

FCC Co-Location Test Report

FCC ID : 2AQYEFMP176
Equipment : Mobile Phone
Model No. : F-51A
Brand Name : FUJITSU
Applicant : FUJITSU CONNECTED TECHNOLOGIES Ltd.
Address : Chuorinkan 7-10-1 Yamato, Kanagawa
242-0007, Japan.
Standard : 47 CFR FCC Part 15.247
47 CFR FCC Part 15.407
47 CFR FCC Part 22 Subpart H
47 CFR FCC Part 24 Subpart E
47 CFR FCC Part 27
Received Date : Mar. 06, 2020
Tested Date : Apr. 28, 2020

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.

Reviewed by:

Approved by:



Along Chen / Assistant Manager



Gary Chang / Manager



Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information.....	5
1.2	The Equipment List	7
1.3	Test Standards	8
1.4	Deviation from Test Standard and Measurement Procedure.....	8
1.5	Measurement Uncertainty	8
2	TEST CONFIGURATION	9
2.1	Testing Condition	9
2.2	The Worst Test Modes and Channel Details	9
3	TRANSMITTER TEST RESULTS.....	10
3.1	Unwanted Emissions into Restricted Frequency Bands	10
4	TEST LABORATORY INFORMATION	42

Release Record

Report No.	Version	Description	Issued Date
FR011605CO	Rev. 01	Initial issue	May 18, 2020

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.247(d) 15.407(b) 15.209 2.1053 22.917(a) 24.238(a) 27.53(g)	Radiated Emissions	[dBuV/m at 3m]: 73.65MHz 32.82 (Margin -7.18dB) - PK	Pass

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Information

1.1.1 Product Details

Product Name	Mobile Phone
Brand Name	FUJITSU
Model Name	F-51A
IMEI Code	353704110013257 / 353704110013364
H/W Version	v2.1.0
S/W Version	R047.4

1.1.2 Specification of the Equipment under Test (EUT)

WLAN	
Operating Frequency	802.11b/g/n/ax: 2412 MHz ~ 2462 MHz 802.11a/n/ac/ax: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5720 MHz
Antenna Type	Monopole antenna
Modulation Type	802.11b: DSSS (DBPSK/DQPSK/CCK) 802.11a/g/n/ac/ax: OFDM/OFDMA (BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM)
Bluetooth	
Operating Frequency	2402 MHz ~ 2480 MHz
Antenna Type	Monopole antenna
Modulation Type	Bluetooth 5.1 LE: GFSK Bluetooth BR(1Mbps): GFSK Bluetooth EDR (2Mbps): $\pi/4$ -DQPSK Bluetooth EDR (3Mbps): 8-DPSK
LTE	
Operating Frequency	Band 5: 824 MHz ~ 849 MHz Band 12: 699 MHz ~ 716 MHz
Antenna Type	Monopole antenna
Modulation Type	QPSK/16QAM/64QAM (Uplink) QPSK/16QAM/64QAM/256QAM (Downlink)
GSM / WCDMA	
Operating Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz
Antenna Type	Monopole antenna
Modulation Type	GSM / GPRS: GMSK WCDMA / HSDPA / HSUPA: BPSK

1.1.3 Antenna Details

WLAN 2.4G

Ant. No.	Model	Type	Connector	Gain (dBi)
1	WLAN #1	Monopole	No	-6.0
2	WLAN #2	Monopole	No	-7.0

WLAN 5G

Ant. No.	Model	Type	Connector	Gain (dBi)
1	WLAN #1	Monopole	No	-4.0
2	WLAN #2	Monopole	No	-6.0

BT

Ant. No.	Type	Connector	Gain (dBi)	Remarks
1	Monopole	No	-6.0	---

GSM850 / WCDMA B5 / LTE B5

Ant. No.	Type	Connector	Gain (dBi)	Remark
1	Monopole	No	-8.0	---

GSM1900

Ant. No.	Type	Connector	Gain (dBi)	Remark
1	Monopole	No	-4.0	---

LTE B12

Ant. No.	Type	Connector	Gain (dBi)	Remark
1	Monopole	No	-10.0	---

1.1.4 Power Supply Type of Equipment under Test (EUT)

Supply Voltage	3.83Vdc from battery: 9Vdc,1.5A from adapter (No bundle, support unit only)
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1.2 The Equipment List

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101498	Dec. 17, 2019	Dec. 16, 2020
Receiver	R&S	ESR3	101657	Feb. 14, 2020	Feb. 13, 2021
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 12, 2019	Jul. 11, 2020
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 12, 2019	Dec. 11, 2020
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 15, 2019	Nov. 14, 2020
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 13, 2019	Nov. 12, 2020
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 07, 2019	Oct. 06, 2020
Preamplifier	EMC	EMC02325	980225	Jul. 09, 2019	Jul. 08, 2020
Preamplifier	Agilent	83017A	MY39501308	Oct. 08, 2019	Oct. 07, 2020
Preamplifier	EMC	EMC184045B	980192	Aug. 01, 2019	Jul. 31, 2020
RF Cable	EMC	EMC104-SM-SM-80 00	181106	Oct. 07, 2019	Oct. 06, 2020
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Oct. 07, 2019	Oct. 06, 2020
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Oct. 07, 2019	Oct. 06, 2020
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 07, 2019	Oct. 06, 2020
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 07, 2019	Oct. 06, 2020
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Oct. 07, 2019	Oct. 06, 2020
Measurement Software	AUDIX	e3	6.120210g	NA	NA

Note: Calibration Interval of instruments listed above is one year.

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101499	Jan. 09, 2020	Jan. 08, 2021
Power Meter	Anritsu	ML2495A	1241002	Oct. 23, 2019	Oct. 22, 2020
Power Sensor	Anritsu	MA2411B	1207366	Oct. 23, 2019	Oct. 22, 2020
AC POWER SOURCE	APC	AFC-500W	F312060012	Dec. 02, 2019	Dec. 01, 2020
Measurement Software	--	SENSE-15407_NII	V5.10.7	NA	NA

Note: Calibration Interval of instruments listed above is one year.

1.3 Test Standards

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

47 CFR FCC Part 15.247

47 CFR FCC Part 15.407

47 CFR FCC Part 22 Subpart H

47 CFR FCC Part 24 Subpart E

47 CFR FCC Part 27

ANSI C63.26-2015

ANSI C63.10-2013

FCC KDB 412172 D01 Determining ERP and EIRP v01r01

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01

FCC KDB 412172 D01 Determining ERP and EIRP v01r01

1.4 Deviation from Test Standard and Measurement Procedure

None

1.5 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor ($k=2$)).

Measurement Uncertainty	
Parameters	Uncertainty
Radiated emission \leq 1GHz	± 3.41 dB
Radiated emission $>$ 1GHz	± 4.59 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
Radiated Emissions	03CH01-WS	23°C / 67%	Roger Lu
Conducted Emissions	TH01-WS	21°C / 67%	Aska Huang

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Test Mode
Radiated Emissions	Mode 1: 11a ch36 + BT EDR GFSK ch00 Mode 2: GSM850 ch251 + 11b ch1+ 11a ch48 Mode 3: GSM1900 ch512 + 11b ch1+ 11a ch48 Mode 4: LTE B12 BW 10MHz 1rb offset 0 ch23060 + 11b ch1+ 11a ch48 Mode 5: GSM850 ch251 + BT EDR GFSK ch00 Mode 6: GSM1900 ch512 + BT EDR GFSK ch00 Mode 7: LTE B12 BW 10MHz 1rb offset 0 ch23060(704MHz) + BT EDR GFSK ch00
Antenna port Conducted Emissions	Mode 1: 11a ch36 + BT EDR GFSK ch00 Mode 2: GSM850 ch251 + 11b ch1+ 11a ch48 Mode 3: GSM1900 ch512 + 11b ch1+ 11a ch48 Mode 4: LTE B12 BW 10MHz 1rb offset 0 ch23060 + 11b ch1+ 11a ch48
NOTE 1: The selected channel is the maximum power channel of wireless mode. NOTE 2: Only common antenna is tested for antenna port conducted emissions.	

3 Transmitter Test Results

3.1 Unwanted Emissions into Restricted Frequency Bands

3.1.1 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.

3.1.2 Test Procedures

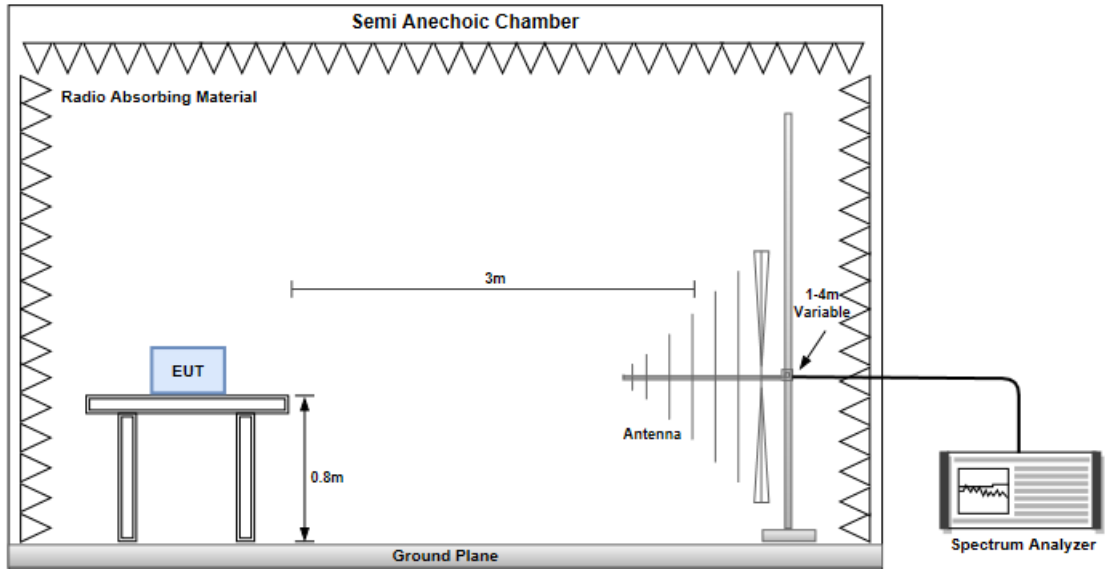
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m.
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:

