1. Application

This specification is applied to LG Innotek Bluetooth v4.1 and WLAN(IEEE 802.11.b/g/n) Module RBHA-T223A which includes WL1833Q.

2. Quality

Quality 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. Appearance and Characteristics

1) Appearance

Appearance should not contaminated by harmful materials and should not have cracks etc. Mechanical dimensions should meet the contents of clause 8.

2) Characteristics

Electrical characteristics should meet the contents of clause 10.

4. Application of Bluetooth v4.1 and WLAN(IEEE 802.11 b/g/n) module

1) Automotive

5. Maximum Rating

No	Item	Rating	Unit
1	Operating Temperature Range	-40 ~ +85	℃
2	Storage Temperature Range	-40 ~ +105	℃
3	VBAT_3V3 Voltage Range	3.1~ 3.6	V
4	VIO_1V8 Voltage Range	1.62 ~ 1.95	V

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6. Test

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

7. Labeling Information

VESPUCCI
RBHA-T223A
LG 5521
1A 001
FCC ID:YZP-RBHAT223A

● CE 0678

VESPUCCI
①

RBHA-T223A
②

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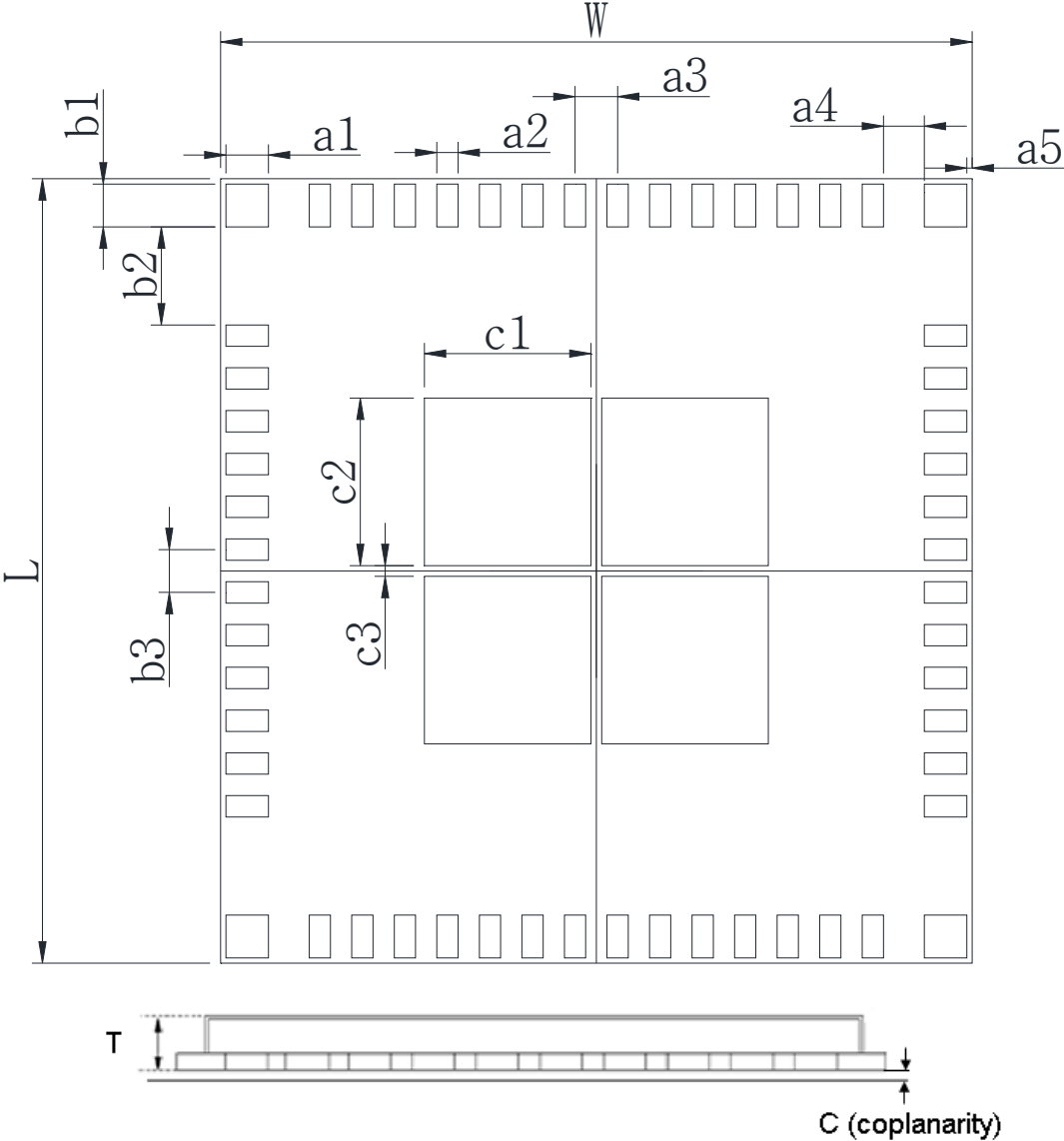③   ④ ⑤   ⑥

