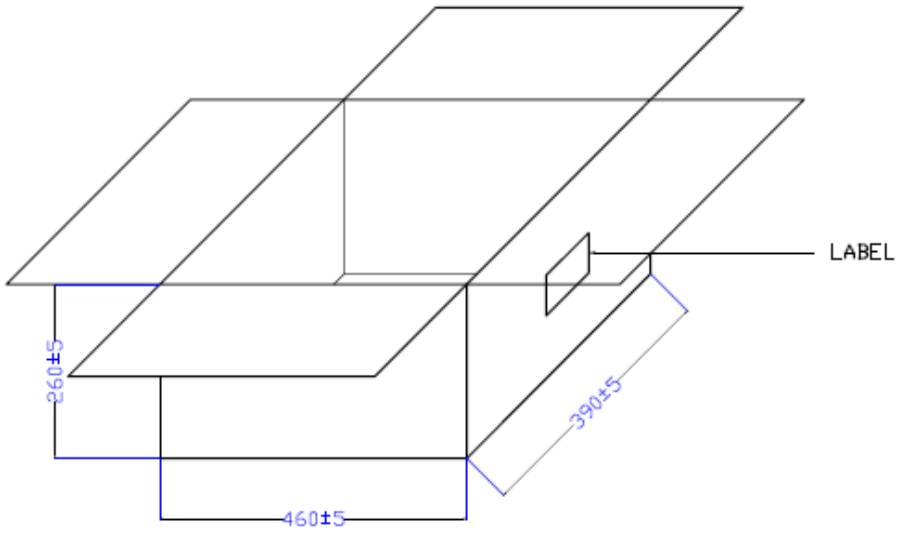
13. Packing Information

13.1 Tray



- Each tray has 40 units of products.

