



FCC RADIO TEST REPORT

FCC ID: LNQSBWD100B

Product : ScreenBeam Pro Wireless Display Receiver,
ScreenBeam Pro - Education Edition 2,
ScreenBeam Pro - Business Edition,
ScreenBeam Kit,
ScreenBeam Pro

Trade Name : Actiontec

Model Name : SBWD100B

Serial Model : N/A

Report No. : NTEK-2014NT0515718F3-02

Prepared for

Actiontec Electronics, Inc.

760 North Mary Ave., Sunnyvale, California 94085 United States

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street
Bao'an District, Shenzhen P.R. China

Tel.: +86-0755-61156588 Fax.: +86-0755-61156599

Website: www.ntek.org.cn

TEST RESULT CERTIFICATION

Applicant's name Actiontec Electronics, Inc.

Address 760 North Mary Ave., Sunnyvale, California 94085 United States

Manufacturer's Name... Actiontec Electronics, Inc.

Address 760 North Mary Ave., Sunnyvale, California 94085 United States

Product description

Product name ScreenBeam Pro Wireless Display Receiver,
ScreenBeam Pro - Education Edition 2,
ScreenBeam Pro - Business Edition,
ScreenBeam Kit,
ScreenBeam Pro

Model and/or type reference SBWD100B

Serial Model N/A

Standards FCC Part15.247 01 Oct.2015

Test procedure ANSI C63.10-2013 and KDB 558074: June 5, 2014
RSS-Gen Rules

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

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

Date of Test

Date (s) of performance of tests 20 Nov. 2015 ~07 Dec. 2015

Date of Issue 07 Dec. 2015

Test Result **Pass**

Testing Engineer : Jason Chen
(Jason Chen)

Technical Manager : Brown Lu
(Brown Lu)

Authorized Signatory : Sam Chen
(Sam Chen)

Table of Contents	Page
1 . SUMMARY OF TEST RESULTS	4
1.1 TEST FACILITY	5
1.2 MEASUREMENT UNCERTAINTY	5
2 . GENERAL INFORMATION	6
2.1 GENERAL DESCRIPTION OF EUT	6
2.2 DESCRIPTION OF TEST MODES	9
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	10
2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)	11
2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS	12
3 . EMC EMISSION TEST	13
3.1 CONDUCTED EMISSION MEASUREMENT	13
3.1.1 POWER LINE CONDUCTED EMISSION LIMITS	13
3.1.2 TEST PROCEDURE	14
3.1.3 DEVIATION FROM TEST STANDARD	14
3.1.4 TEST SETUP	14
3.1.5 EUT OPERATING CONDITIONS	14
3.1.6 TEST RESULTS	15
3.2 RADIATED EMISSION MEASUREMENT	27
3.2.1 RADIATED EMISSION LIMITS	27
3.2.2 TEST PROCEDURE	28
3.2.3 DEVIATION FROM TEST STANDARD	28
3.2.4 TEST SETUP	29
3.2.5 EUT OPERATING CONDITIONS	30
3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)	31
3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)	32
3.2.8 TEST RESULTS (ABOVE 1000 MHZ)	40
4 . EUT TEST PHOTO	41
APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS	

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247 (c)	Radiated Spurious Emission	PASS	

Note : This C2PC testing , the changed is: Only change the Adapter.

1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd

Add.:1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

FCC Registration No.:238937; IC Registration No.:9270A-1

CNAS Registration No.:L5516

1.2 MEASUREMENT UNCERTAINTY

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

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

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	ScreenBeam Pro Wireless Display Receiver, ScreenBeam Pro - Education Edition 2, ScreenBeam Pro - Business Edition, ScreenBeam Kit, ScreenBeam Pro	
Trade Name	Actiontec	
Model Name	SBWD100B	
Product Description	The EUT is a ScreenBeam Pro Wireless Display Receiver, ScreenBeam Pro - Education Edition 2, ScreenBeam Pro - Business Edition, ScreenBeam Kit, ScreenBeam Pro	
	Operation Frequency:	802.11b/g/n(20MHz):2412~2462 MHz 802.11n(40MHz):2422~2452 MHz
	Modulation Type:	802.11b : DSSS (CCK, DQPSK, DBPSK) 802.11g/n (HT20/HT40) : OFDM (64QAM, 16QAM, QPSK, BPSK)
	Bit Rate of Transmitter	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6Mbps 802.11n(20MHz):150/144.44/130/117/115.56/104/86.67/78/52/6.5Mbps 802.11n(40MHz):300/270/240/180/150/120/108/90/54 Mbps
	Number Of Channel	802.11b/g/n20MHz:11CH 802.11n40MHz:7CH
	Antenna Designation:	Please see Note 3.
	Antenna Gain (dBi)	Please see Note 3.
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.	
Channel List	Please refer to the Note 2.	
Ratings	DC 5V	
Adapter	Adapter 1 Mode: KSAS0120500200HU Input: 100-240V~, 50/60Hz, 0.4A Output: 5.0V $\overline{\text{---}}$, 2.0A Adapter 2 Mode: MU05BS050100-A1 Input: 100-240V~, 50/60Hz, 0.18A Output: 5V $\overline{\text{---}}$, 1A Adapter 3 Mode: WB-10E05FU Input: 100-240V~, 50/60Hz, 0.4A Output: 5V $\overline{\text{---}}$, 2A	
Battery	N/A	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

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

2. 2.4GHz

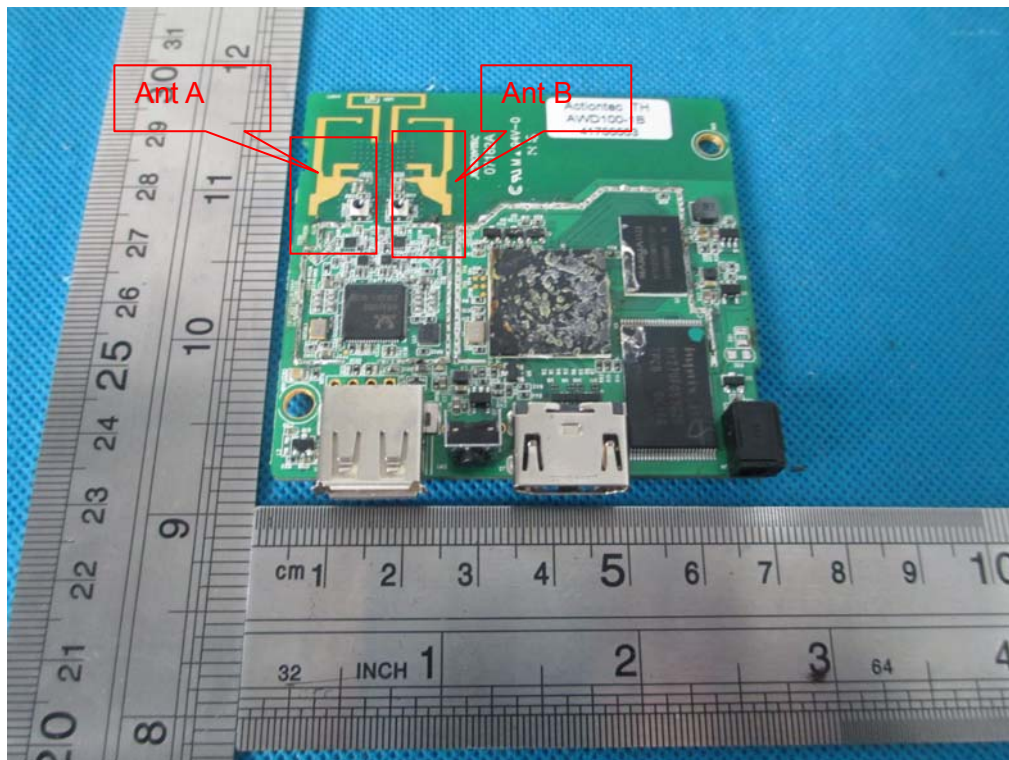
Channel List for 802.11b/g/n(20 MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452	-	-

Channel List for 802.11n(40MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
03	2422	06	2437	09	2452	-	-
04	2427	07	2442	-	-	-	-
05	2432	08	2447	-	-	-	-

3.

Table for Filed Antenna

Ant .	Brand	Model Name	Antenna Type	Gain (dBi)	NOTE
A	N/A	N/A	PCB antenna	2.4G:3.6	Wifi Antenna
B	N/A	N/A	PCB antenna	2.4G:3.6	Wifi Antenna



The Control software(tool_WIFI.exe) can control antenna A/ B ,

For 2.4GHz mode, antenna A/ B are transmitting, two antennas simultaneously transmit. And the data is recorded for radiated emission and band edge.

For 5GHz mode, antenna A B are transmitting ,Two antennas simultaneously transmit. And the data is recorded for radiated emission, and band edge.

For MIMO mode , Directional gain= $G_{ANT} + 10\log(N)$ dbi =6.61dbi in 2.4GHz

Directional gain= $G_{ANT} + 10\log(N)$ dbi =6.61dbi in 5GHz
802.11a/b/g/n 2.4GHz & 5GHz has MIMO mode.

2.2 DESCRIPTION OF TEST MODES

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

Pretest Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n20 CH1/ CH6/ CH11
Mode 4	802.11n40 CH3/ CH6/ CH9
Mode 5	Link Mode

For Conducted Emission	
Final Test Mode	Description
Mode 5	Link Mode

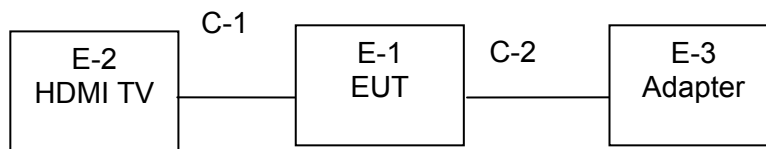
For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n20 CH1/ CH6/ CH11
Mode 4	802.11n40 CH3/ CH6/ CH 9
Mode 5	Link Mode

Note:

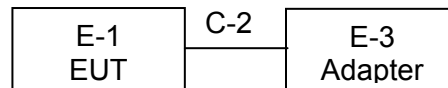
(1) The measurements are performed at the highest, middle, lowest available channels.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission Test



Radiated Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	ScreenBeam Pro Wireless Display Receiver, ScreenBeam Pro - Education Edition 2, ScreenBeam Pro-Business Edition, ScreenBeam Kit, ScreenBeam Pro	Actiontec	SBWD100B	N/A	EUT
E-2	TV	SONY	KDL-24EX520	N/A	
E-3	Adapter 1	Ktec	KSAS0120500200HU	N/A	
E-3	Adapter 2	Actiontec	MU05BS050100-A1	N/A	
E-3	Adapter 3	APD	WB-10E05FU	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	Metal wire	NO	100cm	HDMI Line
C-2	Unshielded	NO	80cm	DC Line

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2015.07.06	2016.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2015.06.06	2016.06.05	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2015.07.06	2016.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2015.06.06	2016.06.05	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2015.06.06	2016.06.05	1 year
6	Horn Antenna	EM	EM-AH-10180	2011071402	2015.07.06	2016.07.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2015.07.06	2016.07.05	1 year
8	Amplifier	EM	EM-30180	060538	2014.12.22	2015.12.21	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2015.06.06	2016.06.05	1 year
10	Power Meter	R&S	NRVS	100696	2015.07.06	2016.07.05	1 year
11	Power Sensor	R&S	URV5-Z4	0395.1619.05	2015.07.06	2016.07.05	1 year

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2015.06.06	2016.06.05	1 year
2	LISN	R&S	ENV216	101313	2015.08.24	2016.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2015.06.06	2016.06.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2015.06.06	2016.06.05	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2015.06.06	2016.06.05	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2015.06.06	2016.06.05	1 year

