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FCC TEST REPORT (15.247)

REPORT NO.: RF110615C13

MODEL NO.: DSL-2750B, DSL-2750U,
DSL-2751U, DSL-2751B

FCC ID: KA2SL2750UT1

RECEIVED: Jun. 15, 2011

TESTED: Jul. 5 ~ 12, 2011

ISSUED: Sep. 23, 2011

APPLICANT: D-Link Corporation

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United States, 92708

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.)
Ltd., Taoyuan Branch

LAB LOCATION : No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New
Taipei City, Taiwan (R.O.C)

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TABLE OF CONTENTS

RELEASE CONTROL RECORD.....	4
1. CERTIFICATION	5
2. SUMMARY OF TEST RESULTS.....	6
2.1 MEASUREMENT UNCERTAINTY	6
3. GENERAL INFORMATION	7
3.1 GENERAL DESCRIPTION OF EUT	7
3.2 DESCRIPTION OF TEST MODES	9
3.2.1 CONFIGURATION OF SYSTEM UNDER TEST	10
3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	11
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS	14
3.4 DESCRIPTION OF SUPPORT UNITS.....	14
4. TEST TYPES AND RESULTS	15
4.1 CONDUCTED EMISSION MEASUREMENT	15
4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	15
4.1.2 TEST INSTRUMENTS	15
4.1.3 TEST PROCEDURES.....	16
4.1.4 DEVIATION FROM TEST STANDARD	16
4.1.5 TEST SETUP	17
4.1.6 EUT OPERATING CONDITIONS.....	17
4.1.7 TEST RESULTS.....	18
4.2 RADIATED EMISSION MEASUREMENT	26
4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT	26
4.2.2 TEST INSTRUMENTS	27
4.2.3 TEST PROCEDURES.....	28
4.2.4 DEVIATION FROM TEST STANDARD	28
4.2.5 TEST SETUP	29
4.2.6 EUT OPERATING CONDITIONS.....	29
4.2.7 TEST RESULTS.....	30
4.3 6dB BANDWIDTH MEASUREMENT	46
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT	46
4.3.2 TEST INSTRUMENTS	46
4.3.3 TEST PROCEDURE	46
4.3.4 DEVIATION FROM TEST STANDARD	46
4.3.5 TEST SETUP	47
4.3.6 EUT OPERATING CONDITIONS.....	47
4.3.7 TEST RESULTS.....	48
4.4 MAXIMUM OUTPUT POWER	52
4.4.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT	52
4.4.2 INSTRUMENTS	52
4.4.3 TEST PROCEDURES.....	52
4.4.4 DEVIATION FROM TEST STANDARD	54
4.4.5 TEST SETUP	54
4.4.6 EUT OPERATING CONDITIONS.....	54
4.4.7 TEST RESULTS.....	55



A D T

4.5	POWER SPECTRAL DENSITY MEASUREMENT	57
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	57
4.5.2	TEST INSTRUMENTS	57
4.5.3	TEST PROCEDURE	57
4.5.4	DEVIATION FROM TEST STANDARD	58
4.5.5	TEST SETUP	58
4.5.6	EUT OPERATING CONDITION	58
4.5.7	TEST RESULTS	59
4.6	BAND EDGES MEASUREMENT	63
4.6.1	LIMITS OF BAND EDGES MEASUREMENT	63
4.6.2	TEST INSTRUMENTS	63
4.6.3	TEST PROCEDURE	64
4.6.4	DEVIATION FROM TEST STANDARD	64
4.6.5	EUT OPERATING CONDITION	64
4.6.6	TEST RESULTS	65
5.	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	91
6.	INFORMATION ON THE TESTING LABORATORIES	92
7.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	93



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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF110615C13	Original release	Sep. 23, 2011



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1. CERTIFICATION

PRODUCT: Wireless N ADSL2+ 3G USB Router
BRAND NAME: D-Link
MODEL NO.: DSL-2750B, DSL-2750U, DSL-2751U, DSL-2751B
APPLICANT: D-Link Corporation
TEST ITEM: ENGINEERING SAMPLE
TESTED: Jul. 5 ~ 12, 2011
STANDARDS: FCC Part 15, Subpart C (Section 15.247)
ANSI C63.4-2003
ANSI C63.10-2009

The above equipment (model no.: DSL-2750B) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Celia Chen , **DATE:** Sep. 23. 2011
(Celia Chen / Senior Specialist)

APPROVED BY : Ken Liu , **DATE:** Sep. 23. 2011
(Ken Liu / Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -7.38dB at 0.464MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -0.4dB at 2483.50MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is R-SMA not a standard connector.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	150kHz~30MHz	2.41 dB
Radiated emissions	30MHz ~ 1GHz	3.87 dB
	Above 1GHz	3.36 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless N ADSL2+ 3G USB Router
MODEL NO.	DSL-2750B, DSL-2750U, DSL-2751U, DSL-2751B
FCC ID	KA2SL2750UT1
NOMINAL VOLTAGE	12Vdc from AC adapter
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 270.0Mbps
OPERATING FREQUENCY	2412.0 ~ 2462.0MHz
NUMBER OF CHANNEL	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
OUTPUT POWER	338.8mW
ANTENNA TYPE	Refer to note below
ANTENNA CONNECTER	Refer to note below
DATA CABLE	Non-shielded RJ11 (1.8m) Non-shielded RJ45 (1.8m) Shielded USB (1m)
I/O PORTS	Refer to User's manual
ACCESSORY DEVICES	Refer to note below

NOTE:

1. The EUT is a router with built-in a WLAN IEEE802.11b/g/n module.
2. The EUT has several models, which are identical to each other except for their marketing differentiation, as follows:

Model No.	Differentiation
DSL-2750B, DSL-2750U, DSL-2751U, DSL-2751B	For marketing differentiation.

For the test, **model: DSL-2750B** was selected as a representative one and therefore only its test data was recorded in this report.

3. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

MODULATION MODE	TX FUNCTION
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	2TX
802.11n (40MHz)	2TX

4. The following antennas were applied to the EUT:

Antenna condition	Antenna	Type	Connector (For detachable antenna only)	Gain (dBi)
Detachable / Non-detachable	A	Dipole	R-SMA	5
	B	Dipole	R-SMA	2

For the test, the **non-detachable antenna A** was selected as a representative one and therefore only its test data was recorded in this report.

5. The EUT consumes power from the following power adapter:

Item	Brand	Model No.	Rating
Adapter 1	FRECOM	FM120010-US	AC I/P: 100-240V~ 0.6A 50/60Hz DC O/P: 12.0V, 1.0A Non-shielded DC (1.8m)
Adapter 2	Gongjin	S12A02-120A100-P4	AC I/P: 100-240V~ 0.5A 50/60Hz DC O/P: 12.0V, 1.0A Non-shielded DC (1.8m)

After pre-tested above AC adapters, the **AC Adapter 1** was the worst case.

6. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 DESCRIPTION OF TEST MODES

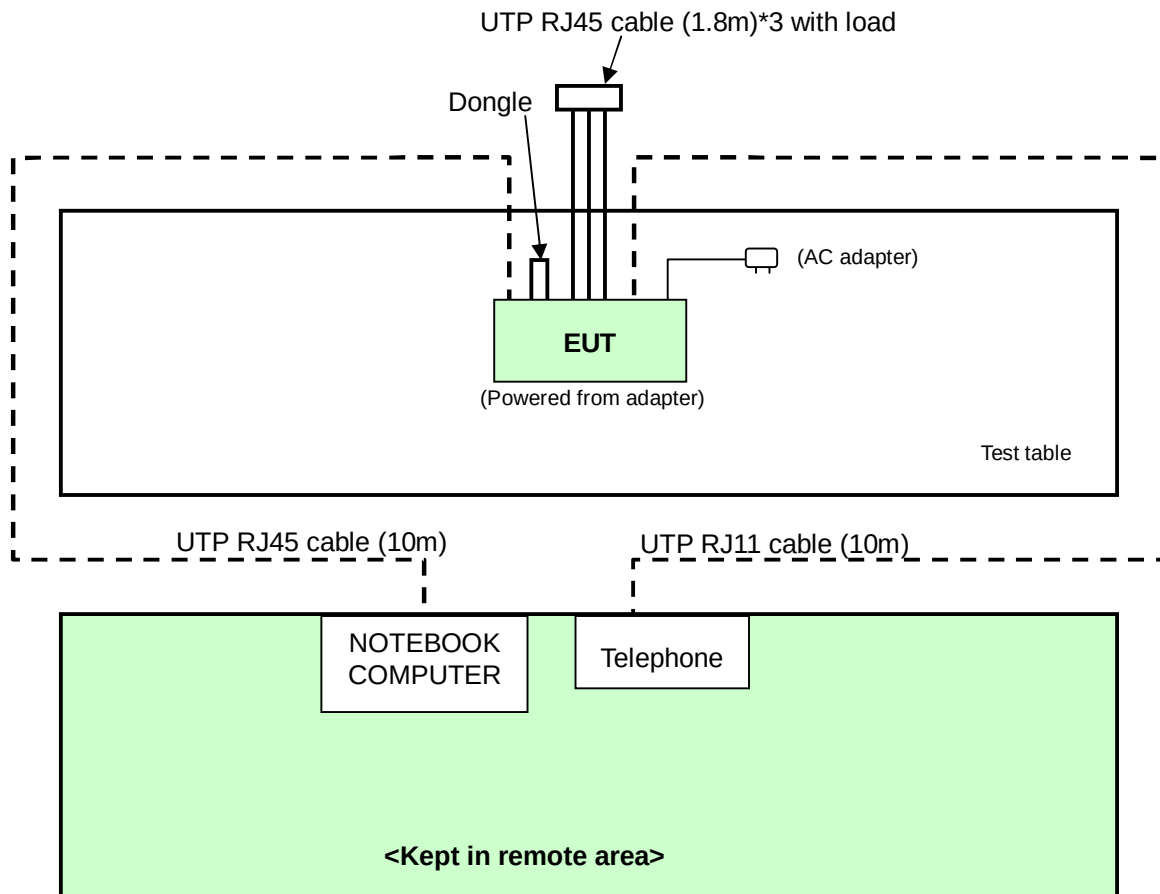
11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2422MHz	5	2442MHz
2	2427MHz	6	2447MHz
3	2432MHz	7	2452MHz
4	2437MHz		

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE ³ 1G	RE<1G	PLC	APCM	
A	√	√	√	√	Non-detachable antenna A (Powered from adapter 1)
B	-	√	√	-	Non-detachable antenna A (Powered from adapter 2)
C	-	√	√	-	Detachable antenna A (Powered from adapter 1)
D	-	√	√	-	Detachable antenna A (Powered from adapter 2)

Where **RE³1G**: Radiated Emission above 1GHz
PLC: Power Line Conducted Emission

RE<1G: Radiated Emission below 1GHz
APCM: Antenna Port Conducted Measurement

RADIATED EMISSION TEST (ABOVE 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ Axis and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	AXIS
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	X
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	X
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	X
A	802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.5	X

RADIATED EMISSION TEST (BELOW 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ Axis and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	AXIS
A ~ D	802.11g	1 to 11	1	OFDM	BPSK	6.0	X

POWER LINE CONDUCTED EMISSION TEST:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A ~ D	802.11g	1 to 11	1	OFDM	BPSK	6.0

BANDEDGE MEASUREMENT:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	6.5
A	802.11n (40MHz)	1 to 7	1, 7	OFDM	BPSK	13.5

ANTENNA PORT CONDUCTED MEASUREMENT:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
A	802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.5

**A D T****TEST CONDITION:**

APPLICABLE TO	EUT CONFIGURE MODE	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE ³ 1G	A	25deg. C, 57% RH, 1006hPa	120Vac, 60Hz	Chad Lee
RE <1G	A ~ D	25deg. C, 57% RH, 1003hPa	120Vac, 60Hz	Chad Lee
PLC	A ~ D	24deg. C, 71% RH, 1004hPa	120Vac, 60Hz	Nick Chen
APCM	A	25deg. C, 78% RH, 1003hPa	120Vac, 60Hz	Jun Wu

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)

ANSI C63.4-2003

ANSI C63.10-2009

All test items have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP05L	19227741184	FCC DoC Approved
2	TELEPHONE	WONDER	IS-333	06007	N/A
3	USB Dongle	D-Link	DWM-156	322500340263	Q78-MF112D

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	10m UTP RJ45 cable
2	10m UTP RJ11 cable
3	N/A

NOTE: (1) All power cords of the above support units are non shielded (1.8m).

(2) Three UTP RJ45 cables (1.8m each) were connected from LAN port of EUT to form an open loop cable, which terminated with load.

(3) The support unit 3 was provided by client

4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTE:** 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100276	Dec. 31, 2010	Dec. 30, 2011
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	100219	Nov. 24, 2010	Nov. 23, 2011
LISN With Adapter (for EUT)	AD10	C10Ada-001	Nov. 24, 2010	Nov. 23, 2011
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100218	Nov. 24, 2010	Nov. 23, 2011
Software	ADT_Cond_V7.3.7	NA	NA	NA
Software	ADT_ISN_V7.3.7	NA	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C10.01	Feb. 22, 2011	Feb. 21, 2012
SUHNTER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010773	Feb. 26, 2011	Feb. 25, 2012

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. 10.
3. The VCCI Site Registration No. C-1852.

4.1.3 TEST PROCEDURES

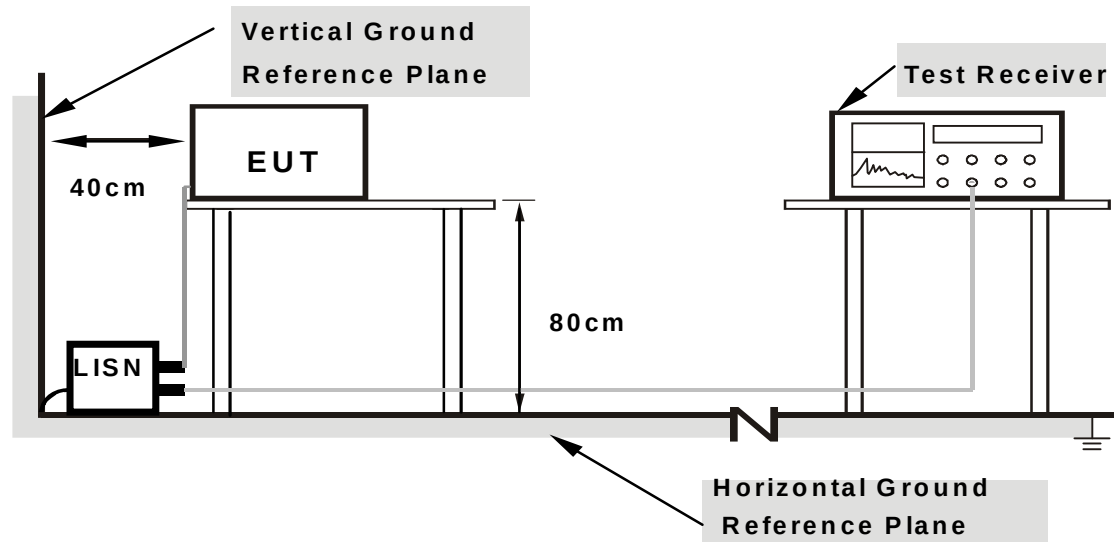
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

- Placed the EUT on the testing table.
- Prepared notebook system outside of testing area to act as communication partner.
- The communication partner connected with EUT via a RJ45 & RJ11 cable and run a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The communication partner sent data to EUT by command "PING".

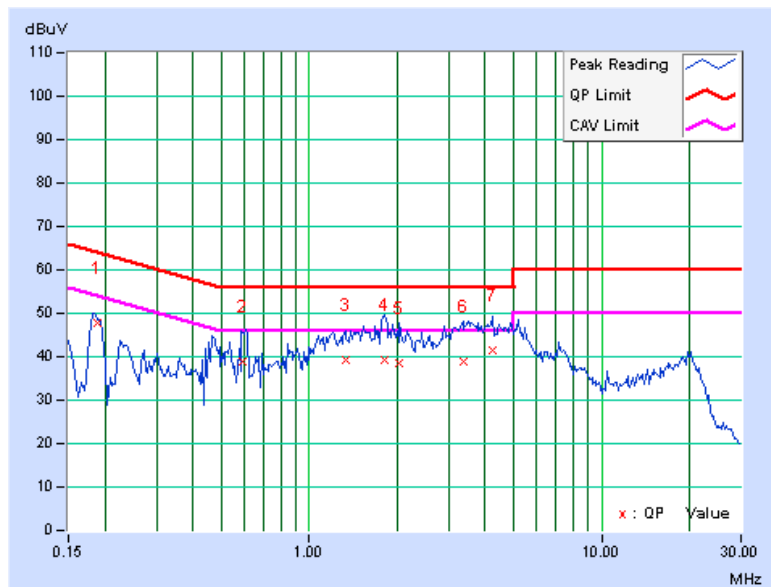
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA : 802.11g

TEST MODE	A		
PHASE	Line 1	6dB BANDWIDTH	9kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.188	0.17	47.44	-	47.61	-	64.14	54.14	-16.53	-
2	0.589	0.25	38.63	-	38.88	-	56.00	46.00	-17.12	-
3	1.331	0.29	38.99	-	39.28	-	56.00	46.00	-16.72	-
4	1.810	0.32	39.10	-	39.42	-	56.00	46.00	-16.58	-
5	2.039	0.33	38.21	-	38.54	-	56.00	46.00	-17.46	-
6	3.374	0.44	38.44	-	38.88	-	56.00	46.00	-17.12	-
7	4.250	0.50	40.80	-	41.30	-	56.00	46.00	-14.70	-

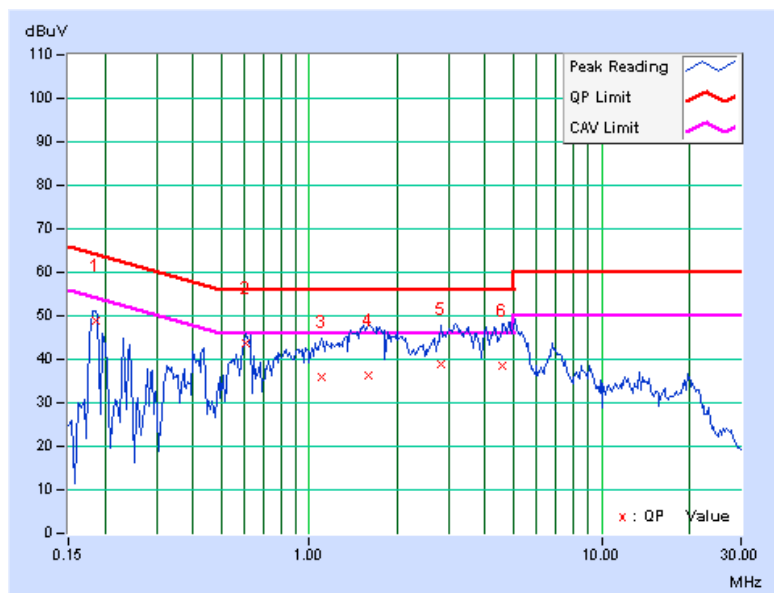
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



TEST MODE	A		
PHASE	Line 2	6dB BANDWIDTH	9kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.187	0.18	48.84	-	49.02	-	64.19	54.19	-15.17	-
2	0.606	0.26	43.35	-	43.61	-	56.00	46.00	-12.39	-
3	1.096	0.28	35.65	-	35.93	-	56.00	46.00	-20.07	-
4	1.586	0.31	36.06	-	36.37	-	56.00	46.00	-19.63	-
5	2.828	0.39	38.56	-	38.95	-	56.00	46.00	-17.05	-
6	4.587	0.49	37.97	-	38.46	-	56.00	46.00	-17.54	-

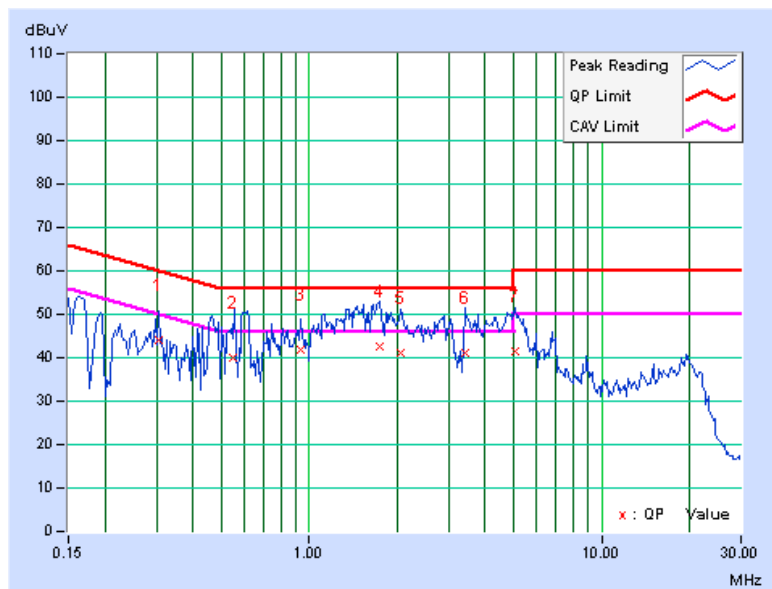
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



TEST MODE	B		
PHASE	Line 1	6dB BANDWIDTH	9kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.306	0.21	43.85	-	44.06	-	60.07	50.07	-16.01	-
2	0.551	0.25	39.67	-	39.92	-	56.00	46.00	-16.08	-
3	0.939	0.27	41.47	-	41.74	-	56.00	46.00	-14.26	-
4	1.744	0.31	42.28	-	42.59	-	56.00	46.00	-13.41	-
5	2.060	0.33	40.72	-	41.05	-	56.00	46.00	-14.95	-
6	3.413	0.44	40.64	-	41.08	-	56.00	46.00	-14.92	-
7	5.057	0.54	40.81	-	41.35	-	60.00	50.00	-18.65	-

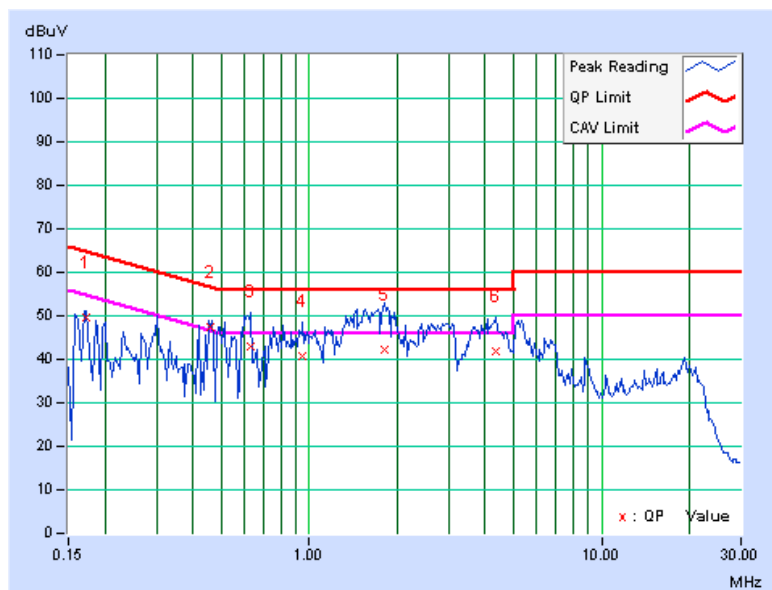
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



TEST MODE	B		
PHASE	Line 2	6dB BANDWIDTH	9kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.172	0.18	49.56	-	49.74	-	64.86	54.86	-15.12	-
2	0.460	0.25	47.18	37.06	47.43	37.31	56.70	46.70	-9.26	-9.38
3	0.630	0.26	42.86	-	43.12	-	56.00	46.00	-12.88	-
4	0.948	0.28	40.62	-	40.90	-	56.00	46.00	-15.10	-
5	1.804	0.32	41.97	-	42.29	-	56.00	46.00	-13.71	-
6	4.340	0.48	41.25	-	41.73	-	56.00	46.00	-14.27	-

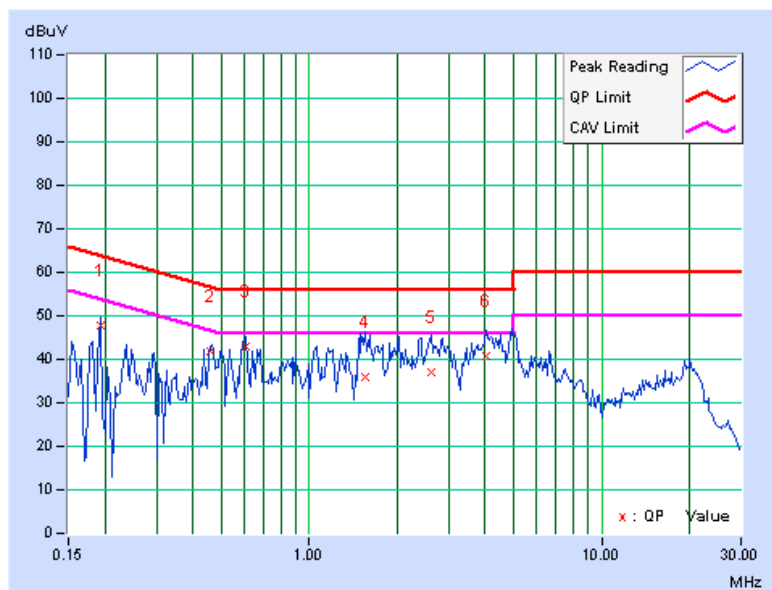
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



TEST MODE	C		
PHASE	Line 1	6dB BANDWIDTH	9kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.193	0.17	47.68	-	47.85	-	63.91	53.91	-16.06	-
2	0.460	0.24	41.60	-	41.84	-	56.69	46.69	-14.85	-
3	0.606	0.25	42.78	-	43.03	-	56.00	46.00	-12.97	-
4	1.547	0.30	35.63	-	35.93	-	56.00	46.00	-20.07	-
5	2.605	0.38	36.67	-	37.05	-	56.00	46.00	-18.95	-
6	4.039	0.49	40.43	-	40.92	-	56.00	46.00	-15.08	-

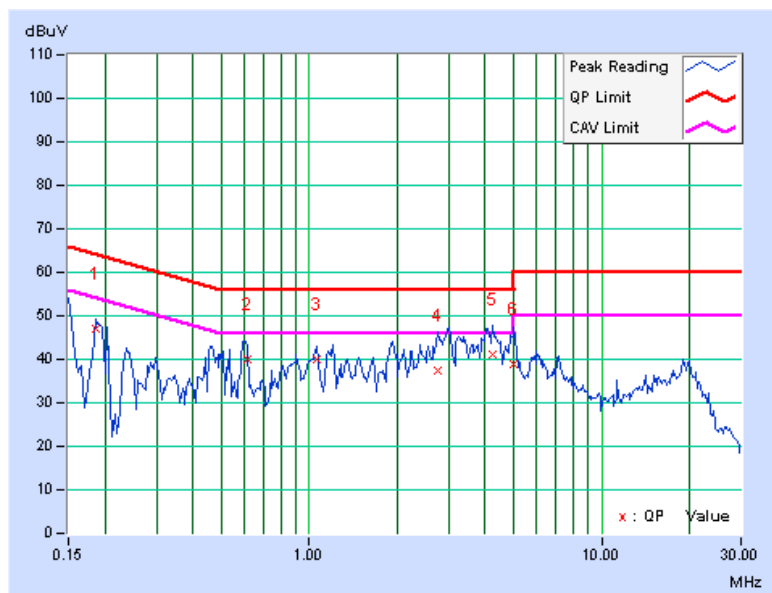
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



