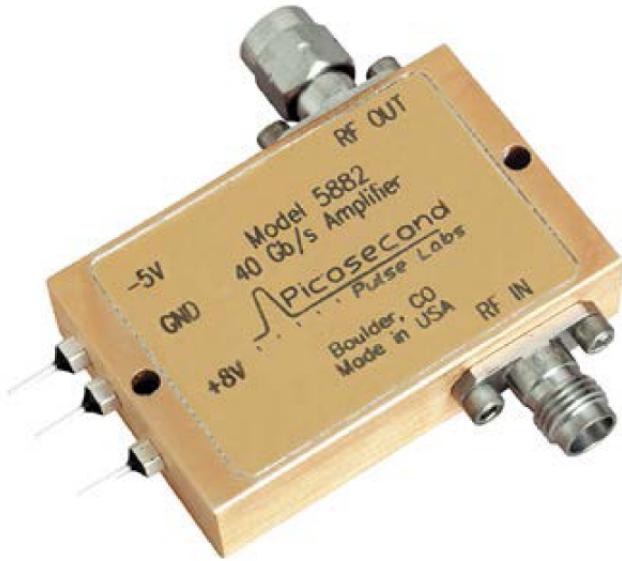
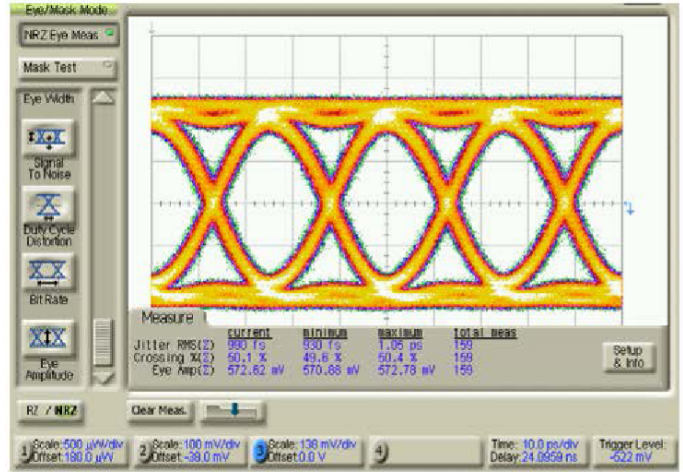


40 Gb/s Broadband Amplifier

PSPL5882 Datasheet



Typical 40 Gb/s Eye Measurements

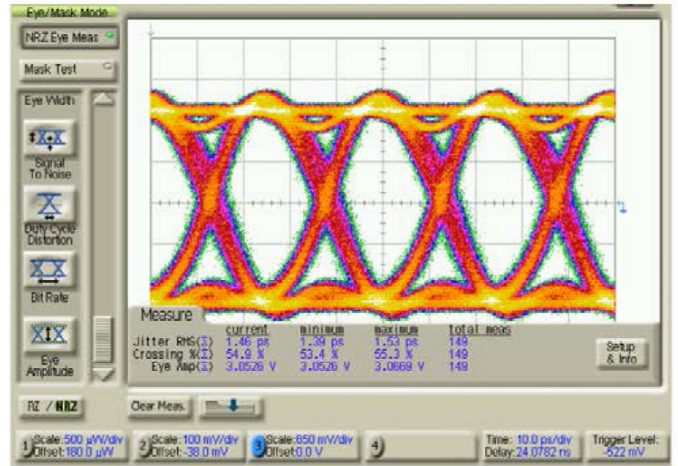


Input test signal¹; Eye amplitude 573 mV

The PSPL5882 is extremely broadband, covering over 6 decades from 25 kHz to 35 GHz. It also demonstrates a very clean time domain response, resulting in high quality 40 Gb/s eye diagrams. The PSPL5882 includes internal reverse voltage protection, power supply regulation, and sequencing circuitry, making it insensitive to power supply voltage variation and application sequence.

