FCC TEST REPORT (15.407)

REPORT NO.:	RF110607C09-1
MODEL NO.:	SWW1810T /27 (refer to item 3.1 for more detail)
FCC ID:	YG7ZRF31200
RECEIVED:	Jun. 02, 2011
TESTED:	Jun. 03 ~ Jun. 24, 2011
ISSUED:	Jun. 29, 2011

APPLICANT:	Zinwell Corporation
ADDRESS:	7F., No. 512, Yuanshan Rd., Zhonghe Dist., New Taipei City 235, Taiwan (R.O.C.)

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
LAB ADDRESS:	No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang, Taipei Hsien 244, Taiwan, R.O.C.
TEST LOCATION:	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	NA	Jun. 29, 2011

1. CERTIFICATION

PRODUCT:	Wireless HD AV Connect Transmitter
MODEL:	SWW1810T /27 (refer to item 3.1 for more detail)
BRAND:	PHILIPS (refer to item 3.1 for more detail)
APPLICANT:	Zinwell Corporation
TESTED:	Jun. 03 ~ Jun. 24, 2011
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	**FCC Part 15, Subpart E (Section 15.407)**
	ANSI C63.4-2003
	ANSI C63.10-2009

The above equipment (Model: SWW1810T /27, WHD200T) 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 : Andrea Hsia / Specialist , **DATE :** Jun. 29, 2011

APPROVED BY : Gary Chang / Assistant Manager , **DATE :** Jun. 29, 2011

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART E (SECTION 15.407)			
STANDARD SECTION	**TEST TYPE AND LIMIT**	**RESULT**	**REMARK**
15.407(b)(5)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -14.72dB at 0.505MHz.
15.407(b/1/2/3) (b)(5)	Electric Field Strength Spurious Emissions, 30MHz ~ 40000MHz	PASS	Meet the requirement of limit. Minimum passing margin is -7.8dB at 5150.00 & 10380.00MHz.
15.407(a/1/2/3)	Peak Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit.
15.407(a/1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

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:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Wireless HD AV Connect Transmitter
MODEL NO.	SWW1810T /27, WHD200T
FCC ID	YG7ZRF31200
POWER SUPPLY	5Vdc
MODULATION TECHNOLOGY	OFDM
TRANSFER RATE	1Gbps
OPERATING FREQUENCY	5190.0 ~ 5230.0MHz
NUMBER OF CHANNEL	2
OUTPUT POWER	45.7mW
ANTENNA TYPE	Printed antenna with 4.0dBi gain (TX) Printed antenna with 6.2dBi gain (RX)
ANTENNA CONNECTOR	NA
DATA CABLE	1.5m shielded HDMI cable with 2 cores (for ZINWELL) 1.5m shielded HDMI cable with 1 core (for PHILIPS) 1.45m IR cable without core
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Adapter, Remote control

NOTE:

1. All models are listed as below.

ITEM	Brand	Model
1	PHILIPS	SWW1810T /27
2	ZINWELL	WHD200T

Difference	Brand: PHILIPS	Brand: ZINWELL
HDMI out (Loop through circuit)	-	√
External LED board	√	-
IR blaster cable	√	√
HDMI (Input) cable	With 1 core	With 2 cores

2. The EUT incorporates a MIMO function. Physically, the EUT provides four completed transmitters and one receiver for 5.0GHz band.

MODULATION MODE	TX FUNCTION
WHDI (40MHz)	4TX

3. The test data are separated into following test reports.

	TEST STANDARD	REFERENCE REPORT
WHDI (40MHz) (5755~5795 MHz)	FCC Part 15, Subpart C (Section 15.247)	RF110607C09
WHDI (40MHz) (5190~ 5230MHz)	FCC Part 15, Subpart E (Section 15.407)	RF110607C09-1

4. The frequency bands used in this EUT are listed as follows:

FREQUENCY BAND (MHz)	5190~5230	5755~5795
WHDI (40MHz)	√	√

5. The EUT was powered by the following adapter:

BRAND:	SINO-AMERICAN
MODEL:	SA110C-05S-A
INPUT:	100-240Vac, 50-60Hz, 0.3A
OUTPUT:	5Vdc, 2A, 10W
POWER LINE:	1.5m shielded cable 1 core

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.

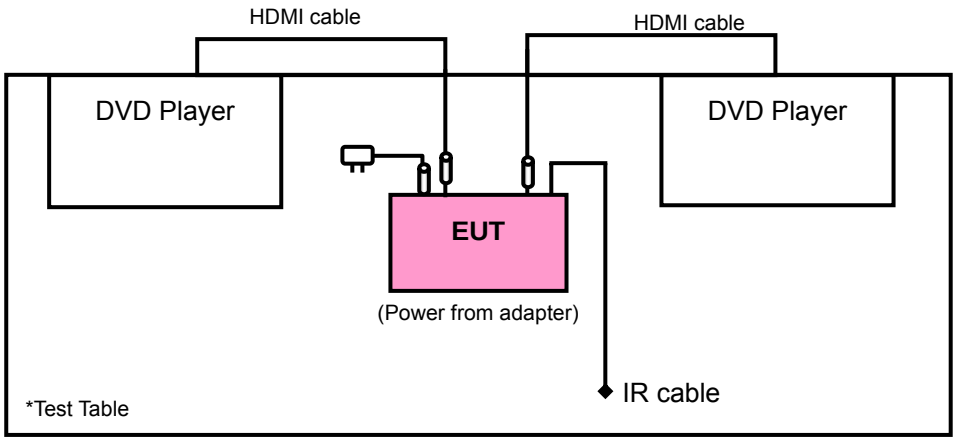
3.2 DESCRIPTION OF TEST MODES

2 channels are provided for WHDI (40MHz):

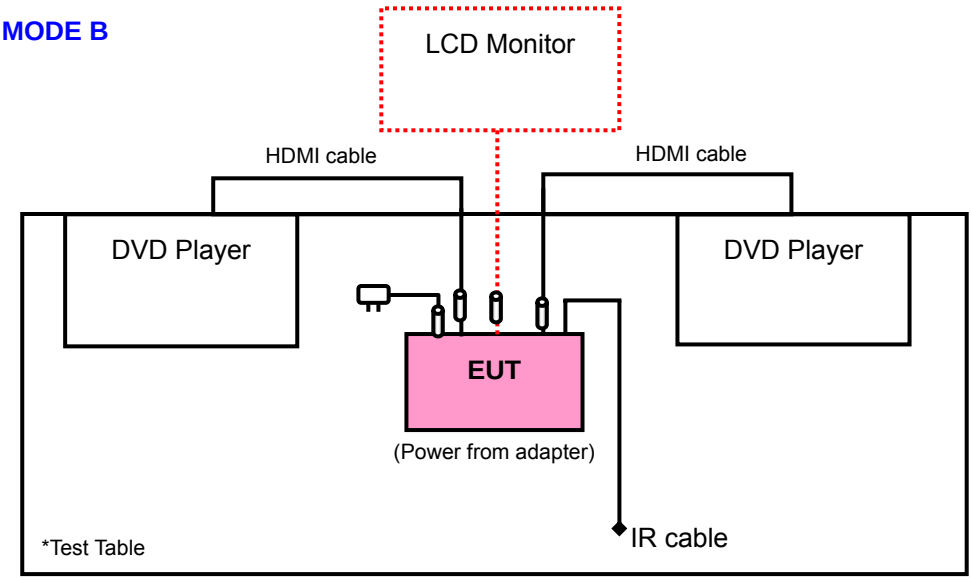
CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190MHz	46	5230MHz

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

TEST MODE A



TEST MODE B



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	EUT item 1 (Brand: PHILIPS)
B	-	√	√	-	EUT item 2 (Brand: ZINWELL)

Where **PLC:** Power Line Conducted Emission **RE<1G:** Radiated Emission below 1GHz
RE≥1G: Radiated Emission above 1GHz **APCM:** Antenna Port Conducted Measurement

NOTE: "-" means no effect.

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	DATA RATE (Gbps)	AXIS
A	WHDI (40MHz)	38 to 46	38, 46	OFDM	1	Z

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	DATA RATE (Gbps)	AXIS
A & B	WHDI (40MHz)	38 to 46	46	OFDM	1	Z

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	DATA RATE (Gbps)
A & B	WHDI (40MHz)	38 to 46	38, 46	OFDM	1

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	DATA RATE (Gbps)
A	WHDI (40MHz)	38 to 46	38, 46	OFDM	1

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	DATA RATE (Gbps)
A	WHDI (40MHz)	38 to 46	38, 46	OFDM	1

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 68%RH, 1017 hPa	120Vac, 60Hz	Sun Lin
RE<1G	25deg. C, 66%RH, 1016 hPa	120Vac, 60Hz	Brad Wu
PLC	25deg. C, 68%RH, 1014 hPa	120Vac, 60Hz	Sun Lin
APCM	25deg. C, 65%RH, 1015 hPa	120Vac, 60Hz	Sun Lin

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 E (15.407)
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	DVD PLAYER	SONY	DVP-NS975V	2030314	FCC DoC Approved
2	DVD PLAYER	SONY	DVP-NS975V	2030941	FCC DoC Approved
3	MONITOR	DELL	2408FPb	CN-0G293H-74261 -874-237S-A00	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.5m shielded HDMI cable with 1 core
2	1.5m shielded HDMI cable with 1 core
3	1.5m shielded HDMI cable with 1 core

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

NOTE 2: HDMI cables were supplied from client.

4. TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 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.

4.1.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

FREQUENCIES (MHz)	EIRP LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBμV/m) *NOTE 3
	PK	PK
5150 ~ 5250	-27	68.3

NOTE: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts).

4.1.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Aug. 04, 2010	Aug. 03, 2011
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Jul. 09, 2010	Jul. 08, 2011
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Apr. 12, 2011	Apr. 11, 2012
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-209	Aug. 02, 2010	Aug. 01, 2011
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 27, 2010	Dec. 26, 2011
Preamplifier Agilent	8449B	3008A01910	Sep. 09, 2010	Sep. 08, 2011
Preamplifier Agilent	8447D	2944A10638	Nov. 03, 2010	Nov. 02, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295013/4 283403/4	Sep 03, 2010	Sep 03, 2011
RF signal cable Worken	8D-FB	Cable-HYCH9-01	Aug. 20, 2010	Aug. 19, 2011
Software	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn Table Controller EMCO	2090	NA	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	07026401	Aug. 25, 2010	Aug. 24, 2011

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 HwaYa Chamber 9.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 460141.
5. The IC Site Registration No. is IC 7450F-4.

4.1.4 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. 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 10dB 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 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

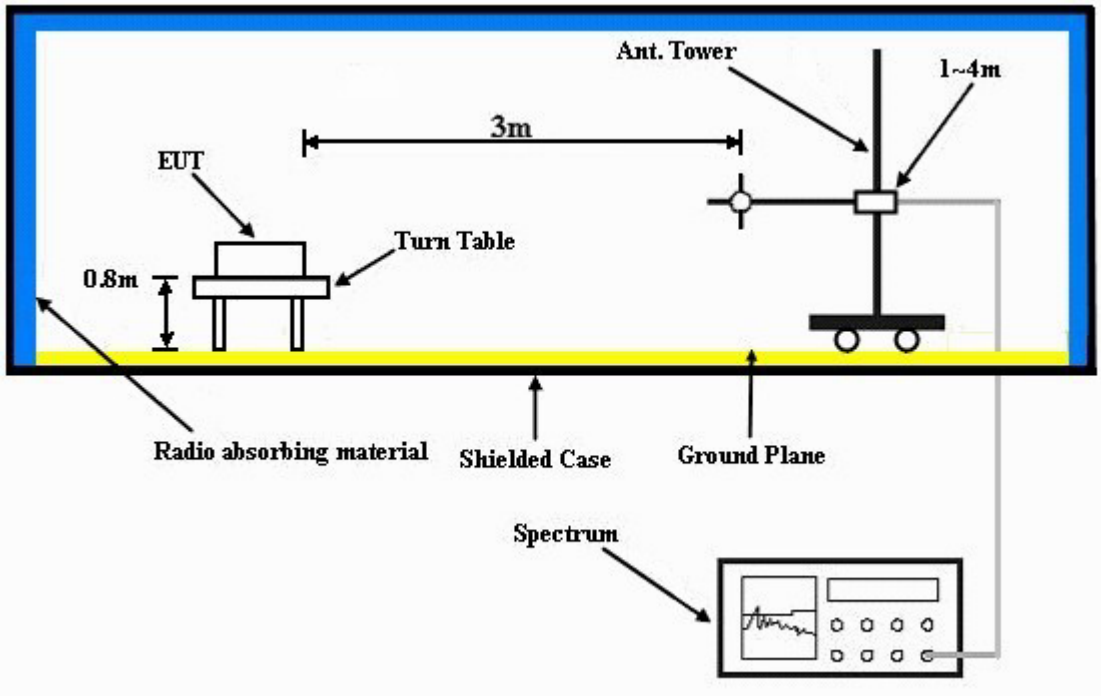
NOTE:

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

4.1.5 DEVIATION FROM TEST STANDARD

No deviation.

4.1.6 TEST SETUP



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

4.1.7 EUT OPERATING CONDITION

TEST MODE A

a. Placed the EUT on the testing table.

b. Prepared the DVD player on test table to act as a communication partners.

c. The communication partners ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.

TEST MODE B

a. Placed the EUT on the testing table.

b. Prepared the DVD player on test table & LCD monitor under the test table to act as a communication partners.

c. The communication partners ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.

4.1.8 TEST RESULTS

ABOVE 1GHz WORST-CASE DATA：

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 38	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH 1017 hPa	TESTED BY	Sun Lin

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	5150.00	58.1 PK	74.0	-15.9	1.18 H	337	18.90	39.20
2	5150.00	42.0 AV	54.0	-12.0	1.18 H	337	2.80	39.20
3	*5190.00	104.2 PK			1.09 H	330	64.90	39.30
4	*5190.00	90.7 AV			1.09 H	330	51.40	39.30
5	#10380.00	59.3 PK	68.3	-9.0	1.00 H	62	9.50	49.80
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	5150.00	62.4 PK	74.0	-11.6	1.07 V	190	23.20	39.20
2	**5150.00**	**46.2 AV**	**54.0**	**-7.8**	**1.07 V**	**190**	**7.00**	**39.20**
3	*5190.00	108.8 PK			1.08 V	194	69.50	39.30
4	*5190.00	94.7 AV			1.08 V	194	55.40	39.30
5	**#10380.00**	**60.5 PK**	**68.3**	**-7.8**	**1.29 V**	**120**	**10.70**	**49.80**

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.
5. " * ": Fundamental frequency.
6. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 46	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH 1017 hPa	TESTED BY	Sun Lin

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	*5230.00	104.8 PK			1.00 H	336	65.50	39.30
2	*5230.00	91.2 AV			1.00 H	336	51.90	39.30
3	5350.00	48.3 PK	74.0	-25.7	1.00 H	336	8.80	39.50
4	5350.00	34.8 AV	54.0	-19.2	1.00 H	336	-4.70	39.50
5	#10460.00	58.8 PK	68.3	-9.5	1.00 H	50	8.90	49.90
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	*5230.00	109.1 PK			1.18 V	192	69.80	39.30
2	*5230.00	95.2 AV			1.18 V	192	55.90	39.30
3	5350.00	49.1 PK	74.0	-24.9	1.18 V	193	9.60	39.50
4	5350.00	36.0 AV	54.0	-18.0	1.18 V	193	-3.50	39.50
5	#10460.00	60.0 PK	68.3	-8.3	1.22 V	120	10.10	49.90

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.

6. "#":The radiated frequency is out the restricted band.

BELOW 1GHz WORST-CASE DATA：802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 46	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH 1016 hPa	TEST MODE	A
TESTED BY	Brad Wu		

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	125.17	29.5 QP	43.5	-14.0	2.00 H	280	17.50	12.00
2	220.44	32.7 QP	46.0	-13.3	1.00 H	115	21.50	11.20
3	319.60	36.1 QP	46.0	-9.9	1.00 H	127	21.00	15.10
4	444.03	33.4 QP	46.0	-12.6	1.00 H	28	15.30	18.10
5	541.25	35.4 QP	46.0	-10.6	1.00 H	127	14.70	20.70
6	762.90	30.3 QP	46.0	-15.7	1.00 H	16	6.40	23.90
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	134.89	32.7 QP	43.5	-10.8	1.00 V	10	19.40	13.30
2	162.11	32.5 QP	43.5	-11.0	1.00 V	292	18.30	14.20
3	405.15	33.1 QP	46.0	-12.9	1.50 V	49	16.00	17.10
4	541.25	34.1 QP	46.0	-11.9	1.25 V	19	13.40	20.70
5	568.47	31.3 QP	46.0	-14.7	1.00 V	178	10.00	21.30
6	661.79	29.8 QP	46.0	-16.2	1.00 V	40	7.00	22.80

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 46	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 63%RH 1016 hPa	TEST MODE	B
TESTED BY	Brad Wu		

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	101.84	24.9 QP	43.5	-18.6	2.00 H	13	16.20	8.70
2	319.60	25.8 QP	46.0	-20.2	1.00 H	310	10.70	15.10
3	601.52	27.5 QP	46.0	-18.5	1.25 H	211	5.40	22.10
4	700.68	33.5 QP	46.0	-12.5	1.00 H	256	10.30	23.20
5	803.73	33.0 QP	46.0	-13.0	1.00 H	163	8.50	24.50
6	902.89	33.5 QP	46.0	-12.5	2.00 H	181	7.40	26.10
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	140.72	28.0 QP	43.5	-15.5	1.25 V	70	14.20	13.80
2	175.72	23.8 QP	43.5	-19.7	1.25 V	46	12.00	11.80
3	319.60	23.0 QP	46.0	-23.0	1.50 V	121	7.90	15.10
4	560.69	24.8 QP	46.0	-21.2	1.25 V	85	3.60	21.20
5	700.68	32.6 QP	46.0	-13.4	2.00 V	16	9.40	23.20
6	937.88	29.0 QP	46.0	-17.0	1.00 V	316	2.60	26.40

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.

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	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.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 23, 2010	Nov. 22, 2011
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 30, 2010	Dec. 29, 2011
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Jan. 06, 2011	Jan. 05, 2012
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jul. 08, 2010	Jul. 07, 2011
V-LISN SCHWARZBECK	NNBL 8226-2	8226-142	Jul. 12, 2010	Jul. 11, 2011
LISN ROHDE & SCHWARZ	ENV216	100072	Jun. 10, 2011	Jun. 09, 2012
Software ADT	ADT_Cond_ V7.3.7	NA	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 test was performed in HwaYa Shielded Room 2.

