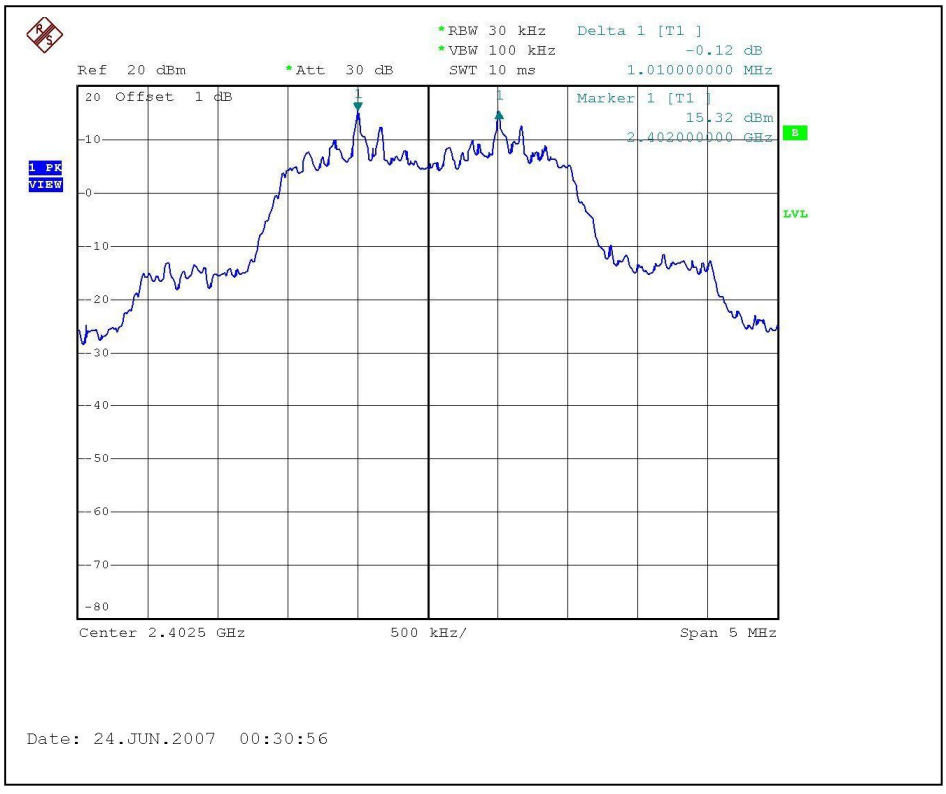
MODULATION TYPE	8DPSK	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 963 hPa	**TESTED BY**	Tony Chen

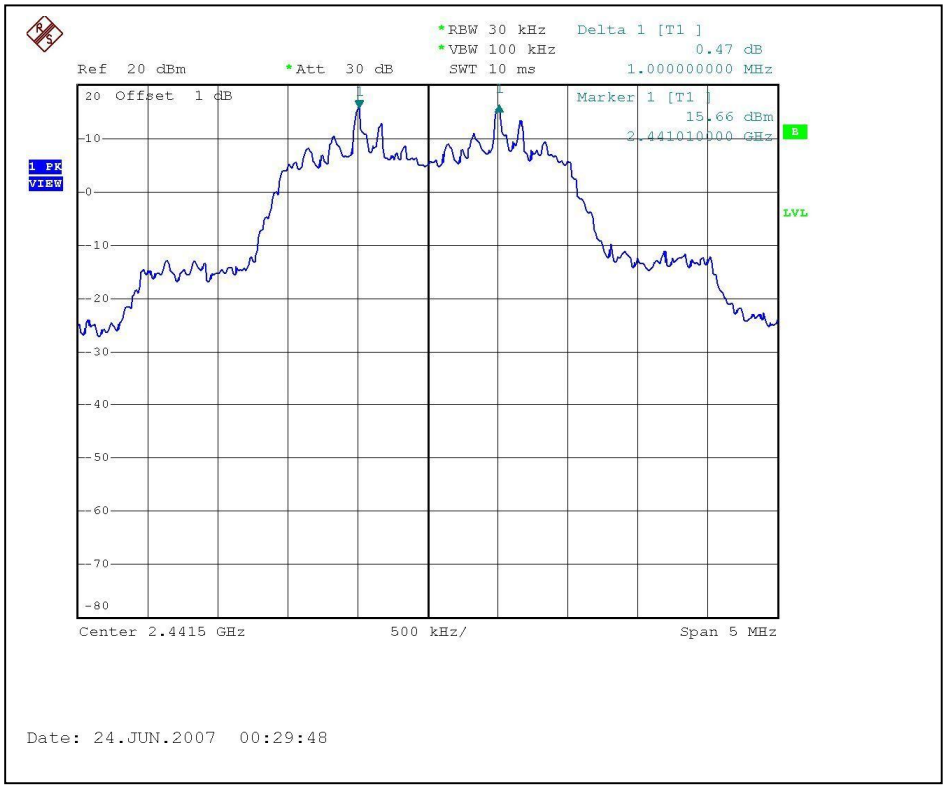
Channel	Frequency (MHz)	Adjacent Channel Separation	Minimum Limit (kHz)	Pass / Fail
0	2402	1.010MHz	833	PASS
39	2441	1.000MHz	853	PASS
78	2480	1.000MHz	853	PASS

The minimum limit is two-thirds of 20dB bandwidth. Test results please refer to next three pages.

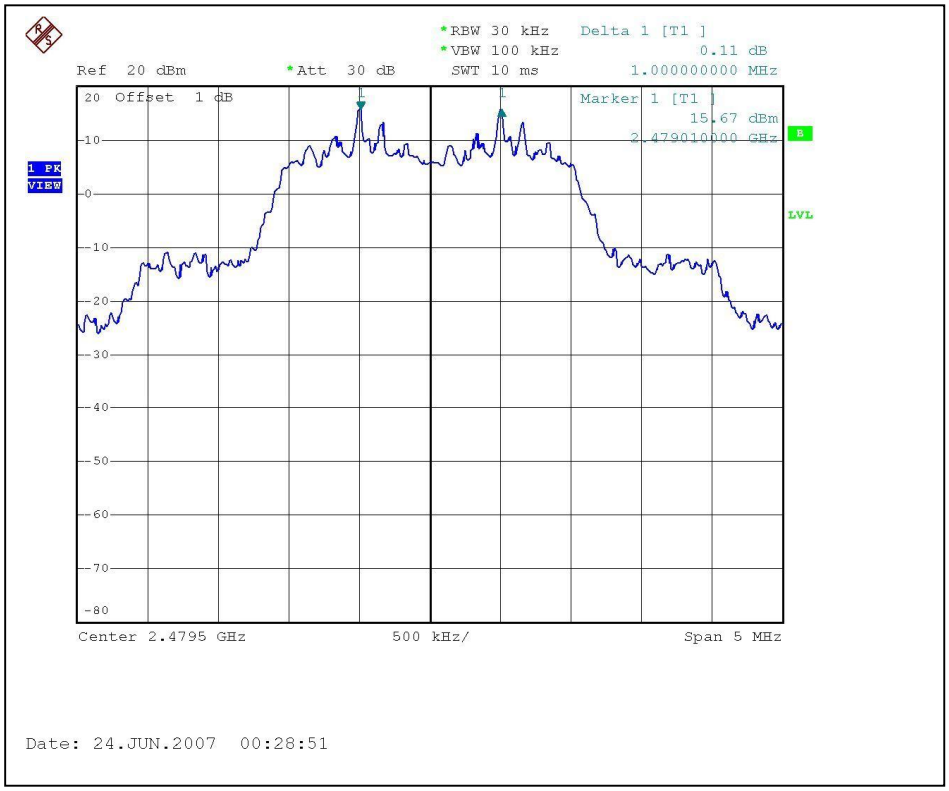
Channel 0



Channel 39



Channel 78

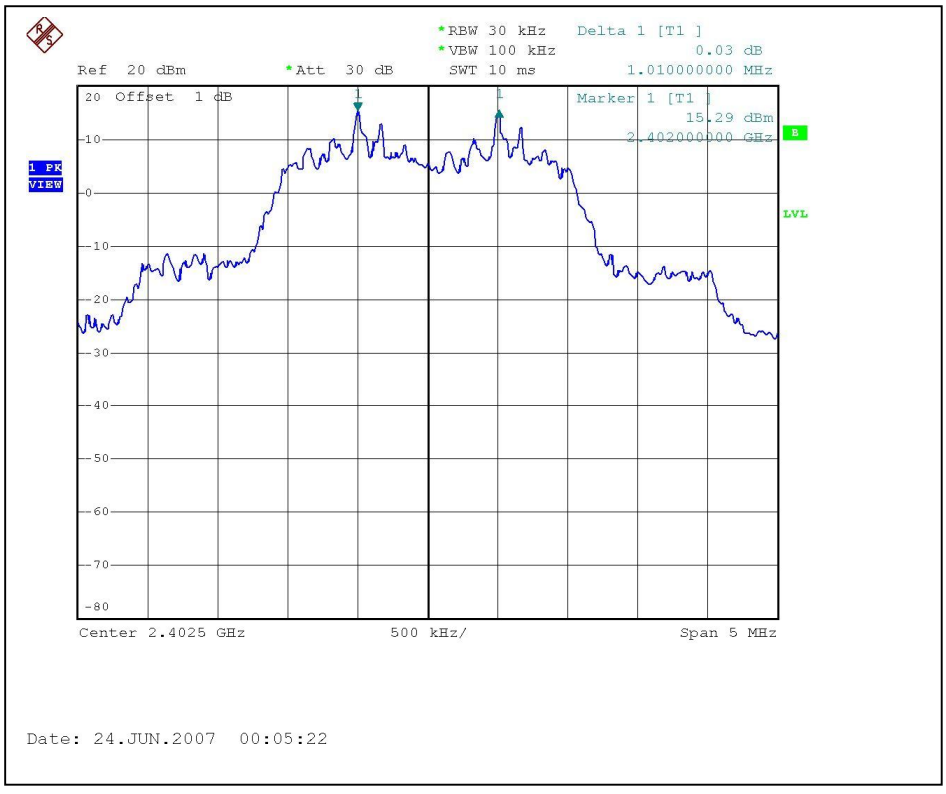


MODULATION TYPE	π /4-DQPSK	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 963 hPa	**TESTED BY**	Tony Chen

