

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	23	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	10	13		
S22	dB	7	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 (2.4 Male-In; 2.4 Female-Out with output bias tee)

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

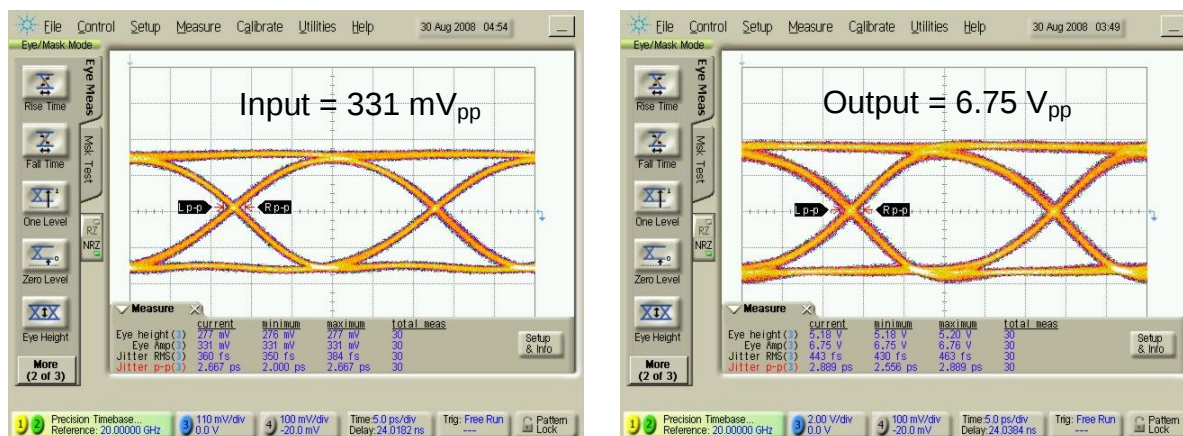


Fig. 1. Typical amplified 40 Gb/s eye diagram (right) for an input signal of 331 V_{pp} (left). Input RMS jitter is 360 fs and output RMS jitter is 443 fs. Additive RMS jitter is 288 fs as calculated by the relation: $Jitter_{out} = [Jitter_{in}^2 + Jitter_{added}^2]^{1/2}$. Bias conditions: +V = 6.5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

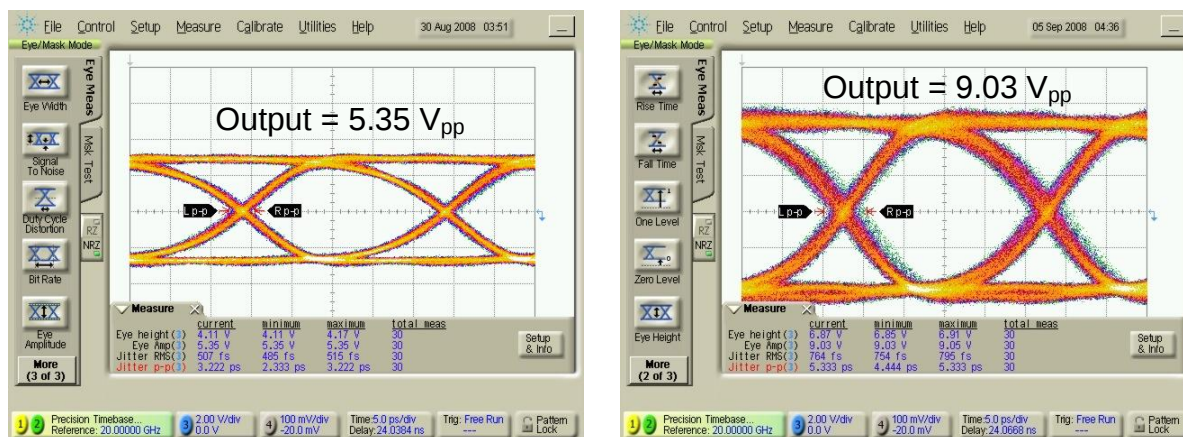


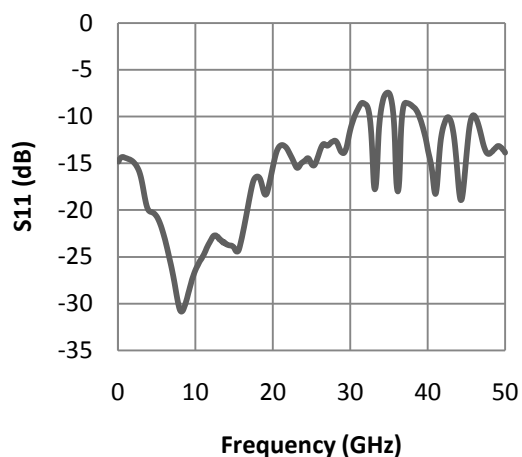
Fig. 2. Typical 40 Gb/s eye diagrams for bias +V = +5 V (left) and +V = +8.5 V (right).

