Date: 2011-08-25 **TEST REPORT**

Report No.: 68.870.11.003.01F

Applicant:	Dorel Juvenile Group 2525 State, Columbus, Indiana, United States, 47201-7494
Description of Samples:	Model name: Baby Monitor(Transmitter) Brand name: Dorel Model no.: MO069T,MO067T,MO068T,MO070T FCCID: MNJ-MO067069
Date Samples Received:	2011-08-16
Date Tested:	2011-08-16 to 2011-08-23
Investigation Requested:	FCC Part 15 Subpart C, Section 15.235
Conclusions:	The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.
Remarks:	----

Checked by: Approved by:-

John Zhi
Project Engineer
Wireless & Telecom department

Nicolas Cheng
Project Manager
Wireless & Telecom department

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No. 4001, Fuqiang Road, Futian District, Shenzhen, China.

CONTENT:

1.0 General Details

1.1 Test Laboratory

Neutron Engineering Inc.
EMC Laboratory registered by FCC with
FCC Registration Number: 538587

Test By: 

Ares Liu

1.2 Applicant Details

Applicant

Dorel Juvenile Group
2525 State, Columbus, Indiana, United States, 47201-7494

Manufacturer

MC Device Co., Ltd.
516, BLD 4, Software Park, Kejizhong RD, Shenzhen Hi-Tech Park, Shenzhen, Guangdong, China, 518057

1.3 Equipment Under Test [EUT]

Description of EUT

Model Name:	Baby Monitor(Transmitter)
Brand Name:	Dorel
Model Number:	MO069T,MO067T,MO068T,MO070T
FCCID:	MNJ-MO067069
Rating:	1.5Vd.c. (1 x " AAA" size battery) Input:120VAC/60Hz Output:DC9V/200mA(adaptor)
Antenna Type:	Integral
Operated Frequency:	49.83MHz,49.85MHz,49.87MHz,49.89MHz
No. of Channel:	4
Accessories and Auxiliary Equipment:	None
EUT Exercising Software:	None

Note: As per Client Declaration, MO069T, MO067T, MO068T and MO070T, Utilize the identical circuit design, PCB layout, shielding and interface with (basic MO069T), only the cosmetic is difference. Therefore this application can be regarded as identical in performance to the submitted test sample. So we use MO069T as a representative model to perform all testing.

General Operation of EUT

The Equipment Under Test (EUT) is a baby monitor operated at 49MHz to transmit the audio signal of the baby to its associated receiver.

1.4 Equipment Modification

No modification was made to the tested unit by TUV SUD China

1.5 Related Submittal(s) Grants

This is a single application for certification of the transmitter.

2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2009 and ANSI C63.4: 2003 for FCC Verification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary				
Test Condition	Test Requirement	Test Result		
		Pass	Failed	N/A
Conducted Emission, 0.15MHz to 30 GHz	Part 15.207(a)	☒	☐	☐
Radiated Emission, 30MHz to 1GHz	Part 15.209(a)	☒	☐	☐
Radiated Emission of Carrier Frequency	Part 15.235(a)	☒	☐	☐
Out of Band Edges Emission Measurement	Part 15.235(b)	☒	☐	☐
Home-built Intentional Radiator	Part 15. 235(c)	☐	☐	☒

Note: N/A - Not Applicable

3.0 Test Methodology

3.1 Radiated Emission

The sample was placed 0.8m above the ground plane on a standard emission test site *. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

*On a standard emission test site with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 538587.

3.2 Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

FS = R + System Factor
System Factor = AF + CF + FA – PA

Where FS = Net Field Strength in dBuV/m at 3 meters.
R = Reading of Spectrum Analyzer / Test Receiver in dBuV.
AF = Antenna Factor in dB.
CF = Cable Attenuation Factor in dB.
FA = Filter Attenuation Factor in dB.
PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

3.3 Conducted Emissions

The EUT was placed on a non-metallic table 0.8m above the horizontal metal reference place and 0.4m from a vertical ground plane which is connected to the horizontal metal ground plane. Meanwhile, the AC main of EUT was connected to the distance of 0.8m line impedance stabilization network (LISN) during measurement.

