

6. Band Edge Measurement

Test Result: PASS

6.1 Limits for Band Edge

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, 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(a)

6.2 Test Instruments

RF Conducted Emission

Test Site and Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Spectrum (9kHz~7GHz)	R&S	FSP7/100106	May 16, 2003
RF Cable	Huber + Suhner	104/C0022	August 1, 2003
Attenuator	HP	8495B/ 2814A13358	December 29,2003
TR4 shielded room	ETS.LINDGREN	TR5/15353-E	August 27, 2003

Note:

1. The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC.
2. NCR : No Calibration Required.
3. The calibration date of the shielded room listed above is the date of shielding effectiveness verification measurement.

RF Radiated Emission

As Radiated Emission Measurement

Measurement Uncertainty

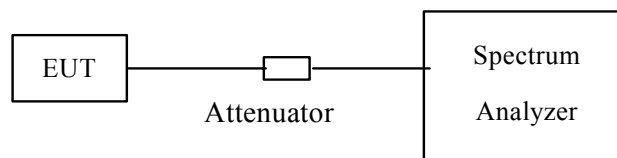
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$. The assessed measurement uncertainty for band edge measurement is 1.62dB.

6.3 Test Procedures

- a. A software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.
- b. The Transmitter output of EUT was connected to the spectrum analyzer through an attenuator and perform the band edge measurement.
- c. Record the band edge measurement result and compare with the required limit.

6.4 Test Configurations

RF Conducted Emission



RF Radiated Emission

As Radiated Emission Measurement

6.5 Test Results

RF Conducted Emission

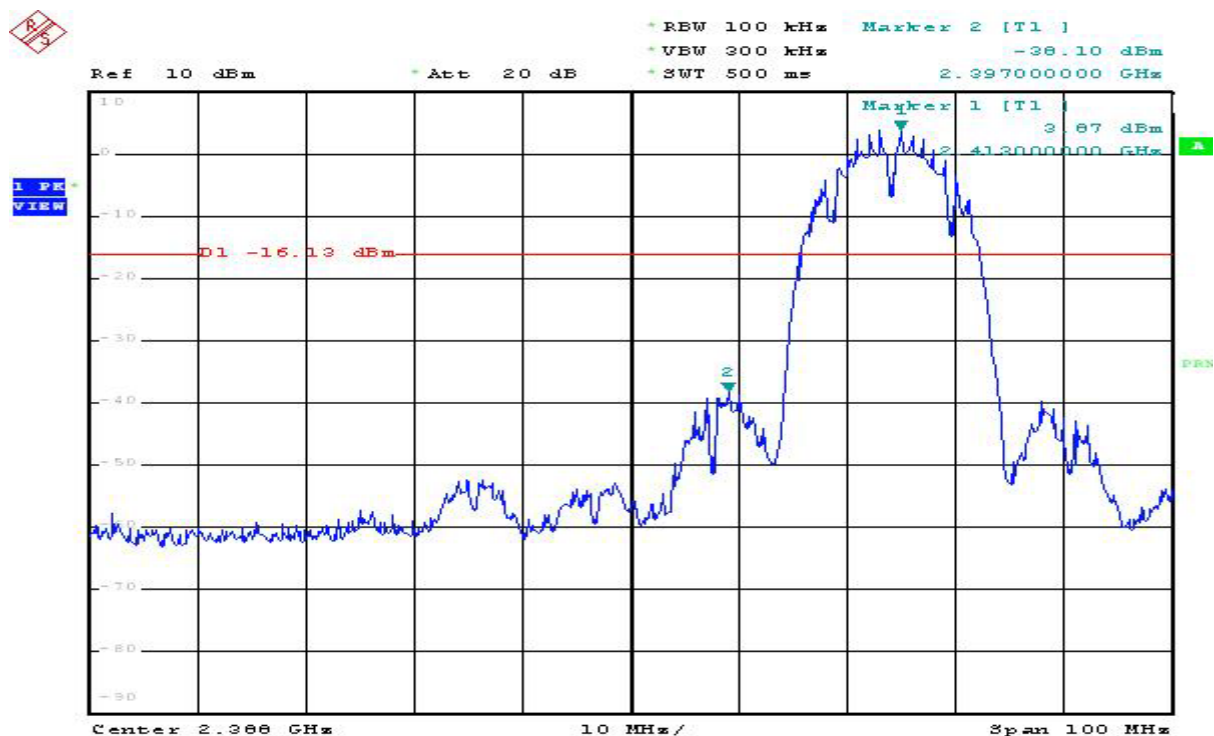
Test Mode : Channel 1, Transmitter
Tester : Cathy Temperature : 19°C
RBW : 100kHz Humidity : 53%RH
VBW : 300kHz

Operation Channel	Maximum Emission Level (dBm)	Emission Frequency(MHz)	Emission Level (dBm)	Attenuation (dB)	Limit (dB)	Margin (dB)
CH 1 (2412MHz)	3.67	2397.00	-38.10	41.77	20	21.77
CH 11 (2462MHz)	2.67	2487.20	-51.85	54.52	20	24.52

