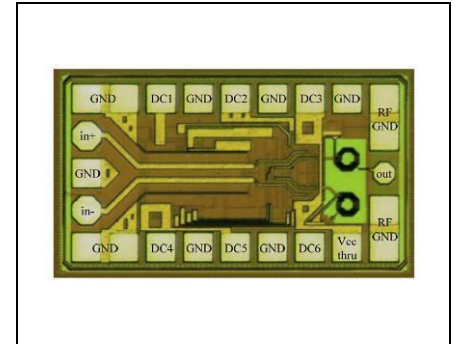


## 50 Gbit/s VCSEL driver



Sample image only. Actual product may vary

Product Code: A50-150C80

### Product Description

The A50-150C80 is a high speed VCSEL driver IC designed for directly modulated VCSEL in fiber optic transmission systems. The A50-150C80 operates from a single 3.3V supply voltage typically dissipating less than 150mW of DC power. The device is available as engineering sample.

### Features

- up to 56 Gbit/s Laser Diode Driver for VCSELs
- differential input 100  $\Omega$  / single ended output
- low power consumption of < 150mW
- small footprint 0.6 mm x 1.0 mm
- supply voltage 3.3V

### Applications

- Fibre Channel
- Ethernet
- Fiber optics systems tests
- Research and development
- Proprietary fiber optic links

Parameter	Typical (PD chips)	Notes
Data rate	Up to 56 Gbit/s	
Supply Voltage ( $V_{DD}$ )	3.3 V	
Power dissipation	< 150 mW	
Differential Input Resistance	100 $\Omega$	
Ambient Operating Temperature	-25°C to +125°C	

All product specifications and descriptions are subject to change without notice.

Please contact our sales department for additional information and to receive a quotation: [sales@v-i-systems.com](mailto:sales@v-i-systems.com)

### Absolute Maximum Ratings

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Power Supply Voltage	$V_{CC}$	w/ respect to GND	0		4	V
Vxing, Vmod, Vbias	$V_{bias}$ $V_{xing}$ $V_{mod}$	w/ respect to GND	0		5	V
Diff. Input	$V_{in+}$ $V_{in-}$	$V_{in+}$ to $V_{in-}$	-1.0		1.0	V
Operating Temperature	$T_{OP}$		-25		+125	°C

### Electrical performance

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Power Supply Voltage	$V_{CC}$		3.2	3.3	3.4	V
Bias current control, supply voltage for output stage	$V_{xing}$		1.0	2.2	3.3	V
Reference Voltage	$V_{mod}$		1.0	2.2	3.3	V
Modulation current control	$V_{bias}$		1.0	1.0	3.3	V

### Input Parameters

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Input Common Level	$V_{IN\ CM}$		1.45	1.6	1.75	V
Input Amplitude	$V_{IN\ DIFF}$	Differential	0.4		0.8	Vpp
Reference Impedance	$Z_{0\ DIFF}$	Differential		100		$\Omega$
Input Return Loss	$ S_{11} $	Differential			10	dB

