

56 Gbaud Differential Linear Amplifier AH54192A

AH54192A is a linear amplifier with superior characteristics for high-speed pulse response. It is suitable for driving optical modulators and amplifying high-speed digital signal.

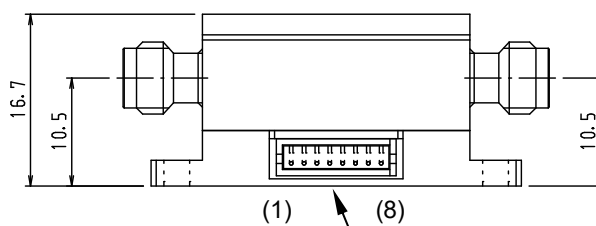
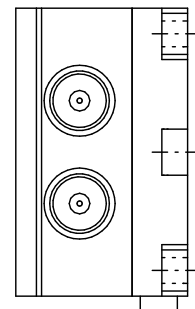
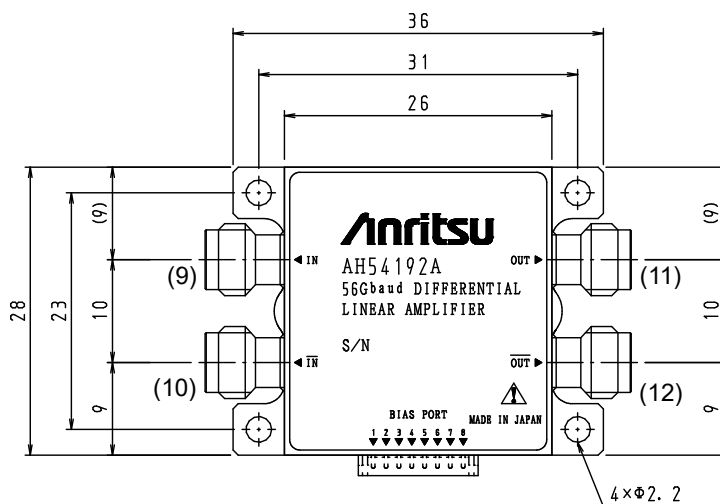
FEATURES

- Operating Baud-Rate: up to 56 Gbaud
- Differential output: 4V_{p-p}(diff) typ.
- Wideband: 100 kHz to 40 GHz
- Power consumption: 0.9 W typ.
- I/O interface: Differential
- Package size: 28mm × 36mm × 17mm
- Standard accessory with dedicated power supply

APPLICATION

- Driver for 400G coherent MZ modulator
- Booster amplifier for measuring equipment

DIMENSIONS



DF13-8P-1.25DS(20) Connector

Input : V-F Connector
Output : V-F Connector

Unit: mm

PIN CONFIGURATION

No.	Symbol	Function	Remarks
1	NC	—	—
2	NC	—	—
3	NC	—	—
4	GND	Ground	—
5	V _{CC}	Power Supply	+3 V
6	V _{amp}	Power Supply	+3 V
7	V _{BT}	Choke Bias	+4.2 V
8	V _{BT}	Choke Bias	+4.2 V
9	IN	Input Port (non-invert)	AC Coupled
10	$\overline{\text{IN}}$	Input Port (invert)	AC Coupled
11	OUT	Output Port (non-invert)	AC Coupled
12	$\overline{\text{OUT}}$	Output Port (invert)	AC Coupled

ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Ratings	Unit
Input Signal Voltage	V _{in}	-1 to +0.7	V
Supply Voltage	V _{BT}	-0.5 to +5	V
	V _{CC}	-0.5 to +3.5	V
	V _{amp}	-0.5 to +3.5	V
Operating Ambient Temperature ^{*1}	T _a	+5 to +50	°C
Storage Temperature ^{*1}	T _{stg}	0 to +60	°C

*Excess over the absolute maximum ratings may cause device failure.

*1 No Condensation

ELECTRICAL CHARACTERISTICS

(T_a = 25°C, V_{BT} = +4.2 V, V_{CC} = +3 V, V_{amp} = +3 V, Z_{in} = 50 Ω, Z_{out} = 50 Ω)

Item	Test condition	Min.	Typ.	Max.	Unit
Baud-Rate	—	56	—	—	Gbaud
Differential Input Voltage ^{*1}	—	—	1	—	V _{p-p} (diff)
Linear Output Voltage ^{*2}	—	—	4	—	V _{p-p} (diff)
Small Signal Gain	@1 GHz	—	12	—	dB
Bandwidth	-3 dB (low end)	—	100	—	kHz
	-3 dB (high end)	—	40	—	GHz
Input Return Loss	10 MHz to 30 GHz	—	10	—	dB
Output Return Loss	10 MHz to 30 GHz	—	10	—	dB
Output Polarity	—	inverted			—

*1 The data input condition is differential only.

