

Recalculated

Table 1
Transmitter's Peak Output Power (Conducted)
BASE UNIT

Ch. No.	Frequency	Reading on Spec. Anal.	Cable Loss	Pre-Amp Gain	Antenna Factor	E-field	E-field	Distance	Gain of DUI's Antenna	Conduct. Transm. Power	Conduct. Transm. Power	Isotr. Radiat. Power
#	f	V ₀	L	G _{PreAmp}	AF _{Horn}	E	E	d	G _{DUI}	P _{TX}	P _{TX}	EIRP
	MHz	dBμV	dB	dB	dB(m ⁻¹)	dBμV/m	V/m	m	dBi	W	dBm	dBm
1	5742.980	116.27	5.43	37.55	32.40	116.55	0.672	3.00	4.00	0.054	17.32	21.32
18	5788.880	111.20	5.46	37.60	32.26	111.32	0.368	3.00	4.00	0.016	12.09	16.09
35	5834.780	108.87	5.50	37.64	32.64	109.37	0.294	3.00	4.00	0.010	10.14	14.14

Table 2
Transmitter's Peak Output Power (Conducted)
HANDSET

Ch. No.	Frequency	Reading on Spec. Anal.	Cable Loss	Pre-Amp Gain	Antenna Factor	E-field	E-field	Distance	Gain of DUI's Antenna	Conduct. Transm. Power	Conduct. Transm. Power	Isotr. Radiat. Power
#	f	V ₀	L	G _{PreAmp}	AF _{Horn}	E	e	d	G _{DUI}	P _{TX}	P _{TX}	EIRP
	MHz	dBμV	dB	dB	dB(m ⁻¹)	dBμV/m	V/m	m	dBi	W	dBm	dBm
1	5742.980	115.88	5.43	37.55	32.40	116.16	0.643	3.00	4.00	0.049	16.93	20.93
18	5788.880	112.17	5.46	37.60	32.26	112.29	0.412	3.00	4.00	0.020	13.06	17.06
35	5834.780	110.54	5.50	37.64	32.64	111.04	0.356	3.00	4.00	0.015	11.81	15.81

Sample calculation for the highest measured power:

Measured voltage: V₀ = 120.2 dBμV

Measured E-field: E = V_{Ant} + AF_{Horn} = V₀ + L - G_{PreAmp1} + AF_{Horn}

$$E = 116.27 + 5.43 - 37.55 + 32.40 = 116.55 \text{ dBμV/m}$$

$$e = 0.672 \text{ V/m}$$

$$G_{DUI} = 10 \cdot \log_{10}(g_{DUI}) = 4.0 \text{ dBi} \quad \Leftrightarrow \quad g_{DUI} = 2.512$$

Using equation: E = sqrt(30*P*G)/d
transmitter power is calculated as:

$$p_{TX} = (e \cdot d)^2 / (30 \cdot g_{DUI}) = (0.672 \times 3.0)^2 / (30 \times 2.512) = 0.054 \text{ W}$$

$$P_{TX} = 17.32 \text{ dBm}$$

$$\text{EIRP} = P_{TX} + G_{DUI} = 17.32 + 4.0 = 21.32 \text{ dBm}$$

$$\text{eirp} = 0.136 \text{ W}$$

V_0 – voltage level measured on spectrum analyzer (dB μ V)

L – loss in cable between antenna pre-amplifier and spectrum analyzer (dB)

G_{PreAmp} – gain of antenna pre-amplifier (dB)

V_{Ant} – voltage at the terminal of testing antenna (dB μ V)

AF_{Horn} – antenna factor of testing antenna - double-ridged wave-guide horn (dB(m⁻¹))

e – RF electric field-strength (V/m)

E – RF electric field-strength (dB μ V/m)

d – distance (m)

G_{DUI} – gain of DUIs antenna (dBi)

p_{TX} – transmitter's peak conducted output RF power (W)

P_{TX} – transmitter's peak conducted output RF power (dBm)

EIRP – Equivalent Isotropically Radiated Power (dBm)

eirp – Equivalent Isotropically Radiated Power (W)