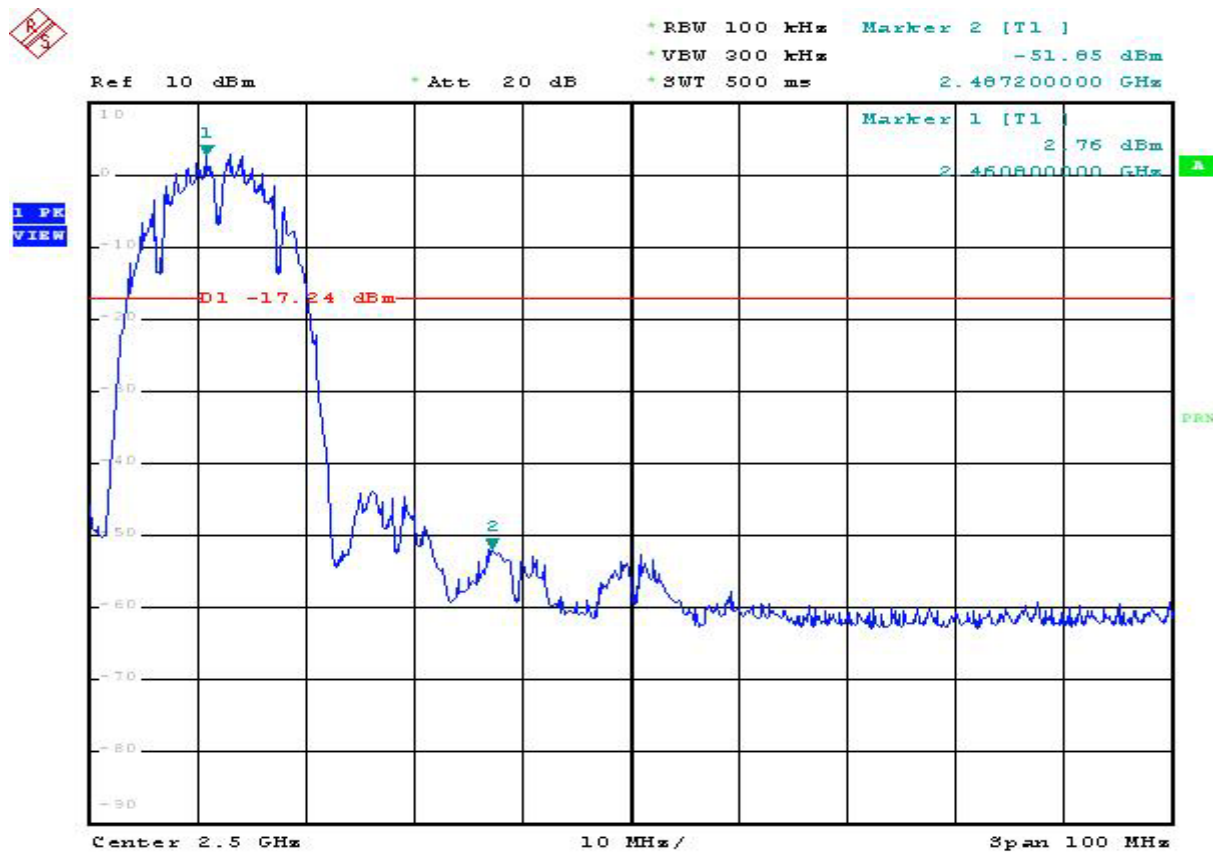
Note:

1. Attenuation (dB) = Maximum Emission Level - Emission Level
2. Margin (dB) = Attenuation – Limit

Ch1 2412MHz



Ch11 2462MHz



RF Radiated Emission

Test Mode : Channel 1, Transmitter

Tester : Alex Temperature : 19°C

RBW : 1MHz Humidity : 53%RH

VBW : 1MHz

Antenna : ANT-OMNI-8

Antenna Polarization	Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB1/m)	Emission (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		PK.	AV.		PK.	AV.	PK.	AV.	PK.	AV.
V	2386.4	52.10	*	0.65	52.75	*	74.00	54.00	21.25	*
H	2390.0	50.84	*	0.66	51.50	*	74.00	54.00	22.50	*

Antenna : ANT-OMNI-12

Antenna Polarization	Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB1/m)	Emission (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		PK.	AV.		PK.	AV.	PK.	AV.	PK.	AV.
V	2386.4	52.53	*	0.65	53.18	*	74.00	54.00	20.82	*
H	2390.0	50.80	*	0.66	51.46	*	74.00	54.00	22.54	*

Antenna : FLAT-PATCH-ANTENNA

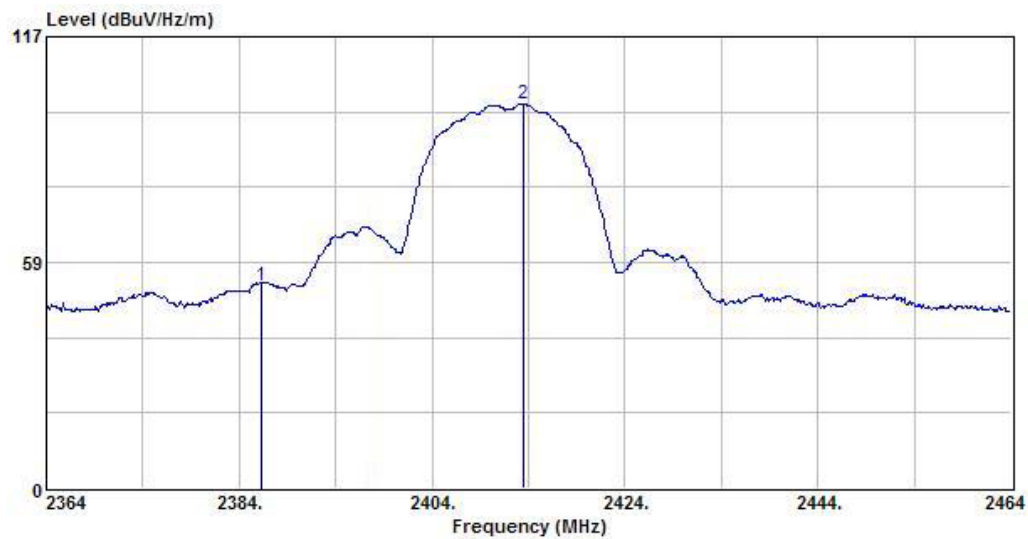
Antenna Polarization	Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB1/m)	Emission (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		PK.	AV.		PK.	AV.	PK.	AV.	PK.	AV.
V	2385.5	50.85	*	0.65	51.50	*	74.00	54.00	22.50	*
H	2390.0	42.51	*	0.66	43.17	*	74.00	54.00	30.83	*