TEST MODE	C		
PHASE	Line 2	6dB BANDWIDTH	9kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.185	0.18	46.71	-	46.89	-	64.25	54.25	-17.36	-
2	0.611	0.26	39.57	-	39.83	-	56.00	46.00	-16.17	-
3	1.055	0.28	39.58	-	39.86	-	56.00	46.00	-16.14	-
4	2.762	0.38	37.14	-	37.52	-	56.00	46.00	-18.48	-
5	4.230	0.48	40.56	-	41.04	-	56.00	46.00	-14.96	-
6	4.999	0.50	38.21	-	38.71	-	56.00	46.00	-17.29	-

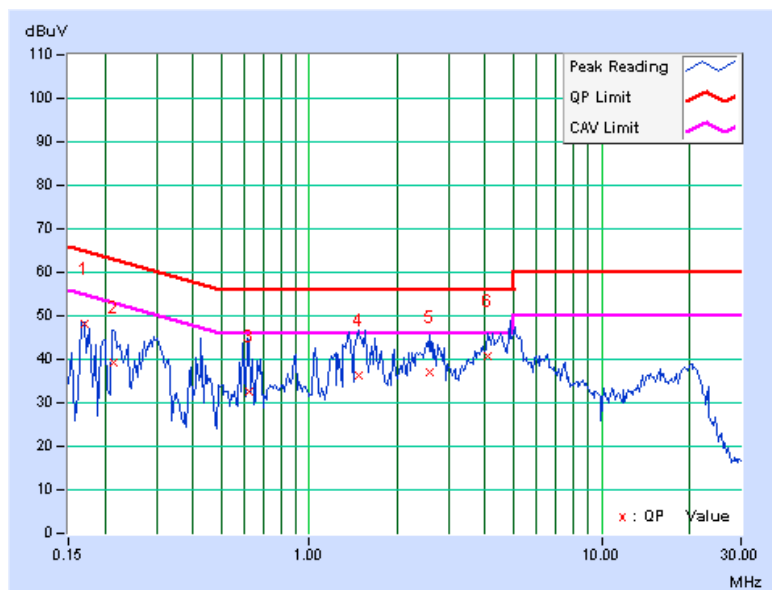
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



TEST MODE	D		
PHASE	Line 1	6dB BANDWIDTH	9kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.17	47.84	-	48.01	-	64.98	54.98	-16.98	-
2	0.214	0.17	39.18	-	39.35	-	63.06	53.06	-23.70	-
3	0.622	0.25	32.22	-	32.47	-	56.00	46.00	-23.53	-
4	1.473	0.30	36.16	-	36.46	-	56.00	46.00	-19.54	-
5	2.599	0.38	36.75	-	37.13	-	56.00	46.00	-18.87	-
6	4.071	0.49	40.28	-	40.77	-	56.00	46.00	-15.23	-

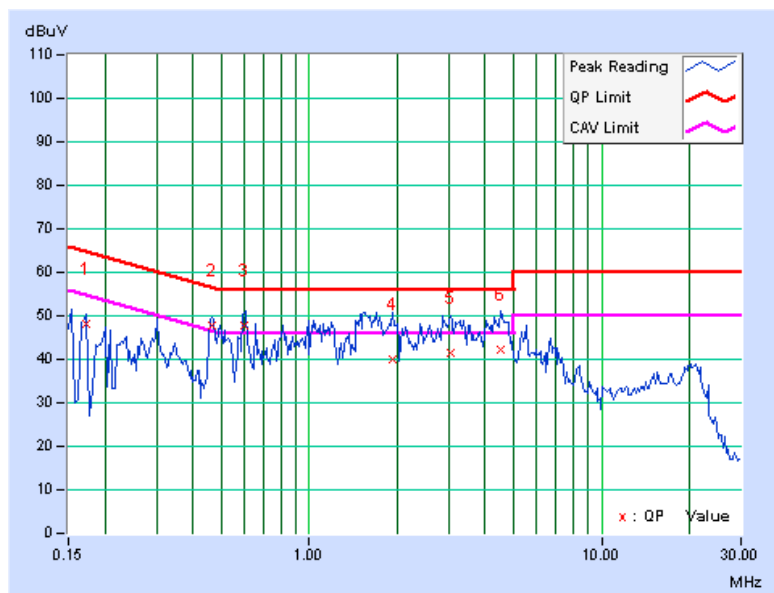
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



TEST MODE	D		
PHASE	Line 2	6dB BANDWIDTH	9kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.172	0.18	48.10	-	48.28	-	64.86	54.86	-16.58	-
2	0.464	0.25	47.64	38.99	47.89	39.24	56.63	46.63	-8.73	-7.38
3	0.603	0.26	47.56	35.47	47.82	35.73	56.00	46.00	-8.18	-10.27
4	1.930	0.33	39.68	-	40.01	-	56.00	46.00	-15.99	-
5	3.030	0.40	41.26	-	41.66	-	56.00	46.00	-14.34	-
6	4.520	0.49	41.58	-	42.07	-	56.00	46.00	-13.93	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
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.

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4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Mar. 04, 2011	Mar. 03, 2012
HP Preamplifier	8449B	3008A01924	Mar. 04, 2011	Mar. 03, 2012
HP Preamplifier	8449B	3008A01292	Mar. 04, 2011	Mar. 03, 2012
ROHDE & SCHWARZ TEST RECEIVER	ESU26	100005	Jun. 10, 2011	Jun. 09, 2012
Schwarzbeck Antenna	VULB 9168	137	Apr. 12, 2011	Apr. 11, 2012
Schwarzbeck Antenna	VHBA 9123	480	May 06, 2011	May 05, 2012
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	ADT_Radiated_V 7.6.15.9.2	NA	NA	NA
SUHNER RF cable	SF102	CABLE-CH6	Aug. 20, 2010	Aug. 19, 2011
EMCO Horn Antenna	3115	6714	Oct. 26, 2010	Oct. 25, 2011
EMCO Horn Antenna	3115	9312-4192	Apr. 22, 2011	Apr. 21, 2012
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA

- NOTE:** 1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.
4. The Industry Canada Reference No. IC 7450E-6.
5. The FCC Site Registration No. is 447212.

4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters 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 lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

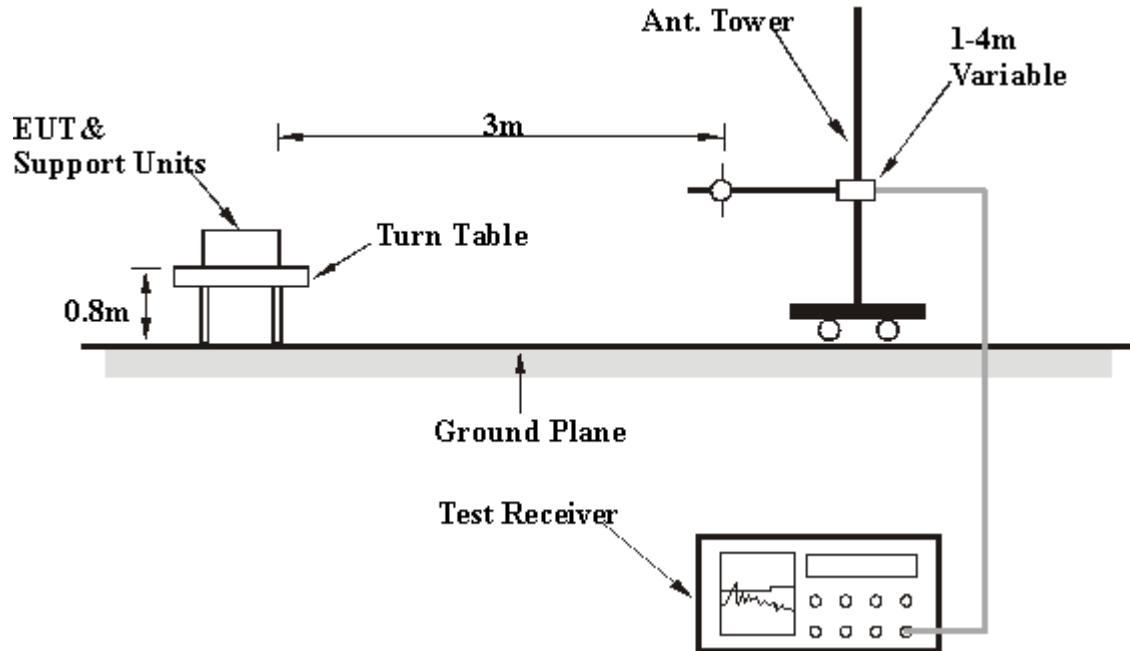
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 100kHz and video bandwidth is 300kHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT OPERATING CONDITIONS

Same as item 4.1.6.



4.2.7 TEST RESULTS

802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1006 hPa	TESTED BY	Chad Lee
TEST MODE	A		

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	52.8 PK	74.0	-21.2	1.09 H	103	20.63	32.15
2	2390.00	41.5 AV	54.0	-12.5	1.09 H	103	9.33	32.15
3	*2412.00	97.7 PK			1.09 H	103	65.43	32.24
4	*2412.00	94.8 AV			1.09 H	103	62.59	32.24
5	4824.00	44.5 PK	74.0	-29.5	1.00 H	185	5.85	38.66
6	4824.00	34.5 AV	54.0	-19.5	1.00 H	185	-4.13	38.66
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	55.9 PK	74.0	-18.2	1.14 V	18	23.70	32.15
2	2390.00	42.7 AV	54.0	-11.3	1.14 V	18	10.58	32.15
3	*2412.00	105.7 PK			1.14 V	18	73.46	32.24
4	*2412.00	102.6 AV			1.14 V	18	70.33	32.24
5	4824.00	47.7 PK	74.0	-26.3	1.00 V	16	9.05	38.66
6	4824.00	36.8 AV	54.0	-17.2	1.00 V	16	-1.85	38.66

- 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.
 5. “ * ”: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1006 hPa	TESTED BY	Chad Lee
TEST MODE	A		

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	*2437.00	96.9 PK			1.00 H	48	64.59	32.33
2	*2437.00	93.6 AV			1.00 H	48	61.22	32.33
3	4874.00	46.4 PK	74.0	-27.6	1.00 H	16	7.64	38.78
4	4874.00	35.4 AV	54.0	-18.6	1.00 H	16	-3.39	38.78
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	*2437.00	105.3 PK			1.00 V	325	72.97	32.33
2	*2437.00	102.2 AV			1.00 V	325	69.85	32.33
3	4874.00	50.0 PK	74.0	-24.0	1.12 V	151	11.22	38.78
4	4874.00	39.7 AV	54.0	-14.3	1.12 V	151	0.95	38.78

- 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.
5. “ * “: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1006 hPa	TESTED BY	Chad Lee
TEST MODE	A		

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	*2462.00	97.8 PK			1.05 H	103	65.34	32.43
2	*2462.00	94.7 AV			1.05 H	103	62.22	32.43
3	2483.50	54.4 PK	74.0	-19.6	1.05 H	103	21.86	32.51
4	2483.50	43.4 AV	54.0	-10.6	1.05 H	103	10.86	32.51
5	4924.00	47.5 PK	74.0	-26.5	1.00 H	16	8.59	38.90
6	4924.00	33.8 AV	54.0	-20.2	1.00 H	16	-5.07	38.90
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	*2462.00	106.9 PK			1.03 V	159	74.49	32.43
2	*2462.00	103.8 AV			1.03 V	159	71.32	32.43
3	2483.50	56.8 PK	74.0	-17.2	1.03 V	159	24.25	32.51
4	2483.50	45.1 AV	54.0	-8.9	1.03 V	159	12.56	32.51
5	4924.00	48.4 PK	74.0	-25.6	1.00 V	151	9.49	38.90
6	4924.00	38.6 AV	54.0	-15.4	1.00 V	151	-0.33	38.90

- 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.
 5. “ * ”: Fundamental frequency.



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802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1006 hPa	TESTED BY	Chad Lee
TEST MODE	A		

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	58.9 PK	74.0	-15.1	1.00 H	155	26.74	32.15
2	2390.00	43.5 AV	54.0	-10.5	1.00 H	155	11.39	32.15
3	*2412.00	97.7 PK			1.00 H	155	65.44	32.24
4	*2412.00	86.1 AV			1.00 H	155	53.89	32.24
5	4824.00	46.3 PK	74.0	-27.8	1.00 H	20	7.59	38.66
6	4824.00	34.6 AV	54.0	-19.5	1.00 H	20	-4.11	38.66
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	69.5 PK	74.0	-4.6	1.15 V	15	37.30	32.15
2	2390.00	51.2 AV	54.0	-2.8	1.15 V	15	19.09	32.15
3	*2412.00	108.2 PK			1.15 V	15	75.98	32.24
4	*2412.00	95.2 AV			1.15 V	15	62.92	32.24
5	4824.00	49.8 PK	74.0	-24.2	1.00 V	10	11.12	38.66
6	4824.00	36.5 AV	54.0	-17.5	1.00 V	10	-2.15	38.66

- 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.
5. “ * ”: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1006 hPa	TESTED BY	Chad Lee
TEST MODE	A		

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	*2437.00	99.2 PK			1.00 H	48	66.87	32.33
2	*2437.00	86.6 AV			1.00 H	48	54.25	32.33
3	4874.00	46.7 PK	74.0	-27.3	1.00 H	16	7.94	38.78
4	4874.00	34.4 AV	54.0	-19.6	1.00 H	16	-4.38	38.78
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	*2437.00	107.5 PK			1.00 V	16	75.12	32.33
2	*2437.00	95.9 AV			1.00 V	16	63.58	32.33
3	4874.00	48.2 PK	74.0	-25.8	1.00 V	16	9.40	38.78
4	4874.00	34.9 AV	54.0	-19.1	1.00 V	16	-3.91	38.78

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.
5. “ * “: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1006 hPa	TESTED BY	Chad Lee
TEST MODE	A		

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	*2462.00	99.3 PK			1.00 H	60	66.83	32.43
2	*2462.00	86.7 AV			1.00 H	60	54.25	32.43
3	2483.50	61.0 PK	74.0	-13.0	1.00 H	60	28.50	32.51
4	2483.50	47.2 AV	54.0	-6.8	1.00 H	60	14.67	32.51
5	4924.00	44.4 PK	74.0	-29.6	1.00 H	16	5.53	38.90
6	4924.00	34.0 AV	54.0	-20.0	1.00 H	16	-4.90	38.90
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	*2462.00	108.9 PK			1.09 V	16	76.46	32.43
2	*2462.00	95.4 AV			1.09 V	16	62.93	32.43
3	2483.50	70.0 PK	74.0	-4.0	1.09 V	16	37.52	32.51
4	2483.50	52.5 AV	54.0	-1.5	1.09 V	16	19.99	32.51
5	4924.00	45.1 PK	74.0	-28.9	1.00 V	64	6.22	38.90
6	4924.00	34.5 AV	54.0	-19.5	1.00 V	64	-4.44	38.90

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.
5. “ * ”: Fundamental frequency.



A D T

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1006 hPa	TESTED BY	Chad Lee
TEST MODE	A		

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	57.7 PK	74.0	-16.3	1.00 H	17	25.54	32.15
2	2390.00	45.9 AV	54.0	-8.1	1.00 H	17	13.75	32.15
3	*2412.00	95.4 PK			1.00 H	17	63.20	32.24
4	*2412.00	83.5 AV			1.00 H	17	51.28	32.24
5	4824.00	44.1 PK	74.0	-29.9	1.00 H	26	5.48	38.66
6	4824.00	33.7 AV	54.0	-20.3	1.00 H	26	-5.00	38.66
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	65.9 PK	74.0	-8.1	1.00 V	16	33.74	32.15
2	2390.00	53.3 AV	54.0	-0.7	1.00 V	16	21.19	32.15
3	*2412.00	99.0 PK			1.00 V	16	66.76	32.24
4	*2412.00	86.5 AV			1.00 V	16	54.25	32.24
5	4824.00	44.1 PK	74.0	-29.9	1.00 V	4	5.47	38.66
6	4824.00	34.1 AV	54.0	-19.9	1.00 V	4	-4.55	38.66

- 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.
 5. “ * ”: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1006 hPa	TESTED BY	Chad Lee
TEST MODE	A		

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	*2437.00	95.3 PK			1.00 H	13	62.95	32.33
2	*2437.00	83.0 AV			1.00 H	13	50.69	32.33
3	4874.00	46.0 PK	74.0	-28.0	1.00 H	10	7.25	38.78
4	4874.00	34.1 AV	54.0	-19.9	1.00 H	10	-4.70	38.78
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	*2437.00	100.5 PK			1.12 V	3	68.16	32.33
2	*2437.00	88.4 AV			1.12 V	3	56.08	32.33
3	4874.00	46.0 PK	74.0	-28.0	1.00 V	16	7.22	38.78
4	4874.00	34.1 AV	54.0	-19.9	1.00 V	16	-4.67	38.78

- 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.
 5. “ * “: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1006 hPa	TESTED BY	Chad Lee
TEST MODE	A		

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	*2462.00	96.4 PK			1.07 H	96	63.98	32.43
2	*2462.00	83.5 AV			1.07 H	96	51.08	32.43
3	2483.50	56.7 PK	74.0	-17.4	1.07 H	96	24.14	32.51
4	2483.50	43.6 AV	54.0	-10.4	1.07 H	96	11.08	32.51
5	4924.00	45.5 PK	74.0	-28.5	1.00 H	354	6.62	38.90
6	4924.00	34.4 AV	54.0	-19.6	1.00 H	354	-4.48	38.90
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	*2462.00	100.1 PK			1.11 V	99	67.64	32.43
2	*2462.00	88.5 AV			1.11 V	99	56.08	32.43
3	2483.50	58.6 PK	74.0	-15.4	1.11 V	99	26.09	32.51
4	2483.50	48.6 AV	54.0	-5.4	1.11 V	99	16.08	32.51
5	4924.00	46.3 PK	74.0	-27.8	1.00 V	9	7.35	38.90
6	4924.00	34.5 AV	54.0	-19.5	1.00 V	9	-4.44	38.90

- 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.
 5. “ * ”: Fundamental frequency.



A D T

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1006 hPa	TESTED BY	Chad Lee
TEST MODE	A		

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	58.8 PK	74.0	-15.2	1.10 H	100	26.64	32.15
2	2390.00	46.1 AV	54.0	-7.9	1.10 H	100	13.99	32.15
3	*2422.00	92.6 PK			1.10 H	100	60.32	32.27
4	*2422.00	80.9 AV			1.10 H	100	48.58	32.27
5	4844.00	46.0 PK	74.0	-28.1	1.00 H	6	7.24	38.71
6	4844.00	34.0 AV	54.0	-20.0	1.00 H	6	-4.72	38.71
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	69.0 PK	74.0	-5.0	1.00 V	70	36.87	32.15
2	2390.00	53.5 AV	54.0	-0.5	1.00 V	70	21.35	32.15
3	*2422.00	103.7 PK			1.00 V	70	71.40	32.27
4	*2422.00	91.6 AV			1.00 V	70	59.35	32.27
5	4844.00	47.6 PK	74.0	-26.4	1.00 V	325	8.93	38.71
6	4844.00	34.9 AV	54.0	-19.1	1.00 V	325	-3.83	38.71

- 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.
5. “ * ”: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1006 hPa	TESTED BY	Chad Lee
TEST MODE	A		

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	*2437.00	90.7 PK			1.16 H	318	58.41	32.33
2	*2437.00	78.9 AV			1.16 H	318	46.58	32.33
3	4874.00	46.1 PK	74.0	-27.9	1.03 H	18	7.32	38.78
4	4874.00	33.9 AV	54.0	-20.1	1.03 H	18	-4.85	38.78
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	*2437.00	103.4 PK			1.00 V	7	71.07	32.33
2	*2437.00	91.3 AV			1.00 V	7	58.98	32.33
3	4874.00	47.1 PK	74.0	-26.9	1.00 V	16	8.33	38.78
4	4874.00	34.4 AV	54.0	-19.6	1.00 V	16	-4.42	38.78

- 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.
5. “ * “: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1006 hPa	TESTED BY	Chad Lee
TEST MODE	A		

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	*2452.00	91.5 PK			1.00 H	125	59.07	32.39
2	*2452.00	80.0 AV			1.00 H	125	47.58	32.39
3	2483.50	57.4 PK	74.0	-16.6	1.00 H	125	24.88	32.51
4	2483.50	44.6 AV	54.0	-9.4	1.00 H	125	12.05	32.51
5	4904.00	45.4 PK	74.0	-28.6	1.00 H	16	6.51	38.86
6	4904.00	35.1 AV	54.0	-18.9	1.00 H	16	-3.76	38.86
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	*2452.00	104.0 PK			1.11 V	5	71.65	32.39
2	*2452.00	91.9 AV			1.11 V	5	59.52	32.39
3	2483.50	69.6 PK	74.0	-4.4	1.11 V	5	37.13	32.51
4	2483.50	53.6 AV	54.0	-0.4	1.11 V	5	21.07	32.51
5	4904.00	46.1 PK	74.0	-27.9	1.00 V	43	7.24	38.86
6	4904.00	35.7 AV	54.0	-18.3	1.00 V	43	-3.14	38.86

- 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.
 5. “ * ”: Fundamental frequency.



A D T

BELOW 1GHz WORST-CASE DATA : 802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1003 hPa	TESTED BY	Chad Lee
TEST MODE	A		

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	69.75	29.9 QP	40.0	-10.1	1.88 H	271	17.23	12.68
2	189.97	32.6 QP	43.5	-11.0	1.69 H	202	20.33	12.22
3	415.87	39.5 QP	46.0	-6.5	1.24 H	337	20.42	19.04
4	451.74	40.4 QP	46.0	-5.6	1.36 H	106	20.41	19.96
5	484.70	35.8 QP	46.0	-10.2	1.75 H	118	15.04	20.80
6	959.77	36.3 QP	46.0	-9.7	1.82 H	109	7.76	28.55
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	69.75	34.9 QP	40.0	-5.1	1.15 V	61	22.23	12.68
2	389.69	42.3 QP	46.0	-3.7	1.63 V	268	23.91	18.35
3	447.38	44.5 QP	46.0	-1.5	1.82 V	196	24.67	19.85
4	479.86	42.8 QP	46.0	-3.2	1.62 V	118	22.15	20.68
5	512.33	40.7 QP	46.0	-5.4	1.12 V	10	19.17	21.48
6	739.69	34.9 QP	46.0	-11.1	1.37 V	133	9.75	25.17

- 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.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1003 hPa	TESTED BY	Chad Lee
TEST MODE	B		

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	70.23	29.7 QP	40.0	-10.3	1.55 H	94	17.07	12.60
2	189.97	32.5 QP	43.5	-11.0	1.67 H	223	20.27	12.22
3	399.87	40.8 QP	46.0	-5.2	1.08 H	358	22.17	18.64
4	443.50	39.3 QP	46.0	-6.7	1.76 H	79	19.51	19.75
5	469.68	35.9 QP	46.0	-10.1	1.22 H	157	15.44	20.42
6	959.77	36.2 QP	46.0	-9.8	1.30 H	103	7.68	28.55
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	40.18	35.0 QP	40.0	-5.0	1.22 V	325	20.67	14.31
2	69.75	35.6 QP	40.0	-4.4	1.53 V	10	22.91	12.68
3	399.87	41.0 QP	46.0	-5.0	1.54 V	283	22.36	18.64
4	448.83	44.4 QP	46.0	-1.6	1.69 V	79	24.55	19.89
5	484.70	40.7 QP	46.0	-5.3	1.88 V	10	19.92	20.80
6	529.79	38.2 QP	46.0	-7.8	1.74 V	58	16.35	21.88

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.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1003 hPa	TESTED BY	Chad Lee
TEST MODE	C		

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	104.24	36.2 QP	43.5	-7.3	1.96 H	130	26.10	10.07
2	318.90	37.2 QP	46.0	-8.9	1.84 H	10	20.94	16.21
3	562.61	36.0 QP	46.0	-10.0	1.08 H	262	13.41	22.63
4	664.29	37.8 QP	46.0	-8.2	1.12 H	238	13.84	23.92
5	732.08	37.7 QP	46.0	-8.3	1.36 H	184	12.71	24.99
6	862.81	39.1 QP	46.0	-7.0	1.85 H	226	11.67	27.38
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	102.63	35.8 QP	43.5	-7.7	1.16 V	133	25.95	9.85
2	299.53	35.6 QP	46.0	-10.4	1.28 V	34	20.07	15.57
3	349.57	35.2 QP	46.0	-10.8	1.35 V	31	17.99	17.21
4	562.61	37.2 QP	46.0	-8.8	1.89 V	253	14.53	22.63
5	732.08	36.8 QP	46.0	-9.2	1.17 V	262	11.80	24.99
6	864.43	38.9 QP	46.0	-7.2	1.42 V	232	11.45	27.40

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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 57%RH 1003 hPa	TESTED BY	Chad Lee
TEST MODE	D		

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	42.91	30.4 QP	40.0	-9.6	1.55 H	172	16.27	14.15
2	107.47	35.0 QP	43.5	-8.5	1.69 H	313	24.46	10.53
3	318.90	37.1 QP	46.0	-8.9	1.84 H	250	20.89	16.21
4	662.68	36.1 QP	46.0	-9.9	1.74 H	253	12.16	23.91
5	861.20	38.6 QP	46.0	-7.4	1.36 H	256	11.23	27.36
6	874.11	37.7 QP	46.0	-8.3	1.82 H	115	10.18	27.50
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	32.28	31.7 QP	40.0	-8.3	1.05 V	217	19.30	12.37
2	63.89	29.5 QP	40.0	-10.5	1.69 V	10	16.45	13.04
3	110.70	36.3 QP	43.5	-7.2	1.84 V	13	25.36	10.98
4	730.47	37.7 QP	46.0	-8.3	1.25 V	4	12.76	24.95
5	861.20	40.6 QP	46.0	-5.4	1.00 V	295	13.23	27.36
6	911.23	42.0 QP	46.0	-4.0	1.49 V	322	14.07	27.93

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.



