

# TEST REPORT

of

FCC CFR 47 part 1, 1.1307(b), 1.1310

FCC ID: BEJIGCJ1PMN

Equipment Under Test : Car AVN  
Model Name : IGCJ1PMN  
Variant Model Name : IGCJ1PME  
Applicant : LG Electronics USA  
Manufacturer : LG Electronics Inc.  
Date of Receipt : 2019.07.09  
Date of Test(s) : 2019.07.15 ~ 2019.07.23  
Date of Issue : 2019.07.31

In the configuration tested, the EUT complied with the standards specified above.

Tested By:



Nancy Park

Date:

2019.07.31

Technical  
Manager:



Jungmin Yang

Date:

2019.07.31

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RTT5041-19(2019.04.24)(1)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

## 1. General Information

### 1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- Designation number: KR0150

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.

Telephone : +82 31 688 0901

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### 1.2. Details of Applicant

Applicant : LG Electronics USA

Address : 1000 Sylvan Avenue, Englewood Cliffs, New Jersey, United States, 07632

Contact Person : Han, Kyung-su

Phone No. : +2 201 472 2623

### 1.3. Details of Manufacturer

Company : LG Electronics Inc.

Address : 10, Magokjungang 10-ro, Gangseo-gu, Seoul, Korea, 07796

### 1.4. Description of EUT

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Kind of Product    | Car AVN                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Model Name         | IGCJ1PMN                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Variant Model Name | IGCJ1PME                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Power Supply       | DC 12 V                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Frequency Range    | Bluetooth: 2 402 MHz ~ 2 480 MHz<br>WLAN 2.4G (11b/g/n_HT20): 2 412 MHz ~ 2 462 MHz<br>WLAN 5G Band 1 (11a/n_HT20, 11ac_VHT20): 5 180 MHz ~ 5 240 MHz<br>WLAN 5G Band 1 (11n_HT40, 11ac_VHT40): 5 190 MHz ~ 5 230 MHz<br>WLAN 5G Band 1 (11ac_VHT80): 5 210 MHz<br>WLAN 5G Band 3 (11a/n_HT20, 11ac_VHT20): 5 745 MHz ~ 5 825 MHz<br>WLAN 5G Band 3 (11n_HT40, 11ac_VHT40): 5 755 MHz ~ 5 795 MHz<br>WLAN 5G Band 3 (11ac_VHT80): 5 775 MHz |

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### 1.5. Information of Variant Model

| Model Name    |          | Description |     |
|---------------|----------|-------------|-----|
|               |          | DAB         | SXM |
| Basic Model   | IGCJ1PMN | O           | X   |
| Variant Model | IGCJ1PME | X           | O   |

**Note;**

- IGCJ1PME is only for FCC

### 1.6. Test Report Revision

| Revision | Report Number        | Date of Issue | Description |
|----------|----------------------|---------------|-------------|
| 0        | F690501/RF-RTL014156 | 2019.07.31    | Initial     |

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## 2. RF Exposure Evaluation

### 2.1. Environmental evaluation and exposure limit according to FCC CFR 47 part 1, 1.1307(b), 1.1310

#### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency Range (MHz)                                   | Electric Field Strength(V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Average Time |
|---------------------------------------------------------|------------------------------|-------------------------------|-------------------------------------|--------------|
| (A) Limits for Occupational/Controlled Exposure         |                              |                               |                                     |              |
| 0.3-3.0                                                 | 614                          | 1.63                          | *100                                | 6            |
| 3.0-30                                                  | 1842/f                       | 4.89/f                        | *900/f <sup>2</sup>                 | 6            |
| 30-300                                                  | 61.4                         | 0.163                         | 1.0                                 | 6            |
| 300-1 500                                               | -                            | -                             | f/300                               | 6            |
| 1 500-100 000                                           | -                            | -                             | 5                                   | 6            |
| (B) Limits for General Population/Uncontrolled Exposure |                              |                               |                                     |              |
| 0.3-1.34                                                | 614                          | 1.63                          | *100                                | 30           |
| 1.34-30                                                 | 824/f                        | 2.19/f                        | *180/f <sup>2</sup>                 | 30           |
| 30-300                                                  | 27.5                         | 0.073                         | 0.2                                 | 30           |
| 300-1 500                                               | -                            | -                             | f/1500                              | 30           |
| <b>1 500-100 000</b>                                    | -                            | -                             | <b>1.0</b>                          | <b>30</b>    |

