

FCC BT LE REPORT

FCC Certification

Applicant Name:

LG Electronics MobileComm U.S.A., Inc.

Address:

1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Issue: February 6, 2017 Test Site/Location: HCT CO., LTD., 74,Seoicheon-ro 578beon-gil,Majangmyeo,Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA Report No.: HCT-R-1701-F030-1 HCT FRN: 0005866421

IC Recognition No.: 5944A-5

FCC ID : ZNFH870

APPLICANT : LG Electronics MobileComm U.S.A., Inc.

Model:	LG-H870
Additional model(s):	LGH870, H870, LG-H870S, LGH870S, H870S, LG-H870DS, LGH870DS, H870DS, LG-H870K, LGH870K, H870K
EUT Type:	Multi-band GSM/EDGE/WCDMA/LTE phone with Bluetooth, WLAN, NFC
RF Peak Output Power:	7.092 dBm (5.119 mW)
Frequency Range:	2402 MHz -2480 MHz
Modulation type	GFSK
FCC Classification:	Digital Transmission System(DTS)
FCC Rule Part(s):	Part 15.247

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this

equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

Report prepared by : Kyung Soo Kang Test Engineer of RF Team

Approved by : Jong Seok Lee Manager of RF Team

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Model: LG-H870

Version

TEST REPORT NO.	DATE	DESCRIPTION		
HCT-R-1701-F030	January 31, 2017	- First Approval Report		
HCT-R-1701-F030-1	February 6, 2017	- Revise the Section 7.		



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1. GENERAL INFORMATION

Applicant:	LG Electronics MobileComm U.S.A., Inc.
Address:	1000 Sylvan Avenue, Englewood Cliffs NJ 07632
FCC ID:	ZNFH870
EUT Type:	Multi-band GSM/EDGE/WCDMA/LTE phone with Bluetooth, WLAN, NFC
Model:	LG-H870
Additional model(s):	LGH870, H870, LG-H870S, LGH870S, H870S, LG-H870DS, LGH870DS, H870DS, LG-H870K, LGH870K, H870K
Date(s) of Tests:	December 19, 2016 ~ January 24, 2017
Place of Tests:	HCT Co., Ltd.
FIALE UI 16313.	74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea

Z. EUT DESCRIPTION						
Model	LG-H870	LG-H870				
Additional model(s)		LGH870, H870, LG-H870S, LGH870S, H870S, LG-H870DS, LGH870DS, H870DS, LG-H870K, LGH870K, H870K				
EUT Type	Multi-ban	d GSM/EDGE/WCDMA/LTE phone with Bluetooth, WLAN, NFC				
Power Supply	DC 3.8 V	DC 3.8 V				
Battery Information		Model: BL-T32 Type: Li-ion Polymer Battery				
Frequency Range	_	TX: 2402 MHz ~ 2480 MHz RX: 2402 MHz ~ 2480 MHz				
	Peak	Data packet length (Min)_ 7.092 dBm (5.119 mW)				
Max. RF Output Power	reak	/ Data packet length (Max)_6.793 dBm (4.779 mW)				
	Average	Data packet length (Min)_6.791 dBm (4.776 mW)				
	Average	/ Data packet length (Max)_6.514 dBm (4.481 mW)				
BT Operating Mode	BT_Low	BT _Low Energy Mode				
Modulation Type	GFSK	GFSK				
Number of Channels	40 Chanr	40 Channels				
	Manufact	Manufacturer: KOMATECH Co., Ltd.				
Antenna Specification	Antenna	type: INTERNAL ANTENNA				
	Peak Gai	n : -0.82 dBi				

2. EUT DESCRIPTION



3. TEST METHODOLOGY

FCC KDB 558074 D01 DTS Meas Guidance v03r05 dated April 8, 2016 entitled "Guidance for Performing Compliance Measurements on Digital Transmission Systems(DTS) and the measurement procedure described in ANSI C63.10(Version : 2013) 'the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices'.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3.75 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 8 of ANSI C63.10. (Version: 2013)

Conducted Antenna Terminal

See Section from 9.1 to 9.2.(KDB 558074 v03r05)

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low, mid and high with highest data rate (worst case) is chosen for full testing.



4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

Espectially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2006).

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 07, 2015 (Registration Number: 90661)

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

* The antennas of this E.U.T are permanently attached.

*The E.U.T Complies with the requirement of §15.203



7. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014.

All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	6.07



8. SUMMARY TEST OF RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
6 dB Bandwidth	§15.247(a)(2)	> 500 kHz		PASS
Conducted Maximum Peak Output Power	§15.247(b)(3)	< 1 Watt		PASS
Power Spectral Density	§15.247(e)	< 8 dBm / 3 kHz Band	CONDUCTED	PASS
Band Edge(Out of Band Emissions)	§15.247(d)	Conducted > 20 dBc		PASS
AC Power line Conducted Emissions	§15.207	cf. Section 9.7		PASS
Radiated Spurious Emissions §15.205, 15.209		cf. Section 9.6.1	RADIATED	PASS
Radiated Restricted Band Edge	§15.247(d), 15.205, 15.209	cf. Section 9.6.2	RADIATED	PASS

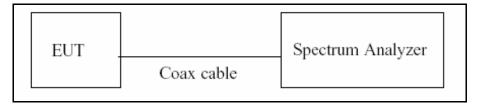


9. TEST RESULT 9.1 DUTY CYCLE

TEST PROCEDURE

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW \geq OBW if possible; otherwise, set RBW to the largest available value. Set VBW \geq RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T \leq 16.7 microseconds.)

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. We tested accroding to the zerospan measurement method, 6.0)b) in KDB 558074 v03r05.

The largest available value of RBW is 8 MHz and VBW is 50 MHz. The zero-span method of measuring duty cycle shall not be used if $T \le 6.25$ microseconds. (50/6.25 = 8)

The zero-span method was used because all measured T data are > 6.25 microseconds and both RBW and VBW are > 50/T.

- 1. RBW = 8 MHz (the largest available value)
- 2. VBW = 8 MHz (≥ RBW)
- 3. SPAN = 0 Hz
- 4. Detector = Peak
- 5. Number of points in sweep > 100
- 6. Trace mode = Clear write
- 7. Measure $T_{total} \,and \, T_{on}$
- 8. Calculate Duty Cycle = T_{on}/T_{total} and Duty Cycle Factor = 10*log(1/Duty Cycle)



Data packet length (Min)

LE Mode	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
	0.3901	0.6245	0.6247	2.04
Data packet length (Max)				
LE Mode	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor
	2.1350	2.5000	0.8540	0.69

RESULT PLOTS_Data packet length (Min)

B n	Δ	MIG-2 201 5 00	
		Mkr3 624.5 µs -0.17 dB	Auto Tune
Xa	ŷ ^{1Δ2}	364	Center Freq 2.402000000 GHz
Medlevilles	Lerrelete alt a tech alt		Start Fred 2.402000000 GHz
			Stop Free 2,402000000 GH:
#VBW 8.0 MHz	Sweep 1.	Span 0 Hz 267 ms (1001 pts)	CF Step 8.000000 MH
390.1 μs (Δ) -2.28 dB	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	Auto Mar
420.1 µs 624.5 µs 428.1 µs 428.1 µs 4.51 dBm			Freq Offse 0 Ha
	#VBW 8.0 MHz #VBW 8.0 MHz 2390 1 µs (Δ) 2.28 dB 423 1 µs 4.61 dBm 5245 µs (Δ) 0.17 dB	#VBW 8.0 MHz Sweep 1.7 200 1 из (д)2.20 dB 423 1 из (д) -0.17 dB	Span 0 Hz Span 0 Hz #VBW 8.0 MH2 Sweep 1.267 ms (1001 pts) 2 Flaction 2390.1 µz (Δ) -2.29 dB 423 µz (Δ) -2.29 dB 423 µz (Δ) -2.79 dB

RESULT PLOTS_ Data packet length (Max)

	eq 2.402000		Trig: Free Run Atten: 20 dB	#Avg Type: Pwr(RMS)	12:56-47 FM Jano4, 2017 TRACI 12:34 F TVPE WALLAND	Frequency
0 dB/div	Ref Offset 11.2 d Ref 20.00 dBn	в		۵	/kr3 2,500 ms 0.04 dB	Auto Tune
09 100 100		×			1Δ2 3Δ4	Center Fred 2.402000000 GH
1910 1970 19,0		Martine			Nelanda	Start Free 2.402000000 GH
000 000 000						Stop Free 2,40200000 GH
Center 2.4 Res BW 8		#VBW	8.0 MHz	Sweep 5.0	Span 0 Hz 100 ms (1001 pts)	CF Step 8.000000 MH
1 A2 1 2 F 1	t (Δ) t t (Δ)	× 2.135 ms (Δ) 1.925 ms 2.500 ms (Δ) 1.925 ms	-1,33 dB 4.85 dBm 0.04 dB 4.85 dBm			Auto Mar Freq Offse 0 H



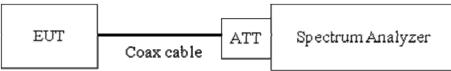
9.2 6 dB BANDWIDTH MEASUREMENT

Test Requirements and limit, §15.247(a)(2)

The bandwidth at 6 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequencies.

The minimum permissible 6 dB bandwidth is 500 kHz.

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to (Procedure 8.1 in KDB 558074 v03r05)

RBW = 100 kHz VBW \geq 3 x RBW Detector = Peak Trace mode = max hold Sweep = auto couple Allow the trace to stabilize

Note : We tested 6 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 6 dB.