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4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100036	Apr. 29, 2011	Apr. 28, 2012

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

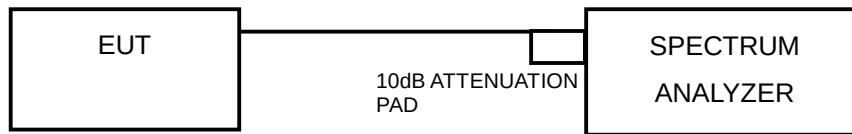
4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

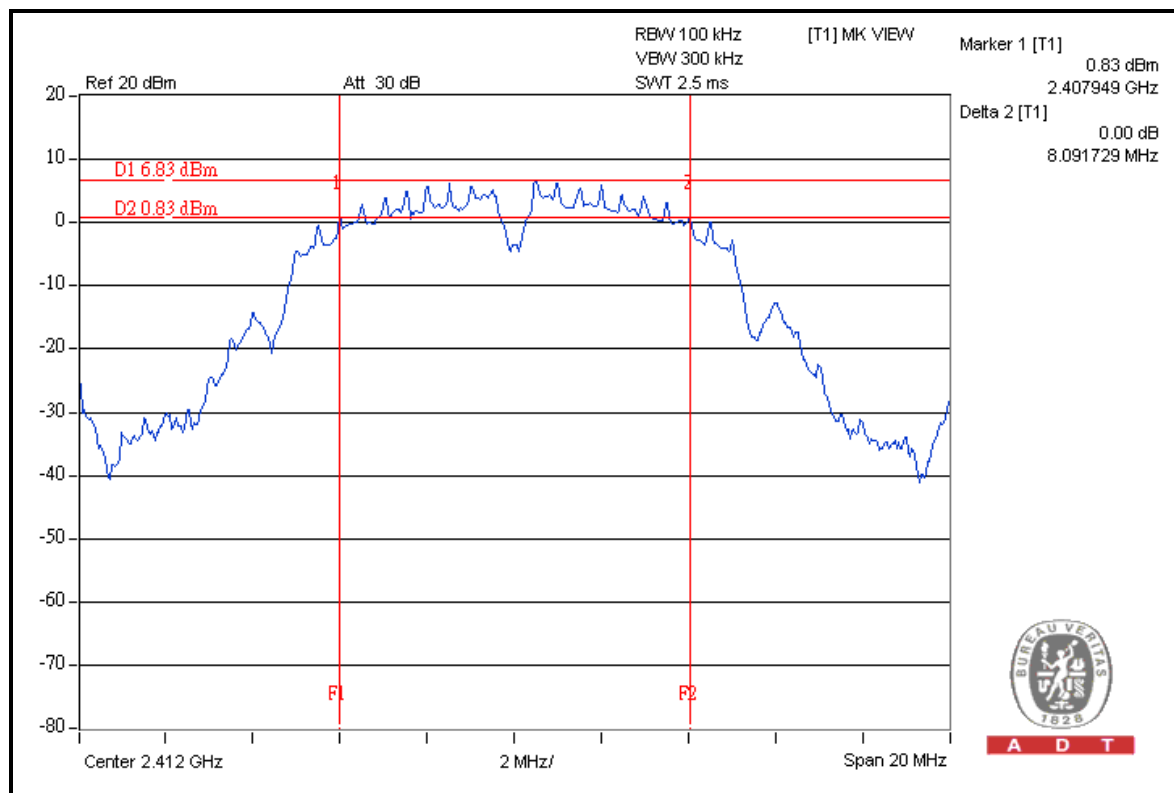
4.3.7 TEST RESULTS

TEST MODE A:

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	8.09	0.5	PASS
6	2437	8.05	0.5	PASS
11	2462	7.62	0.5	PASS

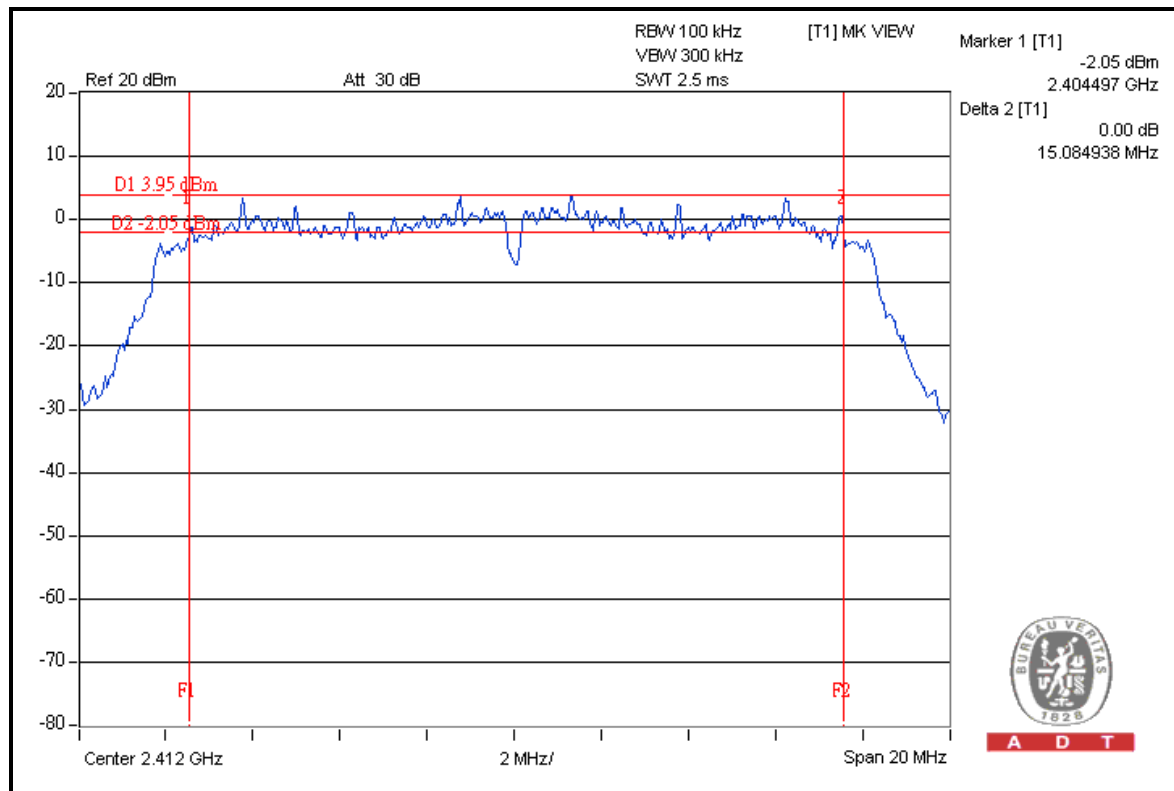
CH 1



802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	15.08	0.5	PASS
6	2437	15.08	0.5	PASS
11	2462	15.07	0.5	PASS

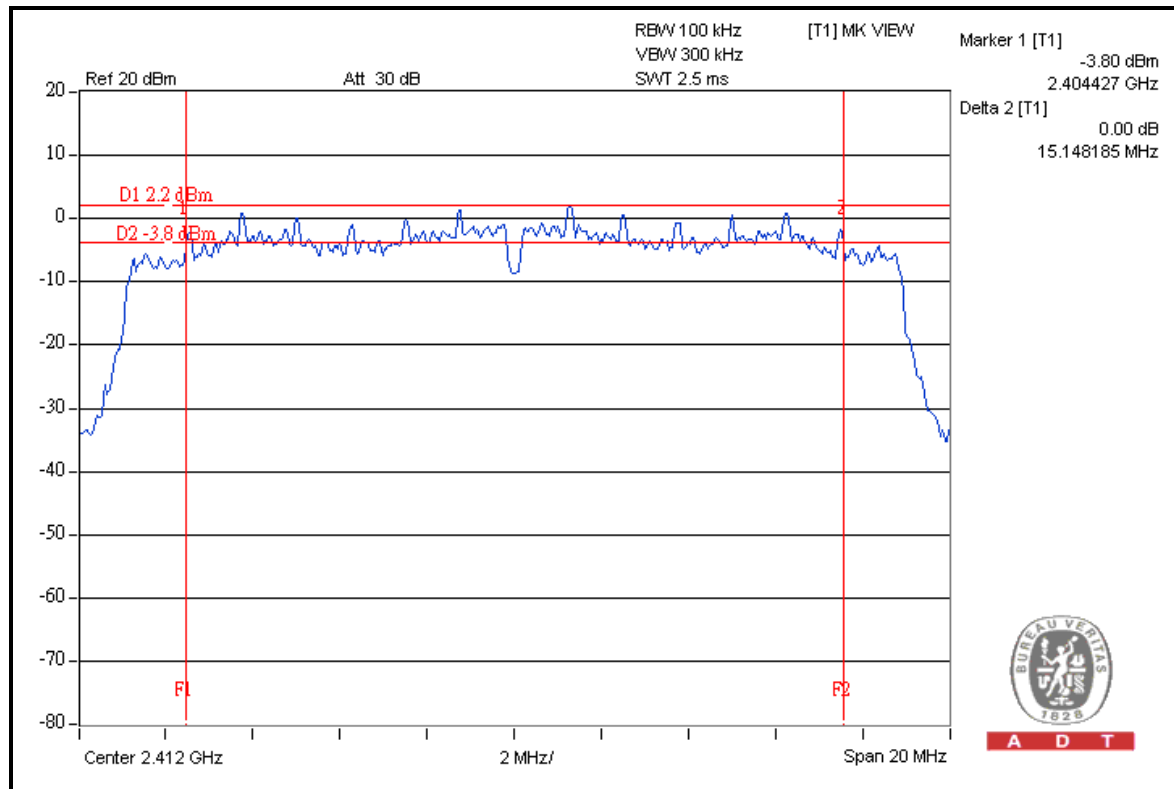
CH 1



802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	15.14	14.74	0.5	PASS
6	2437	15.13	15.12	0.5	PASS
11	2462	15.12	15.12	0.5	PASS

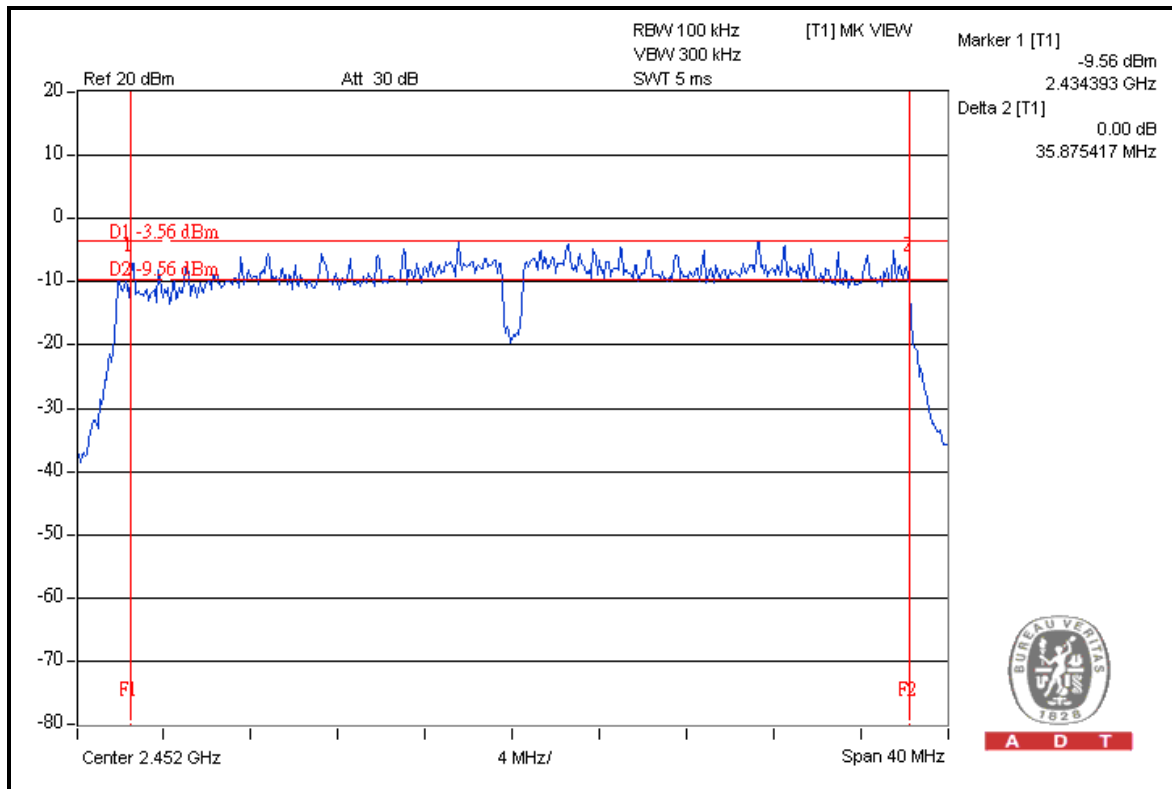
FOR CHAIN 0: CH 1



802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2422	35.88	36.38	0.5	PASS
4	2437	35.86	35.84	0.5	PASS
7	2452	36.43	36.87	0.5	PASS

FOR CHAIN 1: CH 7





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4.4 MAXIMUM OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT

The Maximum Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

FOR PEAK POWER OUTPUT MEASUREMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Anritsu Power Sensor	MA2411B	0738404	Apr. 26, 2011	Apr. 25, 2012
Anritsu Power Meter	ML2495A	0842014	Apr. 26, 2011	Apr. 25, 2012

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Measurement Bandwidth of ML2495A is 65MHz greater than 6dB bandwidth of emission.

FOR AVERAGE POWER OUTPUT MEASUREMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100036	Apr. 27, 2010	Apr. 26, 2011

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST PROCEDURES

FOR PEAK POWER OUTPUT MEASUREMENT

A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

FOR AVERAGE POWER OUTPUT MEASUREMENT

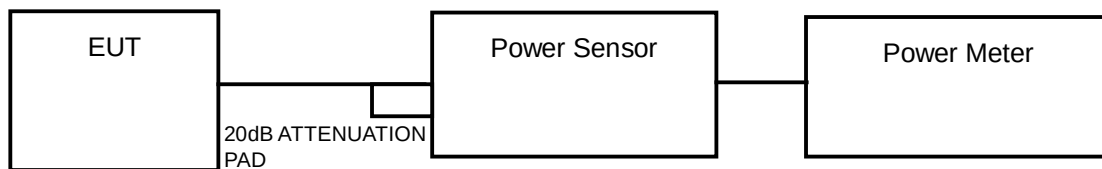
1. Follow DTS measurement (Power Output Option 2), the transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer.
2. Set span to encompass the entire emission bandwidth (EBW) of the signal.
3. Set RBW = 1 MHz ; VBW $\geq$ 3 MHz.
4. Use sample detector mode and video trigger with the trigger level set to enable triggering only on full power pulses.
5. Trace average 100 traces in power averaging mode.
6. Compute power by integrating the spectrum across the 26 dB EBW of the signal.
7. Record the power level.

4.4.4 DEVIATION FROM TEST STANDARD

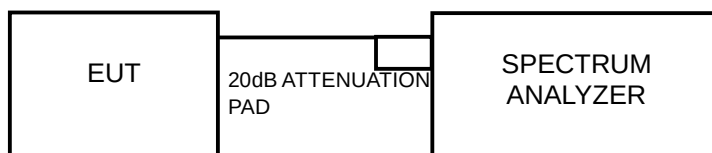
No deviation.

4.4.5 TEST SETUP

FOR PEAK POWER OUTPUT MEASUREMENT



FOR AVERAGE POWER OUTPUT MEASUREMENT



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.



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4.4.7 TEST RESULTS

TEST MODE A:

802.11b

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	POWER LIMIT (dBm)	PASS / FAIL
1	2412	19.8	95.5	30	PASS
6	2437	19.7	93.3	30	PASS
11	2462	19.7	93.3	30	PASS

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER OUTPUT (dBm)	AVERAGE POWER OUTPUT (mW)	POWER LIMIT (dBm)	PASS / FAIL
1	2412	15.6	36.3	30	PASS
6	2437	15.5	35.5	30	PASS
11	2462	15.5	35.5	30	PASS

802.11g

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	POWER LIMIT (dBm)	PASS / FAIL
1	2412	25.3	338.8	30	PASS
6	2437	25.2	331.1	30	PASS
11	2462	25.0	316.2	30	PASS

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER OUTPUT (dBm)	AVERAGE POWER OUTPUT (mW)	POWER LIMIT (dBm)	PASS / FAIL
1	2412	15.1	32.4	30	PASS
6	2437	15.1	32.4	30	PASS
11	2462	15.0	31.6	30	PASS

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	22.1	20.9	285.2	24.6	30	PASS
6	2437	22.5	20.7	295.3	24.7	30	PASS
11	2462	22.0	20.5	270.7	24.3	30	PASS

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER OUTPUT (dBm)		TOTAL AVERAGE POWER (mW)	TOTAL AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	12.00	10.90	28.152	14.50	30	PASS
6	2437	12.50	10.60	29.264	14.66	30	PASS
11	2462	11.90	10.40	26.453	14.22	30	PASS

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2422	21.3	20.9	257.9	24.1	30	PASS
4	2437	20.6	20.0	214.8	23.3	30	PASS
7	2452	21.0	20.1	228.2	23.6	30	PASS

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER OUTPUT (dBm)		TOTAL AVERAGE POWER (mW)	TOTAL AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2422	11.30	10.80	25.512	14.07	30	PASS
4	2437	10.50	10.00	21.220	13.27	30	PASS
7	2452	10.90	10.10	22.536	13.53	30	PASS



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4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100036	Apr. 29, 2011	Apr. 28, 2012

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

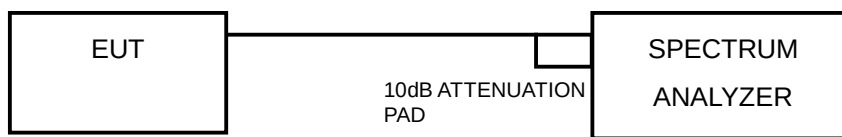
The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

Follow method 2 of KDB 662911 D01 Multiple Transmitter Output v01 to calculate total power density of 2 TX port.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation.

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

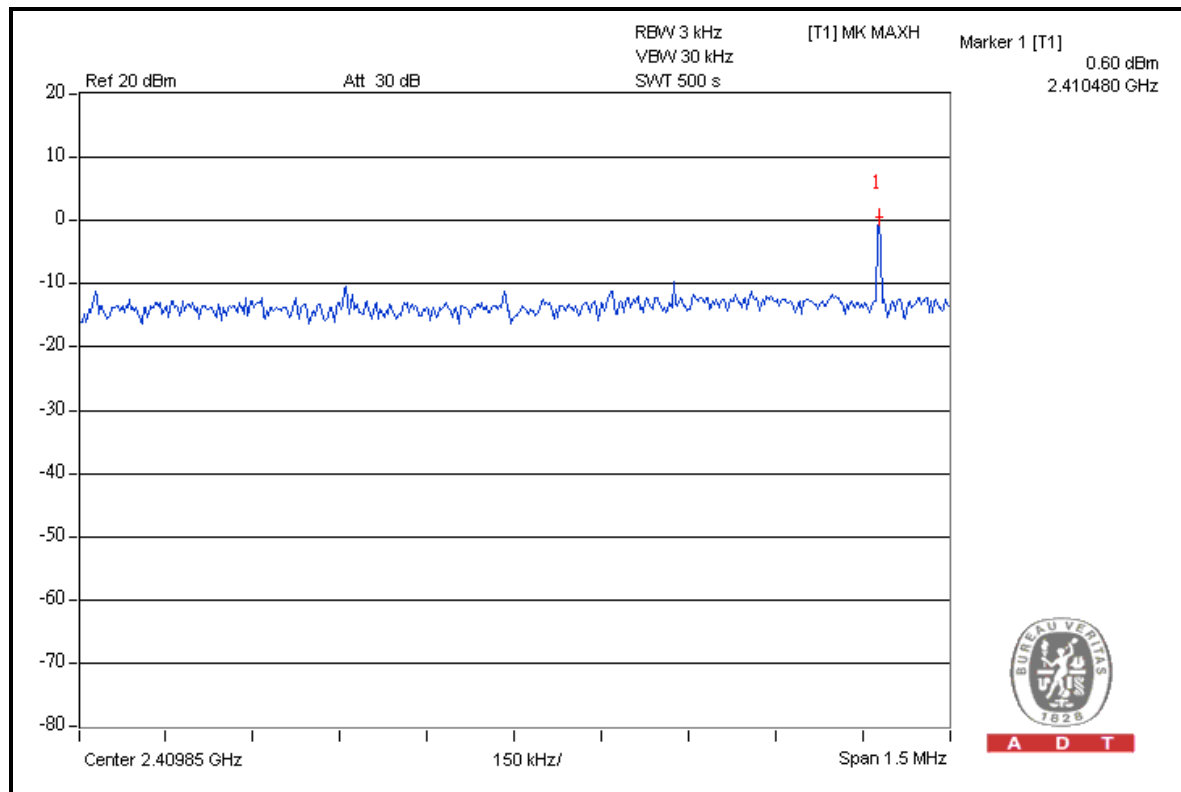
4.5.7 TEST RESULTS

TEST MODE A:

802.11b

CHANNEL	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
1	2412	0.6	8	PASS
6	2437	-2.1	8	PASS
11	2462	-0.3	8	PASS

CH 1



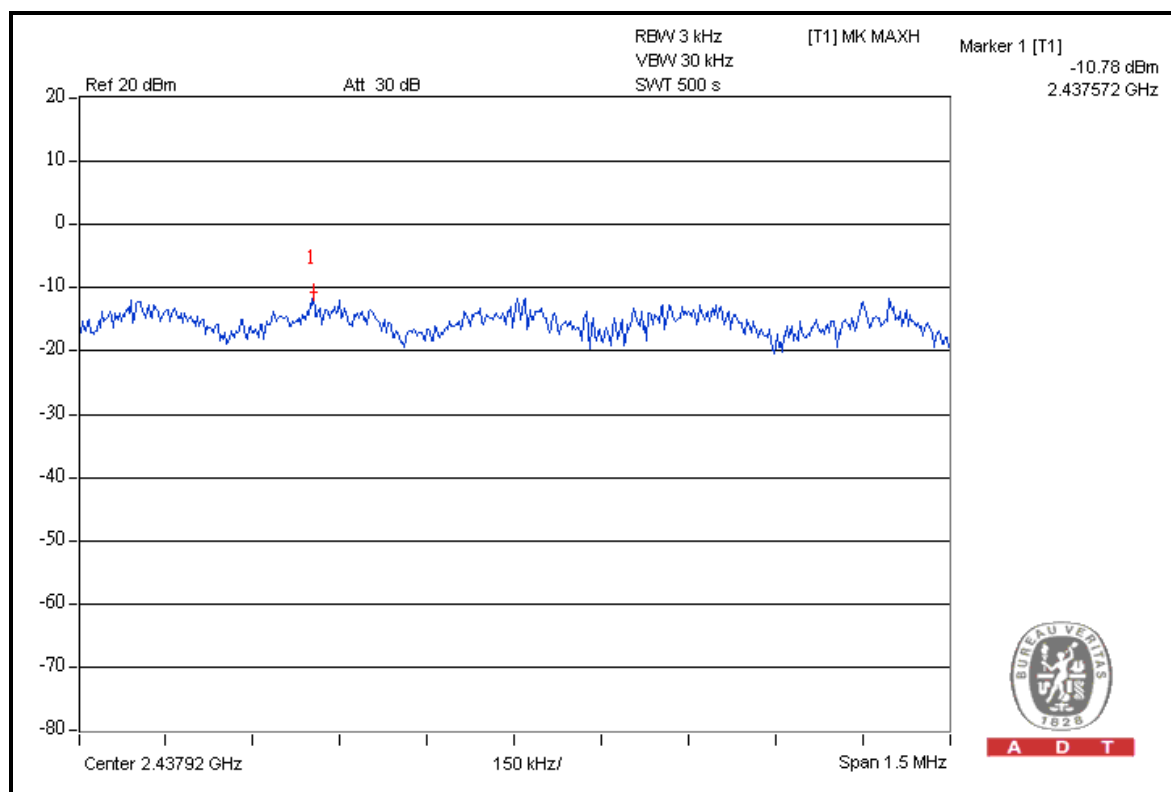


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802.11g

CHANNEL	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
1	2412	-11.3	8	PASS
6	2437	-10.8	8	PASS
11	2462	-12.0	8	PASS

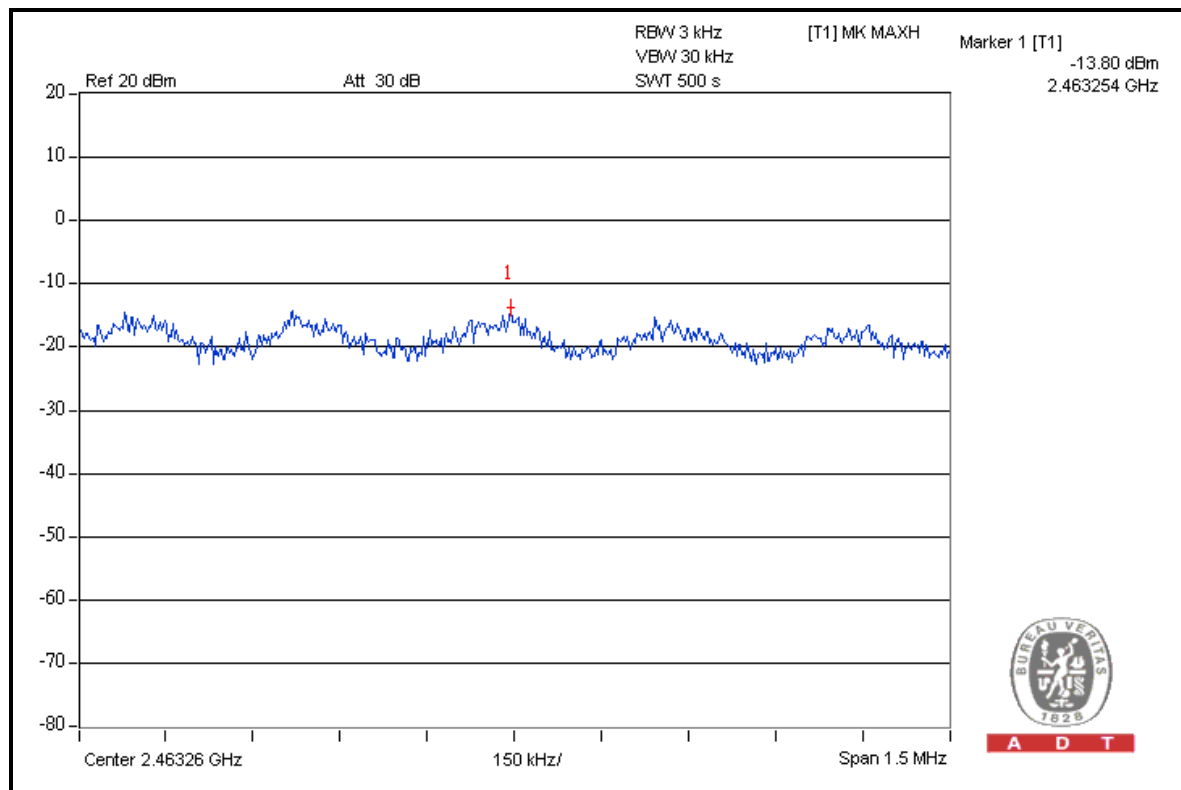
CH 6



802.11n (20MHz)

CHAIN	CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
			MEASURED	10 log (N=2) dB			
0	1	2412	-14.2	3.01	-11.2	8	PASS
	6	2437	-13.9	3.01	-10.9	8	PASS
	11	2462	-13.8	3.01	-10.8	8	PASS
1	1	2412	-14.6	3.01	-11.6	8	PASS
	6	2437	-16.0	3.01	-13.0	8	PASS
	11	2462	-17.3	3.01	-14.3	8	PASS

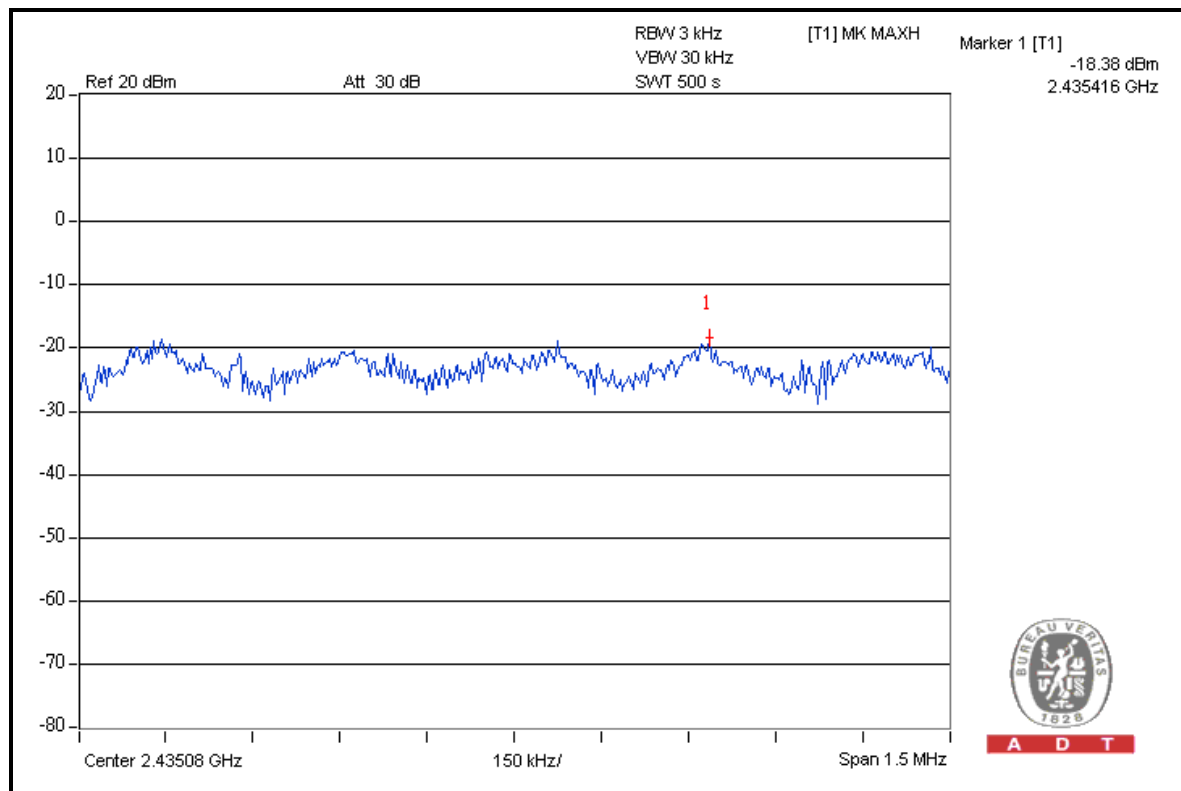
FOR CHAIN 0: CH 11



802.11n (40MHz)

CHAIN	CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
			MEASURED	10 log (N=2) dB			
0	1	2422	-18.9	3.01	-15.9	8	PASS
	4	2437	-18.4	3.01	-15.4	8	PASS
	7	2452	-18.8	3.01	-15.8	8	PASS
1	1	2422	-19.0	3.01	-16.0	8	PASS
	4	2437	-19.2	3.01	-16.2	8	PASS
	7	2452	-19.0	3.01	-16.0	8	PASS

FOR CHAIN 0: CH 4



4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	CALIBRATED UNTIL
FOR CONDUCTED MEASUREMENT:				
R&S SPECTRUM ANALYZER	FSP 40	100036	Apr. 29, 2011	Apr. 28, 2012
FOR RADIATED MEASUREMENT:				
HP Preamplifier	8447D	2432A03504	Mar. 04, 2011	Mar. 03, 2012
HP Preamplifier	8449B	3008A01924	Mar. 04, 2011	Mar. 03, 2012
HP Preamplifier	8449B	3008A01292	Mar. 04, 2011	Mar. 03, 2012
ROHDE & SCHWARZ TEST RECEIVER	ESU26	100005	Jun. 10, 2011	Jun. 09, 2012
Schwarzbeck Antenna	VULB 9168	137	Apr. 12, 2011	Apr. 11, 2012
Schwarzbeck Antenna	VHBA 9123	480	May 06, 2011	May 05, 2012
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
SUHNER RF cable	SF102	CABLE-CH6	Aug. 20, 2010	Aug. 19, 2011
EMCO Horn Antenna	3115	6714	Oct. 26, 2010	Oct. 25, 2011
EMCO Horn Antenna	3115	9312-4192	Apr. 22, 2011	Apr. 21, 2012
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.
 2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 3. The test was performed in Chamber No. 6.
 4. The Industry Canada Reference No. IC 7450E-6.
 5. The FCC Site Registration No. is 447212.

