Electromagnetic Compatibility
Test Report

Prepared in accordance with

FCC Part 15: October 2007, RSS-210: June 2007

On

Electronic Article Surveillance Detection System

Evolve Antenna Family

Prepared for:

Checkpoint Systems Inc.

101 Wolf Drive

Thorofare, NJ 08086

Prepared by:

TUV Rheinland of North America, Inc.

***Auftraggeber**: Client:*	Checkpoint Systems Inc. 101 Wolf Drive Thorofare, NJ 08086	Bayode Olabisi (856) 251-2141 / (856) 384-2366 bayode.olabisi@checkpt.com	
Bezeichnung: *Identification:*	Electronic Article Surveillance Detection System	**Serien-Nr.:** *Serial No.*	See Section 3.5
***Gegenstand der Prüfung**: Test item:*	Evolve Antenna Family	**Prüfdatum:** *Date*	10/30/09
Prüfort: *Testing location:*	TUV Rheinland of North America 12 Commerce Road Newtown, CT 06470-1607 U.S.A.		
Prüfgrundlage: *Test specification:*	Emissions: FCC Part 15 Subpart C: October 2007 / RSS-210: June 2007 FCC Part 15 Subpart 15.223/RSS-210 Annex A2.3 FCC Part 15 Subpart 15.205 and 15.209		
Prüfergebnis: *Test Result*	**Der vorstehend beschriebene Prüfgegenstand wurde geprüft und entspricht oben genannter Prüfgrundlage. The above product was found to be Compliant to the above test standard(s)**		

geprüft / *tested by:* David Hollis	**kontrolliert** / *reviewed by:* Randy Sorrenti
 19 November 2009 **Datum** *Date* / **Name** *Name* / **Unterschrift** *Signature*	 19 November 2009 **Datum** *Date* / **Name** *Name* / **Unterschrift** *Signature*

Sonstiges : *Other Aspects:*	**None**

Abkürzungen: OK, Pass, Compliant, Complies = entspricht Prüfgrundlage Fail, Not Compliant, Does not Comply = entspricht nicht Prüfgrundlage N/A = nicht anwendbar	Abbreviations: OK, Pass, Compliant, Complies = passed Fail, Not Compliant, Does Not Comply = failed N/A = not applicable

FC	NVLAP	**Industry Canada**
US5112	**200111-0**	**3466D-1**

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1 General Information

1.1 Scope

This report is intended to document the status of conformance with the requirements of the FCC Part 15: October 2007, RSS-210: June 2007 based on the results of testing performed on 10/30/09 on the Electronic Article Surveillance Detection System, Model No. Evolve Antenna Family, manufactured by Checkpoint Systems Inc.. This report only applies to the specific samples tested under the stated test conditions. It is the responsibility of the manufacturer to assure that additional production units of this model are manufactured with identical or EMI equivalent electrical and mechanical components. This report is further intended to document changes and modifications to the EUT throughout its life cycle. All documentation will be included as a supplement.

1.2 Purpose

Testing was performed to evaluate the EMC performance of the EUT (Equipment Under Test) in accordance with the applicable requirements, procedures, and criteria defined in the application of regulations and application of standards listed in this report.

1.3 *Summary of Test Results*

Applicant	Checkpoint Systems Inc. 101 Wolf Drive Thorofare, NJ 08086	**Tel**	(856) 251-2141	**Contact**	Bayode Olabisi
		Fax	(856) 384-2366	**e-mail**	bayode.olabisi@checkpt.com

Description	Electronic Article Surveillance Detection System	**Model Number**	Evolve Antenna Family
Serial Number	See Section 3.5	**Test Voltage/Freq.**	120V/60Hz
Test Date Completed:	10/30/09	**Test Engineer**	David Hollis

Standards	Description	Severity Level or Limit	Criteria	Test Result
FCC Part 15 Subpart C: October 2007 / RSS-210: June 2007	Intentional Radiators / Low Power Licenced Exempt Radiocommunication Devices	See sections below	See Below	Complies
FCC Part 15 Subpart 15.223/RSS-210 Annex A2.3	Operation in the band 1.705-10 MHz	100µV/m @30m	Limit	Complies
FCC Part 15 Subpart 15.207	Conducted limits	Per table in section 207, 150kHz - 30MHz	Limit	Complies
FCC Part 15 Subpart 15.205 and 15.209	Radiated emission limits; general requirements	Class B and per table in section 205 From Fundamental - 1000MHz	Limit	Complies

2 Laboratory Information

2.1 Accreditations & Endorsements

2.1.1 US Federal Communications Commission

TUV Rheinland of North America located at 12 Commerce Road, Newtown CT is accredited by the commission for performing testing services for the general public on a fee basis. This laboratory test facilities have been fully described in reports submitted to and accepted by the FCC (Registration No US5112). The laboratory scope of accreditation includes: Title 47 CFR Part 15, and 18. The accreditation is updated every 3 years.

2.1.2 NIST / NVLAP

Program, which is administered under the auspices of the National Institute of Standards and Technology. The laboratory has been assessed and accredited in accordance with ISO Standard 17025:2005 (Lab code: 200111-0). The scope of laboratory accreditation includes emission and immunity testing. The accreditation is updated annually.

2.1.3 Industry Canada

Registration No.: 3466D-1. The OATS has been accepted by Industry Canada to perform testing to 3 and to 10m, based on the test procedures described in ANSI C63.4-2003.

2.2 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions measurements is ± 3.2 dB
The estimated combined standard uncertainty for conducted emissions measurements is ± 1.2dB

2.3 Calibration Traceability

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Measurement method complies with ANSI/NCSL Z540-1-1994 and ISO Standard 17025:2005. Equipment calibration records are kept on file at the test facility.

2.4 Measurement Equipment Used

Equipment	Manufacturer	Model #	Serial/Inst #	Last Cal dd/mm/yy	Next Cal dd/mm/yy	Test
Power Supply	California Instruments	5001iX	HK53766	12/15/08	12/15/09	All
Antenna, Bilog	Sunol Sciences	JB3	A022707	12/12/08	12/12/10	RE
Receiver	Hewlett Packard	HP 8546A, 85460A	3330A00125, 3325A00134	08/27/09	08/27/10	RE, CE
Antenna, Bilog	Schaffner	CBL6112D	22238	05/01/08	05/01/10	RE
LISN	Schwarzbeck	NSLK 8126A (4 x 25A)	8126278	08/20/08	08/20/10	CE
Magnetic Field Loop Antenna	Schwarzbeck	FMZB 1516	151600/94	11/12/08	11/12/10	RE<30MHz

Note: CE = Conducted Emissions, CI= Conducted Immunity, DP=Disturbance Power, EFT=Electrical Fast Transients, ESD = Electrostatic Discharge, FLI=Flicker, HAR=Harmonics, MF=Magnetic Field Immunity, RE=Radiated Emissions, RI=Radiated Immunity, SI=Surge Immunity, VDSI=Voltage Dips and Short Interruptions

3 Product Information

3.1 Equipment Under Test (EUT) Description

The Evolve PAB+SAB Antennas are an Electronic Article Surveillance System (EAS). The system detects target tags attached to merchandise. The targets resonate in the region of 7.2 MHz or 8.2 MHz. When an article of merchandise is purchased, the target is deactivated which causes it to no longer resonate. The Evolve Antennas monitor an area of 3.5 feet on either side of the antenna in the 7.0 to 10.0 MHz range and trigger an alarm when a non-deactivated target is detected.

3.2 General Product Information

The Evolve PAB+SAB family of antennas is used for electronic article surveillance. The Evolve antennas continuously scan at a predetermined frequency and detect anti-pilferage tags which pass through the field generated by the antennas. When a tag is detected the system generates an audible alarm and activates a flashing light on the antenna.

The Evolve PAB+SAB antenna family consists of P10, P20, G10, and G20. All four models are floor standing. The P10 and P20 antenna loops are mounted in a hollow plastic frame. The G10 and G20 antenna loops are mounted in a solid Plexiglas frame that is machined to allow the antenna wire to pass through the frame at various points. Both P and G series have three separate loop antenna configurations per gate. All four antenna models use the same digital electronics and transmitter sections. The primary differences between the models are frame material and frame size.

Wherever the models listed in this report are referred to as “Tanzanite”, the model name should be “Evolve”.

3.3 EUT Modes of Operation

The equipment under test was operated during the measurement under the following conditions:

- Continuous sweep mode at 7.2 Band

3.4 EUT Test Configurations

The models listed below were configured as follows for final testing:

P10: 7.2 band, transmit power = 31

P20: 7.2 band, transmit power = 31

G10: 7.2 band, transmit power = 29

G20: 7.2 band, transmit power = 26

3.5 EUT Serial Numbers

P10 PAB: 741163904D12318019
SAB: 741163904D12318020

P20 PAB: 717272707D11529002
SAB: 717272707D11529008

G10 PAB: 741085900U00248001
SAB: 741085900U03247013

G20 PAB: 7283991C0U03027012
SAB: 7283991C0U03027002

3.6 Electrical Support Equipment

None

3.7 EUT Equipment/Cabling Information

				Cable length	
Antenna	Cable description	Ceonnected to	Port	Length	Shielded
P10/P20/G10/G20	Pedestal main pwr AC	TR4210	J18 / J31	3.05 m	Yes
P10/P20/G10/G20	Ext. dc power supply	TR4210	N/A	3.96 m	Yes
P10/P20	Interpedestal LED Lights/sounder (5594 type)	TR4210	J54/J41	3.96 m	Yes
G10/G20	Interpedestal LED Lights/sounder (Cat 5)	TR4210 & dc pwr pcb	J54/J41 & 24 vdc/gnd	3.96 m	No
P10/P20/G10/G20	Interpedestal RG-59 RF coax cable	Coupler pcb	J5	3.96 m	Yes

3.8 Modifications

No modifications were implemented for compliance relative to previously tested system for certification under FCC ID: DO4EVOLVETZ / IC ID: 3356B-EVOLVETZ.

4 Measurements

4.1 Operation in the band 1.705-10MHz

This test measures the electromagnetic levels of spurious signals generated by the EUT that radiated from the EUT and may affect the performance of other nearby electronic equipment.

4.1.1 Over View of Test

Results	**Complies** (as tested per this report)				**Date**	10/26/09	
Standard	FCC Part 15 Subpart 15.223/RSS-210 Annex A2.3						
Product Model	Evolve Antenna Family		**Serial#**	See Section 3.5			
Configuration	See test plan for details						
Test Set-up	Tested on a 10m O.A.T.S. placed on turn-table, see test plans for details						
EUT Powered By	120V/60Hz	**Temp**	22ºC	**Humidity**	45%	**Pressure**	1000mbar
Emissions Limits	100µV @ 30m (see Note)						
Perf. Criteria	Below Limit		**Perf. Verification**	Readings Under Limit			
Mod. to EUT	None		**Test Performed By**	David Hollis			

Note: The limits were adjusted in dBµV for a 10m testing resulting in a peak limit of 80dBµV/m. Measurements have been made in all three orthogonal axes of loop antenna and the EUT was rotated to locate the maximum emissions.

4.1.2 Test Procedure

The emissions tests on the fundamental signal were performed using the procedures of ANSI C63.4 including methods for signal maximizations and EUT configuration. The photos included with the report show the EUT in its maximized configuration.

The frequency range from 1.705 – 10MHz was investigated for this test using a magnetic field loop antenna.

4.1.3 Deviations

Measurement of the fundamental emissions – 1.705 to 10.0 MHz – was performed by setting a spectrum analyzer to “max-hold”, peak detector, 300 kHz bandwidth and a span from 6.0 MHz to 10 MHz. A resolution bandwidth of 300 kHz was used in performing the “true peak” measurements because increasing the bandwidth above 300 kHz did not increase the detected peak of the fundamental.

4.1.4 Final Test

All final radiated emissions measurements were below (in compliance with) the limits.

