

Optical Modulator Driver Amplifier

MDA-1220-08S

Features

- **Wide Bandwidth:**
30kHz – 15GHz
- **Rise Time:** 15 ps
- **Eye Amplitude:** 7.5 V_{pp}
- **Accepts RZ input signal**
- **Crossover Control**
- **Hermetic Surface Mount Package**
- **Small Form Factor:** 0.679 x 0.447 x 0.170 inches

Applications

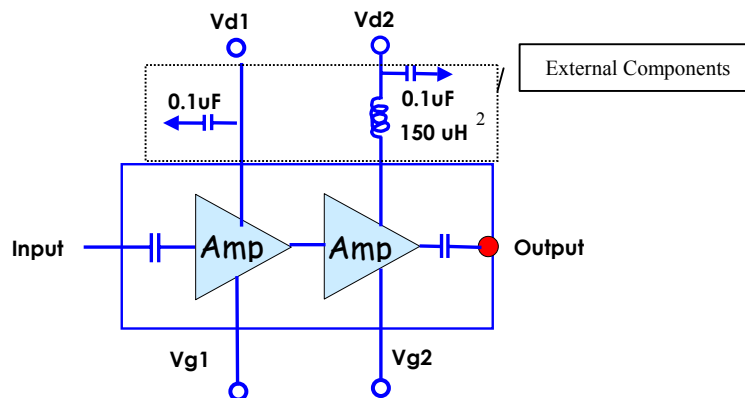
- **Long haul optical transmission systems**
- **Data Driver Amplifier for EA Modulator and LiNbO₃ Modulator**



General Description

The MDA-1220-08S is an extremely broadband non-inverting amplifier in hermetic surface mount package design specifically for OC-192 (STM-64) communication system applications with or without FEC protocols. Using advanced GaAs technology, it provides data driving capability for EA Modulator and LiNbO₃ Modulator. This surface mount amplifier is designed for use between Mux Chips and Optical Modulator to amplify NRZ or RZ signals from 9.953 to 12.5Gb/s

Functional Block diagram



MDA-1220-08S Absolute Maximum Ratings¹

Parameter	Units	Min	Typ	Max
Positive Supply Voltage Vd1 / Vd2	V	8 / 4	9 / 6	10.5 / 6.5
Negative Supply Voltage Vg1 / Vg2	V	-2 / -7	-0.5 / -4	0 / 0
Output Control Port Voltage	V			8.0
Modulation Input Voltage	V (p-p)			1.3
Storage Temperature	C°	-55		+125

Note: 1 Operation of this device in excess of any of these limits may cause permanent damage.
2 Recommended Coil Craft inductor, PN DO1608C-154

MDA-1220-08S Summary Characterization

0° C to 70° C

Parameter	Units	Min	Typ	Max
Input Voltage Range	V	0.4	-	0.8
	dBm	-4	-	+2
High Frequency	GHz	15	18	
Low Frequency	kHz		30	50
Gain*	dB	18	20	
Gain Ripple	dB		+/-1.5	+/-2
Controllable Output Voltage	V	7.0	7.5	
Group Delay Variation – 50MHz to 15GHz (aperture 800MHz)	ps		+/-20	+/-30
Output Rise Time**/ Fall Time (from 20% to 80%)	ps		15/23	20/30
Additive Jitter @25° C at 12.5Gbit/s Peak to Peak / (rms)	ps		5 (0.5)	
Output Power at 1dB gain Compression @ 10 GHz	dBm		22	
Overshoot/Undershoot	%		5	
Output eye amplitude	V	7.0	7.5	
Input Return Loss	dB		-10	TBD
Output Return Loss	dB		-10	TBD
Crossover Adjustable Range	%		35 / 65	
Supply Current (Vd1) 9V	mA		150	200
Positive DC Voltage Supply Vd1 (200mA)	V	9.0	9.5	10
	Vd2 (350mA)	V	5.8	6.2
Supply Current (Vd2) 5V	mA		300	350
Negative DC Voltage Supply Vg1	V	-2	-0.5	0
	Vg2	V	-7	-3
Dimensions	Inches	0.679" x 0.447" x 0.170"		

