

SPECIFICATIONS

PRODUCT NAME : 2.4GHz Module for LGHA Twin washer

MODEL NAME : TWZU-V320D(LZM-001)

The information contained herein is the exclusive property of LG Innotek and shall not be distributed, reproduced or disclosed in whole or no in part without prior written permission of LG Innotek.

Designed	Checked	Approved	LG Innotek Co., Ltd.	
Yeon Ung Jeong		Seok Dong Choi		
2018.01.30		2018.01.30	PAGE	13

REG. DATE : 2018. 01. 30

Specification For Approval
MODEL NAME : TWZU-V320D
LZM-001

REV. NO : 1.0

REV. DATE : 2018. 01. 30

PAGE : 1 / 11

Table of Contents

No	Description	Page
1	Features	2
2	Ordering Information	2
3	Label Marking	2
4	Block Diagram	3
5	Absolute Maximum Ratings	3
6	Operating Test Conditions	4
7	Standard Test Conditions	4
8	Electrical Characteristics	5
9	Environmental Tests	8
10	Pin Description	9
11	Mechanical Characteristics	10
12	Outline Drawing	11
13	Packing Information	12
14	Changing History of Revision	13

REG. DATE : 2018. 01. 30

Specification For Approval
MODEL NAME : TWZU-V320D
LZM-001

REV. NO : 1.0

REV. DATE : 2018. 01. 30

PAGE : 2 / 11

1. Features

TWZU-V320D(LZM-001) is the small size module for Twin washer.

TWZU-V320D(LZM-001) is based on Silicon Labs EFR32FG solution.

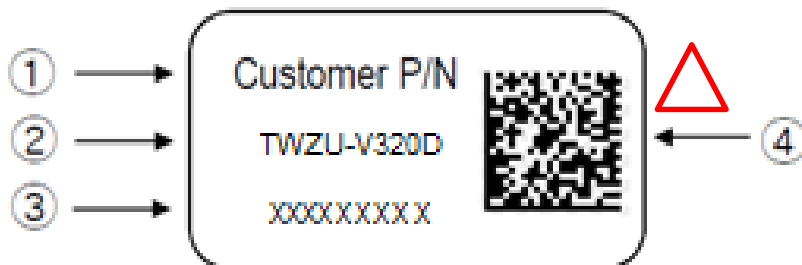
- 2.4GHz RF Transceiver
- Size : 30mm x 43mm x 7.65 mm
- PCB printed Antenna
- UART interface
- Applied the conformal coating
- Application : Home Appliance

2. Ordering Information

Model	Description
TWZU-V320D (LZM-001)	2.4GHz RF Transceiver Module

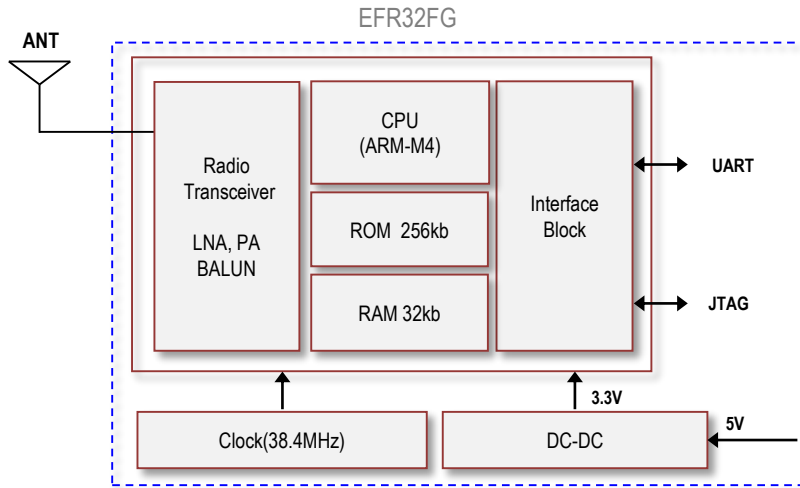
Contact Address : 84, Wanam-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, 51554, Korea

