

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: April 25, 2016 Test Site/Location: HCT CO., LTD., 74,Seoicheon-ro 578beon-gil,Majangmyeo,Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA Report No.: HCT-R-1604-F063 HCT FRN: 0005866421

IC Recognition No.: 5944A-5

FCC ID : ZNFNSO APPLICANT :LG Electronics MobileComm U.S.A., Inc.

Model(s):	KT1601
EUT Type:	Tablet with WLAN and Bluetooth
RF Peak Output Power:	0.409 dBm (1.099 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 : Seul Ki Lee Test Engineer of RF Team

Approved by : Jong Seok Lee Manager of RF Team

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1604-F063	April 25, 2016	- First Approval Report



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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:	ZNFNSO				
EUT Type:	Tablet with WLAN and Bluetooth				
Model (s):	KT1601				
Date(s) of Tests:	March 29, 2016 ~ April 18, 2016				
Place of Tests:	HCT Co., Ltd.				
	74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea				
	(IC Recognition No. : 5944A-5)				

2. EUT DESCRIPTION

Model	KT1601	KT1601		
EUT Type	Tablet wit	Tablet with WLAN and Bluetooth		
Power Supply	DC 3.85 V			
Battery Infomation	Model: BL-	-T20J_KD		
	Type: Li-io	n Polymer		
Frequency Range	TX: 2402 N	MHz ~ 2480 MHz		
	RX: 2402 MHz ~ 2480 MHz			
Max. RF Output Power	Peak	0.409 dBm (1.099 mW)		
	Average 0.243 dBm (1.058 mW)			
BT Operating Mode	BT _Low E	Energy Mode		
Modulation Type	GFSK			
Number of Channels	40 Channels			
	Manufacturer: Ace technology.			
Antenna Specification	Antenna type: INTERNAL ANTENNA			
	Peak Gain : 0.09 dBi			



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 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 8.7		PASS
Radiated Spurious Emissions §15.205, 15.209		cf. Section 8.6.1		PASS
Radiated Restricted Band Edge	3 (,), 1 (,),		RADIATED	PASS

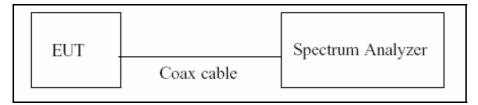


9. TEST RESULT 9.1 DUTY CYCLE

I 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)

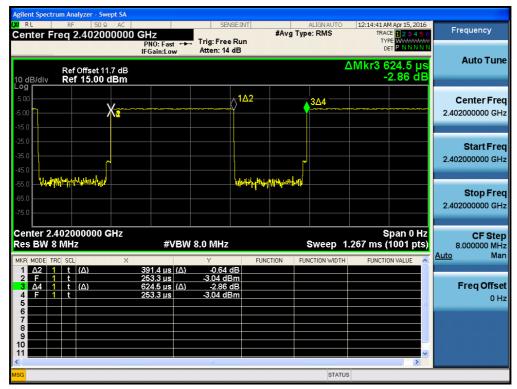
The zero-span method was used because all measured T data are > 6.25 microseconds and both RBW and VBW are > 50/T.

- 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)

LE Mode	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
	0.3914	0.6245	0.6268	2.03



RESULT PLOTS





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

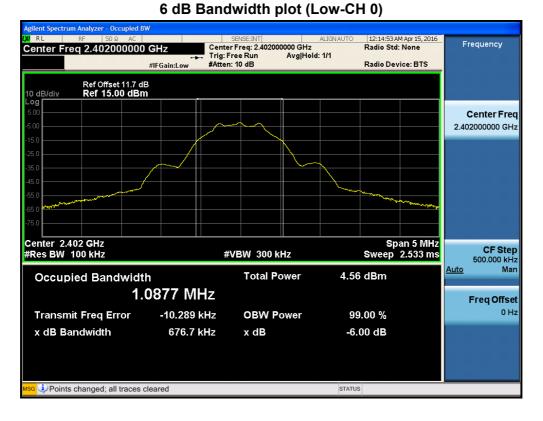
Note : We tested 6 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 6 dB.

TEST RESULT

Mode Channel	Channel	6 dB Bandwidth	Limit	Dece/Fail
	Channel	(kHz)	(kHz)	Pass/Fail
	0	676.7		Pass
BT LE	19	678.0	> 500	Pass
	39	676.4		Pass



RESULT PLOTS



6 dB Bandwidth plot (Mid-CH 19)

Agilent Spectrum Analyzer - Occupied X RL RF 50 Q AC Center Freq 2.444000000	0 GHz →-	SENSE:INT Center Freq: 2.440000 Trig: Free Run	ALIGNAUTO 0000 GHz Avg Hold: 1/1	12:16:29 AM Apr 15, 2016 Radio Std: None	Frequency
Ref Offset 11.7 o 10 dB/div Ref 15.00 dB		#Atten: 10 dB		Radio Device: BTS	
5.00 -5.00 -15.0					Center Freq 2.440000000 GHz
-25.0 -35.0 -45.0					
-65.0 -75.0					
Center 2.44 GHz #Res BW 100 kHz		#VBW 300 ki	Hz	Span 5 MHz Sweep 2.533 ms	CF Step 500.000 kHz
Occupied Bandwid	th .0867 MH	Total Po	ower 6.94	l dBm	<u>Auto</u> Man
Transmit Freq Error x dB Bandwidth	-12.402 k 678.0 k	Hz OBW Po		9.00 % 00 dB	Freq Offset 0 Hz
	678.U K	HZ X AB	-0.	00 dB	
MSG Doints changed; all traces	cleared		STATU	6	





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 ≥ 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 $\ge 2 \times \text{span} / \text{RBW}$. (This gives bin-to-bin spacing $\le \text{RBW}/2$,

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 stand alone with quick cover (close)st tenth dB. So, 10.7 dB is offset for 2.4 GHz Band.



