



FCC RADIO TEST REPORT

FCC ID: 2AC8V-F9

Of

Product Name: GSM mobile phone
Brand Name: WINCOM, FreshFun
Model No.: F9
Series Model: F2,F3,F5,F6,F8,S8,V3
Test Report Number: STS1409021F02

Issued for

WING CHONG INTERNATIONAL ELECTRONIC LIMITED
7/F KIN ON COMM BLDG 49-1 JERVOIS ST SHEUNG WAN HK

Issued by

Shenzhen STS Test Services Co., Ltd.
1/F, Building 2, Zhuoke Science Park, Chongqing Road, Fuyong,
Baoan District, Shenzhen, China
TEL: +86-755 6119 6328
FAX: +86-755 6119 6328
E-mail: sts@stsapp.com

This test report may be reproduced in full only.
All Test Data Presented in this report is only applicable to presented Test sample.

TEST RESULT CERTIFICATION

Applicant's name WING CHONG INTERNATIONAL ELECTRONIC LIMITED
Address 7/F KIN ON COMM BLDG 49-1 JERVOIS ST SHEUNG WAN HK

Manufacture's Name WINCOM ELECTRONIC LIMITED
Address Not1 NOTRH DISTRICT CHANG XUE LNDUSTRIAL PARK
 BANTIAN SHENZHEN CHINA

Product description

Product name GSM mobile phone
Brand name WINCOM, FreshFun

Model and/or type reference F9

Ratings DC 5V/0.50A

Standards FCC Part15.247

Test procedure ANSI C63.10-2009

This device described above has been tested by STS, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of STS, this document may be altered or revised by STS, personal only, and shall be noted in the revision of the document.

Date of Test

Date (s) of performance of tests.. Sep 20 2014 ~Sep 27, 2014

Date of Issue Sep 28, 2014

Test Result **Pass**

Testing Engineer :

Tony Liu

(Tony Liu)

Technical Manager :

Vita Li

(Vita Li)

Authorized Signatory :

Bovey Yang

(Bovey Yang)



Table of Contents	Page
1 . SUMMARY OF TEST RESULTS	5
1.1 TEST FACILITY	6
1.2 MEASUREMENT UNCERTAINTY	6
2 . GENERAL INFORMATION	7
2.1 GENERAL DESCRIPTION OF EUT	7
2.2 DESCRIPTION OF TEST MODES	9
2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING	9
2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	10
2.5 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)	11
2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS	12
3 . EMC EMISSION TEST	13
3.1 CONDUCTED EMISSION MEASUREMENT	13
3.1.1 POWER LINE CONDUCTED EMISSION LIMITS	13
3.1.2 TEST PROCEDURE	14
3.1.3 DEVIATION FROM TEST STANDARD	14
3.1.4 TEST SETUP	14
3.1.5 EUT OPERATING CONDITIONS	14
3.1.6 TEST RESULTS	15
3.2 RADIATED EMISSION MEASUREMENT	17
3.2.1 RADIATED EMISSION LIMITS	17
3.2.2 TEST PROCEDURE	18
3.2.3 DEVIATION FROM TEST STANDARD	18
3.2.4 TEST SETUP	19
3.2.5 EUT OPERATING CONDITIONS	20
3.2.6 TEST RESULTS (BELOW 30 MHZ)	21
3.2.7 TEST RESULTS (BETWEEN 30M – 1000 MHZ)	22
3.2.8 TEST RESU LTS (ABOVE 1000 MHZ)	24
4.1 REQUIREMENT	26
4.1.2 TEST PROCEDURE	26
4.1.2 DEVIATION FROM STANDARD	26
4.1.3 TEST SETUP	26
4.1.4 EUT OPERATION CONDITIONS	26
4.1.5 TEST RESULTS	27
5. NUMBER OF HOPPING CHANNEL	36
5.1 APPLIED PROCEDURES / LIMIT	36
5.1.1 TEST PROCEDURE	36
5.1.2 DEVIATION FROM STANDARD	36
5.1.3 TEST SETUP	36

Table of Contents	Page
5.1.4 EUT OPERATION CONDITIONS	36
5.1.5 TEST RESULTS	37
6. AVERAGE TIME OF OCCUPANCY	38
6.1 APPLIED PROCEDURES / LIMIT	38
6.1.1 TEST PROCEDURE	38
6.1.2 DEVIATION FROM STANDARD	38
6.1.3 TEST SETUP	38
6.1.4 EUT OPERATION CONDITIONS	38
6.1.5 TEST RESULTS	39
7. HOPPING CHANNEL SEPARATION MEASUREMENT	45
7.1 APPLIED PROCEDURES / LIMIT	45
7.1.1 TEST PROCEDURE	45
7.1.2 DEVIATION FROM STANDARD	45
7.1.3 TEST SETUP	45
7.1.4 EUT OPERATION CONDITIONS	45
7.1.4 TEST RESULTS	46
8. BANDWIDTH TEST	52
8.1 APPLIED PROCEDURES / LIMIT	52
8.1.1 TEST PROCEDURE	52
8.1.2 DEVIATION FROM STANDARD	52
8.1.3 TEST SETUP	52
8.1.4 EUT OPERATION CONDITIONS	52
8.1.5 TEST RESULTS	53
9. PEAK OUTPUT POWER TEST	59
9.1 APPLIED PROCEDURES / LIMIT	59
9.1.1 TEST PROCEDURE	59
9.1.2 DEVIATION FROM STANDARD	59
9.1.3 TEST SETUP	59
9.1.4 EUT OPERATION CONDITIONS	59
9.1.5 TEST RESULTS	60
10. ANTENNA REQUIREMENT	61
10.1 STANDARD REQUIREMENT	61
10.2 EUT ANTENNA	61
APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS	

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247(a)(1)	Hopping Channel Separation	PASS	
15.247(b)(1)	Peak Output Power	PASS	
15.247(c)	Radiated Spurious Emission	PASS	
15.247(d)	Conducted Spurious Emission	PASS	
15.247(a)(iii)	Number of Hopping Frequency	PASS	
15.247(a)(iii)	Dwell Time	PASS	
15.247(a)(1)	Bandwidth	PASS	
15.205	Band Edge Emission	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

Shenzhen STS Test Services Co., Ltd.
 1/F, Building 2, Zhuoke Science Park, Chongqing Road, Fuyong,
 Baoan District, Shenzhen, China
 FCC Registration No.: 842334

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	GSM mobile phone
Trade Name	WINCOM, FreshFun
Model Name	F9
Serial Model	F2,F3,F5,F6,F8,S8,V3
Model Difference	Only difference in model name
Channel List	Please refer to the Note 2.
Bluetooth	Frequency:2402 – 2480 MHz Modulation: GFSK(1Mbps), $\pi/4$ -DQPSK(2Mbps), 8-DPSK(3Mbps)
Adapter	Input:AC 100-240V,50/60Hz,0.15A Output:DC 5V,500mA
Battery	Rated Voltage: 3.7V Charge Limit: 4.2V capacity :1100mAh
Hardware version number	S8DA V3.2
Software versioning number	--
Connecting I/O Port(s)	Please refer to the User's Manual

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

3.

Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	Dipole Antenna	NA	0	BT Antenna

The EUT antenna is integral Antenna. no antenna other than that furnished by the responsible party shall be used with the device.

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	CH00
Mode 2	CH39
Mode 3	CH78

For Conducted Emission	
Pretest Mode	Description
Mode4	Charging

For Radiated Emission	
Final Test Mode	Description
Mode 1	CH00
Mode 2	CH39
Mode 3	CH78

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

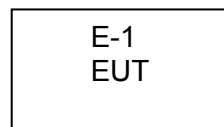
2.3 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

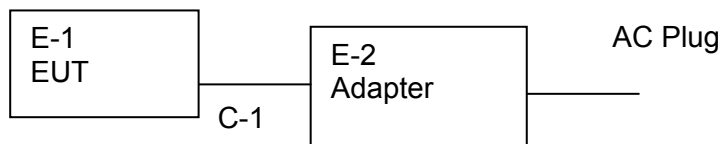
Test software Version	Test program: N/A		
Frequency	2402 MHz	2441 MHz	2480 MHz
Parameters(1Mbps)	DEF	DEF	DEF

2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



Conducted Emission Test



2.5 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	GSM mobile phone	WINCOM, FreshFun	F9	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
C-1	No	No	1.5M	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS**Radiation Test equipment**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2014.07.06	2015.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2014.06.08	2015.06.07	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2014.07.06	2015.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2014.06.06	2015.06.06	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2014.06.06	2015.06.06	1 year
6	Horn Antenna	EM	EM-AH-10180	2011071402	2014.07.06	2015.07.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2014.07.06	2015.07.05	1 year
8	Amplifier	EM	EM-30180	060538	2013.12.22	2014.12.21	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2014.06.08	2015.06.07	1 year
10	Power Meter	R&S	NRVS	100696	2014.07.06	2015.07.05	1 year
11	Power Sensor	R&S	URV5-Z4	0395.1619.05	2014.07.06	2015.07.05	1 year

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2014.06.06	2015.06.05	1 year
2	LISN	R&S	ENV216	101313	2014.08.24	2015.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2014.08.24	2015.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2014.06.06	2015.06.06	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2014.06.06	2015.06.06	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2014.06.08	2015.06.07	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

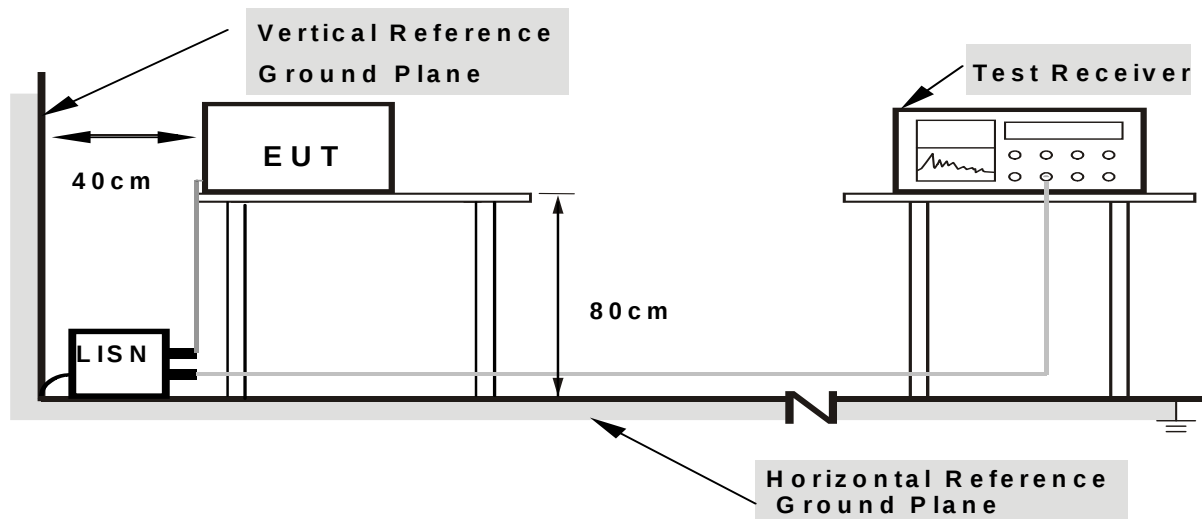
3.1.2 TEST PROCEDURE

- The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 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 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

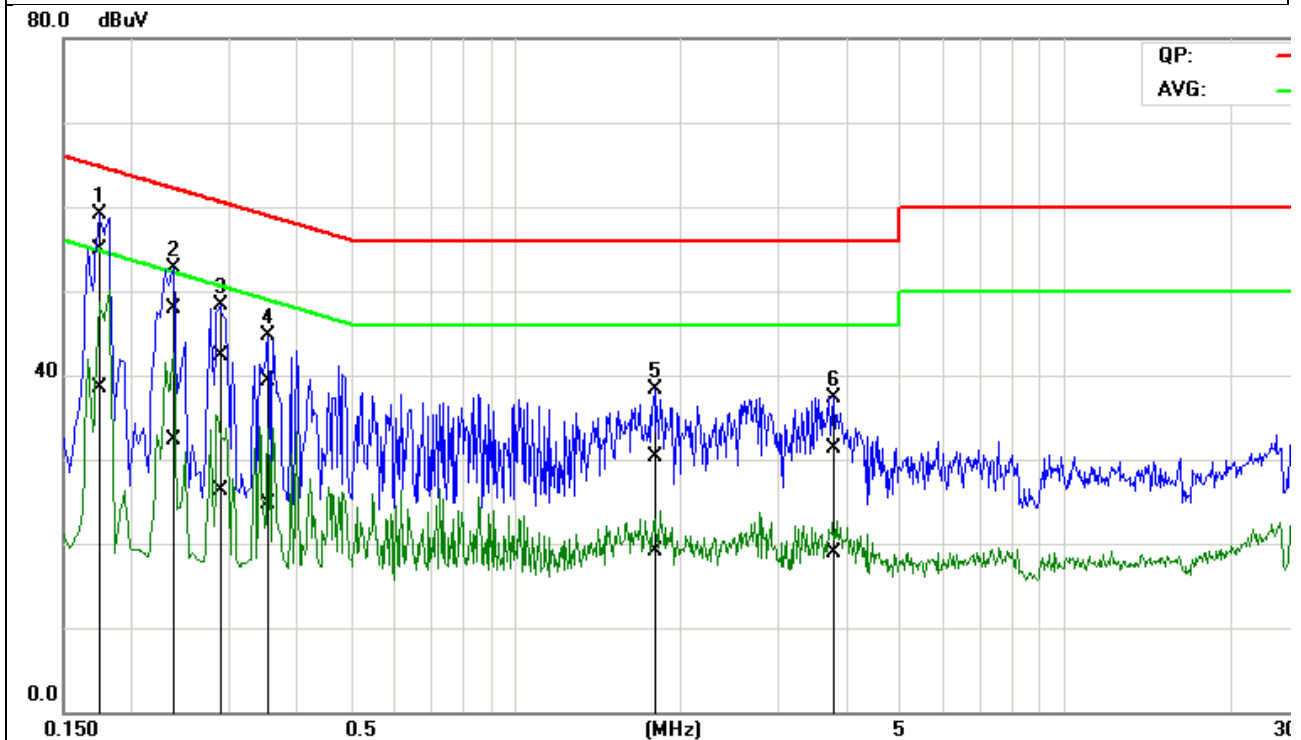
3.1.6 TEST RESULTS

EUT :	GSM mobile phone	Model Name. :	F9
Temperature :	23 °C	Relative Humidity :	50%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V from Adapter AC 120V/60Hz	Test Mode :	Link Mode

Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
0.1750	35.16	18.77	19.71	54.87	38.48	64.72	54.72	-9.85	-16.24	Pass
0.2357	28.36	12.66	19.63	47.99	32.29	62.25	52.25	-14.26	-19.96	Pass
0.2880	22.66	6.57	19.67	42.33	26.24	60.58	50.58	-18.25	-24.34	Pass
0.3516	19.63	4.96	19.72	39.35	24.68	58.92	48.92	-19.57	-24.24	Pass
1.7650	10.44	-0.86	19.91	30.35	19.05	56.00	46.00	-25.65	-26.95	Pass
3.7666	11.25	-1.24	20.15	31.40	18.91	56.00	46.00	-24.60	-27.09	Pass

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

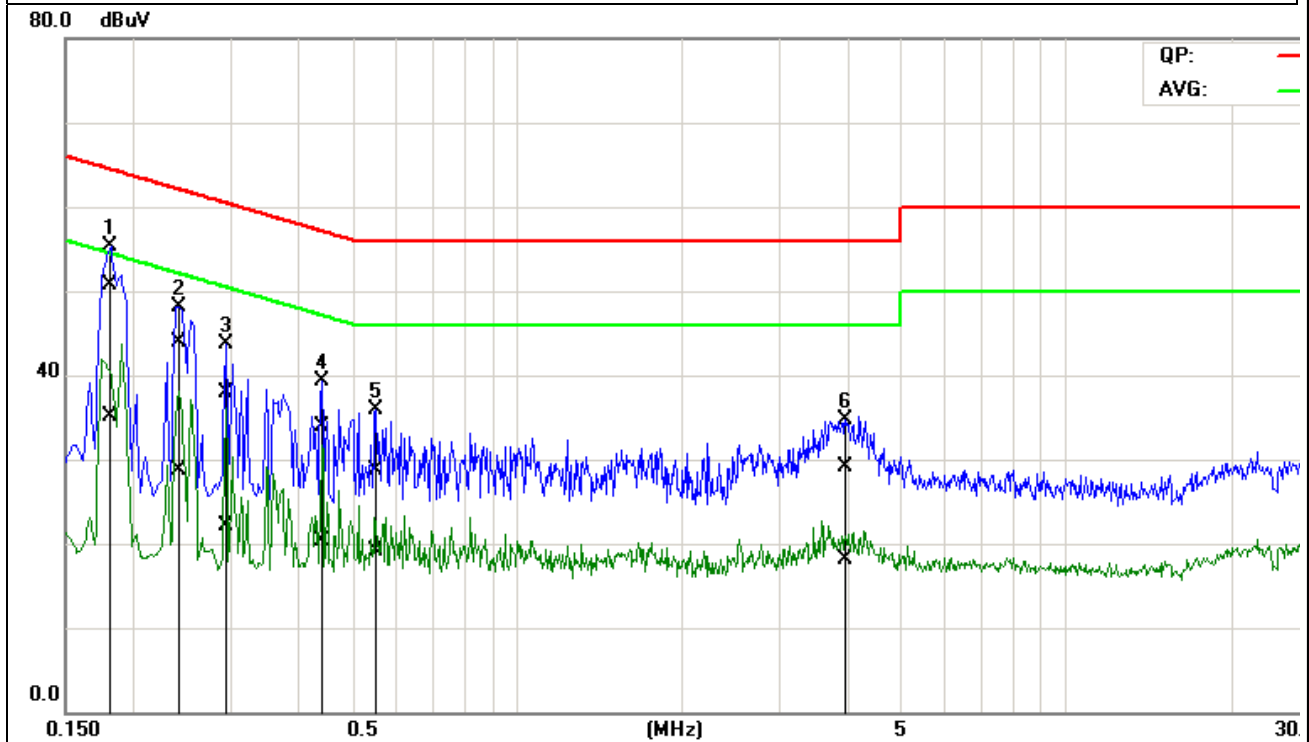


EUT :	GSM mobile phone	Model Name. :	F9
Temperature :	23 °C	Relative Humidity :	50%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V from Adapter AC 120V/60Hz	Test Mode :	Link Mode

Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
0.1792	31.03	15.36	19.68	50.71	35.04	64.52	54.52	-13.81	-19.48	Pass
0.2405	24.25	8.99	19.67	43.92	28.66	62.08	52.08	-18.16	-23.42	Pass
0.2958	18.11	2.37	19.71	37.82	22.08	60.36	50.36	-22.54	-28.28	Pass
0.4421	14.02	0.55	19.81	33.83	20.36	57.02	47.02	-23.19	-26.66	Pass
0.5555	8.87	-0.78	19.85	28.72	19.07	56.00	46.00	-27.28	-26.93	Pass
3.9893	8.91	-2.18	20.19	29.10	18.01	56.00	46.00	-26.90	-27.99	Pass

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (dBuV/m) (at 3M)		Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80	60	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower

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

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

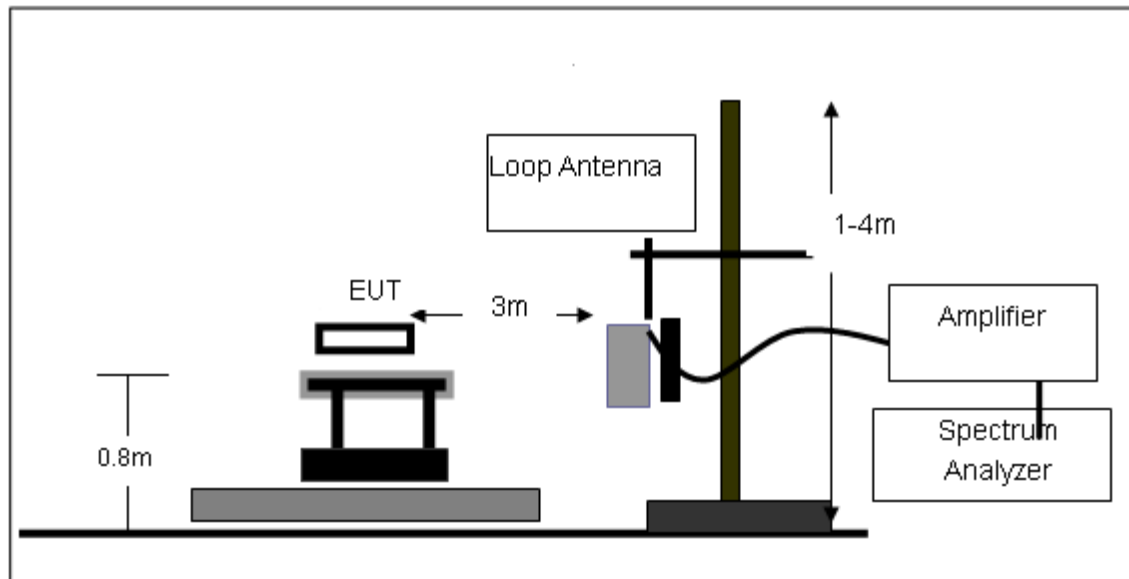
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

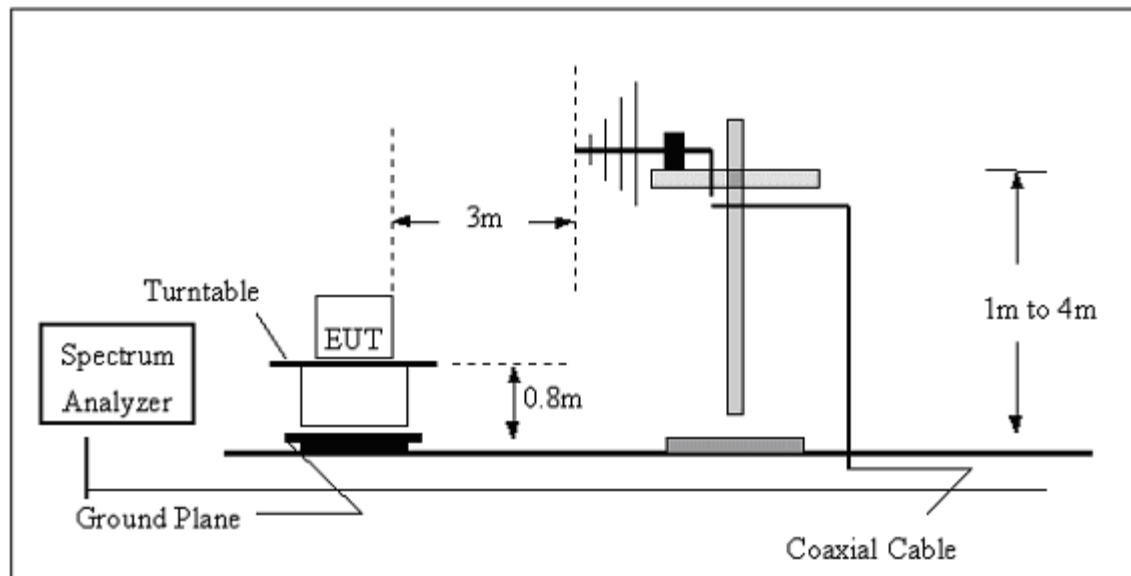
No deviation

3.2.4 TEST SETUP

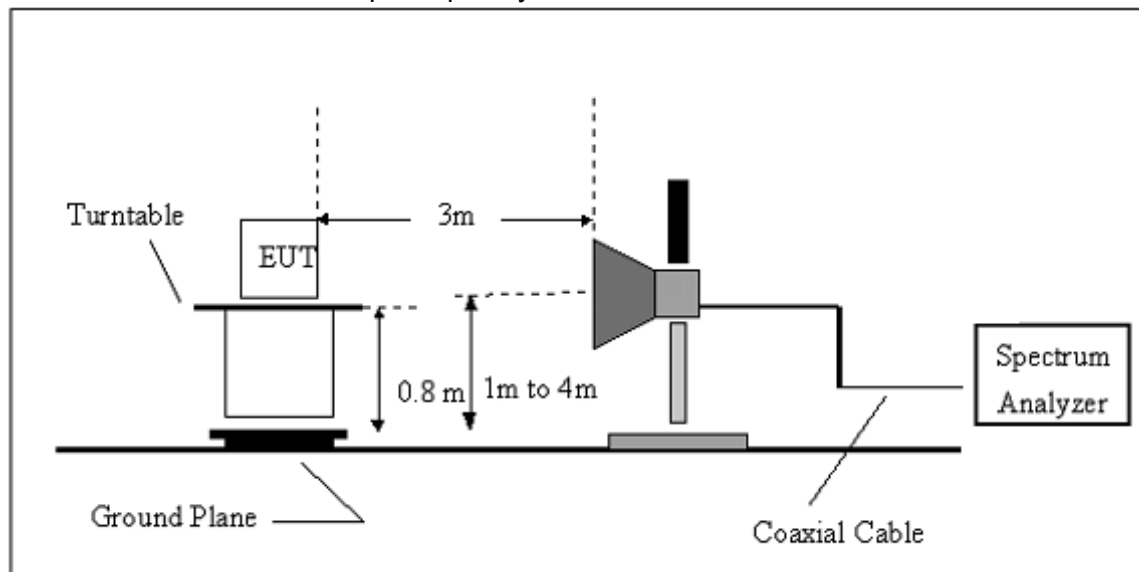
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz

**3.2.5 EUT OPERATING CONDITIONS**

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (BELOW 30 MHZ)

EUT :	GSM mobile phone	Model Name. :	F9
Temperature :	23 °C	Relative Humidity :	50%
Pressure :	1010 hPa	Polarization :	---
Test Voltage :	AC 120V		
Test Mode :	TX Mode		

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

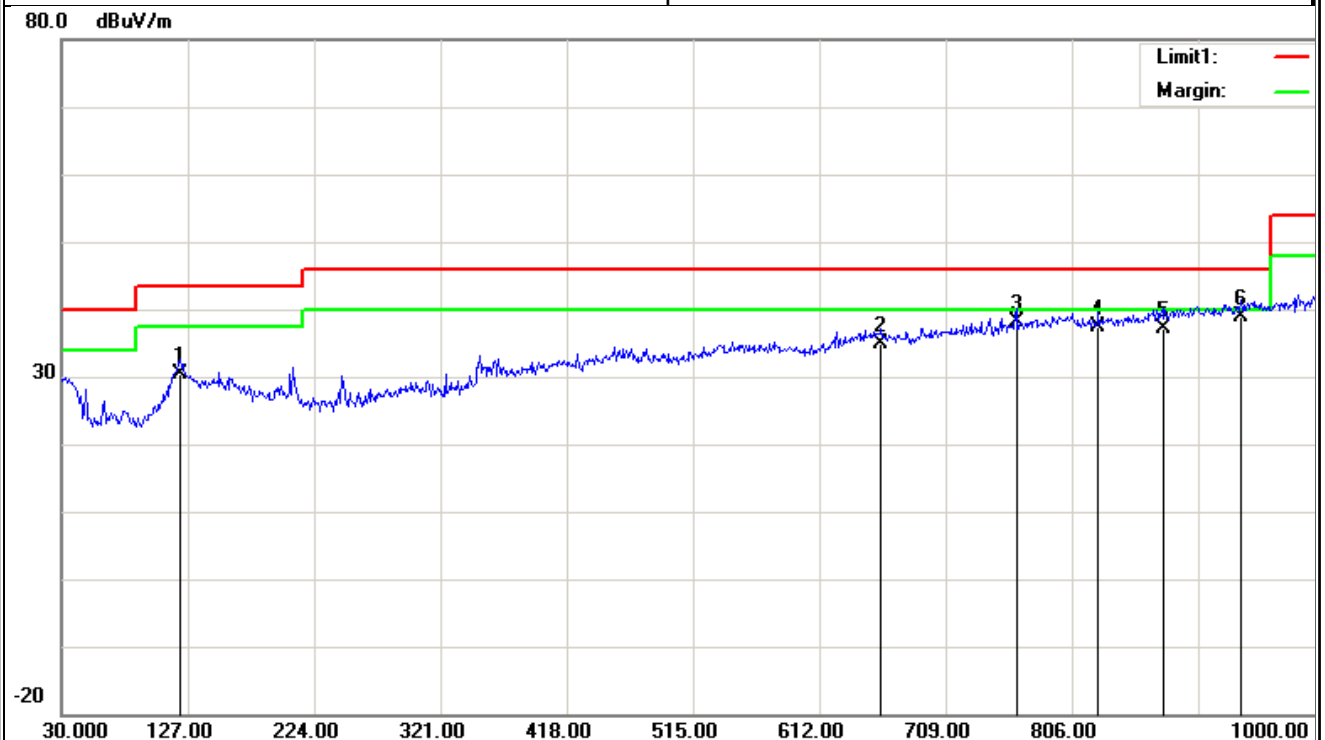
3.2.7 TEST RESULTS (BETWEEN 30M – 1000 MHZ)

EUT :	GSM mobile phone	Model Name. :	F9
Temperature :	23 °C	Relative Humidity :	50%
Pressure :	1010 hPa	Polarization :	Horizontal
Test Voltage :	AC 120V		
Test Mode :	TX Mode		

Frequency	Reading	Correct	Result	Limit	Margin	Height
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)
121.1800	16.20	14.06	30.26	43.50	-13.24	200
659.5300	13.18	21.77	34.95	46.00	-11.05	200
763.3200	15.15	22.87	38.02	46.00	-7.98	100
826.3700	14.37	22.98	37.35	46.00	-8.65	200
875.8400	13.47	23.73	37.20	46.00	-8.80	200
935.9800	13.94	24.90	38.84	46.00	-7.16	100

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

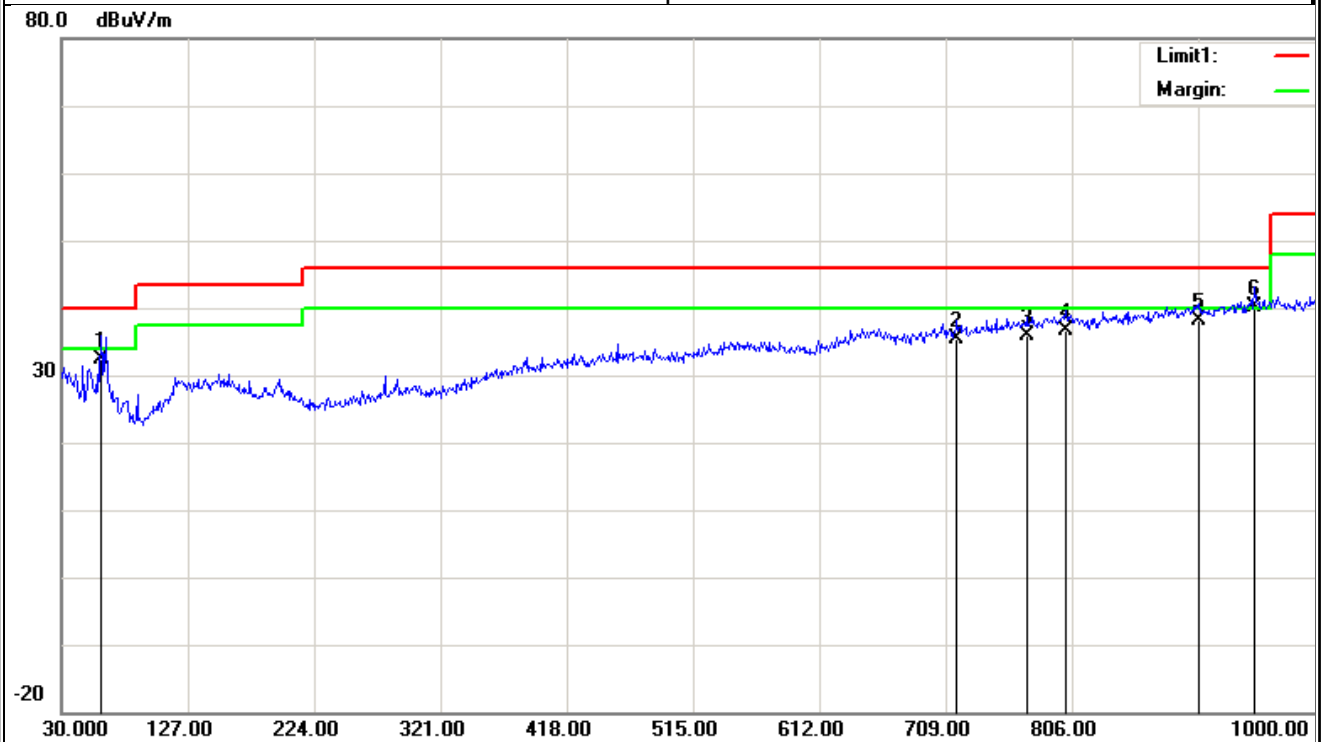


EUT :	GSM mobile phone	Model Name. :	F9
Temperature :	23 °C	Relative Humidity :	50%
Pressure :	1010 hPa	Polarization :	Vertical
Test Voltage :	AC 120V		
Test Mode :	TX Mode		

Frequency	Reading	Correct	Result	Limit	Margin	Height
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)
60.0700	24.16	8.22	32.38	40.00	-7.62	200
717.7300	13.08	22.20	35.28	46.00	-10.72	100
771.0800	12.95	22.89	35.84	46.00	-10.16	100
801.1500	13.13	23.48	36.61	46.00	-9.39	200
903.9700	13.91	24.33	38.24	46.00	-7.76	200
946.6500	14.93	25.17	40.10	46.00	-5.90	100

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



3.2.8 TEST RESU LTS (ABOVE 1000 MHZ)

Radiated Spurious Emission (Transmitting)

30MHz~25GHz:(Scan with GFSK, $\pi/4$ -DQPSK,8DPSK,the worst casw is GFSK Mode

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Emission Level = Meter Reading + Factor

Margin = Limit - Emission Level

3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector	Comment
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type	
Low Channel (2402 MHz)							
4804.187	65.12	-3.62	61.5	74	-12.5	Pk	Vertical
4804.205	47.12	-3.62	43.5	54	-10.5	AV	Vertical
7206.108	62.15	-0.9	61.25	74	-12.75	pk	Vertical
7206.146	43.47	-0.9	42.57	54	-11.43	AV	Vertical
4804.018	62.12	-3.64	58.48	74	-15.52	Pk	Horizontal
4804.030	43.25	-3.64	39.61	54	-14.39	AV	Horizontal
Mid Channel (2441 MHz)							
4882.086	65.13	-3.65	61.48	74	-12.52	Pk	Vertical
4882.139	52.17	-3.65	48.52	54	-5.48	AV	Vertical
7323.208	62.15	-0.82	61.33	74	-12.67	Pk	Vertical
7323.184	46.2	-0.82	45.38	54	-8.62	AV	Vertical
4882.103	63.44	-3.68	59.76	74	-14.24	Pk	Horizontal
4882.136	47.12	-3.68	43.44	54	-10.56	AV	Horizontal
High Channel (2480 MHz)							
4960.260	61.25	-3.59	57.66	74	-16.34	pk	Vertical
4960.307	45.48	-3.59	41.89	54	-12.11	AV	Vertical
4960.169	63.22	-3.59	59.63	74	-14.37	pk	Horizontal
4960.183	46.55	-3.59	42.96	54	-11.04	AV	Horizontal

Radiated band edge

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector	Comment
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type	
GFSK							
2399.9	68.33	-12.99	55.34	74	-18.66	peak	Vertical
2399.9	71.15	-12.99	58.16	74	-15.84	peak	Horizontal
2483.6	72.26	-12.78	59.48	74	-14.52	peak	Vertical
2483.6	70.29	-12.78	58.52	74	-15.48	peak	Horizontal
π/4-DQPSK							
2399.9	72.12	-12.99	59.13	74	-14.87	peak	Vertical
2399.9	72.21	-12.99	59.22	74	-14.78	peak	Horizontal
2483.6	73.1	-12.78	60.32	74	-13.68	peak	Vertical
2483.6	72.68	-12.78	59.9	74	-14.1	peak	Horizontal
8DPSK							
2399.9	70.25	-12.99	57.26	74	-16.74	peak	Vertical
2399.9	72.43	-12.99	59.44	74	-14.56	peak	Horizontal
2483.6	72.33	-12.78	59.55	74	-14.45	peak	Vertical
2483.6	70.19	-12.78	57.41	74	-16.59	peak	Horizontal

NOTE: The result(PK) less than AV limite,No need shown AV result.

