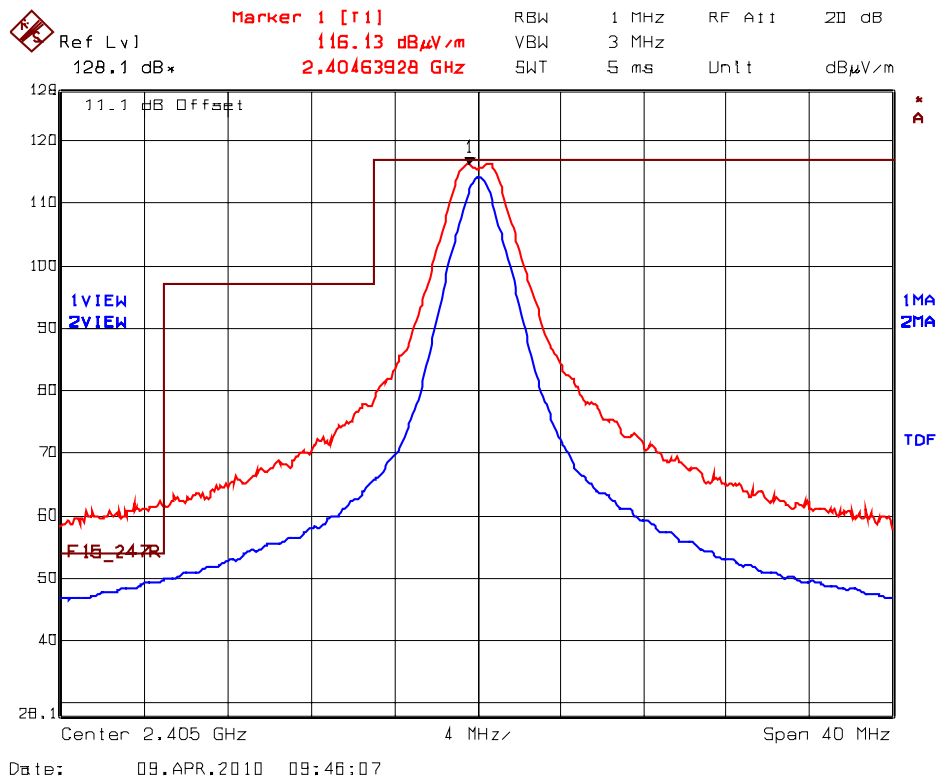
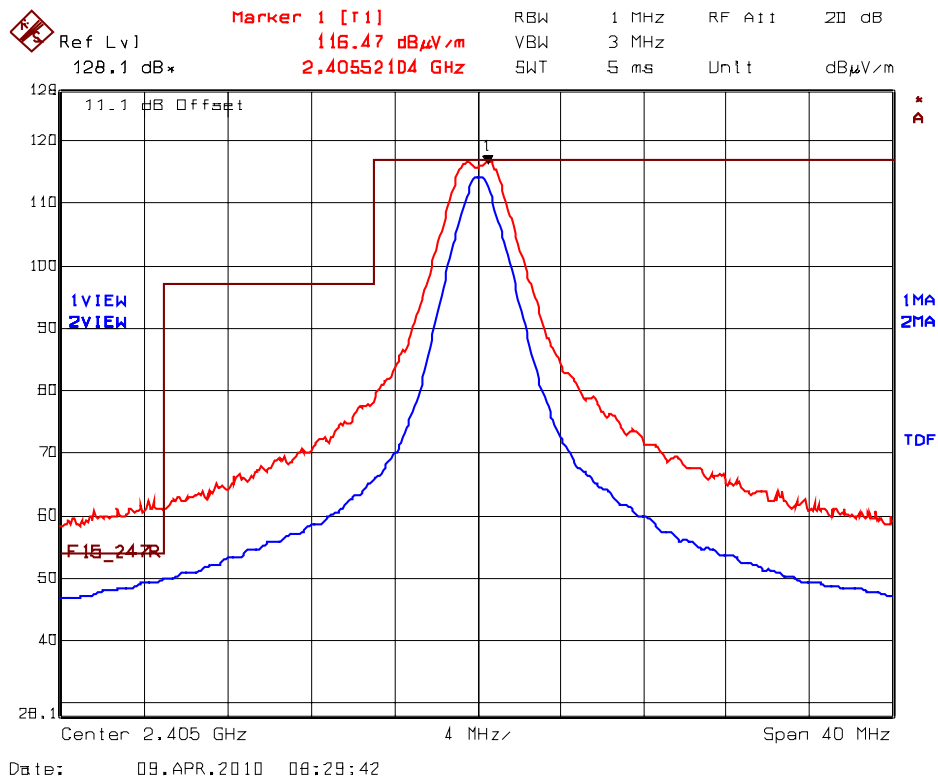


Plot 5.9.4.3.1. Band-Edge RF Radiated Emissions @ 3 m
 Low End of Frequency Band, 2405 MHz
 Rx Antenna Orientation: Horizontal



Trace 1: RBW = 1 MHz, VBW = 3 MHz
 Trace 2: RBW = 1 MHz, VBW = 10 Hz

Plot 5.9.4.3.2. Band-Edge RF Radiated Emissions @ 3 m
 Low End of Frequency Band, 2405 MHz
 Rx Antenna Orientation: Vertical



Trace 1: RBW = 1 MHz, VBW = 3 MHz
 Trace 2: RBW = 1 MHz, VBW = 10 Hz

Fundamental Frequency:		2440 MHz					
Test Frequency Range:		30 MHz – 25 GHz					
Frequency (MHz)	RF Peak Level (dBµV/m)	RF Avg Level (dBµV/m)	Antenna Plane (H/V)	Limit 15.209 (dBµV/m)	Limit 15.247 (dBµV/m)	Margin (dB)	Pass/Fail
2440	116.70	--	V	--	--	--	--
2440	116.37	--	H	--	--	--	--
7320	56.79	34.62	V	54.0	96.7	-19.4	Pass*

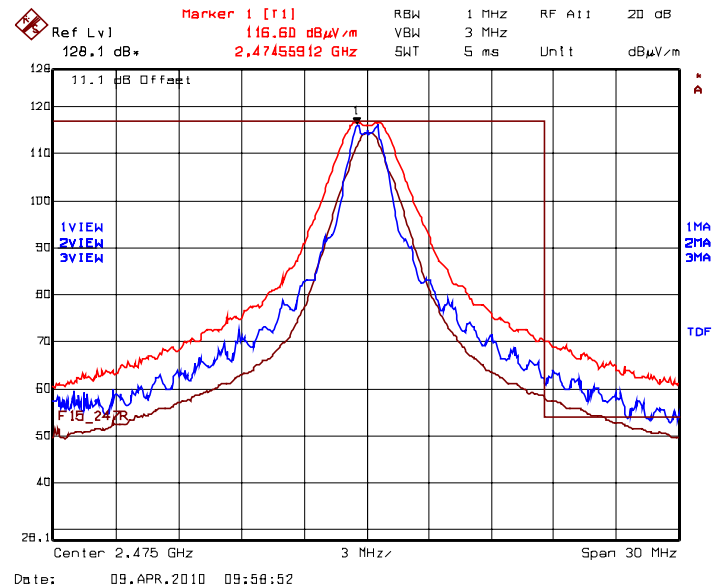
*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

Fundamental Frequency:		2475 MHz					
Test Frequency Range:		30 MHz – 25 GHz					
Frequency (MHz)	RF Peak Level (dBµV/m)	RF Avg Level (dBµV/m)	Antenna Plane (H/V)	Limit 15.209 (dBµV/m)	Limit 15.247 (dBµV/m)	Margin (dB)	Pass/Fail
2475	116.92	--	V	--	--	--	--
2475	116.60	--	H	--	--	--	--
7425	59.19	37.10	V	54.0	96.9	-16.9	Pass*
7425	57.14	34.10	H	54.0	96.9	-19.9	Pass*

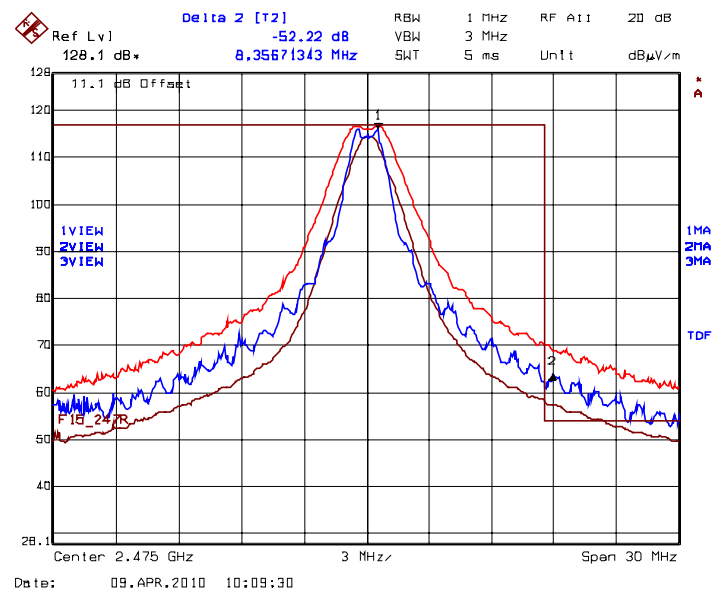
*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

See the following test data plots for band-edge emissions.