4.6.3 TEST PROCEDURE

FOR CONDUCTED MEASUREMENT:

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set both RBW and VBW of spectrum analyzer to 100kHz and 300kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (Peak RBW = 100kHz, VBW = 300kHz; Average RBW = 1MHz, VBW = 10Hz) are attached on the following pages.

FOR RADIATED MEASUREMENT:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna 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.
- 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.
- Set both RBW and VBW of spectrum analyzer to 100kHz and 300kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (Peak RBW = 100kHz, VBW = 300kHz; Average RBW = 1MHz, VBW = 10Hz) are attached on the following pages.

NOTE: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation.

4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6.

4.6.6 TEST RESULTS

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

TEST MODE A:

802.11b

RESTRICT BAND (2310 ~ 2390 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2412.00 (PK)	105.7	53.2	52.5	74.00
2412.00 (AV)	102.6	59.9	42.7	54.00

RESTRICT BAND (2483.5 ~ 2500 MHz)

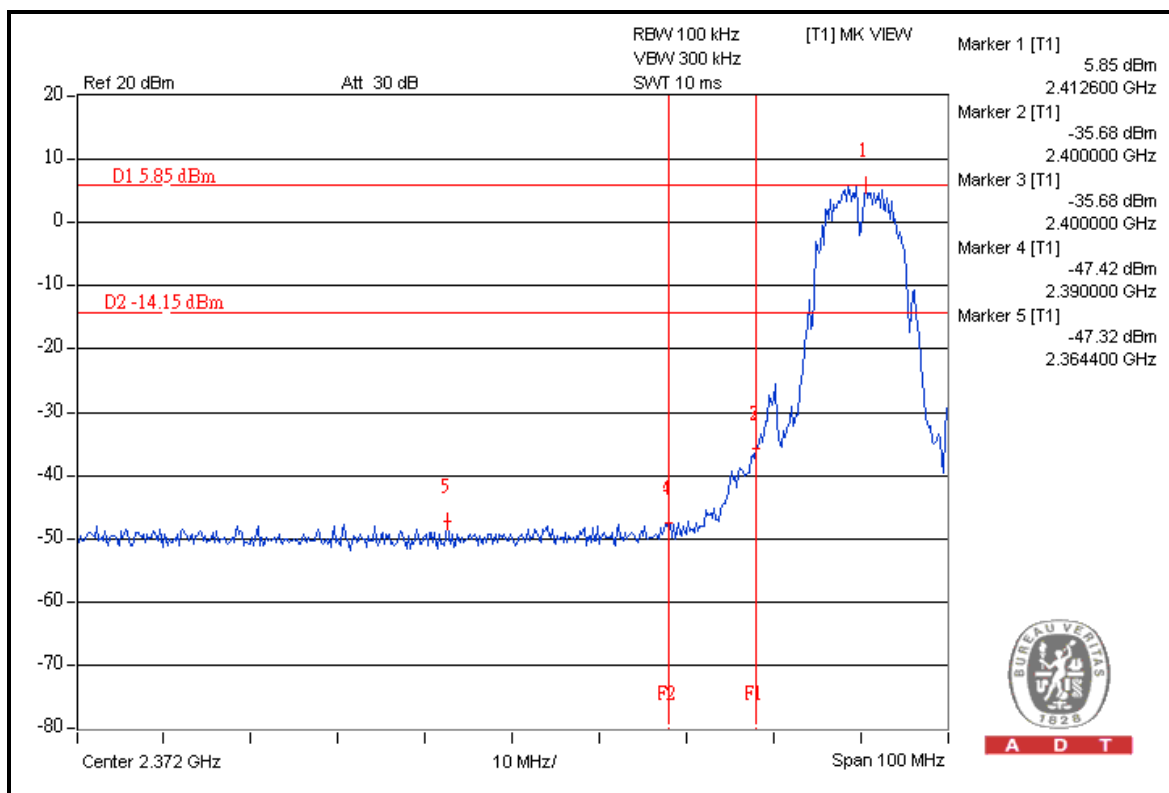
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2462.00 (PK)	106.9	53.1	53.8	74.00
2462.00 (AV)	103.8	57.5	46.3	54.00

NOTE:

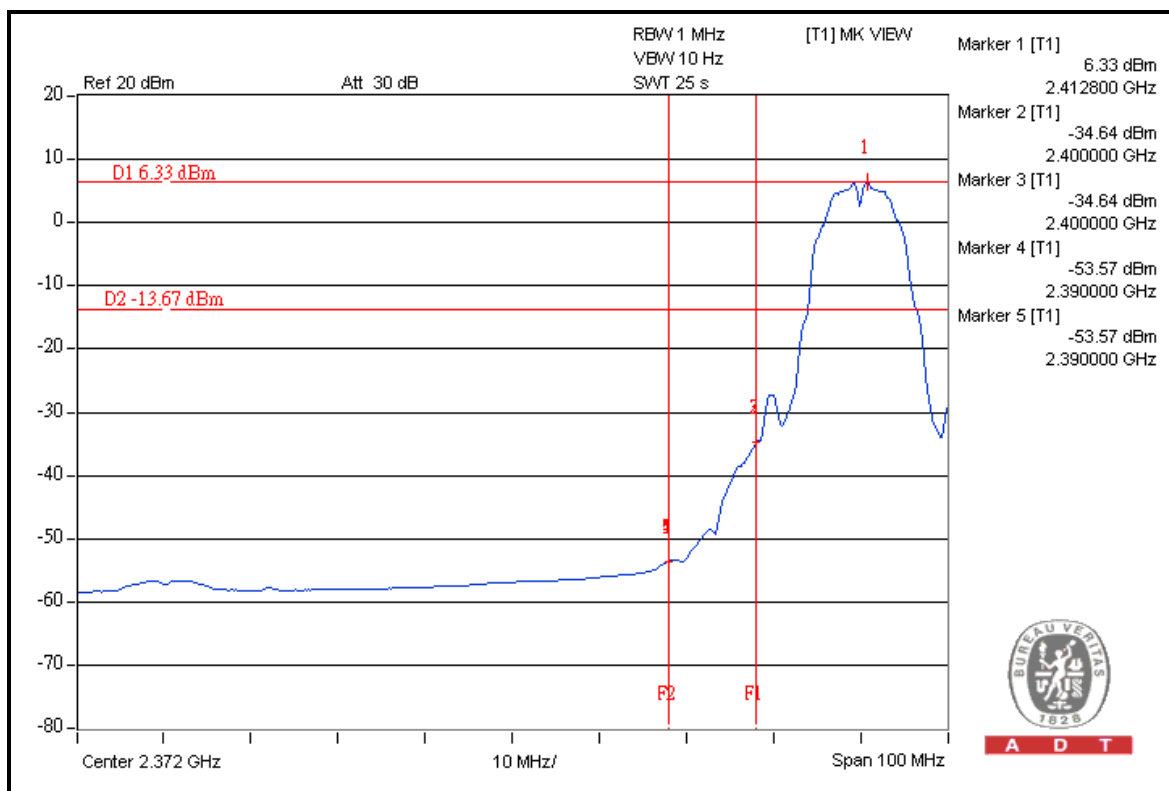
- Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
- Maximum field strength in restrict band = Fundamental emission – Delta.



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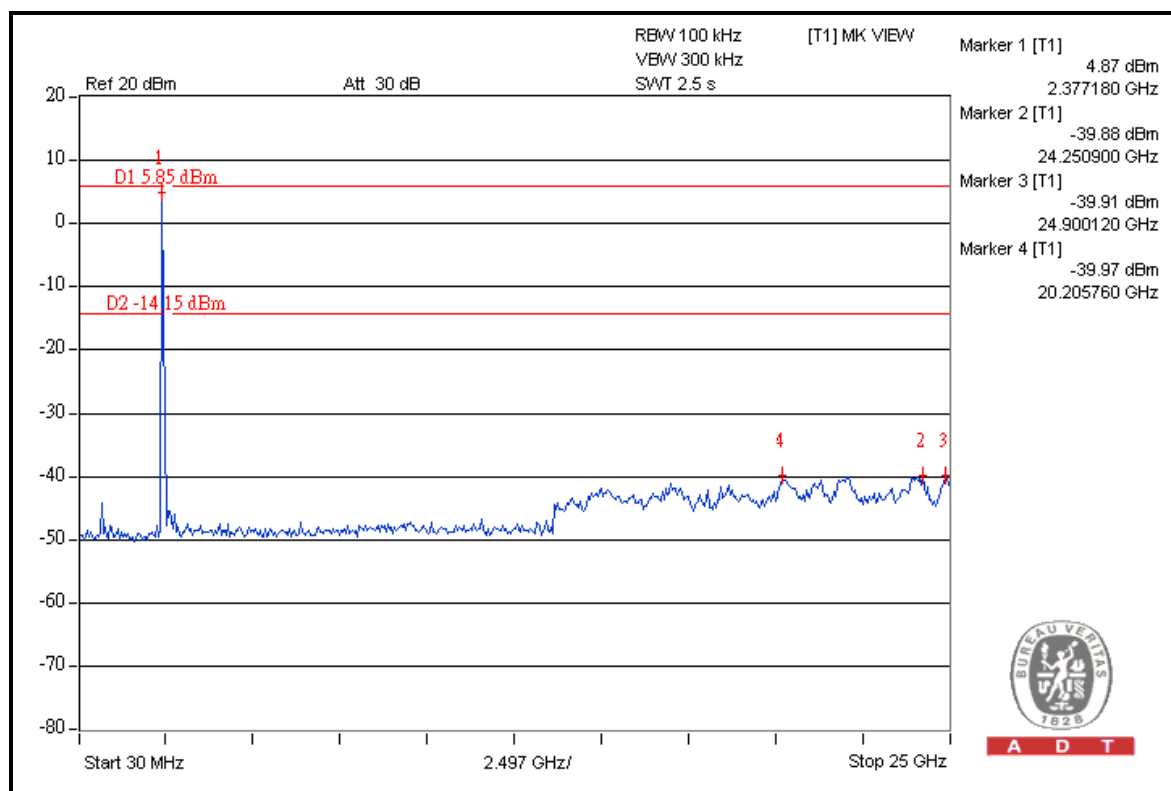
A D T



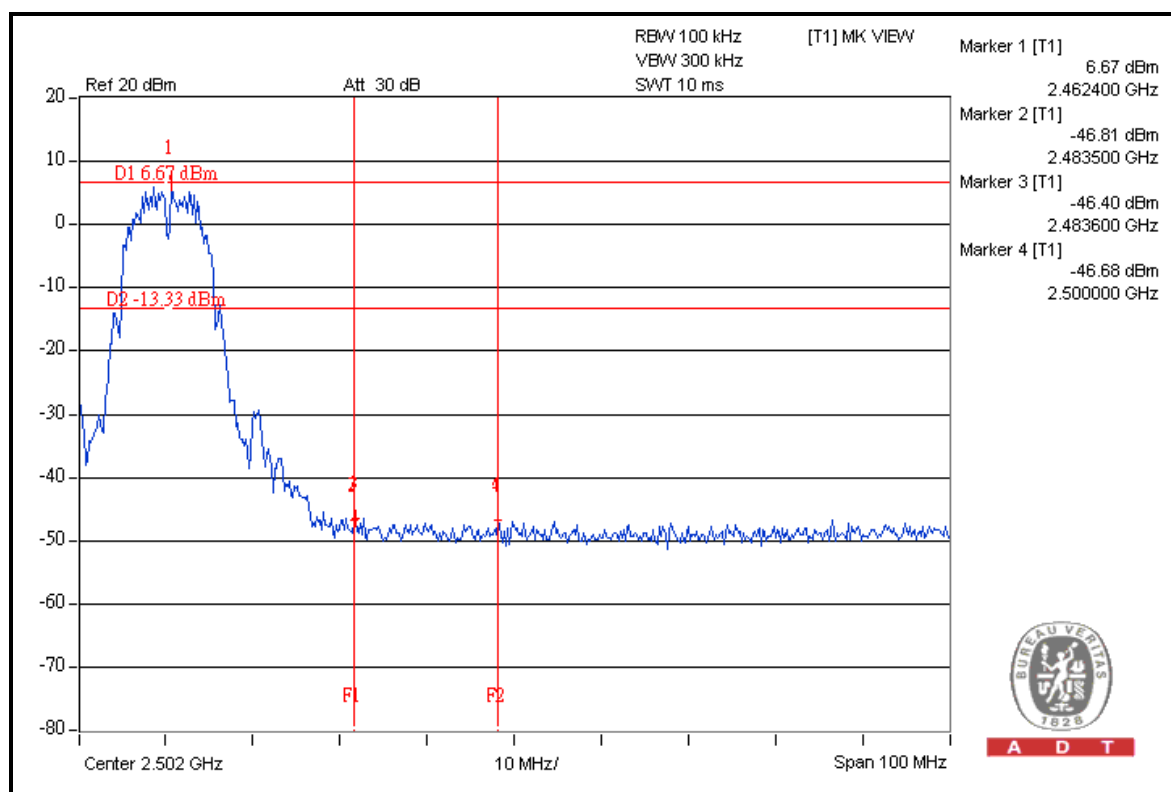
A D T



A D T



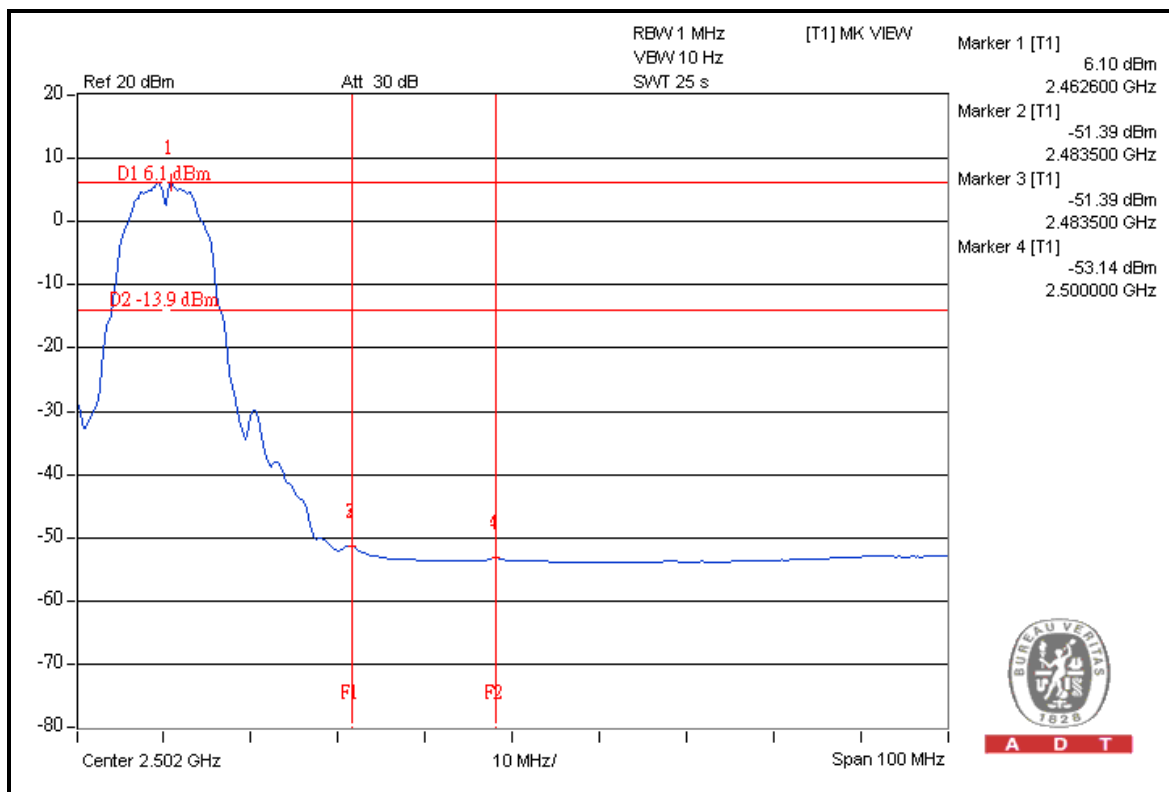
A D T



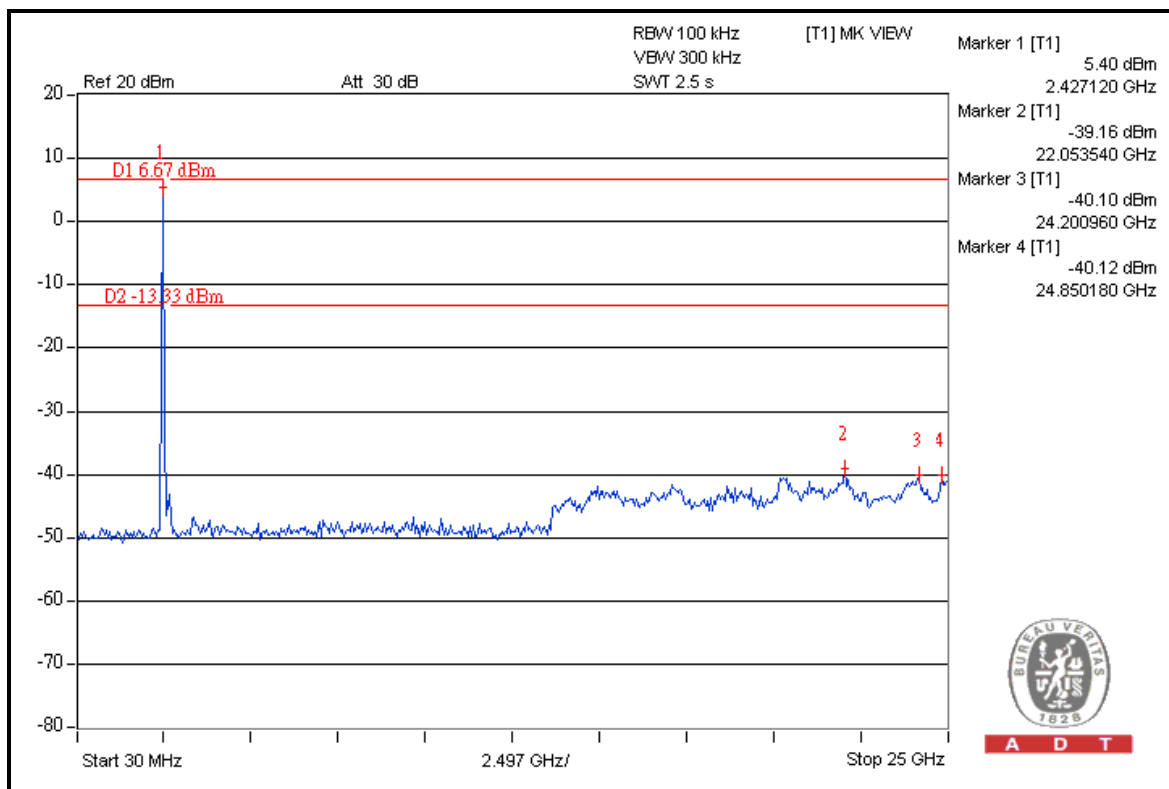
A D T



A D T



A D T



A D T

802.11g

RESTRICT BAND (2310 ~ 2390 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2412.00 (PK)	108.2	40.9	67.3	74.00
2412.00 (AV)	95.2	41.3	53.9	54.00

RESTRICT BAND (2483.5 ~ 2500 MHz)

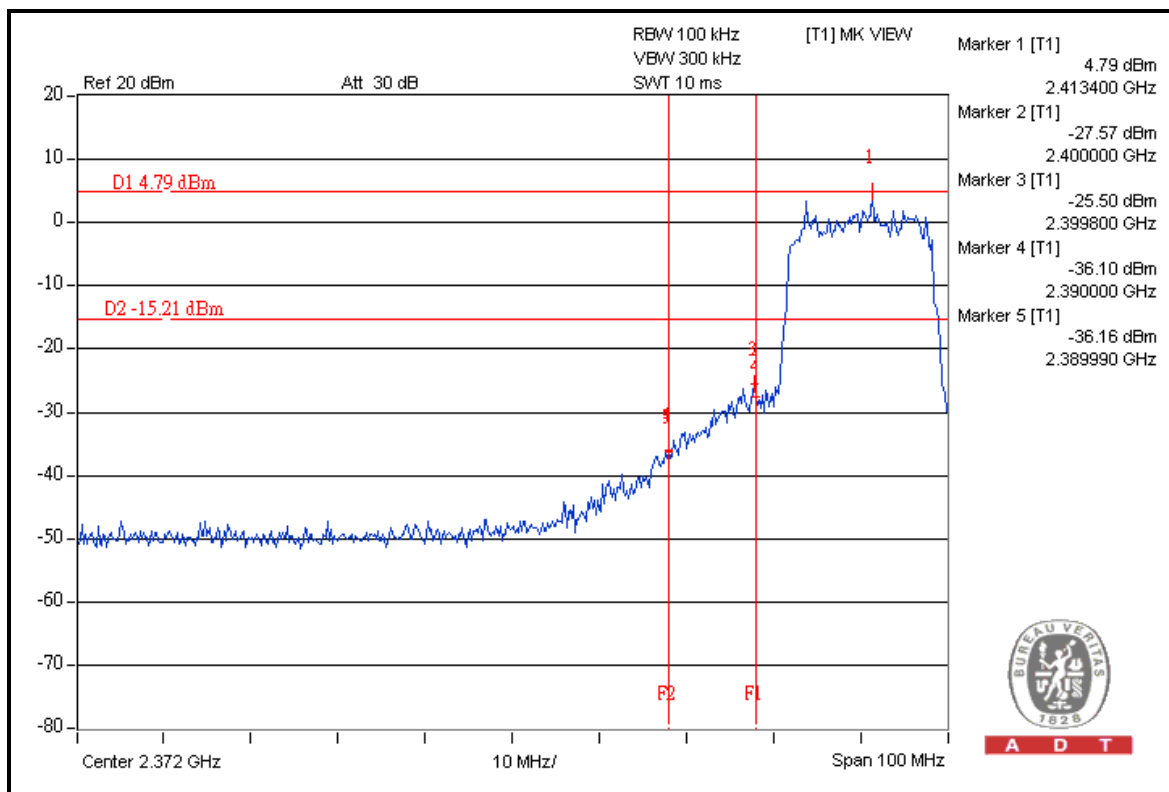
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2462.00 (PK)	108.9	42.4	66.5	74.00
2462.00 (AV)	95.4	41.8	53.6	54.00

NOTE:

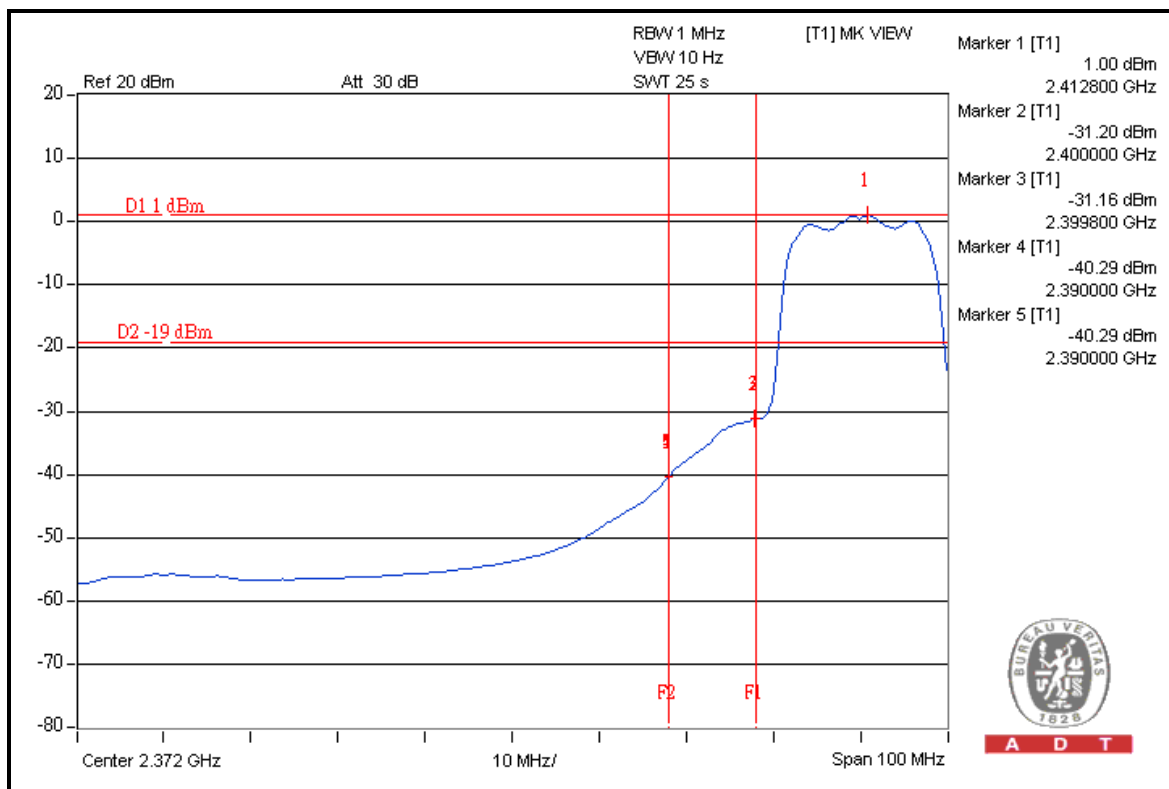
1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.