Note:

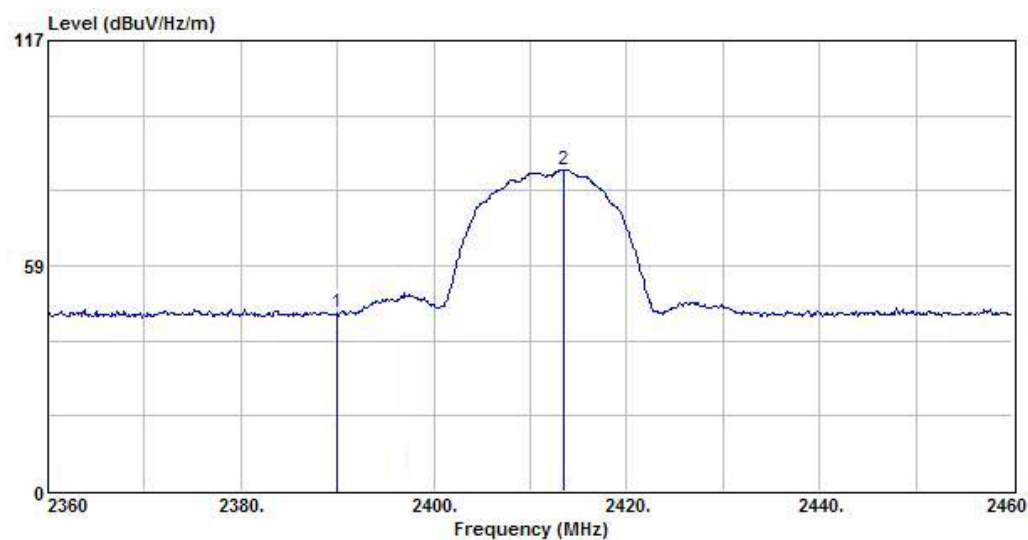
1. Correction Factor (dB1/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission (dBuV/m) = Reading Data + Correction Factor
3. Margin (dB) = Limit – Emission
4. PK., AV., H and V are abbreviation of peak, average, horizontal, and vertical respectively.
5. “*” :The emission is too low to measure.

