

Test Report No. 7191109489-EEC15/03
dated 17 Jun 2015



PSB Singapore

Note: This report is issued subject to the Testing and Certification Regulations of the TÜV SÜD Group and the General Terms and Conditions of Business of TÜV SÜD PSB Pte Ltd. In addition, this report is governed by the terms set out within this report.

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TEST REPORT COVER PAGE

Product Information			
Product Name / Description:	2 Way Radio	Applicant Company Number:	109U
Model Number(s):	H51VCH9PW7AN	UPN Number:	89FT7063
All Used IC Test Site(s) Reg. #:	29321-1	SAR Test Lab Company Number:	--
FCC ID:	AZ489FT7063	IC ID:	109U-89FT7063

Emissions Information								
	Band 1	Band 2	Band 3	Band 4	Band 5	Band 6	Band 7	Band 8
RSS # & Issue #	210 & Issue 10							
Frequency Min (MHz)	2402							
Frequency Max (MHz)	2480							
RF Power Min (W) Conducted / EIRP / ERP	--							
RF Power Max (W) Conducted	0.0061							
Field Strength Units @ distance	103.7dB μ V/m @ 3m							
Measured BW (kHz) (99%, 26dB, 6dB, etc.)	1238kHz							
Calculated BW (kHz) As per TRC-43	1M24							
Emission Classification (FID, GID, DID, etc.)	G1D							
Transmitter Spurious Units @ distance	57.8dB μ V/m @ 3m							
	B	B	B	B	B	B	B	B
RSS # & Issue #								
Frequency Min (MHz)								
Frequency Max (MHz)								
RF Power Min (W) Conducted / EIRP / ERP								
RF Power Max (W) Conducted / EIRP / ERP								
Field Strength Units @ distance								
Measured BW (kHz) (99%, 26dB, 6dB, etc.)								
Calculated BW (kHz) As per TRC-43								
Emission Classification (FID, GID, DID, etc.)								
Transmitter Spurious Units @ distance								

Agreement Signature

ATTESTATION: The test measurements were made in accordance with the above-mentioned departmental standard(s), and that the radio equipment identified in this application has been subject to all the applicable test conditions specified in the departmental standards and all of the requirements of the standards have been met.

Applicant / Agent Name:	Lim Cher Hwee	Applicant / Agent Title:	Assistant Vice President
Applicant / Agent Signature:		Signature Date:	02 Apr 2015

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FORMAL REPORT ON TESTING IN ACCORDANCE WITH
47 CFR FCC Parts 15C
RSS-GEN Issue 4: 2014
RSS-210 Issue 8: 2010
OF A
2-WAY RADIO
[Model : H51VCH9PW7AN]
[FCC ID : AZ489FT7063]
[IC ID : 109U-89FT7063]

TEST FACILITY TÜV SÜD PSB Pte Ltd
Electrical & Electronics Centre (EEC), Product Services,
No. 1 Science Park Drive, Singapore 118221

FCC REG. NO. 99142 (3m and 10m Semi-Anechoic Chamber, Science Park)

IND. CANADA REG. NO. 2932I-1 (3m and 10m Semi-Anechoic Chamber, Science Park)

PREPARED FOR Motorola Solutions Malaysia Sdn Bhd
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QUOTATION NUMBER 2191015220

JOB NUMBER 7191109489

TEST PERIOD 13 Mar 2015 – 13 Aug 2015

PREPARED BY


Quek Keng Huat
Higher Associate Engineer

APPROVED BY


Lim Cher Hwee
Assistant Vice President



LA-2007-0380-A
LA-2007-0381-F
LA-2007-0382-B
LA-2007-0382-B-1
LA-2007-0383-G
LA-2007-0383-G-1

LA-2007-0384-G
LA-2007-0385-E
LA-2007-0386-C
LA-2010-0464-D
FFT-2013-0002-A

The results reported herein have been performed in accordance with the laboratory's terms of accreditation under the Singapore Accreditation Council - Singapore Laboratory Accreditation Scheme. Tests/Calibrations marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our laboratory.

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TUV[®]



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TEST SUMMARY

The product was tested in accordance with the customer's specifications.

Test Results Summary

Test Standard	Description	Pass / Fail
47 CFR FCC Part 15 & RSS-GEN Issue 4: 2014 and RSS-210 Issue 8: 2010		
15.107(a), 15.207 RSS-GEN 8.8	Conducted Emissions	Pass
15.109(a), 15.205, 15.209 RSS-210 2.2, RSS-GEN 8.9, 8.10	Transmitter Radiated Emissions (Spurious Emissions inclusive Restricted Bands Requirement)	Pass
15.247(a)(1) RSS-210 A8.1(b)	Carrier Frequency Separation	Pass
15.247(a)(1) RSS-210 A8.1(b)	Spectrum Bandwidth (20dB and 99% Bandwidth Measurement)	Pass ^{*See Note 5}
15.247(a)(1)(iii) RSS-210 A8.1(d)	Number of Hopping Frequencies	Pass
	Average Frequency Dwell Time	Pass
15.247(b)(1) RSS-210 A8.4(2)	Maximum Peak Power	Pass
15.247(d) RSS-210 A8.5	RF Conducted Spurious Emissions	Pass
	Band Edge Compliance (Conducted)	Pass
	Band Edge Compliance (Radiated)	Pass
15.247(e) RSS-210 A8.2(b)	Peak Power Spectral Density	Pass



TEST SUMMARY

Notes

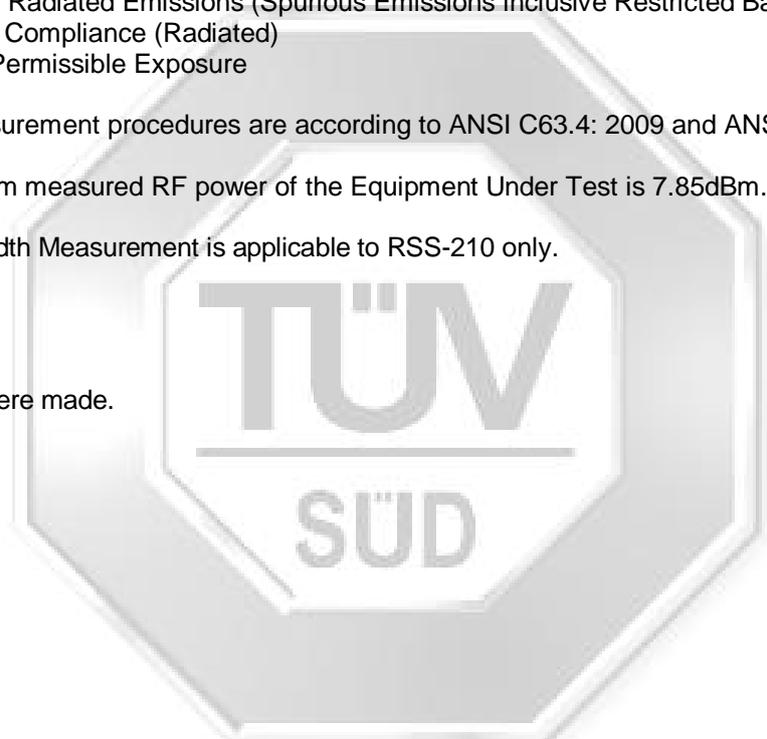
1. Three channels as listed below, which respectively represent the lower, middle and upper channels of the Equipment Under Test (EUT) were chosen and tested. For each channel, the EUT was configured to operate in the test mode.

<u>Transmit Channel</u>	<u>Frequency (GHz)</u>
Channel 0	2.402
Channel 39	2.441
Channel 78	2.480

2. All the measurements were done based on conducted method except
 - Transmitter Radiated Emissions (Spurious Emissions inclusive Restricted Bands Requirement)
 - Band Edge Compliance (Radiated)
 - Maximum Permissible Exposure
3. All test measurement procedures are according to ANSI C63.4: 2009 and ANSI C63.10: 2013.
4. The maximum measured RF power of the Equipment Under Test is 7.85dBm.
5. 99% Bandwidth Measurement is applicable to RSS-210 only.

Modifications

No modifications were made.





PRODUCT DESCRIPTION

Description	: The Equipment Under Test (EUT) is a 2-WAY RADIO .
Applicant	: Motorola Solutions Malaysia Sdn Bhd Plot 2, Technoplex Industrial Park Mukim 12 Swd, Medan Bayan Lepas, Bayan Lepas Industrial Park, 11900 Bayan Lepas, Pulau Penang, Malaysia
Manufacturer	: Motorola Solutions Malaysia Sdn Bhd Plot 2, Technoplex Industrial Park Mukim 12 Swd, Medan Bayan Lepas, Bayan Lepas Industrial Park, 11900 Bayan Lepas, Pulau Penang, Malaysia
Factor (ies)	: Motorola Solutions Malaysia Sdn Bhd Plot 2, Technoplex Industrial Park Mukim 12 Swd, Medan Bayan Lepas, Bayan Lepas Industrial Park, 11900 Bayan Lepas, Pulau Penang, Malaysia
Model Number	: H51VCH9PW7AN
Regulatory ID	: FCC: AZ489FT7063 and IC: 109U-89FT7063
Serial Number	: Nil
Microprocessor	: OMAP
Operating / Transmitting Frequency	: <u>Bluetooth</u> 2.402GHz (lower channel) to 2.480GHz (upper channel) 79 channels <u>Land Mobile</u> 806.0125MHz (lower channel) to 940.9875MHz (upper channel) 512 channels
Clock / Oscillator Frequency	: TX: 806-825MHz, 851-870MHz, 896-902MHz, 935-941MHz RX LO: 960.65-979.65MHz, 825.35-831.35MHz
Modulation	: <u>Bluetooth</u> Gaussian Frequency Shift Keying (GFSK) ($\pi/4$) DQPSK 8DPSK <u>Land Mobile</u> Frequency Modulation (FM)
Antenna Gain	: AN000113A01, Bluetooth Antenna: 2.15dBi PMAF4020A, Land Mobile Antenna: 2.15dBi
Port / Connectors	: Refer to manufacturer's user manual / operating manual
Rated Input Power	: 120V 60Hz
Accessories	: Refer to manufacturer's user manual / operating manual



SUPPORTING EQUIPMENT DESCRIPTION

Equipment Description (Including Brand Name)	Model, Serial & FCC ID Number	Cable Description (List Length, Type & Purpose)
Lenovo Laptop	M/N: T400 S/N: R8-RZCLK FCC ID: DoC	Nil
Lenovo AC Adapter	M/N: 42T4424 S/N: 11S42T4424Z1ZF3E9BV2DD FCC ID: DoC	1.80m unshielded power cable





EUT OPERATING CONDITIONS

47 CFR FCC Part 15 & RSS-GEN Issue 4: 2014 and RSS-210 Issue 8: 2010

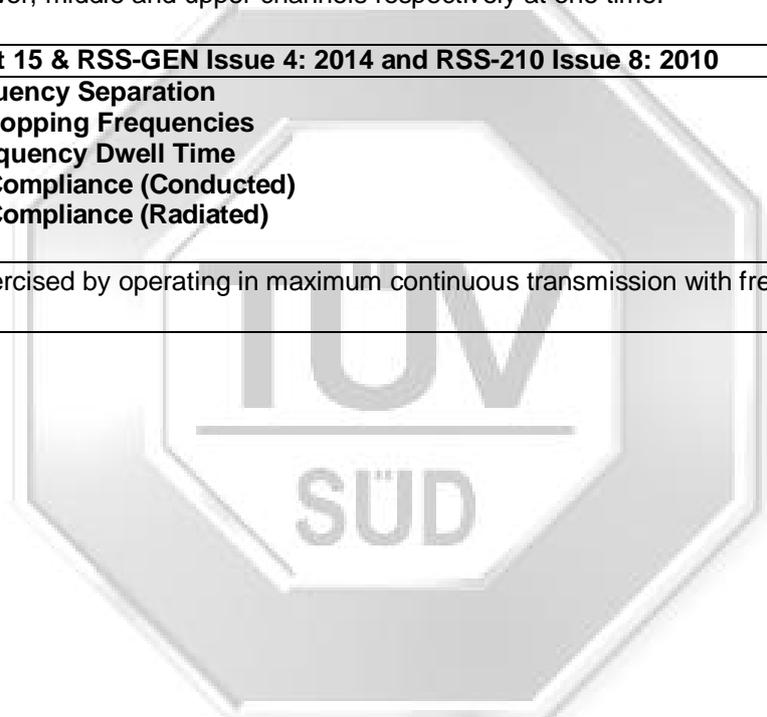
1. Conducted Emissions
2. Transmitter Radiated Emissions (Spurious Emissions inclusive Restricted Bands Requirement)
3. Spectrum Bandwidth (20dB and 99% Bandwidth Measurement)
4. Maximum Peak Power
5. RF Conducted Spurious Emissions
6. Peak Power Spectral Density
7. Maximum Permissible Exposure

The EUT was exercised by operating in maximum continuous transmission with frequency hopping off, i.e transmitting at lower, middle and upper channels respectively at one time.

47 CFR FCC Part 15 & RSS-GEN Issue 4: 2014 and RSS-210 Issue 8: 2010

1. Carrier Frequency Separation
2. Number of Hopping Frequencies
3. Average Frequency Dwell Time
4. Band Edge Compliance (Conducted)
5. Band Edge Compliance (Radiated)

The EUT was exercised by operating in maximum continuous transmission with frequency hopping on.





CONDUCTED EMISSION TEST

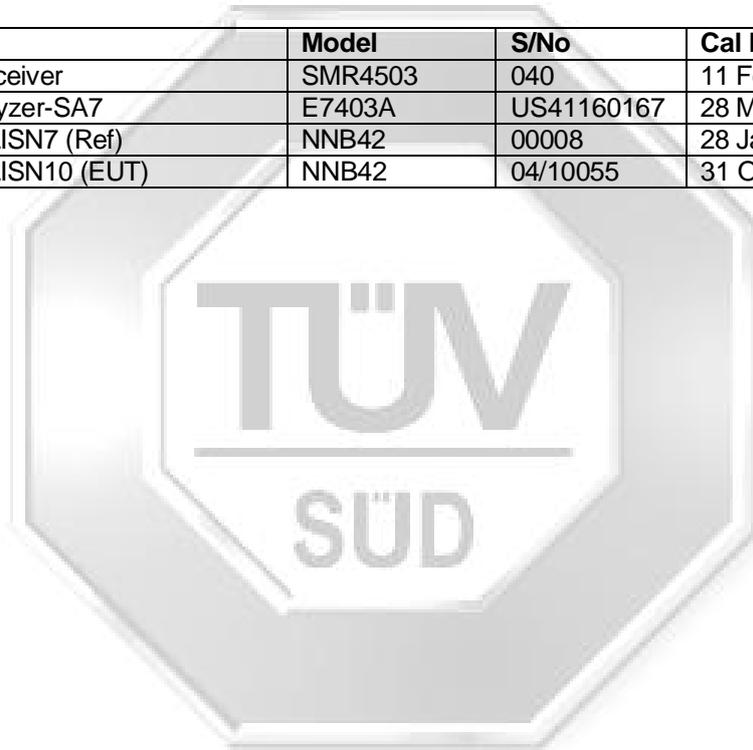
47 CFR FCC Parts 15.107(a), 15.207 and RSS-GEN 8.8 Conducted Emission Limits

Frequency Range (MHz)	Limit Values (dBµV)	
	Quasi-peak (Q-P)	Average (AV)
0.15 - 0.5	66 – 56 *	56 – 46 *
0.5 - 5.0	56	46
5.0 - 30.0	60	50

* Decreasing linearly with the logarithm of the frequency

47 CFR FCC Parts 15.107(a), 15.207 and RSS-GEN 8.8 Conducted Emission Test Instrumentation

Instrument	Model	S/No	Cal Due Date	Cal Interval
Schaffner EMI Receiver	SMR4503	040	11 Feb 2016	1 year
Agilent EMC Analyzer-SA7	E7403A	US41160167	28 May 2015	1 year
Schaffner LISN –LISN7 (Ref)	NNB42	00008	28 Jan 2016	1 year
Schaffner LISN –LISN10 (EUT)	NNB42	04/10055	31 Oct 2015	1 year





CONDUCTED EMISSION TEST

47 CFR FCC Parts 15.107(a), 15.207 and RSS-GEN 8.8 Test Setup

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.
2. The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.
4. All other supporting equipment were powered separately from another LISN.

47 CFR FCC Parts 15.107(a), 15.207 and RSS-GEN 8.8 Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A scan was made on the NEUTRAL line over the required frequency range using an EMI test receiver.
3. High peaks, relative to the limit line, were then selected.
4. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 9kHz. Both Quasi-peak and Average measurements were made.
5. Steps 2 to 4 were then repeated for the LIVE line.

Sample Calculation Example

At 20 MHz	Q-P limit = 60.0 dBμV
Transducer factor of LISN, pulse limiter & cable loss at 20 MHz = 11.2 dB	
Q-P reading obtained directly from EMI Receiver = 40.0 dBμV (Calibrated for system losses)	
Therefore, Q-P margin = 60.0 - 40.0 = 20.0	i.e. 20.0 dB below Q-P limit



CONDUCTED EMISSION TEST

47 CFR FCC Parts 15.107(a), 15.207and RSS-GEN 8.8 Results

Test Input Power	120V 60Hz	Temperature	24°C
Line Under Test	AC Mains	Relative Humidity	60%
Worst Modulation	8DPSK	Atmospheric Pressure	1030mbar
		Tested By	Lim Kay Tak

Frequency (MHz)	Q-P Value (dBµV)	Q-P Limit (dBµV)	Q-P Margin (dB)	AV Value (dBµV)	AV Limit (dBµV)	AV Margin (dB)	Line	Channel
0.1796	50.5	64.5	14.0	38.6	54.5	15.9	Live	39
0.2200	47.2	62.8	15.6	35.6	52.8	17.2	Live	39
0.5033	45.3	56.0	10.7	38.3	46.0	7.7	Neutral	39
0.5062	44.7	56.0	11.3	38.4	46.0	7.6	Live	39
20.2888	43.2	60.0	16.8	36.5	50.0	13.5	Neutral	39
20.3772	43.2	60.0	16.8	36.1	50.0	13.9	Live	39

Notes

- All possible modes of operation were investigated from 150kHz to 30MHz. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
- A "positive" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency. Conversely, a "negative" margin indicates a FAIL.
- EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:
9kHz - 30MHz
RBW: 9kHz VBW: 30kHz
- Conducted Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 9kHz – 30MHz is ±2.2dB.

TRANSMITTER RADIATED EMISSION TEST

47 CFR FCC Part 15.205 and RSS-GEN 8.10 Restricted Bands

MHz		MHz		MHz		GHz	
0.090	- 0.110	16.42	- 16.423	399.9	- 410	4.5	- 5.15
0.495	- 0.505	16.69475	- 16.69525	608	- 614	5.35	- 5.46
2.1735	- 2.1905	16.80425	- 16.80475	960	- 1240	7.25	- 7.75
4.125	- 4.128	25.5	- 25.67	1300	- 1427	8.025	- 8.5
4.17725	- 4.17775	37.5	- 38.25	1435	- 1626.5	9.0	- 9.2
4.20725	- 4.20775	73	- 74.6	1645.5	- 1646.5	9.3	- 9.5
6.215	- 6.218	74.8	- 75.2	1660	- 1710	10.6	- 12.7
6.26775	- 6.26825	108	- 121.94	1718.8	- 1722.2	13.25	- 13.4
6.31175	- 6.31225	123	- 138	2200	- 2300	14.47	- 14.5
8.291	- 8.294	149.9	- 150.05	2310	- 2390	15.35	- 16.2
8.362	- 8.366	156.52475	- 156.52525	2483.5	- 2500	17.7	- 21.4
8.37625	- 8.38675	156.7	- 156.9	2690	- 2900	22.01	- 23.12
8.41425	- 8.41475	162.0125	- 167.17	3260	- 3267	23.6	- 24.0
12.29	- 12.293	167.72	- 173.2	3332	- 3339	31.2	- 31.8
12.51975	- 12.52025	240	- 285	3345.8	- 3358	36.43	- 36.5
12.57675	- 12.57725	322	- 335.4	3600	- 4400	Above 38.6	
13.36	- 13.41						

47 CFR FCC Part 15.109(a), 15.209 and RSS-GEN 8.9 Transmitter Radiated Emission Limits

Frequency Range (MHz)	Quasi-Peak Limit Values (dBµV/m)
0.009 - 0.490	20 log [2400 / F (kHz)] @ 300m
0.490 - 1.705	20 log [24000 / F (kHz)] @ 30m
1.705 - 30.0	30.0 @ 30m
30 - 88	40.0 @ 3m
88 - 216	43.5 @ 3m
216 - 960	46.0 @ 3m
Above 960	54.0* @ 3m

* For frequency bands 9kHz – 90kHz, 110kHz – 490kHz and above 1GHz, average detector was used. A peak limit of 20dB above the average limit does apply.

47 CFR FCC Parts 15.109(a), 15.209, RSS-210 2.2 and RSS-GEN 8.9, 8.10 Transmitter Radiated Emission Test Instrumentation

Instrument	Model	S/No	Cal Due Date	Cal Interval
R&S Test Receiver – ESI1	ESI40	100010	23 Jul 2015	1 year
Schaffner Bilog Antenna –(30MHz-2GHz) BL3 (Ref)	CBL6112D	2549	29 Jan 2016	1 year
ETS Horn Antenna(18GHz-40GHz)(Ref)	3116	0004-2474	02 Oct 2015	1 year
TDK-RF Horn Antenna	HRN-0118	130256	10 Jul 2015	1 year
R&S Preamplifier (1GHz -18GHz)	SCU18	102191	13 Mar 2016	1 year
Agilent Preamplifier(1GHz-26.5GHz) (PA18)	8449D	3008A02305	06 Oct 2015	1 year
Com-Power Preamplifier (1MHz-1GHz)	PAM-103	441096	13 Oct 2015	1 year
Micro-Tronics Bandstop Filter (2.4-2.5 GHz)	BRM50701	017	13 Aug 2015	1 year



TRANSMITTER RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.209, RSS-210 2.2 and RSS-GEN 8.9, 8.10 Transmitter Radiated Emission Test Setup

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table. For >1GHz measurements, the EUT is raised further to a height of 1.5m with a non-metallic foam block.
2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.
3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.

47 CFR FCC Parts 15.109(a), 15.209, RSS-210 2.2 and RSS-GEN 8.9, 8.10 Transmitter Radiated Emission Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A prescan was carried out to pick the worst emission frequencies from the EUT. For EUT which is a portable device, the prescan was carried out by rotating the EUT through three orthogonal axes to determine which altitude and equipment arrangement produces such emissions.
3. The test was carried out at the selected frequency points obtained from the prescan in step 2. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
 - a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
 - b. The EUT was then rotated to the direction that gave the maximum emission.
 - c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
4. A Quasi-peak measurement was made for that frequency point if it was less than or equal to 1GHz. For frequency point in the range of 9kHz – 90kHz, 110kHz – 490kHz and above 1GHz, both Peak and Average measurements were carried out.
5. Steps 3 and 4 were repeated for the next frequency point, until all selected frequency points were measured.
6. The frequency range covered was from the lowest radio frequency signal generated from the EUT, without going below 9kHz to 10th harmonics of the EUT fundamental frequency, using the loop antenna for frequency below 30MHz, Bi-log antenna for frequencies from 30MHz up to 1GHz, and the Horn antenna above 1GHz.

Sample Calculation Example

At 300 MHz	Q-P limit = 46.0 dB μ V/m
Log-periodic antenna factor & cable loss at 300 MHz = 18.5 dB	
Q-P reading obtained directly from EMI Receiver = 40.0 dB μ V/m (Calibrated level including antenna factors & cable losses)	
Therefore, Q-P margin = 46.0 - 40.0 = 6.0	i.e. 6.0 dB below Q-P limit



TRANSMITTER RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205, 15.209, RSS-210 2.2 and RSS-GEN 8.9, 8.10 Transmitter Radiated Emission Results

Test Input Power	120V 60Hz	Temperature	24°C
Test Distance	3m (≥30MHz – 25GHz)	Relative Humidity	60%
Operating Mode	Transmitting	Atmospheric Pressure	1030mbar
Worst Modulation	8DPSK	Tested By	Lim Kay Tak

Spurious Emissions ranging from 30MHz – 1GHz

Frequency (MHz)	Q-P Value (dBµV/m)	Q-P Limit (dBµV/m)	Q-P Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Channel
30.7930	34.8	40.0	5.2	401	42	V	0
604.7990	35.7	46.0	10.3	99	27	H	0
483.8400	34.5	46.0	11.5	99	206	H	0
362.8780	34.1	46.0	11.9	98	285	H	0
907.1810	34.0	46.0	12.0	99	0	V	0
211.2520	28.5	43.5	15.0	105	25	V	0

Spurious Emissions above 1GHz – 25GHz

Freq (MHz)	Peak Value (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
1030.3610	48.3	74.0	25.7	--*See Note 2	54.0	5.7	200	243	V	0
1536.3730	44.4	74.0	29.6	--*See Note 2	54.0	9.6	100	15	V	0
1586.9740	44.1	74.0	29.9	--*See Note 2	54.0	9.9	100	15	V	0
2113.2270	48.8	74.0	25.2	--*See Note 2	54.0	5.2	200	220	V	0
4805.2100	47.7	74.0	26.3	--*See Note 2	54.0	6.3	300	284	V	0
13942.3640	49.9	74.0	24.1	--*See Note 2	54.0	4.1	100	267	V	0
13942.3640	49.9	74.0	24.1	--*See Note 2	54.0	4.1	100	267	V	0

Spurious Emissions above 1GHz - 25GHz

Freq (MHz)	Peak Value (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
1091.0820	40.5	74.0	33.5	--*See Note 2	54.0	13.5	100	269	V	39
1293.4870	38.5	74.0	35.5	--*See Note 2	54.0	15.5	200	80	V	39
4501.6030	42.1	74.0	31.9	--*See Note 2	54.0	11.9	100	106	V	39
4886.1720	42.5	74.0	31.5	--*See Note 2	54.0	11.5	100	264	V	39
9764.7300	49.0	74.0	25.0	--*See Note 2	54.0	5.0	200	354	V	39
9764.7300	49.0	74.0	25.0	--*See Note 2	54.0	5.0	200	354	V	39
13359.4390	49.8	74.0	24.2	--*See Note 2	54.0	4.2	100	183	V	39



TRANSMITTER RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205, 15.209, RSS-210 2.2 and RSS-GEN 8.9, 8.10 Transmitter Radiated Emission Results

Test Input Power	120V 60Hz	Temperature	24°C
Test Distance	3m (≥30MHz – 25GHz)	Relative Humidity	60%
Operating Mode	Transmitting	Atmospheric Pressure	1030mbar
Worst Modulation	8DPSK	Tested By	Lim Kay Tak

Spurious Emissions above 1GHz - 25GHz

Freq (MHz)	Peak Value (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
1068.8180	38.7	74.0	35.3	--*See Note 2	54.0	15.3	300	96	V	78
1584.9500	42.9	74.0	31.1	--*See Note 2	54.0	11.1	100	7	H	78
2101.0820	39.2	74.0	34.8	--*See Note 2	54.0	14.8	300	96	V	78
3167.7560	37.8	74.0	36.2	--*See Note 2	54.0	16.2	200	142	V	78
4475.2910	41.2	74.0	32.8	--*See Note 2	54.0	12.8	200	108	V	78
5886.0520	42.9	74.0	31.1	--*See Note 2	54.0	11.1	100	38	V	78

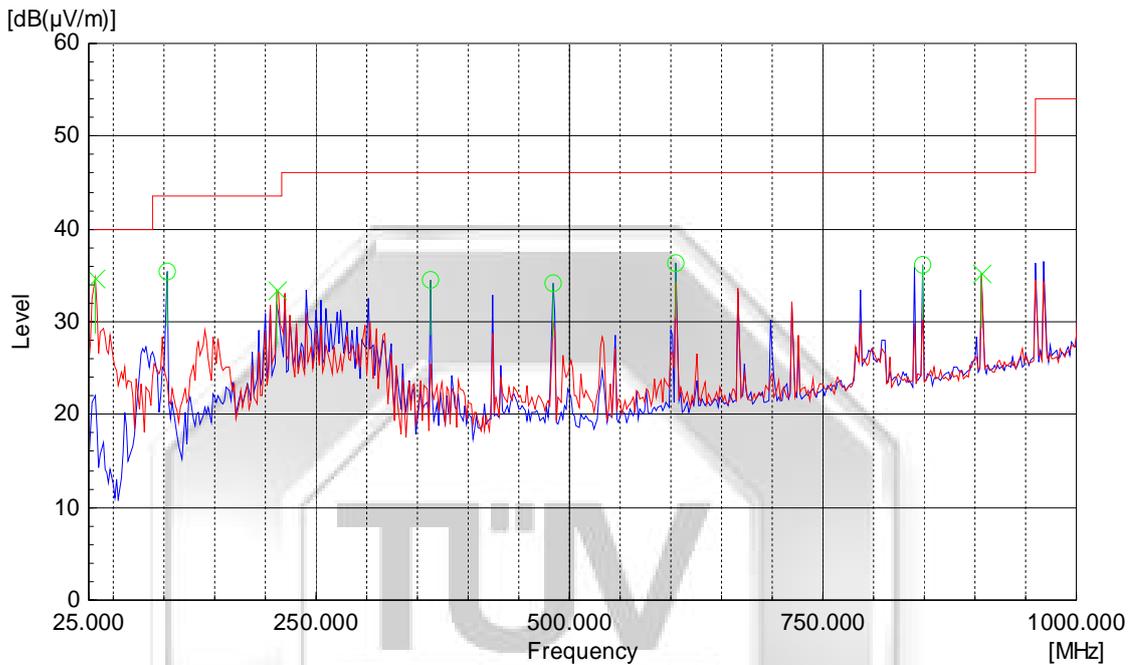
Notes

- All possible modes of operation were investigated. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
- As the measured peak shows compliance to the average limit, as such no average measurement was required.
- Quasi-peak measurement was used for frequency measurement up to 1GHz. Average and peak measurements were used for emissions above 1GHz. The average measurement was done by averaging over a complete cycle of the pulse train, including the blanking interval as the pulse train duration does not exceed 0.1 second..
- A "positive" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency. Conversely, a "negative" margin indicates a FAIL.
- EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:
30MHz - 1GHz
 RBW: 120kHz VBW: 1MHz
>1GHz
 RBW: 1MHz VBW: 1MHz
- The upper frequency of radiated emission investigations was according to requirements stated in RSS-GEN 6.13.
- The channel in the table refers to the transmit channel of the EUT.
- Radiated Emissions Measurement Uncertainty
 All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 25GHz is ±4.0dB.

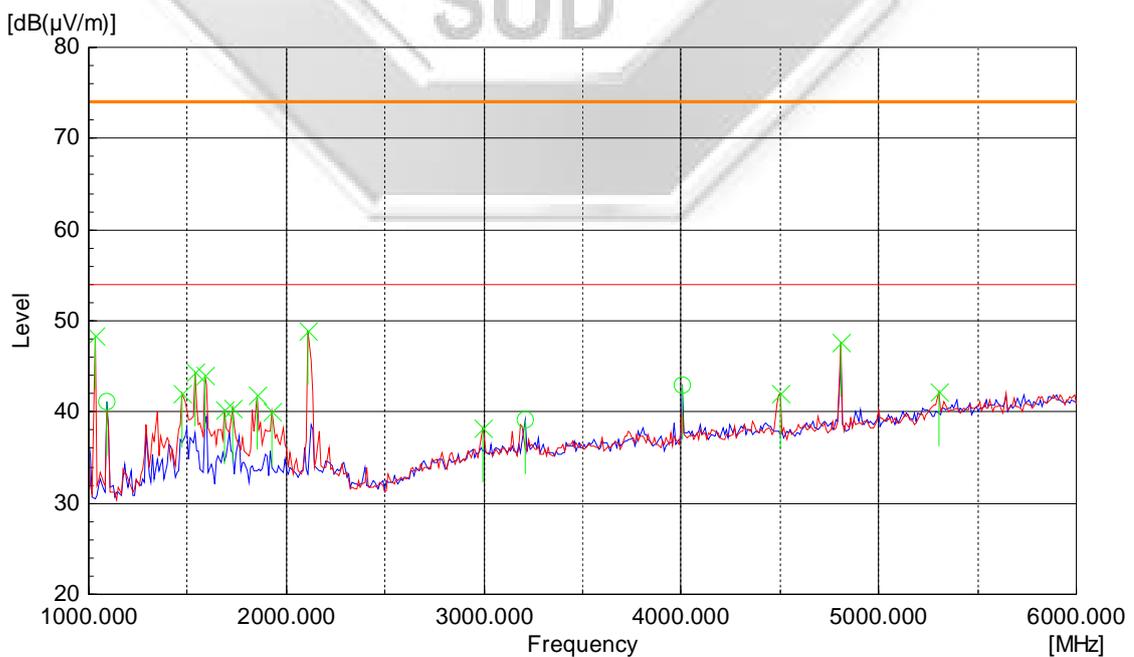


TRANSMITTER RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205, 15.209, RSS-210 2.2 and RSS-GEN 8.9, 8.10 Transmitter Radiated Emission Results



Channel 0 (30MHz – 1GHz)(Peak Plot)

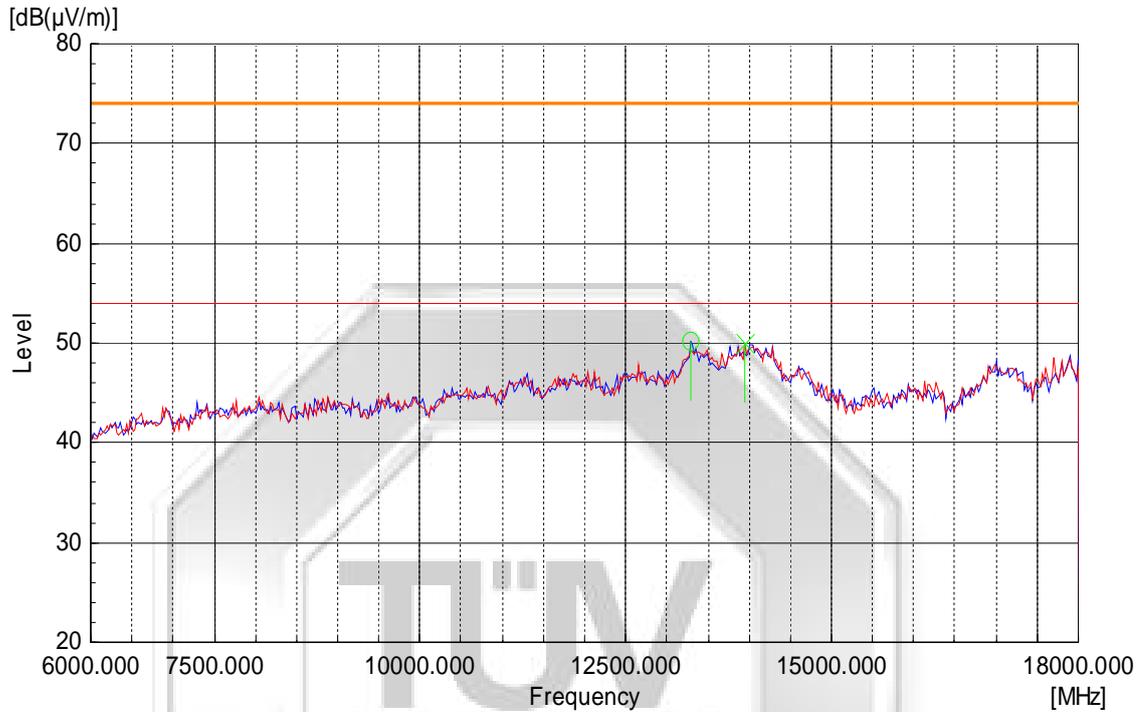


Channel 0 (1GHz – 6GHz)(Peak Plot)

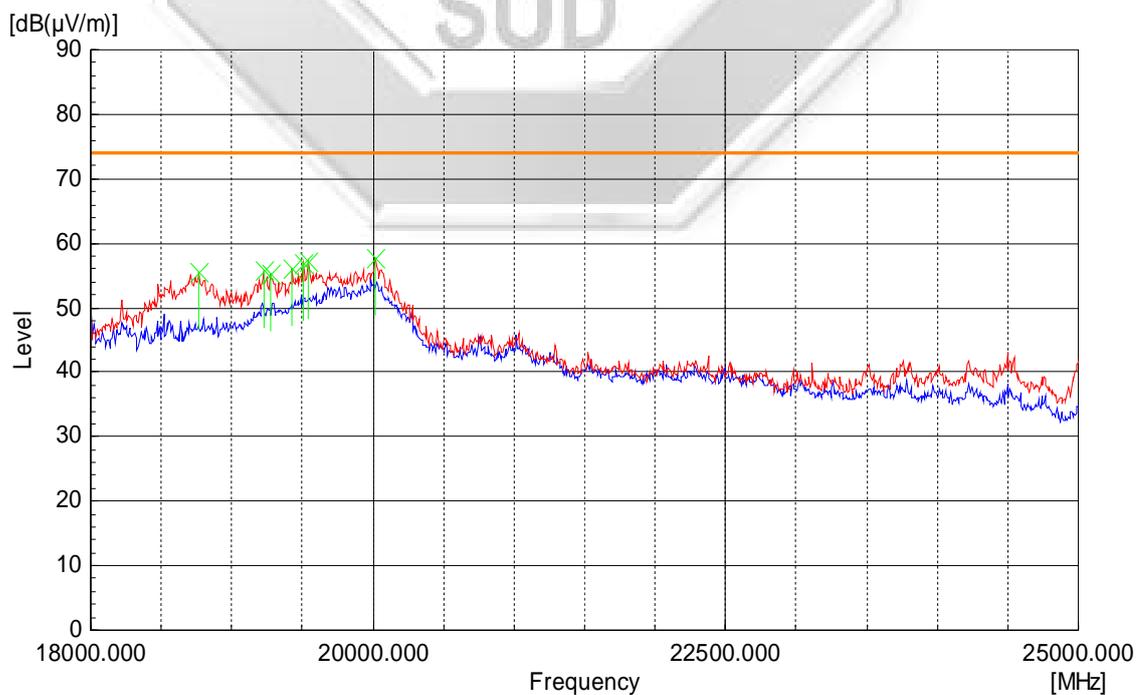


TRANSMITTER RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205, 15.209, RSS-210 2.2 and RSS-GEN 8.9, 8.10 Transmitter Radiated Emission Results



Channel 0 (6GHz – 18GHz)(Peak Plot)

