

Report No.: SZEM141000556802

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FCC REPORT

Application No: SZEM1410005568RF

Applicant:Koss CorporationManufacturer:Koss Corporation

Factory: Dongguan Tai Sing Audio Technology Limited

Product Name: Bluetooth Headset

Model No.(EUT): BT540i
Trade Mark: KOSS

FCC ID: L76BT540I2

Standards: 47 CFR Part 15, Subpart C (2013)

Date of Receipt: 2014-10-11

Date of Test: 2014-10-15 to 2014-10-20

Date of Issue: 2014-10-22

Test Result: PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Jack Zhang EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.



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2 Version

Revision Record					
Version	Chapter	Date	Modifier	Remark	
00		2014-10-22		Original	

Authorized for issue by:		
Tested By	(Chris Zhong)/Project Engineer	2014-10-20 Date
Prepared By	Sade Luo . (Sade Luo) /Clerk	2014-10-22 Date
Checked By	Emen _ L ₁	2014-10-24 Date



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3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10 2009	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 (2009)	PASS
Conducted Peak Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(3)	KDB558074 D01 v03r02	PASS
6dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	KDB558074 D01 v03r02	PASS
Power Spectral Density	47 CFR Part 15, Subpart C Section 15.247 (e)	KDB558074 D01 v03r02	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	KDB558074 D01 v03r02	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	KDB558074 D01 v03r02	PASS
Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2009	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2009	PASS



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5 General Information

Client Information

Applicant:	Koss Corporation
Address of Applicant:	4129 N. Port Washington Avenue, Milwaukee, WI 53212
Manufacturer:	Koss Corporation
Address of Manufacturer:	4129 N. Port Washington Avenue, Milwaukee, WI 53212
Factory:	Dongguan Tai Sing Audio Technology Limited
Address of Factory:	Tai Sing Industrial Road, Bai Zhou Bian Village, Dong Cheng, Dongguan City, Guangdong Province 523113, P.R.China

General Description of EUT

Product Name:	Bluetooth Headset
Model No.:	BT540i
Trade Mark:	KOSS
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V4.0 This test report is for BLE mode.
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Number of Channel:	40
Hopping Channel Type:	Adaptive Frequency Hopping systems
Sample Type:	Portable production
Test Software of EUT:	CSR BlueSuite (manufacturer declare)
Antenna Type :	Integral
Antenna Gain:	0dBi
Battery:	DC 3.7V 230mAh (Li-ion Rechargeable Battery)
Power Supply:	USB charge
Test Voltage:	AC 120V 60Hz
	DC 3.7V battery fully charged
USB Charging Cable:	126cm(Unshielded)
AUX Cable:	138cm(Unshielded)



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Operation F	Operation Frequency each of channel						
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	11	2422MHz	21	2442MHz	31	2462MHz
2	2404MHz	12	2424MHz	22	2444MHz	32	2464MHz
3	2406MHz	13	2426MHz	23	2446MHz	33	2466MHz
4	2408MHz	14	2428MHz	24	2448MHz	34	2468MHz
5	2410MHz	15	2430MHz	25	2450MHz	35	2470MHz
6	2412MHz	16	2432MHz	26	2452MHz	36	2472MHz
7	2414MHz	17	2434MHz	27	2454MHz	37	2474MHz
8	2416MHz	18	2436MHz	28	2456MHz	38	2476MHz
9	2418MHz	19	2438MHz	29	2458MHz	39	2478MHz
10	2420MHz	20	2440MHz	30	2460MHz	40	2480MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency	
The Lowest channel	2402MHz	
The Middle channel	2440MHz	
The Highest channel	2480MHz	



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Test Environment

Operating Environment:		
Temperature:	21.0 °C	
Humidity:	50 % RH	
Atmospheric Pressure:	1020mbar	

Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.
Adapter	Supply by SGS	R00101
USB cable	Supply by SGS	N/A

Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch E&E Lab,

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.



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Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

VCCI

The 3m Semi-anechoic chamber, Full-anechoic Chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197, G-416, T-1153 and C-2383 respectively.

FCC – Registration No.: 556682

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

Industry Canada (IC)

Two 3m Semi-anechoic chambers of SGS-CSTC Standards Technical Services Co., Ltd. have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1 & 4620C-2.

Deviation from Standards

None.

Abnormalities from Standard Conditions

None.

Other Information Requested by the Customer

None.



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Equipment List

	RE in Chamber					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)	
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2015-06-10	
2	EMI Test Receiver	Agilent Technologies	N9038A	SEL0312	2015-09-16	
3	EMI Test software	AUDIX	E3	SEL0050	N/A	
4	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2015-10-24	
5	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2015-10-24	
6	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2015-10-24	
7	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2015-05-16	
8	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2015-10-24	
9	Coaxial cable	SGS	N/A	SEL0027	2015-05-29	
10	Coaxial cable	SGS	N/A	SEL0189	2015-05-29	
11	Coaxial cable	SGS	N/A	SEL0121	2015-05-29	
12	Coaxial cable	SGS	N/A	SEL0178	2015-05-29	
13	Band filter	Amindeon	82346	SEL0094	2015-05-16	
14	Barometer	Chang Chun	DYM3	SEL0088	2015-05-16	
15	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-24	
16	Humidity/ Temperature Indicator	Shanhai Qixiang	ZJ1-2B	SEL0103	2015-10-24	
17	Signal Generator (10M-27GHz)	Rohde & Schwarz	SMR27	SEL0067	2015-05-16	
18	Signal Generator	Rohde & Schwarz	SMY01	SEL0155	2015-10-24	
19	Loop Antenna	Beijing Daze	ZN30401	SEL0203	2015-06-04	



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	RF connected test				
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-24
2	Humidity/ Temperature Indicator	HYGRO	ZJ1-2B	SEL0033	2015-10-24
3	Spectrum Analyzer	Rohde & Schwarz	FSP	SEL0154	2015-10-24
4	Coaxial cable	SGS	N/A	SEL0178	2015-05-29
5	Coaxial cable	SGS	N/A	SEL0179	2015-05-29
6	Barometer	ChangChun	DYM3	SEL0088	2015-05-16
7	Signal Generator	Rohde & Schwarz	SML03	SEL0068	2015-05-16
8	Band filter	amideon	82346	SEL0094	2015-05-16
9	POWER METER	R&S	NRVS	SEL0144	2015-10-24
10	Attenuator	Beijin feihang taida	TST-2-6dB	SEL0205	2015-05-16
11	Power Divider(splitter)	Agilent Technologies	11636B	SEL0130	2015-10-24





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	Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)		
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	2015-06-10		
2	LISN	Rohde & Schwarz	ENV216	SEL0152	2015-10-24		
3	LISN	ETS-LINDGREN	3816/2	SEL0021	2015-05-16		
4	8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN- T8-02	SEL0162	2014-11-10		
5	4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN- T4-02	SEL0163	2014-11-10		
6	2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN- T2-02	SEL0164	2014-11-10		
7	EMI Test Receiver	Rohde & Schwarz	ESCI	SEL0022	2015-05-16		
8	Coaxial Cable	SGS	N/A	SEL0025	2015-05-29		
9	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-24		
10	Humidity/ Temperature Indicator	Shanhai Qixiang	ZJ1-2B	SEL0103	2015-10-24		
11	Barometer	Chang Chun	DYM3	SEL0088	2015-05-16		

Note: The calibration interval is one year, all the instruments are valid.



