

Ideal for Evaluating Optical Transmission Devices Beyond 1T High Speed Wideband High-Power built-in Bias Tee Linear Amplifier **AH15199B, AH15203A/B** NEW



Rapidly increasing data traffic due to explosive growth of AI, machine learning, and other services presents a major challenge to increased communication speeds for servers and network devices. The next-generation Ethernet standard IEEE802.3 supporting high-speed networks uses digital coherent methods, such as 800GBASE-LR1 (for 10 km), 800GBASE-ER1-20 (for 20 km), and 800GBASE-ER1 (for 40 km), as well as the IM-DD method. The Optical Internetworking Forum (OIF) is studying specifications for optical transmission technologies, such as 800ZR, 1600ZR, as well as coherent technology to support increased optical network capacity and accelerate growth of “beyond 1 Terahertz” systems. However, faster transmission speeds suffer larger signal attenuation, so a high-power linear driver is needed to amplify PAM signals faithfully and drive modulators directly.

The AH15199B, AH15203A/B high-output linear amplifiers support evaluation of 2.0 V_{p-p} signals at 140 Gbaud PAM4, high-speed, high-output (2 V_{p-p}) data transmission at a low maximum power consumption of 1.5 W. They can drive modulators requiring high amplitude, such as 800GbE/1.6TbE digital coherent signals, directly and can also serve as IMDD optical modulator drivers widely used in short- to medium-reach optical communications to amplify 140 Gbaud PAM4 signals from various signal sources such as DSPs. Furthermore, they have a gain characteristic of 10 dB or more even at 112 GHz, the Nyquist frequency of 224 Gbaud signals, so they can also amplify 224 Gbaud PAM4 signals. The AH15203A/B has a built-in Bias Tee on the output side for directly driving optical modulators requiring bias addition, such as EML, DML, and VCSEL.

Target Markets

Optical/electrical high-speed device manufacturers, measuring instruments for optical signal testing

Application

Evaluation of high-speed 140 Gbaud optical devices

FEATURES

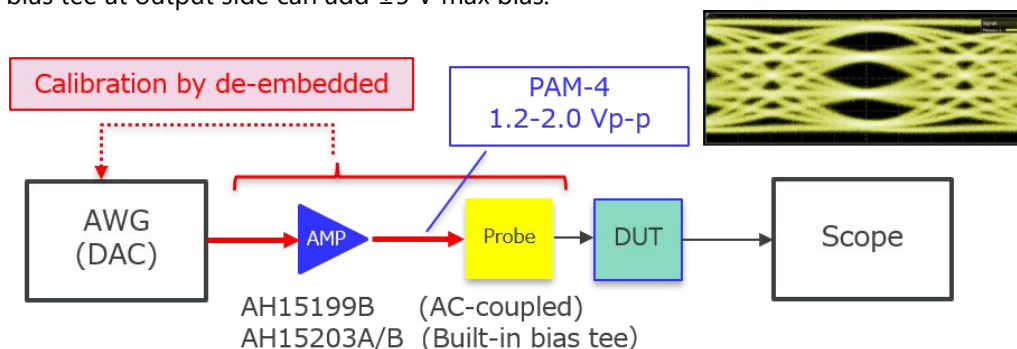
- Good linearity (R_{LM}), low distortion and good waveform quality even at output amplitudes as high as 2.0 V_{p-p}.
- Fast 5 ps Tr/Tf supports PAM4 signals with high SN level.
- Dedicated power supply with AC adapter eliminates concerns about power supply on/off sequence.

AH15199B

- -6 dB bandwidth extending to 135 GHz for 140 Gbaud PAM4 signals.
- High gain characteristic of 15.5 dB to maintain output level when level reduced by signal sources or external equipment.
- Easy-to-use configuration with AC-coupled input and output interfaces.

AH15203A/B

- Built-in bias tee at output side can add ± 5 V max bias.