4.1.5 Final Measurement Data

P-20 7.2 Band TX=31:

Radiated Emissions Measurements										
Standard:	47 CFR FCC Part 15.223				***PRESCAN or FINAL:***		Final		**Date:**	7/16/2009
Device Tested:	P20 PAB/SAB					***Distance:***	10m		**File Name:**	
Mode:	7.2 Band TX=31									
Modifications:										
Meas #	Freq (MHz)	Measured Peak (dBµV/m)	Peak Limit	Peak Margin	Final Average (dBµV/m)	Average Limit	Average Margin	Result	Orientation (X,Y,Z)	Comment
RBW = 300kHz VBW=300kHz (FCC Settings)										
1	7.2	73.95	80.00	-6.05	38.86	60.00	-21.14	**Complied**	X Orientation	
2	7.59	74.49	80.00	-5.51	39.64	60.00	-20.36	**Complied**	X Orientation	
3	8.07	76.88	80.00	-3.12	41.74	60.00	-18.26	**Complied**	X Orientation	
4	8.32	78.57	80.00	-1.43	44.01	60.00	-15.99	**Complied**	X Orientation	
5	7.2	74.36	80.00	-5.64	39.98	60.00	-20.02	**Complied**	Y Orientation	
6	7.59	76.24	80.00	-3.76	41.23	60.00	-18.77	**Complied**	Y Orientation	
7	8.07	78.17	80.00	-1.83	43.98	60.00	-16.02	**Complied**	Y Orientation	
8	8.32	79.27	80.00	-0.73	44.36	60.00	-15.64	**Complied**	Y Orientation	
9	7.2	58.6	80.00	-21.40	32.15	60.00	-27.85	**Complied**	Z Orientation	
10	7.59	64.36	80.00	-15.64	36.65	60.00	-23.35	**Complied**	Z Orientation	
11	8.07	65.1	80.00	-14.90	36.94	60.00	-23.06	**Complied**	Z Orientation	
12	8.32	64.56	80.00	-15.44	36.70	60.00	-23.30	**Complied**	Z Orientation	
Tested by:	David Hollis									
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009										
		Peak Limit = Average Limit + 20dB = 60dBµV/m + 20dB = 80dBµV/m								
		Average limit = 100µV/m @ 30m								
		Average Limit = 20*log(100µV) = 40dBµV/m @ 30m								
		For 10m measurement the average limit was adjusted = 40log(10/30) = 20dB								
		Average limit = 60dBµV/m@10m								

P-10 7.2 Band TX= 31:

Radiated Emissions Measurements										
Standard:	47 CFR FCC Part 15.223				***PRESCAN or FINAL:***		Final		**Date:**	7/17/2009
Device Tested:	P10 PAB/SAB					***Distance:***	10m		**File Name:**	
Mode:	7.2 Band TX=31									
Modifications:										
Meas #	Freq (MHz)	Measured Peak (dBµV/m)	Peak Limit	Peak Margin	Final Average (dBµV/m)	Average Limit	Average Margin	Result	Orientation (X,Y,Z)	Comment
RBW = 300kHz VBW=300kHz (FCC Settings)										
1	7.2	75.22	80.00	-4.78	40.91	60.00	-19.09	**Complied**	X Orientation	
2	7.57	75.54	80.00	-4.46	41.24	60.00	-18.76	**Complied**	X Orientation	
3	8.06	76.43	80.00	-3.57	41.74	60.00	-18.26	**Complied**	X Orientation	
4	8.34	76.9	80.00	-3.10	42.05	60.00	-17.95	**Complied**	X Orientation	
5	7.2	74.86	80.00	-5.14	40.22	60.00	-19.78	**Complied**	Y Orientation	
6	7.57	77.67	80.00	-2.33	41.74	60.00	-18.26	**Complied**	Y Orientation	
7	8.06	78.13	80.00	-1.87	43.85	60.00	-16.15	**Complied**	Y Orientation	
8	8.34	78.29	80.00	-1.71	44.16	60.00	-15.84	**Complied**	Y Orientation	
9	7.2	68.08	80.00	-11.92	36.08	60.00	-23.92	**Complied**	Z Orientation	
10	7.57	66.82	80.00	-13.18	36.65	60.00	-23.35	**Complied**	Z Orientation	
11	8.06	66.02	80.00	-13.98	35.84	60.00	-24.16	**Complied**	Z Orientation	
12	8.34	67.31	80.00	-12.69	39.96	60.00	-20.04	**Complied**	Z Orientation	
Tested by:	David Hollis									
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009										
		Peak Limit = Average Limit + 20dB = 60dBµV/m + 20dB = 80dBµV/m								
		Average limit = 100µV/m @ 30m								
		Average Limit = 20*log(100µV) = 40dBµV/m @ 30m								
		For 10m measurement the average limit was adjusted = 40log(10/30) = 20dB								
		Average limit = 60dBµV/m@10m								

G-20 7.2 Band TX= 26:

Radiated Emissions Measurements										
Standard:	47 CFR FCC Part 15.223				***PRESCAN or FINAL:***		Final		**Date:**	10/26/2009
Device Tested:	G20 PAB/SAB				***Distance:***		10m		**File Name:**	
Mode:	7.2 Band TX=26									
Modifications:	Added Ferrite part number 284760 to lights and sounder cables									
Meas #	Freq (MHz)	Measured Peak (dBµV/m)	Peak Limit	Peak Margin	Final Average (dBµV/m)	Average Limit	Average Margin	Result	Orientation (X,Y,Z)	Comment
RBW = 300kHz VBW=300kHz (FCC Settings)										
1	7.2	76.16	80.00	-3.84	41.74	60.00	-18.26	**Complied**	X Orientation	
2	7.6	77.81	80.00	-2.19	43.95	60.00	-16.05	**Complied**	X Orientation	
3	8.06	78.37	80.00	-1.63	43.72	60.00	-16.28	**Complied**	X Orientation	
4	8.31	78.5	80.00	-1.50	43.66	60.00	-16.34	**Complied**	X Orientation	
5	7.2	74.37	80.00	-5.63	39.99	60.00	-20.01	**Complied**	Y Orientation	
6	7.6	76.86	80.00	-3.14	42.56	60.00	-17.44	**Complied**	Y Orientation	
7	8.06	79.03	80.00	-0.97	44.12	60.00	-15.88	**Complied**	Y Orientation	
8	8.31	79.62	80.00	-0.38	44.58	60.00	-15.42	**Complied**	Y Orientation	
9	7.2	60.41	80.00	-19.59	33.26	60.00	-26.74	**Complied**	Z Orientation	
10	7.6	61.82	80.00	-18.18	34.82	60.00	-25.18	**Complied**	Z Orientation	
11	8.06	63.22	80.00	-16.78	36.09	60.00	-23.91	**Complied**	Z Orientation	
12	8.31	63.79	80.00	-16.21	36.95	60.00	-23.05	**Complied**	Z Orientation	
Tested by:	David Hollis									
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009										
		Peak Limit = Average Limit + 20dB = 60dBµV/m + 20dB = 80dBµV/m								
		Average limit = 100µV/m @ 30m								
		Average Limit = 20*log(100µV) = 40dBµV/m @ 30m								
		For 10m measurement the average limit was adjusted = 40log(10/30) = 20dB								
		Average limit = 60dBµV/m@10m								

G-10 7.2 Band TX= 29:

Radiated Emissions Measurements										
Standard:	47 CFR FCC Part 15.223				***PRESCAN or FINAL:***		Final		**Date:**	9/23/2009
Device Tested:	G10 PAB/SAB					***Distance:***	10m		**File Name:**	
Mode:	7.2 Band TX=29									
Modifications:										
Meas #	Freq (MHz)	Measured Peak (dBµV/m)	Peak Limit	Peak Margin	Final Average (dBµV/m)	Average Limit	Average Margin	Result	Antenna Orientation (X,Y,Z)	Turntable Orientation (in degrees)
RBW = 300kHz VBW=300kHz (FCC Settings)										
1	7.2	72.42	80.00	-7.58	37.56	60.00	-22.44	**Complied**	X Orientation	90
2	7.6	72.88	80.00	-7.12	37.84	60.00	-22.16	**Complied**	X Orientation	90
3	8.06	71.48	80.00	-8.52	36.42	60.00	-23.58	**Complied**	X Orientation	90
4	8.31	71.89	80.00	-8.11	36.98	60.00	-23.02	**Complied**	X Orientation	90
5	7.2	77.82	80.00	-2.18	43.95	60.00	-16.05	**Complied**	Y Orientation	360
6	7.6	78.2	80.00	-1.80	44.19	60.00	-15.81	**Complied**	Y Orientation	360
7	8.06	79.07	80.00	-0.93	44.98	60.00	-15.02	**Complied**	Y Orientation	360
8	8.31	79.21	80.00	-0.79	45.25	60.00	-14.75	**Complied**	Y Orientation	360
9	7.2	59.85	80.00	-20.15	33.68	60.00	-26.32	**Complied**	Z Orientation	360
10	7.6	59.99	80.00	-20.01	33.95	60.00	-26.05	**Complied**	Z Orientation	360
11	8.06	61.93	80.00	-18.07	34.86	60.00	-25.14	**Complied**	Z Orientation	360
12	8.31	61.65	80.00	-18.35	34.59	60.00	-25.41	**Complied**	Z Orientation	360
Tested by:	David Hollis									
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009										
		Peak Limit = Average Limit + 20dB = 60dBµV/m + 20dB = 80dBµV/m								
		Average limit = 100µV/m @ 30m								
		Average Limit = 20*log(100µV) = 40dBµV/m @ 30m								
		For 10m measurement the average limit was adjusted = 40log(10/30) = 20dB								
		Average limit = 60dBµV/m@10m								

