	FCC TEST REPORT
	FOR
	MINIX TECHNOLOGY LIMITED
	Intel Mini PC
	Model No.: NEO Z83-4
Prepared for	: MINIX TECHNOLOGY LIMITED
Address	: Unit 01, 15/F, Chevalier Commercial Center, No.8 Wang Hoi Road, Kowloon Bay, Kowloon, Hong Kong
Prepared by	: Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample	: August 30, 2016
Number of tested samples	: 1
Serial number	: Prototype
Date of Test	: August 30, 2016~September 27, 2016
Date of Report	: September 27, 2016

	FCC TEST REPORT		
FCC CFR 47 PART 15 C(15.247): 2015			
Report Reference No	LCS1608302571E		
Date of Issue :	September 27, 2016		
	Shenzhen LCS Compliance Testing Laboratory Ltd.		
	1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China		
Testing Location/ Procedure :	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □		
Applicant's Name :	MINIX TECHNOLOGY LIMITED		
Address	Unit 01, 15/F, Chevalier Commercial Center, No.8 Wang Hoi Road, Kowloon Bay, Kowloon, Hong Kong		
Test Specification			
Standard	FCC CFR 47 PART 15 C(15.247): 2015		
Test Report Form No :	LCSEMC-1.0		
TRF Originator	Shenzhen LCS Compliance Testing Laboratory Ltd.		
Master TRF :	Dated 2011-03		
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Test Item Description	:	Intel Mini PC
Trade Mark	:	MINIX
Model/ Type reference	:	NEO Z83-4
Ratings	:	DC 12.0V, 3.0A
Result	:	Positive

Compiled by:

Jacky Li

Supervised by:

Approved by:

Jacky Li/ File administrators

Glin Lu/ Technique principal

Gavin Liang/ Manager

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Report No.: LCS1608302571E SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD. FCC ID: 2ADACNE0Z83-4

FCC -- TEST REPORT

Test Report No. : LCS1608302571E		September 27, 2016 Date of issue
r		
EUT	: Intel Mini PC	
Type / Model	: NEO Z83-4	
Applicant	: MINIX TECHNOLOGY	LIMITED
Address		r Commercial Center, No.8 Wang Hoi Road,
Telephone	Kowloon Bay, Kowloon : (852)-31755678	, Hong Kong
Fax	: (852)-31534189	
Manufacturer	: XIANGUAN ELECTRO	
Address	District,Shenzhen, P:51	g Edifice,Tairan 9th Rd.,Futian 8040
Telephone	: /	
Fax	:/	
P		
Factory	: XIANGUAN ELECTRO	g Edifice,Tairan 9th Rd.,Futian
/ 1001 000	District,Shenzhen, P:51	
Telephone	: /	
Fax	: /	

Test Result	Positive
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The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Revision	Issue Date	Revisions	Revised By
00	2016-09-27	Initial Issue	Gavin Liang

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1. GENERAL INFORMATION

1.1 Description of Device EUT	e (EUT) : Intel Mini PC
Model Number	: NEO Z83-4
Model Declaration	: /
Test Model	: NEO Z83-4
Power Supply	: DC 12.0V, 3.0A
Frequency Range	: 2402.00~2480.00MHz; 2412.00~2462.00MHz; 5180.00-5240.00MHz; 5745.00-5825.00MHz
Bluetooth Version	: V4.1
Channel Number	 79 Channels for BT V3.0; 40 Channels for BT LE; 11 Channels for WIFI 20MHz Bandwidth(802.11b/g/n-HT20) 4 Channels for 5180.00-5240.00MHz(802.11a/n-HT20/ac VHT20) 5 Channels for 5745.00-5825.00MHz(802.11a/n-HT20/ac VHT20) 2 Channels for 5190.00-5230.00MHz(802.11n-HT40/ac VHT40) 2 Channels for 5755.00-5795.00MHz(802.11n-HT40/ac VHT40) 1 Channels for 5210.00MHz(802.11 ac VHT80) 1 Channels for 5775.00MHz(802.11 ac VHT80)
Modulation Technology	 BT V3.0: FHSS(GFSK, π/4-DQPSK, 8-DPSK) BT LE: DSSS(GFSK) IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM(64QAM, 16QAM,QPSK,BPSK) IEEE 802.11a: OFDM(64QAM, 16QAM,QPSK,BPSK)
Data Rates	: BT V3.0: 1~3Mbps BT LE: 1Mbps IEEE 802.11b: 1-11Mbps IEEE 802.11g: 6-54Mbps IEEE 802.11n: MCS0-MCS7 IEEE 802.11a: 6-54Mbps IEEE 802.11ac: MCS0-MCS7
Antenna Type And Gain	: R-SMA antenna, 2.0dBi

1.2 Support equipment List

	Manufacturer	Description	Model	Serial Number	Certificate
E	DELTA ELECTRONICS, INC.	AC/DC ADAPTER	ADP-36PH		VoC

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1.3 External I/O Cable

I/O Port Description	Quantity	Cable
DC	1	N/A
Aux	1	N/A
Dock	1	N/A
HDMI	1	0.8m, Shielded
RJ45	1	N/A

1.4 Description of Test Facility

CNAS Registration Number. is L4595. FCC Registration Number. is 899208. Industry Canada Registration Number. is 9642A-1. VCCI Registration Number. is C-4260 and R-3804. ESMD Registration Number. is ARCB0108. UL Registration Number. is 100571-492. TUV SUD Registration Number. is SCN1081. TUV RH Registration Number. is UA 50296516-001

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

1.5 Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.6 Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
		9KHz~30MHz	3.10dB	(1)
		30MHz~200MHz	2.96dB	(1)
Radiation Uncertainty	:	200MHz~1000MHz	3.10dB	(1)
		1GHz~26.5GHz	3.80dB	(1)
		26.5GHz~40GHz	3.90dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	1.63dB	(1)
Power disturbance	:	30MHz~300MHz	1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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1.7 Description Of Test Modes

Bluetooth operates in the unlicensed ISM Band at 2.4GHz. With basic data rate feature, the data rates can be up to 1 Mb/s by modulating the RF carrier using GFSK techniques. The EUT works in the X-axis, Y-axis, Z-axis. The following operating modes were applied for the related test items. All test modes were tested, only the result of the worst case was recorded in the report.

Mode of Operations	Frequency Range (MHz)	Data Rate (Mbps)	
	2402	1/2/3	
BT V 3.0	2441	1/2/3	
	2480	1/2/3	
For Conducted Emission			
Test Mode	-	TX Mode	
For Radiated Emission			
Test Mode	-	TX Mode	

Worst-case mode and channel used for 150kHz-30 MHz power line conducted emissions was the mode and channel with the highest output power, that was determined to be TX(1Mbps).

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was the mode and channel with the highest output power, that was determined to be TX(1Mbps-Low Channel).

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR PART 15C 15.207, 15.209, 15.247 and DA 00-705.

2.1 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.

2.2 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, 15.247 under the FCC Rules Part 15 Subpart C.

2.3 General Test Procedures

2.3.1 Conducted Emissions

The EUT is directly placed on the ground. According to the requirements in Section 6.2.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turntable, which is directly placed on the ground. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m 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 maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10-2013

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a continuous transmit condition.

3.2 EUT Exercise Software

N/A.

3.3 Special Accessories

N/A.

3.4 Block Diagram/Schematics

Please refer to the related document.

3.5 Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6 Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

Applied Standard: FCC Part 15 Subpart C						
FCC Rules	Description of Test	Result				
§15.247(b)(1)	Maximum Conducted Output Power	Compliant				
§15.247(c)	Frequency Separation And 20 dB Bandwidth	Compliant				
§15.247(a)(1)(ii)	5.247(a)(1)(ii) Number Of Hopping Frequency					
§15.247(a)(1)(iii)	Time Of Occupancy (Dwell Time)	Compliant				
§15.209, §15.205	15.209, §15.205 Conducted Spurious Emissions and Band Edges Test					
§15.209, §15.247(d)	Radiated and Conducted Spurious Emissions	Compliant				
§15.205	Emissions at Restricted Band	Compliant				
§15.207(a)	Conducted Emissions	Compliant				
§15.203	Antenna Requirements	Compliant				
§15.247(i)§2.1093	RF Exposure	Compliant				

5. SUMMARY OF TEST EQUIPMENT

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1	Power Sensor	R&S	NRV-Z51	100458	2016-06-18	2017-06-17
2	Power Sensor	R&S	NRV-Z32	10057	2016-06-18	2017-06-17
3	Power Meter	R&S	NRVS	100444	2016-06-18	2017-06-17
4	DC Filter	MPE	23872C	N/A	2016-06-18	2017-06-17
5	RF Cable	Harbour Industries	1452	N/A	2016-06-18	2017-06-17
6	SMA Connector	Harbour Industries	9625	N/A	2016-06-18	2017-06-17
7	Spectrum Analyzer	Agilent	N9020A	MY50510140	2015-10-27	2016-10-26
8	Signal analyzer	Agilent	E4448A(Exter nal mixers to 40GHz)	US44300469	2016-06-16	2017-06-15
9	RF Cable	Hubersuhne	Sucoflex104	FP2RX2	2016-06-18	2017-06-17
10	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2016-06-18	2017-06-17
11	Amplifier	SCHAFFNER	COA9231A	18667	2016-06-18	2017-06-17
12	Amplifier	Agilent	8449B	3008A02120	2016-06-16	2017-06-15
13	Amplifier	MITEQ	AMF-6F-2604 00	9121372	2016-06-16	2017-06-15
14	Loop Antenna	R&S	HFH2-Z2	860004/001	2016-06-18	2017-06-17
15	By-log Antenna	SCHWARZBEC K	VULB9163	9163-470	2016-06-10	2017-06-09
16	Horn Antenna	EMCO	3115	6741	2016-06-10	2017-06-09
17	Horn Antenna	SCHWARZBEC K	BBHA9170	BBHA9170154	2016-06-10	2017-06-09
18	RF Cable-R03m	Jye Bao	RG142	CB021	2016-06-18	2017-06-17
19	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2016-06-18	2017-06-17
20	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101142	2016-06-18	2017-06-17
21	Artificial Mains	ROHDE & SCHWARZ	ENV216	101288	2016-06-18	2017-06-17
22	EMI Test Software	AUDIX	E3	N/A	2016-06-18	2017-06-17

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6. ANTENNA PORT MEASUREMENT

6.1 Peak Power

6.1.1 Block Diagram of Test Setup



DC Filter

6.1.2 Limit

According to §15.247(b)(1), 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 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

6.1.3 Test Procedure

Use the following spectrum analyzer settings:

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

RBW > the 20 dB bandwidth of the emission being measured

 $\mathsf{VBW} \geq \mathsf{RBW}$

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power

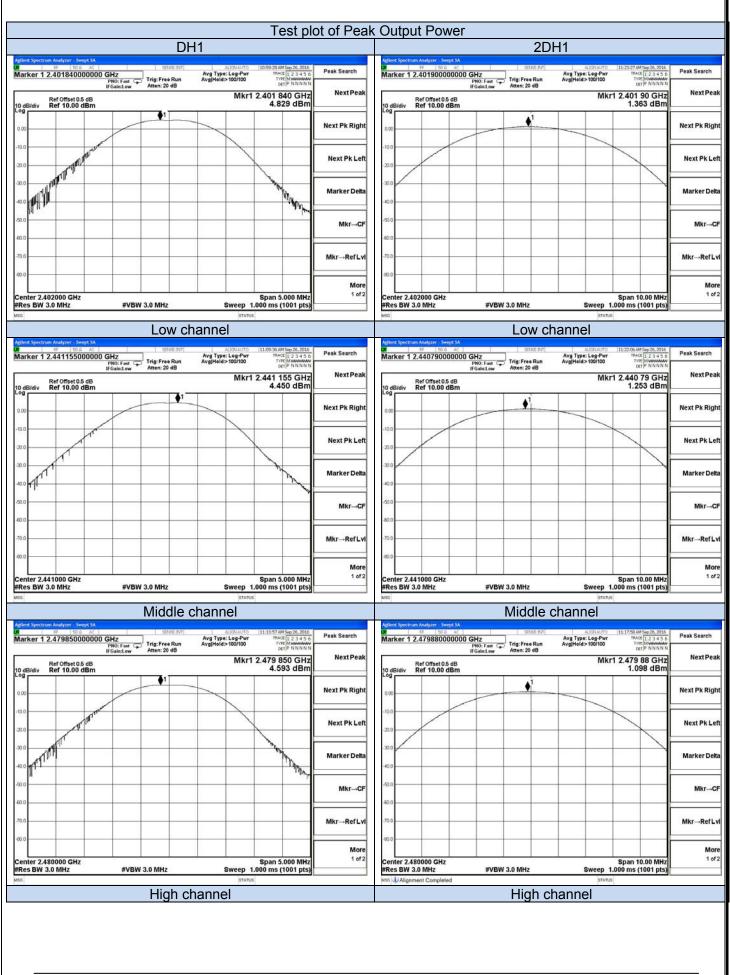
Channel	Frequency (MHz)	Peak Output Power (dBm)	Peak Output Power (mw)	Limit (mW)	Result
	2402	4.829	3.042	125	Pass
GFSK	2441	4.450	2.786	125	Pass
	2480	4.593	2.879	125	Pass
	2402	1.363	1.369	125	Pass
π /4-DQPSK	2441	1.253	1.334	125	Pass
	2480	1.098	1.288	125	Pass
	2402	1.785	1.508	125	Pass
8-DPSK	2441	1.698	1.478	125	Pass
	2480	1.579	1.439	125	Pass

6.1.4 Test Results

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Average Power(for report purpose only)								
Channel	Frequency (MHz)	Conducted Power (AV, dBm)	Limit (mW)	Result				
	2402	2.754	125	Pass				
GFSK	2441	2.562	125	Pass				
	2480	2.584	125	Pass				
	2402	0.165	125	Pass				
π /4-DQPSK	2441	0.174	125	Pass				
	2480	0.098	125	Pass				
	2402	0.821	125	Pass				
8-DPSK	2441	0.642	125	Pass				
	2480	0.567	125	Pass				

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			Tes	st plo	t of Peak
Agslent Spectrum Analyzer - Swept SA	3DH1			_	
Marker 1 2.401980000000 GHz	SENSE INT Avg T Free Run Avg Ho	ALICHAUTO /pe: Log-Pwr lid>100/100	11:25:40 AM 5 TRACE	Sep 26, 2016	Peak Search
IFGain:Low Att	: FreeRun Avg Ho en: 20 dB		1 2.401 9		
Ref Offset 0.5 dB 10 dB/div Ref 10.00 dBm		and	1.78	5 dBm	
0.00	1				Next Pk Right
-10.0					
-20.0					Next Pk Left
-30.0				1	
40.0				Ì	Marker Delta
-50.0					Mkr→CF
60.0					
-70.0					Mkr→RefLvl
-60.0					More
Center 2.402000 GHz			Span 10.	.00 MHz	4
#Res BW 3.0 MHz #VBW 3.0	WHZ	Sweep 1	.000 ms (1	001 pts)	
L	ow chann	el			
Aglent Spectrum Analyzer - Swept SA	SENSE - N/T		11:28:35 AM 5	Sep 26, 2016	Peak Search
Marker 1 2.44091000000 GHz PNO: Fast Frid IFGaincl.ow	Free Run Avg T n: 20 dB	pe: Log-Pwr Id>100/100	11:20:35 AM S TRACE TYPE DET	123456 MWWWWW PNNNNN	reak Search
Ref Offset 0.5 dB			1 2.440 9		
10 dB/div Ref 10.00 dBm	≜ ¹		1.69	o ubin	
0.00		-			Next Pk Right
-10.0					
-20.0		_			Next Pk Left
-300				1	
					Marker Delta
.0.0					
-50.0					Mkr→CF
60.0					
-70.0		-			Mkr→RefLvl
60.0		-			
					More 1 of 2
Center 2.441000 GHz #Res BW 3.0 MHz #VBW 3.0	WHz		Span 10. .000 ms (1	.00 MHz 001 pts)	1012
MSC NA	ddle eker	STATUS	5		
Aglient Spectrum Analyzer - Swept SA	ddle char		_		
Marker 1 2,479790000000 GHz	SENSE (NT) Avg T	ALICHAUTO /pe: Log-Pwr ild>100/100	11:30:01 AMS TRACE TYPE DET	Sep 26, 2016	Peak Search
PN0: Fast C Ing IFGaint.ow Att	: Free Run Avg Ho en: 20 dB				
Ref Offset 0.5 dB 10 dB/div Ref 10.00 dBm		Mkr	1 2.479 7 1.57	79 GHz '9 dBm	NextPeak
10 dB/div Ref 10.00 dBm	♦Î				
0.00		-			Next Pk Right
-10.0					
-20.0					Next Pk Left
30.0		_		1	
40.0					Marker Delta
-50.0					Mkr→CF
-60.0		1			
-70.0		-			Mkr→RefLvl
40.0	-	-			
Center 2 199000 Clin			.		More 1 of 2
Center 2.480000 GHz #Res BW 3.0 MHz #VBW 3.0	WHz		Span 10. .000 ms (1	001 pts)	1012
MBG STATUS					
	ligh chanr				

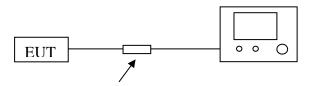
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6.2 Frequency Separation And 20 dB Bandwidth

6.2.1 Limit

According to §15.247(c) or A8.1(a), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, 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 in15.209(a).

6.2.2 Block Diagram of Test Setup



DC Filter

6.2.3 Test Procedure

Frequency separation test procedure :

1). Place the EUT on the table and set it in transmitting mode.

2). Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer.

3). Set center frequency of Spectrum Analyzer = middle of hopping channel.

4). Set the Spectrum Analyzer as RBW = 100kHz, VBW = 300kHz, Span = wide enough to capture the peaks of two adjacent channels, Sweep = auto.

5). Max hold, mark 2 peaks of hopping channel and record the 2 peaks frequency.

20dB bandwidth test procedure :

1). Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel.

- 2). RBW ≥1% of the 20 dB bandwidth, VBW ≥RBW.
- 3). Detector function = peak.

4). Trace = max hold.

6.2.4 Test Results

The Measurement Result With 1Mbps For GFSK Modulation								
Channel	20dB Bandwidth (MHz)	Channel Separation (MHz)	Limit (MHz)	Result				
Low	1.044		>=25 KHz or 2/3 20 dB BW	Pass				
Middle	1.044	1.000	>=25 KHz or 2/3 20 dB BW	Pass				
High	1.046		>=25 KHz or 2/3 20 dB BW	Pass				
The	Measurement Resul	t With 2Mbps For π /4	-DQPSK Modulati	on				
Channel	20dB Bandwidth (MHz)	Channel Separation (MHz)	Limit (MHz)	Result				
Low	1.355		>=25 KHz or 2/3 20 dB BW	Pass				
Middle	1.356	1.000	>=25 KHz or 2/3 20 dB BW	Pass				
High	1.357		>=25 KHz or 2/3 20 dB BW	Pass				
Th	ne Measurement Res	ult With 3Mbps For 8	-DPSK Modulation	1				
Channel	20dB Bandwidth (MHz)	Channel Separation (MHz)	Limit (MHz)	Result				
Low	1.325		>=25 KHz or 2/3 20 dB BW	Pass				
Middle	1.316	1.000	>=25 KHz or 2/3 20 dB BW	Pass				
High	1.323		>=25 KHz or 2/3 20 dB BW	Pass				

Note: The test data refer to the following page.

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Те	est Plot of	Test Result
Aglent Spectrum Audyor - Senget SA SP 050 ± 2 SP 050 ± 2	Select Marker	Astend Spectrum Audyor : Occupied BW Astend Spectrum Audyor : Occupied BW X dB -20.00 dB SFF Gaint.sw Freq: 2.4020000 GHz Frig: Freq: Runn Avg Held>10/10 Atten: 20 dB Aug Held>10/10 Ratio Device: BTS
10 dB/div Log 000	Normal	10 dB/div Ref 10.00 dBm
	Delta	Average
400	Fixed⊳	Center 2.402 GHz Span 3 MHz
40.0	no	#Res BW 30 kHz #VBW 100 kHz Sweep 3.2 ms Min Hole Occupied Bandwidth 904.57 kHz Detector
40.0	Properties> More	Transmit Freq Error 9.404 kHz OBW Power 99.00 % Auto Mail x dB Bandwidth 1.044 MHz x dB -20.00 dB 400 Mail
Start 2.401500 GHz Stop 2.403500 GHz #Res BW 100 kHz #VBW 100 kHz Sweep 1.000 ms (1001 pts) Mag	1 of 2	
Frequency Sepration GFSK-Low chann Agtent Spectrum Analyzer - Swyd SA	ei	20dB Bandwidth GFSK-Low channel
M DS0 β M	Select Trace	M MODE AC MODE RM MUSHANTO MUSH
10 dB/div Ref 10.00 dBm 0.166 dB	Clear Write	Log 0.00 .000 .000 .000 .000
	Trace Average	Averag
-200	Max Hold	Center 2.441 CHz #Res BW 30 kHz #Res BW 30 kHz Kit Strategy 100 kHz Kit
60.0	View Blank	Occupied Bandwidth 906.37 kHz Detector Peak
000 Stop 2.442500 GHz Start 2.440500 GHz Stop 2.442500 GHz #Res BW 100 kHz Sweep 1.000 ms (1001 pts)	More 1 of 3	Transmit Freq Error 14.427 kHz OBW Power 99.00 % Auto Ma x dB Bandwidth 1.044 MHz x dB -20.00 dB
MSG STATUS		
Frequency Sepration GFSK-Middle chan	nel	20dB Bandwidth GFSK-Middle channel
Marker 1 Δ 1.000000000 MHz Micker 1 Δ 1.000000000 Hz HiG Wide HiG Wide HiG Wide HiG Wide Hig Free Run Atten: 20 dB Match 21 a 53 Avg Types Avg Jield 2 100100 Mick 100100 Match 21 a 53 Avg Types Avg Jield 2 100100 Ref Offset 0.5 dB 10 dB/div Ref 10.00 dBm ΔMkr1 1.000 MHz -0.181 dB ΔMkr1 1.000 MHz -0.181 dB		M M
000	Clear Write	Log 0.00 .00 .00 .00
	Trace Average	Averag
40.0	Max Hold	700 Max Hol
600	Min Hold View Blank	#Res BW 30 kHz #VBW 100 kHz Sweep 3.2 ms Min Hol Occupied Bandwidth 903.60 kHz Detect
40.0	Trace On More 1 of 3	Transmit Freq Error 19.048 kHz OBW Power 99.00 % Auto Ma x dB Bandwidth 1.046 MHz x dB -20.00 dB
Start 2.478500 GHz Stop 2.480500 GHz #Res BW 100 kHz #VBW 100 kHz Sweep 1.000 ms (1001 pts)	1 073	
Frequency Sepration GFSK-High chann	el	20dB Bandwidth GFSK-High channel
requeries depretation of ort high chann		