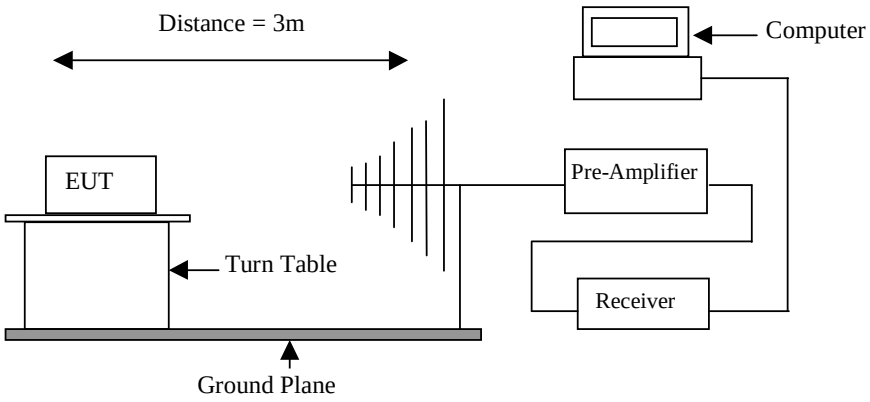
Initial measurements were performed in quasi-peak and average detection modes by the test receiver, any emissions recorded within 30dB of the relevant limit lines were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

4.0 Test Results

4.1 Radiated Emission of Carrier Frequency

Test Requirement:	FCC part 15 section 15.235(a),
Test Method:	ANSI C63.4:2003
Test Date:	2011-08-19
Mode of Operation:	Transmitting mode.
Detector Function	Quasi-peak (Below 1000 MHz) Average and Peak (Above 1000 MHz)
Measurement BW	120 kHz (Below 1000 MHz) 1 MHz (Above 1000 MHz)

Test Setup:



Results: PASS

Radiated Emissions of Carrier Frequency									
Value	Emissions Frequency **MHz**	E-Field Polarity	Reading **dBµV/m**	System Factor **dB**	Field Strength at 3m **dBµV/m**	Average Factor **dB**	Net Field Strength at 3m **dBµV/m**	Limit **dBµV/m**	Delta to Limit **dBµV/m**
PK	49.850	V	58.12	7.99	66.11	0.00	66.11	100	-33.89
AV	49.850	V	58.02	7.99	66.01	0.00	66.01	80	-13.99
PK	49.850	H	47.69	7.99	55.68	0.00	55.68	100	-44.32
AV	49.850	H	47.21	7.99	55.20	0.00	55.20	80	-24.8

Remark:
-Calculated measurement uncertainty: ±5.2dB

Limits for Fundamental Frequency: [Section 15.235(a)]:

Fundamental Frequency [MHz]	Field Strength of Fundamental [µV/m]	Field Strength of Fundamental [dBµV/m]
49.82~49.90	10,000	80

Compliance with the limits in the above table may be based on the use of measurement instrumentation with a average detector.

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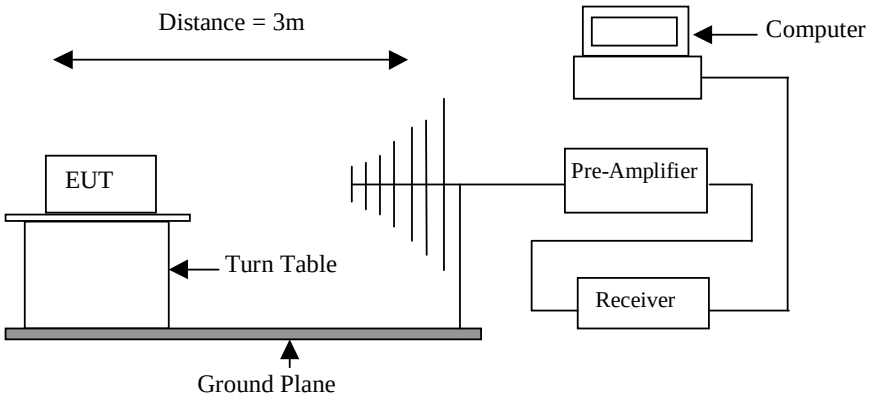
4.2 Out of Band Edges Spurious Radiated Emission

Test Requirement:	FCC part 15 section 15.235(b)
Test Method:	ANSI C63.4:2003
Test Date:	2011-08-19
Mode of Operation:	Transmitting mode.
Detector Function	Quasi-peak (Below 1000 MHz) Average and Peak (Above 1000 MHz)
Measurement BW	120 kHz (Below 1000 MHz) 1 MHz (Above 1000 MHz)