1	Attenuation	MCE	24-10-34	BN9258	2015.06.06	2016.06.05	1 year
---	-------------	-----	----------	--------	------------	------------	--------

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

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

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

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

Note:

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

The following table is the setting of the receiver

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

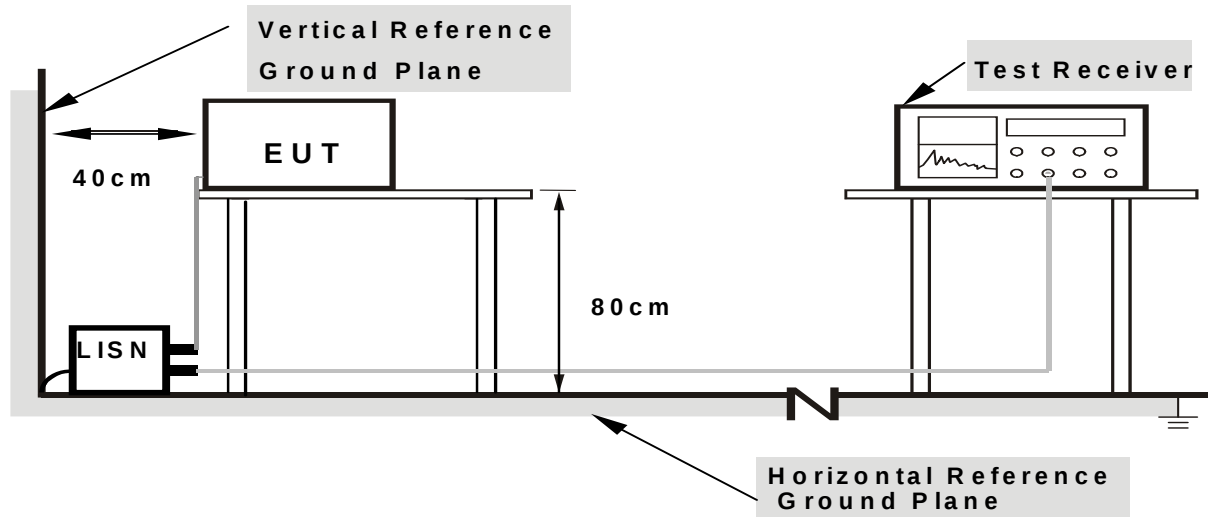
3.1.2 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



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

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

3.1.5 EUT OPERATING CONDITIONS

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

3.1.6 TEST RESULTS

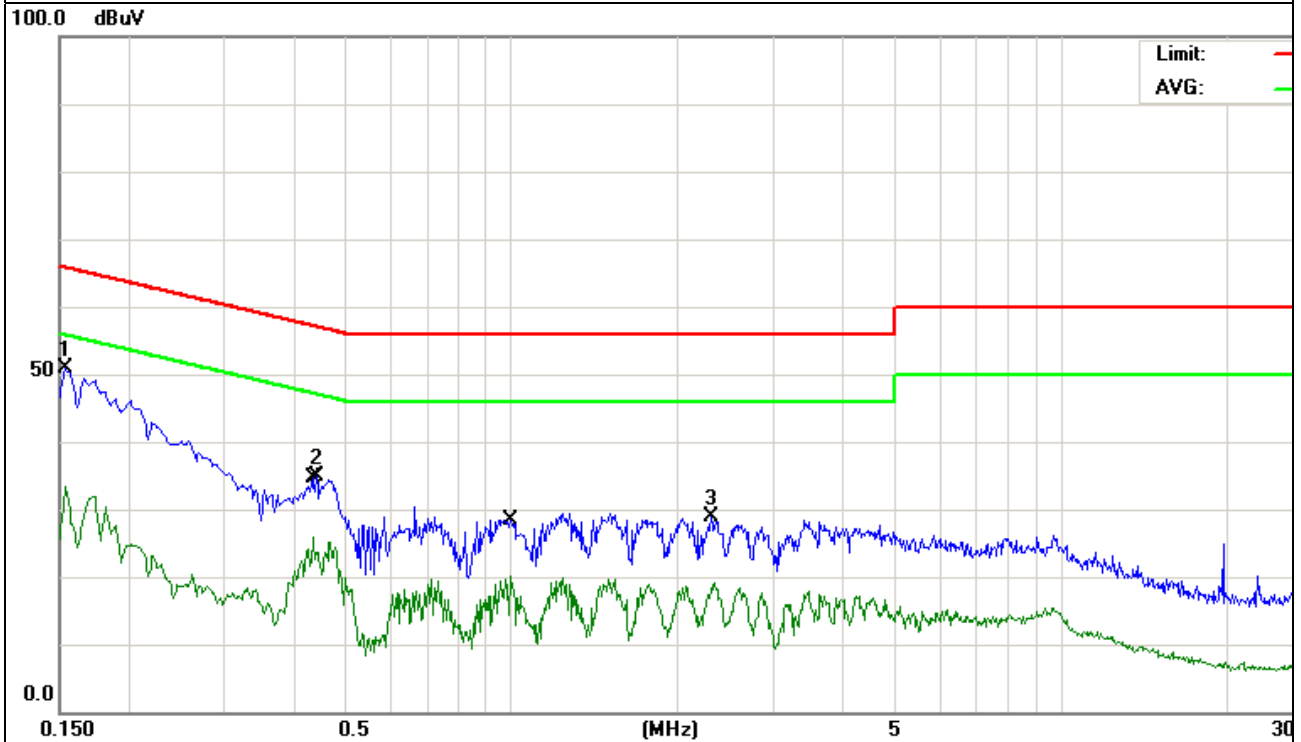
EUT :	Refer to Page 6	Model Name. :	SBWD100B
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V From adapter AC120V/60Hz	Test Mode :	Mode 5-Adapter 1

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1539	41.17	9.63	50.80	65.78	-14.98	QP
0.4420	25.43	9.53	34.96	57.02	-22.06	QP
2.3060	19.11	9.66	28.77	56.00	-27.23	QP
0.1539	23.81	9.63	33.44	55.78	-22.34	AVG
0.4340	16.49	9.50	25.99	47.18	-21.19	AVG
0.9900	10.38	9.73	20.11	46.00	-25.89	AVG

Remark:

1. All readings are Quasi-Peak and Average values.

2. Factor = Insertion Loss + Cable Loss.

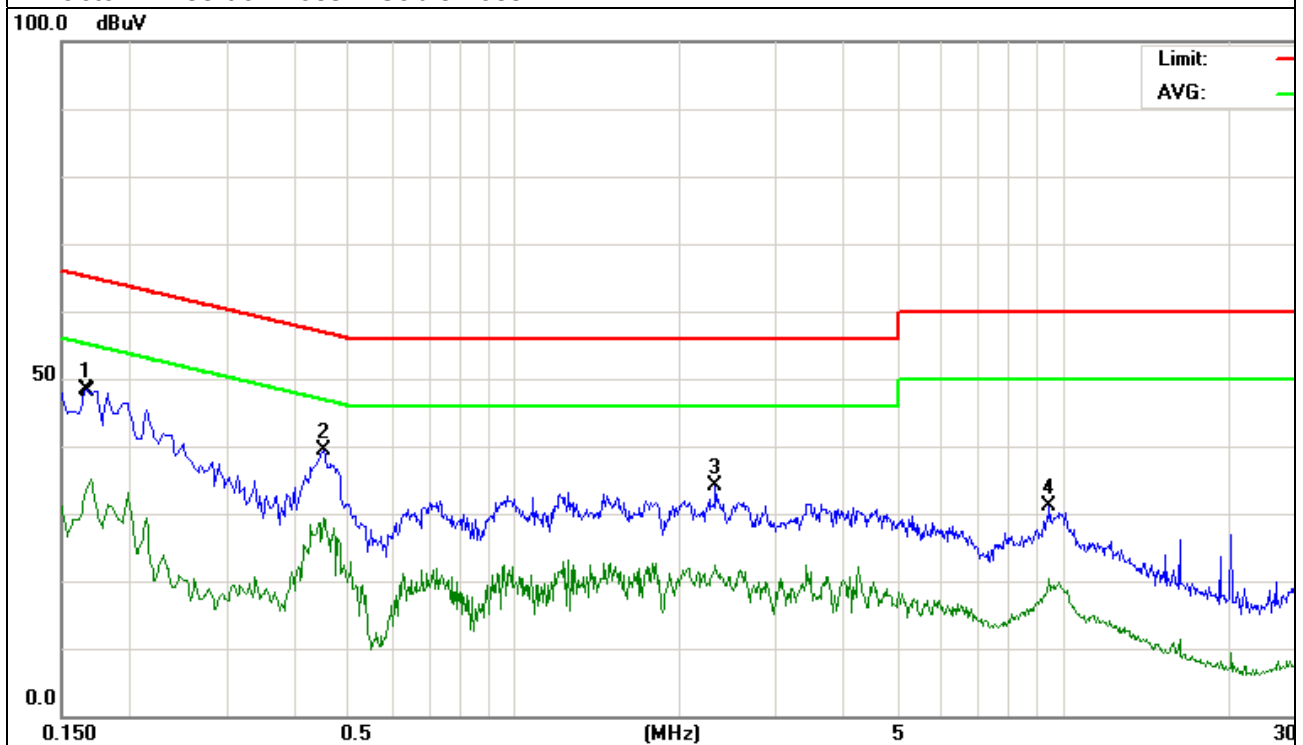


EUT :	Refer to Page 6	Model Name. :	SBWD100B
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V From adapter AC120V/60Hz	Test Mode :	Mode 5-Adapter 1

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1660	38.90	9.60	48.50	65.15	-16.65	QP
0.4500	29.84	9.66	39.50	56.87	-17.37	QP
2.3300	24.67	9.53	34.20	56.00	-21.80	QP
9.4339	21.50	9.63	31.13	60.00	-28.87	QP
0.1700	25.39	9.61	35.00	54.96	-19.96	AVG
0.4500	19.77	9.66	29.43	46.87	-17.44	AVG
9.4339	10.66	9.63	20.29	50.00	-29.71	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