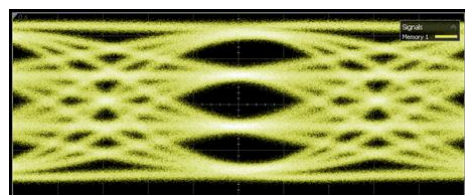


High small-signal gain characteristic of 15.5 dB assures required DUT drive voltage even if the output level drops due to analog bandwidth (limitation) of signal source and further level drops due to frequency compensation (de-embedding function) of external devices.

OUTPUT WAVEFORM (AH15199B)

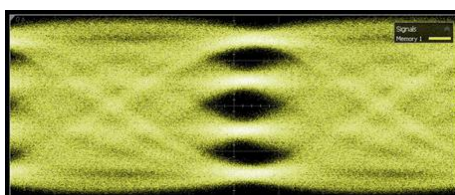
Calibrated waveforms for frequency response (loss) of
AWG and external equipment

112 Gbaud PAM4



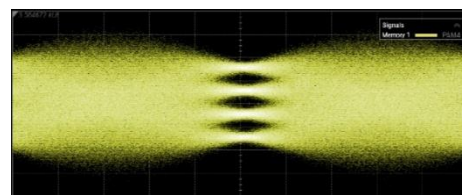
Outer OMA: 2.09 V R_{LM} : 0.92

140 Gbaud PAM4



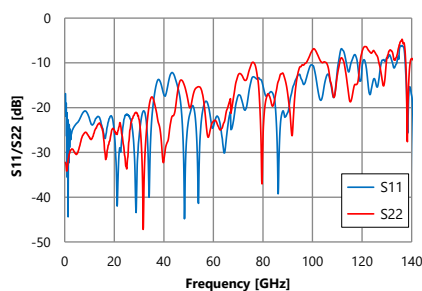
Outer OMA: 2.00 V R_{LM} : 0.92

224 Gbaud PAM4 (diff.)

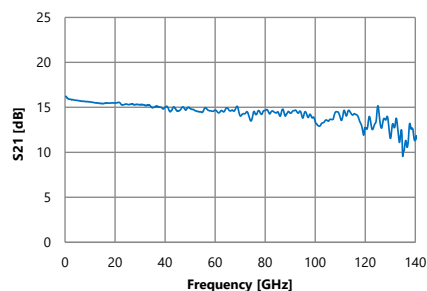


Outer OMA: 1.00 V

FREQUENCY RESPONSE (AH15199B)



S11/S22



S21

SPECIFICATIONS

NEW

Item	Test Condition	AH15199B			AH15203A/B			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Baud Rate	—	—	140	—	—	140	—	Gbaud
Maximum Linear Output Voltage	$V_{in} = 0.35 V_{p-p}$	—	2.0	—	—	2.0	—	V_{p-p}
Jitter	—	—	300	500	—	300	500	fs
T_r/T_f	20 % to 80 %	—	5	—	—	5	—	ps
Small Signal Gain	@1 GHz	—	15.5	—	—	15.0	—	dB
Bandwidth	-3 dB (low end)	—	200	500	—	200	500	kHz
	-3 dB (high end)	—	105	—	—	105	—	GHz
	-6 dB (high end)	—	135	—	—	125	—	GHz
Built-in bias tee ^{*1}	-3 dB	—	—	—	10	15	—	kHz

*1 Supply voltage max. ± 5 V, max. 150 mA, DC Resistance about 3 Ω

ORDERING INFORMATION

Please specify the model, name and quantity when ordering.

Model.	Name
AH15199B	Wideband Linear Amplifier
AH15199B-01	Power Supply for AH15199B (Be sure to specify) — Standard Accessories — AC Adapter: 1 pc, Dedicated DC power cable: 1 pc
AH15203A	Wideband Linear Amplifier with built-in Bias Tee (Input Female connector) — Standard Accessories — MMCX to BNC Adapter cable: 1 pc
AH15203B	Wideband Linear Amplifier with built-in Bias Tee (Input Male connector) — Standard Accessories — MMCX to BNC Adapter cable: 1 pc
AH15203A-01	Bias Controller for AH15203 (Be sure to specify together with 203A or B) — Standard Accessories — AC Adapter: 1 pc, Dedicated DC power cable: 1 pc



Dedicated Power Supply

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