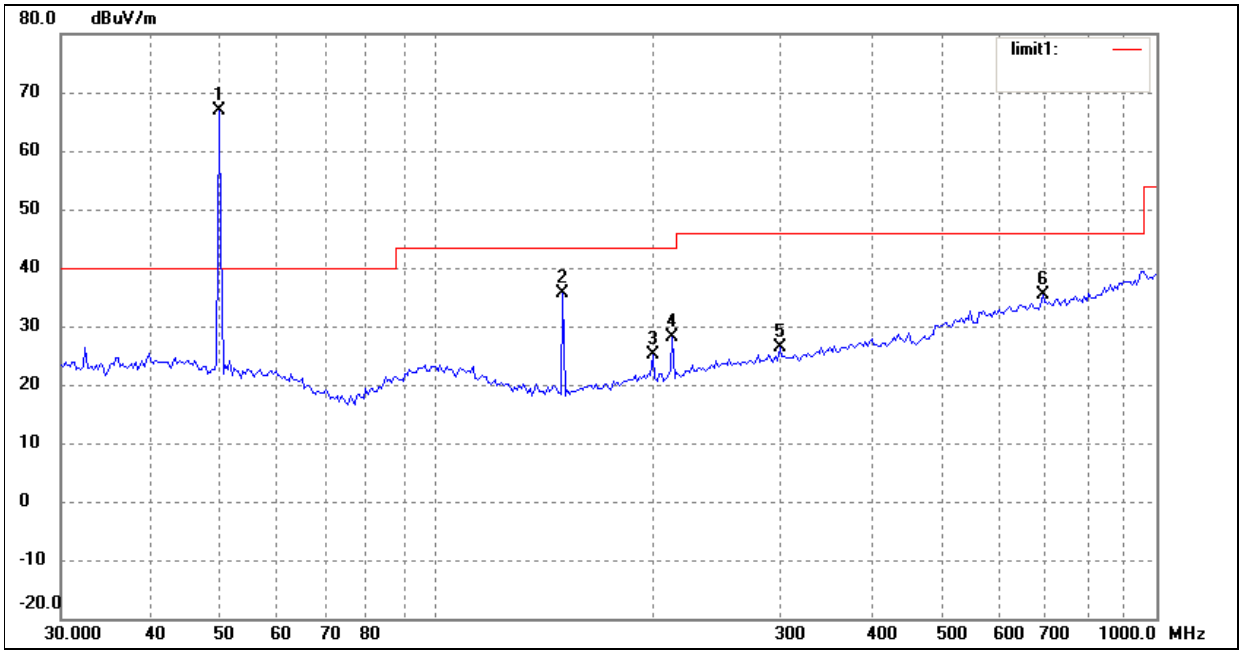
Test Setup:



Results: PASS

Spurious Radiated Emission

Vertical

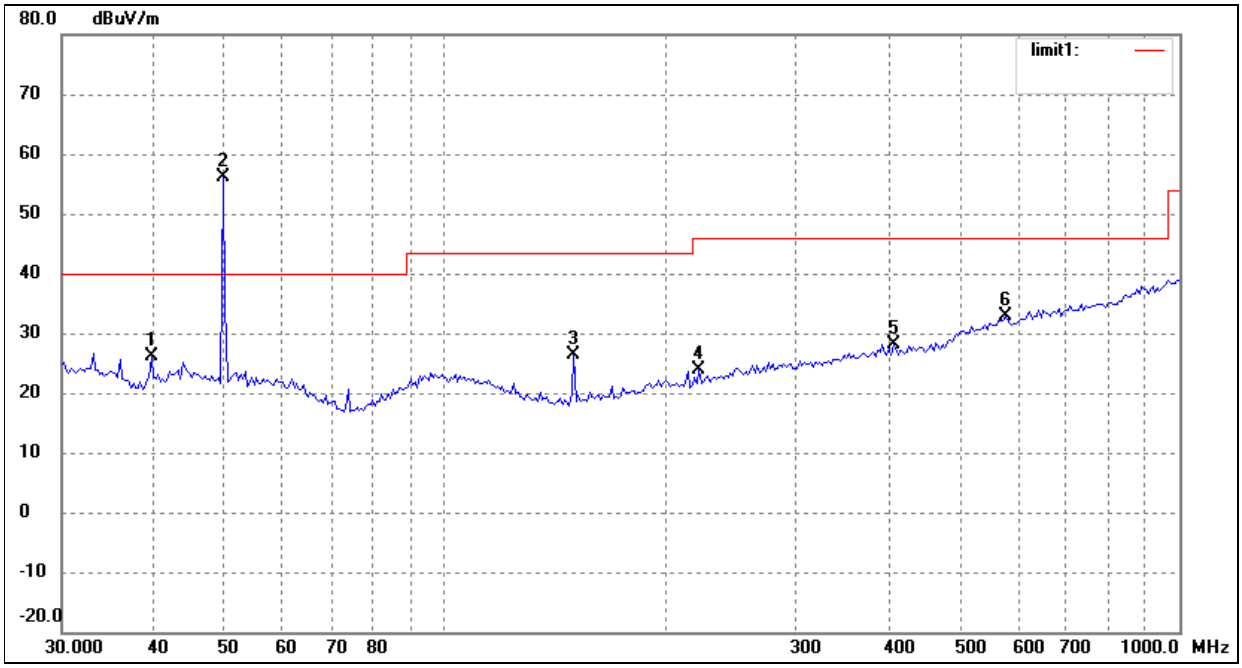


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2	149.4857	31.54	4.08	35.62	43.50	-7.88	QP
3	199.2855	18.50	6.58	25.08	43.50	-18.42	QP
4	212.2695	21.06	7.01	28.07	43.50	-15.43	QP
5	299.3158	16.69	9.77	26.46	46.00	-19.54	QP
6	694.4174	17.84	17.45	35.29	46.00	-10.71	QP

Note: No further spurious emissions found between 30 MHz and lowest internal used/generated frequency.

Remark:
- (*) Radiated emissions which fall in the restricted bands as defined in Section 15.205(a).
- Calculated measurement uncertainty: ±5.2dB.

Horizontal



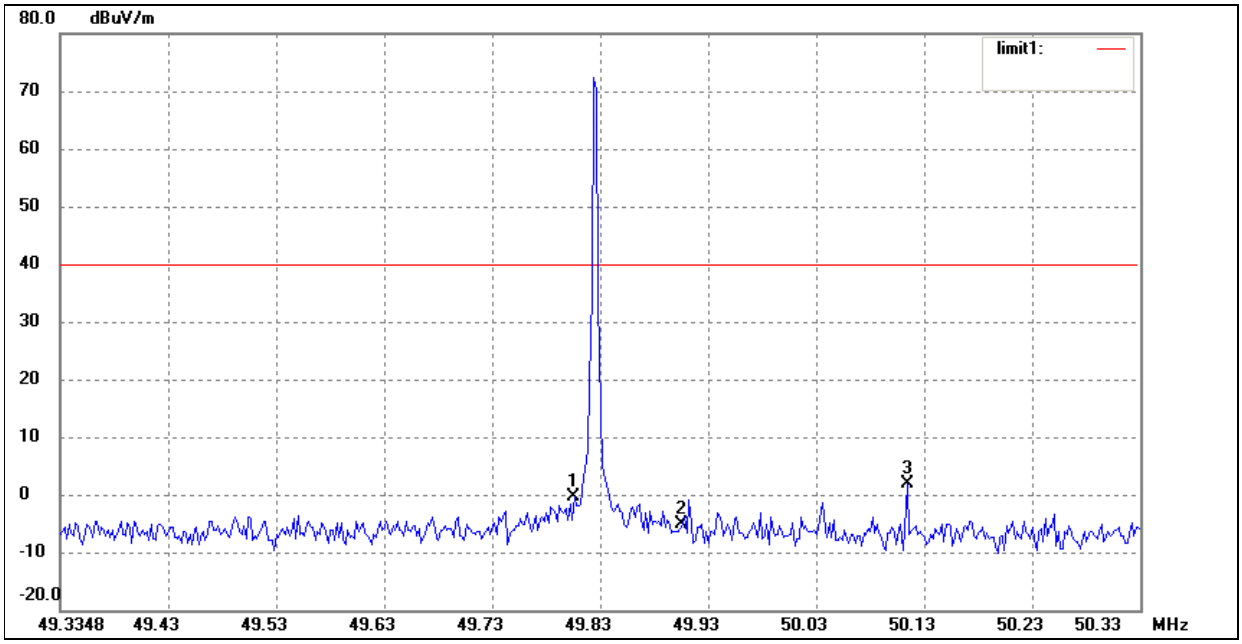
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	39.7147	18.13	8.07	26.20	40.00	-13.80	QP
3	149.4857	22.39	4.08	26.47	43.50	-17.03	QP
4	221.3921	16.46	7.36	23.82	46.00	-22.18	QP
5	407.5145	16.85	11.39	28.24	46.00	-17.76	QP
6	578.6699	16.80	16.18	32.98	46.00	-13.02	QP

Note: No further spurious emissions found between 30 MHz and lowest internal used/generated frequency.

Remark:
- (*) Radiated emissions which fall in the restricted bands as defined in Section 15.205(a).
- Calculated measurement uncertainty: ±5.2dB.