TEST RESULT_Data packet length (Min)

Mode	Channel	6 dB Bandwidth	Limit	Deco/Foil
Mode	Channel	(kHz)	(kHz)	Pass/Fail
	0	722.8		Pass
BT LE	19	723.5	> 500	Pass
	39	726.2		Pass

TEST RESULT_ Data packet length (Max)

Mode	Channel	6 dB Bandwidth	Limit	Pass/Fail
Mode	Channel	(kHz)	(kHz)	Fass/Fall
	0	686.6		Pass
BT LE	19	691.3	> 500	Pass
	39	691.5		Pass

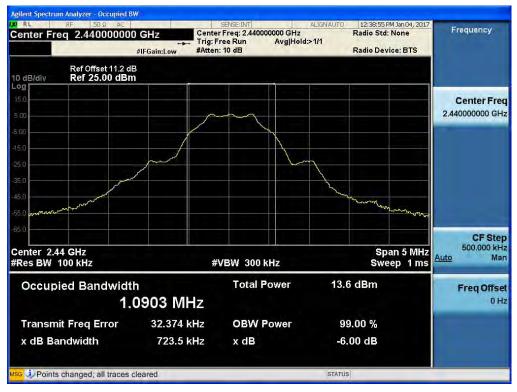


RESULT PLOTS_Min

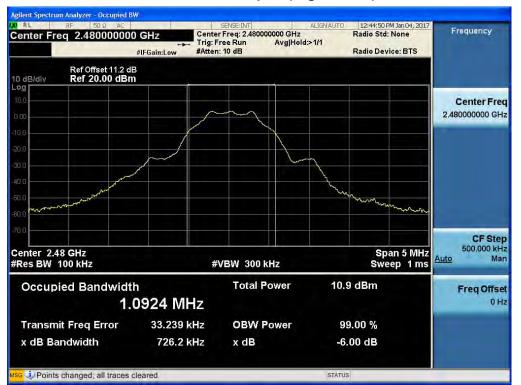


6 dB Bandwidth plot (Low-CH 0)

6 dB Bandwidth plot (Mid-CH 19)







6 dB Bandwidth plot (High-CH 39)

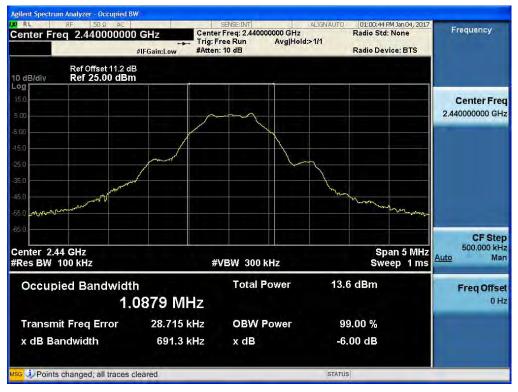


RESULT PLOTS_Max

gilent Spectrum Analyzer - Occupied BW 12:57:00 PM Jan 04, 2017 Radio Std: None Center Freq: 2.402000000 GHz Trig: Free Run Avg|Hold:>1/1 #Atten: 10 dB Frequency Center Freq 2.402000000 GHz #IFGain:Low Radio Device: BTS Ref Offset 11.2 dB Ref 20.00 dBm 10 dB/div og Center Freq 2.402000000 GHz wh CF Step 500.000 kHz Center 2.402 GHz #Res BW 100 kHz Span 5 MHz Sweep 1 ms Man Auto #VBW 300 kHz **Total Power** 11.9 dBm **Occupied Bandwidth** Freq Offset 1.0882 MHz 0 Hz 25.012 kHz **Transmit Freq Error OBW Power** 99.00 % x dB -6.00 dB x dB Bandwidth 686.6 kHz G 🧼 Alignment Completed STATUS

6 dB Bandwidth plot (Low-CH 0)

6 dB Bandwidth plot (Mid-CH 19)





n Analyzer - Occupied BW it Spectri 12:58:23 PM Jan 04, 2017 Radio Std: None RL GHz Center Freq: 2.48000000 GHz Trig: Free Run Avg|Hold: 1/1 #IFGain:Low #Atten: 10 dB Frequency Center Freq 2.480000000 GHz Radio Device: BTS Ref Offset 11.2 dB Ref 20.00 dBm 10 dB/div 00 **Center Freq** 2.480000000 GHz CF Step 500.000 kHz Man Center 2.48 GHz #Res BW 100 kHz Span 5 MHz Sweep 1 ms Auto #VBW 300 kHz **Total Power** 10.8 dBm **Occupied Bandwidth** Freq Offset 1.0889 MHz 0 Hz 29.764 kHz 99.00 % **Transmit Freq Error OBW Power** x dB Bandwidth 691.5 kHz x dB -6.00 dB Points changed; all traces cleared STATUS

6 dB Bandwidth plot (High-CH 39)



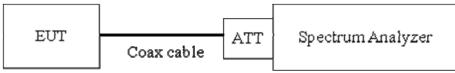
9.3 OUTPUT POWER MEASUREMENT

Test Requirements and limit, §15.247(b)(3)

A transmitter antenna terminal of EUT is connected to the input of a Spectrum Analyzer. Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies.

The maximum permissible conducted output power is 1 Watt.

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. We use the spectrum analyzer's integrated band power measurement function.

This EUT TX condition is actual operating mode by BT LE mode test program.

The Spectrum Analyzer is set to

- Peak Power (Procedure 9.1.1 in KDB 558074 v03r05)
 - RBW ≥ DTS Bandwidth
 - $VBW \ge 3 \times RBW$
 - SPAN \ge 3 x RBW
 - Detector Mode = Peak
 - Sweep = auto couple
 - Trace Mode = max hold

Allow trace to fully stabilize.

Use peak marker function to determine the peak amplitude level

Average Power (Procedure 9.2.2.4 in KDB 558074 v03r05)

Measure the duty cycle

- Set span to at least 1.5 times the OBW
- RBW = 1-5 % of the OBW, not to exceed 1 MHz.

VBW \geq 3 x RBW.

Number of points in sweep $\ge 2 x$ span / RBW. (This gives bin-to-bin spacing \le RBW/2,

so that narrowband signals are not lost between frequency bins.)

Sweep time = auto.

Detector = RMS(i.e., power averaging)

Do not use sweep triggering. Allow the sweep to "free run".

Trace average at least 100 traces in power averaging(RMS) mode.



Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges. Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average

power during the actual transmission times.

Sample Calculation

Output Power = Reading Value + ATT loss + Cable loss(1 ea) + Duty Cycle Factor Output Power = 10 dBm + 10 dB + 0.8 dB + 0.2 dB = 21.0 dBm

Note :

- 1. Spectrum reading values are not plot data. The power results in plot is already including the actual values of loss for the attenuator and cable combination.
- 2. Spectrum offset = Attenuator loss + Cable loss
- 3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. So, 10.7 dB is offset for 2.4 GHz Band.



TEST RESULTS-Peak

LE M	ode	Measured	Limit
Frequency[MHz]	Iz] Channel No. Power(dBm)		(dBm)
2402	0	5.098	30
2440	19	7.092	30
2480	39	4.441	30

Conducted Output Power Measurements_Data packet length (Min)

Conducted Output Power Measurements_ Data packet length (Max)

LE Mode		Measured	Limit
Frequency[MHz]	Channel No.	Power(dBm)	(dBm)
2402	0	5.235	30
2440	19	6.793	30
2480	39	4.132	30

TEST RESULTS-Average

Conducted Output Power Measurements_ Data packet length (Min)

LE Mode			Duty Cycle	Measured	
Frequency[MHz]	Channel No.	Measured Power(dBm)	Duty Cycle Factor (dB)	Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
2402	0	2.34	2.04	4.38	30
2440	19	4.75	2.04	6.79	30
2480	39	2.07	2.04	4.12	30

Conducted Output Power Measurements_ Data packet length (Max)

LE Mode			Duty Cycle	Measured	
Frequency[MHz]	Channel No.	Measured Power(dBm)	Duty Cycle Factor (dB)	Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
2402	0	3.59	0.69	4.27	30
2440	19	5.83	0.69	6.51	30
2480	39	3.11	0.69	3.79	30



RESULT PLOTS-Peak_Data packet length (Min) Conducted Output Power (Low-CH 0)

Center Freq 2.40200000	OGHZ PNO: Fast ↔ Trig: Free Run IEGain:Low Atten: 10 dB	ALIGN AUTO 12:36:59 PM Jan 04, 2 #Avg Type: Pwr(RMS) TRACE 12 3 Avg Hold: 1/1 TYPE M VANA DET P P P	5.5 Frequency
Ref Offset 11.2 dB 0 dB/div Ref 11.20 dBm	Touncow	Mkr1 2.402 236 G 5.098 dE	Hz Auto Tune Bm
1.20			Center Fred 2.402000000 GHz
3.60 mm			Start Free 2.400500000 GH:
8.8			Stop Free 2.403500000 GH
88			CF Stej 300.000 kH <u>Auto</u> Ma
			Freq Offse 0 H
2enter 2.402000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	Span 3.000 M Sweep 1.07 ms (1000 p	Hz

Conducted Output Power (Mid-CH 19)

RL RF 50Ω AC	SENSE:INT	ALIGNAUTO	12:39:04 PM Jan 04, 2017	- a contract of the
enter Freq 2.44000000	PN0: Fast ↔ Trig: Free Run IFGain:Low Atten: 10 dB	#Avg Type: Pwr(RMS) Avg Hold: 1/1	TRACE 1 2 3 4 5 5 TYPE M WWWWWWW DET P P P P P P	Frequency
Ref Offset 11.2 dB 0 dB/div Ref 11.20 dBm		Mkr1 :	2.439 779 GHz 7.092 dBm	Auto Tune
og 1.20 3.80 FFT	¶			Center Fred 2.440000000 GH
3.80 - 1⁶				Start Free 2.438500000 GH
38.8				Stop Fre 2.441500000 GH
18:8 58:8				CF Ste 300.000 kH Auto Ma
58,8				Freq Offse 0 H
Res BW 1.0 MHz	#VBW 3.0 MHz	Sween 1	Span 3.000 MHz .07 ms (1000 pts)	





Conducted Output Power (High-CH 39)



RESULT PLOTS-Peak_Data packet length (Max) Conducted Output Power (Low-CH 0)

RL RF 50Ω AC		SENSE:INT	ALIGNAUTO	12:57:10 PM Jan 04, 2017	Francisco
enter Freq 2.40200000	PNO: Fast +++ IFGain:Low	Trig: Free Run Atten: 10 dB	#Avg Type: Pwr(RMS) Avg Hold: 1/1	TRACE 1 2 3 4 5 5 TYPE M WWWWW DET P P P P P P	Frequency
Ref Offset 11.2 dB dB/div Ref 11.20 dBm			Mkr1 2	.402 266 GHz 5.235 dBm	Auto Tune
og					Center Fre 2.402000000 GH
8.8 5.8 5.8					Start Fre 2.400500000 GH
8.8					Stop Fre 2.403500000 GH
8.8					CF Ste 300.000 kł Auto Ma
3.8					Freq Offs 0 I
enter 2.402000 GHz Res BW 1.0 MHz	#VBW	3.0 MHz	Sweep 1.	Span 3.000 MHz 07 ms (1000 pts)	

Conducted Output Power (Mid-CH 19)

RL RF 50Ω AC	SENSE:INT	ALIGNAUTO	01:00:54 PM Jan 04, 2017	E
	CHZ PNO: Fast ↔ Trig: Free Run FGain:Low Atten: 10 dB	#Avg Type: Pwr(RMS) Avg Hold: 1/1	TRACE 12345 TYPE MW////// DET P P P P P P	Frequency
Ref Offset 11.2 dB dB/div Ref 11.20 dBm		Mkr1 2	.440 269 GHz 6.793 dBm	Auto Tuno
1.20				Center Free 2.440000000 GH
60 (UTT 70 000) 8.8				Start Fre 2.438500000 GH
8.8				Stop Fre 2.441500000 GH
8.8				CF Ste 300.000 kH Auto Ma
88				Freq Offse 0 H
enter 2.440000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	Sween 1	Span 3.000 MHz 07 ms (1000 pts)	