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector	Comment
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type	
GFSK							
2390	66.43	-12.99	53.44	74	-20.56	peak	Vertical
2390	64.33	-12.99	51.34	74	-22.66	peak	Horizontal
2483.5	67.25	-12.78	54.47	74	-19.53	peak	Vertical
2483.5	64.33	-12.78	51.55	74	-22.45	peak	Horizontal
π/4-DQPSK							
2390	67.21	-12.99	54.22	74	-19.78	peak	Vertical
2390	68.3	-12.99	55.31	74	-18.69	peak	Horizontal
2483.5	64.25	-12.78	51.47	74	-22.53	peak	Vertical
2483.5	66.27	-12.78	53.49	74	-20.51	peak	Horizontal
8DPSK							
2390	65.37	-12.99	52.38	74	-21.62	peak	Vertical
2390	66.25	-12.99	53.26	74	-20.74	peak	Horizontal
2483.5	68.28	-12.78	55.5	74	-18.5	peak	Vertical
2483.5	65.59	-12.78	52.81	74	-21.19	peak	Horizontal

4. Conducted Spurious Emissions

4.1 REQUIREMENT

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

4.1.2 TEST PROCEDURE

Spectrum Parameter	Setting
Detector	Peak
Start Frequency	30 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

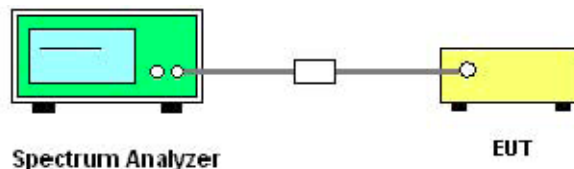
For Band edge

Spectrum Parameter	Setting
Attenuation	Auto
Start/Stop Frequency	Lower Band Edge: 2310 – 2404 MHz Upper Band Edge: 2478 – 2500 MHz
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. Make the measurement with the spectrum analyzer's resolution bandwidth(RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

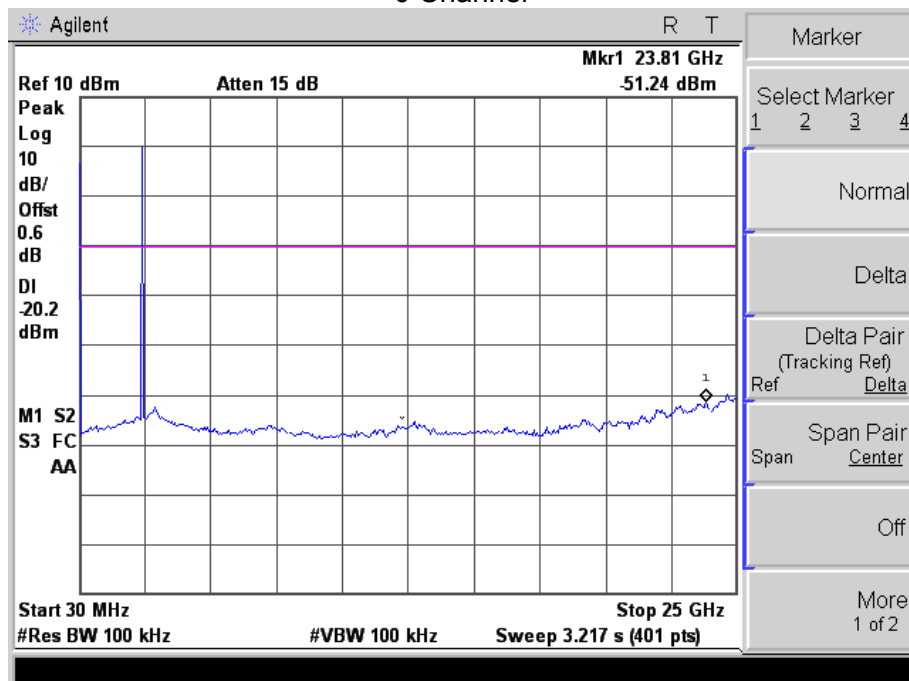
4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

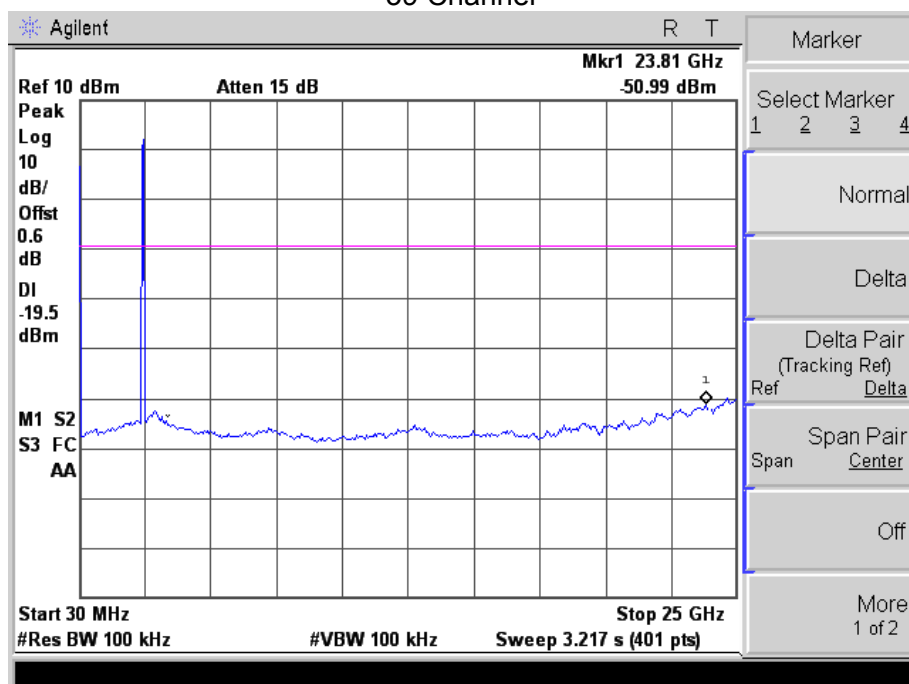
4.1.5 TEST RESULTS

EUT :	GSM mobile phone	Model Name :	F9
Temperature :	25 °C	Relative Humidity :	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	GFSK(1Mbps)-00/39/78 CH		

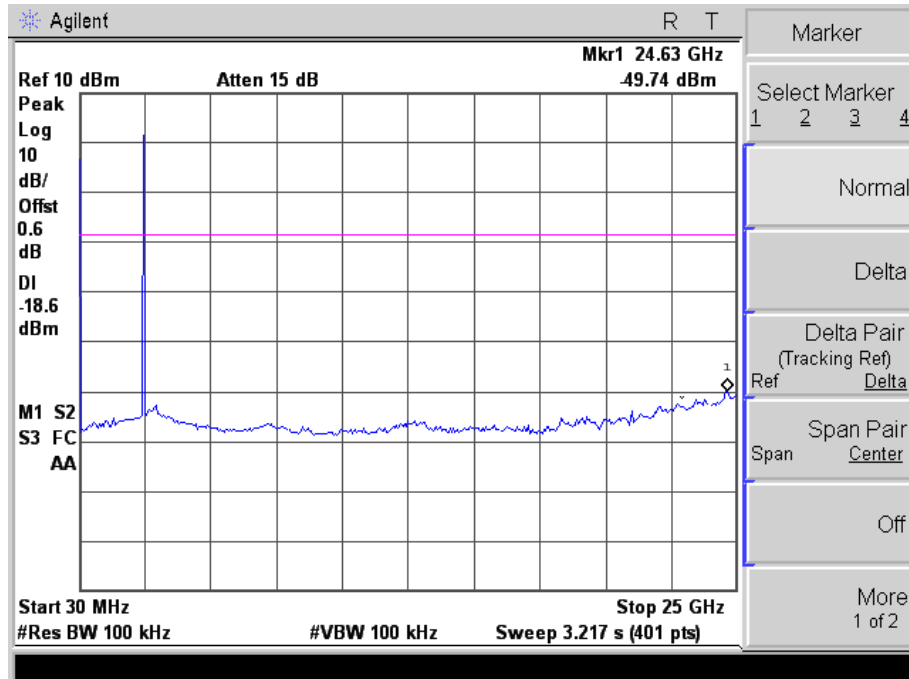
0 Channel



39 Channel

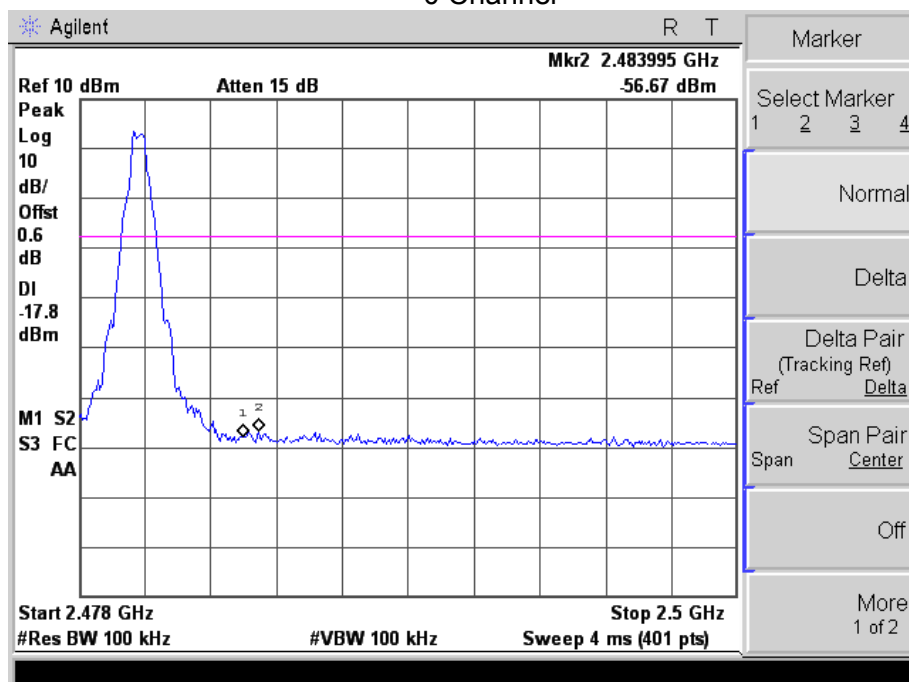


78 Channel

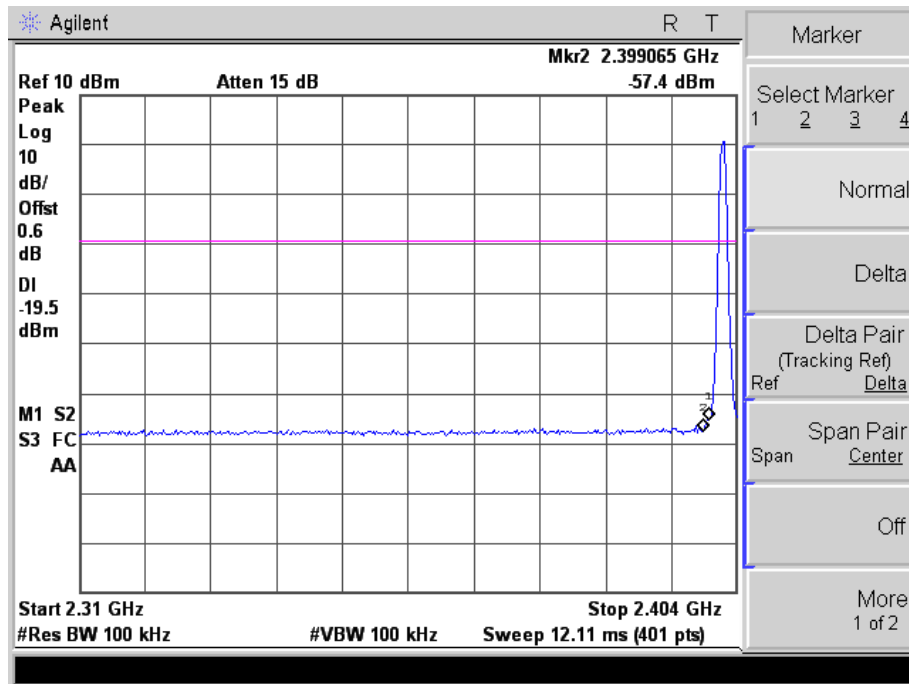


For Band edge

0 Channel

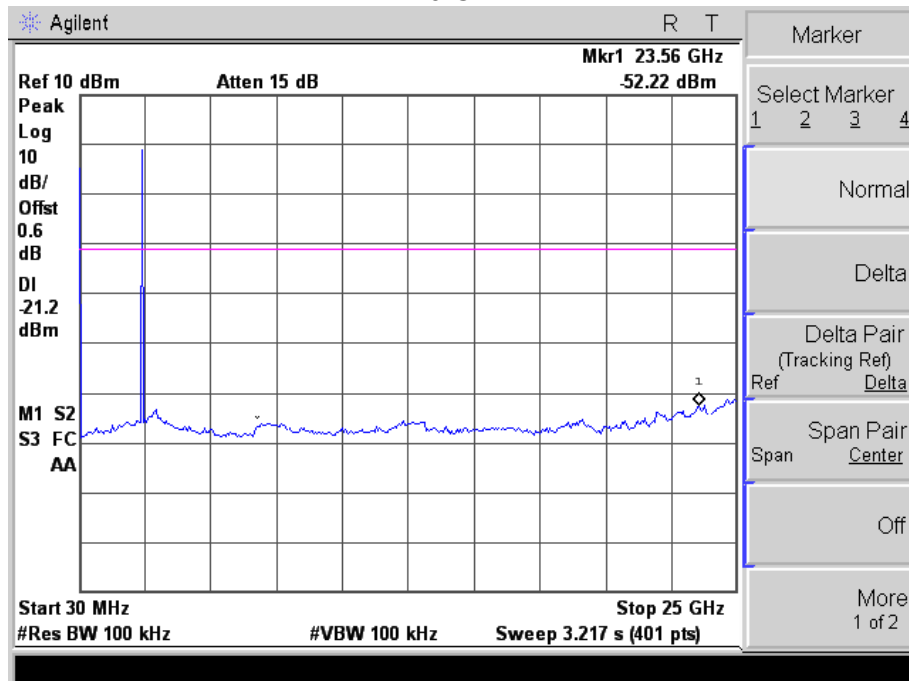


79 CH

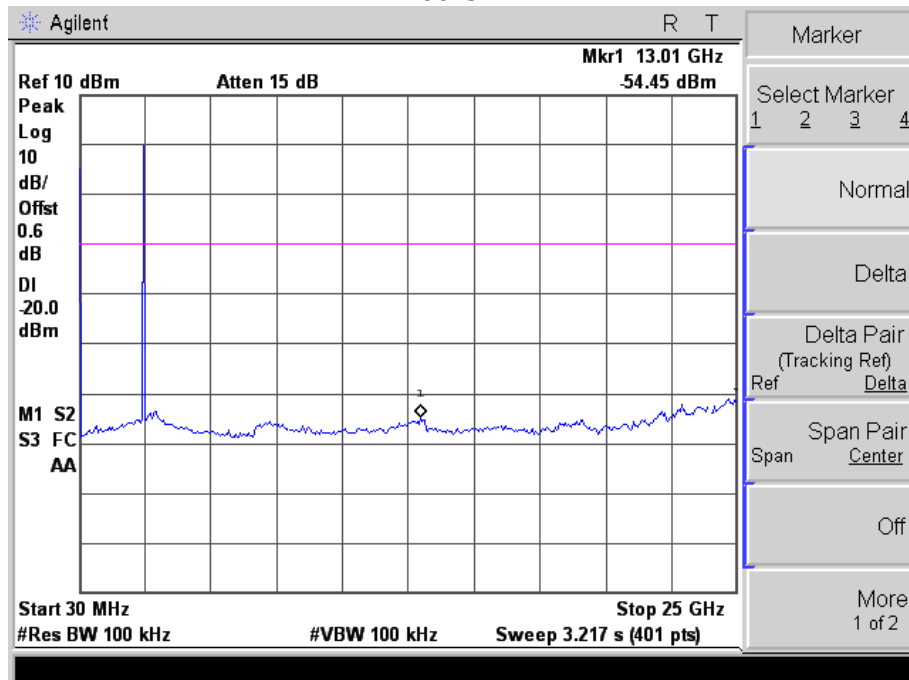


EUT :	GSM mobile phone	Model Name :	F9
Temperature :	25 °C	Relative Humidity :	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	$\pi/4$ -DQPSK(2Mbps) -00/39/78 CH		