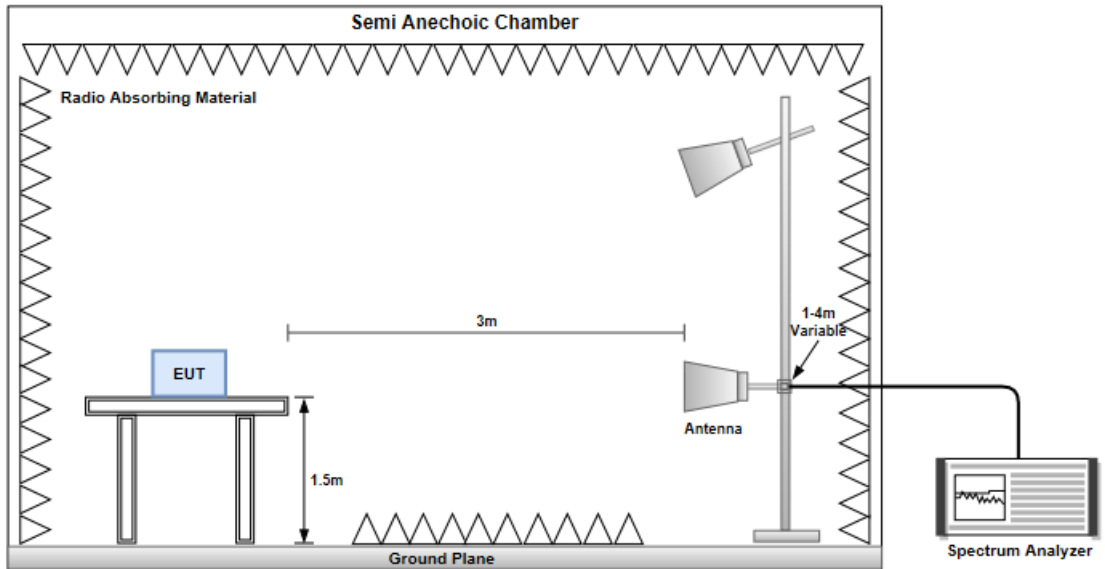
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.1.3 Test Setup

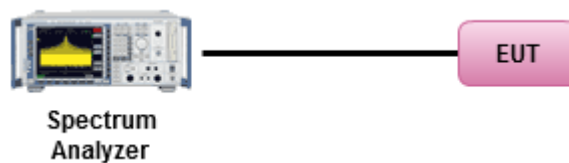
Radiated Emissions below 1 GHz



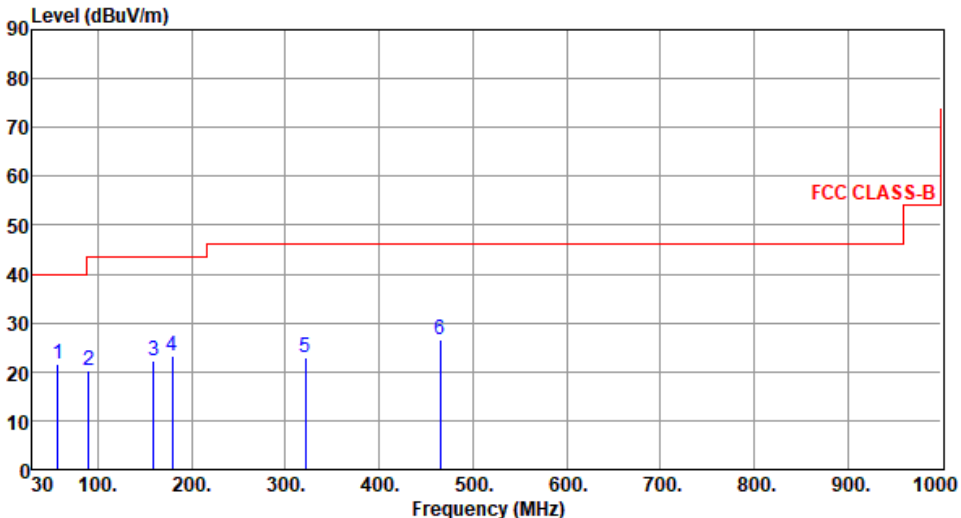
Radiated Emissions above 1 GHz



Transmitter Conducted Unwanted Emissions (30MHz~40GHz)

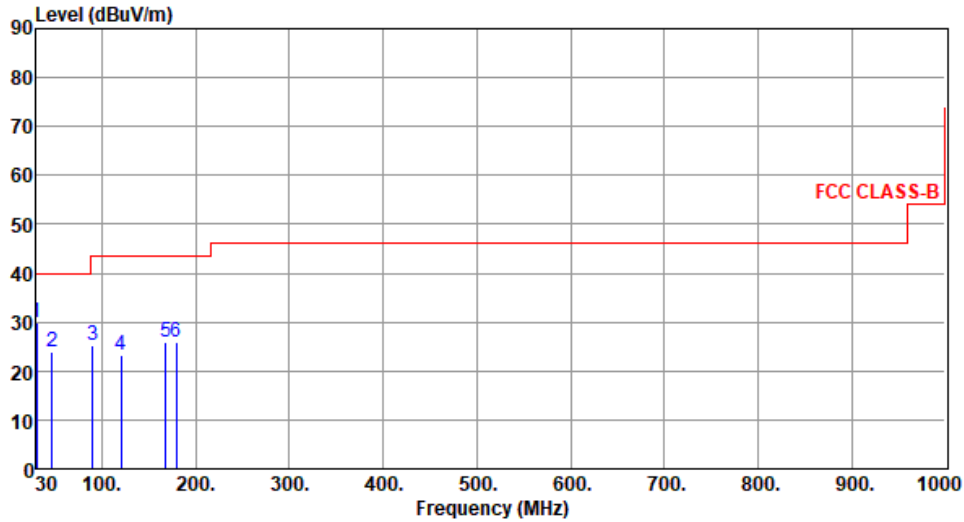


3.1.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Test Mode	Mode 1: 11a ch36 + BT EDR GFSK ch00								
Polarization	Horizontal								
 <p>The graph displays the radiated unwanted emissions level in dBuV/m across a frequency range from 30 MHz to 1000 MHz. A red line represents the FCC CLASS-B limit, which is constant at 40 dBuV/m from 30 MHz to 100 MHz, then steps up to 45 dBuV/m from 100 MHz to 1000 MHz. Six blue vertical lines indicate measured emission peaks at 57.16 MHz, 90.14 MHz, 159.01 MHz, 179.38 MHz, 321.00 MHz, and 465.53 MHz. The emission levels for these peaks are 21.43, 20.26, 22.37, 23.12, 23.04, and 26.68 dBuV/m, respectively. The SA readings and factors for each peak are also provided in the table below.</p>									
	Freq.	Emission	Limit	Margin	SA	Factor	Remark	ANT	Turn
	MHz	level	dBuV/m	dB	reading	dB		High	Table
		dBuV/m			dBuV			cm	deg
1	57.16	21.43	40.00	-18.57	30.16	-8.73	Peak	---	---
2	90.14	20.26	43.50	-23.24	34.53	-14.27	Peak	---	---
3	159.01	22.37	43.50	-21.13	30.69	-8.32	Peak	---	---
4	179.38	23.12	43.50	-20.38	32.93	-9.81	Peak	---	---
5	321.00	23.04	46.00	-22.96	30.42	-7.38	Peak	---	---
6	465.53	26.68	46.00	-19.32	30.42	-3.74	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
 Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Test Mode	Mode 1: 11a ch36 + BT EDR GFSK ch00
Polarization	Vertical



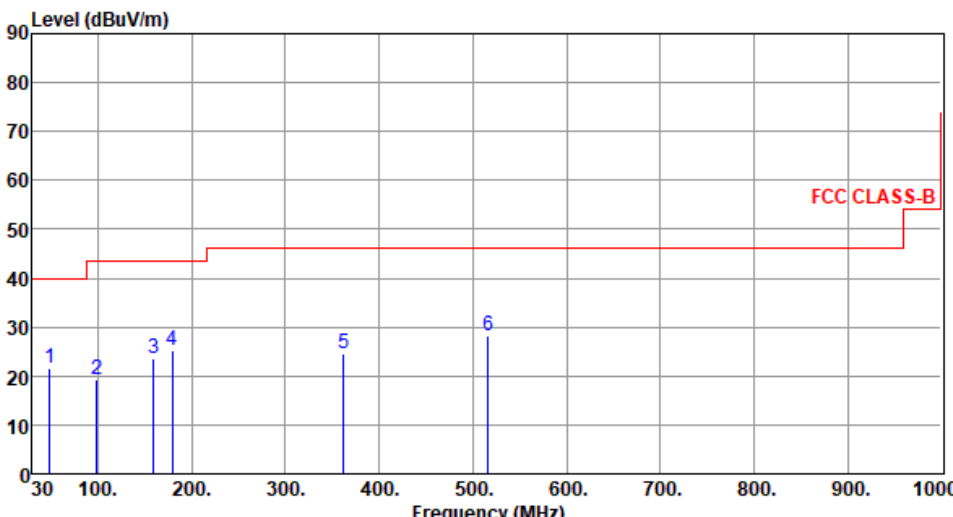
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	30.00	29.74	40.00	-10.26	39.45	-9.71	Peak	---	---
2	46.49	23.78	40.00	-16.22	32.14	-8.36	Peak	---	---
3	90.14	25.29	43.50	-18.21	39.56	-14.27	Peak	---	---
4	120.21	23.13	43.50	-20.37	33.72	-10.59	Peak	---	---
5	167.74	25.99	43.50	-17.51	34.69	-8.70	Peak	---	---
6	179.38	25.86	43.50	-17.64	35.67	-9.81	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

