International Certification Corp.
No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C.
Tel: 886-3-271-8666 Fax: 886-3-318-0155

FCC Test Report

FCC ID	:	**VQK-F07E**
Equipment	:	**Mobile Phone**
Model No.	:	**F-07E**
Brand Name	:	**Xi**
Applicant	:	**FUJITSU LIMITED**
Address	:	**1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki 211-8588, Japan**
Standard	:	**47 CFR FCC Part 15.247**
Received Date	:	**Apr. 09, 2013**
Tested Date	:	**Apr. 26 ~ May 06, 2013**

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Approved & Reviewed by:

Gary Chang / Manager

Testing Laboratory
2732

Table of Contents

Release Record

Report No.	Version	Description	Issued Date
FR331905AE	Rev. 01	Initial issue	May 30, 2013

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.151MHz 52.32(Margin 13.64dB) - QP	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 30 MHz 26.11 (Margin 13.89dB) - PK	Pass
15.247(b)(3)	Fundamental Emission Output Power	Power [dBm]: 1.15	Pass
15.247(a)(2)	6dB Bandwidth	Meet the requirement of limit	Pass
15.247(e)	Power Spectral Density	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

1 General Description

1.1 Information

1.1.1 Product Details

Product Name	Mobile Phone
Brand Name	Xi
Model Name	F-07E
IMEI Code	355277050010573 & 355277050017321
H/W Version	V2.1.0
S/W Version	R13.1e

1.1.2 Specification of the Equipment under Test (EUT)

RF General Information				
Frequency Range (MHz)	**Bluetooth Mode**	**Ch. Freq. (MHz)**	**Channel Number**	**Data Rate**
2400-2483.5	BT LE	2402-2480	0-39 [40]	1 Mbps

1.1.3 Antenna Details

Ant. No.	Type	Gain (dBi)	Connector	Remark
1	λ/4 Monopole	-8.9	---	---

1.1.4 EUT Operational Condition

Supply Voltage	☒ AC mains	☒ DC	
Type of DC Source	☐ Internal DC supply	☒ External DC adapter	☒ Battery

1.1.5 Accessories

Accessories		
No.	**Equipment**	**Description**
1	Cradle	Brand Name: Fujitsu limited Model Name: CA50601-1801 Power Rating: O/P: 5Vdc, 1.5A
2	Battery	Brand Name: Fujitsu limited Model Name: CA54310-0045 Power Rating: O/P: 3.8Vdc, 2600mA

1.1.6 Channel List

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
37	2402.00	18	2442.00
0	2404.00	19	2444.00
1	2406.00	20	2446.00
2	2408.00	21	2448.00
3	2410.00	22	2450.00
4	2412.00	23	2452.00
5	2414.00	24	2454.00
6	2416.00	25	2456.00
7	2418.00	26	2458.00
8	2420.00	27	2460.00
9	2422.00	28	2462.00
10	2424.00	29	2464.00
38	2426.00	30	2466.00
11	2428.00	31	2468.00
12	2430.00	32	2470.00
13	2432.00	33	2472.00
14	2434.00	34	2474.00
15	2436.00	35	2476.00
16	2438.00	36	2478.00
17	2440.00	39	2480.00

1.1.7 Test Tool and Power Setting

Test tool	QCRT , Ver 3.0.7.0		
Modulation Mode	**Test Frequency (MHz)**		
	2402	**2440**	**2480**
BT LE	Default	Default	Default

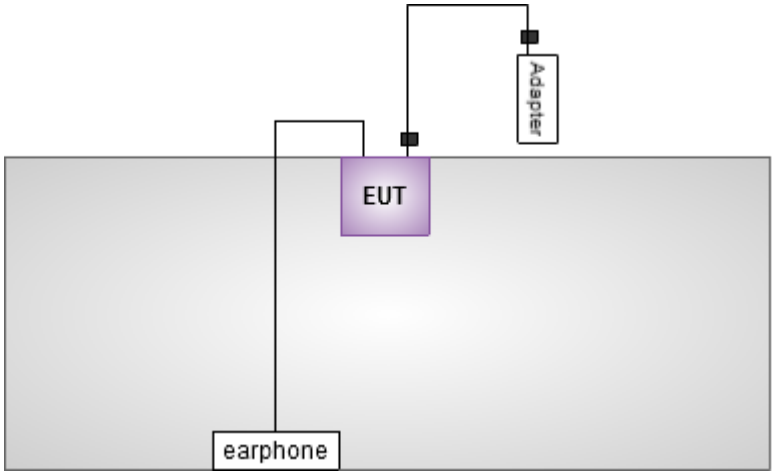
1.2 Local Support Equipment List

Support Equipment List						
No.	**Equipment**	**Brand**	**Model**	**S/N**	**FCC ID**	**Signal cable / Length (m)**
1	Adapter	NTT docomo	AC Adaptor 04	---	---	---
2	Earphone	APPLE	MD827FE/A	---	---	1.2m non-shielded w/o core

Note: Item 1 was provided by client.

1.3 Test Setup Chart

Test Setup Diagram



1.4 The Equipment List

EMI	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
EMC Receiver	R&S	ESCS 30	100169	Dec. 12, 2012	Dec. 11, 2013
LISN	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-667	Dec. 04, 2012	Dec. 03, 2013
LISN (Support Unit)	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-666	Dec. 04, 2012	Dec. 03, 2013
ISN	TESEQ	ISN T800	23342	Feb. 17, 2013	Feb. 16, 2014
ISN	TESEQ	ISN T400	21653	Jun. 22, 2012	Jun. 21, 2013
ISN	TESEQ	ISN T8-Cat6	27262	Sep. 17, 2012	Sep. 16, 2013
ISN	TESEQ	ISN ST08	22589	Jan. 24, 2013	Jan. 23, 2014
RF Current Probe	FCC	F-33-4	121630	Dec. 04, 2012	Dec. 03, 2013
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Dec. 25, 2012	Dec. 24, 2013
ESH3-Z6 V-Network	R&S	ESH3-Z6	100920	Nov. 21, 2012	Nov. 20, 2013
Note: Calibration Interval of instruments listed above is one year.					