TEST RESULTS-Peak

Conducted Output Power Measurements

LE Mode		Measured	Limit
Frequency[MHz]	Channel No.	Power(dBm)	(dBm)
2402	0	-1.885	30
2440	19	0.409	30
2480	39	-1.270	30

TEST RESULTS-Average

Conducted Output Power Measurements

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	-4.18	2.03	-2.15	30
2440	19	-1.79	2.03	0.24	30
2480	39	-3.40	2.03	-1.37	30



RESULT PLOTS-Peak



Conducted Output Power (Low-CH 0)

Conducted Output Power (Mid-CH 19)

Agilent Spectrum Analyzer - Swept SA		SENSE:INT	<u>م</u>	LIGNAUTO	12:16:39 AM Apr 15, 201	5
Center Freq 2.440000000	PNO: Wide +	Trig: Free Run	#Avg Type Avg Hold:	: RMS	TRACE 1 2 3 4 5 TYPE MWWWW DET P P P P	Frequency
	IFGain:Low	Atten: 10 dB		Mkr1	2.440 230 GH	
Ref Offset 11.7 dB 10 dB/div Ref 11.70 dBm Log					0.409 dBr	1
			1			Center Freq
1.70						2.440000000 GHz
-8.30						Otert Exer
-18.3						Start Freq 2.438500000 GHz
-28.3						Stop Freq
-38.3						2.441500000 GHz
-48.3						CF Step
						300.000 kHz <u>Auto</u> Mar
-58.3						
-68.3						Freq Offset
-78.3						
Center 2.440000 GHz	#)(B))/	2.0 MHz		woon 4	Span 3.000 MH	z
#Res BW 1.0 MHz Msg ③ Points changed; all traces cl		3.0 MHz		sweep 1.	.532 ms (1000 pts	2





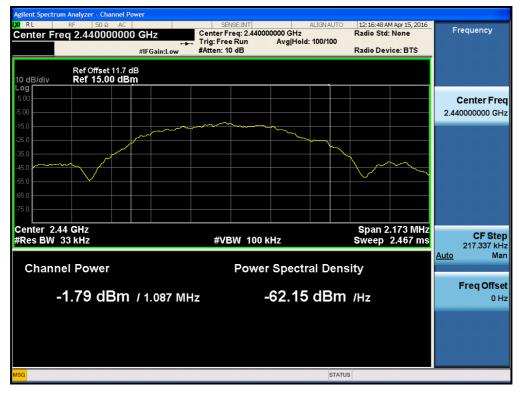
Conducted Output Power (High-CH 39)



RESULT PLOTS-Average



Conducted Output Power (Mid-CH 19)







Conducted Output Power (High-CH 39)



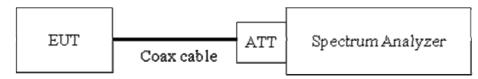
9.4 POWER SPECTRAL DENSITY

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 v03r05

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 stand alone with quick cover (close)st tenth dB. So,10.7 dB is offset for 2.4 GHz Band.



Model:KT1601

TEST RESULTS

Frequency	Frequency Channel	Mode	Test Result						
(MHz)	No.		PSD	Limit	Pass/				
(141112)			(dBm)	(dBm)	Fail				
2402	0		-17.165	8	Pass				
2440	19	LE	-14.750	8	Pass				
2480	39		-16.475	8	Pass				

Conducted Power Density Measurements



RESULT PLOTS



Power Spectral Density (Low-CH 0)

Power Spectral Density (Mid-CH 19)







Power Spectral Density (High-CH 39)

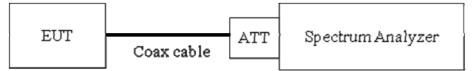


9.5 OUT OF BAND EMISSIONS AT THE BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS Test Requirements and limit, §15.247(d)

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 CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. (Procedure 11.0 in KDB 558074 v03r05)

RBW = 100 kHz

 $VBW \ge 3 \times RBW$

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 stand alone with quick cover (close)st 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			

FACTORS FOR FREQUENCY



Model:KT1601

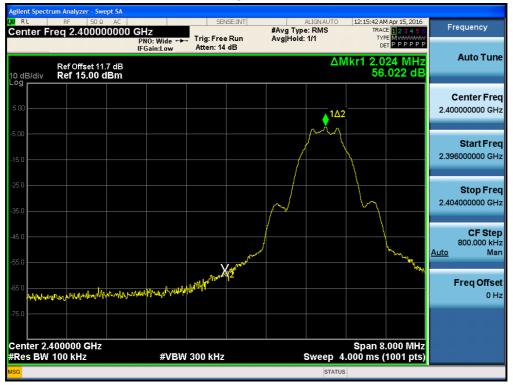
14000	11.90
15000	11.98
16000	12.04
17000	12.02
18000	12.08
19000	12.07
20000	12.14
21000	12.17
22000	12.31
23000	12.60
24000	12.34
25000	12.53