Key performance specifications

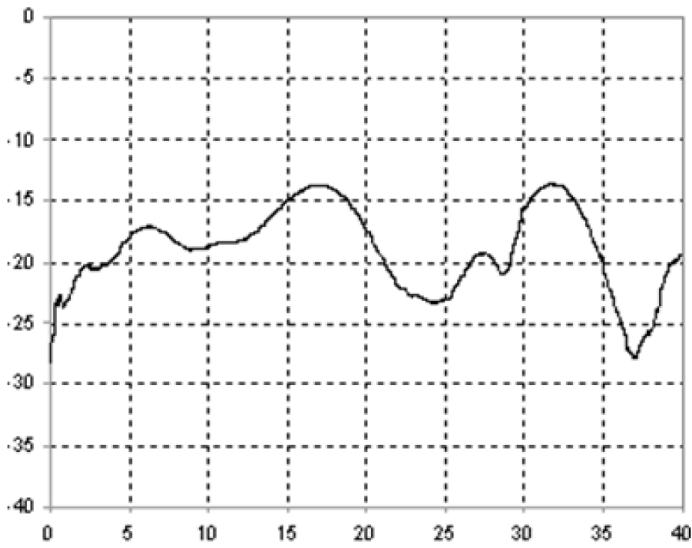
- Electro-Absorption Modulator driver or optical receiver amplifier
- Linear amplifier with 16 dB gain
- 25 kHz to 35 GHz bandwidth
- 2.7 V_{amp} eye amplitude
- 9 ps rise time



Output response; Eye amplitude 3.0 V

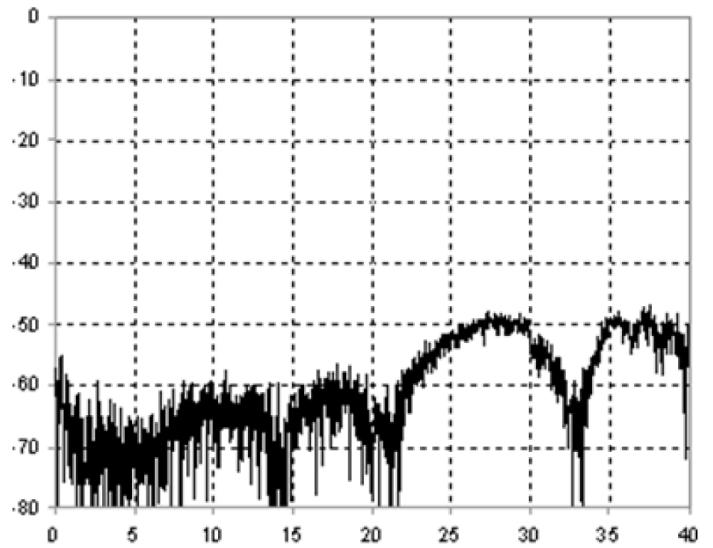
¹ Input test signal is 40 Gb/s NRZ, 2³¹-1 PRBS