EMI	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
3m semi-anechoic chamber	RIKEN	SAC-03	03CH01-WS	Jan. 04, 2013	Jan. 03, 2014
Amplifier	Burgeon	BPA-530	100219	Nov. 28, 2012	Nov. 27, 2013
Amplifier	Agilent	83017A	MY39501308	Dec. 18, 2012	Dec. 17, 2013
Bilog Antenna	ScHwarzbeck	VULB9168	VULB9168-522	Jan. 11, 2013	Jan. 10, 2014
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Feb. 18, 2013	Feb. 17, 2014
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Jan. 14, 2013	Jan. 13, 2014
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R03m	Woken	CFD400NL-LW	CFD400NL-001	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R10m	Woken	CFD400NL-LW	CFD400NL-002	Dec. 25, 2012	Dec. 24, 2013
Spectrum Analyzer	R&S	FSV40	101498	Jan. 24, 2013	Jan. 23, 2014
Receiver	ROHDE&SCHWARZ	ESR3	101658	Jan. 30, 2013	Jan. 29, 2014
control	EM Electronics	EM1000	60612	N/A	N/A
Note: Calibration Interval of instruments listed above is one year.					

RF	RF Conducted				
Test Site	RF Conducted (TH01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV 40	101486	Nov. 14, 2012	Nov. 13, 2013
Spectrum Analyzer	R&S	FSP 40	100593	Aug. 14, 2012	Aug. 13, 2013
DC Power Source	G.W.	GPC-6030D	C671845	Jun. 19, 2012	Jun. 18, 2013
AC Power Source	G.W	APS-9102	EL920581	Jul. 02, 2012	Jul. 01, 2013
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	Nov. 21, 2012	Nov. 20, 2013
Signal Generator	R&S	SMR40	100116	Jun. 26, 2012	Jun. 25, 2013
Power Sensor	Anritsu	MA2411B	1027452	Sep. 08, 2012	Sep. 07, 2013
Power Meter	Anritsu	ML2495A	1124009	Sep. 08, 2012	Sep. 07, 2013
RF Cable-2m	HUBER+SUHNER	SUCOFLEX_104	SN 345675/4	NA	NA
RF Cable-3m	HUBER+SUHNER	SUCOFLEX_104	SN 345669/4	NA	NA

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.247
ANSI C63.10-2009
FCC KDB 558074 D01 DTS Meas Guidance v02
FCC KDB 789033 D01 General UNII Test procedures v01r02
FCC KDB 662911 D01 Multiple Transmitter Output v01r02

Note: The EUT has been tested and complied with FCC part 15B requirement. FCC Part 15B test results are issued to another report.

1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty	
Parameters	**Uncertainty**
Bandwidth	±35.286 Hz
Conducted power	±0.536 dB
Frequency error	±35.286 Hz
Temperature	±0.3 ^{o}C
Conducted emission	±2.946 dB
AC conducted emission	±2.43 dB
Radiated emission	±2.49 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	20°C / 53%	Skys Huang
Radiated Emissions	03CH01-WS	25°C / 65%	Aska Huang
RF Conducted	TH01-WS	24°C / 63%	Brad Wu

- FCC site registration No.: 657002
- IC site registration No.: 10807A-1

2.2 The Worst Test Modes and Channel Details

Test item	Mode	Test channel
Conducted Emissions	BT LE	2440
Radiated Emissions < 1GHz	BT LE	2440
Radiated Emissions > 1GHz	BT LE	2402 / 2440 / 2480
Fundamental Emission Output Power	BT LE	2402 / 2440 / 2480
6dB Bandwidth	BT LE	2402 / 2440 / 2480
Power Spectral Density	BT LE	2402 / 2440 / 2480

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **X-plane** results were found as the worst case and were shown in this report.
2. Adapter and cradle had been pretested and found adapter was the worst case and was selected for final test

3 Transmitter Test Results

3.1 Conducted Emissions

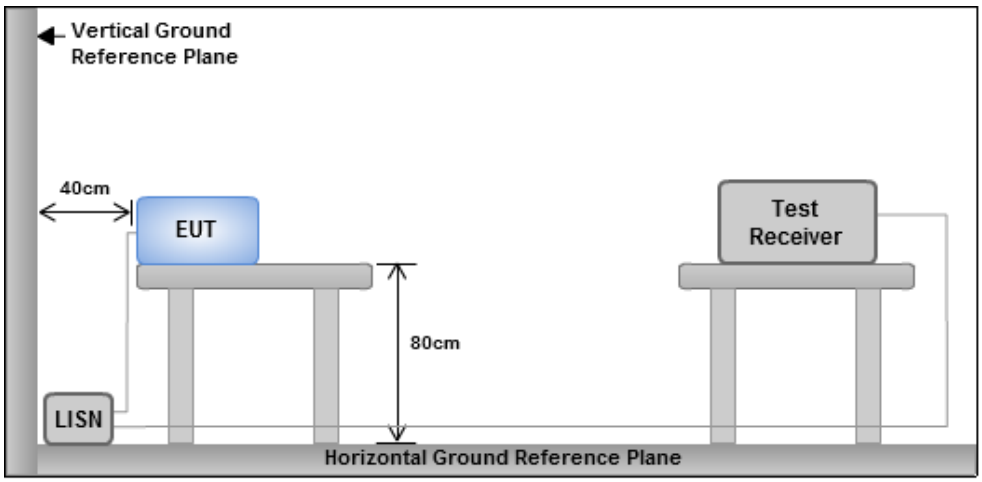
3.1.1 Limit of Conducted Emissions

Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.

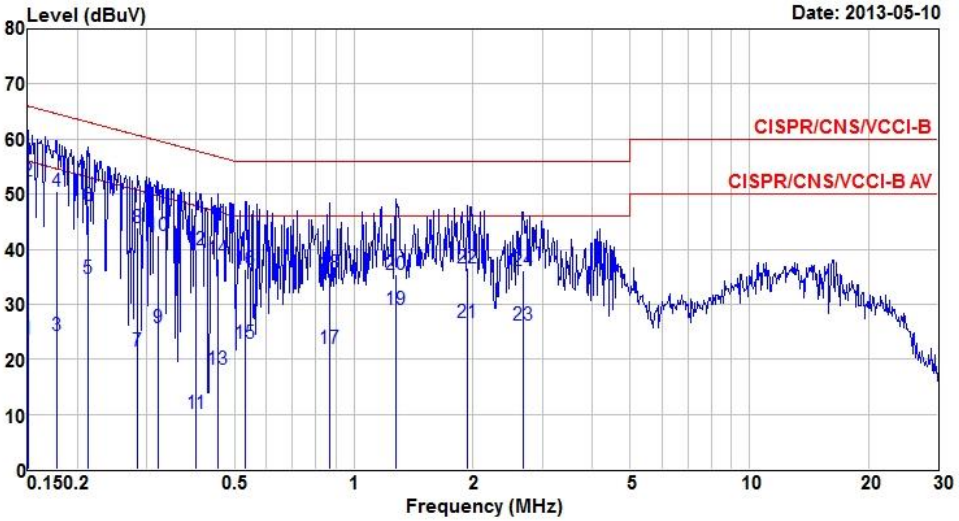
3.1.3 Test Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions

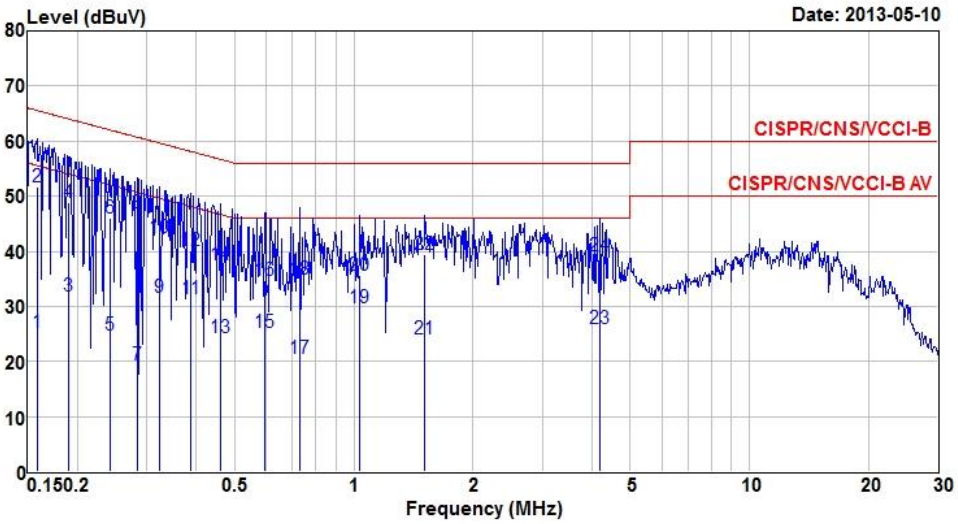
Power Phase	Line	**Test Freq. (MHz)**	2440
Test Mode	AC power & Radio link		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.151	23.51	55.96	-32.45	23.40	0.05	0.06	Average
2	0.151	52.32	65.96	-13.64	52.21	0.05	0.06	QP
3	0.178	24.35	54.59	-30.24	24.17	0.05	0.13	Average
4	0.178	50.52	64.59	-14.07	50.34	0.05	0.13	QP
5	0.213	34.65	53.10	-18.45	34.43	0.05	0.17	Average
6	0.213	47.80	63.10	-15.30	47.58	0.05	0.17	QP
7	0.283	21.43	50.72	-29.29	21.26	0.06	0.11	Average
8	0.283	43.89	60.72	-16.83	43.72	0.06	0.11	QP
9	0.320	25.72	49.71	-23.99	25.57	0.06	0.09	Average
10	0.320	42.40	59.71	-17.31	42.25	0.06	0.09	QP
11	0.400	10.06	47.86	-37.80	9.94	0.07	0.05	Average
12	0.400	39.80	57.86	-18.06	39.68	0.07	0.05	QP
13	0.454	18.16	46.80	-28.64	18.03	0.08	0.05	Average
14	0.454	38.25	56.80	-18.55	38.12	0.08	0.05	QP
15	0.532	22.96	46.00	-23.04	22.82	0.09	0.05	Average
16	0.532	36.41	56.00	-19.59	36.27	0.09	0.05	QP
17	0.866	21.89	46.00	-24.11	21.72	0.13	0.04	Average
18	0.866	35.57	56.00	-20.43	35.40	0.13	0.04	QP
19	1.282	29.06	46.00	-16.94	28.81	0.17	0.08	Average
20	1.282	35.46	56.00	-20.54	35.21	0.17	0.08	QP
21	1.939	26.61	46.00	-19.39	26.25	0.21	0.15	Average
22	1.939	36.66	56.00	-19.34	36.30	0.21	0.15	QP
23	2.678	26.28	46.00	-19.72	25.89	0.20	0.19	Average
24	2.678	36.06	56.00	-19.94	35.67	0.20	0.19	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dBuV) = Limit Line (dBuV) – Level (dBuV).

Power Phase	Neutral	**Test Freq. (MHz)**	2440
Test Mode	AC power & Radio link		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.158	25.18	55.56	-30.38	25.06	0.04	0.08	Average
2	0.158	51.59	65.56	-13.97	51.47	0.04	0.08	QP
3	0.189	31.81	54.06	-22.25	31.61	0.04	0.16	Average
4	0.189	48.87	64.06	-15.19	48.67	0.04	0.16	QP
5	0.242	24.83	52.04	-27.21	24.65	0.04	0.14	Average
6	0.242	46.08	62.04	-15.96	45.90	0.04	0.14	QP
7	0.283	19.40	50.72	-31.32	19.24	0.05	0.11	Average
8	0.283	46.92	60.72	-13.80	46.76	0.05	0.11	QP
9	0.322	31.55	49.66	-18.11	31.41	0.05	0.09	Average
10	0.322	42.48	59.66	-17.18	42.34	0.05	0.09	QP
11	0.387	31.41	48.12	-16.71	31.28	0.07	0.06	Average
12	0.387	40.13	58.12	-17.99	40.00	0.07	0.06	QP
13	0.461	24.30	46.67	-22.37	24.18	0.07	0.05	Average
14	0.461	37.56	56.67	-19.11	37.44	0.07	0.05	QP
15	0.595	25.22	46.00	-20.78	25.08	0.09	0.05	Average
16	0.595	34.75	56.00	-21.25	34.61	0.09	0.05	QP
17	0.727	20.56	46.00	-25.44	20.33	0.19	0.04	Average
18	0.727	34.93	56.00	-21.07	34.70	0.19	0.04	QP
19	1.037	29.76	46.00	-16.24	29.56	0.15	0.05	Average
20	1.037	35.62	56.00	-20.38	35.42	0.15	0.05	QP
21	1.511	23.98	46.00	-22.02	23.70	0.17	0.11	Average
22	1.511	39.44	56.00	-16.56	39.16	0.17	0.11	QP
23	4.202	26.08	46.00	-19.92	25.70	0.15	0.23	Average
24	4.202	39.30	56.00	-16.70	38.92	0.15	0.23	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dBuV) = Limit Line (dBuV) – Level (dBuV).