3. Label Marking



- ① Customer P/N EBR85871801 ③ Product Lot No. : ex) 1801A0502
 ② Model No. 18 : Year 05 : Date
 01 : Month 02 : Manufactured Process
 Revision No. : A
- ④ 2D Matrix Code for GMES

4. Block Diagram



5. Absolute Maximum Ratings

Parameter	Min	Max	Unit
Storage Temperature	-20	+85	°C
Storage Humidity (@ 40°C)	-	90	%

Caution : The specifications above the Table define levels at which permanent damage to the device can occur. Function operation is not guaranteed under these conditions. Operating at absolute maximum conditions for extend periods can adversely affect the long-term reliability of the device.

- Other conditions

- 1) Do not use or store modules in the corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are contained.
Also, avoid exposure to moisture.
- 2) Store the modules where the temperature and relative humidity do not exceed 5 to 40°C and 20 to 60%.
- 3) Assemble the modules within 6 months.
Check the soldering ability in case of 6 months over.

REG. DATE : 2018. 01. 30

Specification For Approval
MODEL NAME : TWZU-V320D
LZM-001

REV. NO : 1.0

REV. DATE : 2018. 01. 30

PAGE : 4 / 11

6. Operating Test Conditions

Parameter	Min	Typ	Max	Unit
Operating Temperature	0	-	+85	°C
Operating Humidity (40°C)	-	-	85	%
Supply Voltage	4.5	5.0	5.5	Vdc

7. Standard Test Conditions

The Test for electrical specification shall be performed under the following condition
 Otherwise this following conditions, not guaranteed this performance.

7-1. Ambient condition

Temperature	25 ± 5°C
Humidity	65 ± 5%

7-2. Power supply voltages

Input power(VDD)	Supply Voltage
+5.0V	+5.0V ± 10%

7-3. Current consumption

Current Consumption	Min.	Typ.	Max.	Unit
TX Mode @ 6dBm	-	-	100	mA
RX Mode	-	16	-	

7-4. ESD Information

Human Body Model (HBM)	Min.	Max.	Unit
Contact	-	±2	kV
Air	-	±10	

Note 1 : IEC 61000-4-2 (150pF, 330R)

REG. DATE : 2018. 01. 30

Specification For Approval
MODEL NAME : TWZU-V320D
LZM-001

REV. NO : 1.0

REV. DATE : 2018. 01. 30

PAGE : 5 / 11

8. Electrical Characteristics

8-1. RF Characteristics

Parameter (Condition)	Min.	Typ.	Max.	Unit
Frequency Range	2405	-	2480	MHz
TX output power			10.5	dBm
Receiver Sensitivity	-	-94	-90	dBm
Maximum Input Level	-10	-	-	dBm
Frequency tolerance	-30	0	+30	ppm
Error Vector Magnitude (EVM)	-	-	35	%

* Normal Condition : 25°C, VDD=5V.

