



Wideband Driver Amplifiers

AMZ-40

The AMZ-40 driver amplifier is a wideband, 100 kHz to 40 GHz amplifier intended for use in broadband microwave and high data rate systems. The AMZ-40 is a 3-stage high output power modulator driver amplifier that can provide up to +23 dBm saturated output (9 V_{pp} in a 50 Ω system) with a 40 Gb/s input signal. The small footprint, high output voltage swing and very low DC power consumption (typ. <1.6 W) makes the AMZ-40 an excellent choice for 40 Gb/s optical, test and measurement and general purpose use.

Features

- Modulator driver amplifier for 40 Gb/s applications
- Small signal gain > 25 dB with saturated output voltage up to 9 V_{pp}
- Additive RMS jitter < 750 fs (typ. 500 fs)
- Extremely fast rise/fall time < 10 ps
- Eye crossing percentage and gain control tunability

Electrical Specifications

| Parameter | Unit | Min | Typ | Max | Comments |
|------------------------------|-----------------|-----|-----|-----|---|
| Maximum Data Rate | Gb/s | | | 43 | |
| Low Frequency Cutoff | kHz | | | 100 | |
| High Frequency Cutoff (3 dB) | GHz | | 35 | | Small signal |
| High Frequency Cutoff (6 dB) | GHz | | 40 | | Small signal |
| Gain to 35 GHz | dB | | 25 | | Small signal |
| Gain to 40GHz | dB | | 22 | | Small signal |
| Output 1 dB Compression | dBm | +10 | +12 | | Frequency < 35 GHz |
| Output Power Saturation | dBm | +18 | +25 | | Input power of +5 dBm @ 20 GHz |
| Max. Output Voltage Swing | V _{pp} | | 9 | | Measured at 40 Gb/s |
| Additive RMS Jitter | fs | | 500 | 750 | 70 GHz scope with Precision Timebase. GC = Ground |
| Return Loss (< 25 GHz) | | | | | |
| S11 | dB | | 13 | | |
| S22 | dB | | 10 | | |
| Rise Time/Fall Time | ps | | 9 | 10 | 80%/20% |
| DC Power Dissipation | W | | 1.6 | | V _D = +6.5 V |

Specifications guaranteed from -30 to +70°C, measured in a 50-Ohm System.

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Operation Conditions

| Parameter | Unit | Absolute Min | Typical | Absolute Max |
|--------------------------------------|-----------------|--------------|-----------------|--------------|
| Input Power | dBm | | -6 | +10 |
| Input Voltage Swing (50 Ω) | V _{pp} | | 0.30 to 0.45 | 2 |
| Positive Drain Voltage (+V) | V mA | 0 | +5 to +7 225 | +9 400 |
| Negative Gate Voltage (-V) | V mA | 0 | -0.65 8 | -2 30 |
| Eye Crossing Percentage (CP) | V mA | 0 | -4 12 | -8 30 |
| Gain Control (GC) | V | 0 | 0 | -2 |
| Output Bias Tee Control ¹ | V mA | -8 -300 | | 8 300 |
| Operating Temperature | C | -30 | | 70 |

¹Output bias tee optional.

Part Number Options

| Please specify connector configuration or bias tee option by adding to model number. | | | |
|--|---|------------------------------|--|
| Package Style | Connector Configuration ¹ | Bias Tee Option ² | Example |
| MZ3 | No dash (F-F) -1 (F-M) -2 (M-F) -3 (M-M) | -B | AMZ-40-2-B <i>(2.4 Male-In; 2.4 Female-Out with output bias tee)</i> |

¹If connector configuration is not indicated, connectors are 2.4mm by default. For other configurations, please contact factory for special part number.

²Output bias tee option. If not indicated no output bias tee will be provided.