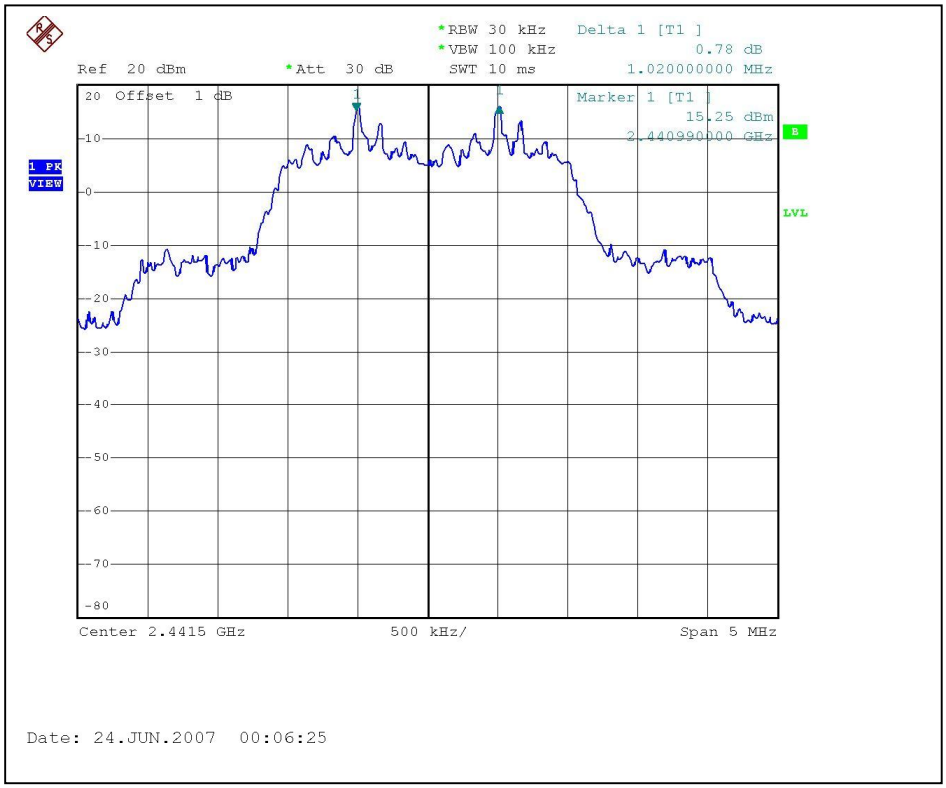
Channel	Frequency (MHz)	Adjacent Channel Separation	Minimum Limit (kHz)	Pass / Fail
0	2402	1.010MHz	840	PASS
39	2441	1.020MHz	840	PASS
78	2480	1.010MHz	840	PASS

The minimum limit is two-thirds of 20dB bandwidth. Test results please refer to next three pages.

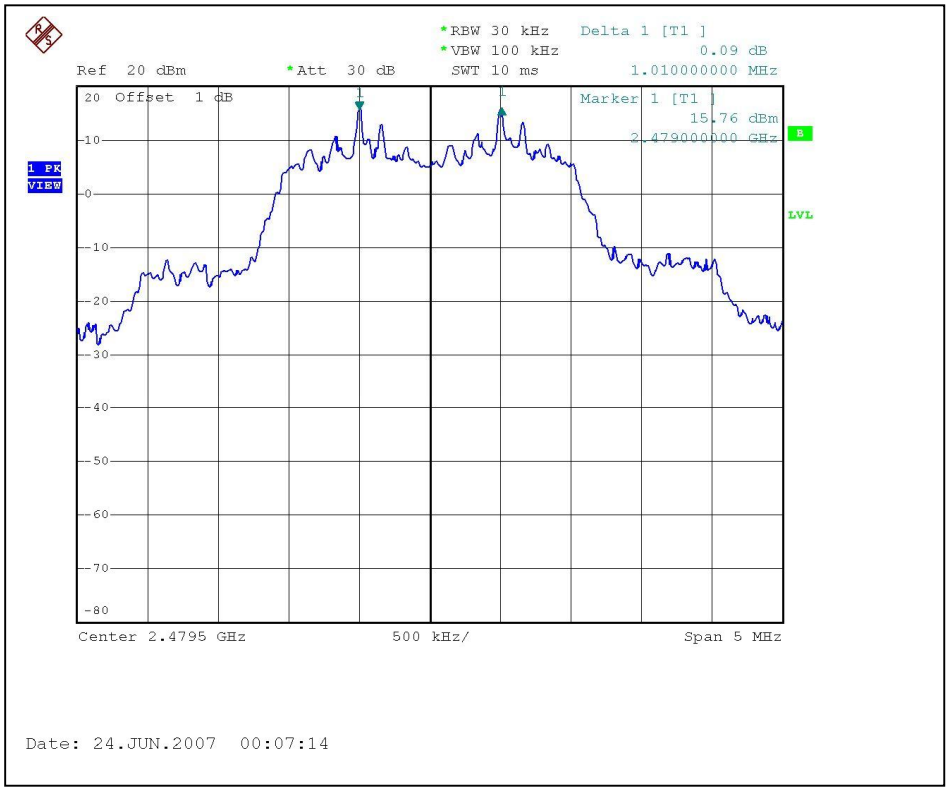
Channel 0



Channel 39



Channel 78



4.6 MAXIMUM PEAK OUTPUT POWER

4.6.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 125mW.

4.6.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 21, 2007

Note:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

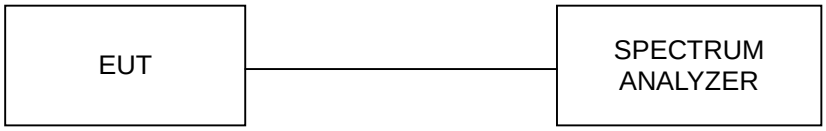
4.6.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 3 MHz RBW and 3 MHz VBW.
4. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
5. Repeat above procedures until all frequencies measured were complete.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

4.6.6 EUT OPERATING CONDITION

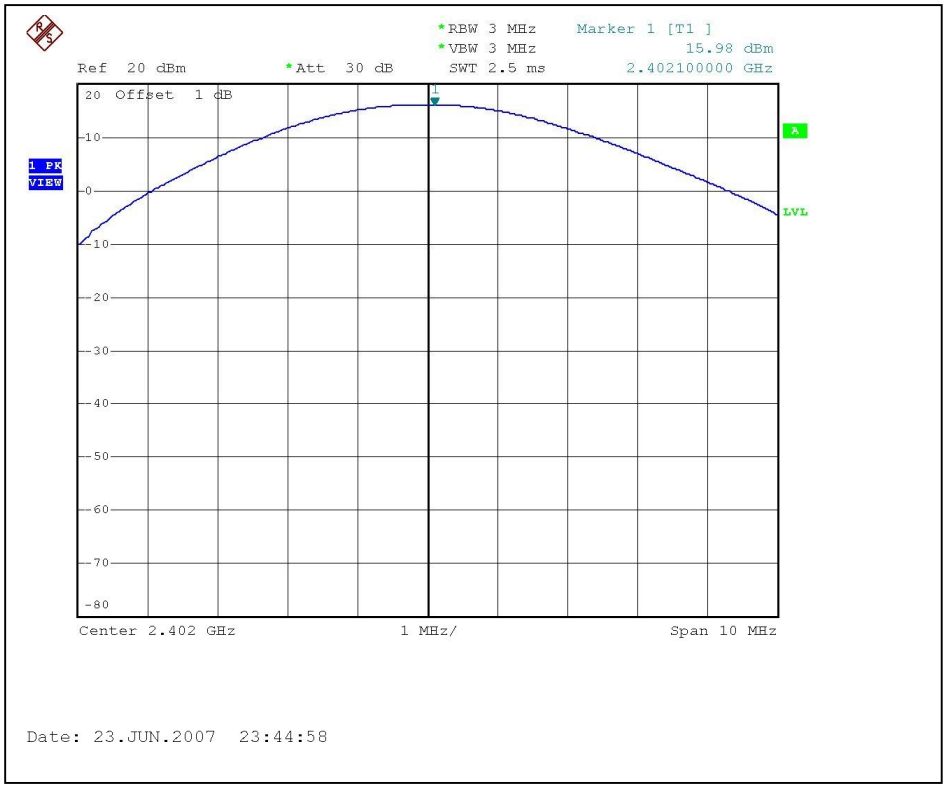
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.6.7 TEST RESULTS

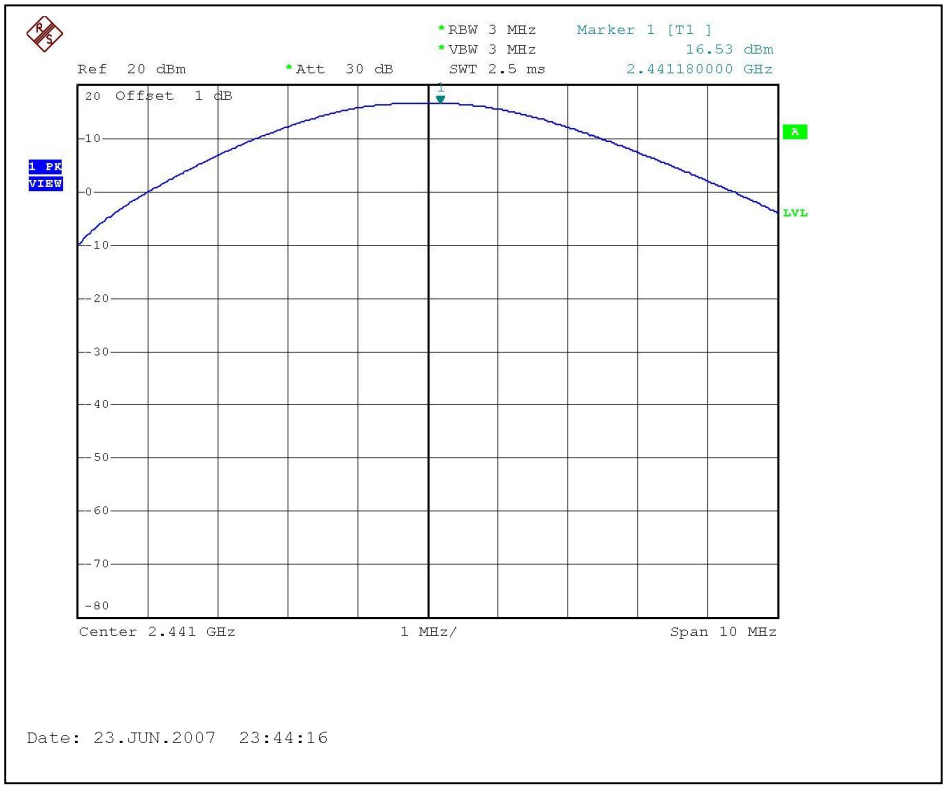
MODULATION TYPE	GFSK	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 62%RH, 960 hPa	TESTED BY	Tony Chen