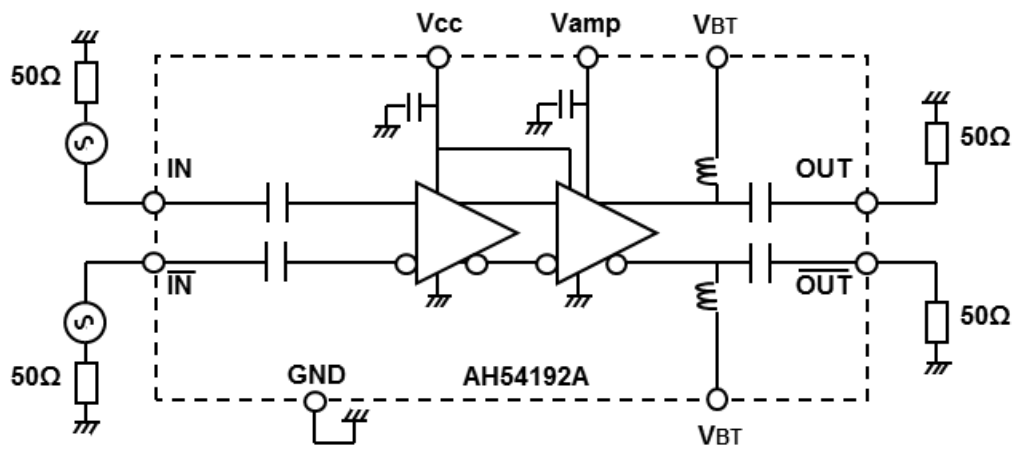
*2 In the case of being measured in the following conditions.

- Connect 15cm V-type coaxial cable to the output of AH54192A.
- Measured by the Keysight 86118A 70GHz remote sampling head with 86107A precision time base.
- Operated by AH54192A-01 dedicated power supply.

POWER SUPPLIES

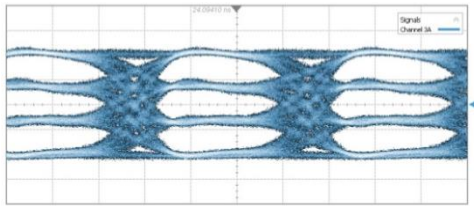
Item	Test Condition	Min.	Typ.	Max.	Unit
Supply Voltage	V_{BT}	–	+4.2	+4.4	V
	V_{CC}	–	+3	–	V
	V_{amp}	–	+3	–	V
Supply Current	$I_{BT} (\times 2)$	–	160	180	mA
	I_{CC}	–	65	75	mA
	I_{amp}	–	10	20	mA
Power Consumption	–	–	0.9	–	W

BLOCK DIAGRAM



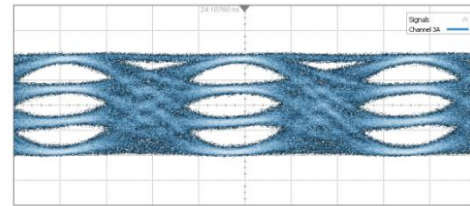
OUTPUT WAVEFORM (Single-ended)

26 Gbaud PAM4



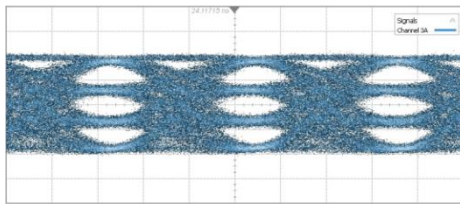
V: 0.5 V/div H: 10 ps/div

53 Gbaud PAM4



V: 0.5 V/div H: 5 ps/div

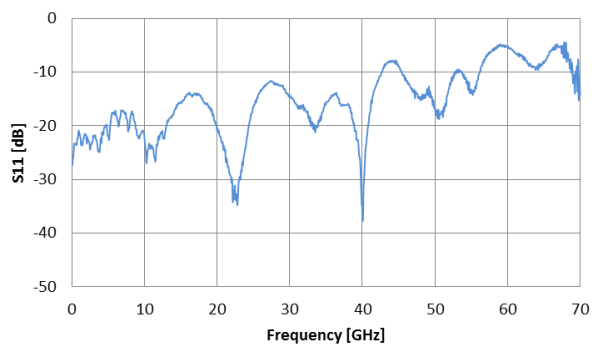
64 Gbaud PAM4



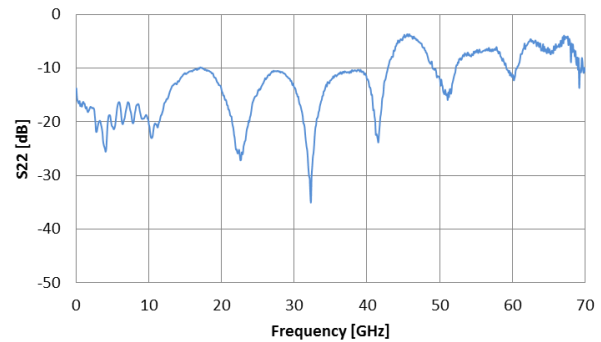
V: 0.5 V/div H: 5 ps/div

Differential input signals have been adjusted with the PAM4 PPG emphasis.