x x xxx
⑦ ⑧ ⑨

FCC ID:YZP-RBHAT223A
⑩

CE 0678
⑪   ⑫

No.	Index
①	PRODUCT NAME
②	MODEL PART NO.
③	COMPANY
④	MANUFACTURED YEAR (0~9)
⑤	MANUFACTURED MONTH(1,2, …9, A,B,C)
⑥	MANUFACTURED DATE (1~31)
⑦	Manufactured Serial Number : SMT Line no
⑧	Manufactured Serial Number : Shift no(A,B,C)
⑨	Manufactured Serial Number : (001~999)
⑩	FCC ID
⑪	CE Logo
⑫	Certification Number

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8. Mechanical Dimension

Unit : mm

Mark	Dimension	Mark	Dimension	Mark	Dimension	Mark	Dimension	Mark	Dimension
W	21.2±0.2	L	22±0.2	a1	1.2±0.1	a2	0.6±0.1	a3	1.2±0.1
a4	1.15±0.1	a5	0.15±0.1	b1	1.2±0.1	b2	2.75±0.1	b3	1.2±0.1
c1	4.85±0.1	c2	4.85±0.1	c3	0.3±0.1	T	2.9 Max	C	0.08 Max

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9. General Features

9.1 BT(v4.1) + WLAN(IEEE 802.11 b/g/n) Module

1) Module Features

- Intended for Automotive infotainment applications (-40℃ to +85℃)
- Operating Voltage is 3.3V Power Rail and 1.8V IO Level
- WLAN, BT, BLE on a single chip provides a unique scalable platform catering to all connectivity needs in vehicle infotainment
- Shared HCI transport for BT/BLE over UART and SDIO for WLAN.
- Automotive Module.
  -. WL1833Q : AEC-Q100 Qualified
  -. Diplexer / TCXO : AEC-Q200 Qualified
- BT 4.1 BLE and all audio processing features work in parallel
- Support 1-Antenna (BT and WLAN 2.4GHz)
- Integrated Bluetooth RF Filter.
- RoHS Compliant

2) Package information

- Module package is QFN (Quad Flat No-Lead) type .
  Notice) If the module attached to the set board is flipped during the reflow process, shieldcase of the module may detach or fall apart.