* RF characteristics is board limit. It can differ according to standards

REG. DATE : 2018. 01. 30

Specification For Approval
MODEL NAME : TWZU-V320D
LZM-001

REV. NO : 1.0

REV. DATE : 2018. 01. 30

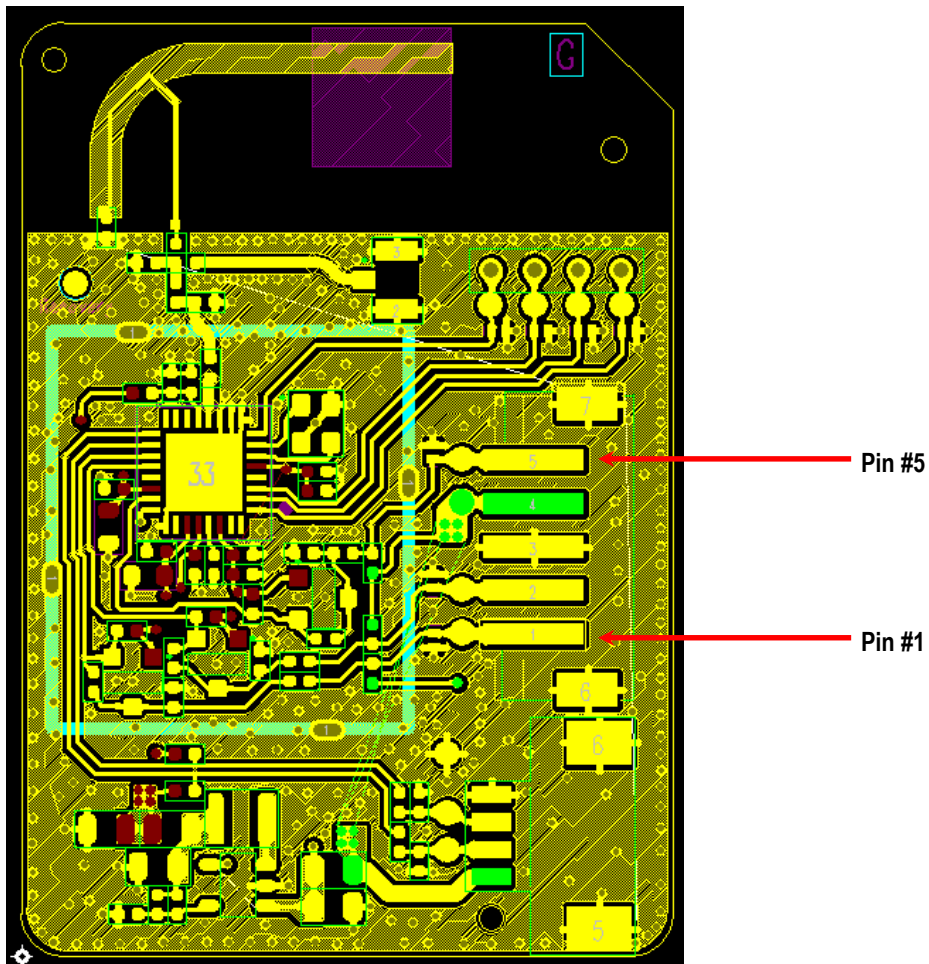
PAGE : 6 / 11

9. Environmental Tests

Item	Test Conditions	SPEC
Heat Load Test	Initial values are measured at the standard test condition. Leave samples in $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 96 ± 5 hours, and in standard test condition for 30 minutes, then take measurements within 1 hour. - Supply voltage : standard $\pm 5\%$	
Humidity Load Test	Initial values are measured at standard test condition. Leave samples in $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$, $85\% \pm 5\%$ RH for 500 ± 5 hours, and in standard test condition for 30 minutes, then take measurements within 1 hour. - Supply voltage : standard + 5%	
Cold Load Test	Initial values are measured at standard test condition. Leave samples in $-20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 500 ± 5 hours, and in the standard test condition for 30 minutes, then take measurements within 1 hour. - Supply voltage : standard + 5%	
Cold Test	Initial values are measured at standard test condition. Leave samples in $-20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 96 ± 5 hours, and in standard ambient for 1 hour with standard power - Supply then take measurements within 1 hour.	•TX Power : $\pm 4\text{dB Max}$
Heat Test	Initial values are measured at standard test condition. Leave samples in $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 96 ± 5 hours, and in standard ambient for 1 hour with standard power - Supply then take measurements within 1 hour.	• Min Input Level : $\pm 4\text{dB Max}$
Temperature Shock	Take measurements in standard test condition. Temp. : $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ / Duration : 30 min Ramp-up & Ramp-down for 5 min / Cycle : 300cycle.	
Vibration Test	Initial values are measured at standard test condition. Sweep rate : 1 single sweep/minute Acceleration : 2G / Frequency : 5-100Hz Duration : 1 Hours per direction (X,Y,Z) In standard condition, take measurements within 3hr.	
Temp. Cycle (Storage)	Take measurements in standard test condition. Storage 12hours at each temperature then performed 5 cycles -Temp. : $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$	
Input Voltage Variation Test	Operate 3hours at each condition. - Input voltage : $\pm 10\%$ variation of the rated voltage	