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (mW)	PASS/FAIL
0	2402	39.63	15.98	125	PASS
39	2441	44.98	16.53	125	PASS
78	2480	48.08	16.82	125	PASS

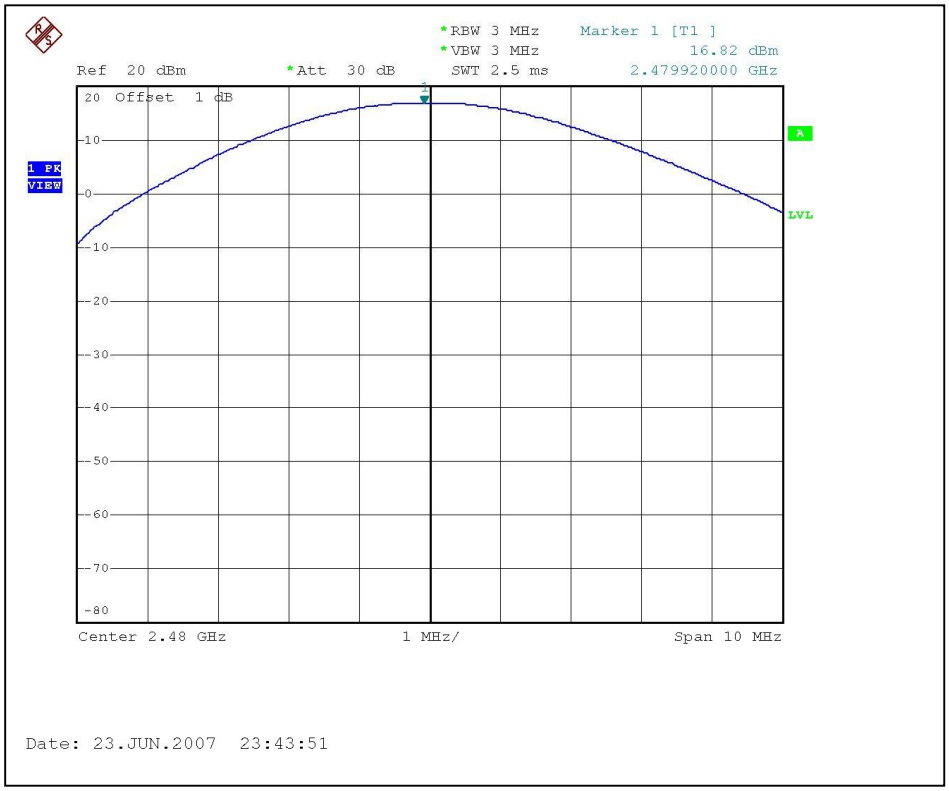
Channel 0



Channel 39



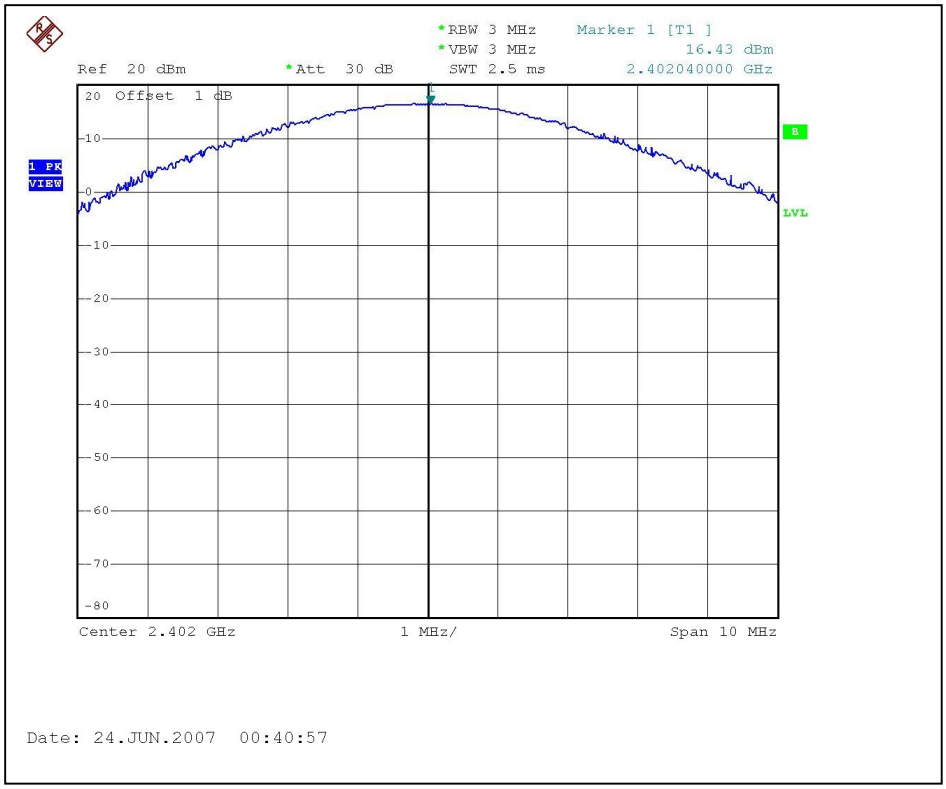
Channel 78



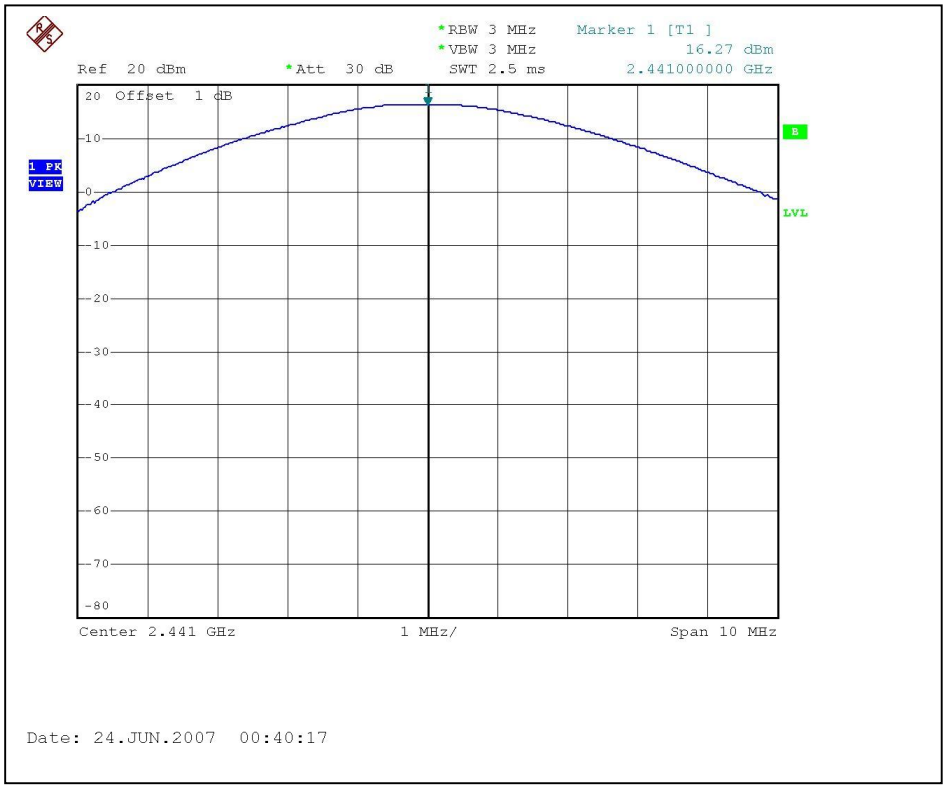
MODULATION TYPE	8DPSK	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 62%RH, 960 hPa	**TESTED BY**	Tony Chen

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (mW)	PASS/FAIL
0	2402	43.05	16.34	125	PASS
39	2441	42.36	16.27	125	PASS
78	2480	43.85	16.42	125	PASS

