

FCC BT REPORT

FCC Certification

Applicant Name: LG Electronics MobileComm U.S.A., Inc.

Address:

1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Issue: May 29, 2015 Test Site/Location: HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea Report No.: HCT-R-1505-F014

HCT FRN: 0005866421

FCC ID : ZNFH735

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

FCC Model(s):	LG-H735
Additional Model(s):	LGH735, H735, LG-H735L,LGH735L,H735L
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA and LTE Phone with Bluetooth, Wi-Fi and NFC
Max. RF Output Power:	10.42 dBm (11.02mW)
Frequency Range:	2402 MHz - 2480 MHz (Bluetooth)
Modulation type	GFSK(Normal), π /4DQPSK and 8DPSK(EDR)
FCC Classification:	FCC Part 15 Spread Spectrum Transmitter
FCC Rule Part(s):	Part 15 subpart C 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 : Jung Lae Cho Test Engineer of RF Team

Approved by : Sang Jun Lee Manager of RF Team

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1505-F014	May 29, 2015	- First Approval Report



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Model: LG-H735

1. GENERAL INFORMATION

Applicant:	LG Electronics MobileComm U.S.A., Inc								
Address:	1000 Sylvan Avenue, Englewood Cliffs NJ 07632								
FCC ID:	ZNFH735								
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA and LTE Phone with Bluetooth, Wi-Fi and NFC								
Model name(s):	LG-H735								
Additional Model name(s):	LGH735, H735, LG-H735L,LGH735L,H735L								
Date(s) of Tests:	May 12, 2015 ~ May 21, 2015								
Place of Tests:	HCT Co., Ltd. 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea								
	(IC Recognition No. : 5944A-3)								

2. EUT DESCRIPTION

FCC Model Name	LG-H735
Additional Name	LGH735, H735, LG-H735L,LGH735L,H735L
EUT Type	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA and LTE Phone with Bluetooth, Wi-Fi and NFC
Power Supply	DC 3.85 V
Battery type	Li-ion Battery(Standard)
Frequency Range	2402 MHz - 2480 MHz (Bluetooth)
Transmit Power	10.42 dBm (11.02mW)
BT Operating Mode	Normal, EDR, AFH
Modulation Type	GFSK(Normal), π/4DQPSK and 8DPSK(EDR)
Modulation Technique	FHSS
Number of Channels	79Channels, Minimum 20 Channels(AFH)
	Manufacturer: Ace Technology
Antenna Specification	Antenna type: INTERNAL Antenna
	Peak Gain : -1.33 dBi

※ 15.247 Requirements for Bluetooth transmitter

• This Bluetooth module has been tested by a Bluetooth Qualification Lab, and we confirm the following:

1) This system is hopping pseudo-randomly.

2) Each frequency is used equally on the average by each transmitter.

3) The receiver input bandwidths that match the hopping channel bandwidths of their corresponding transmitters

4) The receiver shifts frequencies in synchronization with the transmitted signals.

• 15.247(g): The system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this Section 15.247 should the transmitter be presented with a continuous data (or information) stream.

• 15.247(h): The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.



3. TEST METHODOLOGY

The measurement procedure described in the American National Standard for Testing Unlicensed Wireless Devices(ANSI C63.4-2003) and FCC Public Notice DA 00-705 dated March 30, 2000 entitled "Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems" were used in the measurement of the LG Electronics MobileComm U.S.A., Inc.

Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA and LTE Phone with Bluetooth, Wi-Fi and NFC FCC ID: ZNFH735

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 13.1.4.1 of ANSI C63.4. (Version :2003) 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. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 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 13.1.4.1 of ANSI C63.4. (Version: 2003). To record the final measurements, the analyzer detector function was set to CISPR quasi-peak mode and the bandwidth of the spectrum analyzer was set to 120 kHz for frequencies below 1 GHz or 1 MHz for frequencies above 1 GHz. For average measurements above 1 GHz, the analyzer was set to peak detector with a reduced VBW setting(RBW = 1 MHz, VBW = 1/T Hz, where T = Pulse width).

Conducted Antenna Terminal See Section from 8.1 to 8.6.1.(DA 00-705)



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.

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 :2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated February 28, 2014 (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. SUMMARY OF TEST RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
20 dB Bandwidth	§15.247(a)(1)(ii) or (iii)	N/A		PASS
Occupied Bandwidth	N/A	N/A		N/A
Conducted Maximum Peak Output Power	§15.247(b)(1)	< 1 Watts if ≥ 75 non- overlapping hopping channels used < 125 Milliwatts if < 75 non- overlapping hopping channels used		PASS
Carrier Frequency Separation	§15.247(a)(1)	>25 kHz or >2/3 of the 20dB BW	CONDUCTED	PASS
Number of Hopping Frequencies	§15.247(a)(1)(iii)	>15		PASS
Time of Occupancy	§15.247(a)(1)(iii)	<400 ms		PASS
Conducted Spurious Emissions	§15.247(d)	> 20 dB for all out-of band emissions		PASS
Band Edge(Out of Band Emissions)	§15.247(d)	> 20 dB for all out-of band emissions		PASS
AC Power line Conducted Emissions	§15.207(a)	cf. Section 8.7		PASS
Radiated Spurious Emissions	§15.247(d), 15.205, 15.209	cf. Section 8.6.2	DADIATED	PASS
Radiated Restricted Band Edge	§15.247(d), 15.205, 15.209	cf. Section 8.6.3	RADIATED	PASS



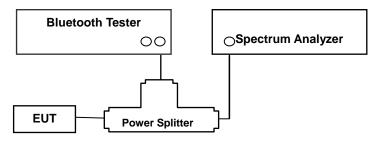
8. FCC PART 15.247 REQUIREMENTS 8.1 PEAK POWER

LIMIT

The maximum peak output power of the intentional radiator shall not exceed the following:

- For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 W. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 W.
- 2. The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. The Spectrum Analyzer is set to the peak detector mode. This test is performed with hopping off.

The Spectrum Analyzer is set to (DA 00-705)

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel RBW > the 20 dB bandwidth of the emission being measured VBW \geq RBW Sweep = Auto Detector = Peak Trace = Max hold

SAMPLE CALCULATION

Output Power = Spectrum Reading Power + Power Splitter loss + Cable loss(2 ea)

= 10 dBm + 6 dB + 1.5 dB = 17.5 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 splitter and cable combination.
- 2. Spectrum offset = Power Splitter loss + Cable loss



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3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the splitter and cable combination is 6.51 dB at 2402 MHz and is 6.54 dB at 2480 MHz. So, 6.5 dB is offset. And the offset gap in the 2.4 GHz range do not affect the conducted peak power final result

TEST RESULTS

No non-compliance noted

Test Data

Channel	Frequency	-	t Power FSK)	Limit	Result
	(MHz)	(dBm)	(mW)	(mW)	
Low	2402	8.94	7.83		PASS
Mid	2441	10.32	10.76	125	PASS
High	2480	8.92	7.80		PASS

Channel	Frequency	Output Power (8DPSK)		Output (π/4DC		Limit	Result	
	(MHz)	(dBm)	(mW)	(dBm)	(mW)	(mW)		
Low	2402	8.92	7.80	8.83	7.64		PASS	
Mid	2441	10.42	11.02	10.31	10.74	125	PASS	
High	2480	8.92	7.80	8.81	7.60		PASS	



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Test Plots (GFSK) Peak Power (Low-CH)

Agilent Spectrum Analyzer - Swept SA					
Center Freq 2.40200000		#Avg Type: Run Avg Hold:>	Pwr(RMS) TRAC	M Apr 05, 2015 E 1 2 3 4 5 6 E M WWWWW T P N N N N N	Frequency
Ref Offset 6.5 dB 10 dB/div Ref 20.00 dBm	in Gain. Low white of G		Mkr1 2.401 8.94	80 GHz 43 dBm	Auto Tune
10.0	<u>1</u>				Center Freq 2.402000000 GHz
-10.0					Start Freq 2.397000000 GHz
-20.0					Stop Freq 2.407000000 GHz
-40.0					CF Step 1.000000 MHz <u>Auto</u> Man
-60.0					Freq Offset 0 Hz
Center 2.402000 GHz #Res BW 3.0 MHz	#VBW 50 MHz		Span 1 Sweep 1.00 ms (0.00 MHz 1001 pts)	
MSG			STATUS		

Test Plots (GFSK) Peak Power (Mid-CH)

LXI			2 AC		SE	NSE:INT		ALIGNAUTO		PM Apr 05, 2015	Frequency
Ger	iller Fr	eq 2.441(Р	NO: Fast 🖵 Gain:Low	Trig: Free #Atten: 30		Avg Hold:		TY		
	B/div	Ref Offset 6. Ref 20.00	5 dB	Sameon				Mkr	1 2.440 10.3	88 GHz 22 dBm	Auto Tune
Log 10.0					♦	1 					Center Freq 2.441000000 GHz
0.00											Start Freq 2.436000000 GHz
-20.0	/										Stop Freq 2.446000000 GHz
-30.0 -40.0											CF Step 1.000000 MHz <u>Auto</u> Man
-50.0											Freq Offset
-70.0											0 Hz
#Re		41000 GHz 3.0 MHz		#VBW	50 MHz			-	1.00 ms (0.00 MHz (1001 pts)	
MSG								STATUS			



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Test Plots (GFSK) Peak Power (High-CH)

Agilent Spectr	um Analyzer - Swe				- 100-00 - X4 100					
Center F	req 2.4800	AC 00000 G	Hz				ALIGNAUTO e: Pwr(RMS)	TRAC	M Apr 05, 2015	Frequency
10 dB/div	Ref Offset 6.5 Ref 20.00 (IF(NO: Fast 🍙 Gain:Low	#Atten: 30		Avgirioid.		1 2.479	81 GHz 9 dBm	Auto Tune
10.0				•						Center Freq 2.480000000 GHz
-10.0										Start Freq 2.475000000 GHz
-20.0										Stop Freq 2.485000000 GHz
-40.0										CF Step 1.000000 MHz <u>Auto</u> Man
-60.0										Freq Offset 0 Hz
	180000 GHz 3.0 MHz		#VBW	50 MHz			Sweep	Span 1 1.00 m <u>s (</u>	0.00 MHz 1001 pts)	
MSG							STATUS			

Test Plots (8DPSK) Peak Power (Low-CH)

Agilent Spectrum Analyzer - Swept SA IXI RF 50 Q AC				5 PM Apr 05, 2015	Frequency
Center Freq 2.40200000	PNO: Fast 😱 Trig: Free	Run Avg Hold:	>1/1 T	ACE 123456 YPE MWWWWWW DET PNNNNN	· · · · · · · · · · · · · · · · · · ·
Ref Offset 6.5 dB 10 dB/div Ref 15.00 dBm	IFGain:Low #Atten: 20) dB	Mkr1 2.401		Auto Tune
5.00		1			Center Freq 2.402000000 GHz
-15.0					Start Freq 2.397000000 GHz
-25.0					Stop Freq 2.407000000 GHz
-45.0					CF Step 1.000000 MHz <u>Auto</u> Man
-65.0					Freq Offset 0 Hz
-75.0 Center 2.402000 GHz #Res BW 3.0 MHz	#VBW 50 MHz		Span Sweep 1.00 ms	10.00 MHz (1001 pts)	
MSG			STATUS		



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Test Plots (8DPSK) Peak Power (Mid-CH)

Agilent Spectru	m Analyzer - Swept SA							
Center Fr	RF 50 Ω AC eq 2.44100000	PNO: Fast 🖕	SENSE:INT	Avg Type: Avg Hold>			MApr 05, 2015 1 2 3 4 5 6 M WWWWWW P N N N N N	Frequency
10 dB/div	Ref Offset 6.5 dB Ref 15.00 dBm	IFGain:Low	#Atten: 20 dB		Mkr1	2.440	85 GHz 27 dBm	Auto Tune
5.00								Center Freq 2.441000000 GHz
-5.00								Start Freq 2.436000000 GHz
-25.0								Stop Freq 2.446000000 GHz
-45.0								CF Step 1.000000 MHz <u>Auto</u> Man
-65.0								Freq Offset 0 Hz
-75.0						Onemati		
Center 2.4 #Res BW 3	41000 GHz 3.0 MHz	#VBW	50 MHz		Sweep 1	.00 ms (1	0.00 MHz 1001 pts)	
MSG					STATUS			

Test Plots (8DPSK) Peak Power (High-CH)