Typical performance



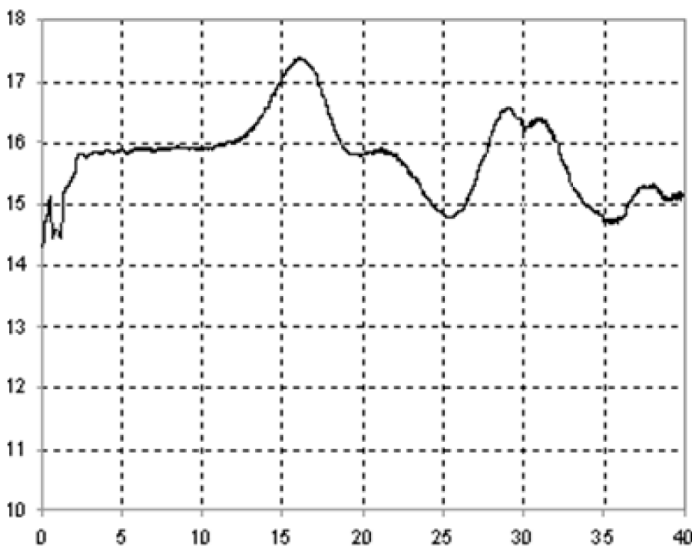
S11

5 dB/div, 5 GHz/div



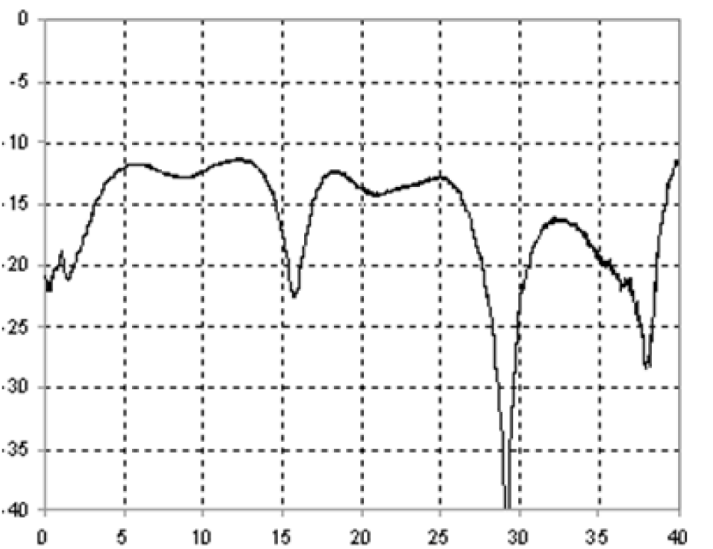
S12

10 dB/div, 5 GHz/div



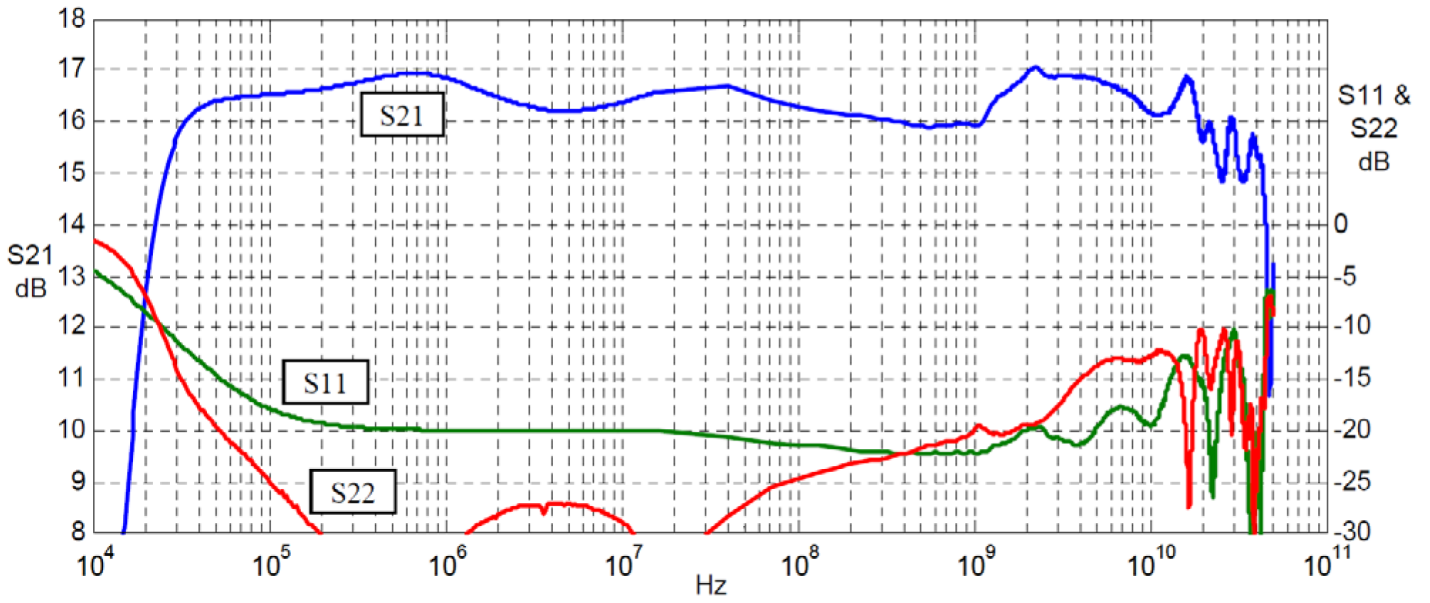
S21

1 dB/div, 5 GHz/div

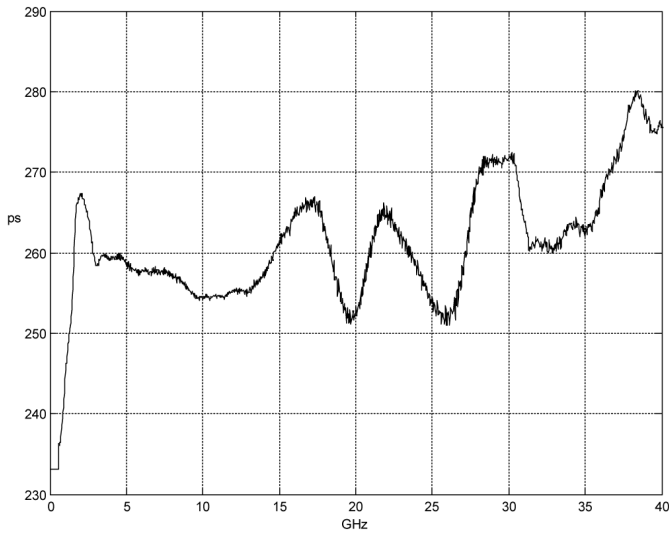


S22

5 dB/div, 5 GHz/div



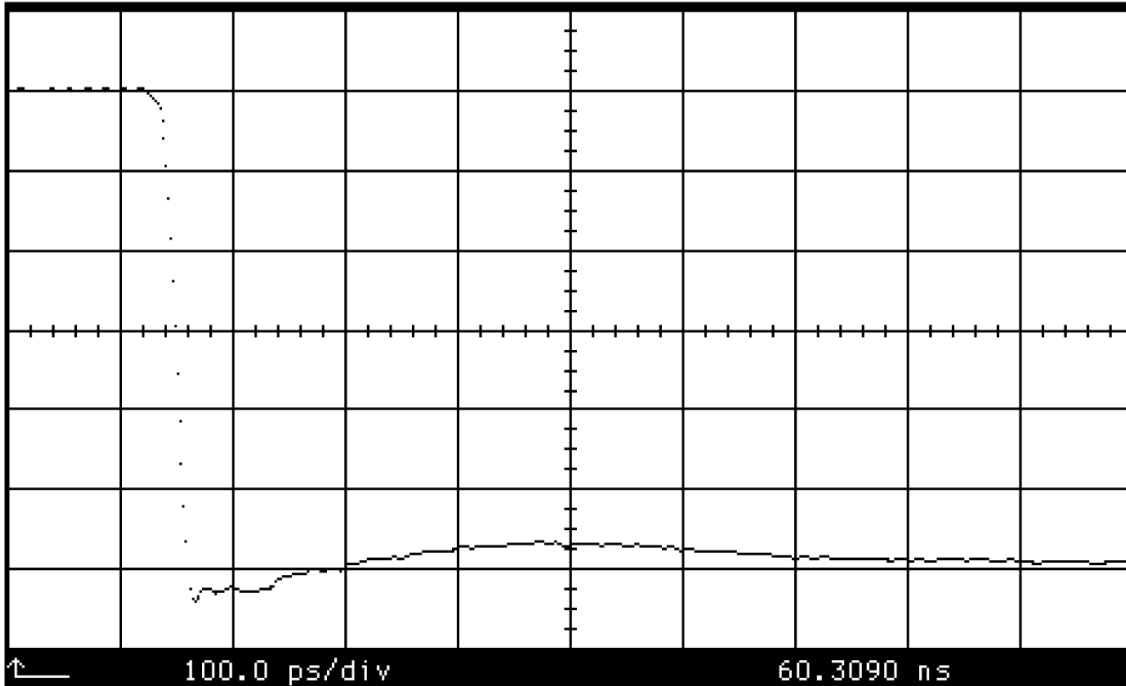
Typical S₂₁ S₁₁ and S₂₂ from 10 kHz to 50 GHz



Typical Group Delay (10 ps/div, 5 GHz/div, 0.8 GHz aperture)

Time Domain Response

#Averages = 256



	current	mean	std dev
Falltime(r1)	18.1 ps	18.12 ps	10 fs

Response 1

Risetime 16 ps

TDR / TDT

TDR TDT

TDT normalize

off on

Normalize scaling...