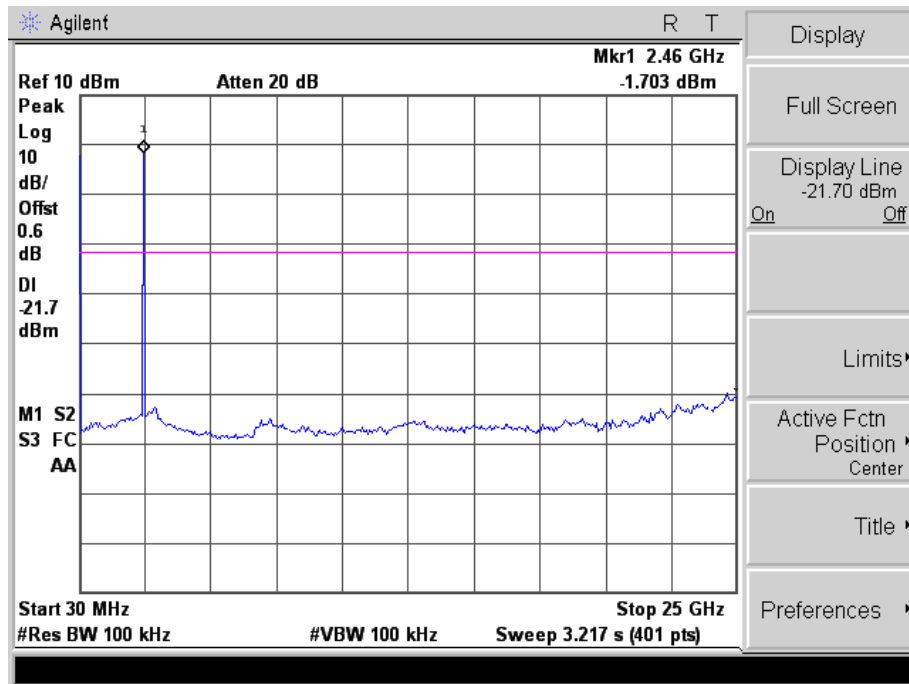
0 CH



39 CH

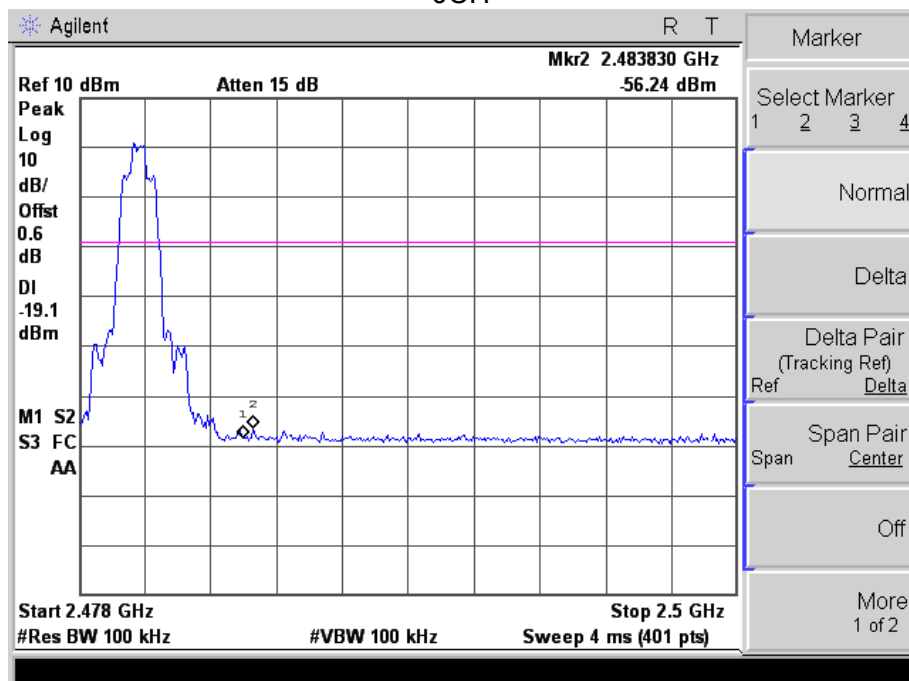


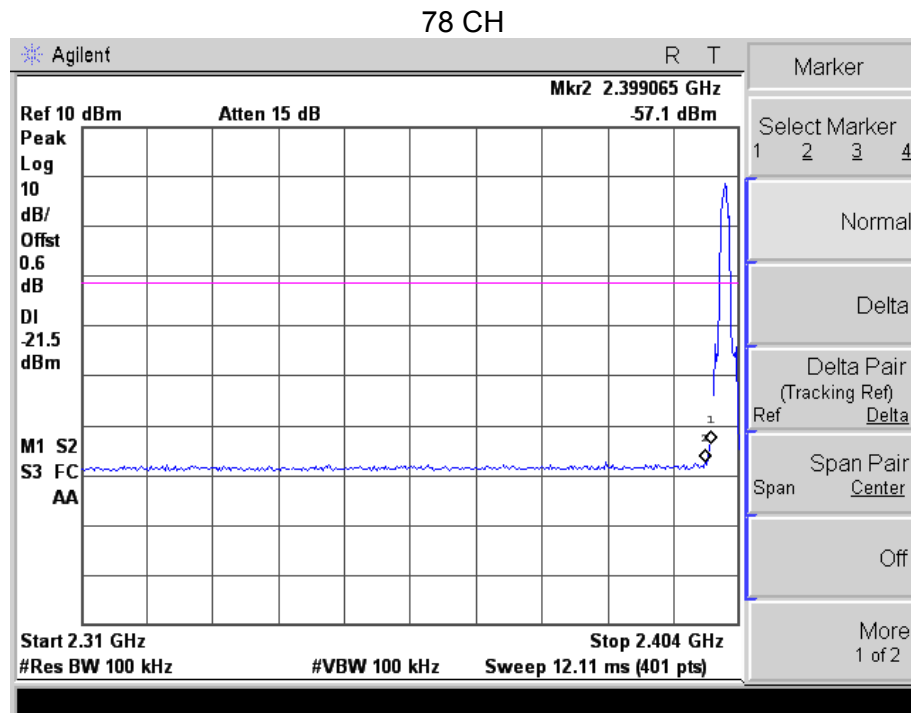
78 CH



Band edge

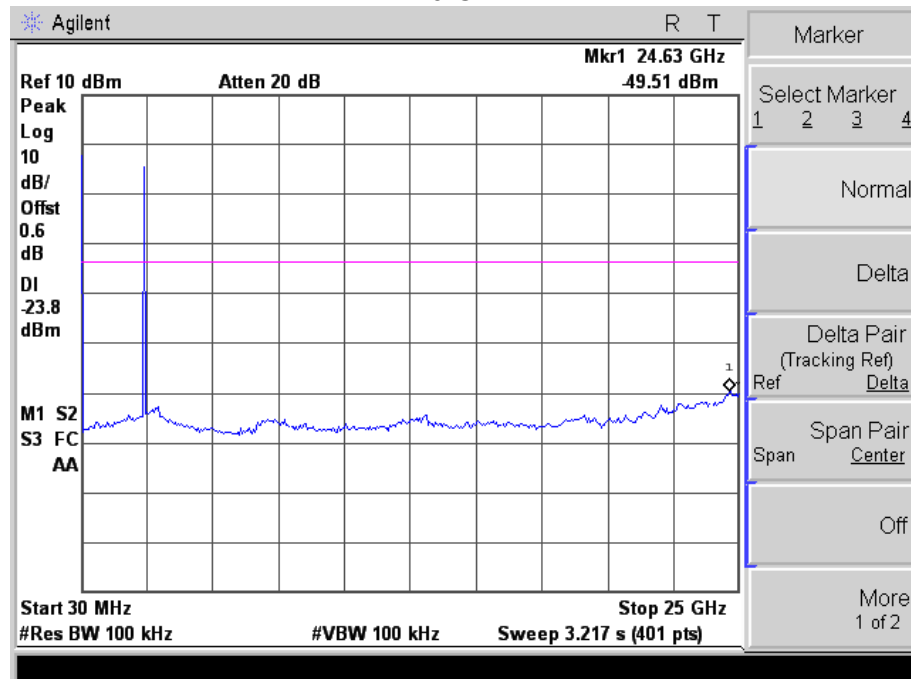
0CH



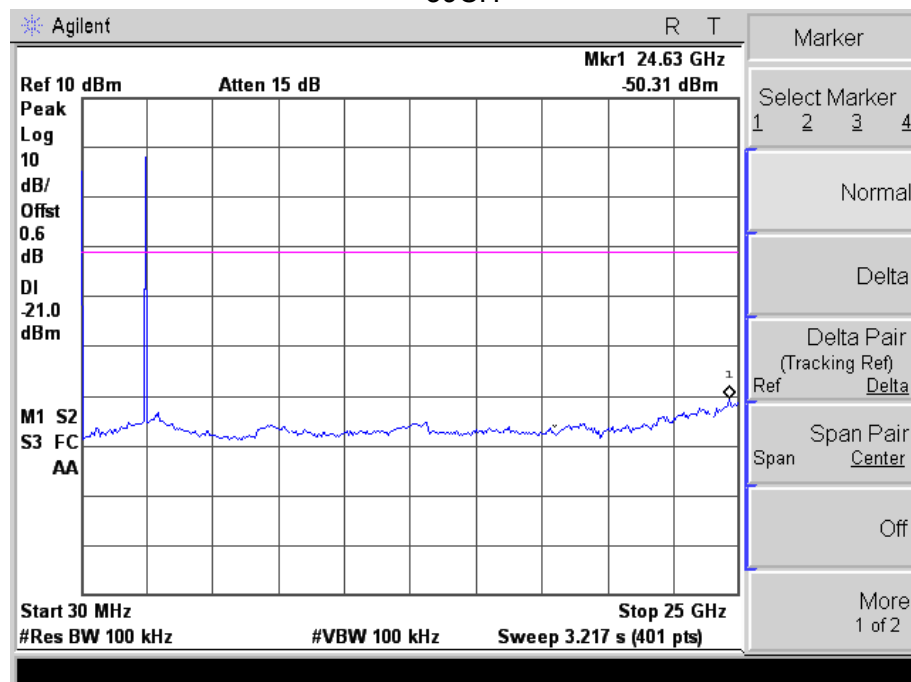


EUT:	GSM mobile phone	Model Name :	F9
Temperature :	25 °C	Relative Humidity :	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	8-DPSK(3Mbps) -00/39/78 CH		

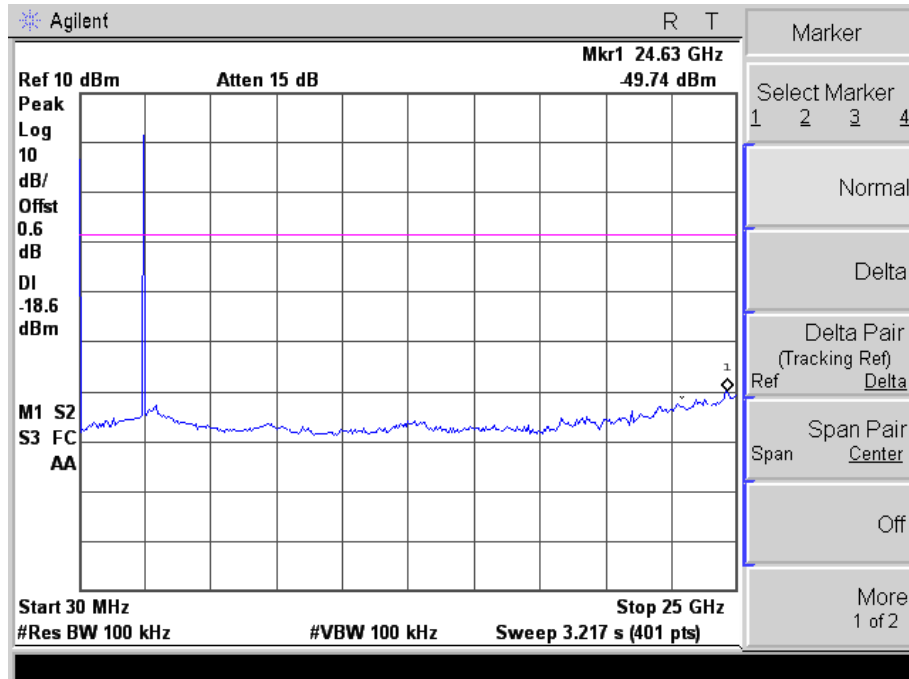
0 CH



39CH

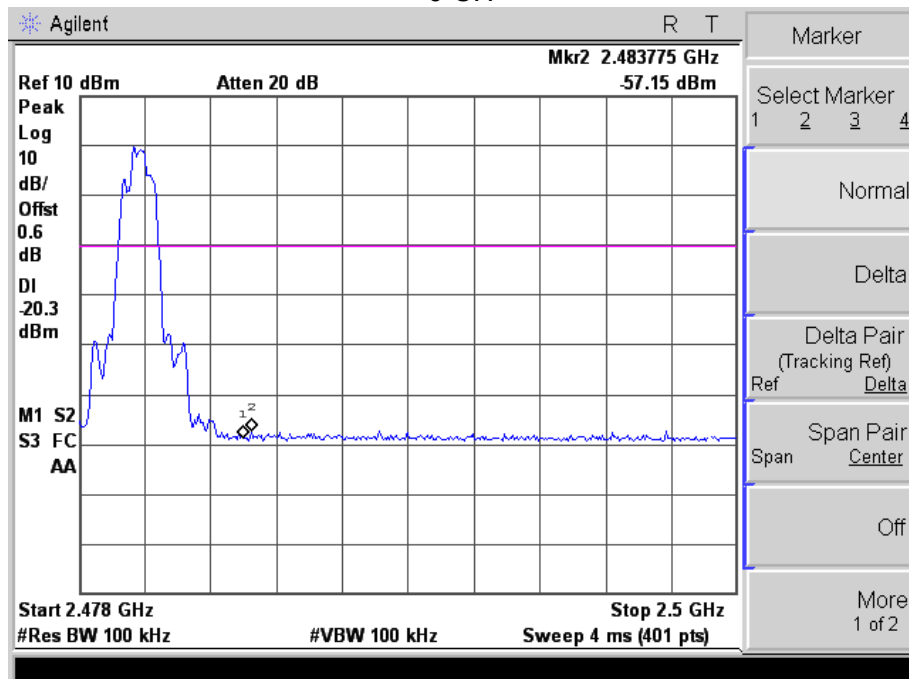


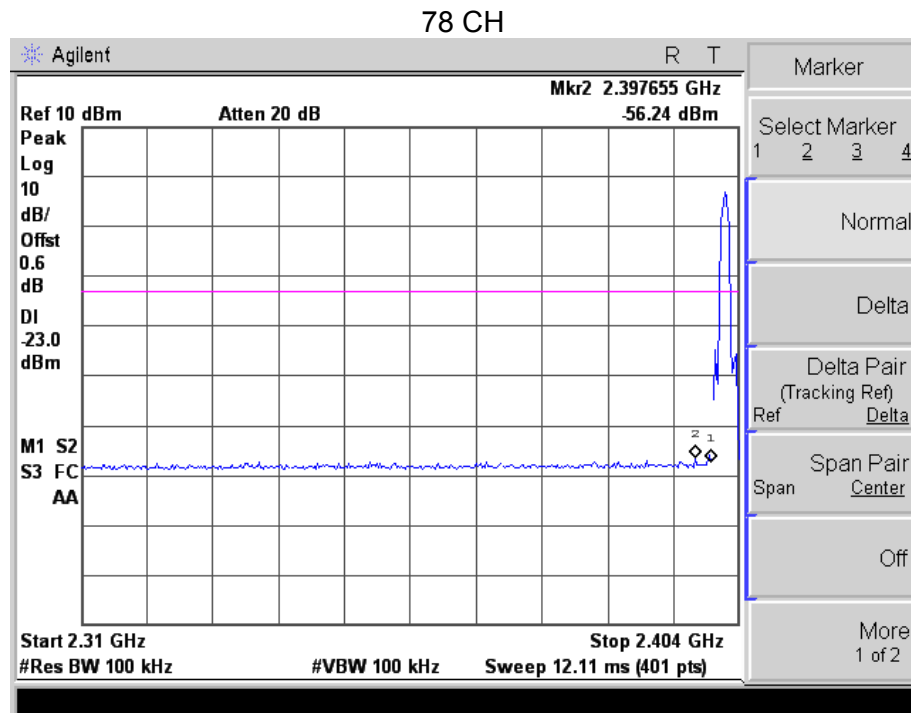
78CH



For Band edge

0 CH





5. NUMBER OF HOPPING CHANNEL

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Number of Hopping Channel	≥15	2400-2483.5	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating Frequency Range
RB	100 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

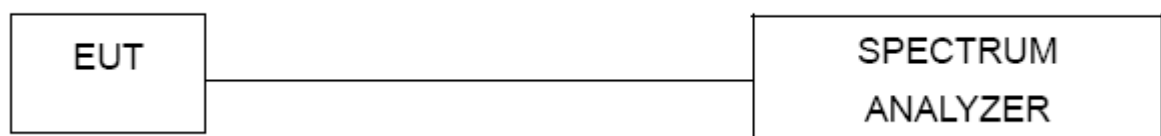
5.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



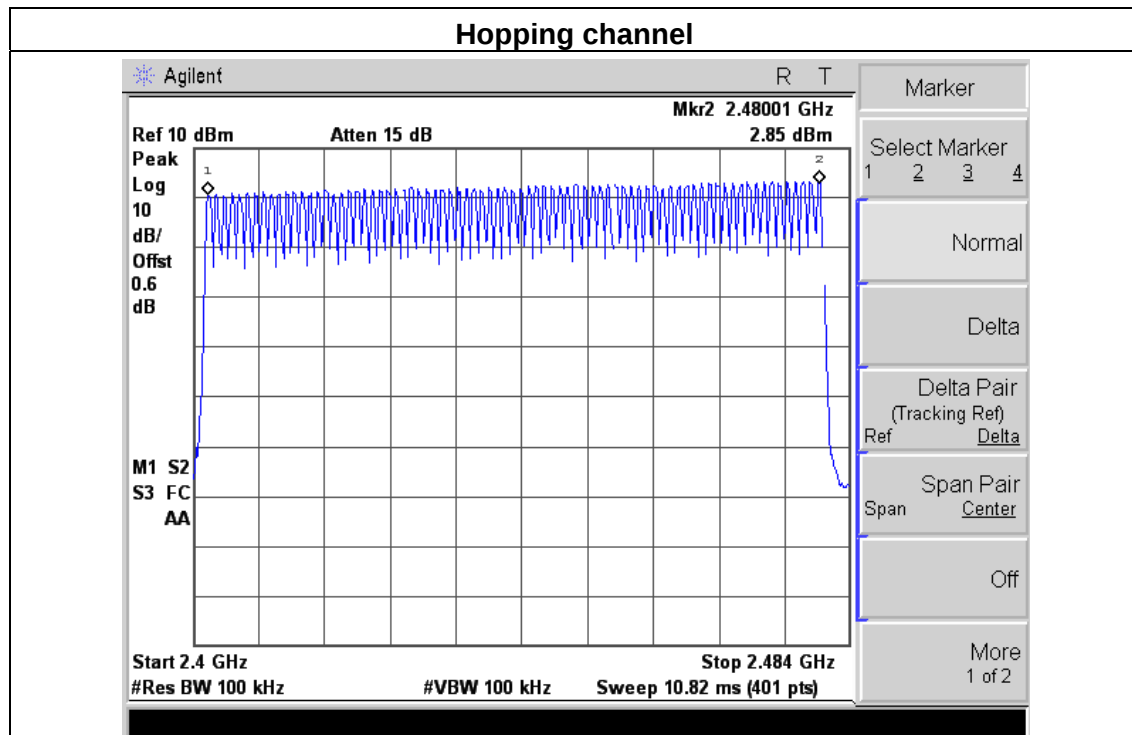
5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 TEST RESULTS