Out of Band Edges Emission

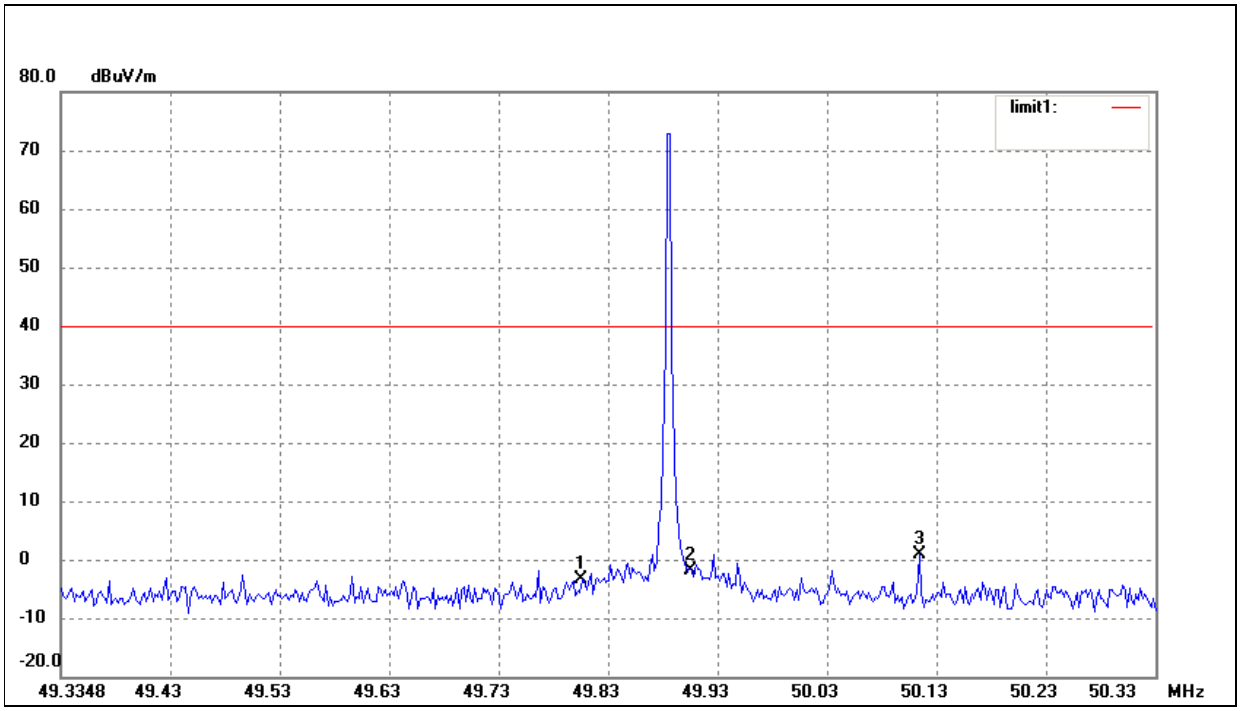
Lowest Channel



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	49.8100	-8.41	7.98	-0.43	40.00	-40.43	QP
2	49.9100	-13.13	7.98	-5.15	40.00	-45.15	QP
3	50.1188	-6.08	7.96	1.88	40.00	-38.12	QP

Note: No further spurious emissions found between 30 MHz and lowest internal used/generated frequency.

Highest Channel



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	49.8100	-11.41	7.98	-3.43	40.00	-43.43	QP
2	49.9100	-9.95	7.98	-1.97	40.00	-41.97	QP
3	50.1188	-7.11	7.96	0.85	40.00	-39.15	QP

Note: No further spurious emissions found between 30 MHz and lowest internal used/generated frequency.
Remark:

- (*) Radiated emissions which fall in the restricted bands as defined in Section 15.205(a).
- Calculated measurement uncertainty: ±5.2dB.

Limits for Radiated Emission [Section 15.235(b)]:
The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits in Section 15.209, whichever permits the higher emission levels. The field strength of any emissions removed by more than 10 kHz from the band edges shall not exceed the general radiated emission limits in Section 15.209. All signals exceeding 20 microvolts/meter at 3 meters shall be reported in the application for certification.

Limit for Radiated Emission Falling in Restricted Bands [Section 15.209]:

Frequency (MHz)	Field Strength [μV/m]	Field Strength [dBμV/m]
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

Radiated emissions, which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209.