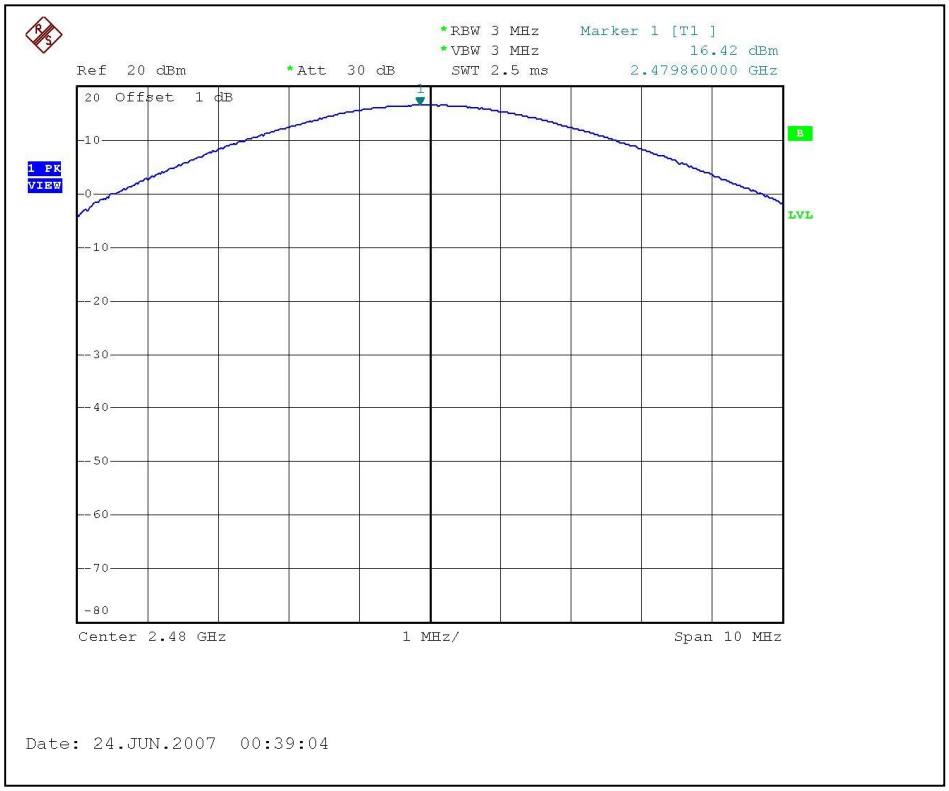
Channel 0



Channel 39



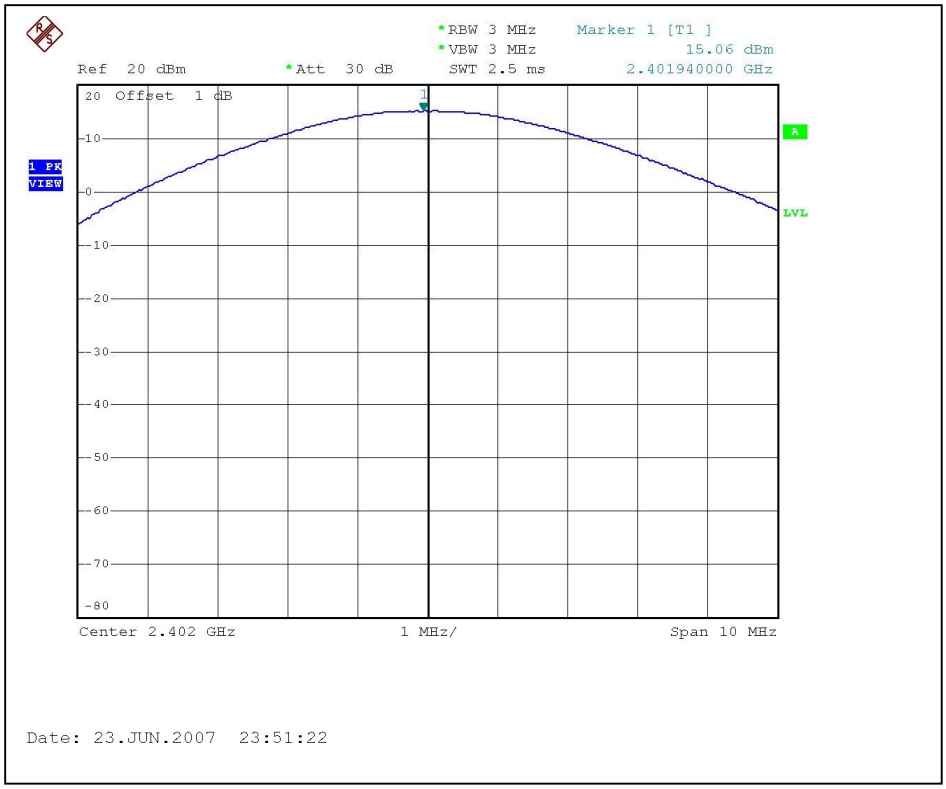
Channel 78



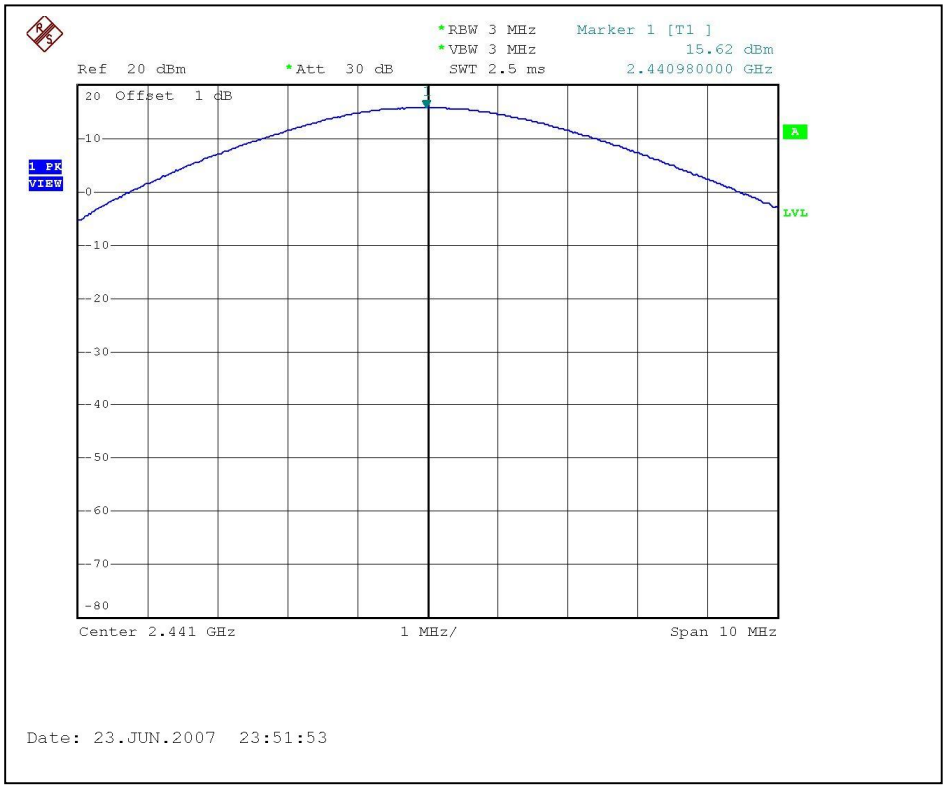
MODULATION TYPE	π /4-DQPSK	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 62%RH, 960 hPa	**TESTED BY**	Tony Chen

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (mW)	PASS/FAIL
0	2402	32.06	15.06	125	PASS
39	2441	36.48	15.62	125	PASS
78	2480	37.50	15.74	125	PASS

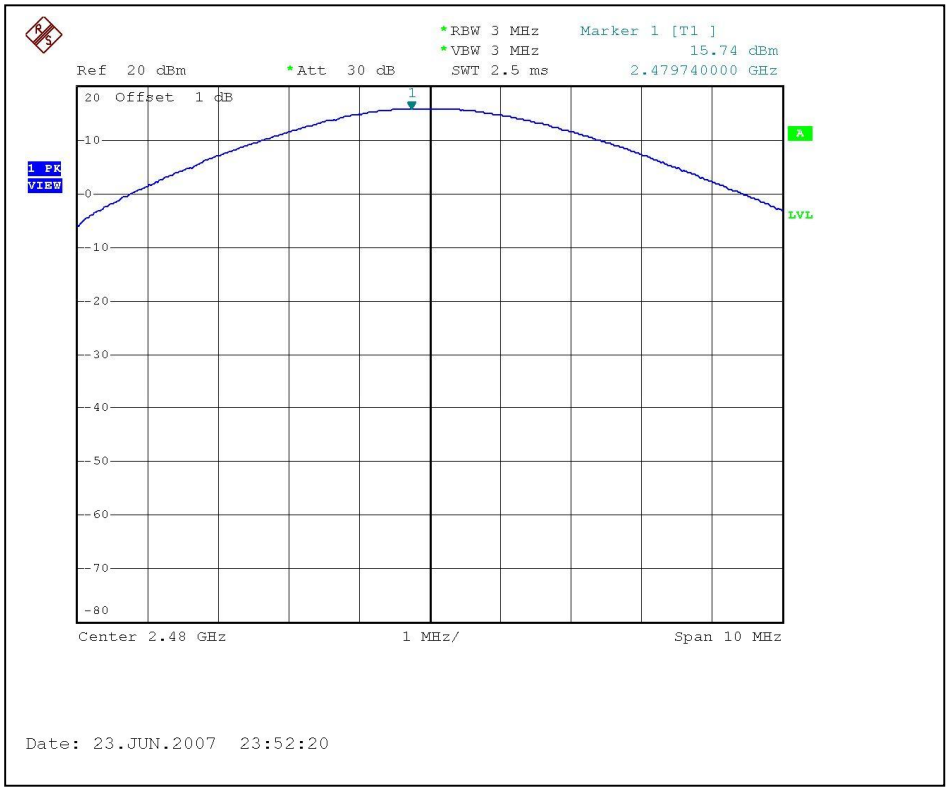
Channel 0



Channel 39



Channel 78



4.7 RADIATED EMISSION MEASUREMENT

4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 03, 2007
HP Pre_Amplifier	8449B	3008A01922	Sep. 18, 2007
ROHDE & SCHWARZ Test Receiver	ESCS30	100375	Sep. 20, 2007
CHASE Broadband Antenna	VULB 9168	138	July 17, 2007
Schwarzbeck Horn_Antenna	BBHA9120	D124	Jan. 01, 2008
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 05, 2008
SCHWARZBECK Biconical Antenna	VHBA9123	459	Jun. 08, 2009
SCHWARZBECK Periodic Antenna	UPA6108	1148	Jun. 08, 2009
R&S Loop Antenna	HFH2-Z2	881058/15	Nov. 29, 2007
RF Switches (ARNITSU)	CS-201	1565157	NA
RF CABLE (Chaintek)	SF102	22054-2	Nov. 14. 2007
RF Cable(RICHTEC)	9913-30M N-N Cable	STCCAB-30M-1 GHz	Jul. 15, 2007
Software	ADT_Radiated_V 7.6.15.7	NA	NA
CHANCE MOST Antenna Tower	AT-100	0203	NA
CHANCE MOST Turn Table	TT-100	0203	NA

Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Biconical and Periodic Antenna)and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: R3271A) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in ADT Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 4824A-3.
7. The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Radiated emissions (30MHz-1GHz)	3.98 dB
Radiated emissions (1GHz ~18GHz)	2.21 dB
Radiated emissions (18GHz ~40GHz)	1.88 dB