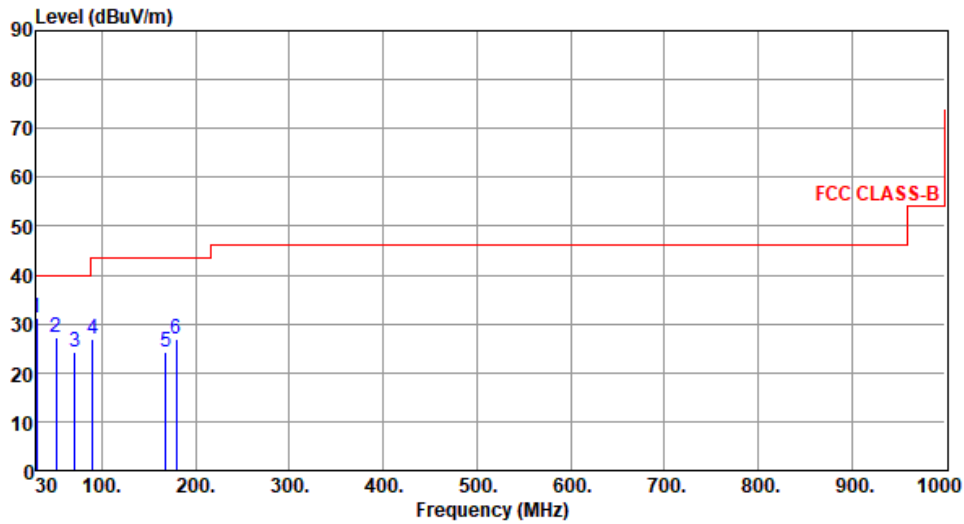
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Test Mode	Mode 2: GSM850 ch251 + 11b ch1+ 11a ch48								
Polarization	Horizontal								
									
	Freq.	Emission	Limit	Margin	SA	Factor	Remark	ANT	Turn
	MHz	level	dBuV/m	dB	reading	dB		High	Table
		dBuV/m			dBuV			cm	deg
1	48.43	21.47	40.00	-18.53	29.83	-8.36	Peak	---	---
2	98.87	19.39	43.50	-24.11	32.61	-13.22	Peak	---	---
3	159.01	23.58	43.50	-19.92	31.90	-8.32	Peak	---	---
4	179.38	25.37	43.50	-18.13	35.18	-9.81	Peak	---	---
5	361.74	24.57	46.00	-21.43	31.11	-6.54	Peak	---	---
6	515.97	28.16	46.00	-17.84	30.97	-2.81	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Test Mode	Mode 2: GSM850 ch251 + 11b ch1+ 11a ch48
Polarization	Vertical



	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	31.05	40.00	-8.95	40.76	-9.71	Peak	---	---
2	51.34	27.12	40.00	-12.88	35.54	-8.42	Peak	---	---
3	70.74	24.38	40.00	-15.62	35.10	-10.72	Peak	---	---
4	90.14	26.92	43.50	-16.58	41.19	-14.27	Peak	---	---
5	167.74	24.26	43.50	-19.24	32.96	-8.70	Peak	---	---
6	179.38	26.99	43.50	-16.51	36.80	-9.81	Peak	---	---

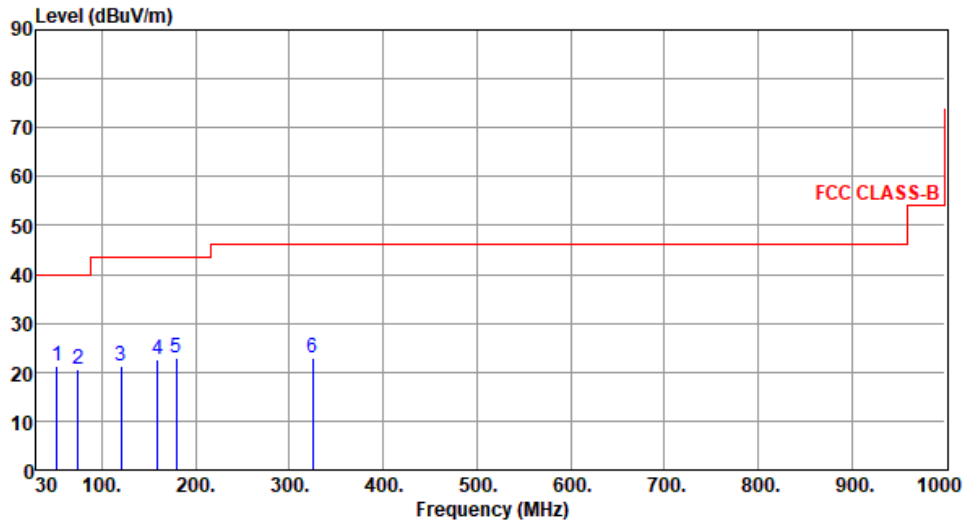
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Test Mode	Mode 3: GSM1900 ch512 + 11b ch1+ 11a ch48
Polarization	Horizontal



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	52.31	21.09	40.00	-18.91	29.55	-8.46	Peak	---	---
2	74.62	20.74	40.00	-19.26	32.30	-11.56	Peak	---	---
3	120.21	21.21	43.50	-22.29	31.80	-10.59	Peak	---	---
4	159.01	22.58	43.50	-20.92	30.90	-8.32	Peak	---	---
5	179.38	22.99	43.50	-20.51	32.80	-9.81	Peak	---	---
6	324.88	22.95	46.00	-23.05	30.23	-7.28	Peak	---	---

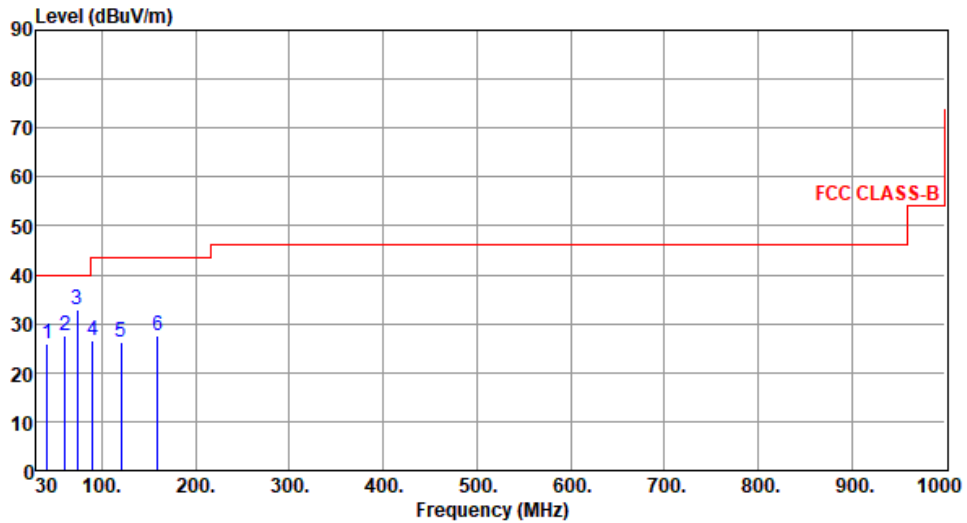
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Test Mode	Mode 3: GSM1900 ch512 + 11b ch1+ 11a ch48
Polarization	Vertical



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	41.64	26.01	40.00	-13.99	34.41	-8.40	Peak	---	---
2	61.04	27.41	40.00	-12.59	36.42	-9.01	Peak	---	---
3	73.65	32.82	40.00	-7.18	44.31	-11.49	Peak	---	---
4	90.14	26.71	43.50	-16.79	40.98	-14.27	Peak	---	---
5	120.21	26.36	43.50	-17.14	36.95	-10.59	Peak	---	---
6	159.01	27.61	43.50	-15.89	35.93	-8.32	Peak	---	---

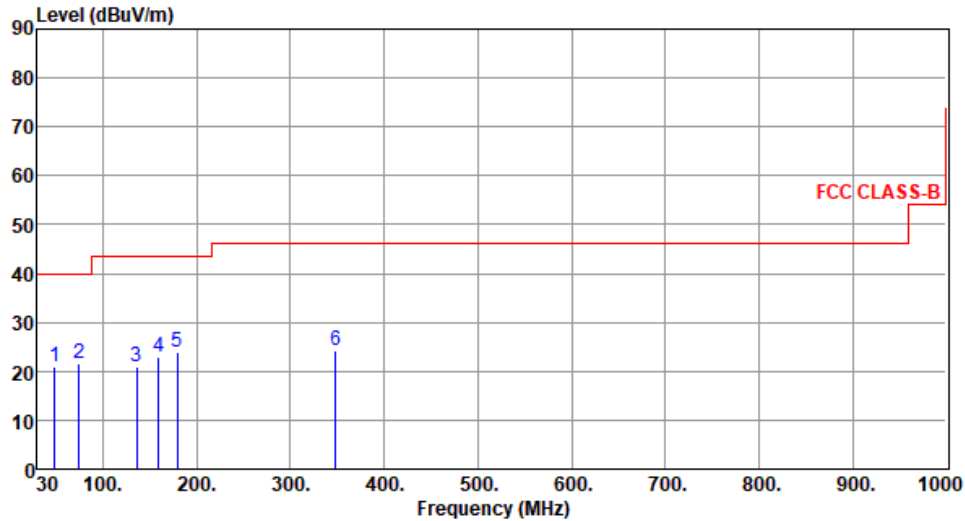
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Test Mode	Mode 4: LTE B12 BW 10MHz 1rb offset 0 ch23060 + 11b ch1+ 11a ch48
Polarization	Horizontal



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	48.43	20.85	40.00	-19.15	29.21	-8.36	Peak	---	---
2	74.62	21.65	40.00	-18.35	33.21	-11.56	Peak	---	---
3	135.73	20.91	43.50	-22.59	30.07	-9.16	Peak	---	---
4	159.01	22.98	43.50	-20.52	31.30	-8.32	Peak	---	---
5	179.38	23.85	43.50	-19.65	33.66	-9.81	Peak	---	---
6	348.16	24.18	46.00	-21.82	31.19	-7.01	Peak	---	---