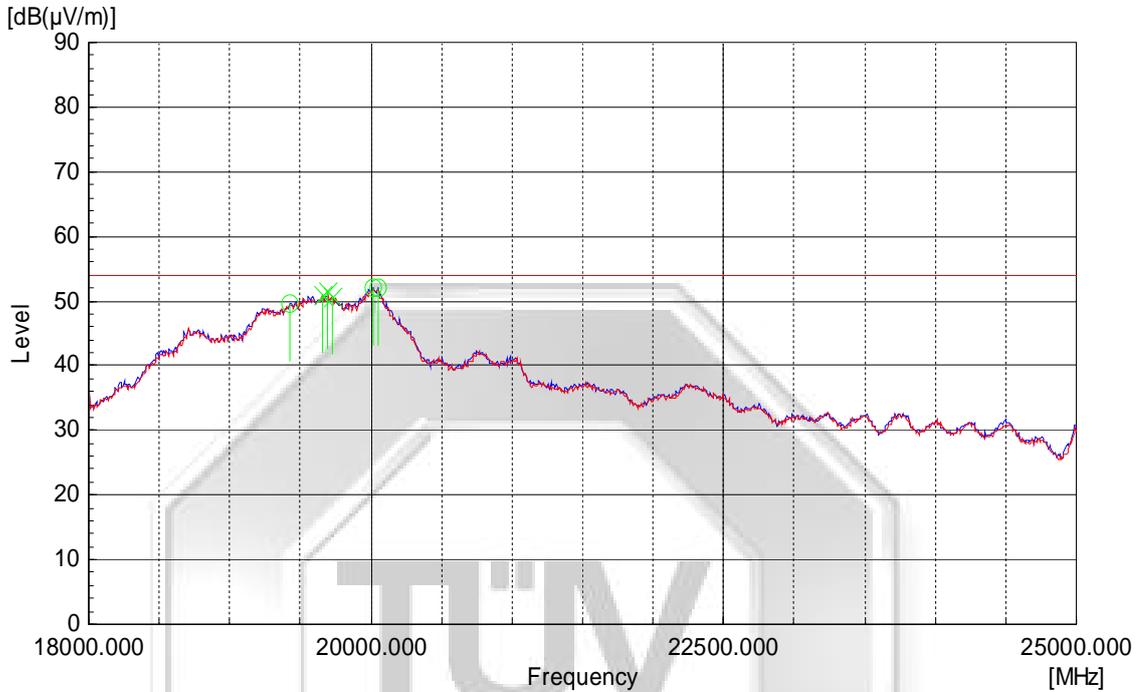


Channel 0 (18GHz – 25GHz)(Peak Plot)



TRANSMITTER RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205, 15.209, RSS-210 2.2 and RSS-GEN 8.9, 8.10 Transmitter Radiated Emission Results

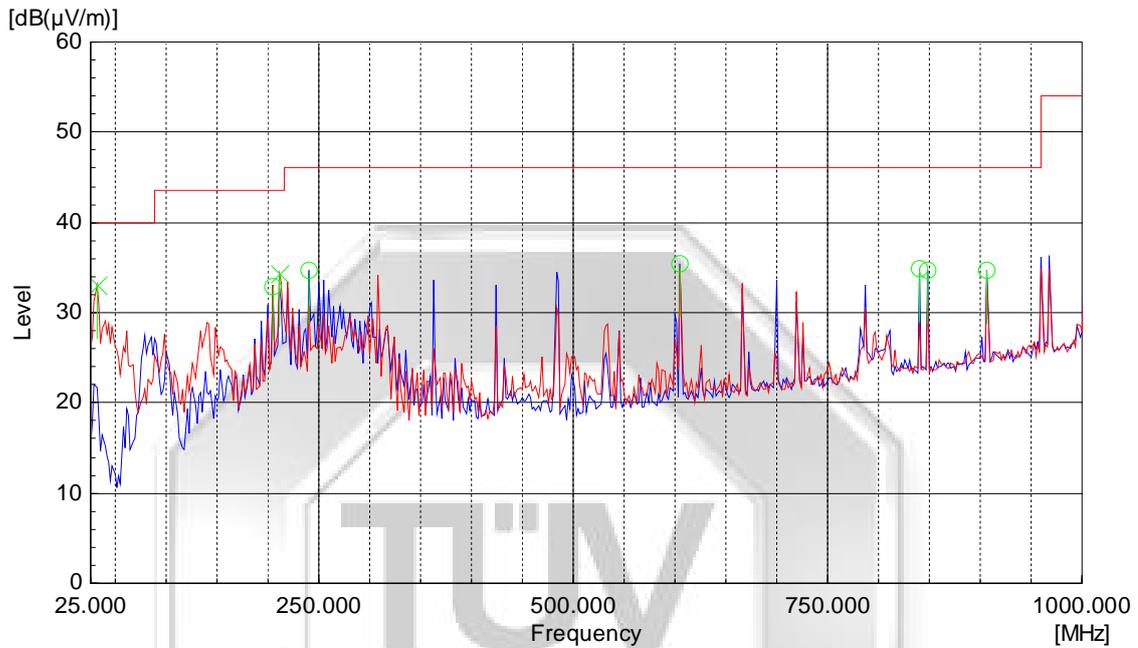


Channel 0 (6GHz – 18GHz)(Average Plot)

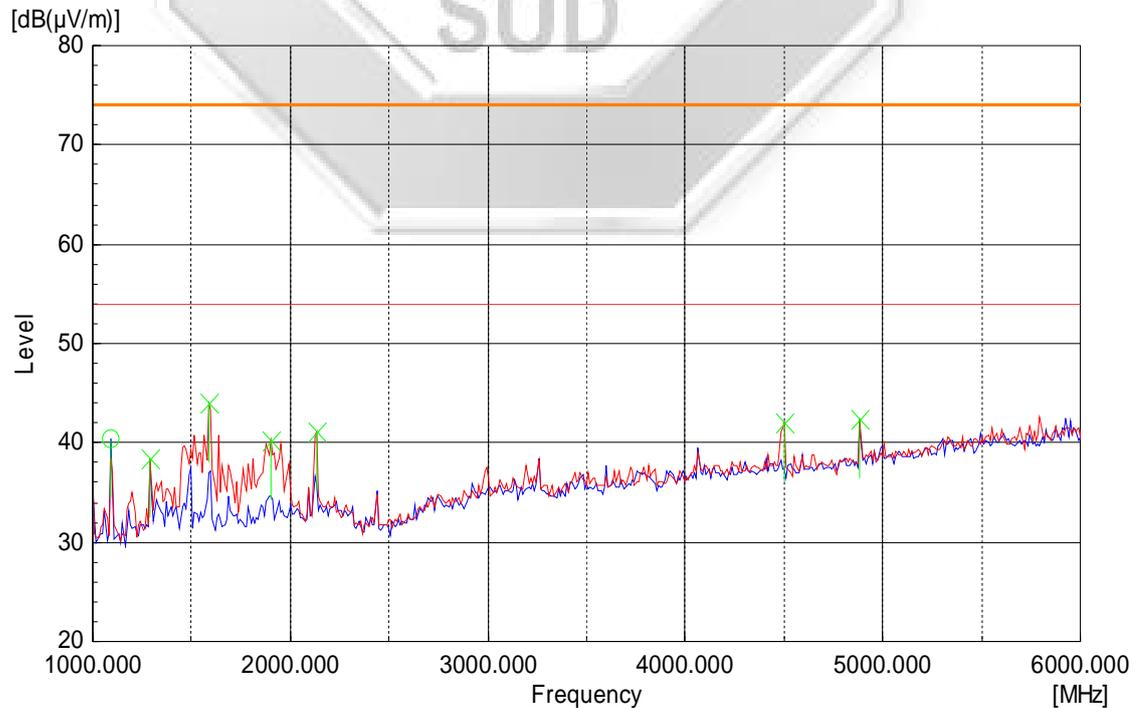


TRANSMITTER RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205, 15.209, RSS-210 2.2 and RSS-GEN 8.9, 8.10 Transmitter Radiated Emission Results



Channel 39 (30MHz – 1GHz)(Peak Plot)

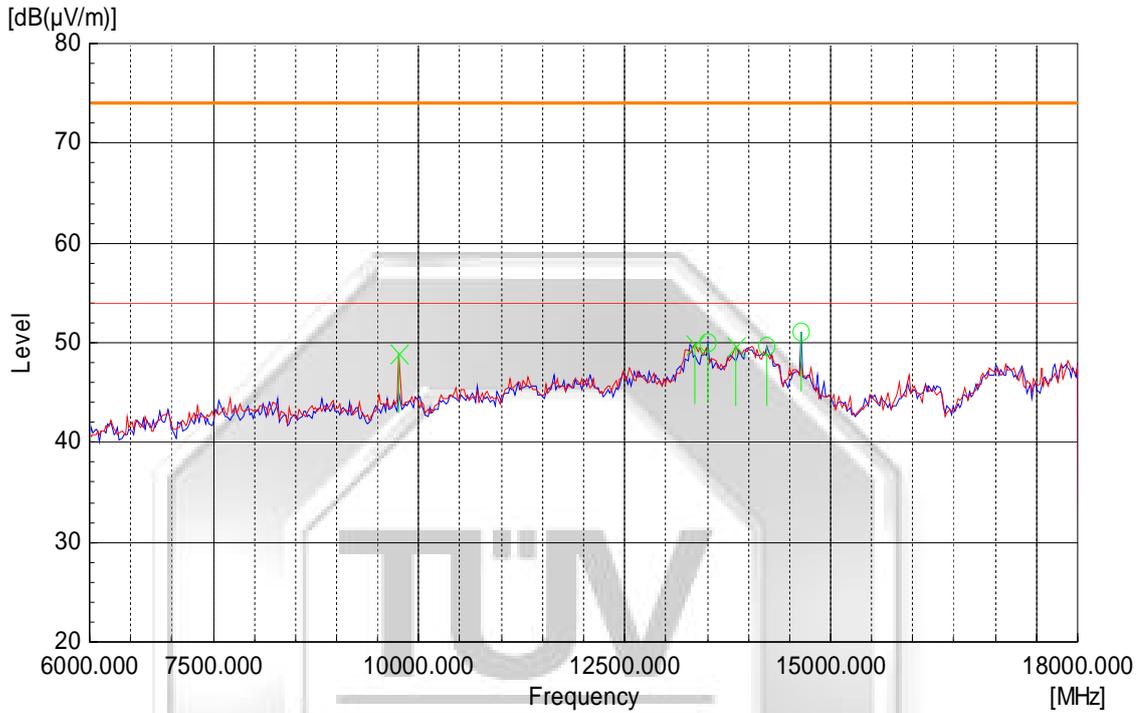


Channel 39 (1GHz – 6GHz)(Peak Plot)

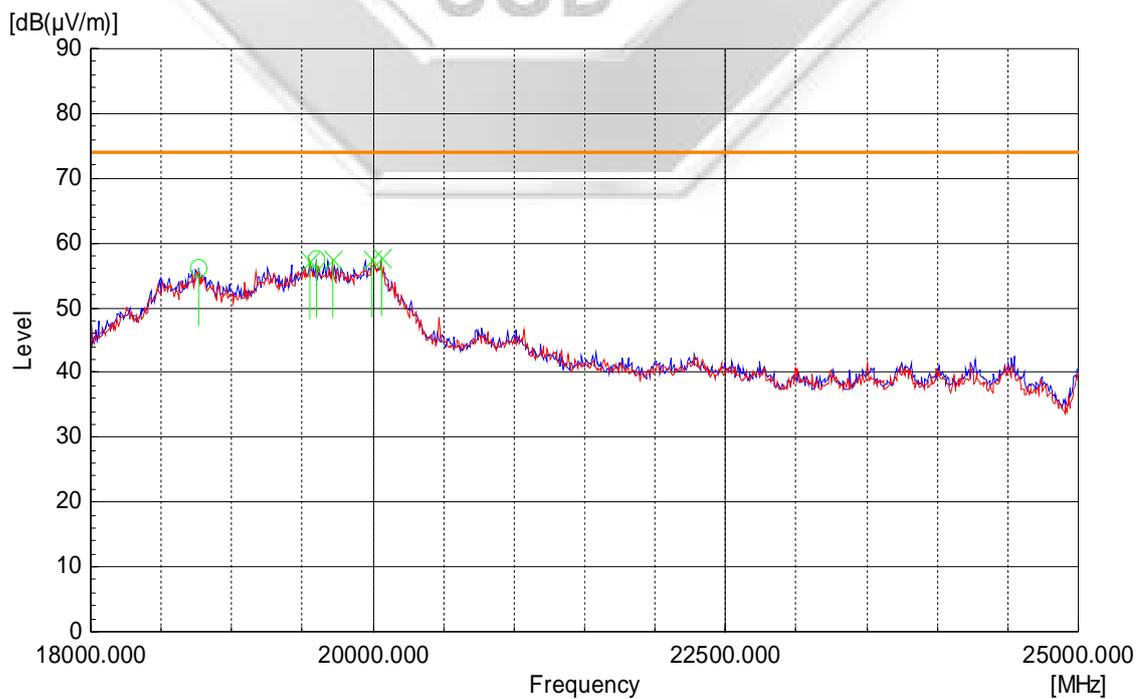


TRANSMITTER RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205, 15.209, RSS-210 2.2 and RSS-GEN 8.9, 8.10 Transmitter Radiated Emission Results



Channel 39 (6GHz – 18GHz)(Peak Plot)

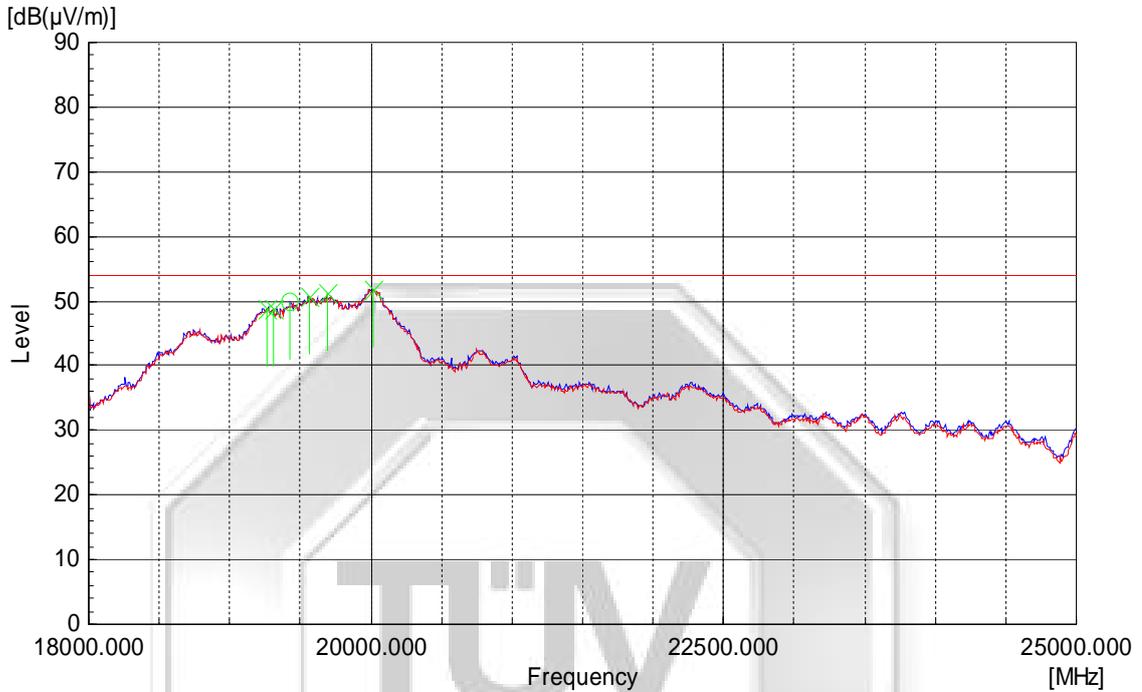


Channel 39 (18GHz – 25GHz)(Peak Plot)



TRANSMITTER RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205, 15.209, RSS-210 2.2 and RSS-GEN 8.9, 8.10 Transmitter Radiated Emission Results

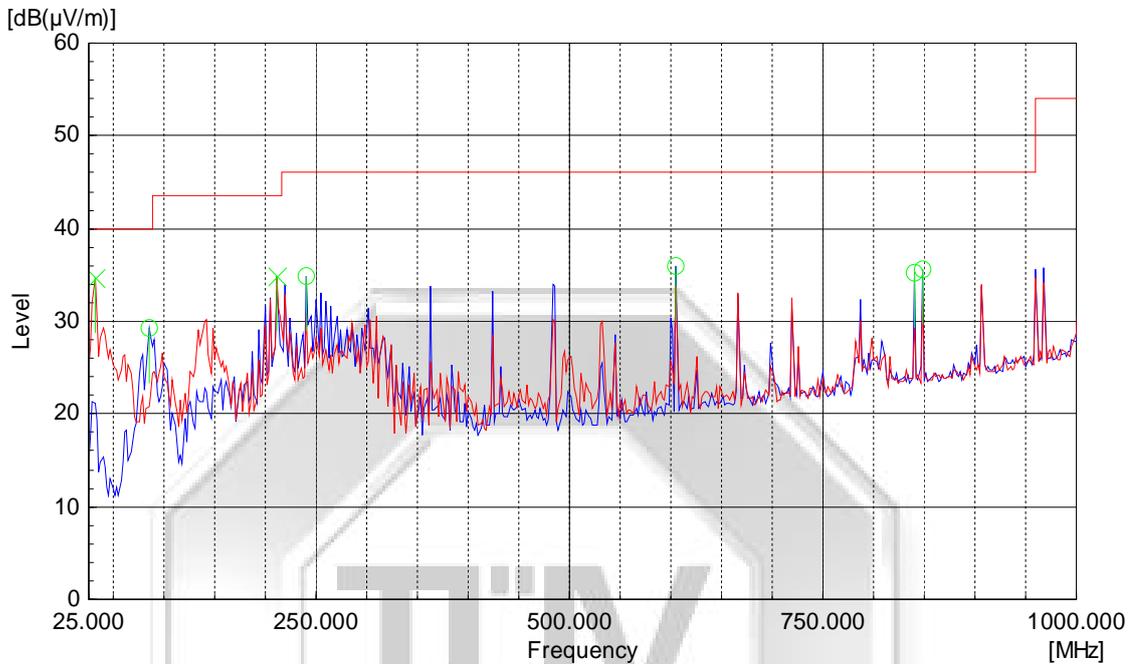


Channel 39 (6GHz – 18GHz)(Average Plot)

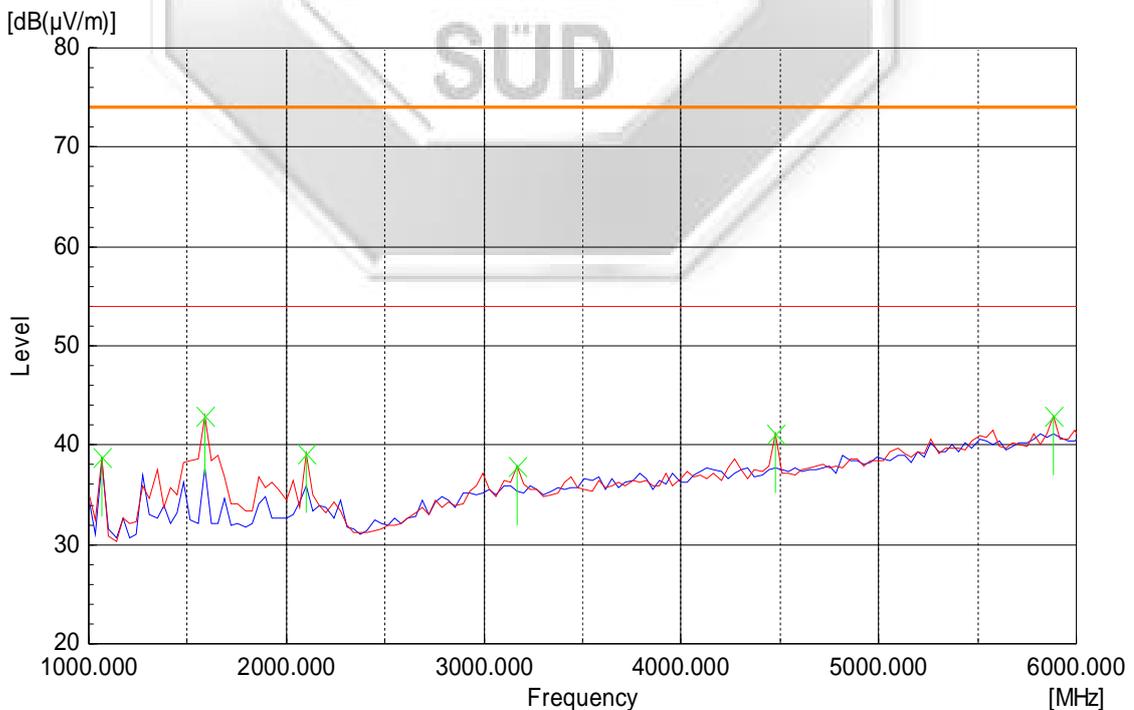


TRANSMITTER RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205, 15.209, RSS-210 2.2 and RSS-GEN 8.9, 8.10 Transmitter Radiated Emission Results



Channel 78 (30MHz – 1GHz)(Peak Plot)

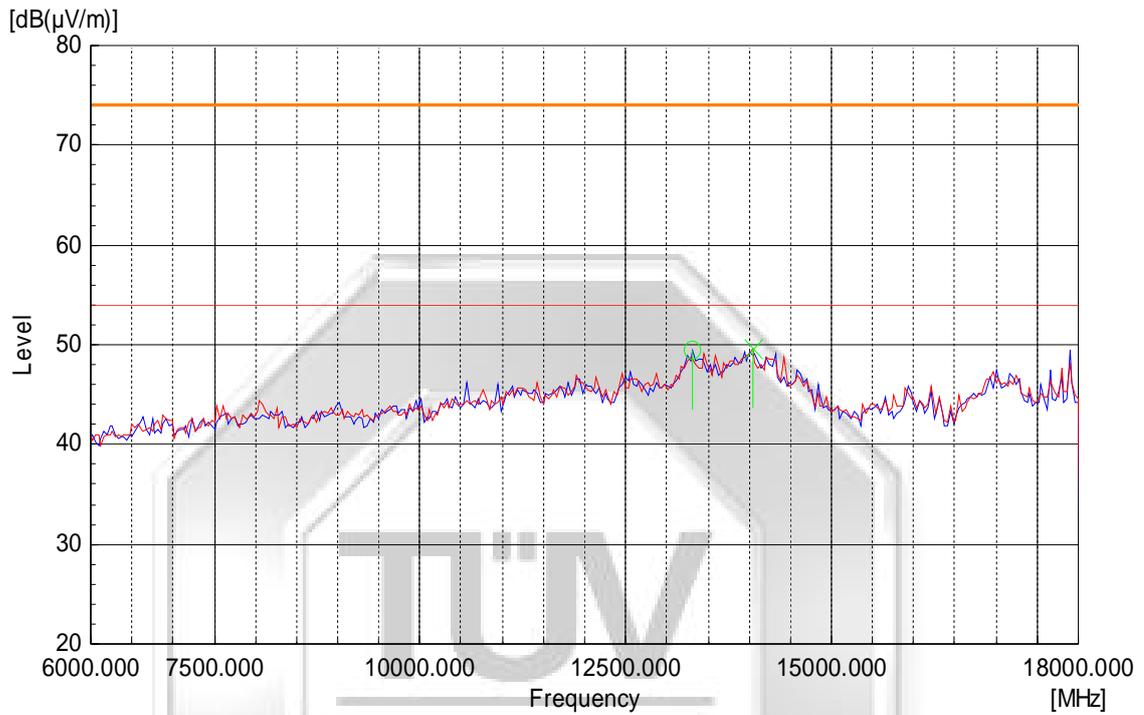


Channel 78 (1GHz – 6GHz)(Peak Plot)

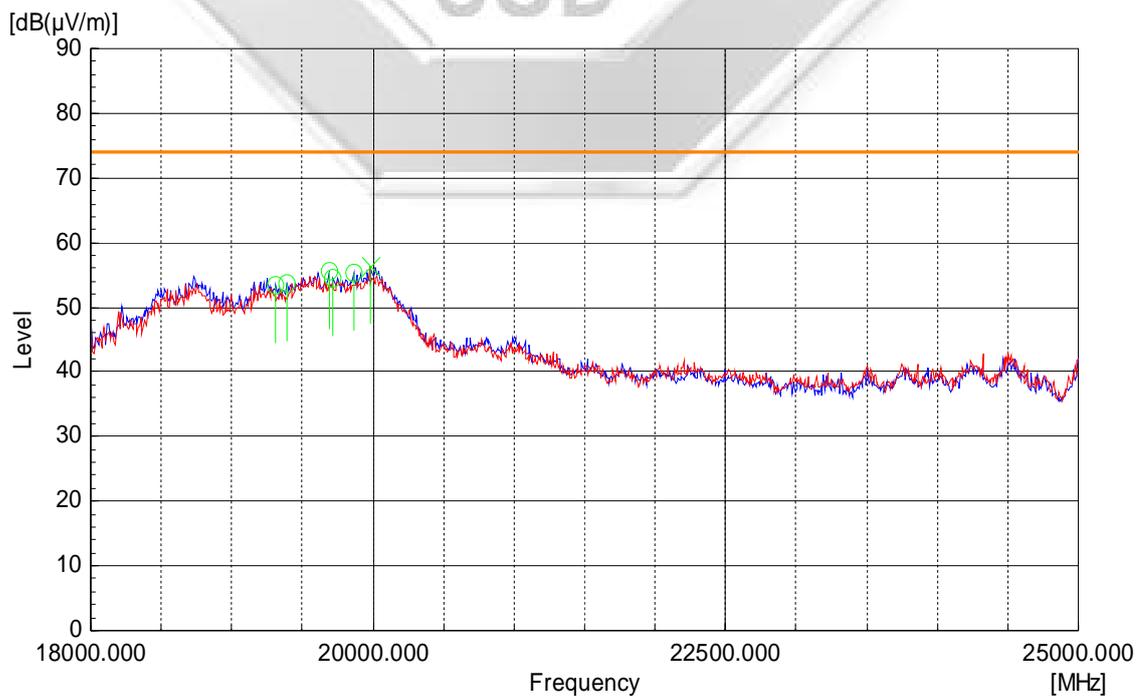


TRANSMITTER RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205, 15.209, RSS-210 2.2 and RSS-GEN 8.9, 8.10 Transmitter Radiated Emission Results



Channel 78 (6GHz – 18GHz)(Peak Plot)

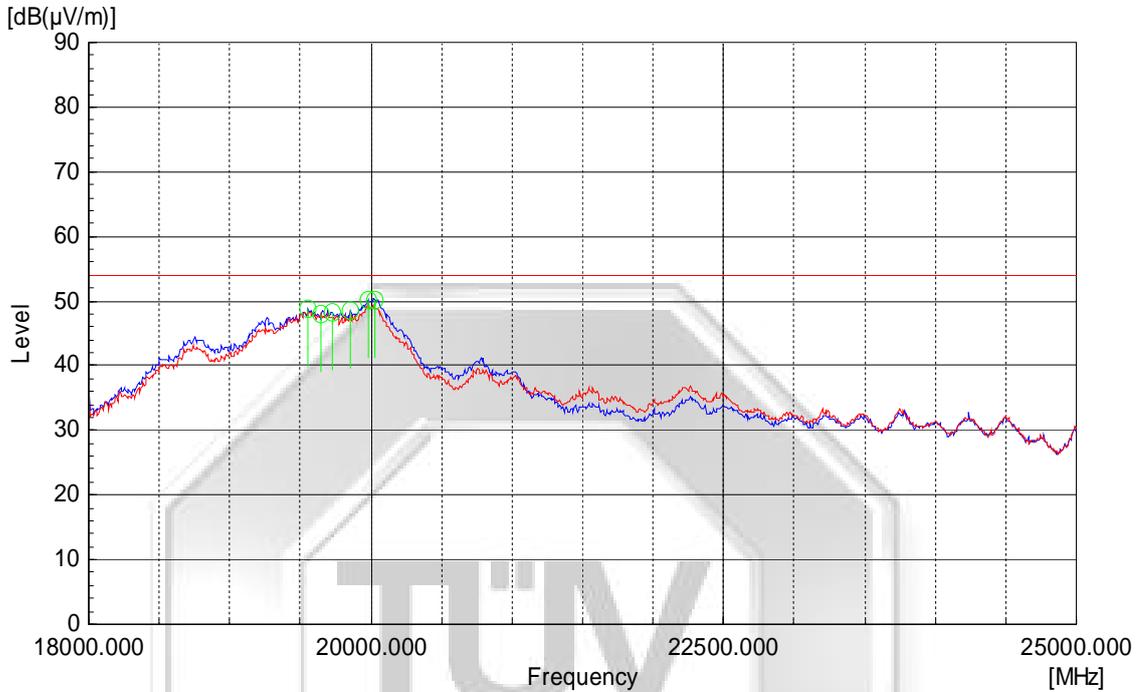


Channel 78 (18GHz – 25GHz)(Peak Plot)



TRANSMITTER RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205, 15.209, RSS-210 2.2 and RSS-GEN 8.9, 8.10 Transmitter Radiated Emission Results



Channel 78 (6GHz – 18GHz)(Average Plot)



CARRIER FREQUENCY SEPARATION TEST

47 CFR FCC Part 15.247(a)(1) and RSS-210 A8.1(b) Carrier Frequency Separation Limits

The EUT shows compliance to the requirements of this section, which states the adjacent carrier frequencies must be separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, the EUT may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125mW (21dBm).

47 CFR FCC Part 15.247(a)(1) and RSS-210 A8.1(b) Carrier Frequency Separation Test Instrumentation

Instrument	Model	S/No	Cal Due Date	Cal Interval
Agilent Spectrum Analyzer	E4440A	MY45304764	12 Dec 2015	1 year

47 CFR FCC Part 15.247(a)(1) and RSS-210 A8.1(b) Carrier Frequency Separation Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz.
5. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(a)(1) and RSS-210 A8.1(b) Carrier Frequency Separation Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with frequency hopping sequence on.
2. The start and stop frequencies of the spectrum analyser were set to 2.400GHz and 2.405GHz.
3. The spectrum analyser was set to max hold to capture the two adjacent transmitting frequencies within the span. The signal capturing was continuous until no further signals were detected.
4. The carrier frequency separation of the two adjacent transmitting / operating frequency was measured by finding the carrier frequency difference between the two adjacent channels.
5. The steps 2 to 4 were repeated with the following start and stop frequencies settings:
 - a. 2.438.5GHz to 2.443.5GHz
 - b. 2.478GHz to 2.481GHz



CARRIER FREQUENCY SEPARATION TEST

47 CFR FCC Part 15.247(a)(1) and RSS-210 A8.1(b) Carrier Frequency Separation Results

Test Input Power	120V 60Hz	Temperature	24°C
Attached Plots	1 – 4	Relative Humidity	60%
		Atmospheric Pressure	1030mbar
		Tested By	Liau Lee Yin

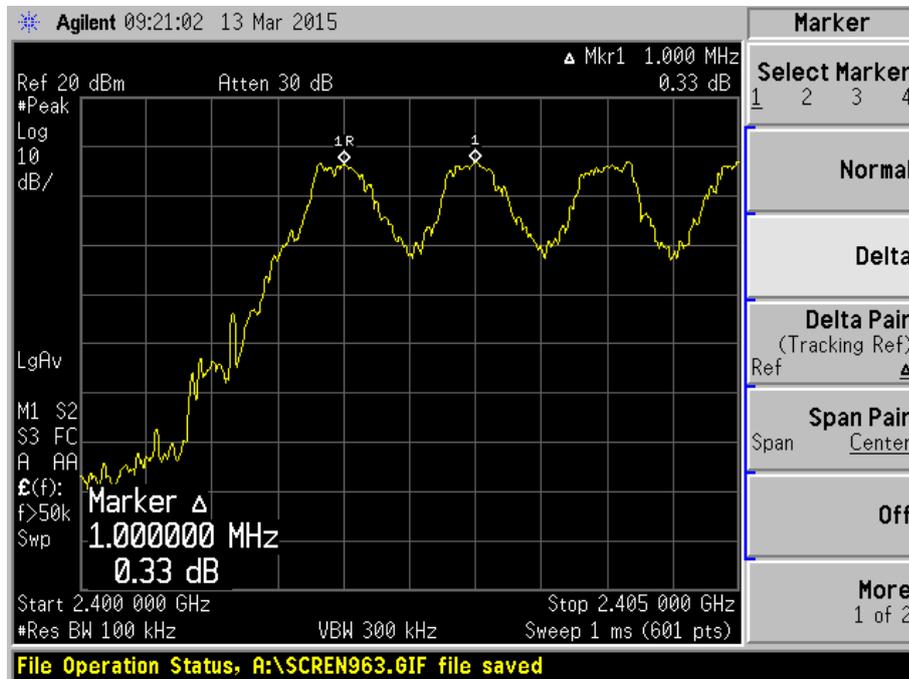
Adjacent Channels	Channel Separation (MHz)
0 and 1 (2.402GHz and 2.403GHz)	1.000
38 and 39 (2.440GHz and 2.441GHz)	1.000
39 and 40 (2.441GHz and 2.442GHz)	1.000
77 and 78 (2.479GHz and 2.480GHz)	1.000



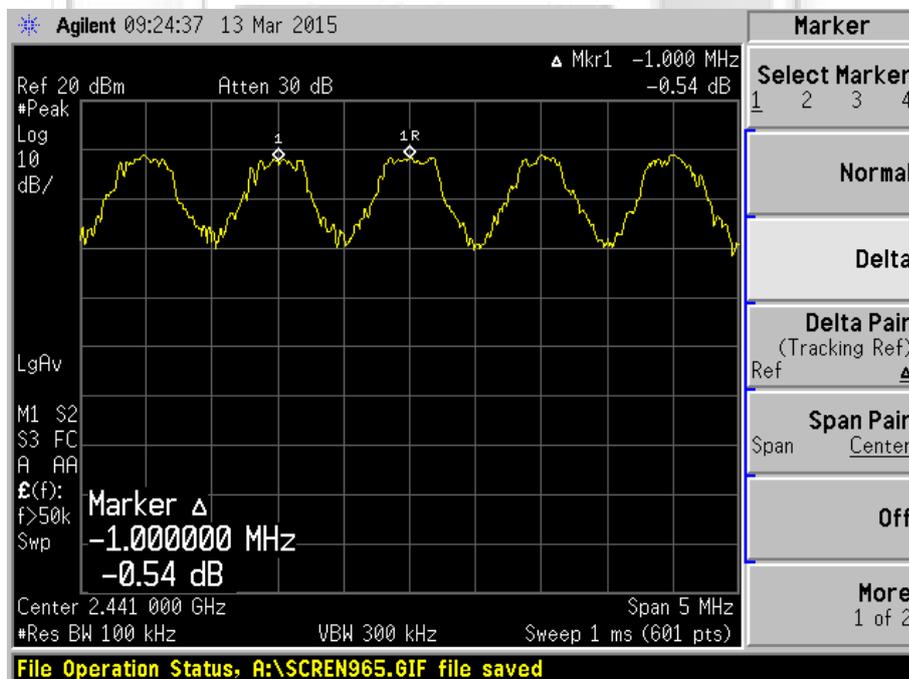


CARRIER FREQUENCY SEPARATION TEST

Carrier Frequency Separation Plots



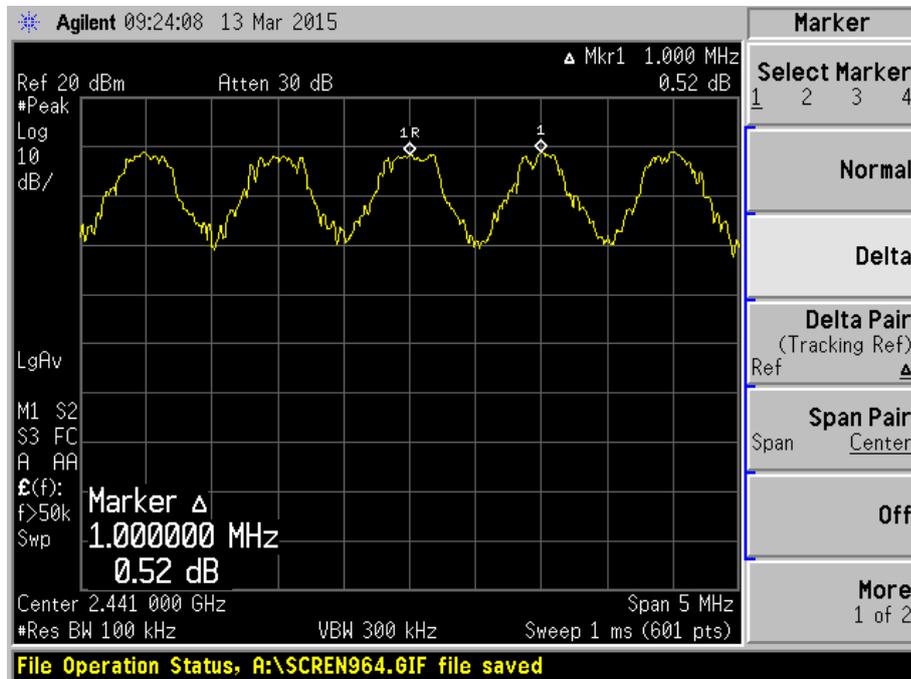
Plot 1 - Channels 0 (lower ch) and 1 (ch after lower ch) Separation



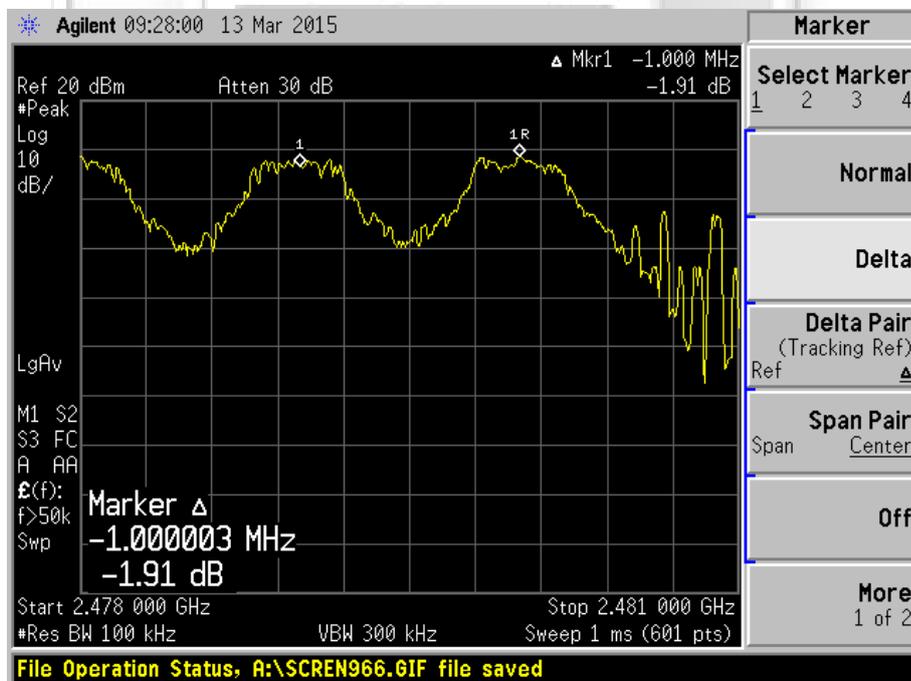
Plot 2 - Channels 38 (preceding mid ch) and 39 (mid ch) Separation

CARRIER FREQUENCY SEPARATION TEST

Carrier Frequency Separation Plots



Plot 3 - Channels 39 (mid ch) and 40 (ch after mid ch) Separation



Plot 4 - Channels 77 (preceding upper ch) and 78 (upper ch) Separation



SPECTRUM BANDWIDTH (20dB and 99% BANDWIDTH MEASUREMENT) TEST

47 CFR FCC Part 15.247(a)(1) and RSS-210 A8.1(b) Spectrum Bandwidth (20dB and 99% Bandwidth Measurement) Limits

The EUT shows compliance to the requirements of this section, which states that the 20dB bandwidth of the hopping channel shall be the channel frequency separation by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

47 CFR FCC Part 15.247(a)(1) and RSS-210 A8.1(b) Spectrum Bandwidth (20dB and 99% Bandwidth Measurement) Test Instrumentation

Instrument	Model	S/No	Cal Due Date	Cal Interval
Agilent Spectrum Analyzer	E4440A	MY45304764	12 Dec 2015	1 year

47 CFR FCC Part 15.247(a)(1) and RSS-210 A8.1(b) Spectrum Bandwidth (20dB and 99% Bandwidth Measurement) Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 10kHz and 30kHz.
5. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(a)(1) and RSS-210 A8.1(b) Spectrum Bandwidth (20dB and 99% Bandwidth Measurement) Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode, non-hopping with transmitting frequency at Channel 0 (2.402GHz) (*lower ch*).
2. The center frequency of the spectrum analyser was set to the transmitting frequency with the frequency span wide enough to capture the 20dB and 99% bandwidth of the transmitting frequency.
3. The spectrum analyser was set to max hold to capture the transmitting frequency. The signal capturing was continuous until no further changes were observed.
4. The peak of the transmitting frequency was detected with the marker peak function of the spectrum analyser. For 6dB bandwidth measurement, the frequencies below the 20dB peak frequency at lower (f_L) and upper (f_H) sides of the transmitting frequency were marked and measured by using the marker-delta function of the spectrum analyser. For 99% bandwidth measurement, the spectrum analyser power measurement was activated with bandwidth measurement as 99%.
5. For 6dB bandwidth measurement, the 20dB bandwidth of the transmitting frequency is the frequency difference between the marked lower and upper frequencies, $|f_H - f_L|$. For 99% bandwidth measurement, the measured 99% bandwidth shown on the spectrum analyser was recorded.
6. The steps 2 to 5 were repeated with the transmitting frequency was set to Channel 39 (2.441GHz) (*mid ch*) and Channel 78 (2.480GHz) (*upper ch*) respectively.