Plot 5.9.4.3.3. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2475 MHz, Rx Antenna Orientation: Horizontal



Plot 5.9.4.3.4. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2475 MHz, Rx Antenna Orientation: Horizontal



Trace 1: RBW = 1 MHz, VBW = 3 MHz

Trace 2: RBW = 300 kHz, VBW = 500 kHz, Delta (Peak to Band-Edge): 52.22 dB

Trace 3: RBW = 1 MHz, VBW = 10 Hz

Peak Band-Edge at 2483.5 MHz: Peak = 116.60 dBμV/m – 52.22 dB = 64.38 dBμV/m (limit 74 dBμV/m)

Average: 58.18 dBμV/m – 11.37dB = 46.81 dBμV/m (limit 54 dBμV/m)

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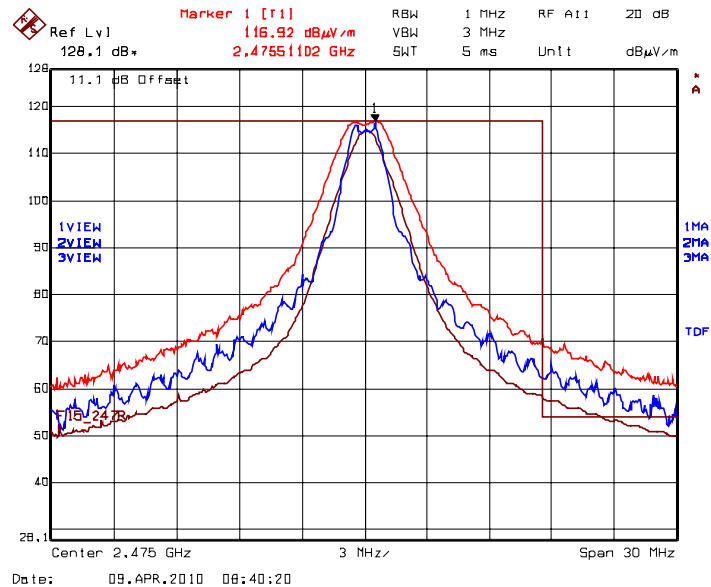
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: DIGI-028Q1F15C247

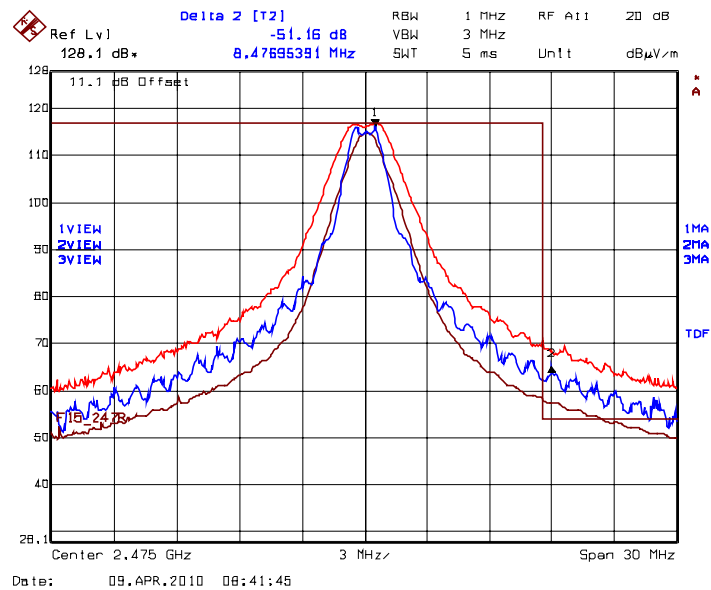
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Plot 5.9.4.3.5. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2475 MHz, Rx Antenna Orientation: Vertical



Plot 5.9.4.3.6. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2475 MHz, Rx Antenna Orientation: Vertical



Trace 1: RBW = 1 MHz, VBW = 3 MHz

Trace 2: RBW = 300 kHz, VBW = 500 kHz, Delta (Peak to Band-Edge): 51.16 dB

Trace 3: RBW = 1 MHz, VBW = 10 Hz

Peak Band-Edge at 2483.5 MHz: Peak = 116.92 dBμV/m – 51.16 dB = 65.76 dBμV/m (limit 74 dBμV/m)

Average: 58.16 dBμV/m – 11.37dB = 46.79 dBμV/m (limit 54 dBμV/m)

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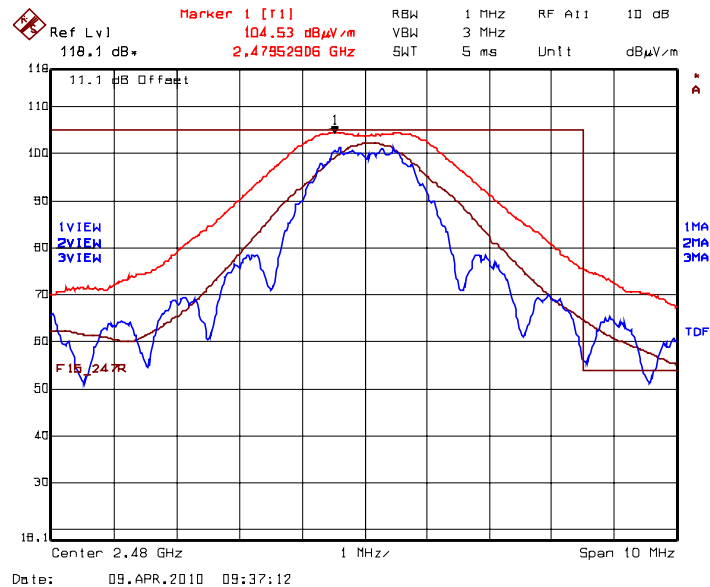
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: DIGI-028Q1F15C247

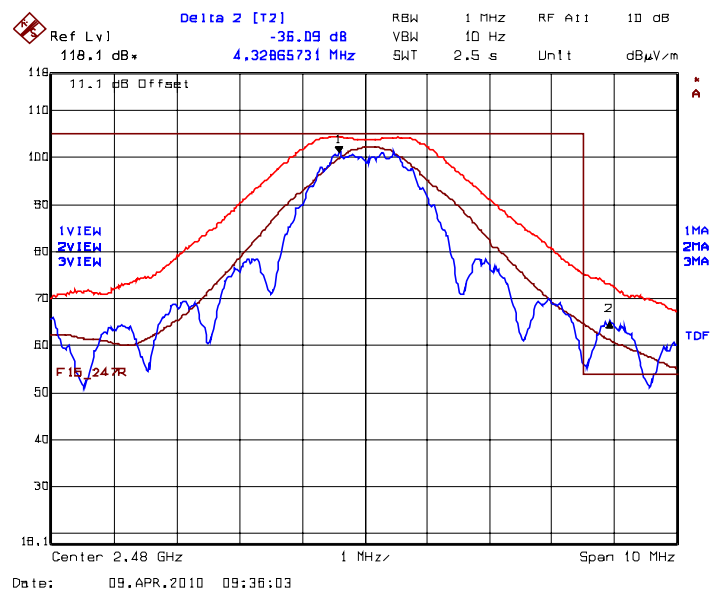
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Plot 5.9.4.3.7. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2480 MHz, Rx Antenna Orientation: Horizontal



Plot 5.9.4.3.8. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2480 MHz, Rx Antenna Orientation: Horizontal



Trace 1: RBW = 1 MHz, VBW = 3 MHz

Trace 2: RBW = 100 kHz, VBW = 300 kHz, Delta (Peak to Band-Edge): 36.09 dB

Trace 3: RBW = 1 MHz, VBW = 10 Hz

Peak Band-Edge at 2483.5 MHz: Peak = 104.53 dBμV/m – 36.09 dB = 68.44 dBμV/m (limit 74 dBμV/m)

Average: 64.44 dBμV/m – 11.37 dB = 53.07 dBμV/m (limit 54 dBμV/m)

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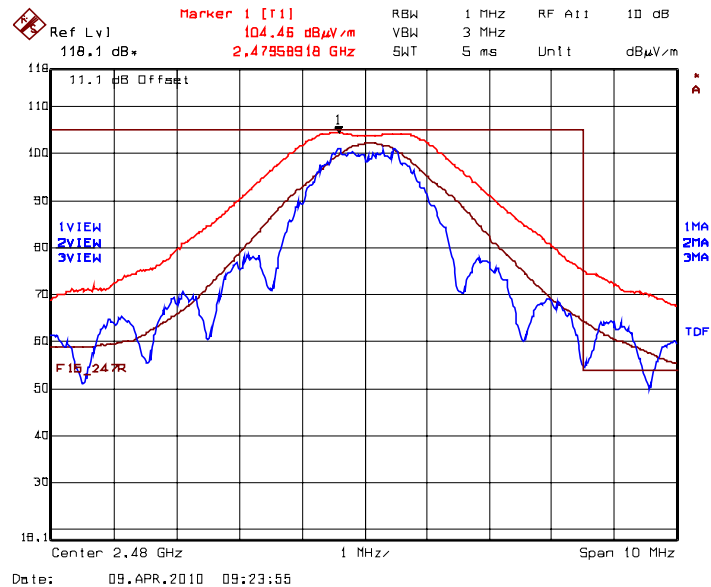
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: DIGI-028Q1F15C247

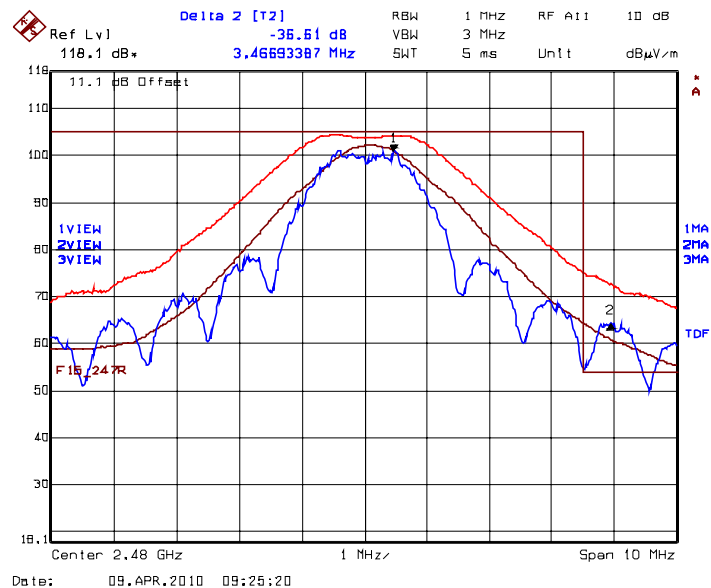
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Plot 5.9.4.3.9. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2480 MHz, Rx Antenna Orientation: Vertical



Plot 5.9.4.3.10. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2480 MHz, Rx Antenna Orientation: Vertical