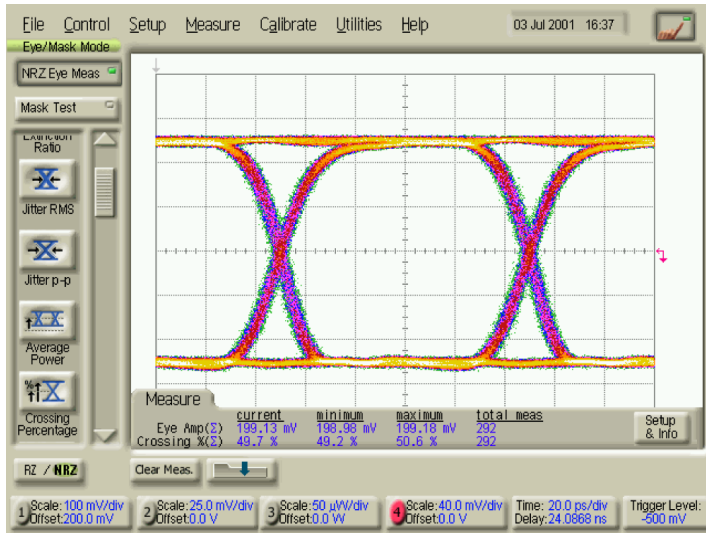
Establish normalization & ref plane

Done

Typical Step Response (input signal is 16 ps fall time)

$$t_r(\text{amplifier}) = \sqrt{[t_r(\text{system})]^2 - [t_r(\text{generator})]^2}$$

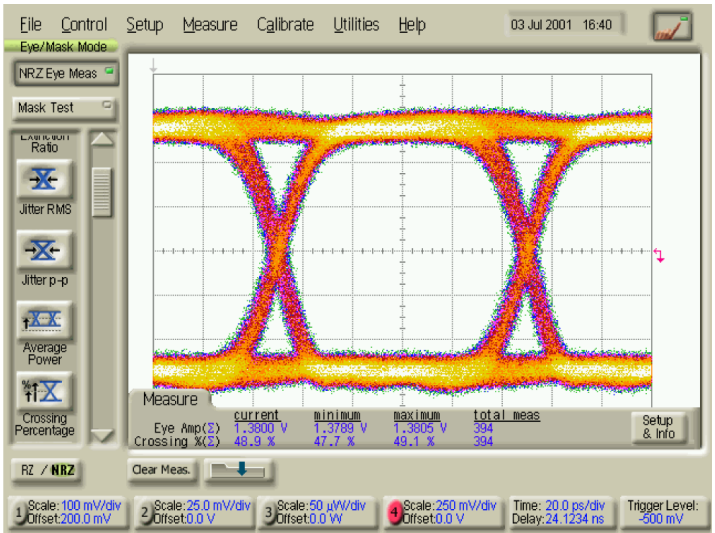
10 Gb/s measurements



0.2 V Input Test Signal

Input signal is NRZ, $2^{31}-1$.

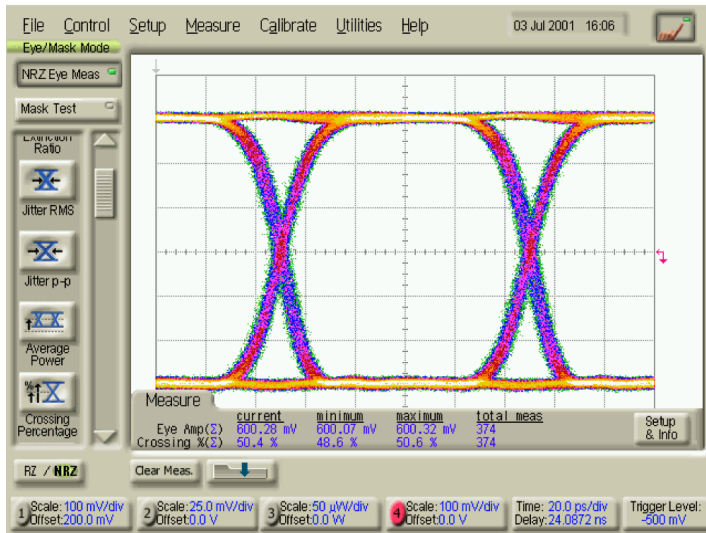
Eye amplitude 0.2 V, 50% crossing point.