SPECTRUM BANDWIDTH (20dB and 99% BANDWIDTH MEASUREMENT) TEST

47 CFR FCC Part 15.247(a)(1) and RSS-210 A8.1(b) Spectrum Bandwidth (20dB Bandwidth Measurement) Results

Test Input Power	120V 60Hz	Temperature	24°C
Attached Plots	5 – 7	Relative Humidity	60%
Modulation	GFSK	Atmospheric Pressure	1030mbar
		Tested By	Liau Lee Yin

Channel	Channel Frequency (GHz)	20dB Bandwidth (MHz)
0 (lower ch)	2.402	0.8080
39 (mid ch)	2.441	0.7631
78 (upper ch)	2.480	0.7631

Test Input Power	120V 60Hz	Temperature	24°C
Attached Plots	8 – 10	Relative Humidity	60%
Modulation	($\pi/4$) DQPSK	Atmospheric Pressure	1030mbar
		Tested By	Liau Lee Yin

Channel	Channel Frequency (GHz)	20dB Bandwidth (MHz)
0 (lower ch)	2.402	1.384
39 (mid ch)	2.441	1.392
78 (upper ch)	2.480	1.399

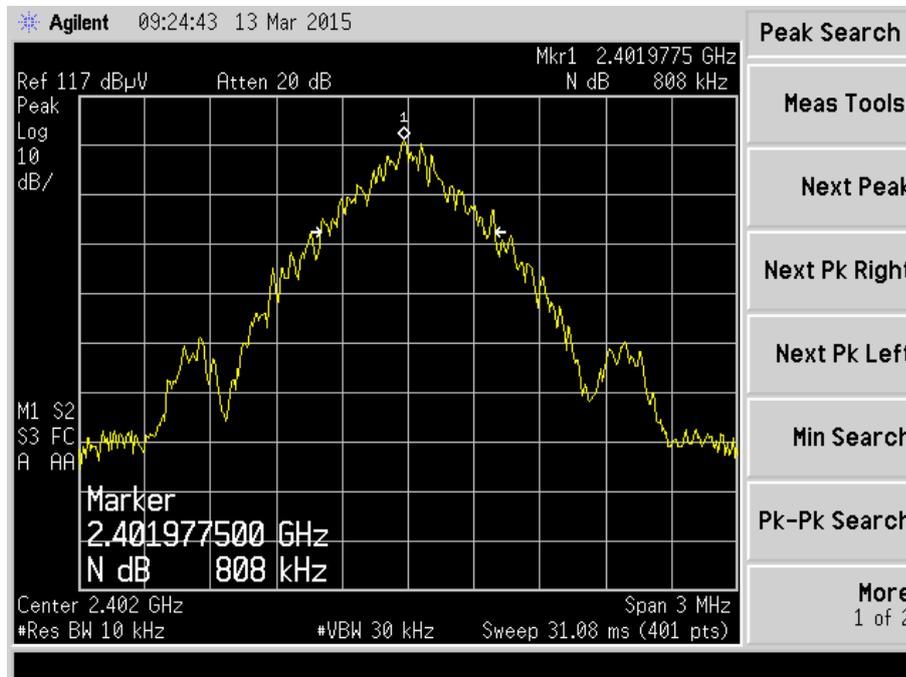
Test Input Power	120V 60Hz	Temperature	24°C
Attached Plots	11 – 13	Relative Humidity	60%
Modulation	8DPSK	Atmospheric Pressure	1030mbar
		Tested By	Liau Lee Yin

Channel	Channel Frequency (GHz)	20dB Bandwidth (MHz)
0 (lower ch)	2.402	1.369
39 (mid ch)	2.441	1.369
78 (upper ch)	2.480	1.384

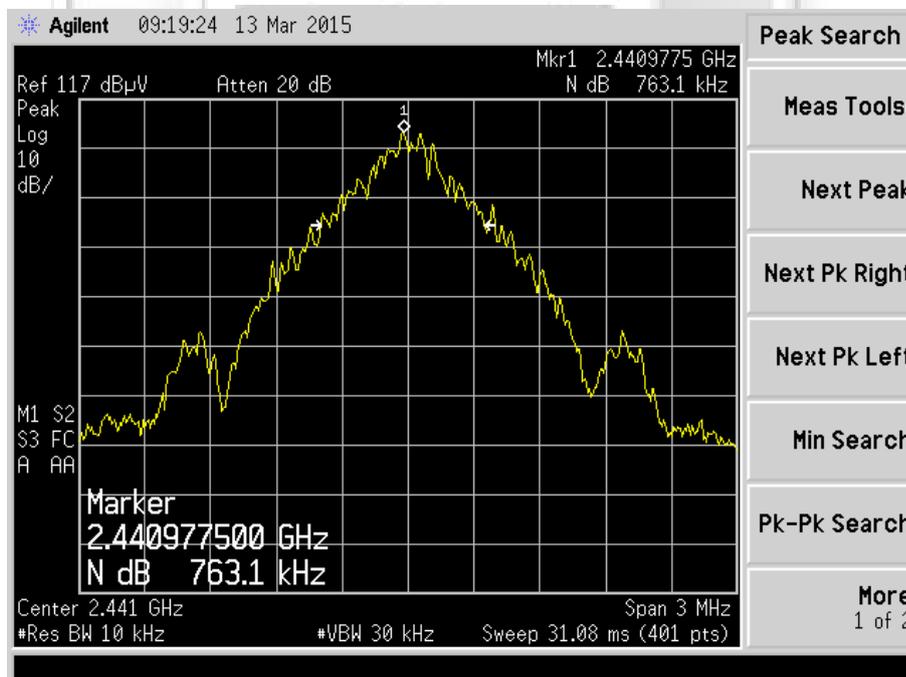


SPECTRUM BANDWIDTH (20dB and 99% BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (20dB Bandwidth Measurement) Plots – GFSK



Plot 5 – Channel 0 (lower ch)

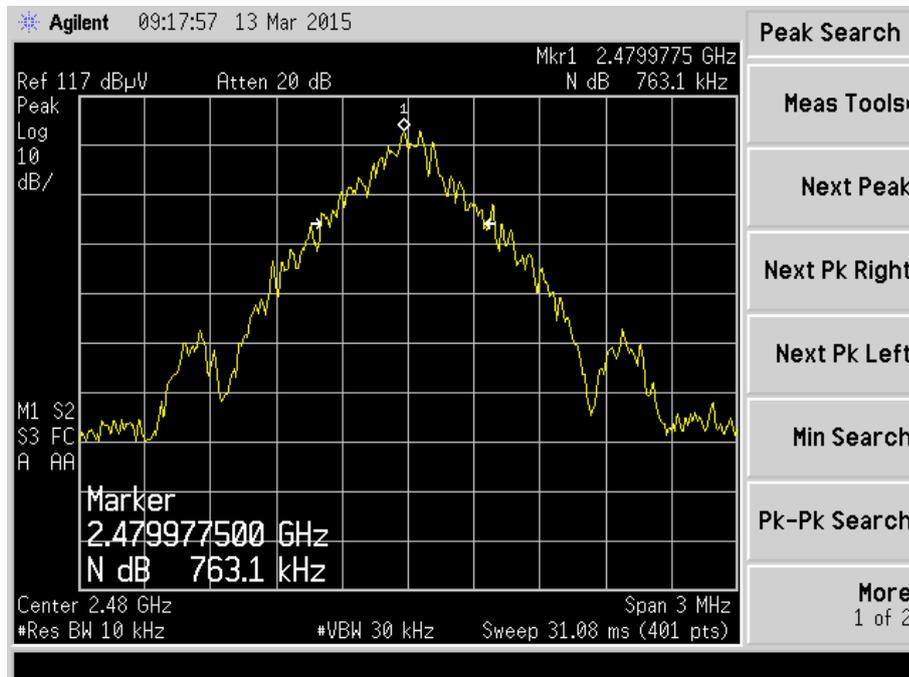


Plot 6 – Channel 39 (mid ch)



SPECTRUM BANDWIDTH (20dB and 99% BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (20dB Bandwidth Measurement) Plots – GFSK



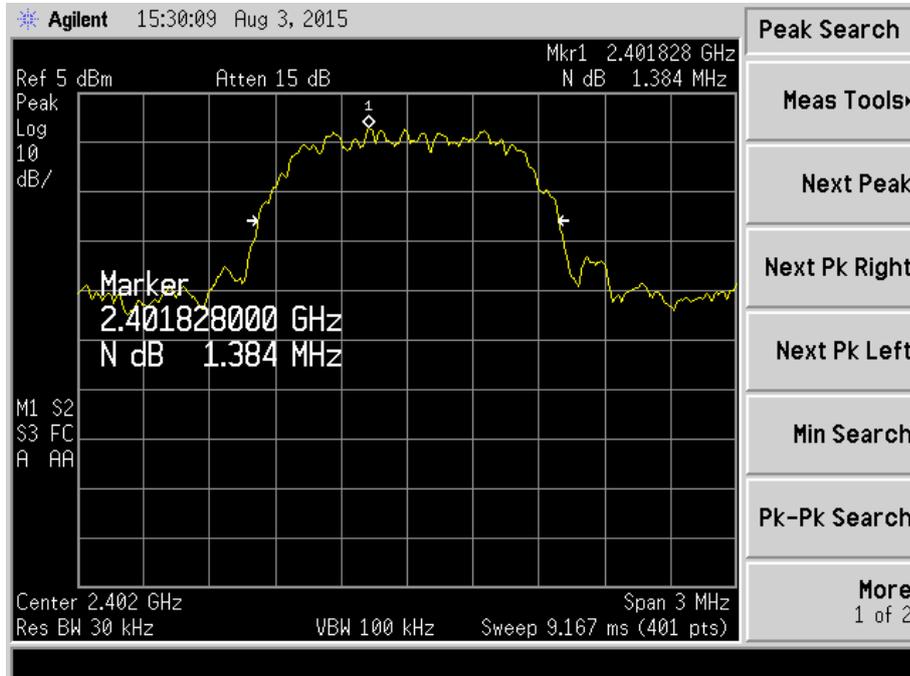
Plot 7 – Channel 78 (upper ch)



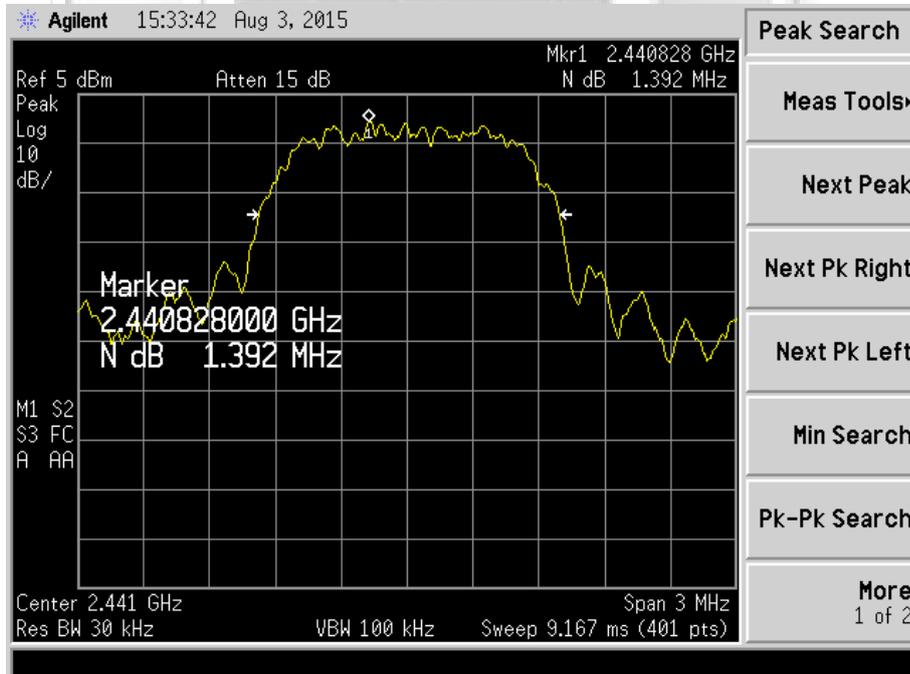


SPECTRUM BANDWIDTH (20dB and 99% BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (20dB Bandwidth Measurement) Plots – ($\pi/4$) DQPSK



Plot 8 – Channel 0 (lower ch)

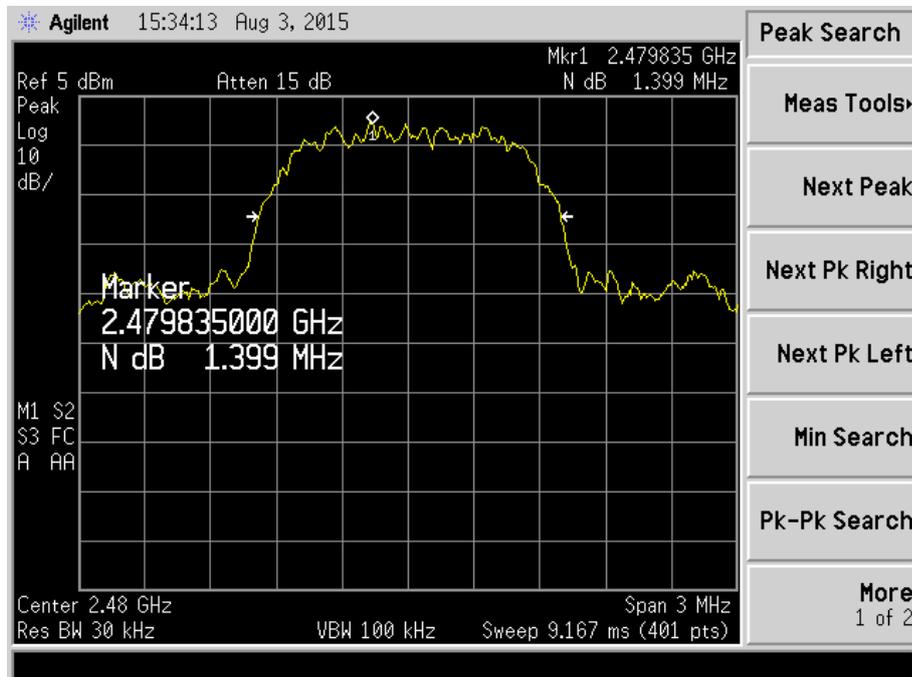


Plot 9 – Channel 39 (mid ch)

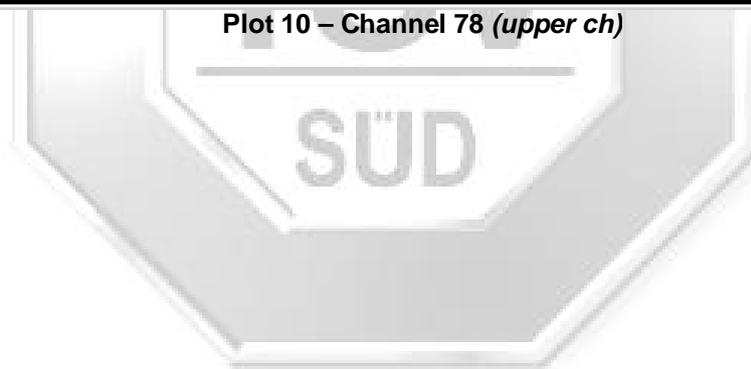


SPECTRUM BANDWIDTH (20dB and 99% BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (20dB Bandwidth Measurement) Plots – ($\pi/4$) DQPSK

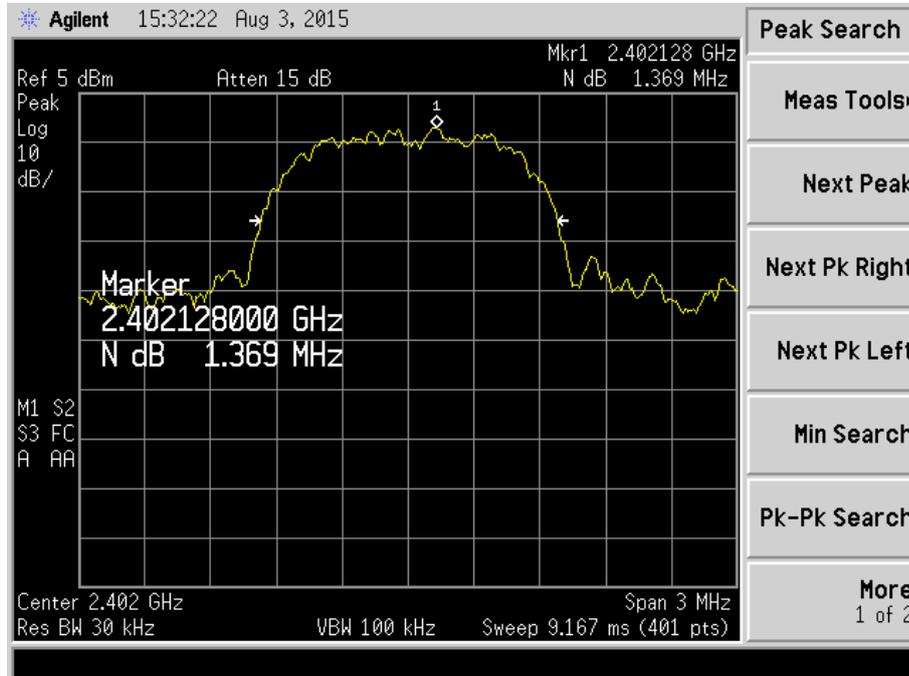


Plot 10 – Channel 78 (upper ch)

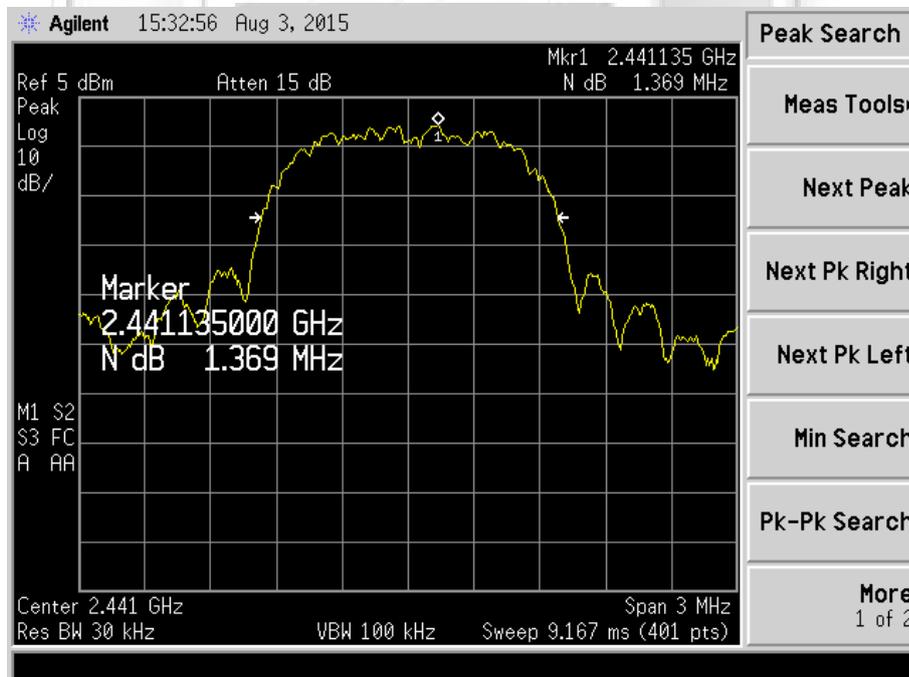


SPECTRUM BANDWIDTH (20dB and 99% BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (20dB Bandwidth Measurement) Plots – 8DPSK



Plot 11 – Channel 0 (lower ch)

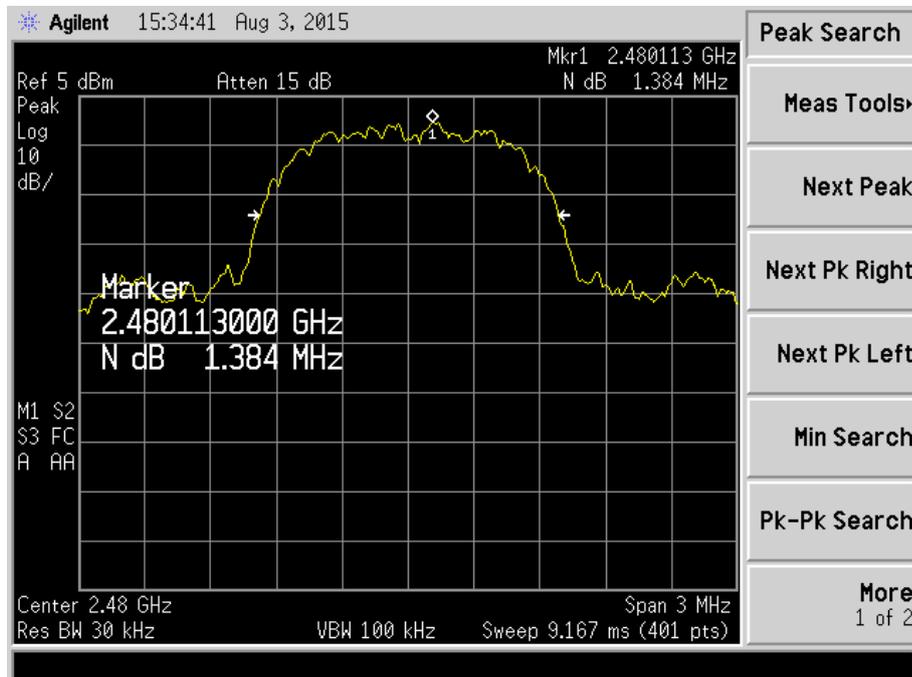


Plot 12 – Channel 39 (mid ch)



SPECTRUM BANDWIDTH (20dB and 99% BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (20dB Bandwidth Measurement) Plots – 8DPSK



Plot 13 – Channel 78 (upper ch)





SPECTRUM BANDWIDTH (20dB and 99% BANDWIDTH MEASUREMENT) TEST

RSS-210 A8.1(b) Spectrum Bandwidth (99% Bandwidth Measurement) Results

Test Input Power	120V 60Hz	Temperature	24°C
Attached Plots	14 – 16	Relative Humidity	60%
Modulation	GFSK	Atmospheric Pressure	1030mbar
		Tested By	Liau Lee Yin

Channel	Channel Frequency (GHz)	99% Bandwidth (MHz)
0 (lower ch)	2.402	0.8681
39 (mid ch)	2.441	0.8846
78 (upper ch)	2.480	0.8059

Test Input Power	120V 60Hz	Temperature	24°C
Attached Plots	17 – 19	Relative Humidity	60%
Modulation	($\pi/4$) DQPSK	Atmospheric Pressure	1030mbar
		Tested By	Liau Lee Yin

Channel	Channel Frequency (GHz)	99% Bandwidth (MHz)
0 (lower ch)	2.402	1.1916
39 (mid ch)	2.441	1.1675
78 (upper ch)	2.480	1.2397

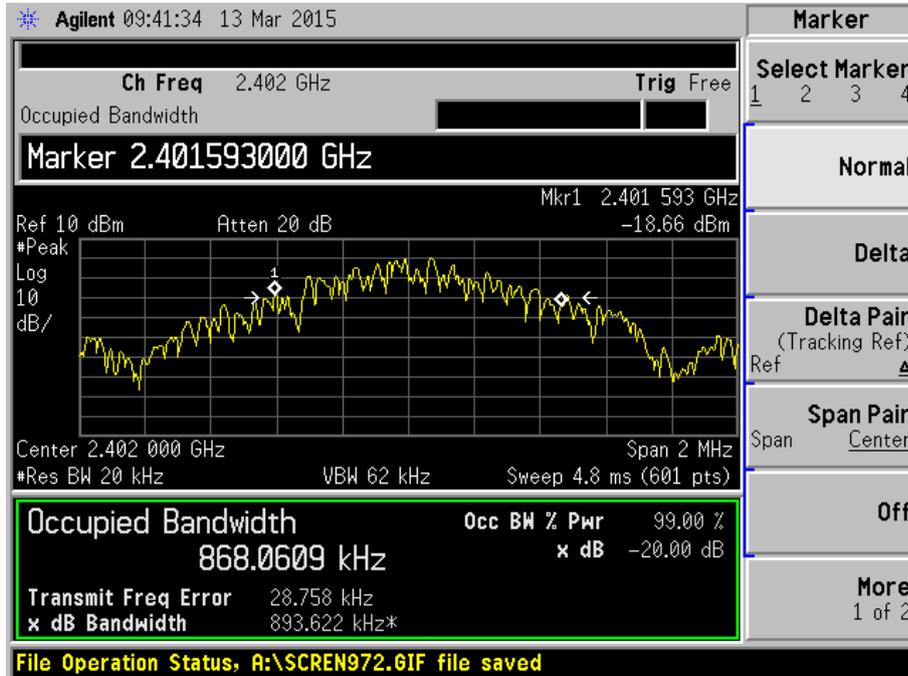
Test Input Power	120V 60Hz	Temperature	24°C
Attached Plots	20 – 22	Relative Humidity	60%
Modulation	8DPSK	Atmospheric Pressure	1030mbar
		Tested By	Liau Lee Yin

Channel	Channel Frequency (GHz)	99% Bandwidth (MHz)
0 (lower ch)	2.402	1.2184
39 (mid ch)	2.441	1.2121
78 (upper ch)	2.480	1.2063

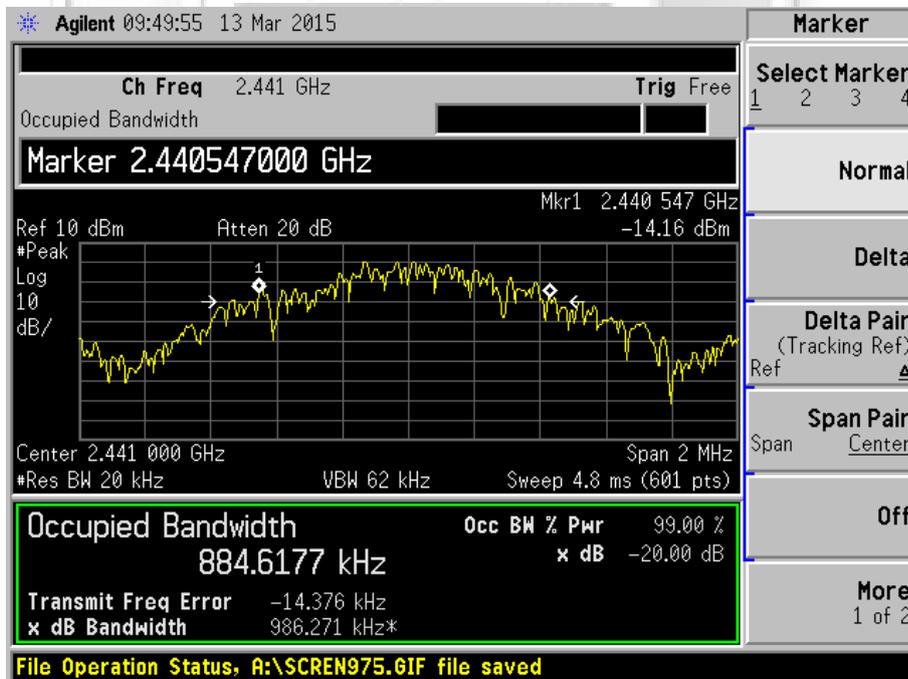


SPECTRUM BANDWIDTH (20dB and 99% BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (99% Bandwidth Measurement) Plots – GFSK



Plot 14 – Channel 0 (lower ch)

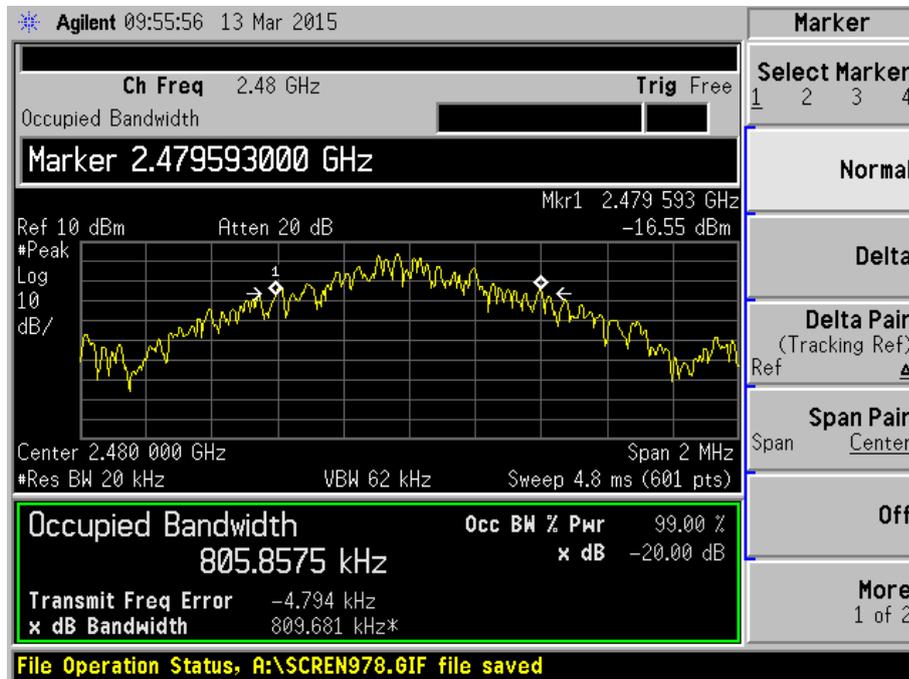


Plot 15 – Channel 39 (mid ch)



SPECTRUM BANDWIDTH (20dB and 99% BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (99% Bandwidth Measurement) Plots – GFSK



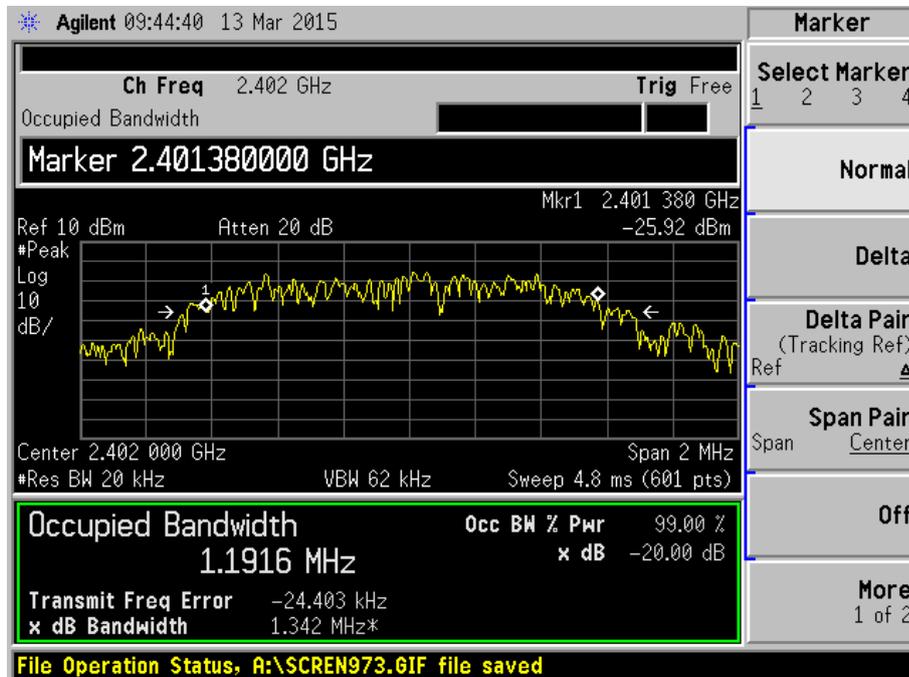
Plot 16 – Channel 78 (upper ch)



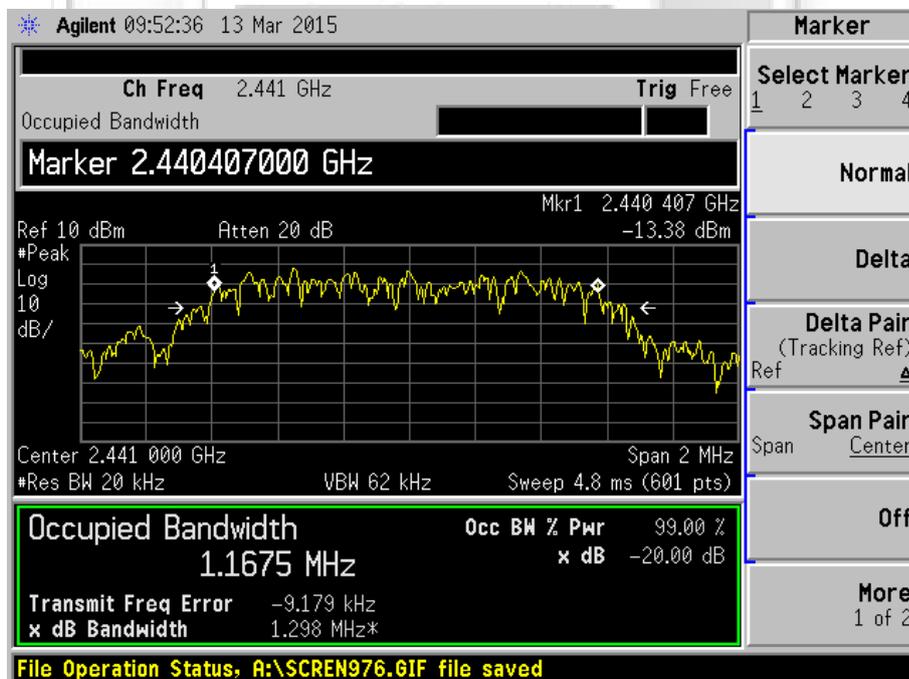


SPECTRUM BANDWIDTH (20dB and 99% BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (99% Bandwidth Measurement) Plots – ($\pi/4$) DQPSK



Plot 17 – Channel 0 (lower ch)

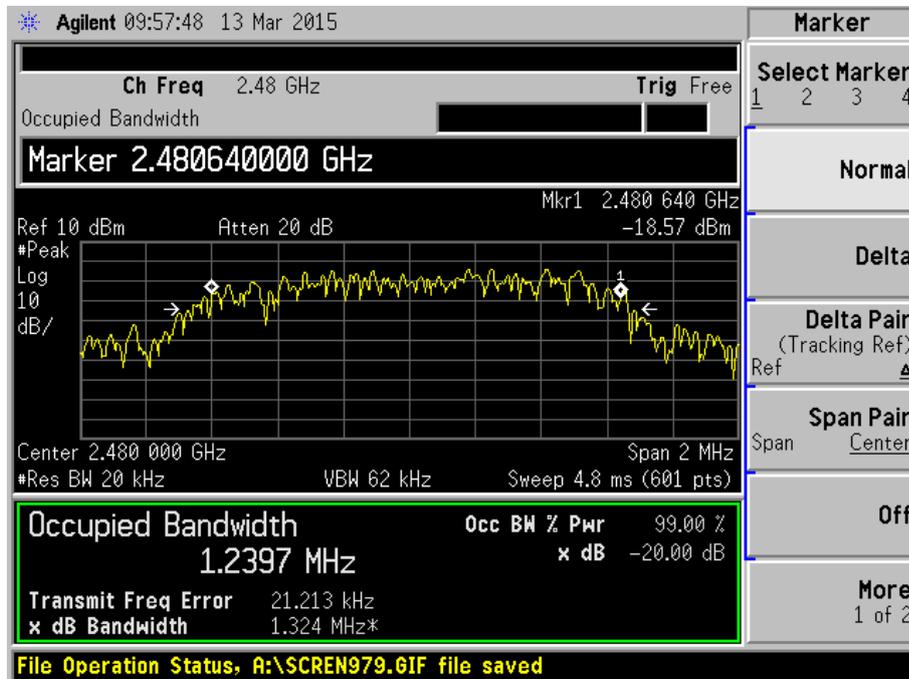


Plot 18 – Channel 39 (mid ch)



SPECTRUM BANDWIDTH (20dB and 99% BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (99% Bandwidth Measurement) Plots – ($\pi/4$) DQPSK

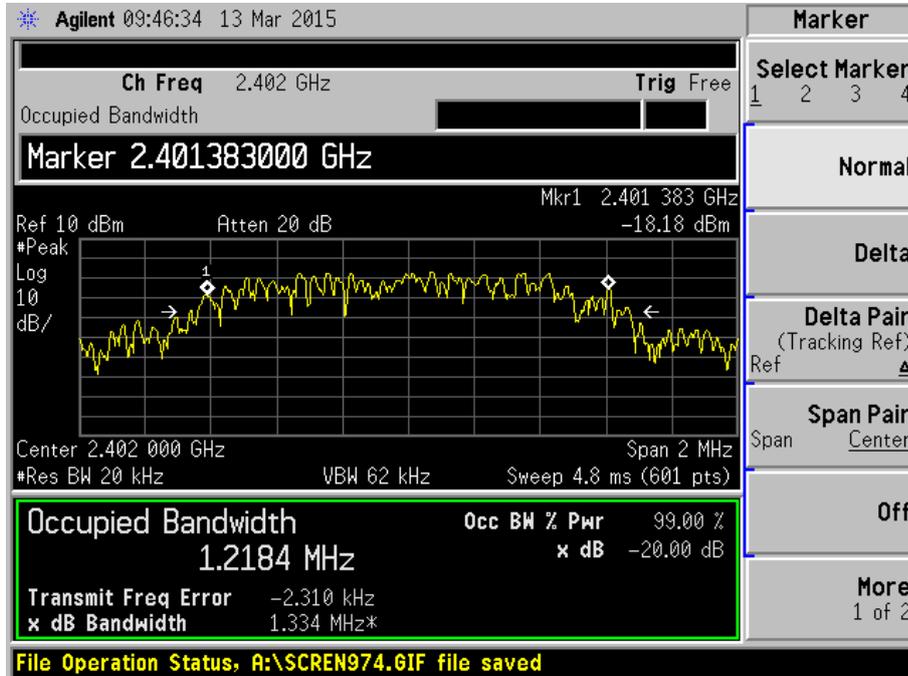


Plot 19 – Channel 78 (upper ch)

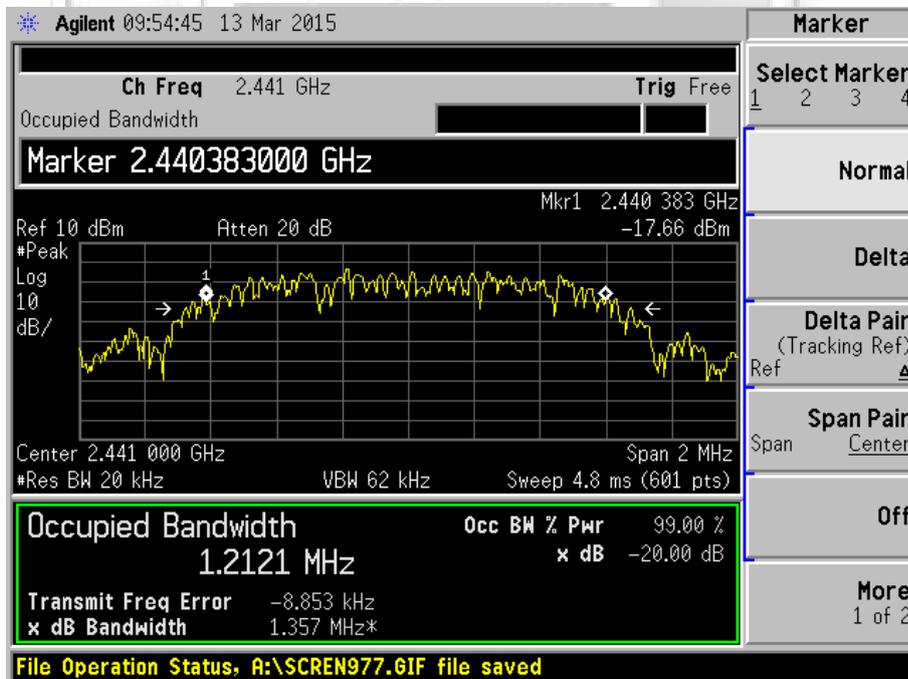


SPECTRUM BANDWIDTH (20dB and 99% BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (99% Bandwidth Measurement) Plots – 8DPSK



Plot 20 – Channel 0 (lower ch)

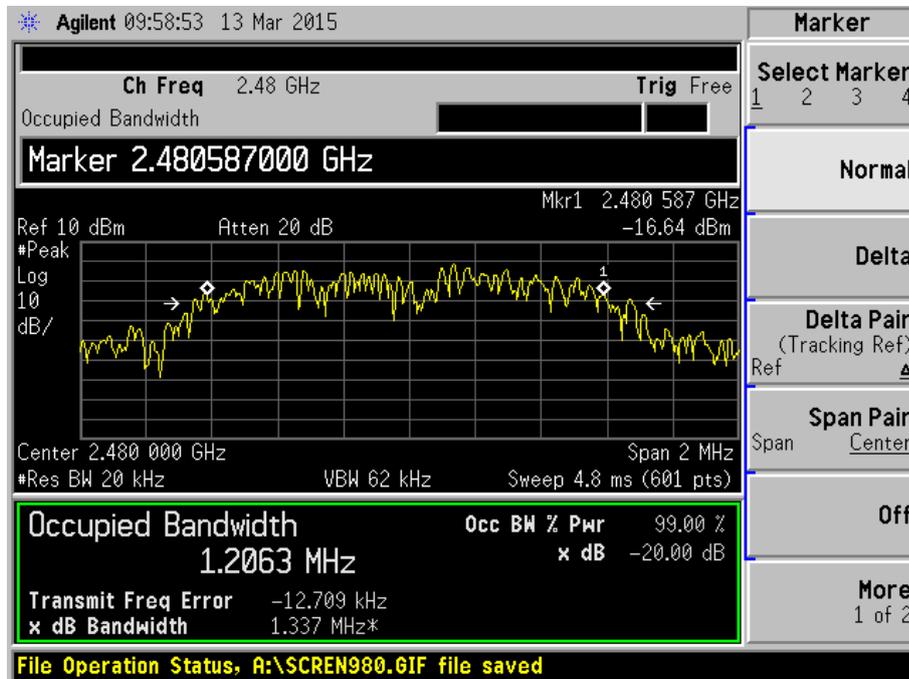


Plot 21 – Channel 39 (mid ch)



SPECTRUM BANDWIDTH (20dB and 99% BANDWIDTH MEASUREMENT) TEST

Spectrum Bandwidth (99% Bandwidth Measurement) Plots – 8DPSK



Plot 22 – Channel 78 (upper ch)





NUMBER OF HOPPING FREQUENCIES TEST

47 CFR FCC Part 15.247(a)(1)(iii) and RSS-210 A8.1(d) Number of Hopping Frequencies Limits

The EUT shows compliance to the requirements of this section, which states the EUT shall use at least 15 channels.

