

Exhibit 2 for FCC Experimental License Request. Expanded information on test methods using the license. File#: 0298-EX-PL-2012.

No changes to the original license Exhibit 1 technical information [WD2XBD], submitted again herein as a part of the new license request.

Test methods, frequencies and setups planned for the shielding evaluation of multiple structures at the St. Petersburg and Largo site were determined using IEEE STD 299-1997, IEEE Standard Method for Measuring the Effectiveness of Electromagnetic Shielding Enclosures, as a guide.

Example to provide information on how the license may be used. Example 1:

A door in a Raytheon facility needs to be characterized for its rf attenuation properties. The characterization will be performed using the nearest frequencies in the FCC license. Test equipment (signal generator, TX antenna, receiver, RX antenna) will be moved to the test location and setup as follows: The signal generator and transmit antenna will be positioned on the side of the door expected to have the rf energy present. The RX antenna and receiver will be positioned on the opposite side of the door. With the door open, a baseline reading will be made with the TX antenna radiating energy into the RX antenna. With the door closed, not moving the position of the antennas, the measurement will be repeated. The difference between the two readings will provide a suitable comparison that relates the rf performance of the door. Sometimes these measurements must be performed where the TX equipment is outside of our faraday cage rooms (EMI chambers, etc.), and the energy could propagate. Therefore the license frequencies are requested. Continuous wave only. No modulation. TX is on for the duration of the test which is short (minutes at a time) The transmit power is low because directional TX and RX antennas are used (see list below and in Exhibit 1) for only a limited dynamic range is required to perform the measurements. The test distances involved are small (est. less than 15 feet between antennas). Photo of previous test example included below. These tests have multiple applications including isolation assessments for sensitive experiments, and assessment of degradation of isolation over time.

Polarity key: LHC = Left-hand circular
V = Vertical
H = Horizontal



Test equipment used for tests may be replaced with suitable equivalent equipment due to availability.

Tx signal sources and antennas are listed below. Rx equipment consists of same model antenna connected to a HP 8562A (1k-22GHz) or equivalent spectrum analyzer.