EUT :	GSM mobile phone	Model Name :	F9
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 3.7V
Test Mode :	Hopping Mode		

Number of Hopping Channel	79
---------------------------	----



6. AVERAGE TIME OF OCCUPANCY

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

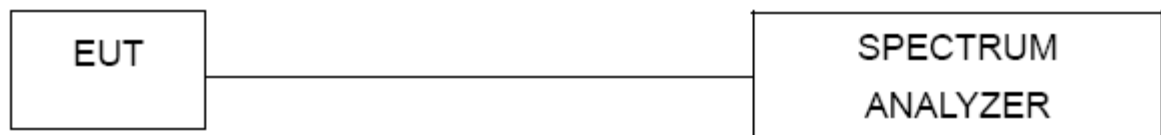
6.1.1 TEST PROCEDURE

- The transmitter output (antenna port) was connected to the spectrum analyzer
- Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- Use a video trigger with the trigger level set to enable triggering only on full pulses.
- Sweep Time is more than once pulse time.
- Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- Measure the maximum time duration of one single pulse.
- Set the EUT for DH5, DH3 and DH1 packet transmitting.
- Measure the maximum time duration of one single pulse.
- DH5 Packet permit maximum $1600 / 79 / 6 = 3.37$ hops per second in each channel (5 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times $3.37 \times 31.6 = 106.6$ within 31.6 seconds.
- DH3 Packet permit maximum $1600 / 79 / 4 = 5.06$ hops per second in each channel (3 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times $5.06 \times 31.6 = 160$ within 31.6 seconds.
- DH1 Packet permit maximum $1600 / 79 / 2 = 10.12$ hops per second in each channel (1 time slot RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times $10.12 \times 31.6 = 320$ within 31.6 seconds.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



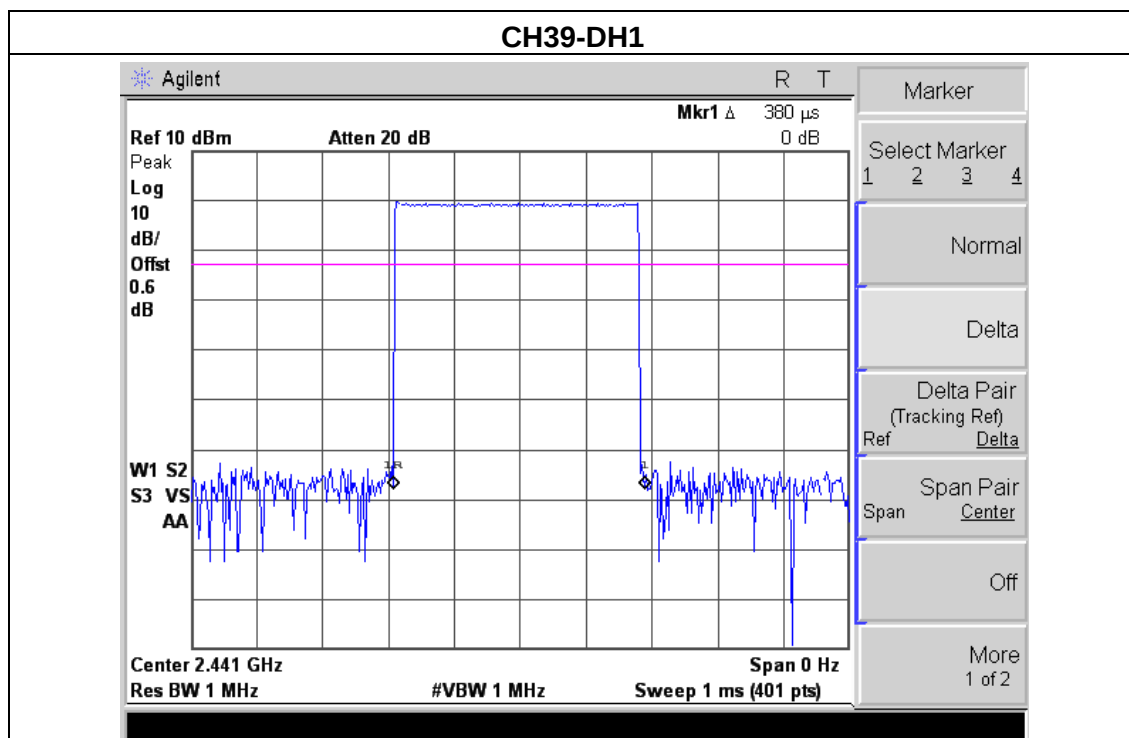
6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

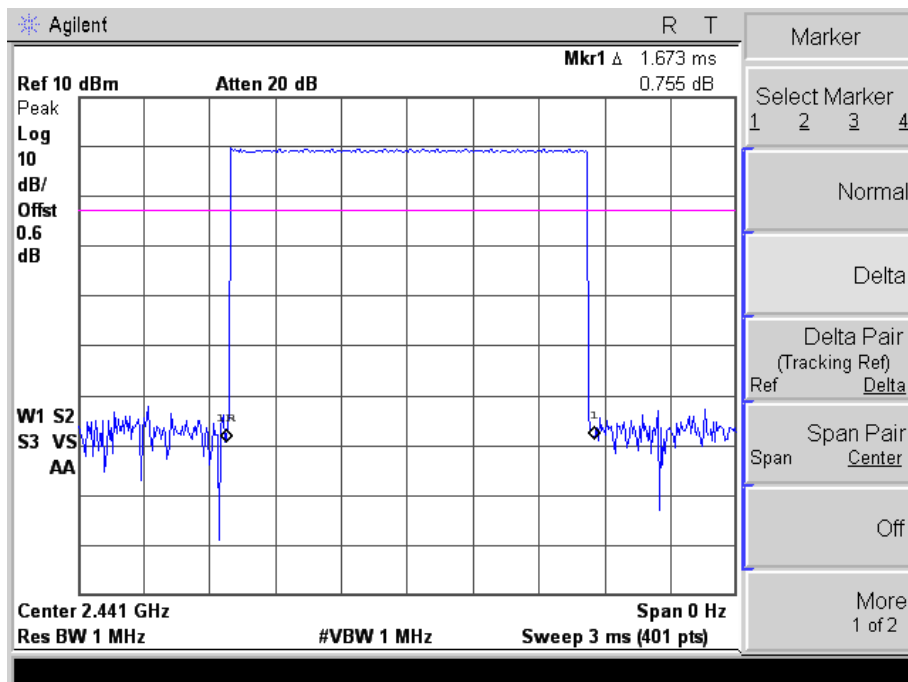
6.1.5 TEST RESULTS

EUT :	GSM mobile phone	Model Name :	F9
Temperature :	25 °C	Relative Humidity :	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	GFSK(1Mbps)-DH1/DH3/DH5		

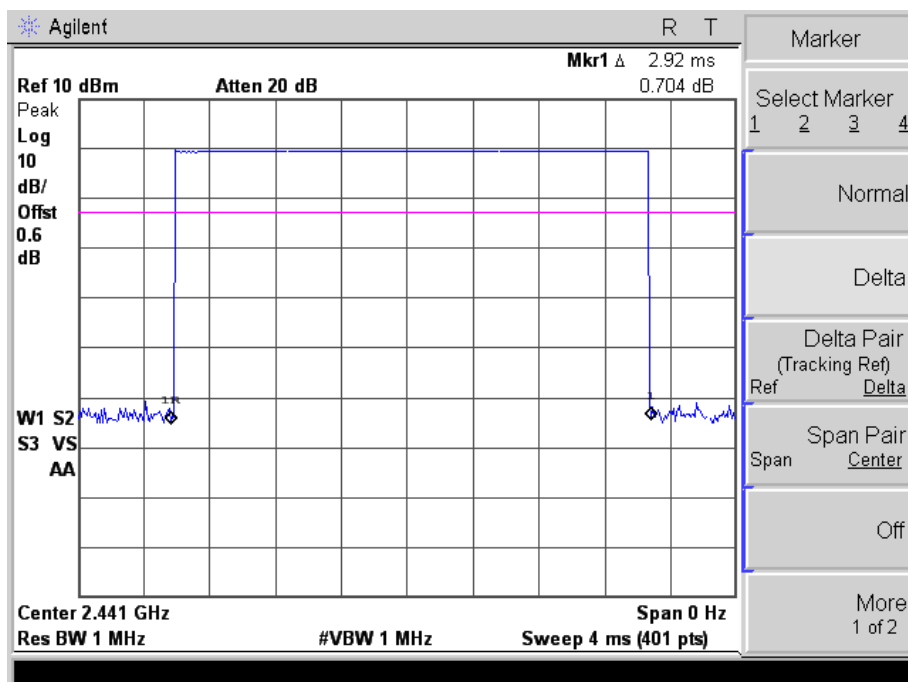
Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limits (s)
DH1	2441 MHz	0.380	0.12	0.4
DH3	2441 MHz	1.673	0.27	0.4
DH5	2441 MHz	2.920	0.31	0.4



CH39-DH3

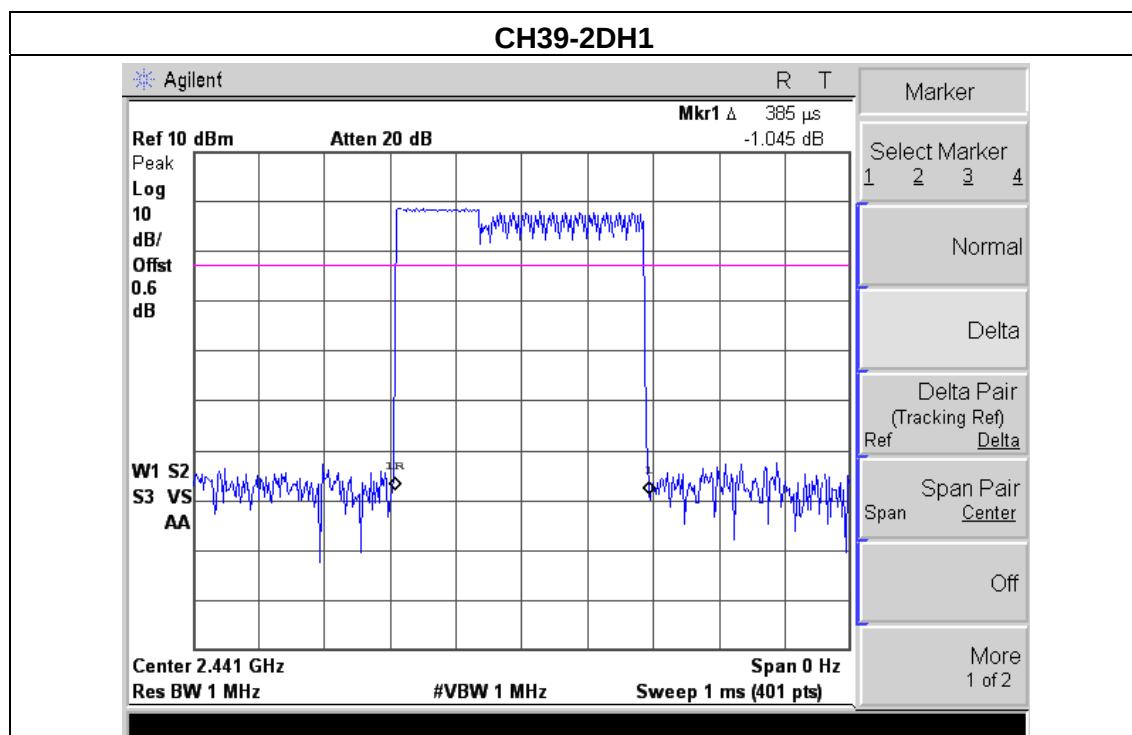


CH39-DH5

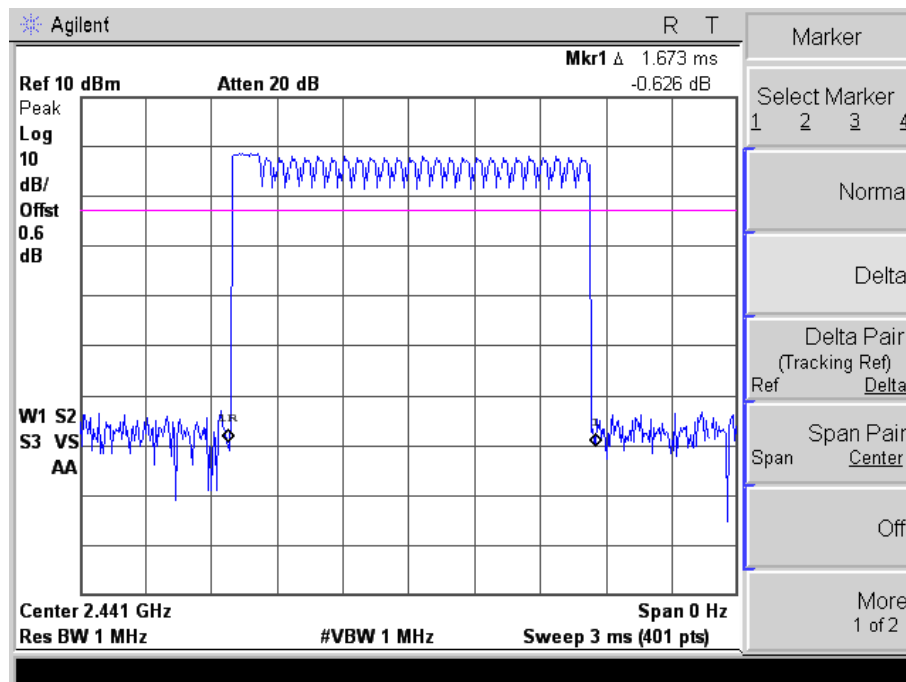


EUT :	GSM mobile phone	Model Name :	F9
Temperature :	25 °C	Relative Humidity :	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	$\pi/4$ -DQPSK(2Mbps) –2DH1/2DH3/2DH5		

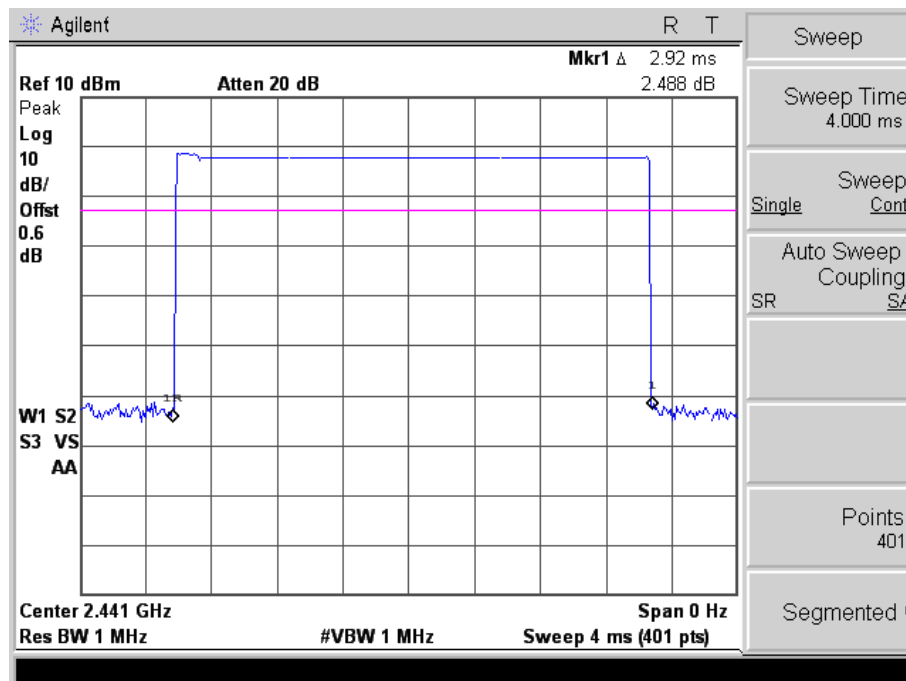
Data Packet	Frequen cy	Pulse Duration (ms)	Dwell Time (s)	Limits (s)
2DH1	2441 MHz	0.385	0.12	0.4
2DH3	2441 MHz	1.673	0.27	0.4
2DH5	2441 MHz	2.920	0.31	0.4