3. The VCCI Site Registration No. is C-2047.

4.2.3 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.

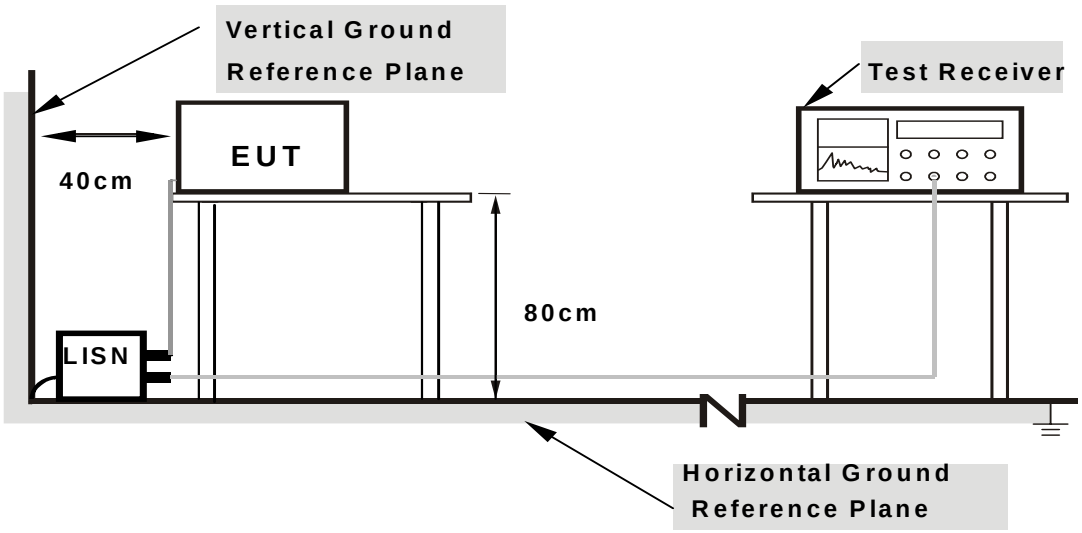
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 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).

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

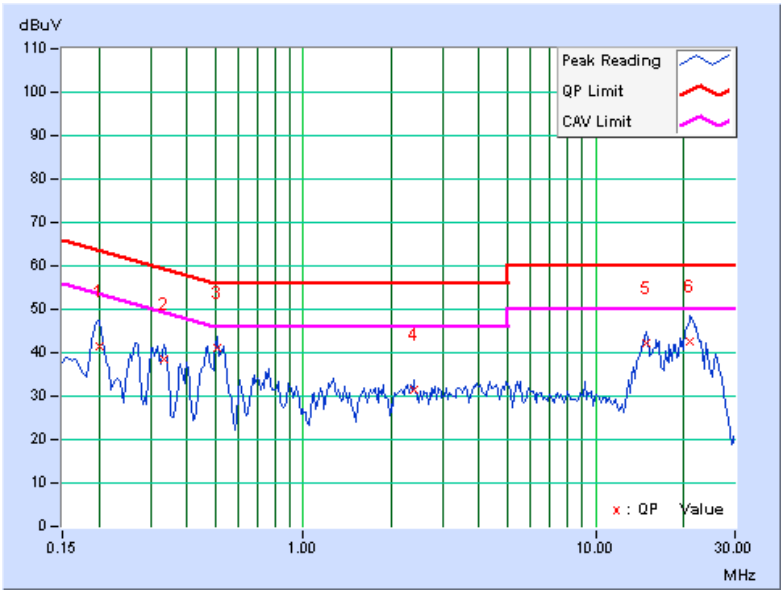
4.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA：

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	A		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.201	0.15	41.24	-	41.39	-	63.58	53.58	-22.19	-
2	0.334	0.16	38.53	-	38.69	-	59.36	49.36	-20.67	-
3	**0.505**	**0.17**	**41.11**	**-**	**41.28**	**-**	**56.00**	**46.00**	**-14.72**	**-**
4	2.383	0.24	31.18	-	31.42	-	56.00	46.00	-24.58	-
5	14.996	0.87	41.38	-	42.25	-	60.00	50.00	-17.75	-
6	21.098	1.16	41.42	-	42.58	-	60.00	50.00	-17.42	-

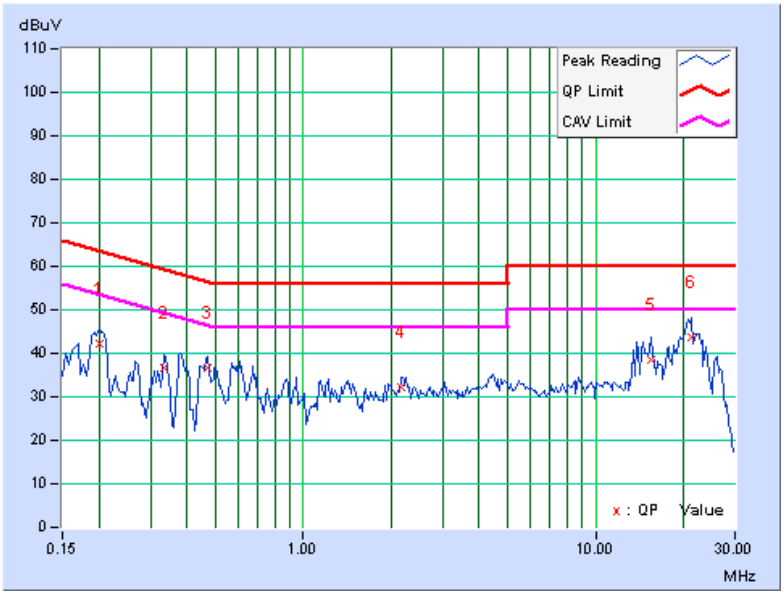
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



PHASE	Line2	6dB BANDWIDTH	9kHz
TEST MODE	A		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.201	0.17	41.90	-	42.07	-	63.58	53.58	-21.51	-
2	0.334	0.18	36.39	-	36.57	-	59.36	49.36	-22.79	-
3	0.470	0.19	36.64	-	36.83	-	56.51	46.51	-19.68	-
4	2.172	0.24	31.87	-	32.11	-	56.00	46.00	-23.89	-
5	15.504	0.75	37.83	-	38.58	-	60.00	50.00	-21.42	-
6	21.313	0.95	42.72	-	43.67	-	60.00	50.00	-16.33	-

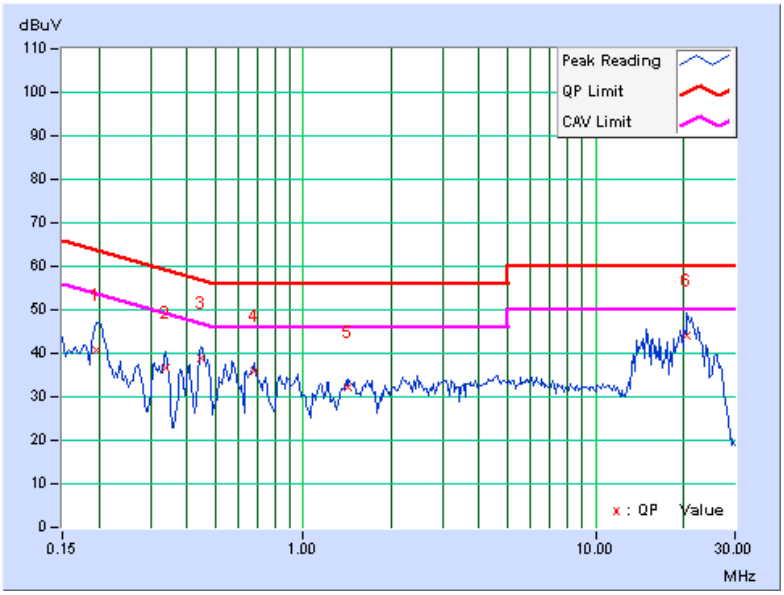
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.197	0.15	40.50	-	40.65	-	63.74	53.74	-23.09	-
2	0.338	0.16	36.63	-	36.79	-	59.26	49.26	-22.47	-
3	0.447	0.17	38.77	-	38.94	-	56.93	46.93	-17.99	-
4	0.677	0.18	35.57	-	35.75	-	56.00	46.00	-20.25	-
5	1.426	0.20	31.98	-	32.18	-	56.00	46.00	-23.82	-
6	20.602	1.15	42.84	-	43.99	-	60.00	50.00	-16.01	-

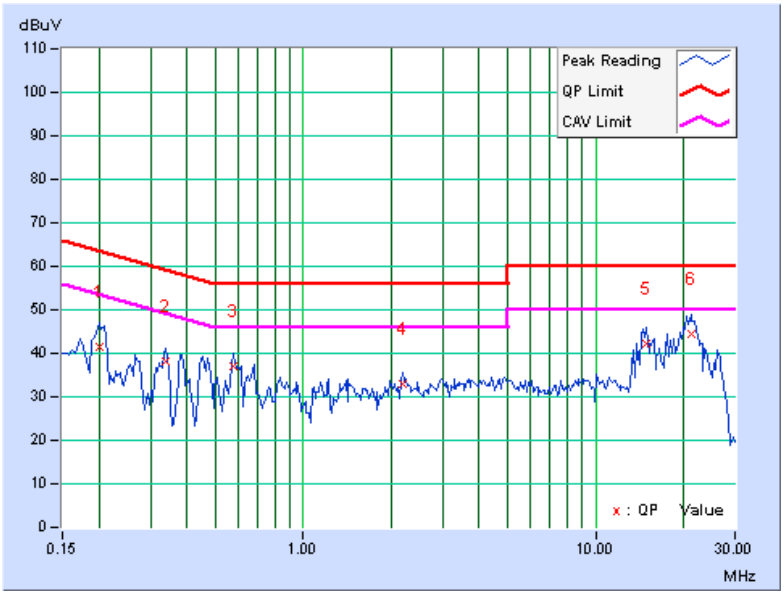
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



PHASE	Line2	6dB BANDWIDTH	9kHz
TEST MODE	B		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.201	0.17	41.26	-	41.43	-	63.58	53.58	-22.15	-
2	0.338	0.18	38.11	-	38.29	-	59.26	49.26	-20.97	-
3	0.576	0.20	36.94	-	37.14	-	56.00	46.00	-18.86	-
4	2.188	0.24	32.77	-	33.01	-	56.00	46.00	-22.99	-
5	14.996	0.73	41.42	-	42.15	-	60.00	50.00	-17.85	-
6	21.199	0.95	43.58	-	44.53	-	60.00	50.00	-15.47	-

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.



4.3 PEAK TRANSMIT POWER MEASUREMENT

4.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

FREQUENCY BAND	LIMIT
5.15 ~ 5.25GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB

NOTE: Where B is the 26dB emission bandwidth in MHz.

4.3.2 TEST INSTRUMENTS

FOR POWER OUTPUT MEASUREMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
High Speed Peak Power Meter	ML2495A	0824011	Aug. 02, 2010	Aug. 01, 2011
Power Sensor	MA2411B	0738171	Aug. 02, 2010	Aug. 01, 2011

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 26dB bandwidth of emission.

FOR 26dB OCCUPIED BANDWIDTH

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
SPECTRUM ANALYZER R&S	FSP40	100040	Jul. 17, 2010	Jul. 16, 2011

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

4.3.3 TEST PROCEDURE

FOR 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 26dB OCCUPIED BANDWIDTH

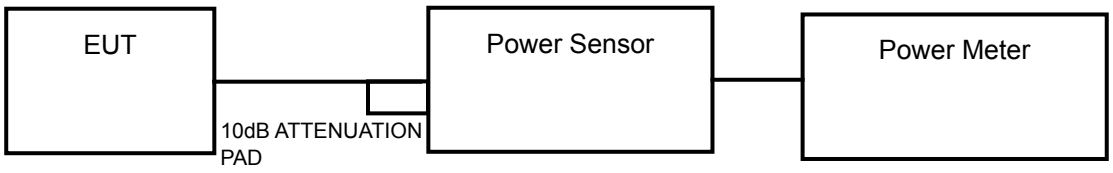
The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 300kHz RBW and 1MHz VBW. The 26dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 26dB.

4.3.4 DEVIATION FROM TEST STANDARD

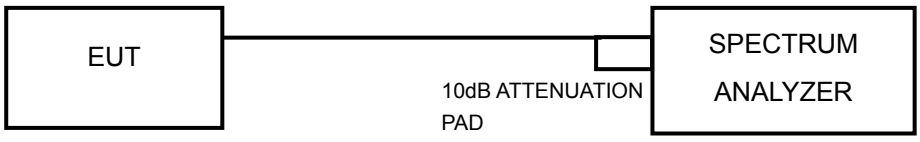
No deviation.

4.3.5 TEST SETUP

FOR POWER OUTPUT MEASUREMENT



FOR 26dB OCCUPIED BANDWIDTH



4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.3.7 TEST RESULTS

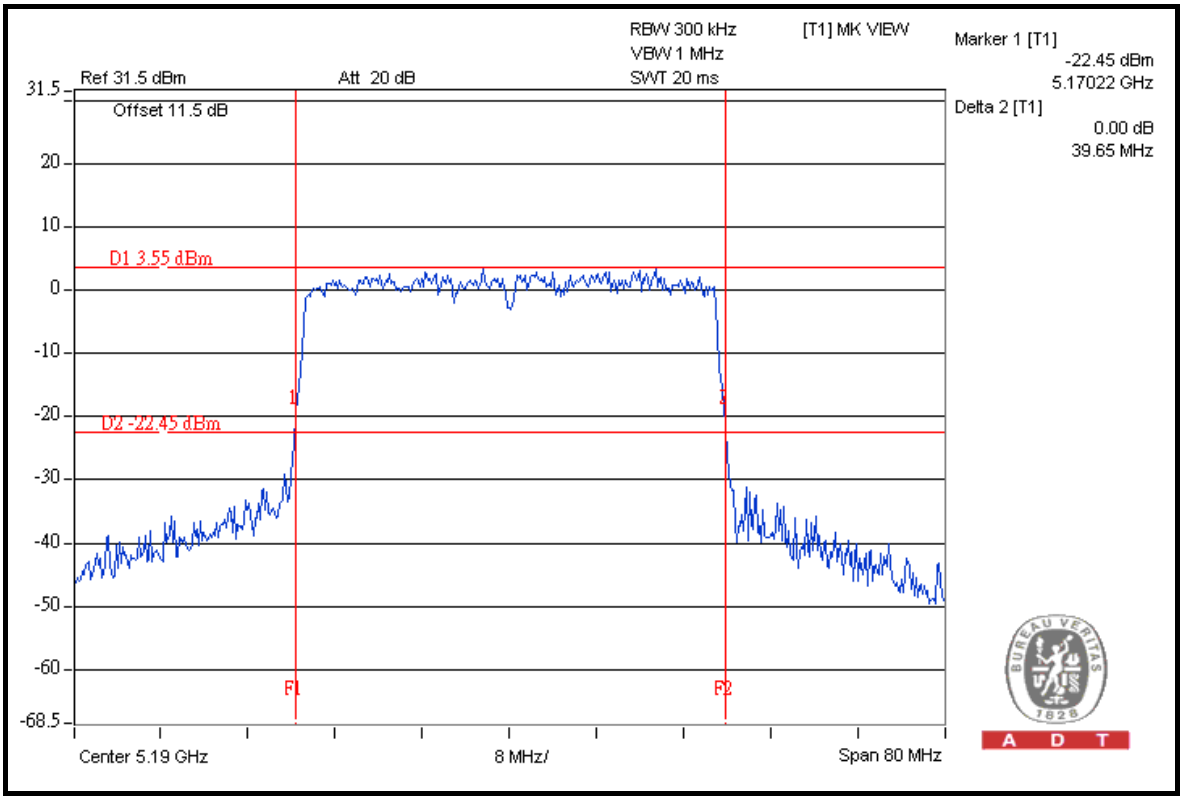
POWER OUTPUT:

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)				TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 3				
38	5190	10.5	10.7	10.6	10.5	45.7	16.6	17	PASS
46	5230	10.5	10.5	10.6	10.7	45.7	16.6	17	PASS

26dB OCCUPIED BANDWIDTH:

CHAN.	CHAN. FREQ. (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)				PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 3	
38	5190	39.65	39.60	39.61	39.58	PASS
46	5230	39.62	39.50	39.76	39.63	PASS

FOR CHAIN 0: CH 38



4.4 PEAK POWER EXCURSION MEASUREMENT

4.4.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

FREQUENCY BAND	LIMIT
5.15 ~ 5.25GHz	13dB

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
SPECTRUM ANALYZER R&S	FSP40	100040	Jul. 17, 2010	Jul. 16, 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 PROCEDURE

a. The transmitter output was connected to the spectrum analyzer.

b. Set the spectrum bandwidth span to view the entire spectrum.

