

Audio Math

Intermodulation Distortion

CCIF style math for IMD

When close together fundamentals (**f2/f1 < 2**) use CCIF2 or CCIF3. QA40xPlot uses CCIF3.

CCIF2 uses a single value

$$\text{CCIF2 IMD} = \frac{V_{fH-fL}}{V_{fH}+V_{fL}}$$

CCIF3 uses a different single value

$$\text{CCIF3 IMD} = \frac{\sqrt{V_{fH-fL}^2 + (V_{2fL-fH} + V_{2fH-fL})^2}}{V_{fH}+V_{fL}}$$

SMPTE/DIN IMD (or MOD IMD)

When the fundamentals are far apart (**f2/f1 > 7**) use SMPTE/DIN math

$$\text{SMPTE/DIN IMD} = \frac{\sqrt{(V_{fH-fL} + V_{fH+fL})^2 + (V_{fH-2fL} + V_{fH+2fL})^2}}{V_{fH}}$$

RMS Power IMD

Finally, when **2 < f2/f1 < 7** the IMD RMS power methods using RMS addition when $2 < f_2/f_1 < 7$

$$\text{POWER IMD} = \frac{\sqrt{V_{fH-fL}^2 + V_{fH+fL}^2 + V_{fL-2fH}^2 + V_{fL+2fH}^2 + V_{fH-2fL}^2 + V_{fH+2fL}^2}}{\sqrt{V_{fH}^2 + V_{fL}^2}}$$