SY88932L

3.3V, 4.25Gbps SONET/SDH Laser Driver with Output Disable

General Description

The SY88932L is the smallest available laser driver with a programmable modulation current up to 60mA for Fabry-Perot (FP) or distribution feedback (DFB) lasers. The device is suitable for SOENT/SDH applications with data rates up to 4.25Gbps. The SY88932L accepts either CML level or AC-coupled PECL inputs, and incorporates an active low TTL /EN function which shuts off the modulation current when HIGH.

Datasheets and support documentation can be found on Micrel's web site at www.micrel.com.

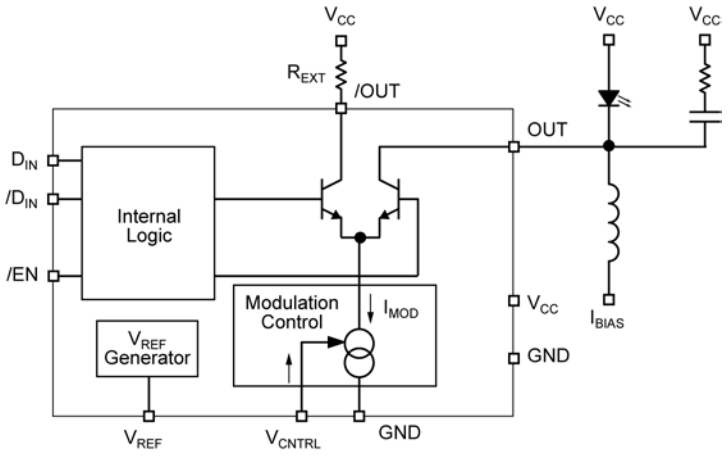
Features

- Up to 4.25Gbps operation
- Modulation current to 60mA
- Rise/fall times 65ps typical
- Input 50Ω internally terminated to VCC
- TTL /EN with internal 75kΩ pull-down
- Designed for use with MIC3000 optical transceiver management IC
- Voltage programmable laser modulation current
- Single 3.3V power supply
- Operating temperature range of –40°C to +85°C
- Available in tiny 16-pin QFN package

Applications

- Fiber optical module
- Transponder
- XAUI CWDM
- SONET/ SDH transmission system
- Add-drop MUX
- Metro area network
- 4.25Gbps optical transmitter

Block Diagram



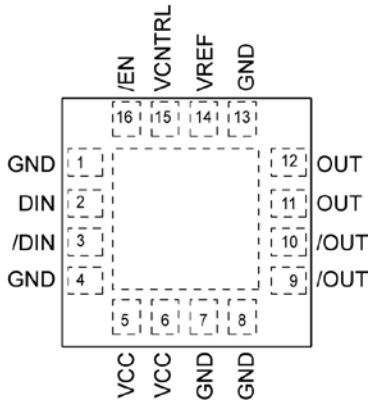
Ordering Information

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY88932LMI	QFN-16	Industrial	932L	Sn-Pb
SY88932LMITR[1]	QFN-16	Industrial	932L	Sn-Pb
SY88932LMG	QFN-16	Industrial	932L with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY88932LMGTR[1]	QFN-16	Industrial	932L with Pb-Free bar-line indicator	Pb-Free NiPdAu

Note:

1. Tape and Reel.

Pin Configuration



16-Pin QFN

Pin Description

Pin Number	Pin Name	Pin Function
2, 3	DIN, /DIN	NRZ differential data (inputs), CML terminated interface with 50Ω to V_{CC}.
1, 4, 7, 8, 13	GND	Ground.
5, 6	VCC	Positive power supply.
9, 10, 11, 12	OUT, /OUT	Open collector (outputs) from the modulation driver.
14	VREF	Voltage reference, nominally 1.25V with respect to ground.
15	VCNTRL	Voltage control of I_{MOD}. 5kΩ input impedance. See "Typical Operating Characteristics."
16	/EN	Enable: TTL-compatible active low input with 75kΩ pull-down resistor.

Truth Table(1,2)

D	/D	/EN	OUT(3)	/OUT
L	H	L	H	L
H	L	L	L	H
X	X	H	H	L

Notes:

1. Truth table parameters are given for voltage rather than optical outputs. Hence, a voltage HIGH and OUT means no modulation current is flowing through OUT, and a voltage LOW on OUT means modulation current is flowing through OUT. A voltage LOW implies an optical HIGH, and vice versa.
2. L = LOW, H = HIGH, X = don't care.
3. $I_{OUT} \leq I_{MOD_OFF}$ when /EN is HIGH.