RL RF 50Ω AC		SENSE:INT	ALIGN AUTO	12:58:32 PM Jan 04, 2017	2 Charles and a second
enter Freq 2.48000000	PNO: Fast Tri	g: Free Run en: 10 dB	#Avg Type: Pwr(RMS) Avg Hold>1/1	TRACE 1 2 3 4 5 5 TYPE M WWWWWWW DET P P P P P P	Frequency
Ref Offset 11.2 dB			Mkr1 :	2.479 761 GHz 4.132 dBm	Auto Tune
20	↓ 1				Center Freq 2.480000000 GHz
8.6					Start Fred 2.478500000 GHz
8.8					Stop Fred 2.481500000 GH2
8.8					CF Step 300.000 kH Auto Mar
8.8					Freq Offse 0 H
enter 2.480000 GHz Res BW 1.0 MHz	#VBW 3.0	MHz	Sweep 1	Span 3.000 MHz .07 ms (1000 pts)	

Conducted Output Power (High-CH 39)



RESULT PLOTS-Average_Data packet length (Min) Conducted Output Power (Low-CH 0)



Conducted Output Power (Mid-CH 19)





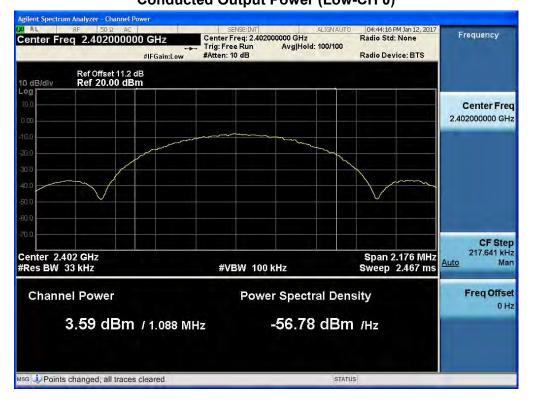
Model: LG-H870

it Spectrum Analyze 12:45:09 PM Jan 04, 2017 Radio Std: None RL GHz Center Freq: 2.480000000 GHz Trig: Free Run Avg|Hold: 100/100 #IFGain:Low #Atten: 10 dB Frequency Center Freq 2.480000000 GHz Radio Device: BTS Ref Offset 11.2 dB Ref 20.00 dBm 10 dB/div og **Center Freq** 2.480000000 GHz CF Step 218.488 kHz Man Center 2.48 GHz #Res BW 33 kHz Span 2.185 MHz Sweep 2.533 ms Auto #VBW 100 kHz Freq Offset **Channel Power Power Spectral Density** 0 Hz 2.07 dBm / 1.092 MHz -58.31 dBm /Hz STATUS

Conducted Output Power (High-CH 39)



RESULT PLOTS-Average_Data packet length (Max) Conducted Output Power (Low-CH 0)



Conducted Output Power (Mid-CH 19)





Model: LG-H870

it Spectrum Analyzer 12:58:42 PM Jan 04, 2017 Radio Std: None RL GHz Center Freq: 2.48000000 GHz Trig: Free Run Avg|Hold: 100/100 #IFGain:Low #Atten: 10 dB Frequency Center Freq 2.480000000 GHz Radio Device: BTS Ref Offset 11.2 dB Ref 20.00 dBm 10 dB/div og **Center Freq** 2.480000000 GHz CF Step 217.774 kHz Man Center 2.48 GHz #Res BW 33 kHz Span 2.178 MHz Sweep 2.467 ms Auto #VBW 100 kHz Freq Offset **Channel Power Power Spectral Density** 0 Hz 3.11 dBm / 1.089 MHz -57.26 dBm /Hz STATUS

Conducted Output Power (High-CH 39)



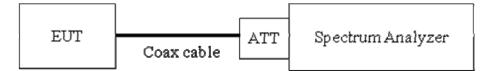
9.4 POWER SPECTRAL DENSITY

Test Requirements and limit, §15.247(e)

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

Minimum Standard – The transmitter power density average over 1-second interval shall not be greater than 8dBm in any 3kHz BW.

TEST CONFIGURATION



TEST PROCEDURE

We tested according to Procedure 10.2 in KDB 558074, issued 01/07/2016

The spectrum analyzer is set to :

Set analyzer center frequency to DTS channel center frequency.

Span = 1.5 times the DTS channel bandwidth.

 $RBW = 3 kHz \le RBW \le 100 kHz.$

VBW \geq 3 x RBW.

Sweep = auto couple

Detector = peak

Trace Mode = max hold

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Sample Calculation

PSD = Reading Value + ATT loss + Cable loss(1 ea) Output Power = -5 dBm + 10 dB + 0.8 dB = 5.8 dBm

Note :

- 1. Spectrum reading values are not plot data. The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
- 2. Spectrum offset = Attenuator loss + Cable loss
- 3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. So,10.7 dB is offset for 2.4 GHz Band.



Model: LG-H870

TEST RESULTS

Conducted Power Density Measurements_Data packet length (Min)

Frequency Channel		Test Result				
	Frequency Channel (MHz) No.		Mode	PSD	Limit	Pass/
(11112)			(dBm)	(dBm)	Fail	
2402	0		-8.993	8	Pass	
2440	19	LE	-6.989	8	Pass	
2480	39	-	-9.707	8	Pass	

Conducted Power Density Measurements_ Data packet length (Max)

Frequency Channel		Test Result			
Frequency (MHz)	No.	Mode	PSD	Limit	Pass/
(11112)			(dBm)	(dBm)	Fail
2402	0		-10.322	8	Pass
2440	19	LE	-9.350	8	Pass
2480	39		-12.216	8	Pass



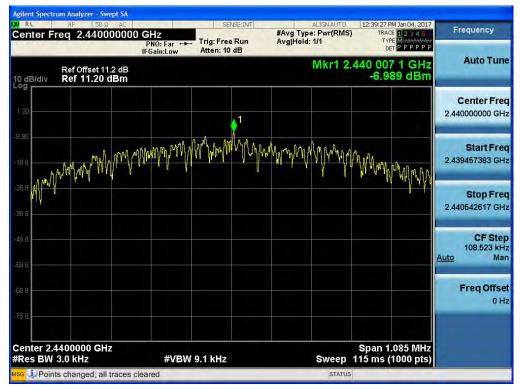
Model: LG-H870

RESULT PLOTS_Data packet length (Min)

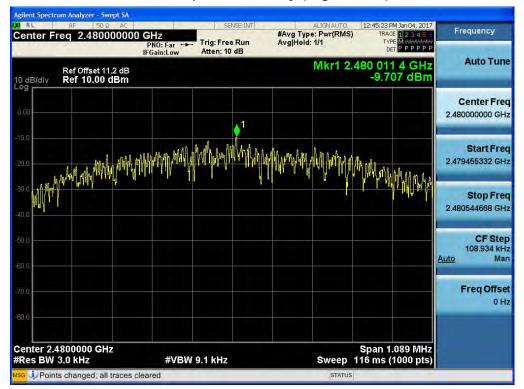


Power Spectral Density (Low-CH 0)

Power Spectral Density (Mid-CH 19)







Power Spectral Density (High-CH 39)



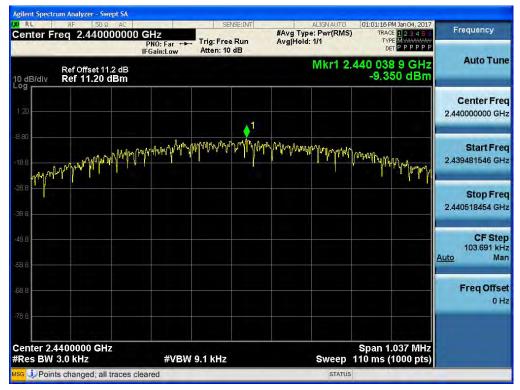
Model: LG-H870

RESULT PLOTS_Data packet length (Max)

Power Spectral Density (Low-CH 0)



Power Spectral Density (Mid-CH 19)





OGHZ	#Avg Type: Pwr(RMS Run Avg Hold: 1/1	12:58:55 PM Jan 04, 2017 TRACE 1 2 3 4 5 5 TYPE M WWWWWW DET P P P P P	Frequency
	Mkr1 2	.480 013 0 GHz -12.216 dBm	Auto Tune
			Center Free 2.480000000 GH:
malled reveral from the form	า นาโโพโองฟลเล็กคลเป็นประการให้บระบ	Maplorated programmer	Start Fre 2.479481366 GH
			Stop Fre 2.480518634 GH
			CF Stej 103.727 kH <u>Auto</u> Ma
			Freq Offse 0 H
#VBW 9.1 kHz	Sweep	Span 1.037 MHz 110 ms (1000 pts)	
	D GHZ PNO: Far →→ IFGain:Low Wmm/m/////////////////////////////////	O GHz PN0: Far Trig: Free Run #Avg Type: Pwr(RMS Avg Hold: 1/1 IFGain: Low Atten: 10 dB Mkr1 2 Why much with the state of th	D GHz PNO: Far

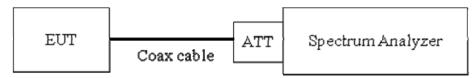
Power Spectral Density (High-CH 39)



9.5 OUT OF BAND EMISSIONS AT THE BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS Test Requirements and limit, §15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.205(c)).

Limit : 20 dBc



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. (Procedure 11.0 in KDB 558074, issued 01/07/2016)

RBW = 100 kHz

VBW ≥ 3 x RBW

Set span to encompass the spectrum to be examined

Detector = Peak

Trace Mode = max hold

Sweep time = auto couple

Ensure that the number of measurement points $\geq 2^{*}$ Span/RBW

Allow trace to fully stabilize.

Use peak marker function to determine the maximum amplitude level.

Measurements are made over the 30 MHz to 10th harmonic range with the transmitter set to the lowest, middle, and highest channels.

Note :

1. The maximum peak conducted output power procedure was used to demonstrate compliance as described in 9.1(KDB558074 v03r05), so the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak



PSD level in 100 kHz (i.e., 20 dBc).

- 2. The band edge results in plot is already including the actual values of loss for the attenuator and cable combination.
- 3. Spectrum offset = Attenuator loss + Cable loss
- 4. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. So, 10.7 dB is offset for 2.4 GHz Band.
- 5. In case of conducted spurious emissions test, please check factors blow table.
- 6. In order to simplify the report, attached plots were only the worst case channel and data rate.