4.7.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

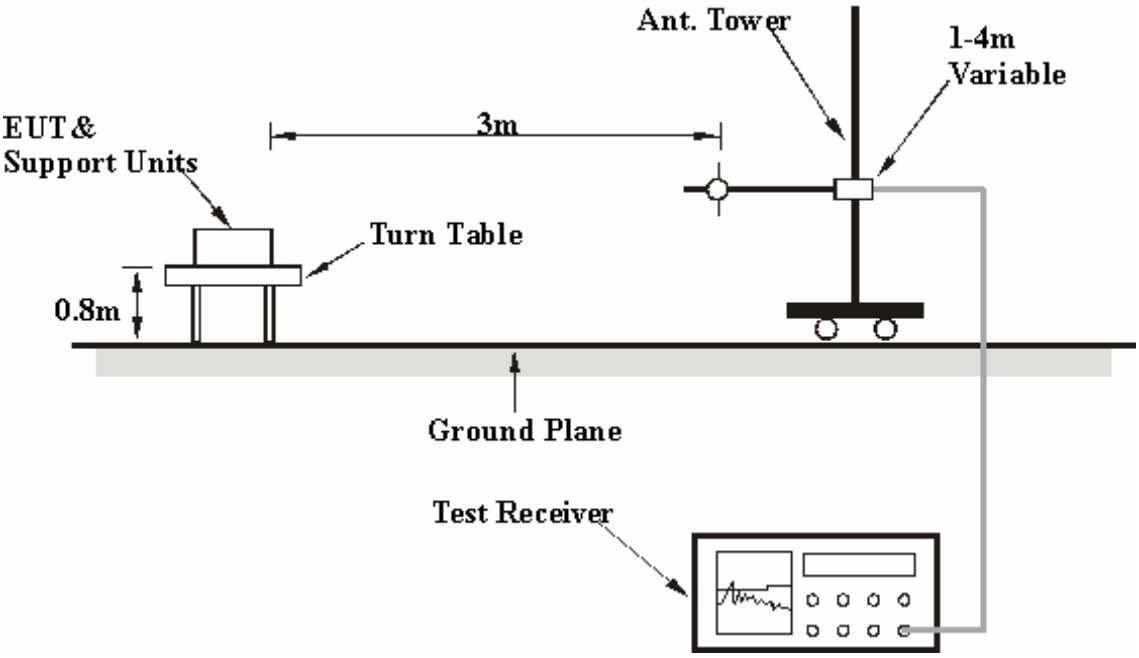
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.7.6 TEST RESULTS

CHANNEL	0	FREQUENCY RANGE	Below 1GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	21 deg. C, 65%RH, 960 hPa	TESTED BY	Phoenix Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	133.00	28.45 QP	43.50	-15.05	1.37 H	284	15.58	12.87
2	270.01	23.76 QP	46.00	-22.24	1.14 H	284	8.39	15.37
3	480.04	27.94 QP	46.00	-18.06	1.71 H	21	6.69	21.25
4	500.04	29.83 QP	46.00	-16.17	1.64 H	359	8.07	21.76
5	599.02	34.41 QP	46.00	-11.59	1.49 H	167	9.95	24.46
6	720.06	28.88 QP	46.00	-17.12	1.16 H	229	2.46	26.42
7	732.23	33.56 QP	46.00	-12.44	1.21 H	294	6.76	26.80
8	960.00	37.52 QP	46.00	-8.48	1.00 H	21	7.63	29.89

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	68.65	33.08 QP	40.00	-6.92	1.02 V	343	20.36	12.72
2	115.77	35.60 QP	43.50	-7.90	1.02 V	223	24.27	11.33
3	200.00	28.19 QP	43.50	-15.31	1.01 V	111	16.59	11.60
4	359.90	33.84 QP	46.00	-12.16	1.00 V	326	16.14	17.70
5	480.10	31.56 QP	46.00	-14.44	1.00 V	1	10.31	21.25
6	500.03	31.31 QP	46.00	-14.69	1.40 V	284	9.55	21.76
7	732.30	35.98 QP	46.00	-10.02	1.36 V	155	9.18	26.80

REMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

For GFSK MODULATION TYPE:

CHANNEL	Channel 0	**FREQUENCY RANGE**	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24 deg. C, 56%RH, 960 hPa	**TESTED BY**	Phoenix Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	55.20 PK	74.00	-18.80	1.51 H	352	24.80	30.40
2	2390.00	43.90 AV	54.00	-10.10	1.51 H	352	13.50	30.40
3	*2402.00	95.60 PK			1.52 H	351	65.15	30.45
4	*2402.00	65.60 AV			1.52 H	351	35.15	30.45
5	4804.00	64.80 PK	74.00	-9.20	1.56 H	82	29.15	35.65
6	4804.00	34.80 AV	54.00	-19.20	1.56 H	82	-0.85	35.65
7	7206.00	64.10 PK	74.00	-9.90	1.61 H	21	21.97	42.13
8	7206.00	34.10 AV	54.00	-19.90	1.61 H	21	-8.03	42.13
9	12010.00	62.40 PK	74.00	-11.60	1.59 H	302	15.91	46.48
10	12010.00	32.40 AV	54.00	-21.60	1.59 H	302	-14.09	46.48

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	56.10 PK	74.00	-17.90	1.00 V	246	25.70	30.40
2	2390.00	43.90 AV	54.00	-10.10	1.00 V	246	13.50	30.40
3	*2402.00	92.90 PK			1.01 V	245	62.45	30.45
4	*2402.00	62.90 AV			1.01 V	245	32.45	30.45
5	4804.00	64.70 PK	74.00	-9.30	1.46 V	109	29.05	35.65
6	4804.00	34.70 AV	54.00	-19.30	1.46 V	109	-0.95	35.65
7	7206.00	61.50 PK	74.00	-12.50	1.45 V	340	19.37	42.13
8	7206.00	31.50 AV	54.00	-22.50	1.45 V	340	-10.63	42.13
9	12010.00	61.80 PK	74.00	-12.20	1.34 V	76	15.31	46.48
10	12010.00	31.80 AV	54.00	-22.20	1.34 V	76	-14.68	46.48

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel.Therefore, the duty cycle be equal to: 20log(3.125/100)= -30dB
7. Average value = peak reading +20log(duty cycle)

CHANNEL	Channel 39	**FREQUENCY RANGE**	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24 deg. C, 56%RH, 960 hPa	**TESTED BY**	Phoenix Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2441.00	95.40 PK			1.40 H	351	64.78	30.62
2	*2441.00	65.40 AV			1.40 H	351	34.78	30.62
3	4882.00	67.50 PK	74.00	-6.50	1.38 H	81	31.69	35.81
4	4882.00	37.50 AV	54.00	-16.50	1.38 H	81	1.69	35.81
5	7323.00	67.30 PK	74.00	-6.70	1.48 H	21	24.74	42.56
6	7323.00	37.30 AV	54.00	-16.70	1.48 H	21	-5.26	42.56
7	12205.00	63.30 PK	74.00	-10.70	1.67 H	310	16.91	46.39
8	12205.00	33.30 AV	54.00	-20.70	1.67 H	310	-13.09	46.39

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2441.00	93.10 PK			1.00 V	247	62.48	30.62
2	*2441.00	63.10 AV			1.00 V	247	32.48	30.62
3	4882.00	65.80 PK	74.00	-8.20	1.47 V	77	29.99	35.81
4	4882.00	35.80 AV	54.00	-18.20	1.47 V	77	-0.01	35.81
5	7323.00	62.00 PK	74.00	-12.00	1.63 V	357	19.44	42.56
6	7323.00	32.00 AV	54.00	-22.00	1.63 V	357	-10.56	42.56
7	12205.00	60.20 PK	74.00	-13.80	1.45 V	103	13.81	46.39
8	12205.00	30.20 AV	54.00	-23.80	1.45 V	103	-16.19	46.39

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel.Therefore, the duty cycle be equal to: 20log(3.125/100)= -30dB
7. Average value = peak reading +20log(duty cycle)

CHANNEL	Channel 78	**FREQUENCY RANGE**	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24 deg. C, 56%RH, 960 hPa	**TESTED BY**	Phoenix Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2480.00	94.60 PK			1.42 H	345	63.80	30.80
2	*2480.00	64.60 AV			1.42 H	345	33.80	30.80
3	2483.50	54.40 PK	74.00	-19.60	1.41 H	346	23.58	30.82
4	2483.50	46.20 AV	54.00	-7.80	1.41 H	346	15.38	30.82
5	**4960.00**	**71.80 PK**	**74.00**	**-2.20**	**1.49 H**	**75**	**35.82**	**35.98**
6	4960.00	41.80 AV	54.00	-12.20	1.49 H	75	5.82	35.98
7	7440.00	67.60 PK	74.00	-6.40	1.81 H	318	24.60	43.00
8	7440.00	37.60 AV	54.00	-16.40	1.81 H	318	-5.40	43.00
9	12400.00	63.90 PK	74.00	-10.10	1.66 H	298	17.61	46.29
10	12400.00	33.90 AV	54.00	-20.10	1.66 H	298	-12.39	46.29

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2480.00	91.20 PK			1.46 V	190	60.40	30.80
2	*2480.00	61.20 AV			1.46 V	190	30.40	30.80
3	2483.50	57.00 PK	74.00	-17.00	1.47 V	191	26.18	30.82
4	2483.50	45.10 AV	54.00	-8.90	1.47 V	191	14.28	30.82
5	4960.00	69.70 PK	74.00	-4.30	1.41 V	89	33.72	35.98
6	4960.00	39.70 AV	54.00	-14.30	1.41 V	89	3.72	35.98
7	7440.00	67.70 PK	74.00	-6.30	1.30 V	0	24.70	43.00
8	7440.00	37.70 AV	54.00	-16.30	1.30 V	0	-5.30	43.00
9	12400.00	61.50 PK	74.00	-12.50	1.38 V	299	15.21	46.29
10	12400.00	31.50 AV	54.00	-22.50	1.38 V	299	-14.79	46.29

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel.Therefore, the duty cycle be equal to: 20log(3.125/100)= -30dB
7. Average value = peak reading +20log(duty cycle)

FOR π/4-DQPSK MODULATION TYPE:

