POWER CONVERSION CHART

dBm	mW	dBm	mW	dBm	mW
-20	0.010	-7	0.200	+6	3.98
-19	0.012	-6	0.250	+7	5.01
-18	0.016	-5	0.316	+8	6.30
-17	0.020	-4	0.398	+9	7.94
-16	0.025	-3	0.501	+10	10.0
-15	0.032	-2	0.630	+11	12.6
-14	0.040	-1	0.794	+12	15.8
-13	0.050	0	1.00	+13	19.9
-12	0.063	+1	1.25	+14	25.1
-11	0.079	+2	1.58	+15	31.6
-10	0.100	+3	2.00	+16	39.8
-9	0.130	+4	2.51	+17	50.1
-8	0.160	+5	3.16	+18	63.1

dBm	W	dBm	W	dBm	W
+19	0.079	+33	2.00	+47	50.1
+20	0.100	+34	2.55	+48	63.1
+21	0.120	+35	3.16	+49	79.4
+22	0.159	+36	3.91	+50	100.0
+23	0.200	+37	5.01	+52	126.0
+24	0.251	+38	6.31	+52	158.0
+25	0.316	+39	7.94	+53	200.0
+26	0.398	+40	10.0	+54	251.0
+27	0.501	+41	12.6	+55	316.0
+28	0.631	+42	15.8	+56	398.0
+29	0.794	+43	20.0	+57	501.0
+30	1.00	+44	25.1	+58	631.0
+31	1.26	+45	31.6	+59	794.0
+32	1.59	+46	39.8	+60	1000

RADITEK INC.

1702L Meridian Ave. Suite 127,
San Jose, Ca 95125 U.S.A.
(408) 266-7404 Phone
(408) 266-4483 Fax
sales@raditek.com Email

RADITEK INC.

$$VSWR = \frac{Emax}{Emin} = \frac{Imax}{Imin} = \frac{1+\Gamma}{1-\Gamma}$$

Γ = reflection coefficient.

$$\text{Return loss} = 20\log\frac{1}{\Gamma}$$

Multi-tone amplifier test

IPn = Intercept point of order n.

$$Ipn = Po + \left\{\frac{Po-Pi}{(n-1)}\right\}$$

Po=output level of each tone.
Pi=output power of IMD product of order n.
For 2-tone test:

$$TOI = \frac{CIM + Po}{2}$$

TOI=third order intercept
CIM = intermod. Level
For the two tones F1 and F2, the third order intermodulation products occur at:
$2F_1 - F_2$ and $2F_2 - F_1$

For a FET, Power added efficiency:

$$\eta_{ADD} = \left\{\frac{P_{1dB}-P_{in}}{V_{DS}-I_D}\right\} \times 100\%$$ P1dB and Pin are in Watts.

Noise Figure (NF)

$$NF = 10\log\left\{\frac{T}{290}+1\right\}$$

T=noise temperature in °K

Miscellaneous:

dBm=10 x log(W x 1000)

For all your isolators, circulators and sources think RADITEK at www.raditek.com

VSWR effect on power

VS WR	Ret. Loss	Trans. Loss	Volt. Refl.	Pwer Refl.	Power Trans.
	dB	dB	Coefft.	%	%
1.00	0	.000	.00	.0	100.0
1.01	46.1	.000	.00	.0	100.0
1.02	*40.1*	.000	.01	.0	100.0
1.03	*36.6*	.001	.01	.0	100.0
1.04	*34.2*	.002	.02	.0	100.0
1.05	*32.3*	.003	.02	.1	99.9
1.06	30.7	.004	.03	.1	99.9
1.07	29.4	.005	.03	.1	99.9
1.08	28.3	.006	.04	.1	99.9
1.09	27.3	.008	.04	.2	99.8
1.10	26.4	.010	.05	.2	99.8
1.11	25.7	.012	.05	.2	99.7
1.12	24.9	.014	.06	.2	99.7
1.13	24.3	0.016	.06	.4	99.6
1.14	23.7	0.019	.07	.4	99.6
1.15	23.1	0.021	.07	.5	99.5
1.16	22.6	0.024	.07	.5	99.5
1.17	22.1	0.027	.08	.6	99.4
1.18	21.7	0.030	.08	.7	99.3
1.19	21.2	0.033	.09	.8	99.2
1.20	20.8	0.036	.09	.8	99.2
1.25	19.1	0.054	.11	1.2	98.8
1.30	17.7	0.075	.13	1.7	98.3
1.40	15.6	0.122	.17	2.8	97.2
1.50	14.0	0.177	.20	4.0	96.0
1.60	12.7	0.238	.23	5.3	94.7
1.70	11.7	0.302	.26	6.7	93.3
1.80	10.9	0370	.29	8.2	91.8
1.90	10.2	0.440	.31	9.6	90.4
2.00	9.5	0.512	.33	11.1	88.9
3.00	6.0	1.24	.50	25.0	75.0
4.00	4.4	1.93	.60	36.0	64.0
5.00	3.5	2.55	.67	44.4	55.6
10.0	1.7	4.80	.82	66.9	33.1
20.0	0.9	7.41	.90	81.9	18.1