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6 Test results and Measurement Data

6.1 Antenna Requirement

Standard requirement: 47 CFR Part 15C Section 15.203 /247(c)

15.203 requirement:

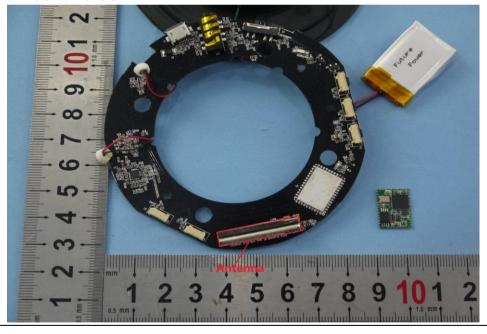
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.





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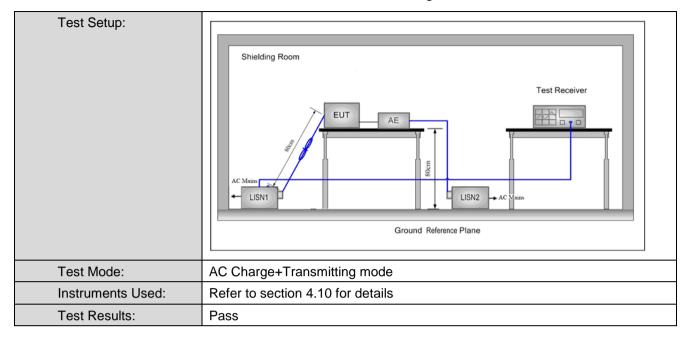
6.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207				
Test Method:	ANSI C63.10: 2009				
Test Frequency Range:	150kHz to 30MHz				
Limit:	Limit (dBuV)				
	Frequency range (MHz)	Quasi-peak	Average		
	0.15-0.5	66 to 56*	56 to 46*		
	0.5-5	56	46		
	5-30	60	50		
	* Decreases with the logarithn	n of the frequency.			
Test Procedure:	The mains terminal disturt room.	bance voltage test was	s conducted in a shie	elded	
	 The mains terminal disturbance voltage test was conducted in a shielded room. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to 			he was ear ne he of 2.	



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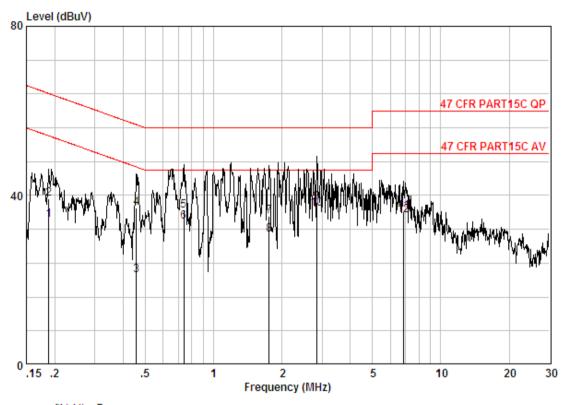
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Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live line:



Site : Shielding Room

Condition : 47 CFR PART15C QP CE LINE

Job.No : 5568CR

Mode : AC Charge+TX mode

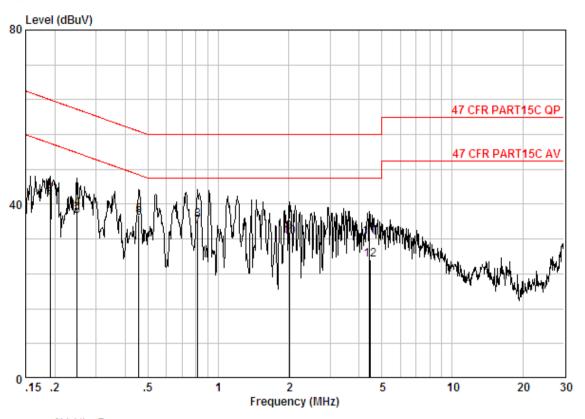
1200	_	. AC Charge 172 inc	a c						
			Cable	LISN	Read		Limit	Over	
		Freq	Loss	Factor	Level	Level	Line	Limit	Remark
		MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	@	0.18838	0.02	0.10	34.18	34.30	54.11	-19.81	Average
2	@	0.18838	0.02	0.10	39.14	39.25	64.11	-24.86	QP
3	@	0.45636	0.01	0.10	21.00	21.11	46.76	-25.65	Average
4	@	0.45636	0.01	0.10	36.91	37.02	56.76	-19.74	QP
5	@	0.73910	0.02	0.16	36.15	36.33	56.00	-19.67	QP
6	@	0.73910	0.02	0.16	33.60	33.78	46.00	-12.22	Average
7	@	1.753	0.02	0.22	34.75	35.00	56.00	-21.00	QP
8	@	1.753	0.02	0.22	30.48	30.72	46.00	-15.28	Average
9	@	2.839	0.02	0.26	38.02	38.29	56.00	-17.71	QP
10	@	2.839	0.02	0.26	36.51	36.79	46.00	-9.21	Average
11	0	6.878	0.01	0.34	35.91	36.26	50.00	-13.74	Average
12	@	6.878	0.01	0.34	34.97	35.32	60.00	-24.68	QP



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Neutral line:



Site : Shielding Room

Condition : 47 CFR PART15C QP FCC DOC NEUTRAL

Job.No : 5568CR

Mode : AC Charge+TX mode

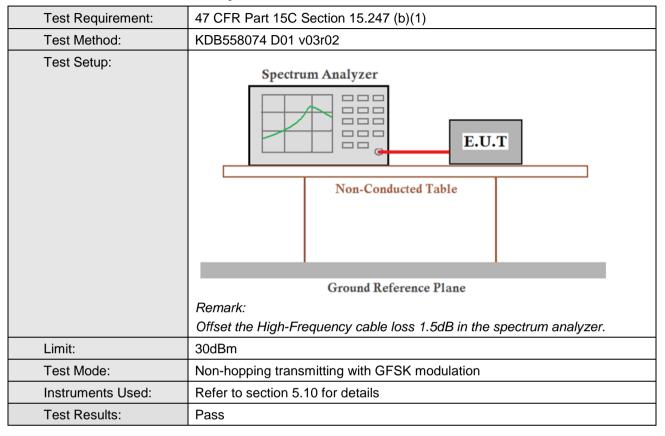
	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.19039	0.02	0.07	39.99	40.08	54.02	-13.94	Average
2	0.19039	0.02	0.07	42.24	42.33	64.02	-21.69	QP
3	0.24945	0.02	0.02	37.15	37.18	51.78	-14.59	Average
4	0.24945	0.02	0.02	39.06	39.10	61.78	-22.68	QP
5	0.45636	0.01	-0.01	37.42	37.41	56.76	-19.34	QP
6	0.45636	0.01	-0.01	36.94	36.94	46.76	-9.82	Average
7	0.81737	0.02	0.03	34.75	34.80	46.00	-11.20	Average
8	0.81737	0.02	0.03	36.26	36.31	56.00	-19.69	QP
9	2.012	0.02	0.09	33.40	33.51	56.00	-22.49	QP
10	2.012	0.02	0.09	32.34	32.45	46.00	-13.55	Average
11	4.430	0.01	0.12	32.28	32.41	56.00	-23.59	QP
12	4.454	0.01	0.12	27.07	27.20	46.00	-18.80	Average