A D T



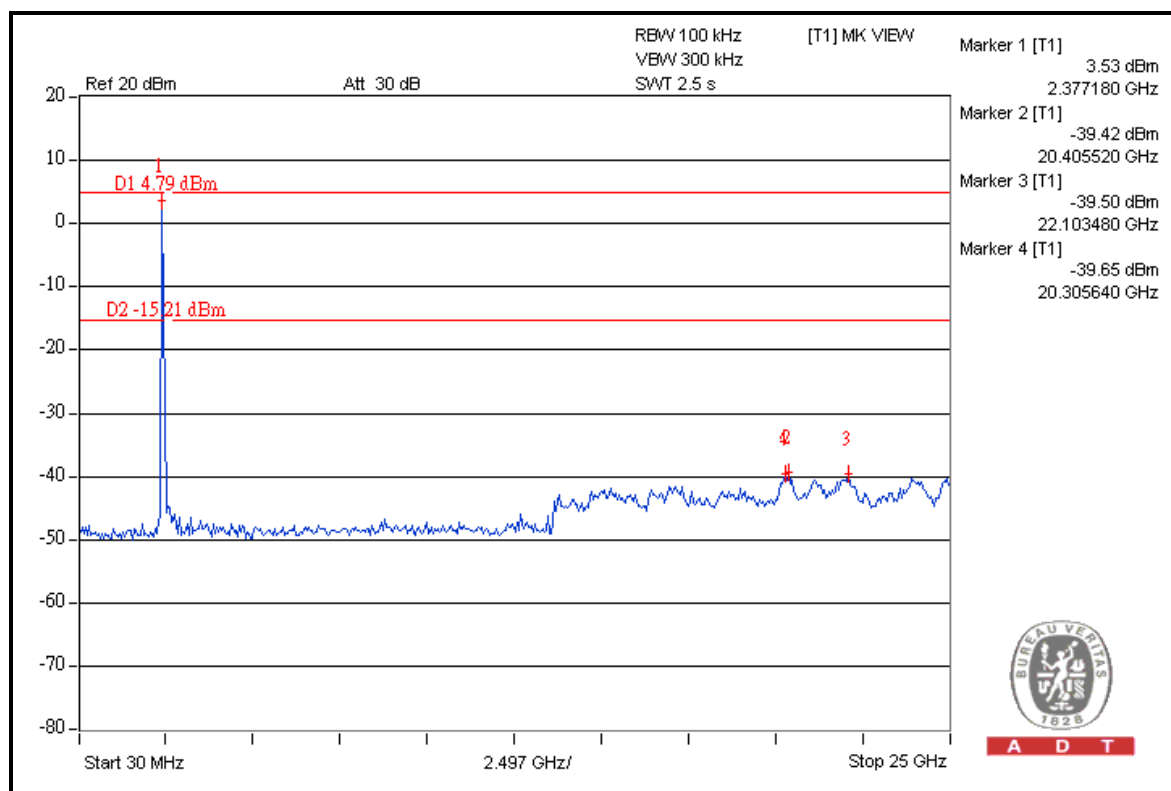
A D T



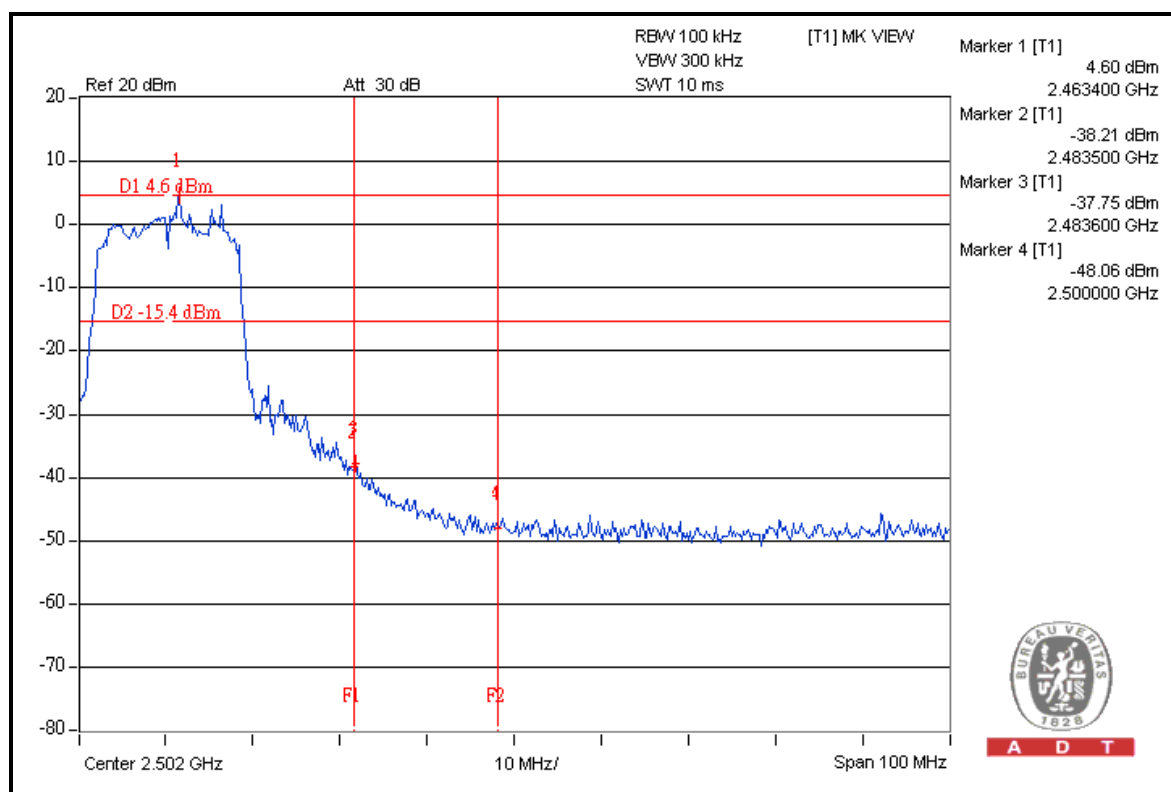
A D T



A D T



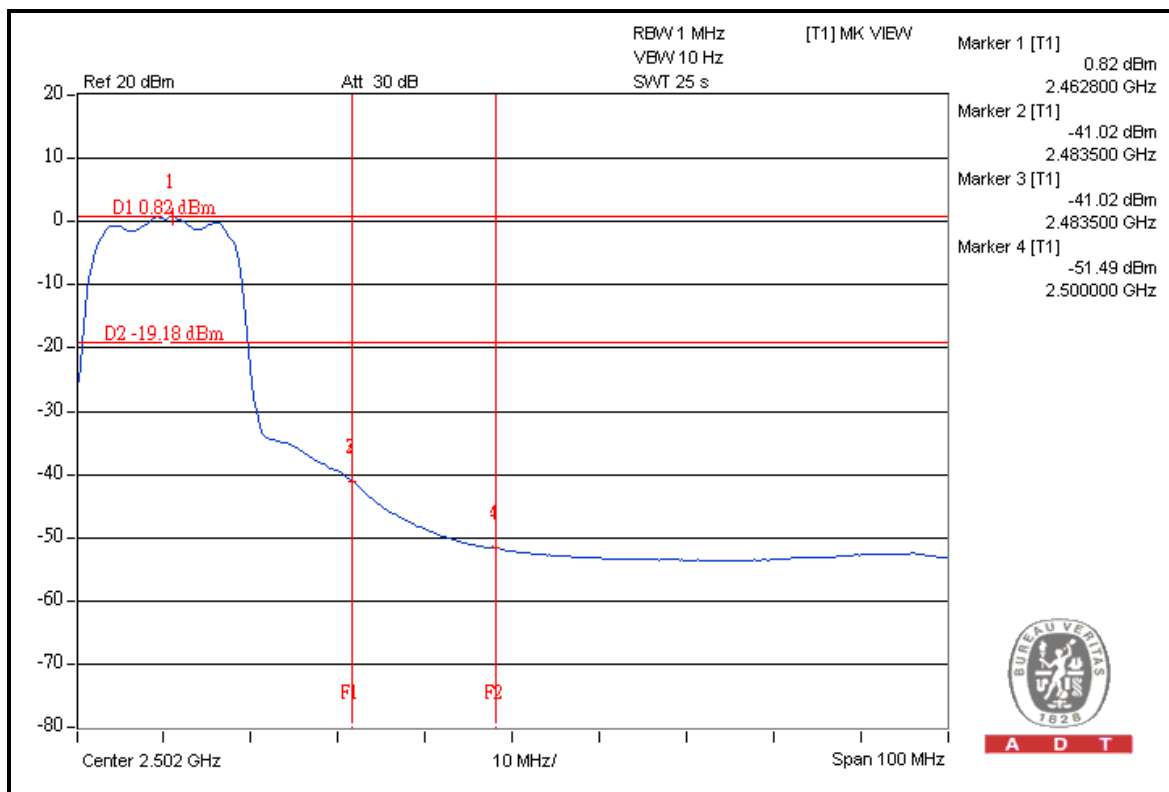
A D T



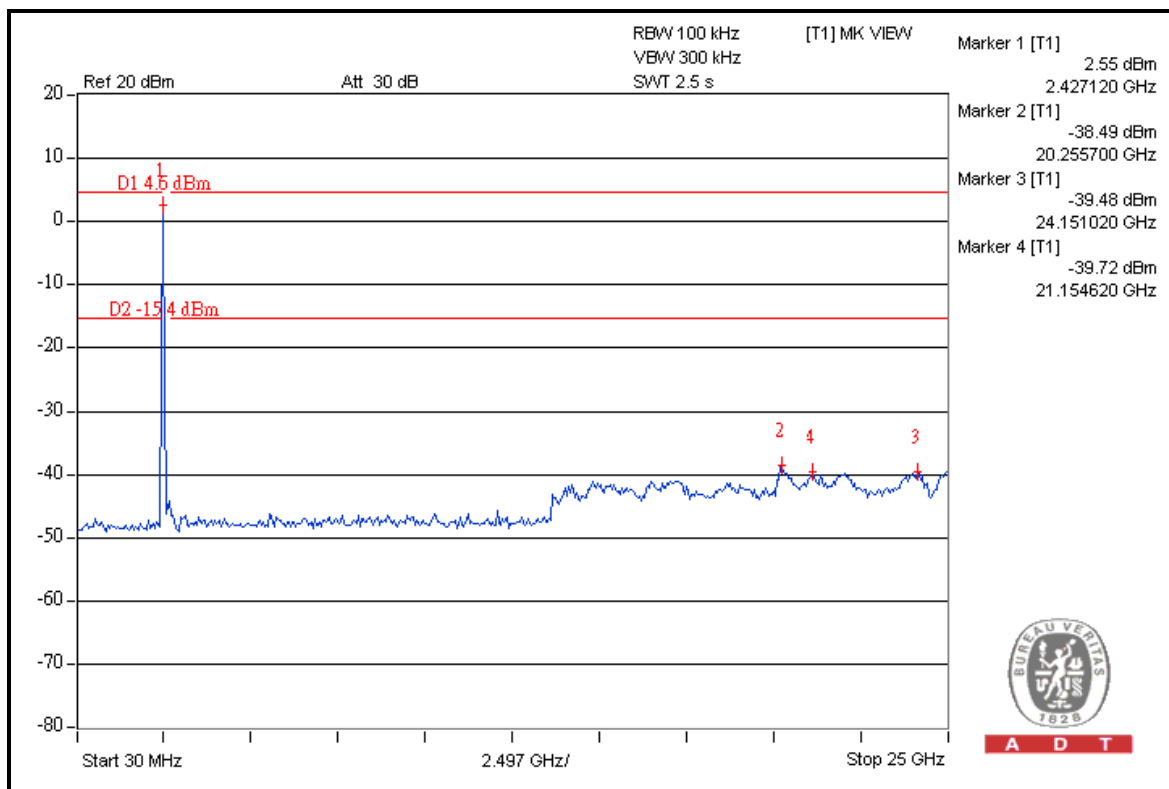
A D T



A D T



A D T



A D T

**A D T****802.11n (20MHz)****RESTRICT BAND (2310 ~ 2390 MHz)**

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2412.00 (PK)	99.0	38.8	60.2	74.00
2412.00 (AV)	86.5	41.4	45.1	54.00

RESTRICT BAND (2483.5 ~ 2500 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2462.00 (PK)	100.1	38.6	61.5	74.00
2462.00 (AV)	88.5	43.6	44.9	54.00

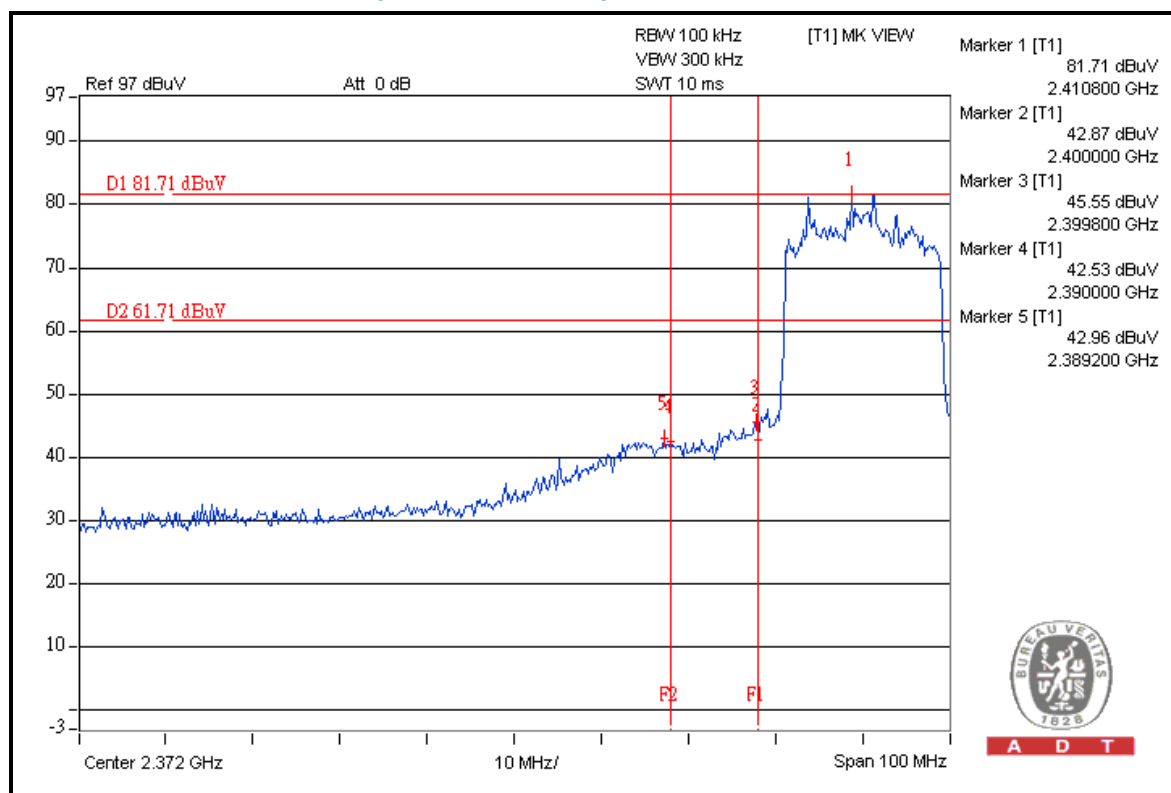
NOTE:

1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 2 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.

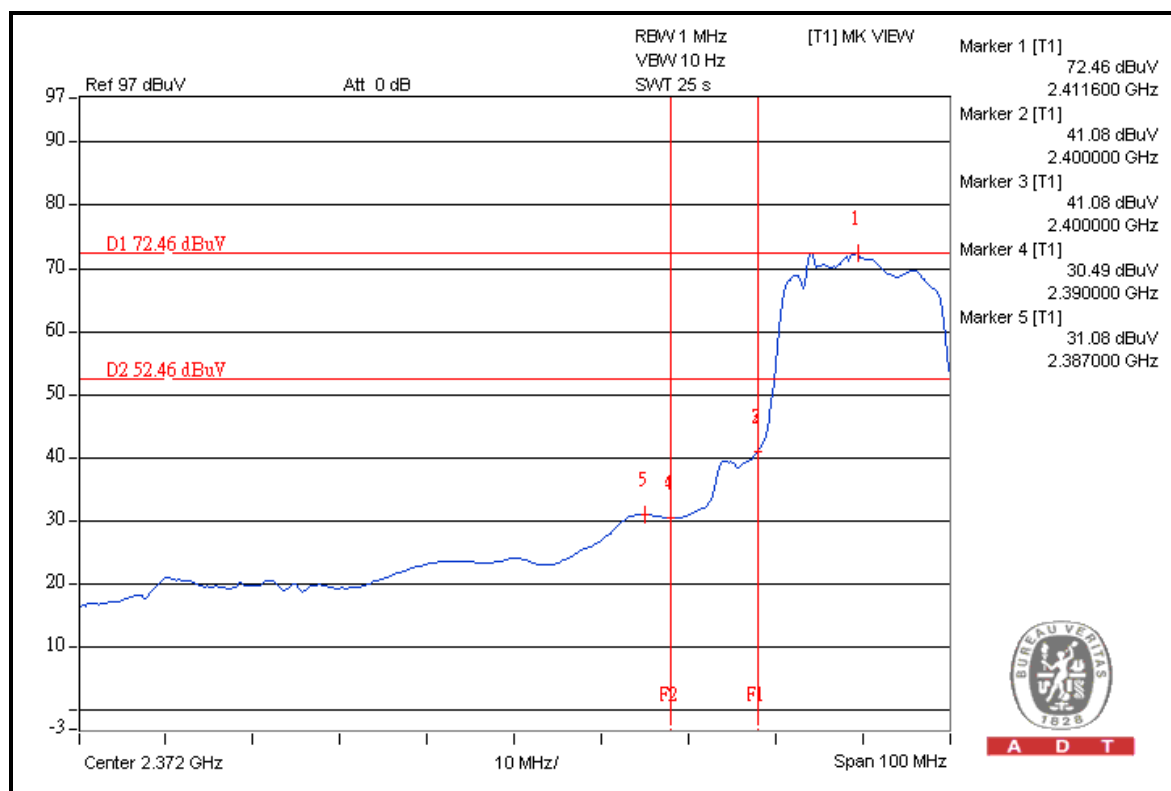


A D T

FOR RADIATED MEASURED (TWO CHAINS ON)