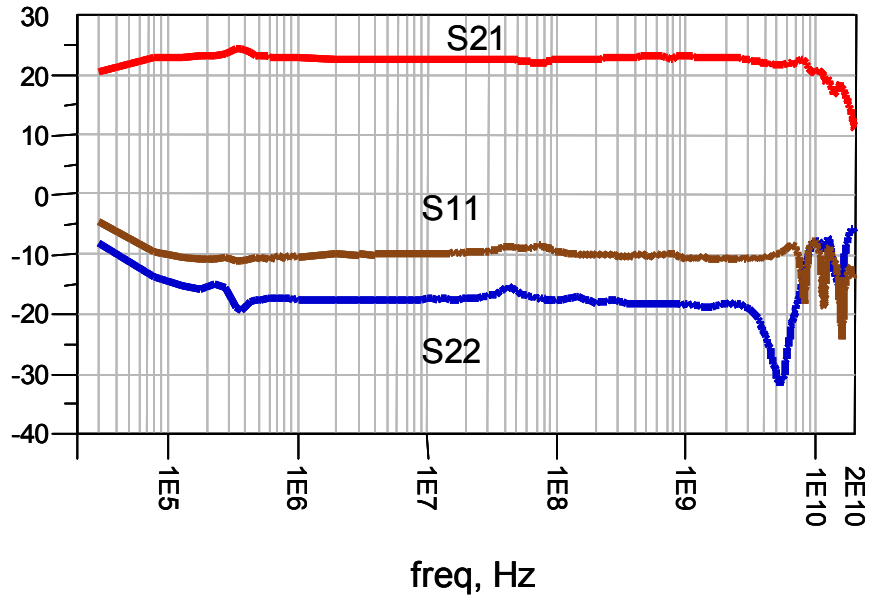
* Contact factory for different Gain and Output Voltage options

** Calculate using formula $t_{d(\text{amplifier})} = \sqrt{(t_{d(\text{system})})^2 - (t_{d(\text{generator})})^2}$

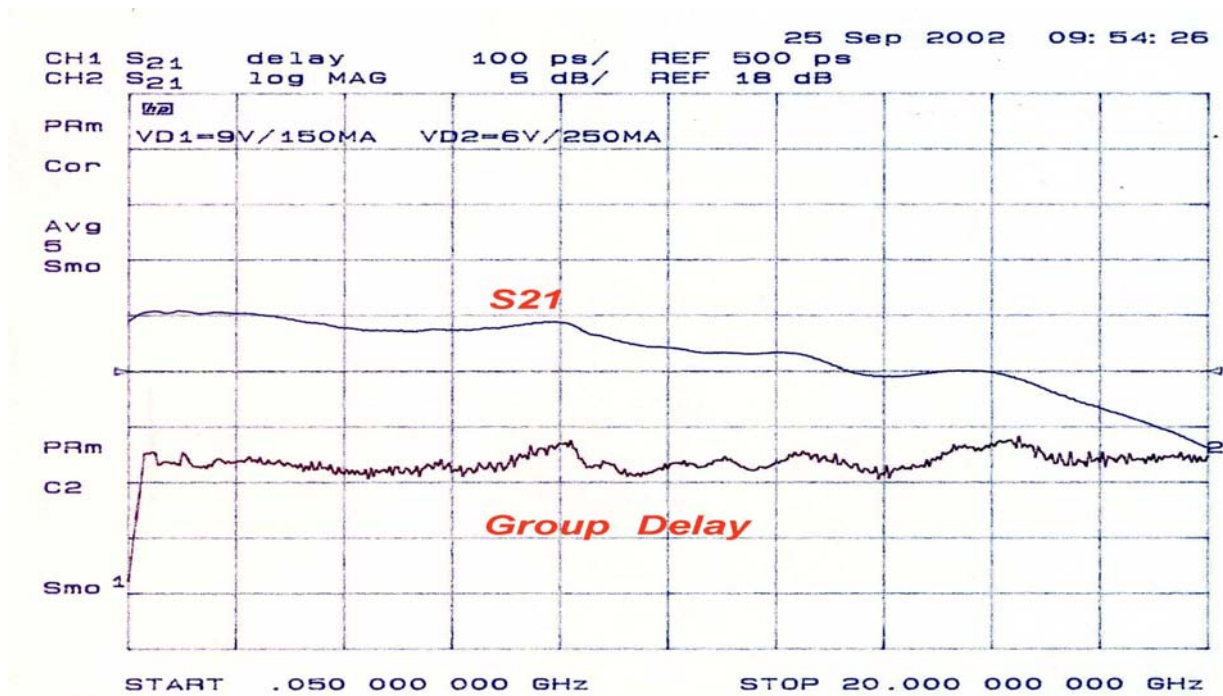
Preliminary Data Sheet for Optical Modulator Driver Amp
Information is subjected to change without prior notification