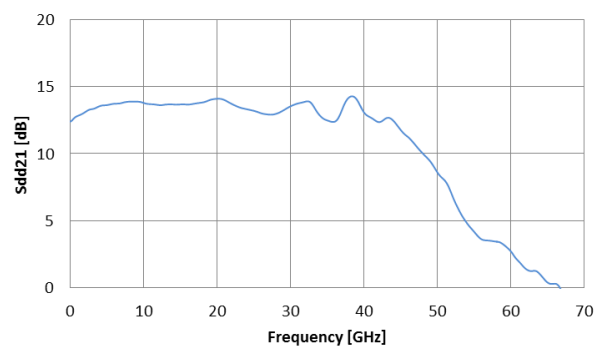
FREQUENCY RESPONSE



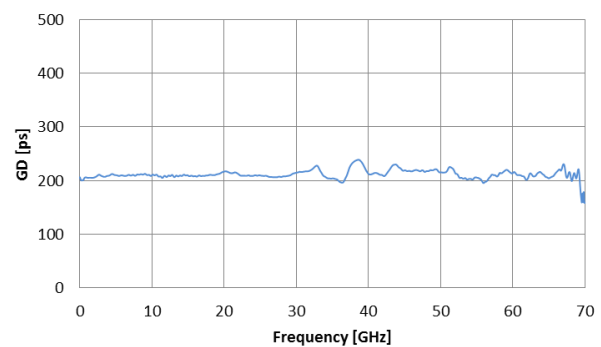
S11



S22



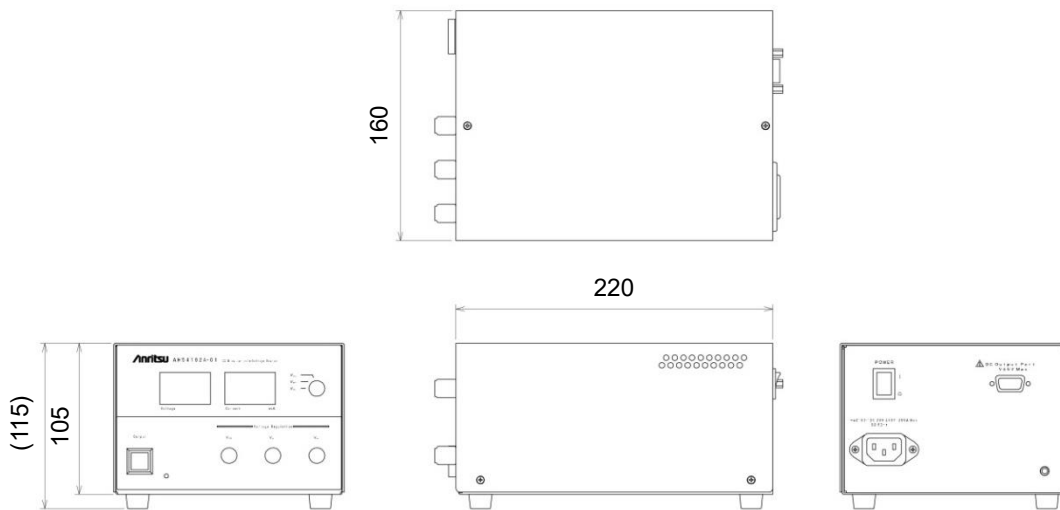
Sdd21



Group Delay

DEDICATED POWER SUPPLY AH54192A-01

DIMENSIONS



Unit: mm

SPECIFICATIONS

($T_a = 25^\circ\text{C}$, $V_{in} = 100\text{-}120/200\text{-}240\text{ V(AC)}$, 50/60 Hz)

Item	Symbol	Test Condition	Min.	Max.	Unit
Voltage Output	V_{BT}	—	+3.5	+4.5	V
	V_{CC}	—	+2.5	+3.2	V
	V_{amp}	—	+1.5	+3.2	V
Current Output	I_{BT}	$V_{BT} = +4.2\text{ V}$	—	180	mA
	I_{CC}	$V_{CC} = +3\text{ V}$	—	75	mA
	I_{amp}	$V_{amp} = +3\text{ V}$	—	20	mA
Ripple Noise	—	—	—	5	mV _{p-p}
Power Consumption	—	—	—	20	VA
Operating Ambient Temperature ^{*1}	T_a	—	+5	+50	°C
Storage Temperature ^{*1}	T_{stg}	—	-20	+60	°C

*1: No Condensation

ORDERING INFORMATION

Please specify the model, name, quantity when ordering.

Model	Name
AH54192A	56 Gbaud Differential Linear Amplifier
AH54192A-01	Power Supply for AH54192A (Be sure to specify)
	— Standard Accessories —
	AC Power Cable: 1 pc
	Dedicated DC Power Cable: 1 pc



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