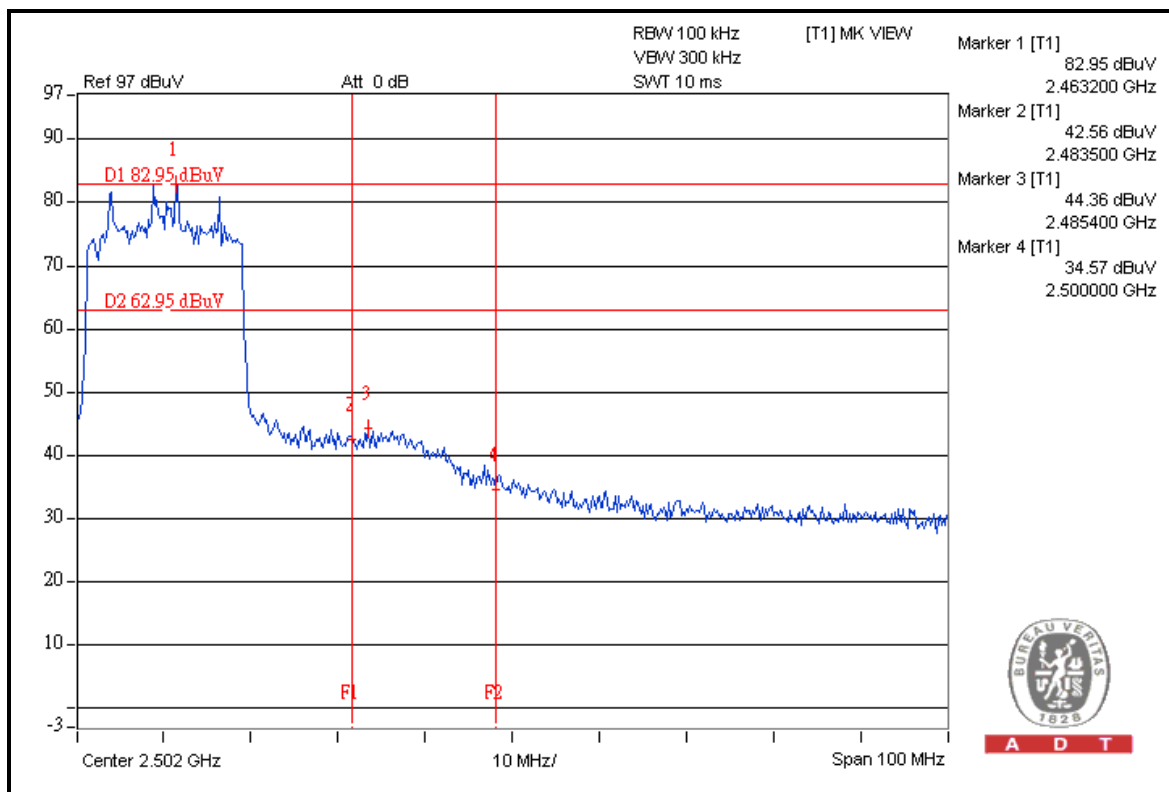
A D T



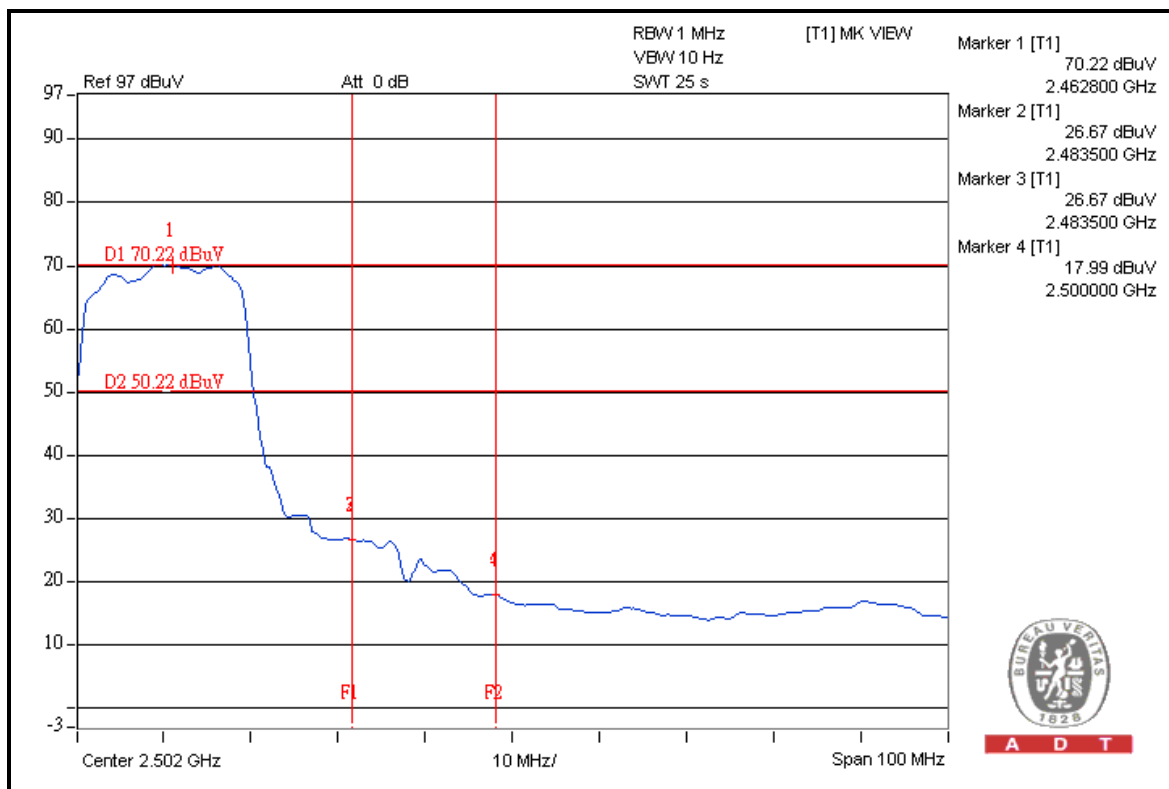
A D T



A D T



A D T



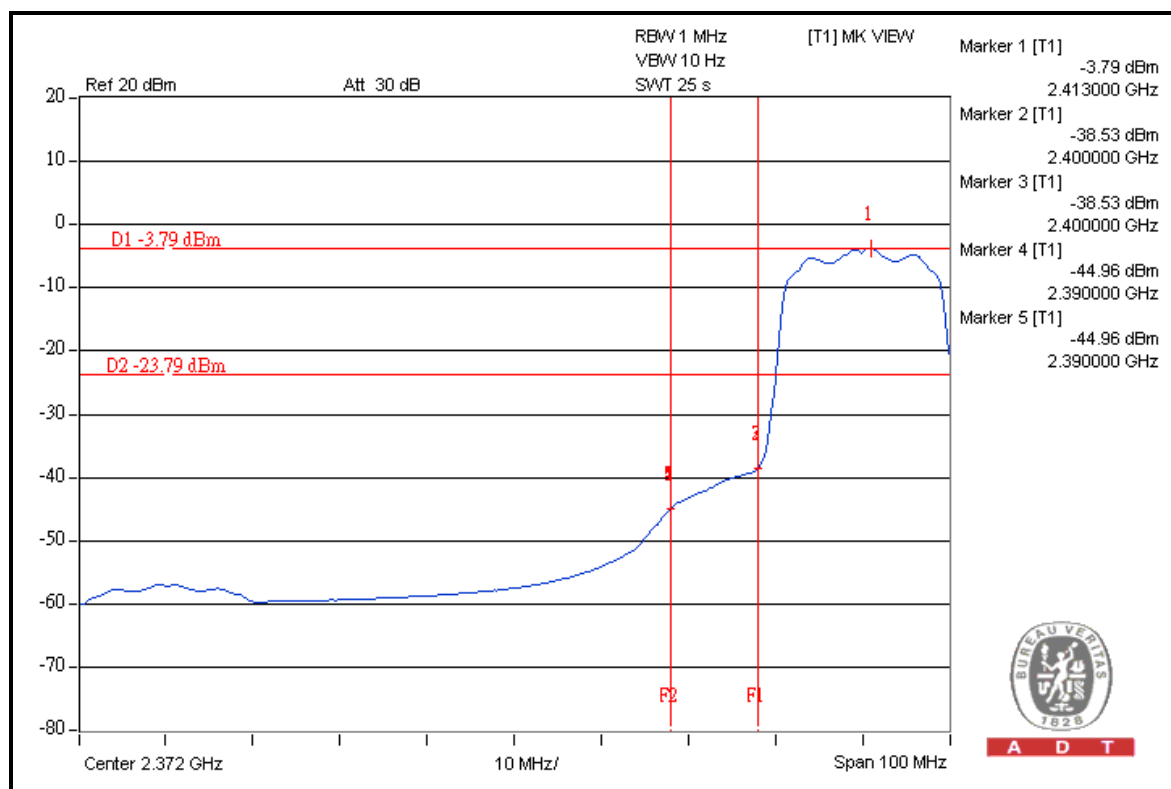
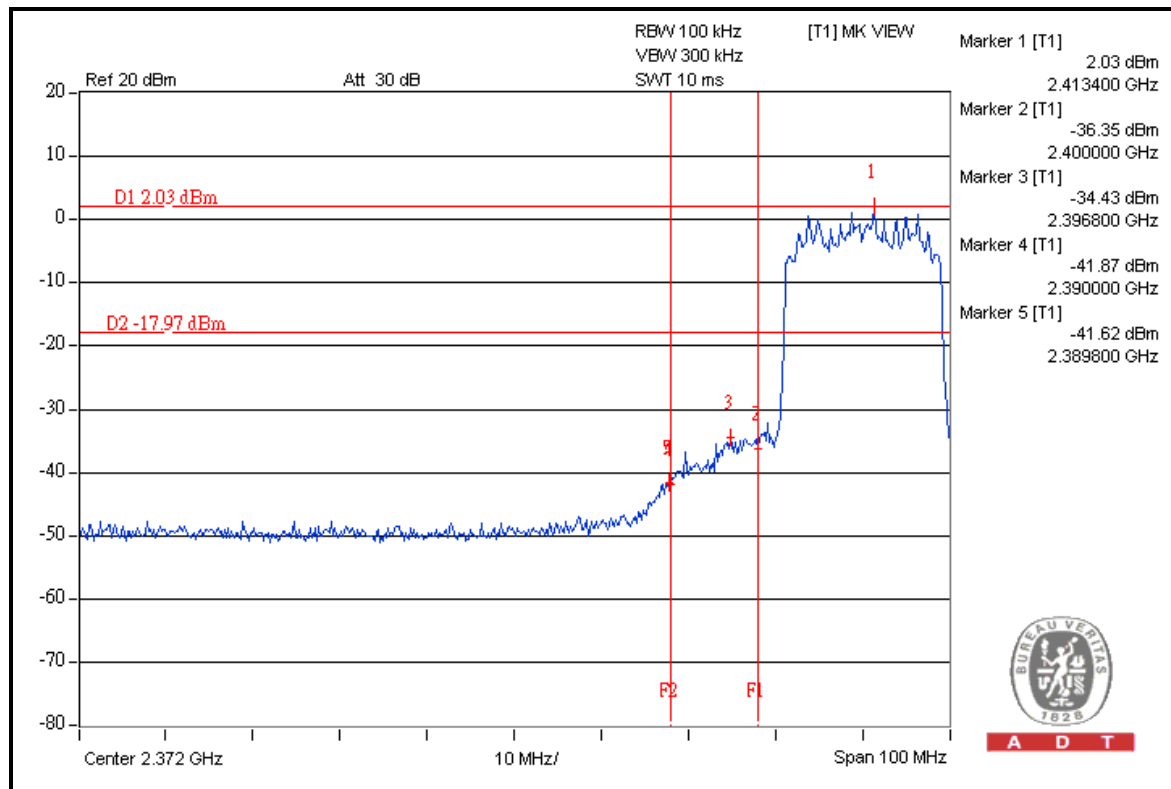
A D T



A D T

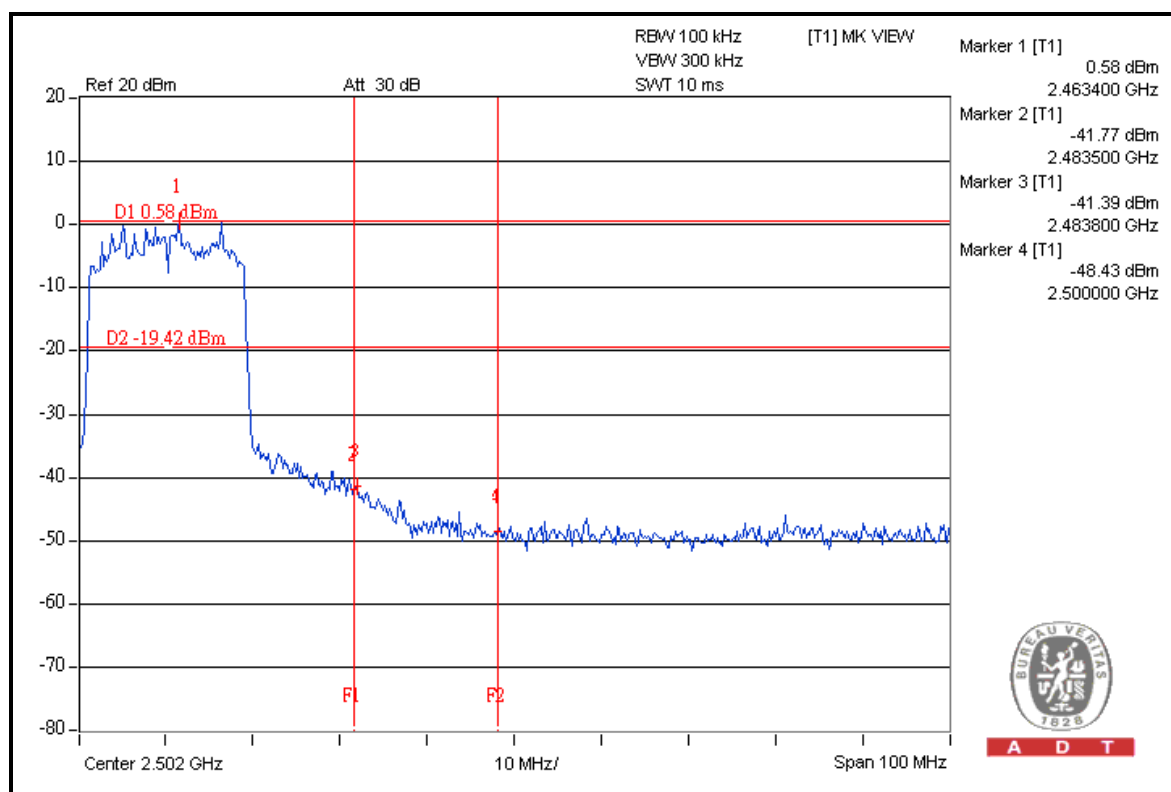
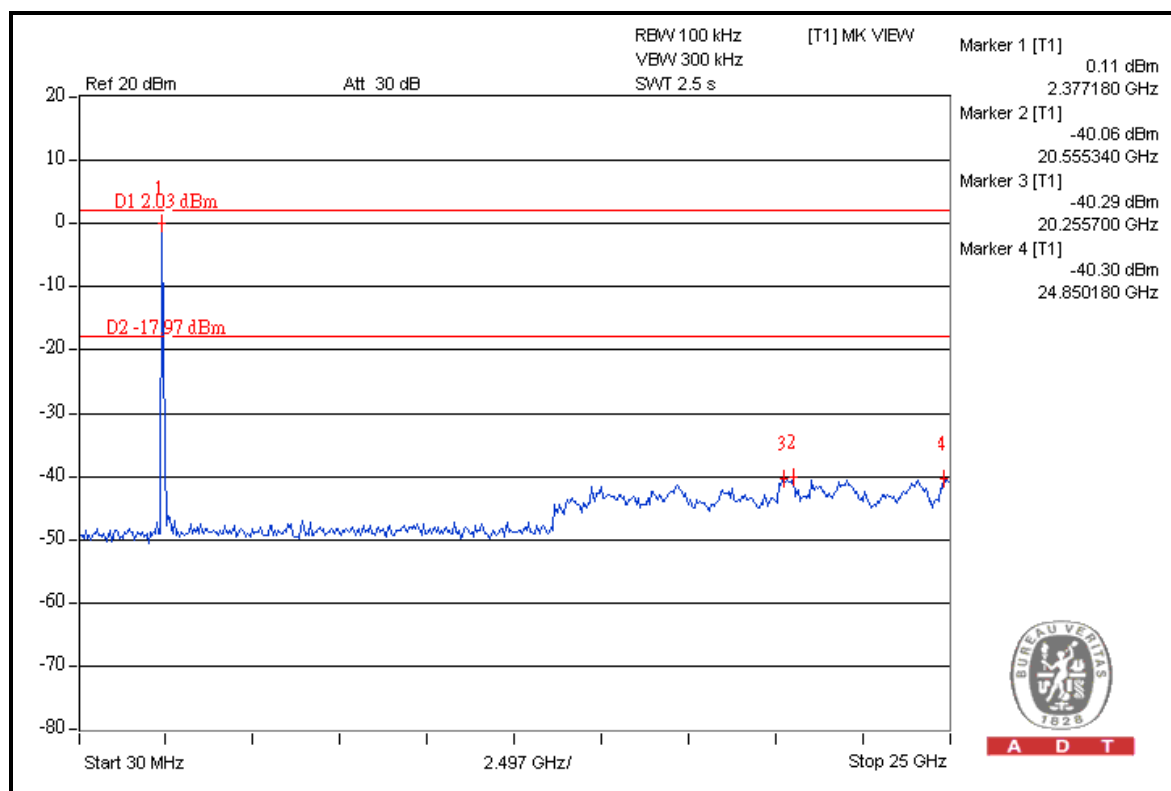
FOR CONDUCTED MEASURED

CHAIN 0



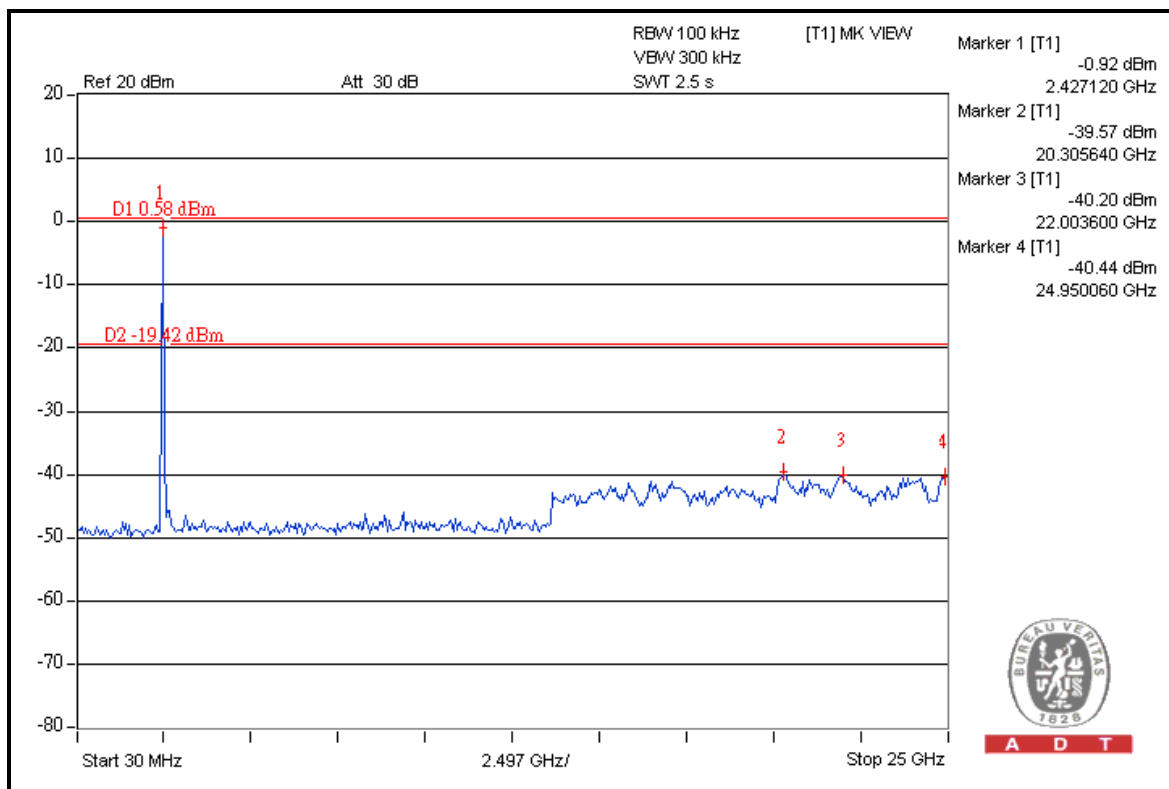
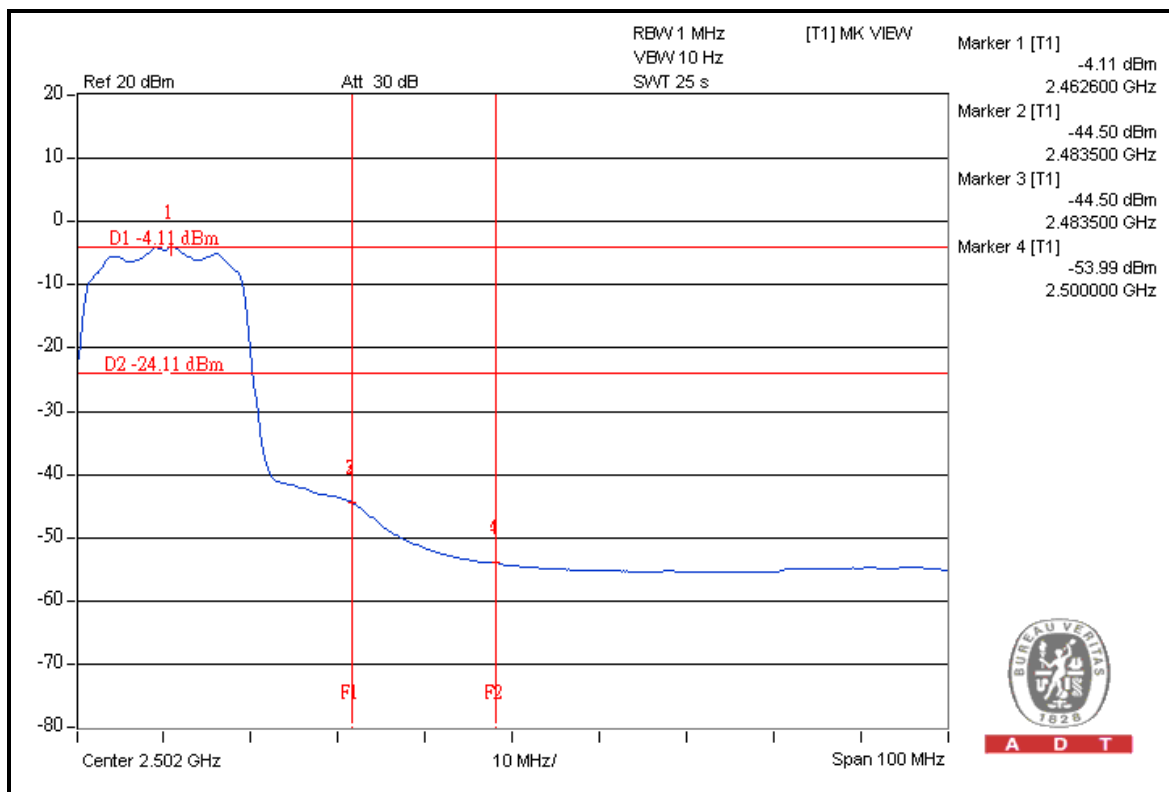


A D T





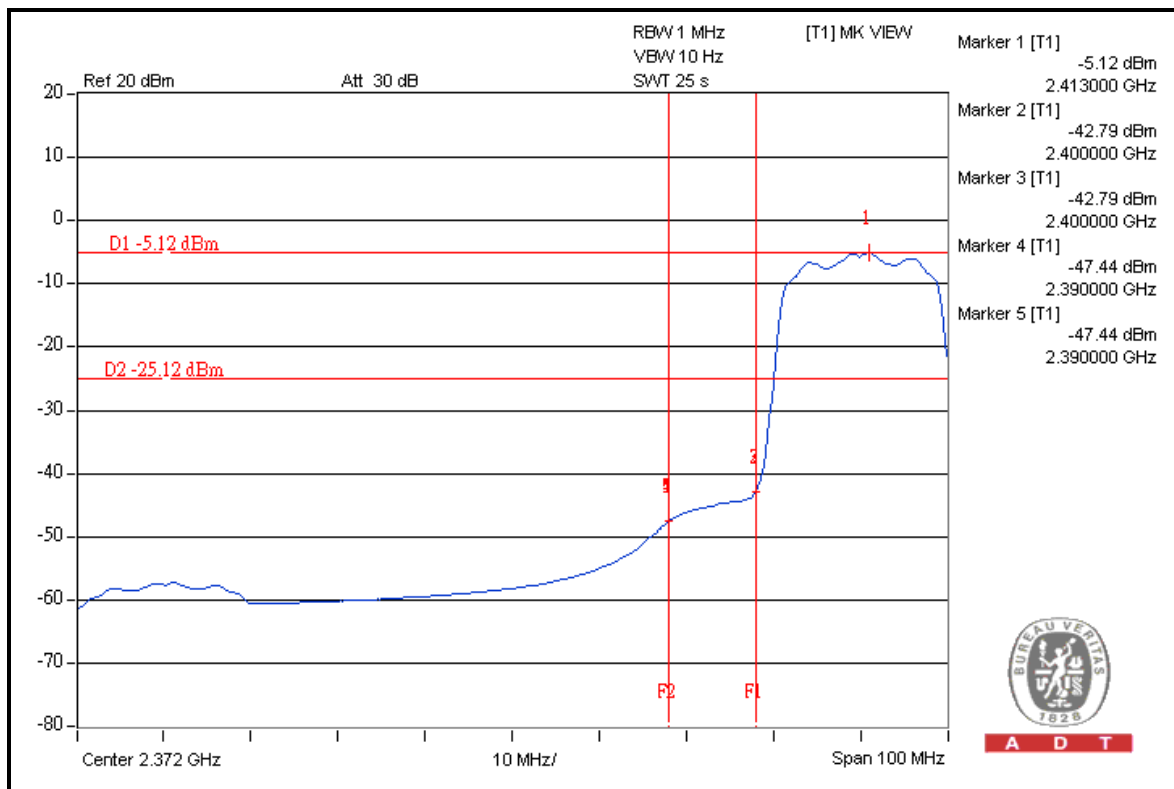
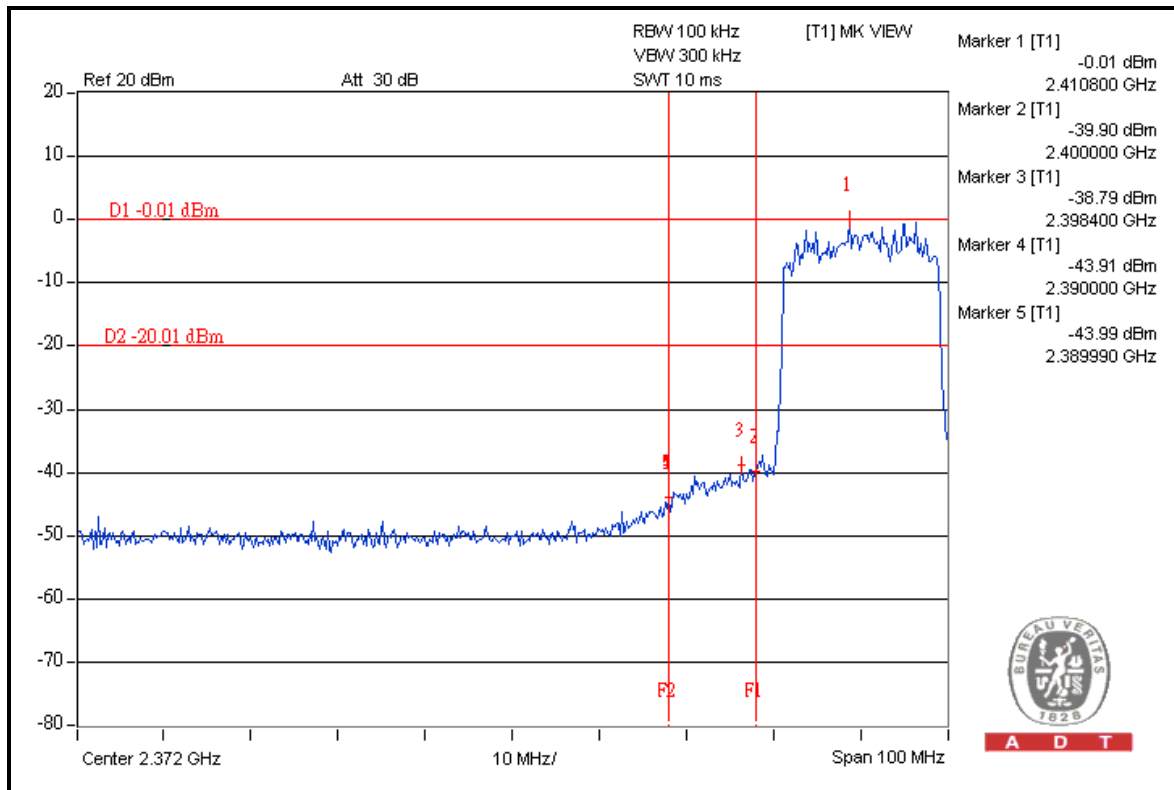
A D T