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

2. Factor = Cable loss + Attenuator loss

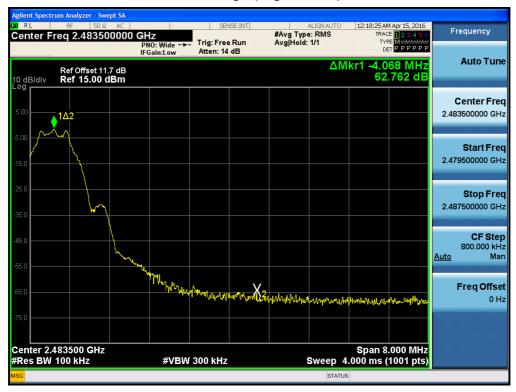


RESULT PLOTS



BandEdge (Low-CH 0)

BandEdge (High-CH 39)





30 MHz ~ 1 GHz

Conducted Spurious Emission (Mid-CH 19)

	um Analyzer - Swept SA					
Center F	RF 50Ω AC reg 515.000000		SENSE:INT	ALIGNAUTO #Avg Type: RMS	TRACE 1 2 3 4 5 6	Frequency
10 dB/div	Ref Offset 11.7 dB Ref 11.70 dBm	PNO: Fast ↔ IFGain:Low	. Trig: Free Run #Atten: 10 dB	Avg Hold: 1/1	түре Муминий Det P P P P P P /kr1 863.76 MHz -70.718 dBm	
1.70						Center Freq 515.000000 MHz
-8.30					-10.87 dBm	Start Freq 30.000000 MHz
-28.3						Stop Freq 1.000000000 GHz
-48.3 						CF Step 97.000000 MHz <u>Auto</u> Mar
	particital pulped standarts at a las	1) alga isana di ada talan ya Mila da t	and the second	gagaliyanan 1 da da ang ang ang ang ang ang ang ang ang an	1	Freq Offset 0 Hz
-78.3 -78.4 Start 30.0 #Res BW	MHz		300 kHz	Sweep 9	2 Stop 1.0000 GHz 93.33 ms (20000 pts)	
	ts changed; all traces			STAT		

1 GHz ~ 3 GHz

LXI RL	um Analyzer - Swe RF 50 Ω req 2.00000	AC 00000 GHz PNO: Fast	SENSE:	#Avg un Avg	ALIGNAUTO 3 Type: RMS Hold: 1/1	12:20:30 AM Apr 15 TRACE 1 2 TYPE MW DET P P	3 4 5 6	Frequency
10 dB/div					Mkr	_	Auto Tune	
Log 1.70 -8.30 -18.3					 	-19	.67 dBm	Center Freq 2.000000000 GHz
-28.3 -38.3 -48.3								Start Freq 1.000000000 GHz
-58.3 -68.3 -78.3	an an think a second dimension of a sector	ant produkti na slavni svoj konstanti svoj ka na konstanti svoj na konstanta produkti na slavni svoj konstanti ka konstanti ka konstanti ka konstanti ka konstanti ka konstanti	en a berge geschenden an Berger bei ber		n king ang ang ang ang ang ang ang ang ang a		ini ang	Stop Freq 3.000000000 GHz
Start 1.00 #Res BW	100 kHz	#V ×	BW 300 kHz	FUNCTION	Sweep 19	Stop 3.000 2.0 ms (40001	pts)	CF Step 200.000000 MHz <u>Auto</u> Mar
1 N 1 2 N 1 3 4 5 5	f	2.440 00 GHz 2.677 75 GHz	0.328 dBm -67.883 dBm					Freq Offset 0 Hz
6 7 8 9 10								
<	ts changed; all t	traces cleared			STATUS		>	



3 GHz ~ 5 GHz

Conducted Spurious Emission (Mid-CH 19)



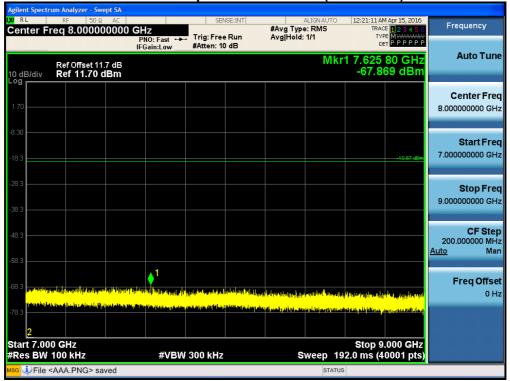
5 GHz ~ 7 GHz

								er - Swept SA		
Frequency	M Apr 15, 2016 CE 123456 (PE M WWWWWW DET P P P P P P	TRA		#Avg Ty; Avg Hold		, Trig: Fre	GHz PNO: Fast ↔	50Ω AC 000000000	_R , Freq 6.0	Center
Auto Tune		kr1 6.187	Mk		0 dB	#Atten: 1	IFGain:Low	set 11.7 dB . 70 dBm		10 dB/div Log
Center Freq 6.000000000 GHz										1.70
Start Freq 5.000000000 GHz	-19.67 dBm									-8.30
Stop Fred 7.000000000 GHz										-28.3
CF Step 200.000000 MH: <u>Auto</u> Mar										-48.3
Freq Offset 0 Hz								allenning generation (
	7.000 GHz	Stop 7							00 GHz	2
	40001 pts)	192.0 ms (4 rus	Sweep 1			/ 300 kHz	#VBV		100 kH <aaa.pn< td=""><td></td></aaa.pn<>	



7 GHz ~ 9 GHz

Conducted Spurious Emission (Mid-CH 19)