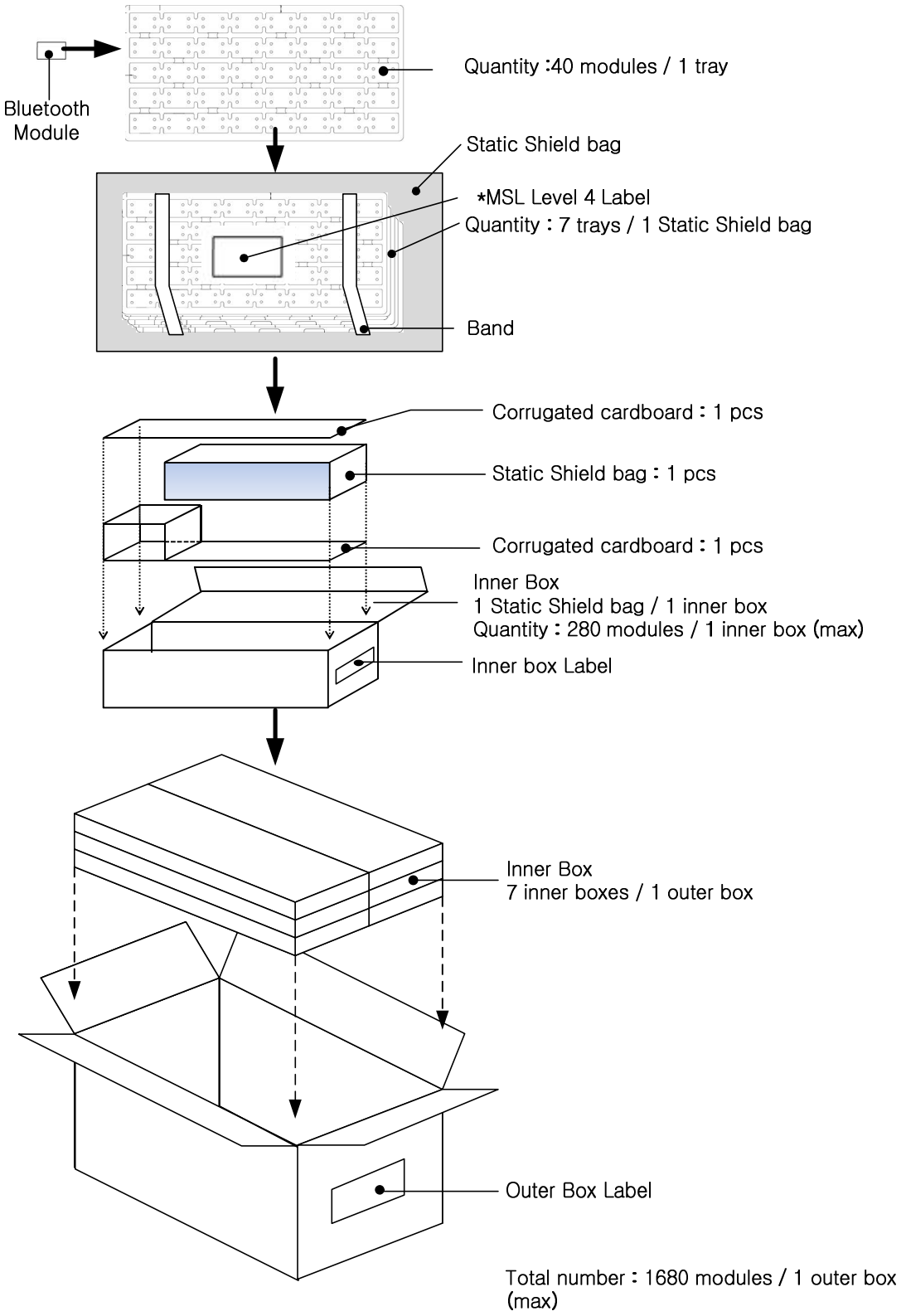
13.3 Outter Box



(Unit : mm)

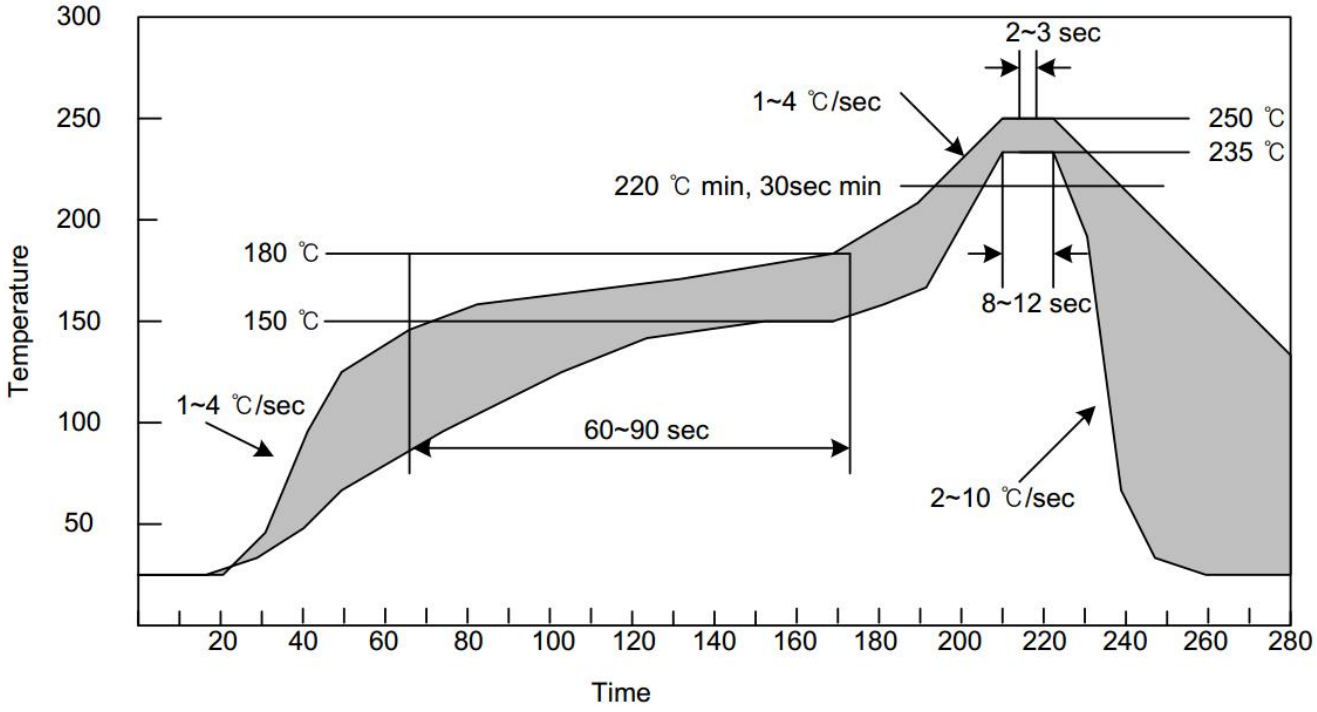
No.	Label Description
①	Company
②	Company Address
③	Customer
④	Model No & Part No.
⑤	Quantity
⑥	Gross Weight(Kg)
⑦	Carton No.
⑧	Rohs