Agilent		Analyzer - Sw	ept SA		SEI	NSE:INT	ALIGNAUTO	05:46:59	PM Apr 05, 2015	
		2.4800	00000 G	Hz NO: Fast 🗔			: Log-Pwr	TRA	CE 1 2 3 4 5 6 PE MWWWWWW ET P N N N N N	Frequency
			IF	Gain:Low	#Atten: 20	dB	 Mkr		89 GHz	Auto Tune
10 dBi Log 🖵		ef Offset 6. ef 15.00 (IVINI	8.9	20 dBm	
					\	1				Center Freq
5.00 -										2.480000000 GHz
-5.00									<u> </u>	
-15.0										Start Freq 2.475000000 GHz
	and the second second									
-25.0										Stop Freq
-35.0 -										2.485000000 GHz
-45.0										CF Step
-55.0 -										1.000000 MHz <u>Auto</u> Man
-33.0										
-65.0 -										Freq Offset 0 Hz
-75.0										
	er 2.480 BW 3.0)000 GHz) MHz		#VBW	50 MHz		Sweep	Span 1 1.00 ms (0.00 MHz (1001 pts)	
MSG							STATUS	6		



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Test Plots (π/4DQPSK) Peak Power (Low-CH)

Agilent Spectrum Analyzer - Swept SA					
Center Freq 2.40200000	0 GHz	Avg Type	Log-Pwr TR4	PM Apr 05, 2015 ACE 123456	Frequency
	PNO: Fast ↔→ Trig: Free IFGain:Low #Atten: 30				Auto Turo
Ref Offset 6.5 dB 10 dB/div Ref 16.50 dBm			Mkr1 2.401 8.8	94 GHz 334 dBm	Auto Tune
		1			Center Freq
6.50					2.402000000 GHz
-3.50					Start Freq
-13.5					2.397000000 GHz
-23.5					Stop Freq
-33.5					2.407000000 GHz
					CF Step
-43.5					1.000000 MHz Auto Man
-53.5					<u>Auto</u> Mari
-63.5					Freq Offset 0 Hz
-73.5					0112
Center 2.402000 GHz #Res BW 3.0 MHz	#VBW 50 MHz		Span Span Sweep 1.00 ms	10.00 MHz (1001 pts)	
MSG			STATUS		

Test Plots (π/4DQPSK) Peak Power (Mid-CH)

Agile	nt Spectr	um Analyzer - Sw RF 50 Ω				1 100 FT 11 100		ALIGNAUTO			
Cer	nter Fr	req 2.4410	AC 00000 G	Hz				: Log-Pwr	TRA	PM Apr 05, 2015	Frequency
	_		IF	NO: Fast 🔸 Gain:Low	#Atten: 30		Arginola.				Auto Tune
10 d Log	B/div	Ref Offset 6.5 Ref 16.50 (dB I Bm					Mkr	1 2.441 10.3	05 GHz 09 dBm	Auto Tune
LUg						↓ 1					Center Freq
6.50											2.441000000 GHz
-3.50											
-13.5											Start Freq 2.436000000 GHz
-10.0											
-23.5											Stop Freq
-33.5											2.446000000 GHz
-43.5											CF Step
											1.000000 MHz <u>Auto</u> Man
-53.5											
-63.5	<u> </u>										Freq Offset
-73.5											0 Hz
10.0											
		41000 GHz		<i>(</i>)					Span 1	0.00 MHz	
#Re	SBW	3.0 MHz		#VBW	50 MHz			Sweep		(1001 pts)	
								STATU			



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Test Plots (π/4DQPSK) Peak Power (High-CH)

Agilent S	Spectrum Analyze	er - Swept SA		05	VSE:INT			05-01-00.5	MAR 05 0015		
Cente	er Freq 2.4						ALIGNAUTO	TRAC	M Apr 05, 2015 E <mark>1 2 3 4 5 6</mark>	Frequen	су
			PNO: Fast 🔸	Trig: Free #Atten: 30		Avg Hold:	101	DE			
10 dB/e		set 6.5 dB 6.50 dBm					Mkr	1 2.479 8.8	79 GHz 05 dBm	Auto	Tune
6.50				1						Center 2.48000000	•
-3.50								<u></u>			
-13.5										Star 2.47500000	t Freq 00 GHz
-23.5											
-33.5										Stop 2.48500000) Freq 00 GHz
-43.5 —										CF	Step
-53.5 —										<u>Auto</u>	Man
-63.5 —										Freq	Offset 0 Hz
-73.5 —											0112
Conto	er 2.480000	CH-						Enon 4			
	BW 3.0 MH		#VBW	50 MHz			Sweep		0.00 MHz 1001 pts)		
MSG							STATUS				

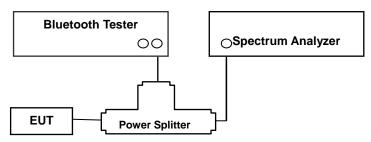


8.2 BAND EDGES

LIMIT

According to §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.

Test Configuration



TEST PROCEDURE

This test is performed with hopping off and hopping on.

The Spectrum Analyzer is set to (DA 00-705)

Span = wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation

RBW \geq 1% of the span

VBW ≥ RBW

Sweep = Auto

Detector = Peak

Trace = Max hold

TEST RESULTS

See attached.

Note :

- 1. The results in plot is already including the actual values of loss for the splitter and cable combination.
- 2. Spectrum offset = Power Splitter loss + Cable loss
- 3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the splitter and cable combination is 6.51 dB at 2402 MHz and is 6.54 dB at 2480 MHz. So, 6.5 dB is offset. And the offset gap in the 2.4 GHz range do not affect the band edge measurement final result.



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Test Data

- Without hopping

Outside Frequency	GFSK	8DPSK	π/4DQPSK	Limit				
Band	(dB)		(dB)	(dBc)	GFSK	8DPSK	π/4DQPSK	Result
Band	(UB)	(dB)			(dBc)	(dBc)	(dBc)	
Lower	55.62	57.99	60.00	20	35.62	37.99	40.00	PASS
Upper	59.81	64.10	63.41	20	39.81	44.10	43.41	PASS

- With hopping

Outside Frequency	GFSK	8DPSK	π/4DQPSK	Limit				
Band	(dB)	(dB)	(dB)	(dBc)	GFSK	8DPSK	π/4DQPSK	Result
Band	(UD)	(UB)		(abc)	(dBc)	(dBc)	(dBc)	
Lower	58.59	58.03	60.00	20	38.59	38.03	40.00	PASS
Upper	66.93	63.92	64.63	20	46.93	43.92	44.63	PASS

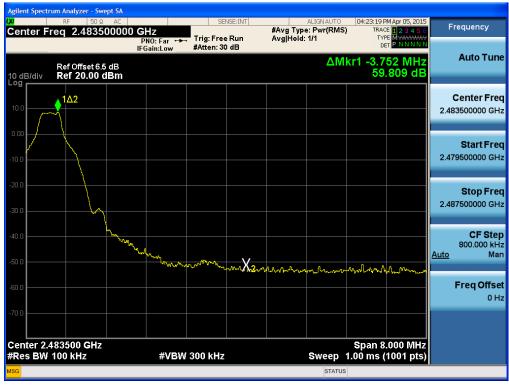


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Test Plots without hopping (GFSK) Band Edges (Low-CH)



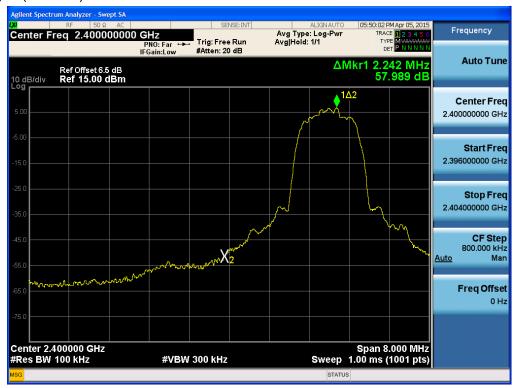
Test Plots without hopping (GFSK) Band Edges (High-CH)



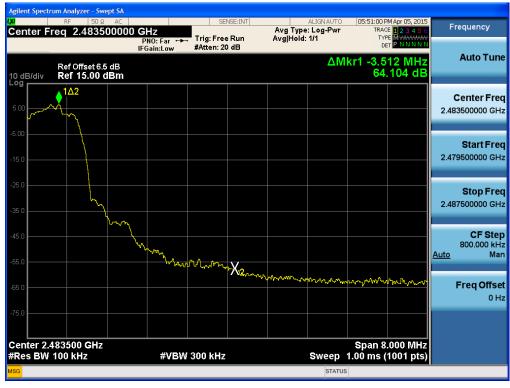


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Test Plots without hopping (8DPSK) Band Edges (Low-CH)



Test Plots without hopping (8DPSK) Band Edges (High-CH)



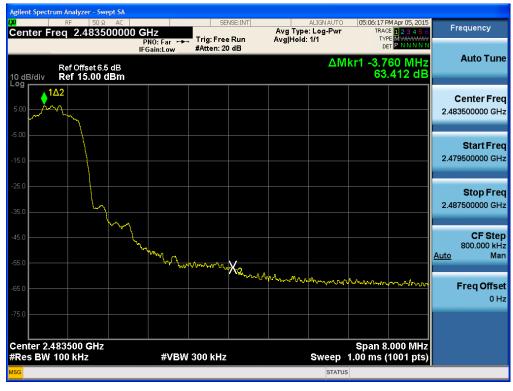


Model: LG-H735

Test Plots without hopping (π /4DQPSK) Band Edges (Low-CH)



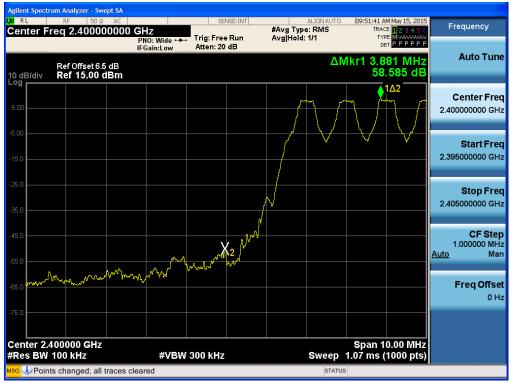
Test Plots without hopping (π /4DQPSK) Band Edges (High-CH)



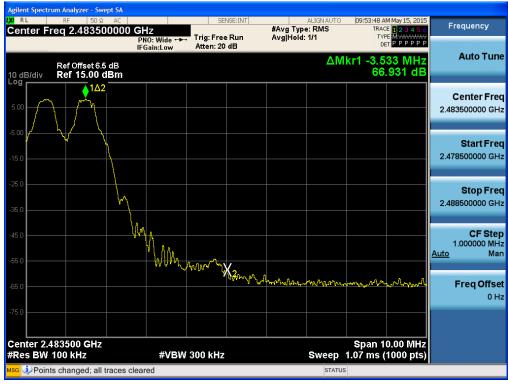


Model: LG-H735

Test Plots with hopping (GFSK) Band Edges (Low-CH)



Test Plots with hopping (GFSK) Band Edges (High-CH)

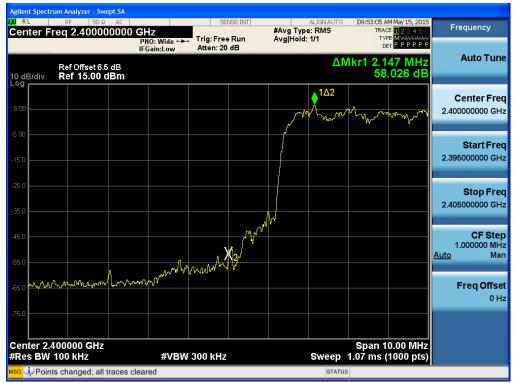




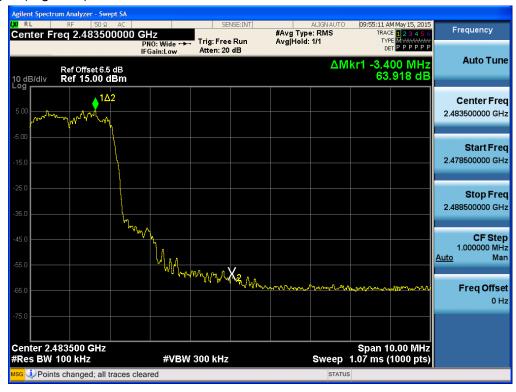
Model: LG-H735

Test Plots with hopping (8DPSK)

Band Edges (Low-CH)



Test Plots with hopping (8DPSK) Band Edges (High-CH)





Model: LG-H735

Test Plots with hopping (π /4DQPSK) Band Edges (Low-CH)



Test Plots with hopping (π /4DQPSK) Band Edges (High-CH)



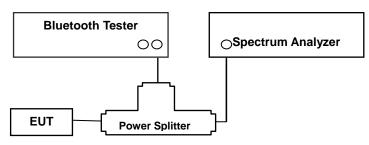


Model: LG-H735

8.3 FREQUENCY SEPARATION / OCCUPIED BANDWIDTH (99% BW) LIMIT

According to §15.247(a)(1), Frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

Test Configuration



TEST PROCEDURE

The Channel Separation test is performed with hopping on. And the 20 dB Bandwidth test is performed with hopping off.

