INSERTION LOSS

Insertion Loss (IL):
The insertion loss of the transformer is a measurement of the signal loss due to the insertion of the transformer in the circuit. Primarily due to the copper loss of the wire, it can also include losses due to the magnetic material. The test circuit below is used by Rhombus Industries to measure insertion loss. Unless otherwise stated in a data sheet, test signal level is 0 Dbm.

\[
\begin{align*}
V_p &= \text{Primary Voltage} \\
V_L &= \text{Load Voltage} \\
Z_1 &= \text{Primary Impedance} \\
Z_2 &= \text{Load Impedance}
\end{align*}
\]

**Insertion Loss Formula**

\[
20 \log \left( \frac{V_L}{Z_1} \right) \frac{V_p}{Z_2}
\]

FREQUENCY RESPONSE

Frequency Response (FR):
Rhombus Industries measures Frequency Response as a variation in Insertion loss over a specified range of frequencies. The test circuit below is used by Rhombus Industries to measure Frequency Response. A meter calibrated in Db can be used. However, care must be taken that the frequency range tested is within the capabilities of the meter. The source voltage must be held constant regardless of voltage measurement technique. Unless otherwise stated in a data sheet, the reference frequency for all audio transformers is 1 KHz and the test signal level is 0 Dbm.

\[
\begin{align*}
V^* &= V_{REF} \text{ & } V_{TEST} \\
V_{REF} &= \text{Voltage at reference frequency} \\
V_{TEST} &= \text{Voltage at frequency under test} \\
V_G &= \text{Source Voltage (Must be held constant)}
\end{align*}
\]

**Frequency Response Formula**

\[
20 \log \left( \frac{V_{L\text{test}}}{V_{L\text{ref}}} \right)
\]