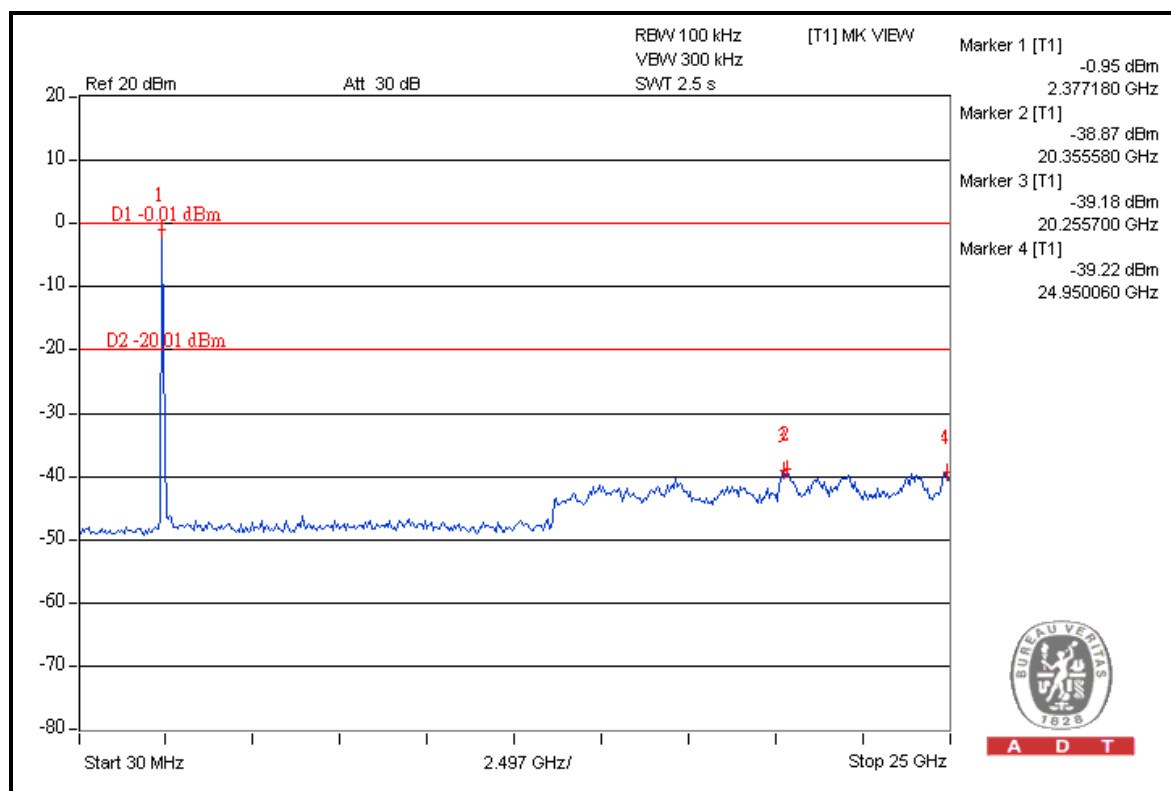
A D T

CHAIN 1

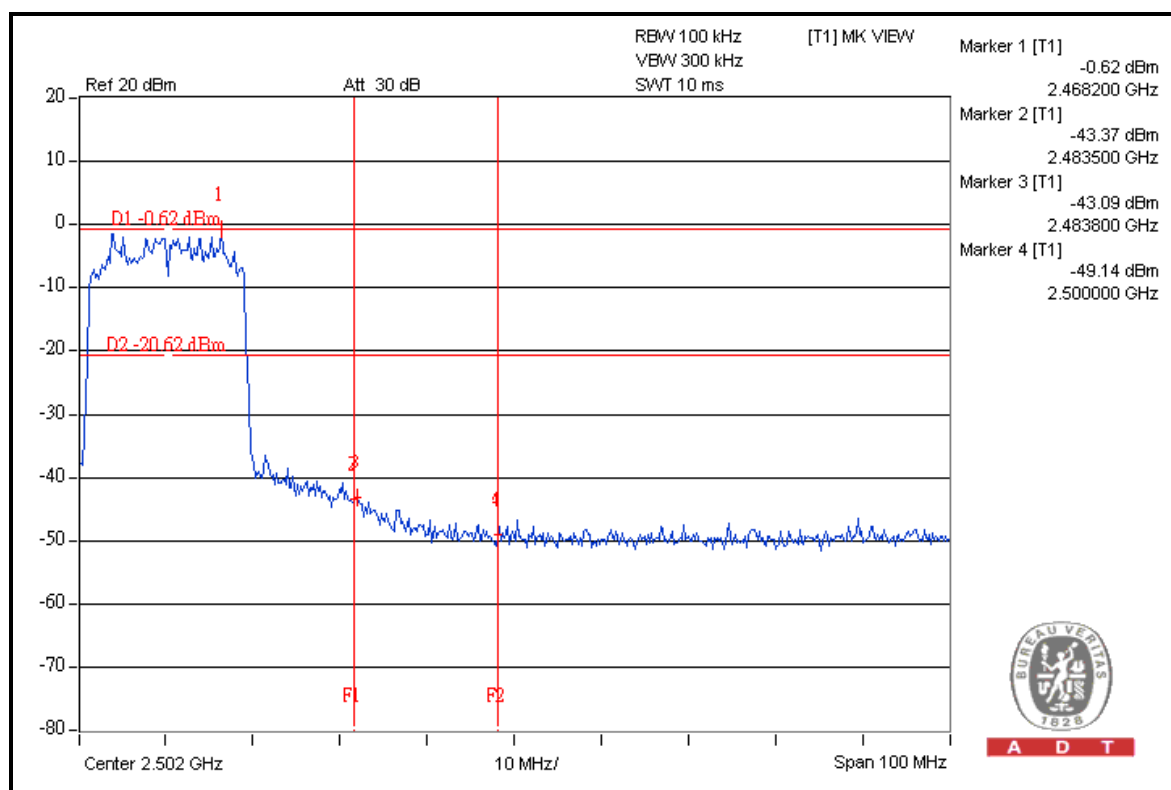




A D T



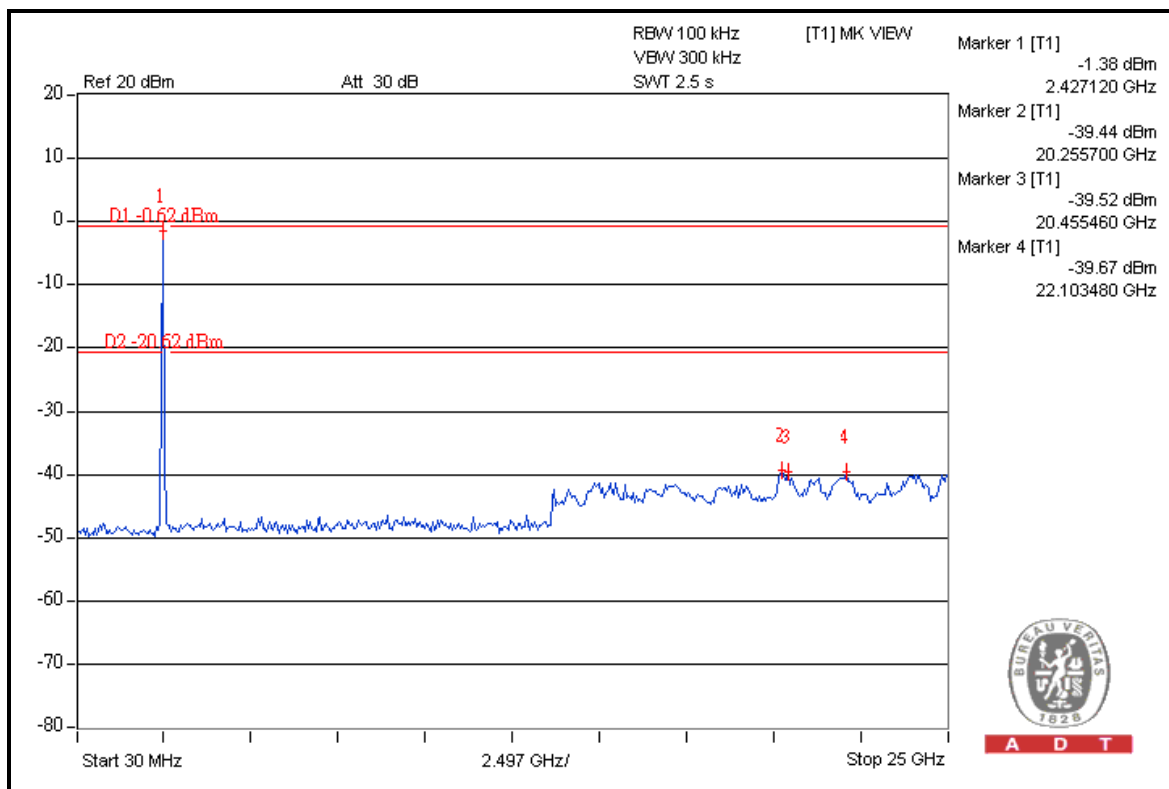
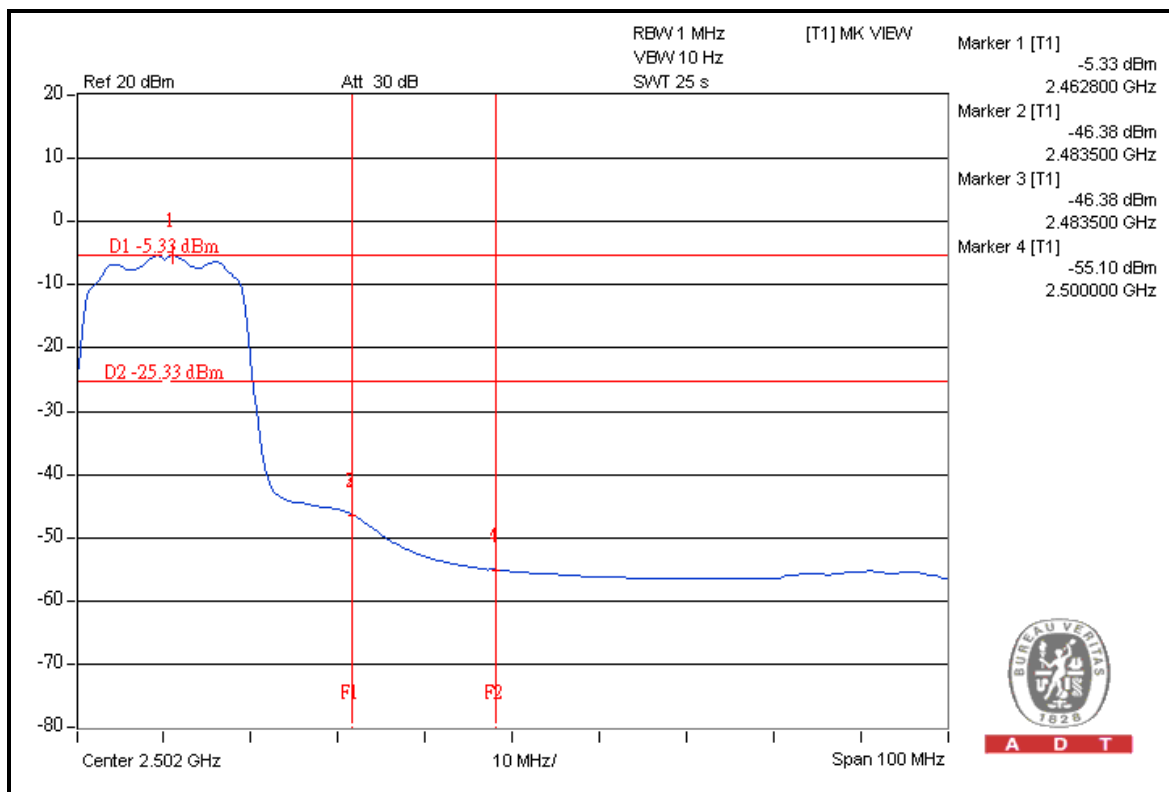
A D T



A D T



A D T



802.11n (40MHz)

RESTRICT BAND (2310 ~ 2390 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2422.00 (PK)	103.7	33.5	70.2	74.00
2422.00 (AV)	91.6	40.5	51.1	54.00

RESTRICT BAND (2483.5 ~ 2500 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2452.00 (PK)	104.0	37.4	66.6	74.00
2452.00 (AV)	91.9	45.6	46.3	54.00

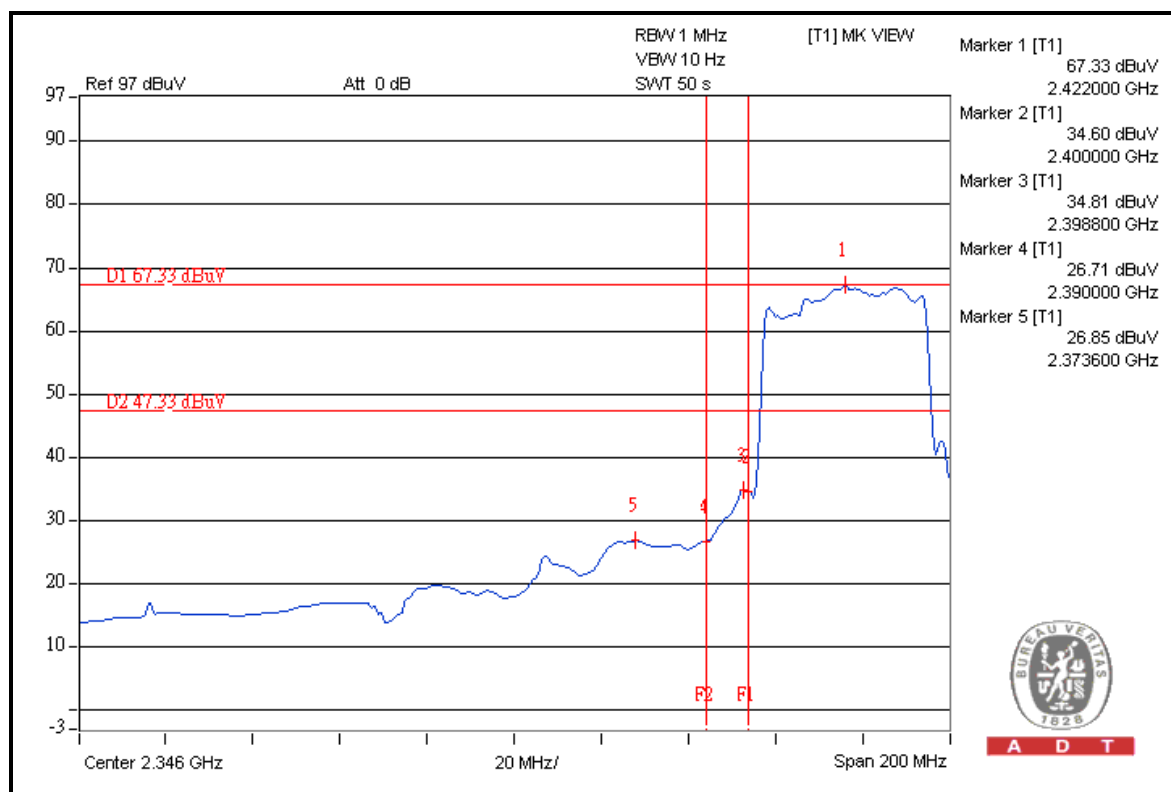
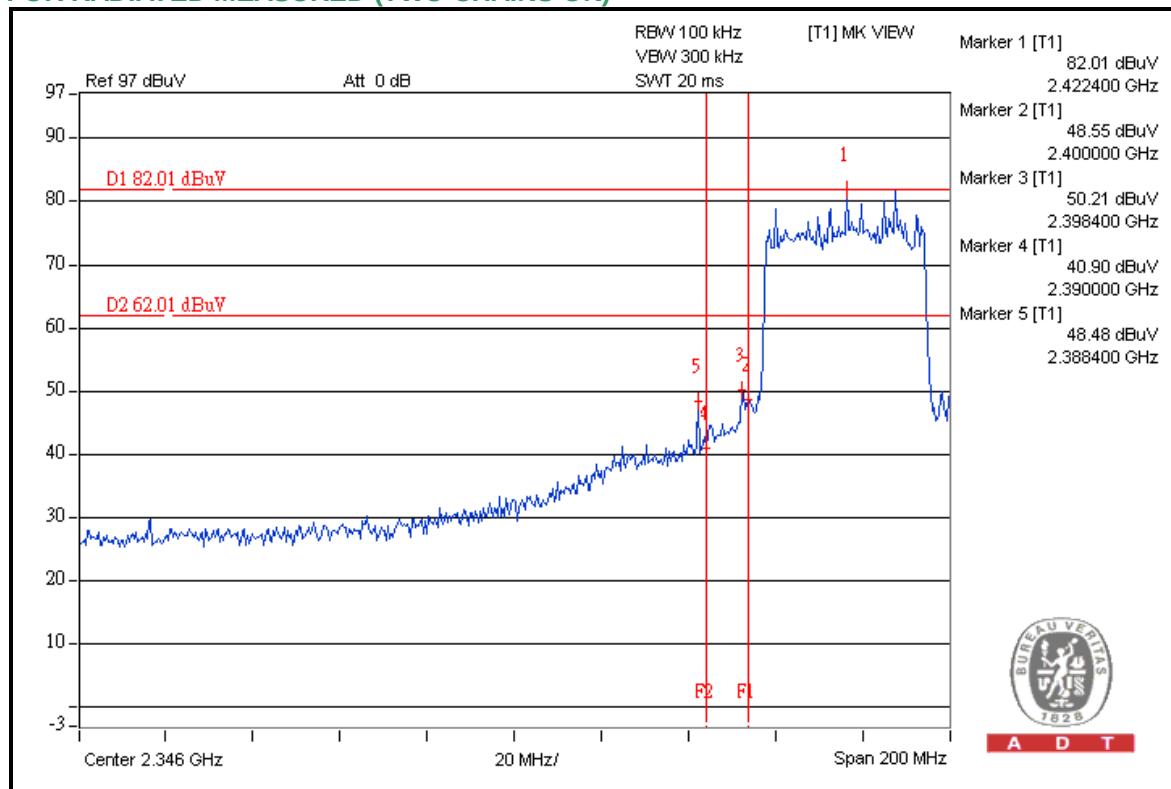
NOTE:

1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 2 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.



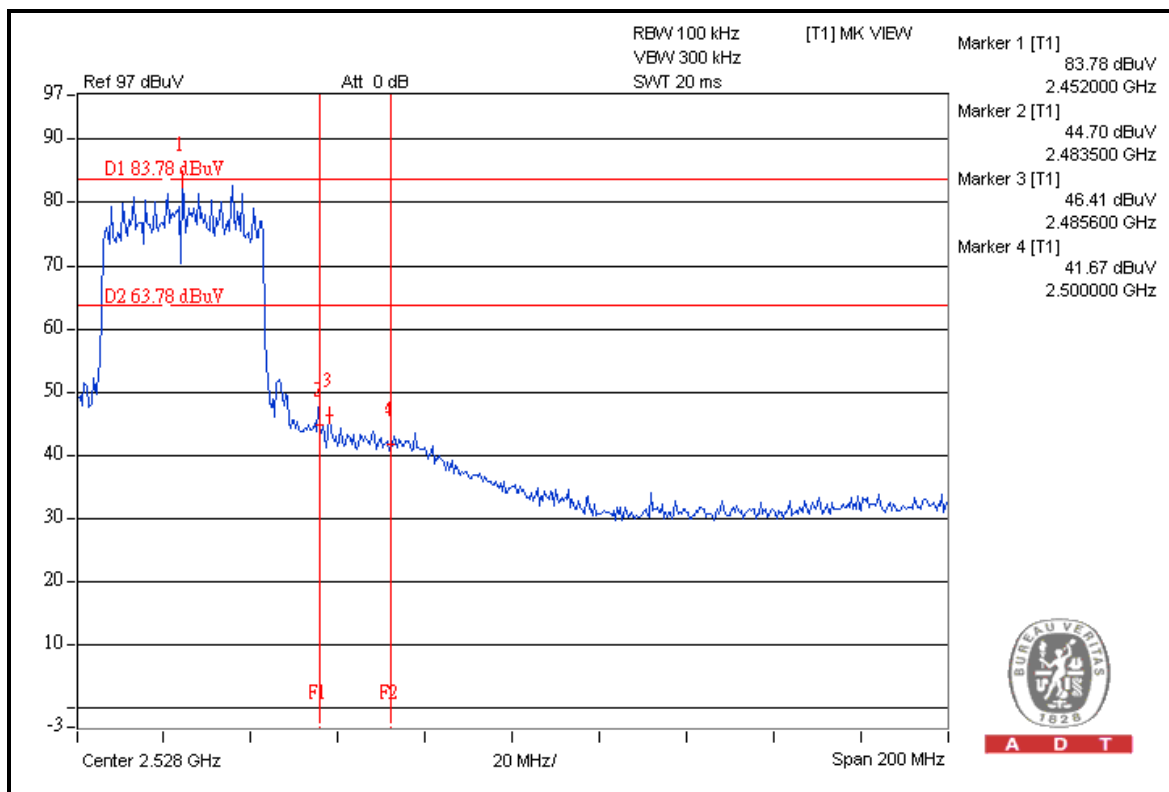
A D T

FOR RADIATED MEASURED (TWO CHAINS ON)

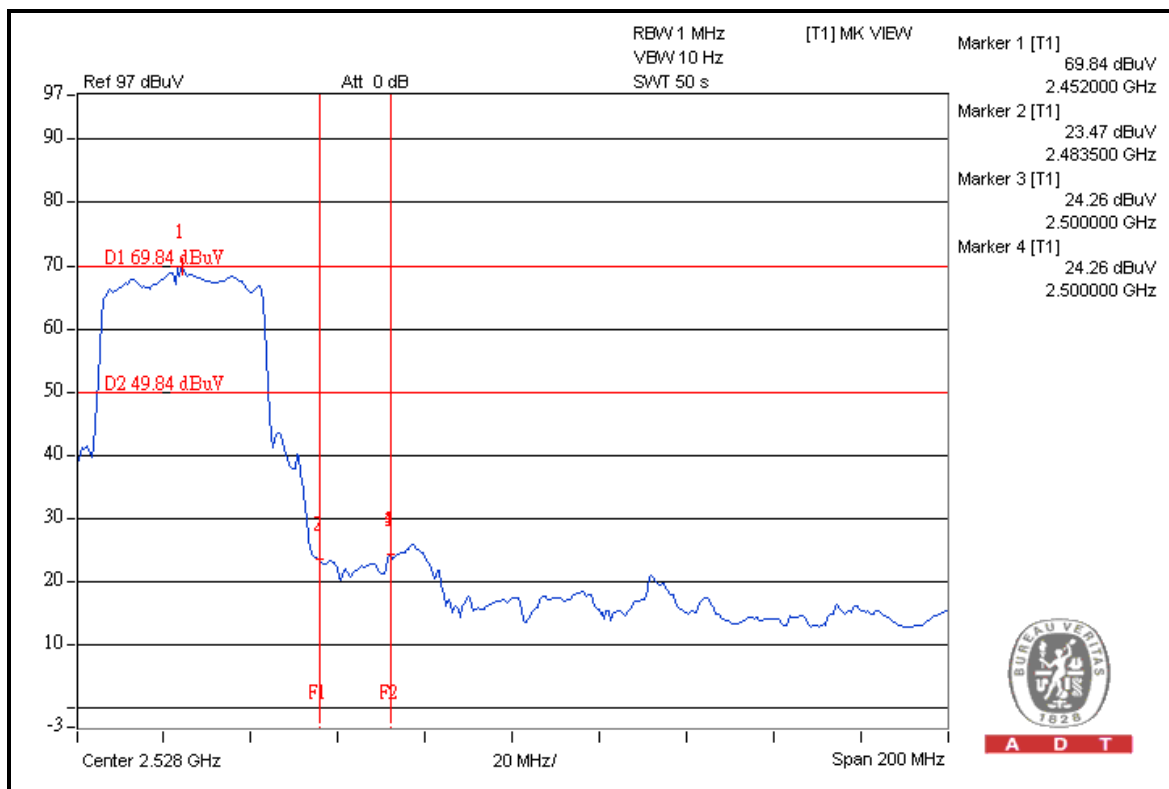




A D T



A D T



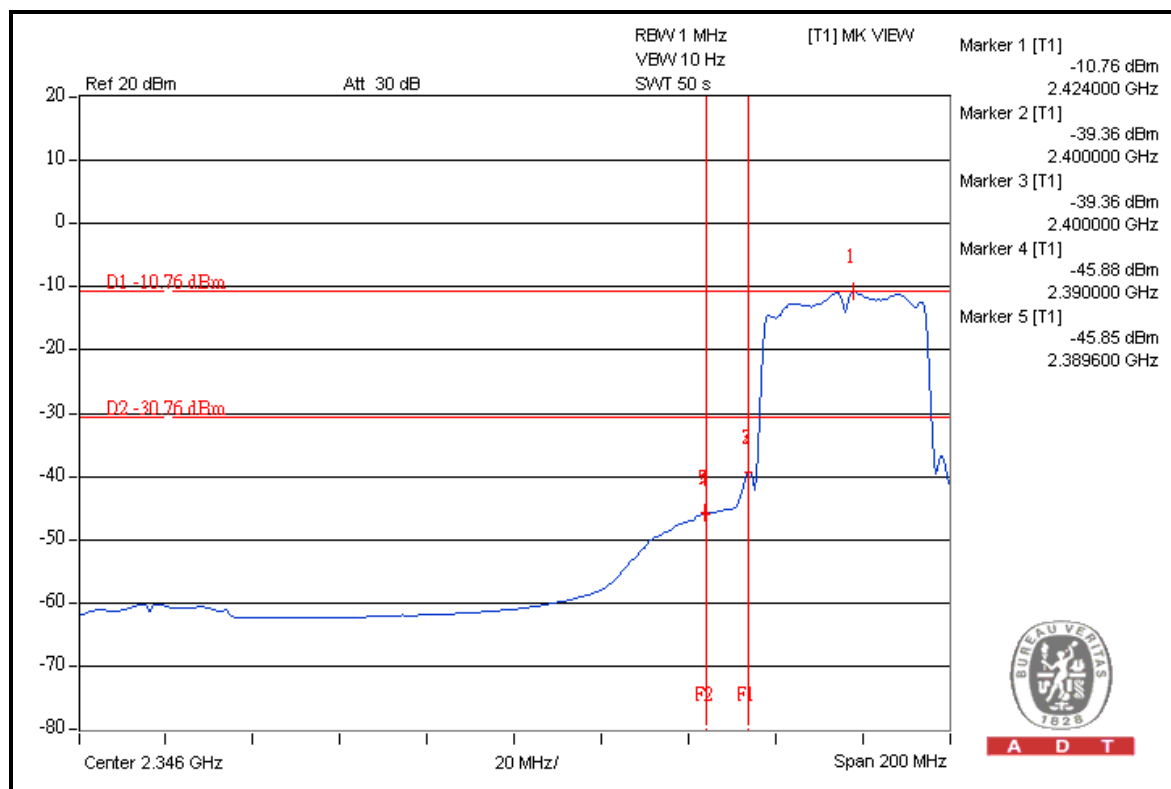
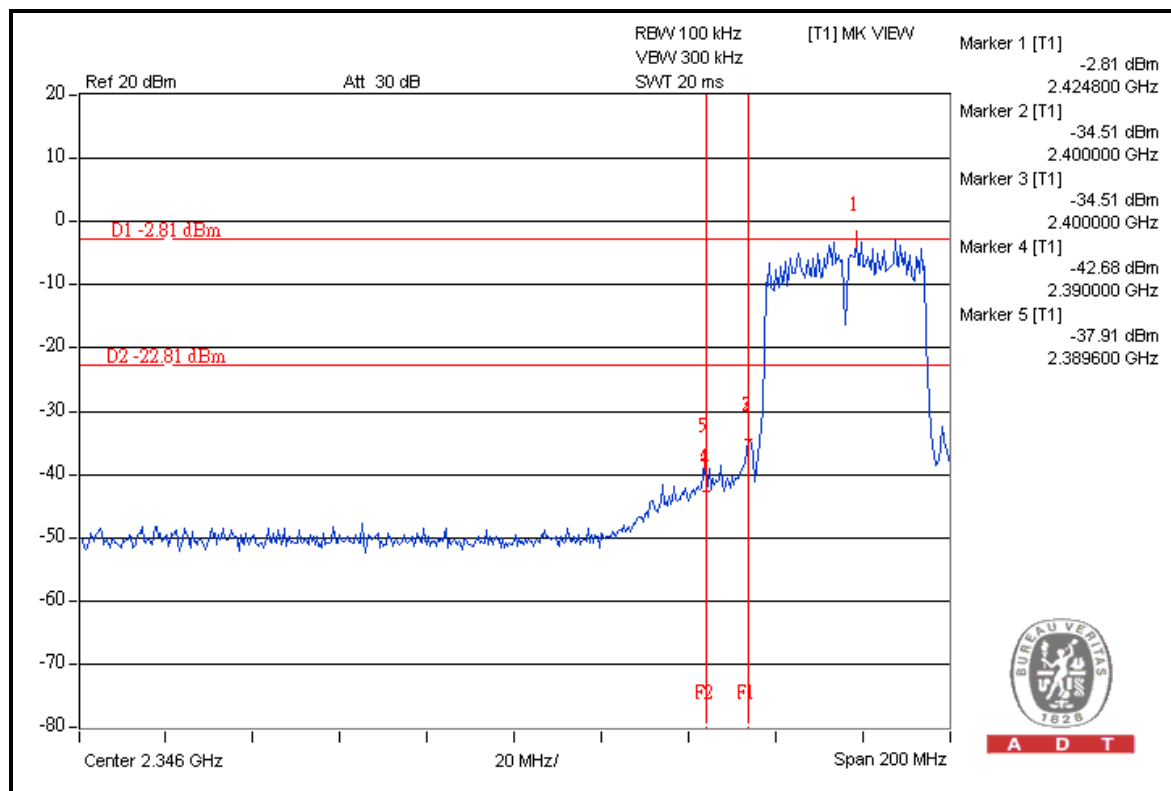
A D T