Typical Performance Curves @ +25° C

Gain Flatness & Return Loss

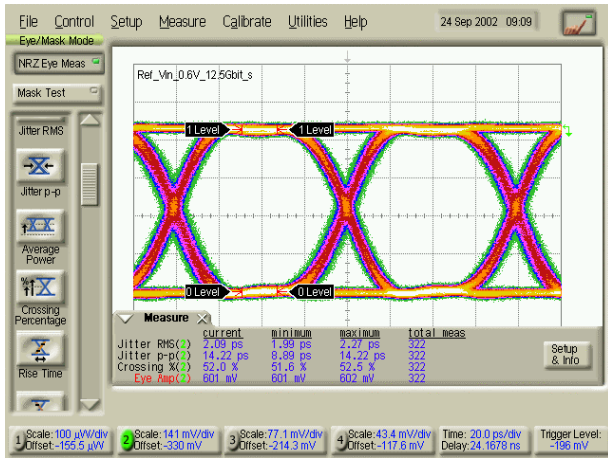


Time Delay

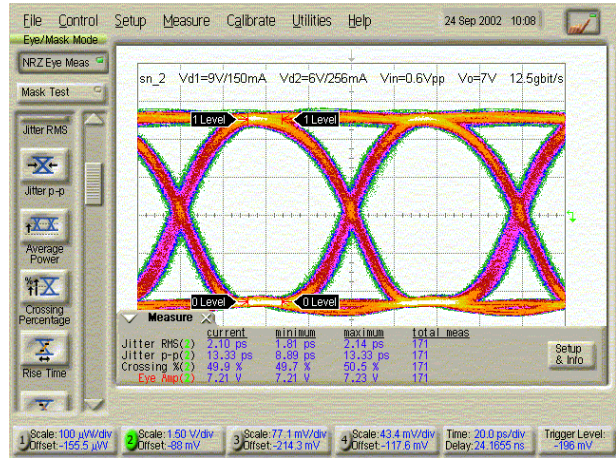


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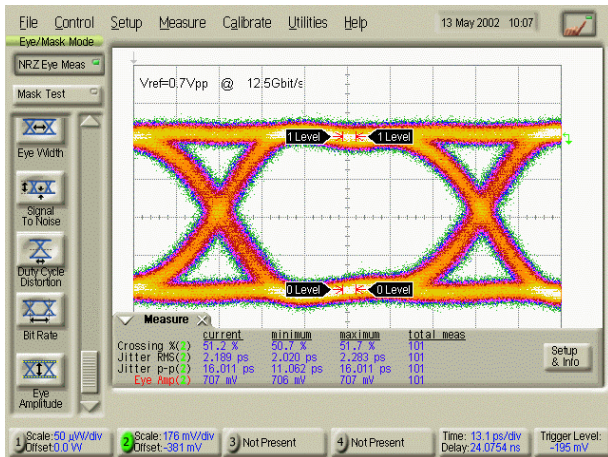
12.5Gbit/s (NRZ) Measurements



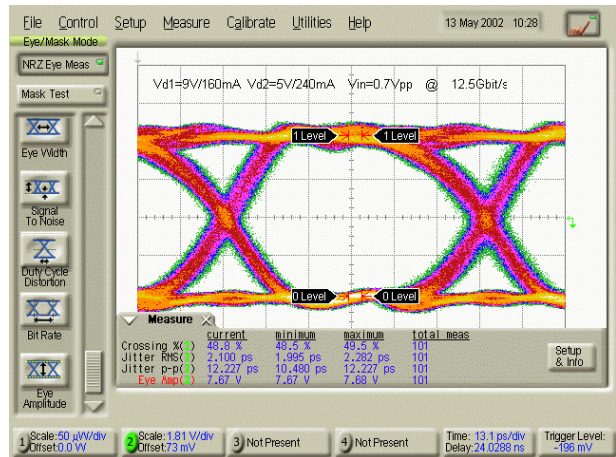
Input signal (NRZ, $2^{31}-1$, 0.6Vp-p)



Output signal (Eye amplitude 7V p-p)

