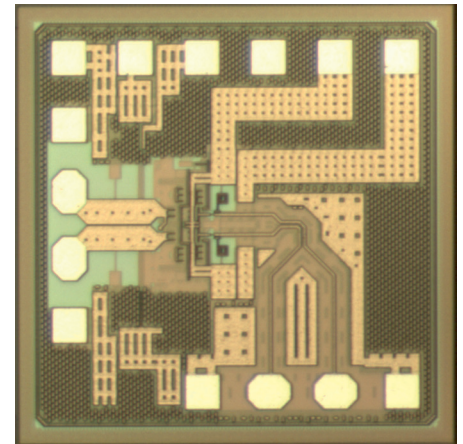
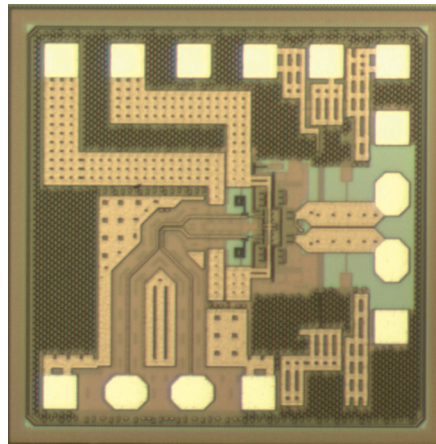


LOW-POWER 32 GBd LINEAR DRIVER FOR OPTICAL MODULATOR

AT A GLANCE

- 32 GBd linear differential driver for telecom and datacom applications

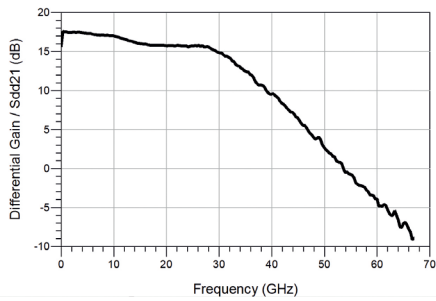


Features

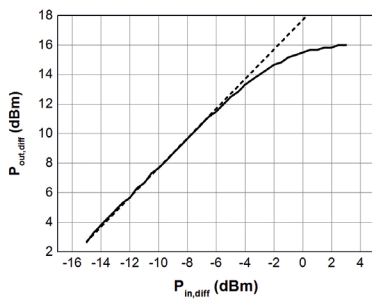
- Differential input and differential output
- Open-collector outputs
- Ultra-low power, 270 mW
- Linear Driver
- 3.0V_{pp} differential output at 2 x 25 Ω loads
- Integrated output peak-level detectors
- 90°-banded RF input, mirrored IC available

Applications

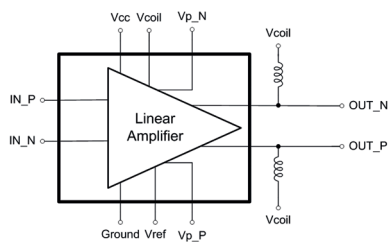
- Mach-Zehnder modulator driver
- Supports NRZ, PAM-4 Signals
- Broadband signal amplification



Differential S21 measurement result
 $(P_{in,diff} = -20\text{ dBm}, \text{Temp} = 23^\circ\text{C},$
 $Z_{in,diff} = 100\Omega, Z_{Load,diff} = 50\Omega)$



1-dB compression point at 1 GHz (40°C)

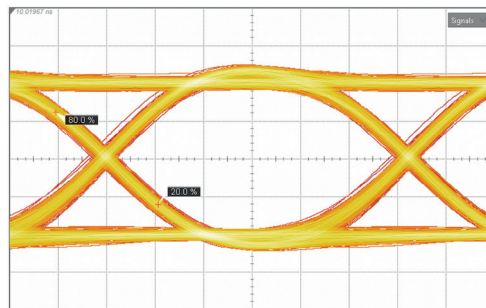


Circuit Block Diagram

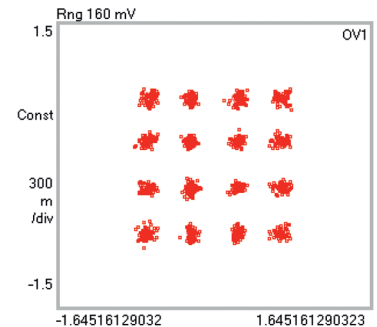
Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Bandwidth	BW		30		GHz	
Power	P		270		mW	
Data Rate	DR		32		Gb/s	
Rise / fall time	t_r/t_f		10		ps	20 % - 80 %
Gain*			17.5		dB	Differential S ₂₁ Z _{in,diff} = 100Ω, Z _{Load,diff} = 50Ω*
Group Delay Distortion*	GD			±5	ps	
Jitter (rms)			523		fs	
Jitter(p-p)			3.47		ps	
Differential Input Signal	$V_{IN,P} - V_{IN,N}$		600		mVpp	AC-coupled
Differential Output Signal	$V_{OUT,P} - V_{OUT,N}$		3000		mVpp	2 x 25 Ω load
P _{1dB}	P _{1dB}	13,6		14,4	dBm	output-referred, Z _{Load,diff} = 50Ω
THD	THD		3.7		%	1 GHz, 3V _{pp} output conditions
CMRR*	CMRR		14		dB	up to 20 GHz
Input Reflection*	S _{dd11}		DC < f < 8 GHz 8 GHz < f < 24 GHz 24 GHz < f < BW	-19 -9 -8	dB	Differential input
Output Peak-level detector			170 mV		V/V _{pp,diff}	Z _{Load,diff} = 50Ω, each output (V _{p_N} , V _{p_P}) referenced to Vref
Operation Temperature			40		°C	

* denotes that measurements were carried out at room temperature condition, 23°C. Unless noted, measurement temperature is 40°C.



Electrical eye waveform at 32 Gb/s
(5 ps/div, 700 mV/div, 40°C)



Electro-optical QAM-16 Constellation at 32 Gb/s, EVM: 6.4% rms

The Fraunhofer HHI

The Fraunhofer Heinrich Hertz Institute conducts research in the areas of video compression and processing, 3D systems, wireless communication as well as photonic components and networks.

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