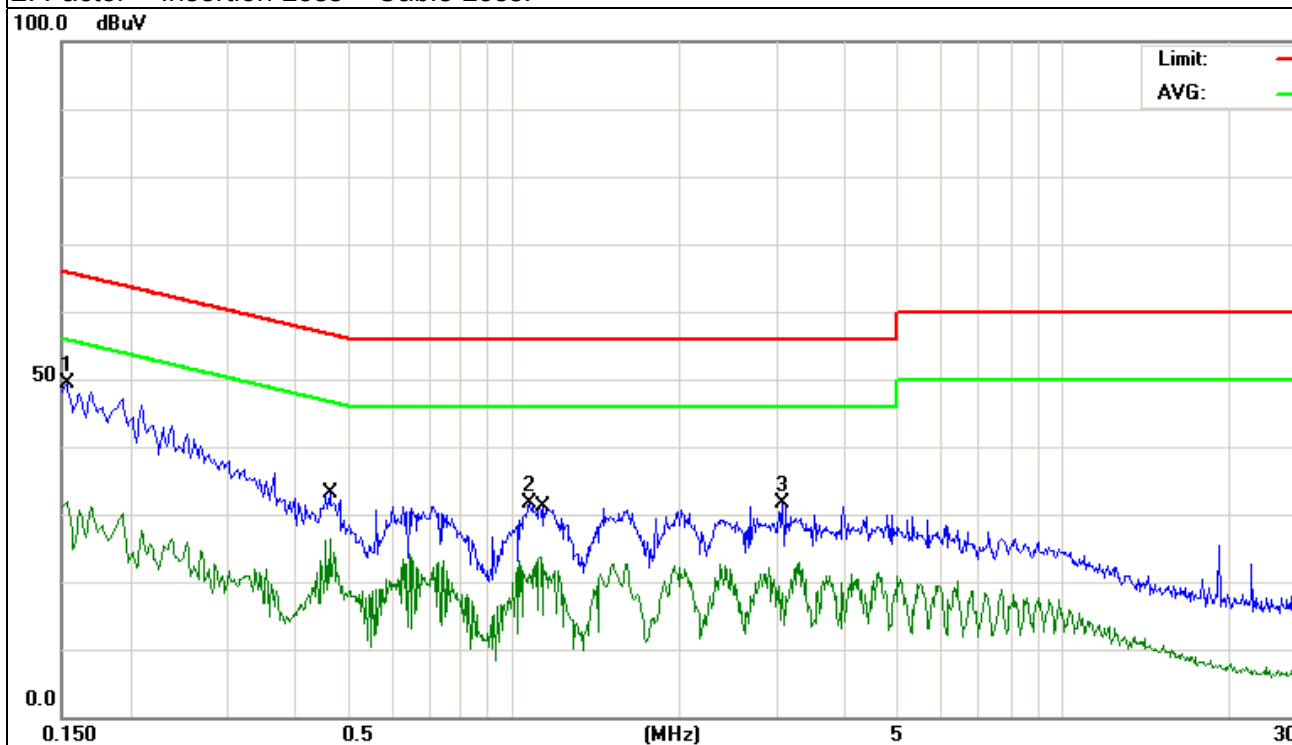


EUT :	Refer to Page 6	Model Name. :	SBWD100B
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V From adapter AC240V/60Hz	Test Mode :	Mode 5-Adapter 1

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1539	39.67	9.63	49.30	65.78	-16.48	QP
1.0660	21.87	9.73	31.60	56.00	-24.40	QP
3.0860	21.90	9.67	31.57	56.00	-24.43	QP
28.3660	27.07	9.98	37.05	60.00	-22.95	QP
0.1539	22.27	9.63	31.90	55.78	-23.88	AVG
0.4620	16.84	9.61	26.45	46.66	-20.21	AVG
1.1220	14.01	9.72	23.73	46.00	-22.27	AVG
28.3660	7.20	9.98	17.18	50.00	-32.82	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

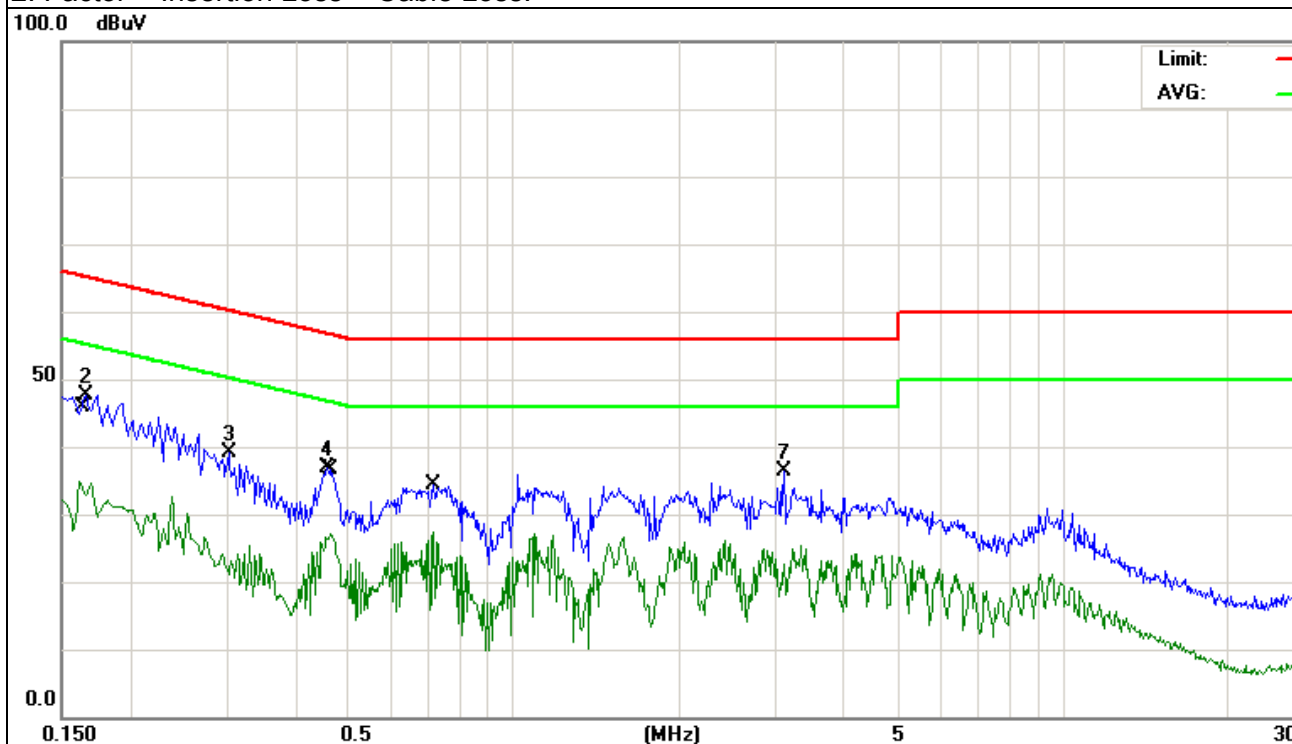


EUT :	Refer to Page 6	Model Name. :	SBWD100B
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V From adapter AC240V/60Hz	Test Mode :	Mode 5-Adapter 1

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1620	25.27	9.60	34.87	55.36	-20.49	AVG
0.1660	38.09	9.60	47.69	65.15	-17.46	QP
0.3020	29.45	9.62	39.07	60.19	-21.12	QP
0.4580	27.25	9.66	36.91	56.73	-19.82	QP
0.4660	17.36	9.66	27.02	46.58	-19.56	AVG
0.7140	17.72	9.64	27.36	46.00	-18.64	AVG
3.0980	26.98	9.52	36.50	56.00	-19.50	QP

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

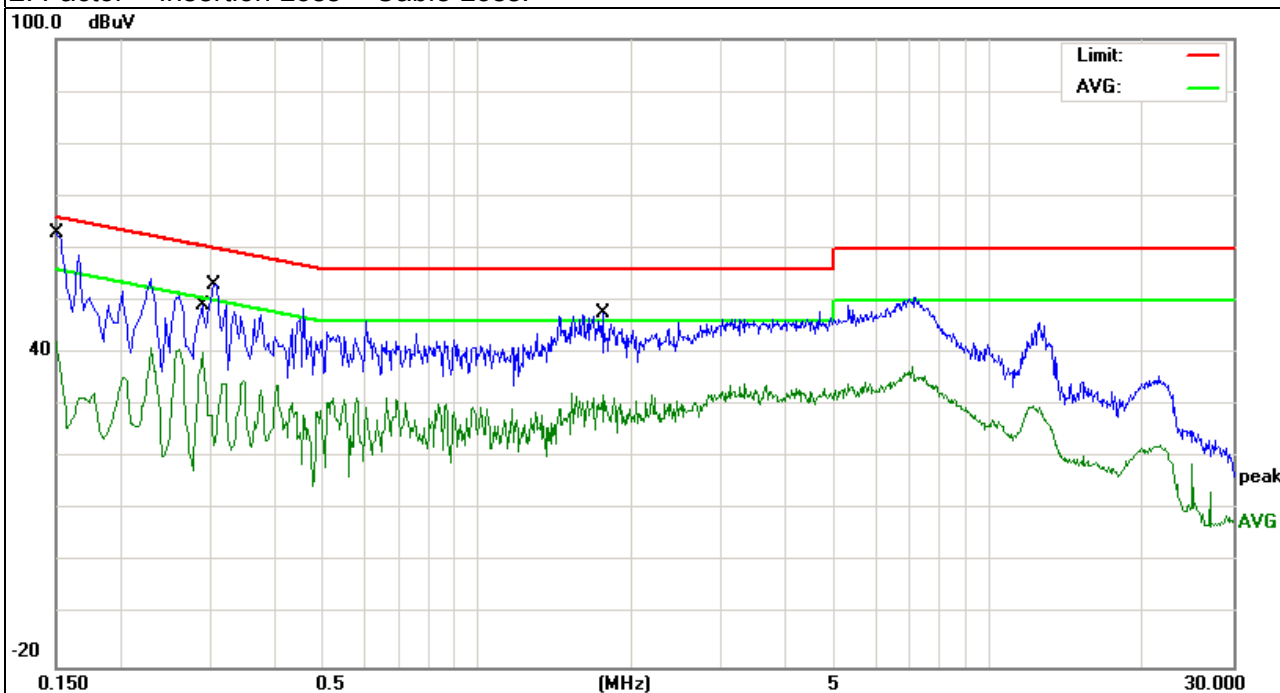


EUT :	Refer to Page 6	Model Name. :	SBWD100B
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V From adapter AC120V/60Hz	Test Mode :	Mode 5-Adapter 2

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1500	53.41	9.49	62.90	65.99	-3.09	QP
0.1500	32.68	9.49	42.17	55.99	-13.82	AVG
0.2900	30.46	9.56	40.02	50.52	-10.50	AVG
0.3060	43.58	9.54	53.12	60.08	-6.96	QP
1.7580	38.13	9.57	47.70	56.00	-8.30	QP
1.7580	22.56	9.57	32.13	46.00	-13.87	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

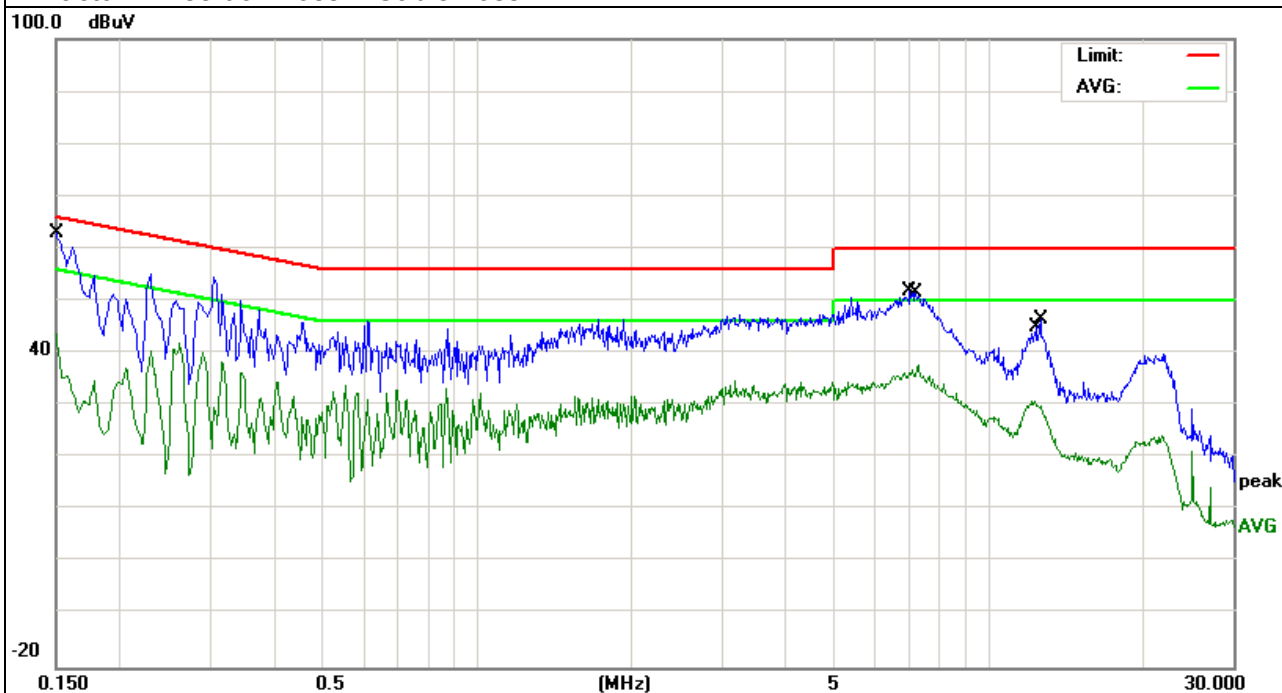


EUT :	Refer to Page 6	Model Name. :	SBWD100B
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V From adapter AC120V/60Hz	Test Mode :	Mode 5-Adapter 2

