

6.7 (revision 1) Effective Radiated Power (ERP)

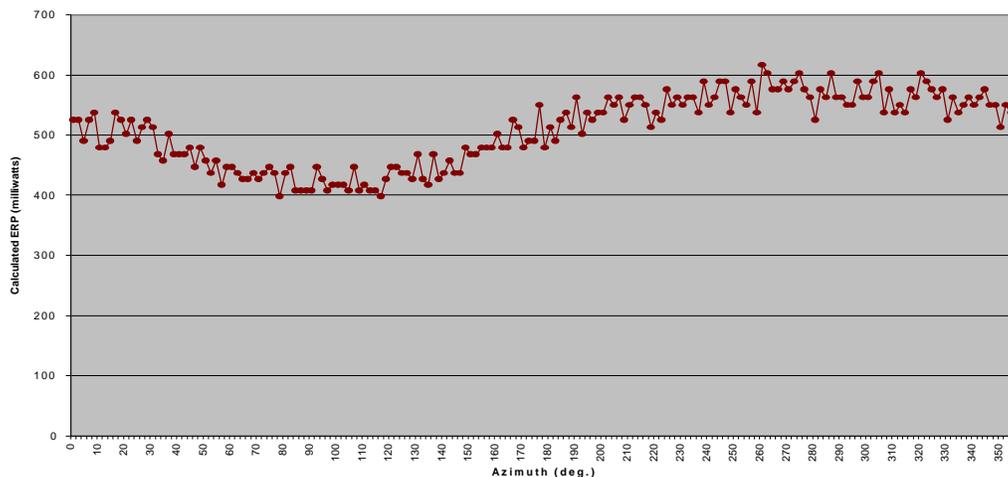
As described in more detail in Exhibit 7.1.b. the radiated power received at a spectrum analyzer was measured from the radio specimen with integral antenna at 2 degree increments as the specimen was rotated. These recorded power readings are uncalibrated ERP measurements. To convert these readings to ERP values a reference reading was obtained from a calibrated (to an ideal dipole) antenna to which was applied the same power level as the measured output power of the radio specimen. The reading at the spectrum analyzer from this calibrated reference antenna served to calibrate the spectrum analyzer readings for ERP measurements. By comparing the readings between the reference antenna and the radio specimen, and with a measurement of the output power of the radio specimen, this measurement also serves to determine the radio specimen antenna gain. The following calculation shows how ERP was determined from these measurements at 262 degrees rotation.

- a. Analyzer reading for radio specimen, as tested at 3.4 dBm output power: -36.7 dBm
- b. Analyzer reading for a substitution ideal dipole antenna, at 3.4 dBm applied power: -36.15 dBm
- c. Antenna gain (logarithmic) compared to an ideal dipole: $(-36.7) - (-36.15) = -0.55$ dBd
- d. Measured ERP: $(3.4) + (-0.55) = 2.85$ dBm
- e. Measured ERP: 1.93 milliwatts

However, the measured ERP value above was not determined at the production controlled maximum output power of the radio product so it is necessary to scale this number. The antenna gain permits the ERP to be calculated for any output power value in a manner similar to steps c and d above. The following calculations were used to determine the Maximum ERP rating of the radio product (617 milliwatts), as stated in Exhibit 12.1.C, revision 2, based upon the maximum output power rating (700 milliwatts) stated in Exhibit 12.1.A, revision 2.

- f. Maximum output power rated: 700 milliwatts
- g. Antenna gain (linear value of item c above): 0.881
- h. Maximum calculated ERP: $0.881 \times 700 = 617$ milliwatts

The method above was used for all information provided in the data table which follows that, for brevity, only lists values of items a, e and h as a function of rotational angle. The following graph of item h. is provided to serve as a simplified summary of that tabulated data and permits observation of the maximum calculated ERP at the 262 degree rotational position.



Angle	SA Reading	Measured ERP	Maximum Calculated ERP	Notes
(deg)	(dBm)	(mw)	(mw)	
0	-37.1	1.76	562	Front
2	-37.4	1.64	525	
4	-37.4	1.64	525	
6	-37.7	1.53	490	
8	-37.4	1.64	525	
10	-37.3	1.68	537	
12	-37.8	1.50	479	
14	-37.8	1.50	479	
16	-37.7	1.53	490	
18	-37.3	1.68	537	
20	-37.4	1.64	525	
22	-37.6	1.57	501	
24	-37.4	1.64	525	
26	-37.7	1.53	490	
28	-37.5	1.60	513	
30	-37.4	1.64	525	
32	-37.5	1.60	513	
34	-37.9	1.46	468	
36	-38.0	1.43	457	
38	-37.6	1.57	501	
40	-37.9	1.46	468	
42	-37.9	1.46	468	
44	-37.9	1.46	468	
46	-37.8	1.50	479	
48	-38.1	1.40	447	
50	-37.8	1.50	479	
52	-38.0	1.43	457	
54	-38.2	1.36	437	
56	-38.0	1.43	457	
58	-38.4	1.30	417	
60	-38.1	1.40	447	
62	-38.1	1.40	447	
64	-38.2	1.36	437	
66	-38.3	1.33	427	
68	-38.3	1.33	427	
70	-38.2	1.36	437	
72	-38.3	1.33	427	
74	-38.2	1.36	437	
76	-38.1	1.40	447	