CH39-2DH3

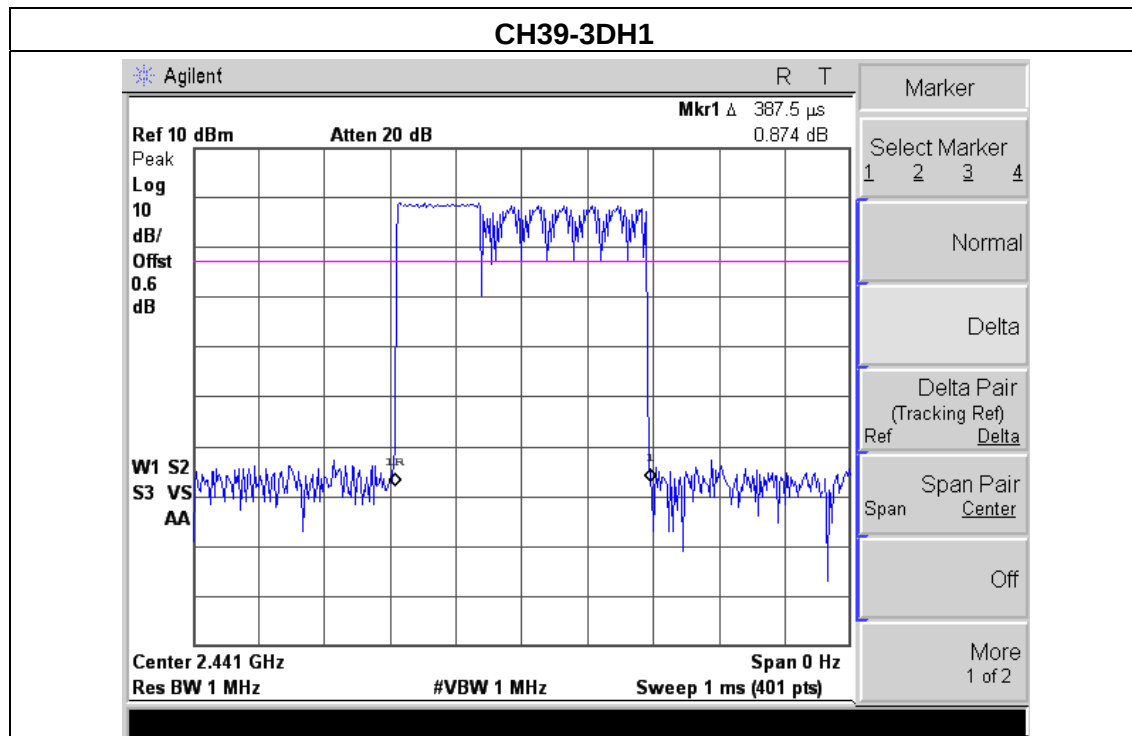


CH39-2DH5

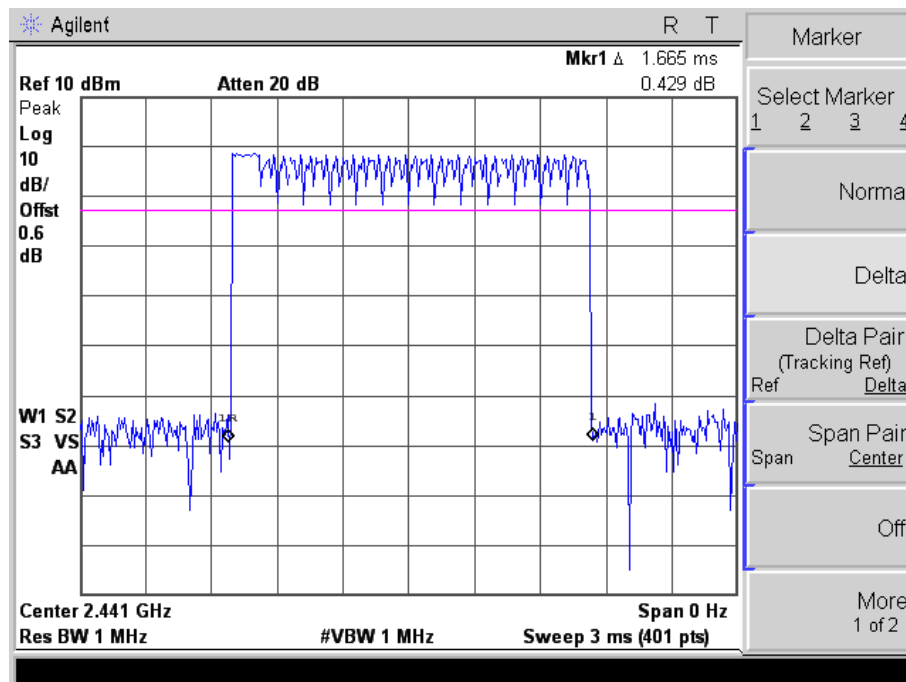


EUT :	GSM mobile phone	Model Name :	F9
Temperature :	25 °C	Relative Humidity :	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	8DPSK(2Mbps) –3DH1/3DH3/3DH5		

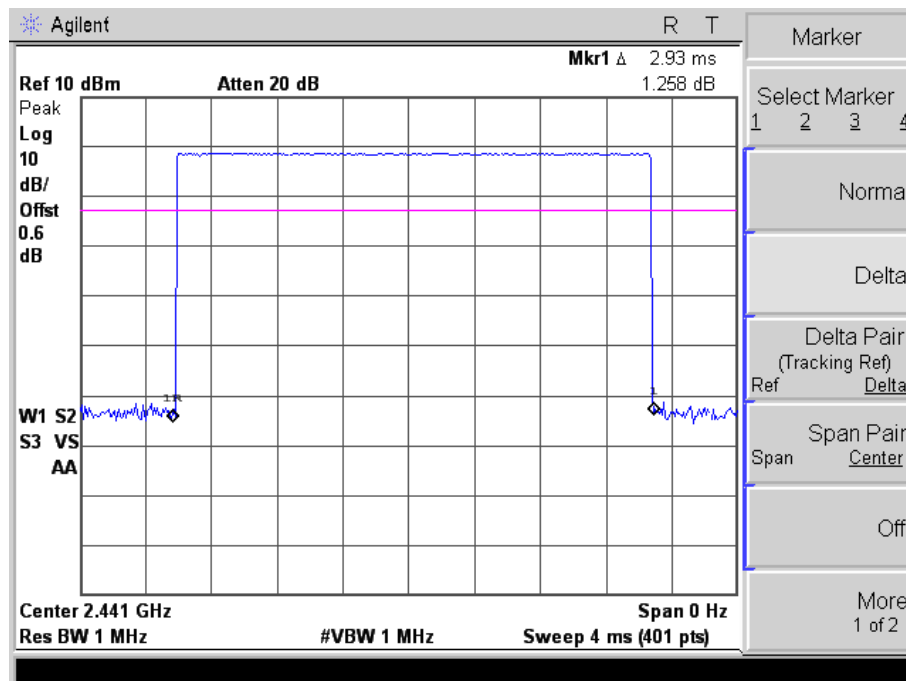
Data Packet	Frequen cy	Pulse Duration (ms)	Dwell Time (s)	Limits (s)
3DH1	2441 MHz	0.387	0.12	0.4
3DH3	2441 MHz	1.680	0.27	0.4
3DH5	2441 MHz	2.940	0.31	0.4



CH39-3DH3



CH39-3DH5



7. HOPPING CHANNEL SEPARATION MEASUREMENT

7.1 APPLIED PROCEDURES / LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 20 dB bandwidth of the hopping channel, whichever is greater.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz (20dB Bandwidth) / 30 kHz (Channel Separation)
VB	100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

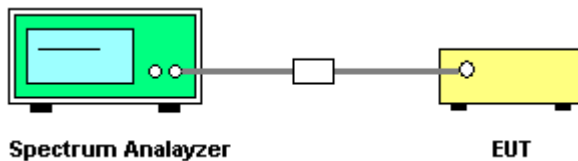
7.1.1 TEST PROCEDURE

- The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
- The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for 20 dB bandwidth measurement.
- The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for channel separation measurement.

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

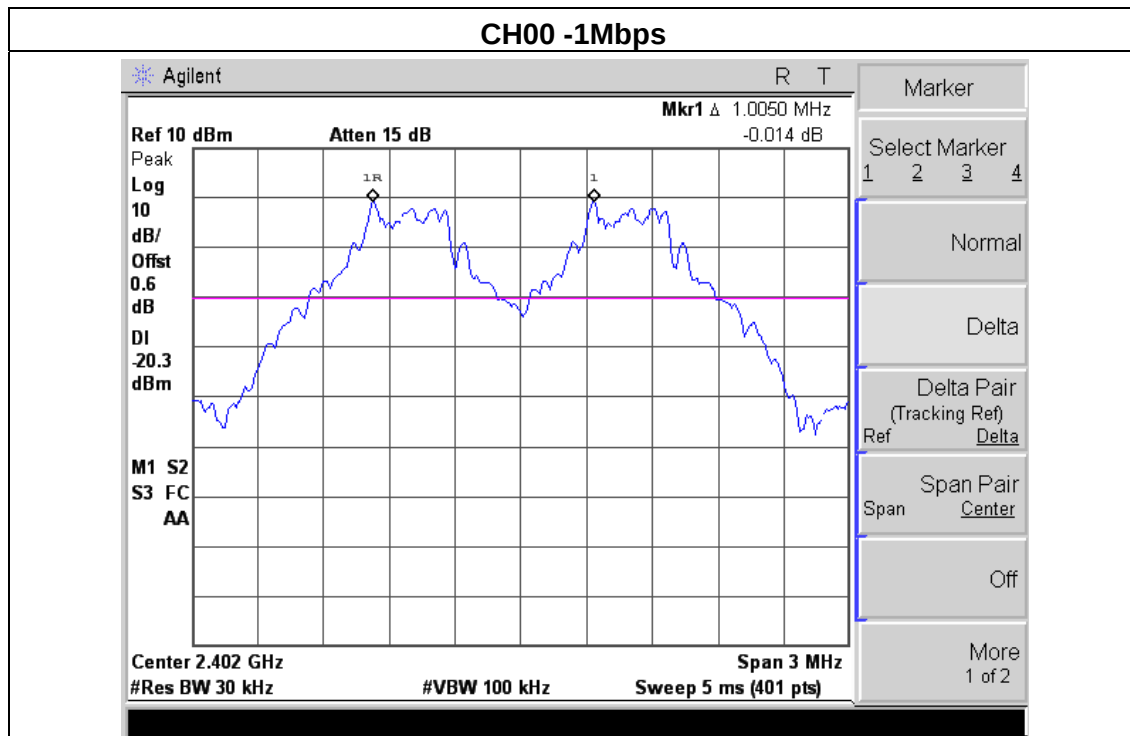
7.1.4 TEST RESULTS

EUT :	GSM mobile phone	Model Name :	F9
Temperature :	25 °C	Relative Humidity :	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /CH78 (GFSK(1Mbps) Mode)		

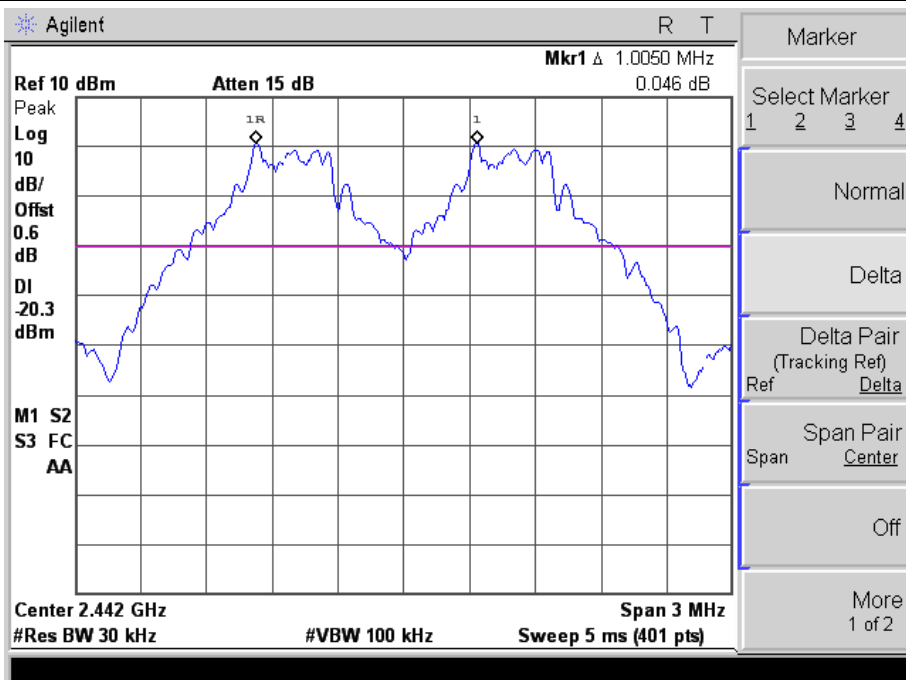
Frequency	Ch. Separation (MHz)	Result
2402 MHz	1.005	Complies
2441 MHz	1.005	Complies
2480 MHz	1.005	Complies

For GFSK:

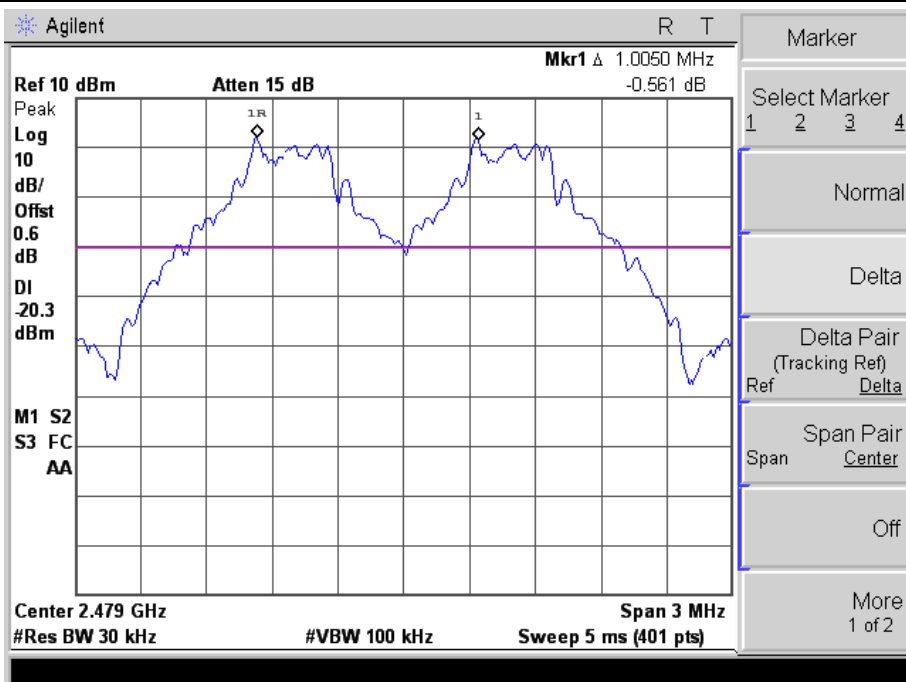
Ch. Separation Limits: > 20dB bandwidth



CH39 -1Mbps



CH78 -1Mbps

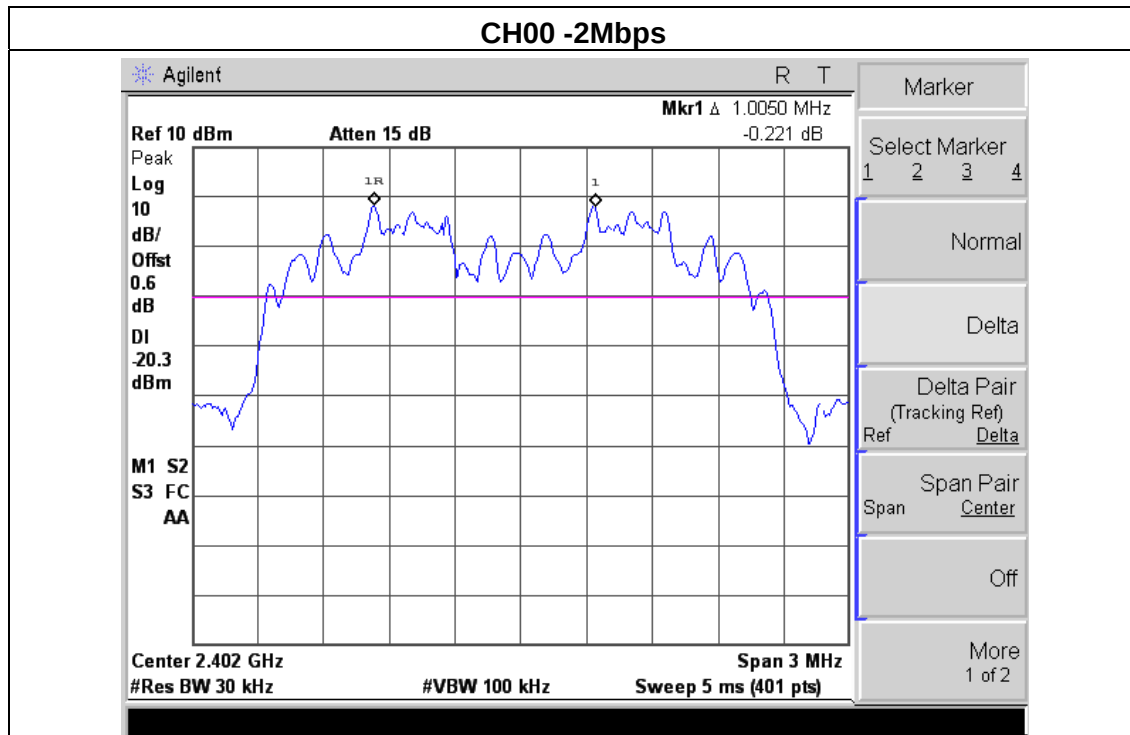


EUT :	GSM mobile phone	Model Name :	F9
Temperature :	25 °C	Relative Humidity :	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /CH78 ($\pi/4$ -DQPSK(2Mbps) Mode)		

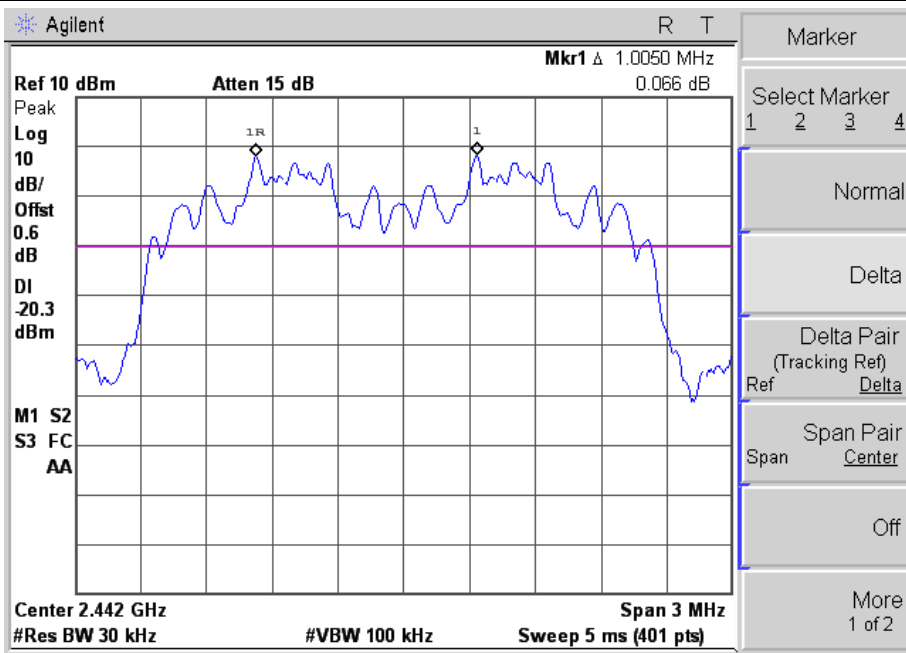
Frequency	Ch. Separation (MHz)	Result
2402 MHz	1.005	Complies
2441 MHz	1.005	Complies
2480 MHz	1.005	Complies