Freq(MHz)	Factor(dB)
30	11.30
100	9.83
200	10.19
300	10.13
400	10.23
500	10.25
600	10.32
700	10.35
800	10.35
900	10.34
1000	10.39
2000	10.64
2400*	10.65
2500*	10.67
3000	10.68
4000	10.89
5000	11.07
6000	11.06
7000	11.35
8000	11.32
9000	11.48
10000	11.56
11000	11.56
12000	11.68
13000	11.83
14000	11.90

FACTORS FOR FREQUENCY



Model: LG-H870

15000	11.98
16000	12.04
17000	12.02
18000	12.08
19000	12.07
20000	12.14
21000	12.17
22000	12.31
23000	12.60
24000	12.34
25000	12.53

Note : 1. '*' is fundamental frequency range.

2. Factor = Cable loss + Attenuator loss

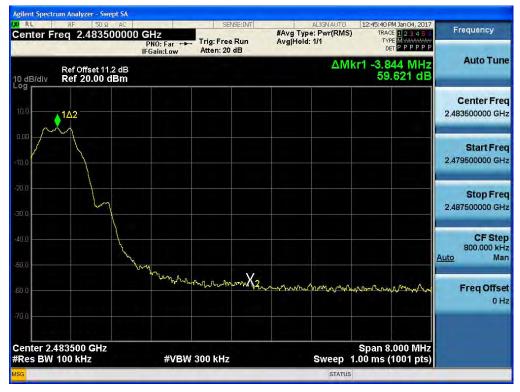


RESULT PLOTS_ Data packet length (Min)

gilent Spectrum Analyzer - Swept SA RI ALIGNAUTO #Avg Type: Pwr(RMS) Avg|Hold: 1/1 12:37:29 PM Jan 04, 2017 TRACE 1 2 3 4 5 TYPE M MARAAAAA Frequency Center Freq 2.400000000 GHz Trig: Free Run TYPE PNO: Far +++ IFGain:Low DET P PPPP Atten: 20 dB Auto Tune ΔMkr1 2.040 MHz 57.801 dB Ref Offset 11.2 dB Ref 20.00 dBm 10 dB/div Center Freq 2.40000000 GHz Start Freq 2.396000000 GHz Stop Freq 2.404000000 GHz CF Step 800.000 kHz Man Auto W.A Mr.M2 mmmmm Freq Offset 0 Hz Center 2.400000 GHz #Res BW 100 kHz Span 8.000 MHz Sweep 1.00 ms (1001 pts) #VBW 300 kHz

BandEdge (Low-CH 0)

BandEdge (High-CH 39)





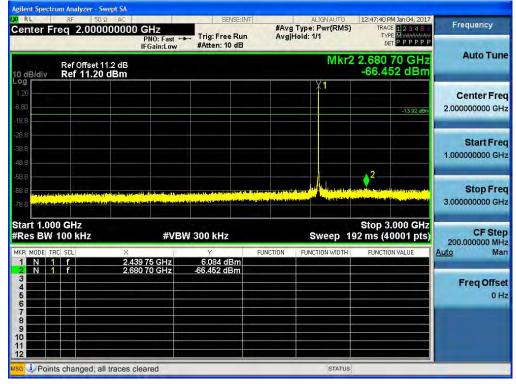
30 MHz ~ 1 GHz

gilent Spectrum Analyzer - Swept SA
 X
 RL
 RF
 50 Ω
 AL

 Center Freq
 515.0000000 MHz
 PN0: Fast
 50 PM Jan 04, 2017 #Avg Type: Pwr(RMS) Avg|Hold: 1/1 Frequency TRACE 12345 TYPE M Trig: Free Run #Atten: 10 dB IFGain:Low Auto Tune Mkr1 902.75 MHz -67.998 dBm Ref Offset 11.2 dB Ref 11.20 dBm 10 dB/div **Center Freq** 515.000000 MHz -13.92 dB Start Freq 30.000000 MHz Stop Freq 1.00000000 GHz CF Step 97.000000 MHz 0 Man Auto 2 **Freq Offset** وار اله 0 Hz Stop 1.0000 GHz Sweep 93.3 ms (20000 pts) Start 30.0 MHz #Res BW 100 kHz #VBW 300 kHz STATUS

Conducted Spurious Emission (Mid-CH 19)

1 GHz ~ 3 GHz





3 GHz ~ 5 GHz

gilent Spectrum Analyzer - Swept SA 00 PM Jan 04, 2017 #Avg Type: Pwr(RMS) Avg[Hold: 1/1 Frequency Center Freq 4.000000000 GHz TRACE 1 2 3 4 5 5 TYPE M Trig: Free Run #Atten: 10 dB PNO: Fast + IFGain:Low Mkr1 4.455 75 GHz -67.221 dBm Auto Tune Ref Offset 11.2 dB Ref 11.20 dBm 10 dB/div **Center Freq** 4.000000000 GHz -13.92 dB Start Freq 3.000000000 GHz Stop Freq 5.00000000 GHz CF Step 200.000000 MHz <u>uto</u> Man Auto ♦1 Freq Offset المال أحط أت 0 Hz Stop 5.000 GHz Sweep 192 ms (40001 pts) Start 3.000 GHz #Res BW 100 kHz #VBW 300 kHz Points changed; all traces cleared STATUS

Conducted Spurious Emission (Mid-CH 19)

5 GHz ~ 7 GHz

enter Freq 6.00000000	PNO: Fast	SENSE:INT Trig: Free Run #Atten: 10 dB	ALIGNAUTO #Avg Type: Pwr(RMS) Avg[Hold: 1/1	12:48:11 PM Jan 04, 2017 TRACE 1 2 3 4 5 5 TYPE MWWWWW DET P P P P P	Frequency
Ref Offset 11.2 dB 0 dB/div Ref 11.20 dBm			Mkr	6.890 55 GHz -66.587 dBm	Auto Tun
1.20					Center Fre 6.000000000 GH
18.8				-13.92 dBm	Start Fre 5.000000000 GH
18.8					Stop Fre 7.000000000 Gi
88					CF Ste 200.000000 Mi <u>Auto</u> Mi
2 68.8 And the stand of the And the stand of the		and the second se	a sectority to the sectority of the sect	and the second second second second	Freq Offs 0 I
res BW 100 KHz	#VBW	300 kHz	Sween_1	Stop 7.000 GHz 92 ms (40001 pts)	



7 GHz ~ 9 GHz

Conducted Spurious Emission (Mid-CH 19)



9 GHz ~ 11 GHz

Center F	RF 50 Ω req 10.0000	00000	GHz NO: Fast ++- Gain:Low				ALIGNAUTO : Pwr(RMS) 1/1	TRACE	1 Jan 04, 2017 1 2 3 4 5 5 M WWWWWWW P P P P P P P	Frequency
Ref Offset 11.2 dB Mkr1 9.347 00 GHz 10 dB/div Ref 11.20 dBm -65.216 dBm							Auto Tuno			
1.20										Center Fre 10.000000000 GH
18.80									-13.92 dBm	Start Fre 9.000000000 GH
38.8										Stop Fre
18:8										CF Ste 200.000000 MH <u>Auto</u> Ma
2 ← ^{58:8} <mark></mark>	and the statisticated		lika la tera di bilita Antonia di producti di bilita	de dise berekeltet _{De} n er de sponset op		nedili olertistato Presi presi				Freq Offs 0 H
78.8 Start 9.00				300 kHz			Sweep 19	Stop 11.0		



11 GHz ~ 13 GHz

gilent Spectrum Analyzer - Swept SA 42 PM Jan 04, 2017 #Avg Type: Pwr(RMS) Avg|Hold: 1/1 Frequency Center Freq 12.000000000 GHz TYPE M Trig: Free Run #Atten: 10 dB PNO: Fast IFGain:Low Auto Tune Mkr1 12.848 15 GHz -64.738 dBm Ref Offset 11.2 dB Ref 11.20 dBm 10 dB/div **Center Freq** 12.00000000 GHz -13.92 dB Start Freq 11.00000000 GHz Stop Freq 13.00000000 GHz CF Step 200.000000 MHz Ito Man Auto 1 **Freq Offset** 0 Hz Stop 13.000 GHz Sweep 192 ms (40001 pts) Start 11.000 GHz #Res BW 100 kHz #VBW 300 kHz File <AAA.PNG> saved STATUS

Conducted Spurious Emission (Mid-CH 19)

13 GHz ~ 15 GHz





15 GHz ~ 17 GHz

gilent Spectrum Analyzer - Swept SA 0:02 PM Jan 04, 2017 #Avg Type: Pwr(RMS) Avg|Hold: 1/1 Frequency Center Freq 16.000000000 GHz TYPE M Trig: Free Run #Atten: 10 dB PNO: Fast IFGain:Low Auto Tune Mkr1 16.451 30 GHz -61.667 dBm Ref Offset 11.2 dB Ref 11.20 dBm 10 dB/div **Center Freq** 16.00000000 GHz -13.92 dB Start Freq 15.00000000 GHz Stop Freq 17.00000000 GHz CF Step 200.000000 MHz Ito Man Auto **Freq Offset** 0 Hz Start 15.000 GHz #Res BW 100 kHz Stop 17.000 GHz Sweep 192 ms (40001 pts) #VBW 300 kHz File <AAA.PNG> saved STATUS

Conducted Spurious Emission (Mid-CH 19)

17 GHz ~ 19 GHz





19 GHz ~ 21 GHz

gilent Spectrum Analyzer - Swept SA Aggingting and the state of t 3 PM Jan 04, 2017 #Avg Type: Pwr(RMS) Avg|Hold: 1/1 Frequency TRACE 1 2 3 4 5 5 TYPE M M P P P P P Trig: Free Run #Atten: 10 dB Auto Tune Mkr1 20.929 75 GHz -58.310 dBm Ref Offset 11.2 dB Ref 11.20 dBm 10 dB/div **Center Freq** 20.00000000 GHz -13.92 dB Start Freq 19.00000000 GHz Stop Freq 21.00000000 GHz CF Step 200.000000 MHz Ito Man Auto Freq Offset 0 Hz Stop 21.000 GHz Sweep 192 ms (40001 pts) Start 19.000 GHz #Res BW 100 kHz #VBW 300 kHz File <AAA.PNG> saved STATUS

Conducted Spurious Emission (Mid-CH 19)