3.2 6dB and Occupied Bandwidth

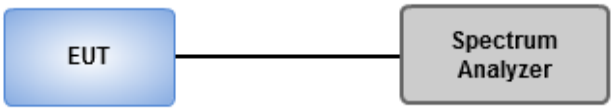
3.2.1 Limit of 6dB Bandwidth

The minimum 6dB bandwidth shall be at least 500 kHz.

3.2.2 Test Procedures

1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth = 300 kHz.
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

3.2.3 Test Setup

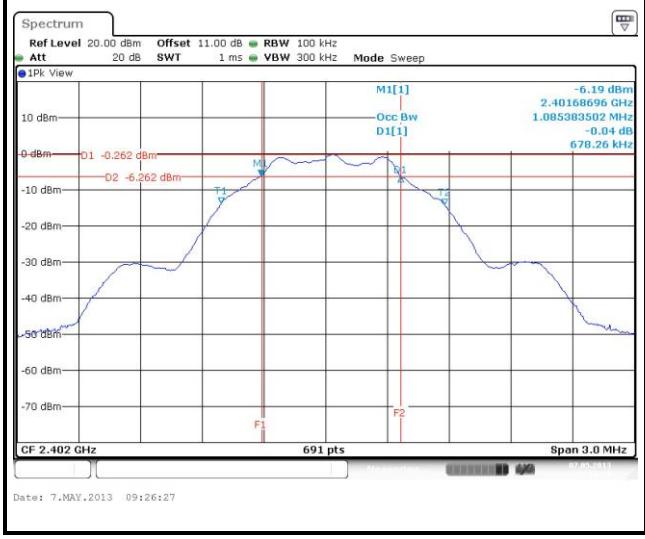


3.2.4 Test Result of 6dB and Occupied Bandwidth

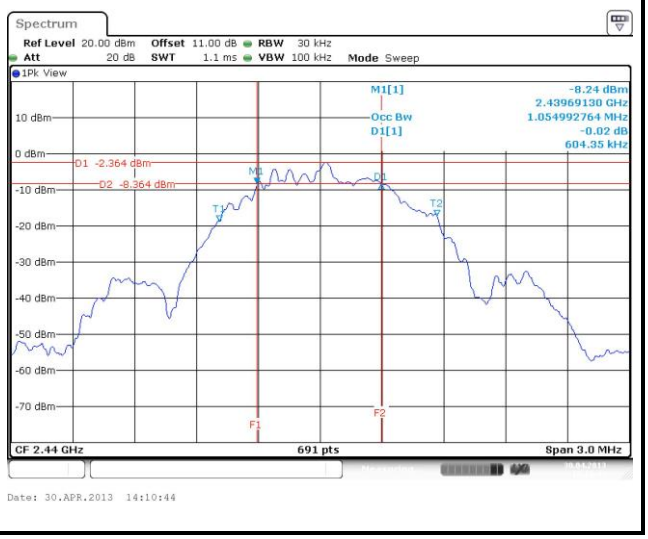
Modulation Mode	Freq. (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit of 6dB Bandwidth (kHz)
BT LE	2402	0.678	1.05	500
BT LE	2440	0.674	1.05	500
BT LE	2480	0.670	1.05	500

Worst Plots

6dB Bandwidth



99% Occupied Bandwidth



3.3 RF Output Power

3.3.1 Limit of RF Output Power

Conducted power shall not exceed 1Watt.

☒ Antenna gain <= 6dBi, no any corresponding reduction is in output power limit.

☐ Antenna gain > 6dBi

☐ Non Fixed, point to point operations.
The conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB

☐ Fixed, point to point operations
Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point Operations, 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 6 dBi.

Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations ,no any corresponding reduction is in transmitter peak output power

3.3.2 Test Procedures

☒ Maximum Peak Conducted Output Power

☐ **Spectrum analyzer**

1. Set RBW = 1MHz, VBW = 3MHz, Detector = Peak.
2. Sweep time = auto, Trace mode = max hold, Allow trace to fully stabilize.
3. Use the spectrum analyzer channel power measurement function with the band limits set equal to the DTS bandwidth edges.

☒ **Power meter**

1. A broadband Peak RF power meter is used for output power measurement. The video bandwidth of power meter is greater than 6dB bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

☒ Maximum Conducted Output Power (For reference only)

☐ **Spectrum analyzer**

1. Set RBW = 1MHz, VBW = 3MHz, Detector = RMS.
2. Set the sweep time to: ≥10 x (number of measurement points in sweep) x (maximum data rate per stream).
3. Perform the measurement over a single sweep.
4. Use the spectrum analyzer's band power measurement function with band limits set equal to the EBW(26dBc) band edges.

☒ **Power meter**

1. A broadband Average RF power meter is used for output power measurement. The video bandwidth of power meter is greater than 6dB bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

3.3.3 Test Setup

3.3.4 Test Result of Maximum Output Power

Modulation Mode	Freq. (MHz)	Peak Power (dBm)	Total Power (mW)	Total Power (dBm)	Limit (dBm)
BT LE	2402	0.99	1.26	0.99	30
BT LE	2440	1.15	1.30	1.15	30
BT LE	2480	1.10	1.29	1.10	30

Modulation Mode	Freq. (MHz)	Conducted Average Power (dBm)	Total Power (mW)	Total Power (dBm)	Limit (dBm)
BT LE	2402	0.62	1.15	0.62	30
BT LE	2440	0.79	1.20	0.79	30
BT LE	2480	0.75	1.19	0.75	30

Note: Average power is for reference only

3.4 Power Spectral Density

3.4.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in any 3 kHz band.

3.4.2 Test Procedures

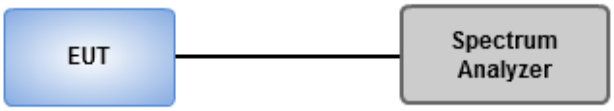
☒ Maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit.

1. Set the RBW = 10kHz, VBW = 30kHz.
2. Detector = Peak, Sweep time = auto couple.
3. Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

☐ Maximum (average) conducted output power was used to demonstrate compliance to the fundamental output power limit.