For $\pi/4$ -DQPSK(2Mbps):

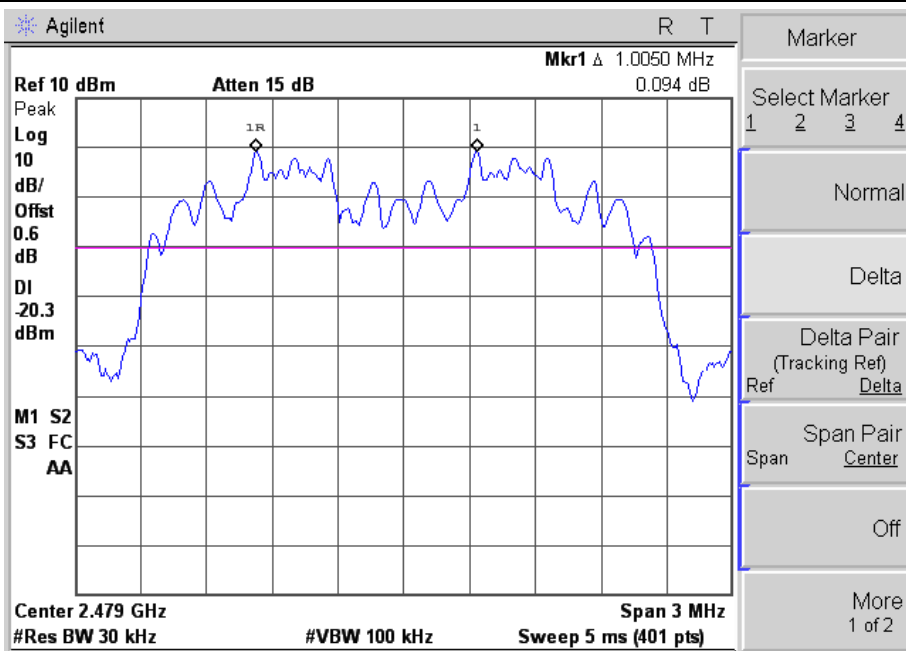
Ch. Separation Limits: > two-thirds 20dB bandwidth



CH39 -2Mbps



CH78 -2Mbps

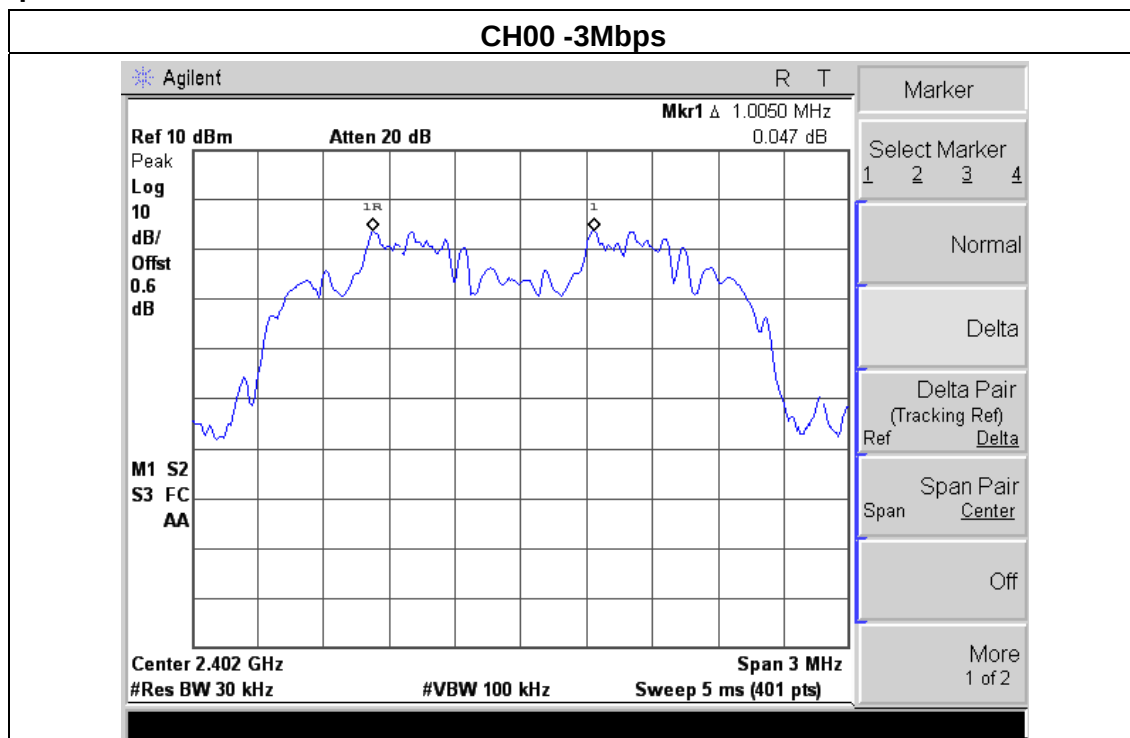


EUT :	GSM mobile phone	Model Name :	F9
Temperature :	25 °C	Relative Humidity :	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /CH78 (8-DPSK(3Mbps)Mode)		

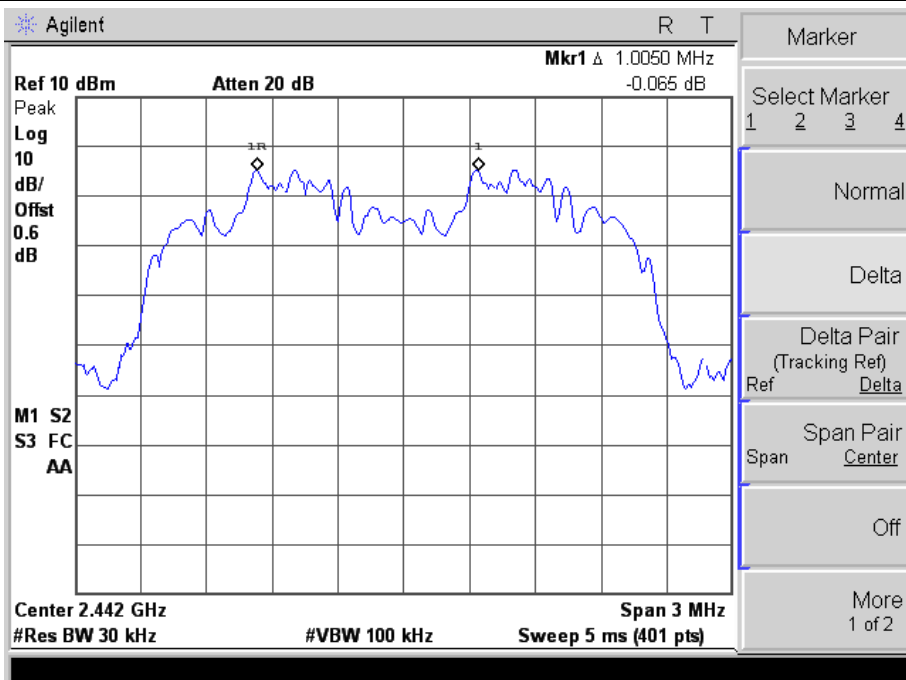
Frequency	Ch. Separation (MHz)	Result
2402 MHz	1.005	Complies
2441 MHz	1.005	Complies
2480 MHz	1.005	Complies

For 8-DPSK(3Mbps):

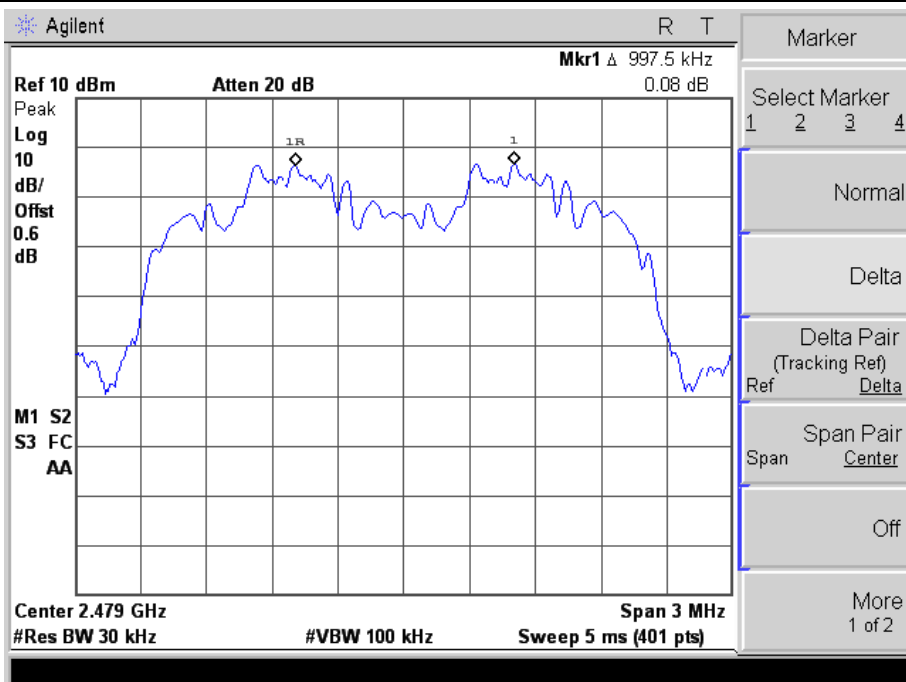
Ch. Separation Limits: > two-thirds 20dB bandwidth



CH39 -3Mbps



CH78 -3Mbps



8. BANDWIDTH TEST**8.1 APPLIED PROCEDURES / LIMIT**

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)	Bandwidth	(20dB bandwidth)	2400-2483.5	PASS

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz (20dB Bandwidth) / 30 kHz (Channel Separation)
VB	100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

8.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 30KHz, VBW=100KHz, Sweep time = Auto.

8.1.2 DEVIATION FROM STANDARD

No deviation.

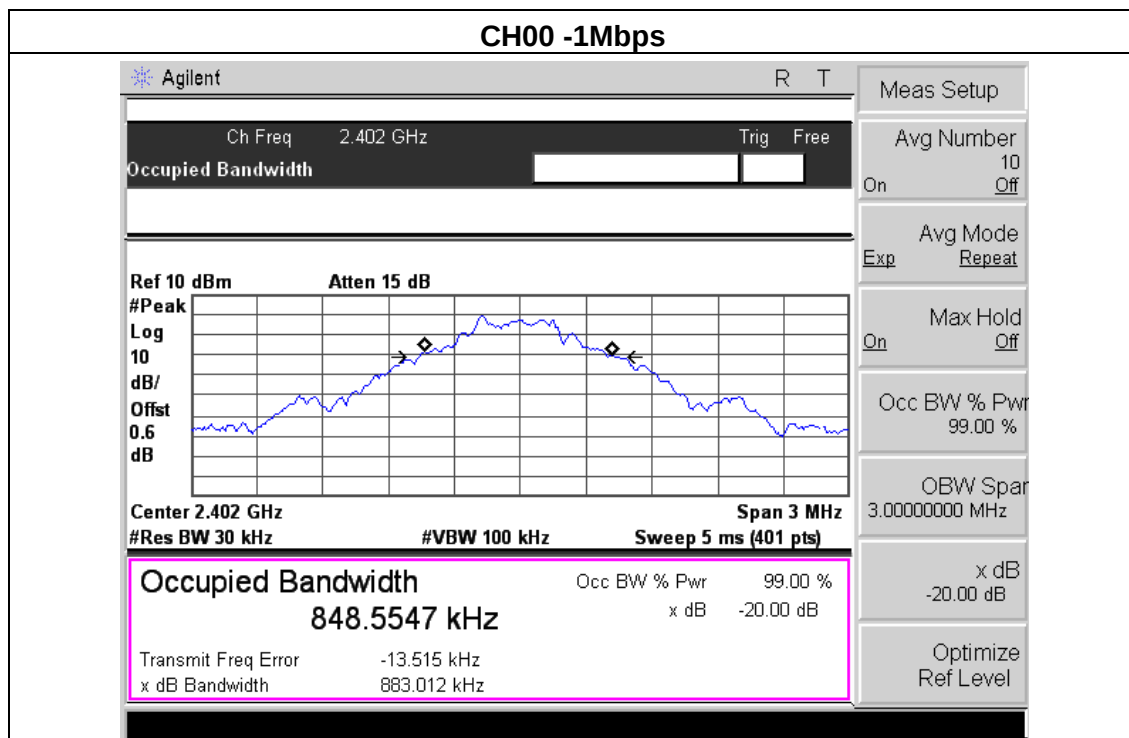
8.1.3 TEST SETUP**8.1.4 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

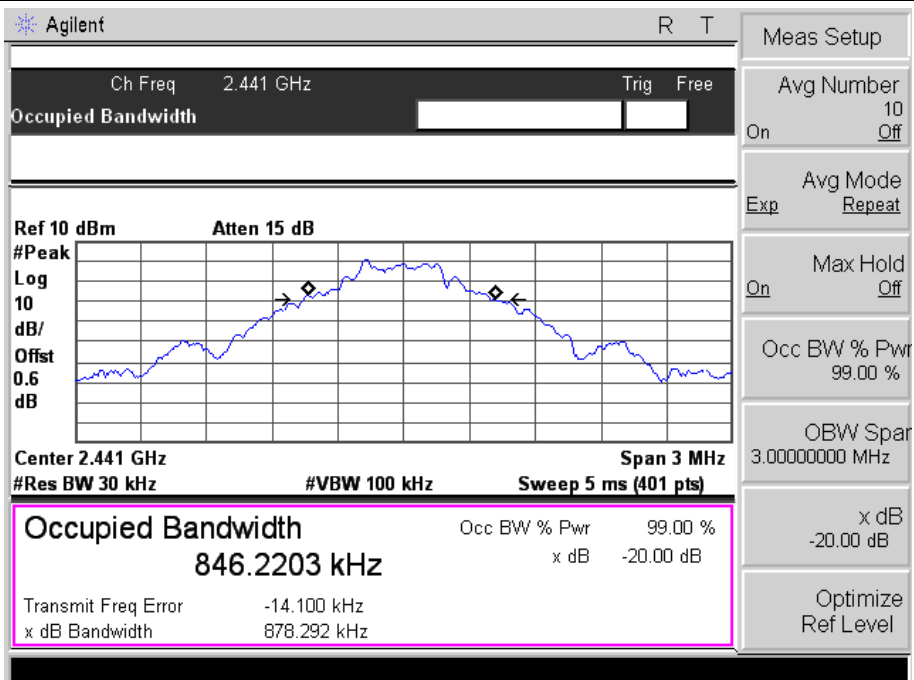
8.1.5 TEST RESULTS

EUT :	GSM mobile phone	Model Name :	F9
Temperature :	25 °C	Relative Humidity :	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	GFSK(1Mbps)CH00 / CH39 /C78		

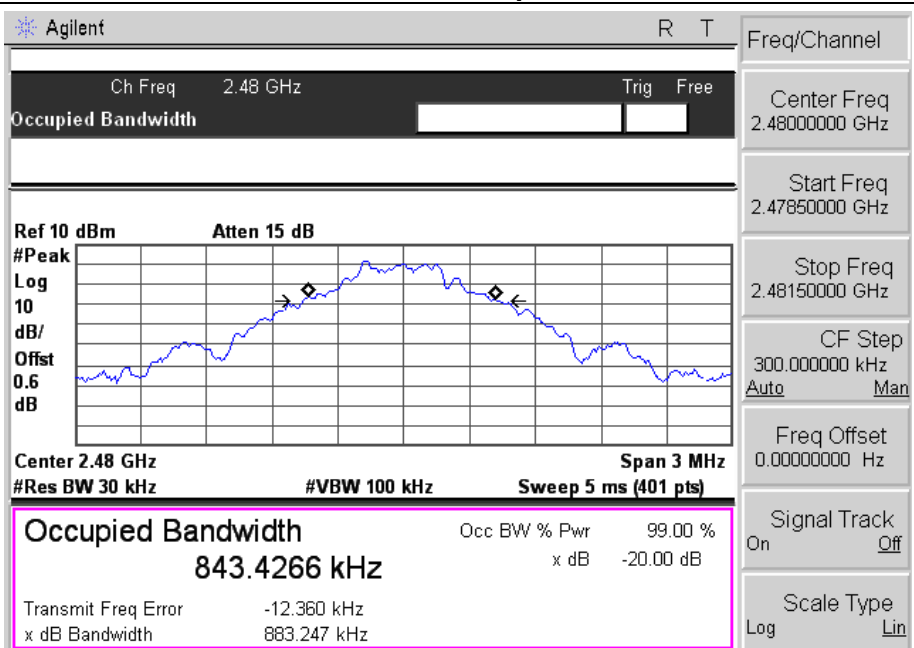
Frequency	20dB Bandwidth (kHz)	Result
2402 MHz	883.012	PASS
2441 MHz	846.220	PASS
2480 MHz	883.247	PASS