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Те	st Plot of	Test Result
Adlent Spectrum Analyzer, Swegt SA 20 at 20 a	Trace/Detector	Agtheric Spectrum Analyzer - Occupied BW 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
Marker 1 ∆ 1.000000000 MHz PNC: Wide IFGaixLow Atten: 20 dB Avg/Hold>100/100 Trac Hereard Avg/Hold>100/100/100 Trac Herear		Center Fred 2.402000000 GH2 Trig: Free Run AvgHold>10/10
IFGaint.ow Atten: 20 00 AMkr1 1.000 MHz	Select Trace	#IF Gain:Low #Atten: 20 dB Radio Device: BTS
10 dB/div Ref 10.00 dBm 0.210 dB		10 dB/div Ref 10.00 dBm
102	Clear Write	
	Great Write	
-10.0		
-20.0	Trace Average	Average Averag
1000		800 Warry W
-30.0	Max Hold	-70.0 Max Hol
-40.0	in a riola	80.0
		Center 2.402 GHz Span 3 MHz
80.0	Min Hold	#Res BW 30 kHz #VBW 100 kHz Sweep 3.2 ms Min Hol
80.0		Occupied Bandwidth
-70.0	View Blank	1.1925 MHz Detect
	Trace On	Transmit Freq Error -4.942 kHz OBW Power 99.00 % Auto Ma
40.0	More	x dB Bandwidth 1.355 MHz x dB -20.00 dB
Start 2.401500 GHz Stop 2.403500 GHz	1 of 3	
#Res BW 100 kHz #VBW 100 kHz Sweep 1.000 ms (1001 pts)		
MSG STATUS		MSG STATUS
Frequency Sepration π /4-DQPSK-Low char	nnel	20dB Bandwidth <pre>n /4-DQPSK-Low channel</pre>
Agilent Spectrum Analyzer - Swigt SA 00 86 55 0 AC 5012010 11:50-57 AM Sep 28, 2016		Address Spectrum Analyzer - Occupied BW 00 NF 50.0 AC 5014211977 ALS21AUTO 311-21-10 AM Sep 26, 2016
Marker 1 & 1.00000000 MHz Avg Type: Log-Pwr TRACE 123456	Trace/Detector	Center Freq 2.441000000 GHz Center Freq: 2.441000000 GHz Radio Std: None Trice/Detector
PRO-Wide C Ing-Free Kon Avenue (Comparison Comparison C	Select Trace	#IFGain:Low #Atten: 20 dB Radio Device: BTS
Ref Offset 0.5 dB 21/0 Win2 10 dB/div Ref 10.00 dBm 0.368 dB	1	10 dB/div Ref 10.00 dBm
2007		
	Clear Write	100 Clear Writ
100		
10.0	Trace Average	300 Averag
-20.0		500 mm mm
300		60.0
	Max Hold	70.0 Max Hol
40.0		Center 2.441 GHz Span 3 MHz
800	Min Hold	#Res BW 30 kHz #VBW 100 kHz Sweep 3.2 ms Min Hol
60.0		Occupied Bandwidth
	View Blank	1.1920 MHz Detecte
-70.0	Trace On	Transmit Freg Error 93 Hz OBW Power 99.00 % Auto Ma
000		x dB Bandwidth 1.356 MHz x dB -20.00 dB
	More 1 of 3	
Start 2.440500 GHz Stop 2.442500 GHz #Res BW 100 kHz #VBW 100 kHz Sweep 1.000 ms (1001 pts)	1013	
MSG STATUS		MSG STATUS
Frequency Sepration π /4-DQPSK-Middle cha	annel	20dB Bandwidth π /4-DQPSK-Middle channel
Aglient Spectrum Analyzer - Swept SA		Agilent Spectrum Analyzer - Occupied IIW
M SS Φ SENSE PUT AL201AUTO 11:55:28 AM59626, 2016 Marker 1 Δ 1.000000000 MHz Trig: Free Run Avg Type: Log-Put PMO2 [12:34:55 PNO: Wide C Trig: Free Run Avg[Inidia: 100/100 Trig: Warking C	Trace/Detector	M Stop Ac Stop Ac Stop Ac Ac Stop Ac
IFGaincLow Atten: 20 dB	Select Trace	#IFGain:Low #Atten: 20 dB Radio Device: BTS
Ref Offset 0.5 dB ΔMkr1 1.000 MHz 10 dB/div Ref 10.00 dBm 0.016 dB	1	10 dB/div Ref 10.00 dBm
	Clear Write	100 Clear Writ
.100		
	Trace Average	300 Average
-20.0		
-30.0		60.0
	Max Hold	70.0 Max Hol
-42.0		Center 2.48 GHz Span 3 MHz
800	Min Hold	#Res BW 30 kHz #VBW 100 kHz Sweep 3.2 ms Min Hol
80.0	AUX 017 017 017	Occupied Bandwidth
	View Blank	1.1928 MHz Detecto
-70.0	Trace On	Transmit Freq Error 4.755 kHz OBW Power 99.00 % Auto Ma
		x dB Bandwidth 1.357 MHz x dB -20.00 dB
	More	
Start 2.478500 GHz Stop 2.480500 GHz #Res BW 100 kHz #VBW 100 kHz Sweep 1.000 ms (1001 pts)	1 of 3	
MSG STATUS		MSG STATUS
Frequency Sepration n /4-DQPSK-High cha	nnel	20dB Bandwidth π /4-DQPSK-High channel