47 CFR FCC Part 15.247(a)(1)(iii) and RSS-210 A8.1(d) Number of Hopping Frequencies Test Instrumentation

Instrument	Model	S/No	Cal Due Date	Cal Interval
Agilent Spectrum Analyzer	E4440A	MY45304764	12 Dec 2015	1 year

47 CFR FCC Part 15.247(a)(1)(iii) and RSS-210 A8.1(d) Number of Hopping Frequencies Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz.
5. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(a)(1)(iii) and RSS-210 A8.1(d) Number of Hopping Frequencies Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with frequency hopping sequence on.
2. The start and stop frequencies of the spectrum analyser were set to 2.390GHz and 2.420GHz.
3. The spectrum analyser was set to max hold to capture all the transmitting frequencies within the span. The signal capturing was continuous until all the transmitting frequencies were captured and no further signals were detected.
4. The numbers of transmitting frequencies were counted and recorded.
5. The steps 2 to 4 were repeated with the following start and stop frequencies settings:
 - a. 2.420GHz to 2.441GHz
 - b. 2.441GHz to 2.461GHz
 - c. 2.461GHz to 2.483GHz
6. The total number of hopping frequencies is the sum of the number of the hopping frequencies found for each span.



NUMBER OF HOPPING FREQUENCIES TEST

47 CFR FCC Part 15.247(a)(1)(iii) and RSS-210 A8.1(d) Number of Hopping Frequencies Results

Test Input Power	120V 60Hz	Temperature	24°C
Attached Plots	23 – 26	Relative Humidity	60%
		Atmospheric Pressure	1030mbar
		Tested By	Liau Lee Yin

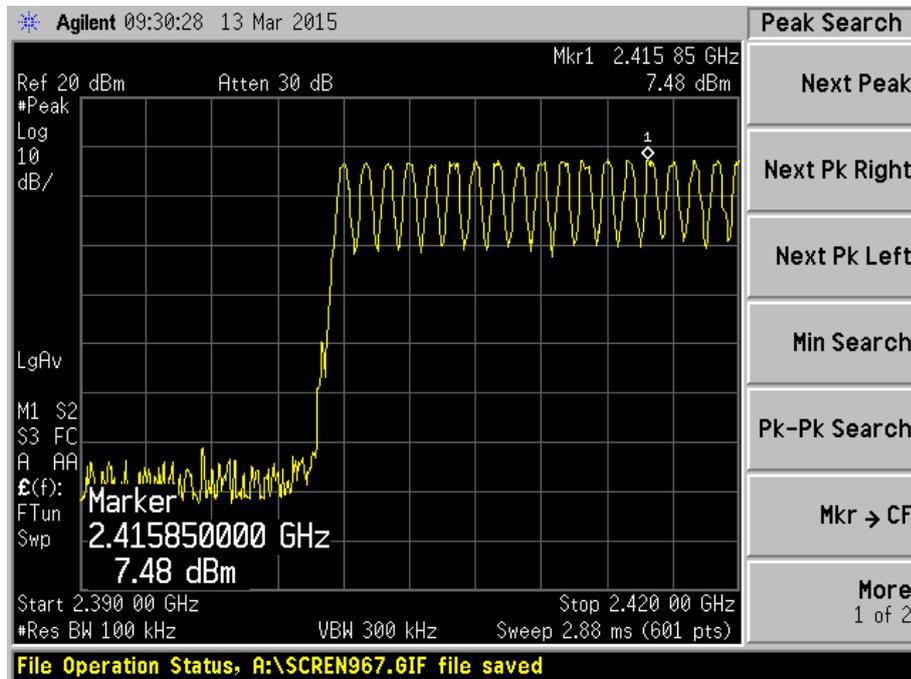
The EUT was found to have 79 (*total number of ch*) hopping frequencies. Please refer to the attached plots.



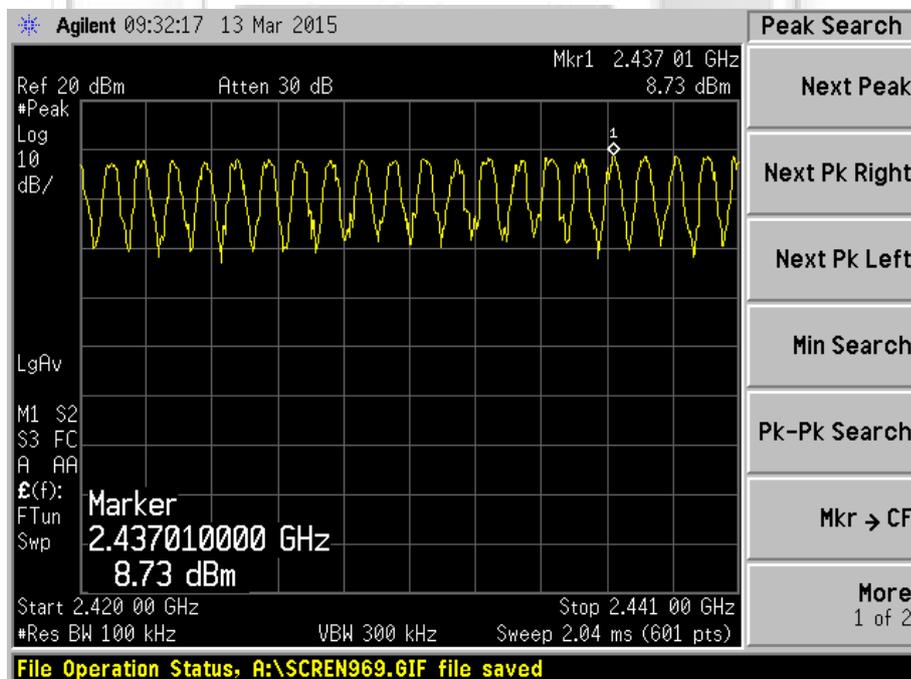


NUMBER OF HOPPING FREQUENCIES TEST

Number of Hopping Frequencies Plots



Plot 23 - Channels 0 to 18

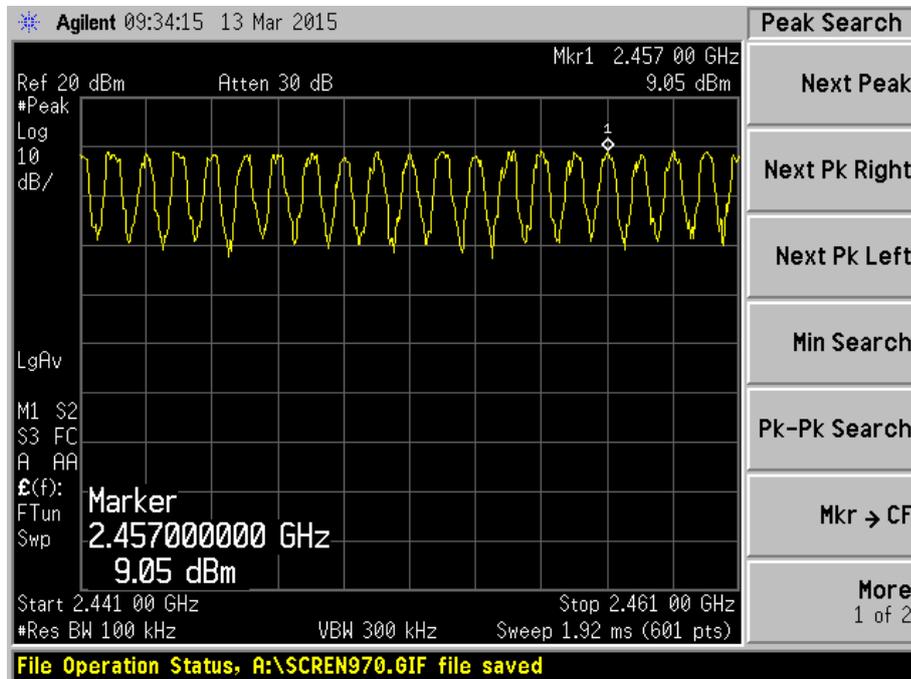


Plot 24 - Channels 18 to 39

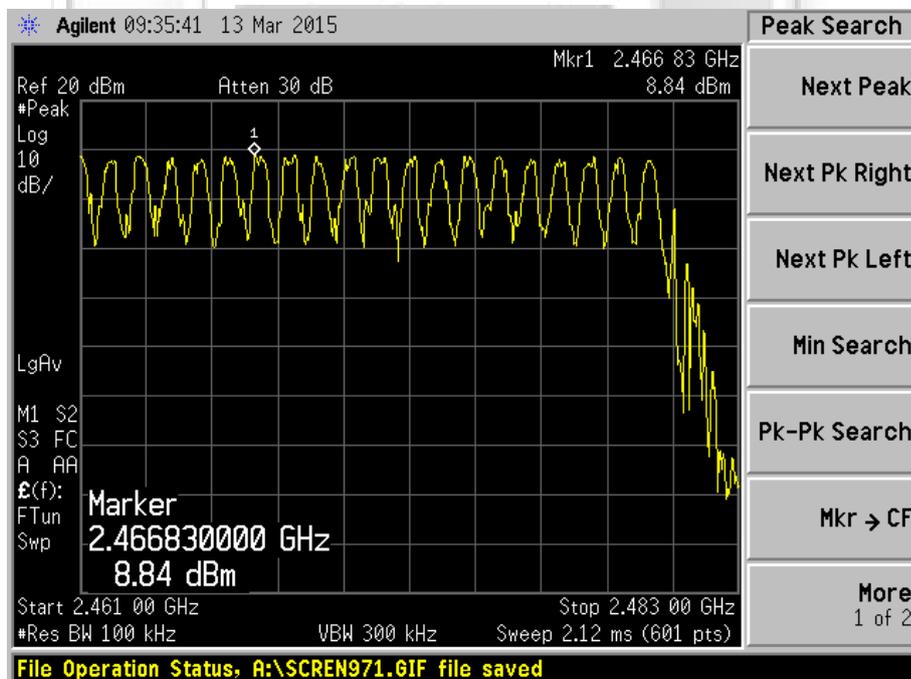


NUMBER OF HOPPING FREQUENCIES TEST

Number of Hopping Frequencies Plots



Plot 25 - Channels 39 to 59



Plot 26 - Channels 59 to 78



AVERAGE FREQUENCY DWELL TIME TEST

47 CFR FCC Part 15.247(a)(1)(iii) and RSS-210 A8.1(d) Average Frequency Dwell Time Limits

The EUT shows compliance to the requirements of this section, which states the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

47 CFR FCC Part 15.247(a)(1)(iii) and RSS-210 A8.1(d) Average Frequency Dwell Time Test Instrumentation

Instrument	Model	S/No	Cal Due Date	Cal Interval
Agilent Spectrum Analyzer	E4440A	MY45304764	12 Dec 2015	1 year

47 CFR FCC Part 15.247(a)(1)(iii) and RSS-210 A8.1(d) Average Frequency Dwell Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 1MHz and 3MHz.
5. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(a)(1)(iii) and RSS-210 A8.1(d) Average Frequency Dwell Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with frequency hopping sequence on.
2. The center frequency of the spectrum analyser was set to 2.402GHz (*lower ch*) with zero frequency span (spectrum analyser acts as an oscilloscope).
3. The sweep time of the spectrum analyser was adjusted until a stable signal can be seen on the spectrum analyser.
4. The duration (dwell time) of a packet was measured using the marker-delta function of the spectrum analyser. The average dwell time of the transmitting frequency was computed as below:
Average Frequency Dwell Time = [measured pulse time x hopping rate / number of hopping channels] x [0.4 x number of hopping channels]
5. The steps 2 to 4 were repeated with the center frequency of the spectrum analyser were set to 2.441GHz (*mid ch*) and 2.480GHz (*upper ch*) respectively.



AVERAGE FREQUENCY DWELL TIME TEST

47 CFR FCC Part 15.247(a)(1)(iii) and RSS-210 A8.1(d) Average Frequency Dwell Time Results

Test Input Power	120V 60Hz	Temperature	24°C
Attached Plots	27 – 35	Relative Humidity	60%
Hopping Rate	1600 hops / s	Atmospheric Pressure	1030mbar
Number of Hopping Channels	79 channels	Tested By	Liau Lee Yin

Channel	Channel Frequency (GHz)	Modulation Type	Pulse Time (ms)	Average Frequency Dwell Time (s)	Average Occupancy Limit (s)
0	2.402	DH1	0.3913	0.1252	0.4
39	2.441		0.3901	0.1248	0.4
78	2.480		0.3872	0.1239	0.4
0	2.402	DH3	1.6467	0.2635	0.4
39	2.441		1.6463	0.2634	0.4
78	2.480		1.6434	0.2629	0.4
0	2.402	DH5	2.8932	0.3086	0.4
39	2.441		2.8933	0.3086	0.4
78	2.480		2.8915	0.3084	0.4

Notes

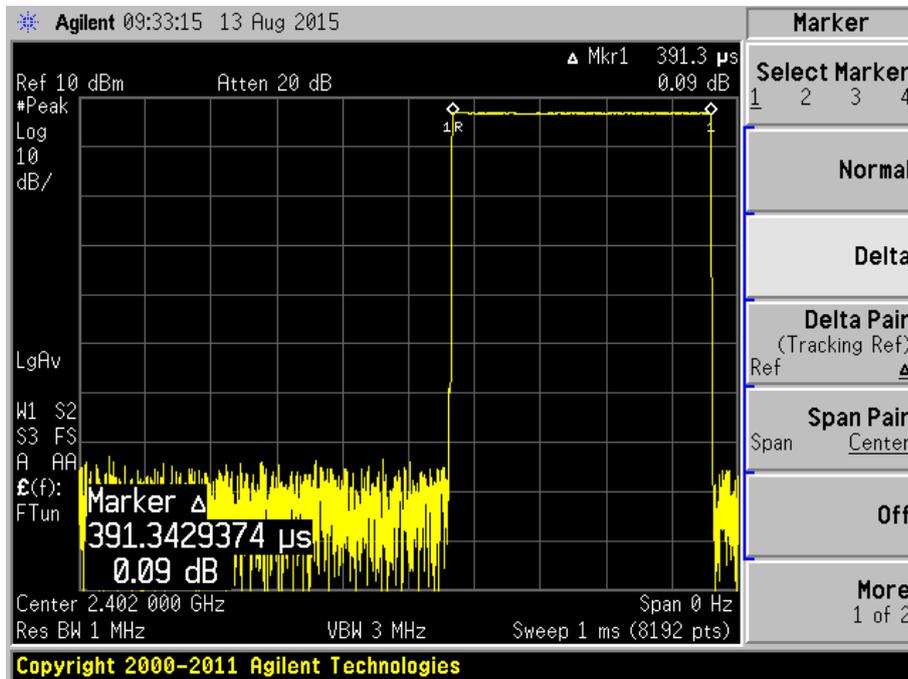
1. Average Frequency Dwell time = $\text{Pulse Time} \times (\text{Hop Rate} / 2 / \text{Number of Channels}) \times 31.6$ (DH1)
 $\text{Pulse Time} \times (\text{Hop Rate} / 4 / \text{Number of Channels}) \times 31.6$ (DH3)
 $\text{Pulse Time} \times (\text{Hop Rate} / 6 / \text{Number of Channels}) \times 31.6$ (DH5)

where:

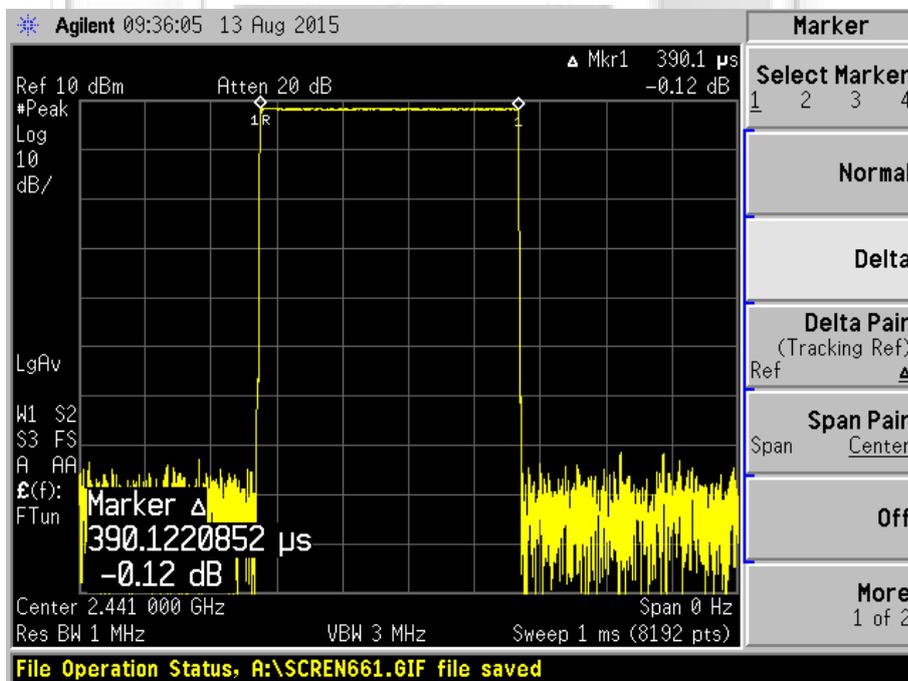
- Hop Rate = 1600
- Number of Channels = 79

AVERAGE FREQUENCY DWELL TIME TEST

Average Frequency Dwell Time Plots – DH1



Plot 27 – Channel 0 (lower ch)

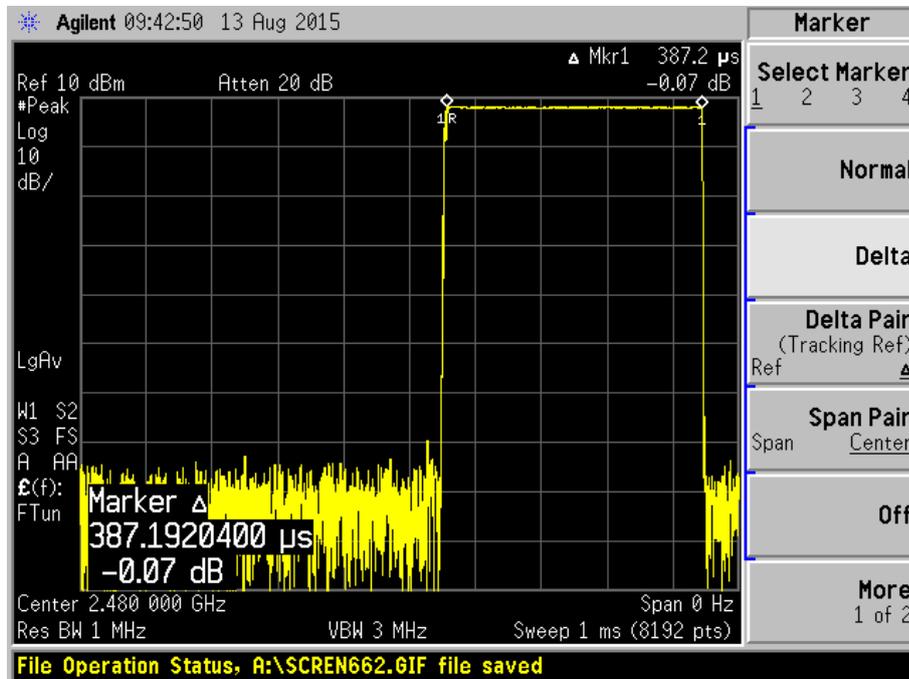


Plot 28 – Channel 39 (mid ch)



AVERAGE FREQUENCY DWELL TIME TEST

Average Frequency Dwell Time Plots – DH1



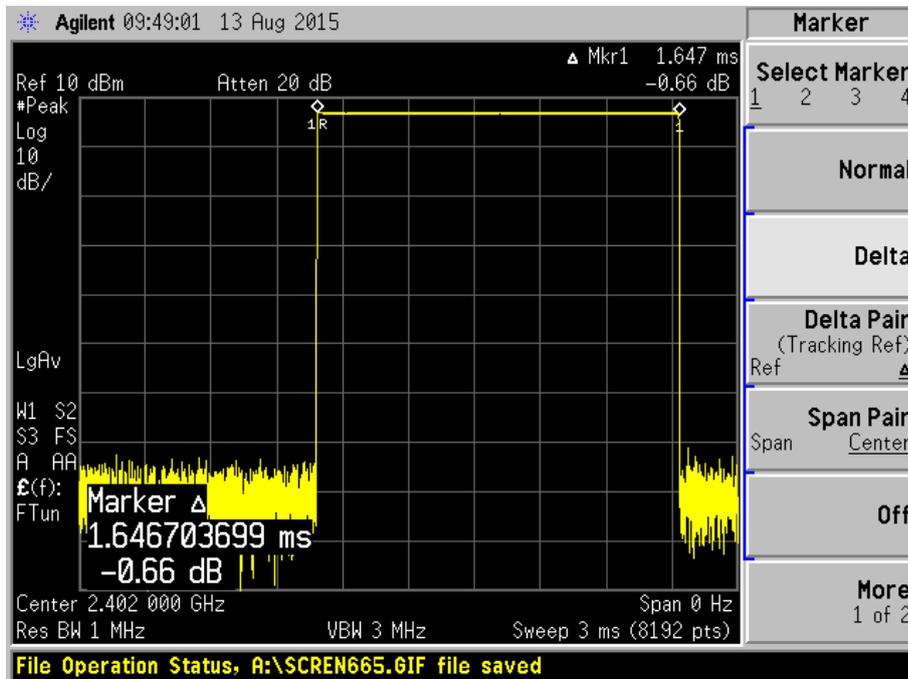
Plot 29 – Channel 78 (upper ch)



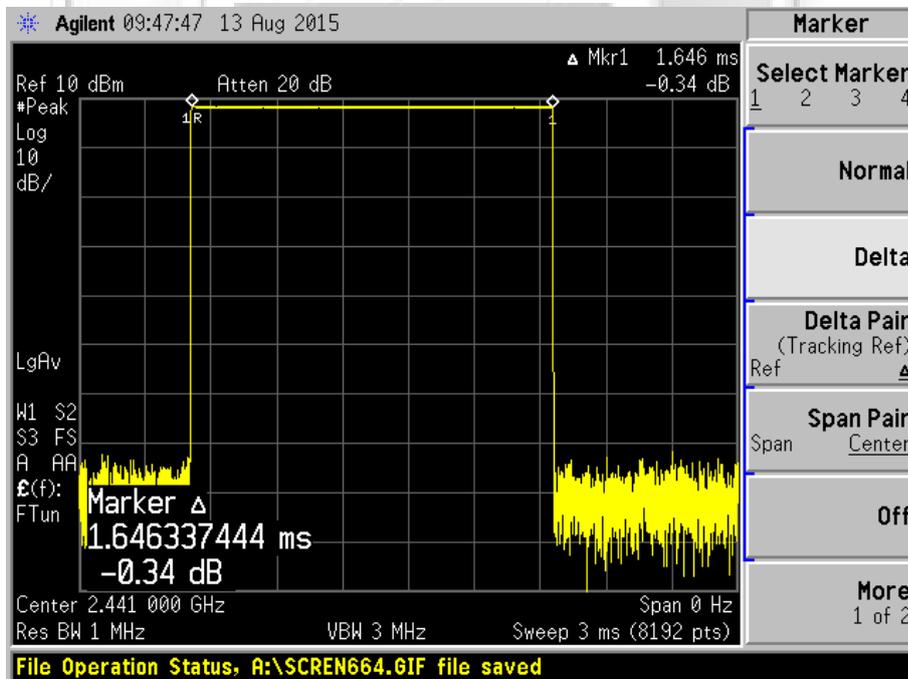


AVERAGE FREQUENCY DWELL TIME TEST

Average Frequency Dwell Time Plots – DH3



Plot 30 – Channel 0 (lower ch)

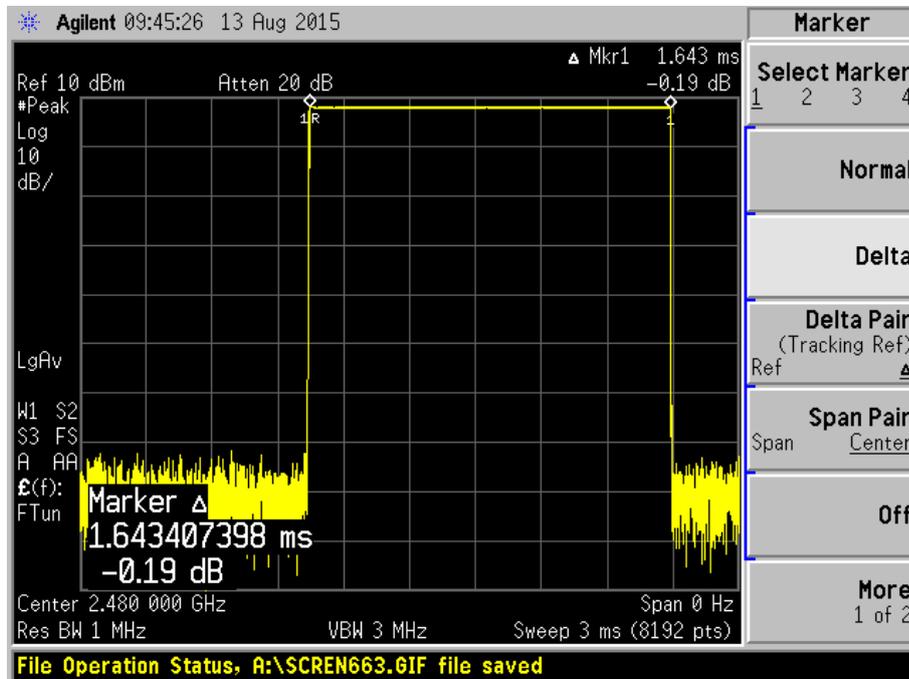


Plot 31 – Channel 39 (mid ch)



AVERAGE FREQUENCY DWELL TIME TEST

Average Frequency Dwell Time Plots – DH3



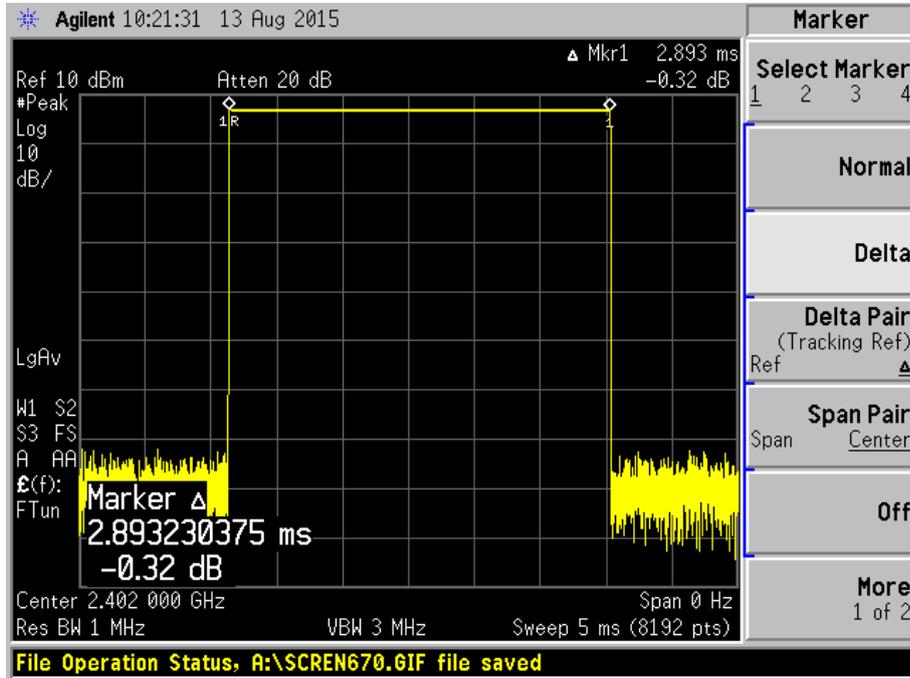
Plot 32 – Channel 78 (upper ch)



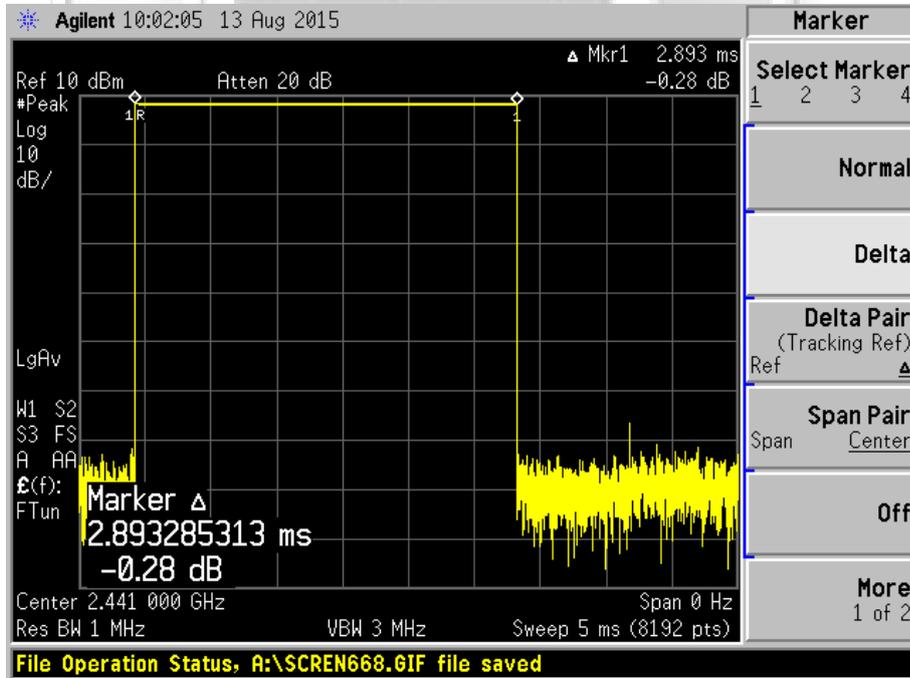


AVERAGE FREQUENCY DWELL TIME TEST

Average Frequency Dwell Time Plots – DH5



Plot 33 – Channel 0 (lower ch)

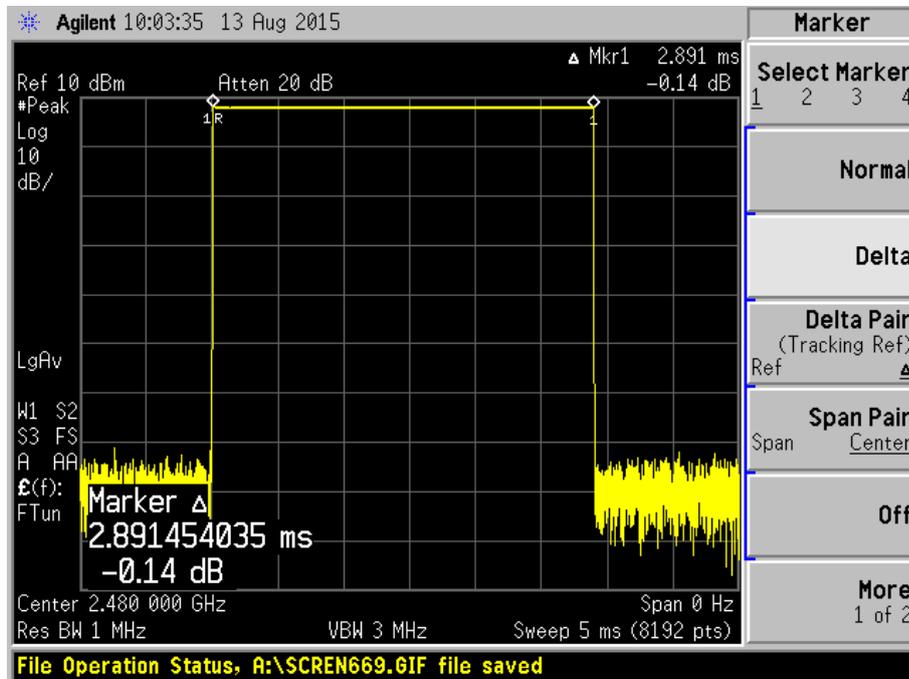


Plot 34 – Channel 39 (mid ch)



AVERAGE FREQUENCY DWELL TIME TEST

Average Frequency Dwell Time Plots – DH5



Plot 35 – Channel 78 (upper ch)





MAXIMUM PEAK POWER TEST

47 CFR FCC Part 15.247(b)(1) and RSS-210 A8.4(2) Maximum Peak Power Limits

The EUT shows compliance to the requirements of this section, which states the EUT employing at least 75 non-overlapping hopping channels shall not exceed 1W (30dBm). For the EUT employs other frequency hopping systems, the peak power shall not greater than 0.125W (21dBm).

47 CFR FCC Part 15.247(b)(1) and RSS-210 A8.4(2) Maximum Peak Power Test Instrumentation

Instrument	Model	S/No	Cal Due Date	Cal Interval
Boonton Electronics RF Power Meter	4532	72901	27 Aug 2015	1 year
Boonton Electronics Peak Power Sensor	56218-S/1	1417	27 Aug 2015	1 year

47 CFR FCC Part 15.247(b)(1) and RSS-210 A8.4(2) Maximum Peak Power Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the Power Meter via a low-loss coaxial cable.
4. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(b)(1) and RSS-210 A8.4(2) Maximum Peak Power Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode, non-hopping with transmitting frequency at Channel 0 (2.402GHz) (*lower ch*).
2. The maximum peak power of the transmitting frequency was detected and recorded.
3. The Equivalent Isotropic Radiated Power (EIRP) of the EUT was computed by adding its antenna gain to the measured maximum peak power.
4. The steps 2 and 3 were repeated with the transmitting frequency was set to Channel 39 (2.441GHz) (*mid ch*) and Channel 78 (2.480GHz) (*upper ch*) respectively.



MAXIMUM PEAK POWER TEST

47 CFR FCC Part 15.247(b)(1) and RSS-210 A8.4(2) Maximum Peak Power Results

Test Input Power	120V 60Hz	Temperature	24°C
Antenna Gain	2.15 dBi	Relative Humidity	60%
		Atmospheric Pressure	1030mbar
		Tested By	Liau Lee Yin

Channel	Channel Frequency (GHz)	Modulation Type	Maximum Peak Power (W)	Limit (W)
0	2.402	GFSK	0.0037	1.0
39	2.441		0.0061	1.0
78	2.480		0.0051	1.0
0	2.402	$(\pi/4)$ DQPSK	0.0021	1.0
39	2.441		0.0033	1.0
78	2.480		0.0032	1.0
0	2.402	8DPSK	0.0021	1.0
39	2.441		0.0033	1.0
78	2.480		0.0032	1.0

Notes

1. Nil.



RF CONDUCTED SPURIOUS EMISSIONS TEST

47 CFR FCC Part 15.247(d) and RSS-210 A8.5 RF Conducted Spurious Emissions Limits

The EUT shows compliance to the requirements of this section, which states in any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator (EUT) is operating, the radio frequency power that is produced by the EUT shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power.

47 CFR FCC Part 15.247(d) and RSS-210 A8.5 RF Conducted Spurious Test Instrumentation

Instrument	Model	S/No	Cal Due Date	Cal Interval
Agilent Spectrum Analyzer	E4440A	MY45304764	12 Dec 2015	1 year

47 CFR FCC Part 15.247(d) and RSS-210 A8.5 RF Conducted Spurious Emissions Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz.
5. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(d) and RSS-210 A8.5 RF Conducted Spurious Emissions Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode, non-hopping with transmitting frequency at Channel 0 (2.402GHz) (*lower ch*).
2. The start and stop frequencies of the spectrum analyser were set to 30MHz and 10GHz.
3. The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected.
4. The steps 2 to 3 were repeated with frequency span was set from 10GHz to 25GHz.
5. The steps 2 to 4 were repeated with the transmitting frequency was set to Channel 39 (2.441GHz) (*mid ch*) and Channel 78 (2.480GHz) (*upper ch*) respectively.