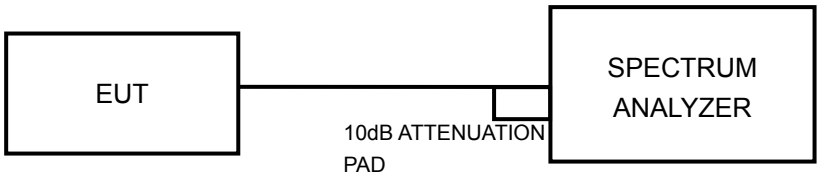
c. Using peak detector and Max-hold function for Trace 1 (RB = 1MHz, VB = 3MHz) and 2 (RB = 1MHz, VB = 300kHz).

d. The differences between Trace1 and Trace 2 in any 1MHz band at f1 to f2 range were recorded and showed to another trace.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP



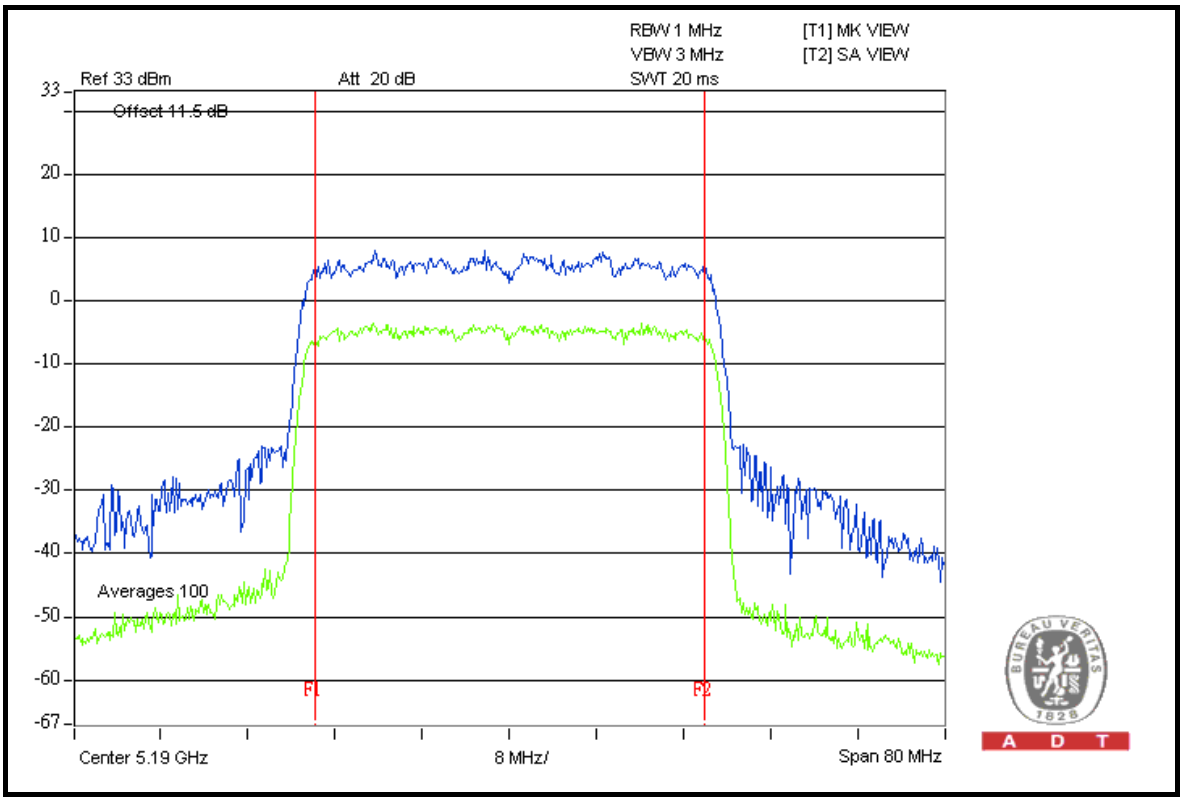
4.4.6 EUT OPERATING CONDITIONS

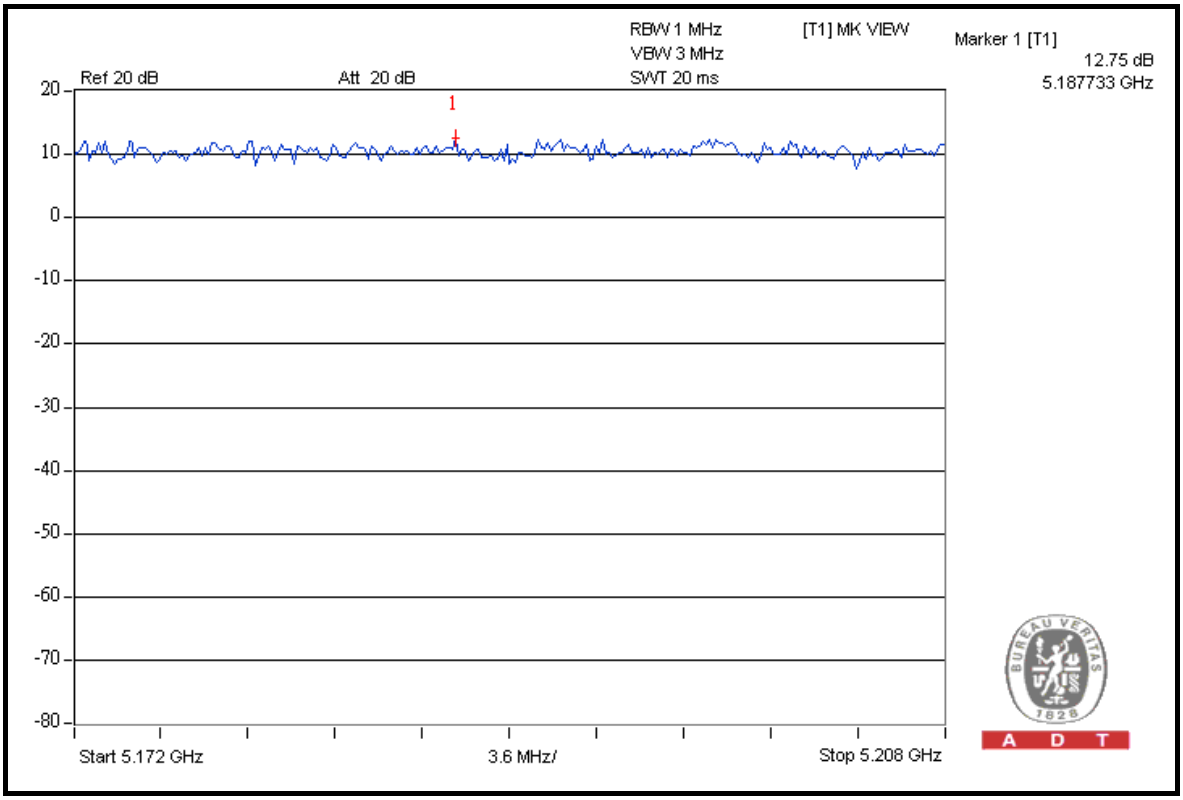
The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.4.7 TEST RESULTS

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER EXCURSION (dB)				PEAK TO AVERAGE EXCURSION LIMIT (dB)	PASS/ FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 3		
38	5190	12.75	12.11	12.40	12.70	13	PASS
46	5230	12.67	12.08	12.37	11.98	13	PASS

FOR CHAIN 0: CH 38





4.5 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

FREQUENCY BAND	LIMIT
5.15 ~ 5.25GHz	4dBm

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
SPECTRUM ANALYZER R&S	FSP40	100040	Jul. 17, 2010	Jul. 16, 2011

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

4.5.3 TEST PROCEDURES

a. The transmitter output was connected to the spectrum analyzer.

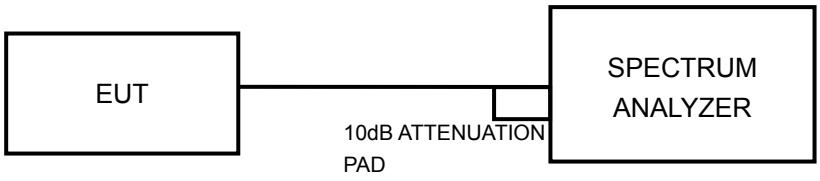
b. Set RBW = 1MHz, VBW = 3MHz. The PPSD is the highest level found across the emission in any 1MHz band.

c. Follow method 2 of KDB 662911 D01 Multiple Transmitter Output v01 to calculate total power density of 4 TX port.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation.

4.5.5 TEST SETUP



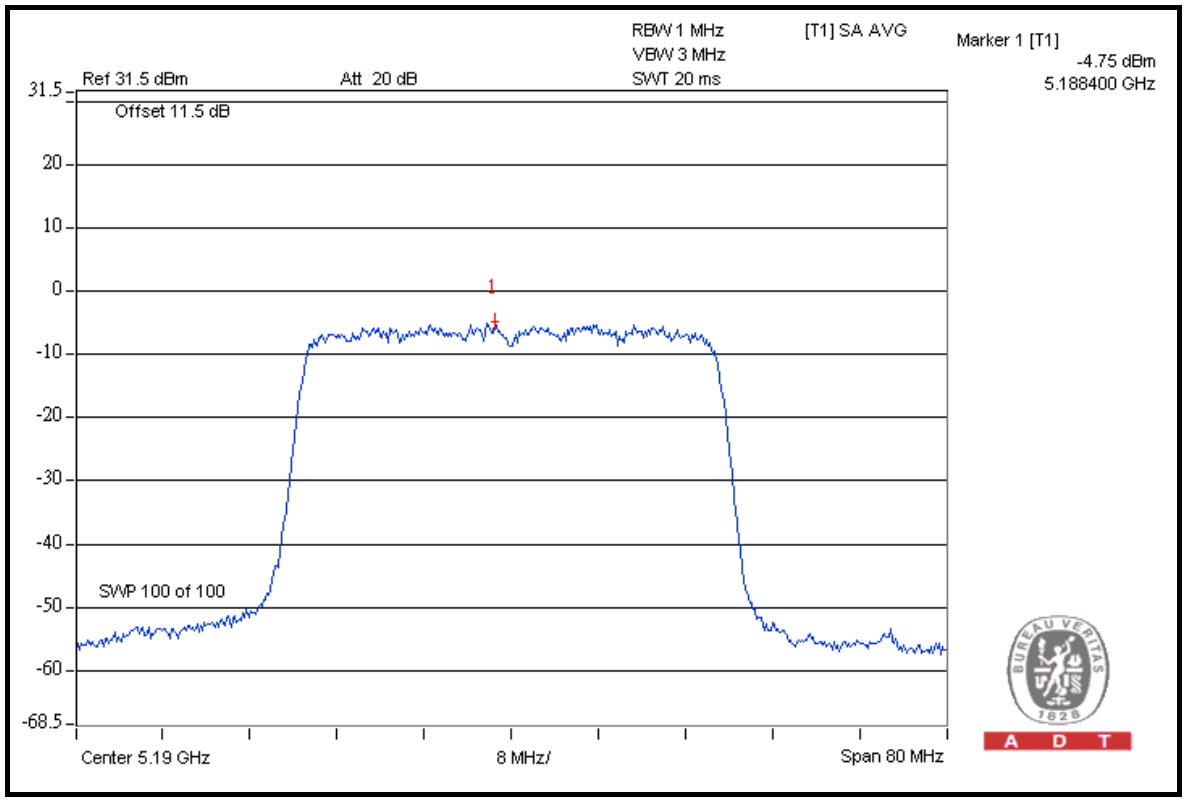
4.5.6 EUT OPERATING CONDITIONS

Same as 4.3.6.

4.5.7 TEST RESULTS

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=4) dB			
0	38	5190	-6.2	6.02	-0.2	4	PASS
	46	5230	-6.4	6.02	-0.4	4	PASS
1	38	5190	-4.8	6.02	1.2	4	PASS
	46	5230	-4.9	6.02	1.1	4	PASS
2	38	5190	-5.1	6.02	0.9	4	PASS
	46	5230	-5.1	6.02	0.9	4	PASS
3	38	5190	-5.6	6.02	0.4	4	PASS
	46	5230	-5.3	6.02	0.7	4	PASS

FOR CHAIN 1: CH 38



4.6 FREQUENCY STABILITY

4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency tolerance of the carrier signal shall be maintained within the band of operation frequency over a temperature variation of –20 degrees to 55 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
SPECTRUM ANALYZER R&S	FSP40	100039	Jul. 09, 2010	Jul. 08, 2011
WIT STANDARD TEMPERATURE AND HUMIDITY CHAMBER	TH-4S-C	W981030	Jun. 28, 2010	Jun. 27, 2011

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

4.6.3 TEST PROCEDURE

a. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.

b. Turn the EUT on and couple its output to a spectrum analyzer.

c. Turn the EUT off and set the chamber to the highest temperature specified.

d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.

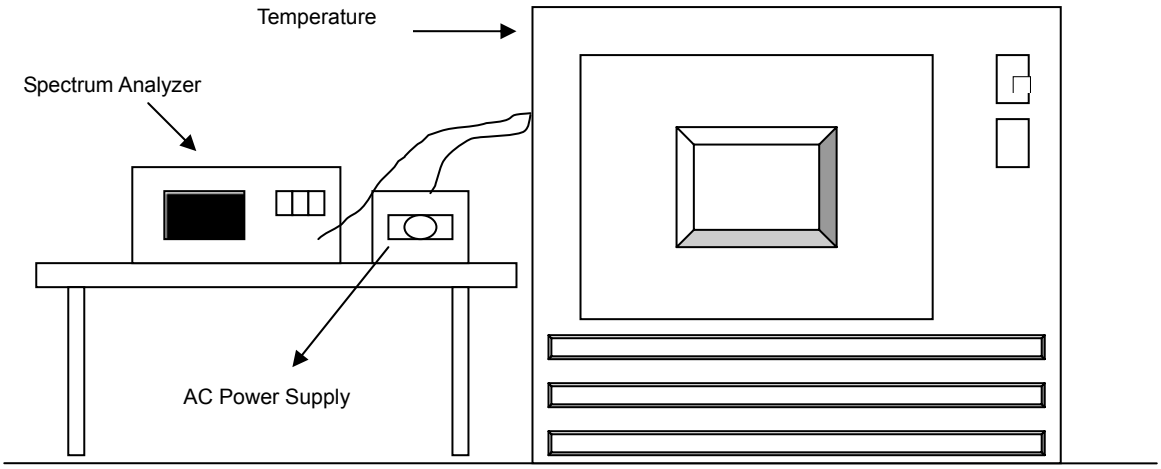
e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.

f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation.

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

Same as Item 4.1.6.

4.6.7 TEST RESULTS

FREQUEMCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5230MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
55	110.0	5230.001409	0.269	5230.001799	0.344	5230.001951	0.373	5230.001596	0.305
50	110.0	5230.002144	0.410	5230.001828	0.350	5230.002697	0.516	5230.002218	0.424
40	110.0	5230.002857	0.546	5230.002820	0.539	5230.003012	0.576	5230.003481	0.666
30	110.0	5230.042862	8.195	5230.043121	8.245	5230.043226	8.265	5230.042878	8.198
20	110.0	5230.007472	1.429	5230.007317	1.399	5230.007264	1.389	5230.007732	1.478
10	110.0	5230.002592	0.496	5230.002756	0.527	5230.002615	0.500	5230.002790	0.533
0	110.0	5230.000191	0.037	5230.000490	0.094	5230.000028	0.005	5230.000503	0.096
-10	110.0	5230.007184	1.374	5230.007024	1.343	5230.007291	1.394	5230.007153	1.368
-20	110.0	5230.024909	4.763	5230.025351	4.847	5230.025407	4.858	5230.024743	4.731
-30	110.0	5230.038713	7.402	5230.038963	7.450	5230.038753	7.410	5230.039048	7.466

FREQUEMCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5230MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
20	93.5	5230.043177	8.256	5230.042677	8.160	5230.042803	8.184	5230.043132	8.247
	110.0	5230.007472	1.429	5230.007317	1.399	5230.007264	1.389	5230.007732	1.478
	126.5	5230.002741	0.524	5230.002945	0.563	5230.002984	0.571	5230.002312	0.442

4.7 BAND EDGES MEASUREMENT

4.7.1 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Aug. 04, 2010	Aug. 03, 2011
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Jul. 09, 2010	Jul. 08, 2011
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Apr. 12, 2011	Apr. 11, 2012
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-209	Aug. 02, 2010	Aug. 01, 2011
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 27, 2010	Dec. 26, 2011
Preamplifier Agilent	8449B	3008A01910	Sep. 09, 2010	Sep. 08, 2011
Preamplifier Agilent	8447D	2944A10638	Nov. 03, 2010	Nov. 02, 2011
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295013/4 283403/4	Sep 03, 2010	Sep 03, 2011
RF signal cable Worken	8D-FB	Cable-HYCH9-01	Aug. 20, 2010	Aug. 19, 2011
Software	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn Table Controller EMCO	2090	NA	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	07026401	Aug. 25, 2010	Aug. 24, 2011

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

4.7.2 TEST PROCEDURE

a. 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.

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. Set both RBW and VBW of spectrum analyzer to 1MHz and 3MHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

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

4.7.3 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.7.4 TEST RESULTS

For signals in the restricted bands above and below the 5.15 to 5.25GHz allocated band a measurement was made of the amplitude of the spurious emissions with respect to the intentional signals. The relative amplitude, in dBc, was applied to the average and peak filed strength of the intentional signal made on the OATS to calculate the field strength of the unintentional signals.

The spectrum plots (Peak RBW = 1MHz, VBW = 3MHz) are attached on the following pages.