21 GHz ~ 23 GHz

enter Freq 22.0000000		ALIGNAUTO 12:49:33 PM Jan 04, 2017 #Avg Type: Pwr(RMS) TRACE 12:14 Avg Hold: 1/1 TYPE MUNICIPAL DET PPPPP	Frequency
Ref Offset 11.2 dB 0 dB/div Ref 11.20 dBm		Mkr1 21.048 65 GHz -58.100 dBm	
1 20			Center Fre 22.000000000 GH
88		13.92 dBr	Start Fre 21.000000000 GH
38.8			Stop Fre 23.000000000 GF
888 1			CF Ste 200.000000 MH Auto Ma
	s kara din sika dalam dalam karak sanak dan sanak dalam karak sa kata dan sika sa na mana kan fahang dalam dalam karak mana dalam dalam dalam ng karak sa sa ka	a a di kana na kana ang kana ya dan ana na na yang na kana na na kana na kana na kana na kana na kana na kana n Rang na	Freq Offse 0 F
itart 21.000 GHz Res BW 100 kHz	#VBW 300 kHz	Stop 23.000 GHz Sweep 192 ms (40001 pts	



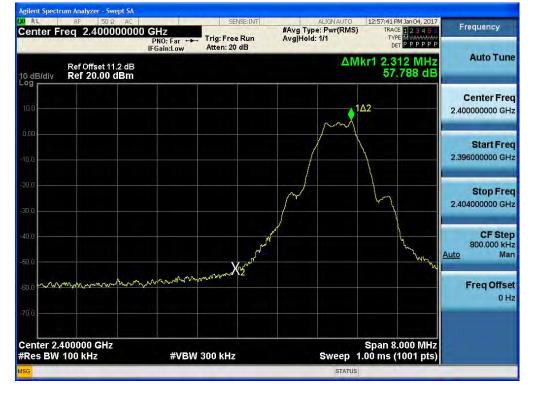
23 GHz ~ 25 GHz

KURL RF 50 Q AC		SENSE:INT	ALIGNAUTO	12:49:44 PM Jan 04, 2017	Francisco
Center Freq 24.000000	PNO: Fast	Trig: Free Run #Atten: 10 dB	#Avg Type: Pwr(RMS) Avg Hold: 1/1	TRACE 1 2 3 4 5 5 TYPE MWWWWW DET P P P P P P	Frequency
Ref Offset 11.2 dB			Mkr1	24.494 20 GHz -55.111 dBm	Auto Tune
1.20					Center Free 24.000000000 GH;
18.8				-13.92 dBm)	Start Free 23.000000000 GH:
28.8					Stop Free 25.000000000 GH
46,8		k de tratale cell al director			CF Stej 200.000000 MH <u>Auto</u> Ma
58.6 Belanda para da belanda da para da para da para da 58.8 Belanda para da para da para da para da para da para da	, ken didde diadau ya kasa kasa kasa ka	<mark>Tenfenels den fissen ander sterne sterne</mark>	an a	and a flood profile of a part of a p	Freq Offse 0 H
Start 23.000 GHz #Res BW 100 kHz	#VBW 3	800 kHz	Sweep 1	Stop 25.000 GHz 92 ms (40001 pts)	
sg 🕕 File <aaa.png> saved</aaa.png>			STATUS		

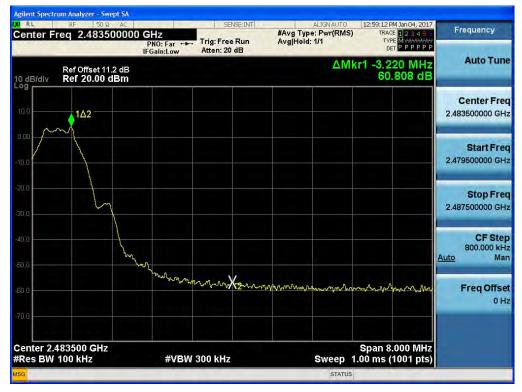


RESULT PLOTS_ Data packet length (Max)

BandEdge (Low-CH 0)



BandEdge (High-CH 39)





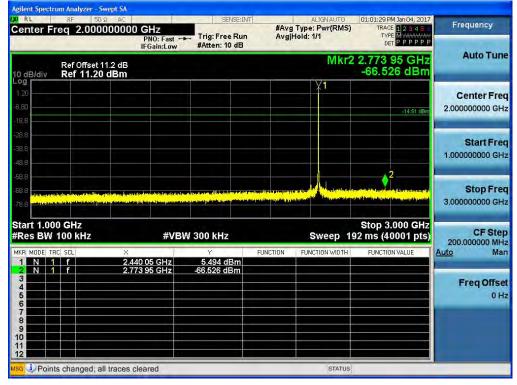
30 MHz ~ 1 GHz

gilent Spectrum Analyzer - Swept SA
 M
 RL
 RF
 50 Ω
 AL

 Center Freq
 515.0000000 MHz
 PN0: Fast
 01:01:39 PM Jan 04, 2017 #Avg Type: Pwr(RMS) Avg|Hold: 1/1 Frequency TYPE M Trig: Free Run #Atten: 10 dB IFGain:Low Auto Tune Mkr1 847.41 MHz -67.739 dBm Ref Offset 11.2 dB Ref 11.20 dBm 10 dB/div **Center Freq** 515.000000 MHz -14.51 dB Start Freq 30.000000 MHz Stop Freq 1.00000000 GHz CF Step 97.000000 MHz 0 Man Auto 01 2 Freq Offset 0 Hz Stop 1.0000 GHz Sweep 93.3 ms (20000 pts) Start 30.0 MHz #Res BW 100 kHz #VBW 300 kHz Points changed; all traces cleared STATUS

Conducted Spurious Emission (Mid-CH 19)

1 GHz ~ 3 GHz



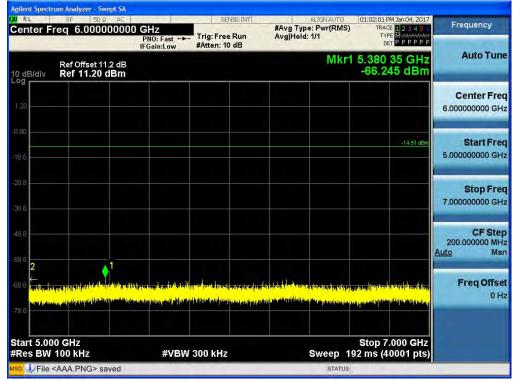


3 GHz ~ 5 GHz

gilent Spectrum Analyzer - Swept SA 01:01:50 PM Jan 04, 2017 #Avg Type: Pwr(RMS) Avg|Hold: 1/1 Frequency Center Freq 4.000000000 GHz TYPE M Trig: Free Run #Atten: 10 dB PNO: Fast IFGain:Low Mkr1 4.992 95 GHz -66.527 dBm Auto Tune Ref Offset 11.2 dB Ref 11.20 dBm 10 dB/div **Center Freq** 4.000000000 GHz -14.51 dB Start Freq 3.000000000 GHz Stop Freq 5.00000000 GHz CF Step 200.000000 MHz Ito Man Auto **Freq Offset** 0 Hz Stop 5.000 GHz Sweep 192 ms (40001 pts) Start 3.000 GHz #Res BW 100 kHz #VBW 300 kHz Points changed; all traces cleared STATUS

Conducted Spurious Emission (Mid-CH 19)

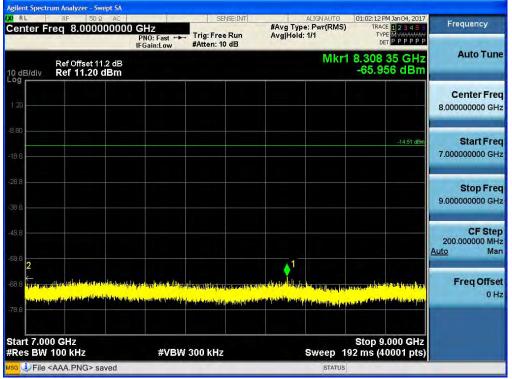
5 GHz ~ 7 GHz



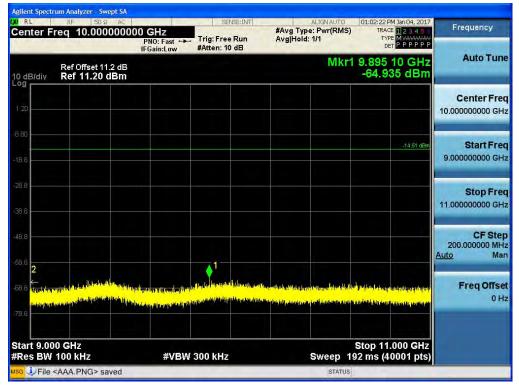


7 GHz ~ 9 GHz

Conducted Spurious Emission (Mid-CH 19)



9 GHz ~ 11 GHz



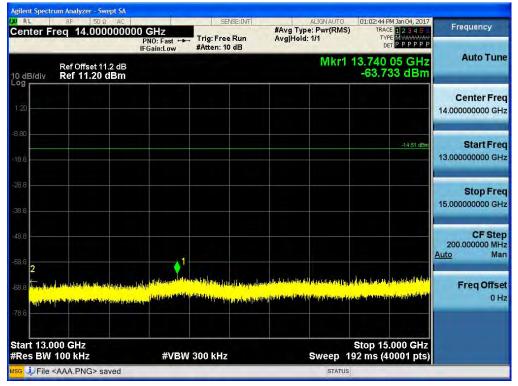


11 GHz ~ 13 GHz

gilent Spectrum Analyzer - Swept SA 32 PM Jan 04, 2017 #Avg Type: Pwr(RMS) Avg|Hold: 1/1 Frequency Center Freq 12.000000000 GHz TRACE 12345 TYPE M Trig: Free Run #Atten: 10 dB PNO: Fast IFGain:Low Mkr1 12.553 05 GHz -64.275 dBm Auto Tune Ref Offset 11.2 dB Ref 11.20 dBm 10 dB/div **Center Freq** 12.000000000 GHz -14.51 dB Start Freq 11.00000000 GHz Stop Freq 13.00000000 GHz CF Step 200.000000 MHz Ito Man Auto **Freq Offset** 0 Hz Stop 13.000 GHz Sweep 192 ms (40001 pts) Start 11.000 GHz #Res BW 100 kHz #VBW 300 kHz File <AAA.PNG> saved STATUS

Conducted Spurious Emission (Mid-CH 19)

13 GHz ~ 15 GHz



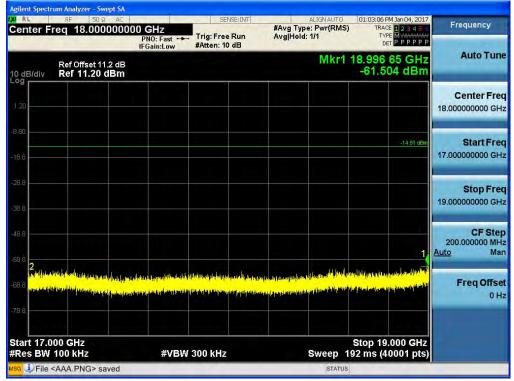


15 GHz ~ 17 GHz

gilent Spectrum Analyzer - Swept SA 5 PM Jan 04, 2017 #Avg Type: Pwr(RMS) Avg|Hold: 1/1 Frequency Center Freq 16.000000000 GHz Trig: Free Run #Atten: 10 dB PNO: Fast IFGain:Low Auto Tune Mkr1 16.377 70 GHz -61.920 dBm Ref Offset 11.2 dB Ref 11.20 dBm 10 dB/div **Center Freq** 16.00000000 GHz -14.51 dB Start Freq 15.00000000 GHz Stop Freq 17.00000000 GHz CF Step 200.000000 MHz Ito Man Auto **Freq Offset** 0 Hz Start 15.000 GHz #Res BW 100 kHz Stop 17.000 GHz Sweep 192 ms (40001 pts) #VBW 300 kHz File <AAA.PNG> saved STATUS

