Europastraße 3a
A-9524 Villach
+43 5 90500 2644
emv@fh-kaernten.at

KÄRNTEN Forschungsgesellschaft
EMV – MESS- UND PRÜFLABOR

EMC Conversion Formulas

LOG → LINEAR VOLTAGE

dBµV to Volts	$V = 10^{((dB\mu V-120)/20)}$
Volts to dBµV	$dB\mu V = 20 * \log(V) + 120$
dBV to Volts	$V=10^{(dBV/20)}$
Volts to dBV	$dBV = 20 * \log(V)$
dBV to dBµV	$dB\mu V = dBV + 120$
dBµV to dBV	$dBV = dB\mu V - 120$

LOG → LINEAR CURRENT

dBµA to µA	$\mu A = 10^{(dB\mu A/20)}$
µA to dBµA	$dB\mu A = 20 * \log(\mu A)$
dBA to A	$A=10^{(dBA/20)}$
A to dBA	$dBA = 20 * \log(A)$
dBA to dBµA	$dB\mu A = dBV + 120$
dBµA to dBA	$dBA = dB\mu A - 120$

LOG → LINEAR POWER

dBm to Watts	$W = 10^{((dBm-30)/10)}$
Watts to dBm	$dBm = 10 * \log(W) + 30$
dBW to Watts	$W=10^{(dBW/10)}$
Watts to dBW	$dBW = 10 * \log(W)$
dBW to dBm	$dBm = dBW - 30$
dBm to dBW	$dBW = dBm - 30$

E-FIELD ANTENNAS

Correction Factor	$dB\mu V/m = dB\mu V + AF$
Field Strength	$V/m = \sqrt{\frac{30*Watts*Gain}{meters}}$
Required Power	$Watts = (V/m*meters)^2$

LOOP ANTENNAS

Correction Factor	$dB\mu A/m = dB\mu V + AF$
Assumed E-field for shielded loops	$dB\mu V/m = dB\mu A/m + 51,5$
	$dBpT = dB\mu V + dBpT/\mu V$

TERM CONVERSIONS

dBm to dBµV	$dB\mu V = dBm + 107$	(50Ω)
	$dB\mu V = dBm + 10 * \log(Z) + 90$	
dBµV to dBm	$dBm = dB\mu V - 107$	(50Ω)
	$dBm = dB\mu V - 10 * \log(Z) - 90$	
dBm to dBµA	$dB\mu A = dBm + 73$	(50Ω)
	$dB\mu A = dBm - 10 * \log(Z) + 90$	
dBµA to dBm	$dBm = dB\mu A - 73$	(50Ω)
	$dBm = dB\mu A +10 * \log(Z) - 90$	
dBµA to dBµV	$dB\mu V = dB\mu A + 34$	(50Ω)
	$dB\mu V = dB\mu A + 20 * \log(Z)$	
dBµV to dBµA	$dB\mu A = dB\mu V - 34$	(50Ω)
	$dB\mu A = dB\mu V - 20 * \log(Z)$	

FIELD STRENGTH & POWER DENSITY

dBµV/m to V/m	$V/m = 10^{(((dB\mu V/m)-120)/20)}$
V/m to dBµV/m	$dB\mu V/m = 20 * \log(V/m) + 120$
dBµV/m to dBµW/m²	$dB\mu W/m^2 = dB\mu V/m - 115,8$
dBµW/m² to dBµV/m	$dB\mu V/m = dB\mu W/m^2 + 115,8$
dBµV/m to dBµA/m	$dB\mu A/m = dB\mu V/m - 51,5$
dBµA/m to dBµV/m	$dB\mu V/m = dB\mu A + 51,5$
dBµA/m to dBpT	$dBpT = dB\mu A/m + 2$
dBpT to dBµA/m	$dB\mu A/m = dBpT - 2$
W/m² to V/m	$V/m = \sqrt{\frac{W}{m^2} * 377}$
V/m to W/m²	$W/m^2 = (V/m)^2 / 377$
µT to A/m	$A/m = \mu T / 1,25$

CURRENT PROBES

Correction Factor	$dB\mu A = dB\mu V - dB_{(ohm)}$

Power needed for injection probe given voltage into 50Ω load and Probe Insertion Loss (I_L)

$Watts = 10^{((IL+10*\log(V^2/50))/10)}$