RESTRICT BAND (4500 ~ 5150 MHz)

FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
5190.00 (PK)	108.8	44.59	64.21	74.00
5190.00 (AV)	94.7	45.81	48.89	54.00

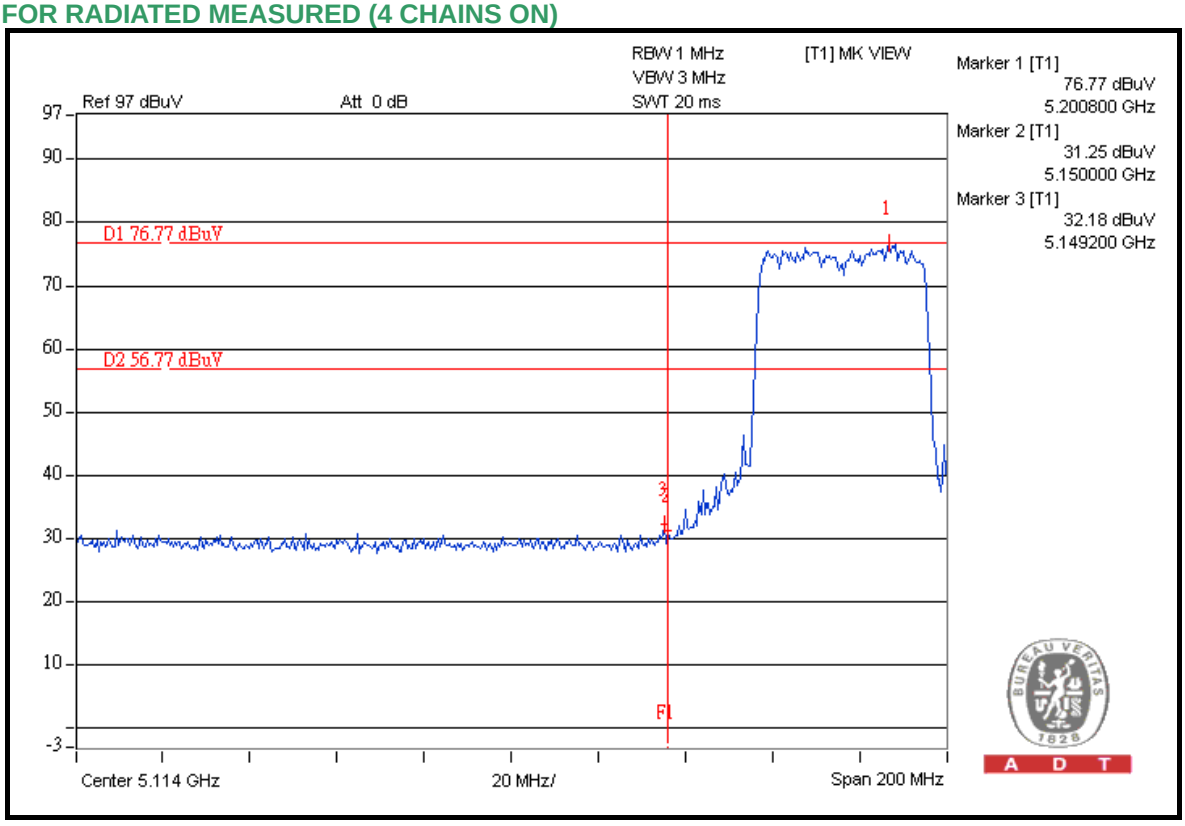
RESTRICT BAND (5350 ~ 5460 MHz)

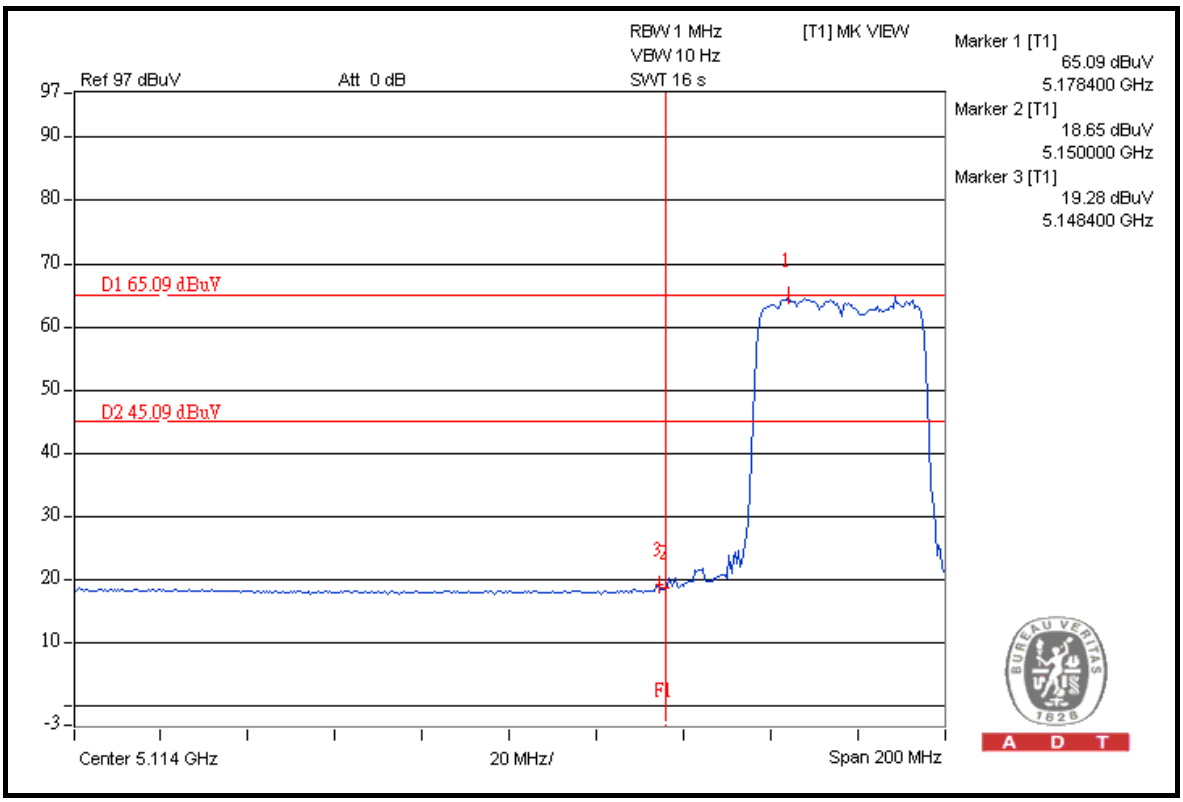
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
5230.00 (PK)	109.1	45.61	63.49	74.00
5230.00 (AV)	95.2	46.62	48.58	54.00

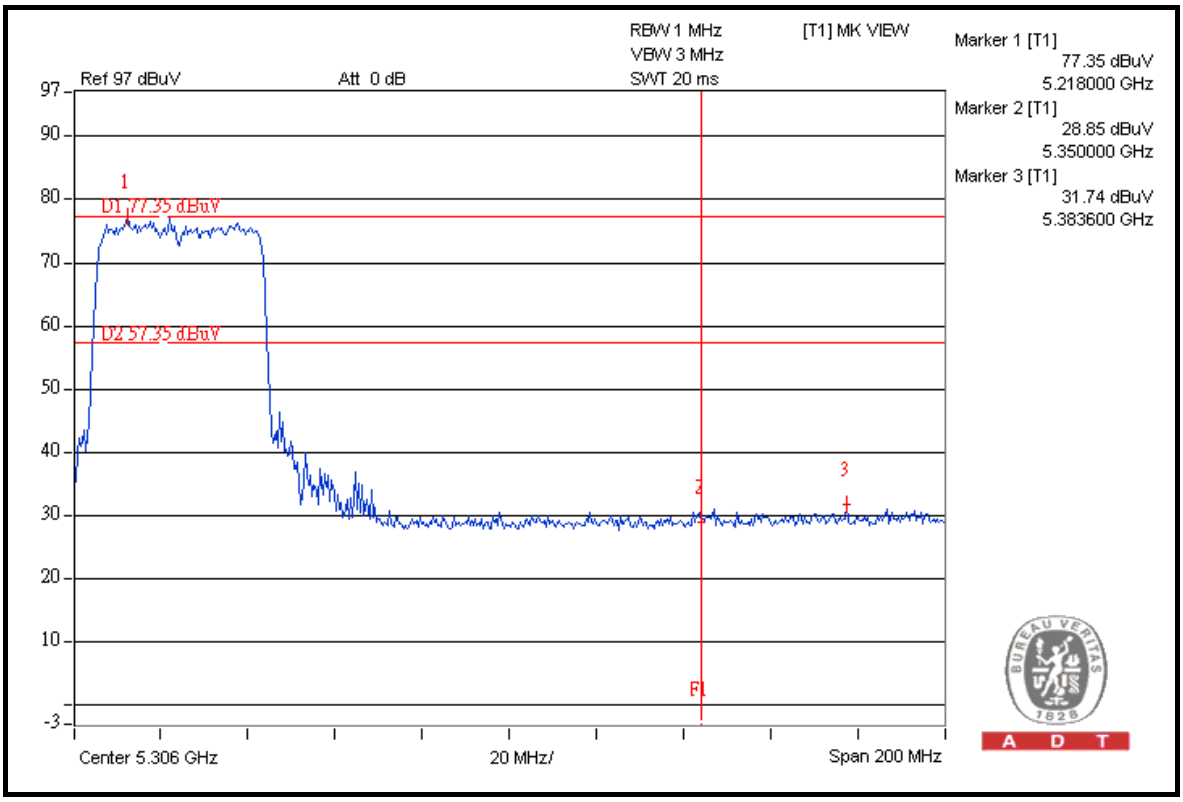
NOTE:

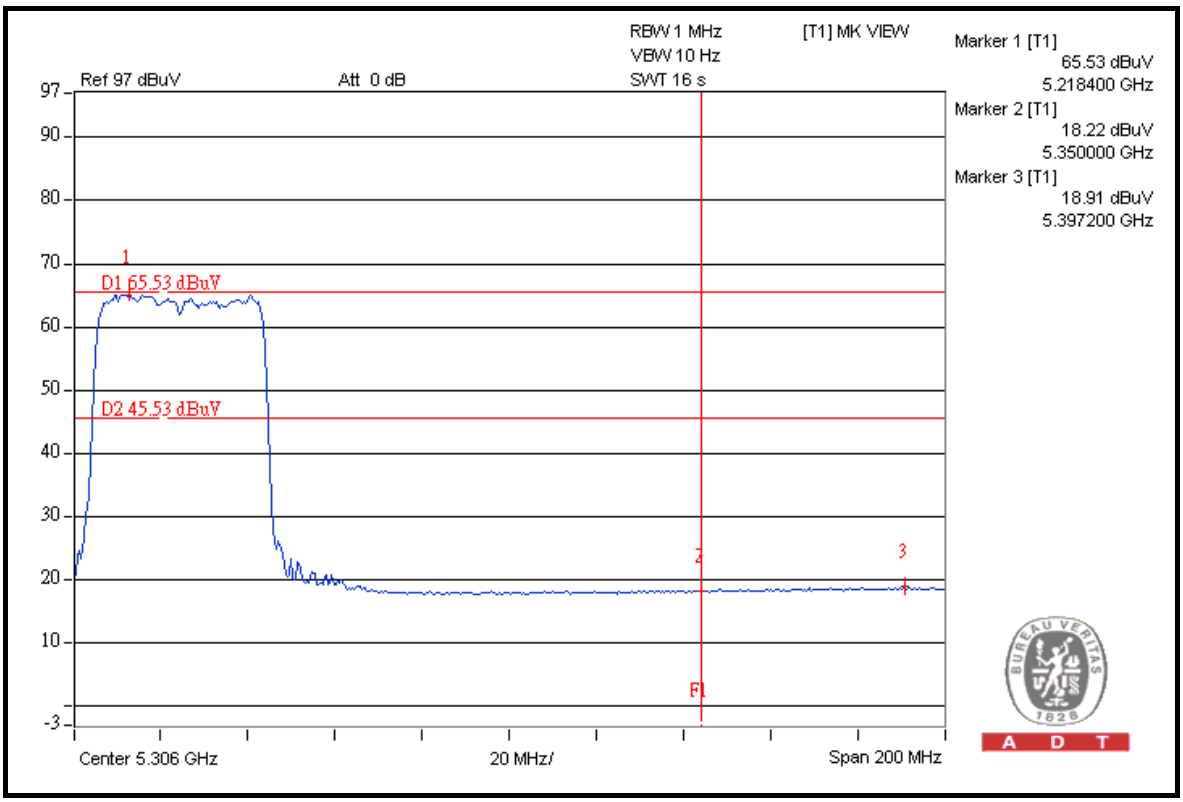
1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.

FOR RADIATED MEASURED (4 CHAINS ON)



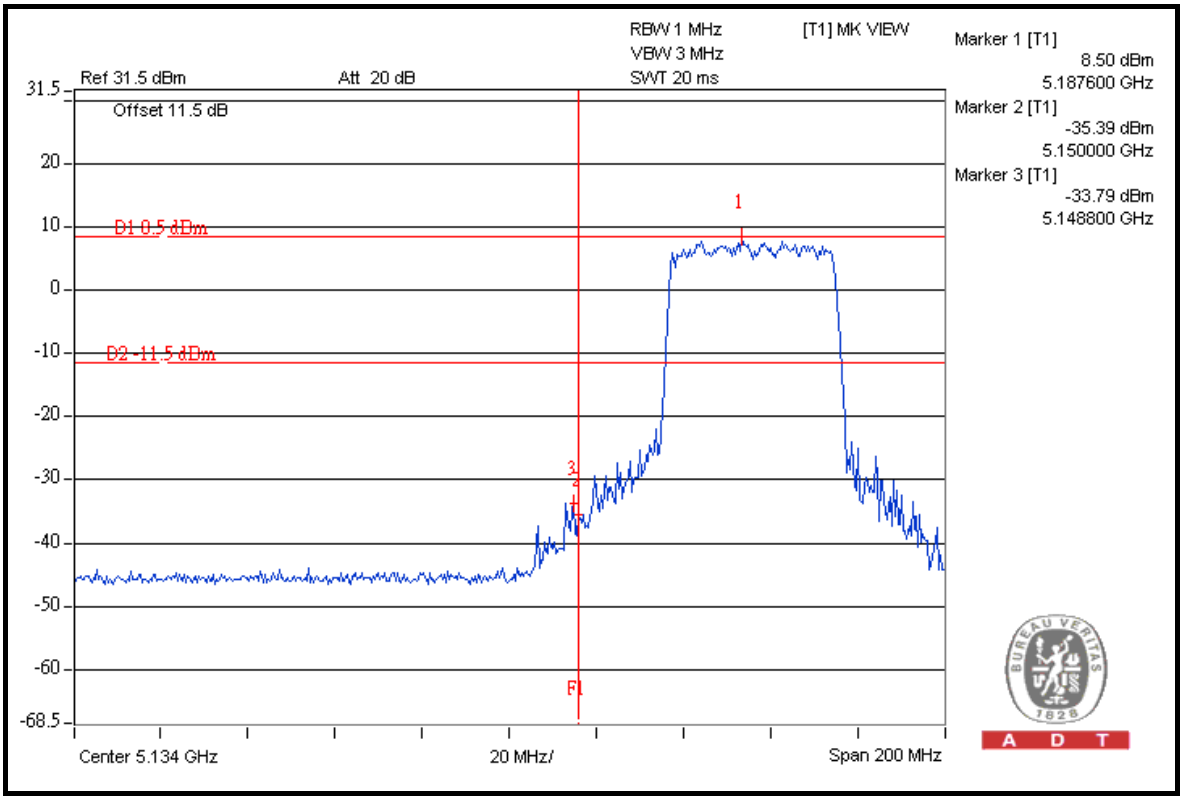


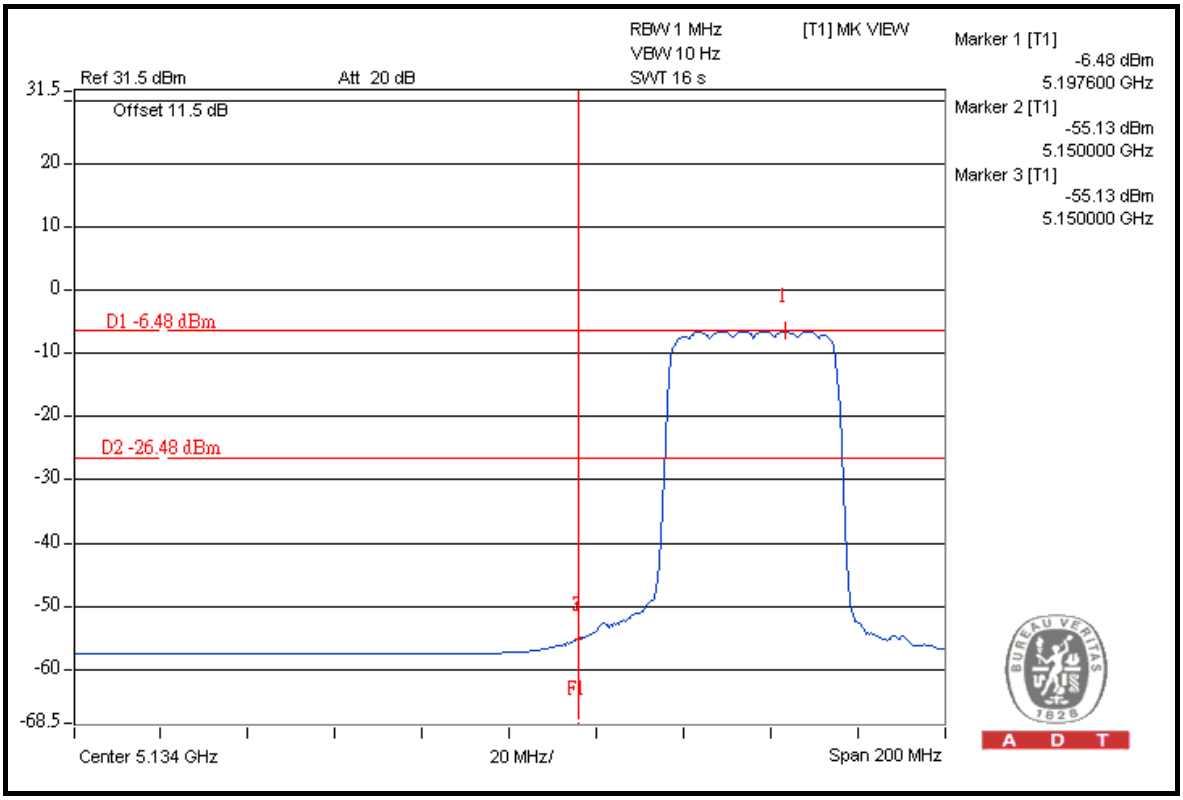

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
77.35 dBuV
5.218000 GHz
Marker 2 [T1]
28.85 dBuV
5.350000 GHz
Marker 3 [T1]
31.74 dBuV
5.383600 GHz
D1 77.35 dBuV
D2 57.35 dBuV
Center 5.306 GHz
20 MHz/
Span 200 MHz

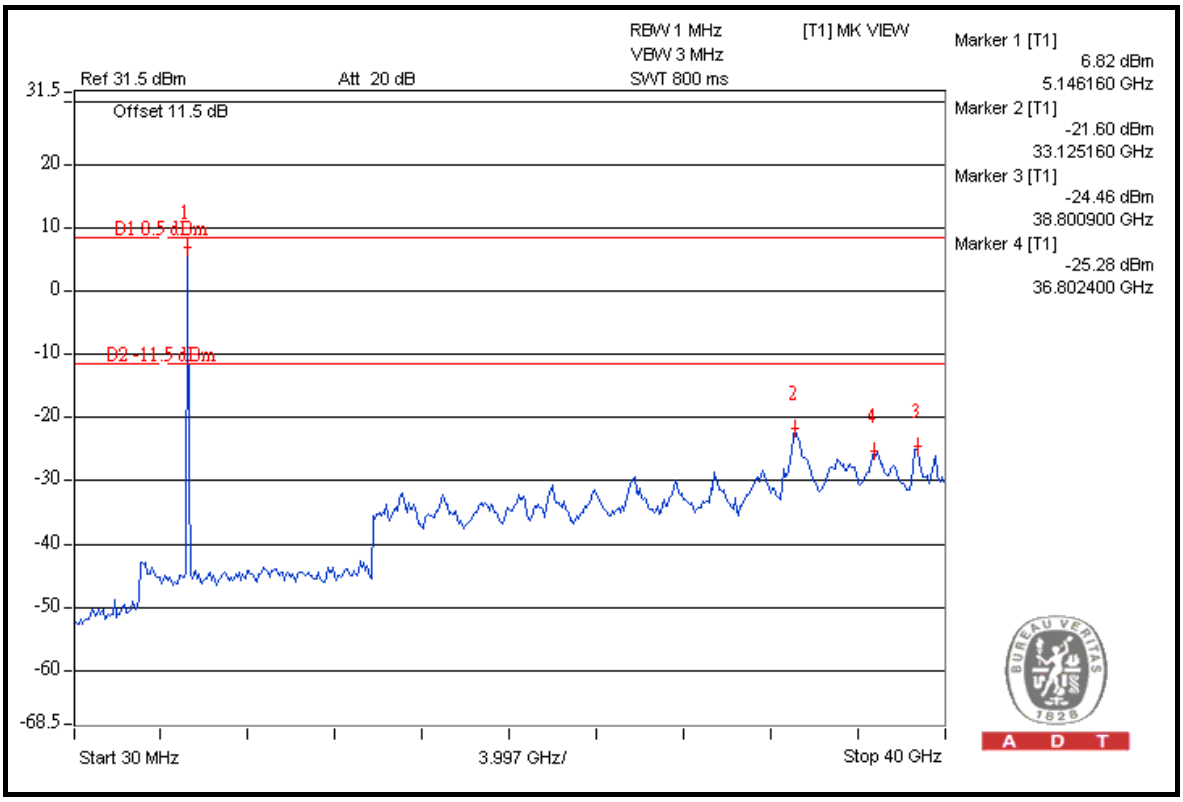

RBW 1 MHz
VBW 10 Hz
SWT 16 s
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
65.53 dBuV
5.218400 GHz
Marker 2 [T1]
18.22 dBuV
5.350000 GHz
Marker 3 [T1]
18.91 dBuV
5.397200 GHz
D1 65.53 dBuV
D2 45.53 dBuV
Center 5.306 GHz
20 MHz/
Span 200 MHz