#	Antenna List	Frequency list using IEEE STD 299-1997 as a guide.	Freq. Units	Modulation	Output waveform type	Tx and Rx Antenna #'s	EIRP		EIRP		ERP dBW	ERP milliwatts	ERP License Value (mW)	dB margin to EEEEC Action Level	Does License emission value Exceed EEEEC Action Levels?	EIRP converted to mW/cm ²	EEEC Action Level (mW/cm ²)	Ant. Gain	Signal source, signal generator	Signal source power out (dBm)	Signal source power out 1E-3 Watts		Polarity used in testing		
							Peak, CW. Based on AF (1 meter) and source Pout.	Peak, CW = dB Watts + dB Gain	conversion of EIRP dBW into milliwatts	ERP dBW											Signal source power out (mW)	Signal source power out (mW)			
1	14	kHz	N/A	CW	1	0.750	A/m	-18.5	dBW	14.13	mW	-20.66	8.59	8.60	-24	No Action	21.2E+0	5004.10	1.5	HP 651A	10	10.00	milli watts	V/H	
2	80	kHz	N/A	CW	1,2	1.050	A/m	-18.5	dBW	14.13	mW	-20.66	8.59	8.60	-21	No Action	41.6E+0	5004.10	1.5	HP 651A	10	10.00	milli watts	V/H	
3	520	kHz	N/A	CW	2	1.050	A/m	-18.5	dBW	14.13	mW	-20.66	8.59	8.60	-14	No Action	41.6E+0	962.33	1.5	HP 651A	10	10.00	milli watts	V/H	
4	VA105 Rod	520	kHz	N/A	CW	3	0.0006	V/m	-14.0	dBW	39.81	mW	-16.16	24.21	24.00	-130	No Action	95.5E-12	962.33	1	HP 651A	15	31.62	milli watts	V/H
5	EMCO 3104, Biconical	1	MHz	N/A	CW	3	0.0006	V/m	-14.0	dBW	39.81	mW	-16.16	24.21	24.00	-127	No Action	95.5E-12	500.41	1	HP3325A	15	31.62	milli watts	V/H
6	EMCO 3101, log spiral	5.1	MHz	N/A	CW	3	0.0006	V/m	-14.0	dBW	39.81	mW	-16.16	24.21	24.00	-114	No Action	95.5E-12	25.81	1	HP3325A	15	31.62	milli watts	V/H
7	EMCO 3146, log periodic	10.1	MHz	N/A	CW	3	0.0006	V/m	-14.0	dBW	39.81	mW	-16.16	24.21	24.00	-108	No Action	95.5E-12	6.58	1	HP83640A	15	31.62	milli watts	V/H
8	EMCO 3115, Horn 1-18	52	MHz	N/A	CW	4	0.019	V/m	-13.0	dBW	50.12	mW	-15.16	30.48	31.00	-65	No Action	96.3E-9	0.30	2	HP83640A	15	31.62	milli watts	V/H
9	EMCO 3102, log spiral 1-10	100	MHz	N/A	CW	4	0.072	V/m	-13.0	dBW	50.12	mW	-15.16	30.48	31.00	-49	No Action	1.4E-6	0.10	2	HP83640A	15	31.62	milli watts	V/H
10	EMCO 3105, double ridged horn 1-12 GHz	523	MHz	N/A	CW	5	0.211	V/m	-11.0	dBW	79.43	mW	-13.16	48.31	49.00	-42	No Action	11.8E-6	0.17	4	HP83640A	15	31.62	milli watts	V/H
11	523	MHz	N/A	CW	6	1.420	V/m	-12.0	dBW	63.10	mW	-14.16	38.37	49.00	-25	No Action	534.9E-6	0.17	3	HP83640A	15	31.62	milli watts	any/all	
12	1.29	GHz	N/A	CW	7	3.333	V/m	1.0	dBW	1258.93	mW	-1.16	765.60	770.00	-22	No Action	2.9E-3	0.43	11	HP8340A	20	100.00	milli watts	any/all	
13	1.29	GHz	N/A	CW	8	0.714	V/m	-7.0	dBW	199.53	mW	-9.16	121.34	770.00	-35	No Action	135.3E-6	0.43	3	HP8340A	20	100.00	milli watts	any/all	
14	1.29	GHz	N/A	CW	9	1.667	V/m	-2.0	dBW	630.96	mW	-4.16	383.71	770.00	-28	No Action	736.8E-6	0.43	8	HP8340A	20	100.00	milli watts	any/all	
15	4.19	GHz	N/A	CW	7,8,9	3.333	V/m	1.0	dBW	1258.93	mW	-1.16	765.60	770.00	-27	No Action	2.9E-3	1.40	11	HP8340A	20	100.00	milli watts	any/all	
16	4.8	GHz	N/A	CW	7,8,9	3.333	V/m	1.0	dBW	1258.93	mW	-1.16	765.60	770.00	-27	No Action	2.9E-3	1.60	11	HP8340A	20	100.00	milli watts	any/all	
17	5.47	GHz	N/A	CW	7,8,9	3.333	V/m	1.0	dBW	1258.93	mW	-1.16	765.60	770.00	-28	No Action	2.9E-3	1.82	11	HP8340A	20	100.00	milli watts	any/all	
18	10.495	GHz	N/A	CW	7,8,9	3.333	V/m	1.0	dBW	1258.93	mW	-1.16	765.60	770.00	-31	No Action	2.9E-3	3.50	11	HP8340A	20	100.00	milli watts	any/all	
19	18	GHz	N/A	CW	7	3.333	V/m	1.0	dBW	1258.93	mW	-1.16	765.60	770.00	-32	No Action	2.9E-3	5.00	11	HP8340A	20	100.00	milli watts	any/all	

NOTE: convert from EIRP to ERP -2.16 dB

See file on comparison of ERP to EIRP - excerpt below:
"antenna info - ERP.PDF" on D drive.

6/13/98 Wireless Information Networks 143
Reference Antennas
ERP and EIRP
• ERP is by comparison to a Dipole
– This is the standard in cellular, land mobile, HF communications, and FM/ TV broadcasting
• EIRP is by comparison to an Isotropic Radiator
– This is the tradition in PCS at 1900 MHz, point-to-point microwave, satellite communications, and radar.
• ERP values can be converted to EIRP and vice versa. For a given amount of power input, a dipole produces 2.16 dB more radiation than an isotropic radiator, due to the dipoles slight directionality.
• ERP dB = EIRP dB - 2.16 dB
• ERP Watts = EIRP Watts /1.64