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1499	53.34	9.49	62.83	66.00	-3.17	QP
0.1499	34.36	9.49	43.85	56.00	-12.15	AVG
7.0140	42.18	9.70	51.88	60.00	-8.12	QP
7.2780	27.93	9.70	37.63	50.00	-12.37	AVG
12.2860	21.20	9.78	30.98	50.00	-19.02	AVG
12.6220	36.73	9.78	46.51	60.00	-13.49	QP

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

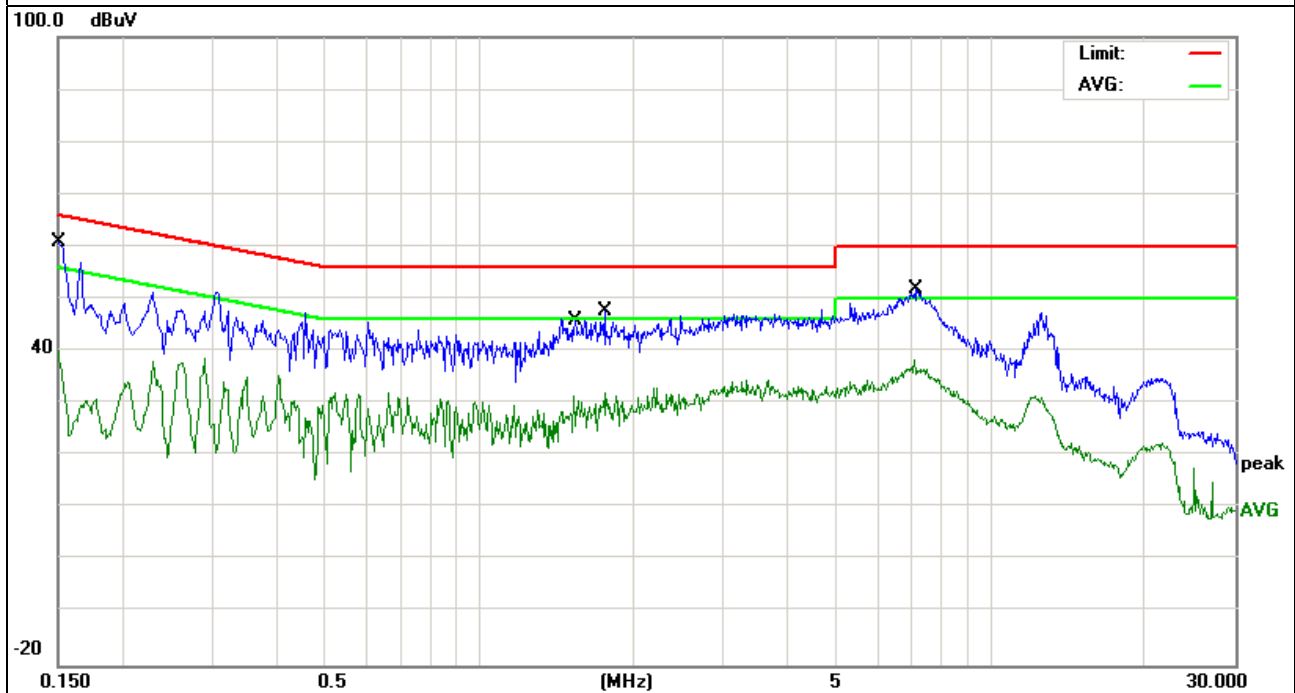


EUT :	Refer to Page 6	Model Name. :	SBWD100B
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V From adapter AC240V/60Hz	Test Mode :	Mode 5-Adapter 2

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1499	30.68	9.49	40.17	56.00	-15.83	AVG
0.1500	51.41	9.49	60.90	65.99	-5.09	QP
1.5339	21.86	9.56	31.42	46.00	-14.58	AVG
1.7580	38.13	9.57	47.70	56.00	-8.30	QP
7.0979	28.70	9.70	38.40	50.00	-11.60	AVG
7.1379	42.05	9.70	51.75	60.00	-8.25	QP

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

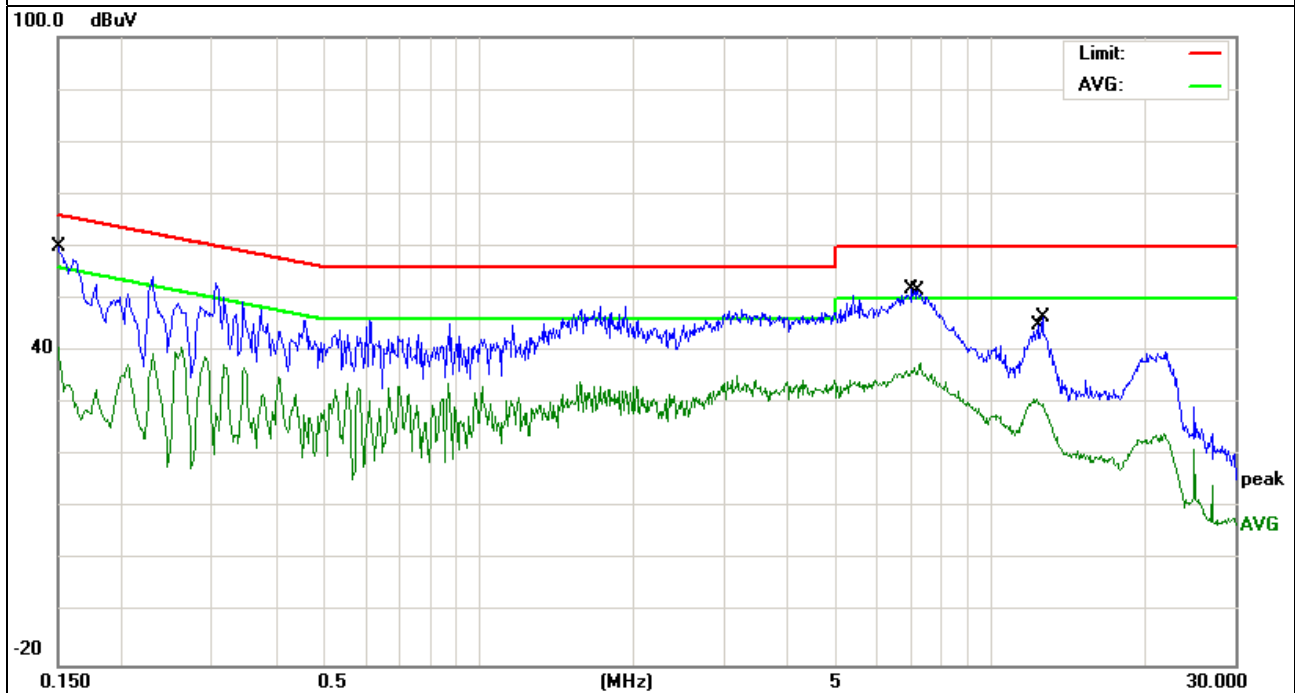


EUT :	Refer to Page 6	Model Name. :	SBWD100B
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V From adapter AC240V/60Hz	Test Mode :	Mode 5-Adapter 2

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1500	50.34	9.49	59.83	65.99	-6.16	QP
0.1500	31.36	9.49	40.85	55.99	-15.14	AVG
7.0140	42.18	9.70	51.88	60.00	-8.12	QP
7.2780	27.93	9.70	37.63	50.00	-12.37	AVG
12.2860	21.20	9.78	30.98	50.00	-19.02	AVG
12.6220	36.73	9.78	46.51	60.00	-13.49	QP

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

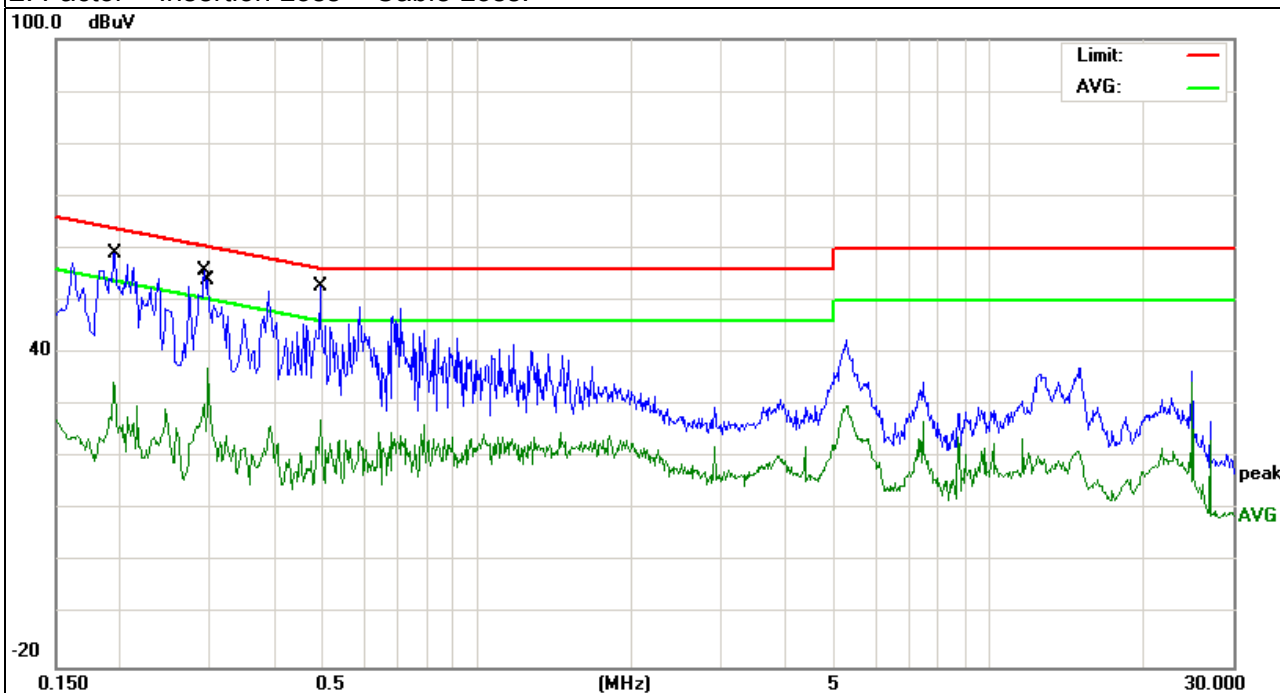


EUT :	Refer to Page 6	Model Name. :	SBWD100B
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V From adapter AC120V/60Hz	Test Mode :	Mode 5-Adapter 3

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1943	25.52	9.45	34.97	53.85	-18.88	AVG
0.1955	50.25	9.45	59.70	63.80	-4.10	QP
0.2923	46.24	9.56	55.80	60.46	-4.66	QP
0.2977	27.65	9.57	37.22	50.30	-13.08	AVG
0.4939	43.25	9.53	52.78	56.10	-3.32	QP
0.4939	17.87	9.53	27.40	46.10	-18.70	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