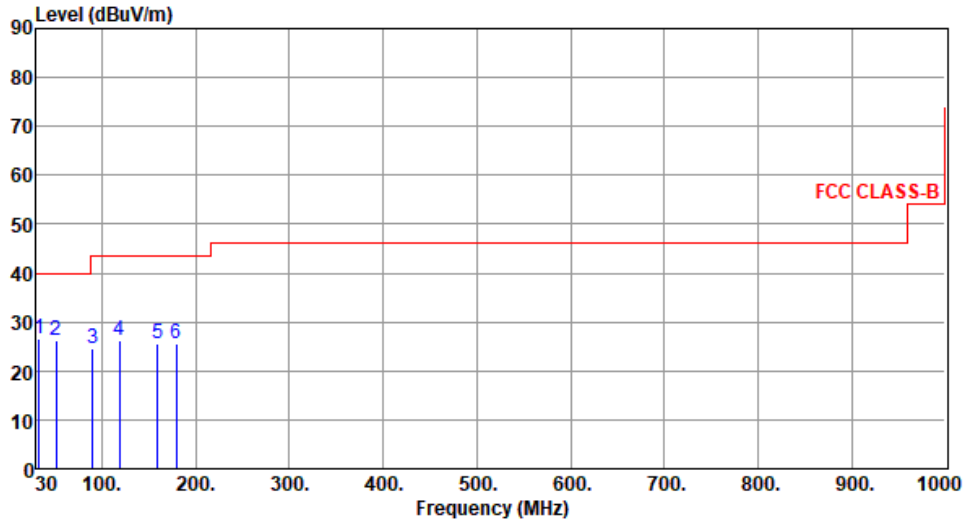
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Test Mode	Mode 4: LTE B12 BW 10MHz 1rb offset 0 ch23060 + 11b ch1+ 11a ch48
Polarization	Vertical



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	32.91	26.44	40.00	-13.56	35.85	-9.41	Peak	---	---
2	51.34	26.07	40.00	-13.93	34.49	-8.42	Peak	---	---
3	90.14	24.65	43.50	-18.85	38.92	-14.27	Peak	---	---
4	118.27	26.17	43.50	-17.33	36.94	-10.77	Peak	---	---
5	159.01	25.65	43.50	-17.85	33.97	-8.32	Peak	---	---
6	179.38	25.49	43.50	-18.01	35.30	-9.81	Peak	---	---

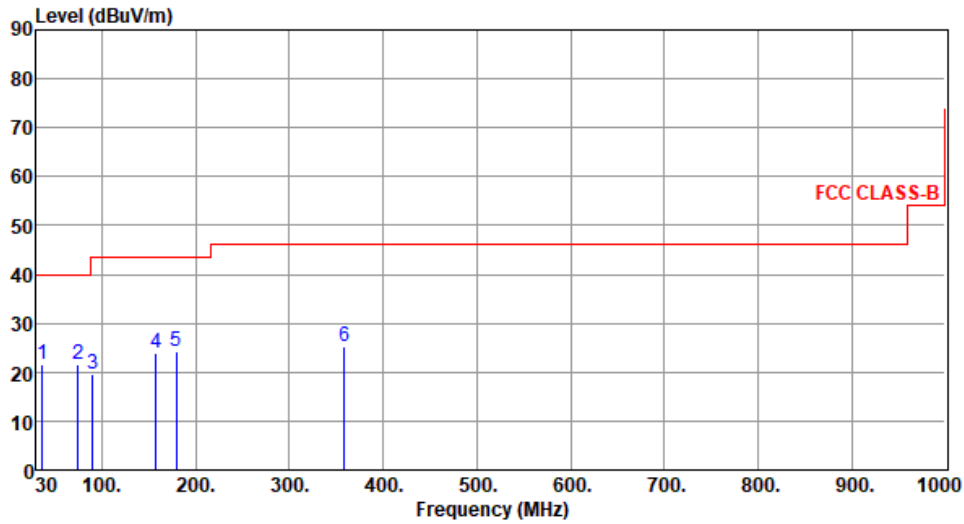
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Test Mode	Mode 5: GSM850 ch251 + BT EDR GFSK ch00
Polarization	Horizontal



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	36.79	21.43	40.00	-18.57	30.50	-9.07	Peak	---	---
2	74.62	21.56	40.00	-18.44	33.12	-11.56	Peak	---	---
3	90.14	19.53	43.50	-23.97	33.80	-14.27	Peak	---	---
4	158.04	24.07	43.50	-19.43	32.50	-8.43	Peak	---	---
5	179.38	24.19	43.50	-19.31	34.00	-9.81	Peak	---	---
6	358.83	25.30	46.00	-20.70	31.95	-6.65	Peak	---	---

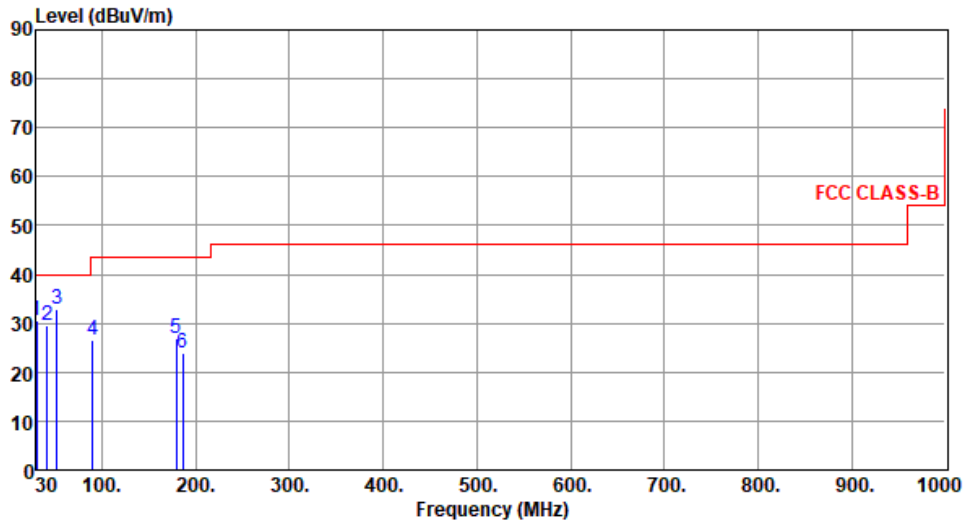
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Test Mode	Mode 5: GSM850 ch251 + BT EDR GFSK ch00
Polarization	Vertical



	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	30.41	40.00	-9.59	40.12	-9.71	Peak	---	---
2	41.64	29.41	40.00	-10.59	37.81	-8.40	Peak	---	---
3	52.31	32.81	40.00	-7.19	41.27	-8.46	Peak	---	---
4	90.14	26.73	43.50	-16.77	41.00	-14.27	Peak	---	---
5	179.38	26.80	43.50	-16.70	36.61	-9.81	Peak	---	---
6	186.17	24.03	43.50	-19.47	34.83	-10.80	Peak	---	---

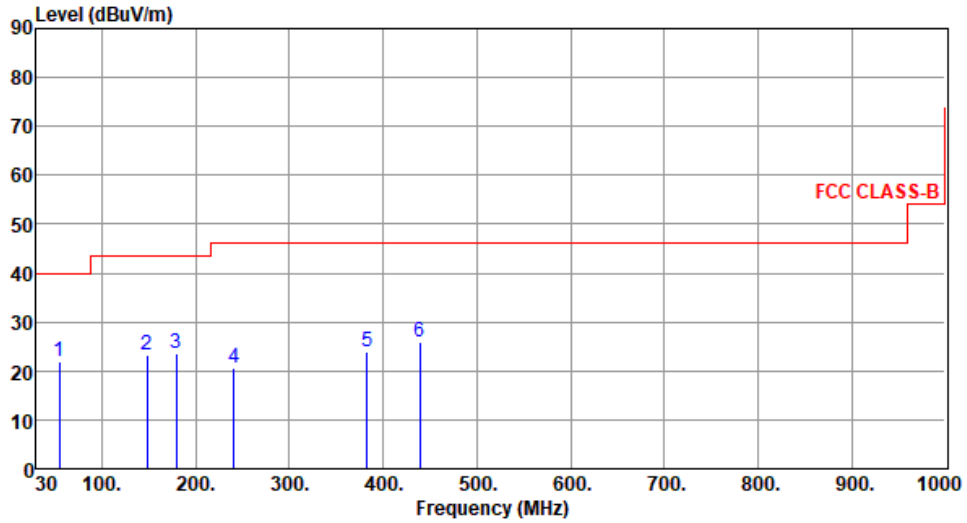
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Test Mode	Mode 6: GSM1900 ch512 + BT EDR GFSK ch00
Polarization	Horizontal



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	54.25	21.78	40.00	-18.22	30.32	-8.54	Peak	---	---
2	148.34	23.24	43.50	-20.26	31.68	-8.44	Peak	---	---
3	179.38	23.57	43.50	-19.93	33.38	-9.81	Peak	---	---
4	240.49	20.69	46.00	-25.31	30.86	-10.17	Peak	---	---
5	383.08	23.80	46.00	-22.20	29.67	-5.87	Peak	---	---
6	439.34	25.88	46.00	-20.12	30.22	-4.34	Peak	---	---

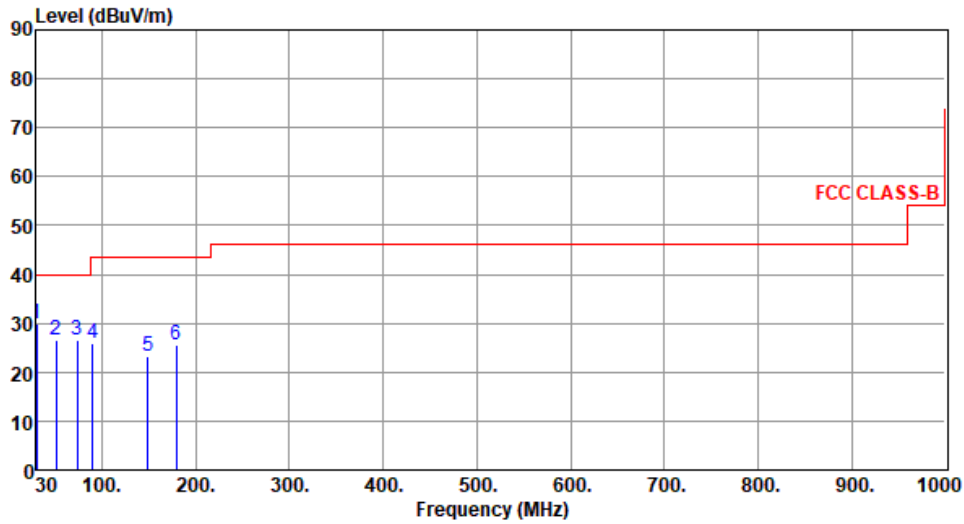
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Test Mode	Mode 6: GSM1900 ch512 + BT EDR GFSK ch00
Polarization	Vertical



