

3.0 RF Output Power and Exposure, and 20 dB Bandwidth

15.247(a)(2), (b)(3)

3.1 Test Procedure

The EUT was connected to a peak RF power meter through a cable with suitable attenuation not to overload the meter. An offset in the meter compensated for the cable and attenuation loss. Channels were selected for testing at the low, middle, and high end of the transmit band. To measure the 20 dB bandwidth of the fundamental the EUT was then connected to a spectrum analyzer with resolution bandwidth of approximately 1% of the signal bandwidth and a marker delta function was used to find the points 20 dB down from the measured RF output power level. RF Output power was measured at varying input voltages and at the maximum and minimum settings to be used at installation. Measurements of RF output power were made at the end of the transmit cables of the EUT. Two different lengths of cable can be installed with the EUT, therefore the RF output power was measured at both output power levels.

Requirement: The RF Power Output must be below 1 W (30 dBm) and the 20 dB bandwidth must be less than 500 kHz. RF exposure must not exceed 3 mW/cm² at any distance greater than 20 cm from the EUT.

3.2 Test Results

Results: Passed

Performed 9/15/2004 and 10/21/2004

Equipment: GIG1, GIG2, WEI8, ROS001, POW2, SAF014

Frequency GHz	Name	Max Power Reading dBm			Min Power Reading dBm			EIRP Limit dBm	Max Antenna Gain dBi	Antenna Gain Limit dBi
		120V	102V	138V	120V	102V	138V			
902.726 (CH0)	Slot 0	29.29	29.26	29.29	26.90	26.89	26.96	30.0	6.00	6.00
902.726 (CH0)	Slot 1	28.56	28.56	28.56	26.53	26.53	26.53	30.0	6.00	6.00
914.773 (CH24)	Slot 0	28.64	28.64	28.64	26.69	26.73	26.69	30.0	6.00	6.00
914.773 (CH24)	Slot 1	28.54	28.54	28.54	26.52	26.52	26.51	30.0	6.00	6.00
927.322 (CH49)	Slot 0	28.96	28.95	28.94	26.82	26.81	26.82	30.0	6.00	6.00
927.322 (CH49)	Slot 1	28.60	28.60	28.60	26.52	26.54	26.57	30.0	6.00	6.00

Frequency GHz	Name	20 dB Bandwidth kHz	Bandwidth Limit kHz
902.726 (CH0)	Slot 0	224.1	<500
902.726 (CH0)	Slot 1	225.4	<500
914.773 (CH24)	Slot 0	226.6	<500
914.773 (CH24)	Slot 1	225.4	<500
927.322 (CH49)	Slot 0	227.9	<500
927.322 (CH49)	Slot 1	249.9	<500

Determination of Worst-Case Antenna Port (Antenna ports 3 and 4 are worst, 4 was selected for testing)

Frequency GHz	Max Power Reading dBm			
	Ant1	Ant2	Ant3	Ant4
902.726 (CH0)	28.79	29.44	29.61	29.59
914.773 (CH24)	28.59	29.19	29.58	29.58
927.322 (CH49)	29.15	28.58	29.57	29.58

Using the maximum measured power of 29.61 dBm plus the 6.00 dBi antenna gain, the maximum possible EIRP is 35.61 dBm (3639 mW). The radius at which the EIRP/(4*Pi*r²) is equal to 3 mW/cm², the occupational/controlled exposure limit, is 9.8 cm, well within 20cm.