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6.3 Conducted Peak Output Power



Measurement Data

	GFSK mode					
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result			
Lowest	-2.08	30.00	Pass			
Middle	1.46	30.00	Pass			
Highest	2.20	30.00	Pass			

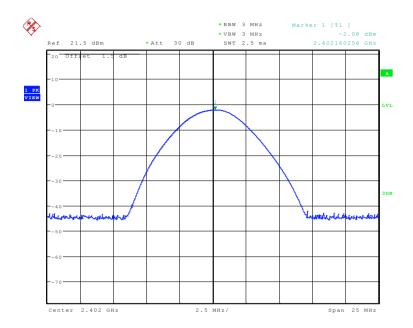


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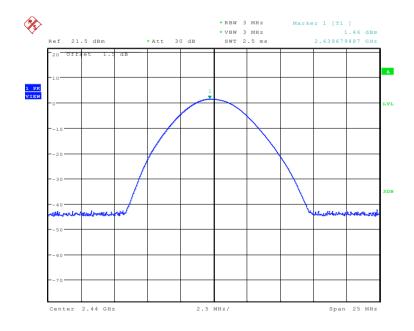
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Test plot as follows:

Test mode: GFSK Test channel: Lowest



Test mode: GFSK Test channel: Middle

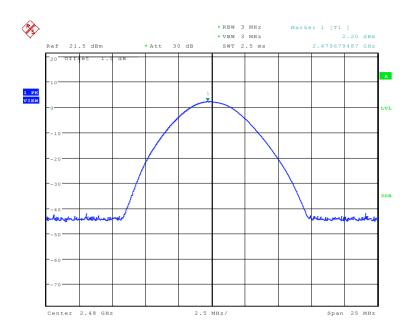




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Test mode: GFSK Test channel: Highest

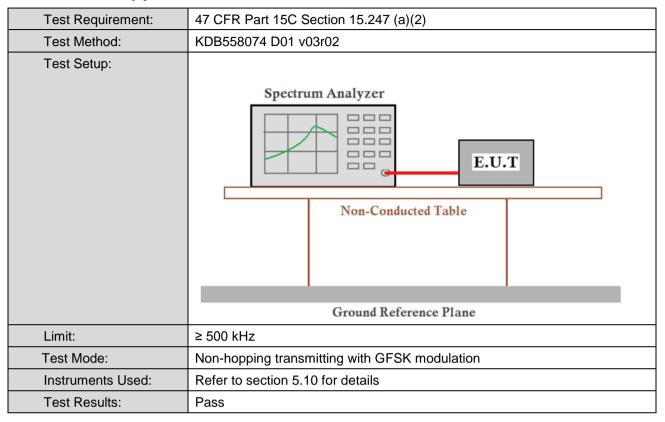




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6.4 6dB Occupy Bandwidth



Measurement Data

Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	0.702	≥500	Pass
Middle	0.702	≥500	Pass
Highest	0.692	≥500	Pass



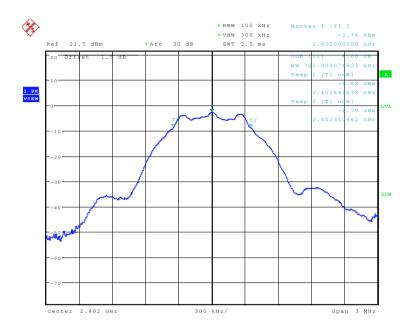


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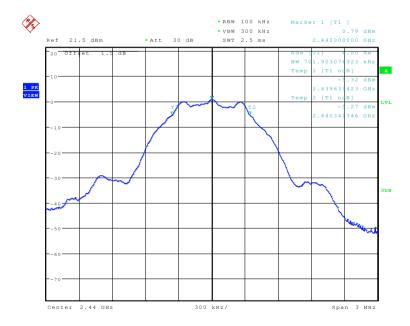
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Test plot as follows:

Test mode: GFSK Test channel: Lowest



Test mode: GFSK Test channel: Middle

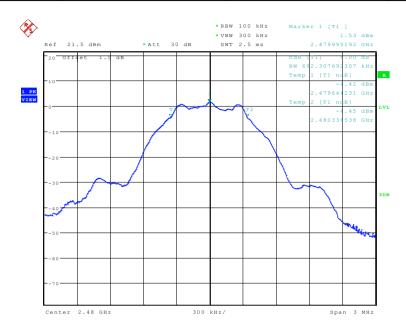




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Test mode: GFSK Test channel: Highest

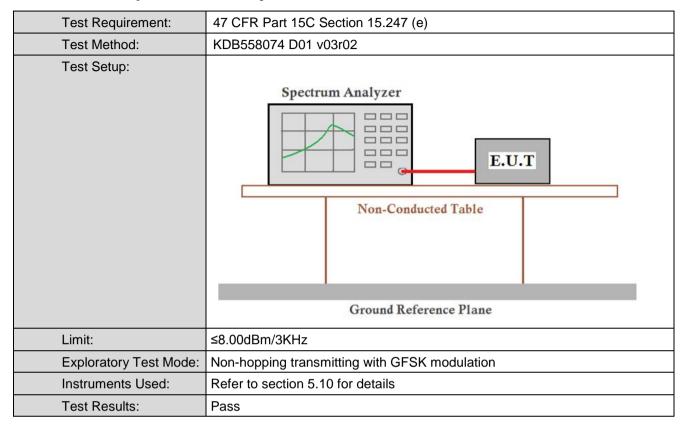




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6.5 Power Spectral Density



Measurement Data

	GFSK mode						
Test channel	Power Spectral Density (dBm/3KHz)	Limit (dBm/3KHz)	Result				
Lowest	-2.78	≤8.00	Pass				
Middle	0.77	≤8.00	Pass				
Highest	1.51	≤8.00	Pass				