Trace 1: RBW = 1 MHz, VBW = 3 MHz

Trace 2: RBW = 100 kHz, VBW = 300 kHz, Delta (Peak to Band-Edge): 36.61 dB

Trace 3: RBW = 1 MHz, VBW = 10 Hz

Peak Band-Edge at 2483.5 MHz: Peak = 104.46 dBμV/m – 36.61 dB = 67.85 dBμV/m (limit 74 dBμV/m)

Average: 64.39 dBμV/m – 11.37 dB = 53.02 dBμV/m (limit 54 dBμV/m)

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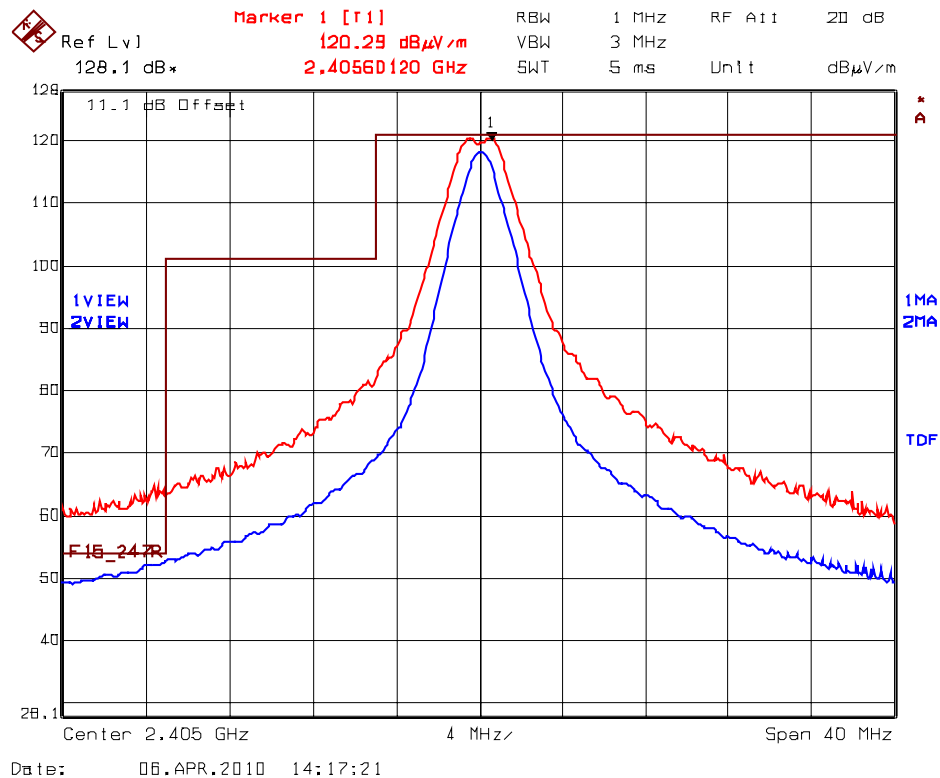
5.9.4.4. EUT with Panel Antenna (19 dBi Gain with 0.62 dB Cable Loss (for 2405-2475 MHz) or 13.62 dB Cable Loss (for 2480 MHz))

Fundamental Frequency: 2405 MHz							
Test Frequency Range: 30 MHz – 25 GHz							
Frequency (MHz)	RF Peak Level (dBµV/m)	RF Avg Level (dBµV/m)	Antenna Plane (H/V)	Limit 15.209 (dBµV/m)	Limit 15.247 (dBµV/m)	Margin (dB)	Pass/Fail
2405	120.75	–	V	--	--	–	--
2405	120.29	--	H	--	--	–	--
30 -25000	*	*	H	*	100.8	*	Pass

*The spurious emissions from intentional radiators are more than 20 dB below the specified limit.

See the following test data plots for band-edge emissions.

Plot 5.9.4.4.1. Band-Edge RF Radiated Emissions @ 3 m
Low End of Frequency Band, 2405 MHz
Rx Antenna Orientation: Horizontal



Trace 1: RBW = 1 MHz, VBW = 3 MHz
Trace 2: RBW = 1 MHz, VBW = 10 Hz

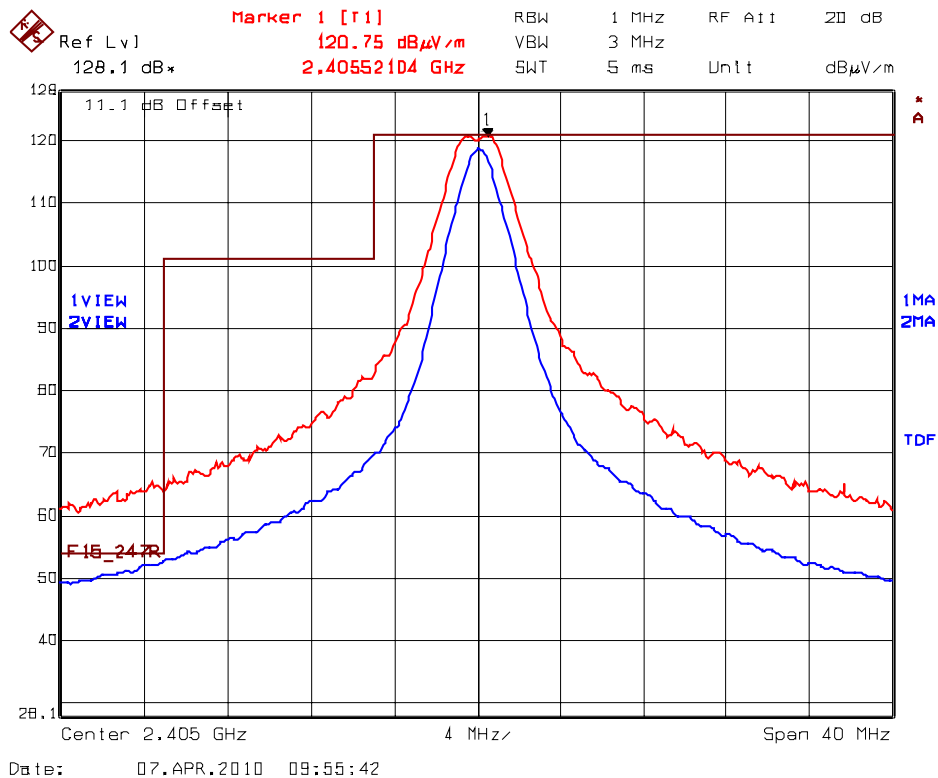
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Plot 5.9.4.4.2. Band-Edge RF Radiated Emissions @ 3 m
Low End of Frequency Band, 2405 MHz
Rx Antenna Orientation: Vertical



Trace 1: RBW = 1 MHz, VBW = 3 MHz
Trace 2: RBW = 1 MHz, VBW = 10 Hz

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Fundamental Frequency:		2440 MHz					
Test Frequency Range:		30 MHz – 25 GHz					
Frequency (MHz)	RF Peak Level (dBµV/m)	RF Avg Level (dBµV/m)	Antenna Plane (H/V)	Limit 15.209 (dBµV/m)	Limit 15.247 (dBµV/m)	Margin (dB)	Pass/Fail
2440	121.11	--	V	--	--	--	--
2440	121.05	--	H	--	--	--	--
7320	59.80	37.66	V	54.0	101.1	-16.3	Pass*
7320	58.44	35.97	H	54.0	101.1	-18.0	Pass*

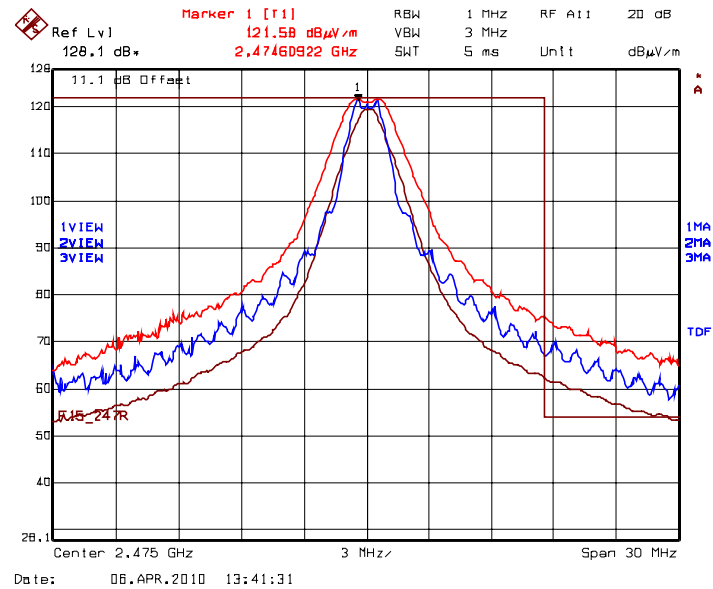
*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

Fundamental Frequency:		2475 MHz					
Test Frequency Range:		30 MHz – 25 GHz					
Frequency (MHz)	RF Peak Level (dBµV/m)	RF Avg Level (dBµV/m)	Antenna Plane (H/V)	Limit 15.209 (dBµV/m)	Limit 15.247 (dBµV/m)	Margin (dB)	Pass/Fail
2475	121.21	--	V	--	--	--	--
2475	121.58	--	H	--	--	--	--
7425	61.96	39.31	V	54.0	101.6	-14.7	Pass*
7425	60.13	37.33	H	54.0	101.6	-16.7	Pass*

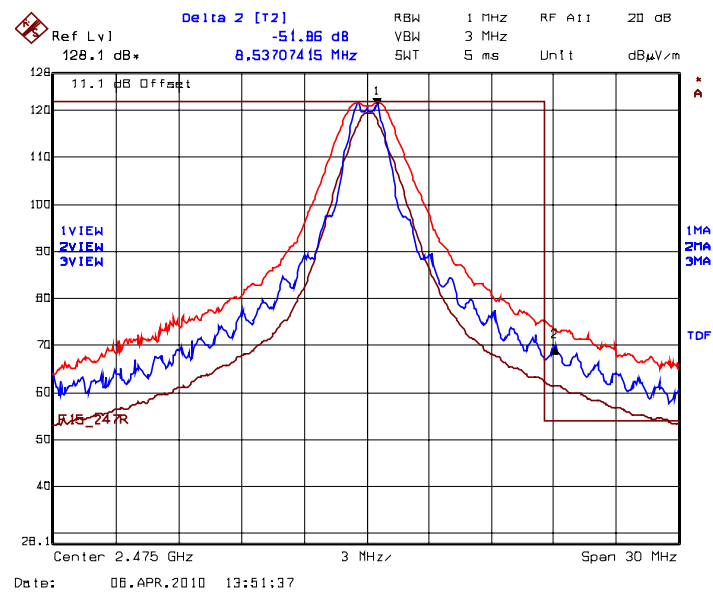
*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

See the following test data plots for band-edge emissions.