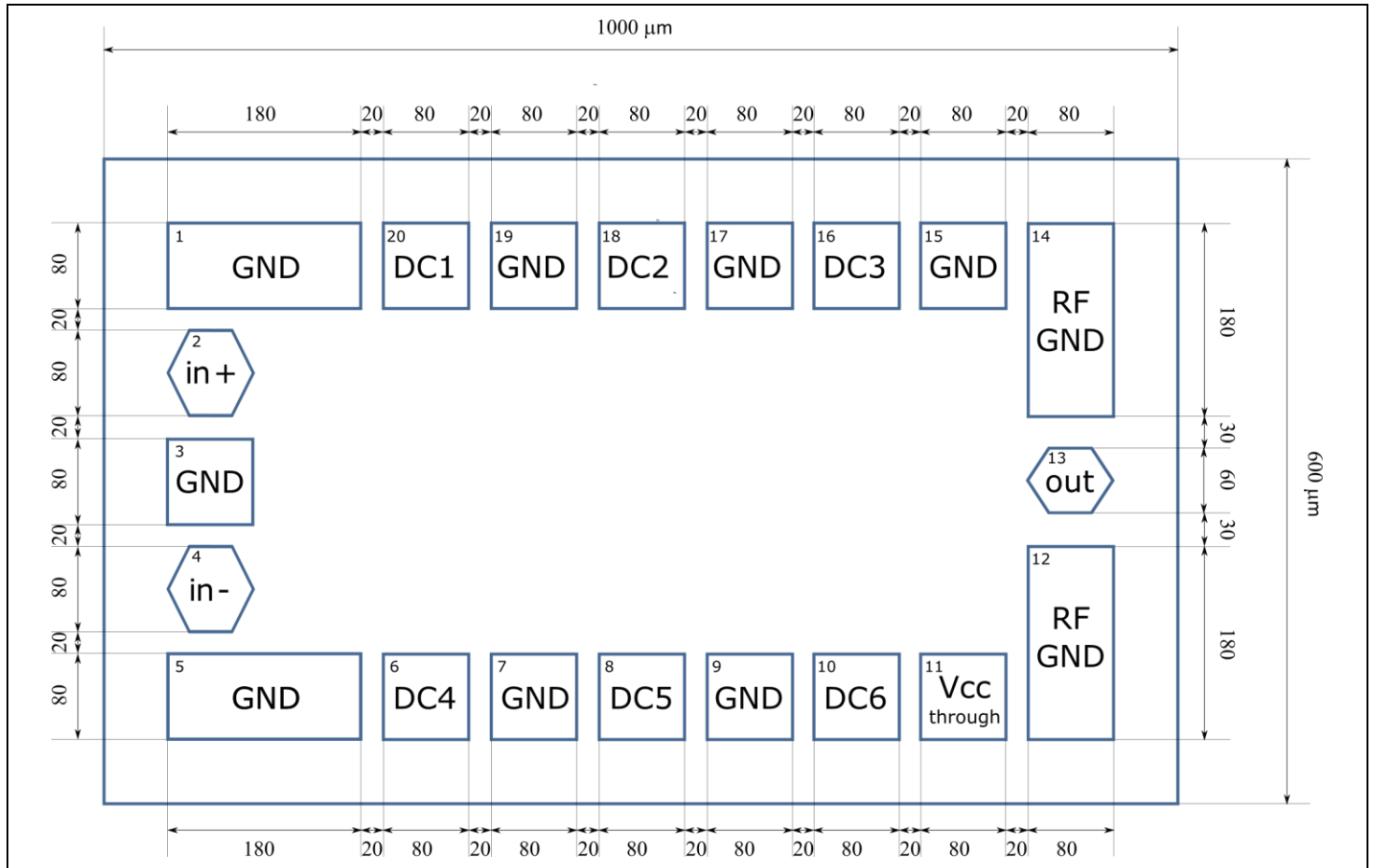
### Output Parameters

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Maximum Data rate		At ER > 0 4dB		50	56	Gbit/s
Rise / Fall Time	$t_R / t_F$	(20-80%)			11	ps
Max. Deterministic Jitter	$J_D$				3	ps
Output Current Swing	$I_{MOD}$				10	mA
Bias Current	$I_{BIAS}$		2	4	6	mA
Output voltage	$V_{OUT}$				2.8	V

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### Pad Layout



Name	Pin	Symbol	Description	Function
In +	2	Vin +	HF input (positive)	Input
In -	4	Vin -	HF input (negative)	Input
VCSEL Anode	13	out	HF output	Output
VCC1	20	DC1	Supply voltage for bias circuitry	Supply
VCC2	18	DC2	Supply voltage for gain stage	Supply
VCC3	16	DC3	Supply voltage for output stage	Supply
Vxing	6	DC4	Zero crossing control voltage	Input
Vmod	8	DC5	Modulation current ( $I_{MOD}$ ) control	Input
Vbias	10	DC6	Bias current ( $I_{BIAS}$ ) control	Input
VCC_Thru	11	Thru	NC	No use
VCSEL cathode	12,14	RF GND	Internally connected GND	Ground
GND	1,3,5,7,9,15,17,19	GND	Ground (0 V)	Ground

