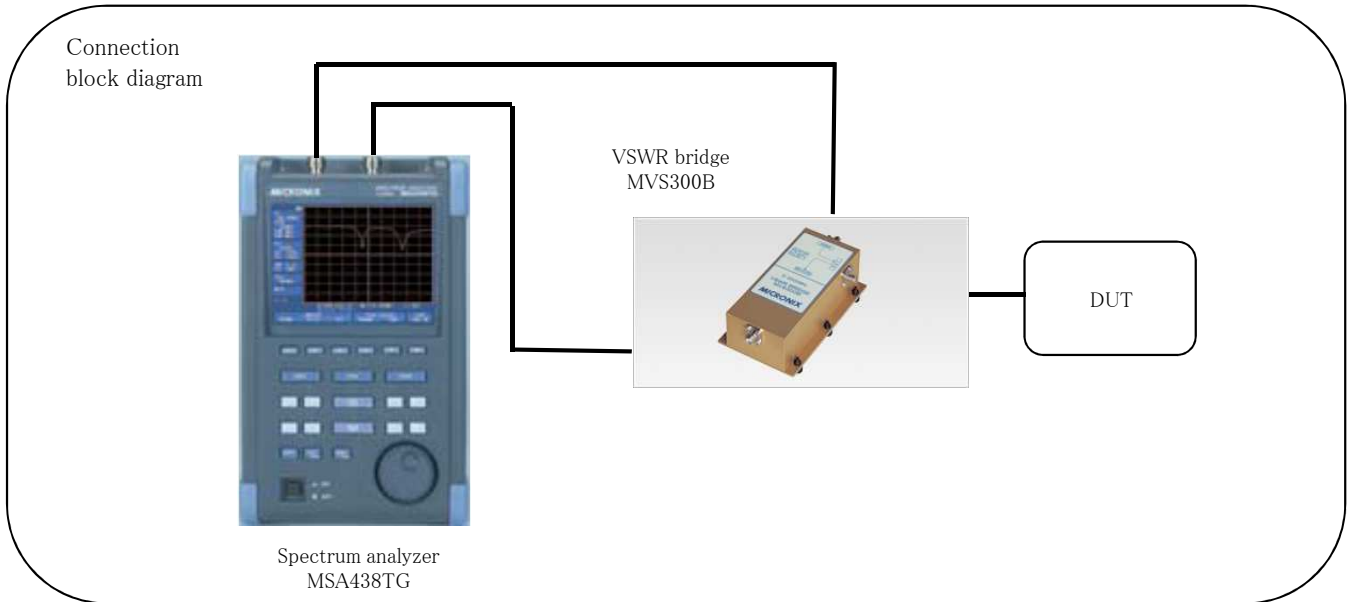


Method for calculating the power loss from the return loss measurement

- ◇ Using a spectrum analyzer with tracking generator, the reflection coefficient is calculated from the return loss measured, and then the power loss is calculated.

Application



Solution

- MSA438TG and VSWR bridge MVS300B enables to measure the return loss of DUT. It can be calculated in the following procedures how much the power loss is.

1) The return loss RL is measured and then the reflection coefficient R_F is calculated from the following equation.

$$R_F = 10^{-\frac{RL}{20}}$$

2) The power loss PL is calculated based on the reflection coefficient R_F from the following equation.

$$PL = -10 \log \left[1 - R_F^2 \right]$$

- The calculation examples of the reflection coefficient and power loss to typical return loss are shown in the table below.

In addition, $VSWR = (1 + R_F) / (1 - R_F)$

Return loss[dB]	5	6	8	10	12	14	16	18	20	25	30
Power loss[dB]	1.651	1.256	0.749	0.458	0.283	0.176	0.110	0.069	0.044	0.014	0.004
VSWR	3.570	3.010	2.323	1.925	1.671	1.499	1.377	1.288	1.222	1.119	1.065
Reflection coeffi.	0.562	0.501	0.398	0.316	0.251	0.200	0.158	0.126	0.100	0.056	0.032

System constitution

Spectrum analyzer [MSA438TG]	×1
MSA438 calibration set	×1
VSWR bridge [MVS300B]	×1
SMA cable (3m) [MC202]	×2
N-SMA adapter [MA306]	×2

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