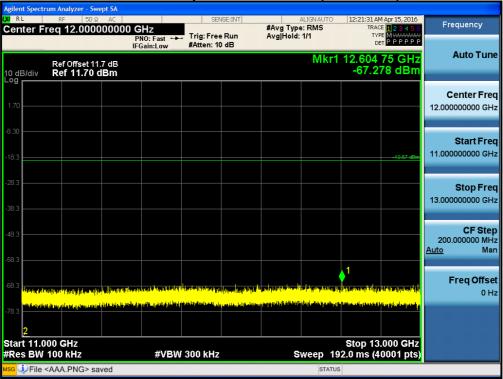


9 GHz ~ 11 GHz

	um Analyzer - Swept S							
Center F	RF 50Ω AC reg 10.000000		SENSE	#A\	ALIGNAUT	TRAC	1 Apr 15, 2016	Frequency
		PNO: Fast +++ IFGain:Low	Trig: Free R #Atten: 10 d		[Hold: 1/1	TYP	ЕМ МАЛАМИ ТРРРРРР	
	Ref Offset 11.7 di	3			Mk	r1 10.552	50 GHz	Auto Tune
10 dB/div Log	Ref 11.70 dBn	1				-67.34	40 dBm	
								Center Freq
1.70								10.000000000 GHz
0.00								
-8.30								Start Freq
-18.3							-19.67 dBm	9.000000000 GHz
-28.3								Stop Freq
-38.3								11.000000000 GHz
-30.3								
-48.3								CF Step 200.000000 MHz
								Auto Man
-58.3						.1		
-68.3						• '		Freq Offset
an delivery de	and the product of the second s	dan pi pi di la su su di sindi			a alay in course a second a s	an a	tereteristikiseteristi Maralalaristik	0 Hz
-78.3 <mark>altratute</mark> et	<mark>itte jan en sind is helping. Lis shere a</mark> pe	الله الشمالية عنوارية معرومة المتقاط المتنافية م	حيالة سارا بعث النظنير وإصابتنا	nahiya ya sa	The second second second second			
2								
Start 9.00					_		.000 GHz	
#Res BW		#VBW	300 kHz			192.0 ms (4	0001 pts)	
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11 GHz ~ 13 GHz



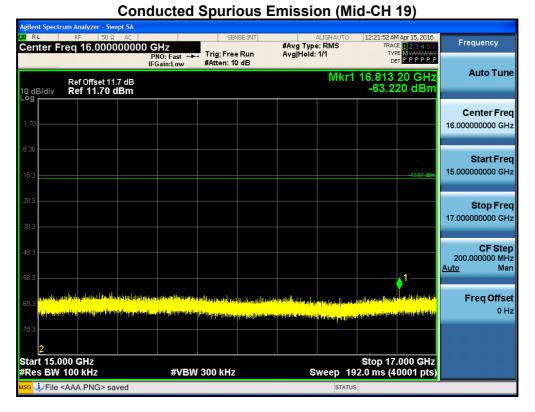
Conducted Spurious Emission (Mid-CH 19)

13 GHz ~ 15 GHz

	rum Analyzer - Swept SA						
XI RL Center Fi	RF 50 Ω AC req 14.00000000			ALIGNAUTO /pe: RMS Id: 1/1	TYPE	123456 MWARAAAAA	Frequency
10 dB/div	Ref Offset 11.7 dB Ref 11.70 dBm	IFGain:Low #Atten: 1	0 dB	Mkr1	14.732 9 -64.61	5 GHz 3 dBm	Auto Tune
- og 1.70							Center Fre 14.000000000 GH
8.30						19.67 dBm	Start Fre 13.000000000 GH
28.3							Stop Fre 15.00000000 GH
48.3							CF Ste 200.000000 M⊢ <u>Auto</u> Ma
68.3	layed line of the foreign terms of the set of the set of the	and the state of t	des han search from the state of the state o	y Player (Player) www.com/com/com/com/com/com/com/com/com/com/	1 Handlard about the ball	Al April 10 and 10 a Company and 10 a	Freq Offse 0 H
78.3 <mark>2</mark>	<mark>ga biya dan panya walawa kanga bilina wa atawa ka waa t</mark>	na de la companya de La companya de la comp					
Start 13.0 #Res BW		#VBW 300 kHz	2	Sweep 19	Stop 15.0 2.0 ms (40		
isg 🛈 File <	<aaa.png> saved</aaa.png>			STATUS			



15 GHz ~ 17 GHz

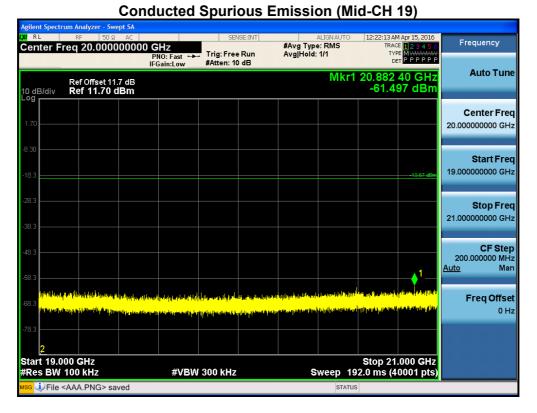


17 GHz ~ 19 GHz

	rum Analyzer - Swe									
Center F	RF 50 Ω req 18.0000	1.12	Hz		ISE:INT	#Avg Type		TRAC	4 Apr 15, 2016 E 1 2 3 4 5 6	Frequency
		Р	NO: Fast 🔸	Trig: Free #Atten: 10		Avg Hold:	1/1	TYI Di		
	Ref Offset 11.		ounicon.				Mkr	1 18.335		Auto Tune
10 dB/div Log	Ref 11.70 d							-62.2	17 dBm	
209										Center Freq
1.70										18.000000000 GHz
-8.30										Start Freq
-18.3									-19.67 dBm	17.000000000 GHz
-28.3										Stop Freq
-38.3										19.00000000 GHz
-30.3										
-48.3										CF Step 200.000000 MHz
										Auto Man
-58.3						├				
-68 3 CT	and the second strengthe	1.1.10						Hangland David	1 N N N	Freq Offset
a) sajata	The territory sector for the sector of the s	^{and} Adapth (Calify		Children and place	and the part of the second second	إنهاعت أفأه الثلية التلا	le s ^{fel} led ⁱⁿ e, stelejter	Later Allocate Lyperfiles of all	in the second	0 Hz
-78.3										
2										
Start 17.0								Stop 19	.000 GHz	
#Res BW			#VBW	300 kHz		S		92.0 ms (4	0001 pts)	
MSG 😲 File	<aaa.png> sav</aaa.png>	ved					STAT	US		