3) JEDEC MSL (Moisture Sensitivity Level) Test

- MSL 3 Level (Floor Life Time : 168Hrs. / Condition : ≤30℃, 60% RH)
- Standard : IPC / JEDEC J-STD-020C

Bake	24Hrs. / 125℃
Soak	40Hrs. / 60℃, 60% RH
Reflow	3 times / 240℃

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9. General Features

9.2 Bluetooth

1) Bluetooth Features

- Bluetooth Power Class 2
- Support Bluetooth 4.1 BLE
- Includes concurrent operation and built-in coexisting prioritization handling of BT,BLE, ANT audio processing and WLAN
- Embedded Fully Bluetooth v4.1(BLE) System Compliant
- Dedicated Audio processor supporting on chip SBC encoding +A2DP;
  - Assisted A2DP(A3DP) support- SBC encoding implemented internally
  - Assisted WB-Speech(AWBS) support- modified SBC codec implemented internally
- Support High-speed UART up to 4Mbps

2) BLE Features

- Fully compliant with BT 4.1 BLE dual mode standard
- Support for all roles and role- combinations, mandatory as well as optional
- Supports up to 10 BLE connections
- Independent buffering for LE allows having large number of multiple connections without affecting BR/EDR performance
- Packet boundary flags
- Encryption
- Extended inquiry response

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9. General Features

9.3 WLAN

1)   WLAN Features

- Support for IEEE 802.11b/g/n
- Support for IEEE 802.11n(20/40MHz) partial streams 2.4GHz
- WLAN MAC Baseband Processor and RF transceiver
- Supports 4bits SDIO host interface , including high speed (HS) and V3 modes
- Medium Access Controller (MAC)
  – Hardware-Based Encryption/Decryption using 64-, 128-, and 256-Bit WEP, TKIP or AES Keys,
  – Supports requirements for Wi-Fi Protected Access (WPA and WPA2.0) and IEEE Std 802.11i [includes hardware-accelerated Advanced Encryption Standard (AES)]
  – Designed to work with IEEE Std 802.1x
- IEEE Std 802.11d,e,h,i,k,r PICS compliant
- Supports Concurrent operation in multiple networks
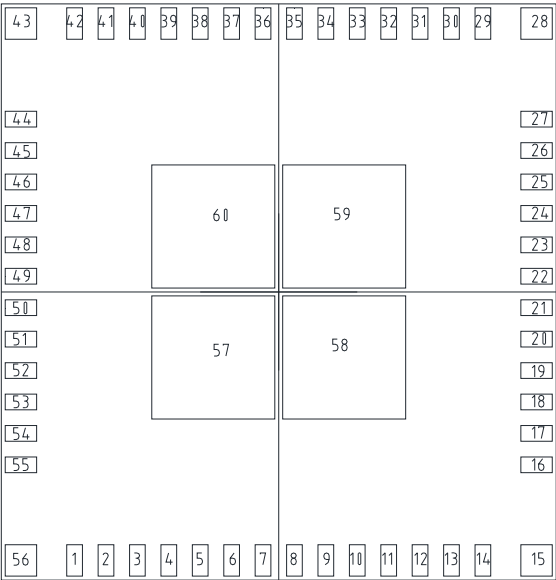- Client of AP, AP, Wi-Fi Direct

2) Functionality Key Features : Encryption

- Hardware encryption according to IEEE 802.11-2007 and IEEE 802.11w-2009:
- WEP40/64
- WEP104/128
- CCMP (AES)
- TKIP
- BIP
- Hardware encryption support for Cisco® CKIP

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11. Pin Configuration

<Top Through View>

No	Pin Name	Description
1	GND	Ground
2	GPIO4	GPIO4
3	UART_DBG_WL	WLAN logger
4	IRQ_WL	SDIO available, interrupt out. Active High Needs to force to 1 at power up to use WL_RS232_TX/RX
5	GND	Ground
6	RTC_CLK	Slow Clock / RTC clock (Real Time Crystal)
7	N.C	N.C
8	WL_RS232_TX	WL_RS232_TX
9	GND	Ground
10	GND	Ground
11	GPIO9	General purpose IO/LTE
12	GPIO10	General purpose IO/LTE
13	GPIO11	General purpose IO/LTE
14	GPIO12	General purpose IO/LTE
15	GND	Ground
16	N.C	N.C
17	GND	Ground
18	UART_DBG_BT	BT debug (logger)
19	1V8_VIO	Connect to 1.8V external VIO / Requires 0.uF cap to GND
20	N.C.	N.C
21	HCI_TX_BT	UART TX HOST
22	HCI_RX_BT	UART RX HOST