Conducted Spurious Emission (Mid-CH 19)

17 GHz ~ 19 GHz





19 GHz ~ 21 GHz

gilent Spectrum Analyzer - Swept SA Agitainspace M RL RF 50 Ω AC Center Freq 20.000000000 GHz PN0: Fast ↔ IFGain:Low 3:16 PM Jan 04, 2017 #Avg Type: Pwr(RMS) Avg|Hold: 1/1 Frequency TRACE 1 2 3 4 5 5 TYPE M M P P P P P Trig: Free Run #Atten: 10 dB Auto Tune Mkr1 20.906 15 GHz -58.762 dBm Ref Offset 11.2 dB Ref 11.20 dBm 10 dB/div **Center Freq** 20.00000000 GHz -14.51 dB Start Freq 19.00000000 GHz Stop Freq 21.00000000 GHz CF Step 200.000000 MHz Ito Man 1 Auto Freq Offset 0 Hz Stop 21.000 GHz Sweep 192 ms (40001 pts) Start 19.000 GHz #Res BW 100 kHz #VBW 300 kHz File <AAA.PNG> saved STATUS

Conducted Spurious Emission (Mid-CH 19)

21 GHz ~ 23 GHz

RL RF 50Ω AC Center Freq 22.00000000	O CHZ PNO: Fast +++ IFGain:Low #Atten: 10 dB	ALIGN AUTO 01:03:27 PM Jano #Avg Type: Pwr(RMS) TRACE 12 Avg Hold: 1/1 Type Mwy Det P.P.	Frequency
Ref Offset 11.2 dB dB/div Ref 11.20 dBm		Mkr1 21.067 65 0 -59.215 d	
.20			Center Fre 22.000000000 GH
88		-14	<u>.\$1 dBm</u> Start Fre 21.000000000 GH
18 8			Stop Fre 23.000000000 GH
8.8			CF Ste 200.000000 MH <u>Auto</u> Ma
SS 8	, der Malan med Alex (Malan y der proble als anternet) von der son er name in Staar met gestaar von meg aller genant von gestarten genant von gestarten genanten genanten genanten er name in Staar met gestaar von der son der so	l de acourte col let a ten el la racia regional a la cale de la cale de la compañía de la completa de la comple La propieta de la cale de la propieta de la cale de la c	Freq Offs 0 H
tart 21.000 GHz Res BW 100 kHz	#VBW 300 kHz	Stop 23.000 Sweep 192 ms (40001	



23 GHz ~ 25 GHz

XIRL RF 50Ω AC		SENSE:INT	ALIGNAUTO	01:03:37 PM Jan 04, 2017	Francisco
Center Freq 24.000000	000 GHz PNO: Fast ↔ IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type: Pwr(RMS) Avg Hold: 1/1	TRACE 12345 TYPE M WAAAAAAA DET P P P P P P	Frequency
Ref Offset 11.2 dE			Mkr1	24.633 90 GHz -55.393 dBm	Auto Tune
1.20					Center Free 24.000000000 GH:
18.8				-14,51 dBm)	Start Free 23.000000000 GH
28.8 38.8					Stop Fre 25.000000000 GH
48.8	a de a dificient de la compacta de l	s, therefore, produced and the state of the st	an a reday field at the start of the start		CF Stej 200.000000 MH <u>Auto</u> Ma
Karlington (l. gikanifaring dibada ang karling 58.8 <mark>kaling ang karling pang karling ang karling ang karling ang karling ang karling ang karling ang karling ang 78.8</mark>	ng ng ng lan n ^{al} an tang tang ti Kang sa Itong sa Ito	an for a state of the state of	<mark>i k i polizio di secondo della di secondo della d</mark>	i haayoo (ka Sirang peravledi ya Kirati	Freq Offse 0 H
Start 23.000 GHz #Res BW 100 kHz	#VBW :	300 kHz	Sweep 1	Stop 25.000 GHz 92 ms (40001 pts)	
sg JFile <aaa.png> saved</aaa.png>	_		STATUS		



9.6 RADIATED MEASUREMENT.

9.6.1 RADIATED SPURIOUS EMISSIONS.

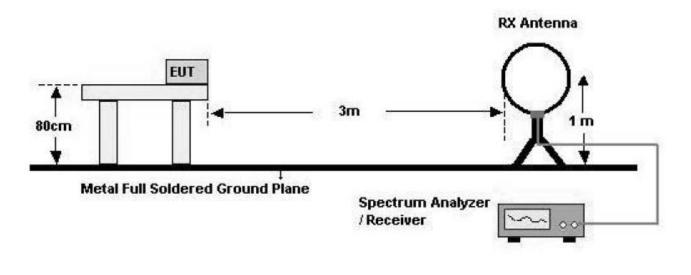
Test Requirements and limit, §15.205, §15.209

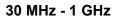
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

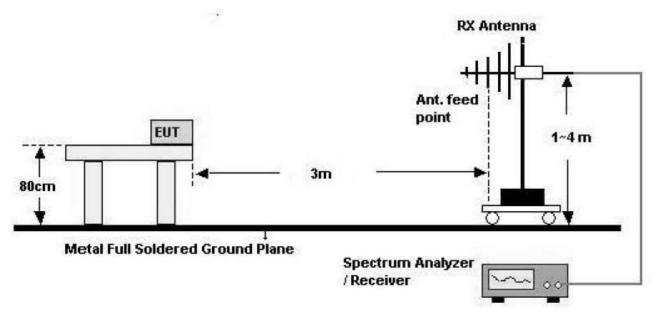


Test Configuration

Below 30 MHz



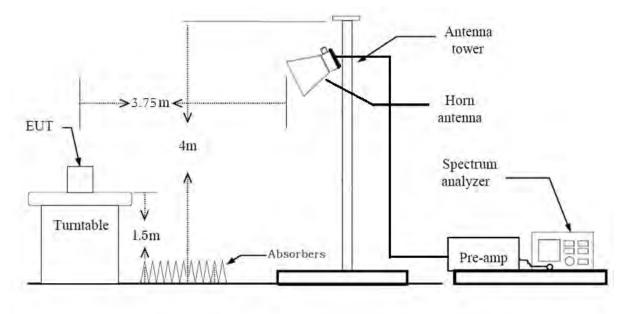






Model: LG-H870

Above 1 GHz



TEST PROCEDURE USED

Method 12.1 in KDB 558074 v03r05

Spectrum Setting

- Peak

Peak emission levels are measured by setting the instrument as follows:

RBW = cf. Table 1.

VBW \geq 3 x RBW.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweeps to continue until the trace stabilizes.

(Note that the required measurement time may be longer for low duty cycle applications).

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

Table 1 — RBW as a function of frequency



Average (duty cycle < 98%, duty cycle variations are less than ±2%)
Set RBW = 1 MHz
Set VBW ≥ 3 x RBW
Detector = RMS.
Averaging type = power (*i.e.*, RMS).
Sweep time = auto.
Trace mode = average (at least 100 traces).

A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle.

Note :

1. We are performed the RSE and radiated band edge using standard radiated method(RMS).

2. According to SVSWR requirement in ANSI 63.4-2014, We performed the radiated test at 3.75 m distance from center of turn table. So, we applied the distance factor(reference distance : 3 m).

3. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)

Data packet length (Min)

LE Mode	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
	0.3901	0.6245	0.6247	2.04

Data packet length (Max)

LE Mode	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
	2.1350	2.5000	0.8540	0.69



TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin	
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB	
No Critical peaks found								

- 1. Measuring frequencies from 9 kHz to the 30MHz.
- 2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
- 3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
- 4. Limit line = specific Limits (dBuV) + Distance extrapolation factor
- 5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



TEST RESULTS

Below 1 GHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin	
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB	
No Critical peaks found								

- 1. Measuring frequencies from 30 MHz to the 1 GHz.
- 2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
- 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



Frequency	Reading	Duty Cycle Factor	A.F.+C.LA.G.+D.F.	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV/m]	[dB]	[dBm]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4804	49.10	0.00	-0.61	V	48.49	73.98	25.49	PK
4804	36.87	2.04	-0.61	V	38.3	53.98	15.68	AV
7206	45.65	0.00	8.78	V	54.43	73.98	19.55	PK
7206	34.01	2.04	8.78	V	44.83	53.98	9.15	AV
4804	49.68	0.00	-0.61	Н	49.07	73.98	24.91	PK
4804	36.92	2.04	-0.61	Н	38.35	53.98	15.63	AV
7206	45.98	0.00	8.78	Н	54.76	73.98	19.22	PK
7206	34.08	2.04	8.78	Н	44.9	53.98	9.08	AV

Above 1 GHz

Operation Mode: CH.0_ Data packet length (Min)

*A.F. : Antenna Factor / C.L. : Cable Loss / A.G. : Amplifier Gain / D.F. : Distance Factor

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- 3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4. Total = Reading Value + Antenna Factor + Cable Loss Amp Gain + Distance Factor
 + Duty Cycle Factor
- 5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
- 6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



Model: LG-H870

Frequency	Reading	Duty Cycle Factor	A.F.+C.LA.G.+D.F.	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV/m]	[dB]	[dBm]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4880	49.89	0.00	0.19	V	50.08	73.98	23.90	PK
4880	37.95	2.04	0.19	V	40.18	53.98	13.80	AV
7320	45.43	0.00	8.85	V	54.28	73.98	19.70	PK
7320	34.12	2.04	8.85	V	45.01	53.98	8.97	AV
4880	49.87	0.00	0.19	Н	50.06	73.98	23.92	PK
4880	38.07	2.04	0.19	Н	40.3	53.98	13.68	AV
7320	45.76	0.00	8.85	Н	54.61	73.98	19.37	PK
7320	34.15	2.04	8.85	н	45.04	53.98	8.94	AV

Operation Mode: CH.19 Data packet length (Min)

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

- 2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- 3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4. Total = Reading Value + Antenna Factor + Cable Loss Amp Gain + Distance Factor+ Duty Cycle Factor
- 5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
- 6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