#### 2.1.1. Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where  $P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi$  = 3.1416

$R$  = distance between observation point and center of the radiator in cm

$P_d$  the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

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### 2.1.2. Test Result of RF Exposure Evaluation

Test Item : RF Exposure Evaluation Data

Test Mode : Normal Operation

### 2.1.3. Test Information of Cable Loss and Antenna Gain

| Test Item | Frequency Range<br>(MHz) | Cable Loss<br>(dB) | Antenna Gain of EUT<br>(dB i) | Final Antenna Gain<br>(dB i) |
|-----------|--------------------------|--------------------|-------------------------------|------------------------------|
| Bluetooth | 2 402 ~ 2 480            | -1.94              | 3.00                          | 1.06                         |
| WLAN 2.4G | 2 412 ~ 2 462            | -1.94              | 3.00                          | 1.06                         |
| WLAN 5G   | 5 180 ~ 5 240            | -2.08              | 8.01                          | 5.93                         |
| WLAN 5G   | 5 745 ~ 5 825            | -2.08              | 8.01                          | 5.93                         |

**Note;**

-Final Antenna Gain (dB i) = Cable Loss (dB) + Antenna Gain of EUT (dB i)

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## 2.1.4. Output Power into Antenna & RF Exposure Evaluation Distance

### Bluetooth

#### - Maximum tune up tolerance

| Frequency (MHz) | Output Average Power to Antenna (dB m) | Final Antenna Gain (dB i) | Power Density at 20 cm (mW/cm <sup>2</sup> ) | Limits (mW/cm <sup>2</sup> ) |
|-----------------|----------------------------------------|---------------------------|----------------------------------------------|------------------------------|
| 2 402 ~ 2 480   | 0.5                                    | 1.06                      | 0.000 285                                    | 1                            |

### WLAN 2.4G

#### - Maximum tune up tolerance

| Frequency (MHz) | Output Average Power to Antenna (dB m) | Final Antenna Gain (dB i) | Power Density at 20 cm (mW/cm <sup>2</sup> ) | Limits (mW/cm <sup>2</sup> ) |
|-----------------|----------------------------------------|---------------------------|----------------------------------------------|------------------------------|
| 2 412 ~ 2 462   | 13.5                                   | 1.06                      | 0.005 685                                    | 1                            |

### WLAN 5G

#### - Maximum tune up tolerance

| Frequency (MHz) | Output Average Power to Antenna (dB m) | Final Antenna Gain (dB i) | Power Density at 20 cm (mW/cm <sup>2</sup> ) | Limits (mW/cm <sup>2</sup> ) |
|-----------------|----------------------------------------|---------------------------|----------------------------------------------|------------------------------|
| 5 180 ~ 5 240   | 6                                      | 5.93                      | 0.003 103                                    | 1                            |
| 5 745 ~ 5 825   | 6                                      | 5.93                      | 0.003 103                                    | 1                            |

### Note;

- The power density Pd (5th column) at a distance of 20 cm calculated from the friis transmission formula is far below the limit of 1 mW/cm<sup>2</sup>.
- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
- This equipment should be installed and operated with minimum 20 cm between the radiator and your body.
- The antenna gain of this transmitter is less than 6 dB i and must not be collocated or operating in conjunction with any other antenna or transmitter unless authorized to do so by the FCC.

### Simultaneous transmission of MPE test exclusion for worst case configuration.

Bluetooth: the ratio is 0.000 285 / 1

WLAN: the ratio is 0.005 685 / 1

Confirm the sum result of individual MPEs ratio is  $\leq 1.0$ ;

BT + WLAN:  $(0.000\ 285 / 1) + (0.005\ 685 / 1)$

$= 0.005\ 970 \leq 1.0$

So this device meets the KDB447498 D01 v06 section 7.2 requirement of "Simultaneous transmission MPE test exclusion"

## - End of the Test Report -

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