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

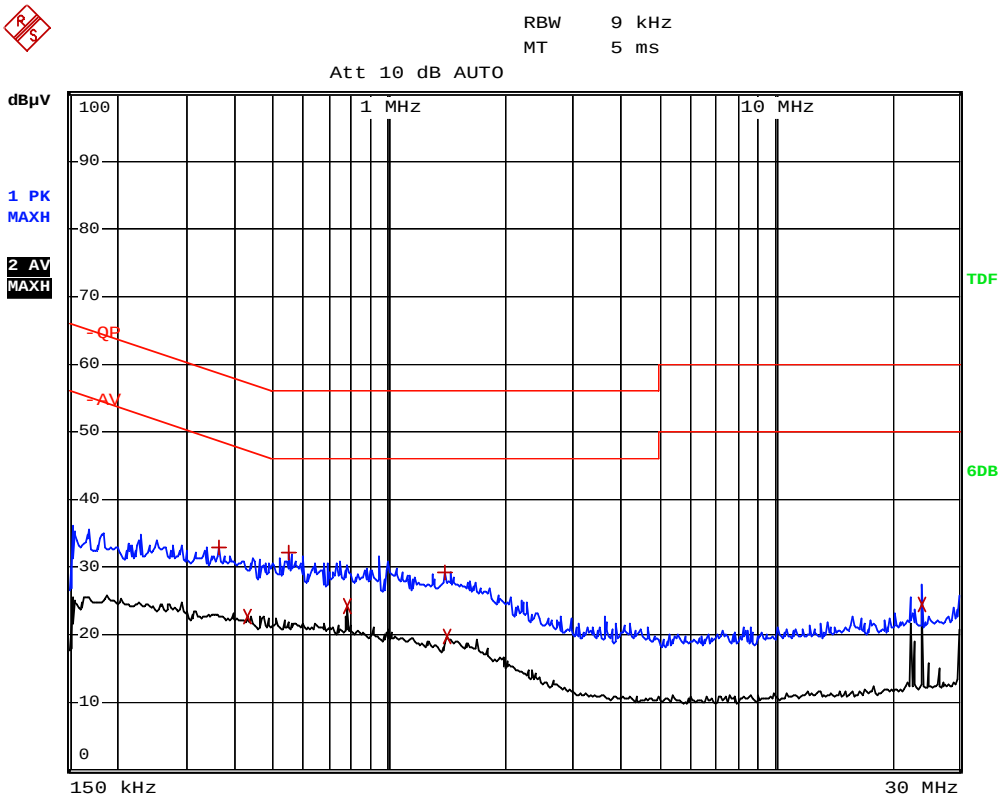
4.3 Conducted Emissions (0.15MHz to 30MHz)

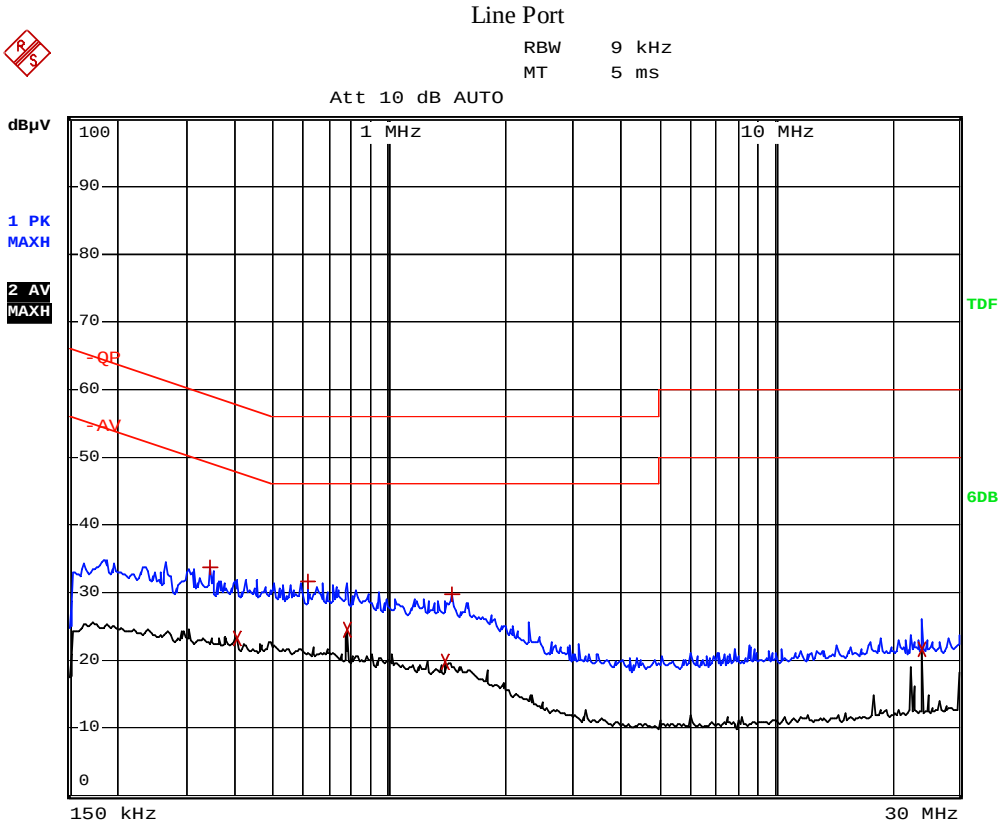
Test Requirement:	FCC part 15 Section 15.207 Class B
Test Method:	ANSI C63.4:2003
Test Date:	2011-08-19
Mode of Operation:	Transmitting mode.