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	Т	est Plot of	f Test Result
ent Spectrum Analyzer - Swept SA			Aglient Spectrum Analyzer - Occupied IIW
#F 50 0 4C SENSE (NT) rker 1 Δ 1.000000000 MHz Στη Γιαι 0 Στη Γιαι 0	ALIGHAUTO 11:47:49 AM Sep 26, 2016 Avg Type: Log-Pwr TRACE 1 2 3 4 5	Trace/Detector	M M SO 0 AC SD 00 (0,1) AL20140TO 11:26:12 AM Sep 26, 2016 Trace/Del Center Freq: 2.402000000 GHz Center Freq: 2.402000000 GHz Radio Std: None Trace/Del
PNO: Wide Trig: Free Run IFGain:Low Atten: 20 dB	Avg Held>100/100 TYPE MWWWWW DET P N N N N	Ň	Trig: Free Run Avg Hold>10/10 #IFGaint.gw #Atten: 20 dB Radio Device: BTS
	ΔMkr1 1.000 MH	Select Trace	
Bidiv Ref 10.00 dBm	-0.157 dE		10 dB/div Ref 10.00 dBm
0 W	1∆2	Clear Write	100 Clea
- martine	and the second		200
			300
		Trace Average	400 A
			800 mm mm
			60.0
		Max Hold	-70.0 Ma
			0.08
			Center 2.402 GHz Span 3 MHz
		Min Hold	#Res BW 30 kHz #VBW 100 kHz Sweep 3.2 ms
		000000-00000	Occupied Bandwidth
			4 4704 1911
		View Blank	1.1/61 MHZ
		Trace On	Transmit Freq Error 10.217 kHz OBW Power 99.00 % Auto
			x dB Bandwidth 1.325 MHz x dB -20.00 dB
		More	
2.401500 GHz	Stop 2.403500 GHz	z 1 of 3	
BW 100 kHz #VBW 100 kHz	Sweep 1.000 ms (1001 pts		
	STATUS		MSG STATUS
Frequency Sepration	8-DPSK-Low chan	inel	20dB Bandwidth 8-DPSK-Low channel
Spectrum Analyzer - Swept SA			Aglent Spectrum Analyzer - Occupied IIW
RF 50 Q AC SENSE:NT	ALIGNAUTO 11:49:24 AM Sep 26, 2016	Trace/Detector	2 RF 50 0 AC SERVER BYT ALLSYLAUTO 11:28:04 AM Sep 26, 2016
ter 1 Δ 1.000000000 MHz PNO: Wide T IFGain:Low Atten: 20 dB	Avg Type: Log-Pwr Avg Hold>100/100 DIT P NNNN	~	Center Fred 2.44 100000 GHZ
IFGain:Low Atten: 20 dB	ΔMkr1 1.000 MH	Select Trace	#IFGain:Low #Atten: 20 dB Radio Device: BTS
Ref Offset 0.5 dB	-0.084 dE		
/div Ref 10.00 dBm	-0.004 dE		10 dB/div Ref 10.00 dBm Log
	▲ 1Δ2	Clear Write	000
		Glear Write	
	the second		
		and a second second second second	30.0
		Trace Average	A A A A A A A A A A A A A A A A A A A
			800
			800
		Max Hold	-700 Ma
			Center 2.441 GHz Span 3 MHz Span 3 MHz
		Min Hold	#Res BW 30 kHz #VBW 100 kHz Sweep 3.2 ms
			Occupied Bandwidth
			1.1771 MHz
		View Blank	
			Transmit Freq Error 14.122 kHz OBW Power 99.00 % Auto
			x dB Bandwidth 1.316 MHz x dB -20.00 dB
		More 1 of 3	
2.440500 GHz	Stop 2.442500 GHz	4	
BW 100 kHz #VBW 100 kHz	Sweep 1.000 ms (1001 pts		MSG STATUS
Frequency Sepration 8	-DPSK-Middle cha	Innel	20dB Bandwidth 8-DPSK-Middle channel
Spectrum Analyzer - Swept SA			Agilent Spectrum Analyzer - Occupied IBW
	- ALCOLDUTE: \$5.00.00 ALCOLDU	Marker	36 50 p AC SERVER SUT AL201AUTO 11:31:02 AM Sep 26, 2036 Center Freq: 2.480000000 GHz Center Freq: 2.480000000 GHz Radio Std: None Trace/Del
26 E5.0 A2	Avg Type: Log-Pwr TRACE 1 2 3 4 5	6 market	
er 1 Δ 1.000000000 MHz PN0: Wide Trig: Free Run	ALIGHAUTO 11:56:56 AM Step 28, 2010 Avg Type: Log-Pwr TRACE 1 2 3 4 5 Avg Hold> 100/100 TYPE MWWWWW	N	Center Fred 2.48000000 GH2
er 1 ∆ 1.00000000 MHz PR0: Wride IFGainLow Atten: 20 dB	Avg Hold>100/100	Select Marker	
er 1 Δ 1.000000000 MHz PHO: Wide IFGalacLow Trig: Free Run IFGalacLow Atten: 20 dB	Avg Held>100/100	Select Marker	Trig: Free Run Avg Heid> 10/10 Radio Device: BTS
er 1 ∆ 1.000000000 MHz PRO: Wide ↓ IFGainLow Trig: Free Run IFGainLow Atten: 20 dB	Avg Hold>100/100	Select Marker	Ceffrer Freq 2.450000000 GHZ Trig: Free Run Avg Held>10/10 Radio Device: BTS Radio Device: BTS Radio Device: BTS Radio Device: BTS
er 1 ∆ 1.000000000 MHz PRO: Wide ↓ IFGainLow Trig: Free Run IFGainLow Atten: 20 dB	Avg Held>100/100	Select Marker	Center Pred 2.450000000 dFZ Trig Free Run #FGaint.ew Avg Heid>10/10 Radio Device: BTS 10 dB/div Ref 10.00 dBm
er 1 ∆ 1.000000000 MHz PRO: Wide ↓ IFGainLow Trig: Free Run IFGainLow Atten: 20 dB	Avg Heid>100/100 ΤΥΡΕ	Select Marker	Certier Pred 2.450000000 GHZ Trig Free Run Avg Hold>10/10 Radio Device: BTS 10 dB/div Ref 10.00 dBm Cleat Cleat Cleat
er 1 ∆ 1.000000000 MHz PRO: Wide IFGalk.tow Ref Offset 0.5 dB div Ref 10.00 dBm	Avg Heid>100/100 ΤΥΡΕ	Select Marker	Certief Pred 2.450000000 GHZ Trig: Free Run Avg Hold>1010 Radio Device: BTS 10 dB/div Ref 10.00 dBm Cleat Cleat Cleat
er 1 ∆ 1.000000000 MHz PRO: Wide IFGalk.tow Ref Offset 0.5 dB div Ref 10.00 dBm	Avg Heid>100/100 ΤΥΡΕΑΝΤΑΝ OCT P NUNN ΔΜkr1 1.000 MH2 -0.579 dE	Normal	Center Pred 2.450000000 dP2 Trig Free Run Avg Field>1010 Radio Device: BTS 10 db/div Ref 10.00 dBm Ciec Ciec Ciec Ciec 10 db/div Ref 10.00 dBm Ciec Ciec Ciec Ciec Ciec
ref 1 Δ 1.0000000000 MHZ 1 20208.01 PRO: Wide Trig: Free Run IF Galk.tow Trig: Stree Run Ref Offset 0.5 dB div	Avg Heid>100/100 ΤΥΡΕΑΝΤΑΝ OCT P NUNN ΔΜkr1 1.000 MH2 -0.579 dE	Select Marker	Certifier Pred 2.450000000 GHZ Trig Free Run Avg Held>10/10 Radio Device: BTS 10 dB/div Ref 10.00 dBm Galdin Low Galdin L
ref 1 Δ 1.0000000000 MHZ 1 20208.01 PRO: Wide Trig: Free Run IF Galk.tow Trig: Stree Run Ref Offset 0.5 dB div	Avg Heid>100/100 ΤΥΡΕΑΝΤΑΝ OCT P NUNN ΔΜkr1 1.000 MH2 -0.579 dE	Normal	Certief Pred 2.45000000 dB/2 Trig Free Run Avg Hold>1010 Radio Device: BTS 10 dB/div Ref 10.00 dBm Cleat Cleat Cleat 000 000 000 August and au
ref 1 Δ 1.0000000000 MHZ 1 20208.01 PRO: Wide Trig: Free Run IF Galk.tow Trig: Stree Run Ref Offset 0.5 dB div	Avg Heid>100/100 ΤΥΡΕΑΝΤΑΝ OCT P NUNN ΔΜkr1 1.000 MH2 -0.579 dE	Normal	Certief Pred 2.45000000 GPZ Trig Free Run Avg Hold>1010 Radio Device: BTS 10 dB/div Ref 10.00 dBm Clean Clean Clean 000 000 000 August and aug
ref 500 4.0 100000 100000 100000 1	Avg Heid>100/100 ΤΥΡΕΑΝΤΑΝ OCT P NUNN ΔΜkr1 1.000 MH2 -0.579 dE	Normal	Certief Pred 2.45000000 GK2 Trig Free Run Avg Hod> 10/10 Radio Device: BTS 10 dB/div Ref 10.00 dBm Clean Clean Clean 000 000 000 Andro Color Clean Andro Color Andro
ref 500 4.0 100000 100000 100000 1	Avg Heid>100/100 ΤΥΡΕΑΝΤΑΝ OCT P NUNN ΔΜkr1 1.000 MH2 -0.579 dE	Normal	Certifier Fred 2.450000000 GHZ Trig: Free Run Avg Heid> 10/10 Radio Device: BTS 10 dbldiv Ref 10.00 dBm Clean Clean Clean 10 dbldiv Ref 10.00 dBm Adder: 20 dB Radio Device: BTS Clean 10 dbldiv Ref 10.00 dBm Adder: 20 dB Adder: 20 dB Adder: 20 dB Adder: 20 dB 10 dbldiv Ref 10.00 dBm Adder: 20 dB Ader: 20 dB Ader: 20 dB Ad
ref 500 4.0 100000 100000 100000 1	Avg Heid>100/100 ΤΥΡΕΑΝΤΑΝ OCT P NUNN ΔΜkr1 1.000 MH2 -0.579 dE	Select Marker Normal Delta	Center Pred 2.45000000 GRZ Trig Free Run Avg Hide> 10/10 Radio Device: BTS 10 dB/div Ref 10.00 dBm Log 00 10 dB/div Ref 10.00 dBm Log 00 00 10 dB/div Ref 10.00 dBm Log 00 00 00 00 00 00 00 00 00 00 00 00 00
ref 500 4.0 100000 100000 100000 1	Avg Heid>100/100 ΤΥΡΕΑΝΤΑΝ OCT P NUNN ΔΜkr1 1.000 MH2 -0.579 dE	Normal	Center Pred 2.45000000 GRZ Trig Free Run Avg Hide> 10/10 Radio Device: BTS 10 dB/div Ref 10.00 dBm Log 00 10 dB/div Ref 10.00 dBm Log 00 00 10 dB/div Ref 10.00 dBm Log 00 00 00 00 00 00 00 00 00 00 00 00 00
ref 9:00 4.0 1000000000000000000000000000000000000	Avg Heid>100/100 ΤΥΡΕΑΝΤΑΝ OCT P NUNN ΔΜkr1 1.000 MH2 -0.579 dE	Select Marker Normal Delta	Center Pred 2.45000000 GK2 Trig Free Run Avg Heid> 10/10 Radio Device: BTS 10 dB/div Ref 10.00 dBm Clean Clean Clean 000 000 000 Clean Clean Main 000 000 000 Main Main Main 000 000 000 000 Main Main Main 000
ref 9:00 4.0 1000000000000000000000000000000000000	Avg Heid>100/100 ΤΥΡΕΑΝΤΑΝ OCT P NUNN ΔΜkr1 1.000 MH2 -0.579 dE	Select Marker Normal Delta	Center Pred 2.450000000 GHZ Trig Free Run Avg Hid> 10/10 Radio Device: BTS 10 dB/div Ref 10.00 dBm Log 000 100 000 000 000 000 000 00
Ref 0ffset0.6 dB Ref 10.000 dBm	Avg Heid>100/100 ΤΥΡΕΑΝΤΑΝ OCT P NUNN ΔΜkr1 1.000 MH2 -0.579 dE	Select Marker Normal Delta	Center Pred 2.480000000 GRZ Trig Free Run Avg Hid> 10/10 Radio Device: BTS 10 dB/div Ref 10.00 dBm Log 10 dB/div Ref 10.00 dBm Control Control Con
ref 500 4.0 100000 100000 100000 1	Avg Heid>100/100 ΤΥΡΕΑΝΤΑΝ OCT P NUNN ΔΜkr1 1.000 MH2 -0.579 dE	Select Marker Normal Delta Fixed Off	Center Pred 2.450000000 GRZ Trig Free Run Avg Hide> 10/10 Ratio Device: BTS Ratio Device: BTS Ratio Device: BTS Clear Clear Ratio Device: BTS Clear
ref 9:00 4.0 1000000000000000000000000000000000000	Avg Heid>100/100 ΤΥΡΕ	Select Marker Normal Delta Fixed Properties	Center Pred 2.480000000 GRZ Trig Free Run Avg Hid> 10/10 Radio Device: BTS 10 dB/div Ref 10.00 dBm Log 10 dB/div Ref 10.00 dBm Control Control Con
Ref 0ffset0.6 dB Ref 10.000 dBm	Avg Heid>100/100 ΤΥΡΕ	Select Marker Normal Delta Fixedb Off Properties> More	Center Pred 2.450000000 GRZ Trig Free Run Avg Hide> 10/10 Ratio Device: BTS Ratio Device: BTS Ratio Device: BTS Clear Clear Ratio Device: BTS Clear
24 2002 40 2002 80 PHC: Write- IF Galaction Trig: Free Run IF Galaction Trig: Free Run IF Galaction Idiv Ref Offset 0.5 dB Ref 10.00 dBm Image: State of the st	Avg Held>100/100	Select Marker 1 Normal Delta Fixedb Off Properties> More 1 of 2	Center Pred 2.450000000 GRZ Trig Free Run Avg Hide> 10/10 Ratio Device: BTS Ratio Device: BTS Ratio Device: BTS Clear Clear Ratio Device: BTS Clear
r1 A 1.0000000000 PRO: Wele Trig: Free Run PRO: Wele Pro: Wele Trig: Free Run address Ref Offset 0.5 dB Ref 10.00 dBm	Avg Held>100/100	Select Marker 1 Normal Delta Fixedb Off Properties> More 1 of 2	Center Pred 2.450000000 GHZ Trig: Free Run Avg Heid> 10/10 Radio Device: BTS 10 dB/div Ref 10.00 dBm Log 00 00 00 00 00 00 00 00 00 0
2.472500 GHz 2002 AV1 2.472500 GHz 2002 AV1	Avg/Heid>100/100 Preprint Δ/Mkr1 1.000 MH: -0.579 dE 1Δ2 1Δ2 500 L480500 GH: Sweep 1.000 ms (1001 pts)	Select Marker Normal Delta Fixed Properties More 1 of 2	Center Pred 2.450000000 GRZ Trig Free Run Avg Hide> 10/10 Ratio Device: BTS Ratio Device: BTS Ratio Device: BTS Clear Clear Ratio Device: BTS Clear

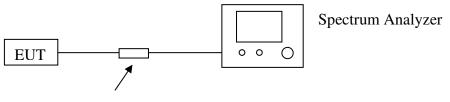
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6.3 Number Of Hopping Frequency

6.3.1 Limit

According to §15.247(a)(1)(ii) or A8.1 (d), Frequency hopping systems operating in the band 2400-2483.5 MHz shall use at least 15 hopping channels.

6.3.2 Block Diagram of Test Setup



DC Filter

6.3.3 Test Procedure

1). Place the EUT on the table and set it in transmitting mode.

2). Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer.

3). Set Spectrum Analyzer Start=2400MHz, Stop = 2483.5MHz, Sweep = auto.

4). Set the Spectrum Analyzer as RBW, VBW=1MHz.

5). Max hold, view and count how many channel in the band.

6.3.4 Test Results

The Measurement Result With The Worst Case of 1Mbps For GFSK Modulation							
Total No. of	Measurement Result (No. of Ch)	Limit (MHz)	Result				
Hopping Channel	79	≥15	Pass				

Note: The test data refer to the following page.

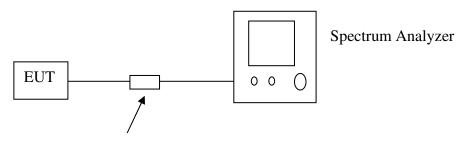
Test plot of	Number Of Hopping Frequency	
nit Spectrum Analyzer - Swept SA 86 50 0 AC - SERVER DYT AUGUAUTO 11:41:34.04 Sep 26, 2016		
rker 1 ∆ 78.00000000 MHz Avg Type: Log-Pwr TRACE 12345 6	Marker	
ir daint, uw	Select Marker	
Ref Offset 0.5 dB ΔMkr1 78.000 0 MHz J8/div Ref 10.00 dBm -0.232 dE	1	
×22000	Normal	
	Delta	
	Fixed>	
	no	
	Properties►	
	More	
rt 2.40000 GHz Stop 2.48350 GHz es BW 1.0 MHz #VBW 1.0 MHz Sweep 1.000 ms (1001 pts)	1 of 2	
STATUS		

6.4 Time Of Occupancy (Dwell Time)

6.4.1 Limit

According to §15.247(a)(1)(iii) or A8.1 (d), Frequency hopping systems operating in the 2400MHz-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.