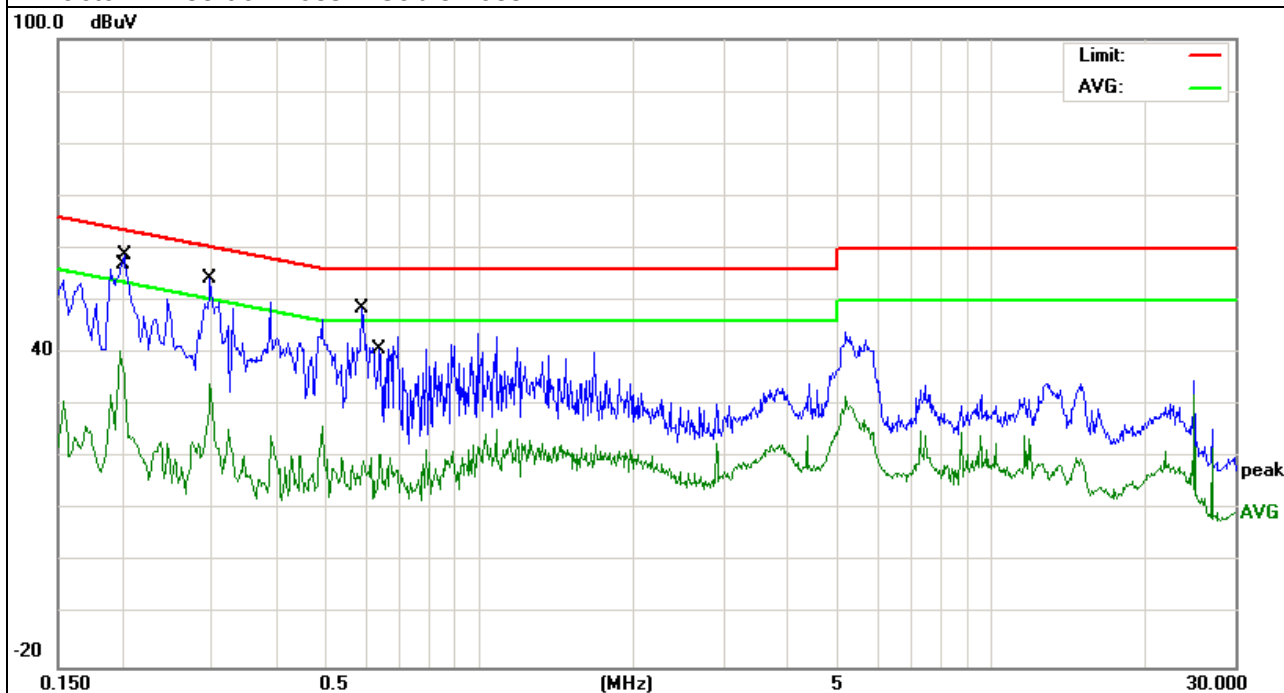


EUT :	Refer to Page 6	Model Name. :	SBWD100B
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V From adapter AC120V/60Hz	Test Mode :	Mode 5-Adapter 3

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1980	33.03	9.45	42.48	53.69	-11.21	AVG
0.2020	50.55	9.45	60.00	63.52	-3.52	QP
0.2977	46.63	9.57	56.20	60.30	-4.10	QP
0.2977	26.66	9.57	36.23	50.30	-14.07	AVG
0.5897	39.90	9.56	49.46	56.00	-6.54	QP
0.6419	12.10	9.56	21.66	46.00	-24.34	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

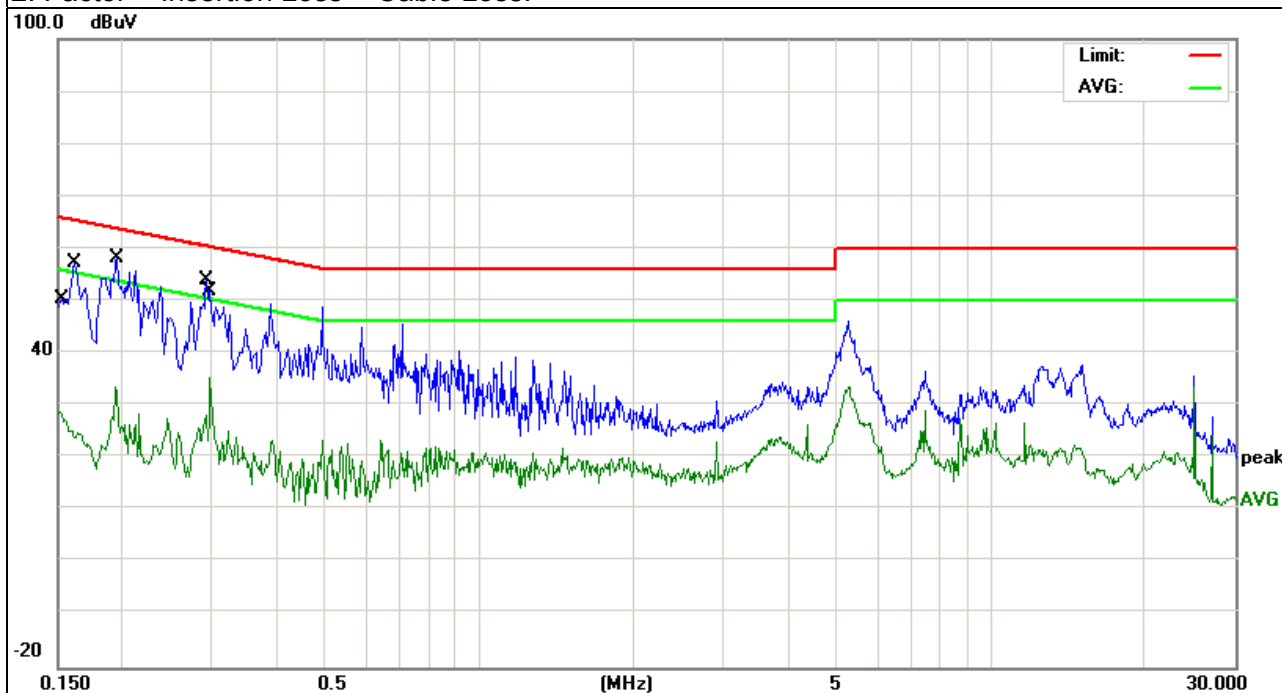


EUT :	Refer to Page 6	Model Name. :	SBWD100B
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V From adapter AC240V/60Hz	Test Mode :	Mode 5-Adapter 3

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1516	18.14	9.49	27.63	55.91	-28.28	AVG
0.1620	48.83	9.48	58.31	65.36	-7.05	QP
0.1943	25.02	9.45	34.47	53.85	-19.38	AVG
0.1955	49.75	9.45	59.20	63.80	-4.60	QP
0.2923	45.74	9.56	55.30	60.46	-5.16	QP
0.2977	27.15	9.57	36.72	50.30	-13.58	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

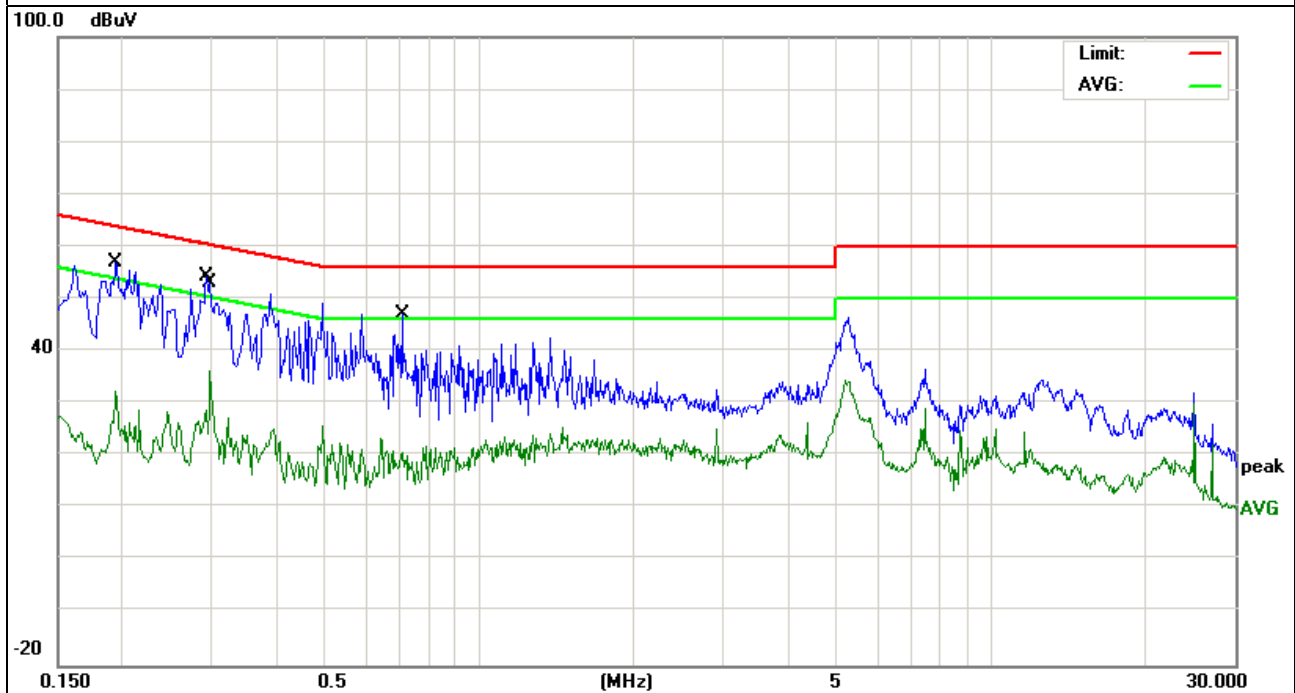


EUT :	Refer to Page 6	Model Name. :	SBWD100B
Temperature :	26 °C	Relative Humidity :	56%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V From adapter AC240V/60Hz	Test Mode :	Mode 5-Adapter 3

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1943	49.05	9.45	58.50	63.85	-5.35	QP
0.1943	24.52	9.45	33.97	53.85	-19.88	AVG
0.2923	45.74	9.56	55.30	60.46	-5.16	QP
0.2977	27.65	9.57	37.22	50.30	-13.08	AVG
0.7056	39.10	9.57	48.67	56.00	-7.33	QP
0.7096	11.54	9.57	21.11	46.00	-24.89	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



3.2 RADIATED EMISSION MEASUREMENT

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

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

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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	dBuV/m@at 3M	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

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

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

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

3.2.2 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

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

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

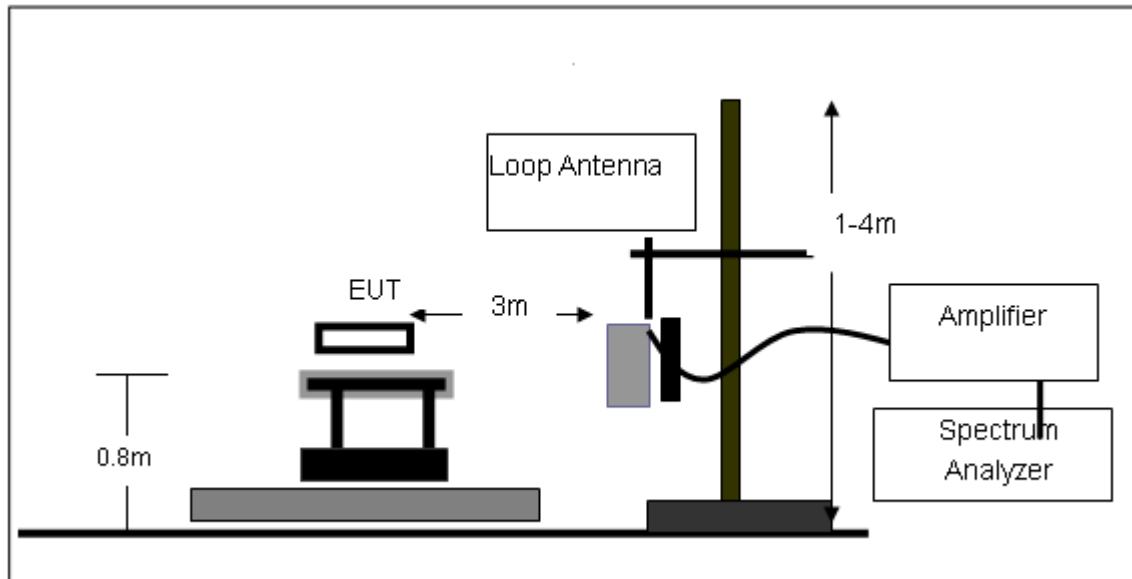
Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	Peak	100 kHz	100 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