Model: LG-H870

Frequency	Reading	Duty Cycle Factor	A.F.+C.LA.G.+D.F.	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV/m]	[dB]	[dBm]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4960	50.22	0.00	0.92	V	51.14	73.98	22.84	PK
4960	38.39	2.04	0.92	V	41.35	53.98	12.63	AV
7440	45.26	0.00	9.03	V	54.29	73.98	19.69	PK
7440	33.98	2.04	9.03	V	45.05	53.98	8.93	AV
4960	49.94	0.00	0.92	Н	50.86	73.98	23.12	PK
4960	38.41	2.04	0.92	Н	41.37	53.98	12.61	AV
7440	46.85	0.00	9.03	Н	55.88	73.98	18.10	PK
7440	34.07	2.04	9.03	Н	45.14	53.98	8.84	AV

Operation Mode: CH.39 Data packet length (Min)

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

- 2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- 3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4. Total = Reading Value + Antenna Factor + Cable Loss Amp Gain + Distance Factor+ Duty Cycle Factor
- 5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
- 6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



Model: LG-H870

Frequency	Reading	Duty Cycle Factor	A.F.+C.LA.G.+D.F.	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV/m]	[dB]	[dBm]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4804	49.10	0.00	-0.61	V	48.49	73.98	25.49	PK
4804	36.92	0.69	-0.61	V	37	53.98	16.98	AV
7206	45.56	0.00	8.78	V	54.34	73.98	19.64	PK
7206	33.94	0.69	8.78	V	43.41	53.98	10.57	AV
4804	49.31	0.00	-0.61	Н	48.7	73.98	25.28	PK
4804	36.87	0.69	-0.61	Н	36.95	53.98	17.03	AV
7206	45.86	0.00	8.78	Н	54.64	73.98	19.34	PK
7206	34.03	0.69	8.78	Н	43.5	53.98	10.48	AV

Operation Mode: CH.0 Data packet length (Max)

*A.F. : Antenna Factor / C.L. : Cable Loss / A.G. : Amplifier Gain / D.F. : Distance Factor

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- 3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4. Total = Reading Value + Antenna Factor + Cable Loss Amp Gain + Distance Factor + Duty Cycle Factor
- 5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
- 6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



Model: LG-H870

Frequency	Reading	Duty Cycle Factor	A.F.+C.LA.G.+D.F.	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV/m]	[dB]	[dBm]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4880	49.25	0.00	0.19	V	49.44	73.98	24.54	PK
4880	38.13	0.69	0.19	V	39.01	53.98	14.97	AV
7320	45.34	0.00	8.85	V	54.19	73.98	19.79	PK
7320	34.09	0.69	8.85	V	43.63	53.98	10.35	AV
4880	50.12	0.00	0.19	Н	50.31	73.98	23.67	PK
4880	38.02	0.69	0.19	Н	38.9	53.98	15.08	AV
7320	45.81	0.00	8.85	Н	54.66	73.98	19.32	PK
7320	34.18	0.69	8.85	Н	43.72	53.98	10.26	AV

Operation Mode: CH.19 Data packet length (Max)

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

- 2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- 3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4. Total = Reading Value + Antenna Factor + Cable Loss Amp Gain + Distance Factor
 + Duty Cycle Factor
- 5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
- 6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



Model: LG-H870

Frequency	Reading	Duty Cycle Factor	A.F.+C.LA.G.+D.F.	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV/m]	[dB]	[dBm]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4960	50.33	0.00	0.92	V	51.25	73.98	22.73	PK
4960	38.44	0.69	0.92	V	40.05	53.98	13.93	AV
7440	45.17	0.00	9.03	V	54.2	73.98	19.78	PK
7440	34.02	0.69	9.03	V	43.74	53.98	10.24	AV
4960	50.07	0.00	0.92	Н	50.99	73.98	22.99	PK
4960	38.36	0.69	0.92	Н	39.97	53.98	14.01	AV
7440	45.90	0.00	9.03	Н	54.93	73.98	19.05	PK
7440	34.10	0.69	9.03	Н	43.82	53.98	10.16	AV

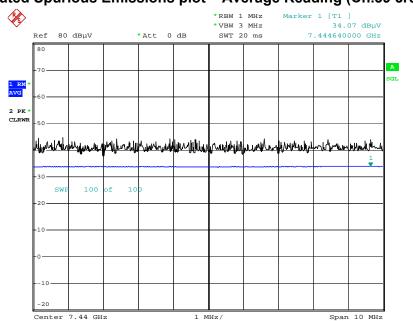
Operation Mode: CH.39 Data packet length (Max)

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

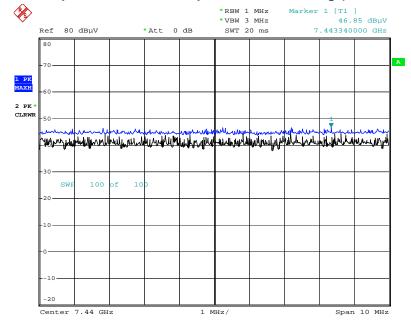
- 2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- 3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4. Total = Reading Value + Antenna Factor + Cable Loss Amp Gain + Distance Factor
 + Duty Cycle Factor
- 5. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
- 6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.





RESULT PLOTS_Data packet length (Min) (Worst case : X-H) Radiated Spurious Emissions plot – Average Reading (Ch.39 3rd Harmonic)

Date: 5.JAN.2017 17:01:34

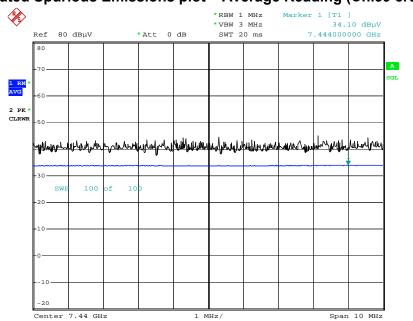




Date: 5.JAN.2017 17:01:00

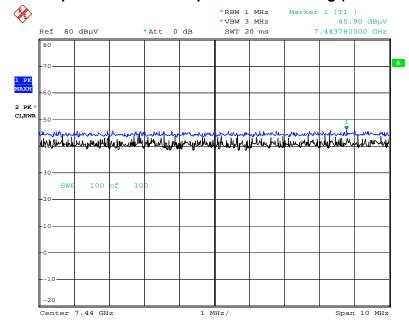
Note : Only the worst case plots for Radiated Spurious Emissions.





RESULT PLOTS_Data packet length (Max) (Worst case : X-H) Radiated Spurious Emissions plot – Average Reading (Ch.39 3rd Harmonic)

Date: 5.JAN.2017 17:02:12



Radiated Spurious Emissions plot – Peak Reading (Ch.39 3rd Harmonic)

Date: 5.JAN.2017 17:02:39

Note : Only the worst case plots for Radiated Spurious Emissions.



9.6.2 RADIATED RESTRICTED BAND EDGES

Test Requirements and limit, §15.247(d) §15.205, §15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c)).

Operation Mode
Operating Frequency
Channel No.

BT LE Data packet length (Min)

2402 MHz

0

Frequency	Reading	Duty Cycle Factor	A.F.+C.L.+D.F.	Ant. Pol.	Total	Limit	Margin	Measurement
[MHz]	[dBuV/m]	[dB]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
2390.0	15.22	0.00	32.68	Н	47.90	73.98	26.08	PK
2390.0	4.18	2.04	32.68	Н	38.90	53.98	15.08	AV
2390.0	14.94	0.00	32.68	V	47.62	73.98	26.36	PK
2390.0	4.11	2.04	32.68	V	38.83	53.98	15.15	AV

BT_	LE	Data	packet	length

Operating Frequency Channel No.

Operation Mode

n (Max) 2402 MHz 0

Frequency	Reading	Duty Cycle Factor	A.F.+C.L.+D.F.	Ant. Pol.	Total	Limit	Margin	Measurement
[MHz]	[dBuV/m]	[dB]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
2390.0	15.52	0.00	32.68	Н	48.20	73.98	25.78	PK
2390.0	4.26	0.69	32.68	Н	37.63	53.98	16.35	AV
2390.0	15.35	0.00	32.68	V	48.03	73.98	25.95	PK
2390.0	4.09	0.69	32.68	V	37.46	53.98	16.52	AV



- 1. Frequency range of measurement = 2310 MHz ~ 2390 MHz
- 2. Total = Reading Value + Antenna Factor + Cable Loss + Duty Cycle Factor + Distance Factor
- 3. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
- 4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



Model: LG-H870

Operation Mode	BT_LE Data packet length (Min)
Operating Frequency	2480 MHz
Channel No.	39

Frequency	Reading	Duty Cycle Factor	A.F.+C.L.+D.F.	Ant. Pol.	Total	Limit	Margin	Measurement
[MHz]	[dBuV/m]	[dB]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
2483.5	15.58	0.00	33.05	н	48.63	73.98	25.35	PK
2483.5	4.34	2.04	33.05	н	39.43	53.98	14.55	AV
2483.5	15.34	0.00	33.05	V	48.39	73.98	25.59	PK
2483.5	4.13	2.04	33.05	V	39.22	53.98	14.77	AV

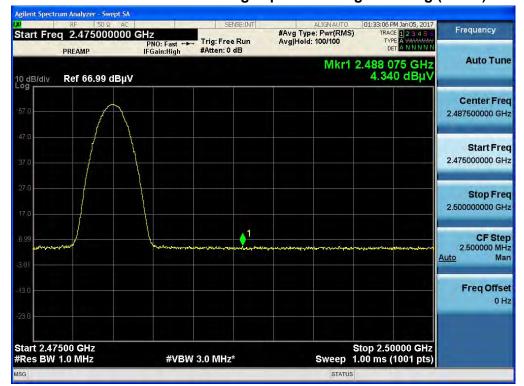
Operation Mode Operating Frequency Channel No. BT_LE Data packet length (Max)

2480 MHz 39

Frequency [MHz]	Reading [dBuV/m]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	Ant. Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	15.48	0.00	33.05	н	48.53	73.98	25.45	PK
2483.5	4.63	0.69	33.05	н	38.37	53.98	15.61	AV
2483.5	15.23	0.00	33.05	V	48.28	73.98	25.70	PK
2483.5	4.40	0.69	33.05	V	38.14	53.98	15.85	AV

- 1. Frequency range of measurement = 2483.5 MHz ~ 2500 MHz
- 2. Total = Reading Value + Antenna Factor + Cable Loss + Duty Cycle Factor + Distance Factor
- 3. Distance extrapolation factor = 20 log (test distance / specific distance) (dB)
- 4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.





