

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450

www.kes.co.kr

Report No.: KES-EM-22T0500 Page (1) of (31)

EMC TEST REPORT

Test Report No. : KES-EM-22T0500

Date of Issue : Jun. 22, 2022

Product name : Bluetooth Earbud

Model/Type No. : TONE-T60Q

Variant Model : TONE-UT60Q, TONE-DT60Q

FCC Applicant : LG Electronics USA, Inc.

FCC Applicant Address : 111 Sylvan Ave, North Building, Englewood Cliffs, New Jersey,

United States

IC Applicant : LG ELECTRONICS INC

IC Applicant Address : 60-39, Gasan-Dong, Gumchon-Gu, Seoul, Korea

Manufacturer : LG Electronics Inc.

Manufacturer Address : 222 LG-ro Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, Korea

FCC ID : ZNFTONET60Q

IC ID : 2703C-TONET60Q

FVIN : 1.0

Date of Receipt : May. 31, 2022

Test date : Jun. 07, 2022 ~ Jun. 09, 2022

Test Results : 🛛 In Compliance 🔲 Not in Compliance

Tested by Reviewed by

Dae Hyun, Kim EMC Test Engineer Dong Hun, Jang EMC Technical Manager



3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (2) of (31)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jun. 22, 2022	KES-EM-22T0500	Issued

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd. This document may be altered or revised by KES Co., Ltd. personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by KES Co., Ltd. will constitute fraud and shall nullify the document.



3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (3) of (31)

TABLE OF CONTENTS

1.0	General Product Description	4
1.1	Test Voltage & Frequency	
1.2	Variant Model Differences	5
1.3	Device Modifications	5
1.4	Equipment Under Test	5
1.5	Support Equipments	5
1.6	External I/O Cabling	
1.7	EUT Operating Mode(s)	6
1.8	Configuration	
1.9	Remarks when standards applied	
	Calibration Details of Equipment Used for Measurement	
1.11	Test Facility	8
	Measurement Procedure	
	Laboratory Accreditations and Listings	
2.0	Test Regulations	
2.1	Conducted Emissions at Mains Power Ports	
2.2	Radiated Electric Field Emissions(Below 1 GHz)	
2.3	Radiated Electric Field Emissions(Above 1 @Hz)	
	NDIX A - TEST DATA	
C	onducted Emissions at Mains Power Ports	17
R	adiated Electric Field Emissions(Below 1 础)	20
R	adiated Electric Field Emissions(Above 1 础)	24
APPE	NDIX B - Test Setup Photos and Configuration	27
	adiated Electric Field Emissions(Below 1 GHz)	
	adiated Electric Field Emissions(Above 1 毗)	



3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (4) of (31)

1.0 General Product Description

Main Specifications of EUT are:

Item	Details	
Communication Method	Bluetooth	
Power	Charging: DC 5 V / 136mA Operating: DC 3.85 V (Battery) / 51 mAh (Lithium Ion Battery)	
Size	Earbud : $(21.5 \times 27.7 \times 24.8)$ mm Cradle : $(54.5 \times 54.5 \times 29.6)$ mm	
Weight	Earbud: 5 g Cradle: 37 g	
Port	Earbud: 3 Pin (Charge) Cradle: USB C Type / 3 Pin x 2 EA (Charge)	



3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450

www.kes.co.kr

Report No.: KES-EM-22T0500 Page (5) of (31)

1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

1.2 Variant Model Differences

TONE-UT60Q: The model is identical to the basic model except for the Marketing area (KOREA, United Kingdom, Australia) and model name.

 ${\sf TONE\text{-}DT60Q}$: The model is identical to the basic model except for the Marketing area (Germany) and model name.