3.2.3 DEVIATION FROM TEST STANDARD

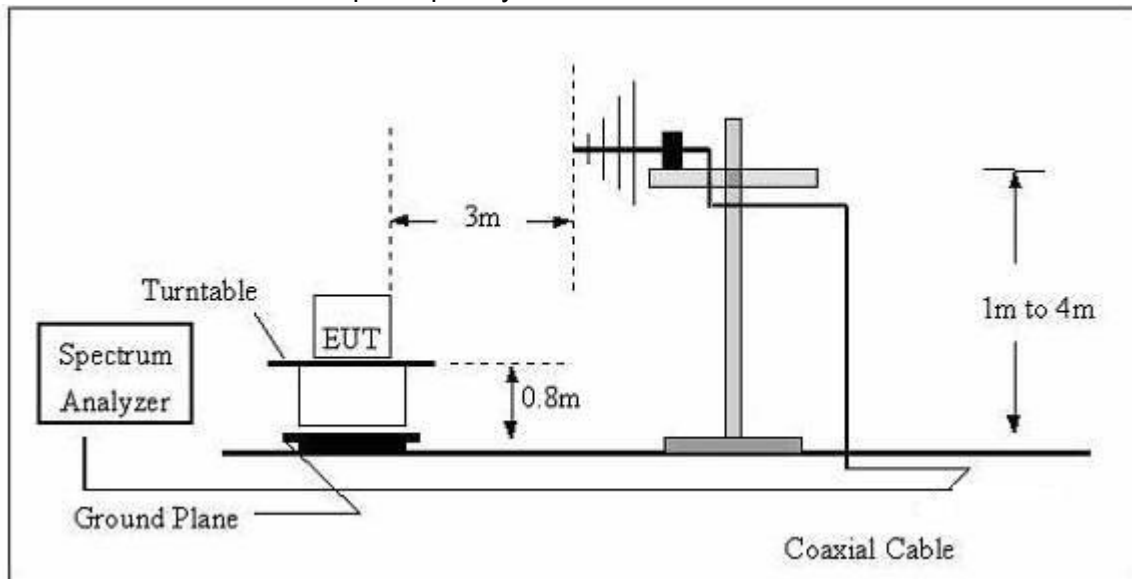
No deviation

3.2.4 TEST SETUP

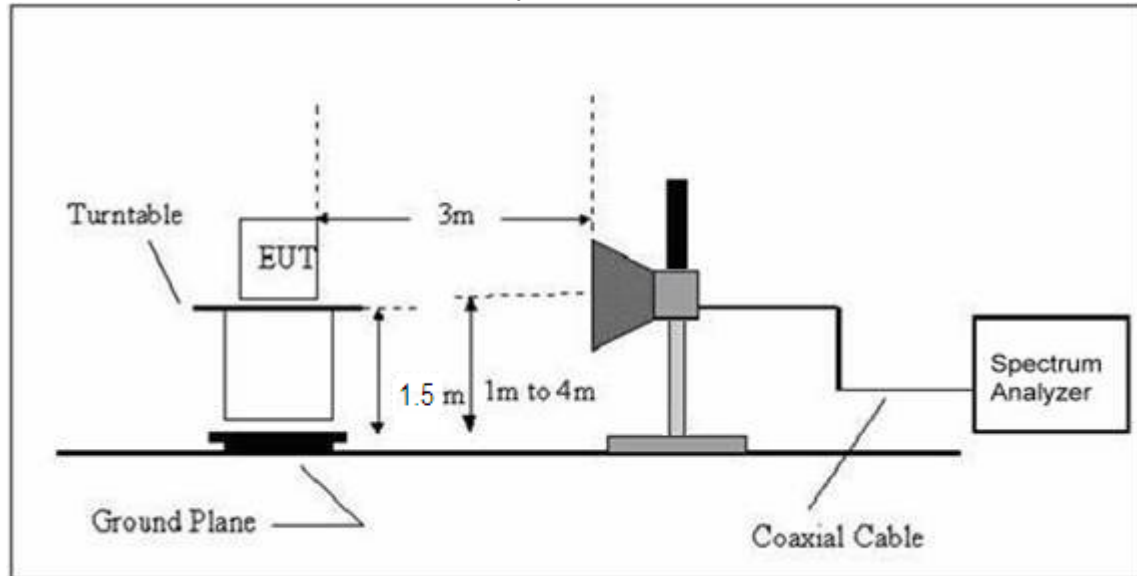
(A) Radiated Emission Test-Up Frequency Below 30MHz



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



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

**3.2.5 EUT OPERATING CONDITIONS**

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

3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

EUT:	Refer to Page 6	Model Name. :	SBWD100B
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX	Polarization :	--

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

NOTE:

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

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

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

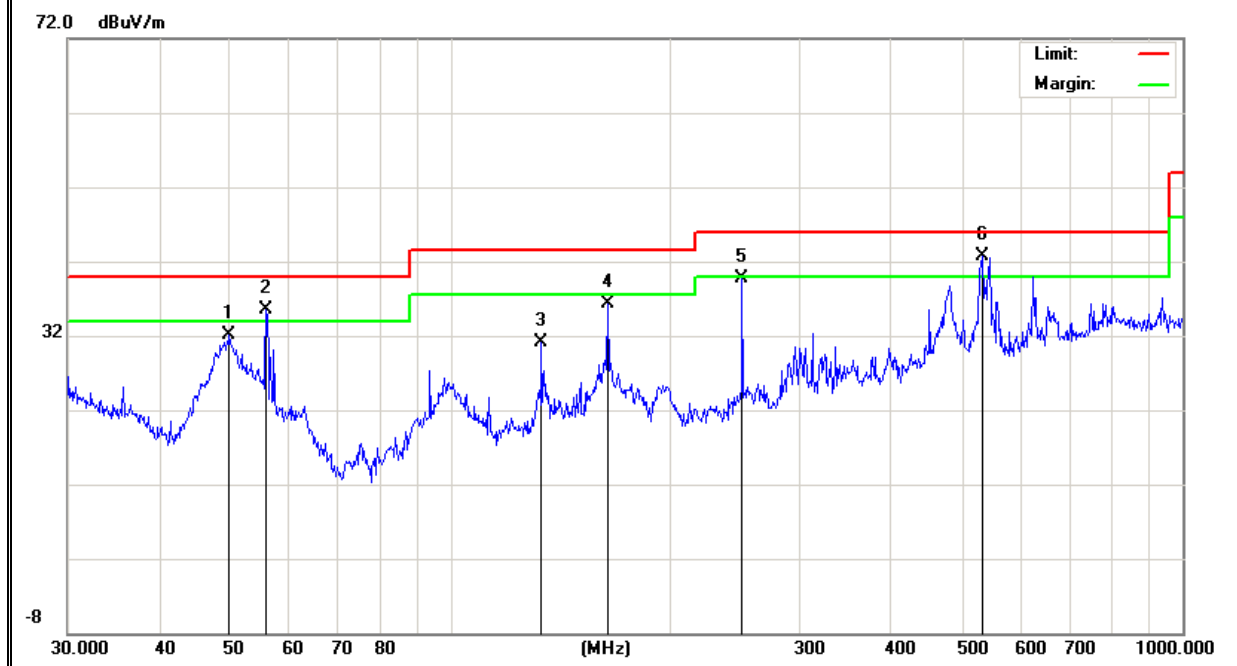
3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT :	Refer to Page 6	Model Name :	SBWD100B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX (2.4G) -Adapter 1		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	49.8814	21.39	10.71	32.10	40.00	-7.90	QP
V	56.0007	26.51	8.97	35.48	40.00	-4.52	QP
V	133.1511	19.44	11.74	31.18	43.50	-12.32	QP
V	163.755	25.73	10.51	36.24	43.50	-7.26	QP
V	250.3012	26.10	13.59	39.69	46.00	-6.31	QP
V	533.8321	21.76	21.00	42.76	46.00	-3.24	QP

Remark:

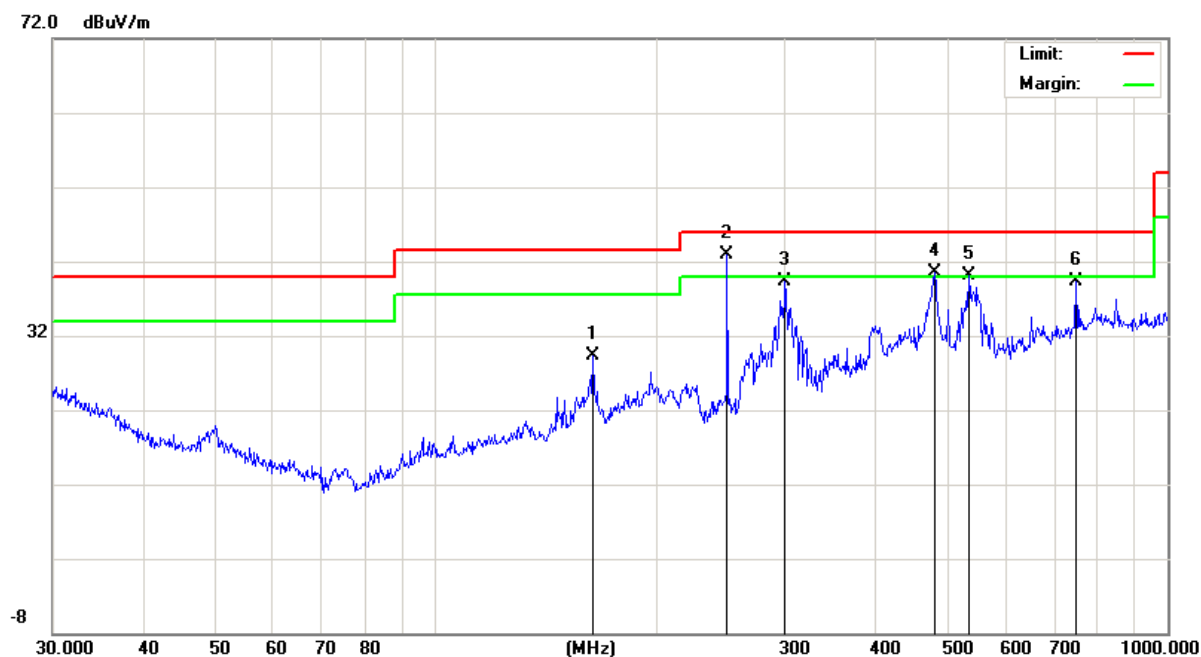
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	163.7548	18.74	10.51	29.25	43.50	-14.25	QP
H	250.3012	29.34	13.59	42.93	46.00	-3.07	QP
H	300.3672	25.06	14.16	39.22	46.00	-6.78	QP
H	480.5276	20.66	19.91	40.57	46.00	-5.43	QP
H	535.7073	18.99	21.04	40.03	46.00	-5.97	QP
H	750.1083	13.18	26.10	39.28	46.00	-6.72	QP