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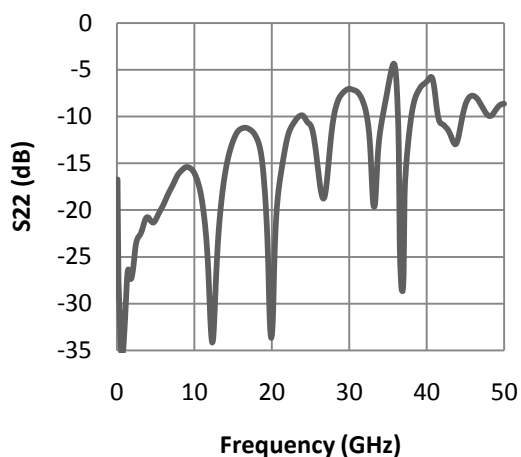
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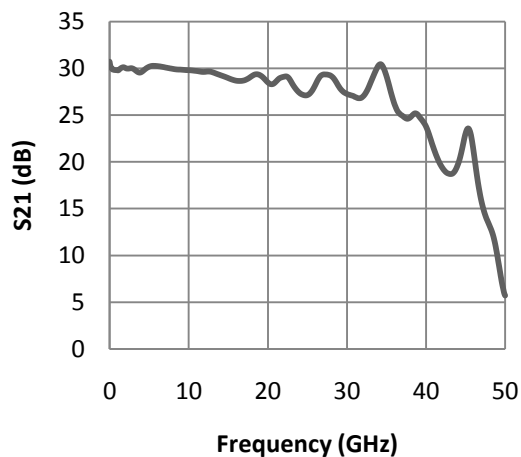
Input Return Loss



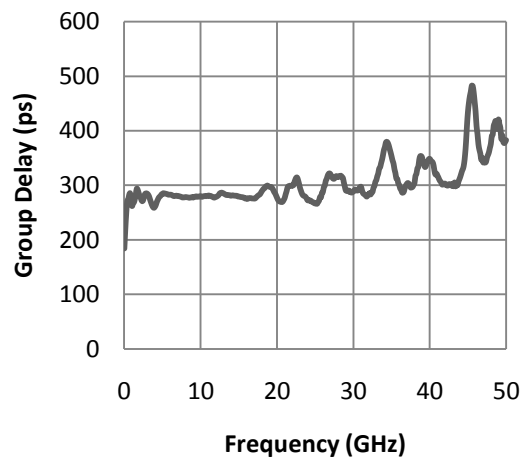
Output Return Loss



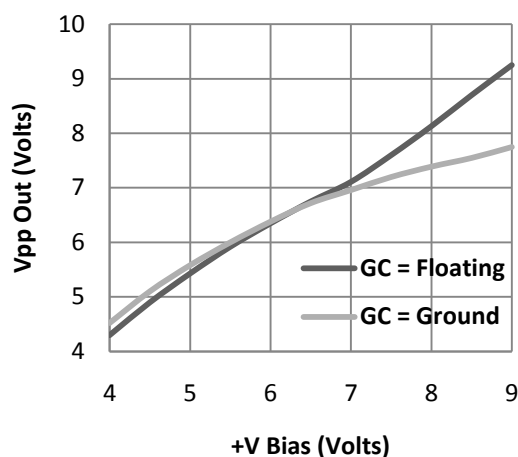
Gain (Small Signal)



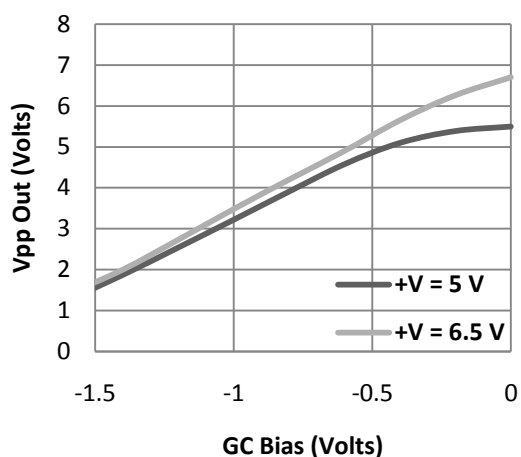
Group Delay



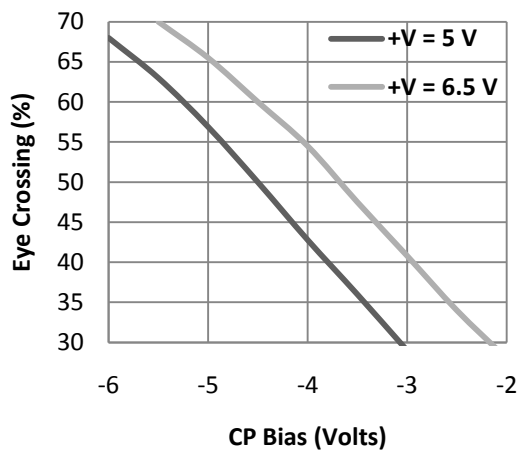
Vpp Out vs. +V

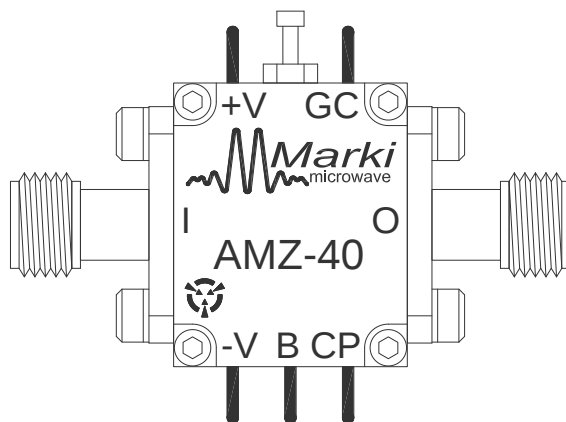


Vpp Out vs. Gain Control



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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