	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	29.81	40.00	-10.19	39.52	-9.71	Peak	---	---
2	51.34	26.61	40.00	-13.39	35.03	-8.42	Peak	---	---
3	73.65	26.56	40.00	-13.44	38.05	-11.49	Peak	---	---
4	90.14	26.05	43.50	-17.45	40.32	-14.27	Peak	---	---
5	149.31	23.40	43.50	-20.10	31.87	-8.47	Peak	---	---
6	179.38	25.45	43.50	-18.05	35.26	-9.81	Peak	---	---

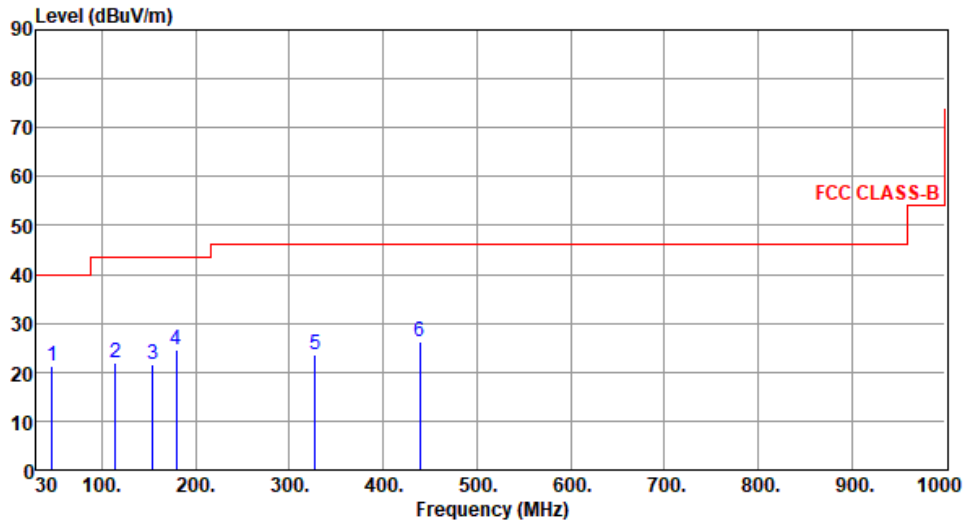
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Test Mode	Mode 7: LTE B12 BW 10MHz 1rb offset 0 ch23060 + BT EDR GFSK ch00
Polarization	Horizontal



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	46.49	21.30	40.00	-18.70	29.66	-8.36	Peak	---	---
2	114.39	21.82	43.50	-21.68	32.92	-11.10	Peak	---	---
3	154.16	21.54	43.50	-21.96	29.88	-8.34	Peak	---	---
4	179.38	24.49	43.50	-19.01	34.30	-9.81	Peak	---	---
5	327.79	23.59	46.00	-22.41	30.80	-7.21	Peak	---	---
6	439.34	26.36	46.00	-19.64	30.70	-4.34	Peak	---	---

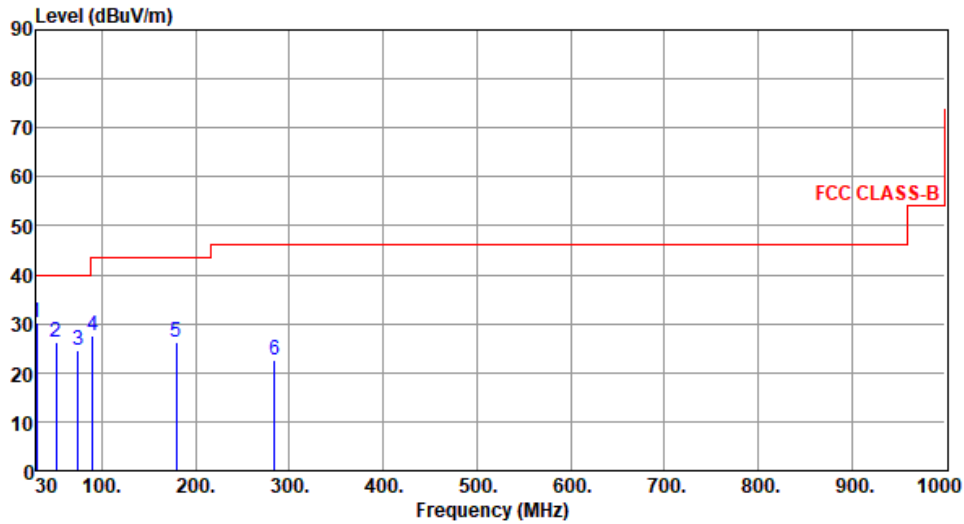
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Test Mode	Mode 7: LTE B12 BW 10MHz 1rb offset 0 ch23060 + BT EDR GFSK ch00
Polarization	Vertical



	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	30.31	40.00	-9.69	40.02	-9.71	Peak	---	---
2	51.34	26.23	40.00	-13.77	34.65	-8.42	Peak	---	---
3	74.62	24.71	40.00	-15.29	36.27	-11.56	Peak	---	---
4	90.14	27.61	43.50	-15.89	41.88	-14.27	Peak	---	---
5	179.38	26.12	43.50	-17.38	35.93	-9.81	Peak	---	---
6	284.14	22.67	46.00	-23.33	31.14	-8.47	Peak	---	---

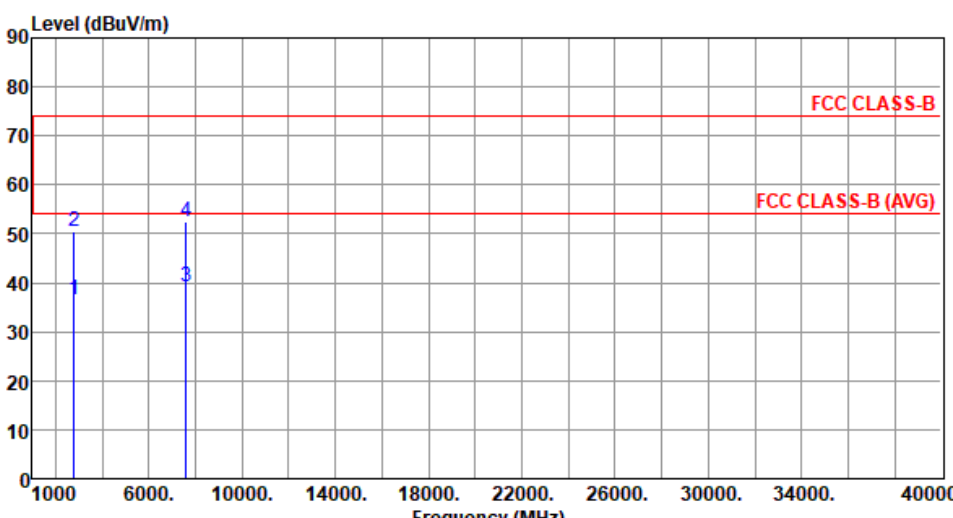
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

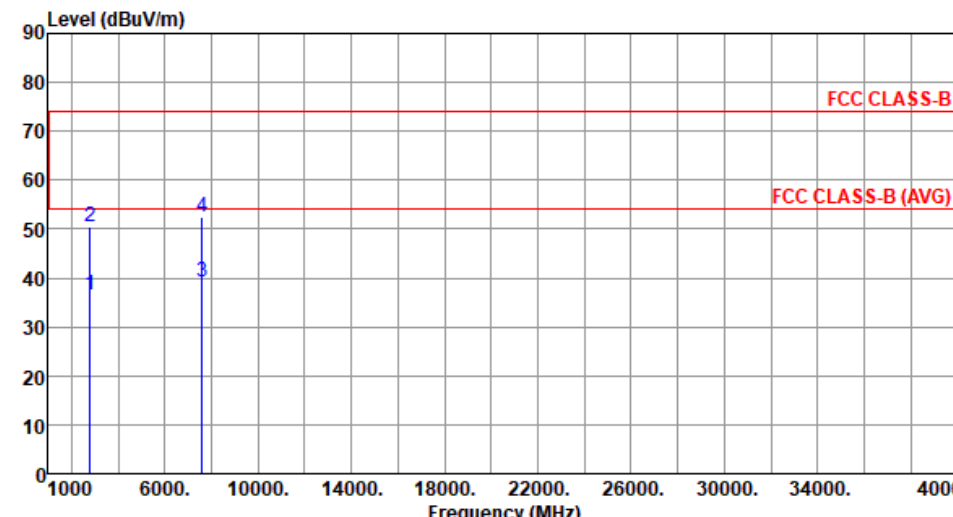
*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

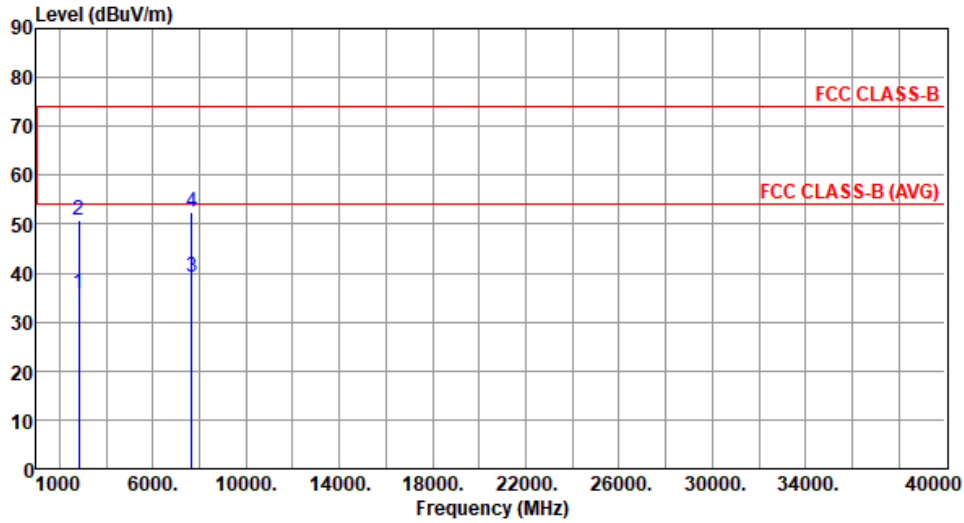
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