6.4.2 Block Diagram of Test Setup



DC Filter

6.4.3 Test Procedure

1). Place the EUT on the table and set it in transmitting mode.

2). Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer.

3). Set center frequency of Spectrum Analyzer = operating frequency.

4). Set the Spectrum Analyzer as RBW, VBW=1MHz, Span = 0Hz, Sweep = auto.

5). Repeat above procedures until all frequency measured were complete.

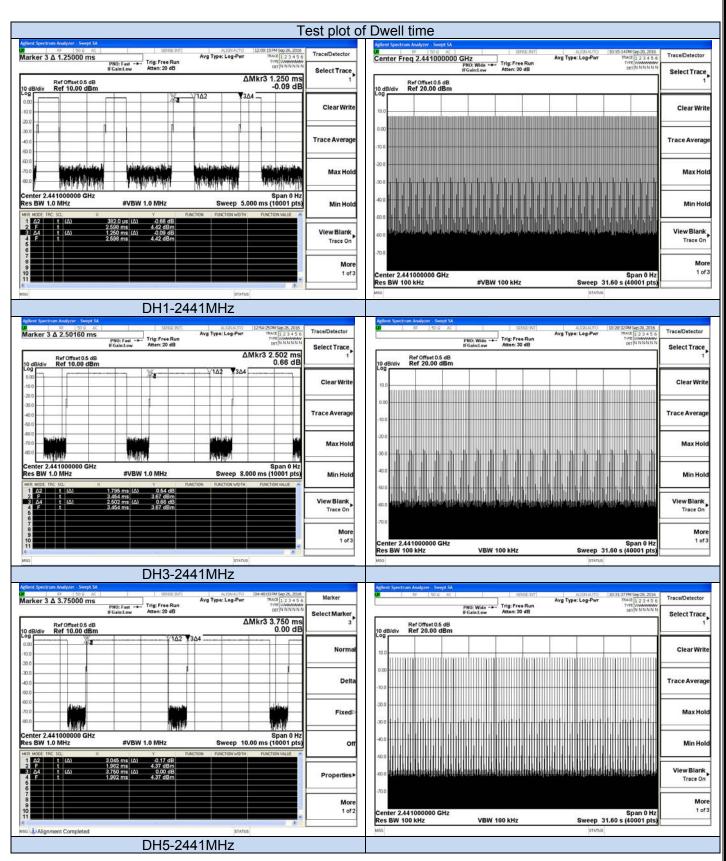
6.4.4 Test Results

The Measurement Result								
Test Mode	Time of Pulse (ms)	Number of Pulse in 31.6s Period Time	Dwell Time (ms)	Limit (ms)				
DH1-2441MHz	0.382	301	114.982	400				
DH3-2441MHz	1.795	164	294.380	400				
DH5-2441MHz	3.045	118	359.310	400				
2DH1-2441MHz	0.389	303	117.867	400				
2DH3-2441MHz	1.794	162	290.628	400				
2DH5-2441MHz	3.045	114	347.130	400				
3DH1-2441MHz	0.389	303	117.867	400				
3DH3-2441MHz	1.795	165	296.175	400				
3DH5-2441MHz	3.043	116	352.988	400				

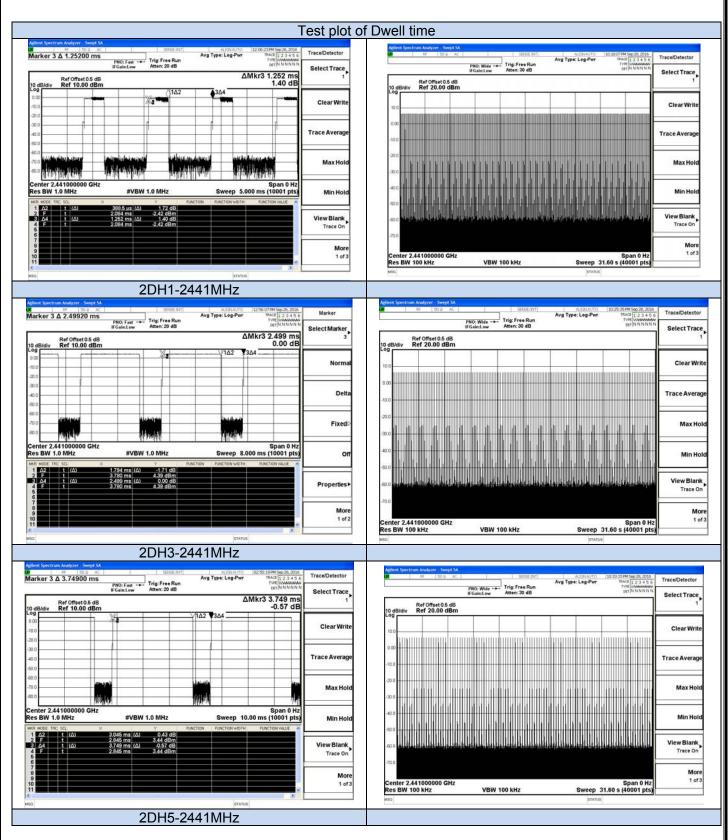
Note:

Dwell time= Time of Pulse * Numbers of Pulse in 31.6s Period Time

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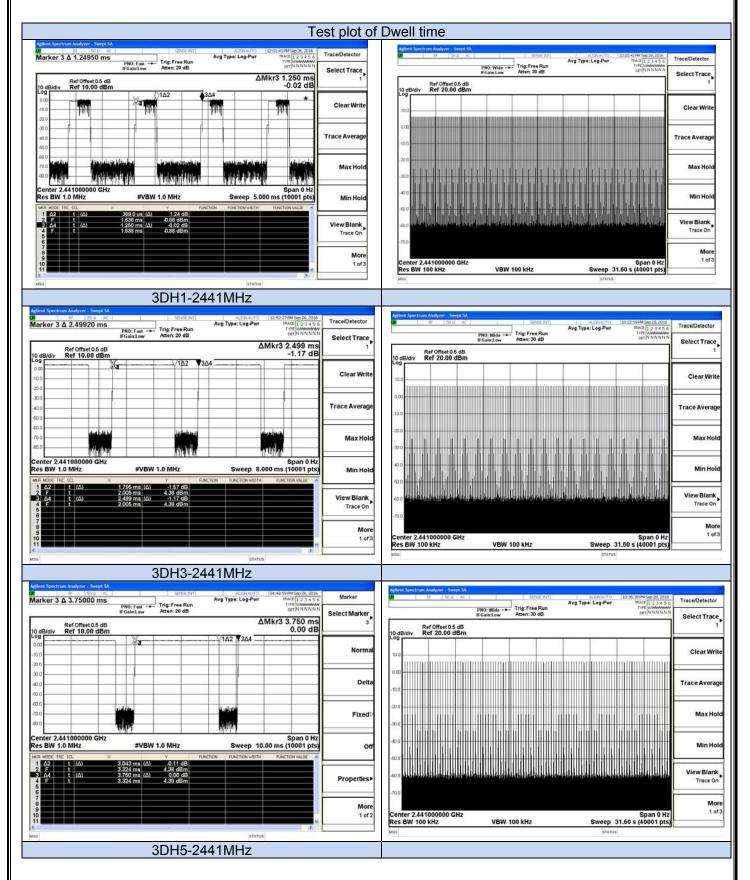
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SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD. FCC ID: 2ADACNE0Z83-4

Report No.: LCS1608302571E



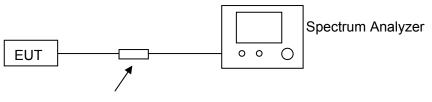
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6.5 Conducted Spurious Emissions and Band Edges Test

6.5.1 Limit

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. Attenuation below the general limits specified in Section 15.209(a) is not required.

6.5.2 Block Diagram of Test Setup



DC Filter

6.5.3 Test Procedure

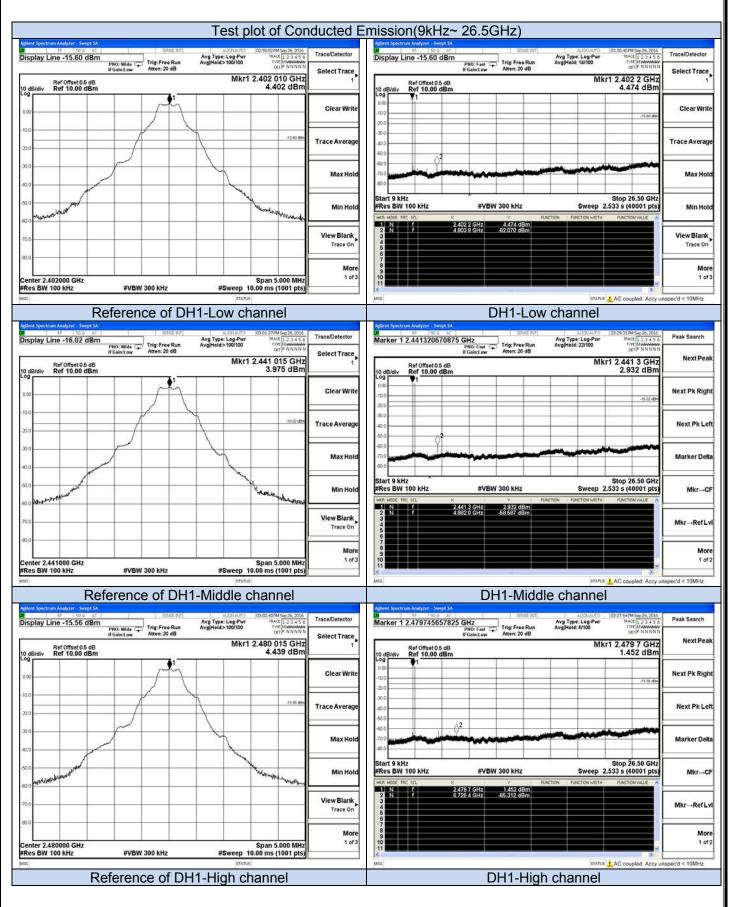
Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 KHz. The video bandwidth is set to 300 KHz.