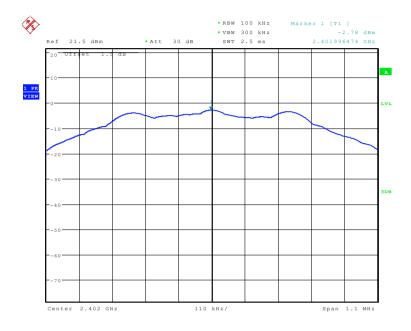


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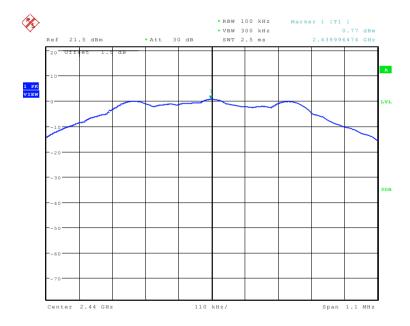
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Test plot as follows:

Test mode: GFSK Test channel: Lowest



Test mode: GFSK Test channel: Middle

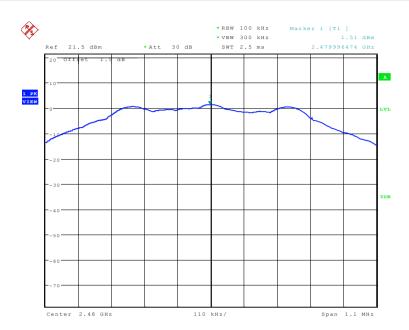




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Test mode: GFSK Test channel: Highest

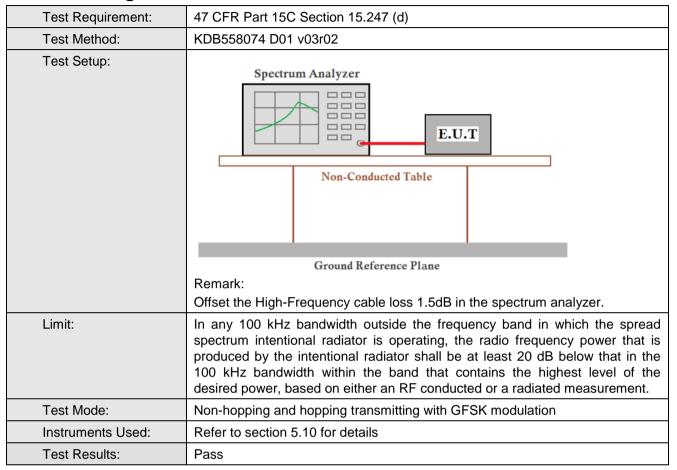




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6.6 Band-edge for RF Conducted Emissions



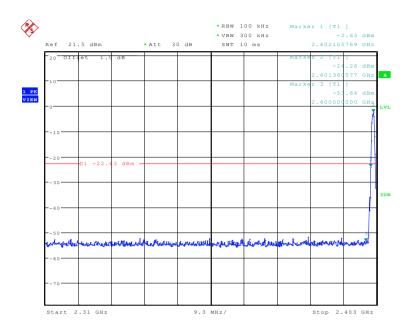


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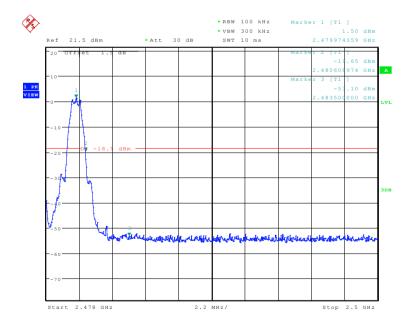
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Test plot as follows:

Test mode: GFSK Test channel: Lowest



Test mode: GFSK Test channel: Highest





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6.7 Spurious RF Conducted Emissions

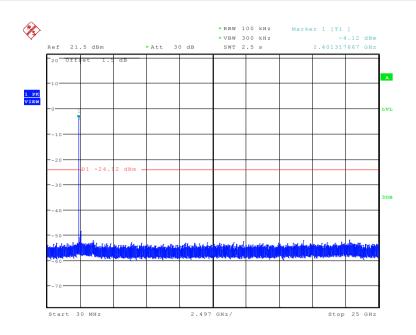
Test Requirement:	47 CFR Part 15C Section 15.247 (d)		
Test Method:	KDB558074 D01 v03r02		
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane		
	Remark:		
	Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.		
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.		
Test Mode:	Non-hopping transmitting with GFSK modulation		
Instruments Used:	Refer to section 5.10 for details		
Test Results:	Pass		

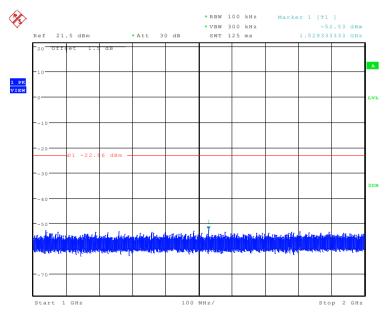


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Test mode: GFSK Test channel: Lowest

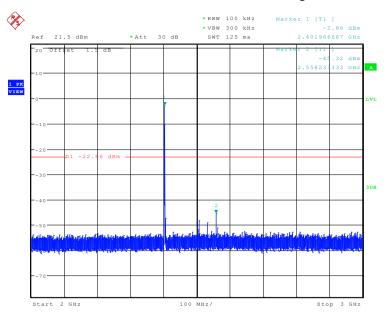


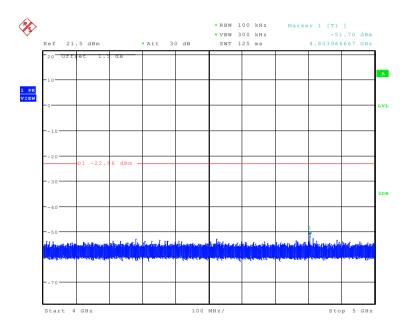




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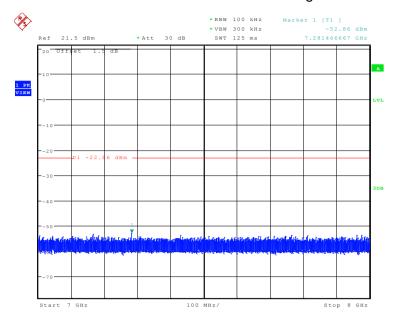




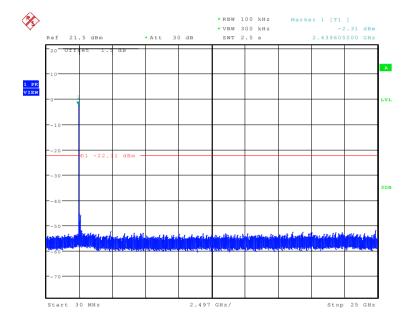


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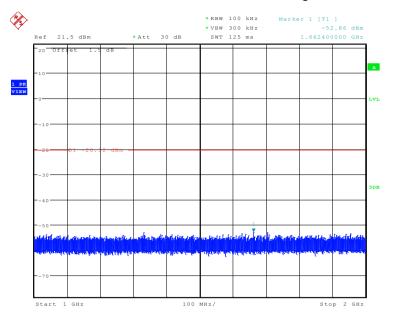