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description Model Number		Serial Number	Manufacturer	Remarks
Bluetooth Earbud	TONE-T60Q	-	LG Electronics Inc.	
Bluetooth Earbud (Cradle)	TONE-T60QC	-	LG Electronics Inc.	EUT

1.5 Support Equipments

Description	Model Number	mber Serial Number Manuf		Remarks
AC/DC Adapter	N9-QC3	-	DONGGUAN CITILAND ELECTRONICS CO.,LTD	-
USB DIGITAL TESTER	J7	-	-	-
SmartPhone	MT9J2KH/A	-	Apple	-



3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (6) of (31)

1.6 External I/O Cabling

■ Charge Mode

Start		END		Cable Spec.	
Description I/O Port		Description I/O Port		Length	Shield
Bluetooth Earbud (EUT)	Charge Port	Bluetooth Earbud (Cradle) (EUT)	Charge Port	-	-
Bluetooth Earbud (Cradle) (EUT)	USB C Type	USB DIGITAL TESTER	USB	0.5	U
USB DIGITAL TESTER	USB	AC/DC Adapter	USB	-	-

^{*} Unshielded = U, Shielded = S

■ Operating Mode

Start		END		Cable Spec.	
Description I/O Port		Description	I/O Port	Length	Shield
Bluetooth Earbud (EUT)	Wireless	SmartPhone	Wireless	-	-

^{*} Unshielded = U, Shielded = S

1.7 EUT Operating Mode(s)

Test mode	operating
Charge	Tested while USB DIGITAL TESTER and Charge Cradle charge LED checking the normal state of charge.
Operating	Connect EUT and SmartPhone wirelessly. It was tested while confirming that the sound from EUT was normally produced.

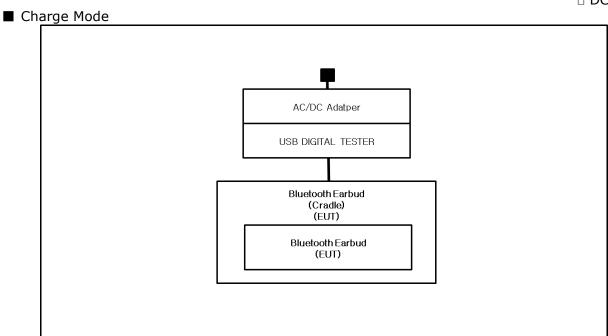
EUT Test operating S/W					
Name Version Manufacture Company					
-	-	-			



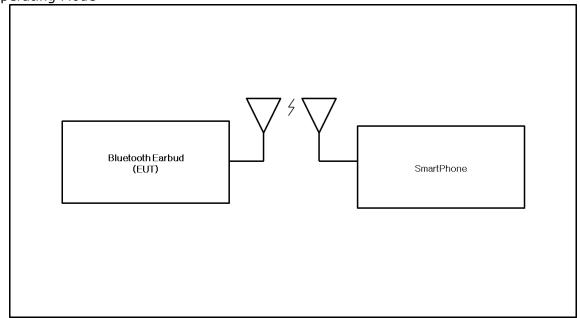
3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (7) of (31)

1.8 Configuration

■ AC Main
□ DC Main



■ Operating Mode



EUT - SmartPhone : Bluetooth



3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450

www.kes.co.kr

Report No.: KES-EM-22T0500 Page (8) of (31)

1.9 Remarks when standards applied

1.10 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

1.11 Test Facility

The measurement facility is located at 473-21 Gayeo-ro, Yeoju-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4a-2017 and CISPR 16-1-4:2019

1.12 Measurement Procedure

- Conducted Emissions

The conducted emission levels were measured on each current-carrying line with the spectrum analyzer operating in the CISPR quasi-peak mode (or peak mode if applicable). The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. If the conducted emission exceed the average limit with the instrument set to the quasi-peak mode, the measurements are made in the average mode. The emission spectrum was scanned from 150 kHz to 30 MHz. The highest emission amplitudes relative to the appropriate limits were measured and have been recorded. Quasi-peak readings are distinguished with a "QP".

- Radiated Electric Field Emissions

The test was done at a SEMI ANECHOIC CHAMBER with quasi-peak detector. The final test data was measured using a Quasi-Peak detector below $1^{\tiny GHZ}$ at 10 m or 3 m distance and a Peak and Average detector above 1 $^{\tiny GHZ}$ at 3 m distance. Test was proceeded worst case test mode and cable configuration.

Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency.