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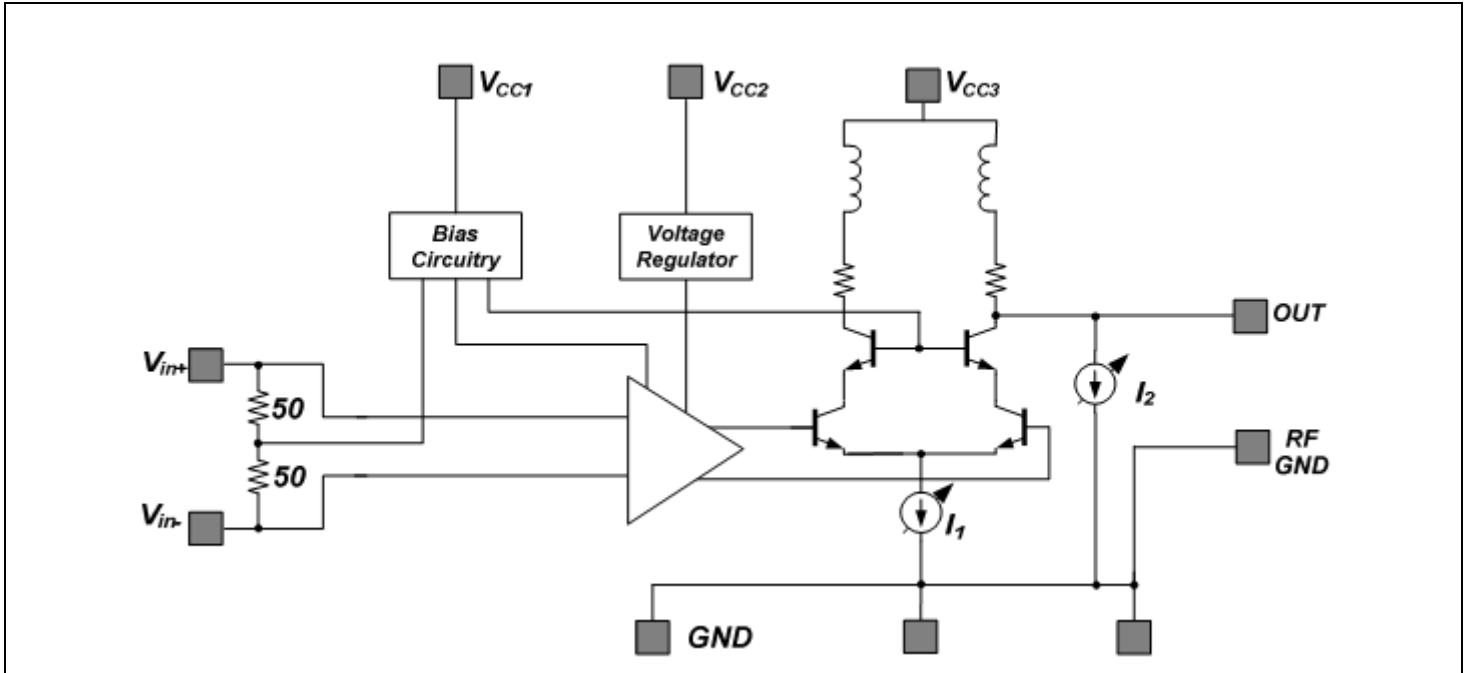
# Datasheet