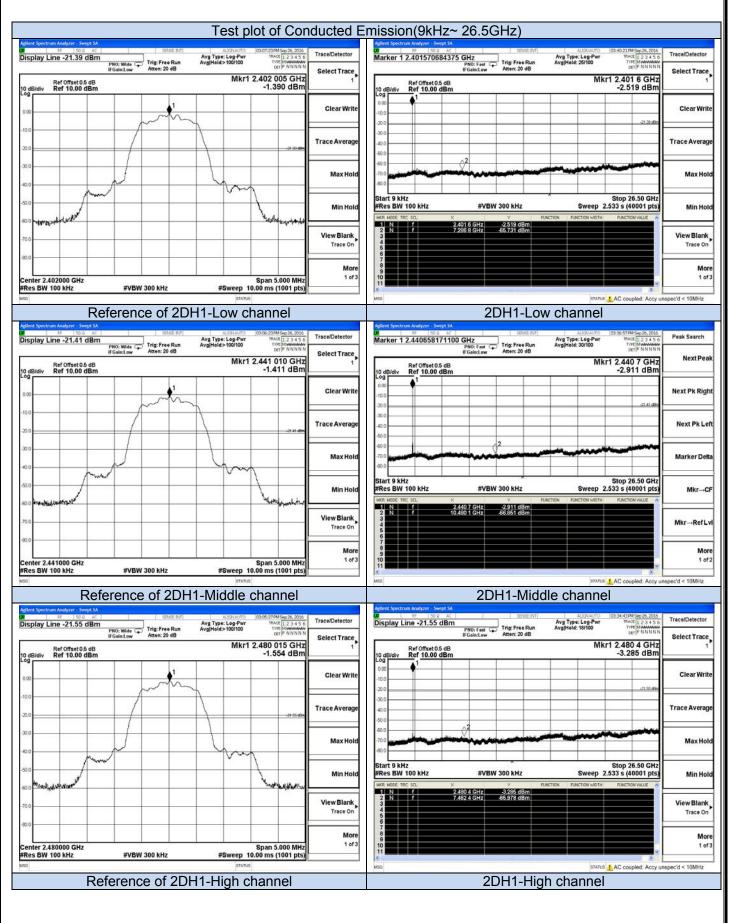
Measurements are made over the 9kHz to 26.5GHz range with the transmitter set to the lowest, middle, and highest channels

6.5.4 Test Results of Conducted Spurious Emissions

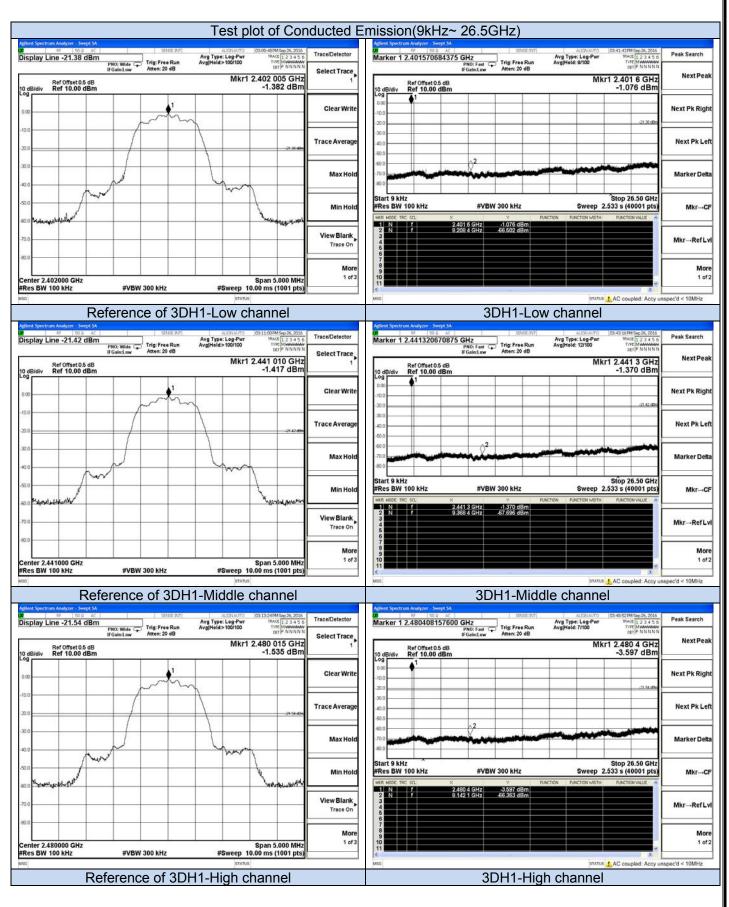
No non-compliance noted. Only record the worst test result (TX-GFSK) in this report. The test data refer to the following page.



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6.5.5 Test Results of Band Edges Test

	st plot of	Band Edges
Agtent Spectrum Analyzer - Swept SA 8 85 50 a. AC 501/02/07 Automation (2019) 59529 MSwp26, 2016 10 000 000 000 000 000 000 000 000 000	Trace/Detector	Addent Spectrum Analyzer - Swept SA 26 88 930 AC SEXEE(bit) AL224AUTO 00:02-40PM Sep 26, 2016 Discredue U.e., 45 55 6, 40 co.
Display Line -15.60 dBm PNO: Wride Trig: Free Run Avg Type: Log-Pwr Trig: Pree Run Avg Held> 100/100 Frei Run 20 dB	Select Trace	Display Line -15.56 dBm Avg Type: Log-Pwr two Log-Pwr traceUsetector Hosinc.twv HGsinc.twv HGsinc.twv
Ref Offset 0.5 dB Mkr1 2.402 010 GHz 10 dB/div Ref 10.00 dBm 4.402 dBm	1*	Ref Offset0.5 dB Mkr1 2.480 015 GHz 1 10 dB/div Ref 10.00 dBm 4.439 dBm
	Clear Write	0.00 Clear Write
-10.0		-10.0
-20.0	Trace Average	20.0 Trace Average
300	Max Hold	300 Max Hold
600 marine the second s	Min Hold	200 weight have the main and th
70.0	View Blank Trace On	70.0 View Blank , Trace On
40.0	More 1 of 3	000 More 1990 Mar 1993
Center 2.402000 GHz Span 5.000 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 10.00 ms (1001 pts) wsg	1013	Center 2.480000 GHz Span 5.000 MHz 1 or 3 #Res BW 100 kHz #VBW 300 kHz #Sweep 10.00 ms (1001 pts)
Reference of GFSK-Low channel		Reference of GFSK-High channel
Agitest Spectrum Analyzer - Swegt SA SD #	Peak Search	Matheway Spectrum Analyzer Served SA Spectrum Failury August Sa Spectrum Failury August Sa Augu
If Galactow Atten: 20 dB CertP MMINN Ref Offset 0.5 dB Mkr1 2.404 000 GHz	NextPeak	IFGaincl.ow Atten: 20 dB Mkr1 2.478 022 GHZ NextPeak
10 dB/div Ref 10.00 dBm 3.851 dBm 1 Log 1 ax	Next Bk Bight	10 dB/dly Ref 10.00 dBm 4.193 dBm
-100	Next Pk Right	100 V V Next Pk Right
400	Next Pk Left	000 Next Pk Left
100	Marker Delta	000 100 2 700 100 100 100 100 100 100 100 100 100
Start 2.31000 GHz Stop 2.40400 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 9.000 ms (1001 pts) #Res EW 100 kHz X Y Punction Punction worth Punction worth	Mkr→CF	Start 2.47800 GHz Stop 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz #Sweep 10.00 ms (100 pts) #MR MORE TRE SQL × Particle Particle Walker
1 N f 2.404.000 GHz 3.851 dBm 2 N f 2.400.000 GHz -60.023 dBm 3 N f 2.380.000 GHz -70.642 dBm	Mkr→RefLvi	1 N f 2478 022 GHz 4.193 dBm 2 N f 2.493 500 GHz 64596 dBm 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
	More	6 7 8 More
10	1 of 2	101 C 2
Hopping On-GFSK-Low channel		Hopping On-GFSK-High channel
Agilent Spectrum Analyzer Swept SA 20 RF 50.0 AC SENSE(INT) ALSOVAUTO 00:59:45 FM Sep 26, 2016	Peak Search	AgBient Spectrum Analyzer - Swept SA
PN0: Fast Trig: Free Run Avg Held>100/100 TVE[NWWWWW IFGaint.ow Atten: 20 dB DET[PINNIN]	NextPeak	PROF.Feat
Ref Offset0.5 dB Mkr1 2.402 120 GHz 10 dB/div Ref 10.00 dBm 4.899 dBm		Ref Offset 0.5 dB 10 dB/div Ref 10.00 dBm 4.341 dBm
1000 000 000 000 000 000 000 000 000 00	Next Pk Right	0.00 11 Next Pk Right
400	Next Pk Left	20.0
		500 Martin Data
000	Marker Delta	
Start 2.31000 GHz Stop 2.404000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 9.000 ms (1001 pts) War work file Stop X Y Inaction workin Plaction workin	Mkr→CF	Start 2.47800 GHz stop 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz #Sweep 10.00 ms (1001 pts) Mm noot First SL x nacron matchine In nacron wate
N f 2.402 120 GHz 4.899 dBm Function Function Walls 2 N f 2.402 000 GHz -55.395 dBm - </td <td>Mkr→RefLvi</td> <td>HAT HODE THE ECL 2 450 024 GHz 4341 dBm 2 N f 2483 500 GHz 4516 06 dBm 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6</td>	Mkr→RefLvi	HAT HODE THE ECL 2 450 024 GHz 4341 dBm 2 N f 2483 500 GHz 4516 06 dBm 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
7 8 9 10 11	More 1 of 2	7 8 9 9 10 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
C STATUS		K STATUS
Hopping Off-GFSK-Low channel		Hopping Off-GFSK-High channel

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SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD. FCC ID: 2A

FCC ID: 2ADACNEOZ83-4 Report No.: LCS1608302571E

Test plot of Band Edges Trace/Detector Display Line -21.39 dBm Display Line -21.55 dBm Trace/Detector Avg Type: Log-Pwr Avg Type: Log-Pw Avg|Held>100/100 PNO: Wide Trig: Free Ru IFGain:Low Atten: 20 dB PNO: Wide Trig: Free Ru IFGain:Low Atten: 20 dB Select Trace Select Trace Mkr1 2.480 015 GHz -1.554 dBm Mkr1 2.402 005 GHz -1.390 dBm Ref Offset 0.5 dB Ref 10.00 dBm Ref Offset 0.5 dB Ref 10.00 dBm Clear Clear W Trace Ave Trace Averag Max Hol Max Ho Min Hol Min Hol View Blank View Blank Trace On Trace On More 1 of 3 More 1 of 3 Center 2.402000 GHz #Res BW 100 kHz Center 2.480000 GHz #Res BW 100 kHz Span 5.000 MH #Sweep 10.00 ms (1001 pts Span 5.000 Mi #Sweep 10.00 ms (1001 pt #VBW 300 kHz #VBW 300 kHz Reference of **π** /4-DQPSK-High channel Reference of **π** /4-DQPSK-Low channel Marker 1 2.479012000000 GHz PN0: Fast → PN0: Fast → PN0: Fast → Atten: 20 dB Marker 1 2.402872000000 GHz Trig: Free Run Trig: Free Run Atten: 20 dB Peak Search Peak Search Avg Type: Log-Pwr Avg|Held>100/100 Avg Type: Log-Pw Avg|Held>100/100 Next Peak Next Peal Mkr1 2.402 872 GHz -1.031 dBm Akr1 2.479 012 GHz -1.548 dBm Ref Offset 0.5 dB Ref 10.00 dBn Ref Offset 0.5 dB Ref 10.00 dBn Next Pk Righ Next Pk Rigi Next Pk Le Next Pk Let 仇 2 13 Marker Del Marker Delt Start 2.47800 GHz #Res BW 100 kHz Start 2.31000 GHz #Res BW 100 kHz Stop 2.40400 GHz Sweep 9.000 ms (1001 pts) Stop 2.50000 GHz #Sweep 10.00 ms (1001 pts) #VBW 300 kHz #VBW 300 kHz Mkr-C Mkr-CF 2.479 012 GHz 2.483 500 GHz -1.548 dBn -69.380 dBn 2.402 872 GHz 2.400 000 GHz 2.390 000 GHz -1.031 dBm -63.169 dBm -70.967 dBm Mkr-RefLv Mkr-RefLy More 1 of 2 More 1 of 2 9 10 11 Hopping On- 11 /4-DQPSK-Low channel Hopping On- **π** /4-DQPSK-High channel Marker 1 2.480024000000 GHz PR0: Fast PR0: Fast Marker 1 2.402120000000 GHz PN0: Fast Peak Search Peak Search Avg Type: Log-Pw Avg|Held>100/100 Avg Type: Log-Pw Avg|Held>100/100 Trig: Free Ru Atten: 20 dB 0 Next Peal Mkr1 2.402 120 GHz -1.084 dBm Next Peak Mkr1 2.480 024 GHz -1.491 dBm Ref Offset 0.5 dB Ref 10.00 dBm Ref Offset 0.5 dB Ref 10.00 dBn Next Pk Righ Next Pk Right Next Pk Le Next Pk Let 12 03. Marker Del Marker Delt Start 2.31000 GHz #Res BW 100 kHz Start 2.47800 GHz #Res BW 100 kHz Stop 2.40400 GHz Sweep 9.000 ms (1001 pts) Stop 2.50000 GHz #Sweep 10.00 ms (1001 pts) #VBW 300 kHz #VBW 300 kHz Mkr-C Mkr-CF 2.402 120 GHz 2.400 000 GHz 2.480 024 GHz 2.483 500 GHz -1.491 dB -66.102 dB -59.146 dBm -71.660 dBm Mkr-RefLw Mkr-RefLy More 1 of 2 More 1 of 2 10 Hopping Off- 11 /4-DQPSK-Low channel Hopping Off- 11 /4-DQPSK-High channel