1. Set the RBW = 100kHz, VBW = 300 kHz.
2. Detector = RMS, Sweep time = auto couple.
3. Set the sweep time to: ≥ 10 x (number of measurement points in sweep) x (maximum data rate per stream).
4. Perform the measurement over a single sweep.
5. Use the peak marker function to determine the maximum amplitude level.\

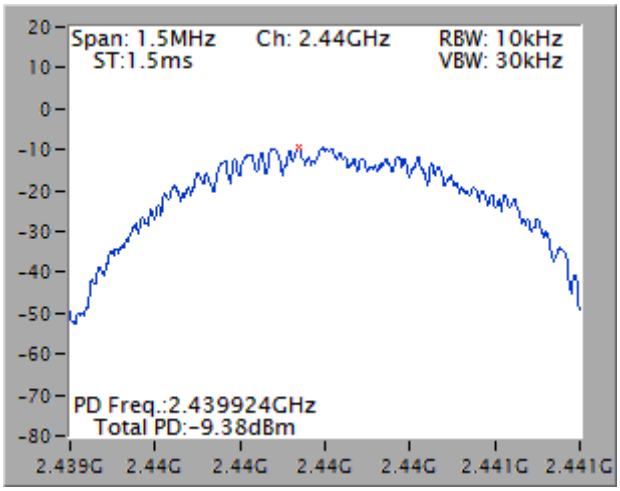
3.4.3 Test Setup



3.4.4 Test Result of Power Spectral Density

Modulation Mode	Freq. (MHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
BT LE	2402	-9.52	8
BT LE	2440	-9.38	8
BT LE	2480	-9.48	8

Worst Plots



3.5 Unwanted Emissions into Restricted Frequency Bands

3.5.1 Limit of Unwanted Emissions into Restricted Frequency Bands

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit
Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

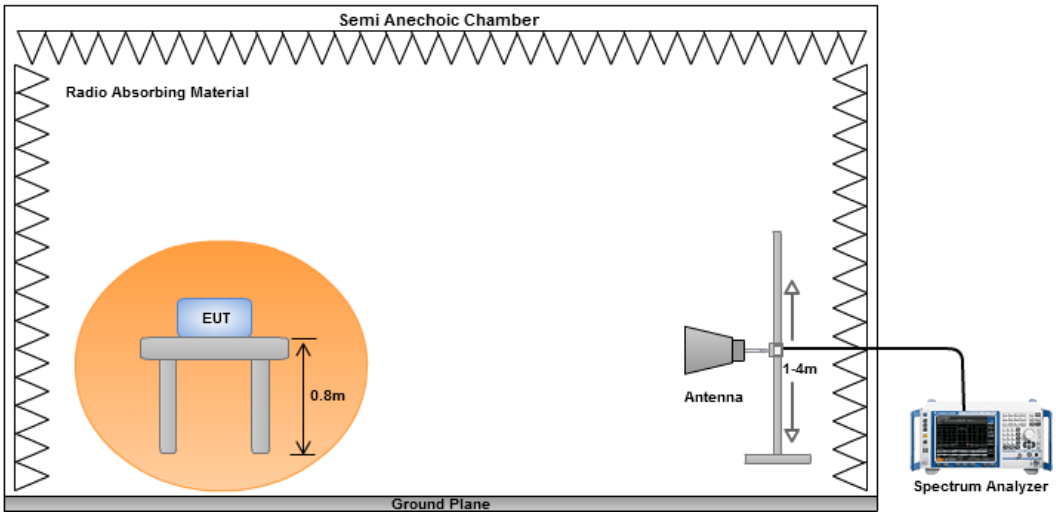
3.5.2 Test Procedures

1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at a height of 0.8 m test table above the ground plane.
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

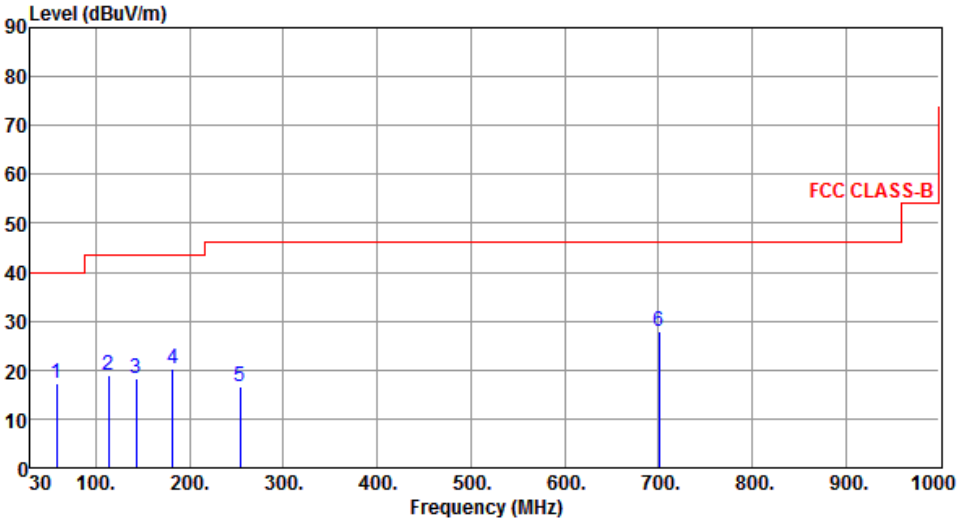
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.5.3 Test Setup



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

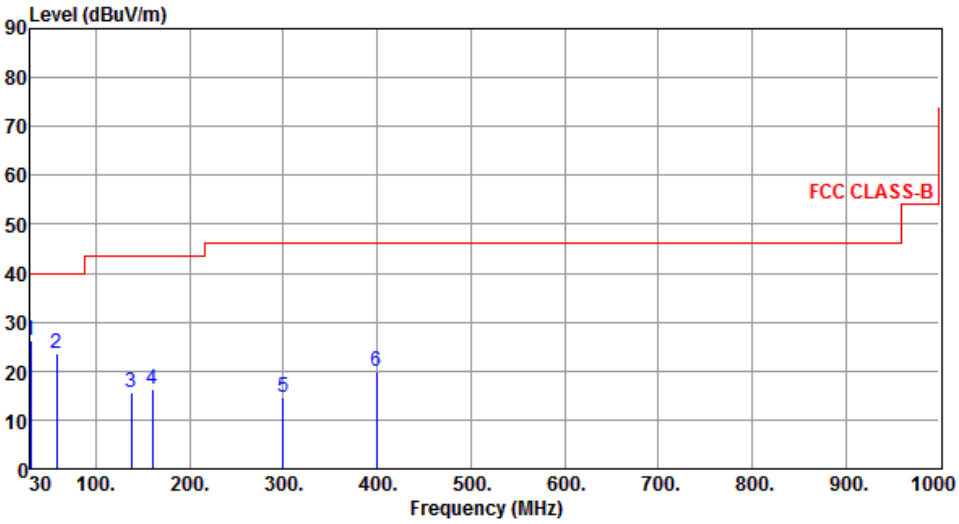
Polarization	Horizontal	**Test Freq. (MHz)**	2440
Test Mode	AC power & Radio link		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	58.13	17.23	40.00	-22.77	34.38	-17.15	Peak	---	---
2	113.42	18.82	43.50	-24.68	38.52	-19.70	Peak	---	---
3	142.52	18.33	43.50	-25.17	35.46	-17.13	Peak	---	---
4	182.29	20.34	43.50	-23.16	38.85	-18.51	Peak	---	---
5	254.07	16.59	46.00	-29.41	34.35	-17.76	Peak	---	---
6	701.24	27.81	46.00	-18.19	36.04	-8.23	Peak	---	---

Note 1: Level (dBuV/m) = Read Level (dBuV/m) + Antenna Factor (dB) + Cable Loss (dB) - Preamp Factor (dB).
2: Over Limit (dBuV/m) = Limit Line (dBuV/m) – Level (dBuV/m).