## A50-150C80

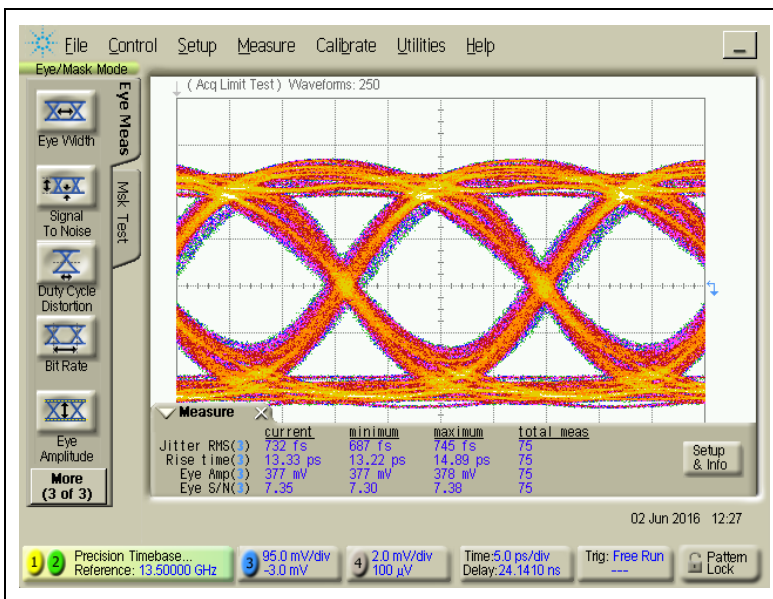


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### Internal circuitry



### Eye diagram at 54 Gbit/s



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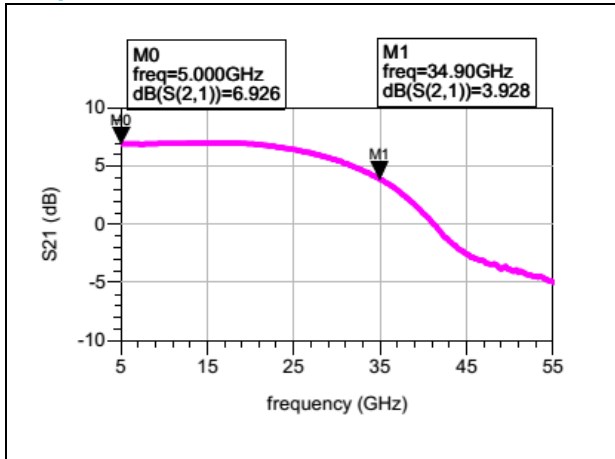
# Datasheet

## A50-150C80

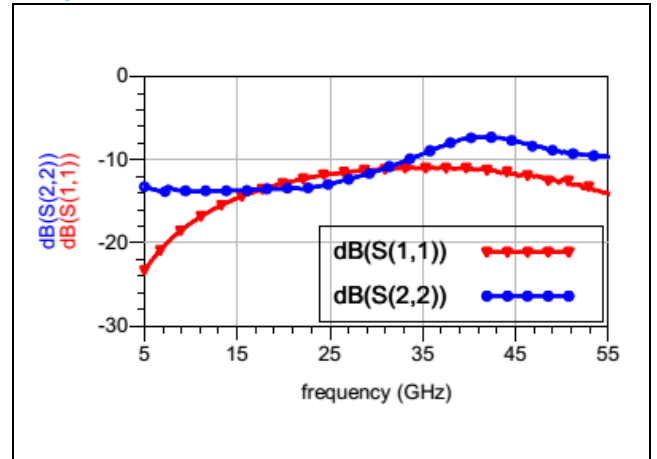


Vertically Integrated Systems

### S-parameters: S21



### S-parameters: S11 and S22



### Limited Qualification Notification

The A50-150C80 has been tested to meet specifications outlined in this data sheet at room temperature. However, it has not undergone full qualification testing or characterization and therefore may not meet the performance specifications over all extremes.



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