10. Pin Description

Pin NO	Pin Name	I/O	Pin Description
1	UART_Tx	I/O	UART Interface
2	UART_Rx	I/O	UART Interface
3	GND	GND	Ground
4	5V	PWR	Power
5	Wake Up	I/O	Wake Up



REG. DATE : 2018. 01. 30

Specification For Approval
MODEL NAME : TWZU-V320D
LZM-001

REV. NO : 1.0

REV. DATE : 2018. 01. 30

PAGE : 8 / 11

11. Mechanical Characteristics

11-1. Outline view

Item	Test Conditions
Assembly	No defects of wiring, soldering and assembling
Appearance	No dirt, rust, corrosion or foreign material

11-2. Appearance structure

Item	Test Conditions
Dimension	As assembly drawing
Mounting	As assembly drawing
Weight	Approximately $4.9 \pm 0.5g$

Simplified EU Declaration of Conformity

Hereby, LG Electronics Inc. declares that the radio equipment type RF Module is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: <http://www.lg.com/global/support/cedoc/cedoc#>

RF Exposure

The antenna (or antennas) must be installed so as to maintain at all times a distance minimum of at least **20 cm** between the radiation source (antenna) and any individual. This device may not be installed or used in conjunction with any other antenna or transmitter

The postal address:

84, Wanam-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, 51554, Korea

The host manufacturer has the responsibility that the host device should be compliance with all essential requirement of RED.