Antenna : ANT-OMNI-8

Receiver Antenna Polarization: V

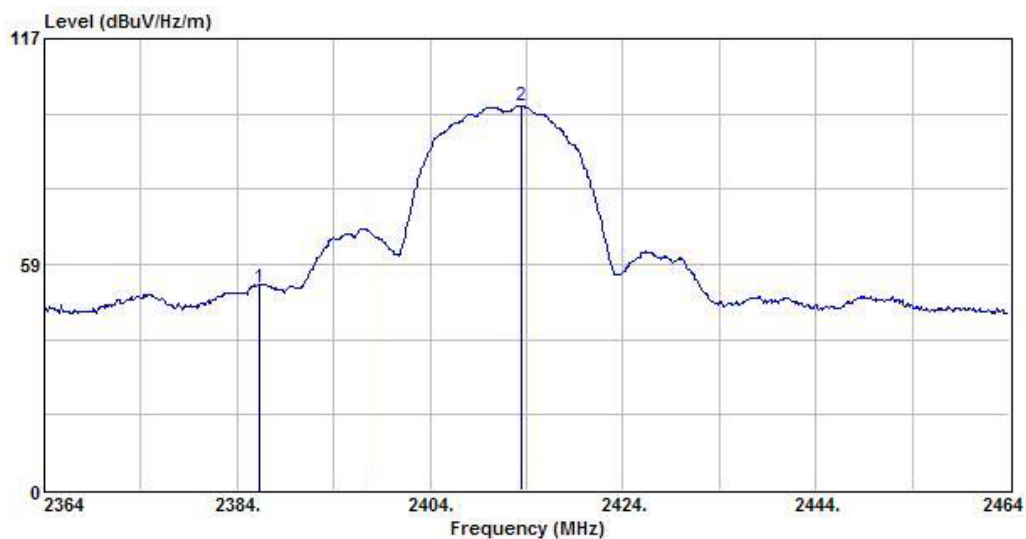


Receiver Antenna Polarization: H

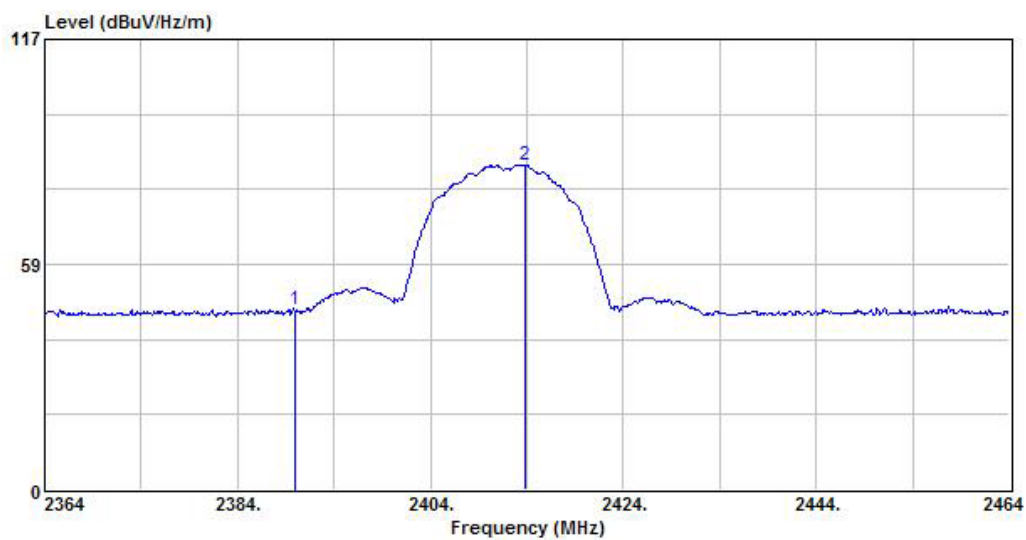


Antenna : ANT-OMNI-12

Receiver Antenna Polarization: V

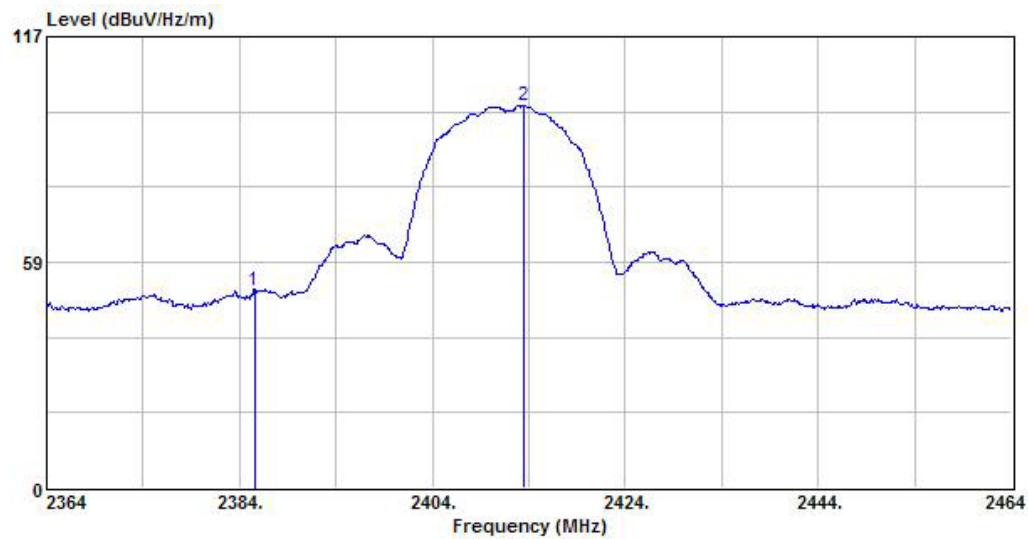


Receiver Antenna Polarization: H

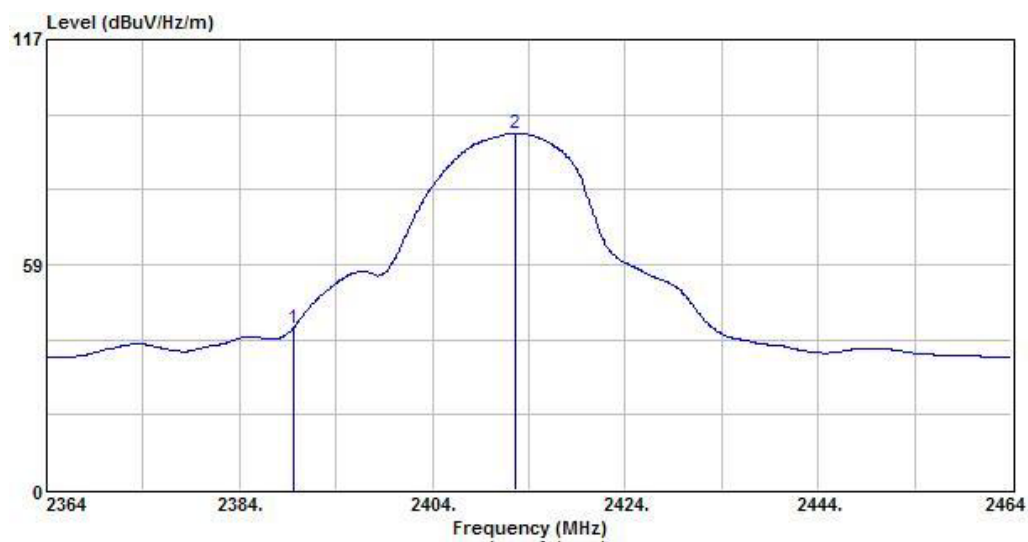


Antenna : FLAT-PATCH-ANTENNA

Receiver Antenna Polarization: V



Receiver Antenna Polarization: H



Test Mode : Channel 11, Transmitter
Tester : Alex **Temperature** : 19°C
RBW : 1MHz **Humidity** : 53%RH
VBW : 1MHz
Antenna : ANT-OMNI-8

Antenna Polarization	Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB1/m)	Emission (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		PK.	AV.		PK.	AV.	PK.	AV.	PK.	AV.
V	2487.5	50.47	*	0.90	51.37	*	74	54	22.63	*
H	2483.5	45.67	*	0.89	46.56	*	74	54	27.44	*

Antenna : ANT-OMNI-12

Antenna Polarization	Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB1/m)	Emission (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		PK.	AV.		PK.	AV.	PK.	AV.	PK.	AV.
V	2499.0	49.30	*	0.93	50.23	*	74	54	23.77	*
H	2483.5	46.84	*	0.89	47.73	*	74	54	26.27	*