RF CONDUCTED SPURIOUS EMISSIONS TEST

47 CFR FCC Part 15.247(d) and RSS-210 A8.5 RF Conducted Spurious Emissions Results

Test Input Power	120V 60Hz	Temperature	24°C
Modulation	GFSK	Relative Humidity	60%
Attached Plots	36 – 41	Atmospheric Pressure	1030mbar
		Tested By	Liau Lee Yin

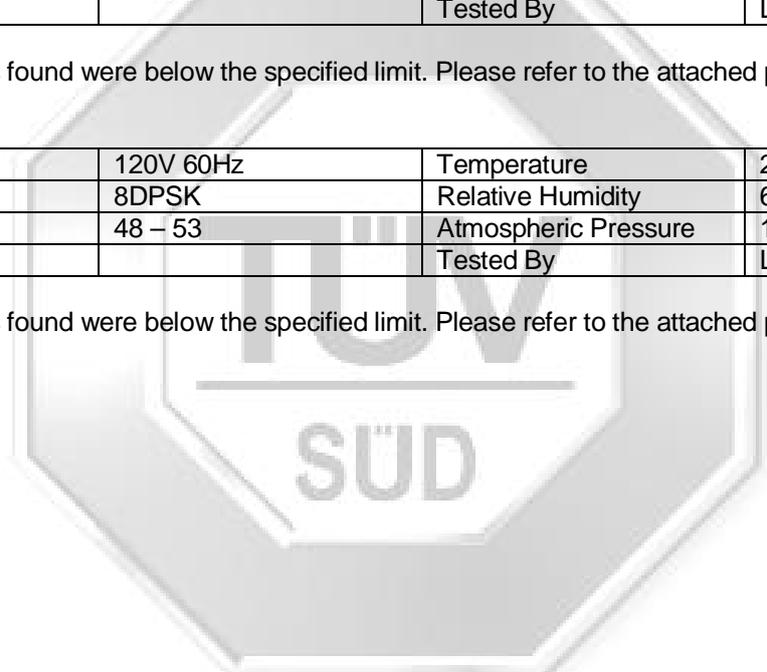
All spurious signals found were below the specified limit. Please refer to the attached plots.

Test Input Power	120V 60Hz	Temperature	24oC
Modulation	($\pi/4$) DQPSK	Relative Humidity	60%
Attached Plots	42 – 47	Atmospheric Pressure	1030mbar
		Tested By	Liau Lee Yin

All spurious signals found were below the specified limit. Please refer to the attached plots.

Test Input Power	120V 60Hz	Temperature	24oC
Modulation	8DPSK	Relative Humidity	60%
Attached Plots	48 – 53	Atmospheric Pressure	1030mbar
		Tested By	Liau Lee Yin

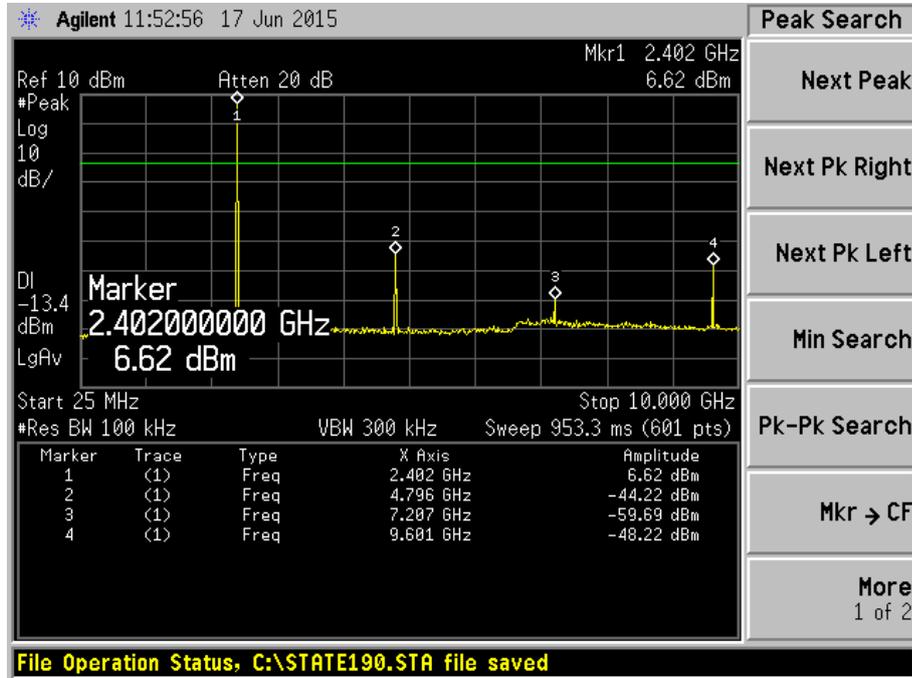
All spurious signals found were below the specified limit. Please refer to the attached plots.



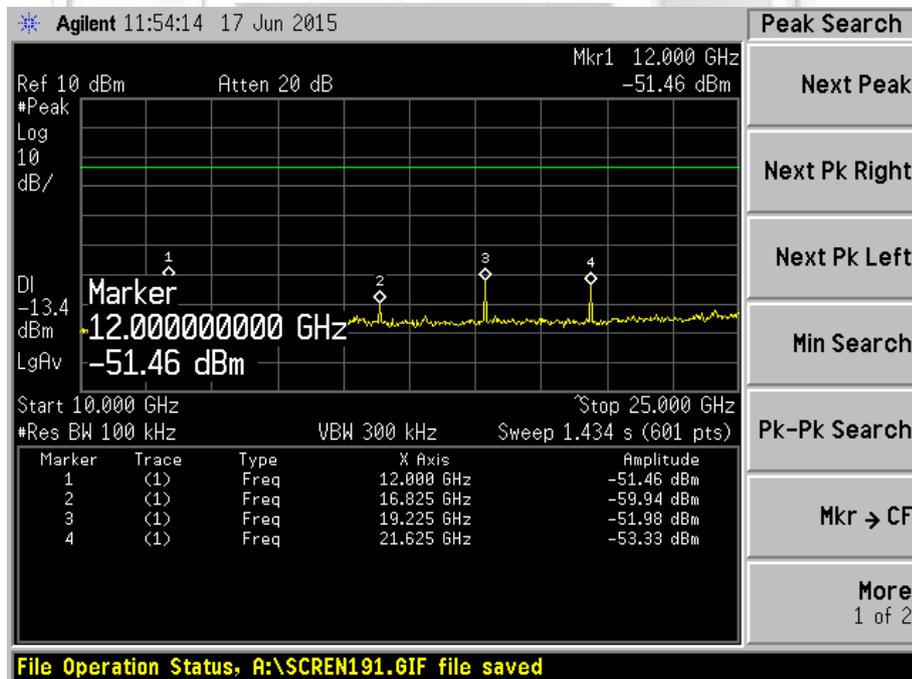


RF CONDUCTED SPURIOUS EMISSIONS TEST

RF Conducted Spurious Emissions Plots – GFSK



Plot 36 – Channel 0 (lower ch)

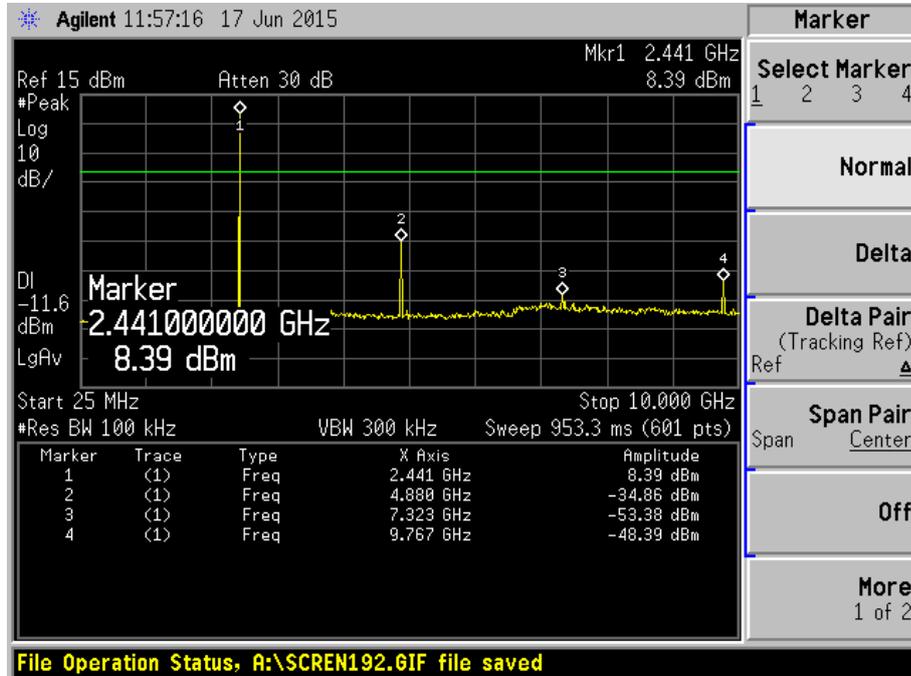


Plot 37 – Channel 0 (lower ch)

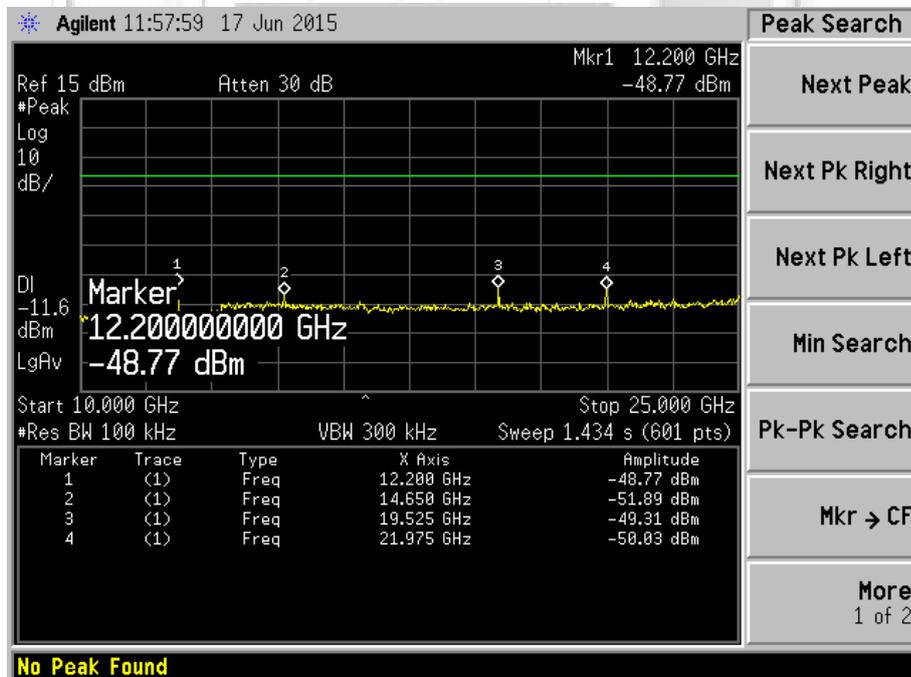


RF CONDUCTED SPURIOUS EMISSIONS TEST

RF Conducted Spurious Emissions Plots – GFSK



Plot 38 – Channel 39 (mid ch)

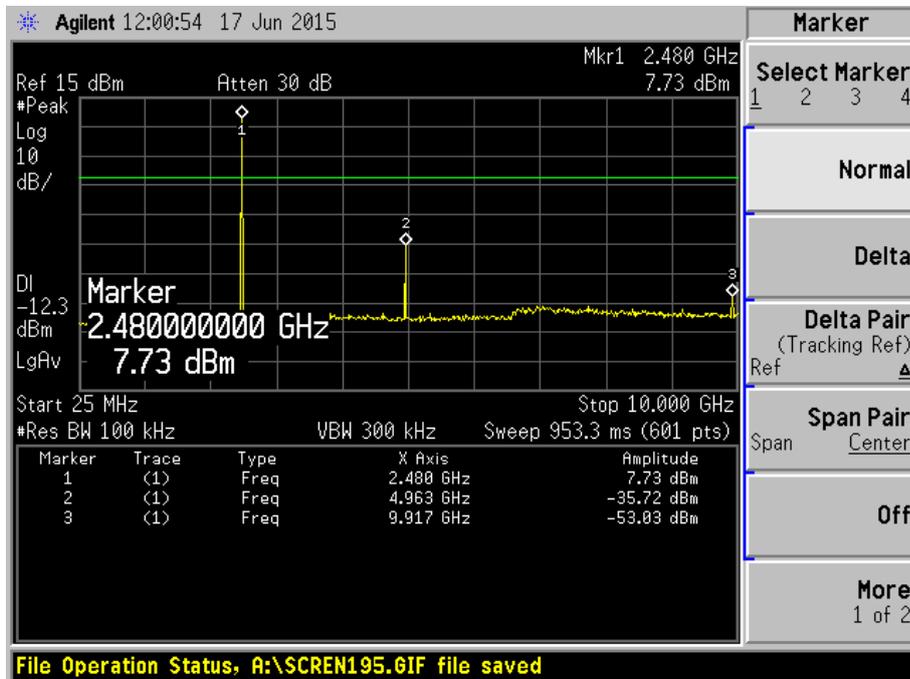


Plot 39 – Channel 39 (mid ch)

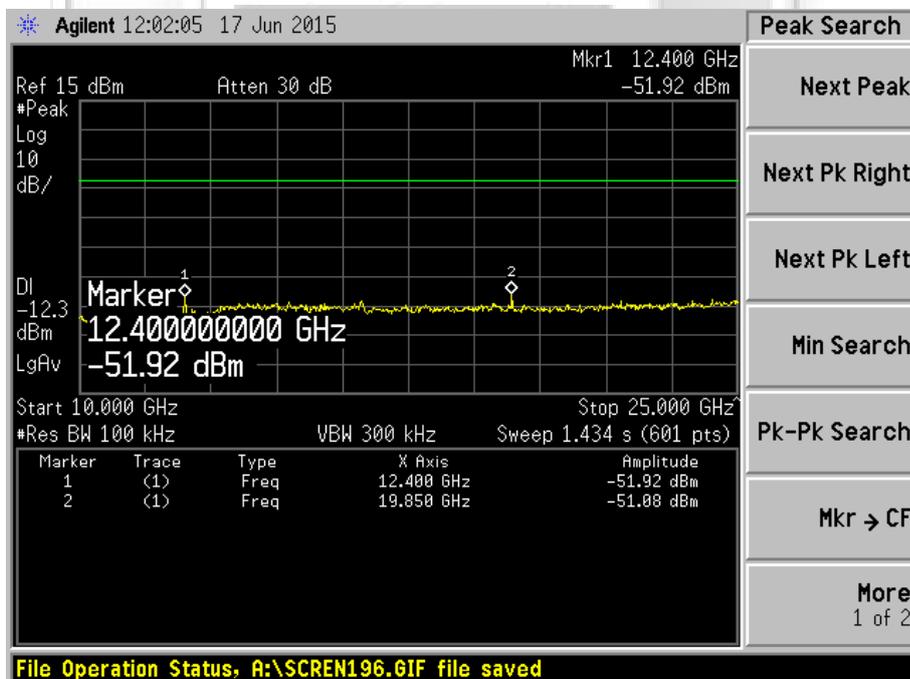


RF CONDUCTED SPURIOUS EMISSIONS TEST

RF Conducted Spurious Emissions Plots – GFSK



Plot 40 – Channel 78 (upper ch)

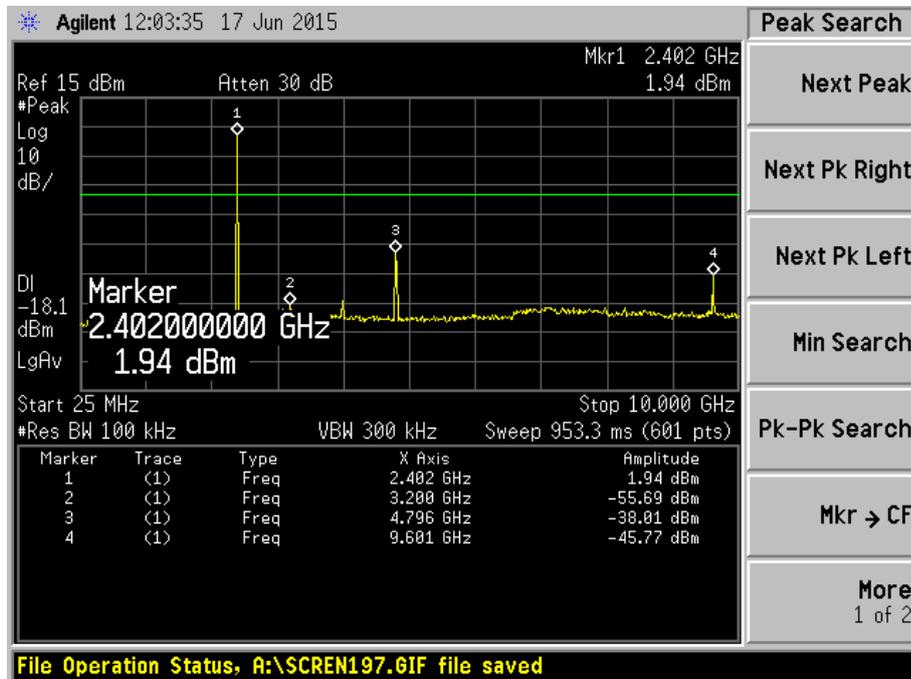


Plot 41 – Channel 78 (upper ch)

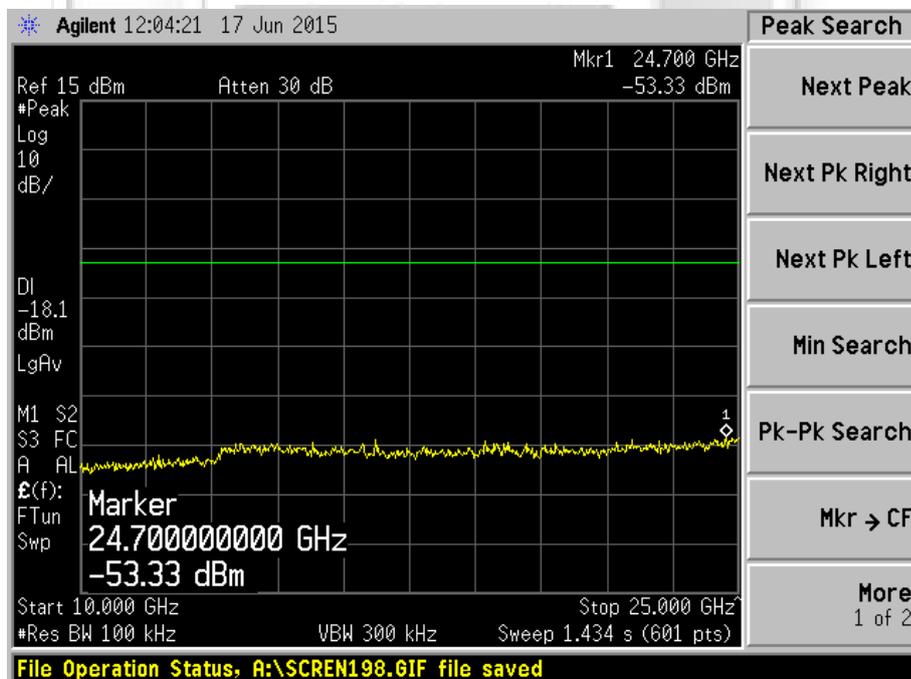


RF CONDUCTED SPURIOUS EMISSIONS TEST

RF Conducted Spurious Emissions Plots – ($\pi/4$) DQPSK



Plot 42 – Channel 0 (lower ch)

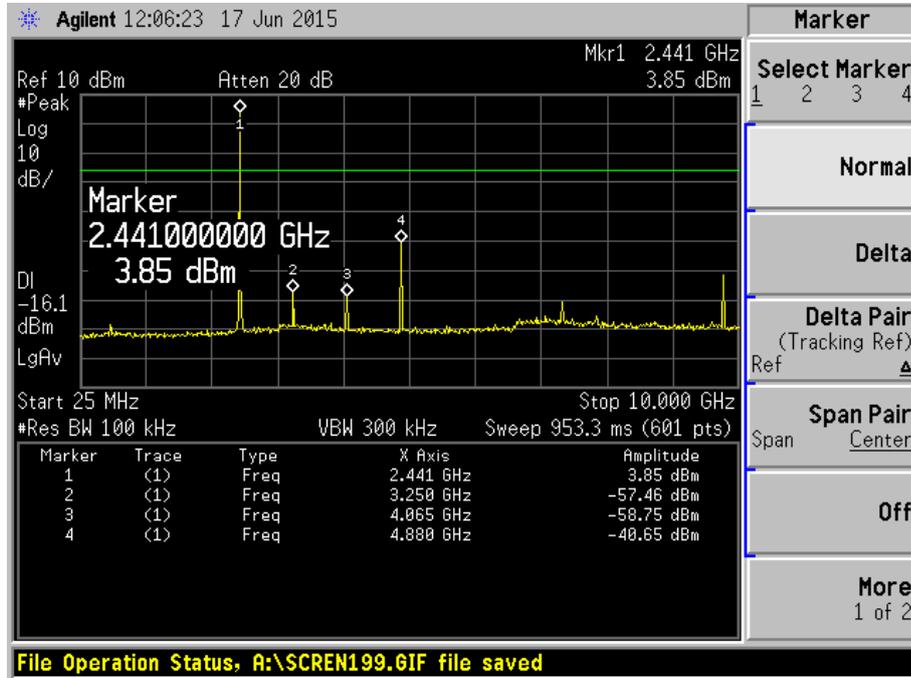


Plot 43 – Channel 0 (lower ch)

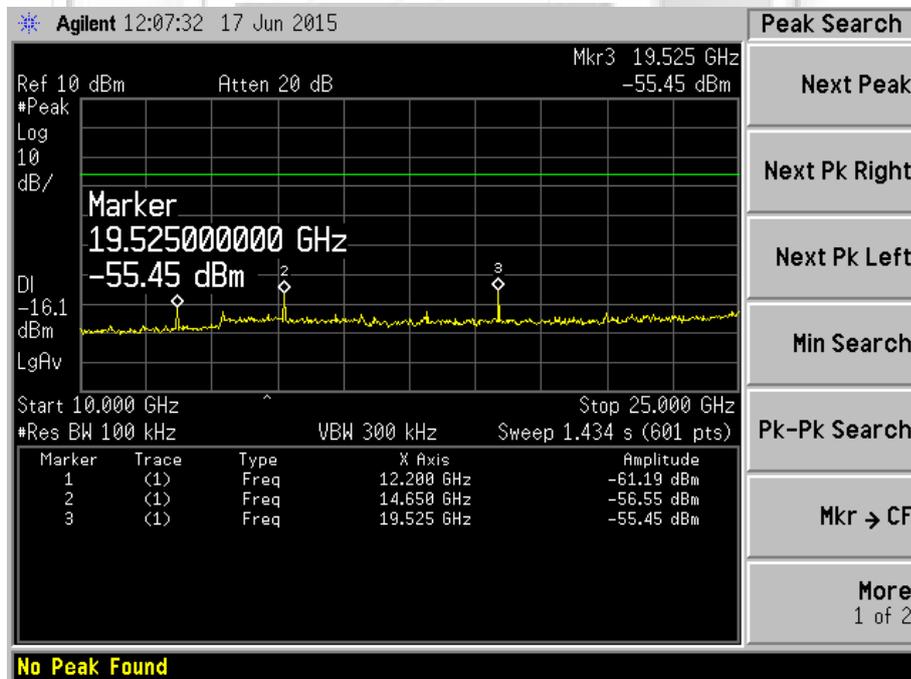


RF CONDUCTED SPURIOUS EMISSIONS TEST

RF Conducted Spurious Emissions Plots – ($\pi/4$) DQPSK



Plot 44 – Channel 39 (mid ch)

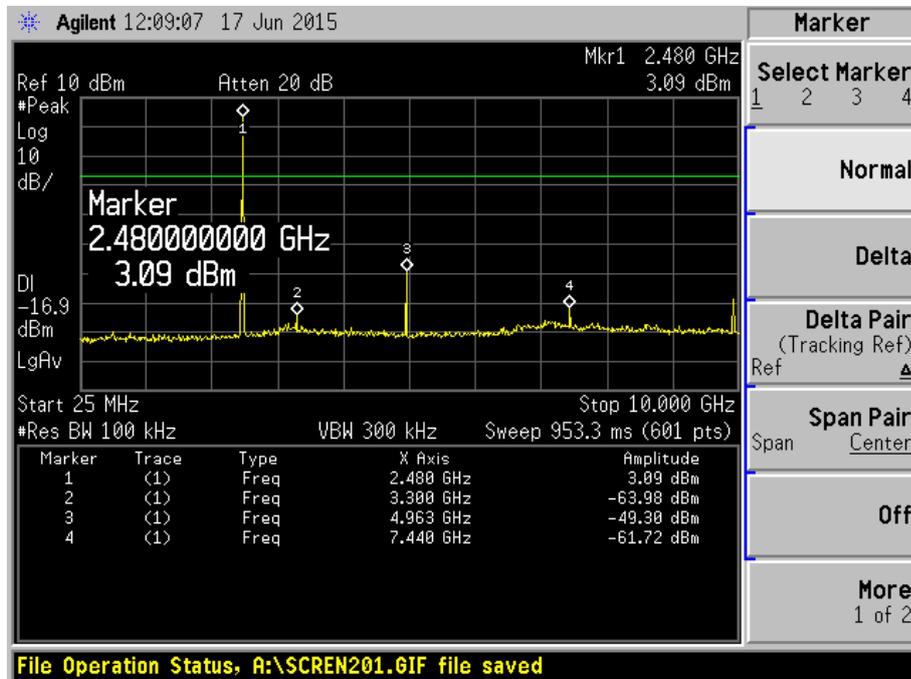


Plot 45 – Channel 39 (mid ch)

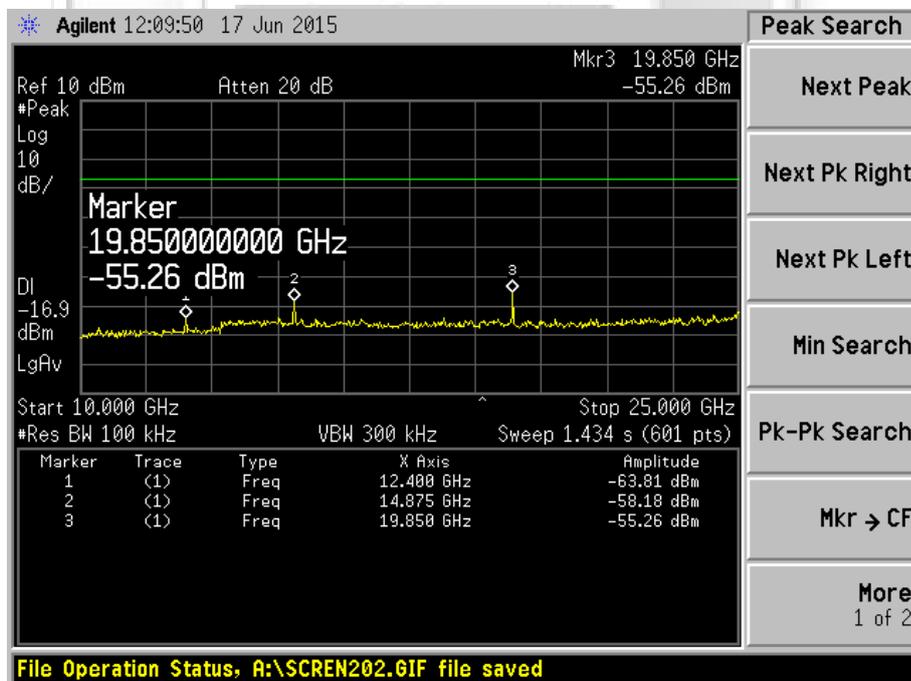


RF CONDUCTED SPURIOUS EMISSIONS TEST

RF Conducted Spurious Emissions Plots – ($\pi/4$) DQPSK



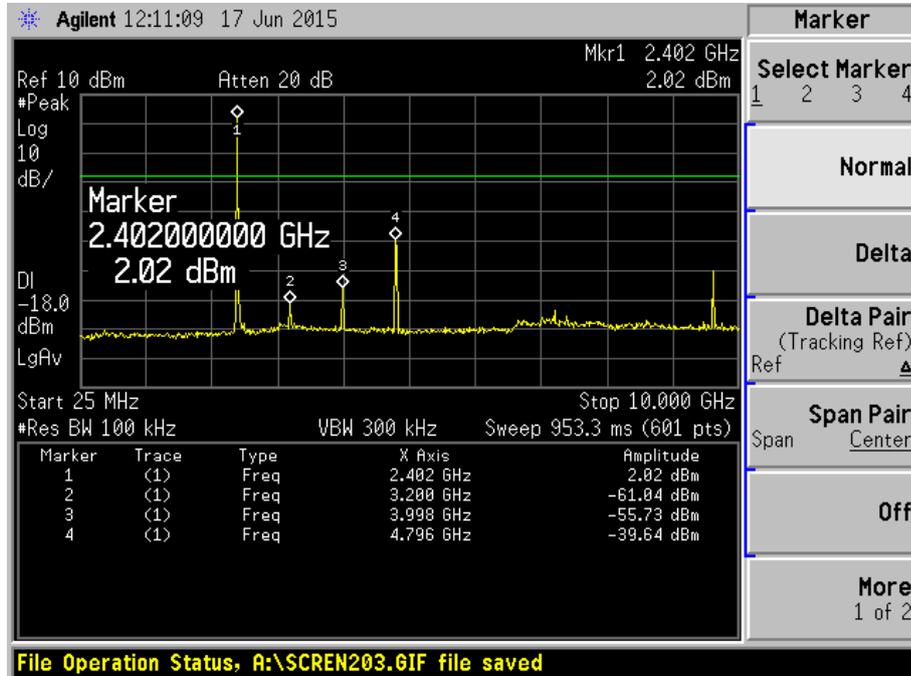
Plot 46 – Channel 78 (upper ch)



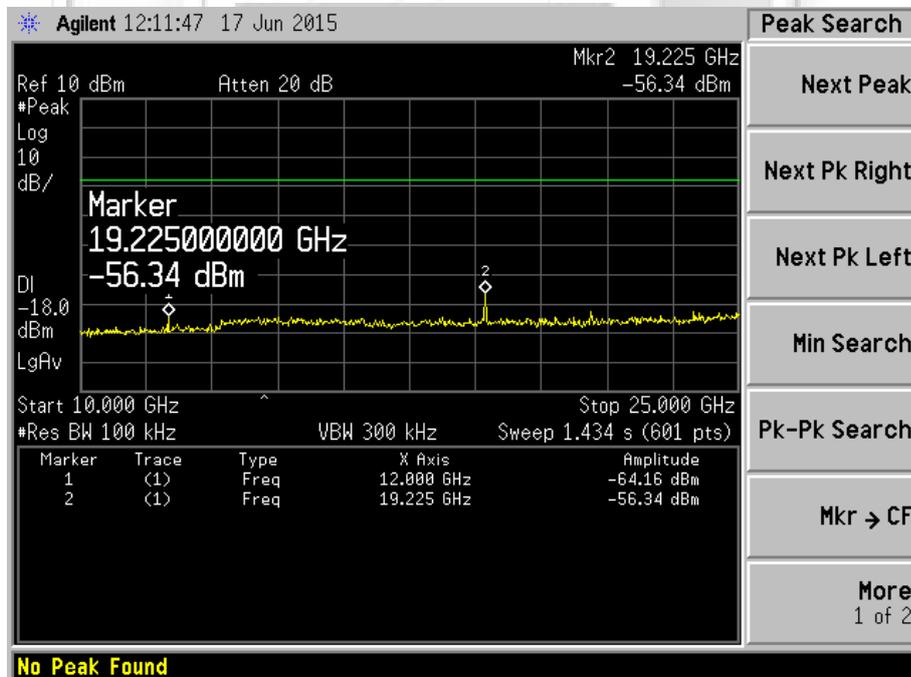
Plot 47 – Channel 78 (upper ch)

RF CONDUCTED SPURIOUS EMISSIONS TEST

RF Conducted Spurious Emissions Plots – 8DPSK



Plot 48 – Channel 0 (lower ch)

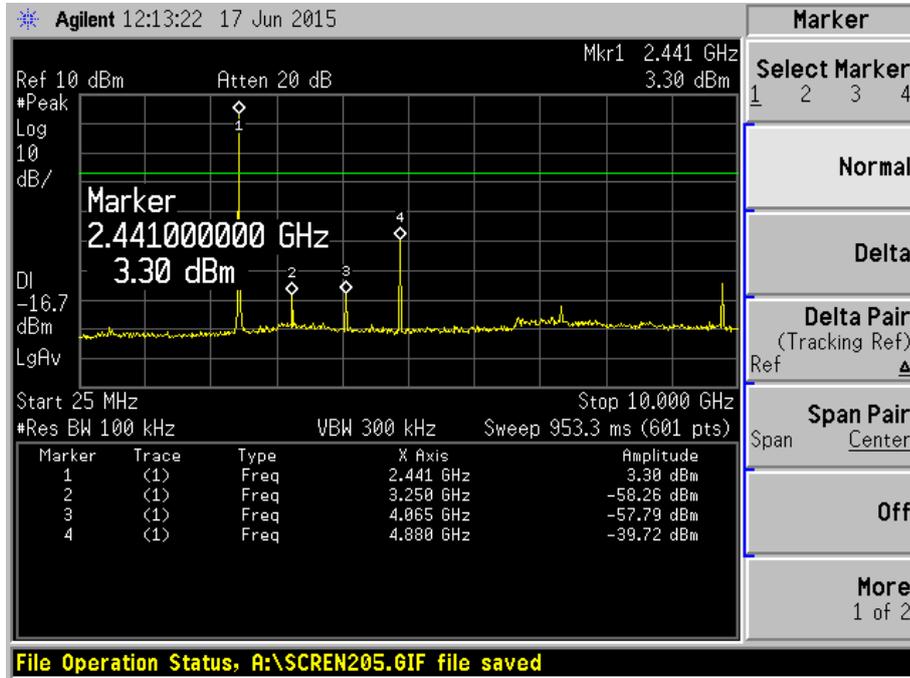


Plot 49 – Channel 0 (lower ch)

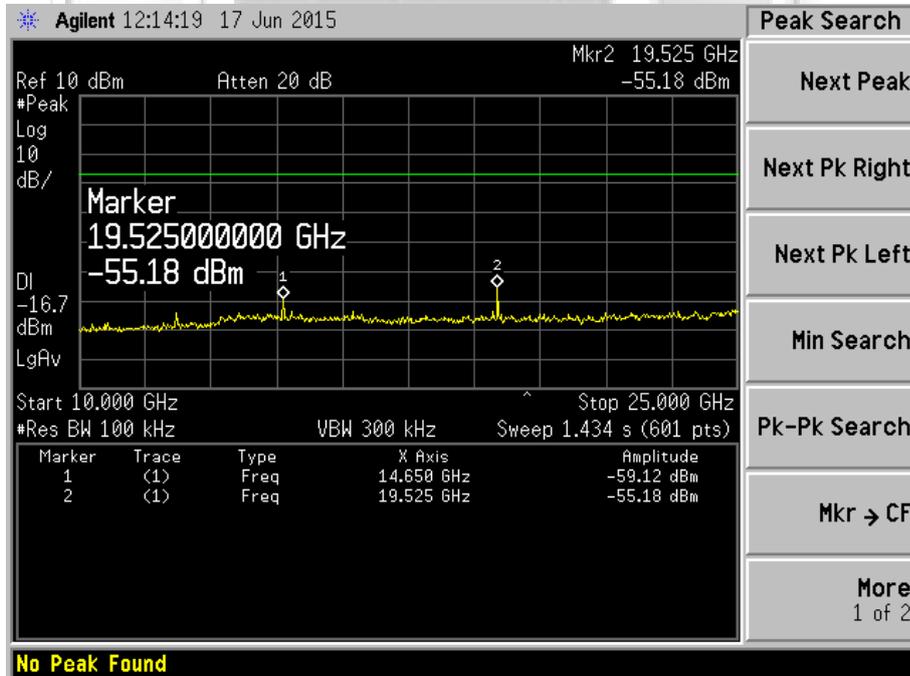


RF CONDUCTED SPURIOUS EMISSIONS TEST

RF Conducted Spurious Emissions Plots – 8DPSK



Plot 50 – Channel 39 (mid ch)

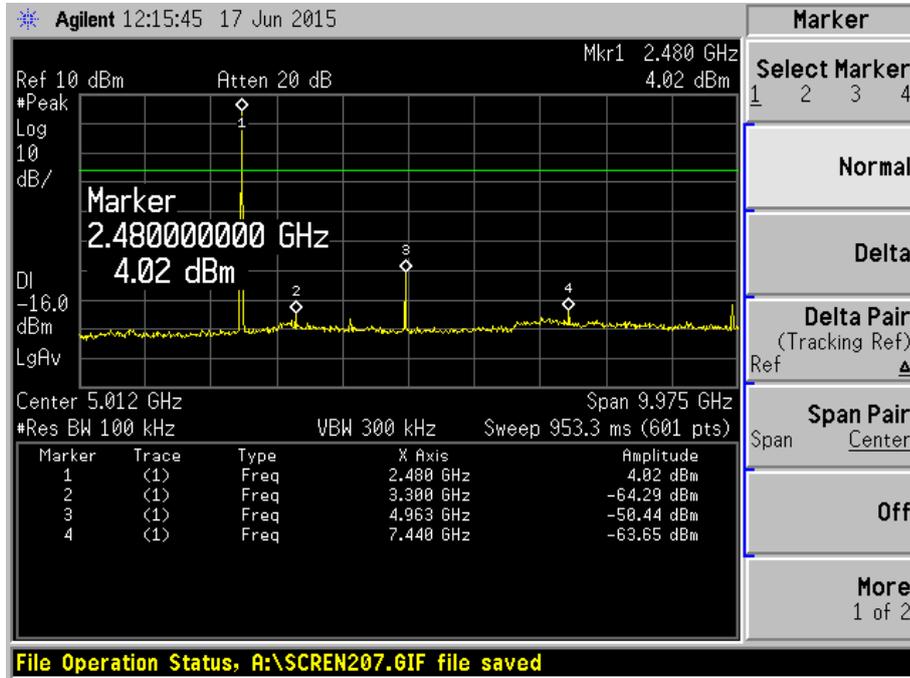


Plot 51 – Channel 39 (mid ch)

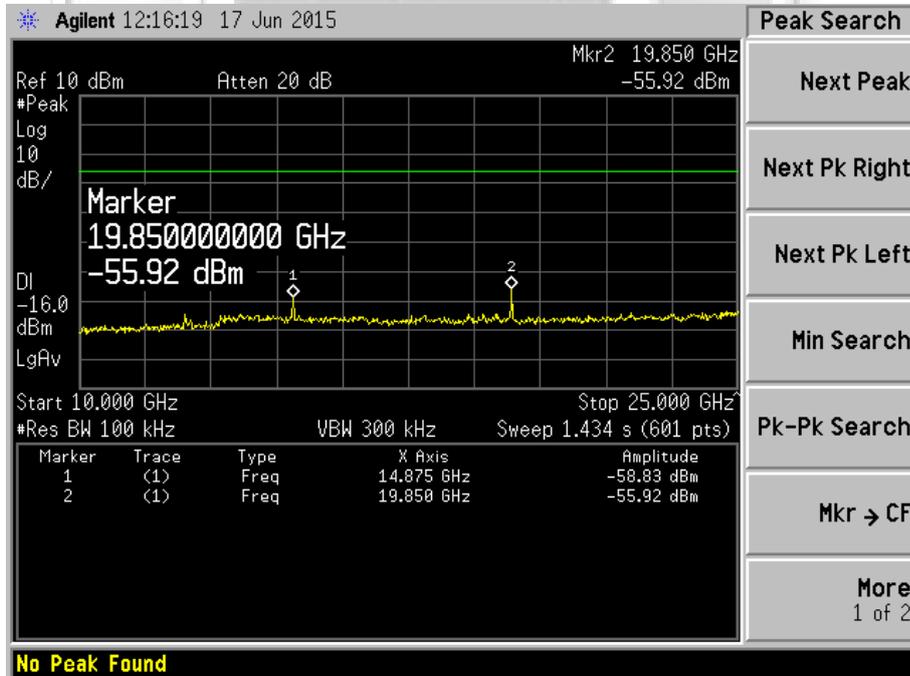


RF CONDUCTED SPURIOUS EMISSIONS TEST

RF Conducted Spurious Emissions Plots – 8DPSK



Plot 52 – Channel 78 (upper ch)



Plot 53 – Channel 78 (upper ch)



BAND EDGE COMPLIANCE (CONDUCTED) TEST

47 CFR FCC Part 15.247(d) and RSS-210 A8.5 Band Edge Compliance (Conducted) Limits

The EUT shows compliance to the requirements of this section, which states in any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator (EUT) is operating, the radio frequency power that is produced by the EUT shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power.