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No	Pin Name	Description
23	HCI_RTS_BT	UART RTS to Host
24	HCI_CTS_BT	UART CTS from Host
25	GND	Ground
26	N.C.	N.C.
27	GND	Ground
28	GND	Ground
29	N.C(2.4GHz_Atenna_Ready)	N.C(2.4GHz_Atenna_Ready)
30	GND	Ground
31	AUD_FSYNC_BT	BT PCM/AUDIO Frame sync
32	AUD_IN_BT	BT PCM/AUDIO DATA in
33	AUD_OUT_BT	BT PCM/AUDIO DATA Out
34	AUD_CLK_BT	BT PCM/AUDIO Clock
35	SDIO_D3_WL	WLAN SDIO Data bit 3
36	SDIO_D2_WL	WLAN SDIO Data bit 2
37	SDIO_D1_WL	WLAN SDIO Data bit 1
38	SDIO_D0_WL	WLAN SDIO Data bit 0
39	SDIO_CMD_WL	WLAN SDIO Command in
40	SDIO_CLK_WL	WLAN SDIO Clock
41	GND	Ground
42	RF Antenna(2.4GHz_ANT)	2.4GHz_ANT(Wi-Fi/BT)
43	GND	Ground
44	GND	Ground
45	GND	Ground
46	GND	Ground
47	GND	Ground
48	GND	Ground
49	WL_RS232_RX	WL_RS232_RX
50	WL_EN	WL Enable High
51	BT_EN	BT Enable High
52	GND	Ground
53	VBAT_3V3	Connect to 3.3V
54	VBAT_3V3	Connect to 3.3V
55	GND	Ground
56	GND	Ground
57	GND	Ground
58	GND	Ground
59	GND	Ground
60	GND	Ground

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ANTENNA Information

Model : THCT-24W

Type : Dipole (λ/4 @ 2GHz band)

Configuration : 2.44GHz for External Dipole Antenna

1. APPLICATION SCORPE

THIS PRODUCT CAN BE USED IN RADIO TELECOMMUNICATION SYSTEM WITH 2.4~2.5Ghz LIKE WIFI SYSTEM.

2. OPERATING CONDITIONS

NO.	ITEMS	SPECIFICATIONS
2-1	OPERATING ENVIRONMENT	TEMPERATURE : -20~70℃ HUMIDITY : ~85% RH

3. ELECTRONIC SPECIFICATIONS

NO	ITEMS	SPECIFICATIONS
3-1	IMPEDANCE	50Ω
3-2	FREQUENCY RANGE	2.4~2.5Ghz
3-3	PEAK GAIN (ON HORIZONTAL)	2.0dBi
3-4	VSWR	≤ 2.0

4. APPEARANCE AND MECHANICAL SPECIFICATIONS

NO.	ITEMS	SPECIFICATIONS	
4-1	CONNECTOR	SMA PLUG WITH MALE	
4-2	BENDING	ANGLE : 180° / 45° / 90° ± 5%	
4-3	COLOR	WHITE	RESINE : CAP=TPEE HOLDER=PBT CONNECTOR= SMA
4-4	APPEARANCE AND DIMENSION	REFER TO DRAWINGTYPE	
4-3	WEIGHT	7.8g	