4.1.6 Photos

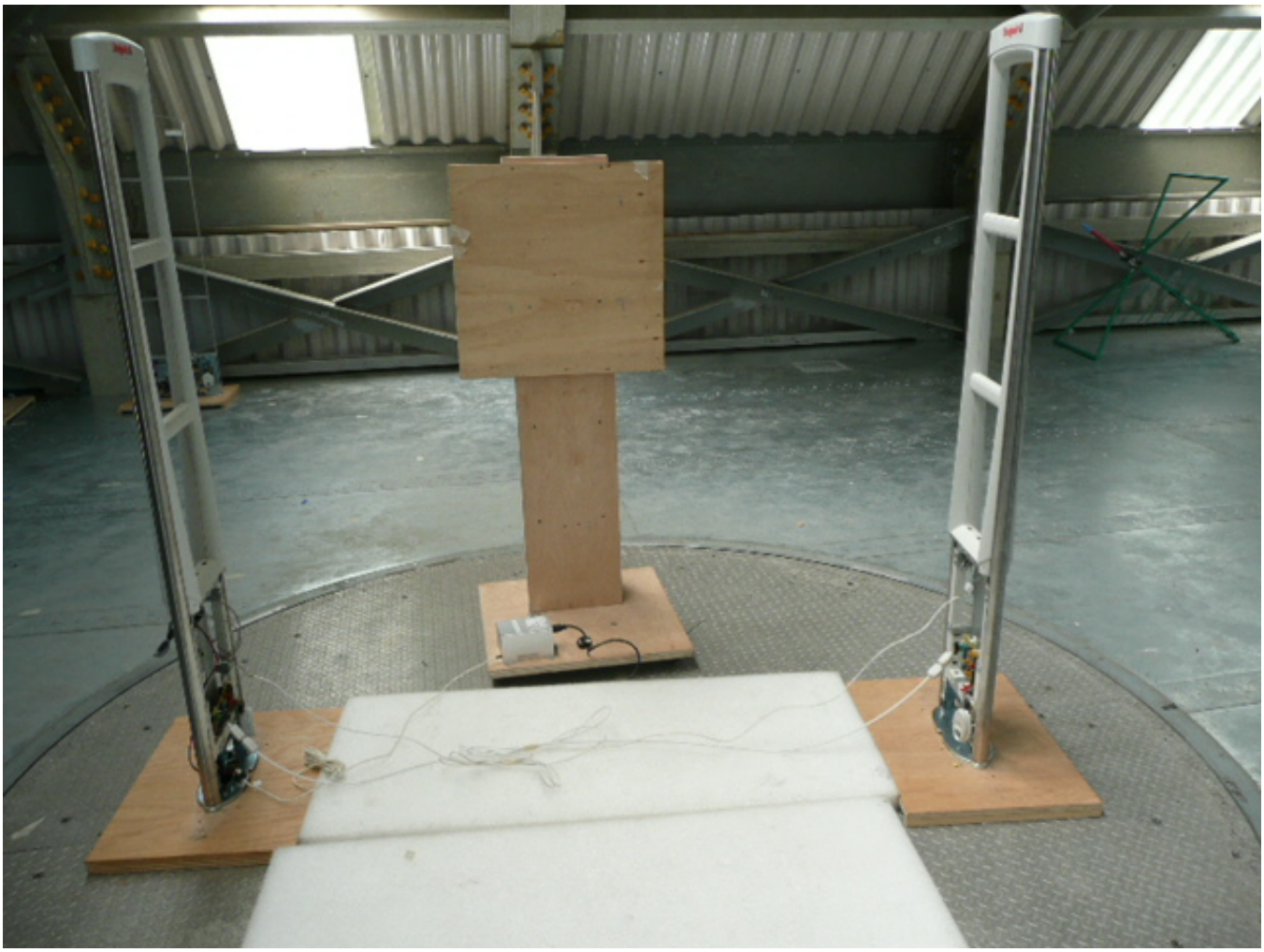


Figure 1 – Radiated Emissions Test Setup – P-20

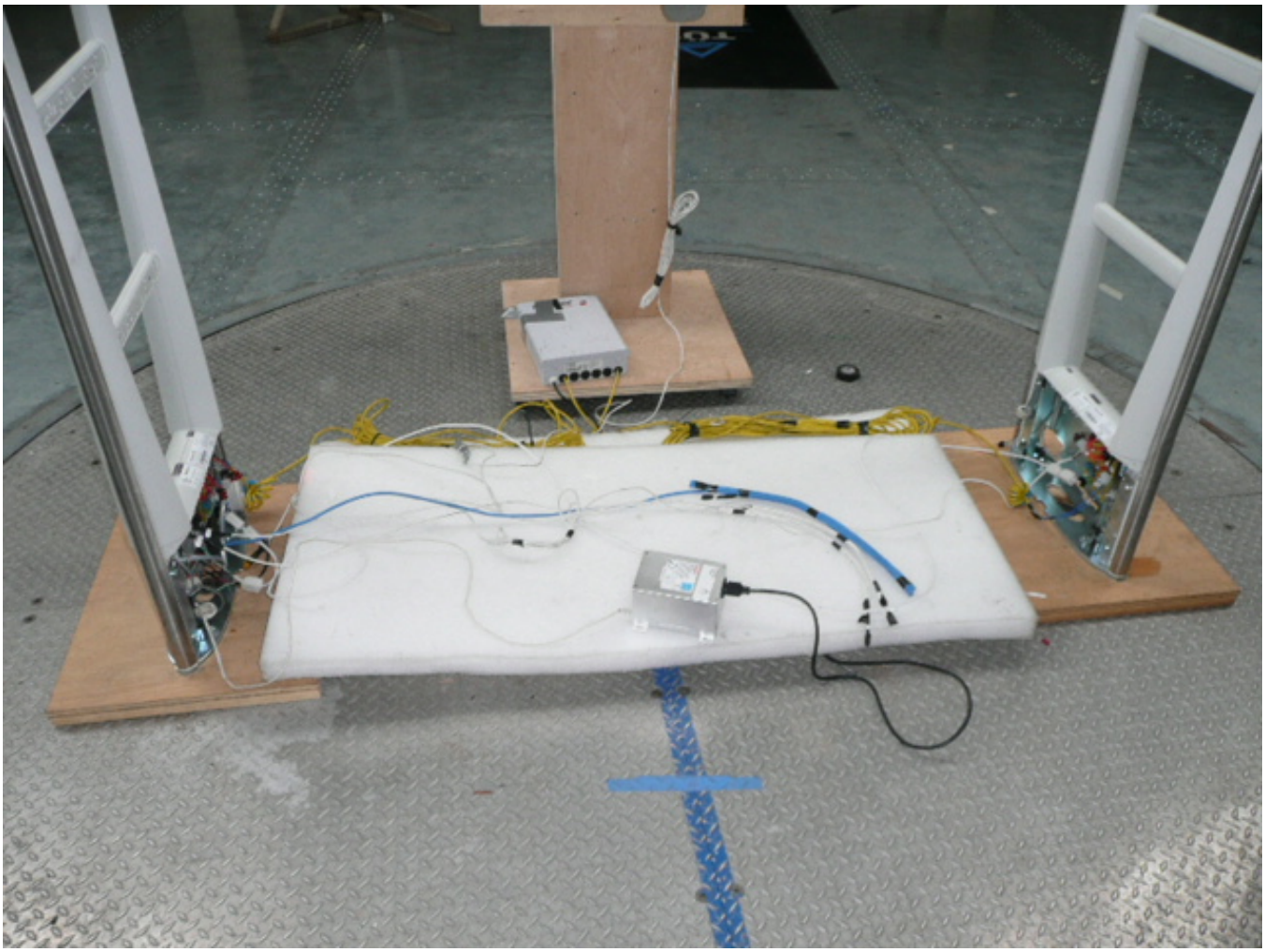


Figure 2 – Radiated Emissions Test Setup – P-10

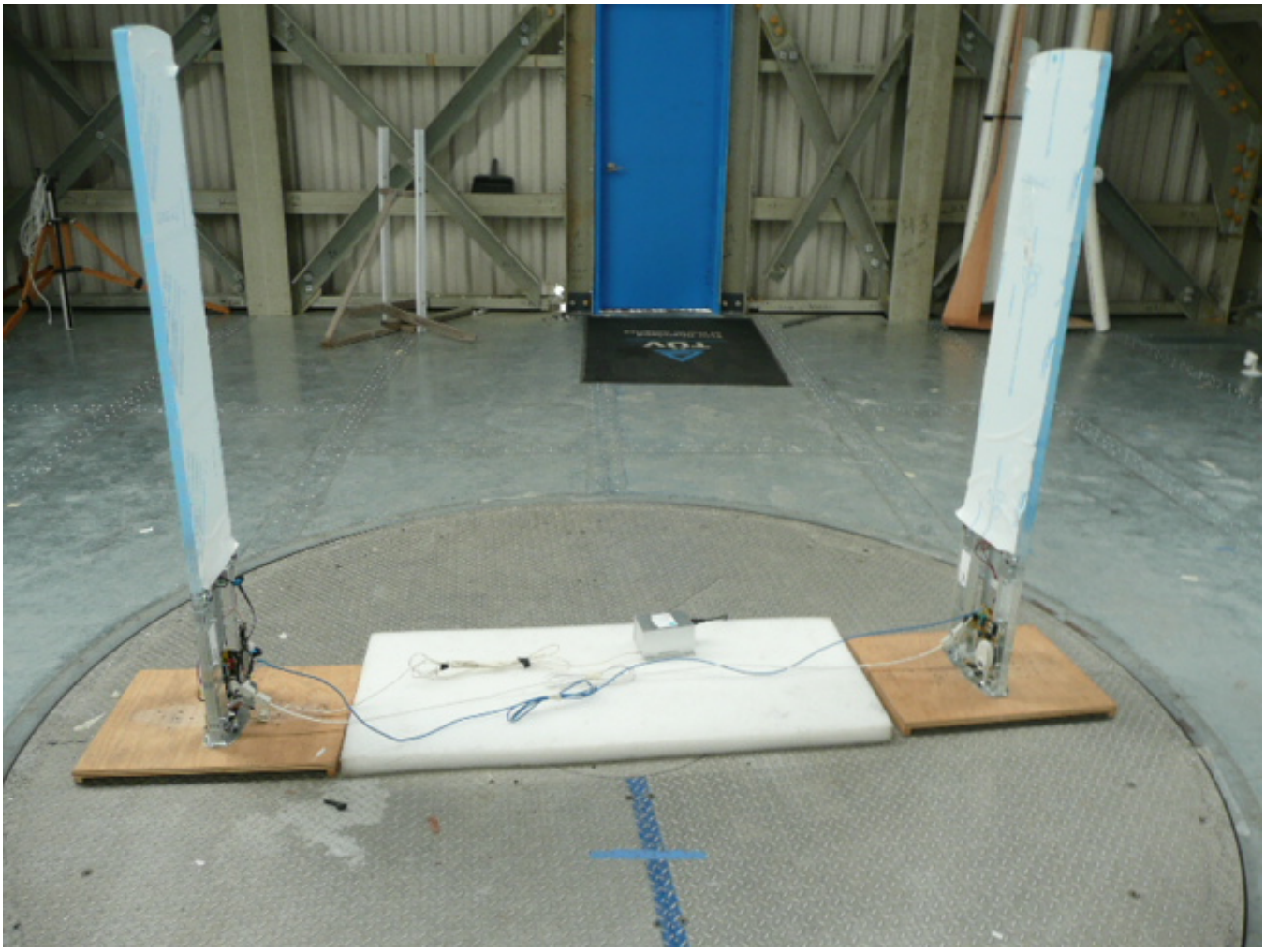


Figure 3 – Radiated Emissions Test Setup – G-20

Figure 4 – Radiated Emissions Test Setup – G-10

4.2 Conducted Limits

This test measures the electromagnetic levels of spurious signals generated by the EUT on the AC power line that may affect the performance of other near by electronic equipment.

4.2.1 Over View of Test

Results	**Complies** (as tested per this report)				**Date**	10/28/2009	
Standard	FCC Part 15 Subpart 15.207/RSS-210 Annex A2.3						
Product Model	Evolve Antenna Family		**Serial#**	See Section 3.5			
Configuration	See test plan for details						
Test Set-up	Tested in shielded room, EUT placed on table. See test plans for details.						
EUT Powered By	120V/60Hz	**Temp**	22º C	**Humidity**	45%	**Pressure**	1000mbar
Frequency Range	150kHz - 30MHz						
Perf. Criteria	Per table in section 207 (Below Limit)			**Perf. Verification**	Readings Under Limit for L1 and L2		
Mod. to EUT	None			**Test Performed By**	David Hollis		

4.2.2 Test Procedure

Conducted and FCC emissions tests were performed using the procedures of ANSI C63.4 including methods for signal maximizations and EUT configuration. The photos included with the report show the EUT in its maximized configuration.

The frequency range from 150kHz - 30MHz was investigated for conducted emissions.

Conducted Emissions measurements were performed in the shielded room using procedures specified in the test plan and standard.

4.2.3 Deviations

There were no deviations from the test methodology listed in the test plan for the conducted emission test.

4.2.4 Final Test

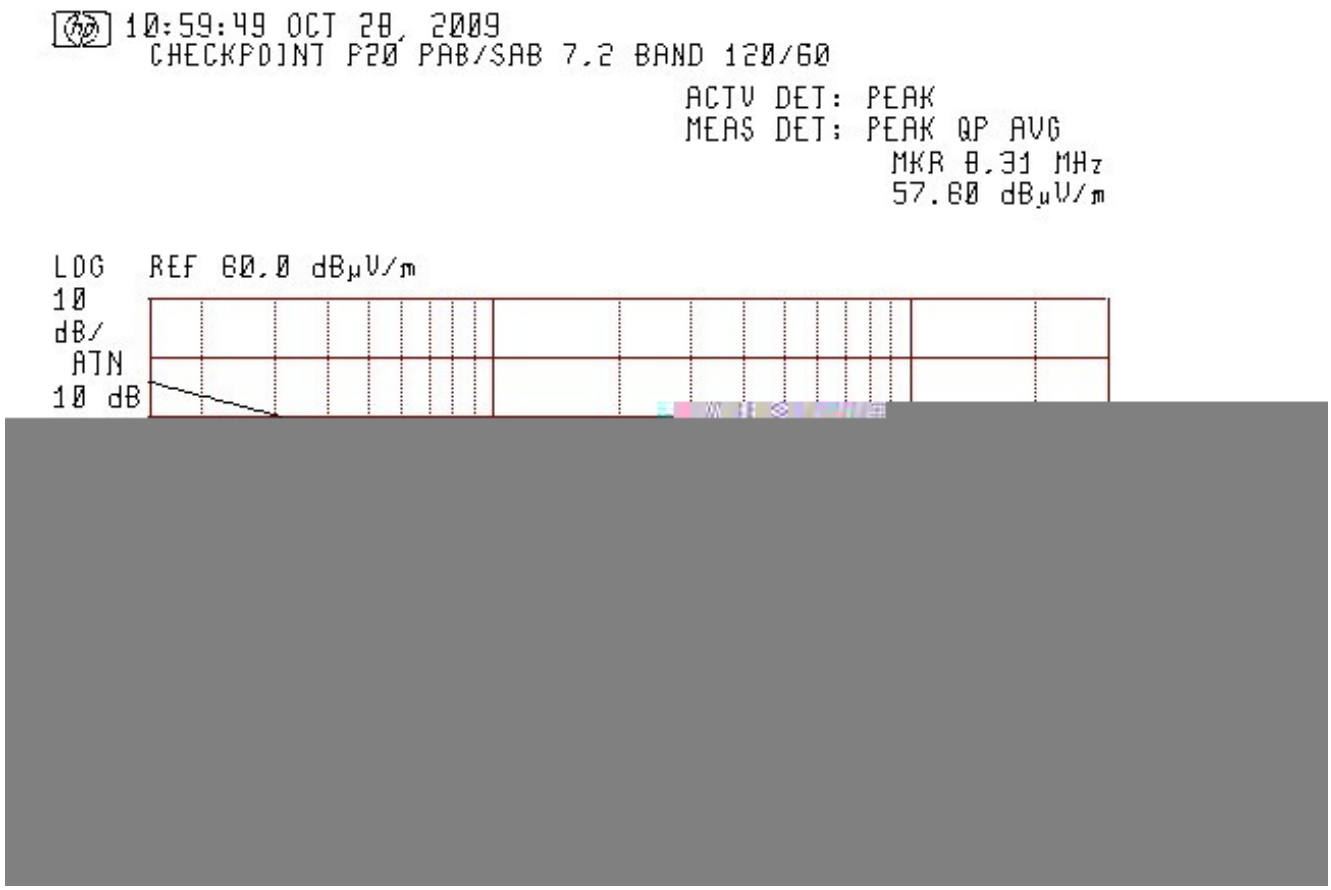
All final conducted emissions measurements were below (in compliance with) the limits.