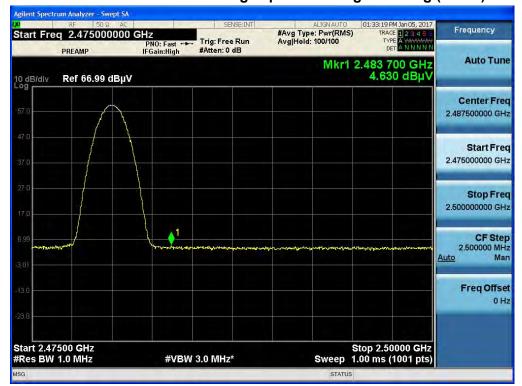
RESULT PLOTS_Data packet length (Min) (Worst case : X-H) Radiated Restricted Band Edges plot – Average Reading (Ch.39)

Radiated Restricted Band Edges plot – Peak Reading (Ch.39)



Note : Only the worst case plots for Radiated Restricted Band Edges.





RESULT PLOTS_Data packet length (Max) (Worst case : X-H) Radiated Restricted Band Edges plot – Average Reading (Ch.39)

Radiated Restricted Band Edges plot – Peak Reading (Ch.39)



Note : Only the worst case plots for Radiated Restricted Band Edges.



9.7 POWERLINE CONDUCTED EMISSIONS

Test Requirements and limit, §15.207

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

	Limits (dBµV)				
Frequency Range (MHz)	Quasi-peak	Average			
0.15 to 0.50	66 to 56	56 to 46			
0.50 to 5	56	46			
5 to 30	60	50			

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

- 1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
- 2. The EUT is connected via LISN to a test power supply.
- 3. The measurement results are obtained as described below:
- 4. Detectors Quasi Peak and Average Detector.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor



RESULT PLOTSConducted Emissions (Line 1)

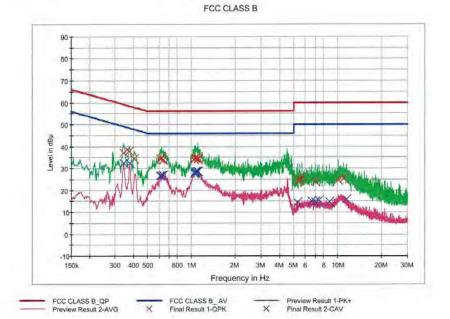
EMI Auto Test(7)

1/2

HCT TEST Report

Common Information

EUT: Manufacturer: Test Site: Operating Conditions: LG-H870 LG SHIELD ROOM BT LE MODE



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.346000	37.3	9.000	Off	L1	9.7	21.8	59.1
0.374000	37.7	9.000	Off	L1	9.7	20.8	58.4
0.406000	34.3	9.000	Off	L1	9.7	23.5	57.7
0.612000	34.4	9.000	Off	L1	9.7	21.6	56.0
0.626000	34.8	9.000	Off	L1	9.7	21.2	56.0
0.636000	33.8	9.000	Off	L1	9.7	22.2	56.0
1.050000	34.1	9.000	Off	L1	9.7	21.9	56.0
1.056000	34.8	9.000	Off	L1	9.7	21.2	56.0
1.064000	34.7	9.000	Off	L1	9.7	21.3	56.0
1.074000	34.9	9.000	Off	L1	9.7	21.1	56.0
1.102000	34.7	9.000	Off	L1	9.7	21.3	56.0
1.108000	34.0	9.000	Off	L1	9.7	22.0	56.0
5.284000	24.2	9.000	Off	L1	9.9	35.8	60.0
5.500000	24.7	9.000	Off	L1	9.9	35.3	60.0
5.718000	25.8	9.000	Off	L1	9.9	34.2	60,0
7.036000	23.9	9.000	Off	L1	10.0	36.1	60.0
10.122000	24.4	9.000	Off	L1	10.1	35.6	60.0
10.998000	25.2	9.000	Off	L1	10.1	34.8	60.0

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EMI Auto Test(7)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.344000	32.3	9.000	Off	L1	9.7	16.8	49.1
0.378000	32,2	9.000	Off	L1	9.7	16.1	48.3
0.614000	26.5	9.000	Off	L1	9.7	19.5	46.0
0.622000	26,5	9.000	Off	L1	9.7	19.5	46.0
0.626000	26.7	9.000	Off	L1	9.7	19.3	46.0
0.638000	26.9	9.000	Off	L1	9.7	19.1	46.0
1.050000	27.8	9.000	Off	L1	9.7	18.2	46.0
1.054000	28.0	9.000	Off	L1	9.7	18.0	46.0
1.058000	28.2	9.000	Off	L1	9.7	17.8	46.0
1.064000	28.5	9.000	Off	L1	9.7	17.5	46.0
1.094000	28.5	9.000	Off	L1	9.7	17.5	46.0
1.102000	28,7	9.000	Off	L1	9.7	17.3	46.0
5.284000	14.6	9.000	Off	L1	9.9	35.4	50.0
6.600000	15.1	9.000	Off	L1	10.0	34.9	50.0
7.036000	14.6	9.000	Off	L1	10.0	35.4	50.0
7.480000	15.5	9.000	Off	L1	10.0	34.5	50.0
8,800000	14.8	9.000	Off	L1	10.1	35.2	50.0
11.432000	15.8	9.000	Off	L1	10.1	34.2	50.0

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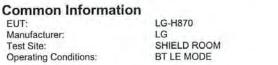


Conducted Emissions (Line 2)

EMI Auto Test(7)

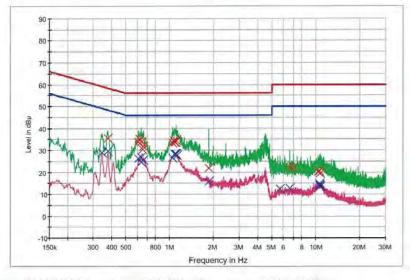
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HCT TEST Report





FCC CLASS B



FCC CLASS B_AV Final Result 1-QPK FCC CLASS B_QP Preview Result 2-AVG Preview Result 1-PK+ Final Result 2-CAV × ×

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.376000	35.5	9.000	Off	N	9.7	22.8	58.4
0.614000	33.7	9.000	Off	N	9.7	22.3	56.0
0.624000	35.2	9.000	Off	N	9.7	20.8	56.0
0.636000	33.6	9.000	Off	N	9.7	22.4	56.0
0.656000	30.5	9.000	Off	N	9.7	25.5	56.0
0.662000	31.9	9.000	Off	N	9.7	24.1	56.0
1.042000	33.3	9.000	Off	N	9.7	22.7	56.0
1.072000	34.5	9.000	Off	N	9.7	21.5	56.0
1.078000	33.8	9.000	Off	N	9.7	22.2	56.0
1.092000	33.9	9.000	Off	N	9.7	22.1	56.0
1.112000	34.4	9.000	Off	N	9.7	21.6	56.0
1.850000	21.8	9.000	Off	N	9.7	34.2	56.0
6.602000	22.1	9.000	Off	N	10.0	37.9	60.0
7.034000	22.2	9.000	Off	N	10.0	37.8	60.0
10.352000	20.2	9.000	Off	N	10.1	39.8	60.0
10.558000	20.3	9.000	Off	N	10.1	39.7	60.0
10.666000	19.4	9.000	Off	N	10.1	40.6	60.0
10.700000	19.4	9.000	Off	N	10.1	40.6	60.0

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EMI Auto Test(7)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.344000	29.1	9.000	Off	N	9.7	20.0	49.1
0.378000	29.7	9.000	Off	N	9.7	18.6	48.3
0.614000	26,2	9.000	Off	N	9.7	19.8	46.0
0.638000	26.8	9.000	Off	N	9.7	19.2	46.0
0.642000	24.5	9.000	Off	N	9.7	21.5	46.0
0.662000	25.6	9.000	Off	N	9.7	20.4	46.0
1.042000	26.7	9.000	Off	N	9.7	19.3	46.0
1.078000	28,1	9.000	Off	N	9.7	17.9	46.0
1.094000	28.3	9.000	Off	N	9.7	17.7	46.0
1.112000	28,1	9.000	Off	N	9.7	17.9	46.0
1.126000	27.7	9.000	Off	N	9.7	18.3	46.0
1.850000	15.7	9.000	Off	N	9.7	30.3	46.0
5,714000	12,4	9.000	Off	N	9.9	37.6	50.0
6.602000	12.8	9.000	Off	N	10.0	37.2	50.0
10,558000	14.7	9.000	Off	N	10.1	35.3	50.0
10.594000	13.9	9.000	Off	N	10.1	36.1	50.0
10.664000	13,9	9.000	Off	N	10.1	36.1	50.0
10.728000	13.6	9.000	Off	N	10.1	36.4	50.0

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10. LIST OF TEST EQUIPMENT

10.1 LIST OF TEST EQUIPMENT(Conducted Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	12/23/2016	Annual	100073
Rohde & Schwarz	ESCI / Test Receiver	12/23/2016	Annual	100584
Agilent	N9020A / Signal Analyzer	06/24/2016	Annual	MY51110085
Agilent	N9030A / Signal Analyzer	11/30/2016	Annual	MY49431210
Agilent	N1911A / Power Meter	03/11/2016	Annual	MY45100523
Agilent	N1921A / Power Sensor	03/11/2016	Annual	MY52260025
Agilent	87300B / Directional Coupler	11/23/2016	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	06/14/2016	Annual	05001
Hewlett Packard	E3632A / DC Power Supply	03/09/2016	Annual	KR75303962
Agilent	8493C / Attenuator(10 dB)	07/15/2016	Annual	07560
Rohde & Schwarz	CBT / Bluetooth Tester	05/16/2016	Annual	100422



10.2 LIST OF TEST EQUIPMENT(Radiated Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Audix	AM4000 / Antenna Position Tower	N/A	N/A	N/A
Audix	Turn Table	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	060520
Rohde & Schwarz	Loop Antenna	02/23/2016	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	04/15/2015	Biennial	255
Schwarzbeck	BBHA 9120D / Horn Antenna	05/07/2015	Biennial	937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	09/03/2015	Biennial	BBHA9170541
Rohde & Schwarz	FSP / Spectrum Analyzer	09/10/2016	Annual	100688
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/23/2016	Annual	101068-SZ
Wainwright Instruments	WHK3.0/18G-10EF / High Pass Filter	06/24/2016	Annual	8
Wainwright Instruments	WHFX7.0/18G-8SS / High Pass Filter	05/13/2016	Annual	29
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	07/06/2016	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	01/26/2016	Annual	2
Agilent	8493C-10 / Attenuator(10 dB)	08/11/2016	Annual	76649
CERNEX	CBLU1183540 / Power Amplifier	07/15/2016	Annual	22964
CERNEX	CBL06185030 / Power Amplifier	07/15/2016	Annual	22965
CERNEX	CBL18265035 / Power Amplifier	07/11/2016	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	07/11/2016	Annual	25956
TESCOM	TC-3000C / Bluetooth Tester	04/01/2016	Annual	3000C000276