Between the antenna and the module a path loss is 0.1dBi and a distance is 30mm.
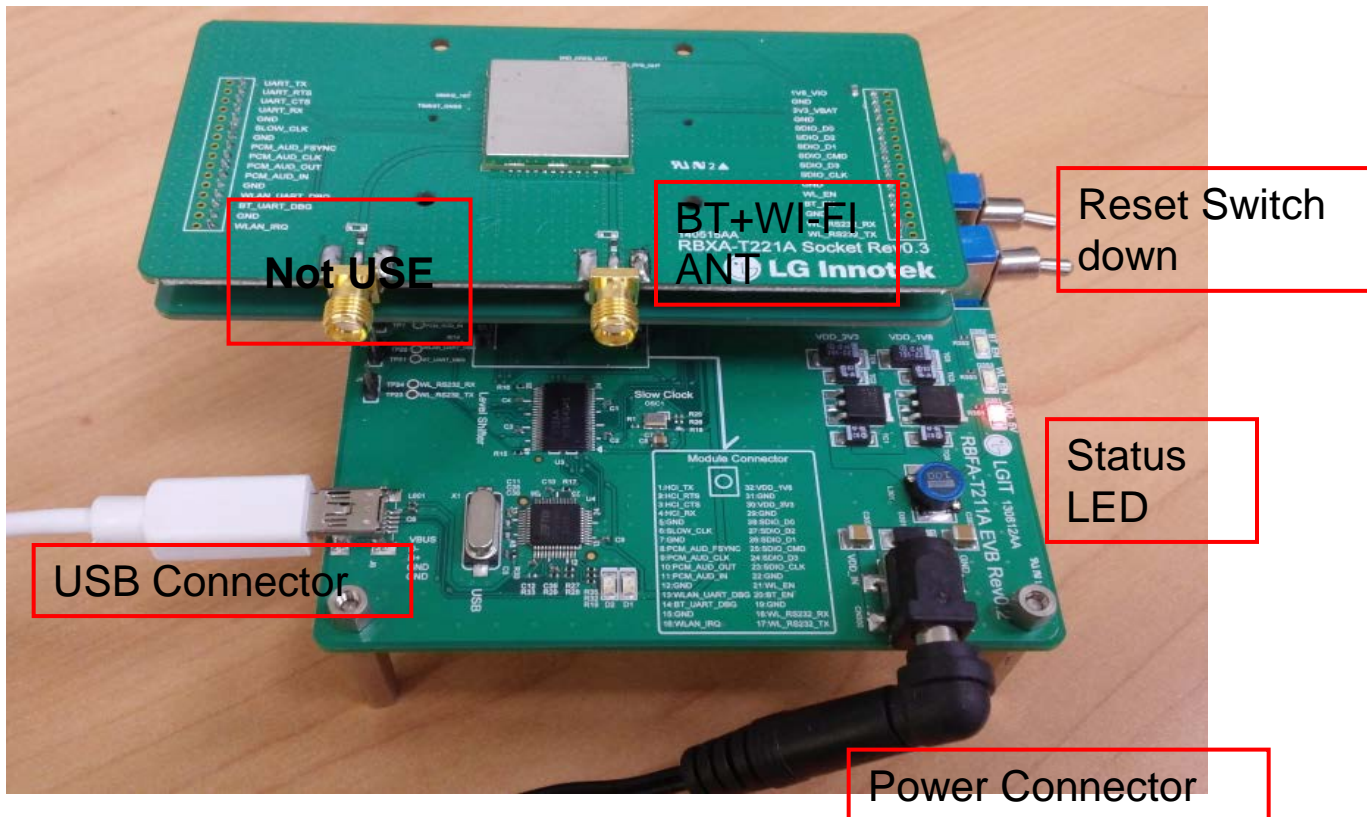
Setting Test Environments