19 GHz ~ 21 GHz



21 GHz ~ 23 GHz

LXI RL	rum Analyzer - Swept SA RF 50 م AC req 22.00000000		SEN	ISE:INT	#Avg Type	ALIGN AUTO	TRAC	Apr 15, 2016	Frequency
10 dB/div	Ref Offset 11.7 dB Ref 11.70 dBm	PNO: Fast ↔→ IFGain:Low	Trig: Free #Atten: 10		Avg[Hold:	1/1	TYF DE 22.971	EMWWWWWW TPPPPP	Auto Tune
1.70									Center Fred 22.000000000 GH;
-8.30								-19.67 dBm	Start Free 21.000000000 GH:
-28.3									Stop Free 23.000000000 GH
-48.3									CF Step 200.000000 MH <u>Auto</u> Ma
-	kayya kapata kataona yi Distri Kashing Madii yin Dana gyala da kan sagi dana sitan arif ying san							eineprilipetitu Autoristista	Freq Offse 0 H
-78.3 2 Start 21.0							Stop 23	.000 GHz	
#Res BW ^{MSG} ①File ·	400 kHz <aaa.png> saved</aaa.png>	#VBW	300 kHz		S	statu	92.0 ms (4 s	0001 pts)	



23 GHz ~ 25 GHz

gilent Spectrum Analyzer - Swept SA RL Center Freq 24.000000000 GHz PN0: Fast → IFGain:Low #Avg Type: RMS Avg|Hold: 1/1 33 AM Apr 15, 2016 Frequency RACE 1 2 3 4 5 6 TYPE M W P P P P P Trig: Free Run #Atten: 10 dB Auto Tune Mkr1 24.230 30 GHz -57.198 dBm Ref Offset 11.7 dB Ref 11.70 dBm 10 dB/div **Center Freq** 24.00000000 GHz Start Freq 23.00000000 GHz Stop Freq 25.00000000 GHz CF Step 200.000000 MHz to Man ▲1 <u>Auto</u> contraction of the local data and the second second **Freq Offset** 0 Hz Start 23.000 GHz #Res BW 100 kHz Stop 25.000 GHz Sweep 192.0 ms (40001 pts) #VBW 300 kHz File <AAA.PNG> saved STATUS



9.6 RADIATED MEASUREMENT.

9.6.1 RADIATED SPURIOUS EMISSIONS.

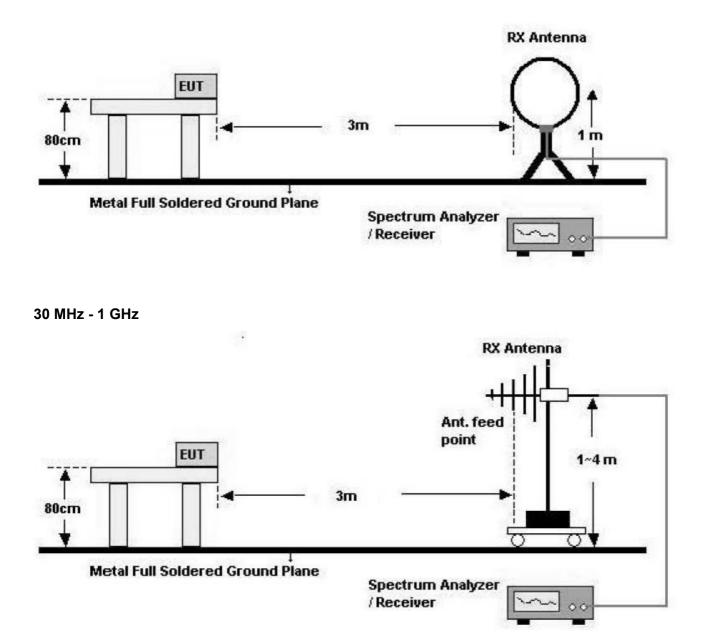
Test Requirements and limit, §15.205, §15.209

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

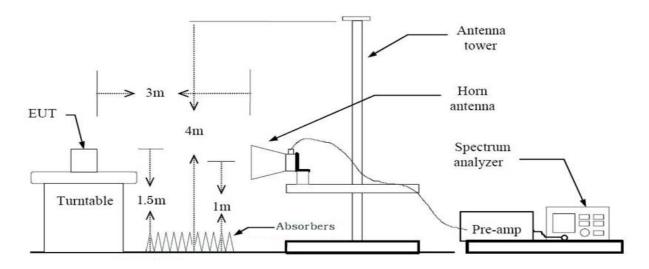
Below 30 MHz





Model:KT1601

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).

	nequency
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 $\pm 2\%$)

Set RBW = 1 MHz

Set VBW \ge 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.

LE Mode	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
	0.3914	0.6245	0.6268	2.03



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.