Output Response to 0.2 V

Amplifier in linear range.

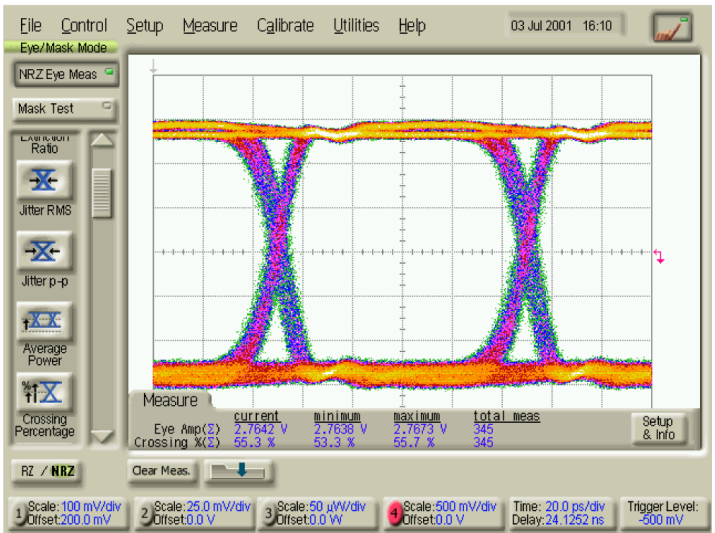
Eye amplitude 1.38 V, 49% crossing point.



0.6 V Input Test Signal

Input signal is NRZ, $2^{31}-1$.

Eye amplitude 0.6 V, 50% crossing point.