4.2.5 Final Measurement Data

P20 7.2 Band TX=31

NOTES:

Conducted Emissions @ 120V/60Hz
P-20 7.2Tx Band
Line / Neutral

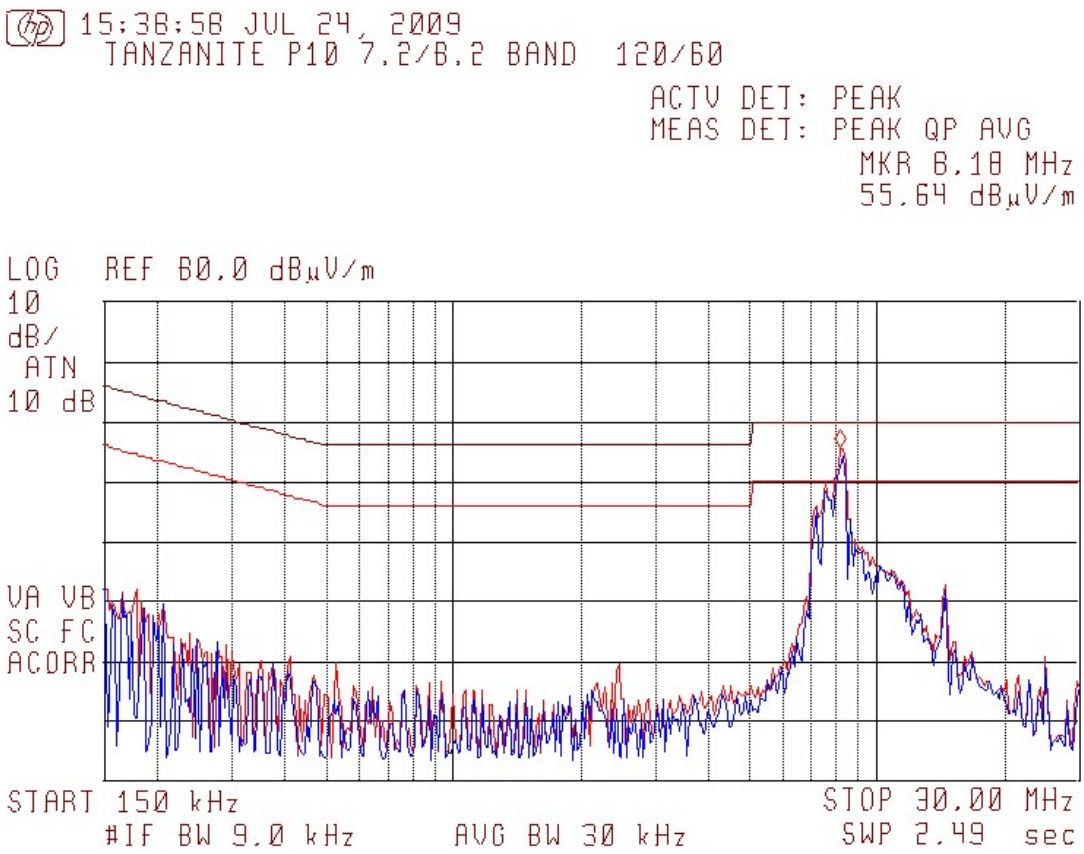


Conducted Emissions Measurements												
Standard:	FCC Part 15.207									***Date:*** 10/28/09		
Device Tested:	Checkpoint P20 PAB/SAB 7.2 band 120VAC/60Hz									***File: .xls***		
Signal Num	Freq	Peak Amp	QP Amp	Avg Amp	QP Limit	Avg Limit	Conductor	QP Δ	QP Result	Avg Δ	Average Result	Mode
	MHz	dBuV	dBuV	dBuV	dBuV	dBuV		dB		dB		
1	0.2705	30.34	23.33	11.42	61.10	51.10	Line	-37.77	Complied	-39.68	Complied	
2	7.2171	52.72	50.30	36.77	60.00	50.00	Line	-9.70	Complied	-13.23	Complied	
3	7.6059	56.21	52.19	36.49	60.00	50.00	Line	-7.81	Complied	-13.51	Complied	
4	8.3275	59.42	55.85	38.76	60.00	50.00	Line	-4.15	Complied	-11.24	Complied	
5	15.0589	24.63	21.60	17.13	60.00	50.00	Line	-38.40	Complied	-32.87	Complied	
6	21.5808	20.63	16.39	5.64	60.00	50.00	Line	-43.61	Complied	-44.36	Complied	
7	27.9988	13.57	9.97	6.28	60.00	50.00	Line	-50.03	Complied	-43.72	Complied	
8	0.2705	29.54	22.82	6.78	61.10	51.10	Neutral	-38.28	Complied	-44.32	Complied	
9	7.2171	53.50	51.09	37.88	60.00	50.00	Neutral	-8.91	Complied	-12.12	Complied	
10	7.6059	56.96	52.93	37.26	60.00	50.00	Neutral	-7.07	Complied	-12.74	Complied	
11	**8.3275**	**59.98**	**56.45**	**39.33**	**60.00**	**50.00**	**Neutral**	**-3.55**	**Complied**	**-10.67**	**Complied**	**Maximum Emissions**
12	15.0589	27.12	24.45	19.28	60.00	50.00	Neutral	-35.55	Complied	-30.72	Complied	
13	21.5808	20.49	16.63	6.18	60.00	50.00	Neutral	-43.37	Complied	-43.82	Complied	
14	27.9988	13.49	10.08	6.38	60.00	50.00	Neutral	-49.92	Complied	-43.62	Complied	
Tested by: David Hollis												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												CE22_B.xlt Revised 21OCT2005

P10 7.2 Band TX= 31

NOTES:

Conducted Emissions @ 120V/60Hz
P-10 7.2 Tx Band
Line / Neutral

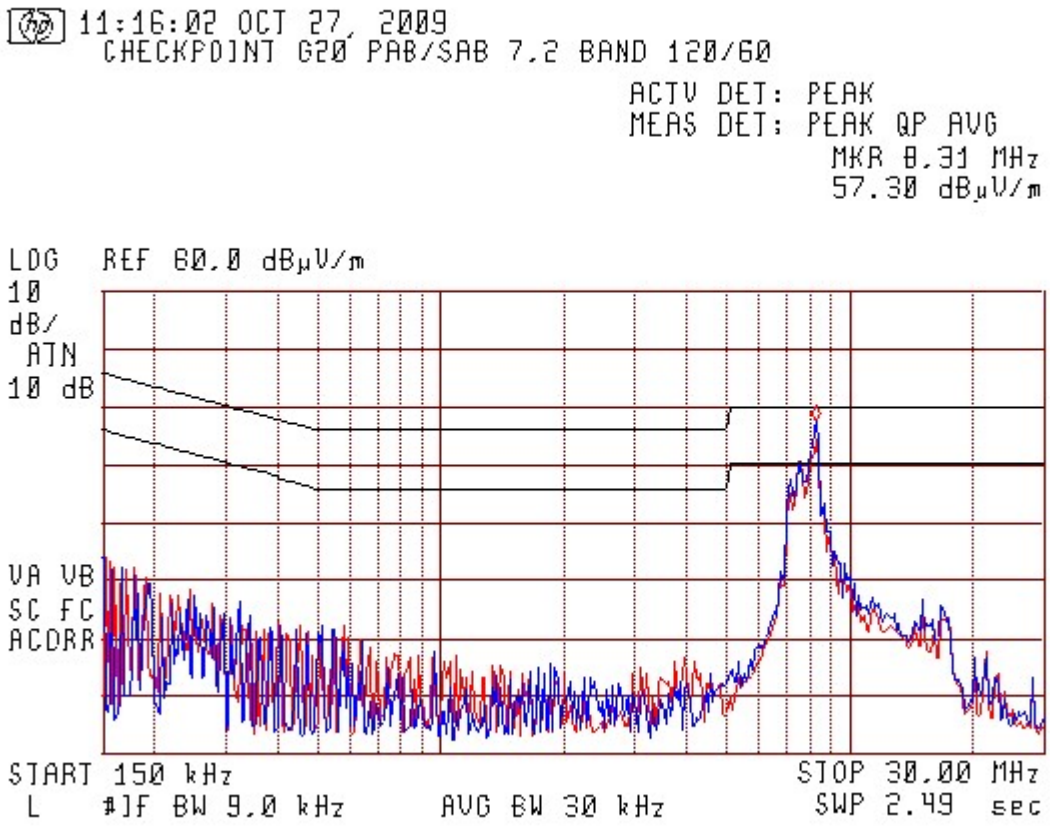


Conducted Emissions Measurements												
Standard:	FCC Part 15.207									***Date:*** 7/24/09		
Device Tested:	Tanzanite P10 7.2 band tx=31 120/60									***File: .xls***		
Signal Num	Freq	Peak Amp	QP Amp	Avg Amp	QP Limit	Avg Limit	Conductor	QP Δ	QP Result	Avg Δ	Average Result	Mode
	MHz	dBuV	dBuV	dBuV	dBuV	dBuV		dB		dB		
1	0.1770	35.71	28.27	9.90	64.62	54.62	Line	-36.35	Complied	-44.72	Complied	
2	1.0643	19.66	17.81	13.60	56.00	46.00	Line	-38.19	Complied	-32.40	Complied	
3	2.4803	19.42	15.77	7.68	56.00	46.00	Line	-40.23	Complied	-38.32	Complied	
4	8.3269	53.12	51.95	32.56	60.00	50.00	Line	-8.05	Complied	-17.44	Complied	
5	12.7496	27.81	26.42	14.00	60.00	50.00	Line	-33.58	Complied	-36.00	Complied	
6	16.1395	25.43	22.51	5.79	60.00	50.00	Line	-37.49	Complied	-44.21	Complied	
7	0.1770	36.26	28.16	10.31	64.62	54.62	Neutral	-36.46	Complied	-44.31	Complied	
8	1.0643	23.21	21.50	16.68	56.00	46.00	Neutral	-34.50	Complied	-29.32	Complied	
9	2.4803	22.59	18.83	10.47	56.00	46.00	Neutral	-37.17	Complied	-35.53	Complied	
10	**8.3269**	**53.87**	**52.63**	**33.27**	**60.00**	**50.00**	**Neutral**	**-7.37**	**Complied**	**-16.73**	**Complied**	**Maximum Emissions**
11	12.7496	27.99	26.61	14.12	60.00	50.00	Neutral	-33.39	Complied	-35.88	Complied	
12	16.1395	22.02	18.41	2.85	60.00	50.00	Neutral	-41.59	Complied	-47.15	Complied	
Tested by: David Hollis												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												CE22_B.xlt Revised 21OCT2005