Antenna : FLAT-PATCH-ANTENNA

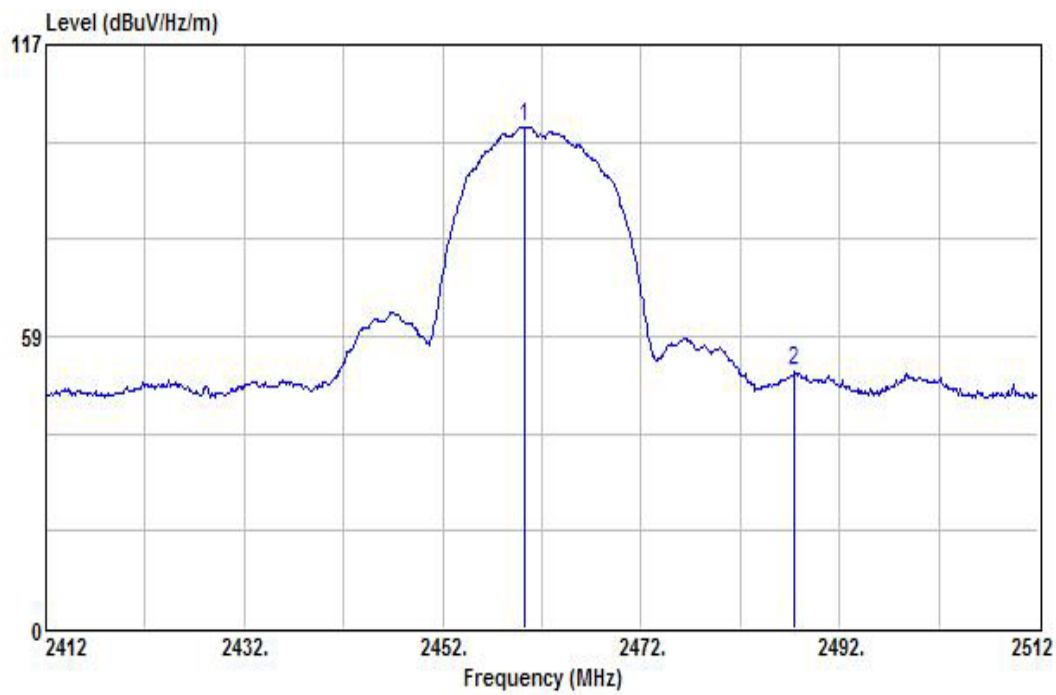
Antenna Polarization	Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB1/m)	Emission (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		PK.	AV.		PK.	AV.	PK.	AV.	PK.	AV.
V	2487.1	48.20	*	0.89	49.09	*	74	54	24.91	*
H	2483.5	46.11	*	0.89	47.00	*	74	54	27.00	*

Note:

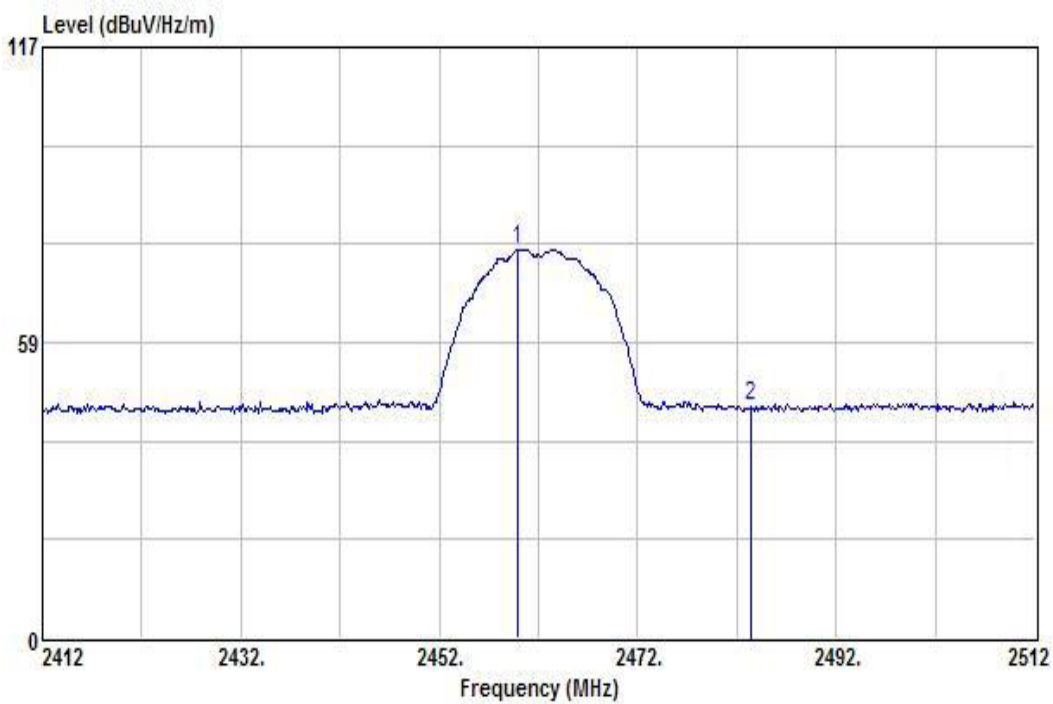
1. Correction Factor (dB1/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission (dBuV/m) = Reading Data + Correction Factor
3. Margin (dB) = Limit – Emission
4. PK., AV., H and V are abbreviation of peak, average, horizontal, and vertical respectively.
5. “*” :The emission is too low to measure.