Polarization	Vertical	**Test Freq. (MHz)**	2440
Test Mode	AC power & Radio link		

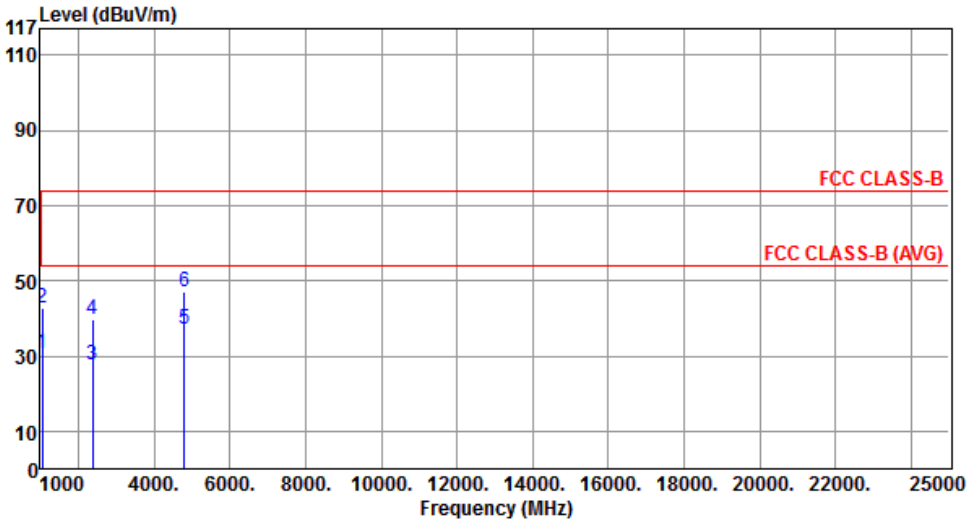


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	30.00	26.11	40.00	-13.89	43.84	-17.73	Peak	---	---
2	58.13	23.66	40.00	-16.34	40.81	-17.15	Peak	---	---
3	137.67	15.61	43.50	-27.89	33.02	-17.41	Peak	---	---
4	159.98	16.38	43.50	-27.12	33.19	-16.81	Peak	---	---
5	299.66	14.75	46.00	-31.25	31.00	-16.25	Peak	---	---
6	399.57	19.98	46.00	-26.02	33.65	-13.67	Peak	---	---

Note 1: Level (dBuV/m) = Read Level (dBuV/m) + Antenna Factor (dB) + Cable Loss (dB) - Preamp Factor (dB).
2: Over Limit (dBuV/m) = Limit Line (dBuV/m) – Level (dBuV/m).

3.5.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for GFSK

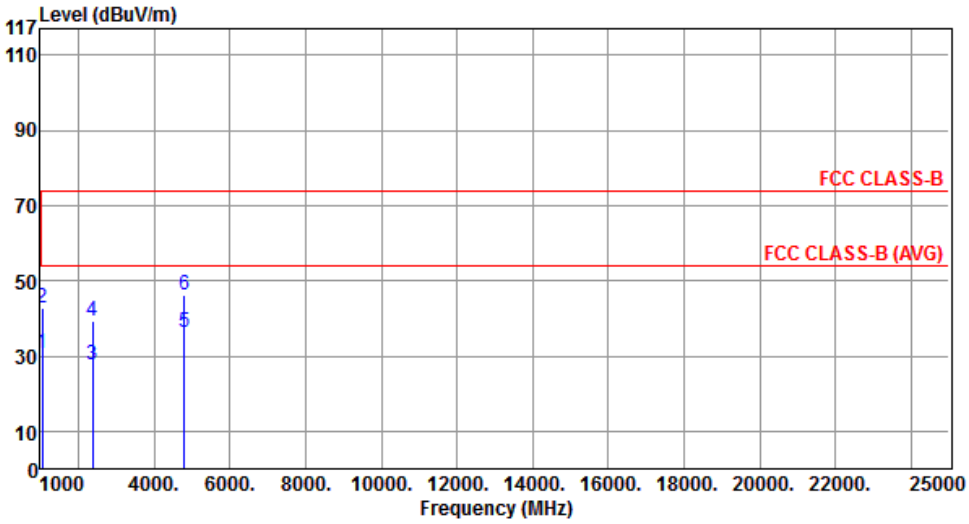
Polarization	Horizontal	**Test Freq. (MHz)**	2402
Test Mode	AC power & Radio link		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1050.00	30.44	54.00	-23.56	39.65	-9.21	Average	---	---
2	1050.00	42.67	74.00	-31.33	51.88	-9.21	Peak	---	---
3	2390.00	27.82	54.00	-26.18	31.04	-3.22	Average	---	---
4	2390.00	39.59	74.00	-34.41	42.81	-3.22	Peak	---	---
5	4804.00	37.12	54.00	-16.88	32.84	4.28	Average	---	---
6	4804.00	47.10	74.00	-26.90	42.82	4.28	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
Note 3: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