Specification For Approval
MODEL NAME : TWZU-V320D
LZM-001

12. Outline Drawing

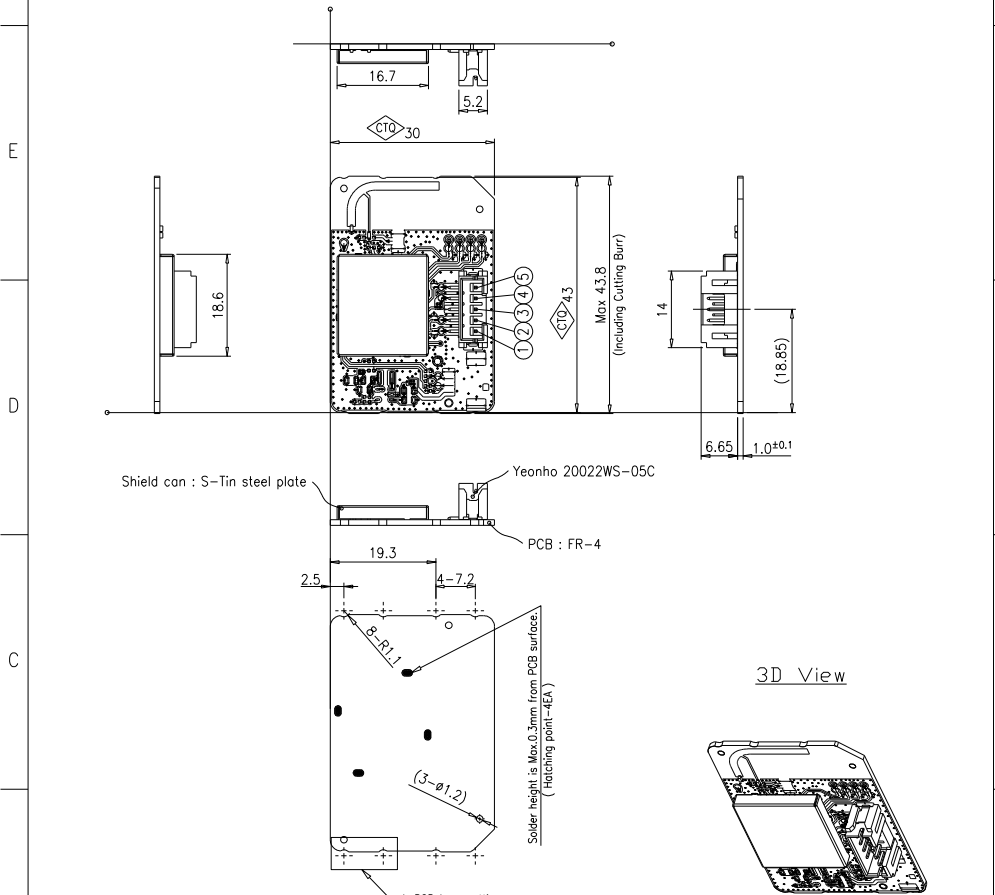
LG Innotek Confidential

All parts which supply to LG Innotek must not contain prohibited substances including RoHS Hazardous substances and for more details refer to LG Innotek's "Manual for management of hazardous substances in Product"

Copyright © 2015 by LG Innotek, Co., Ltd. All rights reserved. No part of this document may be reproduced, stored in a storage