Model:KT1601

Above 1 GHz

Operation Mode: CH.0

Frequency	Reading	D.C.C.F	A.F.+CL-AMP G	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV/m]	[dBm]	[dBm]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4804	48.90	0.00	-2.96	V	45.94	73.98	28.04	PK
4804	37.33	2.03	-2.96	V	36.40	53.98	17.58	AV
7206	45.80	0.00	6.88	V	52.68	73.98	21.30	PK
7206	33.47	2.03	6.88	V	42.38	53.98	11.60	AV
4804	48.80	0.00	-2.96	Н	45.84	73.98	28.14	PK
4804	37.27	2.03	-2.96	Н	36.34	53.98	17.64	AV
7206	46.03	0.00	6.88	Н	52.91	73.98	21.07	PK
7206	33.58	2.03	6.88	Н	42.49	53.98	11.49	AV

- 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 + Duty Cycle Factor
- 5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



Model:KT1601

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Frequency	Reading	D.C.C.F	A.F.+CL-AMP G	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV/m]	[dBm]	[dBm]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4882	49.56	0.00	-2.60	V	46.96	73.98	27.02	PK
4882	37.86	2.03	-2.60	V	37.29	53.98	16.69	AV
7323	46.06	0.00	6.11	V	52.17	73.98	21.81	PK
7323	34.28	2.03	6.11	V	42.42	53.98	11.56	AV
4882	49.31	0.00	-2.60	Н	46.71	73.98	27.27	PK
4882	38.05	2.03	-2.60	Н	37.48	53.98	16.50	AV
7323	46.32	0.00	6.11	Н	52.43	73.98	21.55	PK
7323	34.22	2.03	6.11	Н	42.36	53.98	11.62	AV

Operation Mode: CH.19

- 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 + Duty Cycle Factor
- 5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



Model:KT1601

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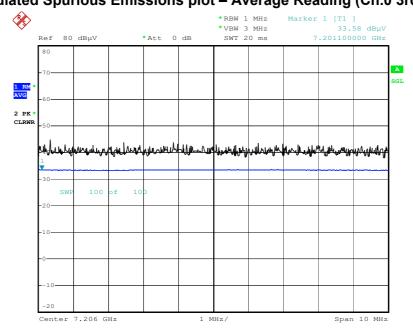
Frequency	Reading	D.C.C.F	A.F.+CL-AMP G	ANT. POL	Total	Limit	Margin	Measurement
[MHz]	[dBuV/m]	[dBm]	[dBm]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
4960	50.48	0.00	-2.53	V	47.95	73.98	26.03	PK
4960	37.99	2.03	-2.53	V	37.49	53.98	16.49	AV
7440	45.77	0.00	5.73	V	51.50	73.98	22.48	PK
7440	33.88	2.03	5.73	V	41.64	53.98	12.34	AV
4960	49.66	0.00	-2.53	Н	47.13	73.98	26.85	PK
4960	38.01	2.03	-2.53	Н	37.51	53.98	16.47	AV
7440	45.96	0.00	5.73	Н	51.69	73.98	22.29	PK
7440	33.92	2.03	5.73	Н	41.68	53.98	12.30	AV

Operation Mode: CH.39

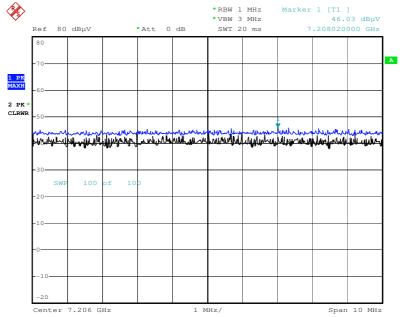
- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already 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 + Duty Cycle Factor
- 5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



RESULT PLOTS (Worst case : y-H) Radiated Spurious Emissions plot – Average Reading (Ch.0 3rd Harmonic)



Date: 14.APR.2016 16:49:03



Radiated Spurious Emissions plot – Peak Reading (Ch.0 3rd Harmonic)

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

Date: 14.APR.2016 16:47:58



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)).

BT_LE		
2402 MHz		
0		

Frequency	Reading	D.C.C.F	A.F.+CL	Ant. Pol.	Total	Limit	Margin	Measurement
[MHz]	[dBuV/m]	[dB]	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	Туре
2390.0	26.52	0.00	31.31	Н	57.83	73.98	16.15	PK
2390.0	15.42	2.03	31.31	Н	48.76	53.98	5.22	AV
2390.0	26.75	0.00	31.31	V	58.06	73.98	15.92	PK
2390.0	15.54	2.03	31.31	V	48.88	53.98	5.10	AV

- 1. Frequency range of measurement = 2310 MHz ~ 2390 MHz
- 2. Total = Reading Value + Antenna Factor + Cable Loss + Duty Cycle Factor
- 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode Operating Frequency Channel No.