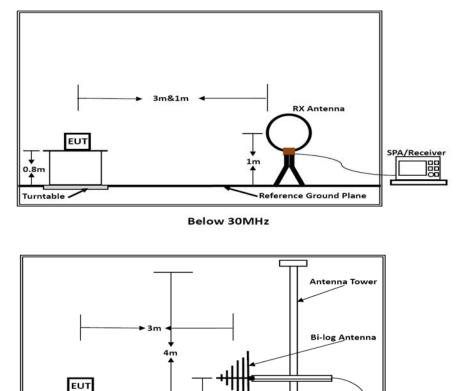
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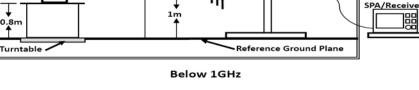
Те	st plot of	Band Edges	
Addent Spectrum Analyzer - Swyst SA 26 50 4 4 50 4 4 50 4 5 5 5 4 5 5 5 5 4 5 5 5 5	Trace/Detector	Addent Spectrum Analyzer - Swipt SA 20 87 150 82 150 82 150 82 150 82 150 82 150 150 150 150 150 150 150 150 150 150	Trace/Detector
Display Line -21.38 dBm PNO: Wide IFGainLow IFGainLow IFGainLow	Select Trace	PNO: Wide Trig: Free Run Avg Held>100/100 TVF MWWWWW	Select Trace
Ref Offset 0.5 dB Mkr1 2.402 005 GHz 10 dB/div Ref 10.00 dBm -1.382 dBm	1*	Ref Offset 0.5 dB Mkr1 2.480 015 GHz 10 dB/d/v Ref 10.00 dBm 10 g -1.535 dBm	1*
1	Clear Write	000	Clear Write
-10.0	Trace Average	-10.0	Trace Average
-20.0		00.0	
-30.0	Max Hold	30.0	Max Hold
400		400 Aurol Aurol	
500	Min Hold	500	Min Hold
500 manyahantar		600 However the	
70.0	View Blank	700	View Blank
40.0		40.0	The off
	More 1 of 3		More 1 of 3
Center 2.402000 GHz Span 5.000 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 10.00 ms (1001 pts)		Center 2.480000 GHz Span 5.000 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 10.00 ms (1001 pts)	
Reference of 8-DPSK-Low channel		Deference of 9 DDSK Lligh shapped	
Agthent Spectrum Analyzer - Swept SA		Reference of 8-DPSK-High channel	
BF 55.6 4.2 BOXE PMT AUSUATO 0052-PTM-266,2016 Marker 1 2.404000000000 GHz File Free Run Avg]Heid>100100 Thys:Leg-Put Thys:Le	Peak Search	Marker 1 2.479012000000 GHz Experiment Arg Type: Leg Port Arg Type: Leg Port Tref Privace 12, 33 006 Marker 1 2.479012000000 GHz Frig Free Run Arg Type: Leg Port Tref Privace 12, 33 007 Tref Privace 12, 33 007 Marker 1 2.479012000000 GHz Frig Free Run Arg Type: Leg Port Tref Privace 12, 33 007 Tref Privace 12, 33 007	Trace/Detector
Mkr1 2 404 000 GHz	Next Peak	Mkr1 2 479 012 GHz	Select Trace
Ref Offset 05 dB 10 dB/div Ref 10.00 dBm Log		10 dB/div Log A1	
10.00	Next Pk Right	0.00	Glear Write
-20.0		-200	
-30.0	Next Pk Left	-0.0 Von	Trace Average
300 2			
700	Marker Delta	700 Miller and a shall all all all and a sure a said of the all we are son management	Max Hold
800		800	
Start 2.31000 GHz Stop 2.40400 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 9.000 ms (1001 pts) Iwar work frac Fac I al. x y rukction rukction vulue	Mkr→CF	Start 2.47800 GHz Stop 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz #Sweep 10.00 ms (1001 pts) HW H00C HTC 5QL X Y Inaction Undertain Working Inaction Working	Min Hold
1 N f 2.404 000 GHz -1.422 dBm 2 N f 2.400 000 GHz -57.688 dBm		1 N f 2.479 012 GHz -1.529 dBm 2 N f 2.483 500 GHz -489.171 dBm	March
3 N f 2.390 000 GHz -70,536 dBm 4	Mkr→RefLvl		View Blank Trace On
6 7 8			
	More 1 of 2	9 10 11	More 1 of 3
K 5		K STATUS	
Hopping On-8-DPSK-Low channel		Hopping On-8-DPSK-High channel	
Agtimit Spectrum Analyzer - Swegt SA 26 15 0 0 42 Warker 1 - 2.401838000000 GHz Avg Type: Log Per TMxxC[12:3:45 6]	Back Samah	Addient Spectrum Analyzer - Swept SA 38 50 p Ad 500 ENT AU301AUTO (00:16:05PM Sep 26, 2016	TransiDatastas
Marker 1 2.401838000000 GHz Avg Type: Leg-Pwr Trig: Free Run Avg Type: Leg-Pwr Type: L	Peak Search	PN0: Fast p' Trig: Free Run Avg Held>100/100 TYEE NUNNIN	Trace/Detector
Ref Offset 0.5 dB Mkr1 2.401 838 GHz	Next Peak	Ref Offset 0.5 dB Mkr1 2.480 002 GHz	Select Trace
10 dB/div Ref 10.00 dBm -0.989 dBm		10 dB/div Ref 10.00 dBm -1.507 dBm -1.507 dBm	
-10.0	Next Pk Right	-10.0	Clear Write
-200		200	
-400	Next Pk Left		Trace Average
100 around a construction of the second second second second of the second seco	Marker Delta	700	Max Hold
Start 2.31000 GHz Stop 2.40400 GHz		Start 2.47800 GHz Stop 2.50000 GHz	
#Res BW 100 kHz #VBW 300 kHz Sweep 9.000 ms (1001 pts) HVR MODE TRD SQL X Y runction worth runction worth	Mkr→CF	#Res BW 100 kHz #VBW 300 kHz #Sweep 10.00 ms (1001 pts) MRI MODE TRC SCL X Y nunction nunction worthit nunction worthit	Min Hold
1 N f 2.401838 GHz 0.988 dBm 2 N f 2.400000 GHz 58,453 dBm 3 N f 2.330000 GHz 56,8453 dBm		1 N f 2.480.002 GHz -1.507 dBm 2 N f 2.483 500 GHz -54.995 dBm 3 F 2.483 500 GHz -54.995 dBm	View Blank
	Mkr→RefLvl		Trace On
	More		More
	1 of 2	9 10 11	1 of 3
K STATUS		KSO STATUS	
Hopping Off-8-DPSK-Low channel		Hopping Off-8-DPSK-High channel	

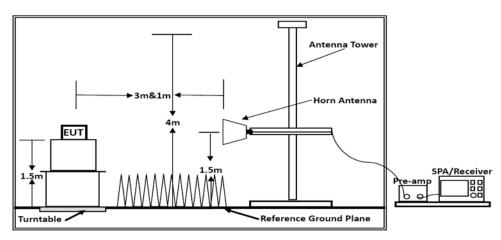
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7. RADIATED MEASUREMENT

7.1 Block Diagram of Test Setup







Above 1GHz

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7.2 Restricted Band Emission Limit

15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
\1\ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293.	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725 13.36-13.41	322-335.4	3600-4400	(\2\)

\1\ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

\2\ Above 38.6

Part 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector.

Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

Part 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100**	3
88–216	150**	3
216–960	200**	3
Above 960	500	3

7.3 Instruments Setting

The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB 100kHz for QP

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7.4 Test Procedures

1) Sequence of testing 9 kHz to 30 MHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

- --- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
- --- If the EUT is a floor standing device, it is placed on the ground.
- --- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- --- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- --- The measurement distance is 3 meter.
- --- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna height is 0.8 meter.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

--- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

- --- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- --- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- --- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- --- The measurement distance is 3 meter.
- --- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

- --- The antenna is polarized vertical and horizontal.
- --- The antenna height changes from 1 to 3 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (\pm 45°) and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1 GHz to 18 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

- --- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- --- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- --- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- --- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- --- The measurement distance is 3 meter.
- --- The EUT was set into operation.

Premeasurement:

- --- The turntable rotates from 0° to 315° using 45° steps.
- --- The antenna is polarized vertical and horizontal.
- --- The antenna height scan range is 1 meter to 2.5 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position $(\pm 45^{\circ})$ and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

- --- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- --- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- --- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- --- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- --- The measurement distance is 1 meter.
- --- The EUT was set into operation.

Premeasurement:

--- The antenna is moved spherical over the EUT in different polarisations of the antenna.

Final measurement:

--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.

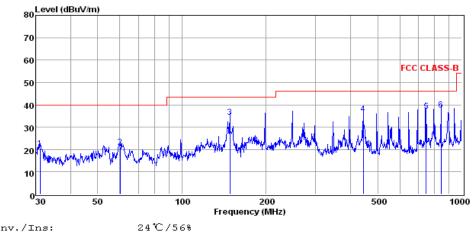
--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

7.5 Results for Restricted Band Radiated Emissions Testing

PASS.

Only record the worst test result in this report.

The test data please refer to following page.



Below 1GHz (Low Channel)

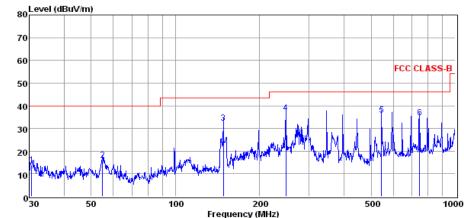


	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	31.07	7.96	0.39	12.32	20.67	40.00	-19.33	QP
2	60.07	7.95	0.49	12.66	21.10	40.00	-18.90	QP
3	148.44	25.29	0.86	8.25	34.40	43.50	-9.10	QP
4	444.85	18.96	1.42	15.57	35.95	46.00	-10.05	QP
5	744.87	16.29	1.61	19.37	37.27	46.00	-8.73	QP
6	842.13	15.37	1.88	20.49	37.74	46.00	-8.26	QP

Note: 1. All readings are Quasi-peak values.