device or retrieval system, or transmitted in any form or by any means, whether electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of LG Innotek, Co., Ltd.

DIMENSIONAL TOLERANCE ~ up to 6 ±0.3 over 6 up to 30 ±0.5 over 30 up to 120 ±0.5 UNLESS OTHERWISE SPECIFIED	C H A N G E S	REV NO.	DATE (YY MM DD)	SIGNATURE	CHANGE CONTENTS

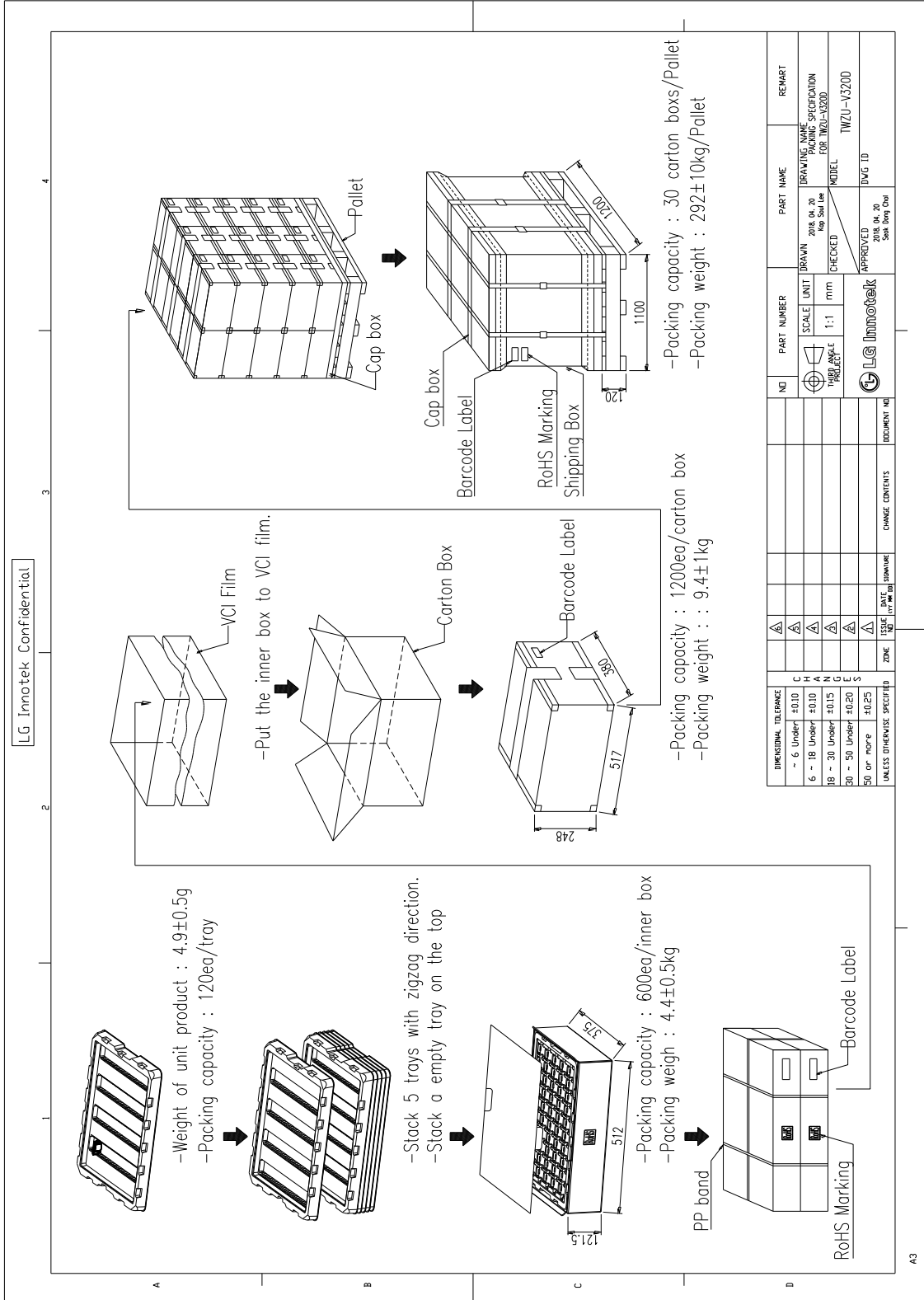
RELEASING THIS DRAWING WITHOUT PERMISSION OF LG Innotek SHOULD BE ACCUSED ACCORDING TO THE LAWS AND COMPANY RULES