Plot 5.9.4.4.3. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2475 MHz, Rx Antenna Orientation: Horizontal



Plot 5.9.4.4.4. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2475 MHz, Rx Antenna Orientation: Horizontal



Trace 1: RBW = 1 MHz, VBW = 3 MHz

Trace 2: RBW = 300 kHz, VBW = 500 kHz, Delta (Peak to Band-Edge): 51.86 dB

Trace 3: RBW = 1 MHz, VBW = 10 Hz

Peak Band-Edge at 2483.5 MHz: Peak = 121.58 dBμV/m - 51.86 dB = 69.72 dBμV/m (limit 74 dBμV/m)

Average: 62.49 dBμV/m - 11.37 dB = 51.12 dBμV/m (limit 54 dBμV/m)

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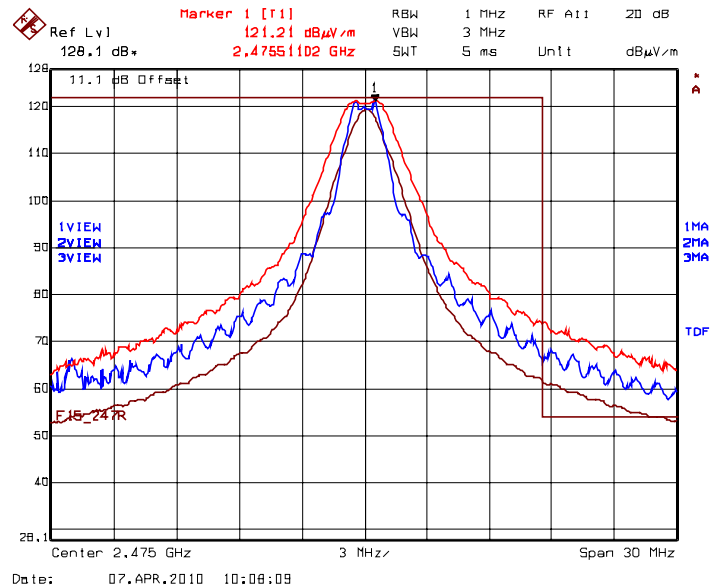
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: DIGI-028Q1F15C247

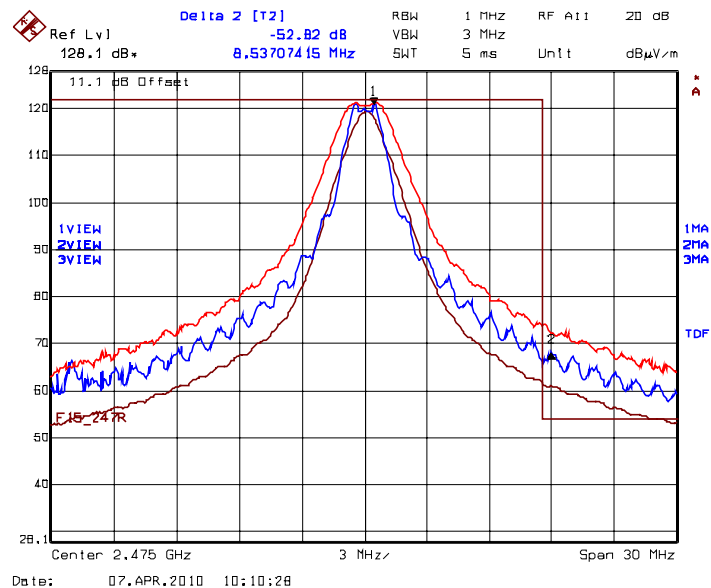
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Plot 5.9.4.4.5. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2475 MHz, Rx Antenna Orientation: Vertical



Plot 5.9.4.4.6. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2475 MHz, Rx Antenna Orientation: Vertical



Trace 1: RBW = 1 MHz, VBW = 3 MHz

Trace 2: RBW = 300 kHz, VBW = 500 kHz, Delta (Peak to Band-Edge): 52.82 dB

Trace 3: RBW = 1 MHz, VBW = 10 Hz

Peak Band-Edge at 2483.5 MHz: Peak = 121.21 dBμV/m – 52.82dB = 68.39 dBμV/m (limit 74 dBμV/m)

Average: 62.49 dBμV/m – 11.37 dB = 51.12 dBμV/m (limit 54 dBμV/m)

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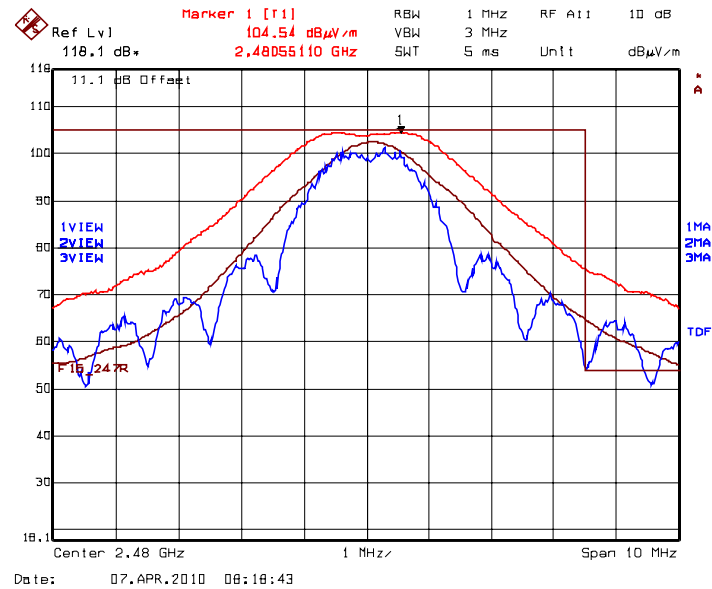
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File #: DIGI-028Q1F15C247

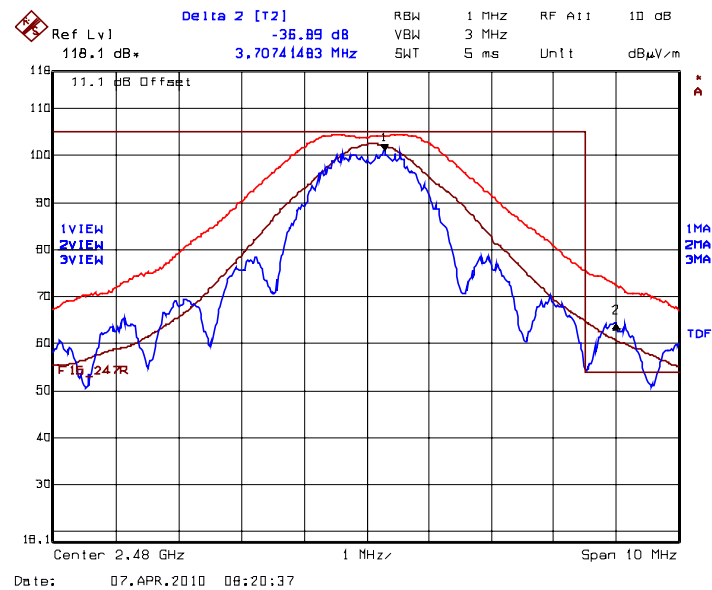
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Plot 5.9.4.4.7. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2480 MHz, Rx Antenna Orientation: Horizontal



Plot 5.9.4.4.8. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2480 MHz, Rx Antenna Orientation: Horizontal



Trace 1: RBW = 1 MHz, VBW = 3 MHz

Trace 2: RBW = 100 kHz, VBW = 300 kHz, Delta (Peak to Band-Edge): 36.89 dB

Trace 3: RBW = 1 MHz, VBW = 10 Hz

Peak Band-Edge at 2483.5 MHz: Peak = 104.54 dBμV/m – 36.89 dB = 67.65 dBμV/m (limit 74 dBμV/m)

Average: 64.72 dBμV/m – 11.37 dB = 53.35 dBμV/m (limit 54 dBμV/m)

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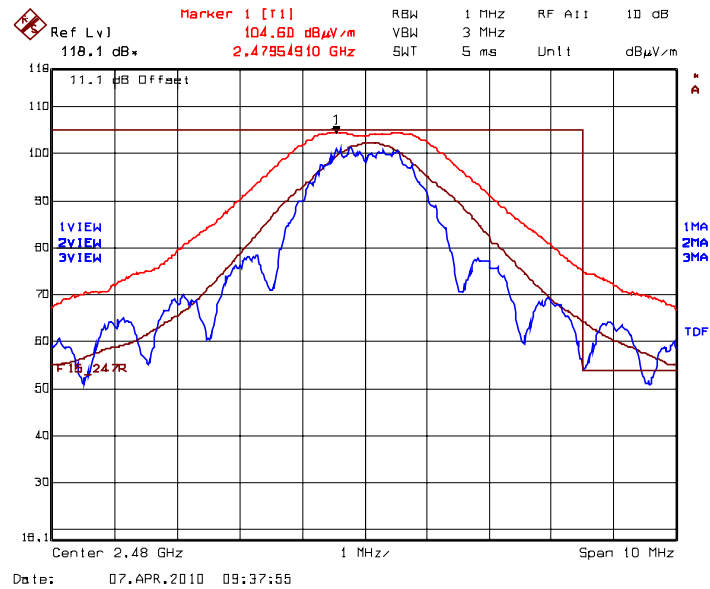
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: DIGI-028Q1F15C247