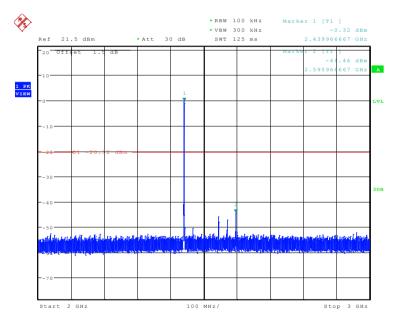




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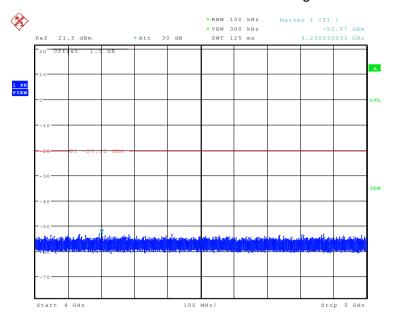


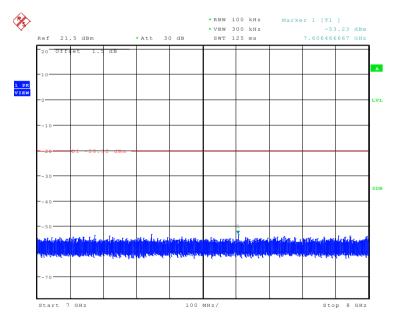




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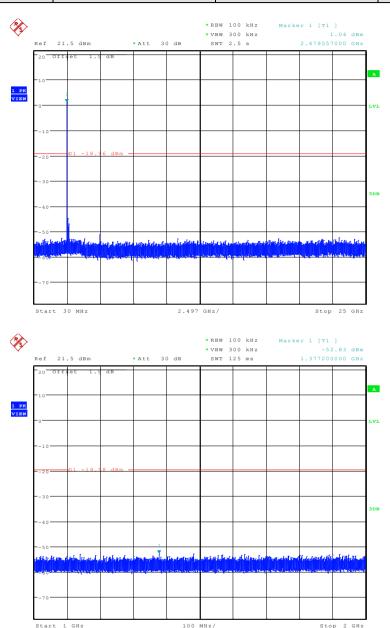




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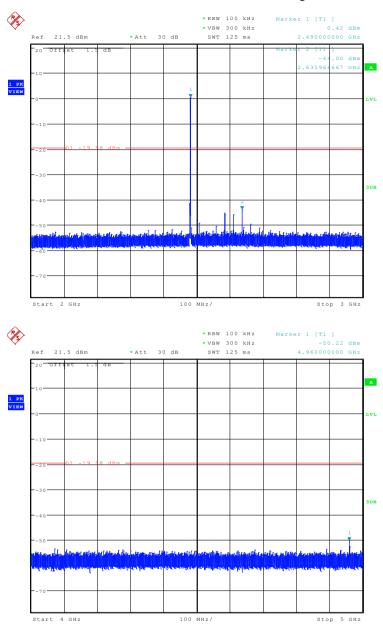






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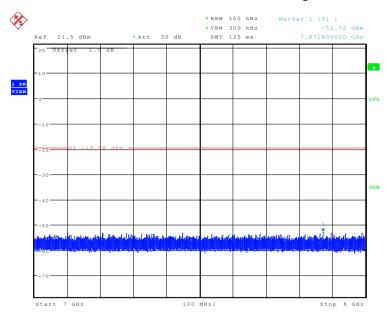
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Remark:

Pretest 9kHz to 25GHz, find the highest point when testing, so only the worst data were shown in the test report.

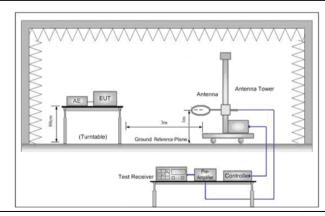


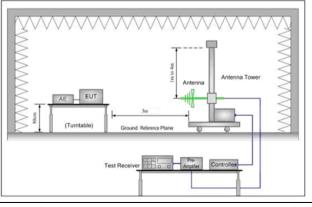
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6.8 Radiated Spurious Emission

6.8.1 Spurious Emiss	sions						
Test Requirement:	47 CFR Part 15C Section	on 1	5 200 and 15	205			
Test Method:	ANSI C63.10 2009	<u> </u>	3.203 and 13	.200			
Test Site:	Measurement Distance	. 3m	. (Sami-Anacl	noic Cham	har)		
Receiver Setup:	Frequency	. 511	Detector	RBW	<u> </u>	Remark	
receiver cotap.	0.009MHz-0.090MH		Peak	10kHz		Peak	
	0.009MHz-0.090MH		Average	10kHz		Average	
	0.090MHz-0.110MH		Quasi-peak	_		Quasi-peak	
	0.110MHz-0.490MH		Peak	10kHz		Peak	
	0.110MHz-0.490MH		Average	10kHz		Average	
	0.490MHz -30MHz		Quasi-peak	+		Quasi-peak	
	30MHz-1GHz		Quasi-peak	100 k⊢	z 300kHz	Quasi-peak	
	Above 1GHz		Peak	1MHz	: 3MHz	Peak	
			Peak	1MHz	10Hz	Average	
Limit:	Frequency		eld strength crovolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)	
	0.009MHz-0.490MHz	2	400/F(kHz)	-	-	300	
	0.490MHz-1.705MHz	24	1000/F(kHz)	-	-	30	
	1.705MHz-30MHz		30	-	-	30	
	30MHz-88MHz		100	40.0	Quasi-peak	3	
	88MHz-216MHz		150	43.5	Quasi-peak	3	
	216MHz-960MHz		200	46.0	Quasi-peak	3	
	960MHz-1GHz		500	54.0	Quasi-peak	3	
	Above 1GHz		500	54.0	Average	3	
	Note: 15.35(b), Unless otherwise specified, the limit on perference of frequency emissions is 20dB above the maximum permitted average of limit applicable to the equipment under test. This peak limit applies to peak emission level radiated by the device.						
Test Setup:							