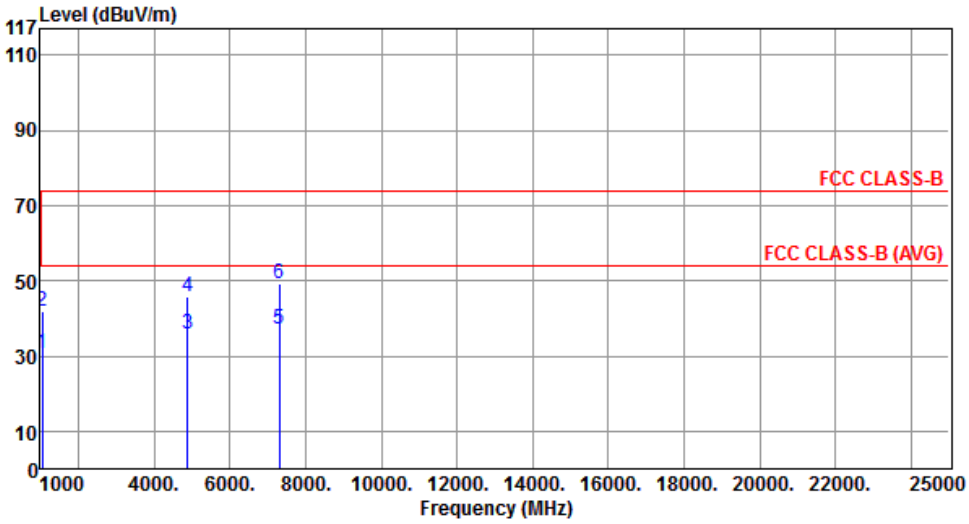
Polarization	Vertical	**Test Freq. (MHz)**	2402
Test Mode	AC power & Radio link		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1050.00	30.48	54.00	-23.52	39.69	-9.21	Average	---	---
2	1050.00	42.57	74.00	-31.43	51.78	-9.21	Peak	---	---
3	2390.00	27.81	54.00	-26.19	31.03	-3.22	Average	---	---
4	2390.00	39.35	74.00	-34.65	42.57	-3.22	Peak	---	---
5	4804.00	36.18	54.00	-17.82	31.90	4.28	Average	---	---
6	4804.00	46.36	74.00	-27.64	42.08	4.28	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
Note 3: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

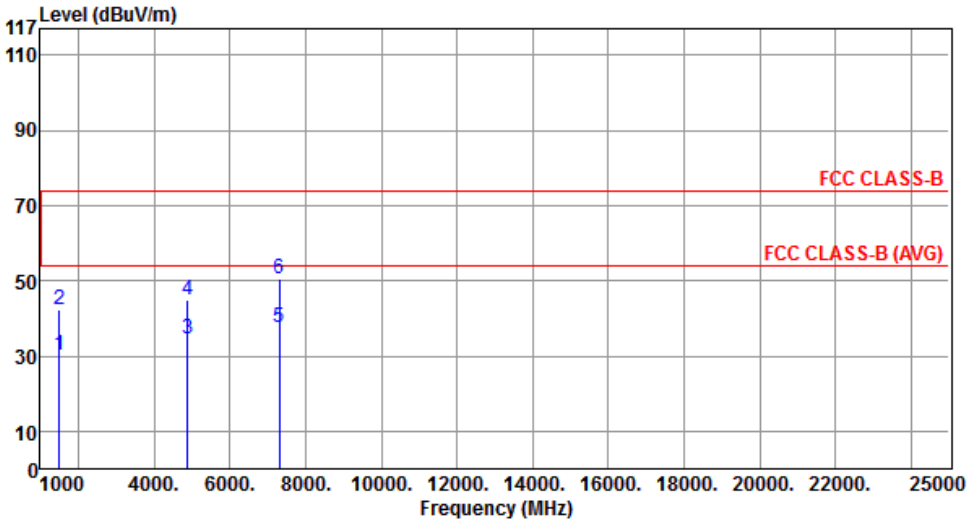
Polarization	Horizontal	**Test Freq. (MHz)**	2440
Test Mode	AC power & Radio link		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1050.00	30.46	54.00	-23.54	39.67	-9.21	Average	---	---
2	1050.00	41.69	74.00	-32.31	50.90	-9.21	Peak	---	---
3	4880.00	35.83	54.00	-18.17	31.43	4.40	Average	---	---
4	4880.00	45.75	74.00	-28.25	41.35	4.40	Peak	---	---
5	7320.00	36.94	54.00	-17.06	28.01	8.93	Average	---	---
6	7320.00	49.08	74.00	-24.92	40.15	8.93	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
Note 3: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

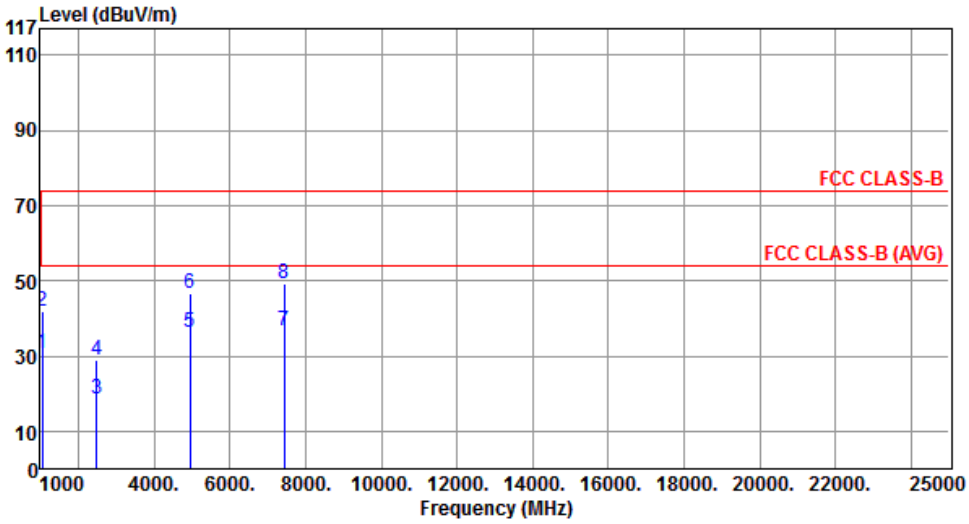
Polarization	Vertical	**Test Freq. (MHz)**	2440
Test Mode	AC power & Radio link		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	30.12	54.00	-23.88	36.67	-6.55	Average	---	---
2	1500.00	42.38	74.00	-31.62	48.93	-6.55	Peak	---	---
3	4880.00	34.56	54.00	-19.44	30.16	4.40	Average	---	---
4	4880.00	44.70	74.00	-29.30	40.30	4.40	Peak	---	---
5	7320.00	37.48	54.00	-16.52	28.55	8.93	Average	---	---
6	7320.00	50.39	74.00	-23.61	41.46	8.93	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
Note 3: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