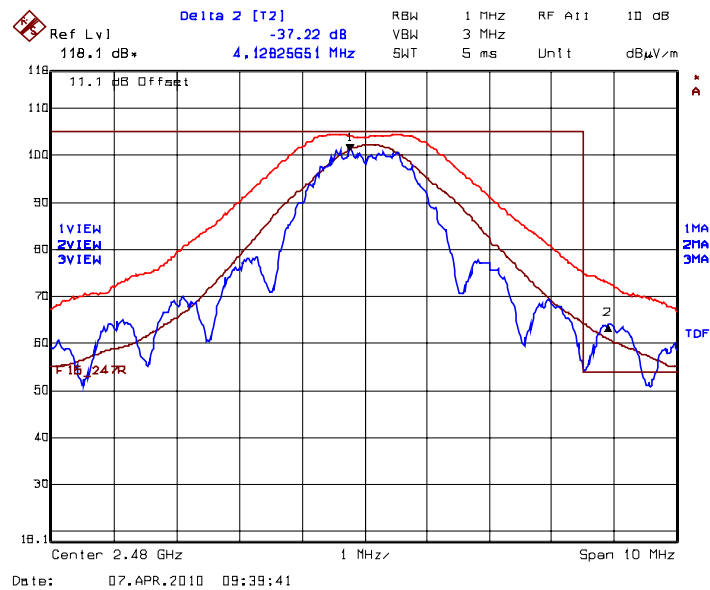
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Plot 5.9.4.4.9. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2480 MHz, Rx Antenna Orientation: Vertical



Plot 5.9.4.4.10. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2480 MHz, Rx Antenna Orientation: Vertical



Trace 1: RBW = 1 MHz, VBW = 3 MHz

Trace 2: RBW = 100 kHz, VBW = 300 kHz, Delta (Peak to Band-Edge): 37.22 dB

Trace 3: RBW = 1 MHz, VBW = 10 Hz

Peak Band-Edge at 2483.5 MHz: Peak = 104.60 dBμV/m – 37.22 dB = 67.38 dBμV/m (limit 74 dBμV/m)

Average: 64.27 dBμV/m – 11.37 dB = 52.90 dBμV/m (limit 54 dBμV/m)

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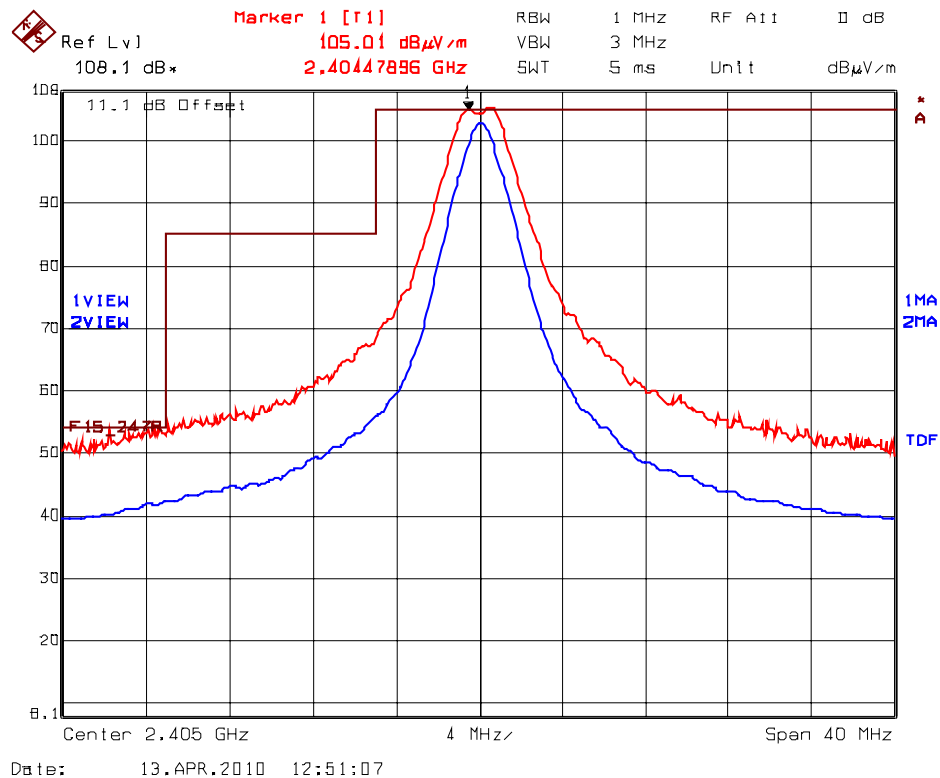
5.9.4.5. EUT with Integrated Whip Monopole Antenna (1.5 dBi Gain)

Fundamental Frequency:		2405 MHz					
Test Frequency Range:		30 MHz – 25 GHz					
Frequency (MHz)	RF Peak Level (dBµV/m)	RF Avg Level (dBµV/m)	Antenna Plane (H/V)	Limit 15.209 (dBµV/m)	Limit 15.247 (dBµV/m)	Margin (dB)	Pass/Fail
2405	100.95	—	V	--	--	—	--
2405	105.01	--	H	--	--	—	--
30-25000	*	*	V/H	*	85.0	*	Pass

*The spurious emissions from intentional radiators are more than 20 dB below the specified limit.

See the following test data plots for band-edge emissions.

Plot 5.9.4.5.1. Band-Edge RF Radiated Emissions @ 3 m
Low End of Frequency Band, 2405 MHz
Rx Antenna Orientation: Horizontal



Trace 1: RBW = 1 MHz, VBW = 3 MHz
Trace 2: RBW = 1 MHz, VBW = 10 Hz

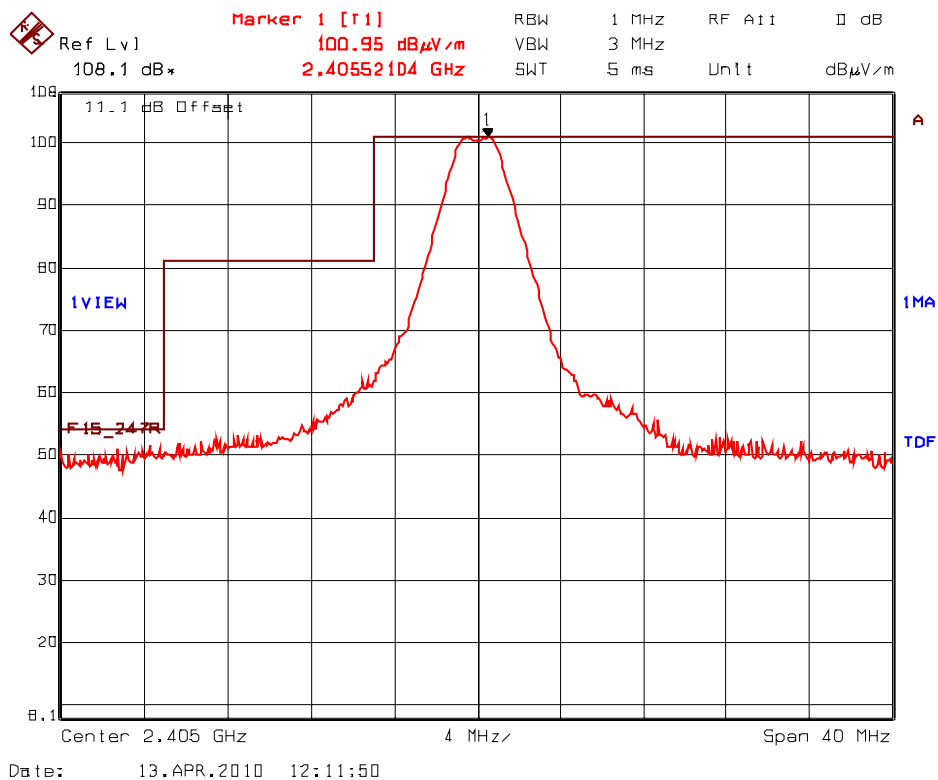
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Plot 5.9.4.5.2. Band-Edge RF Radiated Emissions @ 3 m
Low End of Frequency Band, 2405 MHz
Rx Antenna Orientation: Vertical



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Fundamental Frequency:		2440 MHz					
Test Frequency Range:		30 MHz – 25 GHz					
Frequency (MHz)	RF Peak Level (dBµV/m)	RF Avg Level (dBµV/m)	Antenna Plane (H/V)	Limit 15.209 (dBµV/m)	Limit 15.247 (dBµV/m)	Margin (dB)	Pass/Fail
2440	101.05	--	V	--	--	--	--
2440	106.30	--	H	--	--	--	--
30-25000	*	*	V/H	*	86.3	*	Pass

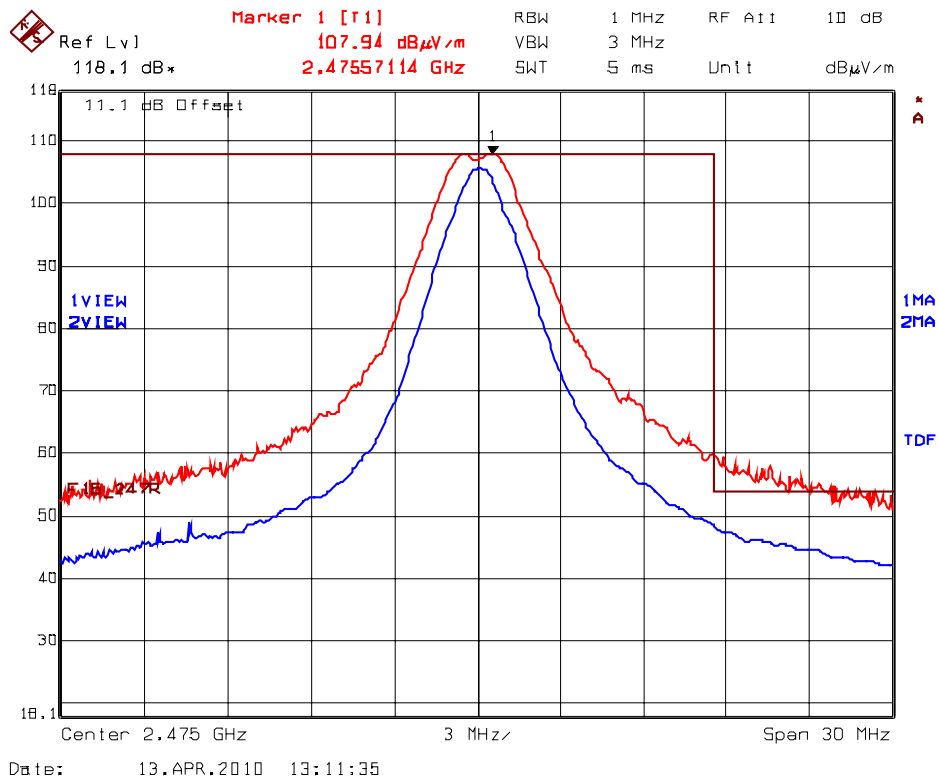
*The spurious emissions from intentional radiators are more than 20 dB below the specified limit.

