3.0 Part 2.1046 (A) RF Power Output: Radiated - ERP

3.1 Test Procedure

Substitution Method:

The EUT was setup at an antenna to EUT distance of 3 meters on an open area test site. The EUT was placed on a nonconductive turntable approximately 0.8 meters above the ground plane.

The physical arrangement of the EUT and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters in order to determine the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarizations.

The worst-case, maximum radiated emission was recorded and used as reference for the ERP measurement.

The EUT was then replaced by an ½ wave dipole antenna andpolarized in accordance with the EUT's antenna polarization. The ½ wave dipole antenna was connected to a RF signal generator with a coaxial cable.

The search antenna height, and search antenna polarity was set to levels that produced the maximum reading obtained in step 3. The signal generator was adjusted to a level that produced the radiated emission level obtained in step 3.

The signal generator level was recorded and corrected by the power loss in the cable between the generator and the antenna and further corrected for the gain of the 1.2 wave dipole used relative to an ideal ½ wave dipole antenna. The signal generator corrected level is the ERP level

Calculation Method:

$$P_{Watt} = \frac{E_{v/m} \times d_m^{\ 2}}{X}$$

3.2 Test Data

Settings:

- High Power: 4 Watt delivered to antenna
- 4W Panther 300P radiated power measurements (3 meter)

Frequency (MHz)	Level Measured (dBµV)	Site Factor (dB/m)	ERP Calculated (Watt)	ERP Calculated (dBm)	EIRP Calculated (dBm)	ERP Substitution Method (dBm)	Antenna
450.025	114.9	22.5	10.05	40.02	42.17	40.35	"G"
469.975	114.0	23.6	10.53	40.22	42.37	42.85	"G"
487.975	111.6	23.6	6.06	37.82	39.97	40.35	"G"

*Antenna as specified by manufacturer (unity gain)
**Measurement accuracy is +/- 1.5 dB

Frequency (MHz)	Level Measured (dBµV)	Site Factor (dB/m)	ERP Calcualated (Watt)	ERP Calculated (dBm)	EIRP Calculated (dBm)	ERP Substitution Method (dBm)	Antenna
450.025	110.3	22.5	3.49	35.42	37.57	36.15	"H"
469.975	110.2	23.6	4.39	36.42	38.57	32.45	"G"
487.975	110.2	23.6	4.39	36.42	38.57	33.85	"G"

*Antenna as specified by manufacturer (unity gain)
**Measurement accuracy is +/- 1.5 dB

Calculations and Measurements:

ERP Substitution Method Data (dBm)					
Frequency (MHz)	Level Measured (dBµV)	Spectrum Analyzer Level with S/G = 6 dBm (dBµV)	SF (cl and Gain dBi])	Extrapolated Signal Generator Level (S/A + 6 – SF)	Antenna
450.025	114.9	78.7	1.85 (1.3 - .55)	40.35	"G"
469.975	114.0	75.3	1.85 (1.3 - .55)	42.85	"G"
487.975	111.6	75.3	1.95 (1.4 - .55)	40.85	"G"

ERP Substitution Method Data (dBm)					
Frequency (MHz)	Level Measured (dBµV)	Spectrum Analyzer Level with S/G = 6 dBm (dBµV)	SF (cl and Gain dBi])	Extrapolated Signal Generator Level (S/A + 6 – SF)	Antenna
450.025	110.3	78.3	1.85 (1.3 - .55)	36.15	"H"
469.975	110.2	81.9	1.85 (1.3 - .55)	32.45	"G"
487.975	110.2	80.4	1.95 (1.4 - .55)	33.85	"G"

3.3 Test Equipment

Spectrum Analyser HP8566B
Antenna Roberts ½ wave dipoles