3.1.5 Transmitter Radiated Unwanted Emissions (Above 1GHz)

Test Mode	Mode 1: 11a ch36 + BT EDR GFSK ch00								
Polarization	Horizontal								
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	2778.00	36.47	54.00	-17.53	38.46	-1.99	Average	100	20
2	2778.00	50.48	74.00	-23.52	52.47	-1.99	Peak	100	20
3	7582.00	39.22	54.00	-14.78	30.12	9.10	Average	100	50
4	7582.00	52.47	74.00	-21.53	43.37	9.10	Peak	100	50
<p>Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).</p>									

Test Mode	Mode 1: 11a ch36 + BT EDR GFSK ch00								
Polarization	Vertical								
									
	Freq.	Emission	Limit	Margin	SA	Factor	Remark	ANT	Turn
	MHz	level	dBuV/m	dB	reading	dB		High	Table
		dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	2778.00	36.53	54.00	-17.47	38.52	-1.99	Average	100	30
2	2778.00	50.53	74.00	-23.47	52.52	-1.99	Peak	100	30
3	7582.00	39.30	54.00	-14.70	30.20	9.10	Average	100	70
4	7582.00	52.42	74.00	-21.58	43.32	9.10	Peak	100	70
<p>Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).</p>									

Test Mode	Mode 2: GSM850 ch251 + 11b ch1+ 11a ch48
Polarization	Horizontal

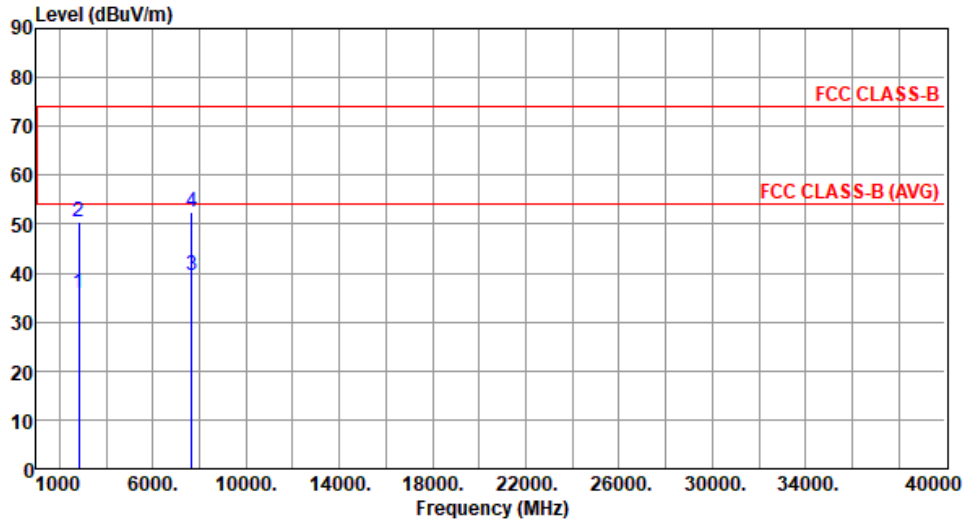


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2828.00	35.93	54.00	-18.07	37.66	-1.73	Average	100	30
2	2828.00	50.71	74.00	-23.29	52.44	-1.73	Peak	100	30
3	7652.00	39.29	54.00	-14.71	30.24	9.05	Average	100	100
4	7652.00	52.61	74.00	-21.39	43.56	9.05	Peak	100	100

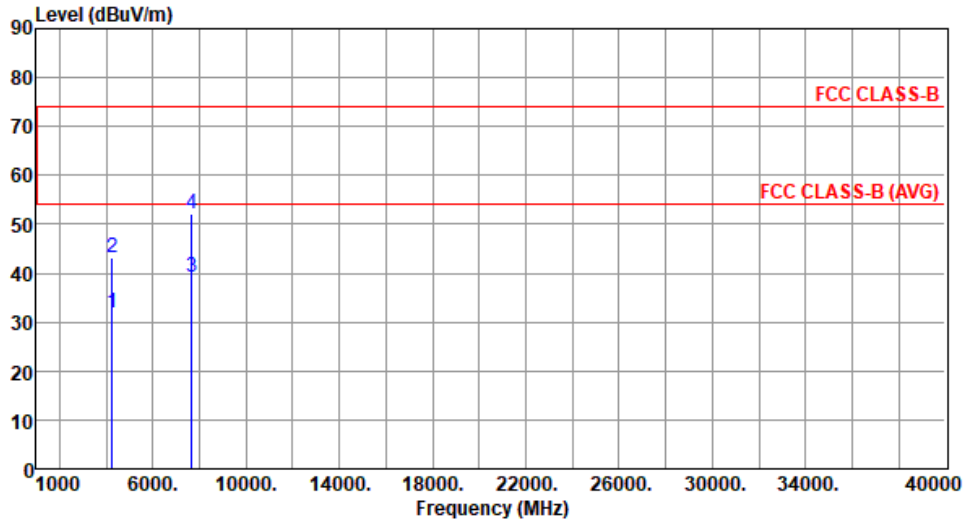
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Test Mode	Mode 2: GSM850 ch251 + 11b ch1+ 11a ch48								
Polarization	Vertical								
									
	Freq.	Emission	Limit	Margin	SA	Factor	Remark	ANT	Turn
	MHz	level	dBuV/m	dB	reading	dB		High	Table
		dBuV/m			dBuV			cm	deg
1	2828.00	35.79	54.00	-18.21	37.52	-1.73	Average	100	50
2	2828.00	50.59	74.00	-23.41	52.32	-1.73	Peak	100	50
3	7652.00	39.36	54.00	-14.64	30.31	9.05	Average	100	60
4	7652.00	52.51	74.00	-21.49	43.46	9.05	Peak	100	60
<p>Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).</p>									

Test Mode	Mode 3: GSM1900 ch512 + 11b ch1+ 11a ch48
Polarization	Horizontal



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	4262.20	31.95	54.00	-22.05	30.12	1.83	Average	100	60
2	4262.20	43.18	74.00	-30.82	41.35	1.83	Peak	100	60
3	7652.00	39.30	54.00	-14.70	30.25	9.05	Average	100	80
4	7652.00	52.29	74.00	-21.71	43.24	9.05	Peak	100	80

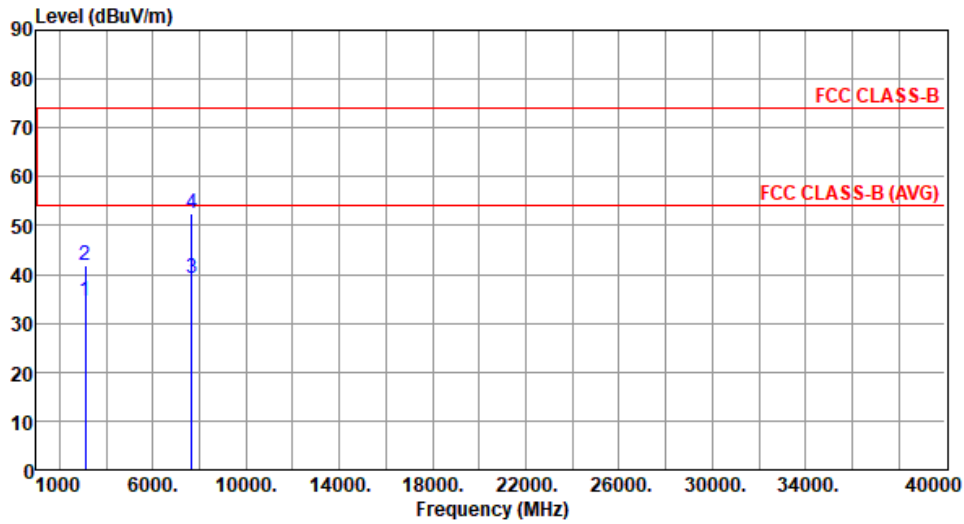
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Test Mode	Mode 3: GSM1900 ch512 + 11b ch1+ 11a ch48								
Polarization	Vertical								
	Freq.	Emission	Limit	Margin	SA	Factor	Remark	ANT	Turn
	MHz	dBuV/m	dBuV/m	dB	reading	dB		High	Table
					dBuV			cm	deg
1	4262.20	32.01	54.00	-21.99	30.18	1.83	Average	100	55
2	4262.20	43.39	74.00	-30.61	41.56	1.83	Peak	100	55
3	7652.00	39.35	54.00	-14.65	30.30	9.05	Average	100	70
4	7652.00	52.19	74.00	-21.81	43.14	9.05	Peak	100	70
<p>Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).</p>									

Test Mode	Mode 4: LTE B12 BW 10MHz 1rb offset 0 ch23060 + 11b ch1+ 11a ch48
Polarization	Horizontal