Measurement procedures was In accordance with ANSI C63.4-2014 7.3.3, 7.3.4, 8.3.1.1, 8.3.1.2, 8.3.2.1, 8.3.2.2



3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (9) of (31)

1.13 Laboratory Accreditations and Listings

Country Agency Scope of Aggreditation Logo						
Country	Agency	Scope of Accreditation	Logo			
KOREA	RRA	EMI (3 m & 10 m Semi-Aechoic Chamber ,10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	KR0100			
International	KOLAS	EMI (3 m & 10 m Semi-Aechoic Chamber , and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	TESTING NO. KTA89 KT489			
USA	FCC	3 m & 10 m Semi-Aechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	FC KR0100			
Canada	ISED	3 m & 10 m Semi-Aechoic Chamber and Conducted test site	23298			
JAPAN	VCCI	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1	R-20056, C-20036 T-20040, G-20057			
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Aechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	CARAT 001633 0004			



3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (10) of (31)

2.0 Test Regulations

The emissions tests were performed according to following regulations:						
□ 47 CFR Part 15, Subpart B						
☐ CISPR 22:2009 +A1:2010	☐ Class A	☐ Class B				
	☐ Class A	⊠ Class B				
☑ IC Regulation ICES-003 Issue 7						
☐ CAN/CSA-CISPR 32:17	☐ Class A	☐ Class B				
	☐ Class A					



3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (11) of (31)

2.1 Conducted Emissions at Mains Power Ports

Test Date

Jun. 07, 2022

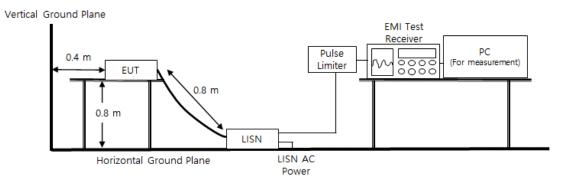
Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due	calibration interval
\boxtimes	EMI Test S/W	EMC32	R & S	9.12.00	-	-
	EMI TEST RECEIVER	ESR3	R & S	101783	12, 28, 2022	1 Year
\boxtimes	LISN	ENV216	R & S	101787	12, 27, 2022	1 Year
	LISN	ESH2-Z5	R & S	100450	12, 27, 2022	1 Year
\boxtimes	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 27, 2022	1 Year

Diagram of test setup





3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (12) of (31)

Test Conditions

Temperature: $(23,4 \pm 0,1)$ °C Relative Humidity: $(44,6 \pm 0,1)$ % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

NOT PASS

☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (13) of (31)

2.2 Radiated Electric Field Emissions (Below 1 %)

Test Date

Jun. 08, 2022

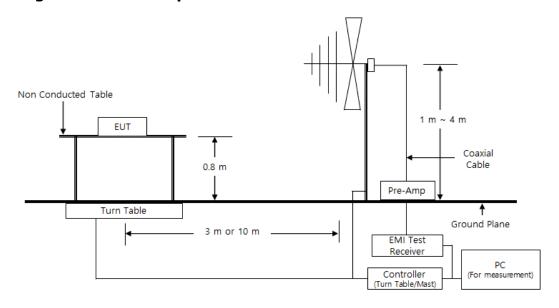
Test Location

OPEN AREA TEST SITE #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due	calibration interval
	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-	-
\boxtimes	EMI TEST RECEIVER	ESU26	R & S	100551	03, 31, 2023	1 Year
\boxtimes	AMPLIFIER	SCU 01	R & S	100603	11, 24, 2022	1 Year
\boxtimes	TRILOG- BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022	2 Year
	ATTENUATOR	8491A	НР	32173	03, 08, 2023	1 Year

Diagram of test setup





3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (14) of (31)

Test Conditions

Temperature: $(23,4 \pm 0,1)$ °C Relative Humidity: $(44,3 \pm 0,2)$ % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

\bowtie	PA	SS

☐ NOT PASS

■ NOT APPLICABLE

Remarks

- See Appendix A for test data.
- The fundamental of the EUT was investigated in thre orthogonal orientations X, Y and Z.