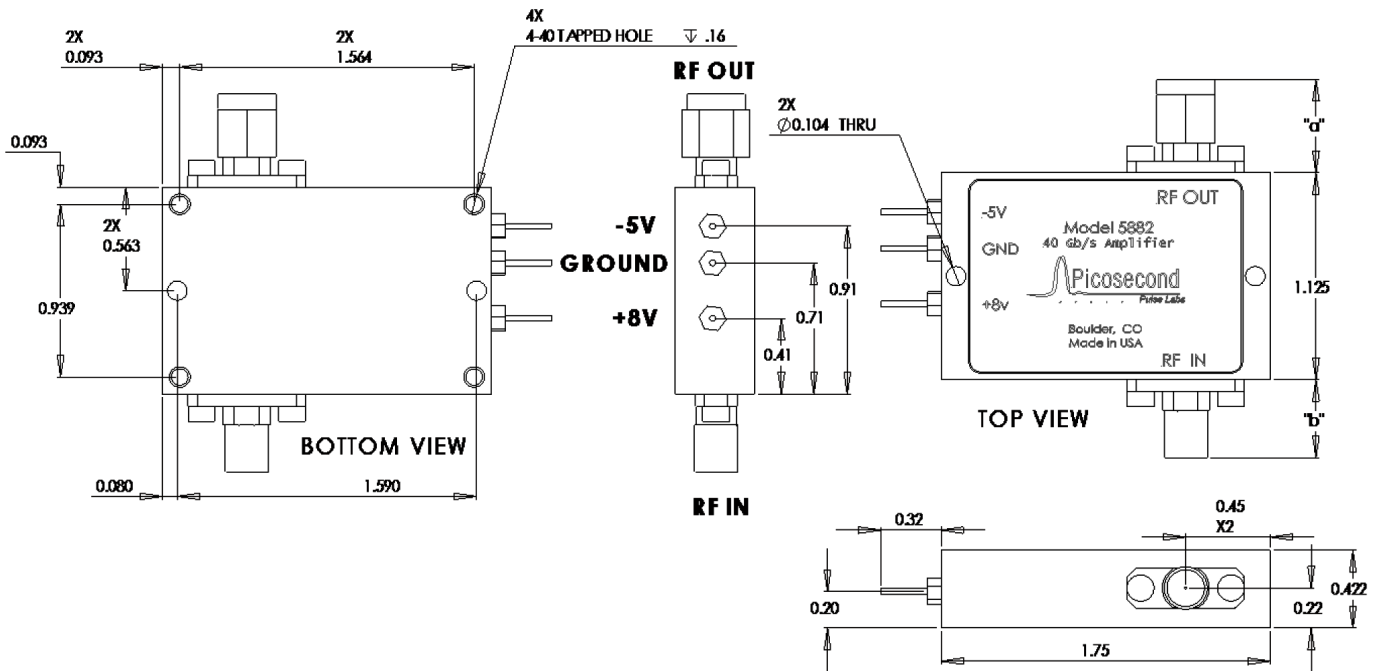
Output Response to 0.6 V

Amplifier in compression (~3.5 dB).

Eye amplitude 2.76 V, 55% crossing point.

Specifications

Parameter	Symbol	Units	Minimum	Typical	Maximum	Comments
Impedance	Z	Ohms		50		
Upper 3 dB freq.	$f_{c,h}$	GHz	30	35		Relative to gain at 100 MHz
Lower 3 dB freq.	$f_{c,l}$	kHz		25	40	
Small Signal Gain	S_{21}	dB	14.5	16		Measured at 100 MHz
Gain Ripple		dB		± 1	± 2	50 MHz < f < 30 GHz
Max Power Out (-1 dB gain comp)	$P_{1\text{ dB}}$	dBm		12 11		f < 25 GHz 25 GHz \leq f < 40 GHz
Output Eye Voltage	V_{OUT}	V_{amp}	2.4	2.7		$V_{\text{in}} = 0.6 V_{\text{amp}}$, 12.5 Gb/s PRBS
Input Return Loss	S_{11}	dB		-18 -10	-14 -8	50 MHz < f < 10 GHz 10 GHz \leq f < 30 GHz
Output Return Loss	S_{22}	dB		-13 -10	-10 -8	50 MHz < f < 10 GHz 10 GHz \leq f < 30 GHz
Rise Time	t_r	ps		9		10-90%, root-sum-of-squares extraction, 16 ps system rise time
Fall Time	t_f	ps		9		
Overshoot		%		7		1 ns window, 16 ps system rise time
Undershoot		%		7		
Noise Figure	NF	dB		6		Measured at 1.5 GHz
Group Delay Variation		ps		± 20	± 30	3 GHz < f < 35 GHz, 0.8 GHz aperture
Polarity	Non-Inverting					
Coupling	AC, input and output					
DC Connector	Solder pins					
Voltage Supply (+)	$+V_{\text{DC}}$	V_{DC}	7	8	9	
Voltage Supply (-)	$-V_{\text{DC}}$	V_{DC}	-5.5	-5	-4.5	
Supply Current (+)	$+I_{\text{DC}}$	mA		155		
Supply Current (-)	$-I_{\text{DC}}$	mA		10		
Max Allowed Input		dBm			16	Input damage threshold
DC Voltage Applied to RF Input or Output		V_{DC}			8	Damage threshold
Operating Temp	T_{CASE}	Deg C			70	Case temperature
Warranty	One Year					



Connector dimensions

Connector	Dimensions "a" / "b"	
	Female	Male
2.92 mm	0.375 in (9.53 mm)	0.507 in (12.88 mm)
2.4 mm	0.430 in (10.92 mm)	0.513 in (13.03 mm)

Ordering information

Models

PSPL5882 AMPLIFIER, 40-45 GHz, 16 dB GAIN

Options

- Opt. 240JJ Female 2.4 mm connectors on Input and Output
- Opt. 240JP Female 2.4 mm connector on Input, Male 2.4mm connector on Output
- Opt. 292JJ Female 2.92 mm connectors on Input and Output

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