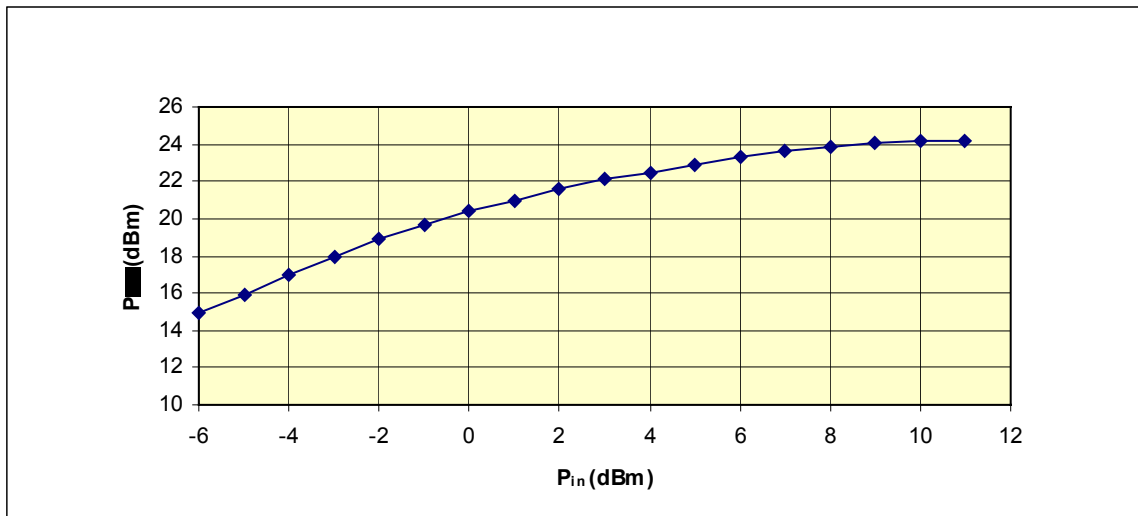


Input signal (NRZ, $2^{31}-1$, 0.7Vp-p)



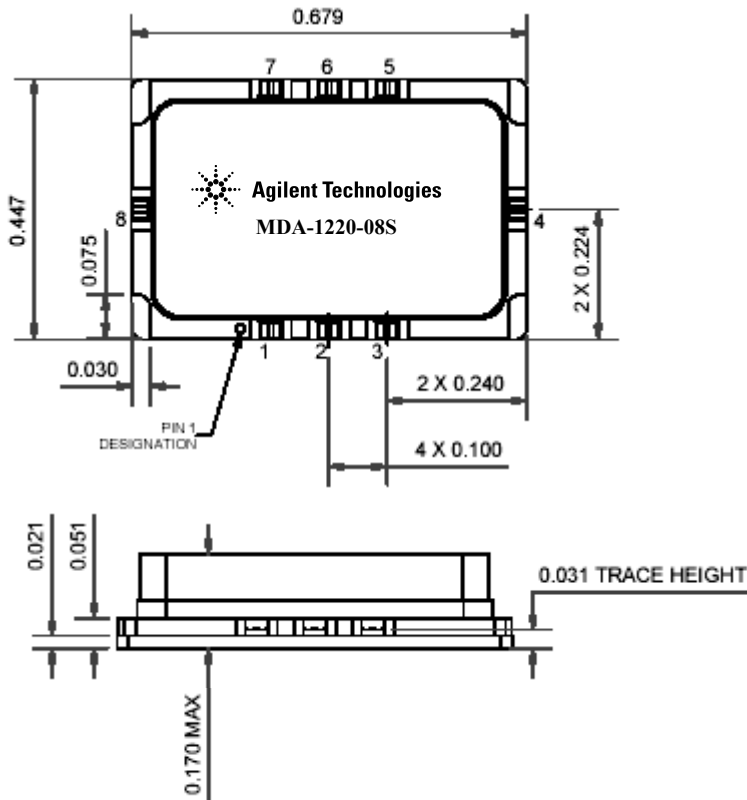
Output signal (Eye amplitude 7.7Vp-p)

Power Output vs. Power Input (@ 12.5GHz)



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Package Drawing and Mechanical Dimensions



Pin#	Description
1	Vg1 (0V to -2V)
4	RF output
3	Vg2 (0V to -7V)
5	Vd2 (6V)
7	Vd1 (+9V/+10V)
8	RF input
6,2	GND

Part Number Ordering Information

Part Number
MDA-1220-08S

For more information:
 United States: call your local Agilent Technologies sales office
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 Ask for a components representative.

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