3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (15) of (31)

2.3 Radiated Electric Field Emissions (Above 1 %)

Test Date

Jun. 09, 2022

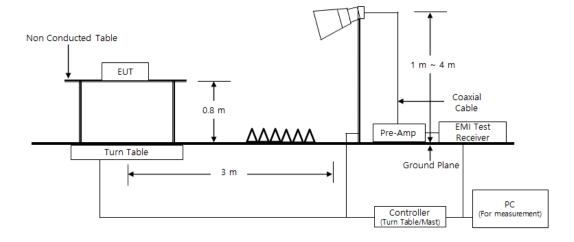
Test Location

SEMI ANECHOIC CHAMBER #4(10m)

Test Equipment

Used	Description Model Number		Manufacturer	Serial Number	Cal. Due	calibration interval
	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-	-
\boxtimes	EMI TEST RECEIVER	ESU26	R & S	100551	03, 31, 2023	1 Year
\boxtimes	PREAMPLIFIER	8449B	AGILENT	3008A01742	12, 27, 2022	1 Year
\boxtimes	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	12, 16, 2022	1 Year

Diagram of test setup





3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (16) of (31)

Test Conditions

Temperature: $(23,7 \pm 0,2)$ °C Relative Humidity: $(44,0 \pm 0,1)$ % R.H.

Frequency Range of Measurement

1 GHz to 12,4 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

\square	DACC
\bowtie	PASS

☐ NOT PASS

NOT APPLICABLE

Remarks

See Appendix A for test data.



3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.: KES-EM-22T0500 Page (17) of (31)

APPENDIX A - TEST DATA

Conducted Emissions at Mains Power Ports

■ Charge Mode

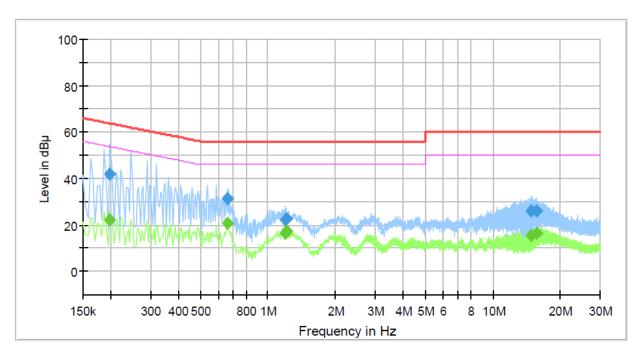
HOT LINE

Common Information

Test Description: Conducted Emission Model No.: TONE-T60Q

Phase:

Mode: Charge Operator Name: KES



Final Result

Frequency	QuasiPeak	Average	Limit	Margin	Meas.	Bandwidth	Line	Corr.
(MHz)	(dBμV)	(dBμV)	(dBµV)	(dB)	Time (ms)	(kHz)		(dB)
0.198000		22.28	53.69	31.41	1000.0	9.000	L1	19.6
0.198000	41.70		63.69	21.99	1000.0	9.000	L1	19.6
0.662000		20.56	46.00	25.44	1000.0	9.000	L1	20.0
0.662000	31.53		56.00	24.47	1000.0	9.000	L1	20.0
1.190000		16.56	46.00	29.44	1000.0	9.000	L1	20.3
1.190000	22.16		56.00	33.84	1000.0	9.000	L1	20.3
1.206000		17.18	46.00	28.82	1000.0	9.000	L1	20.3
1.206000	22.86		56.00	33.14	1000.0	9.000	L1	20.3
14.802000		15.34	50.00	34.66	1000.0	9.000	L1	20.4
14.802000	25.89		60.00	34.11	1000.0	9.000	L1	20.4
15.634000		16.26	50.00	33.74	1000.0	9.000	L1	20.5
15.634000	26.02		60.00	33.98	1000.0	9.000	L1	20.5



3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (18) of (31)

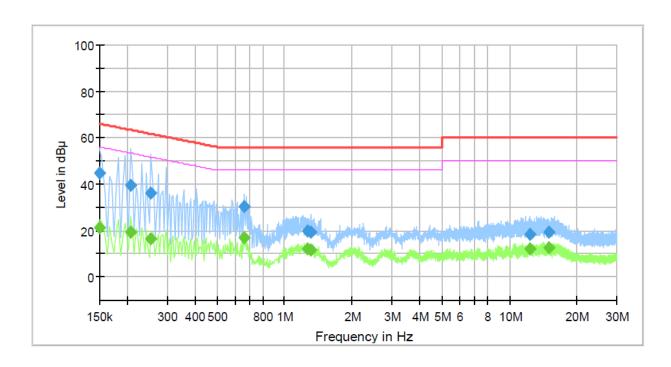
NEUTRAL LINE

Common Information

Test Description: Conducted Emission Model No.: TONE-T60Q

Phase:

Mode: Charge Operator Name: KES





3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (19) of (31)

Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dΒμV)	Limit (dBµV)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	Corr. (dB)
	, , ,	` ' '	,		(ms)			
0.150000		20.99	56.00	35.01	1000.0	9.000	N	19.5
0.150000	44.86		66.00	21.14	1000.0	9.000	N	19.5
0.206000		19.46	53.37	33.91	1000.0	9.000	N	19.5
0.206000	39.51		63.37	23.86	1000.0	9.000	N	19.5
0.254000	36.23		61.63	25.40	1000.0	9.000	N	19.6
0.254000		16.52	51.63	35.11	1000.0	9.000	N	19.6
0.662000		17.09	46.00	28.91	1000.0	9.000	N	20.0
0.662000	30.56		56.00	25.44	1000.0	9.000	N	20.0
1.270000		12.27	46.00	33.73	1000.0	9.000	N	20.3
1.270000	20.01		56.00	35.99	1000.0	9.000	N	20.3
1.314000	19.11		56.00	36.89	1000.0	9.000	N	20.3
1.314000		11.60	46.00	34.40	1000.0	9.000	N	20.3
12.350000		11.87	50.00	38.13	1000.0	9.000	N	20.4
12.350000	18.19		60.00	41.81	1000.0	9.000	N	20.4
14.918000		12.81	50.00	37.19	1000.0	9.000	N	20.4
14.918000	19.11		60.00	40.89	1000.0	9.000	N	20.4

♦ Calculation

QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]

QuasiPeak / CAverage : The Final Value Reading Value : Not shown in the table.

Corr.: Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

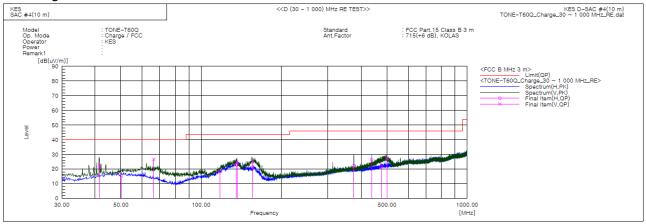


3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (20) of (31)

Radiated Electric Field Emissions(Below 1 € 2)

- 47 CFR Part 15, Subpart B

■ Charge Mode



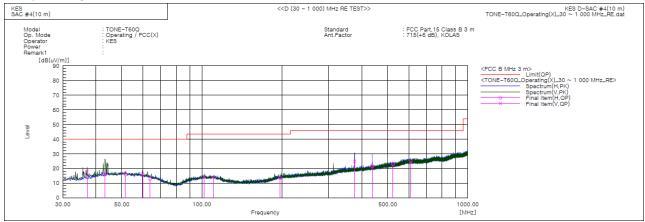
Final Result

No.	Frequency	(P)	Reading QP	c.f	Result OP	Limit QP	Margin QP	Height	Angle	Remark
	[MHz]		[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[cm]	[deg]	
1	41.519	V	44.7	-22.3	22.4	40.0	17.6	126.0	1.0	
2	50.249	Н	36.6	-21.4	15.2	40.0	24.8	400.0	284.0	
3	66.375	٧	50.6	-24.1	26.5	40.0	13.5	149.0	242.0	
4	117.906	Н	42.5	-24.3	18.2	43.5	25.3	400.0	354.0	
5	135.730	Н	48.9	-26.1	22.8	43.5	20.7	341.0	358.0	
6	136.579	٧	50.7	-26.1	24.6	43.5	18.9	110.0	22.0	
7	155.979	Н	46.9	-25.6	21.3	43.5	22.2	310.0	258.0	
8	156.221	٧	50.6	-25.6	25.0	43.5	18.5	122.0	15.0	
9	374.961	٧	38.1	-15.9	22.2	46.0	23.8	100.0	186.0	
10	437.570	Н	40.9	-14.5	26.4	46.0	19.6	400.0	27.0	
11	475.958	Н	35.0	-13.4	21.6	46.0	24.4	400.0	237.0	
12	500.086	٧	40.0	-12.7	27.3	46.0	18.7	196.0	156.0	



3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (21) of (31)