Operation Mode	BT_LE
Operating Frequency	2480 MHz
Channel No.	39

Frequency [MHz]	Reading [dBuV/m]	D.C.C.F [dB]	A.F.+CL [dB]	Ant. Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	27.21	0.00	31.37	Н	58.58	73.98	15.40	PK
2483.5	15.82	2.03	31.37	н	49.22	53.98	4.76	AV
2483.5	26.96	0.00	31.37	V	58.33	73.98	15.65	PK
2483.5	15.64	2.03	31.37	V	49.04	53.98	4.95	AV

Notes:

1. Frequency range of measurement = 2483.5 MHz ~ 2500 MHz

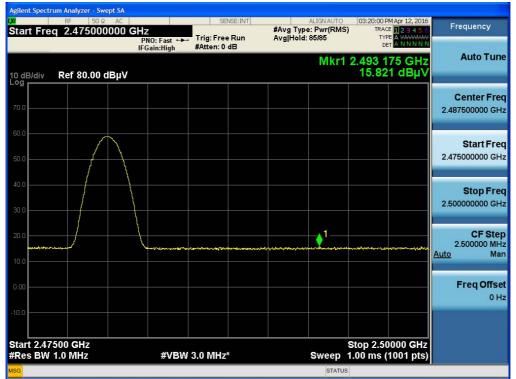
2. Total = Reading Value + Antenna Factor + Cable Loss + Duty Cycle Factor

3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

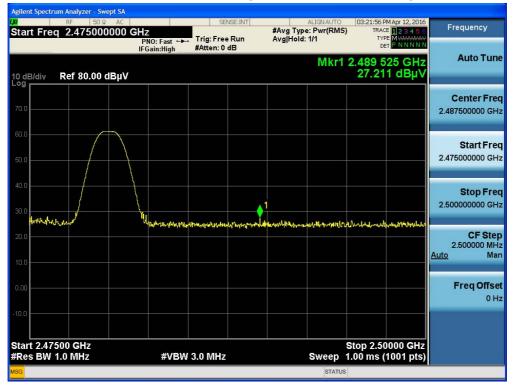


RESULT PLOTS (Worst case : z-H)

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



Model:KT1601

RESULT PLOTSConducted Emissions (Line 1)

BT LE MODE N

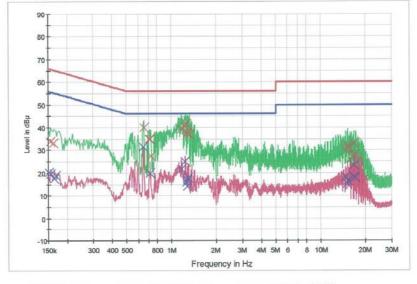
1/2

HCT TEST Report

Common Information

Manufacturer: Test Site: Operating Conditions: KT1601 LG SHIELD ROOM BT LE MODE







Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.156000	33.9	9.000	Off	N	9.6	31.8	65.7
0.162000	33.1	9.000	Off	N	9.6	32.3	65.4
0.652000	40.1	9.000	Off	N	9.6	15.9	56.0
0.712000	35.0	9.000	Off	N	9.7	21.0	56.0
0.718000	34.8	9.000	Off	N	9.7	21.2	56.0
0.728000	27.3	9.000	Off	N	9.7	28.7	56.0
1.166000	39.2	9.000	Off	N	9.7	16.8	56.0
1.234000	40.8	9.000	Off	N	9.7	15.2	56.0
1.240000	41.8	9.000	Off	N	9.7	14.2	56.0
1.270000	37.9	9.000	Off	N	9.7	18.2	56.0
1.280000	37.4	9.000	Off	N	9.7	18.6	56.0
1.320000	36.9	9.000	Off	N	9.7	19.1	56.0
14.618000	29.9	9.000	Off	N	10.1	30.1	60.0
15.148000	30.8	9.000	Off	N	10.1	29.2	60.0
15.276000	31.8	9.000	Off	N	10.1	28.2	60.0
16.640000	27.6	9.000	Off	N	10.2	32.4	60.0
16.716000	33.0	9.000	Off	N	10.2	27.0	60.0
17.154000	28.1	9.000	Off	N	10.2	31.9	60.0

Final Result 2

2016-04-20

오후 8:08:14



2/2

BT LE MODE N

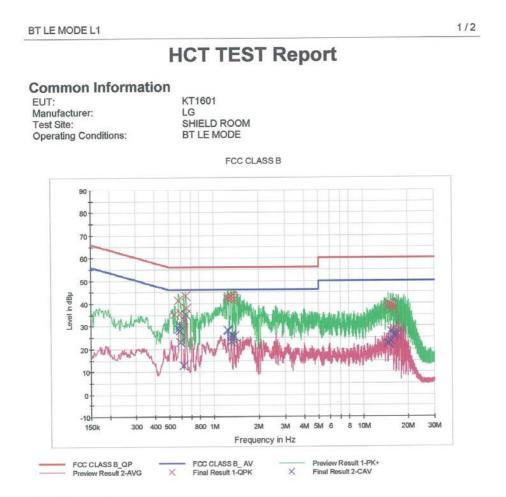
Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.152000	20.3	9.000	Off	N	9.6	35.6	55.9
0.156000	19.7	9.000	Off	N	9.6	36.0	55.7
0.164000	17.6	9.000	Off	N	9.6	37.6	55.3
0.168000	18.8	9.000	Off	N	9.6	36.2	55.1
0.650000	31.6	9.000	Off	N	9.6	14.4	46.0
0.718000	19.9	9.000	Off	N	9.7	26.1	46.0
1.166000	21.6	9.000	Off	N	9.7	24.4	46.0
1.238000	25.2	9.000	Off	N	9.7	20.8	46.0
1.262000	16.0	9.000	Off	N	9.7	30.0	46.0
1.270000	14.1	9.000	Off	N	9.7	31.9	46.0
1.282000	17.0	9.000	Off	N	9.7	29.0	46.0
1.286000	17.9	9.000	Off	N	9.7	28.1	46.0
14.618000	18.1	9.000	Off	N	10.1	31.9	50.0
15.060000	15.1	9.000	Off	N	10.1	34.9	50.0
15.148000	16.6	9.000	Off	N	10.1	33.4	50.0
16.710000	18.1	9.000	Off	N	10.2	31.9	50.0
16.714000	23.4	9.000	Off	N	10.2	26.6	50.0
17.154000	17.9	9.000	Off	N	10.2	32.1	50.0