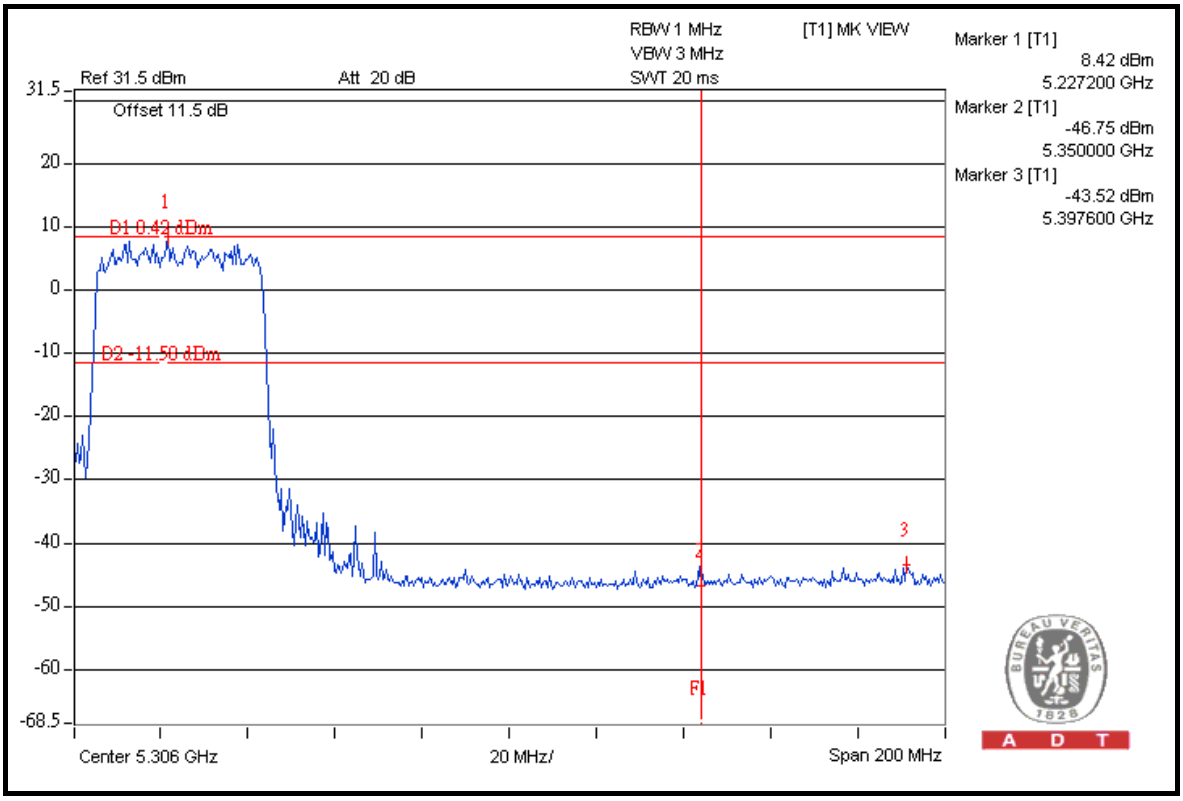
FOR CONDUCTED MEASURED

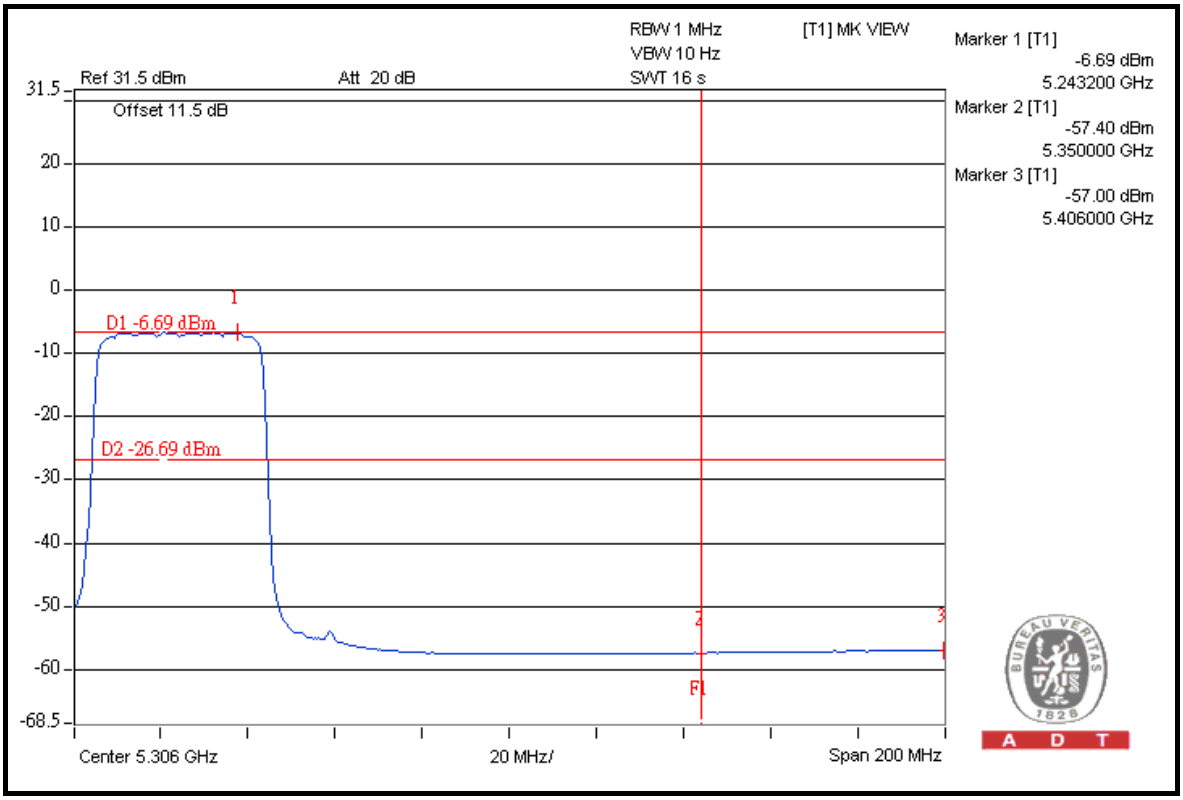
CHAIN 0

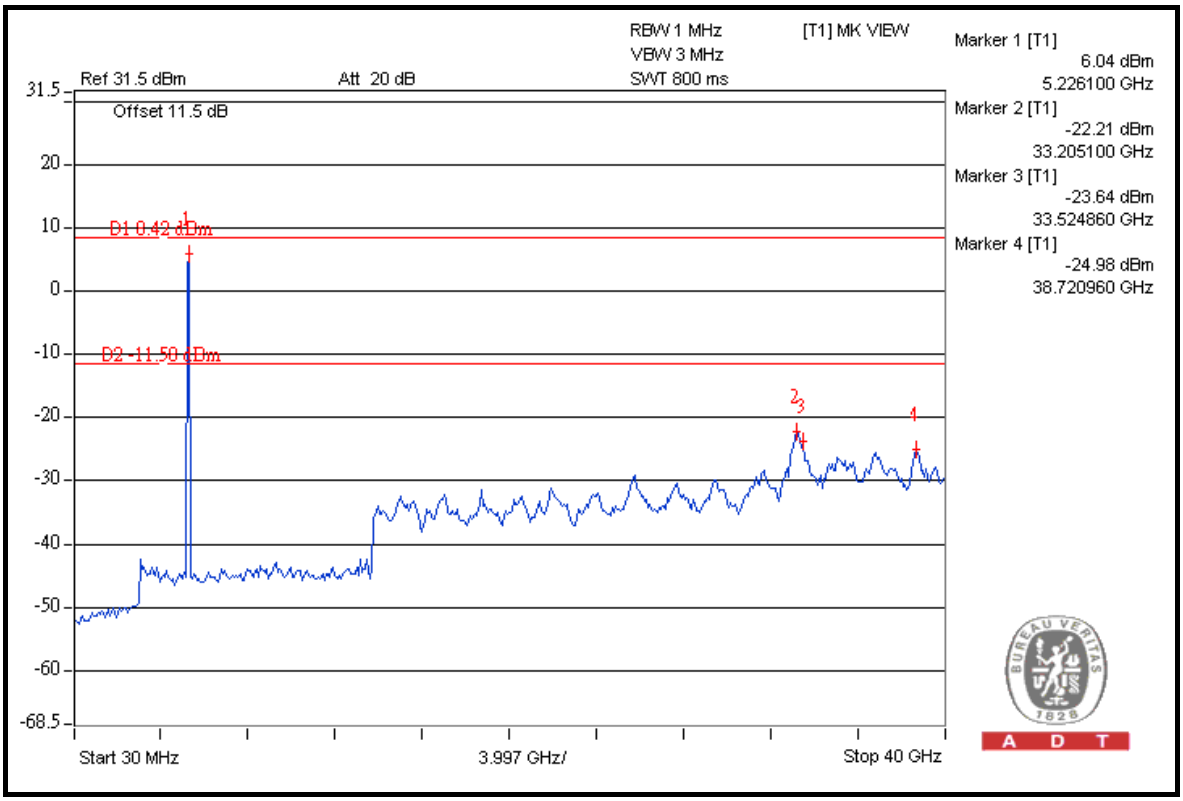




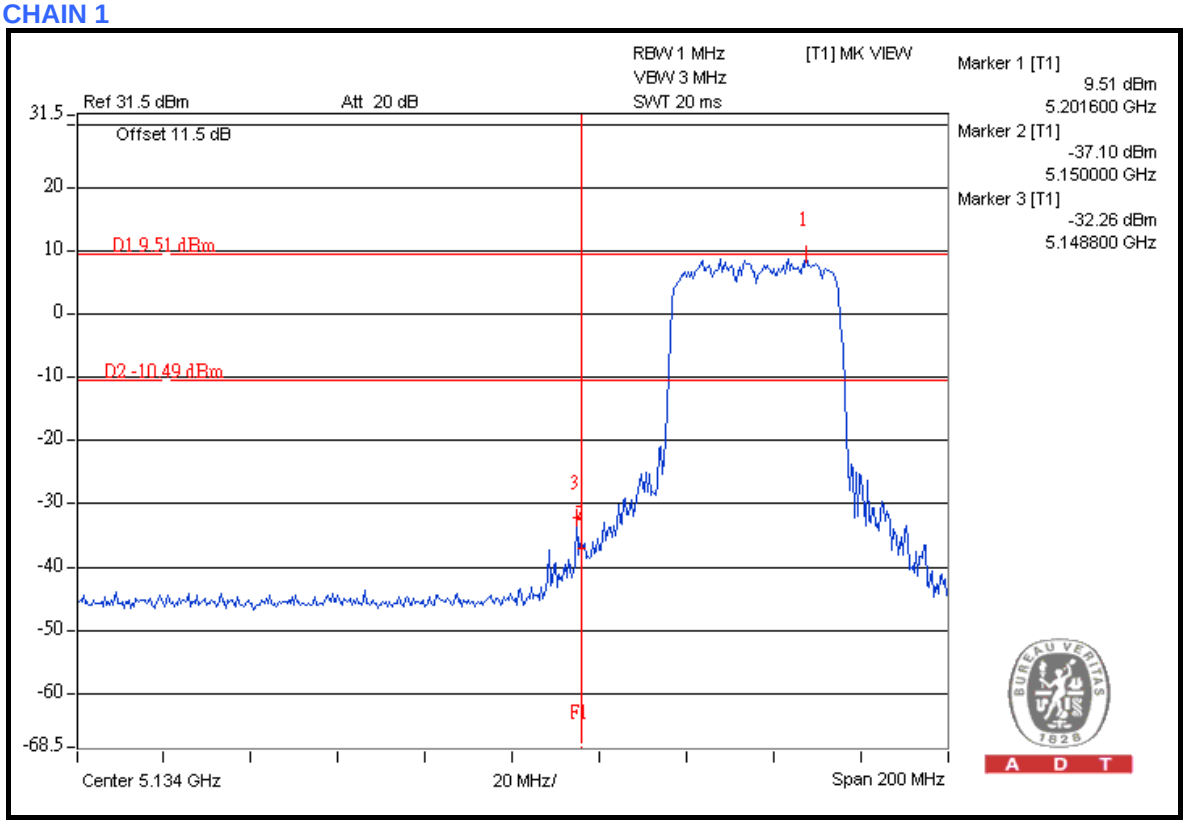

RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
D1 0.5 dBm
D2 -11.5 dBm
Marker 1 [T1]
6.82 dBm
5.146160 GHz
Marker 2 [T1]
-21.60 dBm
33.125160 GHz
Marker 3 [T1]
-24.46 dBm
38.800900 GHz
Marker 4 [T1]
-25.28 dBm
36.802400 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz

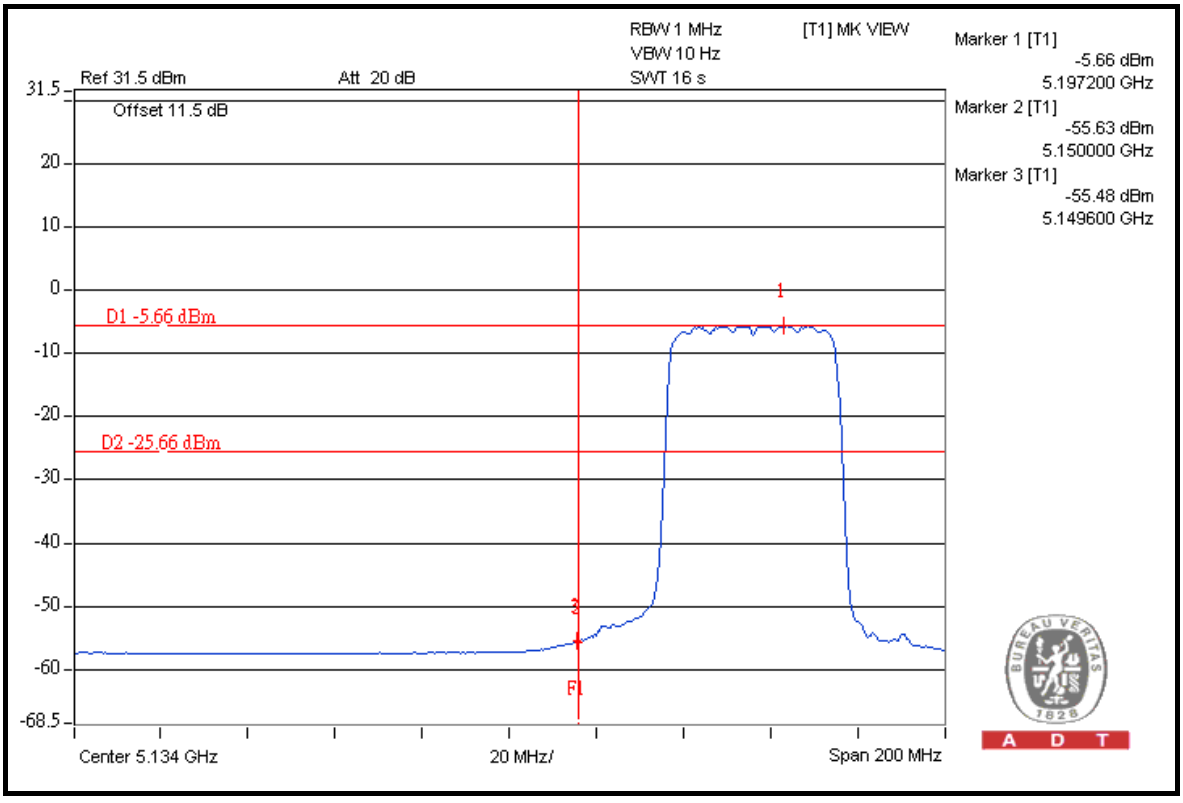

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
D1 0.42 dBm
D2 -11.50 dBm
Marker 1 [T1]
8.42 dBm
5.227200 GHz
Marker 2 [T1]
-46.75 dBm
5.350000 GHz
Marker 3 [T1]
-43.52 dBm
5.397600 GHz
Center 5.306 GHz
20 MHz/
Span 200 MHz