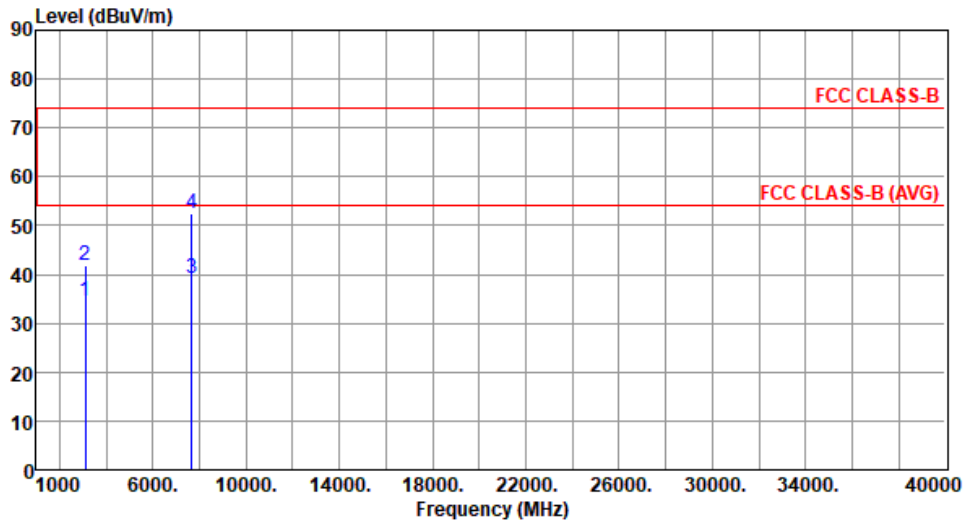
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3116.00	34.58	54.00	-19.42	35.45	-0.87	Average	100	50
2	3116.00	41.69	74.00	-32.31	42.56	-0.87	Peak	100	50
3	7652.00	39.28	54.00	-14.72	30.23	9.05	Average	100	40
4	7652.00	52.49	74.00	-21.51	43.44	9.05	Peak	100	40

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Test Mode	Mode 4: LTE B12 BW 10MHz 1rb offset 0 ch23060 + 11b ch1+ 11a ch48
Polarization	Vertical



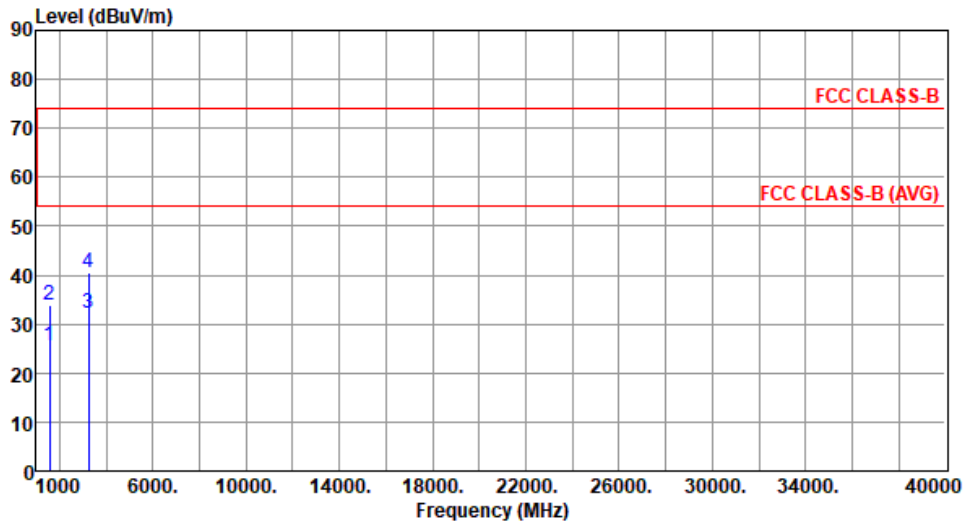
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3116.00	34.64	54.00	-19.36	35.51	-0.87	Average	100	60
2	3116.00	41.71	74.00	-32.29	42.58	-0.87	Peak	100	60
3	7652.00	39.35	54.00	-14.65	30.30	9.05	Average	100	55
4	7652.00	52.55	74.00	-21.45	43.50	9.05	Peak	100	55

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Test Mode	Mode 5: GSM850 ch251 + BT EDR GFSK ch00
Polarization	Horizontal



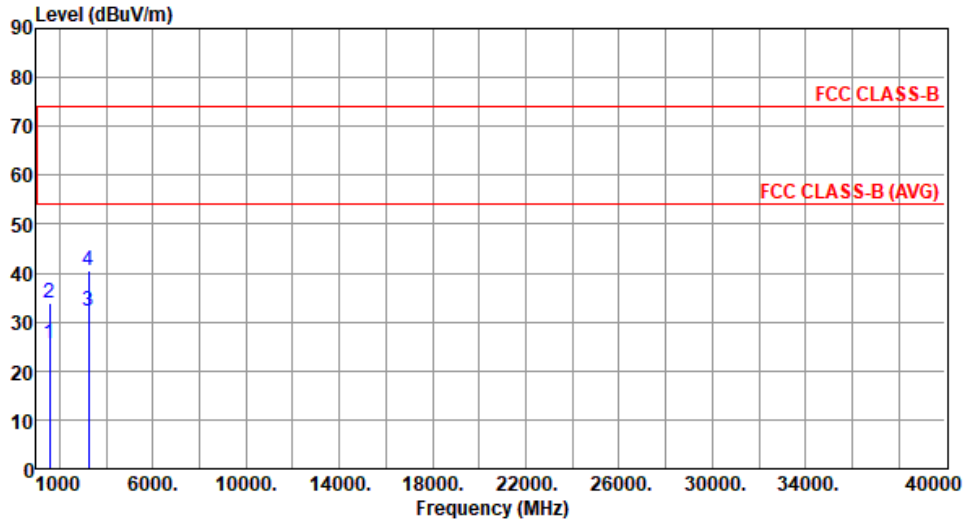
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1553.20	25.56	54.00	-28.44	32.20	-6.64	Average	100	20
2	1553.20	33.96	74.00	-40.04	40.60	-6.64	Peak	100	20
3	3250.80	32.30	54.00	-21.70	33.25	-0.95	Average	100	50
4	3250.80	40.52	74.00	-33.48	41.47	-0.95	Peak	100	50

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Test Mode	Mode 5: GSM850 ch251 + BT EDR GFSK ch00
Polarization	Vertical



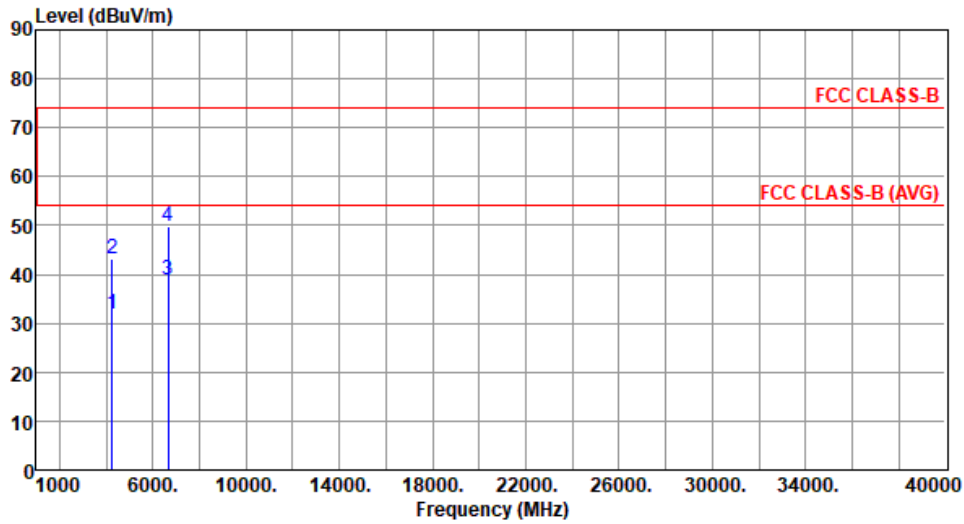
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1553.20	25.53	54.00	-28.47	32.17	-6.64	Average	100	30
2	1553.20	33.83	74.00	-40.17	40.47	-6.64	Peak	100	30
3	3250.80	32.28	54.00	-21.72	33.23	-0.95	Average	100	40
4	3250.80	40.57	74.00	-33.43	41.52	-0.95	Peak	100	40

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Test Mode	Mode 6: GSM1900 ch512 + BT EDR GFSK ch00
Polarization	Horizontal



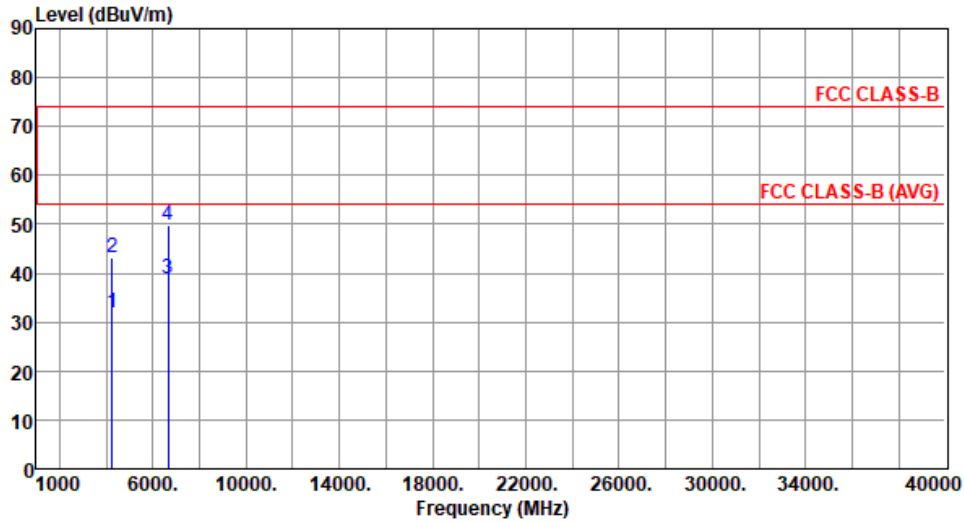
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	4252.20	31.95	54.00	-22.05	30.15	1.80	Average	100	20
2	4252.20	43.15	74.00	-30.85	41.35	1.80	Peak	100	20
3	6654.20	38.90	54.00	-15.10	31.56	7.34	Average	100	50
4	6654.20	49.89	74.00	-24.11	42.55	7.34	Peak	100	50

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Test Mode	Mode 6: GSM1900 ch512 + BT EDR GFSK ch00
Polarization	Vertical