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Absolute Maximum Ratings[1]

Supply Voltage (V_{CC}) ..... –0.5V to +4.0V
CML Input Voltage (V_{IN}) ..... V_{CC} –1.0V to V_{CC} +0.5V
TTL Control Input Voltage (V_{IN}) ..... 0V to V_{CC}
Lead Temperature (soldering, 20sec.) ..... 265°C
Storage Temperature (T_s) ..... –65°C to +150°C

Operating Ratings[2]

Supply Voltage (V_{CC}) ..... +3.0V to +3.6V
Ambient Temperature (T_A) ..... –40°C to +85°C
Junction Temperature (T_J) ..... –40°C to +120°C
Junction Thermal Resistance[3]
QFN
(θ_{JA}) Still-Air ..... 61°C/W
(ψ_{JB}) Still-Air ..... 38°C/W

DC Electrical Characteristics

V_{CC} = 3.0V to 3.6V; GND = 0V; T_A = –40°C to +85°C, Typical values at V_{CC} = 3.3V, T_A = 25°C.

Symbol	Parameter	Condition	Min	Typ	Max	Units
I_{CC}	Power Supply Current	Note 4		57	80	mA
I_{MOD}	Modulation Current Range		10		60	mA
I_{MOD_OFF}	Modulation Off Current	/EN = V_{IHEN}			200	µA
V_{IR}	CML Input Voltage Range		V_{CC}–0.8		V_{CC}+0.4	V
V_{ID}	CML Input Differential Voltage (D_{IN}, /D_{IN})	Note 5	400	800	1600	mV_{PP}
V_{IHEN}	TTL Input HIGH Voltage (/EN)		2.0			V
V_{ILEN}	TTL Input LOW Voltage (/EN)				0.8	V
V_{OUT}	Voltage (OUT, /OUT)	Note 6	V_{CC}–1.5		V_{CC}	V
V_{REF}	Reference Voltage	Note 7	1.2	1.25	1.3	V

Notes:

1. Permanent device damage may occur is Absolute Maximum Ratings are exceeded. This is a stress rating only and functional operation is not implied at conditions other than those detailed in the operational sections of this datasheet. Exposed to Absolute Maximum Ratings conditions for extended periods may affect device reliability.
2. The device is not guaranteed to function outside its operating rating.
3. Thermal resistance numbers are 4-layer PCB. Thermal performance assumes exposed pad is soldered (or equivalent) to the same potential as the ground pins on the PCB.
4. Excluding I_{MOD}. I_{MOD} set to 60mA with 25Ω load to V_{CC} on OUT, /OUT. Inputs floating.
5. V_{ID} is the voltage required to guarantee a stable logic level. For logic “1”, D_{IN} must be V_{ID}/2 above /D_{IN}. For stable logic “0”, D_{IN} must be V_{ID}/2 below /D_{IN}.
6. OUT and /OUT are current outputs. This specification defines the voltage range that the user must guarantee these pins remain within for proper operation.
7. V_{REF} intended to source/sink ≤ |5mA|.

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AC Electrical Characteristics[8]

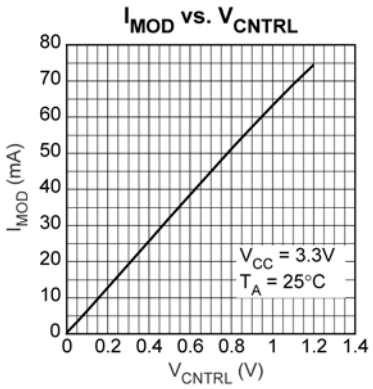
V_{CC} = 3.0V to 3.6V; GND = 0V; T_A = –40°C to +85°C, Typical values at V_{CC} = 3.3V, T_A = 25°C.