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

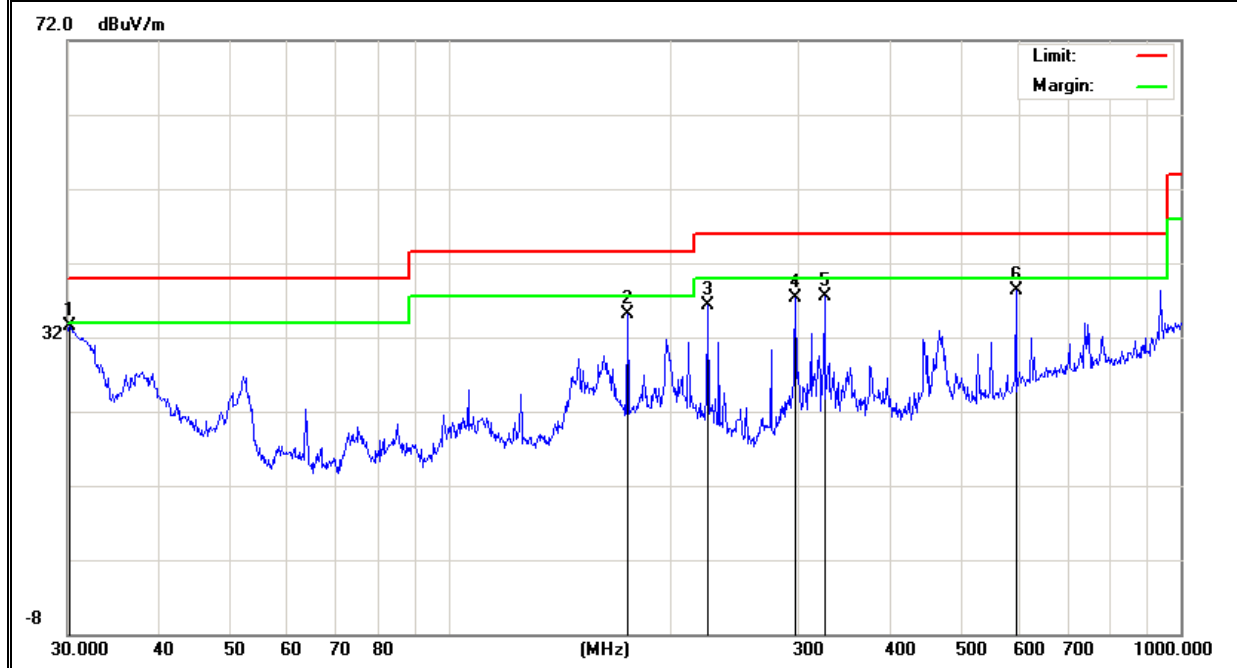


EUT :	Refer to Page 6	Model Name :	SBWD100B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX (2.4G) -Adapter 2		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	30.2107	14.07	19.49	33.56	40.00	-6.44	QP
V	175.0364	22.79	12.31	35.10	43.50	-8.40	QP
V	225.3077	25.36	10.92	36.28	46.00	-9.72	QP
V	297.2241	24.86	12.51	37.37	46.00	-8.63	QP
V	325.5957	23.96	13.46	37.42	46.00	-8.58	QP
V	595.1326	19.07	19.21	38.28	46.00	-7.72	QP

Remark:

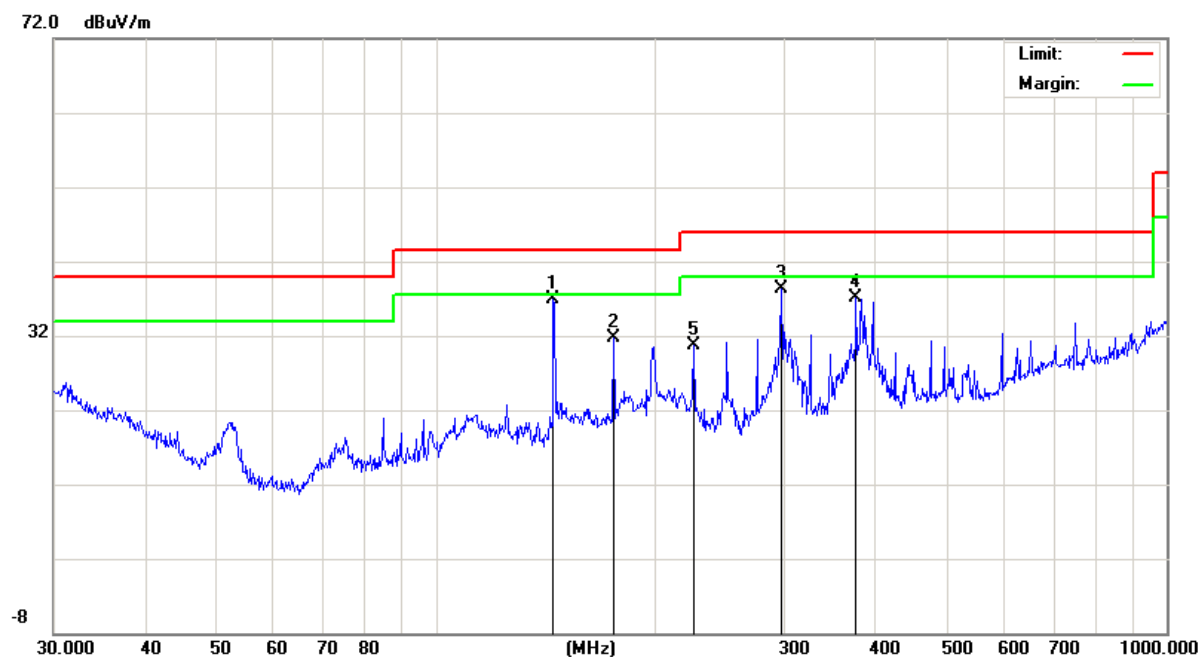
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	144.8418	25.63	11.27	36.90	43.50	-6.60	QP
H	175.0363	19.45	12.31	31.76	43.50	-11.74	QP
H	297.2241	25.82	12.51	38.33	46.00	-7.67	QP
H	375.9384	22.18	14.86	37.04	46.00	-8.96	QP
H	225.3077	19.79	10.92	30.71	46.00	-15.29	QP

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

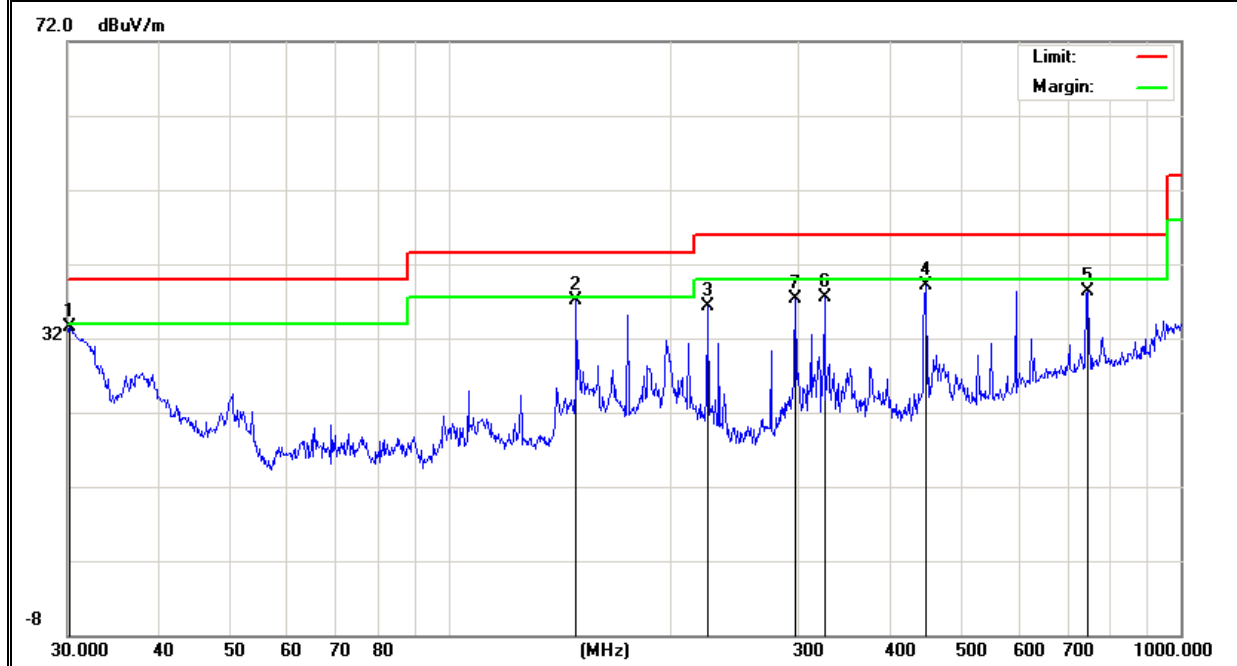


EUT :	Refer to Page 6	Model Name :	SBWD100B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX (2.4G) -Adapter 3		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	30.2103	14.07	19.49	33.56	40.00	-6.44	QP
V	148.9625	25.59	11.61	37.20	43.50	-6.30	QP
V	225.3077	25.36	10.92	36.28	46.00	-9.72	QP
V	447.9821	23.14	15.96	39.10	46.00	-6.90	QP
V	744.8659	16.26	22.04	38.30	46.00	-7.70	QP
V	325.5957	23.96	13.46	37.42	46.00	-8.58	QP
V	297.2241	24.86	12.51	37.37	46.00	-8.63	QP

Remark:

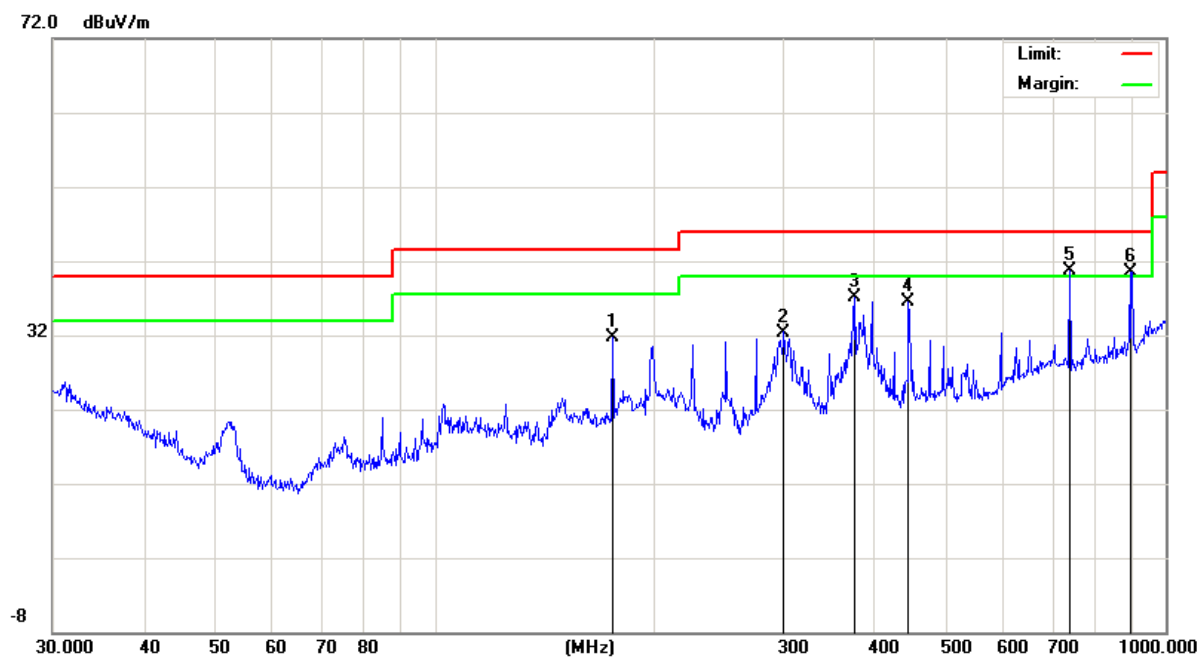
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	175.0363	19.45	12.31	31.76	43.50	-11.74	QP
H	300.3673	19.80	12.60	32.40	46.00	-13.60	QP
H	375.9384	22.18	14.86	37.04	46.00	-8.96	QP
H	444.8514	20.63	15.87	36.50	46.00	-9.50	QP
H	739.6603	18.83	21.97	40.80	46.00	-5.20	QP
H	893.8567	16.39	24.05	40.44	46.00	-5.56	QP