47 CFR FCC Part 15.247(d) and RSS-210 A8.5 Band Edge Compliance (Conducted) Test Instrumentation

Instrument	Model	S/No	Cal Due Date	Cal Interval
Agilent Spectrum Analyzer	E4440A	MY45304764	12 Dec 2015	1 year

47 CFR FCC Part 15.247(d) and RSS-210 A8.5 Band Edge Compliance (Conducted) Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz.
5. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(d) and RSS-210 A8.5 Band Edge Compliance (Conducted) Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with frequency hopping off.
2. The frequency span of the spectrum analyser was set to wide enough to capture the lower band edge of the transmission band, 2.400GHz and any spurious emissions at the band edge.
3. The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected.
4. The steps 2 to 3 were repeated with the frequency span of the spectrum analyser was set to wide enough to capture the upper band edge frequency of the transmission band, 2.4835GHz and the any spurious emissions at the band-edge.
5. The steps 2 to 4 were repeated with the EUT configured to operate in the test mode with frequency hopping on.



BAND EDGE COMPLIANCE (CONDUCTED) TEST

47 CFR FCC Part 15.247(d) and RSS-210 A8.5 Band Edge Compliance (Conducted) Results

Test Input Power	120V 60Hz	Temperature	24°C
Modulation	GFSK	Relative Humidity	60%
Attached Plots	54 – 55 (Non-Hopping)	Atmospheric Pressure	1030mbar
	56 – 57 (Hopping)	Tested By	Liau Lee Yin

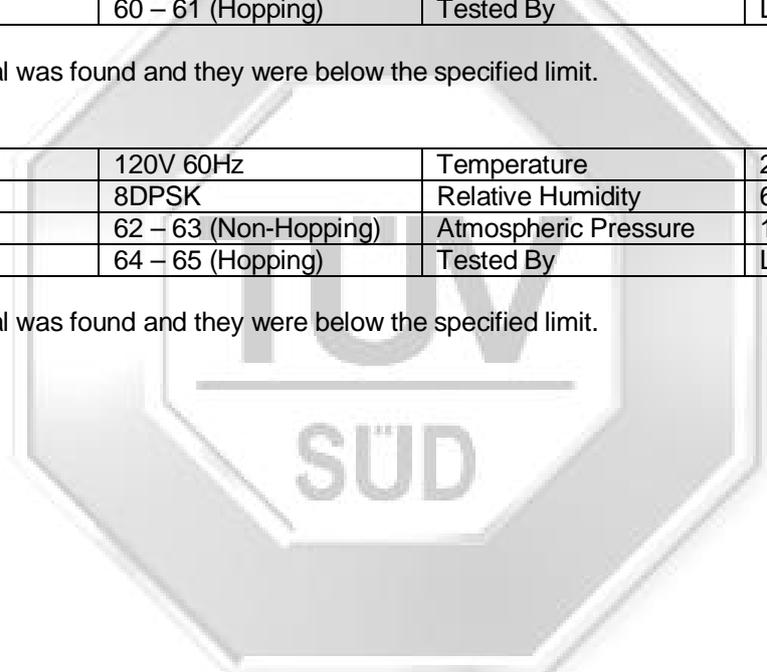
No significant signal was found and they were below the specified limit.

Test Input Power	120V 60Hz	Temperature	24°C
Modulation	($\pi/4$) DQPSK	Relative Humidity	60%
Attached Plots	58 – 59 (Non-Hopping)	Atmospheric Pressure	1030mbar
	60 – 61 (Hopping)	Tested By	Liau Lee Yin

No significant signal was found and they were below the specified limit.

Test Input Power	120V 60Hz	Temperature	24°C
Modulation	8DPSK	Relative Humidity	60%
Attached Plots	62 – 63 (Non-Hopping)	Atmospheric Pressure	1030mbar
	64 – 65 (Hopping)	Tested By	Liau Lee Yin

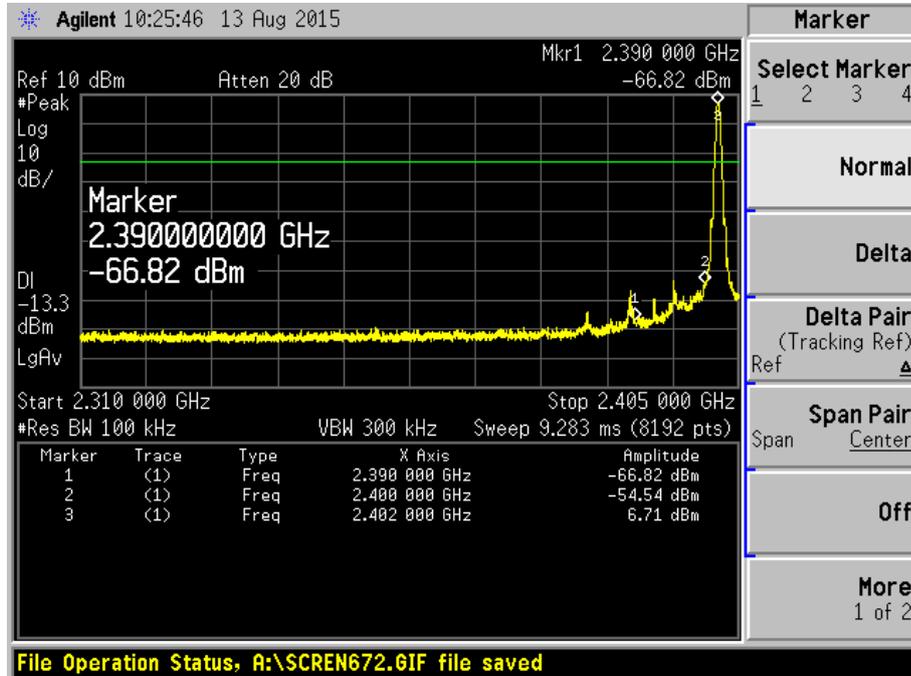
No significant signal was found and they were below the specified limit.



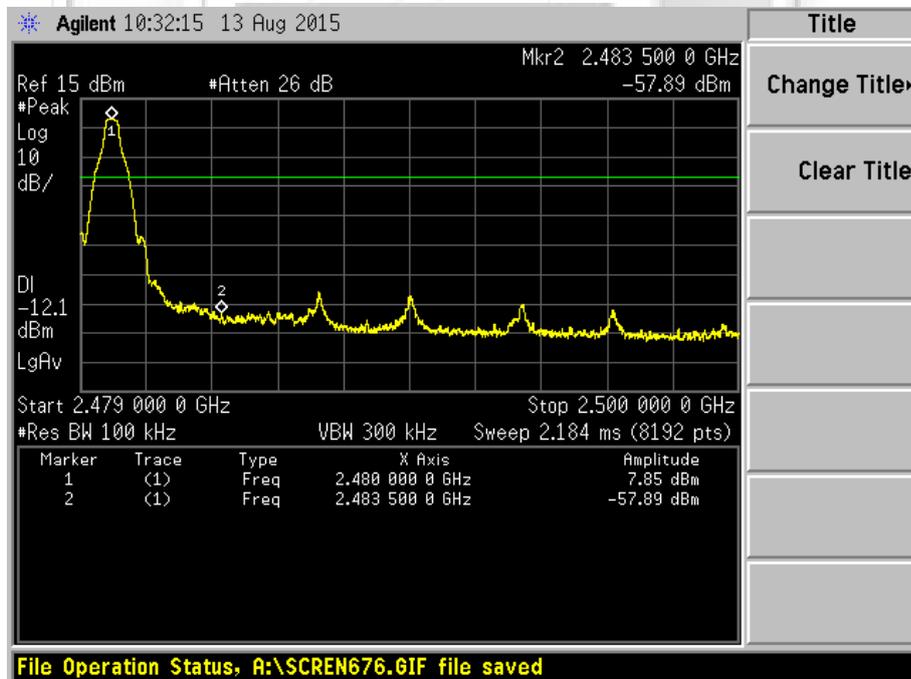


BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots – GFSK (Non-Hopping)



Plot 54 – Lower Band Edge at 2.4000GHz

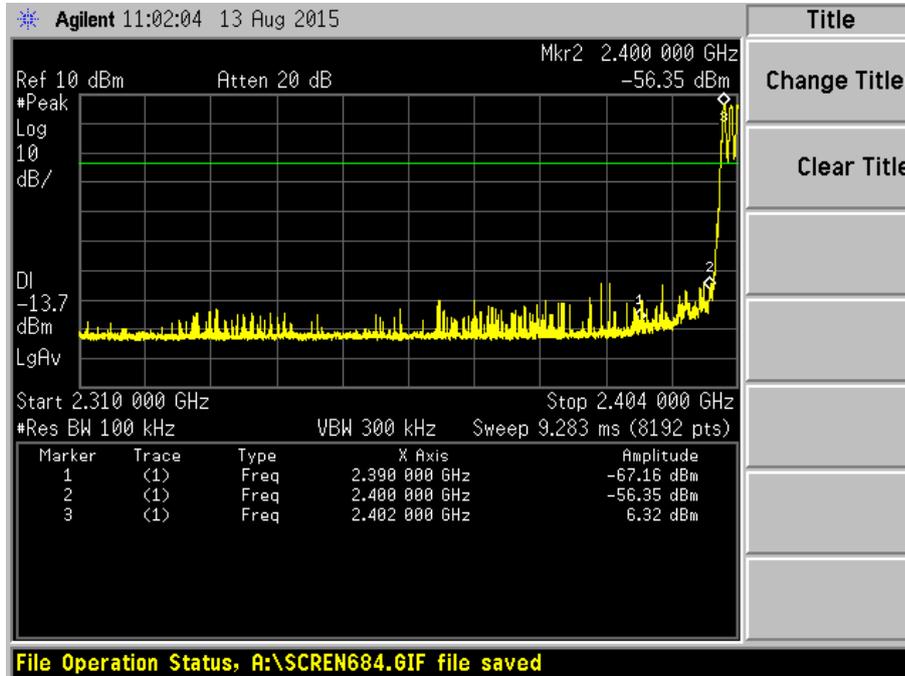


Plot 55 – Upper Band Edge at 2.4835GHz

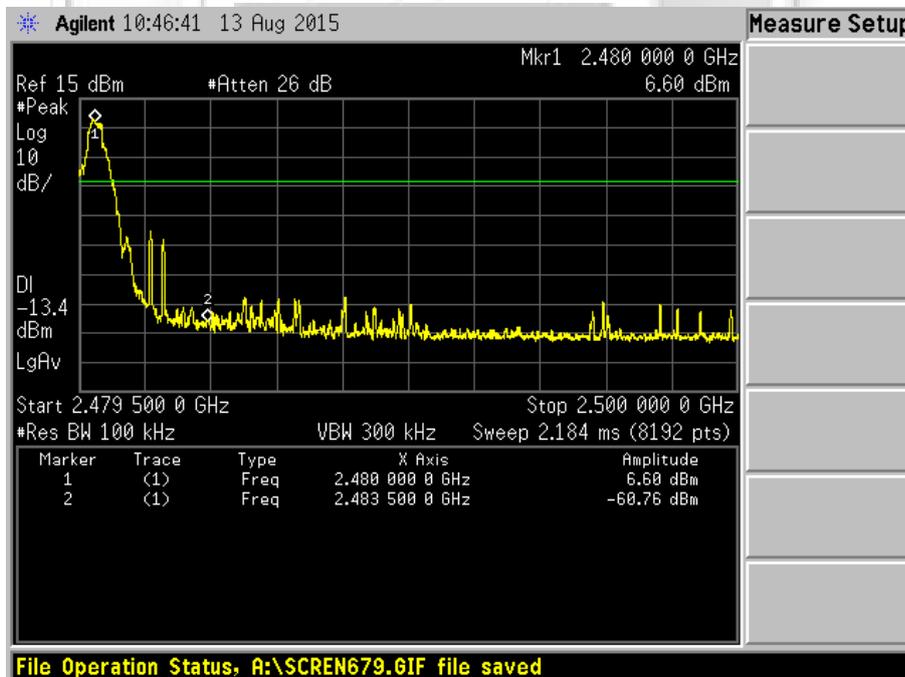


BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots – GFSK (Hopping)



Plot 56 – Lower Band Edge at 2.4000GHz

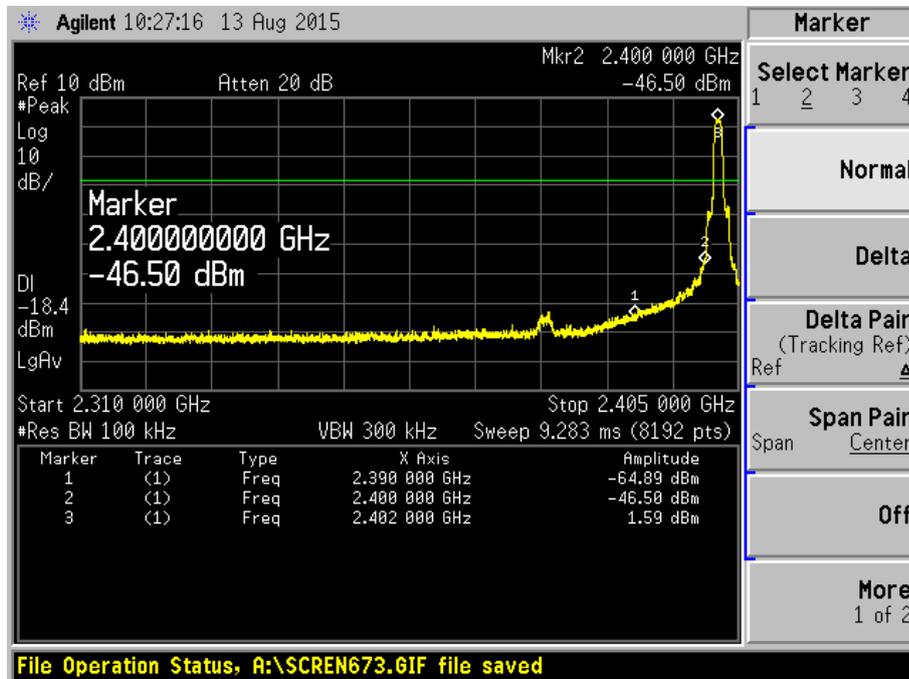


Plot 57 – Upper Band Edge at 2.4835GHz

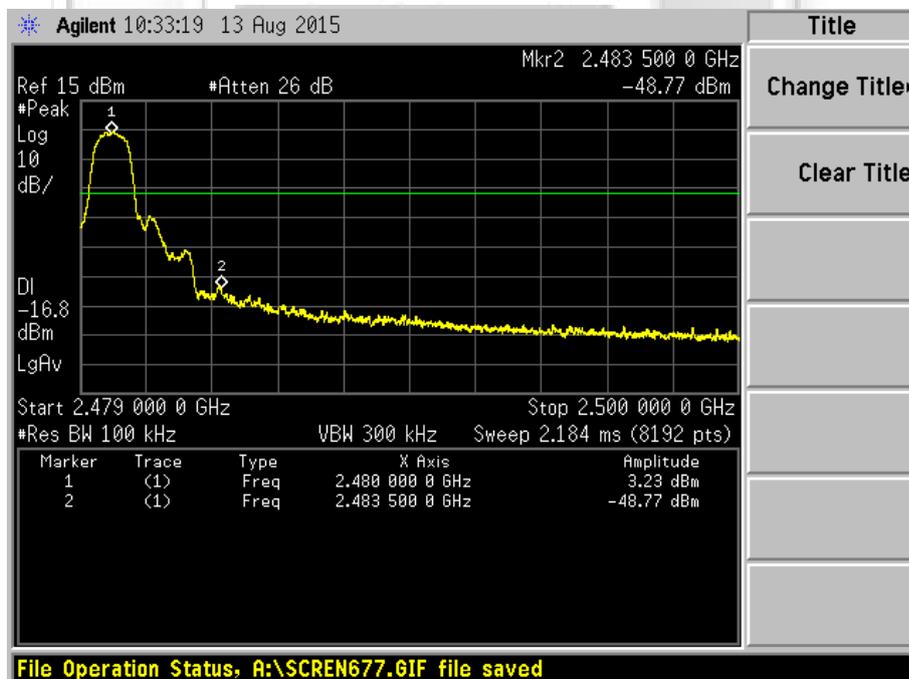


BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots – ($\pi/4$) DQPSK (Non-Hopping)



Plot 58 – Lower Band Edge at 2.4000GHz

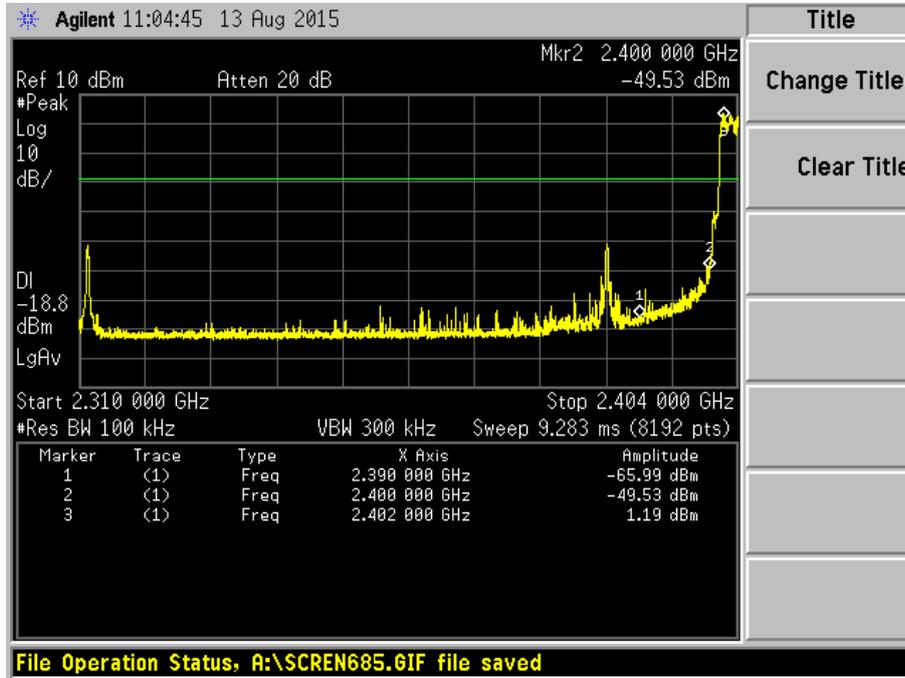


Plot 59 – Upper Band Edge at 2.4835GHz

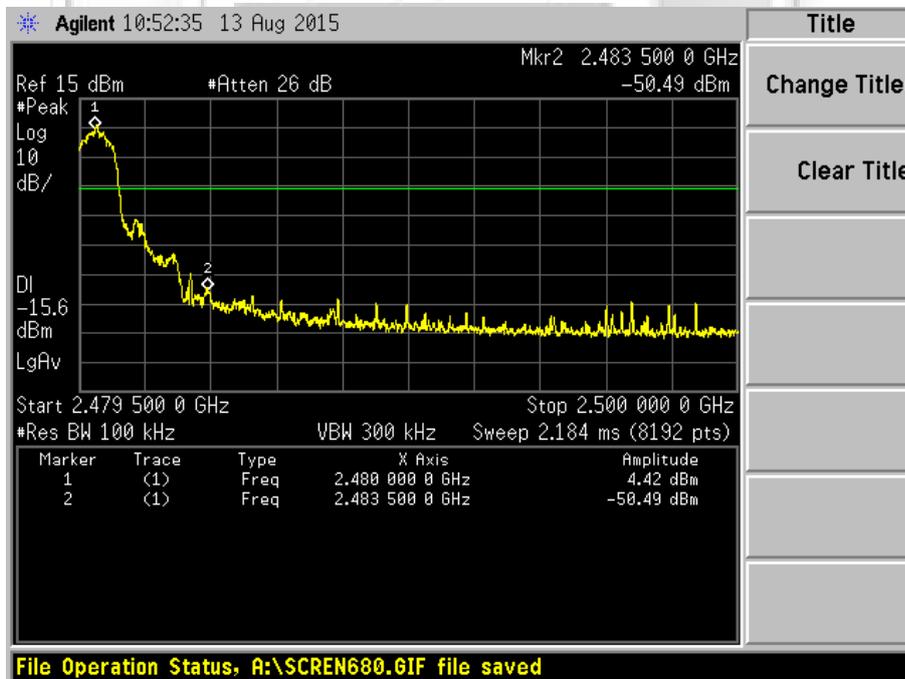


BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots – ($\pi/4$) DQPSK (Hopping)



Plot 60 – Lower Band Edge at 2.4000GHz

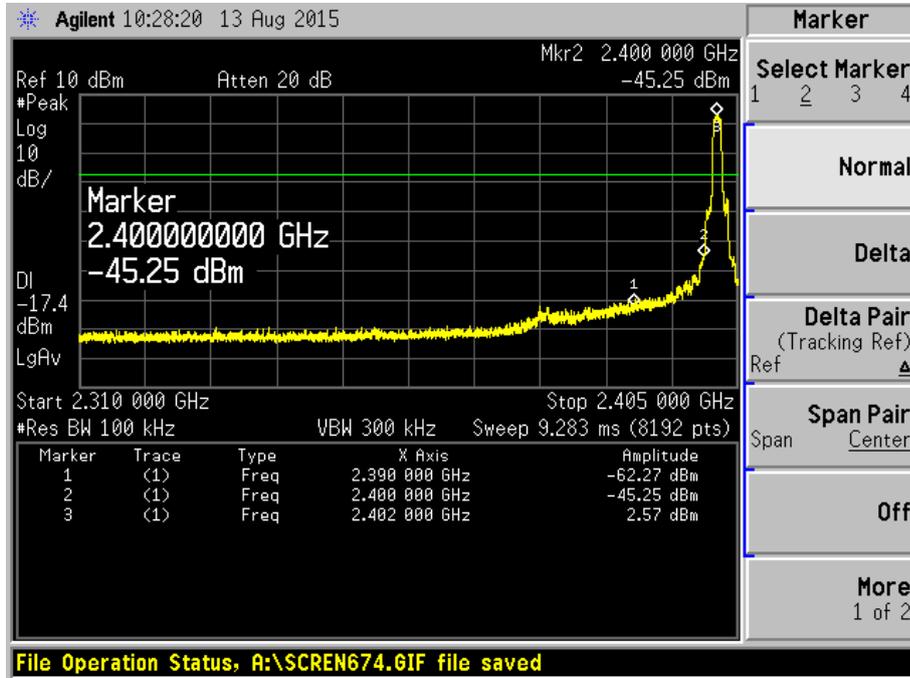


Plot 61 – Upper Band Edge at 2.4835GHz

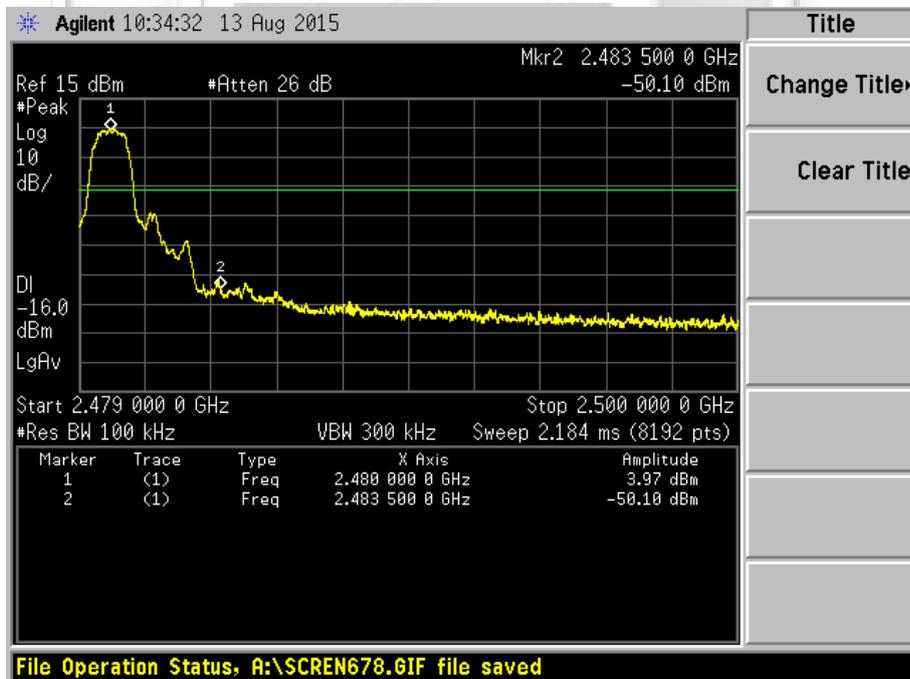


BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots – 8DPSK (Non-Hopping)



Plot 62 – Lower Band Edge at 2.4000GHz

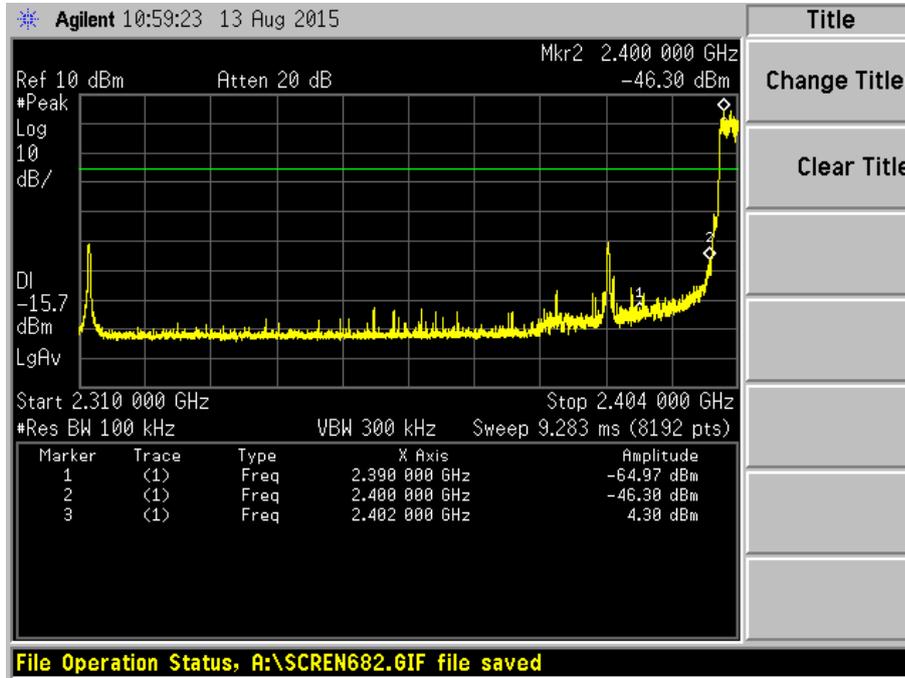


Plot 63 – Upper Band Edge at 2.4835GHz

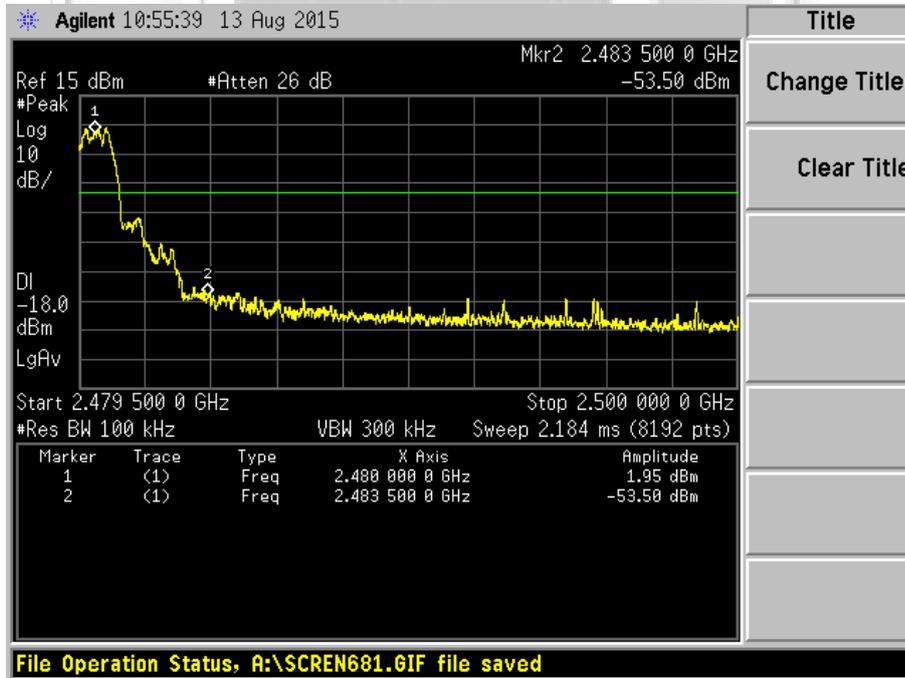


BAND EDGE COMPLIANCE (CONDUCTED) TEST

Band Edge Compliance (Conducted) Plots – 8DPSK (Hopping)



Plot 64 – Lower Band Edge at 2.4000GHz



Plot 65 – Upper Band Edge at 2.4835GHz



BAND EDGE COMPLIANCE (RADIATED) TEST

47 CFR FCC Part 15.247(d) and RSS-210 A8.5 Band Edge Compliance (Radiated) Limits

The EUT shows compliance to the requirements of this section, which states in any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator (EUT) is operating, the radio frequency power that is produced by the EUT shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power. In addition, radiated emissions which fall in the restricted bands shall comply to the radiated emission limits specified in 15.209.

47 CFR FCC Part 15.247(d) and RSS-210 A8.5 Band Edge Compliance (Radiated) Test Instrumentation

Instrument	Model	S/No	Cal Due Date	Cal Interval
R&S Test Receiver – ESI1	ESI40	100010	23 Jul 2015	1 year
TDK-RF Horn Antenna	HRN-0118	130256	10 Jul 2015	1 year
R&S Preamplifier (1GHz -18GHz)	SCU18	102191	13 Mar 2016	1 year

47 CFR FCC Part 15.247(d) and RSS-210 A8.5 Band Edge Compliance (Radiated) Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz to show compliance of spurious at band edges are at least 20dB below the carriers. For restricted band spurious at band edges, peak and average measurement plots were taken using the following setting:
 - a. Peak Plot:
RBW = VBW = 1MHz
 - b. Average Plot
RBW = 1MHz, VBW = 10Hz
4. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(d) and RSS-210 A8.5 Band Edge Compliance (Radiated) Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with frequency hopping sequence on.
2. The frequency span of the spectrum analyser was set to wide enough to capture the lower band edge of the transmission band, 2.400GHz and any spurious emissions at the band edge.
3. The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected.
4. The steps 2 to 3 were repeated with the frequency span of the spectrum analyser was set to wide enough to capture the upper band edge frequency of the transmission band, 2.4835GHz and the any spurious emissions at the band-edge.



BAND EDGE COMPLIANCE (RADIATED) TEST

47 CFR FCC Part 15.247(d) and RSS-210 A8.5 Band Edge Compliance (Radiated) Results

Test Input Power	120V 60Hz	Temperature	24°C
Attached Plots	66 – 71 (GFSK)	Relative Humidity	60%
	72 – 77 ($\pi/4$) DQPSK)	Atmospheric Pressure	1030mbar
	78 – 83 (8DPSK)	Tested By	Lim Kay Tak

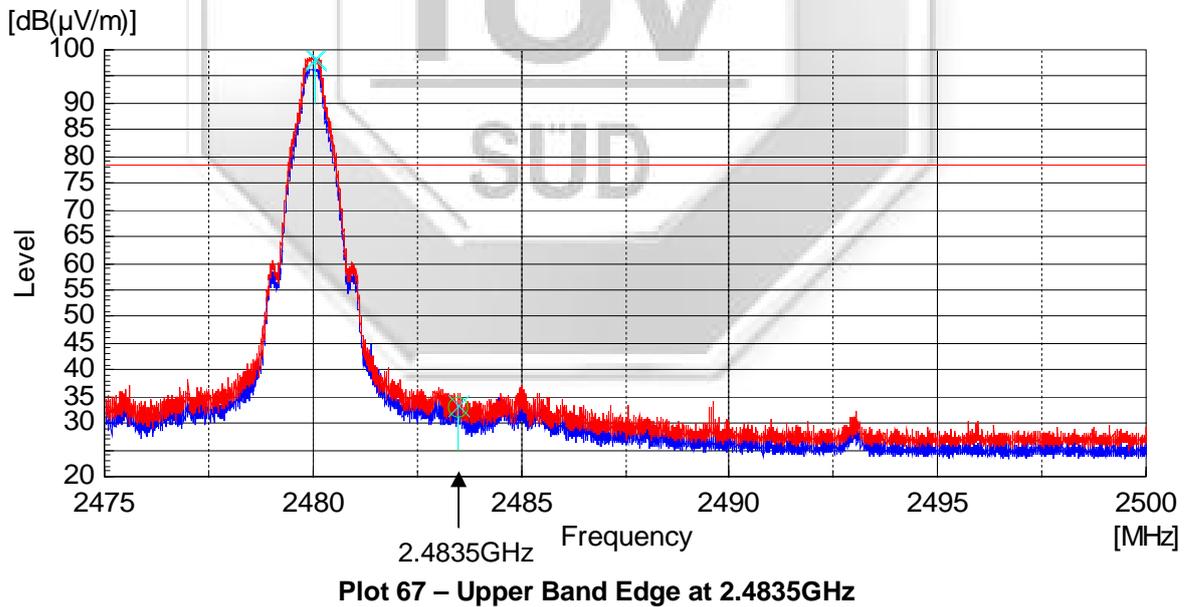
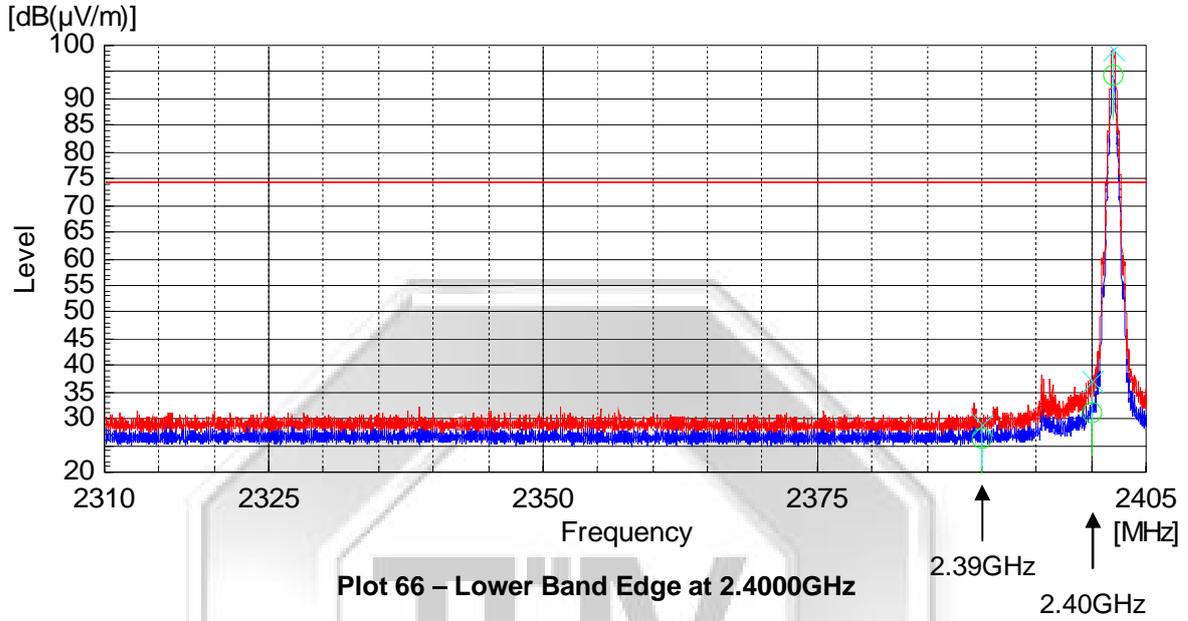
No significant signal was found and they were below the specified limit.