2. Measured= Reading + Antenna Factor + Cable Loss

3. The emission that ate 20db blow the offficial limit are not reported





Env./Ins: pol:

1

2

З

4

5

6

545.18

744.87

24℃/56% HORIZONTAL

Freq Reading CabLos Antfac Measured Limit Over Remark MHz dBuV dВ dB/m dBuV/m dBuV/m dв 30.64 1.31 0.39 12.33 14.03 40.00 -25.97 QP 54.83 2.60 0.46 13.03 16.09 40.00 -23.91 QP 148.44 23.32 0.86 8.25 32.43 43.50 -11.07 QP 247.68 23.94 0.97 12.07 36.98 46.00 -9.02 QP

36.01

34.86

46.00

46.00

-9.99

-11.14

QP

QP

Note: 1. All readings are Quasi-peak values.

1.44

1.61

17.15

13.88

2. Measured= Reading + Antenna Factor + Cable Loss

3. The emission that ate 20db blow the offficial limit are not reported

17.42

19.37

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SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD. FCC ID: 2ADACNE0Z83-4 Report No.: LCS1608302571E

Above 1GHz

The worst test result for GFSK, Tx-Low Channel:

Freq. MHz	Reading dBuv	Ant. Fac dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4804.00	55.91	33.06	35.04	3.94	57.87	74	-16.13	Peak	Horizontal
4804.00	39.4	33.06	35.04	3.94	41.36	54	-12.64	Average	Horizontal
4804.00	54.97	33.06	35.04	3.94	56.93	74	-17.07	Peak	Vertical
4804.00	39.45	33.06	35.04	3.94	41.41	54	-12.59	Average	Vertical

The worst test result for GFSK, Tx-Middle Channel:

Freq. MHz	Reading dBuv	Ant. Fac dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4882.00	54.06	33.16	35.15	3.96	56.03	74	-17.97	Peak	Horizontal
4882.00	39.44	33.16	35.15	3.96	41.41	54	-12.59	Average	Horizontal
4882.00	53.28	33.16	35.15	3.96	55.25	74	-18.75	Peak	Vertical
4882.00	38.81	33.16	35.15	3.96	40.78	54	-13.22	Average	Vertical

The worst test result for GFSK, Tx-High Channel:

Freq. MHz	Reading dBuv	Ant. Fac dB/m	Pre. Fac dB	Cab. Los dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4960.00	54.23	33.26	35.14	3.98	56.33	74	-17.67	Peak	Horizontal
4960.00	38.95	33.26	35.14	3.98	41.05	54	-12.95	Average	Horizontal
4960.00	53.31	33.26	35.14	3.98	55.41	74	-18.59	Peak	Vertical
4960.00	38.47	33.26	35.14	3.98	40.57	54	-13.43	Average	Vertical

Notes:

1). Measuring frequencies from 9k~10th harmonic (ex. 26GHz), No emission found between lowest internal used/generated frequency to 30 MHz.

2). Radiated emissions measured in frequency range from 9k~10th harmonic (ex. 26GHz) were made with an instrument using Peak detector mode.

3). 18~25GHz at least have 20dB margin. No recording in the test report.

7.6 Results for Restricted Band edge Testing

Tx-24	Tx-2402, GFSK, Non-hopping										
Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.		
2390.00	49.79	32.89	35.16	3.51	51.03	74	-22.97	Peak	Horizontal		
2390.00	34.54	32.89	35.16	3.51	35.78	54	-18.22	Average	Horizontal		
2400.00	51.93	32.92	35.16	3.54	53.23	74	-20.77	Peak	Horizontal		
2400.00	36.11	32.92	35.16	3.54	37.41	54	-16.59	Average	Horizontal		
2390.00	49.53	32.89	35.16	3.51	50.77	74	-23.23	Peak	Vertical		
2390.00	34.12	32.89	35.16	3.51	35.36	54	-18.64	Average	Vertical		
2400.00	51.72	32.92	35.16	3.54	53.02	74	-20.98	Peak	Vertical		
2400.00	36.48	32.92	35.16	3.54	37.78	54	-16.22	Average	Vertical		

Tx-2480, GFSK, Non-hopping

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
2483.50	49.1	33.06	35.18	3.60	50.58	74	-23.42	Peak	Horizontal
2483.50	33.56	33.06	35.18	3.60	35.04	54	-18.96	Average	Horizontal
2483.50	51.3	33.06	35.18	3.60	52.78	74	-21.22	Peak	Vertical
2483.50	34.58	33.06	35.18	3.60	36.06	54	-17.94	Average	Vertical

Note:

1). All modes have been tested and we only record the worst test result;

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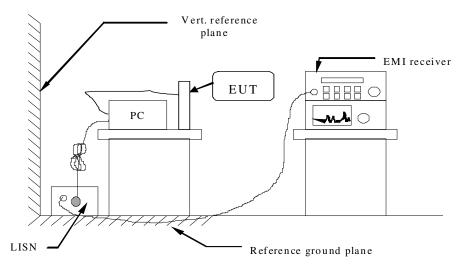
7.7. Power line conducted emissions

7.7.1 Standard Applicable

According to §15.207 (a): 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:

Frequency Range	Limits (dBµV)					
(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				

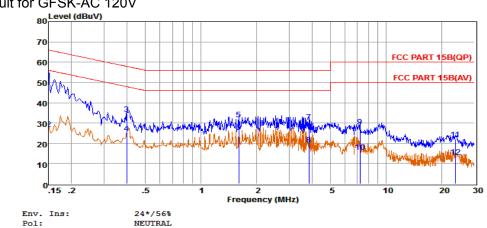
7.7.2 Block Diagram of Test Setup



7.7.3 Test Results

PASS.

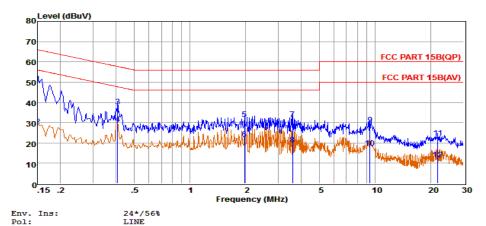
The test data please refer to following page.

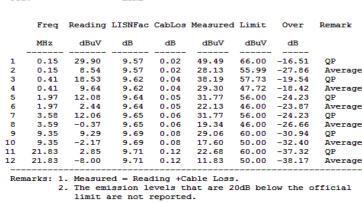


	Freq	Reading	LISNFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.15	31.29	9.70	0.02	51.01	66.00	-14.99	QP
2	0.15	7.40	9.70	0.02	27.12	55.99	-28.87	Average
3	0.40	14.84	9.61	0.04	34.49	57.90	-23.41	QP
4	0.40	5.45	9.61	0.04	25.10	47.90	-22.80	Average
5	1.60	12.08	9.63	0.05	31.76	56.00	-24.24	QP
6	1.60	6.01	9.63	0.05	25.69	46.00	-20.31	Average
7	3.82	10.94	9.65	0.06	30.65	56.00	-25.35	QP
8	3.82	-0.49	9.65	0.06	19.22	46.00	-26.78	Average
9	7.21	8.37	9.69	0.07	28.13	60.00	-31.87	QP
10	7.21	-3.90	9.69	0.07	15.86	50.00	-34.14	Average
11	23.64	2.04	9.82	0.13	21.99	60.00	-38.01	QP
12	23.64	-6.60	9.82	0.13	13.35	50.00	-36.65	Average

Remarks: 1. Measured = Reading +Cable Loss

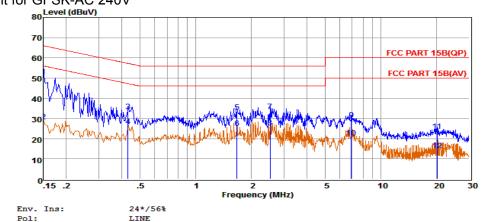
 The emission levels that are 20dB below the official limit are not reported.





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Test result for GFSK-AC 120V

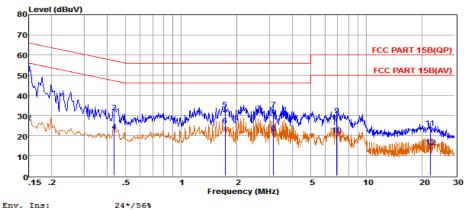


Test result for GFSK-AC 240V

	Freq	Reading	LISNFac	CabLos	Measured	Limit	Over	Remark		
	MHz	dBuV	dB	dB	dBuV	dBuV	dB			
1	0.15	31.38	9.57	0.02	50.97	66.00	-15.03	QP		
2	0.15	9.09	9.57	0.02	28.68	55.99	-27.31	Average		
3	0.43	13.98	9.62	0.04	33.64	57.24	-23.60	QP		
4	0.43	6.51	9.62	0.04	26.17	47.24	-21.07	Average		
5	1.67	13.62	9.64	0.05	33.31	56.00	-22.69	QP		
6	1.67	5.50	9.64	0.05	25.19	46.00	-20.81	Average		
7	2.53	14.03	9.64	0.05	33.72	56.00	-22.28	QP		
8	2.53	5.90	9.64	0.05	25.59	46.00	-20.41	Average		
9	6.91	9.78	9.68	0.07	29.53	60.00	-30.47	QP		
10	6.92	0.81	9.68	0.07	20.56	50.00	-29.44	Average		
11	20.06	4.00	9.76	0.12	23.88	60.00	-36.12	QP		
12	20.06	-5.67	9.76	0.12	14.21	50.00	-35.79	Average		

 Measured = Reading +Cable Loss.
 The emission levels that are 20dB below the official Remarks:

limit are not reported.





Freq Reading LISNFac CabLos Measured Limit Over Remark

	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.15	31.08	9.70	0.02	50.80	66.00	-15.20	QP
2	0.15	6.64	9.70	0.02	26.36	55.99	-29.63	Average
3	0.44	11.77	9.62	0.04	31.43	57.15	-25.72	QP
4	0.44	2.27	9.62	0.04	21.93	47.15	-25.22	Average
5	1.73	13.30	9.63	0.05	32.98	56.00	-23.02	QP
6	1.73	5.17	9.63	0.05	24.85	46.00	-21.15	Average
7	3.16	13.35	9.64	0.06	33.05	56.00	-22.95	QP
8	3.16	1.68	9.64	0.06	21.38	46.00	-24.62	Average
9	6.91	10.36	9.69	0.07	30.12	60.00	-29.88	QP
10	6.92	0.32	9.69	0.07	20.08	50.00	-29.92	Average
11	22.06	4.00	9.81	0.12	23.93	60.00	-36.07	QP
12	22.06	-5.59	9.81	0.12	14.34	50.00	-35.66	Average

marks:

NEUTRAL

Measured = Reading +Cable Loss.
 The emission levels that are 20dB below the official limit are not reported.

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8. ANTENNA REQUIREMENT

8.1 Standard Applicable

According to antenna requirement of §15.203.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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 manufacturer may design the unit so that a broken antenna can be re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

And according to §15.247(4)(1), system operating in the 2400-2483.5MHz bands that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

8.2 Antenna Connected Construction

8.2.1. Standard Applicable

According to § 15.203 & RSS-Gen, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

8.2.2. Antenna Connector Construction

The directional gains of antenna used for transmitting is 2.0dBi, and the antenna is an FPC antenna connect to PCB board and no consideration of replacement. Please see EUT photo for details.

8.2.3. Results: Compliance.

SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD. FCC ID: 2ADACNEOZ83-4 Report No.: LCS1608302571E

9. TEST SETUP PhotographS of eut

Please refer to separated files for Test Setup Photos of the EUT.

10. Exterior Photographs of the eut

Please refer to separated files for External Photos of the EUT.

11. INTERIOR Photographs of the eut

Please refer to separated files for Internal Photos of the EUT.

-----THE END OF REPORT------