Results: PASS

Refer to the following diagram and table for the result details

Neutral Port





Frequency (MHz)	Detector (QP/AV)	Phase	Result (dBµV)	Limit (dBµV)	Margin
0.342	QP	L	33.66	59.12	-25.46
0.614	QP	L	31.49	56.12	-24.63
1.456	QP	L	29.88	55.99	-26.11
0.402	AV	L	23.17	47.80	-24.63
0.778	AV	L	24.49	46.00	-21.51
1.402	AV	L	19.74	46.00	-26.26
23.982	AV	L	21.68	50.00	-28.32
23.990	AV	L	41.13	49.99	-8.86
0.362	QP	N	32.84	58.67	-25.83
0.546	QP	N	32.26	56.00	-23.74
1.406	QP	N	29.37	56.00	-26.63
0.430	AV	N	22.61	47.24	-24.63
0.778	AV	N	24.20	45.99	-21.79
1.410	AV	N	19.85	46.00	-26.15
23.982	AV	N	24.63	50.00	-25.37

Limits for Conducted Emission [Section 15.207]:

Frequency Range [MHz]	Quasi-Peak Limit [dBμV]	Average Limit [dBμV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Remarks:
Calculated measurement uncertainty: ±2.8dB

4.4 Bandwidth Measurement

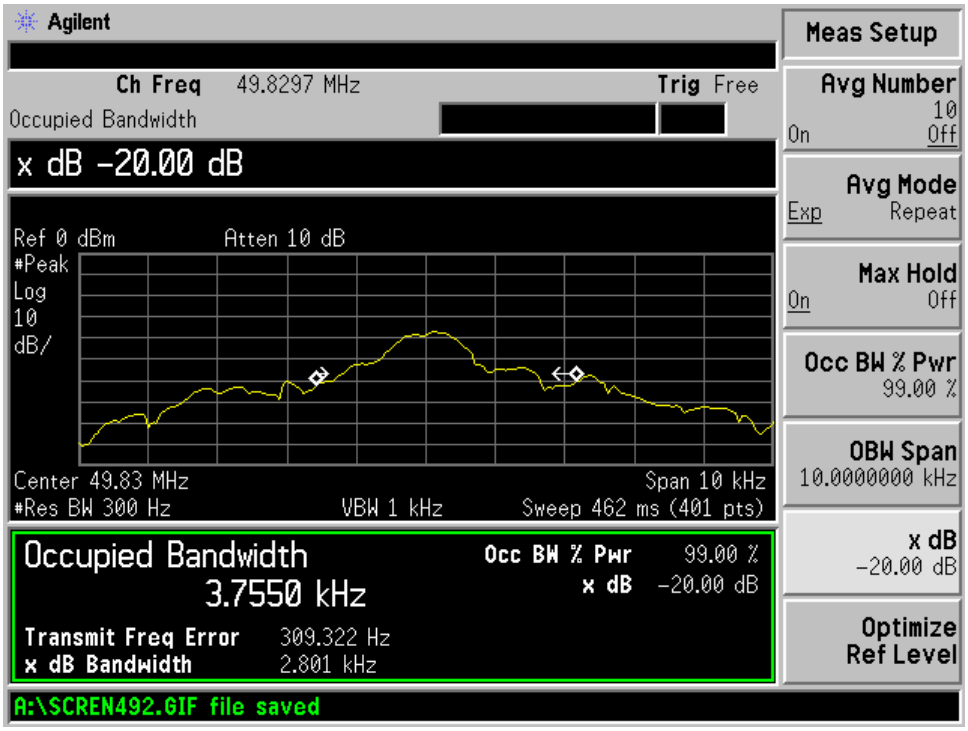
Test Requirement:	FCC part 15 section 15.215 (c)
Test Method:	ANSI C63.4:2003
Test Date:	2011-08-19
Mode of Operation:	Transmitting mode.
Detector Function:	Peak

Results: PASS

Refer to the data graph, the 20dB occupied bandwidth is 2.801kHz on lowest channel and 2.046 kHz on the highest channel. And, both 20dB point is contained within the frequency band.