CHANNEL	Channel 0	**FREQUENCY RANGE**	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24 deg. C, 56%RH, 960 hPa	**TESTED BY**	Phoenix Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	55.80 PK	74.00	-18.20	1.51 H	350	25.40	30.40
2	2390.00	44.10 AV	54.00	-9.90	1.51 H	350	13.70	30.40
3	*2402.00	94.90 PK			1.51 H	357	64.45	30.45
4	*2402.00	64.90 AV			1.51 H	357	34.45	30.45
5	4804.00	61.90 PK	74.00	-12.10	1.38 H	77	26.25	35.65
6	4804.00	31.90 AV	54.00	-22.10	1.38 H	77	-3.75	35.65
7	7206.00	63.60 PK	74.00	-10.40	1.50 H	21	21.47	42.13
8	7206.00	33.60 AV	54.00	-20.40	1.50 H	21	-8.53	42.13
9	12010.00	60.00 PK	74.00	-14.00	1.67 H	302	13.52	46.48
10	12010.00	30.00 AV	54.00	-24.00	1.67 H	302	-16.48	46.48

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	56.70 PK	74.00	-17.30	1.09 V	260	26.30	30.40
2	2390.00	44.00 AV	54.00	-10.00	1.09 V	260	13.60	30.40
3	*2402.00	93.20 PK			1.00 V	246	62.75	30.45
4	*2402.00	63.20 AV			1.00 V	246	32.75	30.45
5	4804.00	64.50 PK	74.00	-9.50	1.46 V	107	28.85	35.65
6	4804.00	34.50 AV	54.00	-19.50	1.46 V	107	-1.15	35.65
7	7206.00	61.20 PK	74.00	-12.80	1.45 V	346	19.07	42.13
8	7206.00	31.20 AV	54.00	-22.80	1.45 V	346	-10.93	42.13
9	12010.00	63.50 PK	74.00	-10.50	1.33 V	75	17.02	46.48
10	12010.00	33.50 AV	54.00	-20.50	1.33 V	75	-12.98	46.48

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel.Therefore, the duty cycle be equal to: 20log(3.125/100)= -30dB
7. Average value = peak reading +20log(duty cycle)

CHANNEL	Channel 39	**FREQUENCY RANGE**	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24 deg. C, 56%RH, 960 hPa	**TESTED BY**	Phoenix Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2441.00	94.40 PK			1.40 H	346	63.78	30.62
2	*2441.00	64.40 AV			1.40 H	346	33.78	30.62
3	4882.00	66.50 PK	74.00	-7.50	1.50 H	76	30.69	35.81
4	4882.00	36.50 AV	54.00	-17.50	1.50 H	76	0.69	35.81
5	7323.00	65.10 PK	74.00	-8.90	1.47 H	20	22.54	42.56
6	7323.00	35.10 AV	54.00	-18.90	1.47 H	20	-7.46	42.56
7	12205.00	60.60 PK	74.00	-13.40	1.67 H	296	14.21	46.39
8	12205.00	30.60 AV	54.00	-23.40	1.67 H	296	-15.79	46.39

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2441.00	93.40 PK			1.00 V	247	62.78	30.62
2	*2441.00	63.40 AV			1.00 V	247	32.78	30.62
3	4882.00	68.90 PK	74.00	-5.10	1.44 V	78	33.09	35.81
4	4882.00	38.90 AV	54.00	-15.10	1.44 V	78	3.09	35.81
5	7323.00	67.80 PK	74.00	-6.20	1.43 V	348	25.24	42.56
6	7323.00	37.80 AV	54.00	-16.20	1.43 V	348	-4.76	42.56
7	12205.00	64.40 PK	74.00	-9.60	1.36 V	105	18.01	46.39
8	12205.00	34.40 AV	54.00	-19.60	1.36 V	105	-11.99	46.39

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel.Therefore, the duty cycle be equal to: 20log(3.125/100)= -30dB
7. Average value = peak reading +20log(duty cycle)

CHANNEL	Channel 78	**FREQUENCY RANGE**	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24 deg. C, 56%RH, 960 hPa	**TESTED BY**	Phoenix Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2480.00	94.40 PK			1.40 H	346	63.60	30.80
2	*2480.00	64.40 AV			1.40 H	346	33.60	30.80
3	2483.50	67.40 PK	74.00	-6.60	1.41 H	346	36.58	30.82
4	2483.50	50.70 AV	54.00	-3.30	1.41 H	346	19.88	30.82
5	4960.00	70.80 PK	74.00	-3.20	1.49 H	73	34.82	35.98
6	4960.00	40.80 AV	54.00	-13.20	1.49 H	73	4.82	35.98
7	7440.00	65.20 PK	74.00	-8.80	1.78 H	10	22.20	43.00
8	7440.00	35.20 AV	54.00	-18.80	1.78 H	10	-7.80	43.00
9	12400.00	63.40 PK	74.00	-10.60	1.00 H	297	17.11	46.29
10	12400.00	33.40 AV	54.00	-20.60	1.00 H	297	-12.89	46.29

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2480.00	92.30 PK			1.45 V	204	61.50	30.80
2	*2480.00	62.30 AV			1.45 V	204	31.50	30.80
3	2483.50	63.70 PK	74.00	-10.30	1.46 V	202	32.88	30.82
4	2483.50	48.10 AV	54.00	-5.90	1.46 V	202	17.28	30.82
5	4960.00	70.10 PK	74.00	-3.90	1.41 V	342	34.12	35.98
6	4960.00	40.10 AV	54.00	-13.90	1.41 V	342	4.12	35.98
7	7440.00	69.30 PK	74.00	-4.70	1.30 V	0	26.30	43.00
8	7440.00	39.30 AV	54.00	-14.70	1.30 V	0	-3.70	43.00
9	12400.00	63.50 PK	74.00	-10.50	1.29 V	103	17.21	46.29
10	12400.00	33.50 AV	54.00	-20.50	1.29 V	103	-12.79	46.29

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel.Therefore, the duty cycle be equal to: 20log(3.125/100)= -30dB
7. Average value = peak reading +20log(duty cycle)

4.8 BAND EDGES MEASUREMENT

4.8.1 LIMITS OF BAND EDGES MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100KHz RBW).

4.8.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 21, 2007

Note:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.8.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

4.8.4 DEVIATION FROM TEST STANDARD

No deviation

4.8.5 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.8.6 TEST RESULTS

The spectrum plots are attached on the following 2 pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

For GFSK MODULATION TYPE:

NOTE (Peak):
The band edge emission plot on the following first page show 65.29dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.2 is 95.60dBuV/m, so the maximum field strength in restrict band is 95.60-65.29=30.31dBuV/m which is under 74 dBuV/m limit.

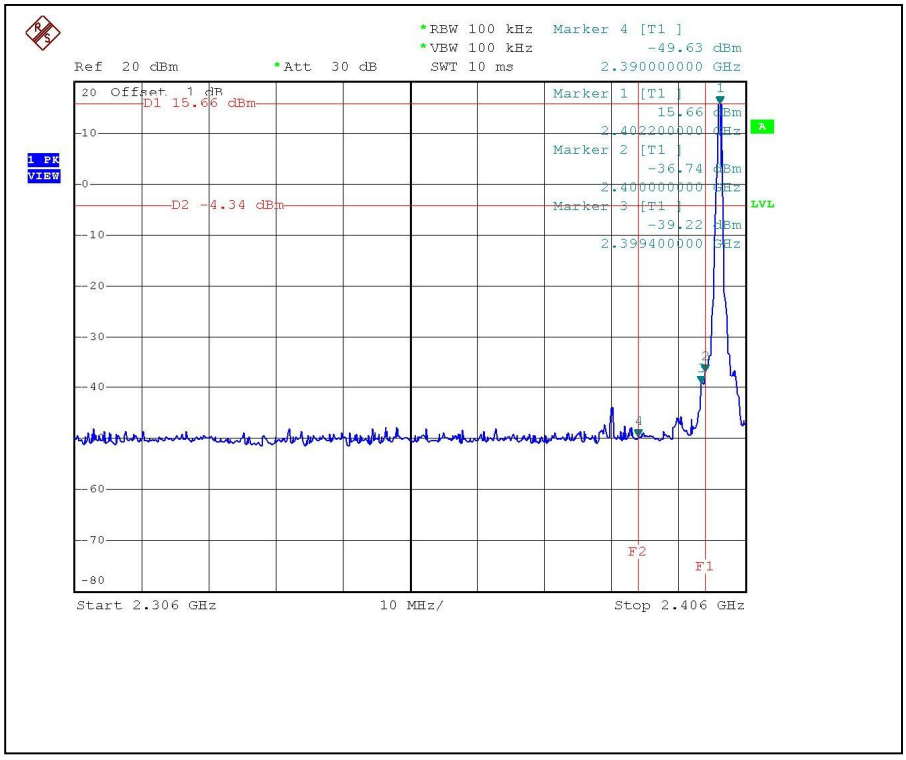
The band edge emission plot on the following first page shows 65.14dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.2 is 94.60dBuV/m, so the maximum field strength in restrict band is 94.60-65.14=29.46dBuV/m which is under 74 dBuV/m limit.

NOTE (Average):

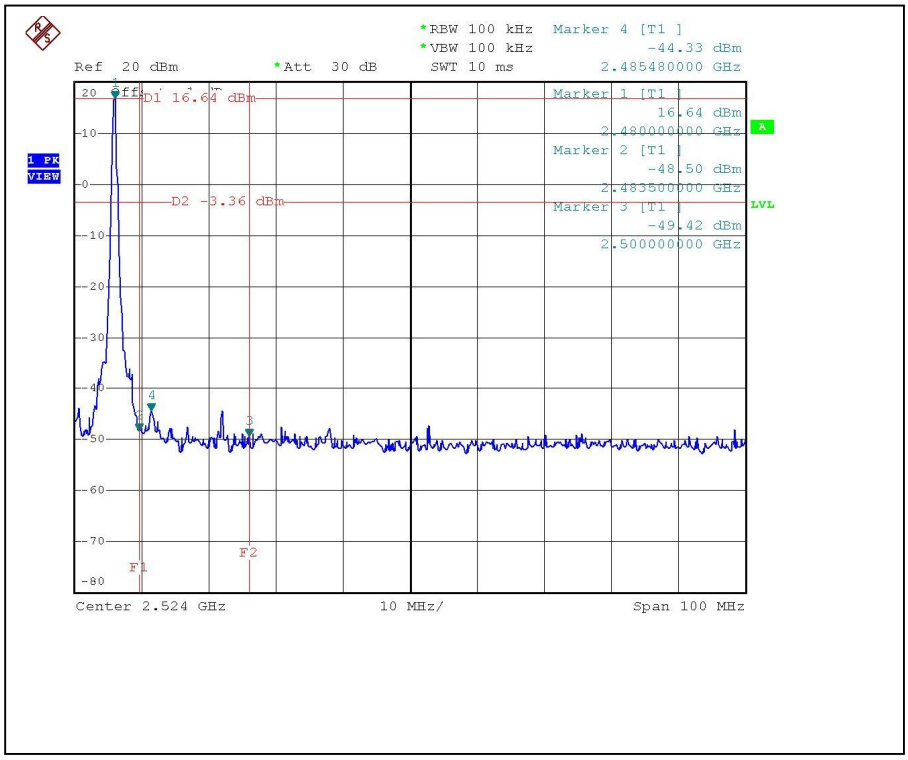
Average value = 30.31-30.00=0.31dBuV/m, which is under 54dBuV/m limit.
*The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle be equal to: 20log(3.125/100)= -30 dB. Average value = peak reading – 30.00.