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Conducted Emissions (Line 2)



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.544000	35.2	9.000	Off	L1	9.7	20.8	56.0
0.578000	41.2	9.000	Off	L1	9.7	14.8	56.0
0.598000	35.8	9.000	Off	L1	9.7	20.2	56.0
0.628000	33.1	9.000	Off	L1	9.7	22.9	56.0
0.646000	43.3	9.000	Off	L1	9.7	12.7	56.0
0.654000	38.0	9.000	Off	L1	9.7	18.0	56.0
1.236000	42.3	9.000	Off	L1	9.7	13.7	56.0
1.244000	43.0	9.000	Off	L1	9.7	13.0	56.0
1.298000	42.1	9.000	Off	L1	9.7	13.9	56.0
1.306000	43.2	9.000	Off	L1	9.7	12.8	56.0
1.310000	43.5	9.000	Off	L1	9.7	12.5	56.0
1.362000	42.1	9.000	Off	L1	9.7	13.9	56.0
14.680000	39.7	9.000	Off	L1	10.1	20.3	60.0
14.688000	38.4	9.000	Off	L1	10.1	21.6	60.0
15.304000	39.8	9.000	Off	L1	10.2	20.2	60.0
15.364000	38.9	9.000	Off	L1	10.2	21.1	60.0
15.880000	37.5	9.000	Off	L1	10.2	22.5	60.0
15,900000	39.1	9.000	Off	L1	10.2	20.9	60.0

Final Result 2

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BT LE MODE L1

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.578000	28.8	9.000	Off	L1	9.7	17.2	46.0
0.586000	30.5	9.000	Off	L1	9.7	15.5	46.0
0.590000	28.1	9.000	Off	L1	9.7	17.9	46.0
0.598000	23.1	9.000	Off	L1	9.7	22.9	46.0
0.628000	12.8	9.000	Off	L1	9.7	33.2	46.0
0.648000	35.1	9.000	Off	L1	9.7	10.9	46.0
1.234000	28.4	9.000	Off	L1	9.7	17.6	46.0
1.242000	28.0	9.000	Off	L1	9.7	18.0	46.0
1.298000	25.9	9.000	Off	L1	9.7	20.1	46.0
1.306000	25.0	9.000	Off	L1	9.7	21.0	46.0
1.310000	23.2	9.000	Off	L1	9.7	22.8	46.0
1.362000	25.6	9.000	Off	L1	9.7	20.4	46.0
14.680000	22.7	9.000	Off	L1	10.1	27.3	50.0
14.688000	22.5	9.000	Off	L1	10.1	27.5	50.0
15.304000	23.7	9.000	Off	L1	10.2	26.3	50.0
15.364000	27.9	9.000	Off	L1	10.2	22.1	50.0
15.878000	26.0	9.000	Off	L1	10.2	24.0	50.0
16.804000	25.9	9.000	Off	L1	10.2	24.1	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	12/28/2015	Annual	100073
Rohde & Schwarz	ESCI / TEST RECEIVER	12/28/2015	Annual	100584
Agilent	E4440A/ Spectrum Analyzer	03/18/2016	Annual	US45303008
Agilent	N9020A / SIGNAL ANALYZER	06/30/2015	Annual	MY51110085
Agilent	N9030A / SIGNAL ANALYZER	11/24/2015	Annual	MY49431210
Agilent	N1911A/Power Meter	07/09/2015	Annual	MY45100523
Agilent	N1921A /Power Sensor	03/11/2016	Annual	MY52260025
Agilent	87300B/Directional Coupler	11/30/2015	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	06/15/2015	Annual	5001
Hewlett Packard	E3632A / DC POWER SUPPLY	03/09/2016	Annual	KR75303962
Agilent	8493C / Attenuator(10 dB)	07/23/2015	Annual	07560
Rohde & Schwarz	CBT / BLUETOOTH TESTER	05/11/2015	Annual	100422



10.2 LIST OF TEST EQUIPMENT(Radiated Test)

Manufacturer	Model / Equipment	Calibration	Calibration	Serial No.	
		Date	Interval		
Schwarzbeck	VULB 9160/ TRILOG Antenna	10/10/2014	Biennial	3368	
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	
CERNEX	CBL18265035 / POWER AMP	07/27/2015	Annual	22966	
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	09/24/2015	Annual	100688	
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/23/2015	Annual	101068-SZ	
Wainwright		00/20/2045	Annual	0	
Instrument	WHF3.0/18G-10EF / High Pass Filter	06/29/2015	Annuai	8	
Wainwright	WRCJV2400/2483.5-2370/2520-	07/06/2015	Annual	2	
Instrument	60/12SS / Band Reject Filter	07/06/2015	Annuai	2	
Wainwright	WRCJV5100/5850-40/50-8EEK /	01/26/2016	Appual	0	
Instruments	Band Reject Filter	01/20/2016	Annual	2	
Agilent	8493C-10 / Attenuator(10 dB)	08/20/2015	Annual	76649	
Rohde & Schwarz	LOOP ANTENNA	02/23/2016	Biennial	1513-175	
CERNEX	CBL06185030 / POWER AMP	07/21/2015	Annual	22965	
CERNEX	CBLU1183540 / POWER AMP	07/21/2015	Annual	22964	
CERNEX	CBL26405040 / Power Amplifier	07/09/2015	Annual	25956	
Rohde & Schwarz	CBT / BLUETOOTH TESTER	05/11/2015	Annual	100422	