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Typical Performance Plots

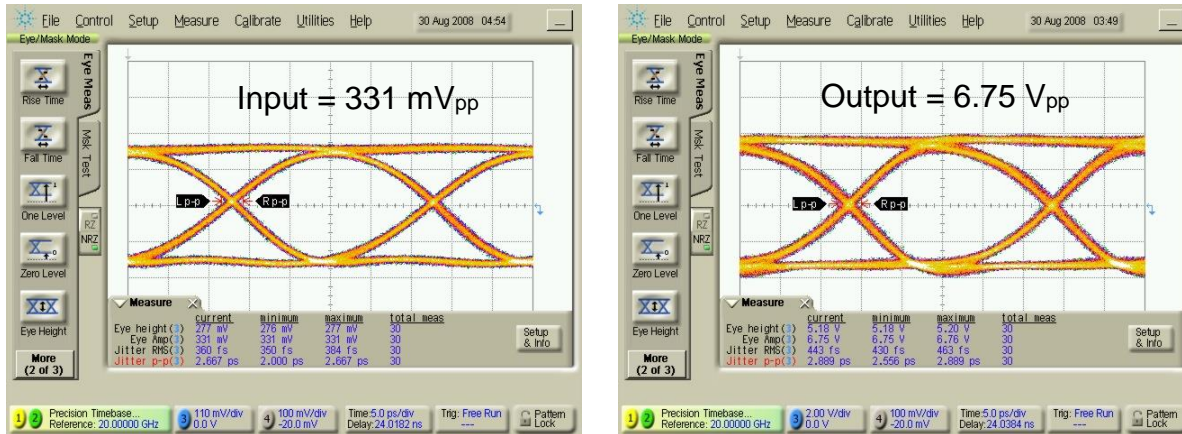


Fig. 1. Typical amplified 40 Gb/s eye diagram (right) for an input signal of 331 V_{pp} (left). Input RMS jitter is 360 fs and output RMS jitter is 443 fs. Additive RMS jitter is 288 fs as calculated by the relation: $Jitter_{out} = [Jitter_{in}^2 + Jitter_{added}^2]^{1/2}$. Bias conditions: +V = 6.5 V, -V = -0.63 V, CP = -3.75 V, GC = Ground.

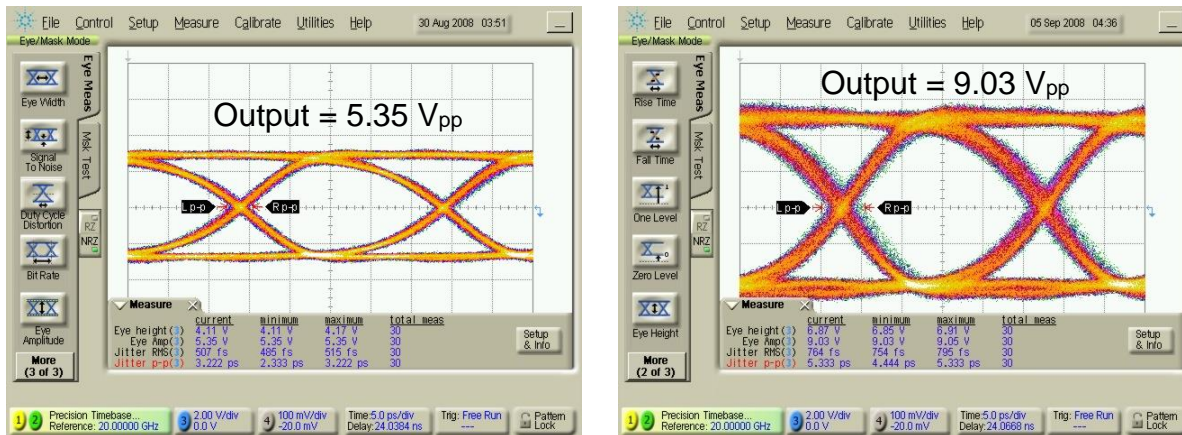
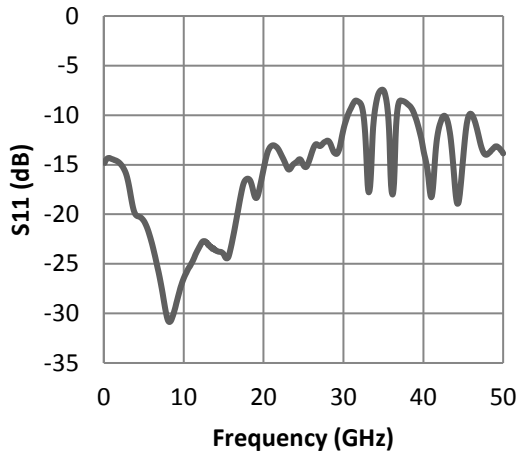
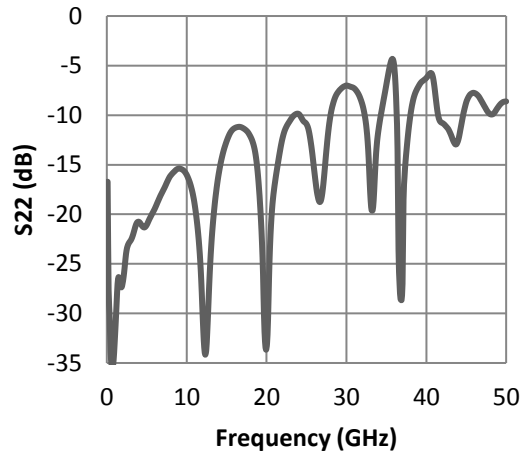


Fig. 2. Typical 40 Gb/s eye diagrams for bias +V = +5 V (left) and +V = +8.5 V (right).