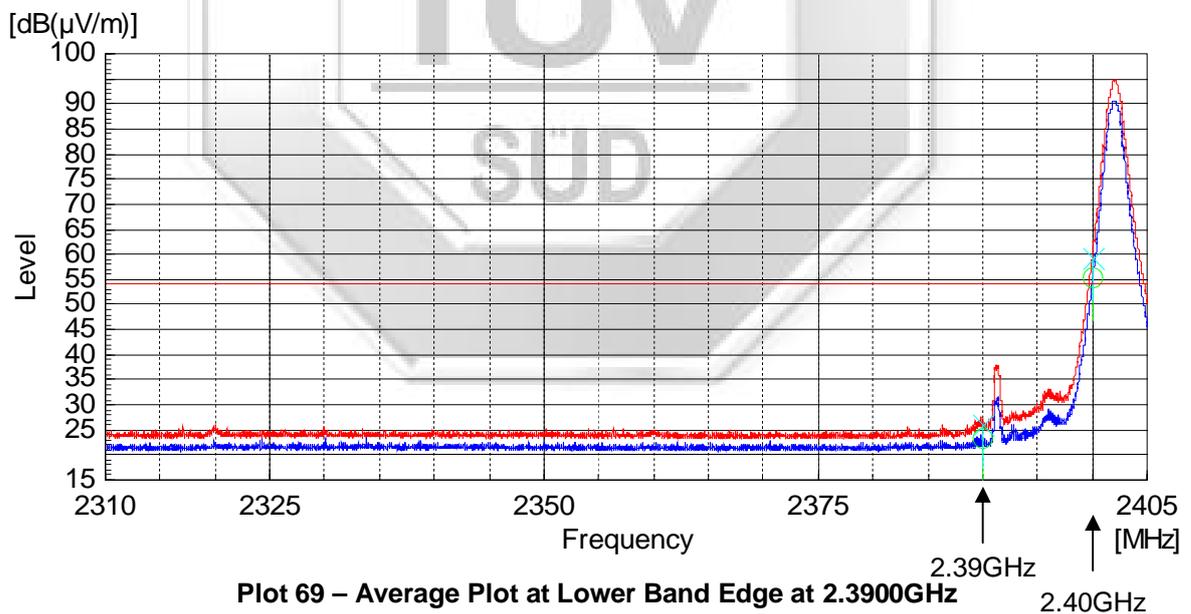
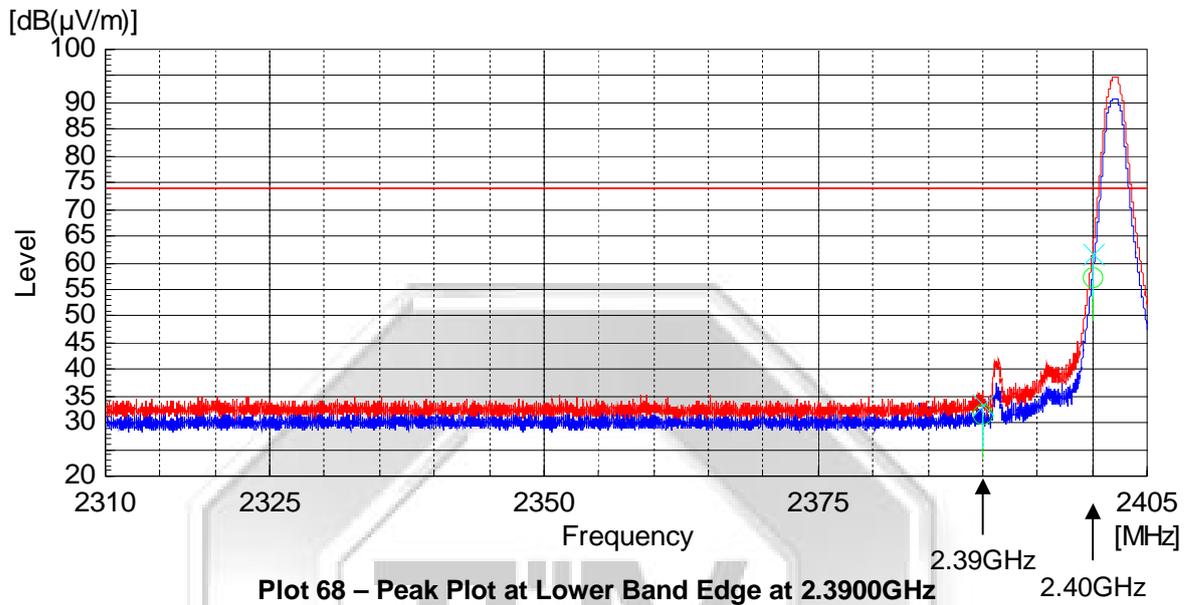
BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge) – GFSK



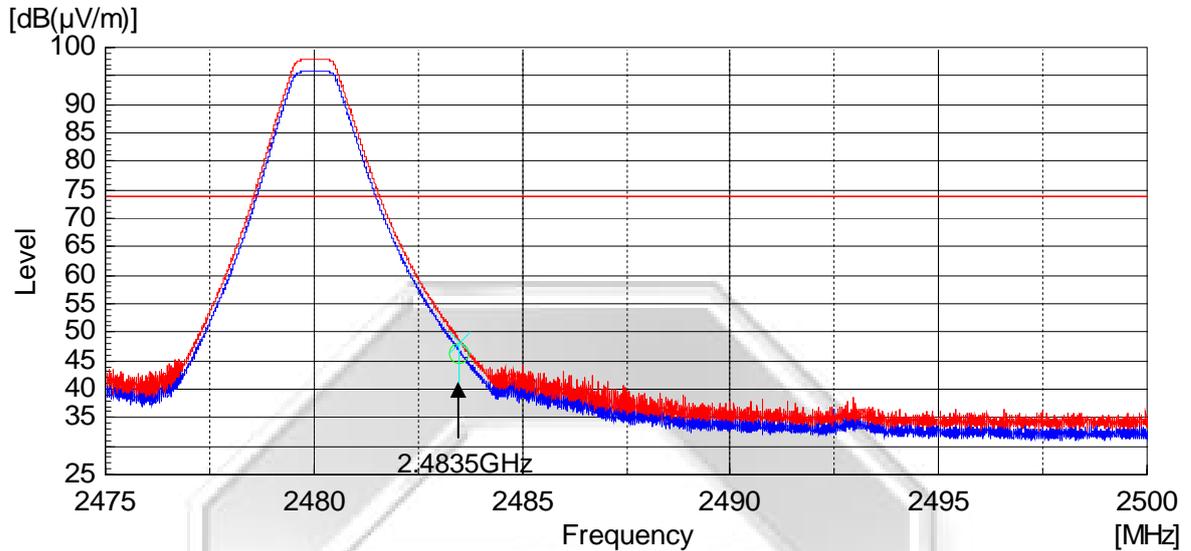
BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band) – GFSK

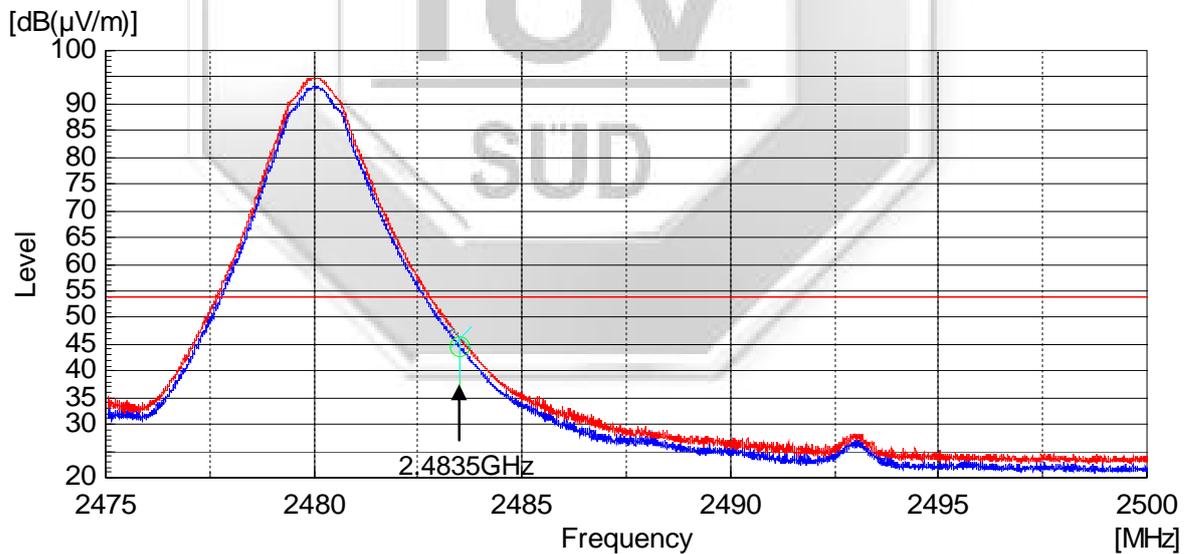


BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band) – GFSK



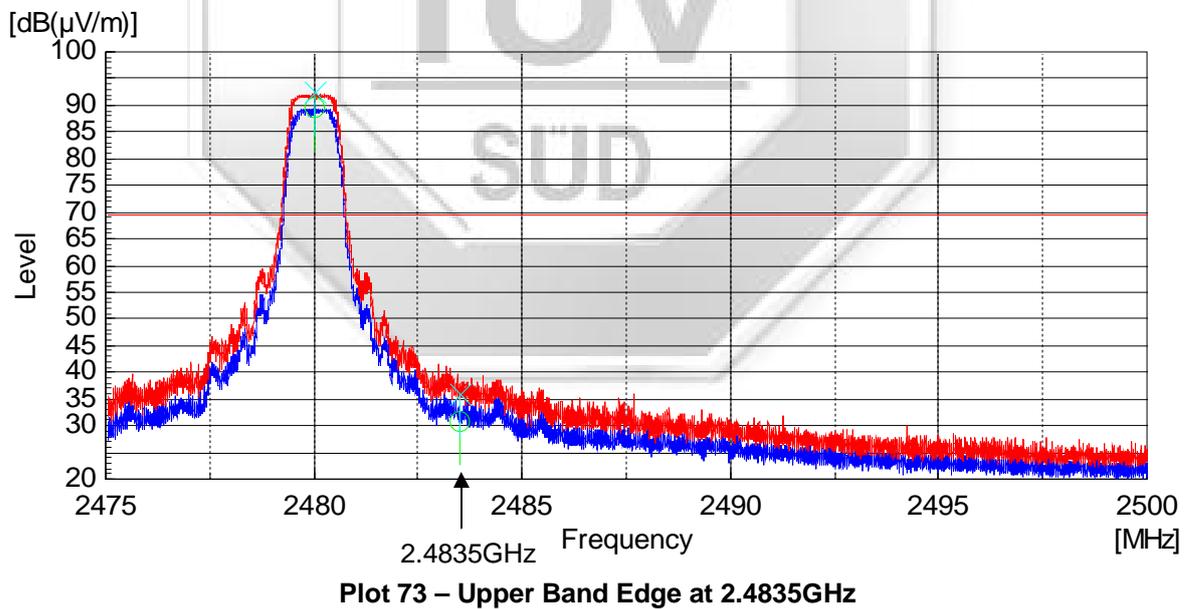
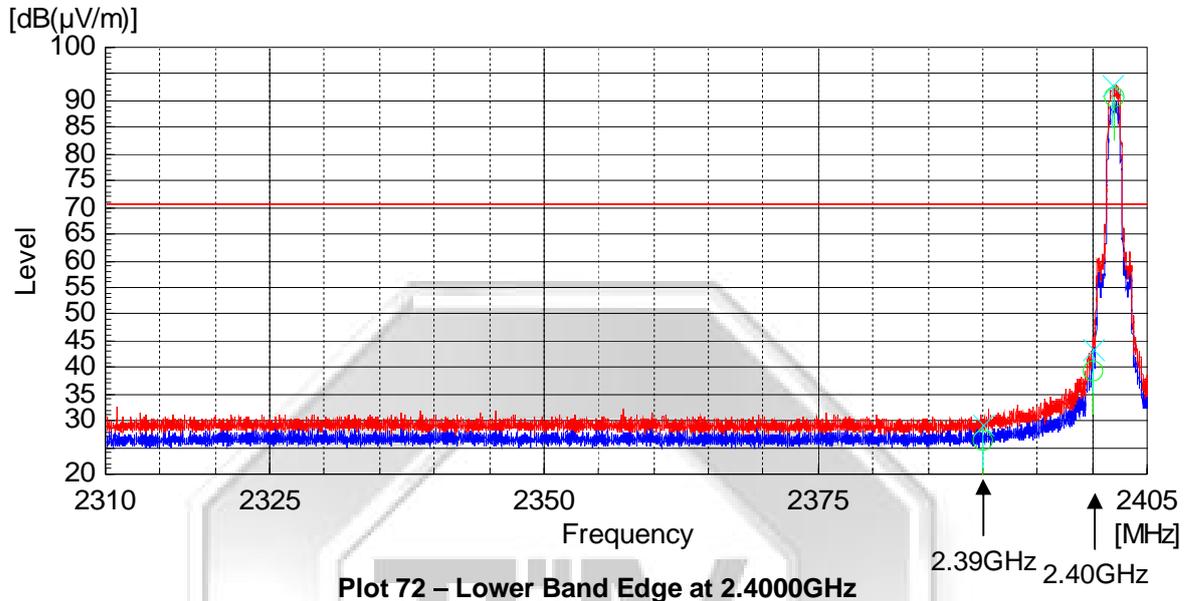
Plot 70 – Peak Plot at Upper Band Edge at 2.4835GHz



Plot 71 – Average Plot at Upper Band Edge at 2.4835GHz

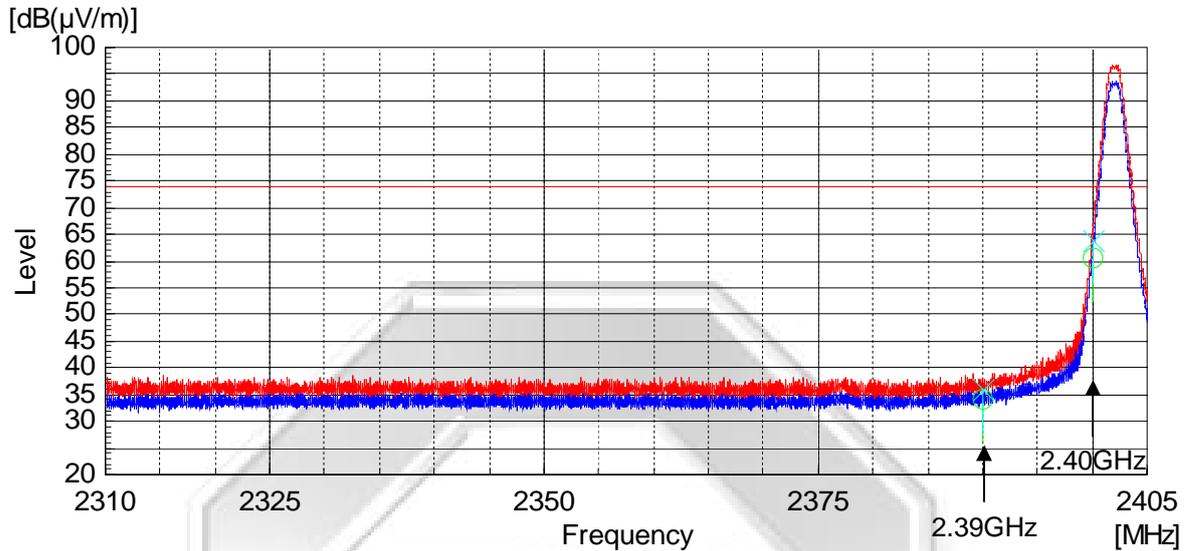
BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge) – ($\pi/4$) DQPSK

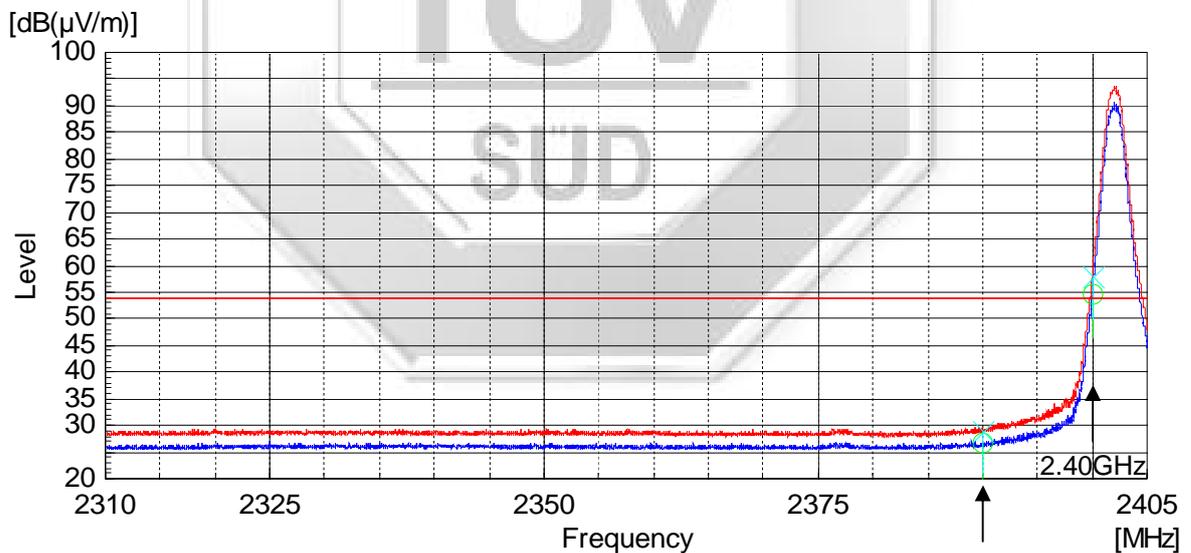


BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band) – ($\pi/4$) DQPSK



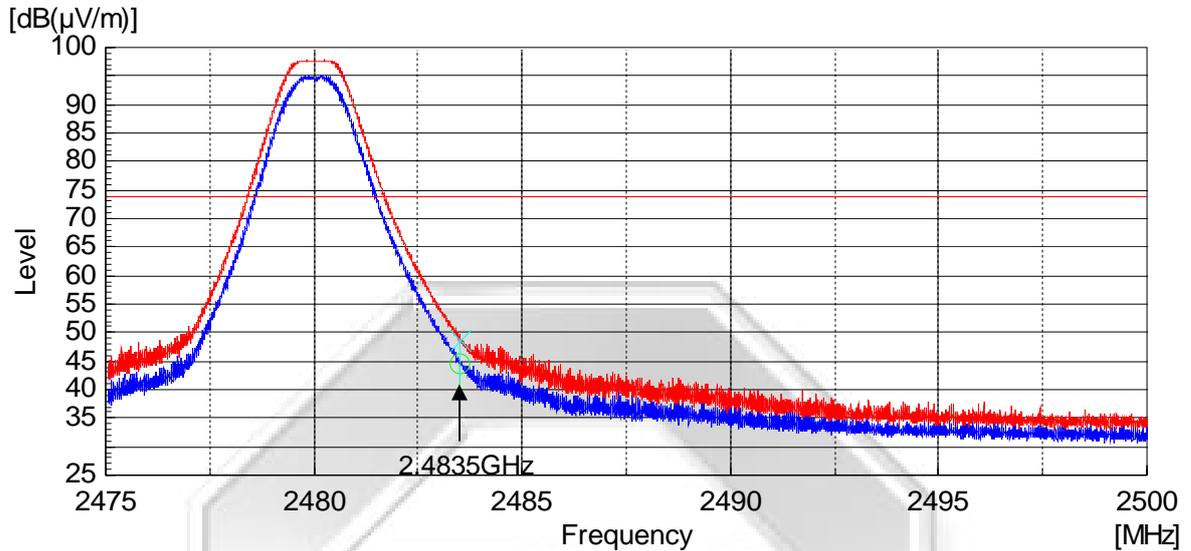
Plot 74 – Peak Plot at Lower Band Edge at 2.3900GHz



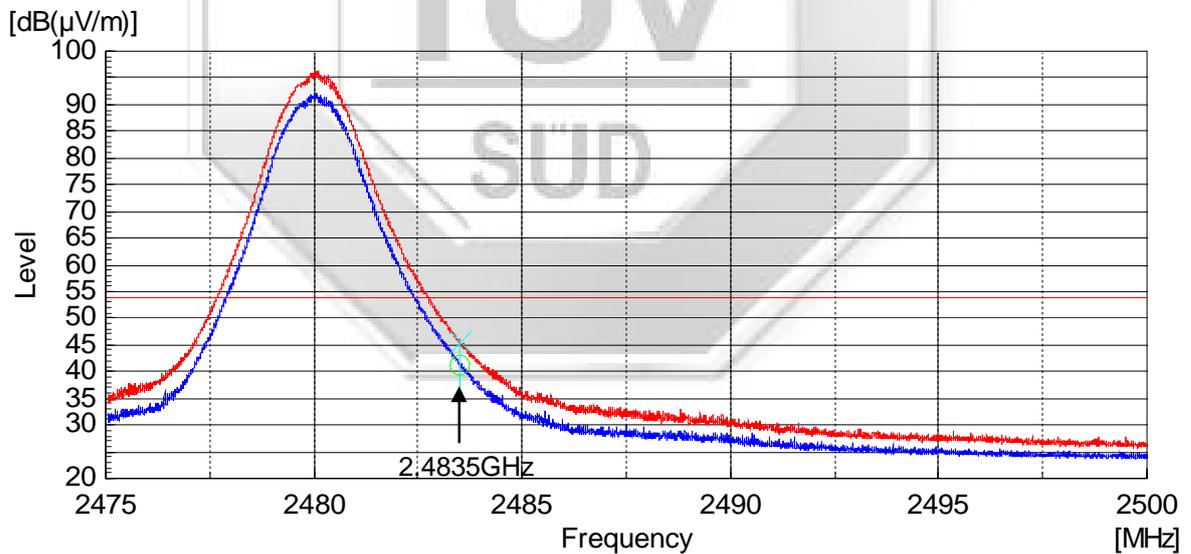
Plot 75 – Average Plot at Lower Band Edge at 2.3900GHz

BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band) – $(\pi/4)$ DQPSK



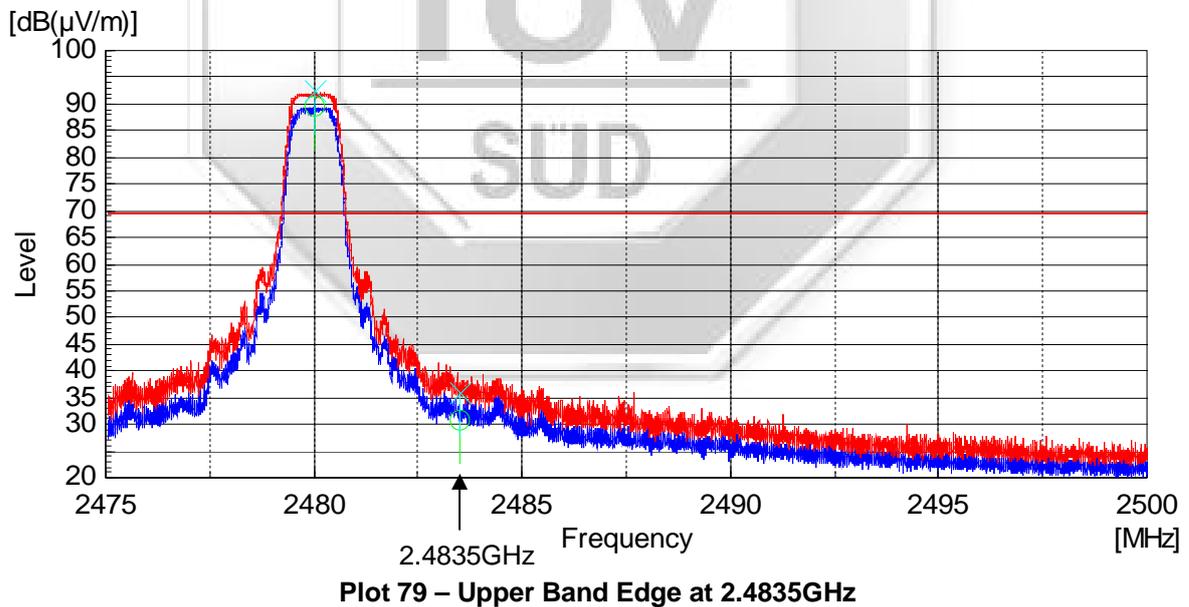
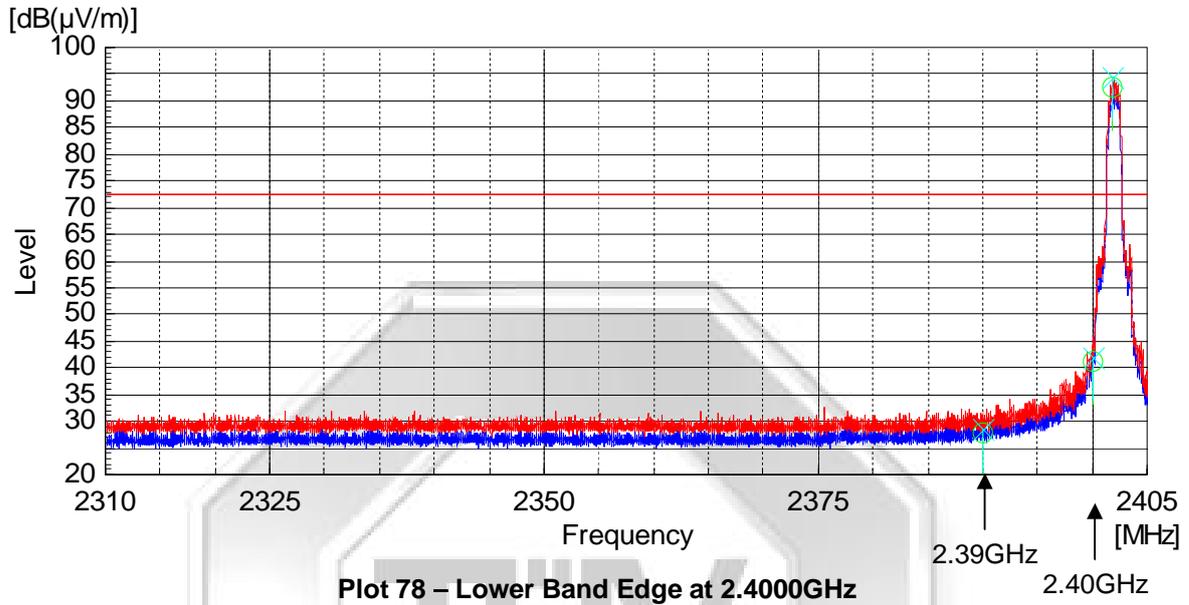
Plot 76 – Peak Plot at Upper Band Edge at 2.4835GHz



Plot 77 – Average Plot at Upper Band Edge at 2.4835GHz

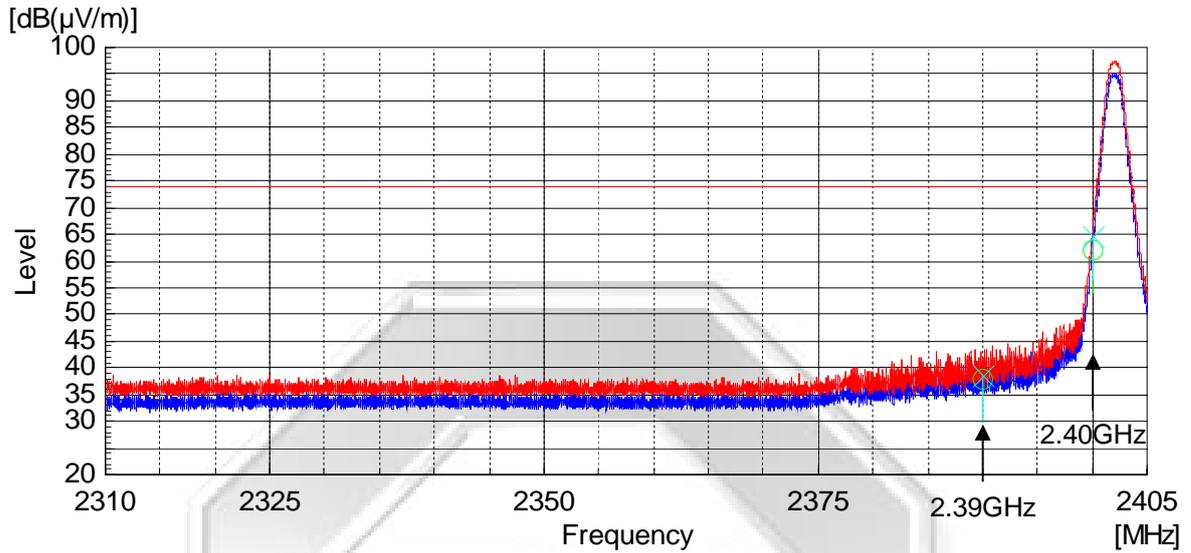
BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge) – 8DPSK

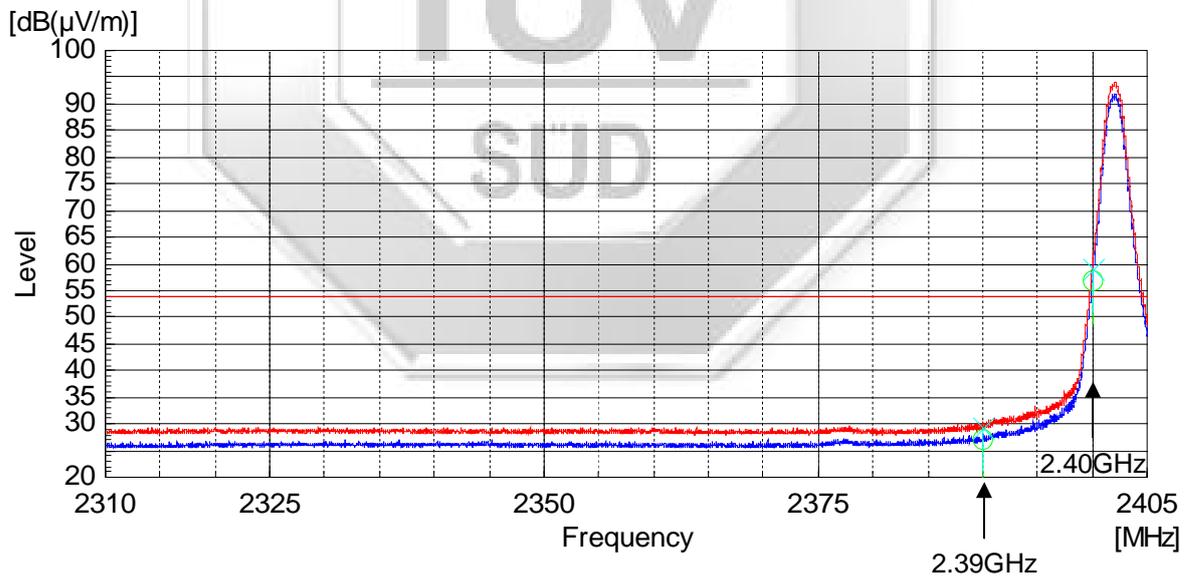


BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band) – 8DPSK



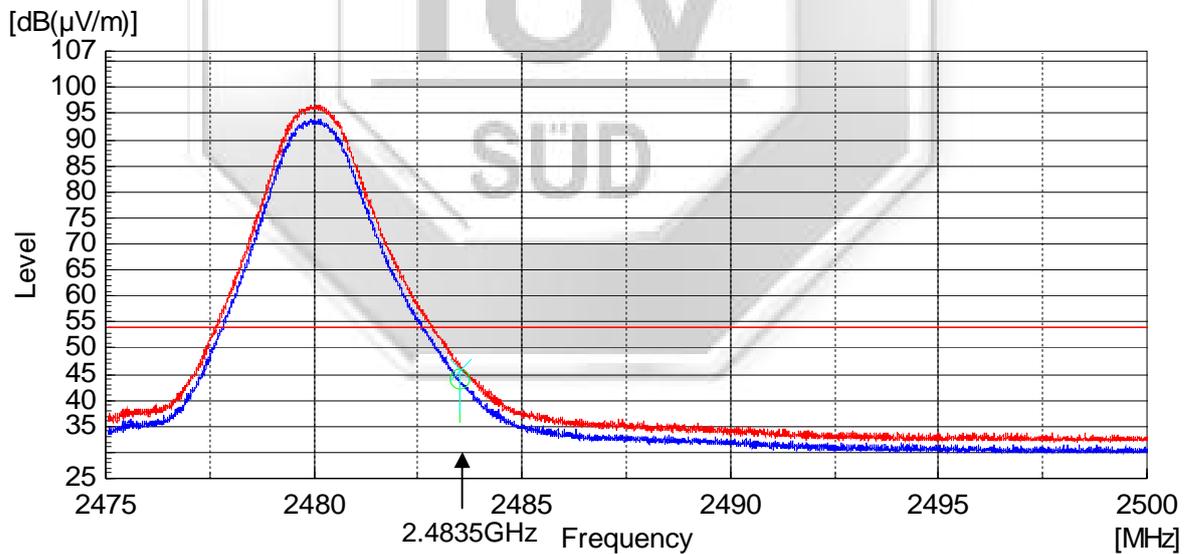
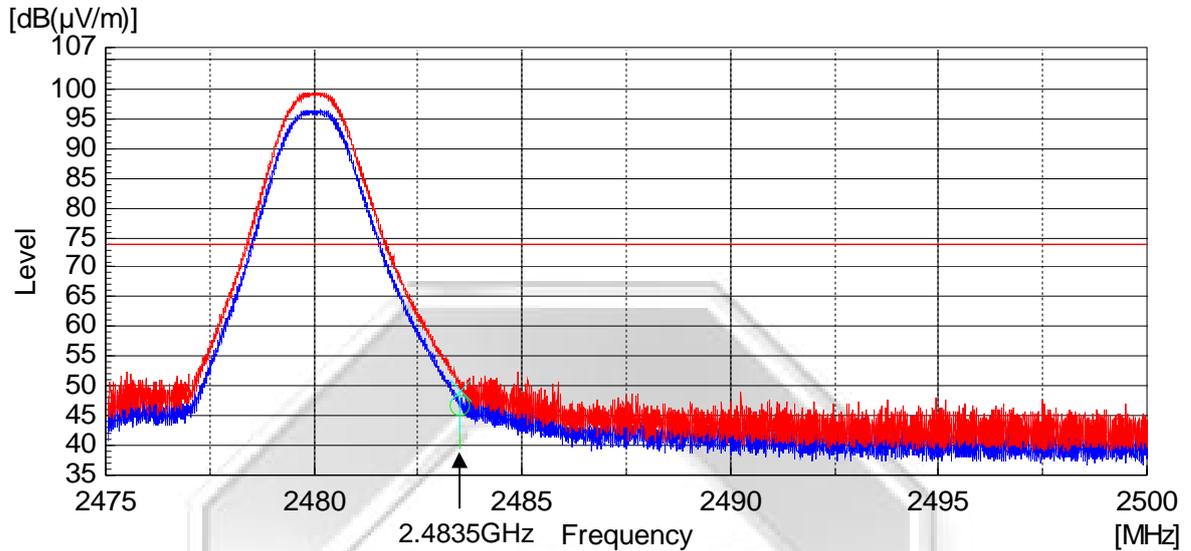
Plot 80 – Peak Plot at Lower Band Edge at 2.3900GHz



Plot 81 – Average Plot at Lower Band Edge at 2.3900GHz

BAND EDGE COMPLIANCE (RADIATED) TEST

Band Edge Compliance (Radiated) Plots (Restricted Band) – 8DPSK





PEAK POWER SPECTRAL DENSITY TEST

47 CFR FCC Part 15.247(e) and RSS-210 A8.2(b) Peak Power Spectral Density Limits

The EUT shows compliance to the requirements of this section, which states the peak power spectral density conducted from the intentional radiator (EUT) to the antenna shall not be greater than 8dBm (6.3mW) in any 3kHz band during any time interval of continuous transmission.

47 CFR FCC Part 15.247(e) and RSS-210 A8.2(b) Peak Power Spectral Density Test Instrumentation

Instrument	Model	S/No	Cal Due Date	Cal Interval
Agilent Spectrum Analyzer	E4440A	MY45304764	12 Dec 2015	1 year

47 CFR FCC Part 15.247(e) and RSS-210 A8.2(b) Peak Power Spectral Density Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 3kHz and 10kHz.
5. All other supporting equipment were powered separately from another filtered mains.

47 CFR FCC Part 15.247(e) and RSS-210 A8.2(b) Peak Power Spectral Density Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode, non-hopping with transmitting frequency at Channel 0 (2.402GHz) (*lower ch*).
2. The sweep time of the spectrum analyser was set to the value of the ratio of the frequency span divided by the RBW.
3. The peak power density of the transmitting frequency was detected and recorded.
4. The step 3 was repeated with the transmitting frequency was set to Channel 39 (2.441GHz) (*mid ch*) and Channel 78 (2.480GHz) (*upper ch*) respectively.