G20 7.2 Band TX= 26

NOTES:

Conducted Emissions @ 120V/60Hz
G-20 7.2Tx Band
Line / Neutral

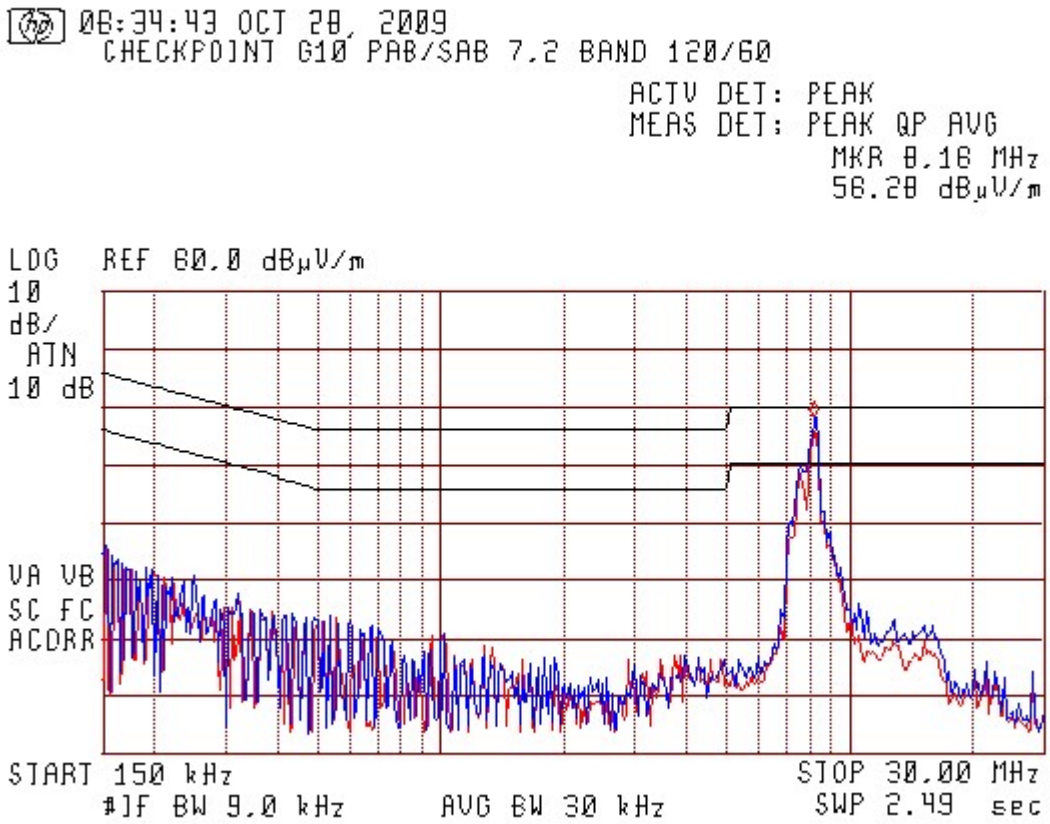


Conducted Emissions Measurements												
Standard:	FCC Part 15.207									***Date:*** 10/27/09		
Device Tested:	Checkpoint G20 PAB/SAB 7.2 band 120VAC/60Hz									***File: .xls***		
Signal Num	Freq	Peak Amp	QP Amp	Avg Amp	QP Limit	Avg Limit	Conductor	QP Δ	QP Result	Avg Δ	Average Result	Mode
	MHz	dBuV	dBuV	dBuV	dBuV	dBuV		dB		dB		
1	0.2344	29.14	21.38	18.26	62.29	52.29	Line	-40.91	Complied	-34.03	Complied	
2	7.1846	44.60	42.24	28.69	60.00	50.00	Line	-17.76	Complied	-21.31	Complied	
3	7.5900	50.68	47.20	31.83	60.00	50.00	Line	-12.80	Complied	-18.17	Complied	
4	8.2961	55.90	52.34	36.13	60.00	50.00	Line	-7.66	Complied	-13.87	Complied	
5	16.7953	26.47	22.53	10.60	60.00	50.00	Line	-37.47	Complied	-39.40	Complied	
6	21.6018	19.00	14.41	4.35	60.00	50.00	Line	-45.59	Complied	-45.65	Complied	
7	27.9986	13.09	9.33	5.85	60.00	50.00	Line	-50.67	Complied	-44.15	Complied	
8	0.2344	29.24	20.16	13.06	62.29	52.29	Neutral	-42.13	Complied	-39.23	Complied	
9	7.1846	46.98	44.62	31.04	60.00	50.00	Neutral	-15.38	Complied	-18.96	Complied	
10	7.5900	52.70	49.17	33.79	60.00	50.00	Neutral	-10.83	Complied	-16.21	Complied	
11	**8.2961**	**57.53**	**53.93**	**37.66**	**60.00**	**50.00**	**Neutral**	**-6.07**	**Complied**	**-12.34**	**Complied**	**Maximum Emissions**
12	16.7953	27.76	23.34	12.62	60.00	50.00	Neutral	-36.66	Complied	-37.38	Complied	
13	21.6018	18.91	14.32	4.42	60.00	50.00	Neutral	-45.68	Complied	-45.58	Complied	
14	27.9986	12.82	9.44	5.94	60.00	50.00	Neutral	-50.56	Complied	-44.06	Complied	
Tested by: David Hollis												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												CE22_B.xlt Revised 21OCT2005

G10 7.2 Band TX= 29

NOTES:

Conducted Emissions @ 120V/60Hz
G-10 7.2Tx Band
Line / Neutral



Conducted Emissions Measurements												
Standard:	FCC Part 15.207									***Date:*** 10/28/09		
Device Tested:	Checkpoint G10 PAB/SAB 7.2 band 120VAC/60Hz									***File: .xls***		
Signal Num	Freq	Peak Amp	QP Amp	Avg Amp	QP Limit	Avg Limit	Conductor	QP Δ	QP Result	Avg Δ	Average Result	Mode
	MHz	dBuV	dBuV	dBuV	dBuV	dBuV		dB		dB		
1	0.2335	32.57	24.61	20.47	62.32	52.32	Line	-37.71	Complied	-31.85	Complied	
2	7.2025	37.19	34.87	21.67	60.00	50.00	Line	-25.13	Complied	-28.33	Complied	
3	7.6304	46.17	44.07	30.04	60.00	50.00	Line	-15.93	Complied	-19.96	Complied	
4	8.3275	57.45	53.84	36.96	60.00	50.00	Line	-6.16	Complied	-13.04	Complied	
5	14.9730	18.66	16.30	12.58	60.00	50.00	Line	-43.70	Complied	-37.42	Complied	
6	21.5958	16.45	11.82	2.84	60.00	50.00	Line	-48.18	Complied	-47.16	Complied	
7	27.9988	13.08	9.87	6.28	60.00	50.00	Line	-50.13	Complied	-43.72	Complied	
8	0.2335	31.42	22.28	12.95	62.32	52.32	Neutral	-40.04	Complied	-39.37	Complied	
9	7.2025	40.07	37.79	24.42	60.00	50.00	Neutral	-22.21	Complied	-25.58	Complied	
10	7.6304	48.46	46.39	32.30	60.00	50.00	Neutral	-13.61	Complied	-17.70	Complied	
11	**8.3275**	**59.03**	**55.39**	**38.27**	**60.00**	**50.00**	**Neutral**	**-4.61**	**Complied**	**-11.73**	**Complied**	**Maximum Emissions**
12	14.9730	22.97	19.27	13.71	60.00	50.00	Neutral	-40.73	Complied	-36.29	Complied	
13	21.5958	16.64	12.26	3.08	60.00	50.00	Neutral	-47.74	Complied	-46.92	Complied	
14	27.9988	13.01	9.86	6.40	60.00	50.00	Neutral	-50.14	Complied	-43.60	Complied	
Tested by: David Hollis												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												CE22_B.xlt Revised 21OCT2005

4.2.6 Photos

Figure 5 – Conducted Emissions Test Setup – P-20

Figure 6 – Conducted Emissions Test Setup – P-10

Figure 7 – Conducted Emissions Test Setup – G-20

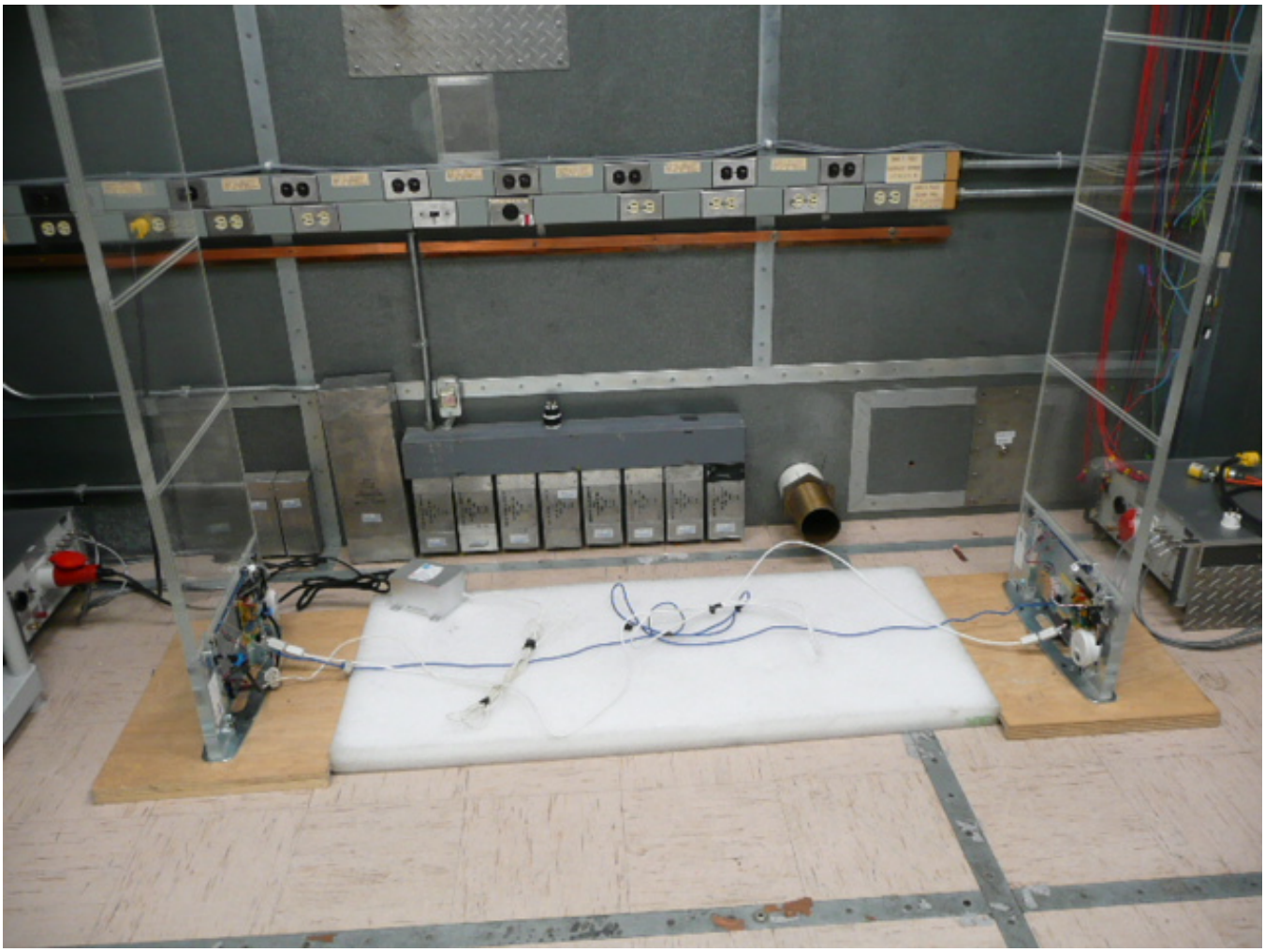


Figure 8 – Conducted Emissions Test Setup – G-10

4.3 Radiated Emissions Limits

This test measures the electromagnetic levels of spurious signals generated by the EUT that radiated from the EUT and may affect the performance of other nearby electronic equipment.