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

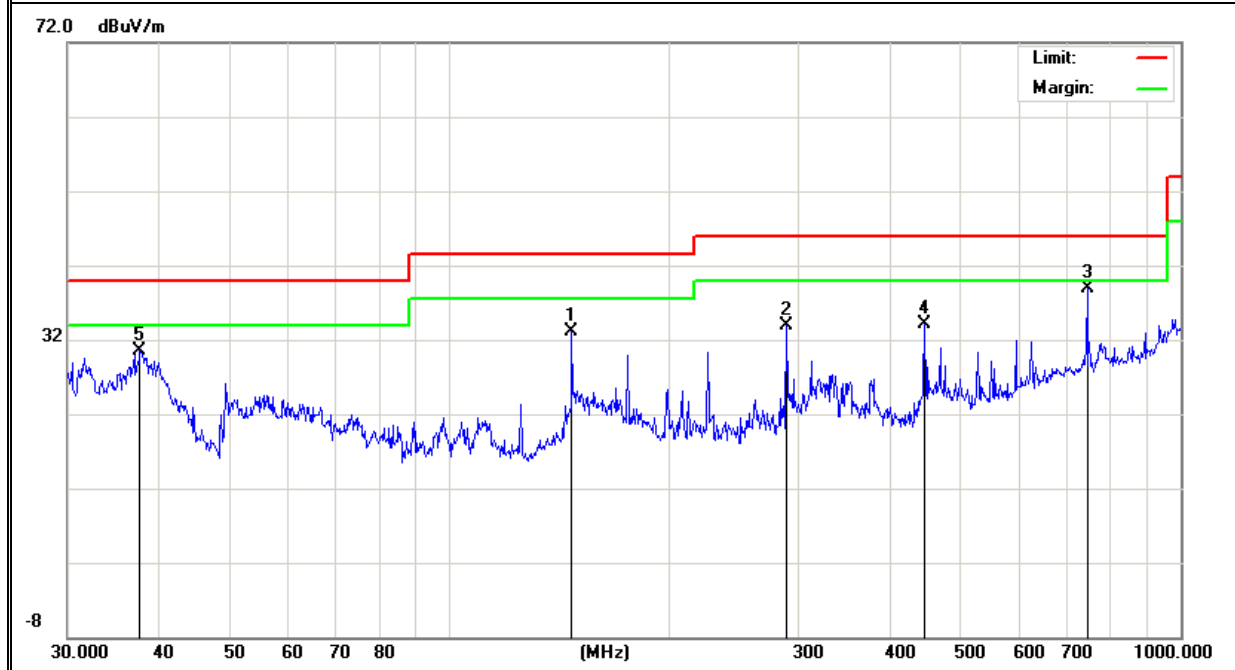


EUT :	Refer to Page 6	Model Name :	SBWD100B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX(5.0G) -Adapter 3		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	146.8874	21.67	11.43	33.10	43.50	-10.40	QP
V	289.0020	21.82	12.18	34.00	46.00	-12.00	QP
V	744.8659	16.77	22.04	38.81	46.00	-7.19	QP
V	446.4141	18.27	15.91	34.18	46.00	-11.82	QP
V	37.6798	14.67	15.93	30.60	40.00	-9.40	QP

Remark:

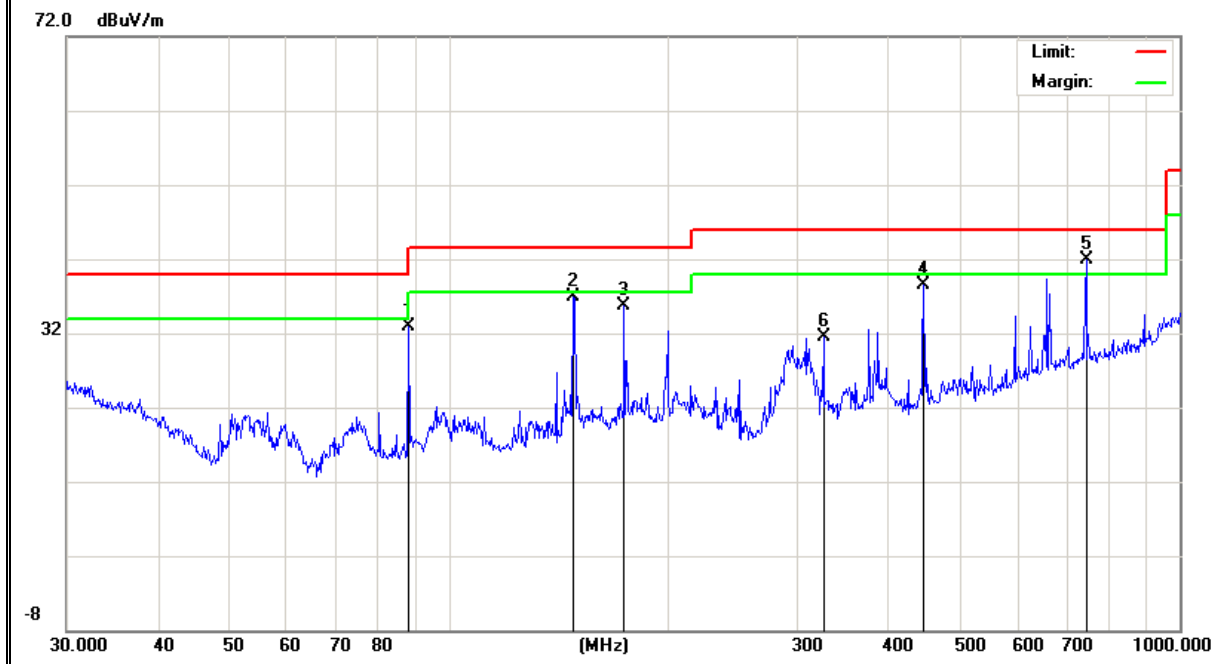
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	88.0327	23.22	9.64	32.86	43.50	-10.64	QP
H	147.9214	25.47	11.53	37.00	43.50	-6.50	QP
H	173.8135	23.25	12.37	35.62	43.50	-7.88	QP
H	446.4141	22.52	15.91	38.43	46.00	-7.57	QP
H	744.8659	19.95	22.04	41.99	46.00	-4.01	QP
H	325.5957	18.11	13.46	31.57	46.00	-14.43	QP

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

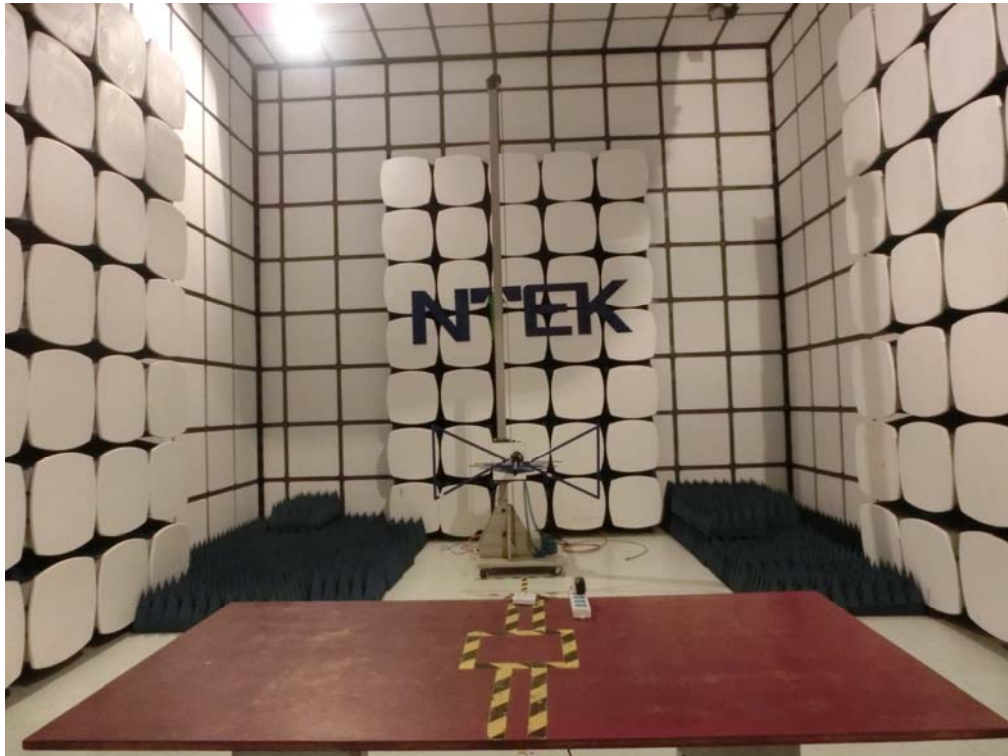
EUT :	Refer to Page 6	Model Name :	SBWD100B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V From adapter AC120V/60Hz
Test Mode :	TX (2.4G)		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (2412 MHz)-Above 1G							
Vertical	4824.012	46.13	10.44	56.57	74	-17.43	Pk
Vertical	4824.012	36.04	10.44	46.48	54	-7.52	AV
Vertical	7236	38.15	12.39	50.54	74	-23.46	pk
Horizontal	4824.012	44.03	10.44	54.47	74	-19.53	pk
Horizontal	4824.012	36.51	10.44	46.95	54	-7.05	AV
Horizontal	7236	32.05	12.39	44.44	74	-29.56	pk
Mid Channel (2437 MHz)-Above 1G							
Vertical	4874.043	46.25	10.4	56.65	74	-17.35	pk
Vertical	4874.043	36.51	10.4	46.91	54	-7.09	AV
Vertical	7311.147	35.13	12.75	47.88	74	-26.12	Pk
Horizontal	4874.043	45.72	10.4	56.12	74	-17.88	Pk
Horizontal	4874.043	35.19	10.4	45.59	54	-8.41	AVk
Horizontal	7311.147	31.29	12.75	44.04	74	-29.96	Pk
High Channel (2462 MHz)- Above 1G							
Vertical	4924.124	48.15	10.39	58.54	74	-15.46	pk
Vertical	4924.124	36.24	10.39	46.63	54	-7.37	AV
Vertical	7386.076	38.42	12.68	51.1	74	-22.9	pk
Horizontal	4924.124	46.51	10.39	56.9	74	-17.1	pk
Horizontal	4924.124	34.06	10.39	44.45	54	-9.55	AV
Horizontal	7386.033	32.42	12.68	45.1	74	-28.9	pk

Note:"802.11b" mode is the worst mode. When PK value is lower than the Average value limit, average didn't record.

4. EUT TEST PHOTO

Radiated Measurement Photos



Conducted Measurement Photos