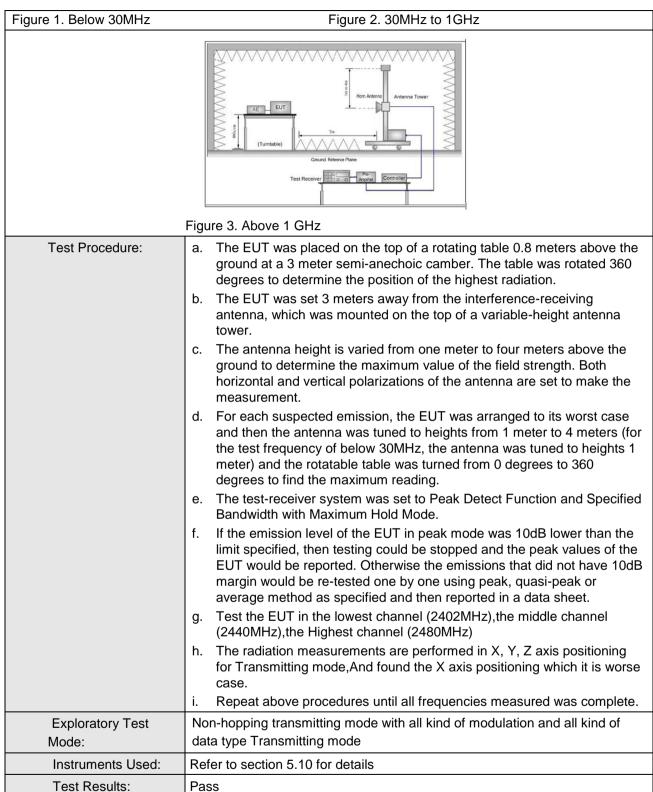






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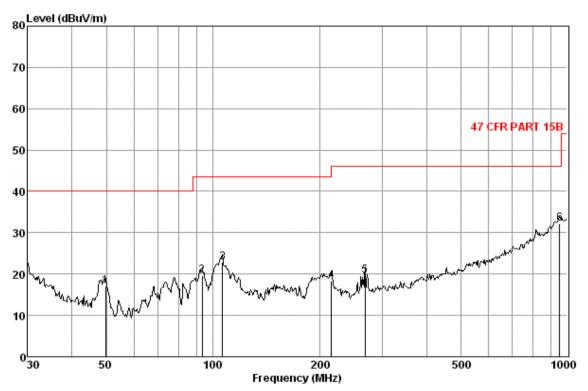


Radiated Emission below 1GHz							
30MHz~1GHz (QP)							
Test mode:	AC Charge+Transmitting	Vertical					



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Condition: 47 CFR PART 15B 3m 3142C HORIZONTAL

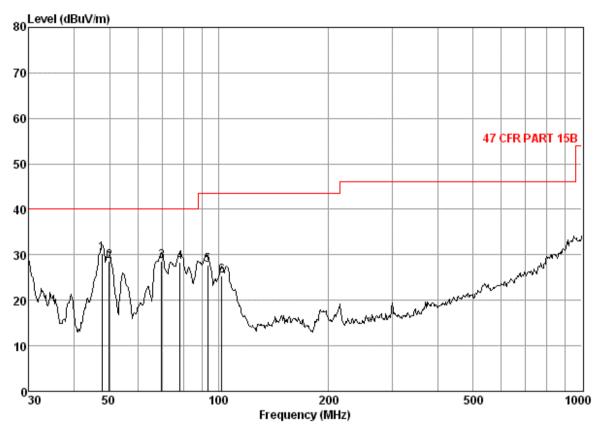
Job No. : 5568CR Mode : AC Charge+TX mode

	Freq			Preamp Factor			Limit Line	Over Limit
_	MHz	dB	dB/m	dB	dBuV	$\overline{\text{dBuV/m}}$	$\overline{\text{dBuV/m}}$	dB
1 2 3 4 5	49.71 93.11 106.39 216.02 268.49 952.09	0.79 1.13 1.22 1.49 1.76 3.65	7.42 5.68 7.12 7.36 9.00 21.30	27. 29 27. 21 27. 15 26. 64 26. 49 26. 54		17.08 19.62 22.78 18.29 19.69 32.14	43.50 43.50 46.00 46.00	-22. 92 -23. 88 -20. 72 -27. 71 -26. 31 -13. 86



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Condition: 47 CFR PART 15B 3m 3142C VERTICAL

Job No. : 5568CR

Mode : AC Charge+TX mode

	Freq			Preamp Factor				Over Limit
	MHz	dB	dB/m	dB	dBuV	$\overline{\text{dBuV/m}}$	$\overline{\text{dBuV/m}}$	dB
1 2 3 4 5	47. 66 49. 88 69. 60 78. 14 93. 11	0.76 0.80 0.80 1.04 1.13	7.31 4.87 4.95	27. 30 27. 29 27. 25 27. 23 27. 21	47. 73 50. 08 49. 53	30. 21 28. 55 28. 50 28. 29 27. 83	40.00 40.00 40.00	
6	102.00	1.21	6.84	27.19	44.62	25.48	43.50	-18.02





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Transmitte	Transmitter Emission above 1GHz									
Test mode:		GFSK	Test	channel:	Lowest	R	Remark:		Peak	
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Li (dBuV/		Over Limit (dB)	Polarization	
3653.463	5.08	33.04	38.81	45.23	44.54	74		-29.46	Vertical	
4804.000	5.63	34.70	39.24	46.36	47.45	74		-26.55	Vertical	
6017.064	6.68	36.28	39.18	46.00	49.78	74		-24.22	Vertical	
7206.000	6.80	35.63	39.07	44.77	48.13	74		-25.87	Vertical	
9608.000	8.94	37.33	37.93	42.83	51.17	74		-22.83	Vertical	
11752.600	9.41	38.45	38.59	43.98	53.25	74		-20.75	Vertical	
3543.550	4.99	32.94	38.76	46.31	45.48	74		-28.52	Horizontal	
4804.000	5.63	34.70	39.24	46.80	47.89	74		-26.11	Horizontal	
5956.109	6.45	36.22	39.19	46.58	50.06	74		-23.94	Horizontal	
7206.000	6.80	35.63	39.07	45.36	48.72	74		-25.28	Horizontal	
9608.000	8.94	37.33	37.93	42.12	50.46	74		-23.54	Horizontal	
11574.460	9.55	38.28	38.50	44.46	53.79	74		-20.21	Horizontal	

Test mode:		GFSK	Те	st channel:	Middle	Re	emark:	Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line	I Limit	Polarization
3690.853	5.04	33.07	38.82	45.65	44.94	74	-29.06	Vertical
4880.000	5.61	34.78	39.26	45.42	46.55	74	-27.45	Vertical
6172.197	6.39	36.11	39.17	46.15	49.48	74	-24.52	Vertical
7320.000	6.73	35.51	39.06	44.69	47.87	74	-26.13	Vertical
9760.000	8.84	37.80	37.84	42.12	50.92	74	-23.08	Vertical
11872.880	9.36	38.57	38.64	43.74	53.03	74	-20.97	Vertical
3616.451	5.11	33.01	38.79	45.21	44.54	74	-29.46	Horizontal
4880.000	5.61	34.78	39.26	48.31	49.44	74	-24.56	Horizontal
5956.109	6.45	36.22	39.19	46.53	50.01	74	-23.99	Horizontal
7320.000	6.73	35.51	39.06	45.03	48.21	74	-25.79	Horizontal
9760.000	8.84	37.80	37.84	42.03	50.83	74	-23.17	Horizontal
11933.470	9.34	38.63	38.67	43.74	53.04	74	-20.96	Horizontal