■ Operating Mode



Final Result

No.	Frequency	(P)	Reading QP	c.f	Result OP	Limit QP	Margin QP	Height	Angle	Remark
	[MHz]		[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[cm]	[deg]	
1	37.033	V	42.3	-24.5	17.8	40.0	22.2	106.0	359.0	
2	43.216	V	38.7	-21.9	16.8	40.0	23.2	156.0	359.0	
3	51.583	Н	37.2	-21.4	15.8	40.0	24.2	400.0	256.0	
4	59.828	V	38.5	-22.3	16.2	40.0	23.8	114.0	255.0	
5	63.829	Н	36.2	-23.3	12.9	40.0	27.1	400.0	135.0	
6	102.023	V	37.5	-23.0	14.5	43.5	29.0	100.0	169.0	
7	110.995	Н	36.9	-22.9	14.0	43.5	29.5	375.0	68.0	
8	196.840	Н	35.4	-21.9	13.5	43.5	30.0	400.0	349.0	
9	374.956	V	40.7	-15.9	24.8	46.0	21.2	100.0	251.0	
10	437.521	Н	36.0	-14.5	21.5	46.0	24.5	280.0	229.0	
11	523.488	Н	35.2	-12.2	23.0	46.0	23.0	400.0	279.0	
12	609.939	V	34.1	-9.8	24.3	46.0	21.7	228.0	192.0	

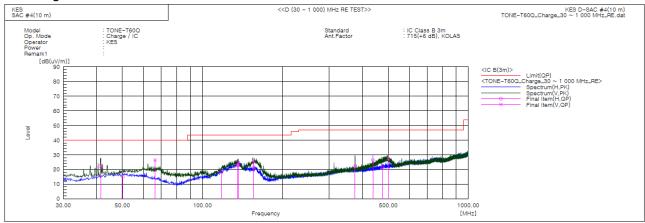
<u>It was determined that X orientation was worst-case orientation; therefore, al final radiated testing was performed with the EUT in X orientation.</u>



3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (22) of (31)

- IC Regulation ICES-003 Issue 7

■ Charge Mode



Final Result

No.	Frequency	(P)	Reading OP	c.f	Result QP	Limit QP	Margin OP	Height	Angle	Remark
1 2 3 4 5	[MHz] 41.519 50.249 66.375 117.906 135.730	V H V H	QP [dB(uV)] 44.7 36.6 50.6 42.5 48.9	[dB(1/m)] -22.3 -21.4 -24.1 -24.3 -26.1	QP [dB(uV/m)] 22.4 15.2 26.5 18.2 22.8	QP [dB(uV/m)] 40.0 40.0 40.0 43.5 43.5	QP [dB] 17.6 24.8 13.5 25.3 20.7	[cm] 126.0 400.0 149.0 400.0 341.0	[deg] 1.0 284.0 242.0 354.0 358.0	
6 7 8 9 10 11 12	136.579 155.979 156.221 374.961 437.570 475.958 500.086	V V V H H V	50.7 46.9 50.6 38.1 40.9 35.0 40.0	-26.1 -25.6 -25.6 -15.9 -14.5 -13.4 -12.7	24.6 21.3 25.0 22.2 26.4 21.6 27.3	43.5 43.5 43.5 47.0 47.0 47.0 47.0	18.9 22.2 18.5 24.8 20.6 25.4 19.7	110.0 310.0 122.0 100.0 400.0 400.0 196.0	22.0 258.0 15.0 186.0 27.0 237.0 156.0	

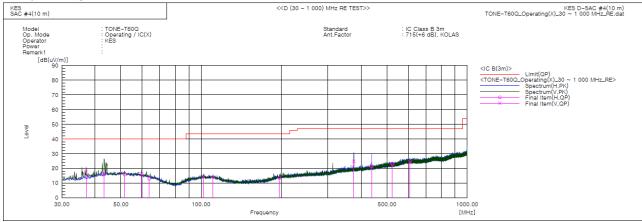


3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450

www.kes.co.kr

Report No.: KES-EM-22T0500 Page (23) of (31)