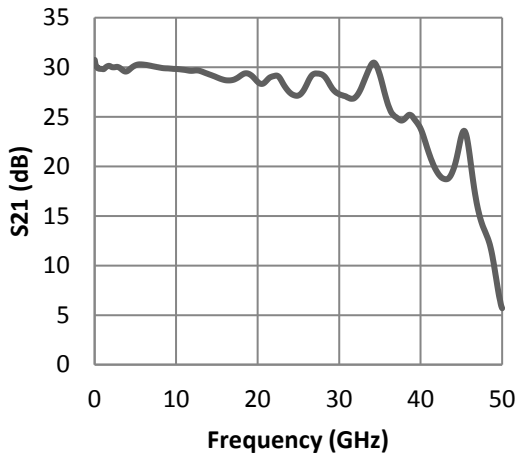
Input Return Loss



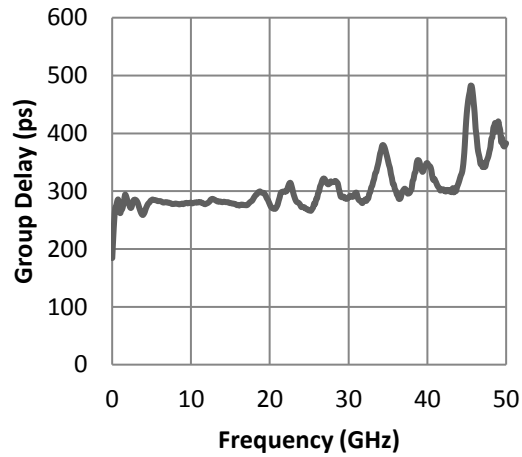
Output Return Loss



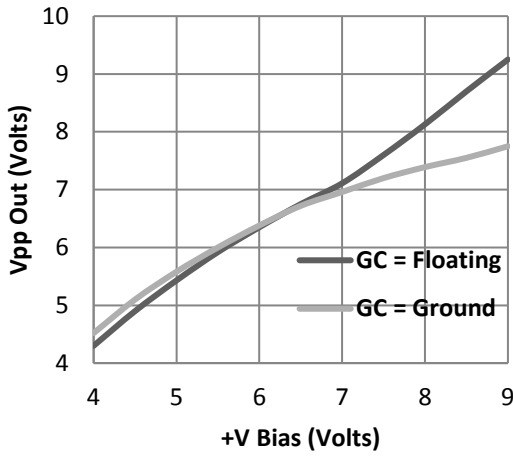
Gain (Small Signal)



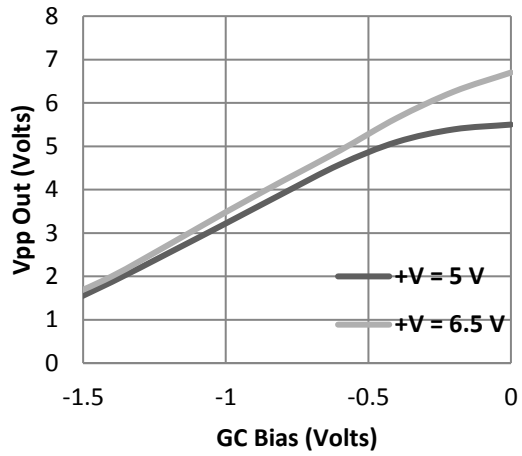
Group Delay



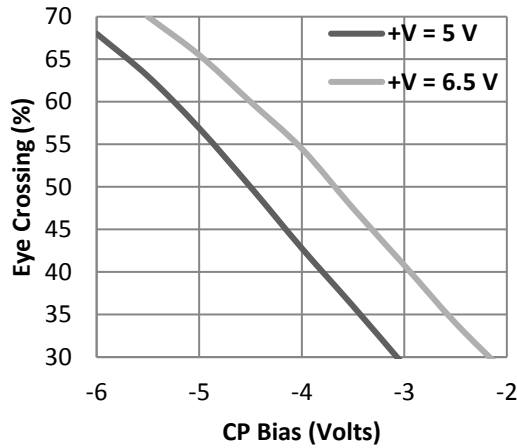
Vpp Out vs. +V



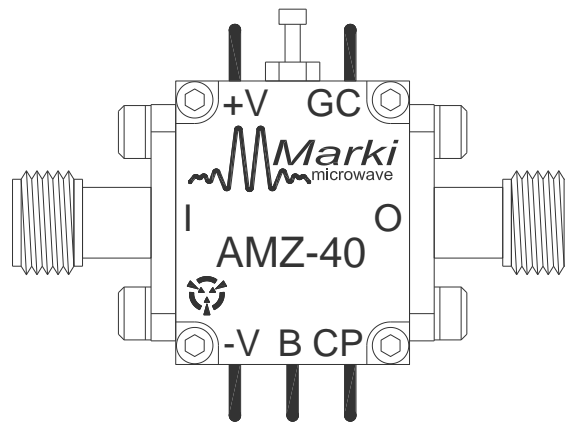
Vpp Out vs. Gain Control



Eye Crossing vs. CP



Pin Description



NOTES

1. Bias pin "B" only available with output bias tee option "-B"
2. Consult [MZ3](#) package drawing for exact package dimensions
3. Consult [AMZ-40 Operation Guide](#) for bias ON/OFF procedure

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