

VSWR & Return Loss (Impedance)

Impedance = $Z = E_i / I_i$

50 Ohm or 75 Ohm is normally used as the amplifier interface to other equipment where: E_i and I_i are the incident voltage and current.

VSWR = $E_{\max} / E_{\min} = (1 + |P|) / (1 - |P|)$
where P = reflection coefficient = $(Z - Z_0) / (Z + Z_0)$

Return Loss in dB = $20 \log |P|$

COMMON TRANSFORMATIONS				
VSWR	RETURN LOSS	POWER REFLECTED	POWER TRANSMITTED	REFLECTION COEFFICIENT
1.0	-	0 %	100 %	0.00
1.1	26.4 dB	0.2 %	99.8 %	0.05
1.25	19.1 dB	1.2 %	98.8 %	0.11
1.5	14.0 dB	4.0 %	96.0 %	0.20
1.75	11.3 dB	7.4 %	92.6 %	0.27
2.0	9.5 dB	11.1 %	88.9 %	0.33
3.0	6.0 dB	25.0 %	75.0 %	0.50
6.0	2.9 dB	51.0 %	49.0 %	0.71
-	0 dB	100 %	0 %	1.00

Notes:

1. A purely capacitive or inductive load has an infinite VSWR.
2. $VSWR = Z_L / Z_0$ or Z_0 / Z_L for resistive loads only.