Test Result: Result data graph is shown at the diagram for reference.

Lowest Channel



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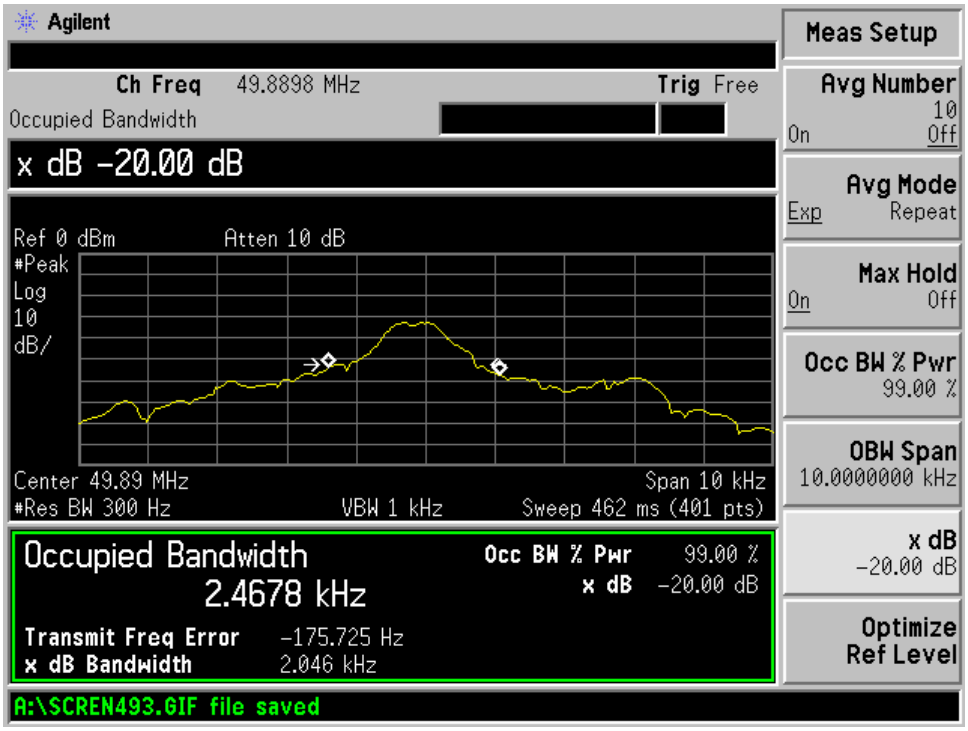
Highest Channel



Limit of the 20dB bandwidth of the emission [Section 15.215 (c)]:

Intentional radiators operating under the alternative provisions to the general emission limits, must be designed to ensure that the 20dB bandwidth of the emissions, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated I the rule section under which the equipment is operated.

5.0 List of Measurement Equipment

Radiated Emission and Out of Band Emissions

Description	Manufacturer	Model no.	Serial no.	Last cal	CAL due
Horn Antenna	EMCO	3115	9605-4803	Jul.13.2011	Jul.14.2012
Antenna	EMCO	3142C	00066464	Jul.13.2011	Jul.14.2012
Amplifier	Agilent	8449B	3008A02584	May.25.2011	May.26.2012
Test Receiver	R&S	ESCI	100382	May.25.2011	May.26.2012
Spectrum Analyzer	Agilent	E4447A	MY48250208	Nov.25.2010	Nov.26.2011
Test Cable	N/A	C-01_CB03	N/A	May.25.2011	May.26.2012
Controller	CT	SC100	N/A	May.25.2011	May.26.2012
Test Cable	Huber+Suhner	SUCOFLEX_15m_4m	N/A	May.25.2011	May.26.2012
Coaxial Cable 50ohm	Rosenberger	RTK081-05S-10m	LA2-001-10M/002	May.25.2011	May.26.2012
RF Communications Test Set	HP	8920B	US36492628	May.25.2011	May.26.2012

Conducted Emission

Description	Manufacturer	Model no.	Serial no.	Last cal	CAL due
LISN	EMCO	3816/2	00052765	May.25.2011	May.26.2012
LISN	R&S	ENV216	100087	May.25.2011	May.26.2012
Test Cable	N/A	C_17	N/A	May.25.2011	Mar.26.2012
EMI TEST RECEIVER	R&S	ESCS30	826547/022	May.25.2011	May.26.2012
50Ω Terminator	SHX	TF2-3G-A	08122902	May.25.2011	May.26.2012