The Spectrum Analyzer is set to (DA 00-705)

Span = wide enough to capture the peaks of two adjacent channels

RBW ≥ 1% of the span

VBW ≥ RBW

Sweep = Auto

Detector = Peak

Trace = Max hold

The trace was allowed to stabilize. The marker-delta function was used to determine the separation between the peaks of the adjacent channels.

TEST RESULTS

No non-compliance noted



Model: LG-H735

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Test Data

Channel Separation (kHz)				Limit	Result			
GFSK	8DPSK	π/4DQPSK	Channel	(kHz)				
			Low CH	971.6	1,302.0	1,290.0	>25 or	
999	999	999	Middle CH	970.5	1,301.0	1,290.0	>2/3 of the	Pass
			High CH	968.9	1,301.0	1,288.0	20dB BW	

Occupied Bandwidth (99% BW)

99% BW (kHz)										
Channel GFSK 8DPSK π/4DQPSK										
Low CH	894.7	1172.9	1166.6							
Middle CH	895.3	1172.9	1171.0							
High CH	893.1	1171.3	1166.2							

Note : We can not know what use channel in AFH mode. So, we can not test in AFH mode. Also, if the test performs some channel in AFH mode, the test result is not different with normal mode.



Model: LG-H735

Test Plots (GFSK) Channel Separation



Test Plots (8DPSK) Channel Separation

LXI		AC					ALIGNAUTO e: Pwr(RMS)	TRAC	M Apr 13, 2015 E 1 2 3 4 5 6	Frequency
10 dB/div	Ref Offset 6. Ref 20.00	PNO: IFGair 5 dB	:Far 😱	Trig: Free F Atten: 24 d		.vg Hold:		⊳ kr3 1.0	er P NNNNN 02 MHz .071 dB	Auto Tune
Log 10.0 0.00	~X2	-	~~~	1 	Δ2 	\sim	~~~~	3∆4		Center Fred 2.441000000 GH2
-20.0 -30.0 -40.0										Start Free 2.439500000 GH:
-50.0 -60.0 -70.0										Stop Fre 2.442500000 GH
Center 2.4 #Res BW	RC SCL	×	#VBW	100 kHz Y -0.076 dl	FUNCTIO	IN FU	Sweep 3	.20 ms (CF Stej 300.000 kH <u>Auto</u> Ma
2 F 1 3 A4 1 4 F 1 5 6	f (Δ) f	2.439 980 G	GHz ∕IHz (∆)	5.622 dBr 0.071 d 5.546 dBr	n B					Freq Offse 0 H
7 8 9 10 11 12										
MSG							STATUS			



Model: LG-H735

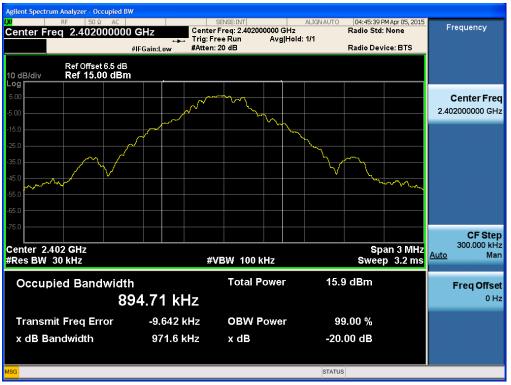
Test Plots (π/4DQPSK) Channel Separation

Agilent Spectr	um Analyzer - :										
Center Fr		Ω AC 000000 GH2	z				ALIGNAUTO e: Pwr(RMS)	TRAC	M Apr 13, 2015 E <mark>1 2 3 4 5</mark> 6	Fre	quency
): Far 😱 in:Low	Trig: Free F Atten: 24 d		Avg Hold:	>1/1	DE	E M www.ww T P N N N N N		
10 dB/div									Auto Tune		
10.0 0.00	~~X	2	~~~~	~~~X4	Δ2 	h.,	~~~~~	3Δ4	~~~~~		e nter Freq 000000 GHz
-20.0											Start Freq 500000 GHz
-50.0 -60.0 -70.0										2.442	Stop Freq 500000 GHz
Center 2.4 #Res BW	441000 GH 30 kHz	Z	#VBW	100 kHz			Sweep 3		.000 MHz 1001 pts)		CF Step 300.000 kHz
MKR MODE TR	ic scl f (Δ)	× 999	kHz (Δ)	⊻ -0.024 di	FUNCTI	ON FU	NCTION WIDTH	FUNCTIO	IN VALUE	<u>Auto</u>	Man
2 F 1 3 Δ4 1 4 F 1 5 6	f f (Δ)	2.439 980 (GHz MHz (∆)	5.593 dBr -0.010 dI 5.569 dBr	n B					F	r eq Offset 0 Hz
7 8 9 10 11											
MSG							STATUS				



Test Plots (GFSK)

20 dB Bandwidth & Occupied Bandwidth (Low-CH)



Test Plots (GFSK)

20 dB Bandwidth & Occupied Bandwidth (Mid-CH)





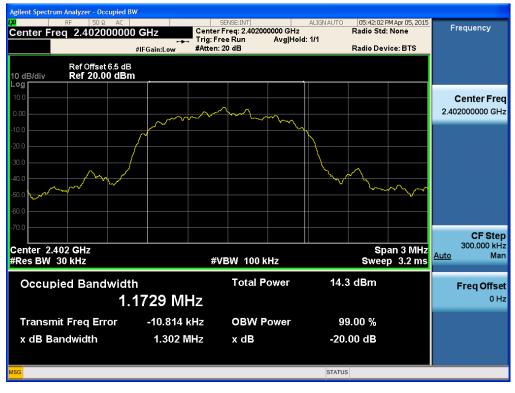
Test Plots (GFSK)

20 dB Bandwidth & Occupied Bandwidth (High-CH)



Test Plots (8DPSK)

20 dB Bandwidth & Occupied Bandwidth (Low-CH)





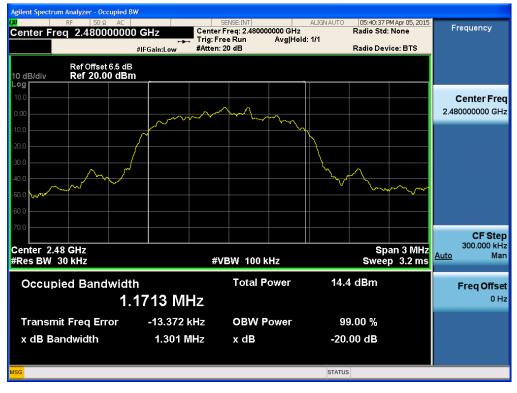
Test Plots (8DPSK)

20 dB Bandwidth & Occupied Bandwidth (Mid-CH)



Test Plots (8DPSK)

20 dB Bandwidth & Occupied Bandwidth (High-CH)





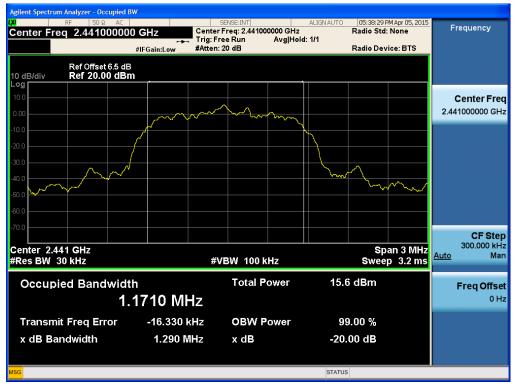
Test Plots (π/4DQPSK)

20 dB Bandwidth & Occupied Bandwidth (Low-CH)



Test Plots (π/4DQPSK)

20 dB Bandwidth & Occupied Bandwidth (Mid-CH)





Test Plots (π/4DQPSK)

20 dB Bandwidth & Occupied Bandwidth (High-CH)



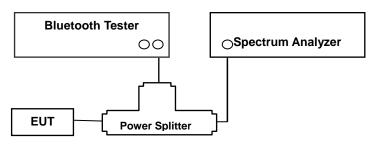


8.4 NUMBER OF HOPPING FREQUENCY

LIMIT

According to 15.247(a)(1)(iii), Frequency hopping systems operating in the 2400 MHz ~ 2483.5 MHz bands shall use at least 15 hopping frequencies.

Test Configuration



TEST PROCEDURE

The Bluetooth frequency hopping function of the EUT was enabled.

The Spectrum Analyzer is set to (DA 00-705)

Span = the frequency band of operation

RBW \geq 1% of the span

VBW ≥ RBW

Sweep = Auto

Detector = Peak

Trace = Max hold

The trace was allowed to stabilize.

TEST RESULTS

No non-compliance noted

Test Data

	Result (No. of CH)	1 : :4	Decult		
GFSK	GFSK 8DPSK π/4DQPSK		Limit	Result	
79	79	79	>15	Pass	

Note : In case of AFH mode, minimum number of hopping channels is 20.



Test Plots (GFSK)

Number of Channels (2.4 GHz - 2.441 GHz)

Agilent Spectrum Analyzer - Swept SA				
M RF 50 Ω AC Start Freq 2.400000000 G	Hz	:Log-Pwr TRA		requency
Ref Offset 6.5 dB 10 dB/div Ref 15.00 dBm	PNO: Fast ↔ Trig: Free IFGain:Low #Atten: 20	: 1/1 Tì		Auto Tune
Log	vwwww		7 17 17 17 17 17	Center Freq 0500000 GHz
-5.00			2.40	Start Freq 0000000 GHz
-25.0			2.44	Stop Freq 1000000 GHz
-45.0			Auto	CF Step 4.100000 MHz Man
-66.0				Freq Offset 0 Hz
Start 2.40000 GHz #Res BW 430 kHz	#VBW 430 kHz	Stop 2.4 Sweep 1.00 ms	4100 GHz (1001 pts)	
MSG		STATUS		

Test Plots (GFSK)

Number of Channels (2.441 GHz - 2.4835 GHz)

	Agilent Spectrum Analyzer - Swept SA VX RF 50 Ω AC SENSE:INT ALIGN AUTO 05:29:37 PM Apr 05, 2015																												
LXI Stol	o Frec	RF				7					SEN	ISE:IN	Т		Avg	Туре				05	TRA	CE 📘	23	456		F	reque	ncy	
10 di		Ref (Offset 6 15.00	.5 dB		PNO): Fas in:Lo	t ⊶► w		rig: F Atten						Hold					TY	'PE 🛛	WW	N N N			Aut	o Tu	ine
Log 5.00	γvγ	γγ	γγγ	γγ	γγ	γ	Ŵ	γγ	Y	ſY	M	N	Ŵ	Y	ŶŢ	η	ſŢ	Ŵ	Ŷ	γγ	γv	Y					Cent		
-5.00 -15.0																										2.44	Sta 11000	n t Fr 000 G	
-25.0 -35.0																										2.48	Sto 33500	p Fr 000 G	
-45.0 -55.0																								M _{life'u}	A	<u>uto</u>	C 4.250		
-65.0																											Frec		set Hz
	t 2.44′ s BW 4						#\	/BW	43	0 kl	Hz						Sw	vee) 2.4 ms								
MSG																		STA	TUS										



Test Plots (8DPSK)