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Test mode:		GFSK	Tes	t channel:	Highest	Rem	nark:	Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
3747.656	4.98	33.11	38.85	45.32	44.56	74	-29.44	Vertical
4960.000	5.60	34.86	39.29	45.54	46.71	74	-27.29	Vertical
6017.064	6.68	36.28	39.18	46.30	50.08	74	-23.92	Vertical
7440.000	6.72	35.43	39.05	45.39	48.49	74	-25.51	Vertical
9920.000	9.19	38.27	37.75	42.17	51.88	74	-22.12	Vertical
12178.980	9.01	38.93	38.85	44.63	53.72	74	-20.28	Vertical
3709.691	5.02	33.08	38.83	45.16	44.43	74	-29.57	Horizontal
4960.000	5.60	34.86	39.29	45.60	46.77	74	-27.23	Horizontal
5956.109	6.45	36.22	39.19	46.00	49.48	74	-24.52	Horizontal
7440.000	6.72	35.43	39.05	44.93	48.03	74	-25.97	Horizontal
9920.000	9.19	38.27	37.75	41.78	51.49	74	-22.51	Horizontal
11692.920	9.44	38.39	38.56	43.89	53.16	74	-20.84	Horizontal

Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
 - Final Test Level = Receiver Reading + Antenna Factor + Cable Factor Preamplifier Factor
- 2) Scan from 9kHz to 25GHz,The disturbance above 13GHz and below 30 MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

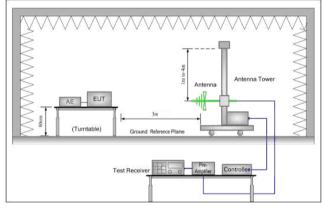


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6.9 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205								
Test Method:	ANSI C63.10 2009	ANSI C63.10 2009							
Test Site:	Measurement Distance: 3m	Measurement Distance: 3m (Semi-Anechoic Chamber)							
Limit:	Frequency	Limit (dBuV/m @3m)	Remark						
	30MHz-88MHz	40.0	Quasi-peak Value						
	88MHz-216MHz	43.5	Quasi-peak Value						
	216MHz-960MHz	46.0	Quasi-peak Value						
	960MHz-1GHz	54.0	Quasi-peak Value						
	Above 1GHz	54.0	Average Value						
	Above IGHZ	74.0	Peak Value						
			_						
Test Setup:									



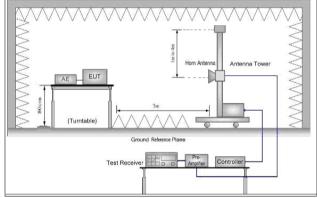


Figure 1. 30MHz to 1GHz

Figure 2. Above 1 GHz

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- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel



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	 g. Test the EUT in the lowest channel, the Highest channel h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case. i. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Non-hopping transmitting mode with all kind of modulation and all kind of
	data type Transmitting mode
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass

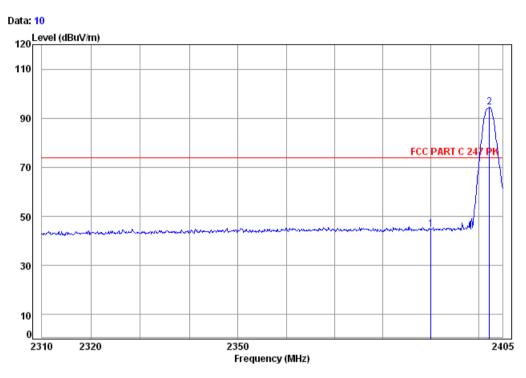


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Test plot as follows:

Restricted bands	Restricted bands around fundamental frequency								
Test mode:	GFSK	Test channel:	Lowest	Remark:	Peak	Vertical			



Site : chamber

Condition: FCC PART C 247 PK 3m Vertical

Job No: : 5568CR

Mode: : 2402 Bandedge

: BLE

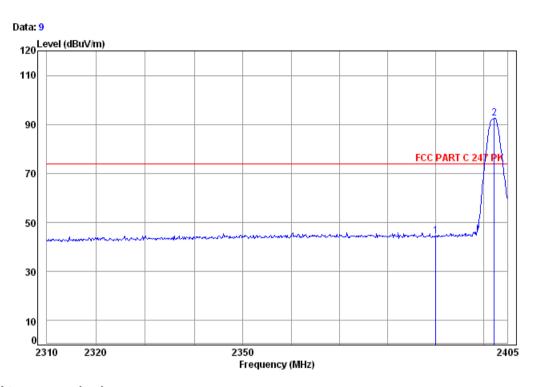
	Freq				Preamp Factor				
-	MHz	dB	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 2 pp	2390.00 2402.29								



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Test mode: GFSK Test channel: Lowest Remark: Peak Horizontal



Site : chamber

Condition: FCC PART C 247 PK 3m Horizontal

Job No: : 5568CR

Mode: : 2402 Bandedge

: BLE

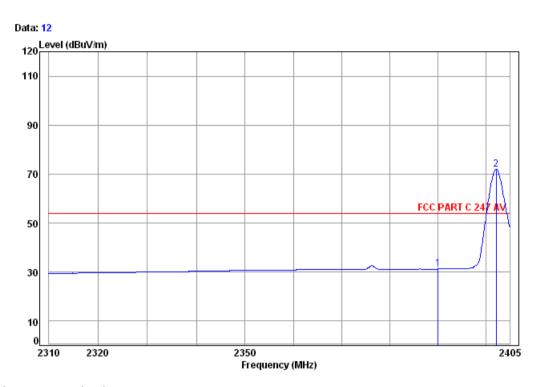
	Freq				Preamp Factor				
-	MHz	dB	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.00	0.00	3.36	32.35	38.46	47.06	44.31	74.00	-29.69
2 pp	2402.29	0.00	3.37	32.41	38.46	95.28	92.60	74.00	18.60



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	Test mode:	GFSK	Test channel:	Lowest	Remark:	Average	Vertical
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Site : chamber

Condition: FCC PART C 247 AV 3m Vertical

Job No: : 5568CR

Mode: : 2402 Bandedge

: BLE

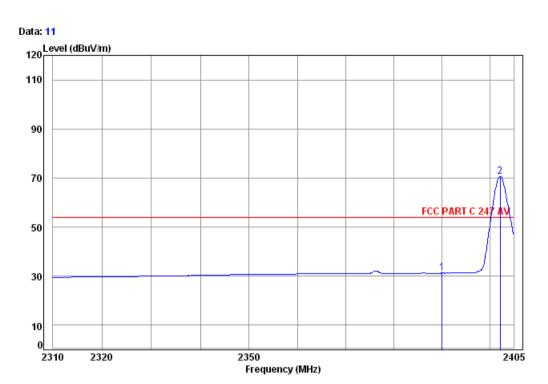
			Aux	Cable	Ant	Preamp	Read		Limit	0∨er
		Freq	Factor	Loss	Factor	Factor	Level	Level	Line	Limit
	_	MHz	dB	dB	dB/m	dB	dBuV	dBu\//m	dBuV/m	dB
		7.11.2	ab	ab	GD/III	u.D	abav	abav, iii	abav, iii	G.D
		2200 00	0.00	2.26	22.25	30.46	34.03	24.20	F4 00	22.72
1		2390.00	0.00	3.36	32.35	38.46	34.03	31.28	54.00	-22./2
2	pp	2402.19	0.00	3.37	32.41	38.46	74.78	72.10	54.00	18.10