■ Operating Mode



Final Result

No.	Frequency	(P)	Reading QP	c.f	Result QP	Limit QP	Margin QP	Height	Angle	Remark
	[MHz]		[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[ďB]	[cm]	[deg]	
1	37.033	V	42.3	-24.5	17.8	40.0	22.2	106.0	359.0	
2	43.216	V	38.7	-21.9	16.8	40.0	23.2	156.0	359.0	
3	51.583	Н	37.2	-21.4	15.8	40.0	24.2	400.0	256.0	
4	59.828	٧	38.5	-22.3	16.2	40.0	23.8	114.0	255.0	
5	63.829	Н	36.2	-23.3	12.9	40.0	27.1	400.0	135.0	
6	102.023	٧	37.5	-23.0	14.5	43.5	29.0	100.0	169.0	
7	110.995	Н	36.9	-22.9	14.0	43.5	29.5	375.0	68.0	
8	196.840	Н	35.4	-21.9	13.5	43.5	30.0	400.0	349.0	
9	374.956	٧	40.7	-15.9	24.8	47.0	22.2	100.0	251.0	
10	437.521	Н	36.0	-14.5	21.5	47.0	25.5	280.0	229.0	
11	523.488	Н	35.2	-12.2	23.0	47.0	24.0	400.0	279.0	
12	609.939	V	34.1	-9.8	24.3	47.0	22.7	228.0	192.0	

<u>It was determined that X orientation was worst-case orientation; therefore, al final radiated testing was performed with the EUT in X orientation.</u>

♦ Calculation - SAC #4(10 m)

Result(QP) $[dB(\mu V/m)] = (Reading(QP)[dB(\mu V)] + c.f[dB(1/m)]$

 $Margin(QP)[dB] = Limit[dB(\mu V/m)] - Result(QP)[dB(\mu V/m)]$

Reading(QP): Reading value, Result(QP): Reading value + Factor value

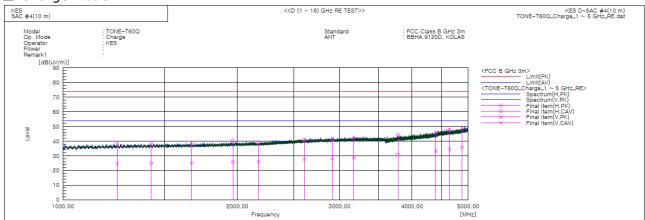
Limit(QP): Limit value, c.f: (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value



3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (24) of (31)

Radiated Electric Field Emissions(Above 1 6 ₪)

■ Charge Mode



Final Result

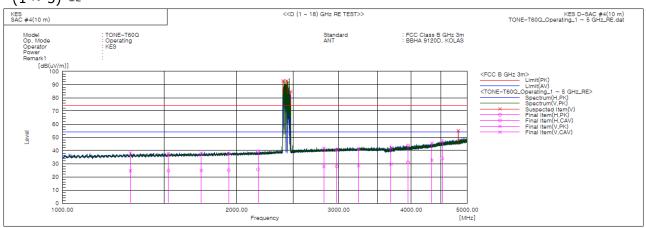
No.	Frequency	(P)	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin	Height	Angle	Remark
			PK	CAV		PK	CAV	PK	AV	PK	CAV			
	[MHz]		[dB(uV)]	[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[dB]	[cm]	[deg]	
1	1242.165	V	43.0	29.4	-4.7	38.3	24.7	74.0	54.0	35.7	29.3	113.0	202.0	
2	1420.154	Н	41.8	28.5	-3.7	38.1	24.8	74.0	54.0	35.9	29.2	382.0	148.0	
3	1667.709	٧	40.7	27.7	-2.6	38.1	25.1	74.0	54.0	35.9	28.9	150.0	206.0	
4	1965.502	Н	41.8	27.2	-1.4	40.4	25.8	74.0	54.0	33.6	28.2	400.0	30.0	
5	2175.788	Н	39.4	26.4	-0.4	39.0	26.0	74.0	54.0	35.0	28.0	400.0	342.0	
6	2608.445	V	39.2	25.9	1.8	41.0	27.7	74.0	54.0	33.0	26.3	100.0	105.0	
7	2913.635	Н	37.8	25.2	3.0	40.8	28.2	74.0	54.0	33.2	25.8	360.0	137.0	
8	3175.311	V	38.7	25.0	3.7	42.4	28.7	74.0	54.0	31.6	25.3	100.0	75.0	
9	3785.829	Н	38.4	24.8	6.0	44.4	30.8	74.0	54.0	29.6	23.2	400.0	193.0	
10	4397.682	V	36.6	23.8	9.4	46.0	33.2	74.0	54.0	28.0	20.8	167.0	107.0	
11	4640.169	H	36.5	23.4	11.2	47.7	34.6	74.0	54.0	26.3	19.4	288.0	104.0	
12	4881.902	V	36.3	23.1	12.7	49.0	35.8	74.0	54.0	25.0	18.2	144.0	40.0	