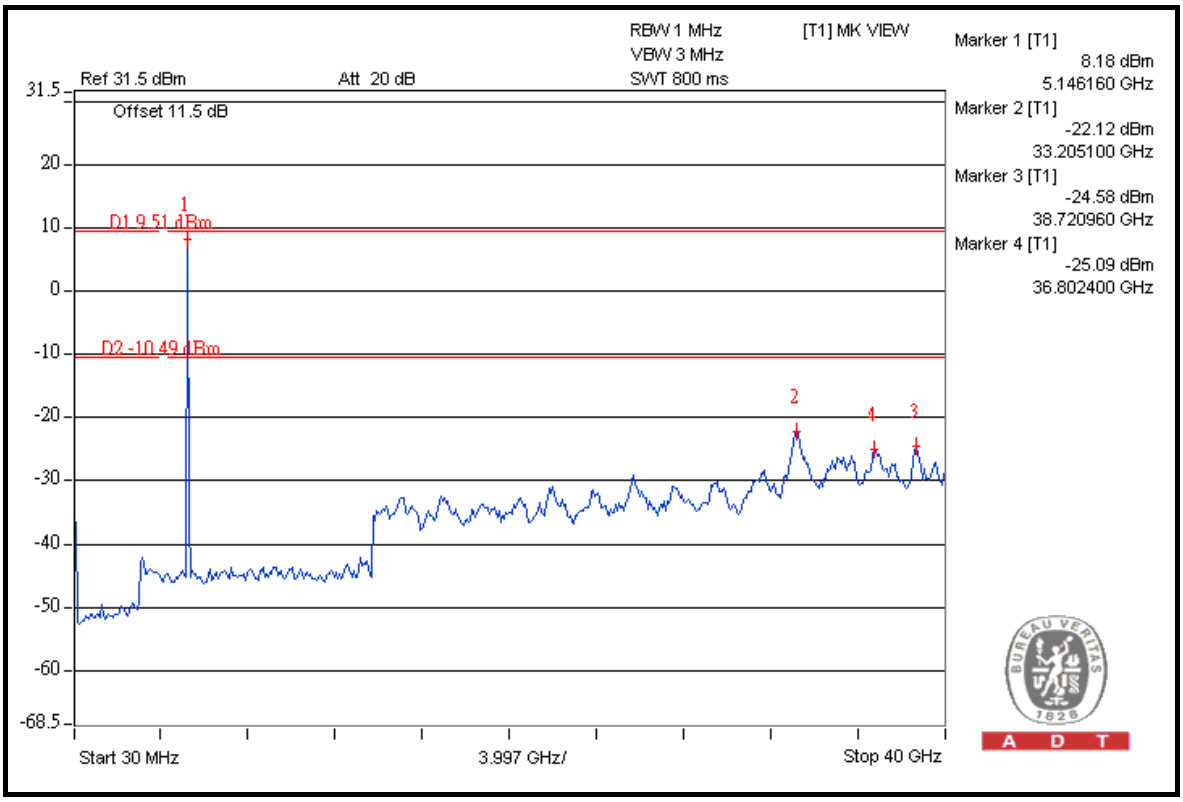

RBW 1 MHz
VBW 10 Hz
SWT 16 s
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
D1 -6.69 dBm
D2 -26.69 dBm
Center 5.306 GHz
20 MHz/
Span 200 MHz
Marker 1 [T1]
-6.69 dBm
5.243200 GHz
Marker 2 [T1]
-57.40 dBm
5.350000 GHz
Marker 3 [T1]
-57.00 dBm
5.406000 GHz

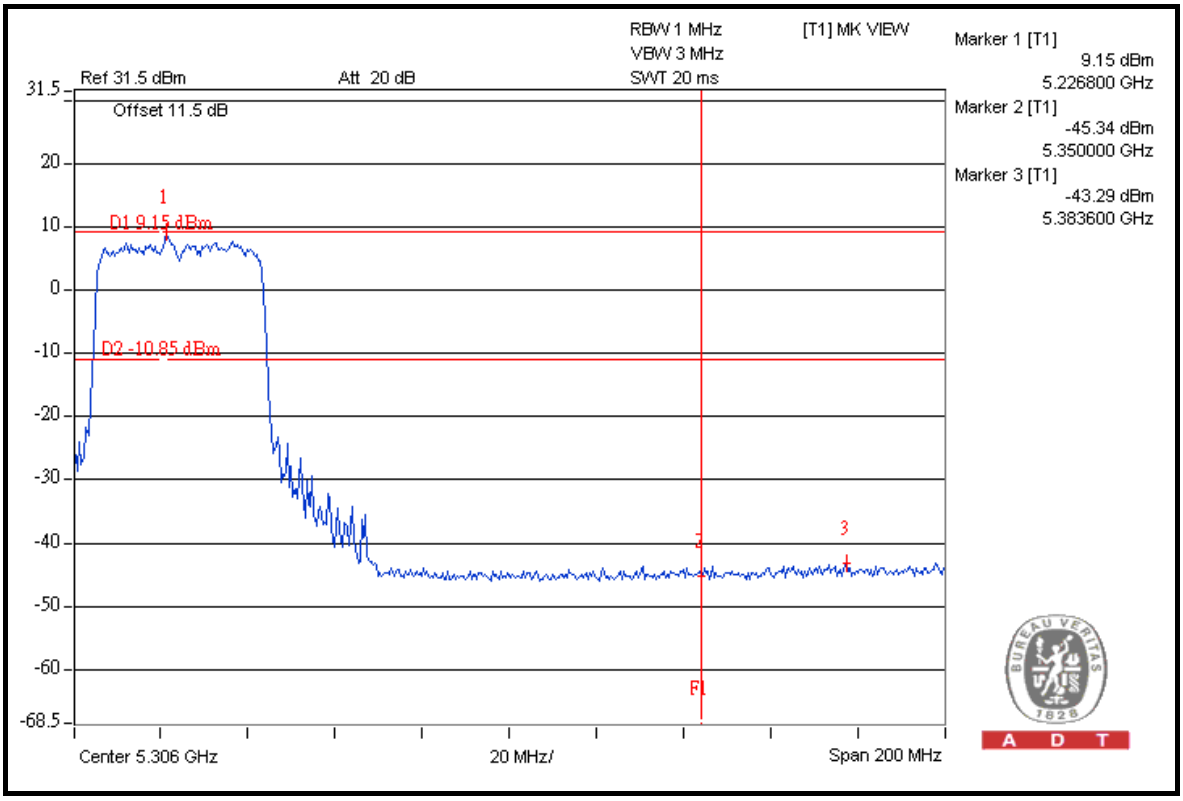

RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
D1 0.42 dBm
D2 -11.50 dBm
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Marker 1 [T1]
6.04 dBm
5.226100 GHz
Marker 2 [T1]
-22.21 dBm
33.205100 GHz
Marker 3 [T1]
-23.64 dBm
33.524860 GHz
Marker 4 [T1]
-24.98 dBm
38.720960 GHz

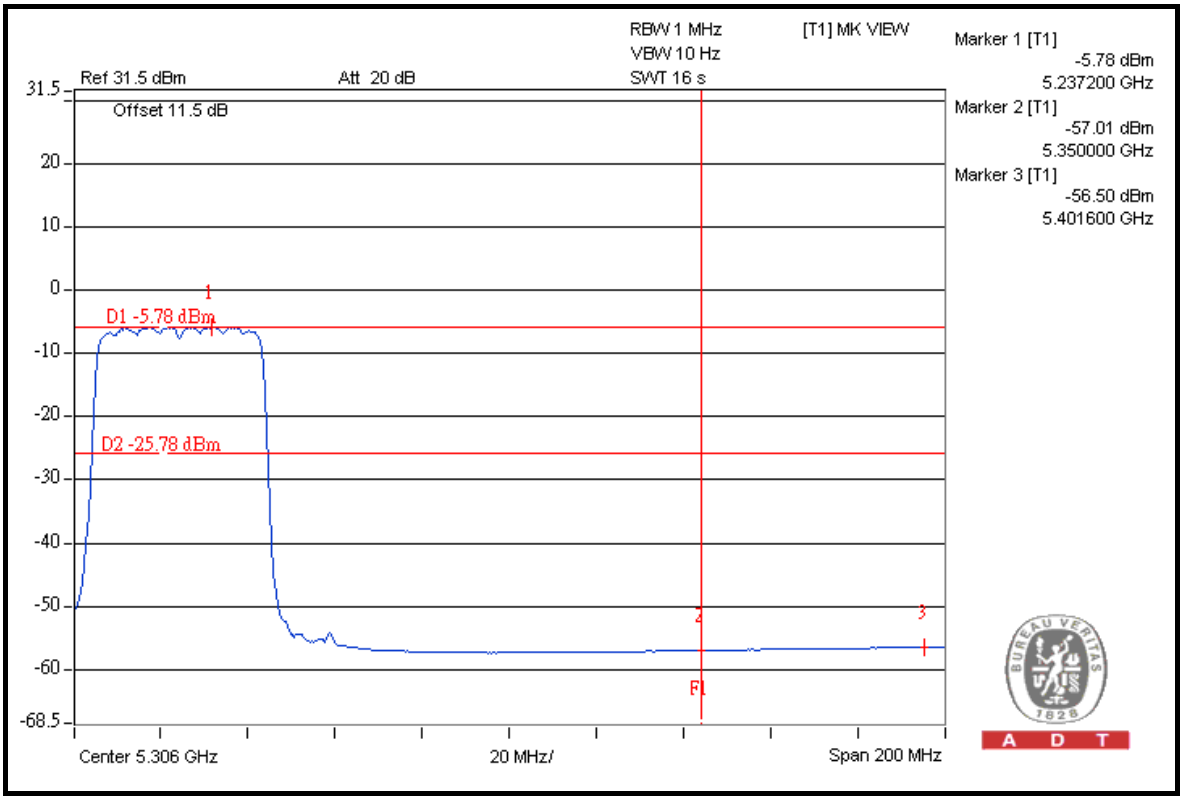
CHAIN 1

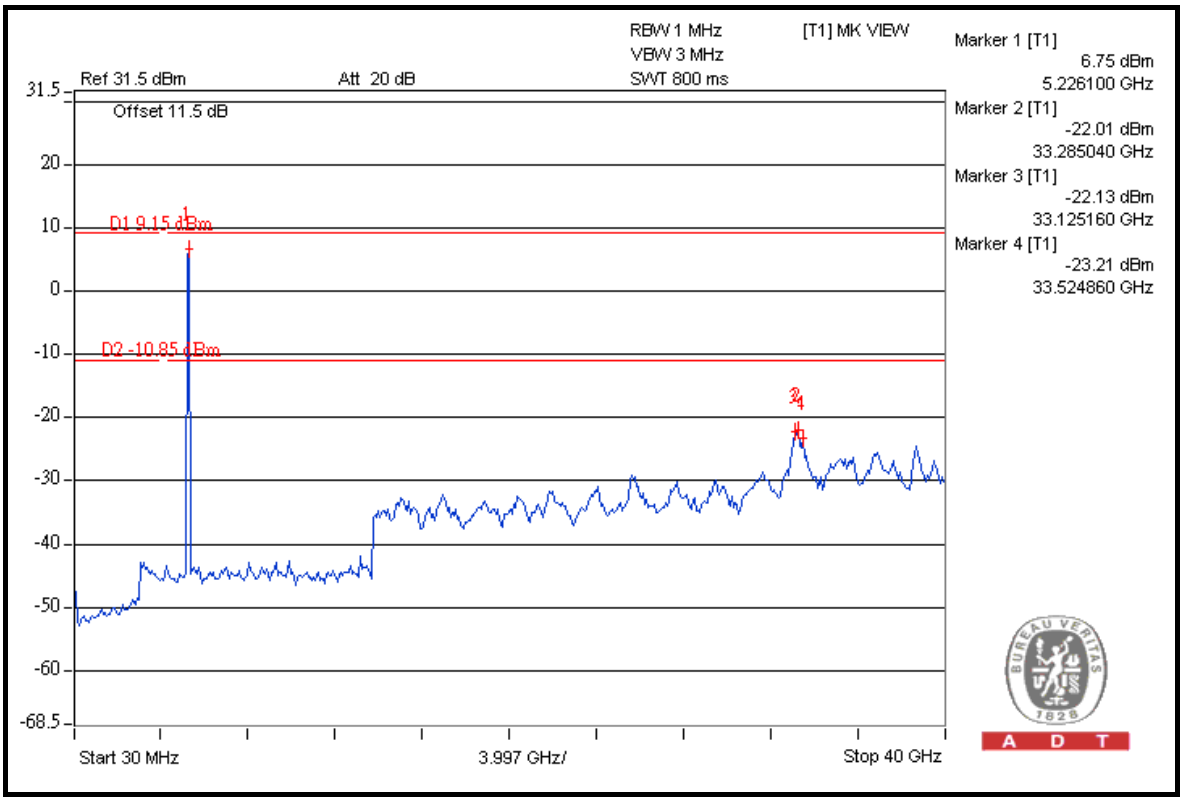

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
9.51 dBm
5.201600 GHz
Marker 2 [T1]
-37.10 dBm
5.150000 GHz
Marker 3 [T1]
-32.26 dBm
5.148800 GHz
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
D1 9.51 dBm
D2 -10.49 dBm
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
Center 5.134 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 10 Hz
SWT 16 s
[T1] MK VIEW
Marker 1 [T1]
-5.66 dBm
5.197200 GHz
Marker 2 [T1]
-55.63 dBm
5.150000 GHz
Marker 3 [T1]
-55.48 dBm
5.149600 GHz
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
D1 -5.66 dBm
D2 -25.66 dBm
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
Center 5.134 GHz
20 MHz/
Span 200 MHz

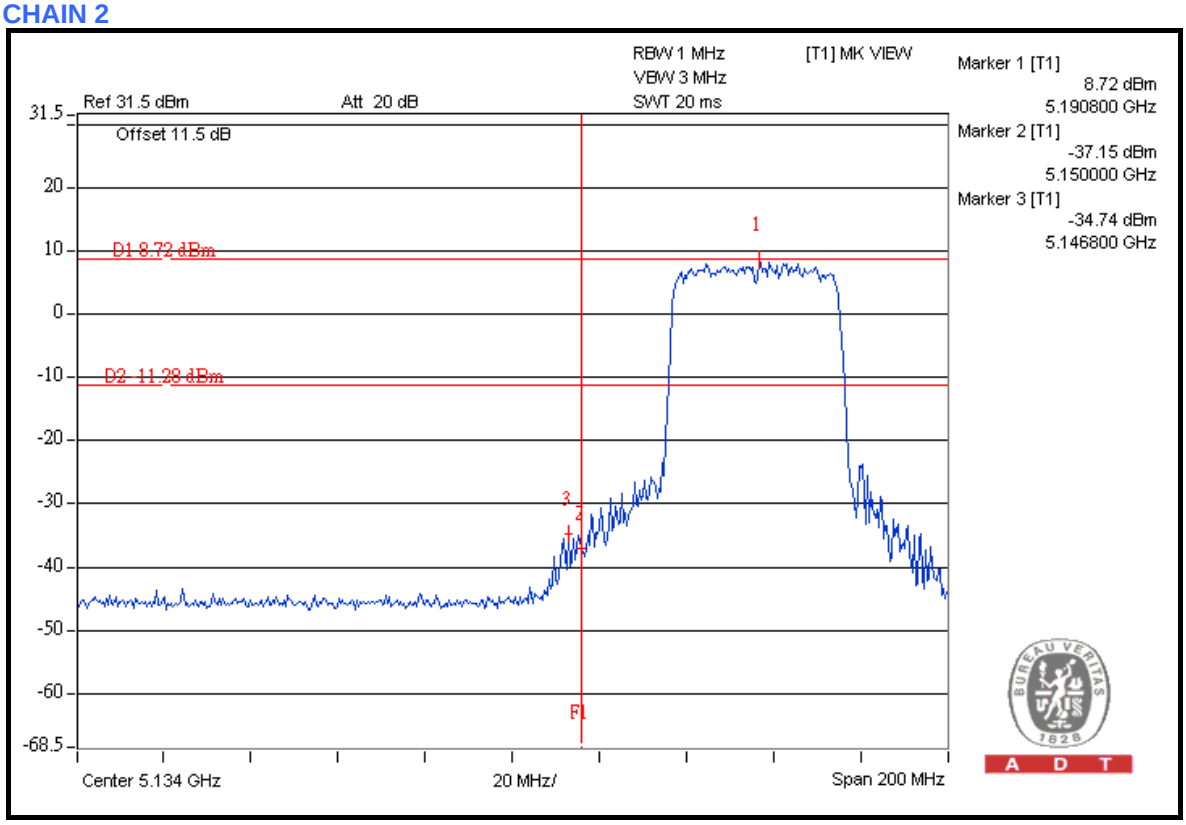

RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
D1 9.51 dBm
D2 -10.49 dBm
Marker 1 [T1]
8.18 dBm
5.146160 GHz
Marker 2 [T1]
-22.12 dBm
33.205100 GHz
Marker 3 [T1]
-24.58 dBm
38.720960 GHz
Marker 4 [T1]
-25.09 dBm
36.802400 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz

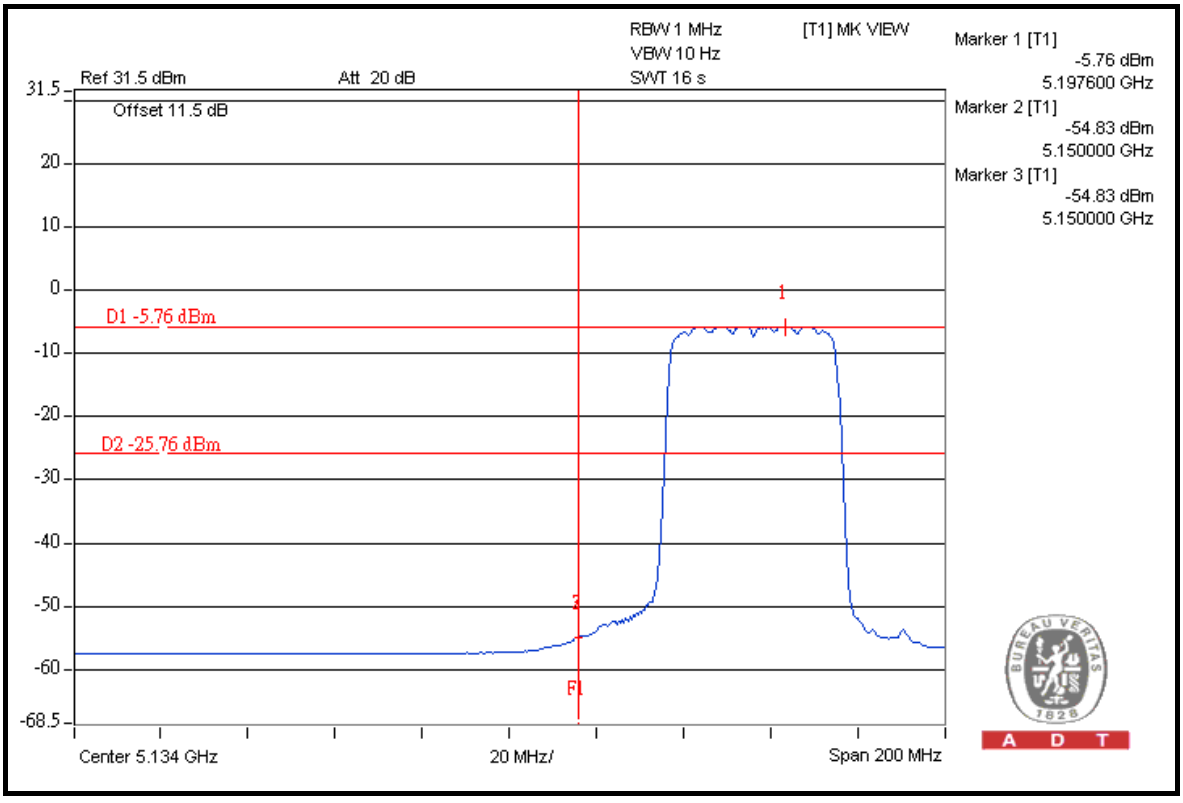

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
D1 9.15 dBm
D2 -10.85 dBm
Marker 1 [T1]
9.15 dBm
5.226800 GHz
Marker 2 [T1]
-45.34 dBm
5.350000 GHz
Marker 3 [T1]
-43.29 dBm
5.383600 GHz
Center 5.306 GHz
20 MHz/
Span 200 MHz