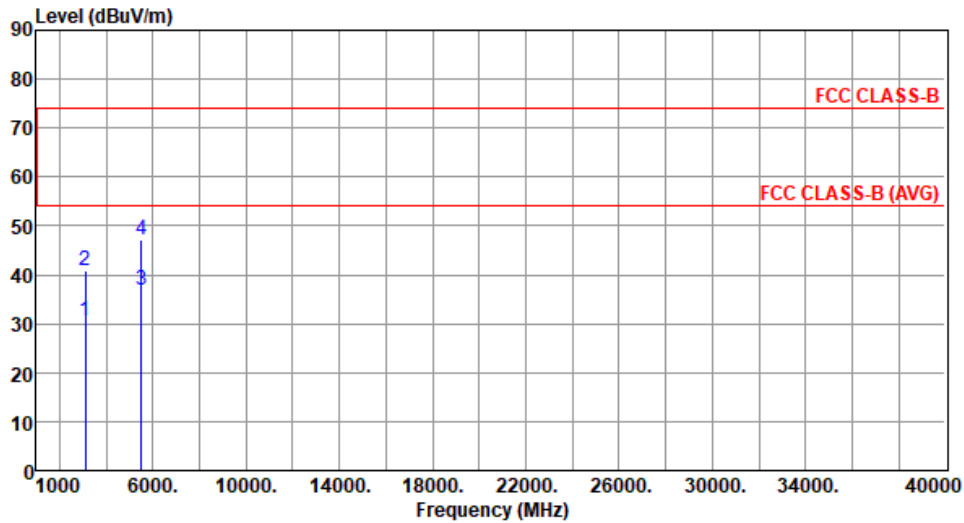
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	4252.20	32.01	54.00	-21.99	30.21	1.80	Average	100	30
2	4252.20	43.33	74.00	-30.67	41.53	1.80	Peak	100	30
3	6654.20	38.82	54.00	-15.18	31.48	7.34	Average	100	40
4	6654.20	49.80	74.00	-24.20	42.46	7.34	Peak	100	40

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Test Mode	Mode 7: LTE B12 BW 10MHz 1rb offset 0 ch23060 + BT EDR GFSK ch00
Polarization	Horizontal



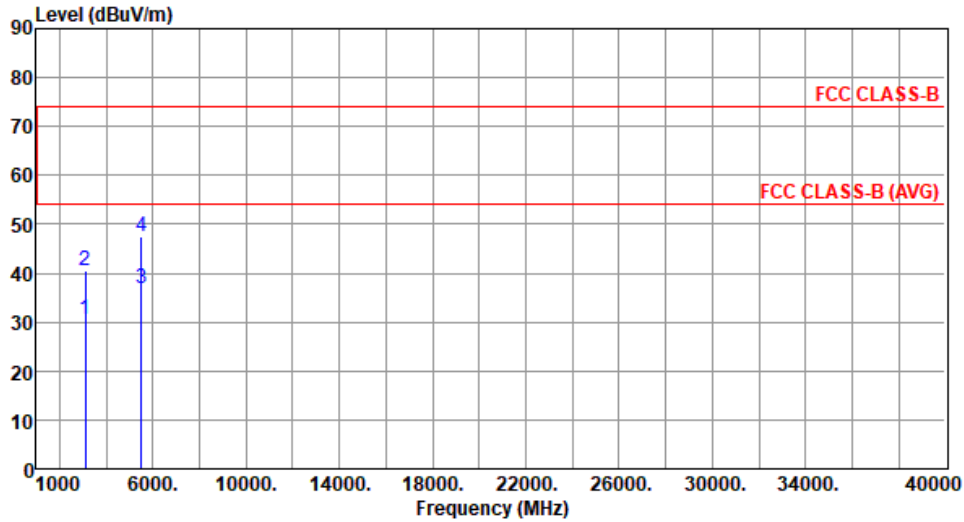
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3106.00	30.62	54.00	-23.38	31.52	-0.90	Average	100	50
2	3106.00	40.69	74.00	-33.31	41.59	-0.90	Peak	100	50
3	5508.00	36.90	54.00	-17.10	32.26	4.64	Average	100	40
4	5508.00	47.23	74.00	-26.77	42.59	4.64	Peak	100	40

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Test Mode	Mode 7: LTE B12 BW 10MHz 1rb offset 0 ch23060 + BT EDR GFSK ch00
Polarization	Vertical



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3106.00	30.53	54.00	-23.47	31.43	-0.90	Average	100	30
2	3106.00	40.52	74.00	-33.48	41.42	-0.90	Peak	100	30
3	5508.00	36.82	54.00	-17.18	32.18	4.64	Average	100	55
4	5508.00	47.33	74.00	-26.67	42.69	4.64	Peak	100	55

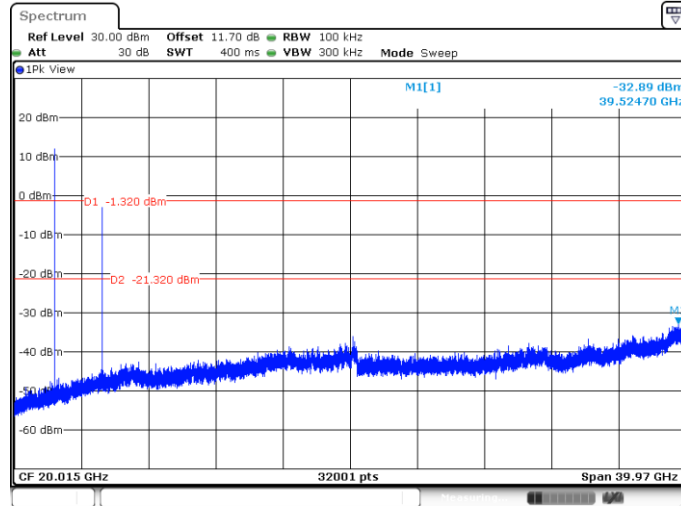
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

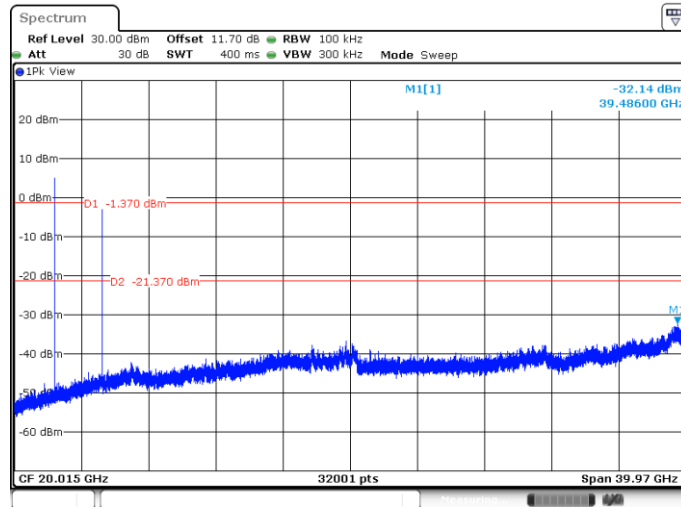
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

3.1.6 Conducted Emissions (30MHz~40GHz)

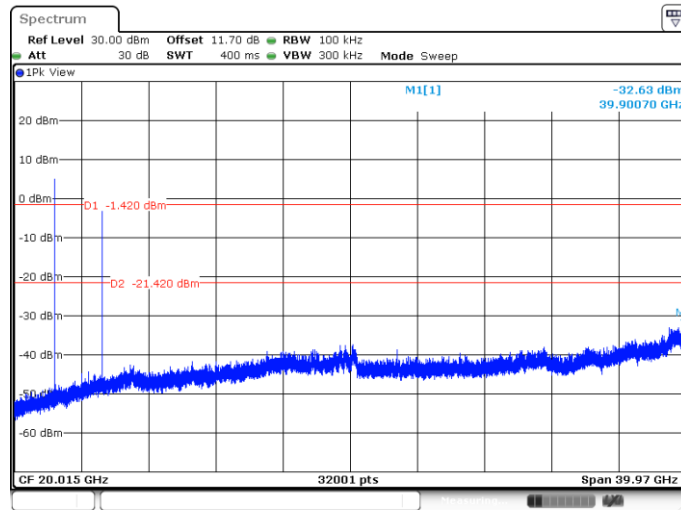
Mode 1: 11a ch36 + BT EDR GFSK ch00 / common antenna is used for 5GHz Wi-Fi and BT



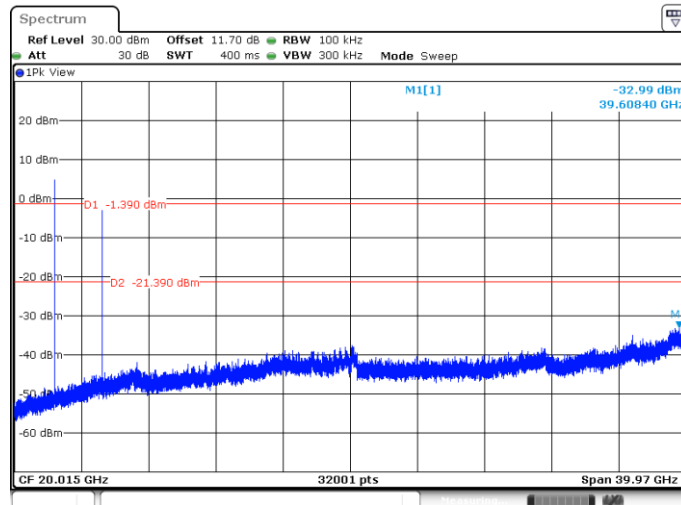
Mode 2: GSM850 ch251 + 11b ch1+ 11a ch48 / common antenna is used for 2.4 GHz and 5GHz Wi-Fi



Mode 3: GSM1900 ch512 + 11b ch1+ 11a ch48/ common antenna is used for 2.4 GHz and 5GHz Wi-Fi



Mode 4: LTE B12 BW 10MHz 1rb offset 0 ch23060 + 11b ch1+ 11a ch48/ common antenna is used for 2.4 GHz and 5GHz Wi-Fi



4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

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