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Test mode:	GFSK	Test channel:	Lowest	Remark:	Average	Horizontal	
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Site : chamber

Condition: FCC PART C 247 AV 3m Horizontal

Job No: : 5568CR

Mode: : 2402 Bandedge

: BLE

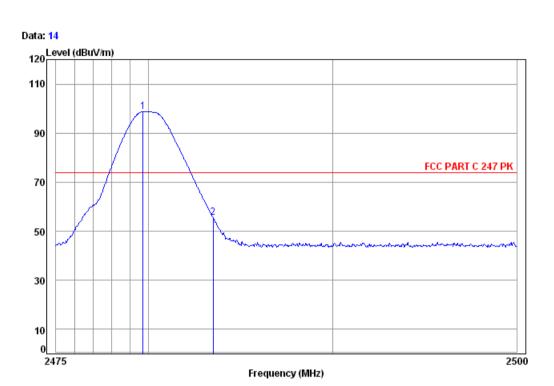
	Freq				Preamp Factor				
-	MHz	dB	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.00	0.00	3.36	32.35	38.46	33.98	31.23	54.00	-22.77
2 nn	2402.19	0.00	3.37	32.41	38.46	73.42	70.74	54.00	16.74



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lest mode: GFSK lest channel: Highest Remark: Peak Vertical	Test mode:	GFSK	Test channel:	Highest	Remark:	Peak	Vertical
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Site : chamber

Condition: FCC PART C 247 PK 3m Vertical

Job No: : 5568CR

Mode: : 2480 Bandedge

: BLE

	Limit Line						Aux Factor	Freq	
dB	dBuV/m	dBuV/m	dBuV	dB	dB/m	dB	dB	MHz	-
								2479.71 2483.50	1 pp

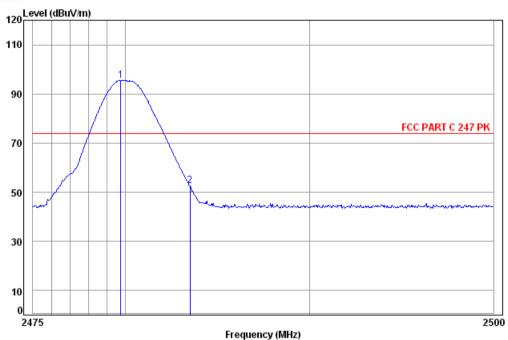


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Test mode:	GFSK	Test channel:	Highest	Remark:	Peak	Horizontal
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Data: 13



Site : chamber

Condition: FCC PART C 247 PK 3m Horizontal

Job No: : 5568CR

Mode: : 2480 Bandedge

: BLE

Aux Cable Ant Preamp Read Limit 0ver Level Freq Factor Loss Factor Factor Le∨el Line Limit MHz dΒ dB/m dΒ dBuV dBuV/m dBuV/m 1 pp 2479.76 0.00 3.46 32.44 38.47 98.09 95.52 74.00 21.52 38.47 55.10 52.54 74.00 -21.46 2483.50 0.00 3.47 32.44

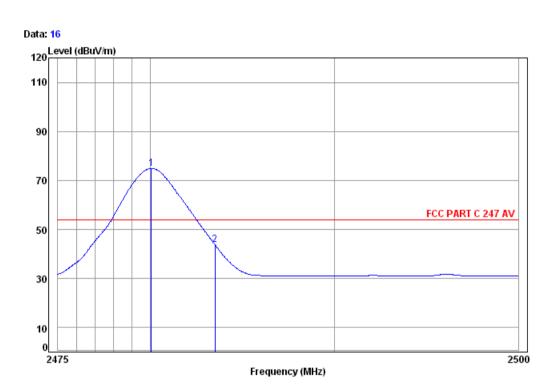




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Test mode:	GFSK	Test channel:	Highest	Remark:	Average	Vertical
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Site : chamber

Condition: FCC PART C 247 AV 3m Vertical

Job No: : 5568CR

Mode: : 2480 Bandedge

: BLE

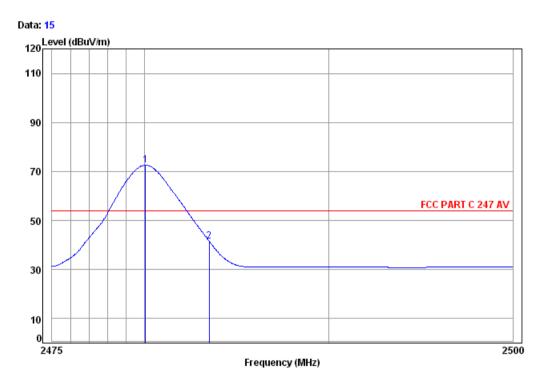
				Preamp Factor				Freq	
dB	dBuV/m	dBuV/m	dBuV	dB	dB/m	dB	dB	MHz	_
								2480.06 2483.50	



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Test mode:	GFSK	Test channel:	Highest	Remark:	Average	Horizontal
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Site : chamber

Condition: FCC PART C 247 AV 3m Horizontal

Job No: : 5568CR

Mode: : 2480 Bandedge

: BLE

		Aux	Cable	Ant	Preamp	Read		Limit	0∨er
	Freq	Factor	Loss	Factor	Factor	Le∨el	Le∨el	Line	Limit
_									
	MHz	dB	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2480.06	0.00	3.46	32.44	38.47	75.09	72.52	54.00	18.52
2	2483.50	0.00	3.47	32.44	38.47	44.19	41.63	54.00	-12.37

Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor



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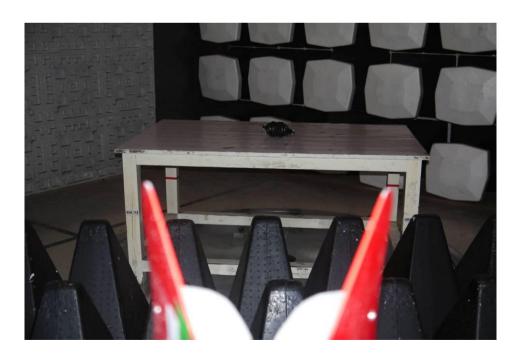
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7 Photographs - EUT Test Setup

Test model No.: BT540i

7.1 Radiated Spurious Emission







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7.2 Conducted Emissions





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8 Photographs - EUT Constructional Details

Test model No.: BT540i

Refer to Report No. SZEM141000556801 for EUT external and internal photos.