13.4 Packing process



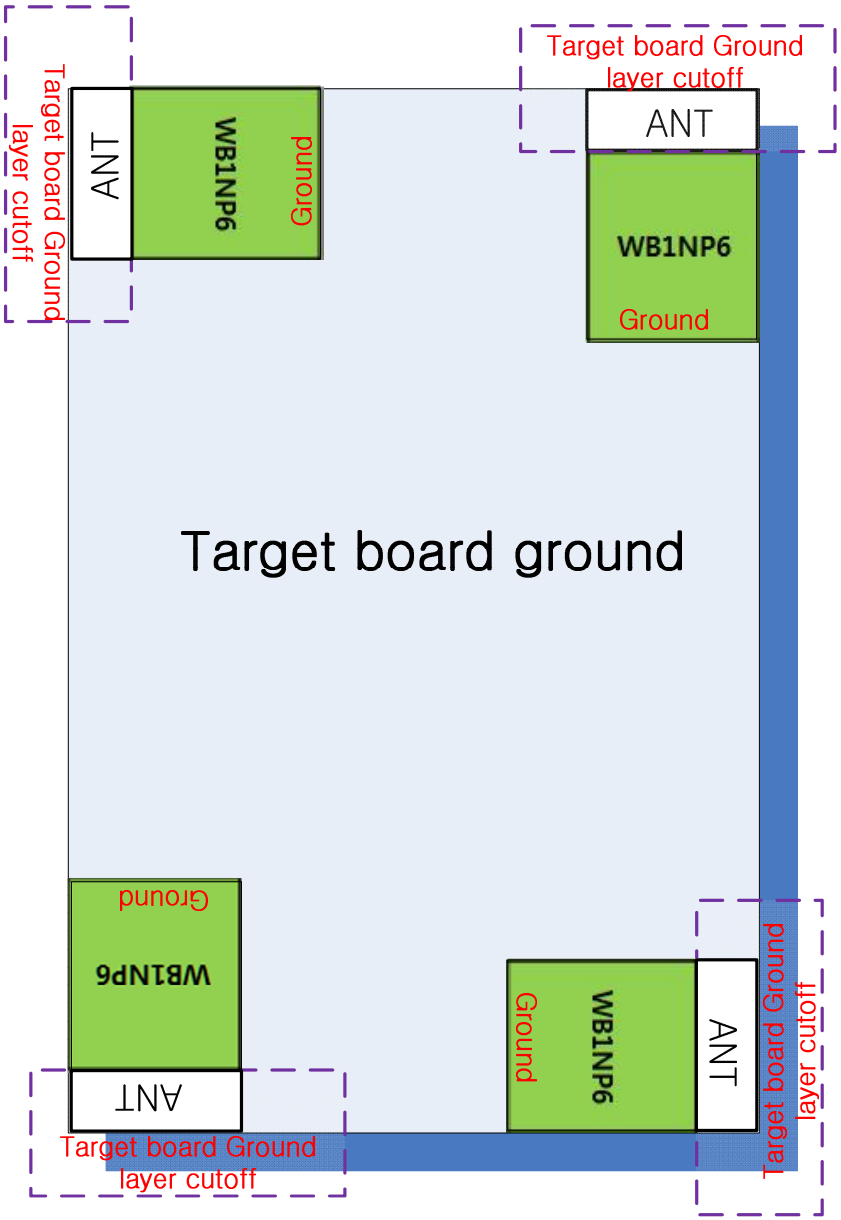
14. Reflow Profile

Reflow Conditions : Pb-Free
Allowable reflow soldering times : 2times based on the below profile



15. Module Position Guide

Ground & Shield CAN must not exist around Antenna area.



Approval Statements

CE approval

Hereby, we declare that this device is in compliance with the essential requirements and other relevant provisions of directive 1999/5/EC.

Restrictions of use: In France, this device must not be used outdoors.

FCC approval

This device complies with Part 15 of the FCC`s 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 undesirable operation.

To satisfy FCC exterior labeling requirements, the following text must be placed on the exterior of the end product.
Contains Transmitter module FCC ID: BEJ9QK-DMWB1NP6

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 or more 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.

IC approval

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme avec Industrie Canada exempts de licence standard RSS (s). L'opération est soumise aux deux conditions suivantes: (1) cet appareil ne peut causer d'interférences, et (2) cet appareil doit accepter toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement de l'appareil.

The host device must be labeled to display the Industry Canada certification number of the module.
Contains transmitter module IC: 2703H-DMWB1NP6

Le dispositif d'accueil doivent être étiquetés pour afficher le numéro de certification d'Industrie Canada du module.
Contient module émetteur IC : 2703H-DMWB1NP6

User information

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

Attention: Toute changé ou modifications non expressément approuvés par la partie responsable de la conformité pourraient annuler l'utilisateur `autorité de faire fonctionner cet équipement.

IMPORTANT NOTE

This device complies with FCC & IC radiation exposure limits set forth for an uncontrolled environment. This device should be installed and operated with minimum distance 20cm between the radiating element of this device and the user.
This device must not be co-located or operating in conjunction with any other antenna or transmitter.
This device is intended only for OEM integrators under the following conditions:

1) This module may not be co-located with any other transmitters or antennas.

As long as 2 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 with this module installed.
In the event that these conditions cannot be met, then the FCC & IC authorizations are no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product including this module and obtaining separate FCC & IC authorizations.

NOTE IMPORTANTE

Cet appareil est conforme aux limites de la FCC et IC exposition aux radiations dans un environnement non contrôlé. Cet appareil doit être installé et utilisé à distance minimum de 20cm entre l'élément rayonnant de cet appareil et l'utilisateur.
Cet appareil doit être installé et ne doit pas être co-localisées ou opérant en conjonction avec une autre antenne ou un autre émetteur.
Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes :

1) Ce module ne peut pas être co-localisés avec les autres émetteurs ou les antennes.

Aussi longtemps que deux conditions précitées sont remplies, le test du transmetteur supplémentaires ne seront pas tenus. Toutefois, l'intégrateur OEM est toujours responsable de tester leurs produits finis pour toutes les exigences de conformité supplémentaires avec ce module installé.
Dans le cas où ces conditions ne peuvent pas être remplies, alors la FCC et IC autorisations ne sont plus considérés comme valides et l'ID de la FCC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera responsable de réévaluer le produit final, y compris l'obtention de ce module et séparée de la FCC et IC autorisations

Label and manual requirements for the End Product

For an end product using the WB1NP6 there must be a label containing, at least, the following information:

For FCC ID
This device contains
FCC ID : BEJ9QK-DMWB1NP6

For IC Certification No
This device contains
IC ID : 2703H-DMWB1NP6