Fundamental Frequency:		2475 MHz					
Test Frequency Range:		30 MHz – 25 GHz					
Frequency (MHz)	RF Peak Level (dBµV/m)	RF Avg Level (dBµV/m)	Antenna Plane (H/V)	Limit 15.209 (dBµV/m)	Limit 15.247 (dBµV/m)	Margin (dB)	Pass/Fail
2475	102.39	--	V	--	--	--	--
2475	107.94	--	H	--	--	--	--
30-25000	*	*	V/H	*	87.9	*	Pass

*The spurious emissions from intentional radiators are more than 20 dB below the specified limit.

See the following test data plots for band-edge emissions.

Plot 5.9.4.5.3. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2475 MHz
Rx Antenna Orientation: Horizontal



Trace 1: RBW = 1 MHz, VBW = 3 MHz
Trace 2: RBW = 1 MHz, VBW = 10 Hz

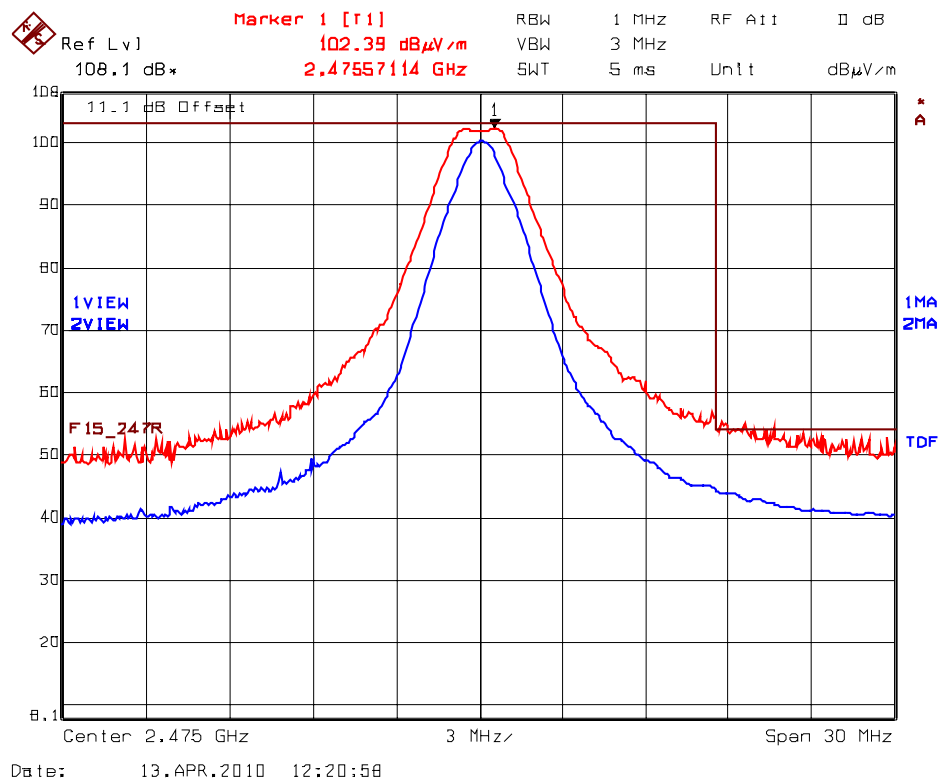
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Plot 5.9.4.5.4. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2475 MHz
Rx Antenna Orientation: Vertical



Trace 1: RBW = 1 MHz, VBW = 3 MHz
Trace 2: RBW = 1 MHz, VBW = 10 Hz

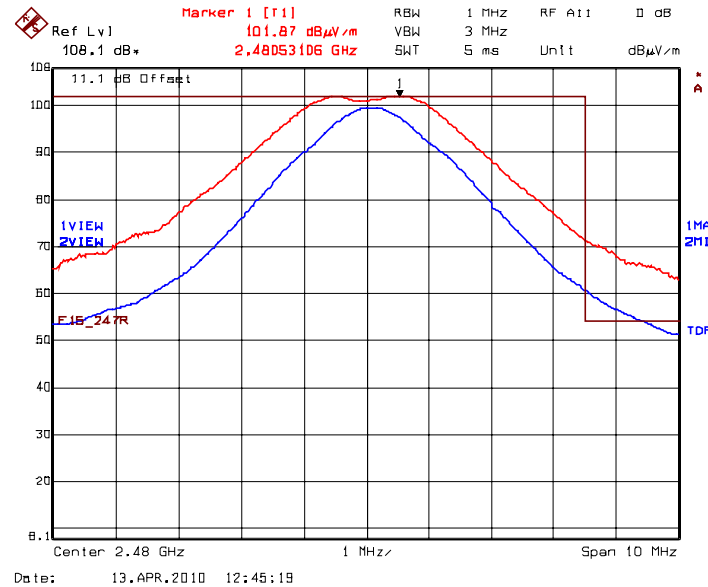
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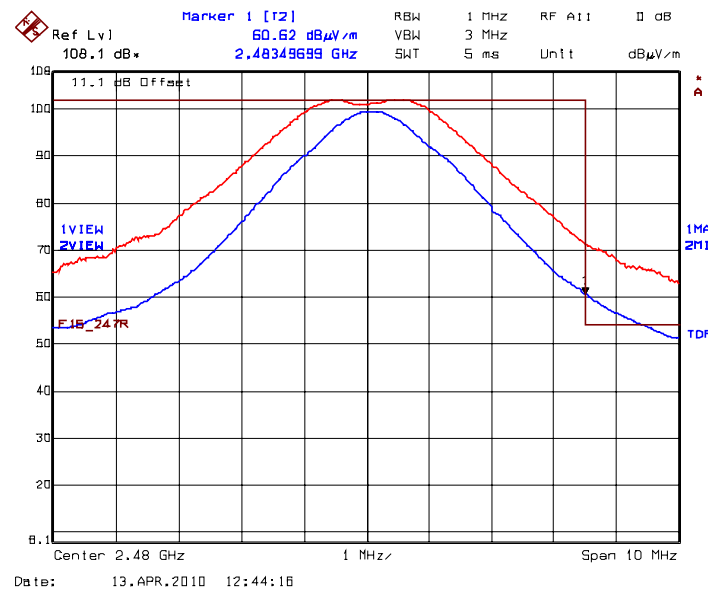
File #: DIGI-028Q1F15C247
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Plot 5.9.4.5.5. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2480 MHz, Rx Antenna Orientation: Horizontal



Plot 5.9.4.5.6. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2480 MHz, Rx Antenna Orientation: Horizontal



Trace 1: RBW = 1 MHz, VBW = 3 MHz

Trace 2: RBW = 1 MHz, VBW = 10 Hz

Average: 60.62 dBμV/m – 11.37 dB = 49.25 dBμV/m (limit 54 dBμV/m)

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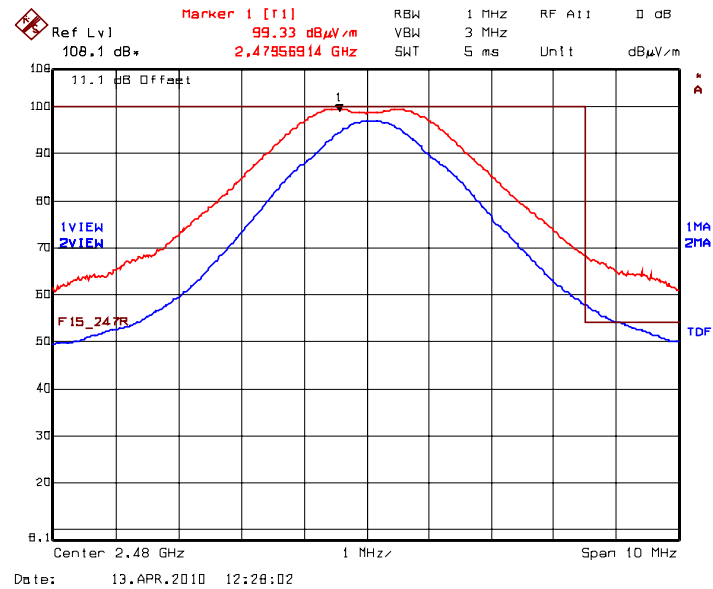
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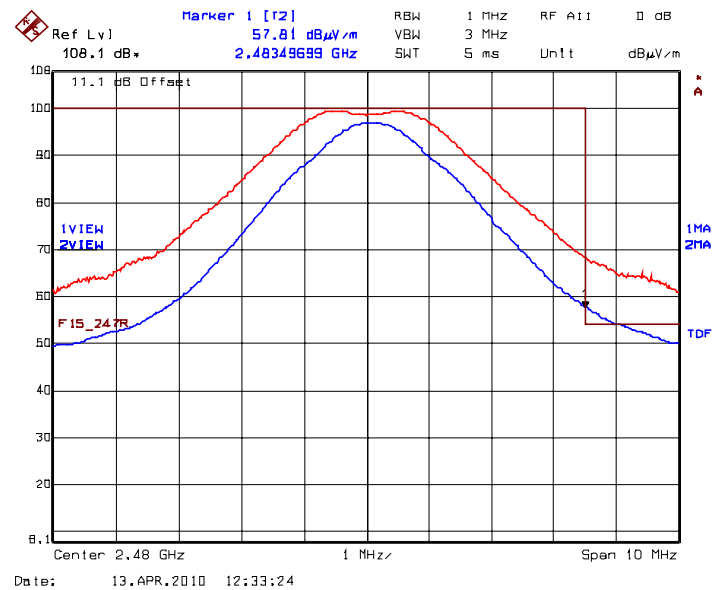
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Plot 5.9.4.5.7. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2480 MHz, Rx Antenna Orientation: Vertical