Antenna : ANT-OMNI-8

V Polarization , PK detector

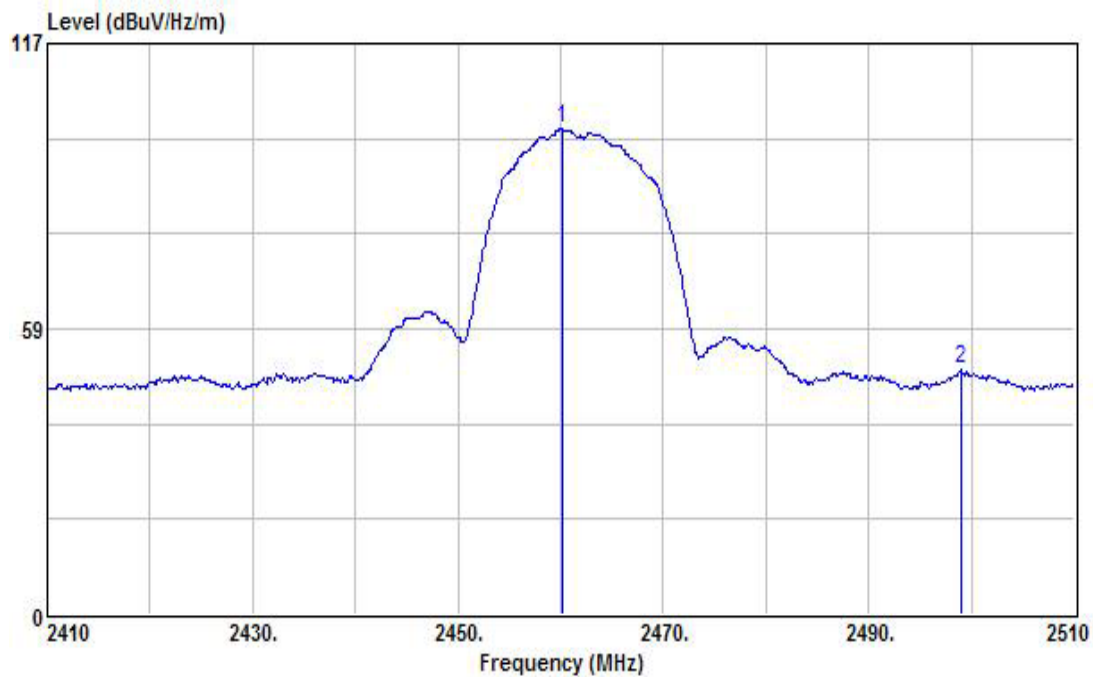


H Polarization , PK detector

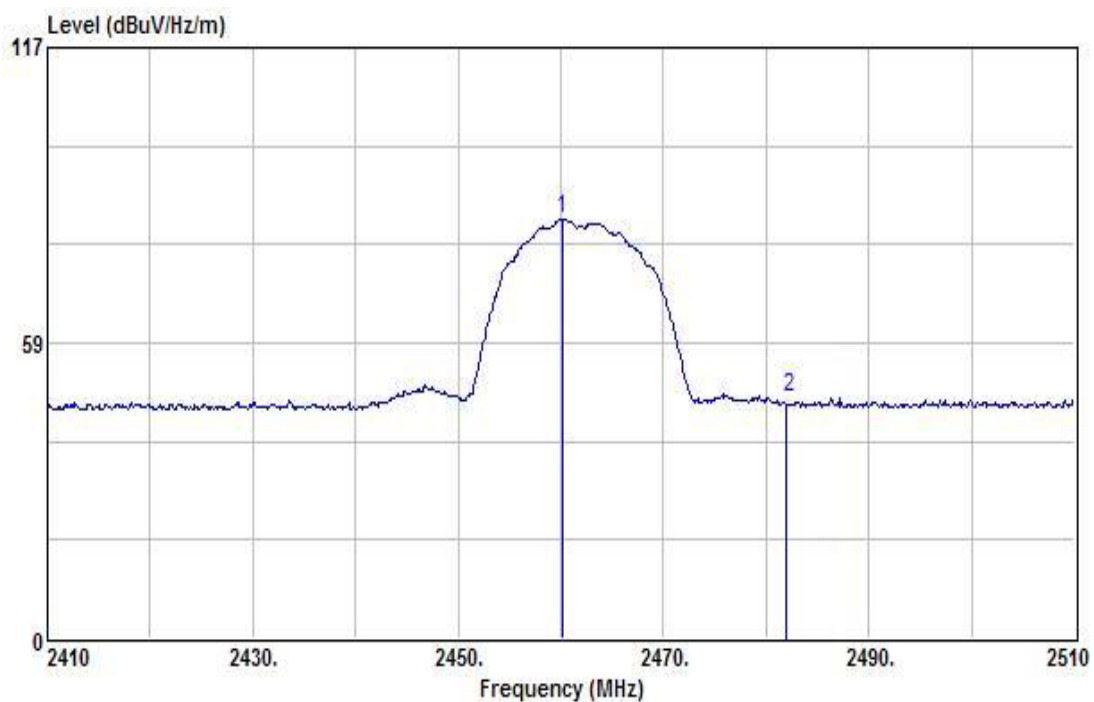


Antenna : ANT-OMNI-12

V Polarization , PK detector

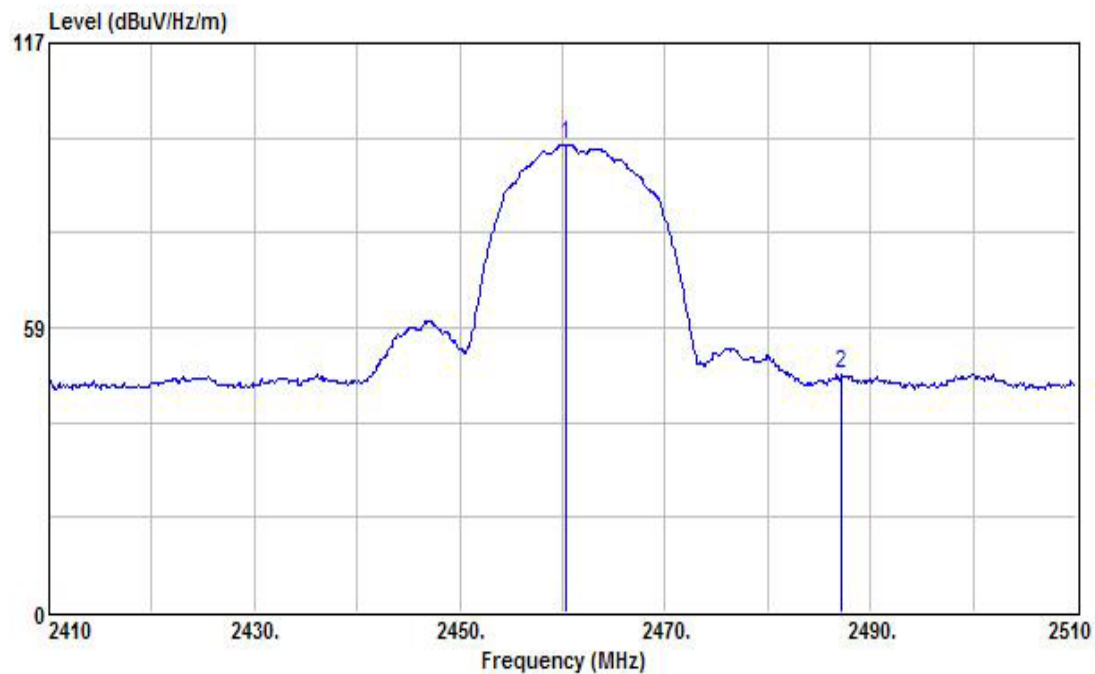


Receiver Antenna Polarization: H

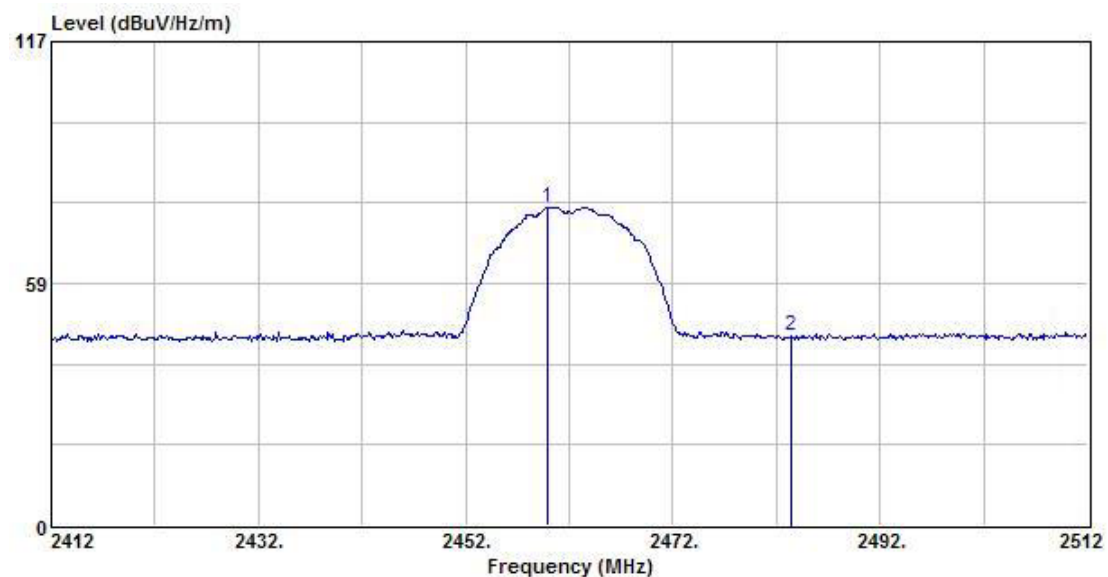


Antenna : FLAT-PATCH-ANTENNA

Receiver Antenna Polarization: V



Receiver Antenna Polarization: H



7. Peak Power Spectral Density Measurement

Test Result: PASS

7.1 Limits for Peak Power Spectral Density

The peak power spectral density shall not exceed 8dBm/3kHz.

7.2 Test Instruments

Test Site and Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Spectrum (9kHz~7GHz)	R&S	FSP7/100106	May 16, 2003
Attenuator	HP	8495B/ 2814A13358	December 29,2003
RF Cable	Huber + Suhner	104/C0022	August 1, 2003
TR4 shielded room	ETS.LINDGREN	TR5/15353-E	August 27, 2003

Note:

1. The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC.
2. NCR : No Calibration Required.
3. The calibration date of the shielded room listed above is the date of shielding effectiveness verification measurement.

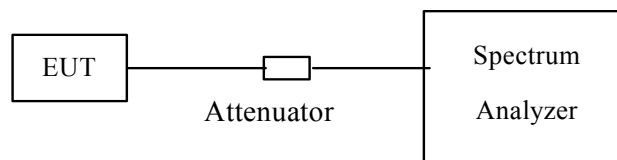
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$. The assessed measurement uncertainty for peak power spectral density measurement is 1.62dB.

7.3 Test Procedures

- a. A software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.
- b. The Transmitter output of EUT was connected to the spectrum analyzer through an attenuator and performs the band edge measurement.
- c. Record the peak power spectral density and compare with the required limit.