Number of Channels (2.4 GHz - 2.441 GHz)

		nalyzer - Swe									
<mark>IXI</mark> Star		ε 50 Ω 2.400000		7	SE	NSE:INT	Avg Type	ALIGNAUTO Log-Pwr	TRAC	M Apr 05, 2015	Frequency
Critici			PI	NO:Fast ↔ Gain:Low	Trig: Free #Atten: 20		Avg Hold:	1/1	TYI Di		
	Re	of Offset 6.5									Auto Tur
10 dE Log	3/div R	ef 15.00 c	IBm								
3											Center Fre
5.00	-777	᠋ᡎᢇ᠁	ᡃᡳᢇᡳᡊᢊ᠕᠇᠆	$\gamma \gamma $	$\sim\sim\sim\sim$	$\sim \sim \sim \sim$	$\sim\sim\sim\sim\sim$	\sim	᠕ᡧᡞ᠆ᡣ᠆ᠬ	ᡧᠠ᠊ᡳ᠋ᡗ	2.420500000 GH
-5.00											
-9.00											Start Fre
-15.0	_										2.400000000 GH
-25.0											Stop Fre
-35.0	1										2.441000000 GH
	Ň										
-45.0											CF Ste 4.100000 MH
55.0											Auto Ma
-55.0											
-65.0											Freq Offs
											0 H
-75.0											
	t 2.40000 s BW 430			#VRM	430 kHz			Sweep	Stop 2.44	100 GHz 1001 pts)	
MSG	5 DW 450	- MI12		<i></i>	450 MHZ			STATU		roor pts)	
MSG								STATU			

Test Plots (8DPSK) Number of Channels (2.441 GHz - 2.4835 GHz)

	nt Spectrum	Analyzer - Sw									
ايرا Stal	rt Frea	RF 50 Ω	AC 0000 GH:	Z		NSE:INT		ALIGNAUTO Log-Pwr	TRA	PM Apr 05, 2015	Frequency
		tef Offset 6.	P	NO: Fast ↔ Gain:Low	#Atten: 2		Avg Hold:	1/1			Auto Tune
10 di Log		lef 15.00 (
5.00	ᢩᠰᡝ᠋ᢩᠰᠬᢦ	ᡝ᠊ᢩ᠕᠂᠋ᢩᡘ᠆ᡘ	ww	᠈ᠰᡳ᠁ᠰᢤ	\sim	ᢆᢦᢦᡢ᠊ᢩ᠁	ᡃᢦᠬᡳ᠆ᠰ᠈	᠇ᠰᢩ᠈ᡟ᠆ᢩᡁ᠆᠂ᡁ	ᡝᡗ᠊ᠵ᠊ᢩ᠈ᡟ	~	Center Freq 2.462250000 GHz
-5.00 -15.0											Start Freq 2.441000000 GHz
-25.0 -35.0											Stop Freq 2.483500000 GHz
-45.0											CF Step 4.250000 MHz
-55.0										Ĭ44	<u>Auto</u> Man
-65.0											Freq Offset 0 Hz
-75.0											
	t 2.4410 s BW 43			#VBW	430 kHz			Sweep	Stop 2.4 1.00 ms	8350 GHz (1001 pts)	
MSG								STATU	s		



Test Plots (π /4DQPSK)

Number of Channels (2.4 GHz - 2.441 GHz)

Agilen	Agilent Spectrum Analyzer - Swept SA Δ0 RF 50 g AC SENSE:INT ALIGN AUTO 05:30:19 PM Apr 05, 2015												
Stor	p Freq 2					NSE:INT	Avg Type	ALIGNAUTO	TRACE	Apr 05, 2015	Frequency		
			PI IFC	NO: Fast ↔↔ Gain:Low	Trig: Free #Atten: 20		Avg Hold:	1/1	TYPE DET	123450 M wwww PNNNNN	Auto Tune		
10 dE Log i		f Offset 6.5 ef 15.00 d											
5.00	᠈ᠰ᠋ᡁᢦᢦᠬ	ᢦᠰᢧᢇᡘᢩᡔᠺᢦᠬ	᠕᠊ᠢᢩ᠕᠊ᠬ	ᡗᢩᡘ᠆ᢧᠰ᠕	ᠶᠬ᠋᠂ᡔᡎ	᠈᠂᠂᠂	·····	ᠬᠬᢇᢩ᠁	ᡥᡇ᠋᠋ᠵᢦᡧ᠋ᠵᢦᡇ		Center Freq 2.462250000 GHz		
-5.00											Start Freq 2.441000000 GHz		
-15.0 -25.0											Stop Freq		
-35.0											2.483500000 GHz		
-45.0 -55.0)MA	CF Step 4.250000 MHz <u>Auto</u> Man		
-65.0											Freq Offset 0 Hz		
-75.0													
	t 2.44100 s BW 430			#VBW	430 kHz			Sweep	Stop 2.483 1.00 ms (1	350 GHz 001 pts)			
MSG								STATU	s				

Test Plots (π/4DQPSK) Number of Channels (2.441 GHz - 2.4835 GHz)

	it Spectr		alyzer - Sw									
1XI Stol	o Fred	RF		AC 0000 G	-17	SE	NSE:INT	Avg Type	ALIGNAUTO	TRA	PM Apr 05, 2015 CE 123456	Frequency
		Ref	Offset 6.	5 dB	PNO: Fast ↔ IFGain:Low	- Trig: Free #Atten: 20		Avg Hold:	: 1/1		PE MWWWWW ET P NNNNN	Auto Tune
10 di Log			15.00 (~~~~~		- Mariana Mari	$\gamma \gamma \gamma \gamma \gamma \gamma \gamma$	ᢧᠰᡇᡊᡇ᠆ᡧ	γ	~~~~	᠇ᡗᢇ᠇ᢇᠬᡞ	~~~~	Center Freq 2.420500000 GHz
-5.00 -15.0												Start Freq 2.400000000 GHz
-25.0 -35.0	-											Stop Freq 2.441000000 GHz
-45.0 -55.0	}											CF Step 4.100000 MHz <u>Auto</u> Man
-65.0												Freq Offset 0 Hz
	t 2.40 s BW				#VBM	√ 430 kHz			Sweep	Stop 2.4	4100 GHz (1001 pts)	
MSG									STATU	s		

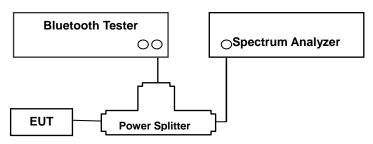


8.5 TIME OF OCCUPANCY (DWELL TIME)

LIMIT

According to \$15.247(a)(1)(iii), Frequency hopping systems operating in the 2400 MHz ~ 2483.5 MHz bands. The average time of occupancy on any channels shall not greater than 0.4 s within a period 0.4 s multiplied by the number of hopping channels employed.

Test Configuration



TEST PROCEDURE

This test is performed with hopping off.

EUT was set to transmit the longest packet type (DH5)

The Spectrum Analyzer is set to (DA 00-705)

Span = Zero span, Centered on a hopping channel

RBW = 1 MHz

VBW ≥ RBW

Sweep = as necessary to capture the entire dwell time per hopping channel

Detector = Peak

Trace = Max hold

The marker-delta function was used to determine the dwell time.

Normal Mode / EDR Mode

DH 5(The longest packet type for GFSK) CH Mid : 2.885 * (1600/6)/79 * 31.6 = 307.73 (ms)**2-DH 5**(The longest packet type for $\pi/4DQPSK$) CH Mid : 2.890 * (1600/6)/79 * 31.6 = 308.3 (ms)**3-DH 5**(The longest packet type for 8DPSK) CH Mid : 2.885 * (1600/6)/79 * 31.6 = 307.73 (ms)

AFH Mode

DH 5(The longest packet type for GFSK) CH Mid : 2.885 * (800/6)/20 * 8.0 = 153.87 (ms)



2-DH 5(The longest packet type for π/4DQPSK)
CH Mid : 2.890 * (800/6)/20 * 8.0 = 154.13 (ms)
3-DH 5(The longest packet type for 8DPSK)
CH Mid : 2.885 * (800/6)/20 * 8.0 = 153.87 (ms)
Note :

A DH5 Packet need 5 time slot for transmitting and 1 time slot for receiving. Then the system makes worst case 1600/6 hops per second with 79 channels. So the system have each channel 3.3755 times per second and so for 31.6 seconds the system have 106.7 times of appearance. Each tx-time per appearance of DH5 is 2.892 ms.

Dwell time = Tx-time * 106.7

TEST RESULTS

See the table.

	Channel	GFSK	8DPSK	π/4DQPSK
Pulse	Low	2.885	2.893	2.871
Time	Mid	2.885	2.890	2.885
(ms)	High	2.880	2.893	2.885

	Channel	GFSK	8DPSK	π/4DQPSK	Period Time (s)	Limit (ms)	Result
Total of	Low	307.7	308.6	306.2	31.6		PASS
Dwell	Mid	307.7	308.3	307.7	31.6	400	PASS
(ms)	High	307.2	308.6	307.7	31.6		PASS



Model: LG-H735

Test Plots (GFSK) Dwell Time (Low-CH)

Agilent Spectrum Analyzer - Swept SA				
Center Freq 2.40200000		·Log-Pwr I	17 PM Apr 05, 2015 RACE 1 2 3 4 5 6	Frequency
	PNO: Fast +++ Trig: Free IFGain:Low Atten: 24	-		
Ref Offset 6.5 dB 10 dB/div Ref 20.00 dBm		∆Mkr1	2.885 ms 0.23 dB	Auto Tune
10.0 X2		1Δ2		Center Freq 2.402000000 GHz
-10.0				Start Freq 2.402000000 GHz
-20.0				Stop Freq 2.402000000 GHz
-40.0				CF Step 1.000000 MHz <u>Auto</u> Man
		hold Uniform	₩ ¹	Freq Offset 0 Hz
Center 2.402000000 GHz Res BW 1.0 MHz	VBW 1.0 MHz	Sweep 5.000 m	Span 0 Hz	
Kes BW 1.0 WHZ		STATUS	5 (1001 pts)	

Test Plots (GFSK) Dwell Time (Mid-CH)

Agilent Spectrum Analyze								
Center Freq 2.4	50Ω AC 41000000 G	Hz	ENSE:INT		ALIGNAUTO Log-Pwr	TRA	PM Apr 05, 2015	Frequency
		NO: Fast ↔ Trig: Fr Gain:Low Atten: 2				D		
	set 6.5 dB 1.00 dBm				Δ	Mkr1 2	.885 ms 0.24 dB	Auto Tune
Log						1Δ2		
10.0					<u> </u>			Center Freq 2.441000000 GHz
	A2							
0.00								Start Freq
-10.0								2.441000000 GHz
-20.0								Stop Freq
-30.0								2.441000000 GHz
-40.0								CF Step 1.000000 MHz
-50.0						adk/l		<u>Auto</u> Man
	thread				ļ,	Make Make	111 unt	
-60.0						lahi Juti	վե քեր	Freq Offset
-70.0								0 Hz
-70.0								
Center 2.4410000	100 GHz						ipan 0 Hz	
Res BW 1.0 MHz		VBW 1.0 MHz		ę	Sweep 5	.000 ms ((1001 pts)	
MSG					STATUS	3		



Model: LG-H735

Test Plots (GFSK) Dwell Time (High-CH)



Test Plots (8DPSK) Dwell Time (Low-CH)





Model: LG-H735

Test Plots (8DPSK) Dwell Time (Mid-CH)

Agilent Spec	trum Analyzer - Swe										
Center	 Freq 2.4410		Hz	SE	NSE:INT	Avg Typ	ALIGN. e: Log-			:52 PM Apr 05, 2015 TRACE 1 2 3 4 5 6	Frequency
Contor		PI	NO: Fast 🔸	Trig: Free #Atten: 20		•	-				
	Ref Offset 6.5		5411.204					Δ	Mkr1	2.890 ms	Auto Tune
10 dB/div Log	Ref 15.00 c						_			-0.25 dB	
	X 2 Hills Topy	magnations	and the second second			-	1∆2		r -	- Jaffellan Arthony Jacob	Center Freq
5.00											2.441000000 GHz
-5.00											
-15.0											Start Freq 2.441000000 GHz
-15.0											
-25.0											Stop Freq
-35.0											2.441000000 GHz
-45.0											CF Step 1.000000 MHz
-55.0							ľ,	4			<u>Auto</u> Man
(Wy	9 1 /1/1							₩.	W		Ere a Offe et
-65.0											Freq Offset 0 Hz
-75.0											
	2.441000000 G 1.0 MHz	Hz	#\/P\W	1.0 MHz			Swaa	on 6	000 -	Span 0 Hz is (1001 pts)	
			#VDVV					STATUS		i s (1001 pts)	

Test Plots (8DPSK) Dwell Time (High-CH)