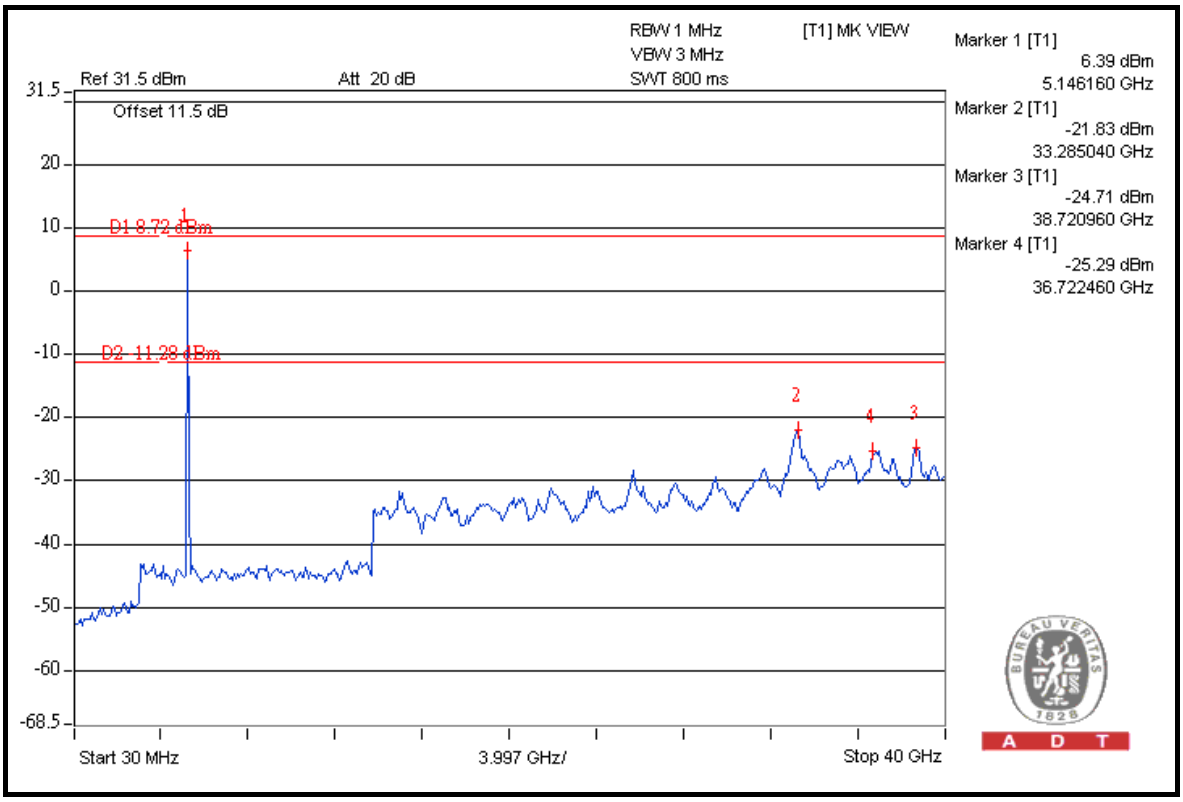

RBW 1 MHz
VBW 10 Hz
SWT 16 s
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
D1 -5.78 dBm
D2 -25.78 dBm
Center 5.306 GHz
20 MHz/
Span 200 MHz
Marker 1 [T1]
-5.78 dBm
5.237200 GHz
Marker 2 [T1]
-57.01 dBm
5.350000 GHz
Marker 3 [T1]
-56.50 dBm
5.401600 GHz

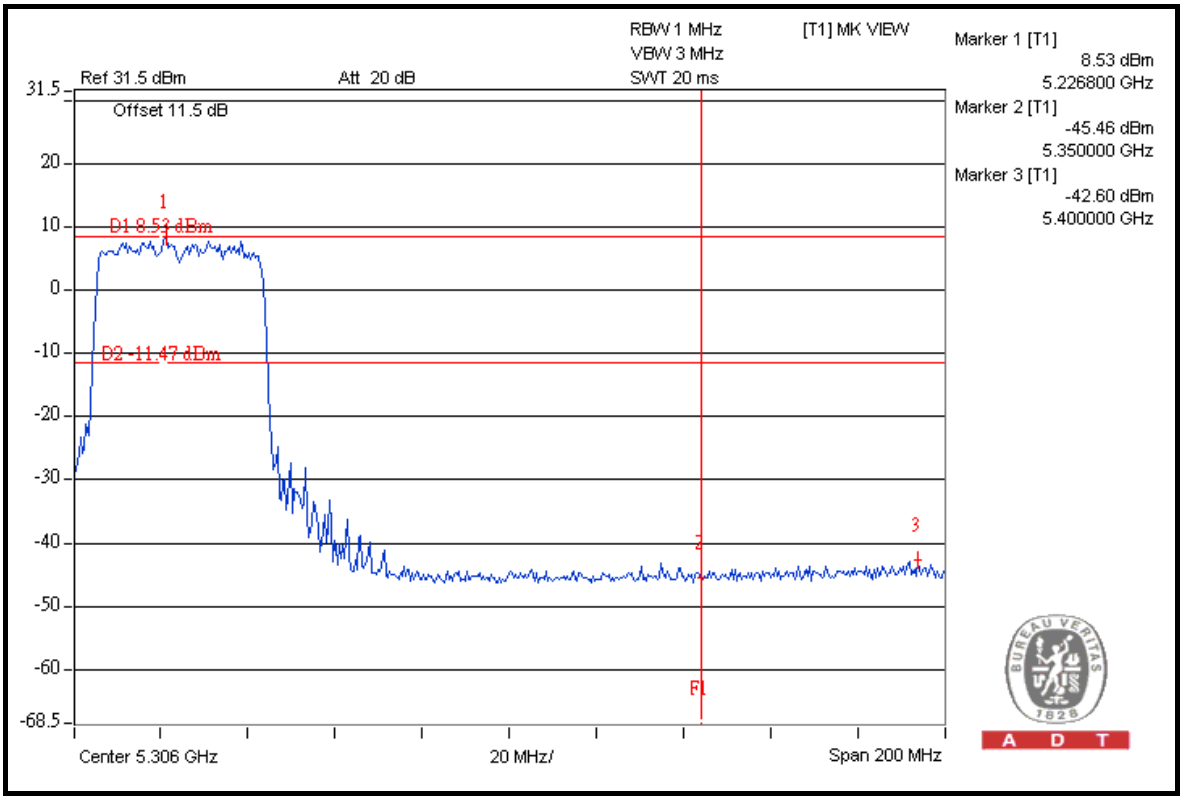

RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
D1 9.15 dBm
D2 -10.85 dBm
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Marker 1 [T1]
6.75 dBm
5.226100 GHz
Marker 2 [T1]
-22.01 dBm
33.285040 GHz
Marker 3 [T1]
-22.13 dBm
33.125160 GHz
Marker 4 [T1]
-23.21 dBm
33.524860 GHz

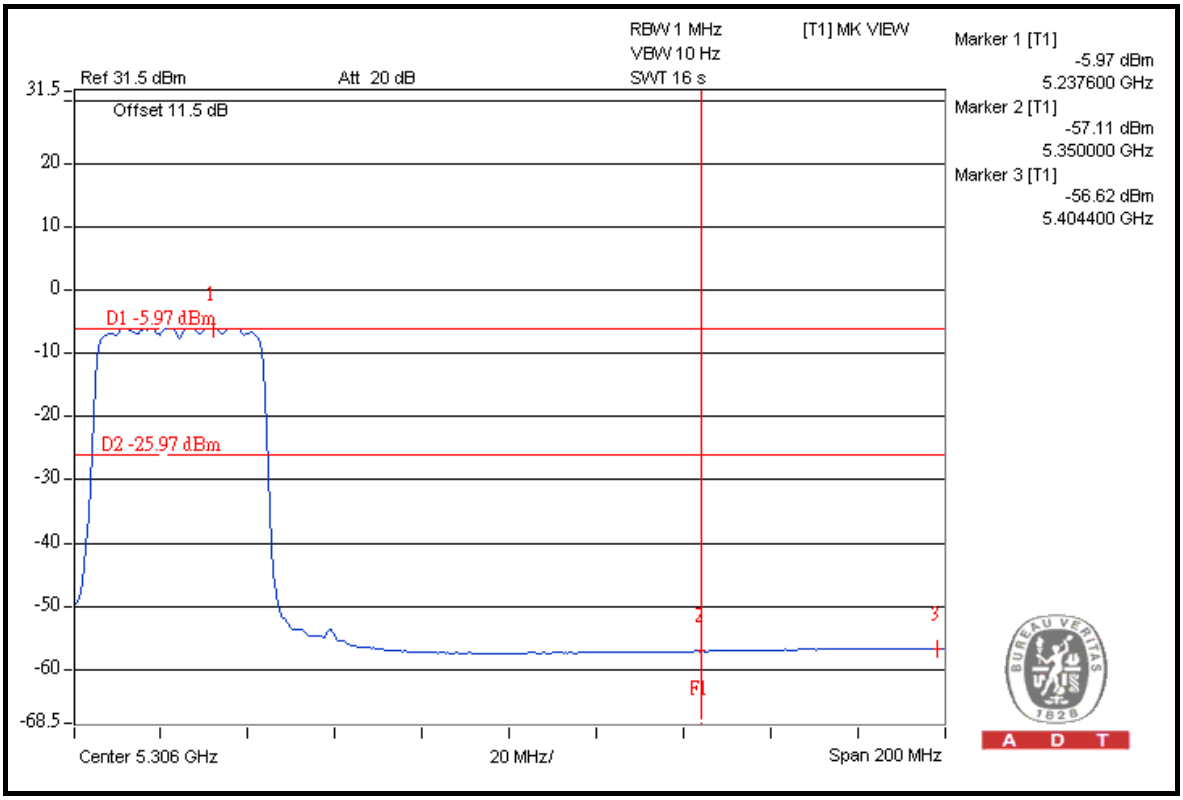
CHAIN 2

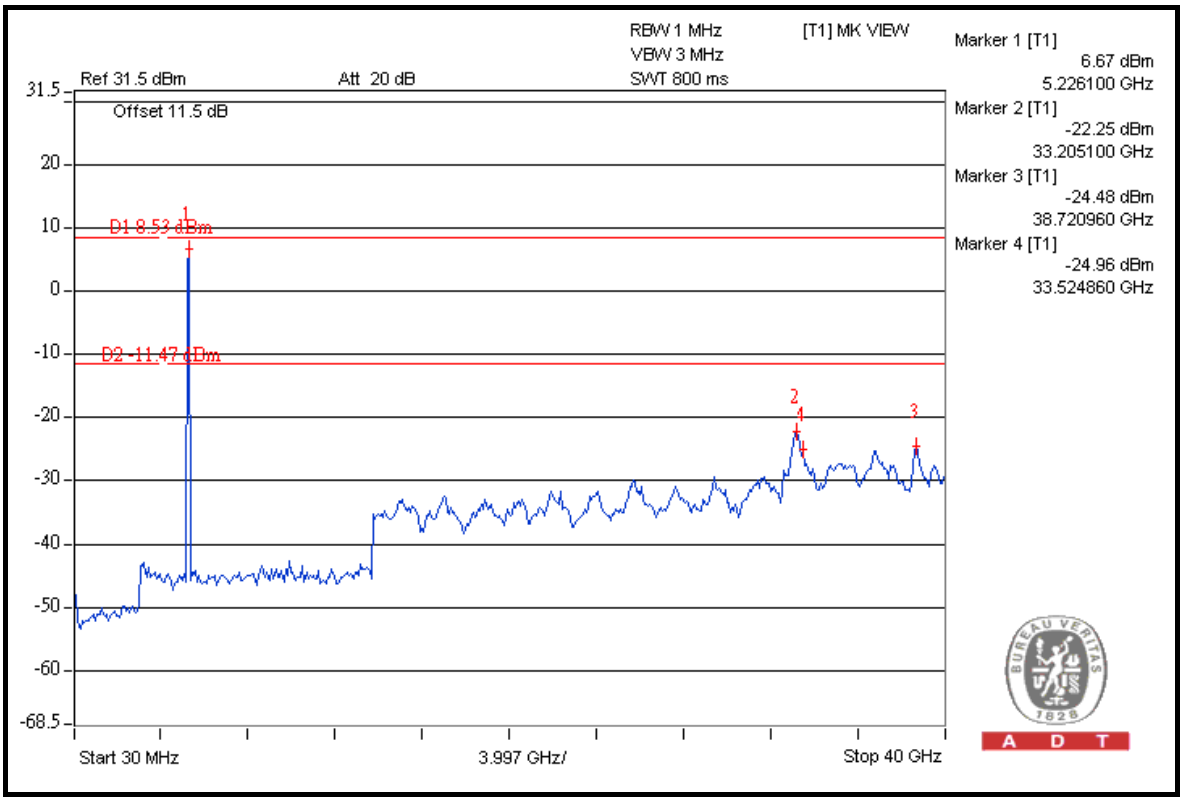

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
D1 8.72 dBm
D2 -11.28 dBm
Marker 1 [T1]
8.72 dBm
5.190800 GHz
Marker 2 [T1]
-37.15 dBm
5.150000 GHz
Marker 3 [T1]
-34.74 dBm
5.146800 GHz
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
Center 5.134 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 10 Hz
SWT 16 s
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
D1 -5.76 dBm
D2 -25.76 dBm
Marker 1 [T1]
-5.76 dBm
5.197600 GHz
Marker 2 [T1]
-54.83 dBm
5.150000 GHz
Marker 3 [T1]
-54.83 dBm
5.150000 GHz
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
Center 5.134 GHz
20 MHz/
Span 200 MHz

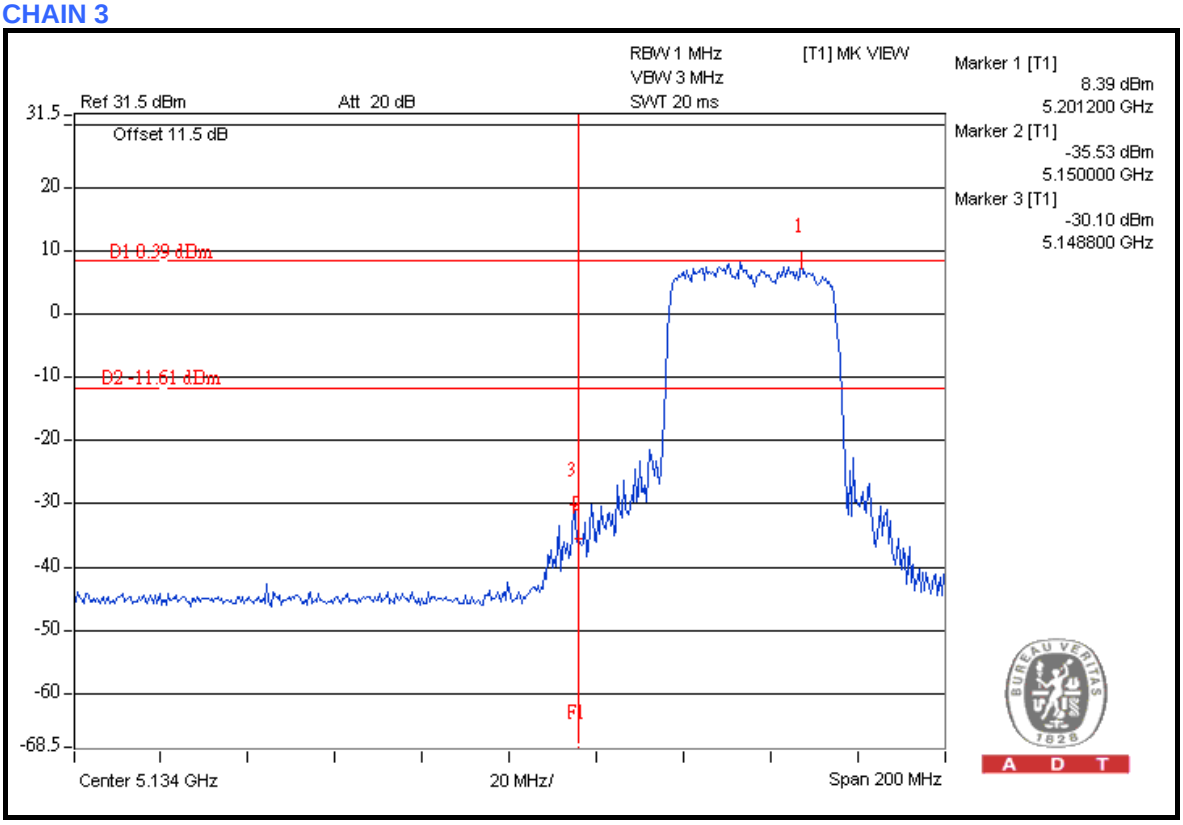

RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
D1 8.72 dBm
D2 -11.28 dBm
Marker 1 [T1]
6.39 dBm
5.146160 GHz
Marker 2 [T1]
-21.83 dBm
33.285040 GHz
Marker 3 [T1]
-24.71 dBm
38.720960 GHz
Marker 4 [T1]
-25.29 dBm
36.722460 GHz
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
Start 30 MHz
3.997 GHz/
Stop 40 GHz