- Required Items

1) The Evaluation Board
2) Power supply (DC Adapter +5V ,1A)
3) USB Cable
4) Shield Box
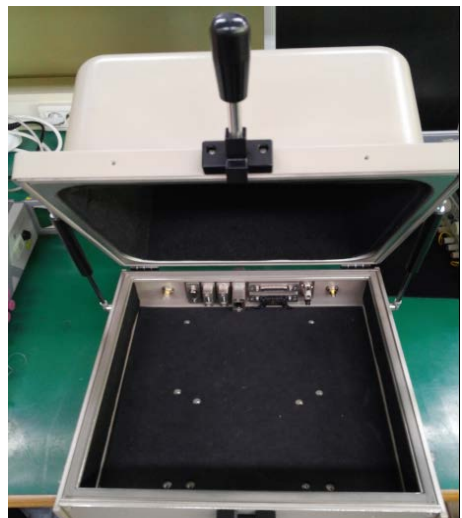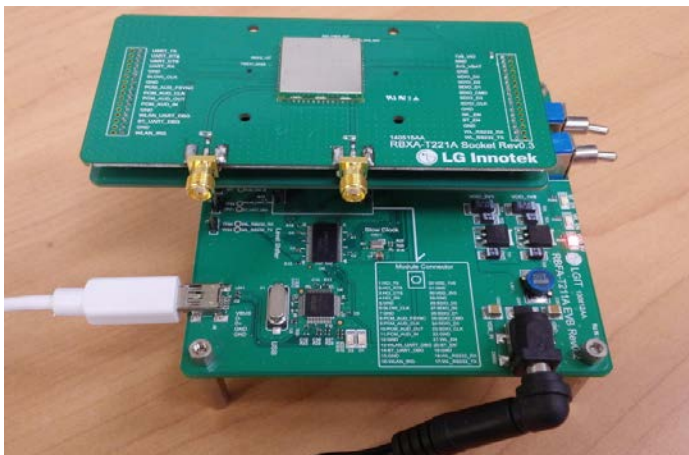
- Evaluation Board Setting

Please connect +5V Power Cable at the Power Connector

And USB Connector with Host PC

Reset Switch down

BT+WI-FI ANT

Status LED

Not USE

USB Connector

Power Connector

IMPORTANT INFORMATION

The information contained in this document is confidential and should not be disclosed to any third party without the prior written consent of LGIT.

FCC 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.

Part 15.105 (B) Note : 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.

Important: Any changes or modifications (including the antennas) to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment.

Radiation Exposure Statement

This equipment complies with FCC RF Radiation exposure limits set forth for an uncontrolled environment. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.
This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

OEM instructions

I. "Module is limited to OEM installation **ONLY** "

II. "OEM integrators is responsible for ensuring that the end-user has no manual instructions to remove or install module"

III. "FCC RF Exposure requirements: Module is limited to installation in mobile or fixed applications, according to Part 2.1091(b). Separate FCC approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations."

IV. "If (1) the module's FCC ID is not visible when installed in the host, or (2) if the host is marketed so that end users do not have straightforward commonly used methods for access to remove the module so that the FCC ID of the module is visible; then an additional permanent label referring to the enclosed module: "Contains Transmitter Module FCC ID: YZP-RBHAT223A" or "Contains FCC ID: YZP-RBHAT223A" must be used. The host OEM user manual must also contain clear instructions on how end users can find and/or access the module and the FCC ID."

V. "A host product is required to comply with all applicable FCC equipment authorizations regulations, requirements and equipment functions not associated with the transmitter module portion. For example, compliance must be demonstrated to regulations for other transmitter components within the host product; to requirements for unintentional radiators (Part 15B), such as digital devices, computer peripherals, radio receivers, etc.; and to additional authorization requirements for the non-transmitter functions on the transmitter module (i.e., Verification, or Declaration of Conformity) (e.g., Bluetooth and WiFi transmitter modules may also contain digital logic functions) as appropriate.

VI. To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and is fully operational. For example, if a host was previously authorized as an unintentional radiator under the Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements. Since this may depend on the details of how the module is integrated with the host, the grantee (the party responsible for the module grant) shall provide guidance to the host manufacturer for compliance with the Part 15B requirements."