Agilent Spectrum Analyzer - Swept SA IXI RF 50 Ω AC		SEI	VSE:INT		ALIGN AUTO		M Apr 05, 2015	
	Hz NO: Fast +++ Gain:Low	Trig: Free #Atten: 20		Avg Type	: Log-Pwr	TRAC TYI DI	^{2E} 123456 ^{PE} W MMMMM P N N N N N	Frequency
Ref Offset 6.5 dB 10 dB/div Ref 15.00 dBm					Δ		.893 ms 0.46 dB	Auto Tune
5.00	$ \rightarrow $	(1994-1994) 12	አባ _ት ዚህች _መ ላት-የያኤት[ሁሩ	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		1∆2	N [#] \$5.6710. ⁶ 14 ² 1447	Center Freq 2.480000000 GHz
-5.00								Start Freq 2.48000000 GHz
-25.0								Stop Fred 2.480000000 GHz
-45.0	port and traditions					/H du landddid		CF Step 1.000000 MH: <u>Auto</u> Mar
-65.0	hal harakala.				ľ	di an wild.		Freq Offset 0 Hz
Center 2.480000000 GHz Res BW 1.0 MHz	#VBW	1.0 MHz			Sweep 7	S .533 ms (pan 0 Hz 1001 pts)	
MSG					STATUS	6		



Model: LG-H735

Test Plots (π/4DQPSK) Dwell Time (Low-CH)



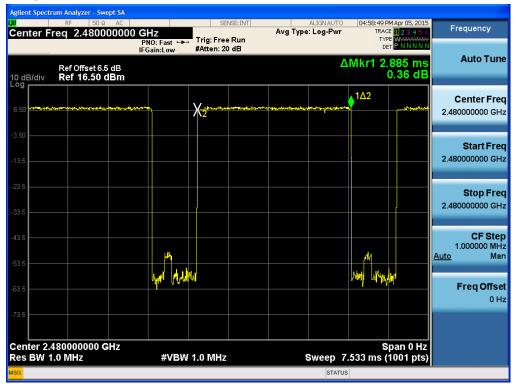
Test Plots (π/4DQPSK) Dwell Time (Mid-CH)

Agiler	it Spectr		alyzer - S																	
Cen	ter Fr	RF req	50 2.441	Ω AC	0 GI	lz			SENSE:IN		Avg T		LIGN AUT		04:58:01 TR/	ACE 12	3456		Frequen	су
					PN	IO: Fast ain:Lov		Trig: Fr #Atten:		1						YPE WH Det P N	NNNN		Auto	Tune
10 dl	3/div		Offset 6 16.50											ΔM	kr1 2		5 ms 3 dB		Auto	Tune
Log 6.50		~~ 8⁴⁸~ ~	h any way a	v/s-se s h	u yr afr	nay (as an Igrar)	-hours off	********		Xź	-	.yuyu	-MP-Laure-Jah		نيه، يا «اي موا ^ر در».	Houl Same	1Δ2	2.4	Cente 44100000	•
-3.50 -13.5																		2.4	Star 1 44100000	t Freq 00 GHz
-23.5 -33.5																		2.4	Stop 44100000	Freq 00 GHz
-43.5 -53.5									m									Auto	1.00000	Step 0 MHz Man
-63.5 -73.5	Million I							h	MM	₩							ya i		Freq (Offset 0 Hz
Cen Res	ter 2.4 BW 1		00000 Hz	GHz		#V	'BW 1	1.0 MH	z			s	weep		33 ms	Span (100	0 Hz 1 pts)			
MSG													STAT	TUS						



Model: LG-H735

Test Plots (π/4DQPSK) Dwell Time (High-CH)





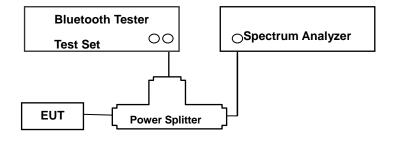
8.6 SPURIOUS EMISSIONS

8.6.1 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 Configuration



TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer.

The Spectrum Analyzer is set to (DA 00-705)

- Span = wide enough to capture the peak level of the in-band emission and all spurious emissions(e.g.,harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic.
- 2. RBW = 100 kHz
- 3. VBW ≥ 300 kHz
- 4. Sweep = auto
- 5. Sweep point \geq 2*span/RBW



5. Detector function = peak

6. Trace = max hold

Measurements are made over the 30 MHz to 26 GHz range with the transmitter set to the lowest,

middle, and highest channels.

This test is performed with hopping off.

TEST RESULTS

No non-compliance noted.

Note : In order to simplify the report, attached plots were only the worst case channel and data rate.

FACTORS F	FACTORS FOR FREQUENCY									
Freq(MHz)	Factor(dB)									
30	10.01									
100	10.02									
200	10.10									
300	10.09									
400	10.13									
500	10.21									
600	10.13									
700	10.31									
800	10.18									
900	10.30									
1000	10.17									
2000	8.53									
2400*	6.51									
2500*	6.54									
3000	8.59									
4000	10.02									
5000	9.88									
6000	5.70									
7000	10.21									
8000	6.13									
9000	8.79									
10000	12.46									
11000	8.11									
12000	9.52									
13000	8.98									
14000	8.13									
15000	11.82									
16000	6.92									
17000	13.23									
18000	10.25									
19000	10.28									
20000	9.10									
21000	10.94									
22000	11.54									
23000	8.81									
24000	11.71									
25000	9.37									
26000	9.34									

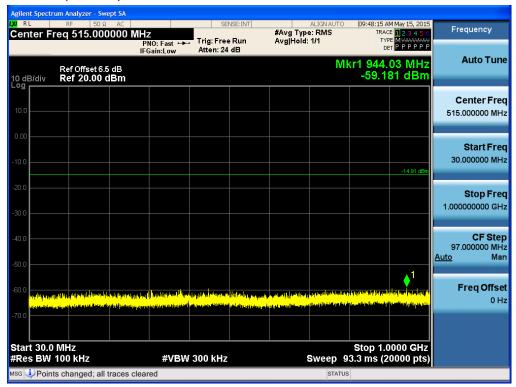
Note : 1. '*' is fundamental frequency range.

2. Factor = Cable loss + Splitter loss



Model: LG-H735

Test Plots (8DPSK)- 30 MHz - 1 GHz Spurious Emission (Mid-CH)



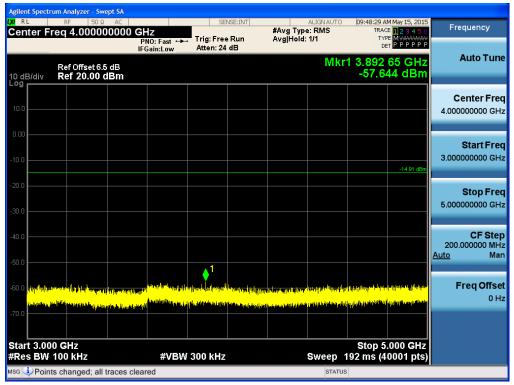
Test Plots (8DPSK)- 1 GHz – 3 GHz Spurious Emission (Mid-CH)

		ım Analyzer									
LXI R Sta			50Ω AC	247	SE	NSE:INT	#Avg Type	ALIGNAUTO		M May 15, 2015	Frequency
Cita	It IIG	11.0000		PNO: Fast ↔ IFGain:Low	Trig: Free Atten: 24		Avg Hold:	1/1	TY D		Auto Tune
10 d Log	B/div	Ref Offse Ref 20.						Mkr	1 2.673 -57.3	05 GHz 20 dBm	Auto Tune
											Center Freq
10.0								1			2.000000000 GHz
0.00											Start Freq
-10.0										-14.91 dBm	1.000000000 GHz
-20.0											Stop Freq
-30.0											3.000000000 GHz
-40.0											CF Step
											200.000000 MHz Auto Man
-50.0									1		
-60.0	the William Star	n and the state of	in de la la constances	landin dia kita ka Pipana	an a	and The State		ob <mark>linite de tot</mark>	yn a diffiliansja stale Anne felster	ti fulor og bledstada	Freq Offset 0 Hz
-70.0	postina, pos	ang ito ang ito ini ang ito	a a line with the second	<mark>ianajan pinishina apanajan</mark>	dan Camabia diplar	and a second	a li a la canada da ser a da s	and the difference of		and an and the set	
	rt 1.00 s BW	0 GHz 100 kHz		#VBW	/ 300 kHz			Sweep 1	Stop 3 92 ms (4	.000 GHz .0001 pts)	
MSG								STATUS			



Model: LG-H735

Test Plots (8DPSK)- 3 GHz - 5 GHz Spurious Emission (Mid-CH)



Test Plots (8DPSK)- 5 GHz - 7 GHz Spurious Emission (Mid-CH)

		ım Analyzer -	Swept SA								
LXI R Cer		RF 5 eq 6.000		GHz	SE	NSE:INT	#Avg Typ	ALIGNAUTO e: RMS	TRA	M May 15, 2015	Frequency
		04 0.000		PNO: Fast ++ IFGain:Low	Trig: Free Atten: 24		Avg Hold:		TY D		Auto Tune
	B/div	Ref Offset Ref 20.0						Mkr	1 5.697 -56.9	20 GHz 76 dBm	Auto Tune
Log 10.0											Center Freq 6.000000000 GHz
0.00											Start Freq 5.000000000 GHz
-20.0										-14.91 dBm	Stop Freq 7.000000000 GHz
-30.0 -40.0											CF Step 200.000000 MHz
-50.0				1							<u>Auto</u> Man
	al-anarabhan			a sebuah pahahan badata. Mangka panjadar kerina panj	lad a start to by Marine and the start		lali shekababa aliyeta				Freq Offset 0 Hz
-70.0											
	rt 5.000 s BW 1) GHz 100 kHz		#VBW	300 kHz			Sweep		.000 GHz 0001 pts)	
MSG 🤇	Points	s changed;	all traces of	cleared				STATU	5		



Model: LG-H735

Test Plots (8DPSK)- 7 GHz - 9 GHz Spurious Emission (Mid-CH)

	um Analyzer - Swept S								
Conter Fr	RF 50 Ω A req 8.0000000		SEI	NSE:INT	#Avg Type	ALIGNAUTO		M May 15, 2015 E 1 2 3 4 5 6	Frequency
Center F	eq 0.0000000	PNO: Fast +> IFGain:Low	Trig: Free Atten: 24		Avg Hold:		TYF	E MWWWWW T P P P P P P	
10 dB/div	Ref Offset 6.5 dB Ref 20.00 dBr					Mki	1 7.392 -57.3	45 GHz 38 dBm	Auto Tune
10.0									Center Freq 8.000000000 GHz
-10.0								-14.91 dBm	Start Freq 7.000000000 GHz
-20.0									Stop Freq 9.000000000 GHz
-40.0									CF Step 200.000000 MHz <u>Auto</u> Man
-60.0 <mark>di wikida</mark>	1 Addinated builds for disper- and the state of the								Freq Offset 0 Hz
-70.0									
Start 7.00 #Res BW		#VBV	V 300 kHz			Sweep	Stop 9 192 ms (4	.000 GHz 0001 pts)	
мsg 🗼 Point	s changed; all trac	es cleared				STATU	s		

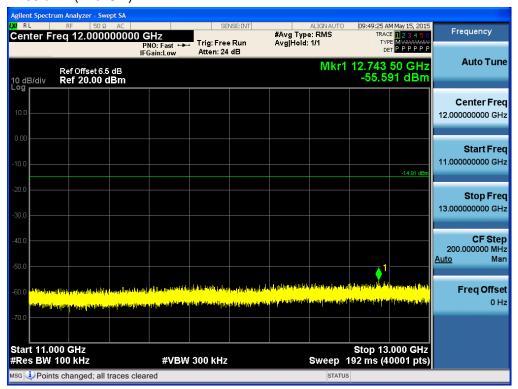
Test Plots(8DPSK)- 9 GHz - 11 GHz Spurious Emission (Mid-CH)

	nt Spectru											
LXI R Cen		RF ea 1		AC	GHz		NSE:INT	#Avg Typ		TRA	M May 15, 2015	Frequency
					PNO: Fast ↔ IFGain:Low	Atten: 24		Avg Hold:		D	at GHz	Auto Tune
	B/div		offset 6.5 20.00 (-57.0	98 dBm	
Log 10.0												Center Freq 10.00000000 GHz
0.00												
-10.0											-14.91 dBm	Start Freq 9.000000000 GHz
-20.0												Stop Freq
-30.0												11.000000000 GHz
												CF Step
-40.0												200.000000 MHz Auto Man
-30.0												
-60.0	1.1.1.1.1.1.1.1	here here		a filitate de la	ditals and the she stars		and the second	de la secola de		diberti del degla est.	helder of the second second	Freq Offset 0 Hz
-70.0	nitiliaa jirioofi	Mar (ha	an an is a s	difficult postal	ind the local transfer constrained in		n dia	n a filling a star part of the	a destruction of the second	and the first of a local state	an the state of th	0 112
	t 9.000									Stop 11	.000 GHz	
	s BW 1					V 300 kHz			_		0001 pts)	
MSG	Points	s chan	ged; all	traces cl	eared				STATUS	5		