4.3.1 Test Over View

Results	**Complies** (as tested per this report)				**Date**	10/28/09	
Standard	FCC Part 15 Subpart 15.205 and 15.209						
Product Model	Evolve Antenna Family		**Serial#**	See Section 3.5			
Configuration	See test plan for details						
Test Set-up	Tested on a 10m O.A.T.S. placed on turn-table, see test plans for details.						
EUT Powered By	120V/60Hz	**Temp**	22º C	**Humidity**	45%	**Pressure**	1000mbar
Frequency Range	From Fundamental - 1000MHz						
Perf. Criteria	Below Limit		**Perf. Verification**	Readings under Limit			
Mod to EUT	None		**Test Performed By**	David Hollis			

4.3.2 Test Procedure

Radiated emissions tests were performed using the procedures of ANSI C63.4 including methods for signal maximizations and EUT configuration. The photos included with the report show the EUT in its maximized configuration.

The frequency range from 30MHz to 1000MHz was investigated for radiated emissions.

Radiated emission testing was first performed at a distance of 3 meters in the semi-anechoic chamber in order to identify the specific frequencies for which these measurements will be made. Harmonics and spurious emissions testing <30MHz were performed at 10m distance on the OATS using a magnetic field loop antenna. Harmonics and spurious emissions test >30MHz were performed on the 3 m OATS using a Bilog antenna

4.3.3 Deviations

There were no deviations from the test methodology listed in the test plan for the harmonic current emissions test.

4.3.4 Final Test

All final radiated emissions measurements were below (in compliance with) the limits. No emissions at harmonics of the fundamental frequencies were detected on any of the systems listed in this test report.

Radiated emissions prescan data above 30MHz for the G10 and G20 systems yielded similar data. Based on these results, it was deemed unnecessary to perform final measurements for both systems. The G10 system was selected to represent both systems for radiated emissions final testing.

4.3.5 Final Measurement Data

P-20 7.2 Band TX=31 RE Final:

Radiated Emissions Measurements												
Standard:	47 CFR 15.209, Class B					***PRESCAN or FINAL:***		Final		***Date:*** 7/16/09		
Device Tested:	Checkpoint Tanzanite P20 7.2/8.2 band tx=31					***Distance:***		3.0m		***File:***		
		Measured Level										
Meas #	Freq (MHz)	Peak	Quasi-Peak	Average	Quasi-Peak Limit	Quasi-Peak Δ	Antenna + Cable Correction Factor (included in measured levels)	Result	Polarization	Angle (degrees)	Antenna Height (meters)	Comment
1	43.2000	34.85	29.50	10.11	40.00	-10.50	12.65	**Complied**	Vertical	0	1.40	
2	45.6150	39.17	32.87	18.83	40.00	-7.13	11.78	**Complied**	Vertical	0	1.40	
3	57.6250	37.36	32.09	11.63	40.00	-7.91	7.96	**Complied**	Vertical	0	1.40	
4	407.9775	45.67	40.91	9.79	46.00	-5.09	15.76	**Complied**	Vertical	180	1.30	
5	424.5286	47.34	42.50	11.64	46.00	-3.50	16.28	**Complied**	Vertical	180	1.30	
6	428.0125	47.37	42.63	11.42	46.00	-3.37	16.33	**Complied**	Vertical	180	1.30	
7	432.0400	48.40	43.36	13.28	46.00	-2.64	16.38	**Complied**	Vertical	180	1.30	
8	446.5075	46.61	41.99	11.59	46.00	-4.01	16.55	**Complied**	Vertical	180	1.30	
Tested by: David Hollis												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												REFCC15B.xlt Revised 10MAR03

P-10 7.2 Band TX= 31 RE Final:

Radiated Emissions Measurements												
Standard:	47 CFR 15.209, Class B					***PRESCAN or FINAL:***		Final		***Date:*** 7/17/09		
Device Tested:	Checkpoint Tanzanite P10 7.2/8.2 band tx=31					***Distance:***		3.0m		***File:***		
		Measured Level										
Meas #	Freq (MHz)	Peak	Quasi-Peak	Average	Quasi-Peak Limit	Quasi-Peak Δ	Antenna + Cable Correction Factor (included in measured levels)	Result	Polarization	Angle (degrees)	Antenna Height (meters)	Comment
1	441.3000	50.17	44.93	13.93	46.00	-1.07	19.21	**Complied**	Vertical	0	1.50	
2	452.5000	53.70	43.63	15.92	46.00	-2.37	19.42	**Complied**	Vertical	0	1.50	
3	460.5500	51.29	43.42	16.35	46.00	-2.58	19.47	**Complied**	Vertical	0	1.50	
4	466.5000	55.90	44.44	14.96	46.00	-1.56	19.51	**Complied**	Vertical	0	1.50	
5	474.7305	50.08	44.46	15.98	46.00	-1.54	19.56	**Complied**	Vertical	0	1.50	
Tested by: David Hollis												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009												REFCC15B.xlt Revised 10MAR03

G-10 7.2 Band TX= 29 RE Final:

Radiated Emissions Measurements												
Standard:	47 CFR 15.209					***PRESCAN or FINAL:***		Final		***Date:*** 10/7/09		
Device Tested:	Checkpoint G10 PAB/SAB 7.2 Band TX=29						***Distance:***	3.0m			***File:***	
		Measured Level										
Meas #	Freq (MHz)	Peak	Quasi-Peak	Average	Quasi-Peak Limit	Quasi-Peak Δ	Antenna + Cable Correction Factor (included in measured levels)	Result	Polarization	Angle (degrees)	Antenna Height (meters)	Comment
1	50.4000	38.01	29.52	10.88	40.00	-10.48	8.66	**Complied**	Horizontal	360	2.40	
2	72.6875	43.55	37.16	8.93	40.00	-2.84	6.97	**Complied**	Vertical	360	1.00	
3	88.5025	37.94	32.85	28.58	43.50	-10.65	10.04	**Complied**	Vertical	360	1.00	
4	249.7375	28.15	22.67	4.95	46.00	-23.33	14.31	**Complied**	Horizontal	250	1.20	
5	457.8750	47.39	42.04	13.51	46.00	-3.96	19.46	**Complied**	Horizontal	250	1.20	
6	468.3750	48.57	43.56	14.06	46.00	-2.44	19.52	**Complied**	Horizontal	250	1.90	
7	492.6750	41.55	36.45	11.73	46.00	-9.55	19.89	**Complied**	Horizontal	250	1.90	
8	539.6000	38.34	32.51	11.17	46.00	-13.49	21.13	**Complied**	Horizontal	250	1.90	
Tested by: David Hollis												
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009											REFCC15B.xlt Revised 10MAR03	

4.3.6 Operation in Restricted Bands

The EUT is a digital swept frequency hopping transmitter. The EUT hops on discrete frequencies. The discrete frequencies that can be transmitted by the EUT are as follows:

Frequency Band	Band width	Actual Transmitted frequencies (MHz)	Region
8.2	7.950 to 8.450 MHz	8.450, 8.325, 8.075, 7.950	NAM and EU
8.6	8.075 to 9.125 MHz	9.125, 8.875, 8.325, 8.075	NAM
9	8.075 to 9.325 MHz	9.325, 9.075, 8.325, 8.075	NAM
9.5	9.200 to 9.800 MHz	9.800, 9.600, 9.400, 9.200	NAM
7.2 + 8.2	7.200 to 8.325 MHz	8.325, 8.075, 7.600, 7.200	NAM

The restricted frequency bands (per FCC Part 15 Clause 15.205) in the operating frequency band of the EUT are as follows:

8.291 – 8.294 MHz
8.362 – 8.366 MHz
8.37625 – 8.38675 MHz
8.41425 – 8.41475 MHz

The transmitter is not capable of hopping into, or operating, in the restricted frequency bands and therefore complies with the restriction.

4.4 Emissions Bandwidth

This test measures the emission bandwidth of the fundamental frequency generated by the EUT that may be outside the allowed transmission frequency

4.4.1 Test Over View

Results	**Complies** (as tested per this report)				**Date**	10/27/09	
Standard	FCC Part 15 Subpart 15.215 and RSS-210						
Product Model	Evolve Antenna Family		**Serial#**	See Section 3.5			
Configuration	See test plan for details						
Test Set-up	Tested on a 10m O.A.T.S. placed on turn-table, see test plans for details						
EUT Powered By	120V/60Hz	**Temp**	22º C	**Humidity**	45%	**Pressure**	1000mbar
Frequency Range	8.2MHz Band						
Perf. Criteria	Within Frequency Range		**Perf. Verification**	Readings under Limit			
Mod to EUT	None		**Test Performed By**	David Hollis			

4.4.2 Test Procedure

The emissions of the fundamental were measured with a loop antenna in 3 orthogonal orientations. The measurement of the bandwidth was done at -6db and -20dB on each side of the fundamental frequency. The test method includes signal maximizations of EUT configuration, by turning the turntable 360degres and recording the highest emissions. The photos included with the report show the EUT in its maximized configuration.

4.4.3 Deviations

There were no deviations from the test methodology listed in the test plan for the Bandwidth Emissions test.

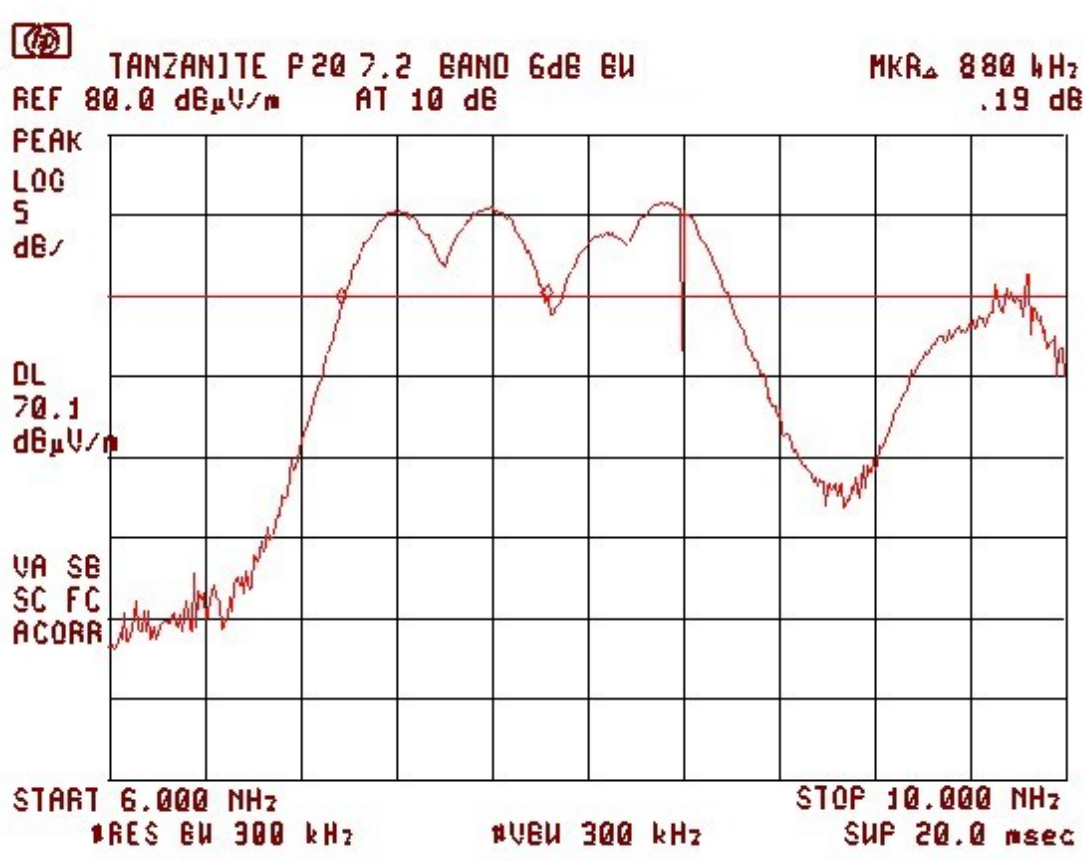
4.4.4 Final Test

All final radiated emissions measurements were below (in compliance with) the limits.