A D T

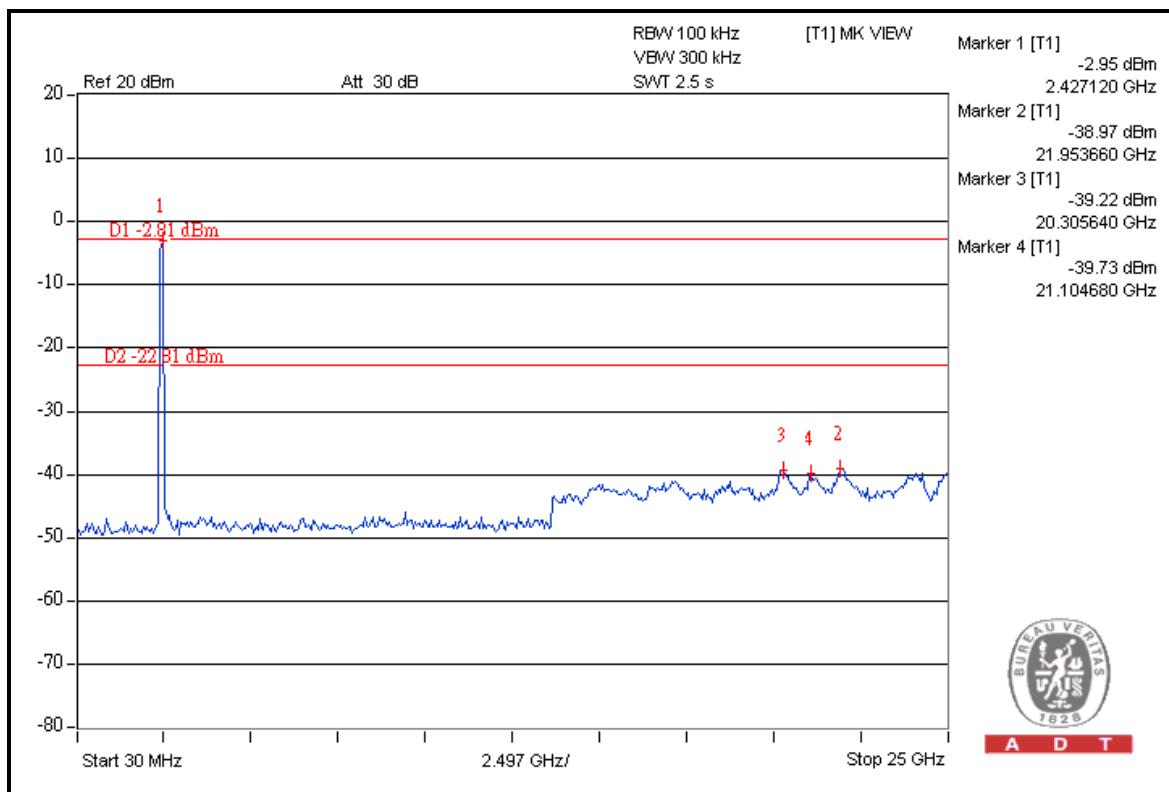
FOR CONDUCTED MEASURED

CHAIN 0

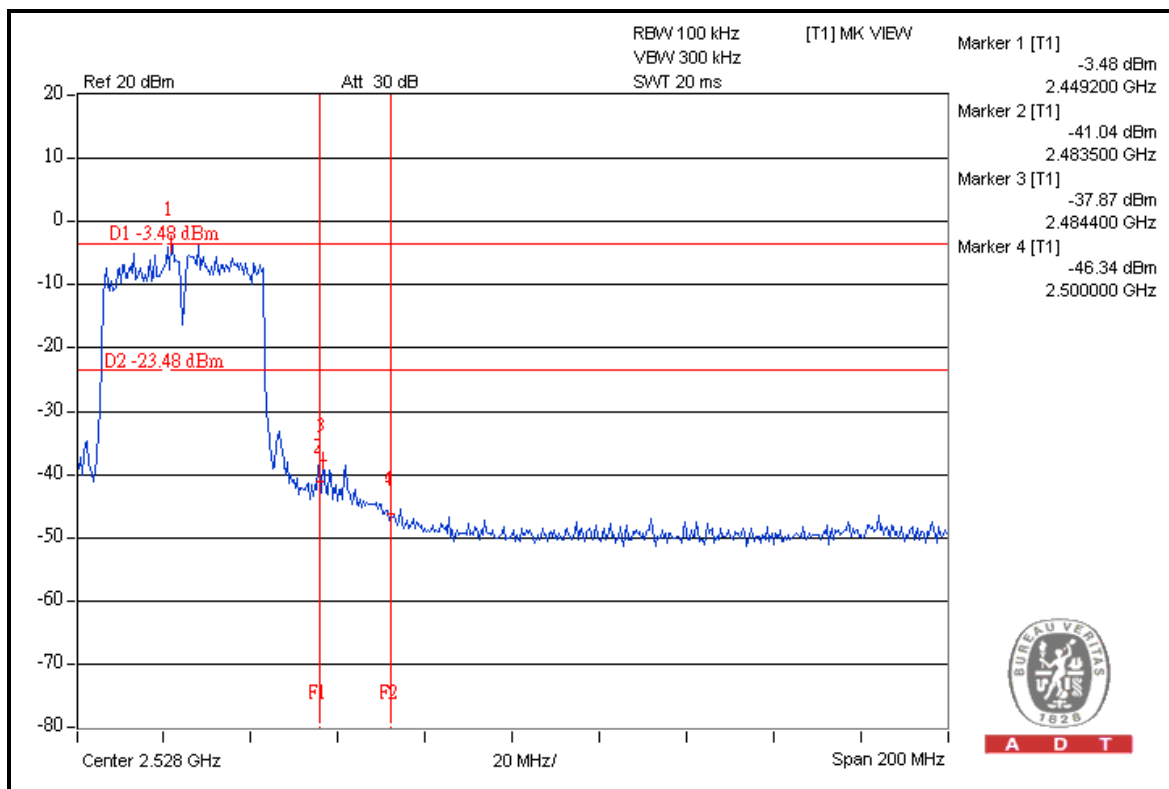




A D T



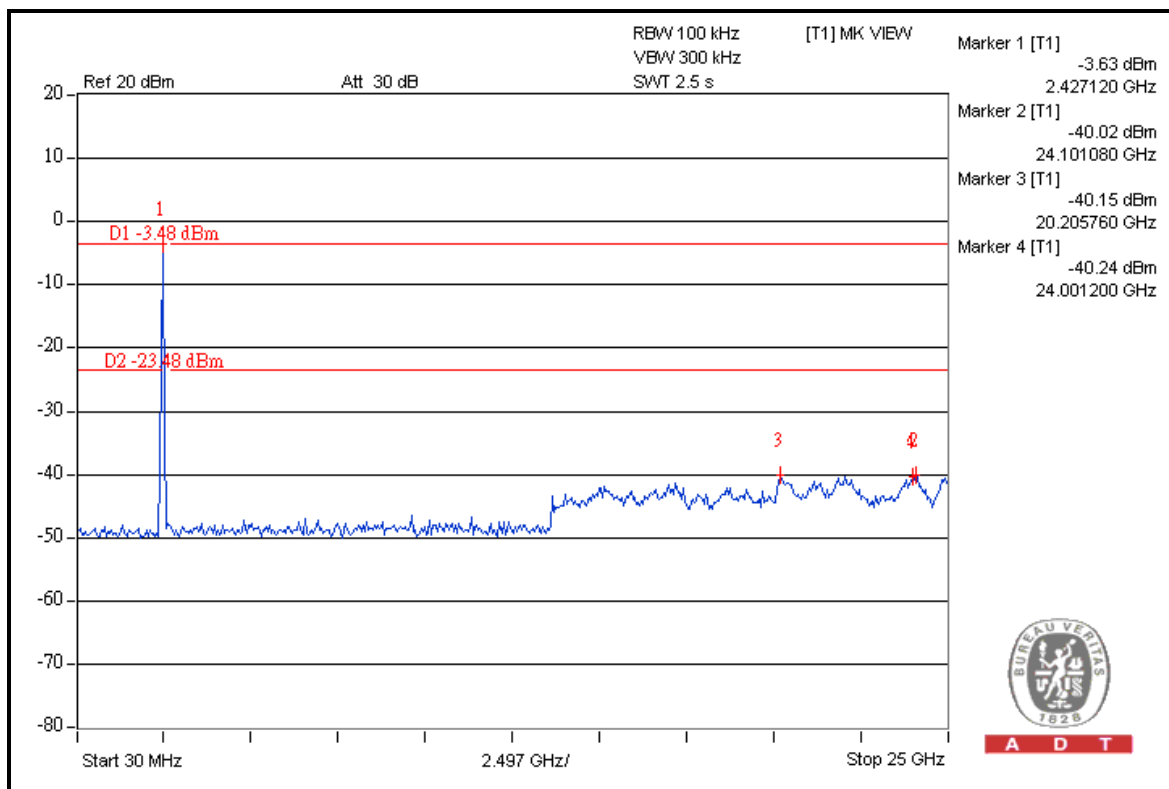
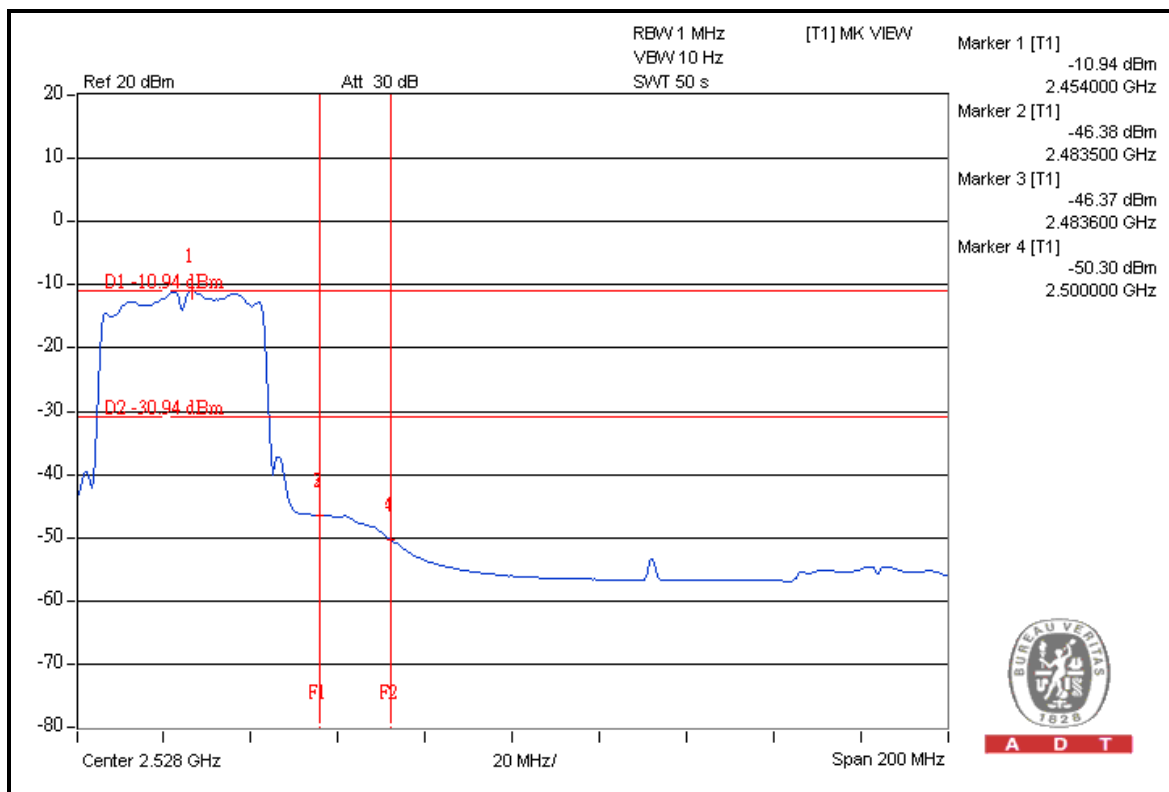
A D T



A D T



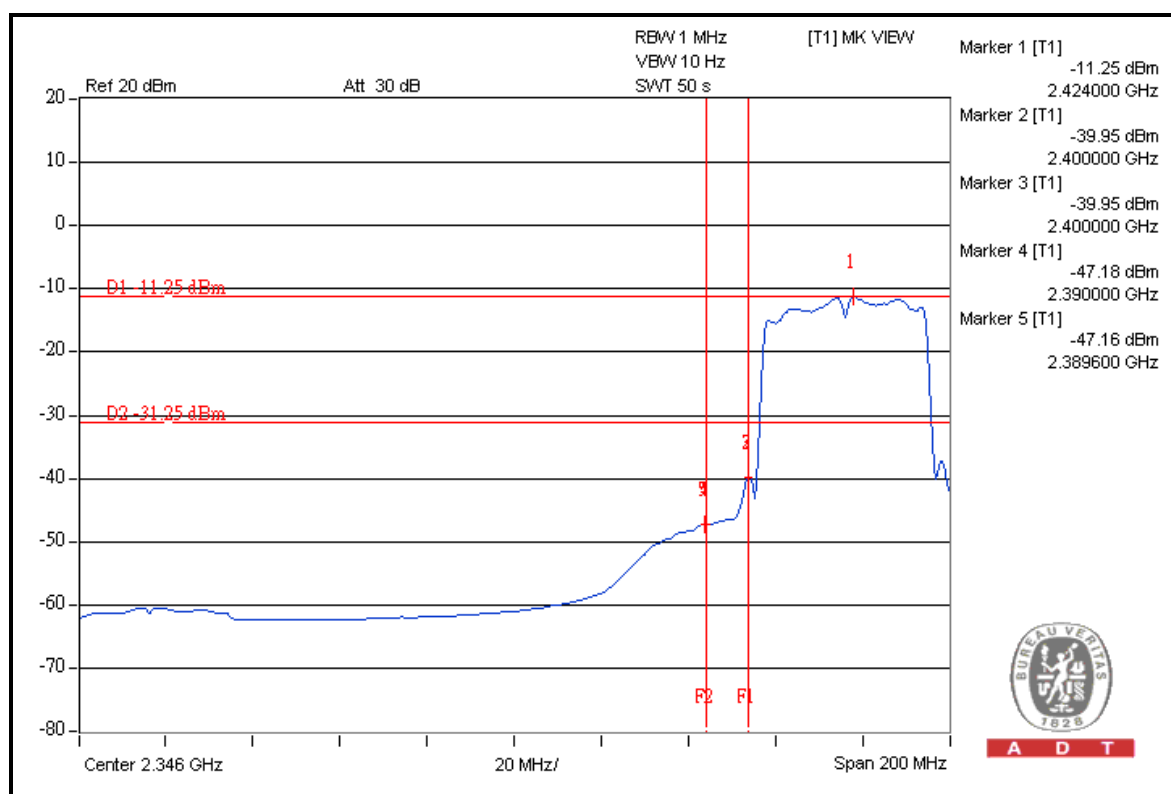
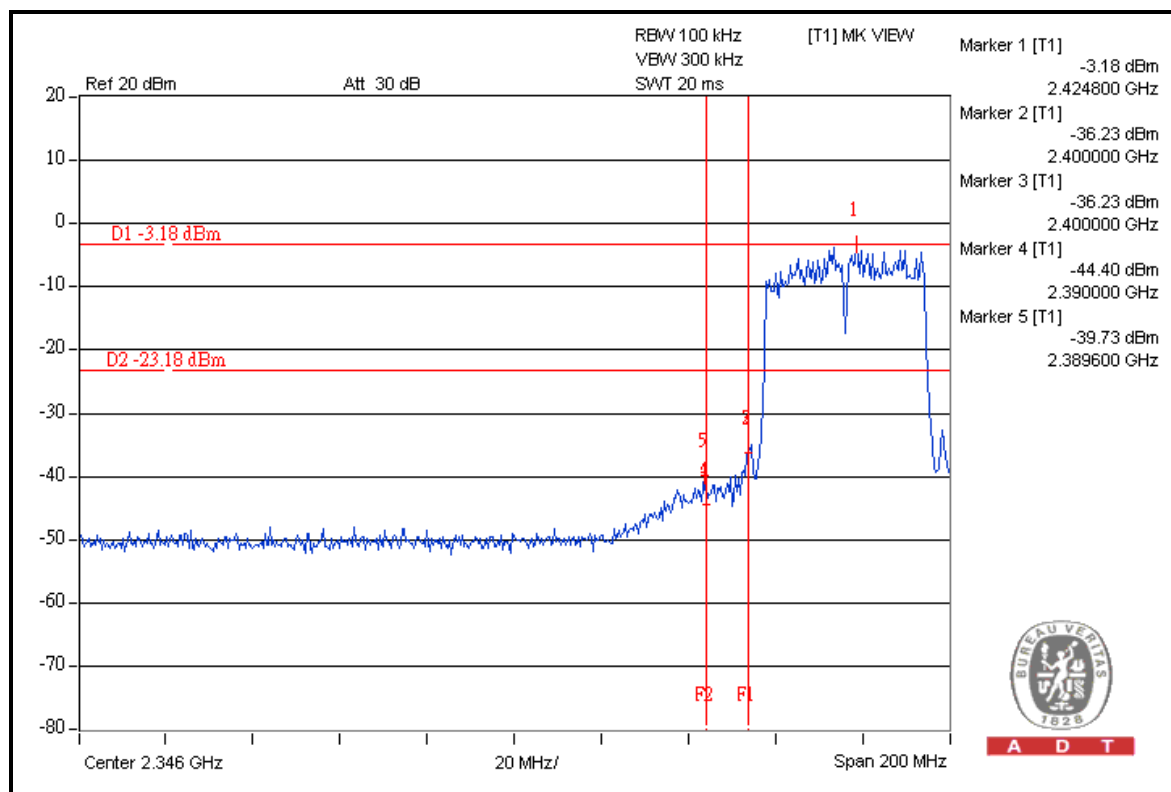
A D T





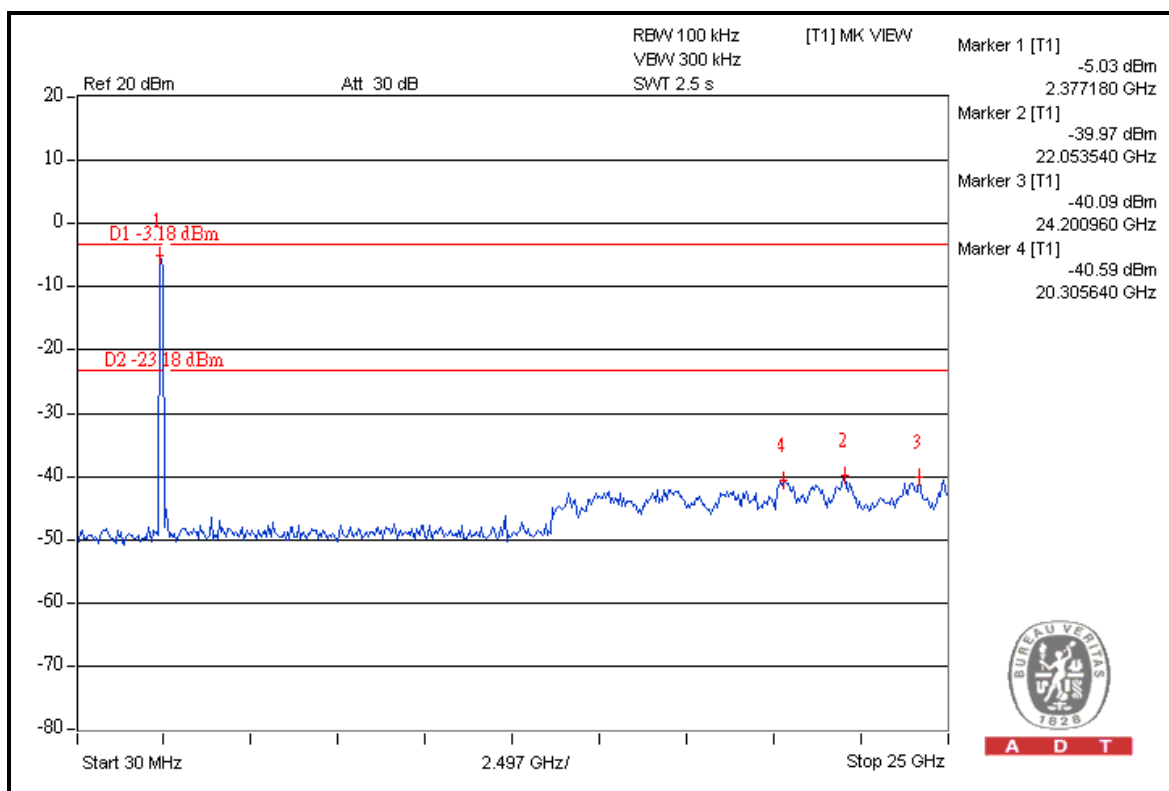
A D T

CHAIN 1

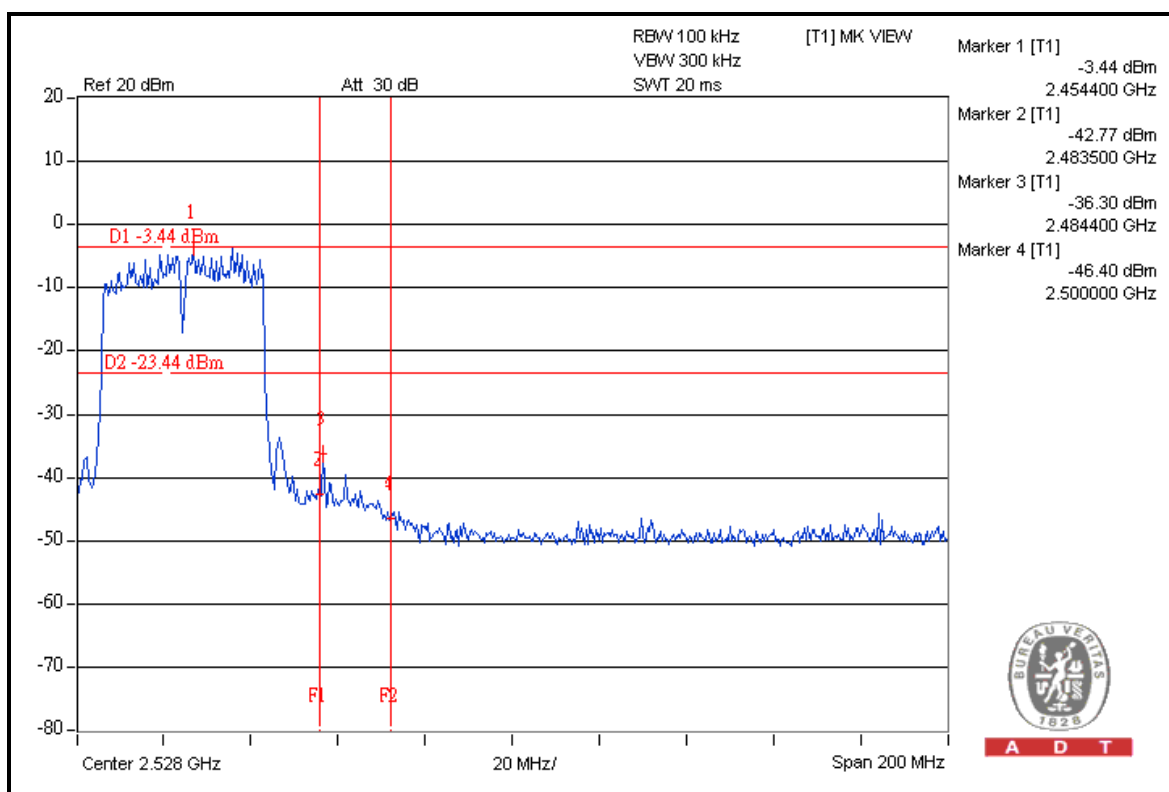




A D T



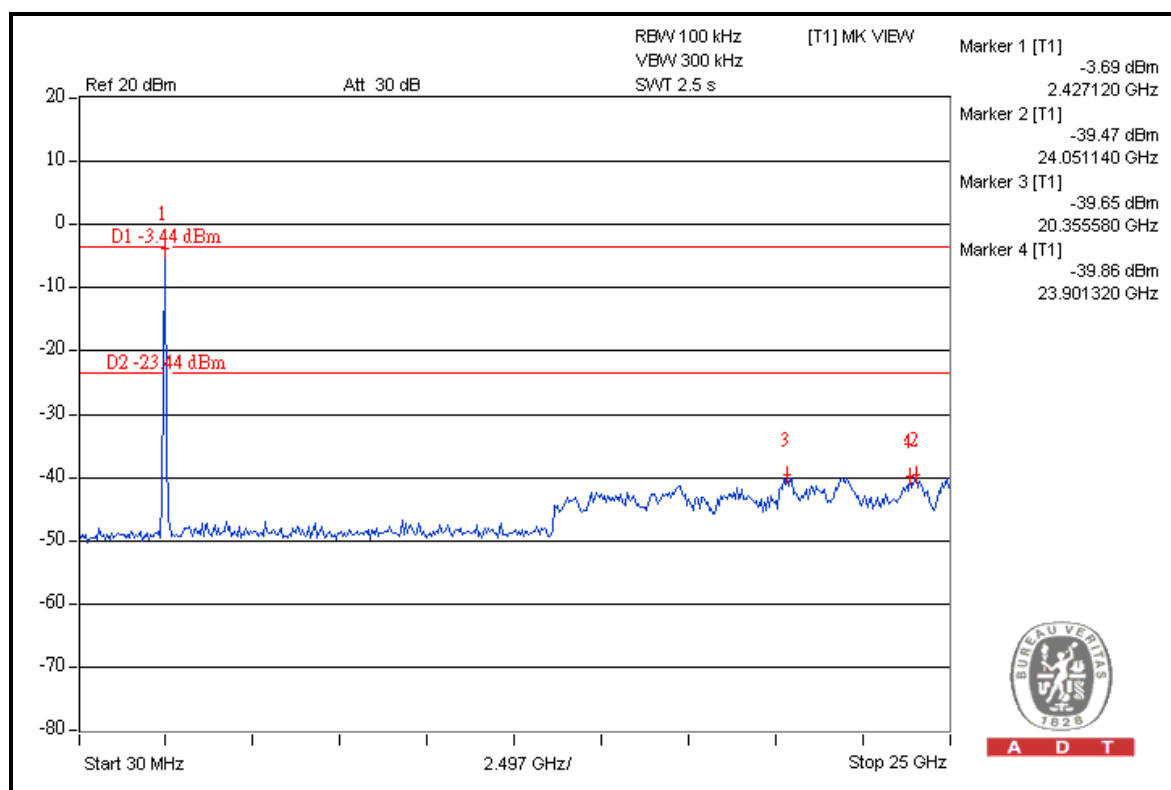
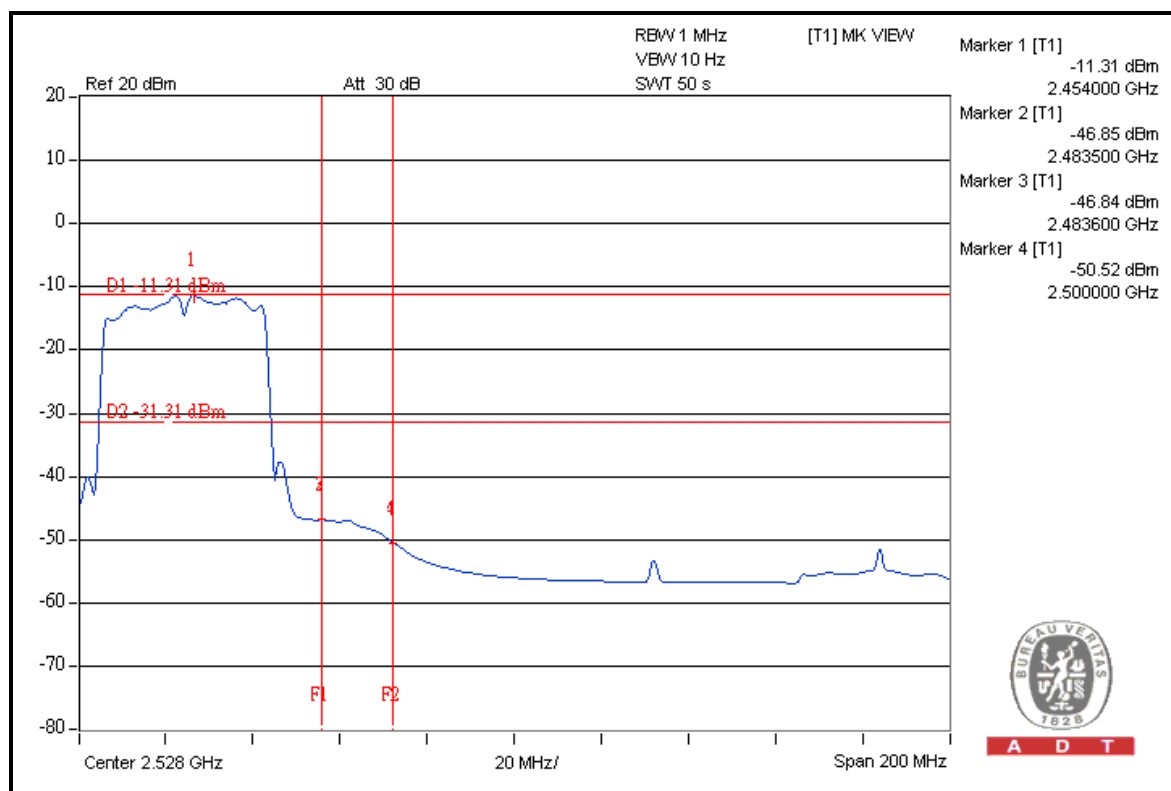
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5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



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6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

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: 886-2-26051924

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3185050

Email: service.adt@tw.bureauveritas.com

Web Site: www.adt.com.tw

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



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7. 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.

---END---