PEAK POWER SPECTRAL DENSITY TEST

47 CFR FCC Part 15.247(e) and RSS-210 A8.2(b) Peak Power Spectral Density Results

Test Input Power	120V 60Hz	Temperature	24°C
Attached Plots	84 – 86	Relative Humidity	60%
Modulation	GFSK	Atmospheric Pressure	1030mbar
		Tested By	Liau Lee Yin

Channel	Channel Frequency (GHz)	Peak Power Spectral Density (mW)	Limit (mW)
0 (lower ch)	2.402	0.35351	6.3
39 (mid ch)	2.441	0.59553	6.3
78 (upper ch)	2.480	0.53641	6.3

Test Input Power	120V 60Hz	Temperature	24°C
Attached Plots	87 – 89	Relative Humidity	60%
Modulation	($\pi/4$) DQPSK	Atmospheric Pressure	1030mbar
		Tested By	Liau Lee Yin

Channel	Channel Frequency (GHz)	Peak Power Spectral Density (mW)	Limit (mW)
0 (lower ch)	2.402	0.06918	6.3
39 (mid ch)	2.441	0.10980	6.3
78 (upper ch)	2.480	0.10919	6.3

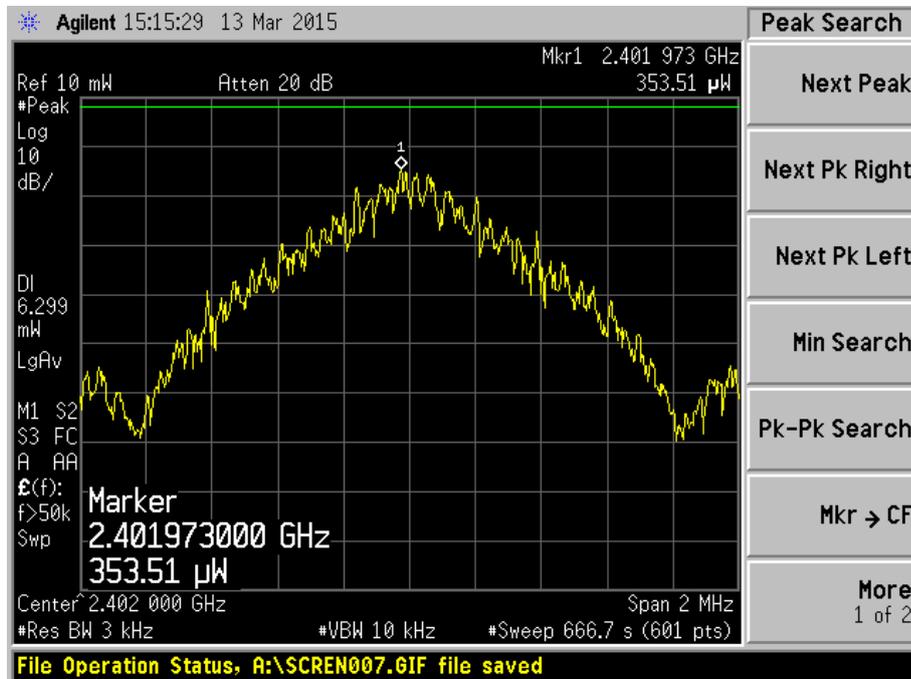
Test Input Power	120V 60Hz	Temperature	24°C
Attached Plots	90 – 92	Relative Humidity	60%
Modulation	8DPSK	Atmospheric Pressure	1030mbar
		Tested By	Liau Lee Yin

Channel	Channel Frequency (GHz)	Peak Power Spectral Density (mW)	Limit (mW)
0 (lower ch)	2.402	0.06875	6.3
39 (mid ch)	2.441	0.10844	6.3
78 (upper ch)	2.480	0.11056	6.3

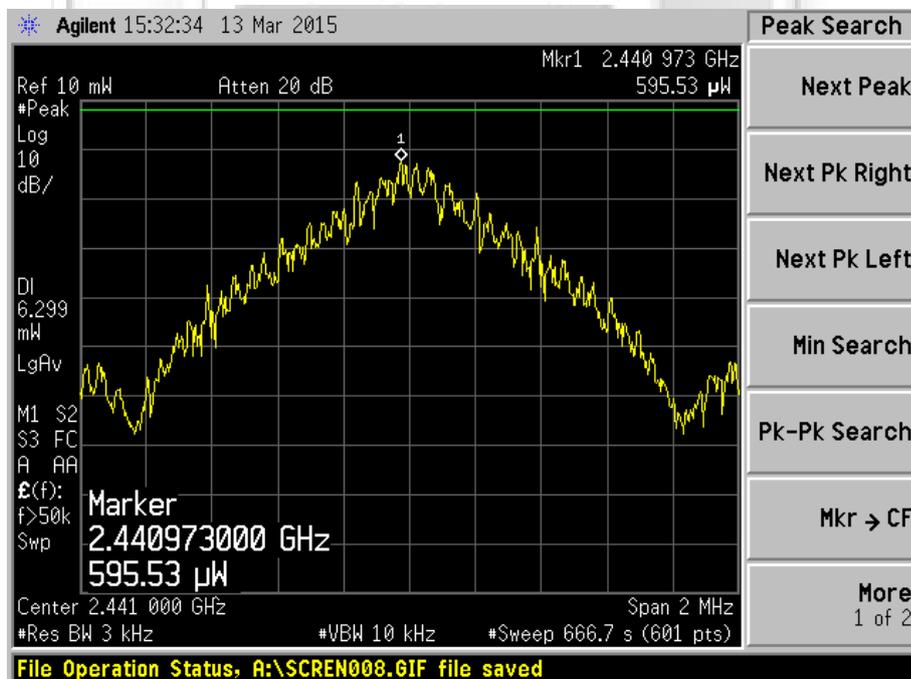


PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – GFSK



Plot 84 – Channel 0 (lower ch)

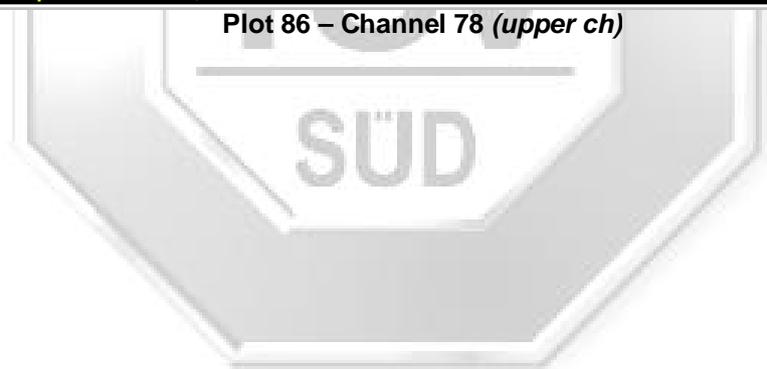
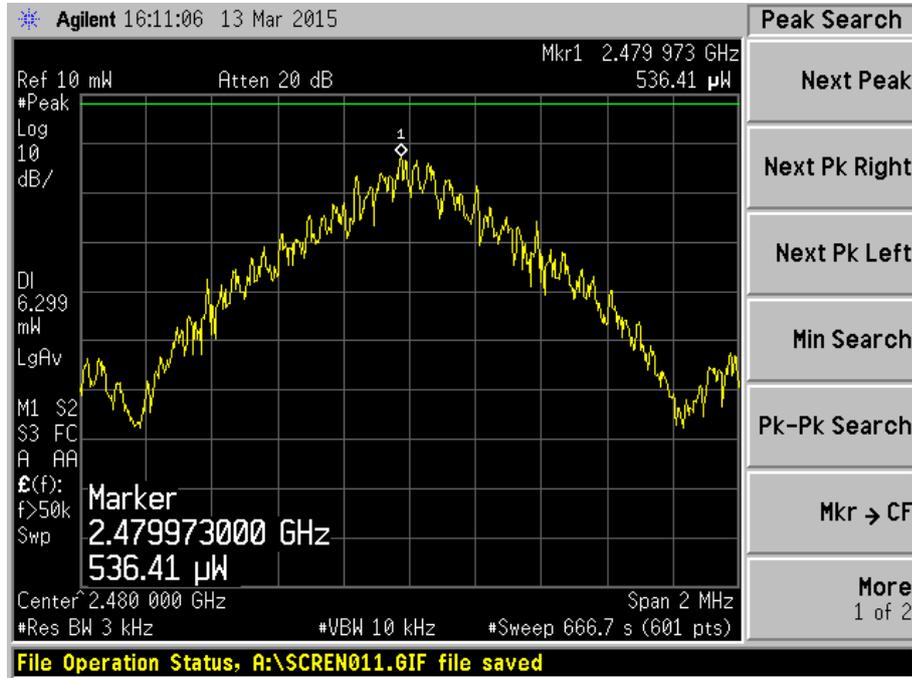


Plot 85 – Channel 39 (mid ch)



PEAK POWER SPECTRAL DENSITY TEST

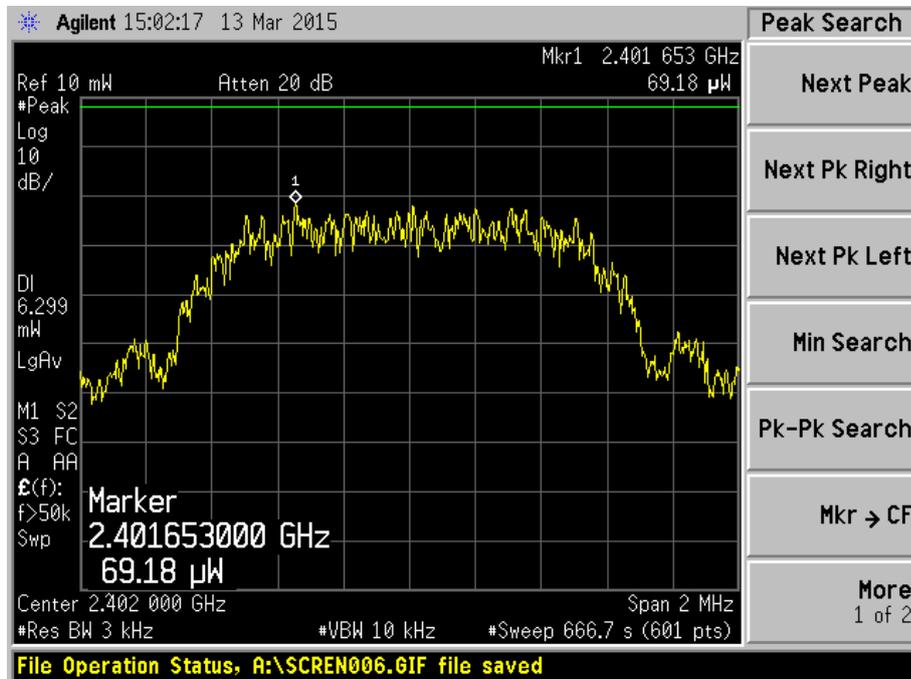
Peak Power Spectral Density Plots – GFSK



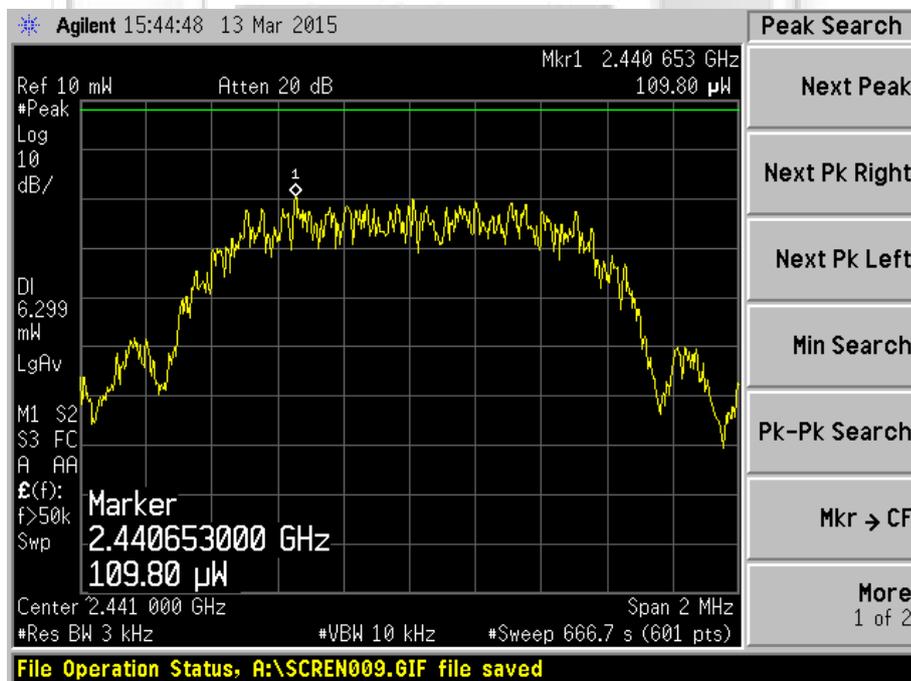


PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – ($\pi/4$) DQPSK



Plot 87 – Channel 0 (lower ch)

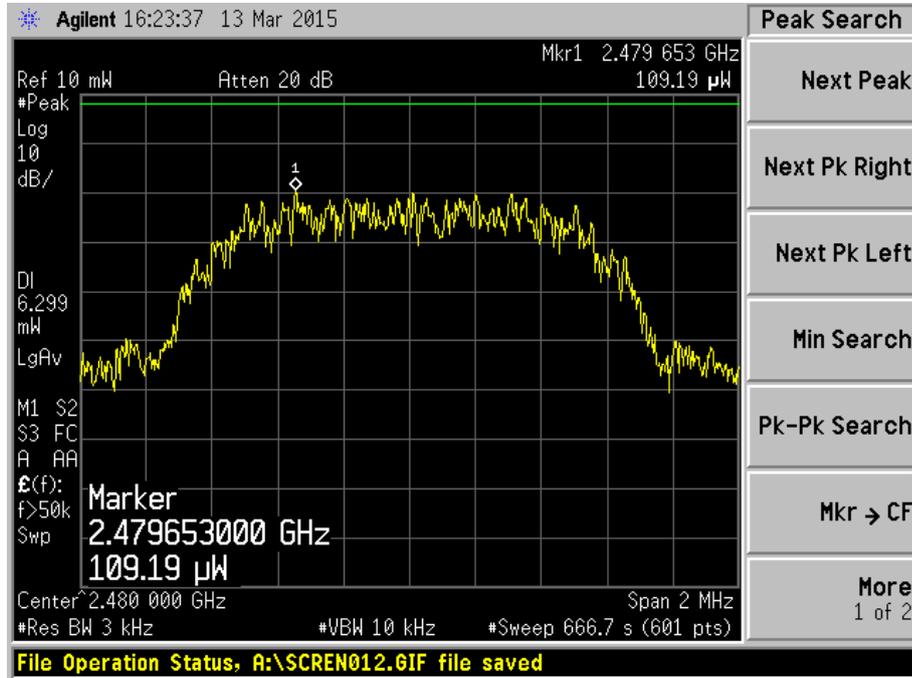


Plot 88 – Channel 39 (mid ch)

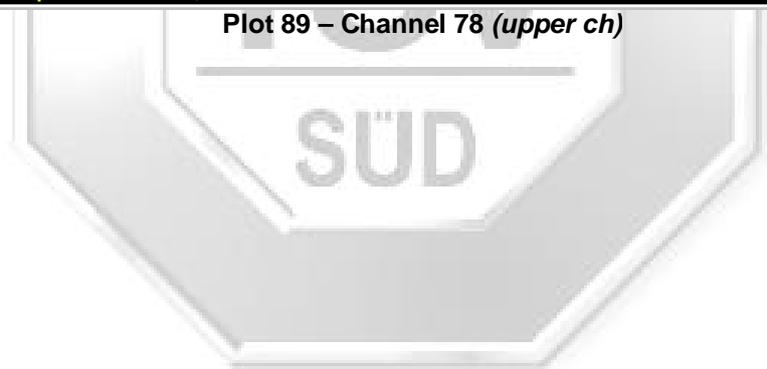


PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – ($\pi/4$) DQPSK



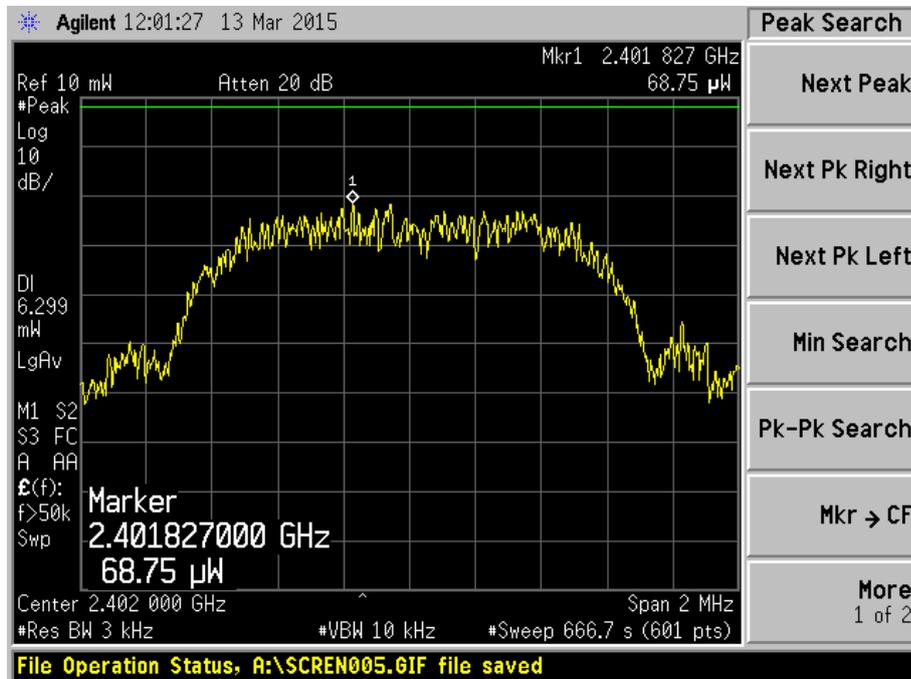
Plot 89 – Channel 78 (upper ch)



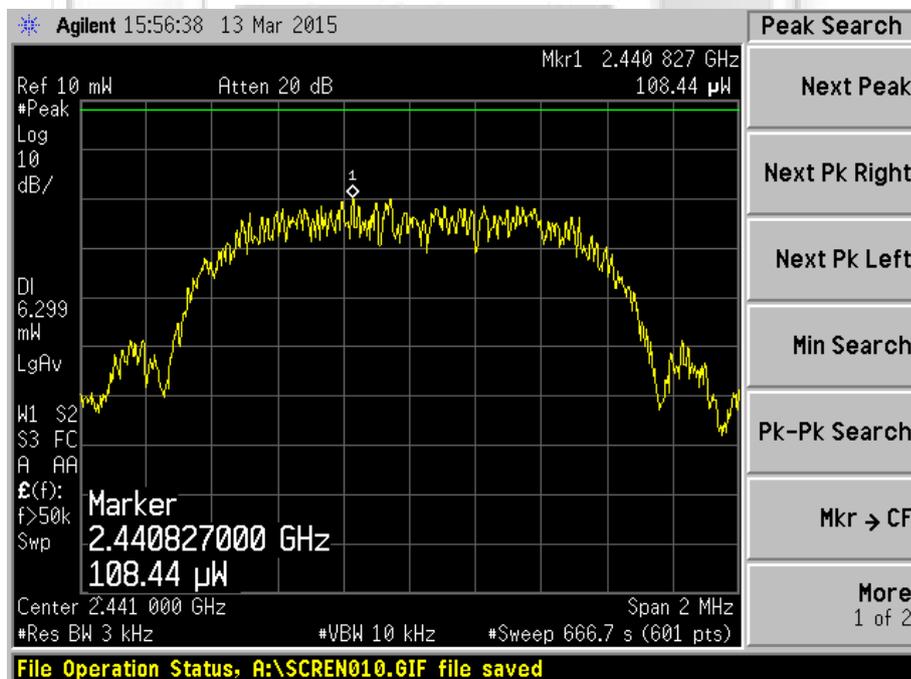


PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 8DPSK



Plot 90 – Channel 0 (lower ch)

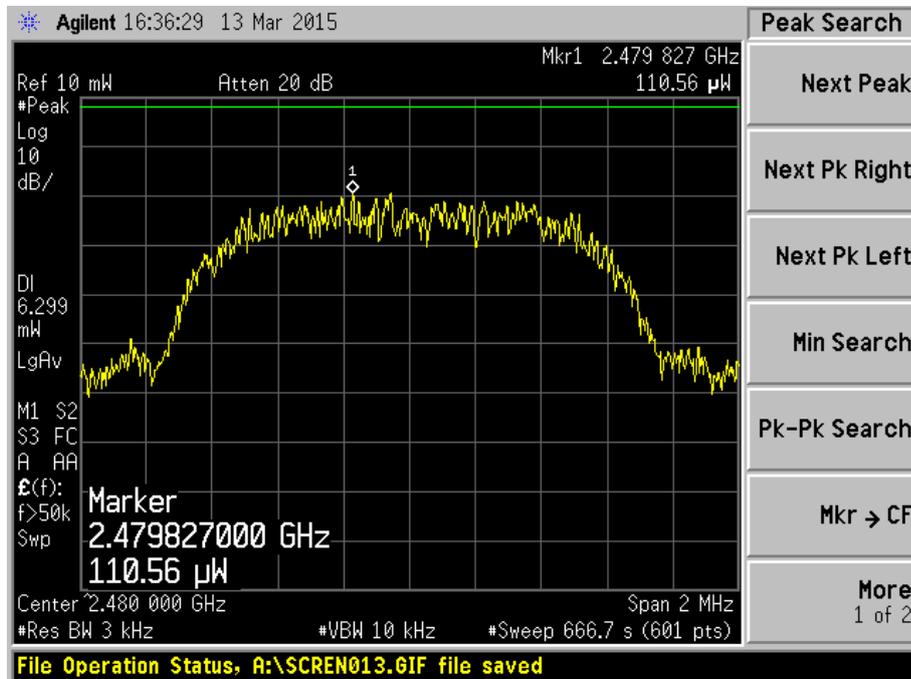


Plot 91 – Channel 39 (mid ch)

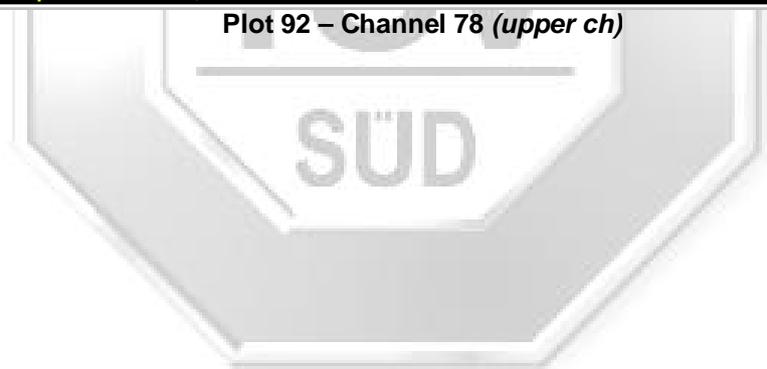


PEAK POWER SPECTRAL DENSITY TEST

Peak Power Spectral Density Plots – 8DPSK



Plot 92 – Channel 78 (upper ch)





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July 2011





ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

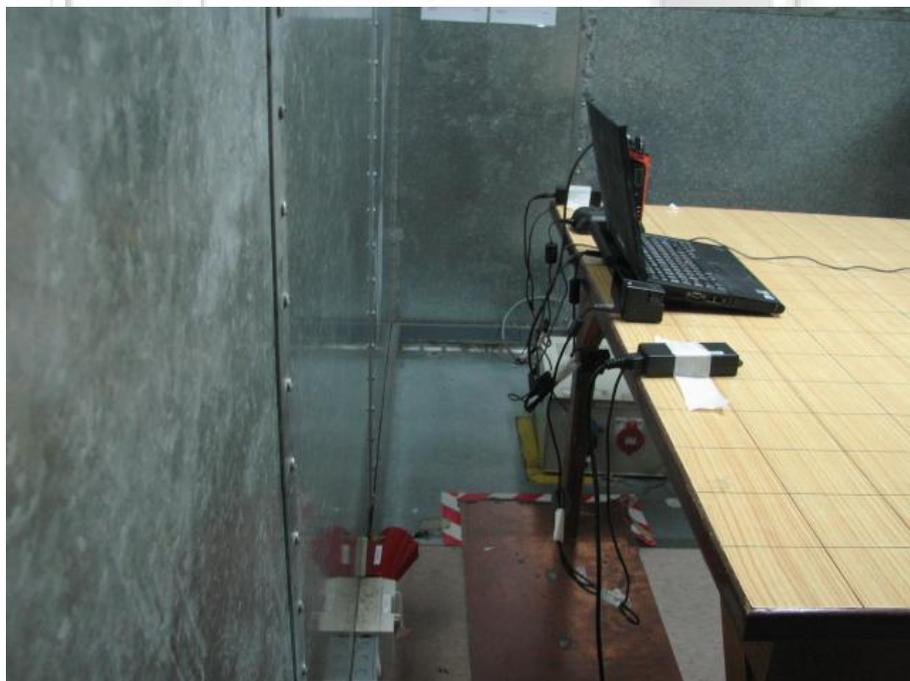


ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

TEST SETUP



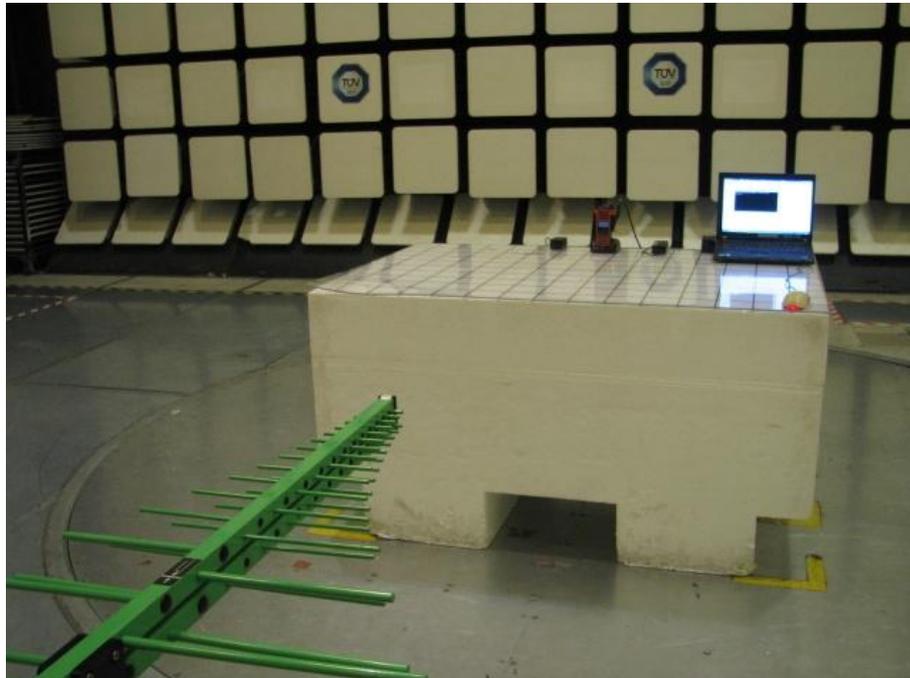
Conducted Emissions Test Setup (Front View)



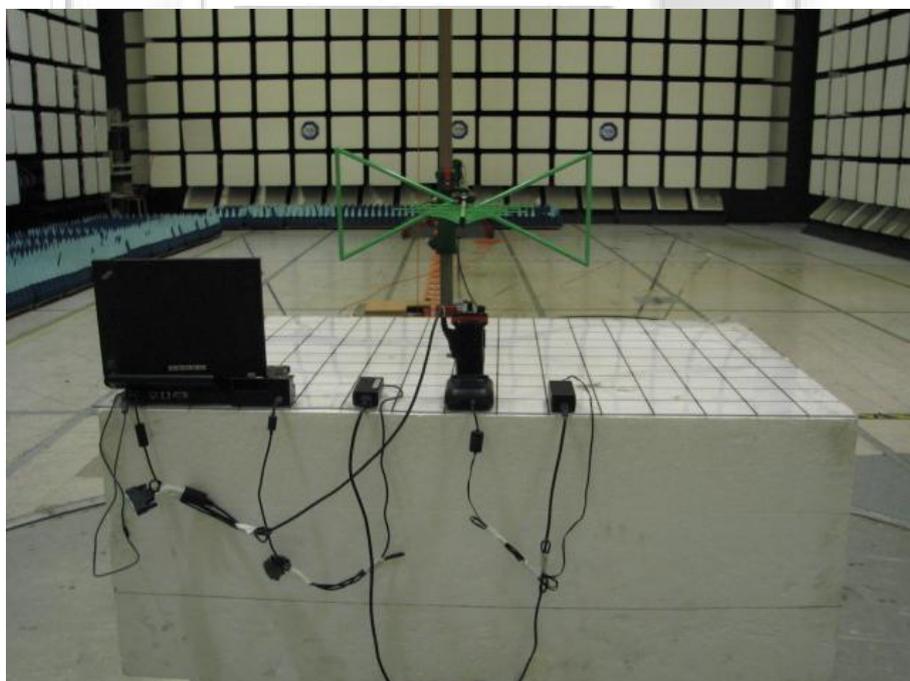
Conducted Emissions Test Setup (Rear View)

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

TEST SETUP (30MHz to 1GHz)



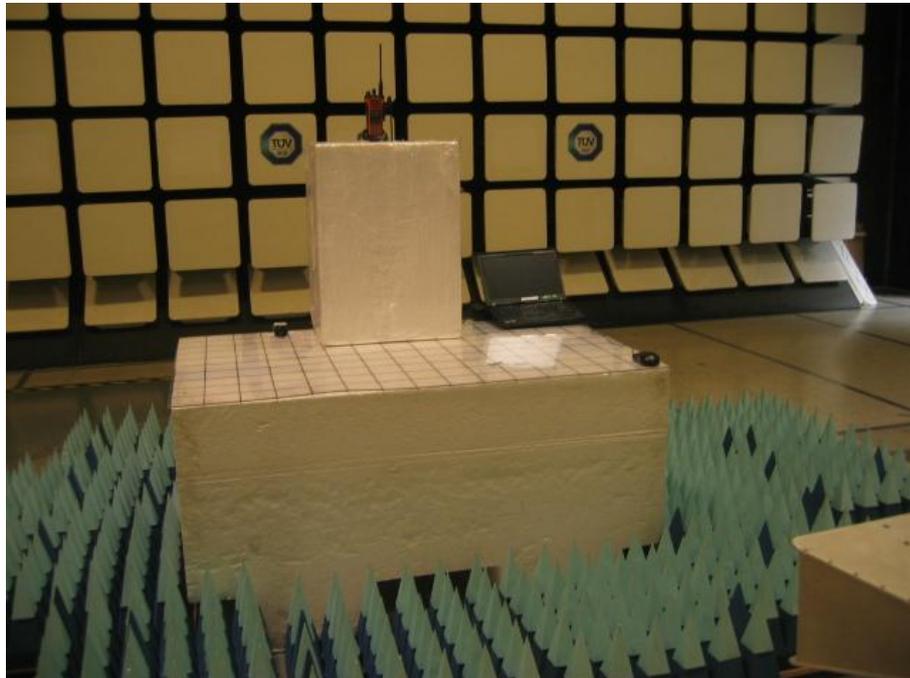
Radiated Emissions Test Setup (Front View)



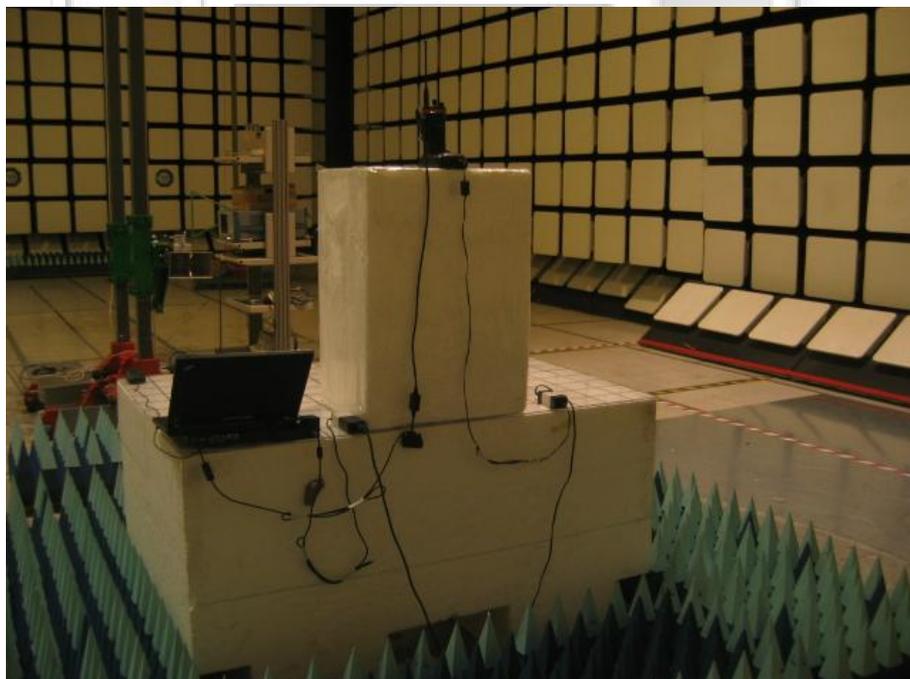
Radiated Emissions Test Setup (Rear View)

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

TEST SETUP (Above 1GHz)



Radiated Emissions Test Setup (Front View)



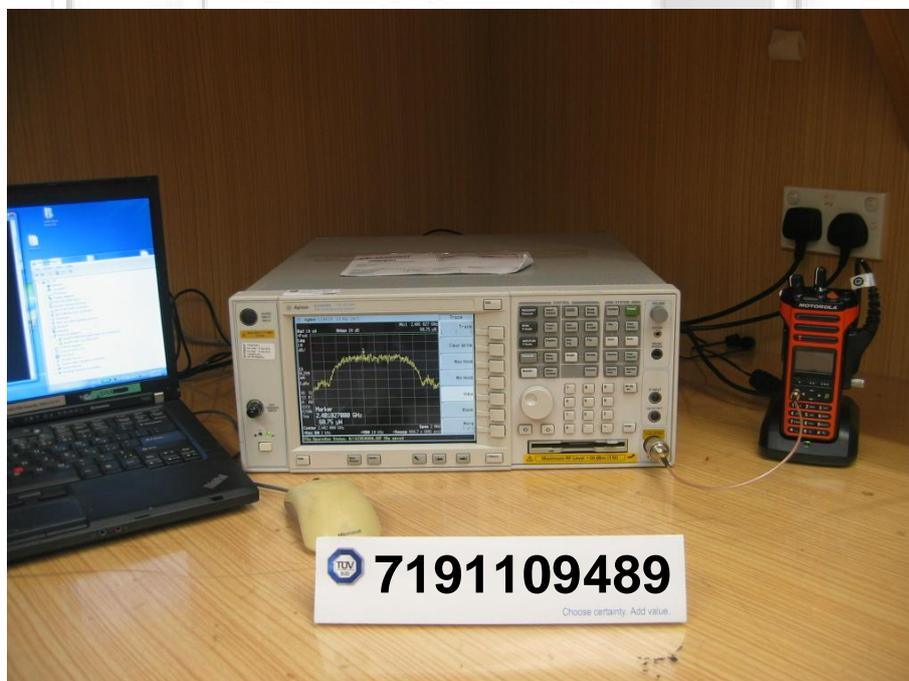
Radiated Emissions Test Setup (Rear View)

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

TEST SETUP



Carrier Frequency Separation Test Setup



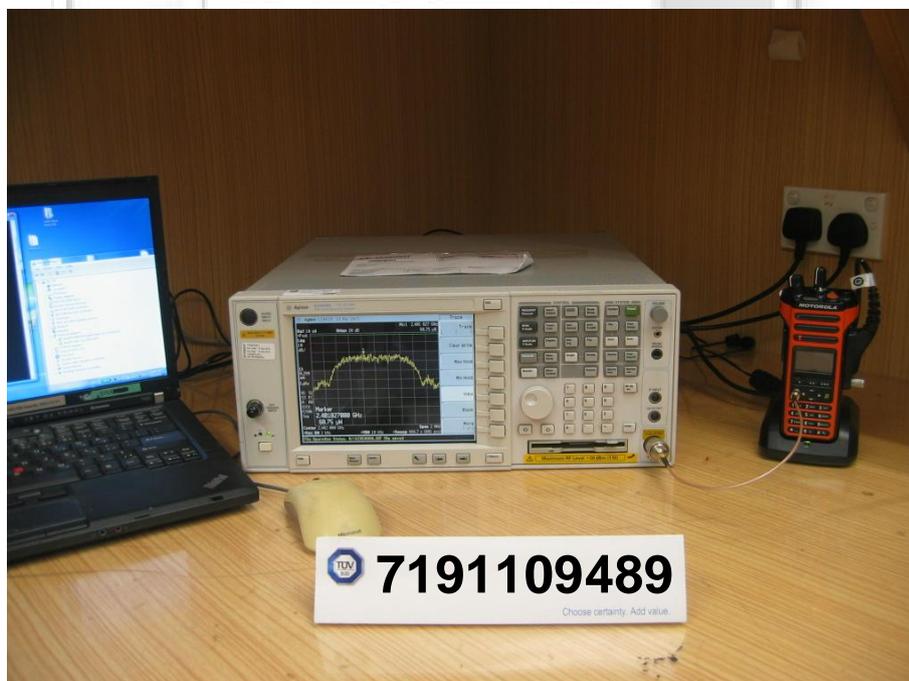
Spectrum Bandwidth (20dB Bandwidth Measurement) Test Setup

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

TEST SETUP



Number of Hopping Frequencies Test Setup



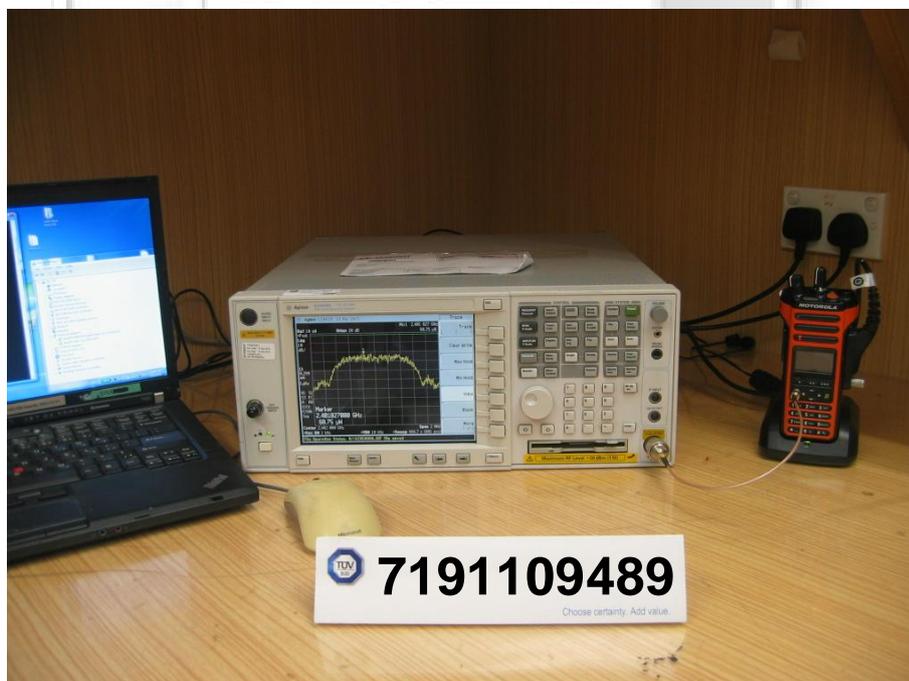
Average Frequency Dwell Time Test Setup

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

TEST SETUP



Maximum Peak Power Test Setup



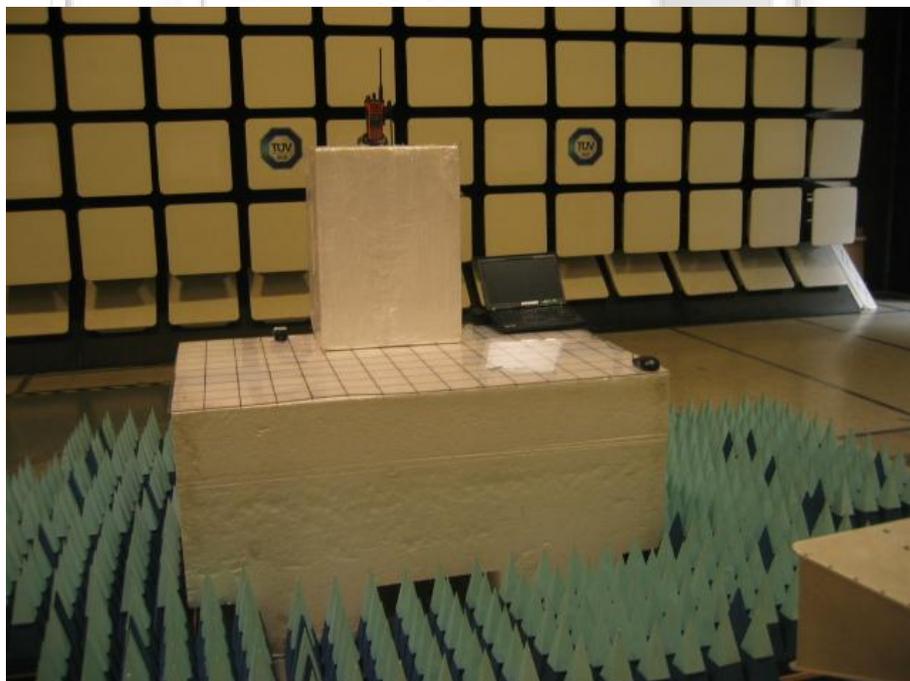
RF Conducted Spurious Emissions Test Setup

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

TEST SETUP



Band Edge Compliance (Conducted) Test Setup



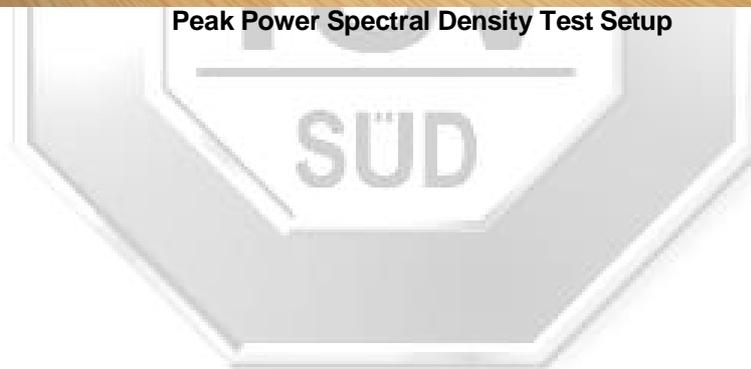
Band Edge Compliance (Radiated) Test Setup

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

TEST SETUP



Peak Power Spectral Density Test Setup



ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS



Front View



Rear View

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS



Front View



Rear View

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS – Battery



Front View



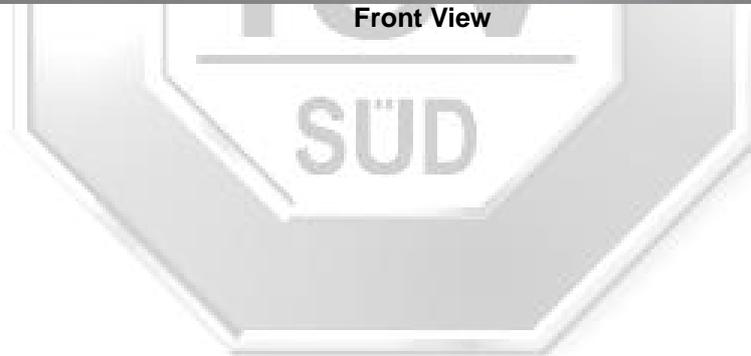
Rear View

ANNEX A TEST SETUP / EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS – LMR Antenna (PMAF 4020A)



Front View





ANNEX B USER MANUAL TECHNICAL DESCRIPTION BLOCK & CIRCUIT DIAGRAMS





ANNEX C FCC & IC LABELS & POSITIONS