Model: LG-H735

Test Plots (8DPSK)- 11 GHz - 13 GHz Spurious Emission (Mid-CH)



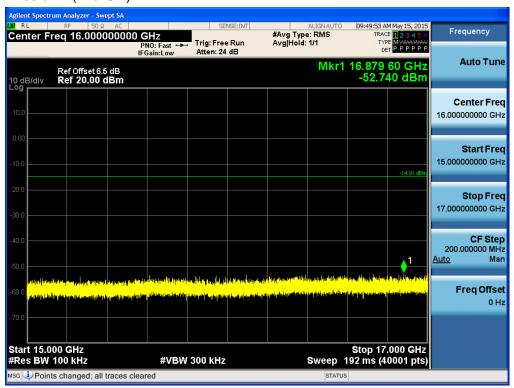
Test Plots (8DPSK)- 13 GHz – 15 GHz Spurious Emission (Mid-CH)

		ım Analyz										
LXI R Cen		RF	50 Ω	AC 00000	GHz	SE	NSE:INT	#Avg Typ	ALIGNAUTO e: RMS	TRA	M May 15, 2015	Frequency
		oq 14			PNO: Fast ↔ IFGain:Low	Trig: Fre Atten: 24		Avg Hold:		D		Auto Tune
10 di Log	B/div	Ref Off Ref 2							Mkr1	13.699 -53.8	85 GHz 52 dBm	Auto Tune
LUg												Center Freq
10.0												14.000000000 GHz
0.00												
-10.0												Start Freq 13.000000000 GHz
											-14.91 dBm	
-20.0												Stop Freq
-30.0	<u> </u>											15.000000000 GHz
-40.0												CF Step
												200.000000 MHz <u>Auto</u> Man
-50.0												
-60.0	ala aya da	s shell all mine	t kali Masa ng	Hole Hales be	n an	and a start of the second	the Happing Applied Parties			deserve a sec	na leg burketi (i pula Levez versitita eti ^{sate} ti	Freq Offset
-70.0	and the second s	a da na kata kata	بد ای پر در در	Notes Resp. (1)	Ket '		te _{n a} Nith, Indexedi	ni Munislah, shi Mai ya		adara da ser a la ser	it at a line in the	0 Hz
		0 GHz			<i>J</i> (B).						.000 GHz	
		100 kH				/ 300 kHz			_	Ì	0001 pts)	
MSG	Point	s change	ed; all t	races cle	ared				STATUS	5		



Model: LG-H735

Test Plots (8DPSK)– 15 GHz - 17 GHz Spurious Emission (Mid-CH)



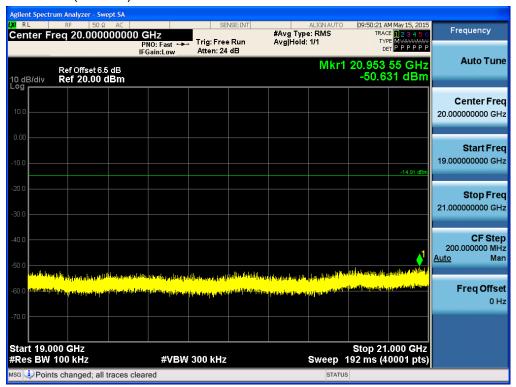
Test Plots (8DPSK)- 17 GHz - 19 GHz Spurious Emission (Mid-CH)

			yzer - Sw									
Cer		RF rea 1		AC 000000	GHz		ENSE:INT	#Avg Typ		TRA	AM May 15, 2015 CE 123456	Frequency
					PNO: Fast + IFGain:Low	Trig: Fre Atten: 24		Avg Hold		C		Auto Tune
10 di Log	B/div		offset 6.5 20.00 (_			18 dBm	
10.0												Center Freq 18.00000000 GHz
0.00												Start Freq
-10.0	<u> </u>										-14.91 dBm	17.000000000 GHz
-20.0												
-30.0												Stop Freq 19.000000000 GHz
-40.0											1	CF Step 200.000000 MHz <u>Auto</u> Man
-50.0	ANH ANHA	الاليد	t da a Harana I	l de clima	ى بەتەخەق . بارى ب	dapeter bet and a	ado tata da l	alt of Arabit	(), , party shi sail	a di si se an de de de de	a webe did a day	
-60.0						lege wither an interaction and the second					and the stand	Freq Offset
-70.0												0 Hz
10.0												
	t 17.0										.000 GHz	
	s BW			traces cl		W 300 kHz			Sweep		0001 pts)	
MSG	Point	s chân	ged; all	u aces cl	eared				STATU	5		



Model: LG-H735

Test Plots (8DPSK)- 19 GHz - 21 GHz Spurious Emission (Mid-CH)



Test Plots (8DPSK)- 21 GHz - 23 GHz Spurious Emission (Mid-CH)

		ım Analyz										
Cen		RF eq 22		AC 00000	GHz	SE	NSE:INT	#Avg Typ	ALIGNAUTO e: RMS	TRA	M May 15, 2015	Frequency
			fset 6.5		PNO: Fast ↔ FGain:Low	 Trig: Free Atten: 24 		Avg Hold:		D		Auto Tune
10 dE Log	3/div		0.00 c							-49.2	03 dBm	
10.0												Center Freq 22.000000000 GHz
0.00												
-10.0												Start Freq 21.000000000 GHz
											-14.91 dBm	
-20.0 -30.0												Stop Freq 23.000000000 GHz
00.0												
-40.0					↓ 1							CF Step 200.000000 MHz <u>Auto</u> Man
-50.0	ultraken.	and distant	dela prese	pales de la terre	in the state of th	n an Alexandrian and a	ne sellit dans he	ali baalaa ki maaa	The second s	al talls on an dispose	uldy middle of	
-60.0	nka jikishatistanj	<mark>is (kin kan ka</mark> d	leffinik, pedalahi	ul _{ti} nternetari	i sin an airin a' linean an airin an an airin an	<mark>er térőkellettele _{de d}eletetetetetetetetetetetetetetetetetete</mark>	<mark>ti atika in prinsi</mark>	all à la fha than dù an dù an sa	Lahistana inida	<mark>, and any a line start of an and an </mark>	<mark>, a a followich wie de la constante de la const</mark>	Freq Offset 0 Hz
-70.0												
		00 GHz 100 kH			#VBV	V 300 kHz			Sweep		.000 GHz 0001 pts)	
MSG 🤇	Point	s chang	ed; all t	traces cle	ared				STATU	S		



Model: LG-H735

Test Plots (8DPSK)- 23 GHz - 25 GHz Spurious Emission (Mid-CH)

	m Analyzer - Swept SA								
	RF 50 Ω AC eq 24.00000000	00 GHz PN0: Fast ↔		E:INT	#Avg Type Avg Hold:		TRAC	M May 15, 2015 E 1 2 3 4 5 6 E M WWWWWW	Frequency
10 dB/div	Ref Offset 6.5 dB Ref 20.00 dBm	IFGain:Low	Atten: 24 d				DE 1 24.909	T PPPPP	Auto Tune
10.0									Center Freq 24.000000000 GHz
-10.0								-14.91 dBm	Start Fred 23.000000000 GHz
-20.0									Stop Freq 25.000000000 GHz
-40.0	ala fa fa fa fa su a su a su a su a su a s	i ali na na mana na ma	ege gen fan it de pleaster t	haydan Maria	un per tet fingli a sel p	lation at a const	la na ng papat kan	and an other states of the states	CF Step 200.000000 MH 2 <u>Auto</u> Mar
-60.0	de bijde je postava konstruction politika i statistica. Posta je postava statistica provinstva konstruction politika i statistica i politika i statistica i politika i Posta je postava statistica politika i statistica i politika i statistica i politika i statistica i politika i s	n de ser de ser de la	<mark>, _{da} dalam pekalak ^{dala}ng pekalak sakar sakar</mark>	in in the second se	invitati a particula	ing a survey of the second	ite, iligaia seriajan, ili Kiles		Freq Offset 0 Hz
Start 23.00 #Res BW 1		#\/B}A	300 kHz			Sweep	Stop 25 192 ms (4	.000 GHz	
	changed; all traces		000 MH2			STATL		666 F pt3)	



8.6.2 RADIATED SPURIOUS EMISSIONS

LIMIT : §15.247(d), §15.205, §15.209

1. 20dBc in any 100kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

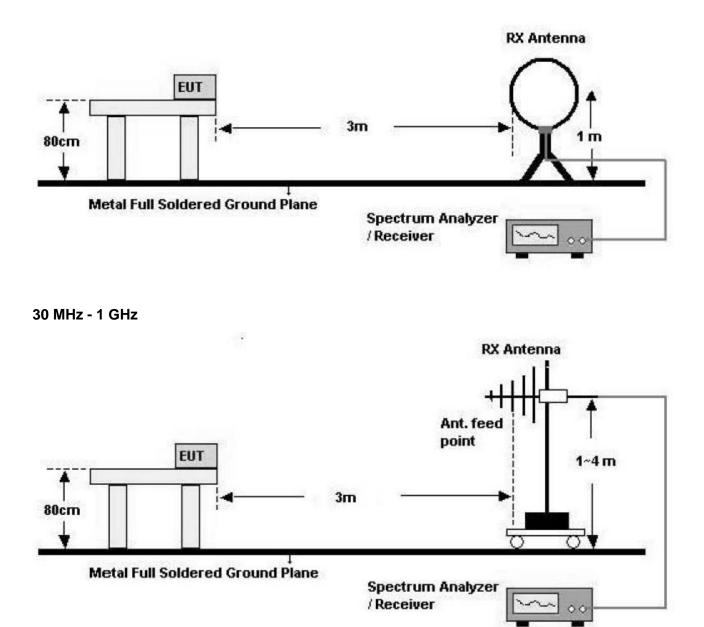
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3



Model: LG-H735

Test Configuration

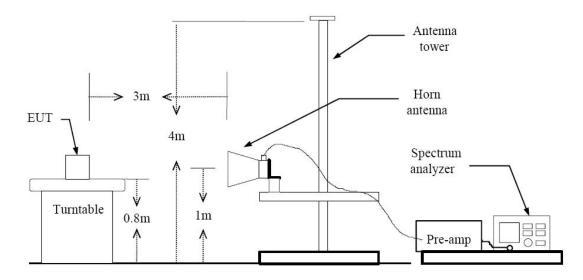
Below 30 MHz





Model: LG-H735

Above 1 GHz



TEST PROCEDURE

- 1. The EUT is placed on a turntable, which is 0.8 m above ground plane.
- 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 6. Repeat above procedures until the measurements for all frequencies are complete.
- 7. Spectrum Setting
 - a. Peak: 1 GHz 25 GHz, RBW = 1 MHz, VBW ≥3*RBW
 - b. Average: 1 GHz 25 GHz, RBW = 1 MHz, VBW \geq 1/T Hz, where T = pulse width in seconds.



TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

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

Notes:

- 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. This test is performed with hopping off.
- 6. 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	dBμN	dB /m	dB	(H/V)	dBµN/m	dBµN/m	dB			
No Critical peaks found										

Notes:

- 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. This test is performed with hopping off.
- 4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



Model: LG-H735

Above 1 GHz

Operation Mode: CH Low(GFSK)

Frequency	Reading	* A.F+CL-AMP GAIN	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	DBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4804	49.21	-2.16	V	47.05	73.98	26.93	PK
4804	35.40	-2.16	V	33.24	53.98	20.74	AV
7206	46.04	7.31	V	53.35	73.98	20.63	PK
7206	32.42	7.31	V	39.73	53.98	14.25	AV
4804	49.17	-2.16	Н	47.01	73.98	26.97	PK
4804	35.42	-2.16	Н	33.26	53.98	20.72	AV
7206	46.12	7.31	Н	53.43	73.98	20.55	PK
7206	32.43	7.31	Н	39.74	53.98	14.24	AV

Operation Mode: CH Low(8DPSK)

Frequency	Reading	* A.F+CL-AMP GAIN	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	DBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4804	49.07	-2.16	V	46.91	73.98	27.07	PK
4804	35.37	-2.16	V	33.21	53.98	20.77	AV
7206	46.04	7.31	V	53.35	73.98	20.63	PK
7206	32.37	7.31	V	39.68	53.98	14.30	AV
4804	49.14	-2.16	Н	46.98	73.98	27.00	PK
4804	35.40	-2.16	Н	33.24	53.98	20.74	AV
7206	45.97	7.31	Н	53.28	73.98	20.70	PK
7206	32.39	7.31	Н	39.7	53.98	14.28	AV



Model: LG-H735

Frequency	Reading	* A.F+CL-AMP GAIN	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	DBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4804	49.01	-2.16	V	46.85	73.98	27.13	PK
4804	35.39	-2.16	V	33.23	53.98	20.75	AV
7206	46.13	7.31	V	53.44	73.98	20.54	PK
7206	32.40	7.31	V	39.71	53.98	14.27	AV
4804	49.04	-2.16	Н	46.88	73.98	27.10	PK
4804	35.41	-2.16	Н	33.25	53.98	20.73	AV
7206	46.03	7.31	Н	53.34	73.98	20.64	PK
7206	32.41	7.31	Н	39.72	53.98	14.26	AV

Operation Mode: CH Low(π/4DQPSK)

* A·F: ANTENNA FACTOR

C·L: CABLE LOSS

AMP GAIN: AMPLIFIER GAIN

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.
- 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
- 5. Spectrum setting:
 - a. Peak: 1 GHz 25 GHz, RBW = 1 MHz, VBW ≥3*RBW
 - b. Average: 1 GHz 25 GHz, RBW = 1 MHz, VBW \ge 1/T Hz, where T = pulse width in seconds. We performed using a reduced video BW method was done with the analyzer in linear mode.
- 6. FYI : Duty Cycle Correction Factor (79 channel hopping)
 - a. Time to cycle through all channels= Δ t= τ [ms] x 79 channels = 229.100 ms, where τ = pulse width
 - b. 100 ms/ Δt [ms] = $H \rightarrow$ Round up to next highest integer, H '=1
 - c. Worst Case Dwell Time = T [ms] x H '= 2.900 ms
 - d. Duty Cycle Correction = 20log (Worst Case Dwell Time/ 100ms) dB = -30.752 dB
- 7. Duty Cycle Correction Factor(AFH mode minimum channel number case 20 channels)
 - a. Time to cycle through all channels= Δ t= τ [ms] x 20 channels = 58.00 ms, where τ = pulse width
 - b. 100 ms/ Δt [ms] = $H \rightarrow$ Round up to next highest integer, H' = 2
 - c. Worst Case Dwell Time = T [ms] x H ' = 5.800 ms
 - d. Duty Cycle Correction(AFH) = 20log (Worst Case Dwell Time/ 100ms) dB = -24.7314 dB



- e. We applied DCCF in the test result which hopping channel number is 20.
- 8. We have done Normal Mode and EDR Mode test.
- 9. This test is performed with hopping off.
- 10. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



Model: LG-H735

Operation Mode: CH Mid(GFSK)

Frequency	Reading	* A.F+CL-AMP GAIN	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	DBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4882	49.45	-1.95	V	47.5	73.98	26.48	PK
4882	35.73	-1.95	V	33.78	53.98	20.20	AV
7323	46.61	7.34	V	53.95	73.98	20.03	PK
7323	32.70	7.34	V	40.04	53.98	13.94	AV
4882	49.84	-1.95	Н	47.89	73.98	26.09	PK
4882	35.77	-1.95	Н	33.82	53.98	20.16	AV
7323	46.89	7.34	Н	54.23	73.98	19.75	PK
7323	32.76	7.34	Н	40.1	53.98	13.88	AV

Operation Mode: CH Mid(8DPSK)

Frequency	Reading	* A.F+CL-AMP GAIN	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	DBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4882	49.51	-1.95	V	47.56	73.98	26.42	PK
4882	35.70	-1.95	V	33.75	53.98	20.23	AV
7323	46.48	7.34	V	53.82	73.98	20.16	PK
7323	32.67	7.34	V	40.01	53.98	13.97	AV
4882	49.41	-1.95	н	47.46	73.98	26.52	PK
4882	35.72	-1.95	н	33.77	53.98	20.21	AV
7323	46.29	7.34	Н	53.63	73.98	20.35	PK
7323	32.68	7.34	Н	40.02	53.98	13.96	AV



Model: LG-H735

Frequency	Reading	* A.F+CL-AMP GAIN	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	DBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4882	49.40	-1.95	V	47.45	73.98	26.53	PK
4882	35.73	-1.95	V	33.78	53.98	20.20	AV
7323	46.51	7.34	V	53.85	73.98	20.13	PK
7323	32.68	7.34	V	40.02	53.98	13.96	AV
4882	49.55	-1.95	Н	47.60	73.98	26.38	PK
4882	35.74	-1.95	н	33.79	53.98	20.19	AV
7323	46.38	7.34	Н	53.72	73.98	20.26	PK
7323	32.70	7.34	Н	40.04	53.98	13.94	AV

Operation Mode: CH Mid(π/4DQPSK)

* A·F: ANTENNA FACTOR

C·L: CABLE LOSS

AMP GAIN: AMPLIFIER GAIN

Notes:

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 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
- 5. Spectrum setting:
 - a. Peak: 1 GHz 25 GHz, RBW = 1 MHz, VBW ≥3*RBW
 - b. Average: 1 GHz 25 GHz, RBW = 1 MHz, VBW \geq 1/T Hz, where T = pulse width in seconds.

We performed using a reduced video BW method was done with the analyzer in linear mode.

- 6. FYI : Duty Cycle Correction Factor (79 channel hopping)
 - a. Time to cycle through all channels= Δ t= τ [ms] x 79 channels = 229.100 ms, where τ = pulse width
 - b. 100 ms/ Δt [ms] = $H \rightarrow$ Round up to next highest integer, H '=1
 - c. Worst Case Dwell Time = T [ms] x H ' = 2.900 ms
 - d. Duty Cycle Correction = 20log (Worst Case Dwell Time/ 100ms) dB = -30.752 dB
- 7. Duty Cycle Correction Factor(AFH mode minimum channel number case 20 channels)
 - a. Time to cycle through all channels= Δ t= τ [ms] x 20 channels = 58.00 ms, where τ = pulse width
 - b. 100 ms/ Δt [ms] = $H \rightarrow$ Round up to next highest integer, H' = 2
 - c. Worst Case Dwell Time = τ [ms] x H ' = 5.800 ms



- d. Duty Cycle Correction(AFH) = 20log (Worst Case Dwell Time/ 100ms) dB = -24.7314 dB
- e. We applied DCCF in the test result which hopping channel number is 20.
- 8. We have done Normal Mode and EDR Mode test.
- 9. This test is performed with hopping off.
- 10. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



Frequency	Reading	* A.F+CL-AMP GAIN	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	DBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4960	49.78	-1.84	V	47.94	73.98	26.04	PK
4960	36.11	-1.84	V	34.27	53.98	19.71	AV
7440	45.73	7.13	V	52.86	73.98	21.12	PK
7440	32.34	7.13	V	39.47	53.98	14.51	AV
4960	50.31	-1.84	Н	48.47	73.98	25.51	PK
4960	36.13	-1.84	н	34.29	53.98	19.69	AV
7440	45.80	7.13	Н	52.93	73.98	21.05	PK
7440	32.35	7.13	Н	39.48	53.98	14.50	AV

Operation Mode: CH High(GFSK)

Operation Mode: CH High(8DPSK)

Frequency	Reading	* A.F+CL-AMP GAIN	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	DBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4960	49.61	-1.84	V	47.77	73.98	26.21	PK
4960	36.09	-1.84	V	34.25	53.98	19.73	AV
7440	45.49	7.13	V	52.62	73.98	21.36	PK
7440	32.29	7.13	V	39.42	53.98	14.56	AV
4960	50.18	-1.84	Н	48.34	73.98	25.64	PK
4960	36.11	-1.84	Н	34.27	53.98	19.71	AV
7440	45.63	7.13	Н	52.76	73.98	21.22	PK
7440	32.32	7.13	Н	39.45	53.98	14.53	AV



Model: LG-H735

Frequency	Reading	* A.F+CL-AMP GAIN	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	DBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4960	49.70	-1.84	V	47.86	73.98	26.12	PK
4960	36.10	-1.84	V	34.26	53.98	19.72	AV
7440	45.61	7.13	V	52.74	73.98	21.24	PK
7440	32.31	7.13	V	39.44	53.98	14.54	AV
4960	50.21	-1.84	Н	48.37	73.98	25.61	PK
4960	36.11	-1.84	н	34.27	53.98	19.71	AV
7440	45.69	7.13	Н	52.82	73.98	21.16	PK
7440	32.33	7.13	Н	39.46	53.98	14.52	AV

Operation Mode: CH High (π /4DQPSK)

* A·F: ANTENNA FACTOR

C·L: CABLE LOSS

AMP GAIN: AMPLIFIER GAIN

Notes:

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 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
- 5. Spectrum setting:
 - a. Peak: 1 GHz 25 GHz, RBW = 1 MHz, VBW ≥3*RBW
 - b. Average: 1 GHz 25 GHz, RBW = 1 MHz, VBW \geq 1/T Hz, where T = pulse width in seconds.

We performed using a reduced video BW method was done with the analyzer in linear mode.

- 6. FYI : Duty Cycle Correction Factor (79 channel hopping)
 - a. Time to cycle through all channels= Δ t= τ [ms] x 79 channels = 229.100 ms, where τ = pulse width
 - b. 100 ms/ Δt [ms] = $H \rightarrow$ Round up to next highest integer, H '=1
 - c. Worst Case Dwell Time = τ [ms] x H ' = 2.900 ms
 - d. Duty Cycle Correction = 20log (Worst Case Dwell Time/ 100ms) dB = -30.752 dB
- 7. Duty Cycle Correction Factor(AFH mode minimum channel number case 20 channels)
 - a. Time to cycle through all channels= Δ t= τ [ms] x 20 channels = 58.00 ms, where τ = pulse width
 - b. 100 ms/ Δt [ms] = $H \rightarrow$ Round up to next highest integer, H' = 2
 - c. Worst Case Dwell Time = τ [ms] x H ' = 5.800 ms



- d. Duty Cycle Correction(AFH) = 20log (Worst Case Dwell Time/ 100ms) dB = -24.7314 dB
- e. We applied DCCF in the test result which hopping channel number is 20.
- 8. We have done Normal Mode and EDR Mode test.
- 9. This test is performed with hopping off.
- 10. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



8.6.3 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

Normal(GFSK) 2402 MHz, 2480 MHz CH 0, CH 78

Frequency	Reading	* A.F.+CL	Ant. Pol.	Duty Cycle Correction	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	Туре
2390.0	25.00	31.47	Н	0	56.47	73.98	17.51	PK
2390.0	12.16	31.47	Н	-24.73	18.89	53.98	35.09	AV
2390.0	24.88	31.47	V	0	56.35	73.98	17.63	PK
2390.0	12.14	31.47	V	-24.73	18.87	53.98	35.11	AV
2483.5	33.74	31.46	Н	0	65.20	73.98	8.78	PK
2483.5	30.84	31.46	Н	-24.73	37.57	53.98	16.41	AV
2483.5	32.21	31.46	V	0	63.67	73.98	10.31	PK
2483.5	29.07	31.46	V	-24.73	35.80	53.98	18.18	AV



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Operation Mode	EDR(8DPSK)
Operating Frequency	2402 MHz , 2480 MHz
Channel No	CH 0, CH 78

Frequency	Reading	* A.F.+CL	Ant. Pol.	Duty Cycle Correction	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	Туре
2390.0	26.06	31.47	H	0	57.53	73.98	16.45	PK
2390.0	12.17	31.47	Н	-24.73	18.90	53.98	35.08	AV
2390.0	25.76	31.47	V	0	57.23	73.98	16.75	PK
2390.0	12.13	31.47	V	-24.73	18.86	53.98	35.12	AV
2483.5	33.70	31.46	H	0	65.16	73.98	8.82	PK
2483.5	28.96	31.46	Н	-24.73	35.69	53.98	18.29	AV
2483.5	31.79	31.46	V	0	63.25	73.98	10.73	PK
2483.5	26.54	31.46	V	-24.73	33.27	53.98	20.71	AV

Operation Mode

Channel No

EDR(π/4DQPSK)

2402 MHz , 2480 MHz

Operating Frequency

CH 0, CH 78

V

31.46

			,					
Frequency	Reading	* A.F.+CL	Ant. Pol.	Duty Cycle Correction	Total	Limit	Margin	Measurement
[MHz]	dBuV	[dB]	[H/V]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	Туре
2390.0	25.79	31.47	н	0	57.26	73.98	16.72	PK
2390.0	12.14	31.47	Н	-24.73	18.87	53.98	35.11	AV
2390.0	25.68	31.47	V	0	57.15	73.98	16.83	PK
2390.0	12.12	31.47	V	-24.73	18.85	53.98	35.13	AV
2483.5	33.72	31.46	Н	0	65.18	73.98	8.80	PK
2483.5	28.71	31.46	н	-24.73	35.44	53.98	18.54	AV
2483.5	31.82	31.46	V	0	63.28	73.98	10.70	PK

-24.73

* A·F: ANTENNA FACTOR

2483.5

C·L: CABLE LOSS AMP GAIN: AMPLIFIER GAIN

26.58

AV

53.98

33.31

20.67



Notes:

- 1. Frequency range of measurement = 2483.5 MHz ~ 2500 MHz
- 2. Total = Fundamental Reading Value + Antenna Factor + Cable Loss + Duty Cycle Correction Factor
- 3. Spectrum setting:
 - a. Peak: 1 GHz 25 GHz, RBW = 1 MHz, VBW ≥3*RBW

b. Average: 1 GHz – 25 GHz, RBW = 1 MHz, VBW ≥ 1/T Hz, where T = pulse width in seconds.