Average value = 29.46-30.00=-0.54dBuV/m, which is under 54dBuV/m limit.
*The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle be equal to: 20log(3.125/100)= -30 dB. Average value = peak reading – 30.00.

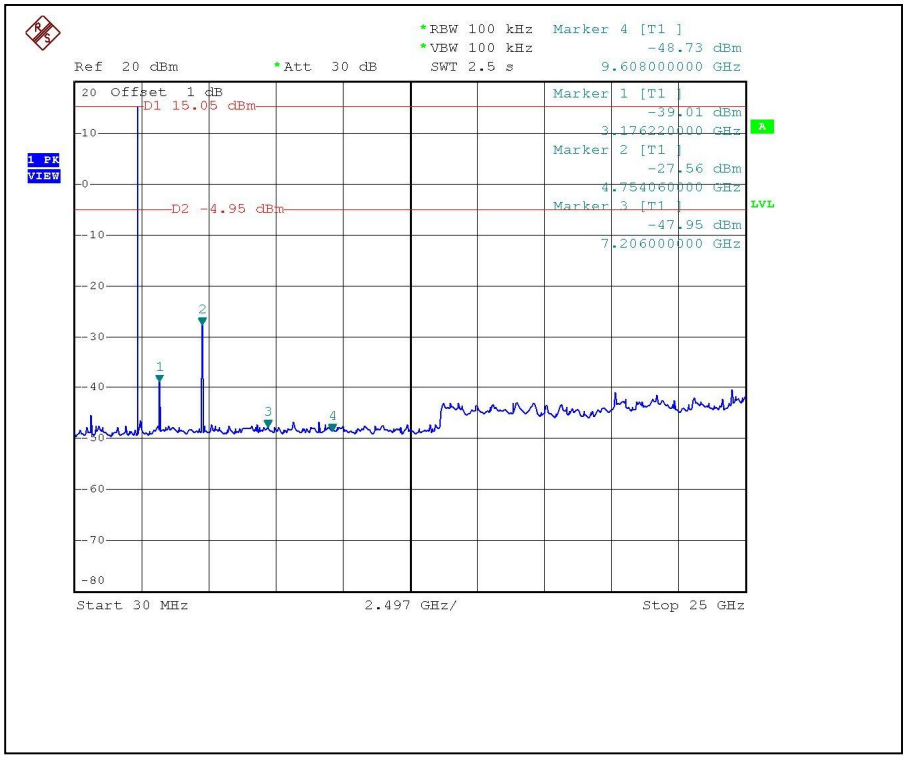
CH0


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 4 [T1]
-49.63 dBm
2.390000000 GHz
Ref 20 dBm
*Att 30 dB
Offset 1 dB
D1 15.66 dBm
D2 -4.34 dBm
Marker 1 [T1]
15.66 dBm
2.402200000 GHz
Marker 2 [T1]
-36.74 dBm
2.400000000 GHz
Marker 3 [T1]
-39.22 dBm
2.399400000 GHz
1 PK
VIEW
LVL
F2
F1
Start 2.306 GHz
10 MHz/
Stop 2.406 GHz

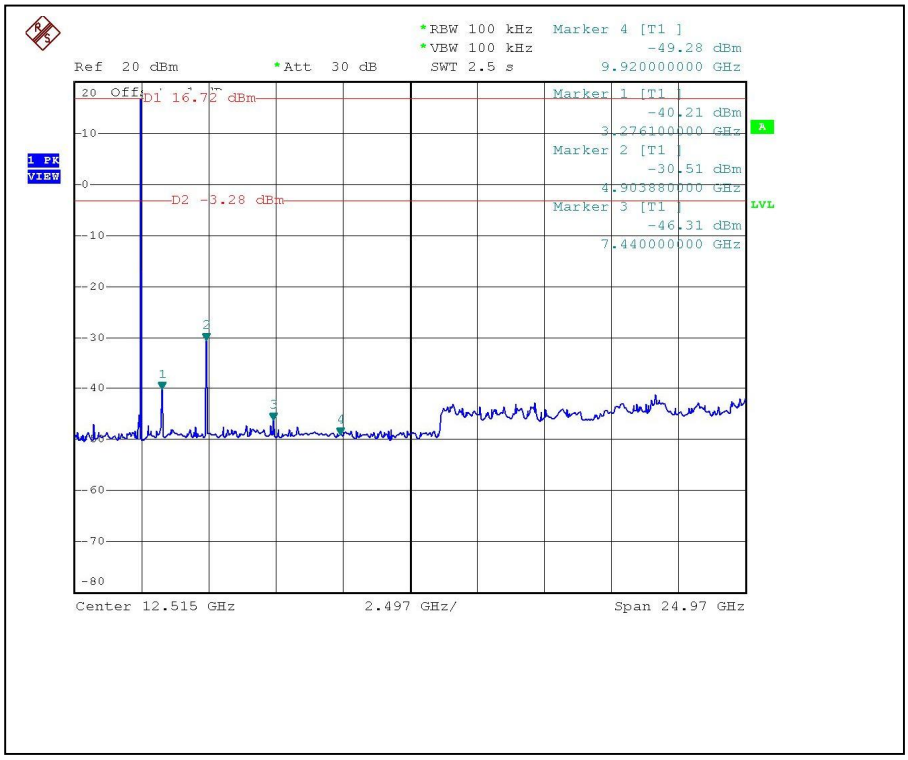
CH78


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 4 [T1]
-44.33 dBm
2.485480000 GHz
Ref 20 dBm
*Att 30 dB
Offset 1 dB
D1 16.64 dBm
D2 -3.36 dBm
Marker 1 [T1]
16.64 dBm
2.480000000 GHz
Marker 2 [T1]
-48.50 dBm
2.483500000 GHz
Marker 3 [T1]
-49.42 dBm
2.500000000 GHz
1 PK
VIEW
LVL
F1
F2
Center 2.524 GHz
10 MHz/
Span 100 MHz

CH0


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 4 [T1]
-48.73 dBm
9.608000000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
D1 15.05 dBm
D2 -4.95 dBm
Marker 1 [T1]
-39.01 dBm
3.176220000 GHz
Marker 2 [T1]
-27.56 dBm
4.754060000 GHz
Marker 3 [T1]
-47.95 dBm
7.206000000 GHz
1 PK
VIEW
A
LVL
Start 30 MHz
2.497 GHz/
Stop 25 GHz

CH78


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 4 [T1]
-49.28 dBm
9.920000000 GHz
Ref 20 dBm
*Att 30 dB
D1 16.72 dBm
D2 -3.28 dBm
Marker 1 [T1]
-40.21 dBm
3.276100000 GHz
Marker 2 [T1]
-30.51 dBm
4.903880000 GHz
Marker 3 [T1]
-46.31 dBm
7.440000000 GHz
1 PK
VIEW
A
LVL
Center 12.515 GHz
2.497 GHz/
Span 24.97 GHz

FOR π/4-DQPSK MODULATION TYPE:

NOTE (Peak):

The band edge emission plot on the following first page show 64.45dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.2 is 94.90dBuV/m, so the maximum field strength in restrict band is 94.90-64.45=30.45dBuV/m which is under 74 dBuV/m limit.

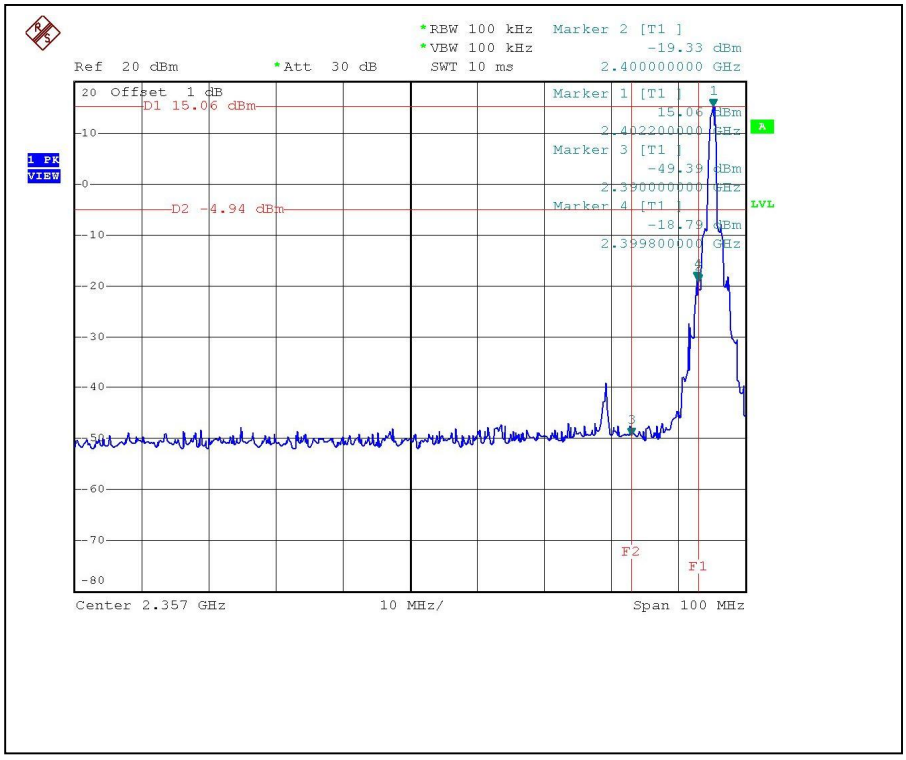
The band edge emission plot on the following first page shows 50.19dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.2 is 93.40dBuV/m, so the maximum field strength in restrict band is 94.40-50.19=44.21dBuV/m which is under 74 dBuV/m limit.