3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (25) of (31)

■ Operating Mode

- (1 ~ 5) GHz



Final Result

No.	Frequency	(P)	Reading PK	Reading CAV	c.f	Result PK	Result CAV	Limit PK	Limit AV	Margin PK	Margin CAV	Height	Angle	Remark
	[MHz]		[dB(uV)]	[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[dB]	[cm]	[deg]	
1	1310,771	V	42.4	28.9	-4.3	38.1	24.6	74.0	54.0	35.9	29.4	120.0	14.0	
2	1524,590	Н	40.6	27.9	-3.2	37.4	24.7	74.0	54.0	36.6	29.3	400.0	218.0	
3	1737,662	V	40.4	27.3	-2.4	38.0	24.9	74.0	54.0	36.0	29.1	100.0	306.0	
4	1937,890	Н	39.3	26.5	-1.5	37.8	25.0	74.0	54.0	36.2	29.0	400.0	328.0	
5	2176.337	Н	39.8	26.0	-0.4	39.4	25.6	74.0	54.0	34.6	28.4	350.0	103.0	
6	2826.764	V	39.0	25.2	2.7	41.7	27.9	74.0	54.0	32.3	26.1	168.0	274.0	
7	2975.019	Н	37.6	24.8	3.2	40.8	28.0	74.0	54.0	33.2	26.0	400.0	353.0	
8	3246.125	V	37.5	24.5	3.9	41.4	28.4	74.0	54.0	32.6	25.6	100.0	69.0	
9	3691.522	V	36.8	24.3	5.3	42.1	29.6	74.0	54.0	31.9	24.4	105.0	108.0	
10	3949.689	Н	37.0	24.1	6.8	43.8	30.9	74.0	54.0	30.2	23.1	270.0	60.0	
11	4342.635	V	36.5	23.6	9.1	45.6	32.7	74.0	54.0	28.4	21.3	162.0	208.0	
12	4524.119	Н	36.6	23.5	10.5	47.1	34.0	74.0	54.0	26.9	20.0	400.0	350.0	
13	2403.500	V			0.8			74.0	54.0			100.0	351.0	
14	2443.000	V			1.0			74.0	54.0			100.0	78.0	
15	2479.000	V			1.2			74.0	54.0			100.0	30.0	
16	4824.500	V			12.2			74.0	54.0			100.0	201.0	

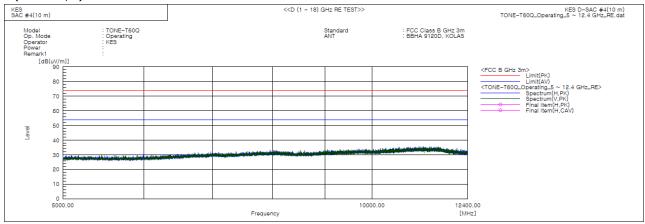
* Exclusion Bands

- Fundamental Frequency: 2.4 ^ℍ Band - Harmonic Frequency: 4.8 ^ℍ Band



3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea Tel: +82-31-425-6200 / Fax: +82-31-424-0450 www.kes.co.kr Report No.: KES-EM-22T0500 Page (26) of (31)

- (5 ~ 12,4) GHz



* No spurious emission were detected above 5 GHz.

◆ Calculation

 $Result(PK/CAV) [dB(\mu V/m)] = (Reading(PK/CAV)[dB(\mu V)] + c.f[dB(1/m)]$

 $Margin(PK/CAV)[dB] = Limit[dB(\mu V/m)] - Result(PK/CAV) [dB(\mu V/m)]$

Reading(PK/CAV): Reading value, Result(PK/CAV): Reading value + Factor value

Limit(QP): Limit value, c.f: (ANT Factor + Cable Loss - Preamp Factor), Margin: Marjin value