CH39 -1Mbps

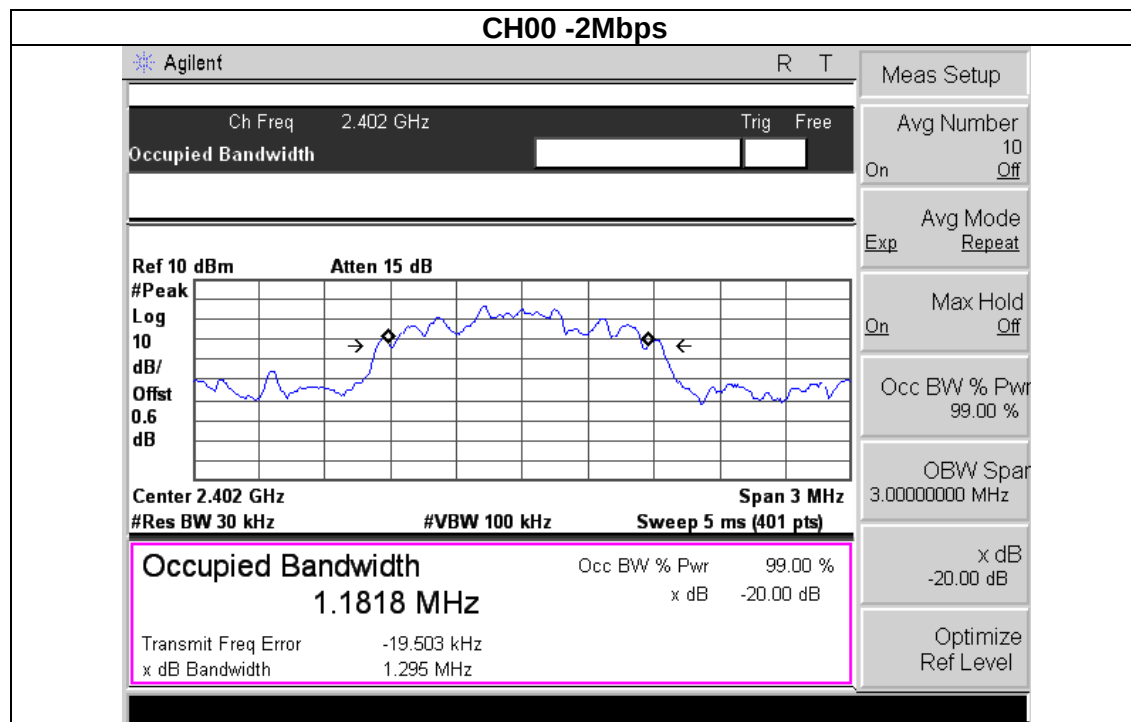


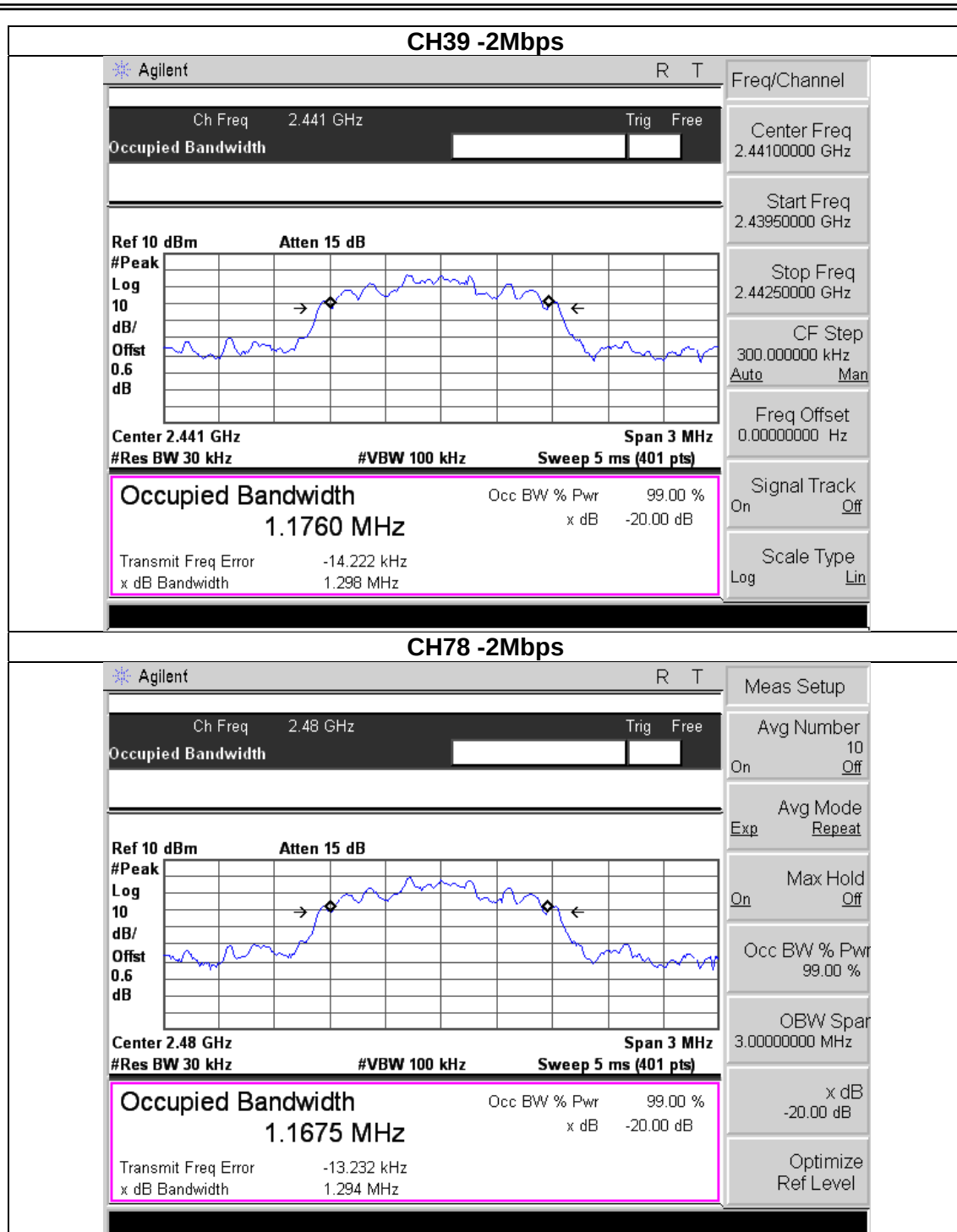
CH78 -1Mbps



EUT:	GSM mobile phone	Model Name :	F9
Temperature:	25 °C	Relative Humidity:	50%
Pressure:	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	$\pi/4$ -DQPSK(2Mbps)CH00 / CH39 /C78		

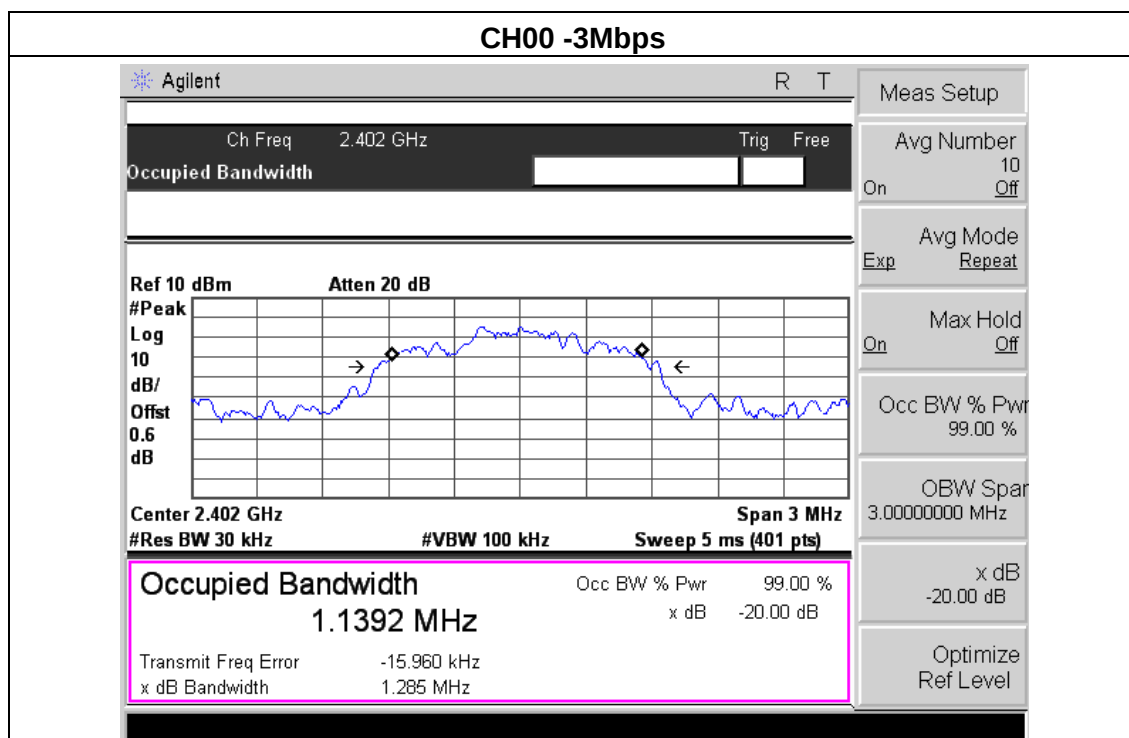
Frequency	20dB Bandwidth(kHz)	Result
2402 MHz	1.295	PASS
2441 MHz	1.298	PASS
2480 MHz	1.294	PASS



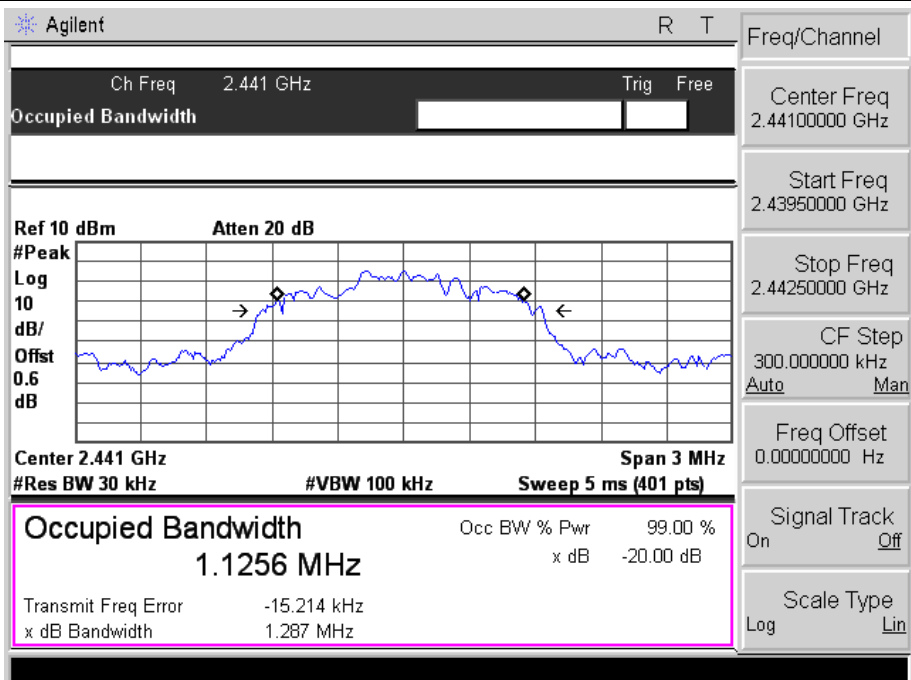


EUT :	GSM mobile phone	Model Name :	F9
Temperature :	25 °C	Relative Humidity :	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	8-DPSK(3Mbps)CH00 / CH39 /C78		

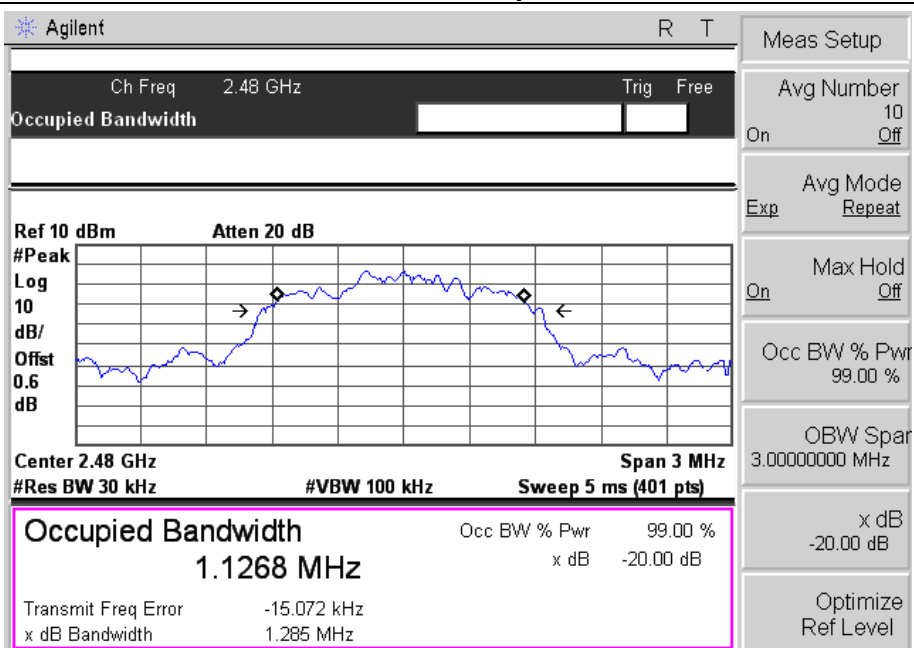
Frequency	20dB Bandwidth (kHz)	Result
2402 MHz	1.285	PASS
2441 MHz	1.287	PASS
2480 MHz	1.285	PASS



CH39 -3Mbps



CH78 -3Mbps



9. PEAK OUTPUT POWER TEST

9.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (b)(i)	Peak Output Power	1 W or 30dBm	2400-2483.5	PASS
		Or if channel separation > 2/3 bandwidth provided the systems operate with an output power no greater than 125 mW (20.96dBm)		

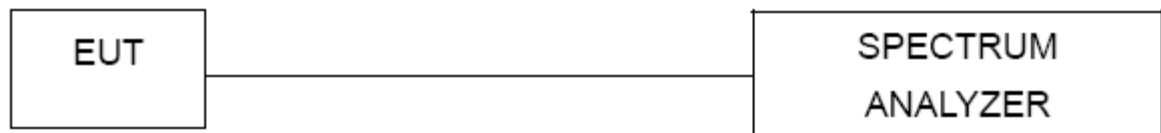
9.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 1MHz, VBW= 1MHz, Sweep time = Auto.

9.1.2 DEVIATION FROM STANDARD

No deviation.

9.1.3 TEST SETUP



9.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

9.1.5 TEST RESULTS

EUT :	GSM mobile phone	Model Name :	F9
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00/ CH39 /CH78 GFSK(1Mbps)		

Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)
CH00	2402	1.062	30
CH39	2441	1.431	30
CH78	2480	2.694	30

EUT :	GSM mobile phone	Model Name :	F9
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00/ CH39 /CH78 $\pi/4$ -DQPSK(2Mbps)		

Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)
CH00	2402	-1.007	20.96
CH39	2441	0.549	20.96
CH78	2480	0.712	20.96

Note : the channel separation $>2/3$ bandwidth

EUT:	GSM mobile phone	Model Name :	F9
Temperature:	25 °C	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00/ CH39 /CH78 8-DPSK(3Mbps)		

Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)
CH00	2402	-2.411	20.96
CH39	2441	-1.682	20.96
CH78	2480	-0.633	20.96

NOTE: THE CHANNEL SEPARATION $>2/3$ BANDWIDTH

10. ANTENNA REQUIREMENT

10.1 STANDARD REQUIREMENT

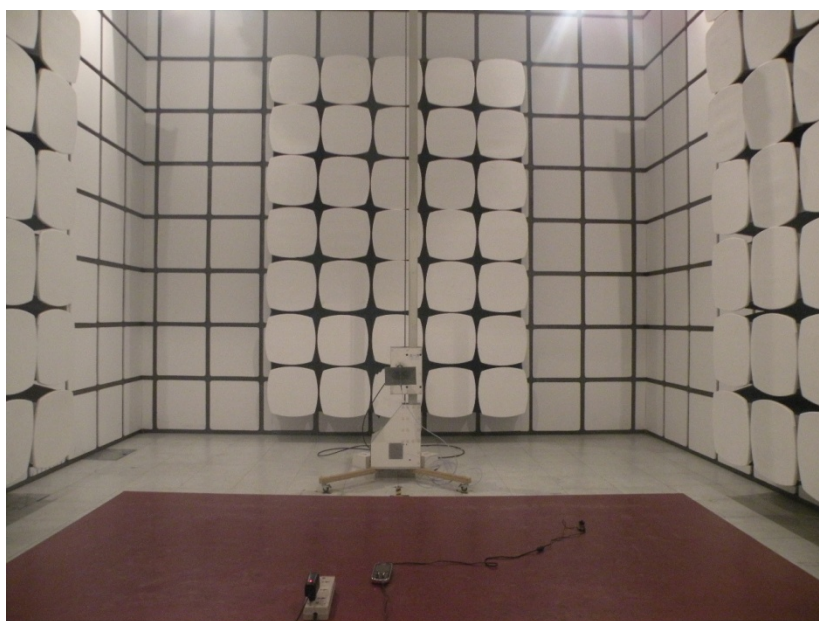
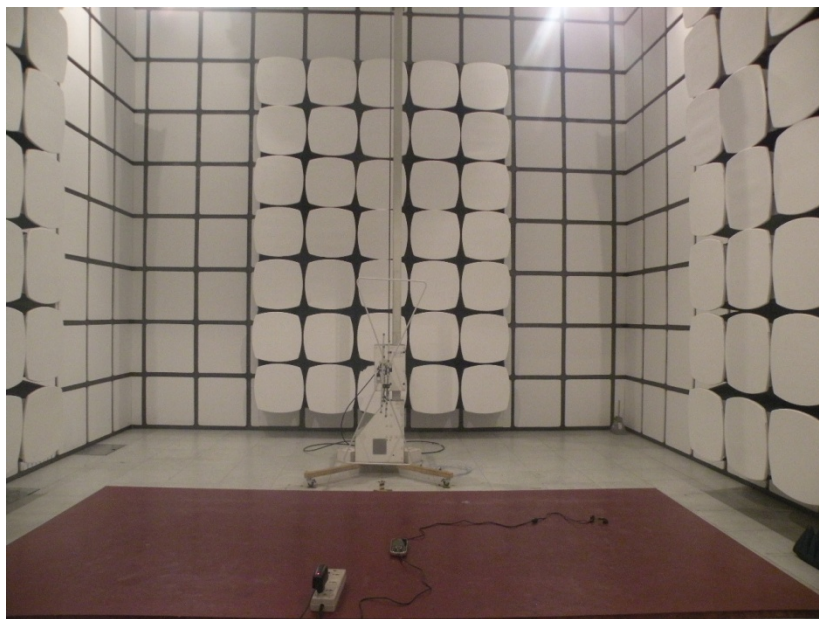
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

10.2 EUT ANTENNA

The EUT antenna is integral Antenna. It comply with the standard requirement.

TEST SETUP

Radiated Measurement Photos



Conducted Measurement Photos