Symbol	Parameter	Condition	Min	Typ	Max	Units
t_r, t_f	Output Rise/Fall Times (20% to 80%)	Note 9		65	100	ps
DJ	Deterministic Jitter	Note 9, 10		20		ps_{PP}

Notes:

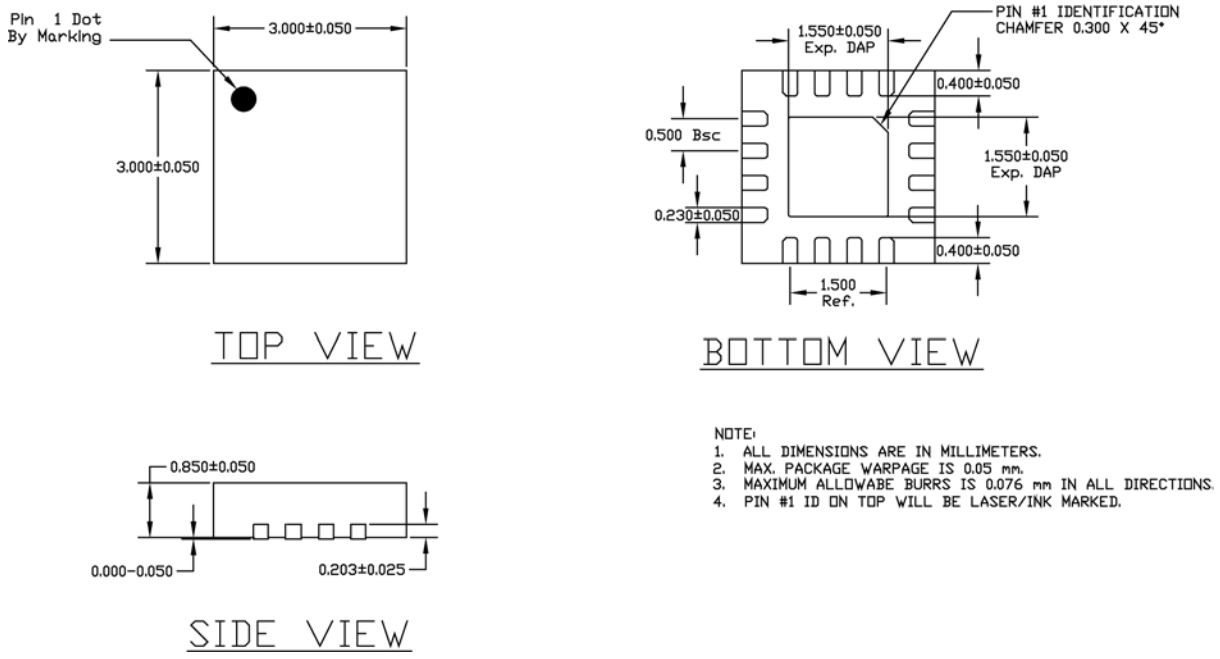
8. AC characteristics are guaranteed by design and characterization.
9. I_{MOD} = 60mA.
10. Deterministic jitter measured using K28.5 pattern of 2.486Gbps, V_{ID} = 1600mV_{PP}.

Typical Operating Characteristics

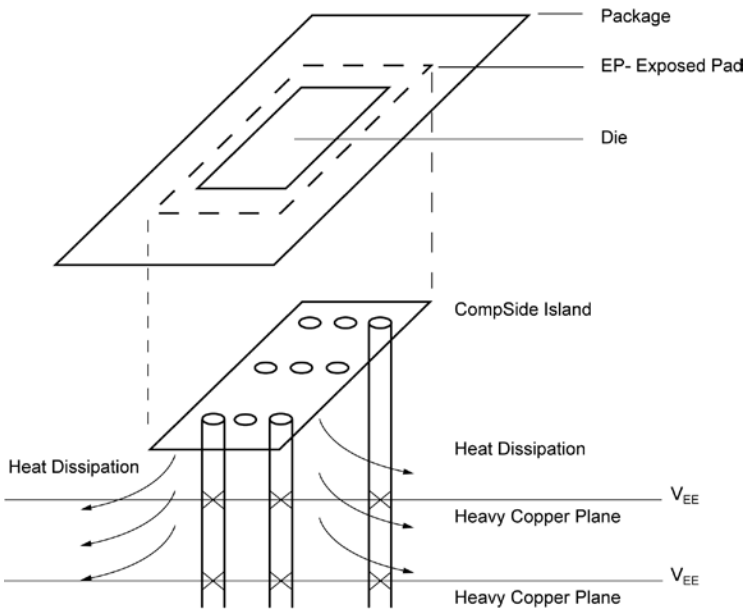


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Package Information



16-Pin QFN



PCB Thermal Consideration for 16-Pin QFN Package

Package Notes:

1. Package meets Level 2 qualifications.
2. All parts are dry-packaged before shipment.
3. Exposed pads must be soldered to a ground for proper thermal management.

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