78	-38.2	1.36	437	
80	-38.6	1.24	398	
82	-38.2	1.36	437	
84	-38.1	1.40	447	
86	-38.5	1.27	407	
88	-38.5	1.27	407	
90	-38.5	1.27	407	
92	-38.5	1.27	407	
94	-38.1	1.40	447	
96	-38.3	1.33	427	
98	-38.5	1.27	407	
100	-38.4	1.30	417	
102	-38.4	1.30	417	
104	-38.4	1.30	417	
106	-38.5	1.27	407	
108	-38.1	1.40	447	
110	-38.5	1.27	407	
112	-38.4	1.30	417	
114	-38.5	1.27	407	
116	-38.5	1.27	407	
118	-38.6	1.24	398	
120	-38.3	1.33	427	
122	-38.1	1.40	447	
124	-38.1	1.40	447	
126	-38.2	1.36	437	
128	-38.2	1.36	437	
130	-38.3	1.33	427	
132	-37.9	1.46	468	
134	-38.3	1.33	427	
136	-38.4	1.30	417	
138	-37.9	1.46	468	
140	-38.3	1.33	427	
142	-38.2	1.36	437	
144	-38.0	1.43	457	
146	-38.2	1.36	437	
148	-38.2	1.36	437	
150	-37.8	1.50	479	
152	-37.9	1.46	468	
154	-37.9	1.46	468	
156	-37.8	1.50	479	
158	-37.8	1.50	479	
160	-37.8	1.50	479	

162	-37.6	1.57	501	
164	-37.8	1.50	479	
166	-37.8	1.50	479	
168	-37.4	1.64	525	
170	-37.5	1.60	513	
172	-37.8	1.50	479	
174	-37.7	1.53	490	
176	-37.7	1.53	490	
178	-37.2	1.72	550	
180	-37.8	1.50	479	
182	-37.5	1.60	513	
184	-37.7	1.53	490	
186	-37.4	1.64	525	
188	-37.3	1.68	537	
190	-37.5	1.60	513	
192	-37.1	1.76	562	
194	-37.6	1.57	501	
196	-37.3	1.68	537	
198	-37.4	1.64	525	
200	-37.3	1.68	537	
202	-37.3	1.68	537	
204	-37.1	1.76	562	
206	-37.2	1.72	550	
208	-37.1	1.76	562	
210	-37.4	1.64	525	
212	-37.2	1.72	550	
214	-37.1	1.76	562	
216	-37.1	1.76	562	
218	-37.2	1.72	550	
220	-37.5	1.60	513	
222	-37.3	1.68	537	
224	-37.4	1.64	525	
226	-37.0	1.80	576	
228	-37.2	1.72	550	
230	-37.1	1.76	562	
232	-37.2	1.72	550	
234	-37.1	1.76	562	
236	-37.1	1.76	562	
238	-37.3	1.68	537	
240	-36.9	1.84	589	
242	-37.2	1.72	550	
244	-37.1	1.76	562	

246	-36.9	1.84	589	
248	-36.9	1.84	589	
250	-37.3	1.68	537	
252	-37.0	1.80	576	
254	-37.1	1.76	562	
256	-37.2	1.72	550	
258	-36.9	1.84	589	
260	-37.3	1.68	537	
262	-36.7	1.93	617	Maximum
264	-36.8	1.88	603	
266	-37.0	1.80	576	
268	-37.0	1.80	576	
270	-36.9	1.84	589	
272	-37.0	1.80	576	
274	-36.9	1.84	589	
276	-36.8	1.88	603	
278	-37.0	1.80	576	
280	-37.1	1.76	562	
282	-37.4	1.64	525	
284	-37.0	1.80	576	
286	-37.1	1.76	562	
288	-36.8	1.88	603	
290	-37.1	1.76	562	
292	-37.1	1.76	562	
294	-37.2	1.72	550	
296	-37.2	1.72	550	
298	-36.9	1.84	589	
300	-37.1	1.76	562	
302	-37.1	1.76	562	
304	-36.9	1.84	589	
306	-36.8	1.88	603	
308	-37.3	1.68	537	
310	-37.0	1.80	576	
312	-37.3	1.68	537	
314	-37.2	1.72	550	
316	-37.3	1.68	537	
318	-37.0	1.80	576	
320	-37.1	1.76	562	
322	-36.8	1.88	603	
324	-36.9	1.84	589	
326	-37.0	1.80	576	
328	-37.1	1.76	562	

330	-37.0	1.80	576	
332	-37.4	1.64	525	
334	-37.1	1.76	562	
336	-37.3	1.68	537	
338	-37.2	1.72	550	
340	-37.1	1.76	562	
342	-37.2	1.72	550	
344	-37.1	1.76	562	
346	-37.0	1.80	576	
348	-37.2	1.72	550	
350	-37.2	1.72	550	
352	-37.5	1.60	513	
354	-37.2	1.72	550	
356	-37.3	1.68	537	
358	-37.7	1.53	490	