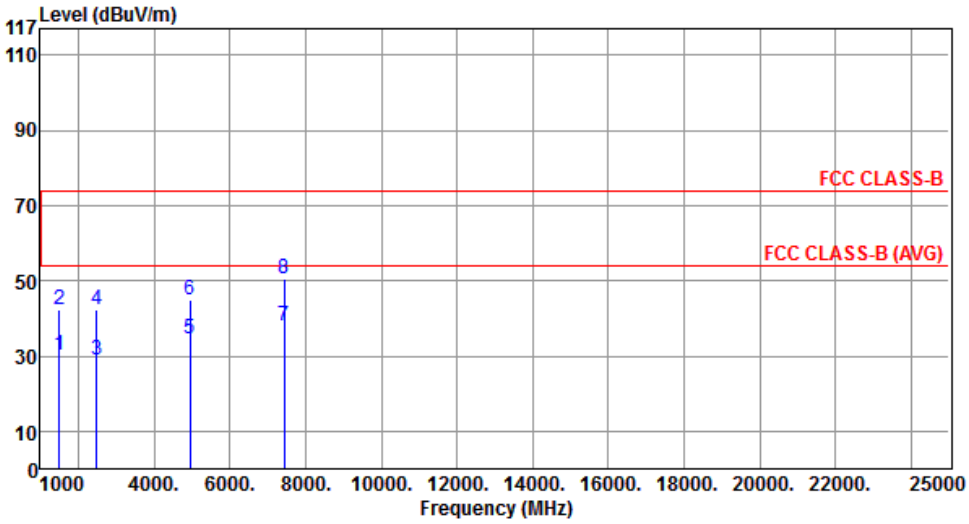
Polarization	Horizontal	**Test Freq. (MHz)**	2480
Test Mode	AC power & Radio link		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1050.00	30.55	54.00	-23.45	39.76	-9.21	Average	---	---
2	1050.00	41.83	74.00	-32.17	51.04	-9.21	Peak	---	---
3	2483.50	18.46	54.00	-35.54	21.29	-2.83	Average	---	---
4	2483.50	29.07	74.00	-44.93	31.90	-2.83	Peak	---	---
5	4960.00	36.21	54.00	-17.79	31.67	4.54	Average	---	---
6	4960.00	46.53	74.00	-27.47	41.99	4.54	Peak	---	---
7	7440.00	36.82	54.00	-17.18	27.70	9.12	Average	---	---
8	7440.00	49.26	74.00	-24.74	40.14	9.12	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
Note 3: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

Polarization	Vertical	**Test Freq. (MHz)**	2480
Test Mode	AC power & Radio link		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	30.42	54.00	-23.58	36.97	-6.55	Average	---	---
2	1500.00	42.51	74.00	-31.49	49.06	-6.55	Peak	---	---
3	2483.50	28.77	54.00	-25.23	31.60	-2.83	Average	---	---
4	2483.50	42.45	74.00	-31.55	45.28	-2.83	Peak	---	---
5	4960.00	34.63	54.00	-19.37	30.09	4.54	Average	---	---
6	4960.00	44.69	74.00	-29.31	40.15	4.54	Peak	---	---
7	7440.00	37.85	54.00	-16.15	28.73	9.12	Average	---	---
8	7440.00	50.63	74.00	-23.37	41.51	9.12	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
Note 3: For un-restricted bands, unwanted emissions shall be attenuated by at least 20 dB relative to the maximum measured in-band level.

3.6 Unwanted Emissions into Non-Restricted Frequency Bands

3.6.1 Limit of Unwanted Emissions into Non-Restricted Frequency Bands

☒ The peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz.

☐ The peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz.

3.6.2 Test Procedures

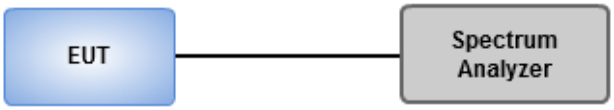
Reference Level Measurement

1. Set the RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Set Sweep time = auto couple, Trace mode = max hold.
3. Allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

Unwanted Emissions Level Measurement

1. Set RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Trace Mode = max hold, Sweep = auto couple.
3. Allow the trace to stabilize.
4. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

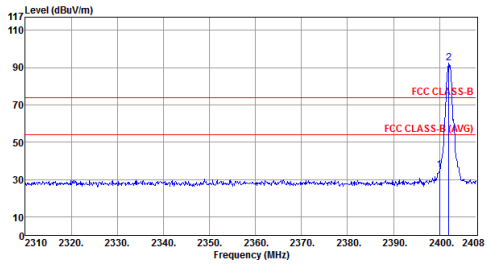
3.6.3 Test Setup



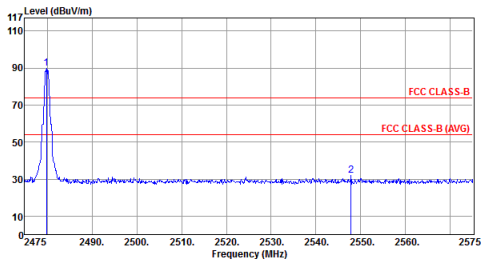
3.6.4 Unwanted Emissions into Non-Restricted Frequency Bands

Transmitter Radiated Bandedge Emissions Result								
Non-restricted Band (MHz)	Test Ch. Freq. (MHz)	In-band PSD [i] (dBuV/100kHz)	NBE Freq. (MHz)	Out-band PSD [o] (dBuV/100kHz)	[i] – [o] (dB)	Limit (dB)	Level Type	Pol. note 1
2390-2400	2402	92.42	2399.96	34.77	57.65	20	PK	H
2390-2400	2402	84.75	2399.96	33.13	51.62	20	PK	V
2500-2690	2480	89.77	2547.80	31.97	57.80	20	PK	H
2500-2690	2480	82.49	2530.80	31.47	51.02	20	PK	V

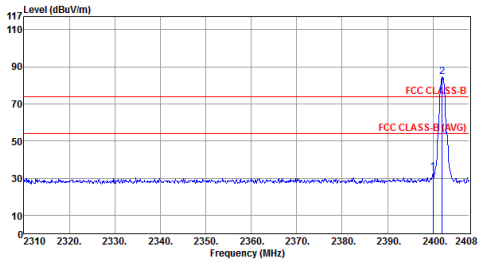
Low Bandedge - H



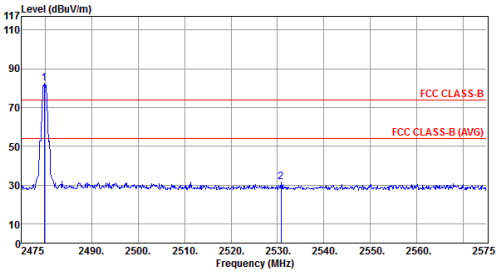
Up Bandedge - H



Low Bandedge - V



Up Bandedge - V



Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)

==END==