Plot 5.9.4.5.8. Band-Edge RF Radiated Emissions @ 3 m
High End of Frequency Band, 2480 MHz, Rx Antenna Orientation: Vertical



Trace 1: RBW = 1 MHz, VBW = 3 MHz

Trace 2: RBW = 1 MHz, VBW = 10 Hz

Average: 57.81 dBμV/m – 11.37 dB = 46.44 dBμV/m (limit 54 dBμV/m)

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5.10. POWER SPECTRAL DENSITY [§ 15.247(e)]

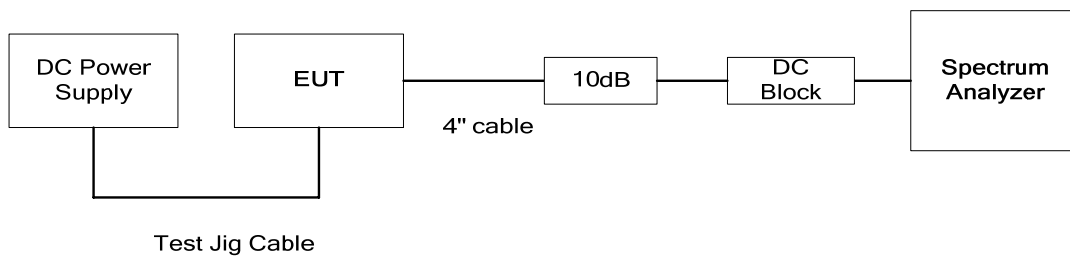
5.10.1. Limit(s)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.10.2. Method of Measurements

KDB Publication No. 558074: Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247), PSD Option 1 method.

5.10.3. Test Arrangement



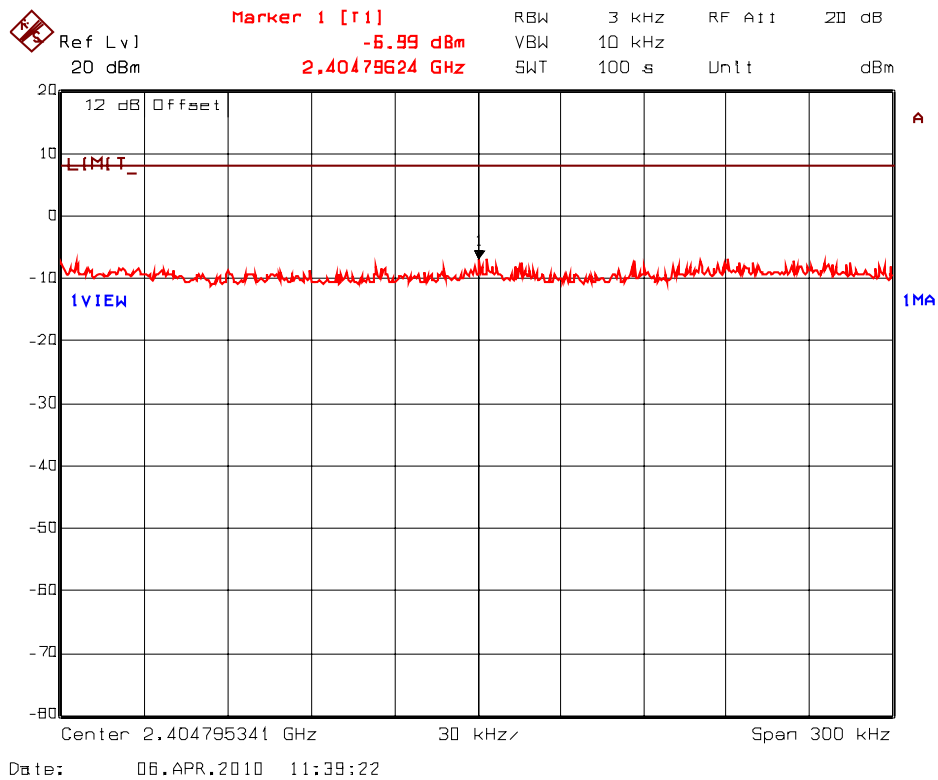
5.10.4. Test Data

Remark: Measurement method: Power spectral density (PSD) Option 1.

Channel	Frequency (MHz)	*PSD in 3 kHz BW (dBm)	Limit (dBm)	Margin (dB)	Results (Pass/Fail)
11	2405	-6.99	8	-14.99	Pass
18	2440	-7.04	8	-15.04	Pass
25	2475	-6.87	8	-14.87	Pass
26	2480	-11.40	8	-19.40	Pass

*See the following plots for measurement details.

Plot 5.10.4.1. Power Spectral Density
Test Frequency: 2405 MHz (CH 11)



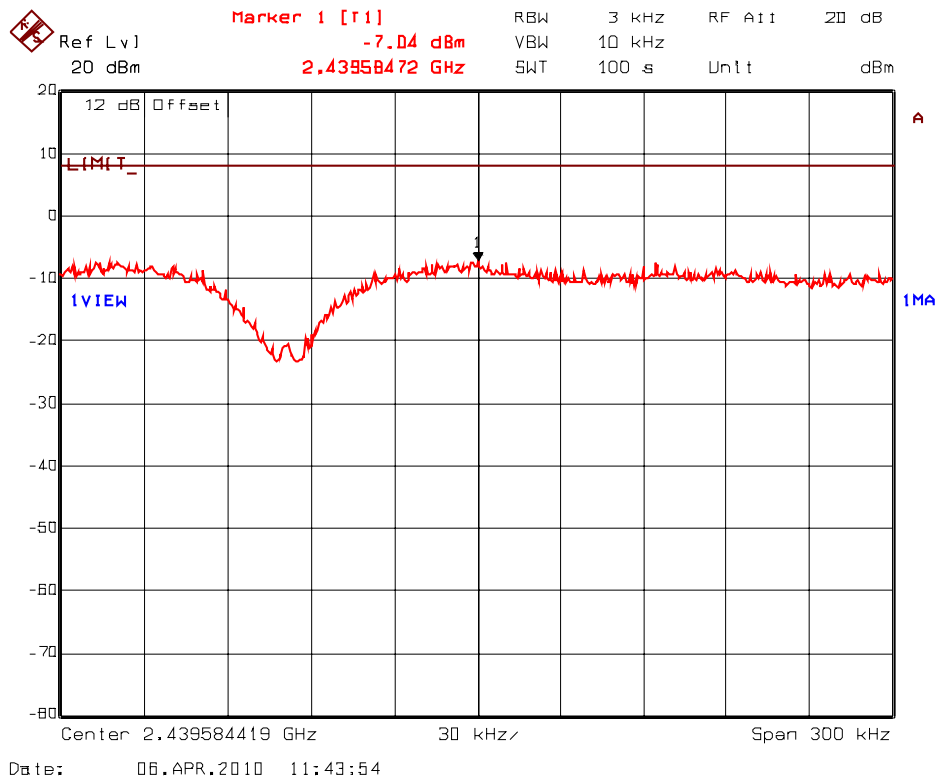
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Plot 5.10.4.2. Power Spectral Density
Test Frequency: 2440 MHz (CH 18)



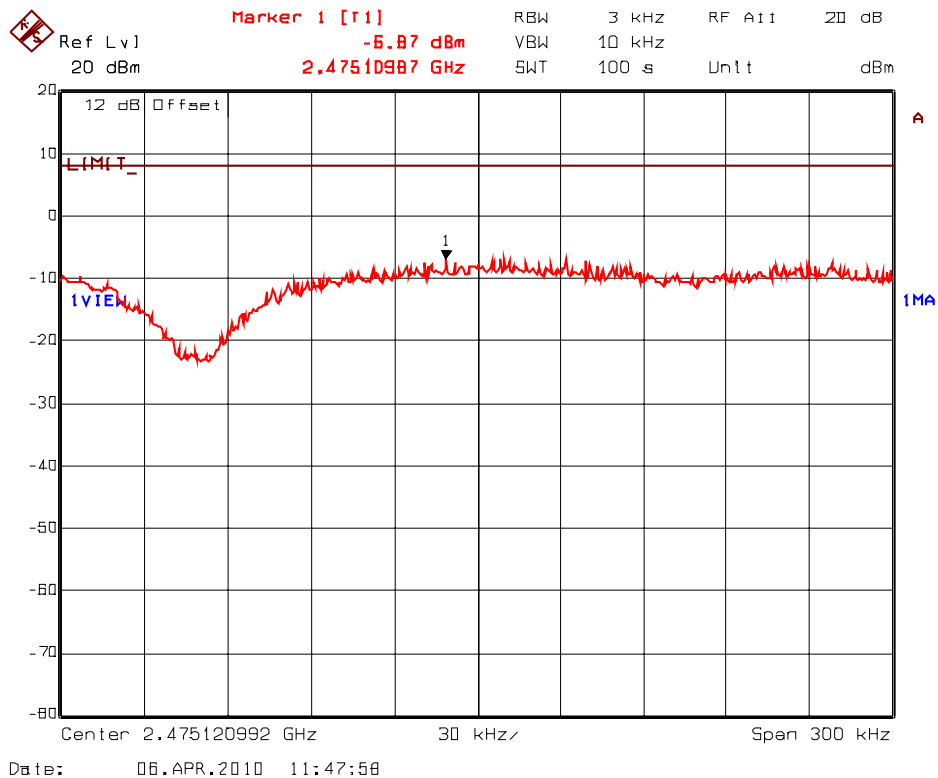
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Plot 5.10.4.3. Power Spectral Density
Test Frequency: 2475 MHz (CH 25)