NOTE (Average):

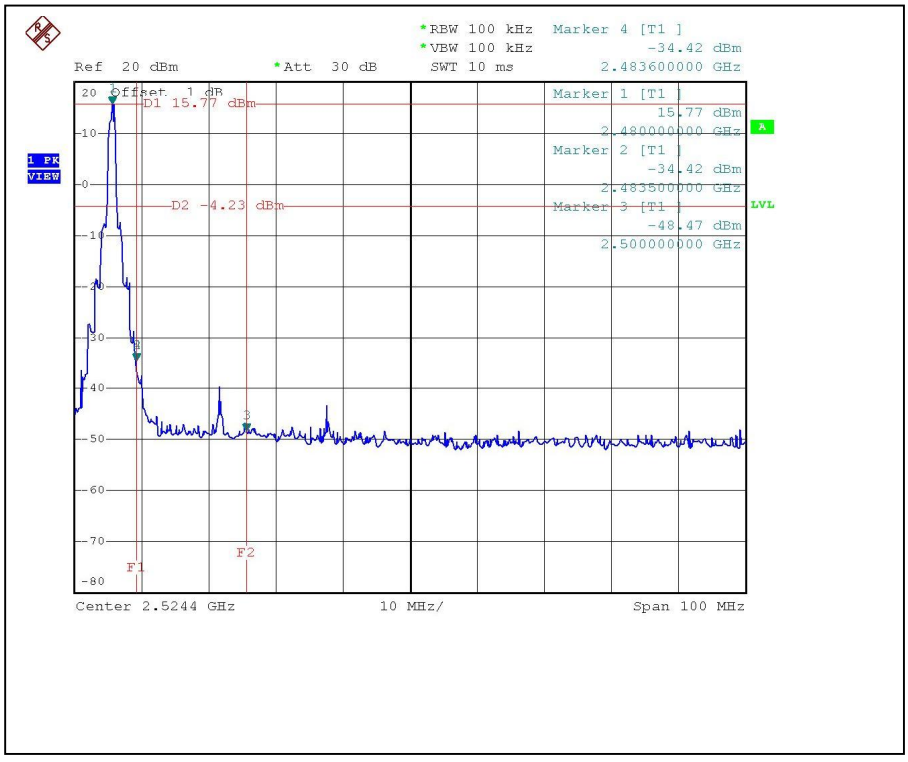
Average value = 30.45-30.00=0.45dBuV/m, which is under 54dBuV/m limit.
*The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle be equal to: 20log(3.125/100)= -30 dB. Average value = peak reading – 30.00.

Average value = 44.21-30.00=44.21dBuV/m, which is under 54dBuV/m limit.
*The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle be equal to: 20log(3.125/100)= -30 dB. Average value = peak reading – 30.00.

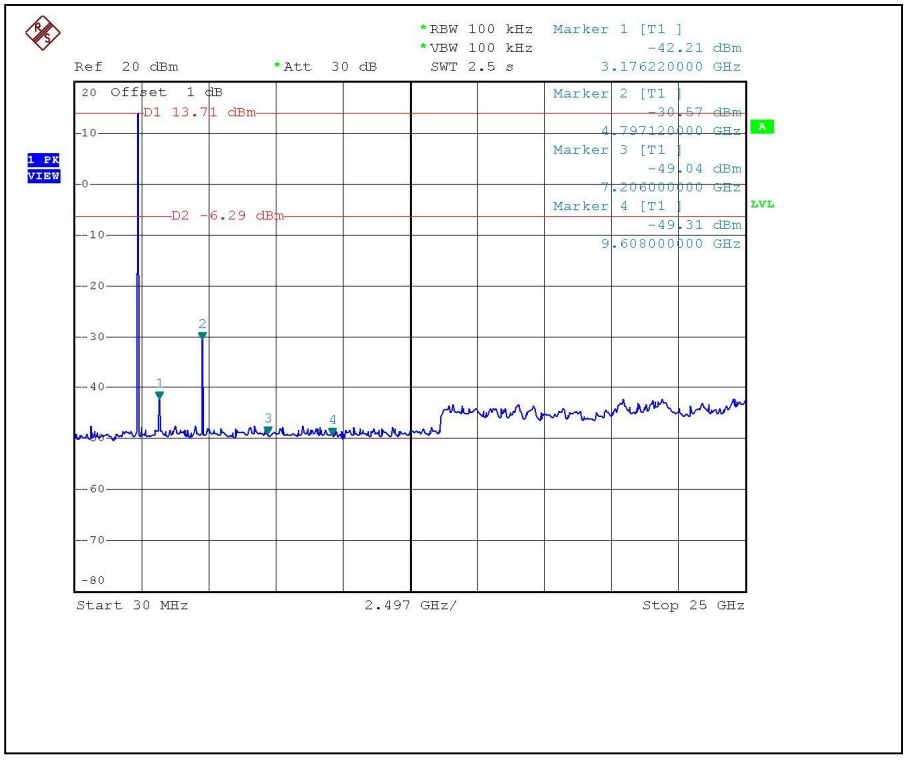
CH0


*RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
SWT 10 ms
Marker 2 [T1]
-19.33 dBm
2.400000000 GHz
20 Offset 1 dB
D1 15.06 dBm
Marker 1 [T1]
15.06 dBm
2.402200000 GHz
Marker 3 [T1]
-49.39 dBm
2.390000000 GHz
D2 -4.94 dBm
Marker 4 [T1]
-18.79 dBm
2.399800000 GHz
1 PK
VIEW
A
LVL
F2
F1
Center 2.357 GHz
10 MHz/
Span 100 MHz

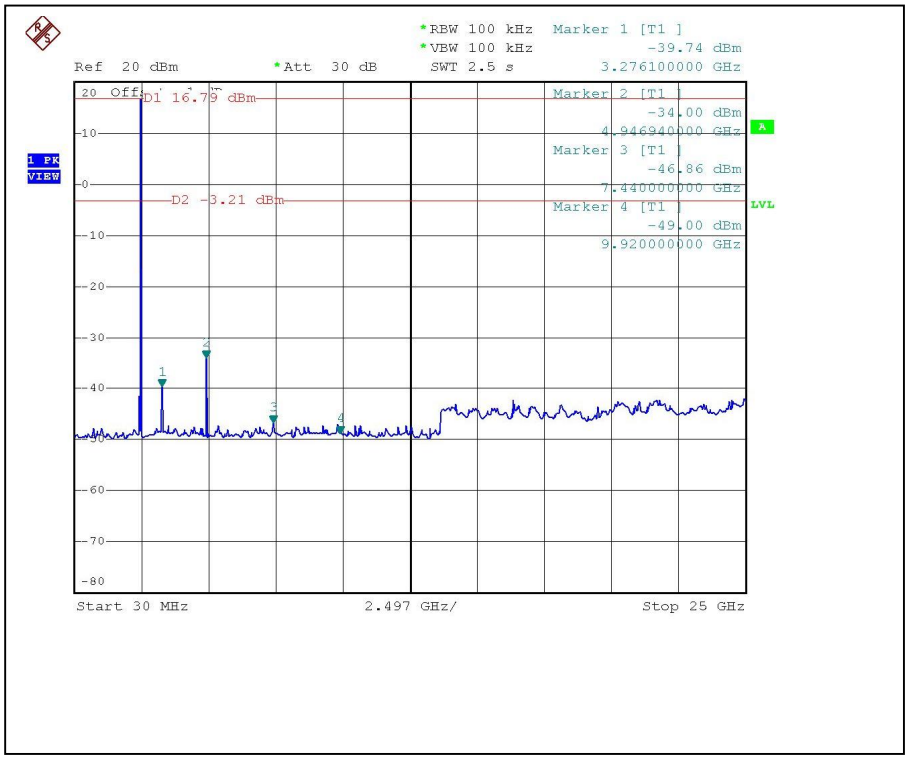
CH78


*RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
SWT 10 ms
Marker 4 [T1]
-34.42 dBm
2.483600000 GHz
20 Offset 1 dB
D1 15.77 dBm
Marker 1 [T1]
15.77 dBm
2.480000000 GHz
Marker 2 [T1]
-34.42 dBm
2.483500000 GHz
Marker 3 [T1]
-48.47 dBm
2.500000000 GHz
D2 -4.23 dBm
1 PK
VIEW
A
LVL
F1
F2
Center 2.5244 GHz
10 MHz/
Span 100 MHz

CH0


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
-42.21 dBm
3.176220000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
D1 13.71 dBm
D2 -6.29 dBm
Marker 2 [T1]
-30.57 dBm
4.797120000 GHz
Marker 3 [T1]
-49.04 dBm
7.206000000 GHz
Marker 4 [T1]
-49.31 dBm
9.608000000 GHz
1 PK
VIEW
LVL
Start 30 MHz
2.497 GHz/
Stop 25 GHz

CH78


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
-39.74 dBm
3.276100000 GHz
Ref 20 dBm
*Att 30 dB
D1 16.79 dBm
D2 -3.21 dBm
Marker 2 [T1]
-34.00 dBm
4.946940000 GHz
Marker 3 [T1]
-46.86 dBm
7.440000000 GHz
Marker 4 [T1]
-49.00 dBm
9.920000000 GHz
1 PK
VIEW
LVL
Start 30 MHz
2.497 GHz/
Stop 25 GHz

4.9 ANTENNA REQUIREMENT

4.9.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.9.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is built-in printing antenna without connector. The maximum Gain of the antenna is 0dBi.

5 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025:

USA	FCC, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA, CSA
R.O.C.	CNLA, BSMI, NCC
Netherlands	Telefication
Singapore	PSB, GOST-ASIA (MOU)
Russia	CERTIS (MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.
If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

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Email: service@adt.com.tw
Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.

APPENDIX-A

MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.