We performed using a reduced video BW method was done with the analyzer in linear mode.

- 4. FYI : Duty Cycle Correction Factor (79 channel hopping)
 - a. Time to cycle through all channels = Δ t = τ [ms] x 79 channels = 229.100 ms, where τ = pulse width
 - b. 100 ms/ Δt [ms] = $H \rightarrow$ Round up to next highest integer, H' = 1
 - c. Worst Case Dwell Time = τ [ms] x H ' = 2.900 ms
 - d. Duty Cycle Correction = 20log (Worst Case Dwell Time/ 100ms) dB = -30.752 dB
- 5. Duty Cycle Correction Factor(AFH mode minimum channel number case 20 channels)
 - a. Time to cycle through all channels= Δ t= τ [ms] x 20 channels = 58.00 ms, where τ = pulse width
 - b. 100 ms/ Δt [ms] = $H \rightarrow$ Round up to next highest integer, H' = 2
 - c. Worst Case Dwell Time = τ [ms] x H ' = 5.800 ms
 - d. Duty Cycle Correction(AFH) = 20log (Worst Case Dwell Time/ 100ms) dB = -24.7314 dB
 - e. We applied DCCF in the test result which hopping channel number is 20.
- 6. We have done Normal Mode, EDR Mode.
- 7. This test is performed with hopping off.
- 8. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



8.7 POWERLINE CONDUCTED EMISSIONS

LIMIT

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 microvolt (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.
- 5. This test is performed with hopping off and 3 Mbps (8DPSK) data rate of No.39 channel.

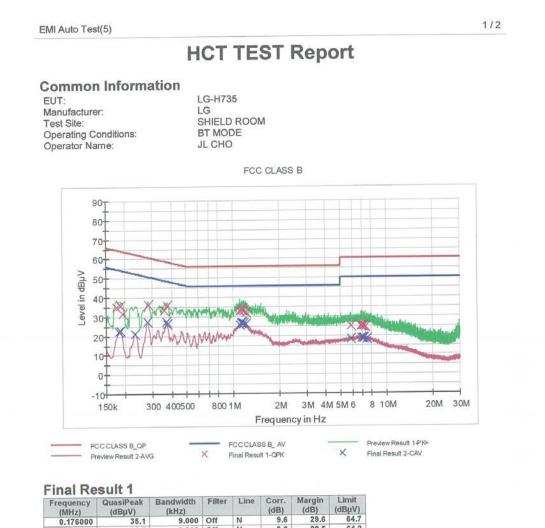
Sample Calculation

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



Model: LG-H735

RESULT PLOTSConducted Emissions (Line 1)



(MHz)	(dBµV)	(kHz)		and the second second	(dB)	(dB)	(dBµV)
0.176000	35.1	9.000	Off	N	9.6	29.6	64.7
0.186000	35.7	9.000	Off	N	9.6	28.5	64.2
0,192000	31.4	9.000	Off	N	9.6	32.5	63.9
0.282000	36.2	9.000	Off	N	9.7	24.6	60.8
0,360000	33.5	9.000	Off	N	9.7	25.2	58.7
0.374000	35.6	9.000	Off	N	9.7	22.8	58.4
1,114000	33.0	9,000	Off	N	9.7	23.0	56.0
1,138000	34.2	9.000	Off	N	9.7	21.8	56.0
1,152000	33.3	9,000	Off	N	9.7	22.7	56.0
1.180000	32.8	9,000	Off	N	9.7	23.2	56.0
1.190000	33.2	9,000	Off	N	9.7	22.8	56.0
1,216000	32.0	9.000	Off	N	9.7	24.0	56.0
5,866000	24.7	9.000	Off	N	9.9	35.3	60.0
6.838000	25.0	9.000	Off	N	9.9	35.0	60.0
6.848000	24.8	9.000	Off	N	9.9	35.2	60.0
7.060000	24.8	9,000	Off	N	9.9	35.2	60.0

5/14/2015

2:45:06



Model: LG-H735

EMI Auto Test(5)

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
7.106000	24.7	9.000	Off	N	9.9	35.3	60.0
7.264000	24.6	9.000	Off	N	9.9	35.4	60.0

Final Result 2

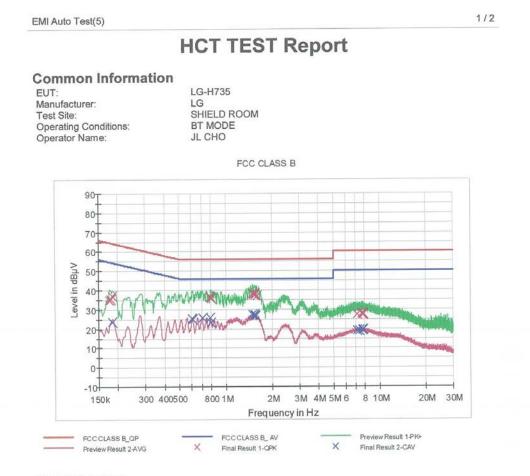
Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	22.4	9.000	Off	N	9.6	32.0	54.4
0.186000	22.8	9.000	Off	N	9,6	31.4	54.2
0.230000	21.1	9.000	Off	N	9.6	31.3	52.4
0.280000	27.5	9.000	Off	N	9.7	23.3	50.8
0.370000	27.4	9.000	Off	N	9.7	21.1	48.5
0.374000	26.3	9.000	Off	N	9.7	22.1	48.4
1.114000	25.8	9.000	Off	N	9.7	20.2	46.0
1.140000	27.1	9.000	Off	N	9.7	18.9	46.0
1.144000	26.7	9.000	Off	N	9.7	19.3	46.0
1.152000	26.8	9.000	Off	N	9.7	19.2	46.0
1.180000	26.8	9.000	Off	N	9.7	19.2	46.0
1.216000	26.1	9.000	Off	N	9.7	19.9	46.0
5.866000	18.2	9.000	Off	N	9.9	31.8	50.0
6.848000	18.6	9.000	Off	N	9.9	31.4	50.0
6.880000	18.8	9.000	Off	N	9.9	31.2	50.0
7.060000	18.6	9.000	Off	N	9.9	31.4	50.0
7.106000	18.7	9.000	Off	N	9.9	31.3	50.0
7.480000	18.2	9.000	Off	N	9.9	31.8	50.0

2/2

2:45:06



Conducted Emissions (Line 2)



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.176000	35.1	9.000	Off	L1	9.6	29.6	64.7
0.180000	35.5	9.000	Off	L1	9.6	29.0	64.5
0.184000	37.0	9.000	Off	L1	9.6	27.3	64.3
0.792000	36.1	9.000	Off	L1	9.7	19.9	56.0
0.796000	36.8	9.000	Off	L1	9.7	19.2	56.0
0.802000	35.8	9.000	Off	L1	9.7	20.2	56.0
1,496000	38.2	9.000	Off	L1	9.8	17.8	56.0
1,502000	37.7	9.000	Off	L1	9.8	18.3	56.0
1.540000	37.9	9.000	Off	L1	9.8	18.1	56.0
1.544000	37.9	9.000	Off	L1	9,8	18.1	56.0
1.550000	37.6	9.000	Off	L1	9.8	18.4	56.0
1,598000	37.0	9.000	Off	L1	9.8	19.0	56.0
7.160000	27.3	9.000	Off	L1	10.0	32.7	60.0
7.582000	27.8	9.000	Off	L1	10.0	32.2	60.0
7.730000	27.3	9.000	Off	L1	10.0	32.7	60.0
7.746000	27.6	9.000	Off	L1	10.0	32.4	60.0

5/14/2015

2:09:37



EMI Auto Test(5)

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
7.778000	27.7	9.000	Off	L1	10.0	32.3	60.0
7.796000	27.6	9.000	Off	L1	10.0	32.4	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.184000	23.7	9.000	Off	L1	9.6	30.6	54.3
0.606000	25.4	9.000	Off	L1	9.6	20.6	46.0
0.612000	25.0	9.000	Off	L1	9.6	21.0	46.0
0.704000	25.8	9.000	Off	L1	9.7	20.2	46.0
0.794000	25.6	9.000	Off	L1	9.7	20.4	46.0
0.804000	23.3	9.000	Off	L1	9.7	22.7	46.0
1,494000	27.2	9.000	Off	L1	9.8	18.8	46.0
1,498000	27.3	9.000	Off	L1	9.8	18.7	46.0
1.542000	27.3	9.000	Off	L1	9.8	18.7	46.0
1.546000	27.2	9.000	Off	L1	9.8	18.8	46.0
1,550000	26.9	9.000	Off	L1	9.8	19.1	46.0
1.554000	26.6	9.000	Off	L1	9.8	19.4	46.0
7.160000	19,1	9.000	Off	L1	10.0	30.9	50.0
7,408000	19,1	9.000	Off	L1	10.0	30.9	50.0
7.746000	19.3	9.000	Off	L1	10.0	30.7	50.0
7.774000	19.4	9.000	Off	L1	10.0	30.6	50.0
7.780000	19.5	9.000	Off	L1	10.0	30.5	50.0
7,786000	19.5	9,000	Off	L1	10.0	30.5	50.0

2/2

2:09:37



9. LIST OF TEST EQUIPMENT

9.1 LIST OF TEST EQUIPMENT(Conducted Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.	
Rohde & Schwarz	ENV216/ LISN	01/13/2015	Annual	100073	
Agilent	E4440A/ Spectrum Analyzer	03/18/2015	Annual	US45303008	
Agilent	N9020A/ SIGNAL ANALYZER	04/29/2015	Annual	MY51110063	
Agilent	N1911A/Power Meter	01/15/2015	Annual	MY45100523	
Agilent	N1921A /POWER SENSOR	07/09/2014	Annual	MY45241059	
Agilent	87300B/Directional Coupler	12/08/2014	Annual	3116A03621	
Hewlett Packard	11667B / Power Splitter	04/30/2015	Annual	11275	
ITECH	IT6720 / DC POWER SUPPLY	11/04/2014	Annual	010002156287001199	
Rohde & Schwarz	CBT / BLUETOOTH TESTER	05/11/2015	Annual	100422	
Agilent	8493C / Attenuator(10 dB)	07/21/2014	Annual	76649	



9.2 LIST OF TEST EQUIPMENT(Radiated Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Schwarzbeck	VULB 9160/ TRILOG Antenna	10/10/2014	Biennial	3368
HD	MA240/ Antenna Position Tower	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	12
Rohde & Schwarz	SCU-18/ Signal Conditioning Unit	09/04/2014	Annual	10094
CERNEX	CBL18265035 / POWER AMP	07/23/2014	Annual	22966
Schwarzbeck	BBHA 9120D/ Horn Antenna	07/05/2013	Biennial	1151
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	07/05/2013	Biennial	BBHA9170541
Rohde & Schwarz	FSP / Spectrum Analyzer	10/23/2014	Annual	836650/016
Wainwright Instrument	WHF3.0/18G-10EF / High Pass Filter	06/23/2014	Annual	8
Wainwright Instrument	WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter	06/23/2014	Annual	2
Rohde & Schwarz	CBT / BLUETOOTH TESTER	05/11/2015	Annual	100422
Rohde & Schwarz	LOOP ANTENNA	09/03/2014	Biennial	1513-175
CERNEX	CBL06185030 / POWER AMP	07/21/2014	Annual	22965
CERNEX	CBLU1183540 / POWER AMP	07/21/2014	Annual	22964