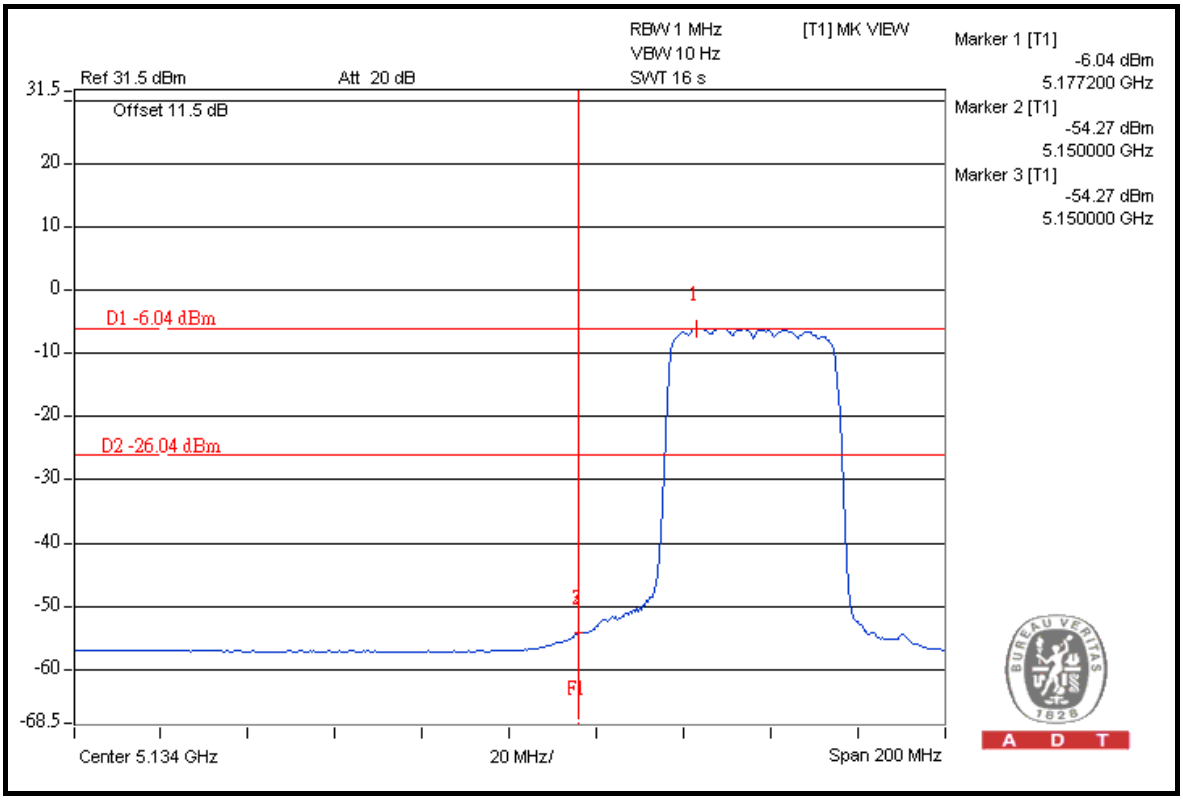

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
D1 8.53 dBm
D2 -11.47 dBm
Marker 1 [T1]
8.53 dBm
5.226800 GHz
Marker 2 [T1]
-45.46 dBm
5.350000 GHz
Marker 3 [T1]
-42.60 dBm
5.400000 GHz
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
Center 5.306 GHz
20 MHz/
Span 200 MHz

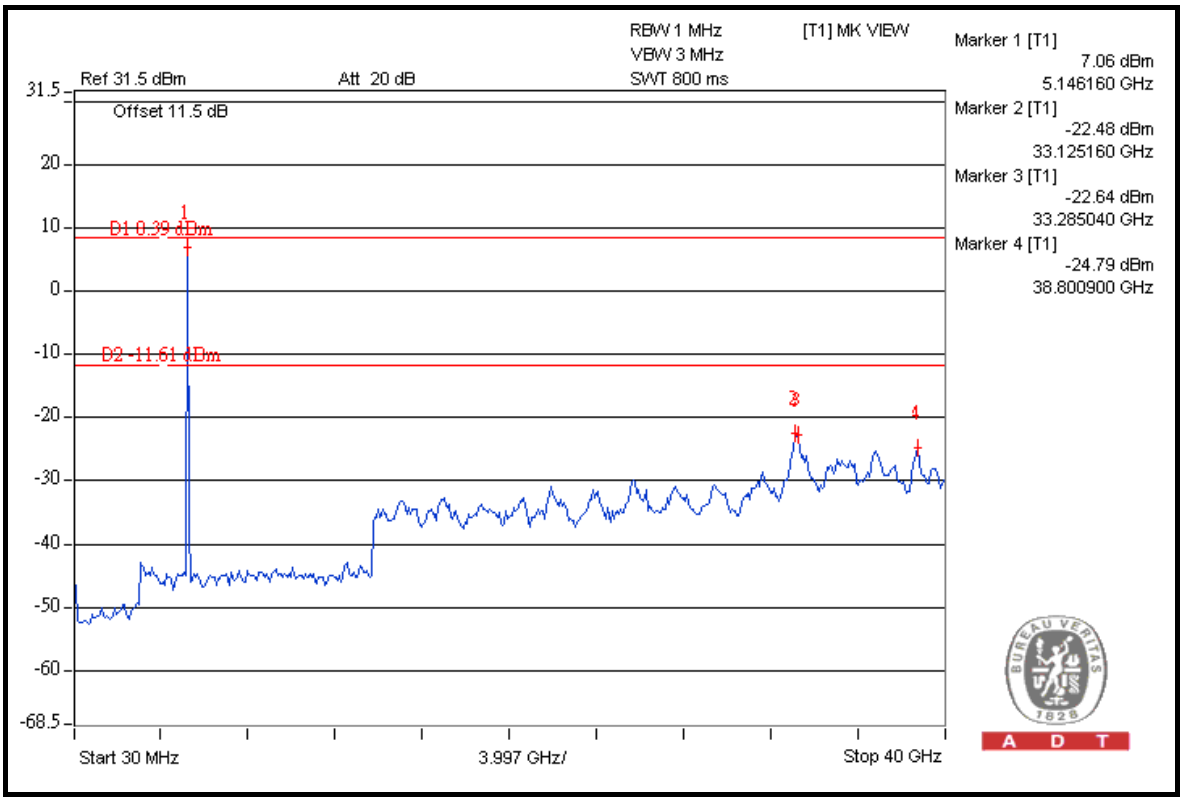

RBW 1 MHz
VBW 10 Hz
SWT 16 s
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
D1 -5.97 dBm
D2 -25.97 dBm
Marker 1 [T1]
-5.97 dBm
5.237600 GHz
Marker 2 [T1]
-57.11 dBm
5.350000 GHz
Marker 3 [T1]
-56.62 dBm
5.404400 GHz
Center 5.306 GHz
20 MHz/
Span 200 MHz

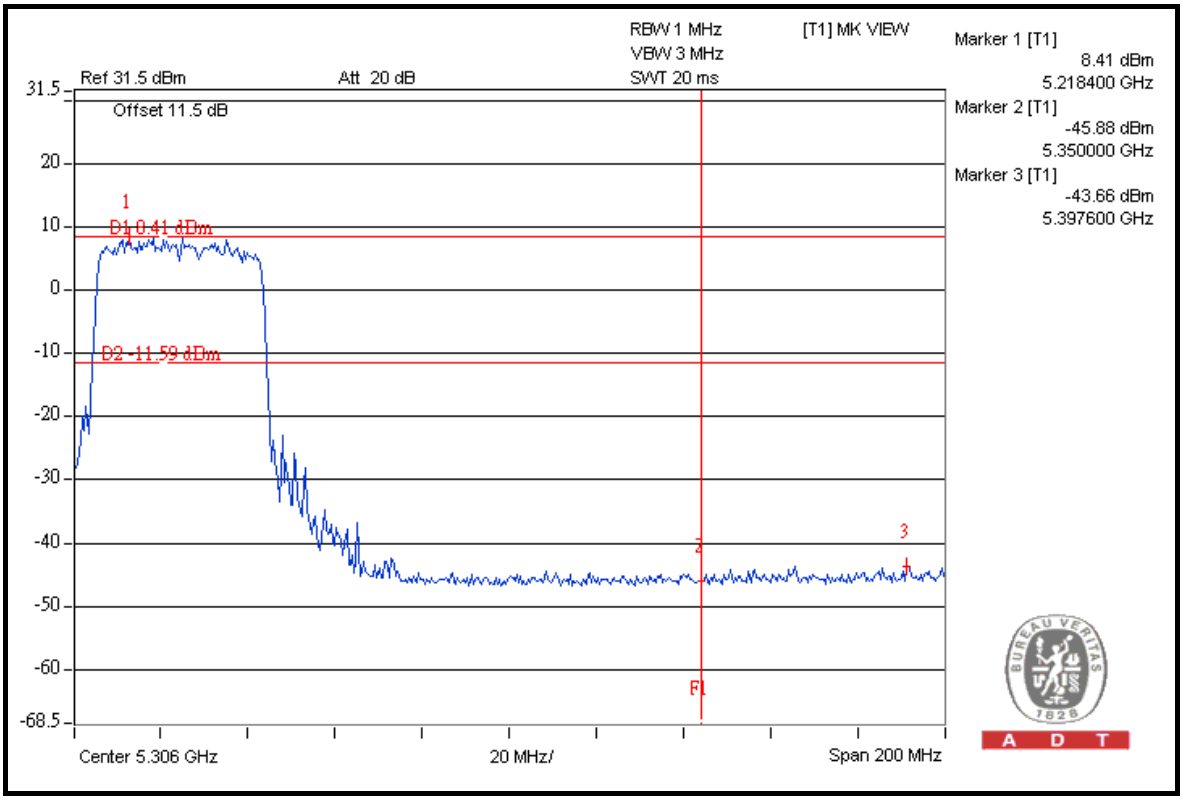

RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
D1 8.53 dBm
D2 -11.47 dBm
Marker 1 [T1]
6.67 dBm
5.226100 GHz
Marker 2 [T1]
-22.25 dBm
33.205100 GHz
Marker 3 [T1]
-24.48 dBm
38.720960 GHz
Marker 4 [T1]
-24.96 dBm
33.524860 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz

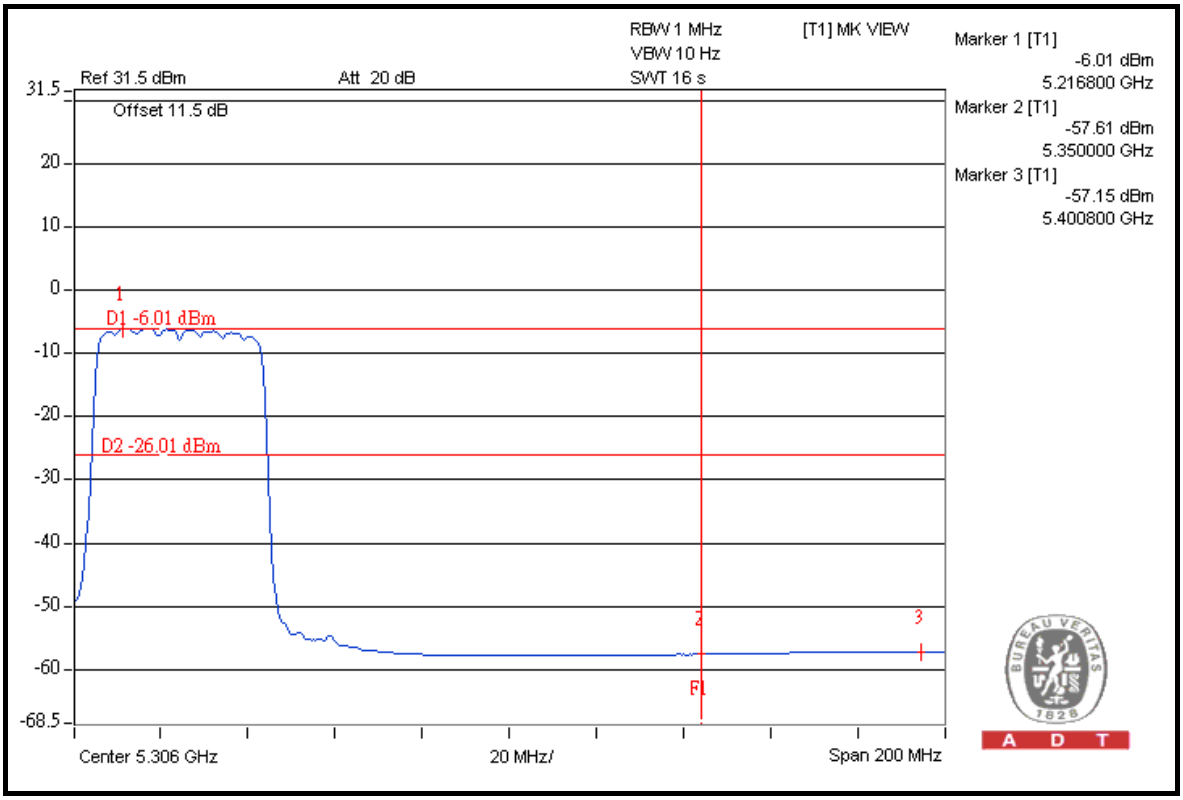
CHAIN 3

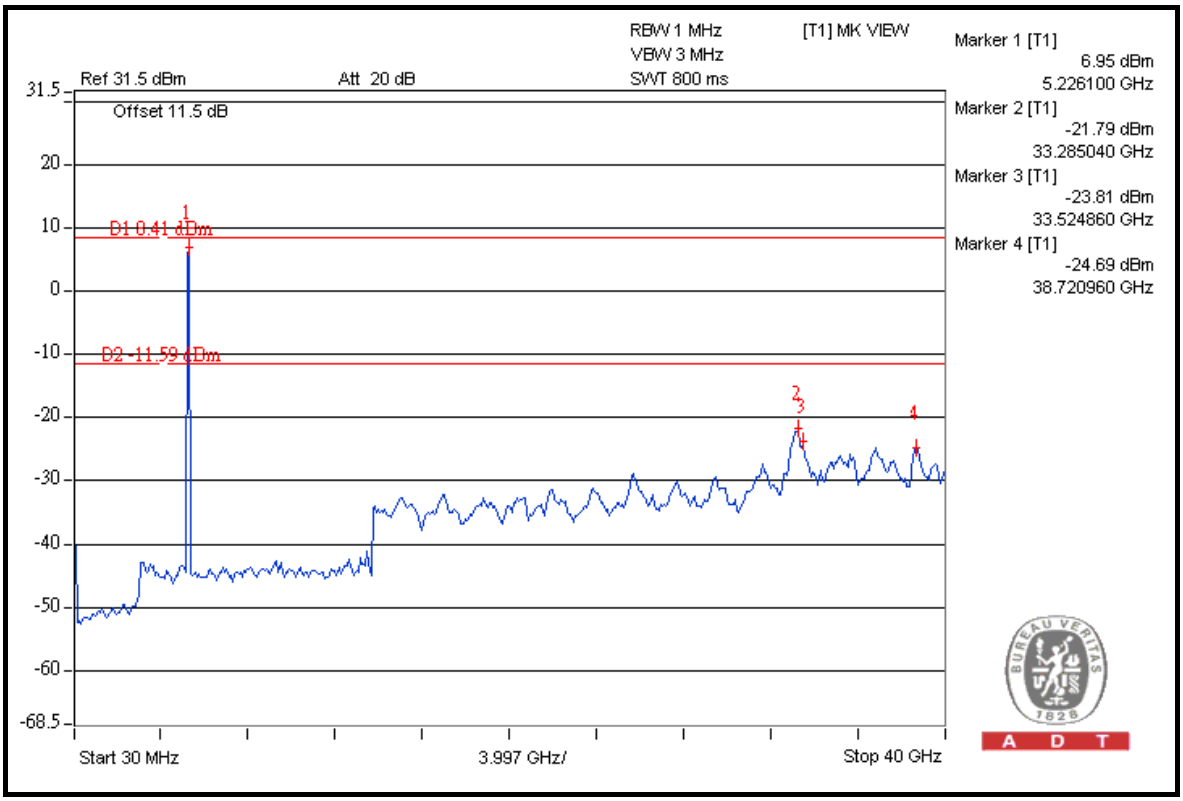

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
8.39 dBm
5.201200 GHz
Marker 2 [T1]
-35.53 dBm
5.150000 GHz
Marker 3 [T1]
-30.10 dBm
5.148800 GHz
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
D1 0.39 dBm
D2 -11.61 dBm
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
Center 5.134 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 10 Hz
SWT 16 s
[T1] MK VIEW
Marker 1 [T1]
-6.04 dBm
5.177200 GHz
Marker 2 [T1]
-54.27 dBm
5.150000 GHz
Marker 3 [T1]
-54.27 dBm
5.150000 GHz
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
D1 -6.04 dBm
D2 -26.04 dBm
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
Center 5.134 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
D1 0.39 dBm
D2 -11.61 dBm
Marker 1 [T1]
7.06 dBm
5.146160 GHz
Marker 2 [T1]
-22.48 dBm
33.125160 GHz
Marker 3 [T1]
-22.64 dBm
33.285040 GHz
Marker 4 [T1]
-24.79 dBm
38.800900 GHz
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
Start 30 MHz
3.997 GHz/
Stop 40 GHz


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
D1 0.41 dBm
D2 -11.59 dBm
Marker 1 [T1]
8.41 dBm
5.218400 GHz
Marker 2 [T1]
-45.88 dBm
5.350000 GHz
Marker 3 [T1]
-43.66 dBm
5.397600 GHz
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
Center 5.306 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 10 Hz
SWT 16 s
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
D1 -6.01 dBm
D2 -26.01 dBm
Center 5.306 GHz
20 MHz/
Span 200 MHz
Marker 1 [T1]
-6.01 dBm
5.216800 GHz
Marker 2 [T1]
-57.61 dBm
5.350000 GHz
Marker 3 [T1]
-57.15 dBm
5.400800 GHz


RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 31.5 dBm
Att 20 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
D1 0.41 dBm
D2 -11.59 dBm
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Marker 1 [T1]
6.95 dBm
5.226100 GHz
Marker 2 [T1]
-21.79 dBm
33.285040 GHz
Marker 3 [T1]
-23.81 dBm
33.524860 GHz
Marker 4 [T1]
-24.69 dBm
38.720960 GHz

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

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:
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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.

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---