- Notes
1. Tolerances are ±0.3, Radii are 0.5, unless otherwise specified.
 2. Lot No. shall be conformed to LGIT standard specification.
 3. As long as the outer appearance doesn't affect the performance of the product, it can be changed without prior notice.
 4. Out line dimensions do not contains coating thickness.

RELATED P/N THIRD ANGLE PROJECT	SCALE 1:1	UNIT mm	DESIGN '18.06.14 Kap Soul Lee.	TITLE Outline Drawing
			CHECKED '18.06.14 Youn Ung Jeong.	PART NO
			APPROVED '18.06.14 Seok Dong Choi.	MODEL TWZU-V320D
				DWG NO

13. Packing Information



NO	PART NUMBER	PART NAME	REMARK
1	1200ea	1200ea	1200ea
2	600ea	600ea	600ea
3	30ea	30ea	30ea
4	10ea	10ea	10ea
5	5ea	5ea	5ea
6	1ea	1ea	1ea
7	1ea	1ea	1ea
8	1ea	1ea	1ea
9	1ea	1ea	1ea
10	1ea	1ea	1ea
11	1ea	1ea	1ea
12	1ea	1ea	1ea
13	1ea	1ea	1ea
14	1ea	1ea	1ea
15	1ea	1ea	1ea
16	1ea	1ea	1ea
17	1ea	1ea	1ea
18	1ea	1ea	1ea
19	1ea	1ea	1ea
20	1ea	1ea	1ea
21	1ea	1ea	1ea
22	1ea	1ea	1ea
23	1ea	1ea	1ea
24	1ea	1ea	1ea
25	1ea	1ea	1ea
26	1ea	1ea	1ea
27	1ea	1ea	1ea
28	1ea	1ea	1ea
29	1ea	1ea	1ea
30	1ea	1ea	1ea
31	1ea	1ea	1ea
32	1ea	1ea	1ea
33	1ea	1ea	1ea
34	1ea	1ea	1ea
35	1ea	1ea	1ea
36	1ea	1ea	1ea
37	1ea	1ea	1ea
38	1ea	1ea	1ea
39	1ea	1ea	1ea
40	1ea	1ea	1ea
41	1ea	1ea	1ea
42	1ea	1ea	1ea
43	1ea	1ea	1ea
44	1ea	1ea	1ea
45	1ea	1ea	1ea
46	1ea	1ea	1ea
47	1ea	1ea	1ea
48	1ea	1ea	1ea
49	1ea	1ea	1ea
50	1ea	1ea	1ea
51	1ea	1ea	1ea
52	1ea	1ea	1ea
53	1ea	1ea	1ea
54	1ea	1ea	1ea
55	1ea	1ea	1ea
56	1ea	1ea	1ea
57	1ea	1ea	1ea
58	1ea	1ea	1ea
59	1ea	1ea	1ea
60	1ea	1ea	1ea
61	1ea	1ea	1ea
62	1ea	1ea	1ea
63	1ea	1ea	1ea
64	1ea	1ea	1ea
65	1ea	1ea	1ea
66	1ea	1ea	1ea
67	1ea	1ea	1ea
68	1ea	1ea	1ea
69	1ea	1ea	1ea
70	1ea	1ea	1ea
71	1ea	1ea	1ea
72	1ea	1ea	1ea
73	1ea	1ea	1ea
74	1ea	1ea	1ea
75	1ea	1ea	1ea
76	1ea	1ea	1ea
77	1ea	1ea	1ea
78	1ea	1ea	1ea
79	1ea	1ea	1ea
80	1ea	1ea	1ea
81	1ea	1ea	1ea
82	1ea	1ea	1ea
83	1ea	1ea	1ea
84	1ea	1ea	1ea
85	1ea	1ea	1ea
86	1ea	1ea	1ea
87	1ea	1ea	1ea
88	1ea	1ea	1ea
89	1ea	1ea	1ea
90	1ea	1ea	1ea
91	1ea	1ea	1ea
92	1ea	1ea	1ea
93	1ea	1ea	1ea
94	1ea	1ea	1ea
95	1ea	1ea	1ea
96	1ea	1ea	1ea
97	1ea	1ea	1ea
98	1ea	1ea	1ea
99	1ea	1ea	1ea
100	1ea	1ea	1ea

<Regulatory notice>

1. FCC

FCC Part 15.19 Statements:

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.

FCC Part 15.21 statement

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

FCC Part 15.105 statement (Class B)

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.

OEM Responsibilities to comply with FCC and Industry Canada Regulations

The module has been certified for integration into products only by OEM integrators under the following condition:

- The antenna(s) must be installed such that a minimum separation distance of at least 20 cm is maintained between the radiator (antenna) and all persons at all times.
- The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

As long as the two condition above is met, further transmitter testing 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 (for example, digital device emissions, PC

peripheral requirements, etc.).

End Product Labeling

The module is labeled with its own FCC ID and IC Certification Number. If the FCC ID and IC Certification Number are not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

"Contains FCC ID: BEJ-LZM001"

"Contains IC: 2703N-LZM001"

2. ISED

RSS-GEN, Sec. 7.1.3– (licence-exempt radio apparatus)

This device complies with Industry Canada licence-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.

Le présent appareil est conforme aux CNR d'Industrie 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, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RF Exposure

The antenna (or antennas) must be installed so as to maintain at all times a distance minimum of at least **20 cm** between the radiation source (antenna) and any individual. This device may not be installed or used in conjunction with any other antenna or transmitter.

l'exposition aux RF

L'antenne (ou les antennes) doit être installée de façon à maintenir à tout instant une distance minimum de au moins **20 cm** entre la source de radiation (l'antenne) et toute personne physique.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment. Attention:

Les changements ou modifications de cet appareil non expressément approuvé par le fabricant

peuvent annuler votre droit à utiliser cet équipement.

Étiquetage du produit final (IC)

Le module BT111 est étiqueté avec sa propre identification FCC et son propre numéro de certification IC. Si l'identification FCC et le numéro de certification IC ne sont pas visibles lorsque le module est installé à l'intérieur d'un autre dispositif, la partie externe du dispositif dans lequel le module est installé devra également présenter une étiquette faisant référence au module inclus. Dans ce cas, le produit final devra être étiqueté sur une zone visible avec les informations suivantes :

« Contient module émetteur identification FCC ID: BEJ-LZM001

« Contient module émetteur IC : 2703N-LZM001”