4.4.5 Final Measurement Data

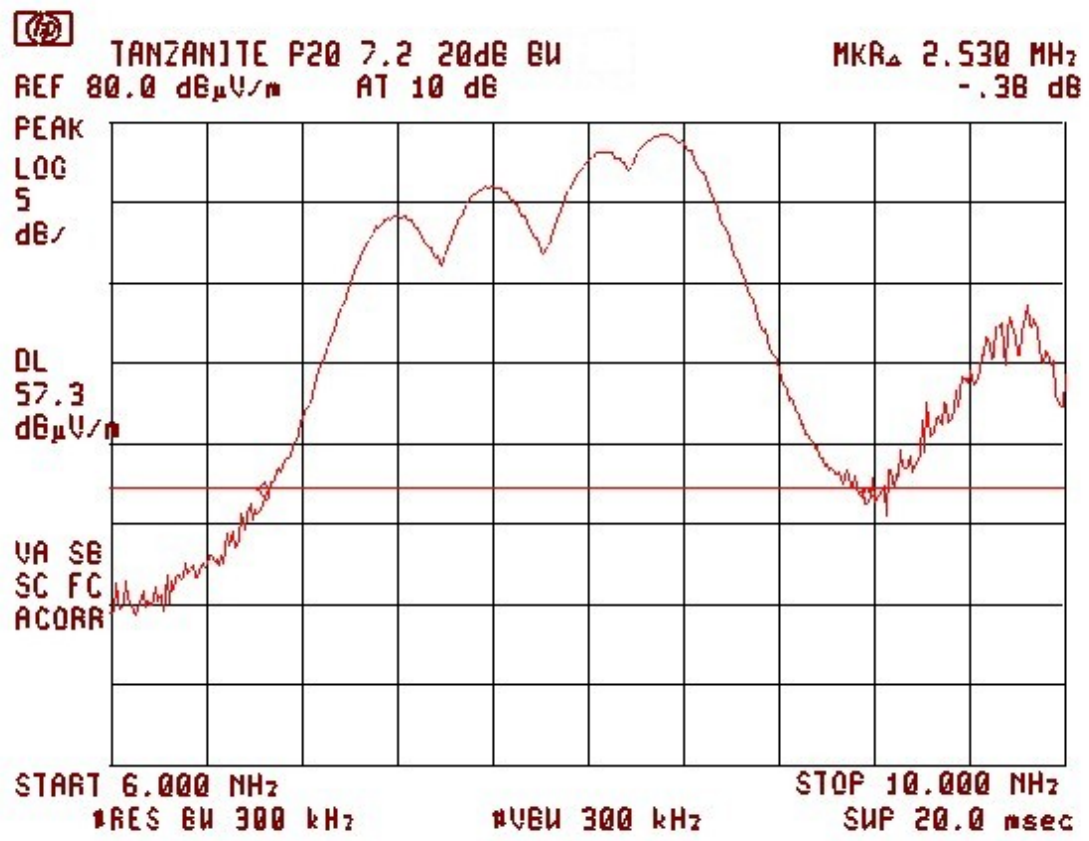
NOTES:

Emission Bandwidth
P20 7.2 Band
6dB Bandwidth



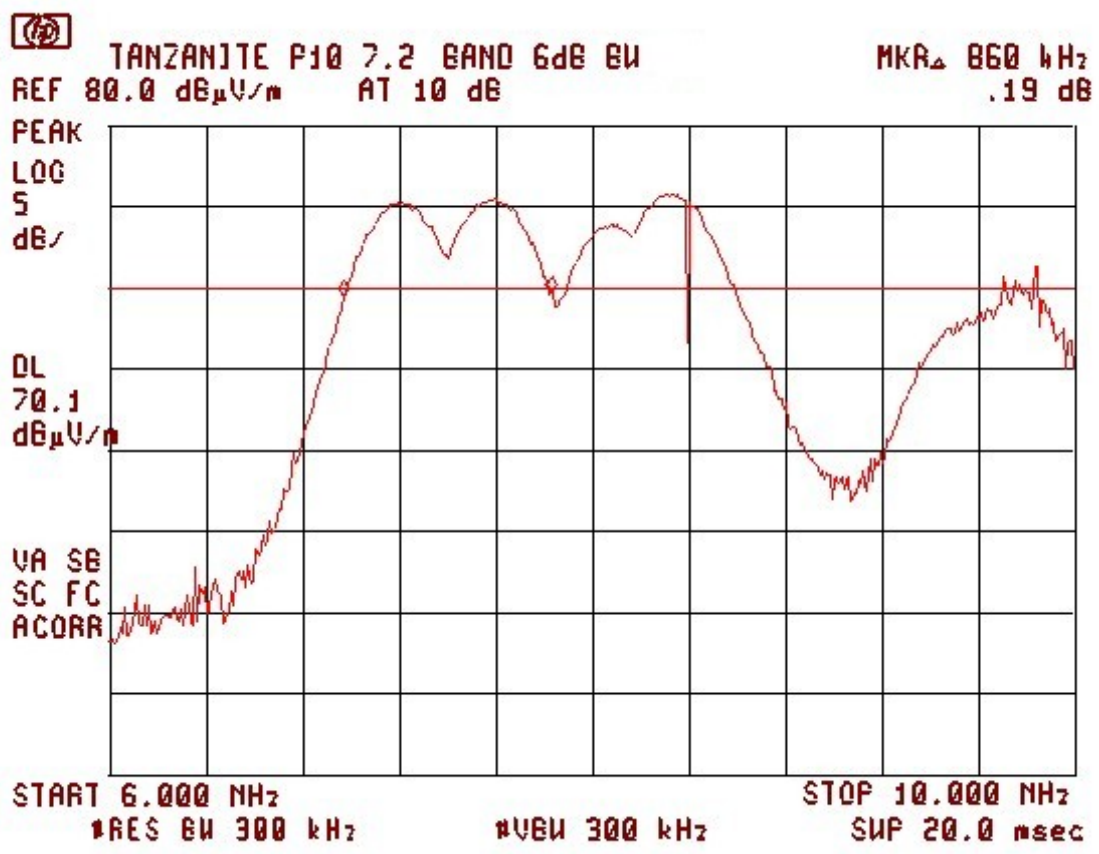
NOTES:

Emission Bandwidth
P-20 7.2 Band
20 dB Bandwidth



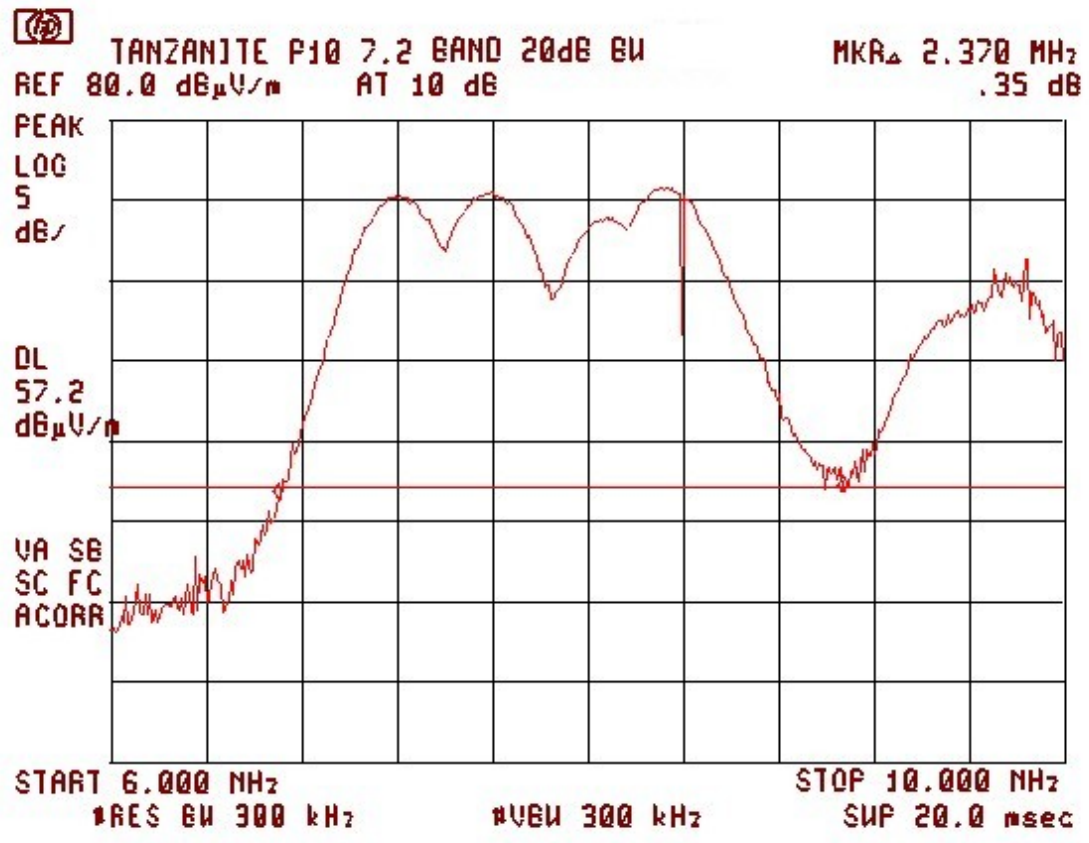
NOTES:

Emission Bandwidth
P-10 7.2 Band
6 dB Bandwidth



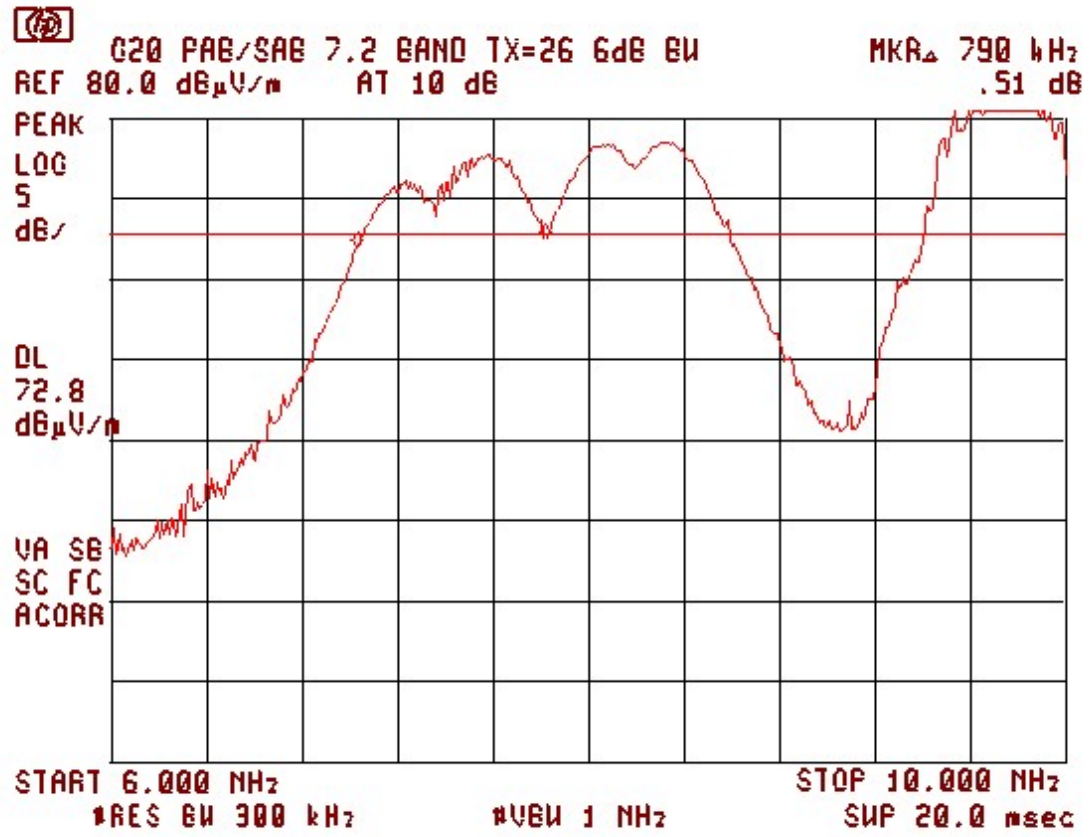
NOTES:

Emission Bandwidth
P-10 7.2 Band
20 dB Bandwidth



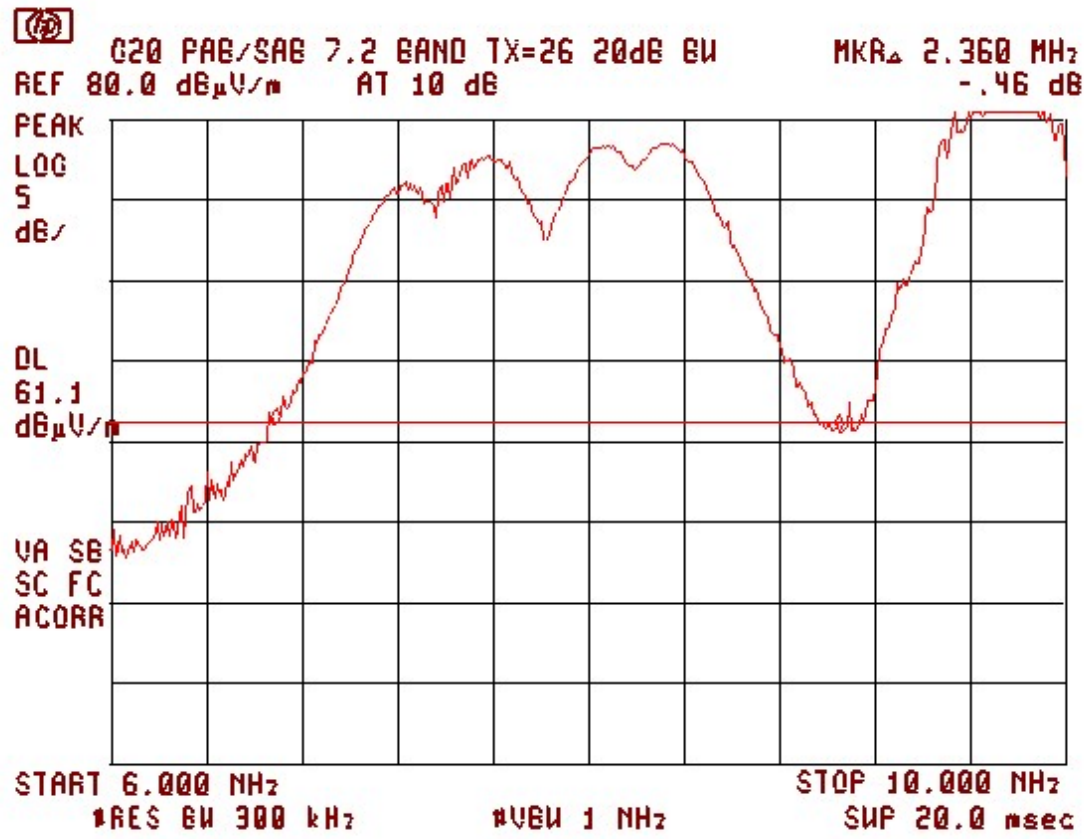
NOTES:

Emission Bandwidth
G-20 7.2 Band
6 dB Bandwidth



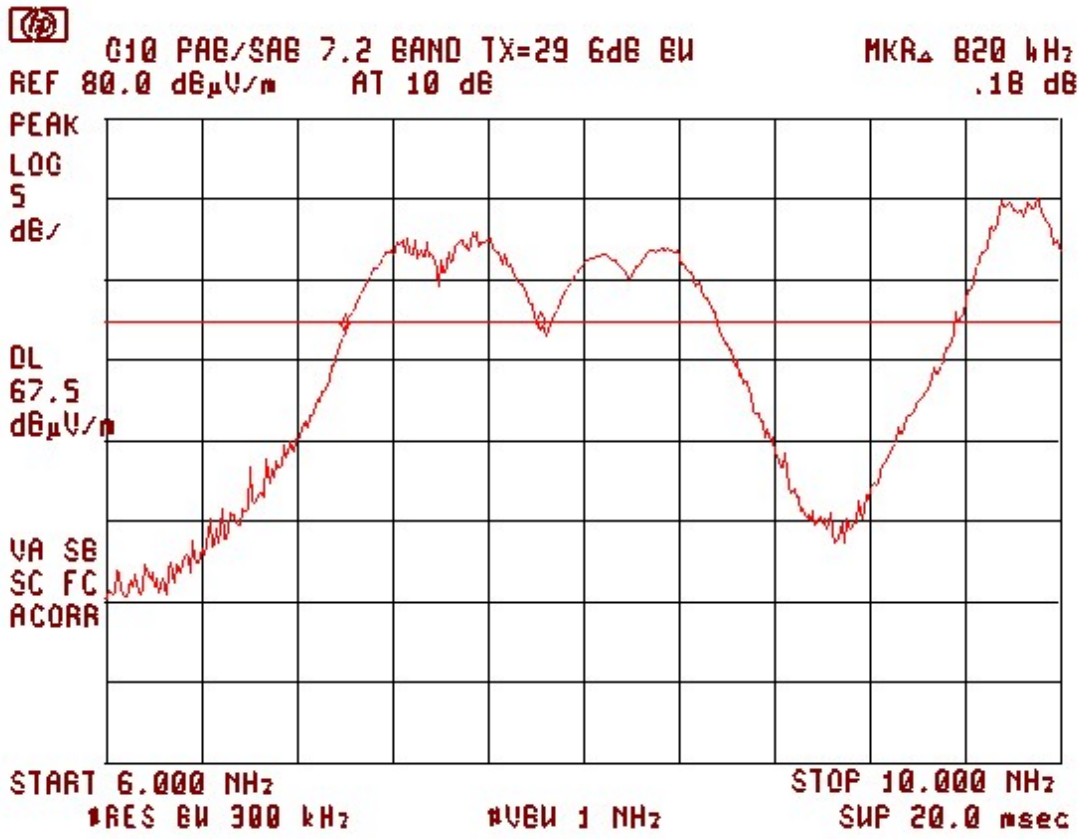
NOTES:

Emission Bandwidth
G-20 7.2 Band
20 dB Bandwidth



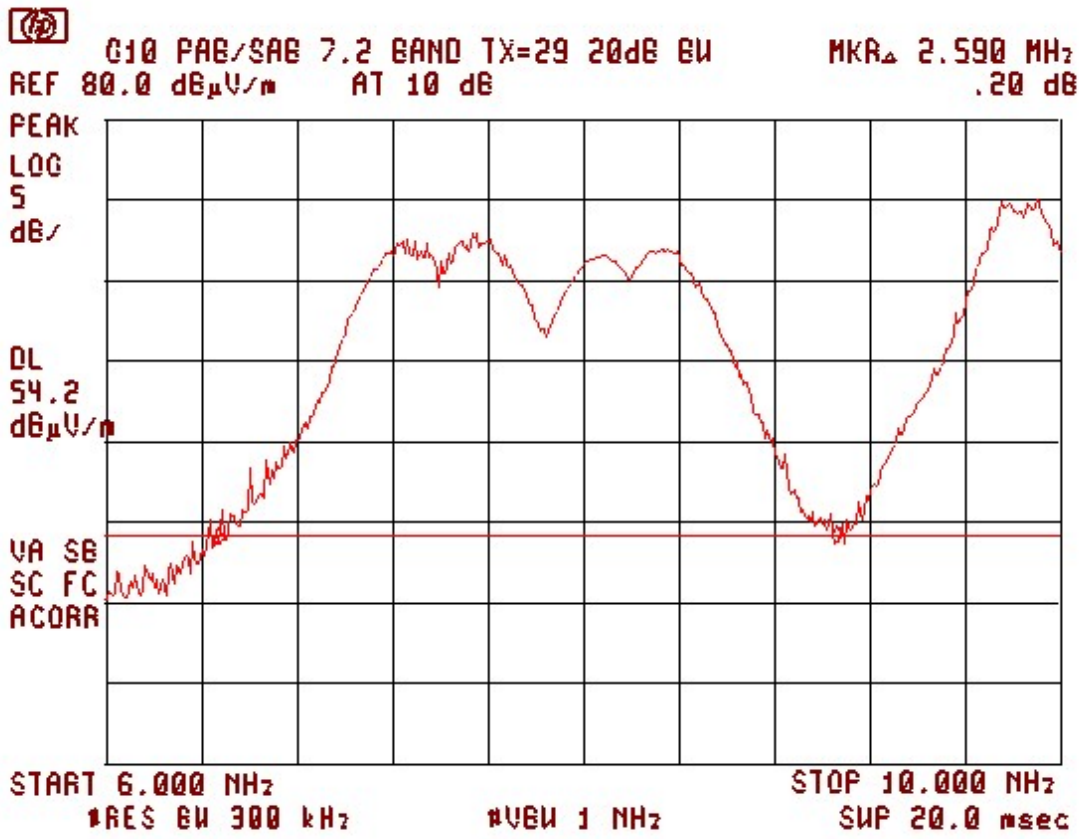
NOTES:

Emission Bandwidth
G-10 7.2 Band
6 dB Bandwidth



NOTES:

Emission Bandwidth
G-10 7.2 Band
20 dB Bandwidth



Band Edge Measurement									
Standard:	47 CFR FCC Part 15.215 /RSS-210				***PRESCAN or FINAL:***		Final	***Date:***	7/16/2009
Device Tested:	P20 PAB/SAB 7.2 Band TX=31					***Distance:***	3m	***File:***	
	Measured Level								
Meas #	TX Band	-6dB Low End (MHz)	-6dB High End (MHz)	Measured Bandwith (MHz)	-20dB Low End (MHz)	-20dB High End (MHz)	Measured Bandwith (MHz)		Comment
RBW = 300kHz VBW=300kHz (FCC Settings)									
1	7.2	7.000	7.880	0.880	6.640	9.170	2.530		
Tested by:	David Hollis								
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009									

Band Edge Measurement									
Standard:	47 CFR FCC Part 15.215 /RSS-210				***PRESCAN or FINAL:***		Final	***Date:***	7/17/2009
Device Tested:	P10 PAB/SAB 7.2 Band TX=31					***Distance:***	3m	***File:***	
	Measured Level								
Meas #	TX Band	-6dB Low End (MHz)	-6dB High End (MHz)	Measured Bandwith (MHz)	-20dB Low End (MHz)	-20dB High End (MHz)	Measured Bandwith (MHz)		Comment
RBW = 300kHz VBW=300kHz (FCC Settings)									
1	7.2/8.2	6.970	7.830	0.860	6.700	9.070	2.370		
Tested by:	David Hollis								
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009									

Band Edge Measurement									
Standard:	47 CFR FCC Part 15.215 /RSS-210				***PRESCAN or FINAL:***		Final	***Date:***	10/26/2009
Device Tested:	G20 PAB/SAB 7.2 Band TX=26					***Distance:***	3m	***File:***	
	Measured Level								
Meas #	TX Band	-6dB Low End (MHz)	-6dB High End (MHz)	Measured Bandwith (MHz)	-20dB Low End (MHz)	-20dB High End (MHz)	Measured Bandwith (MHz)		Comment
RBW = 300kHz VBW=300kHz (FCC Settings)									
1	7.2	7.030	7.820	0.790	6.690	9.050	2.360		
Tested by:	David Hollis								
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009									

Band Edge Measurement									
Standard:	47 CFR FCC Part 15.215 /RSS-210				***PRESCAN or FINAL:***		Final	***Date:***	9/23/2009
Device Tested:	G10 PAB/SAB 7.2 Band TX=29					***Distance:***	10m	***File:***	G10 Bandedge.xls
	Measured Level								
Meas #	TX Band	-6dB Low End (MHz)	-6dB High End (MHz)	Measured Bandwith (MHz)	-20dB Low End (MHz)	-20dB High End (MHz)	Measured Bandwith (MHz)		Comment
RBW = 300kHz VBW=300kHz (FCC Settings)									
1	7.2	7.000	7.820	0.820	6.470	9.050	2.590		
Tested by:	David Hollis								
TUV Rheinland of North America, Inc. 12 Commerce Road Newtown, CT 06470 Tel:(203) 426-0888 Fax: (203) 426-4009									