7.4 Test Configurations



7.5 Test Results

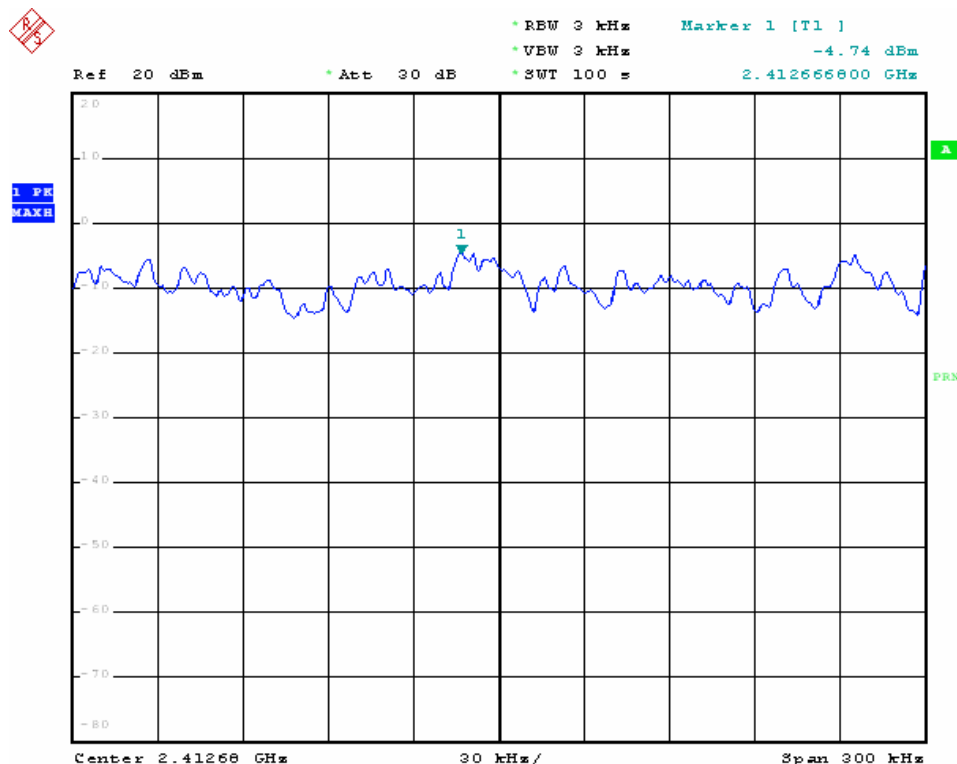
Test Mode : Transmitter
Tester : Alex **Temperature** : 19°C
RBW : 3kHz **Humidity** : 53%RH
VBW : 3kHz

Operating Frequency	Reading Data (dBm)	Correction Factor (dB)	Emission (dBm)	Limit (dBm)	Margin (dBm)
Ch1 (2412MHz)	-4.74	0.97	-3.77	8	11.77
Ch6 (2437MHz)	-4.48	0.98	-3.50	8	11.5
Ch11(2462MHz)	-5.77	0.99	-4.78	8	12.78

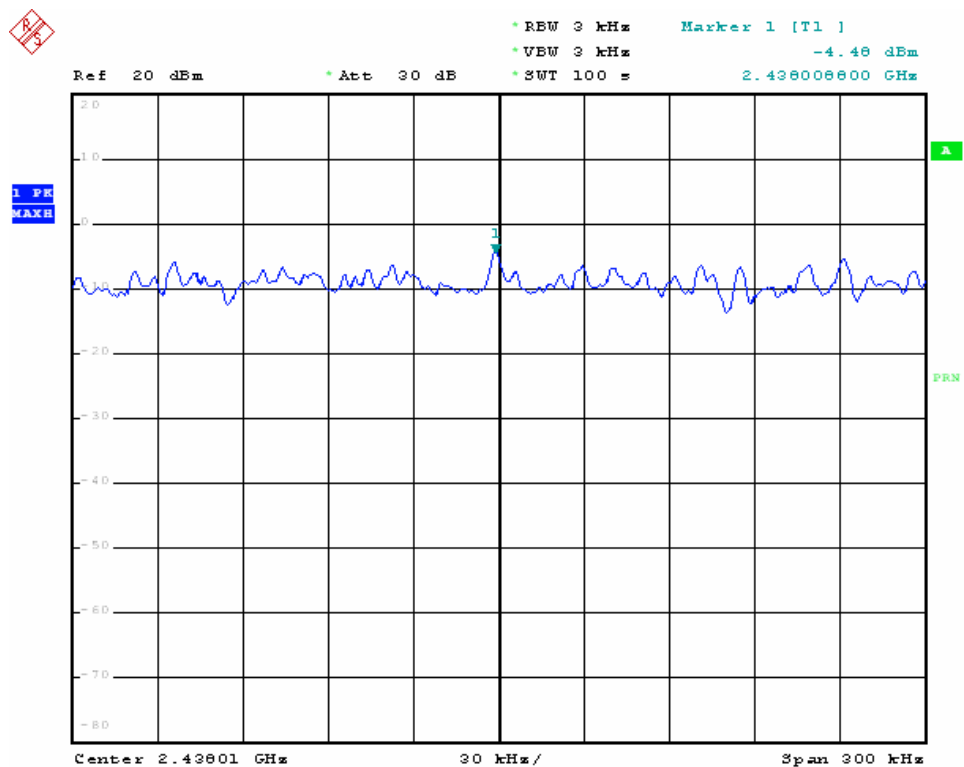
Note:

1. Correction Factor (dB) = Cable Loss + Attenuator
2. Emission (dB) = Reading Data + Correction Factor
3. Margin (dB) = Limit – Emission

Channel 1 : 2412MHz



Channel 6 : 2437MHz



Channel 11 : 2462MHz