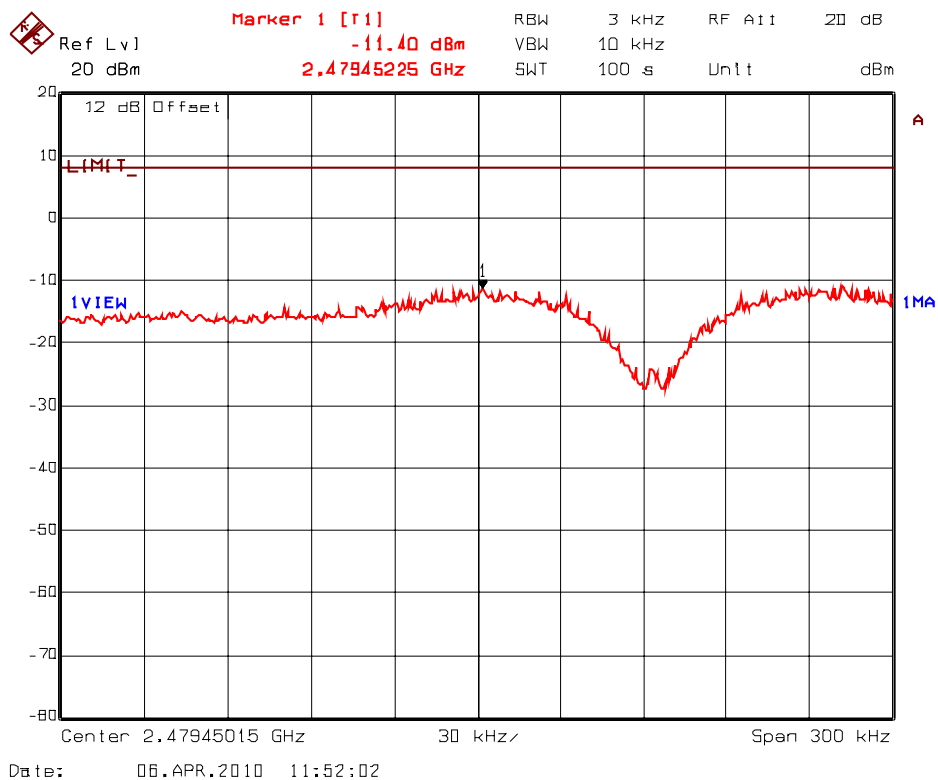
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Plot 5.10.4.4. Power Spectral Density
Test Frequency: 2480 MHz (CH 26)



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5.11. RF EXPOSURE REQUIRMENTS [§§ 15.247(e)(i), 1.1310 & 2.1091]

The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation.

FCC 47 CFR § 1.1310:

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

5.11.1. Method of Measurements

Refer to Sections 1.1310, 2.1091

In order to demonstrate compliance with MPE requirements (see Section 2.1091), the following information is typically needed:

- (1) Calculation that estimates the minimum separation distance (20 cm or more) between an antenna and persons required to satisfy power density limits defined for free space.
- (2) Antenna installation and device operating instructions for installers (professional/unskilled users), and the parties responsible for ensuring compliance with the RF exposure requirement
- (3) Any caution statements and/or warning labels that are necessary in order to comply with the exposure limits
- (4) Any other RF exposure related issues that may affect MPE compliance

Calculation Method of RF Safety Distance:

$$S = \frac{P \cdot G}{4 \cdot \pi \cdot r^2} = \frac{EIRP}{4 \cdot \pi \cdot r^2}$$

Where: P: power input to the antenna in mW
EIRP: Equivalent (effective) isotropic radiated power
S: power density mW/cm²
G: numeric gain of antenna relative to isotropic radiator
r: distance to centre of radiation in cm

5.11.2. RF Evaluation

Evaluation of RF Exposure Compliance Requirements	
RF Exposure Requirements	Compliance with FCC Rules
Minimum calculated separation distance between antenna and persons required: *6.3 cm	Manufacturer' instruction for separation distance between antenna and persons required: 20 cm.
Antenna installation and device operating instructions for installers (professional/unskilled users), and the parties responsible for ensuring compliance with the RF exposure requirement	Antenna installation and device operating instructions shall be provided to installers to maintain and ensure compliance with RF exposure requirements.
Caution statements and/or warning labels that are necessary in order to comply with the exposure limits	Refer to User's Manual for RF Exposure Information.
Any other RF exposure related issues that may affect MPE compliance	None.

*The minimum separation distance between the antenna and bodies of users are calculated using the following formula:

$$r = \sqrt{\frac{P \cdot G}{4 \cdot \pi \cdot S}} = \sqrt{\frac{EIRP}{4 \cdot \pi \cdot S}}$$

S = 1.0 mW/cm²

EIRP = 8 dBm (max. conducted power) + 19 dBi (max. antenna gain) = 27 dBm = 10^(27/10) mW = 501 mW (Worst Case)

$$(\text{Minimum Safe Distance, } r) = \sqrt{\frac{EIRP}{4 \cdot \pi \cdot S}} = \sqrt{\frac{501}{4 \cdot \pi \cdot (1.0)}} \approx 6.3 \text{ cm}$$

EXHIBIT 6. TEST EQUIPMENT LIST

Test Instruments	Manufacturer	Model No.	Serial No.	Operating Range
Spectrum Analyzer/ EMI Receiver	Hewlett Packard	HP 8593EM	3412A00103	9 kHz – 26.5 GHz
Transient Limiter	Hewlett Packard	11947A	310701998	9 kHz – 200 MHz 10 dB attenuation
L.I.S.N.	EMCO	3825/2	89071531	9 kHz – 200 MHz 50 Ohms / 50 μ H
RF Shielded Chamber	Braden Shielding	...	...	...
Spectrum Analyzer	Rohde & Schwarz	FSEK30	100077	20 Hz – 40 GHz with external mixer
DC Block	Hewlett Packard	11742A	12460	0.045 – 26.5 GHz
Attenuator	Narda	4768-10	-	DC - 40 GHz
High Pass Filter	K & L	11SH10-4000/T12000	4	Cut off 3.4 GHz
Biconi-Log Antenna	EMCO	3142	10005	0.03 – 2 GHz
Horn Antenna	EMCO	3155	9701-6570	1 – 18 GHz
Horn Antenna	ETS-Lindgren	360-09	00118385	18 – 26.5 GHz
RF Amplifier	Com-Power	PA-103A	161243	10 MHz – 1 GHz
RF Amplifier	Hewlett Packard	84498	3008A00769	1 – 26.5 GHz
Signal Generator	Hewlett Packard	83752B	3610400457	0.01 – 20 GHz
Power Divider	Mini-Circuits	15542	0235	DC - 10 GHz
Signal Generator	Hewlett Packard	8648C	3443U00391	100 kHz-3200 MHz
Tenma DC Power Supply	Tenma	72-6153	0001526	20Vdc 10A

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EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 and NIS 81 (1994)

7.1. LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY

CONTRIBUTION (Line Conducted)	PROBABILITY DISTRIBUTION	UNCERTAINTY (dB)	
		9-150 kHz	0.15-30 MHz
EMI Receiver specification	Rectangular	± 1.5	± 1.5
LISN coupling specification	Rectangular	± 1.5	± 1.5
Cable and Input Transient Limiter calibration	Normal (k=2)	± 0.3	± 0.5
Mismatch: Receiver VRC $\Gamma_1 = 0.03$ LISN VRC $\Gamma_R = 0.8(9 \text{ kHz}) 0.2 (30 \text{ MHz})$ Uncertainty limits $20\text{Log}(1+\Gamma_1\Gamma_R)$	U-Shaped	± 0.2	± 0.3
System repeatability	Std. deviation	± 0.2	± 0.05
Repeatability of EUT	—	--	--
Combined standard uncertainty	Normal	± 1.25	± 1.30
Expanded uncertainty U	Normal (k=2)	± 2.50	± 2.60

Sample Calculation for Measurement Accuracy in 450 kHz to 30 MHz Band:

$$u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)} = \pm \sqrt{(1.5^2 + 1.5^2)/3 + (0.5/2)^2 + (0.05/2)^2 + 0.35^2} = \pm 1.30 \text{ dB}$$

$$U = 2u_c(y) = \pm 2.6 \text{ dB}$$

7.2. RADIATED EMISSION MEASUREMENT UNCERTAINTY

CONTRIBUTION (Radiated Emissions)	PROBABILITY DISTRIBUTION	UNCERTAINTY (+ dB)	
		3 m	10 m
Antenna Factor Calibration	Normal (k=2)	± 1.0	± 1.0
Cable Loss Calibration	Normal (k=2)	± 0.3	± 0.5
EMI Receiver specification	Rectangular	± 1.5	± 1.5
Antenna Directivit	Rectangular	+0.5	+0.5
Antenna factor variation with height	Rectangular	± 2.0	± 0.5
Antenna phase center variation	Rectangular	0.0	± 0.2
Antenna factor frequency interpolation	Rectangular	± 0.25	± 0.25
Measurement distance variation	Rectangular	± 0.6	± 0.4
Site imperfections	Rectangular	± 2.0	± 2.0
Mismatch: Receiver VRC $\Gamma_1 = 0.2$ Antenna VRC $\Gamma_R = 0.67(\text{Bi}) 0.3 (\text{Lp})$ Uncertainty limits $20\text{Log}(1 \pm \Gamma_1 \Gamma_R)$	U-Shaped	+1.1 -1.25	± 0.5
System repeatability	Std. Deviation	± 0.5	± 0.5
Repeatability of EUT		-	-
Combined standard uncertainty	Normal	+2.19 / -2.21	+1.74 / -1.72
Expanded uncertainty U	Normal (k=2)	+4.38 / -4.42	+3.48 / -3.44

Calculation for maximum uncertainty when 3m biconical antenna including a factor of k = 2 is used:

$$U = 2u_c(y) = 2x(+2.19) = +4.38 \text{ dB} \quad \text{And} \quad U = 2u_c(y) = 2x(-2.21) = -4.42 \text{ dB}$$