

FEATURES

- Up to 3.2Gbps operation
- Modulation current to 60mA
- Rise/Fall times <70PS
- Single 3.3V power supply
- Programmable laser modulation current
- Operating temperature range of -40°C to 85°C
- Available in tiny 16-pin MFL™ package

DESCRIPTION

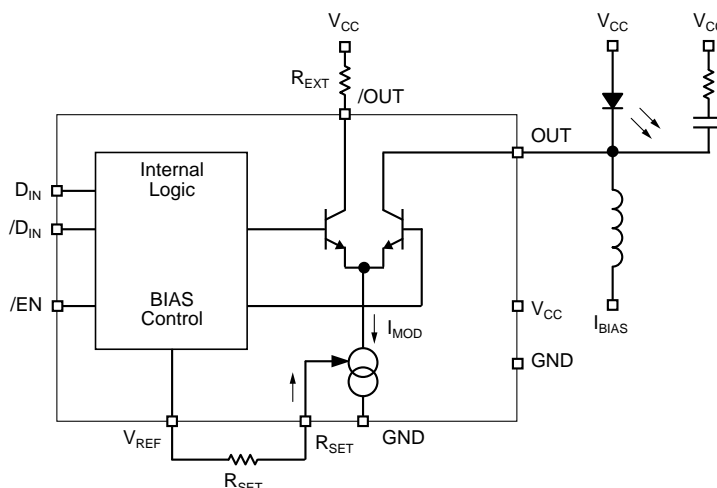
The SY88912L is the smallest laser driver with programmable modulation current for SONET/SDH applications up to 3.2Gbps. The device accepts either PECL or CML level data inputs. The SY88912L provides modulation current of up to 60mA for FP (Fabry-Perot) or DFB (Distributed Feedback) laser.

There is a 75k Ω pull-down resistor to V_{EE} at the input of /EN. An active low PECL enable signal shuts off modulation current.

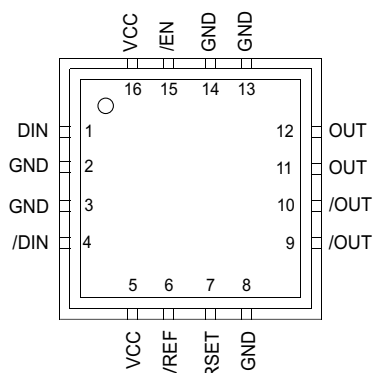
APPLICATIONS

- Fiber optical module
- Transponder
- XAUI CWDM
- SONET/SDH transmission system
- Add-drop mux
- Metro area network
- 2.5Gbps optical transmitter

BLOCK DIAGRAM



PACKAGE/ORDERING INFORMATION



16-Pin MLF™ (MLF-16)

Ordering Information

Part Number	Package Type	Operating Range	Package Marking	Lead Finish
SY88912LMI	MLF-16	Industrial	912L	Sn-Pb
SY88912LMITR ⁽¹⁾	MLF-16	Industrial	912L	Sn-Pb
SY88912LMG	MLF-16	Industrial	912L with Pb-Free bar-line indicator	Pb-Free NiPdAu
SY88912LMGTR ⁽¹⁾	MLF-16	Industrial	912L with Pb-Free bar-line indicator	Pb-Free NiPdAu

Note:

1. Tape and Reel.

PIN NAMES

Pin	Function
D _{IN} , /D _{IN}	NRZ differential data inputs.
/EN	PECL compatible active low input.
GND	Most negative power supply input.
OUT, /OUT	Open collector outputs from the modulation driver.
R _{SET}	An external resistor between V _{REF} and R _{SET} defines the modulation current.
V _{CC}	Most positive power supply input.
V _{REF}	Voltage reference for use with R _{SET} .

TRUTH TABLE⁽¹⁾

D	/D	/EN	OUT ⁽²⁾	/OUT
L	H	L	H	L
H	L	L	L	H
X	X	H	H	L

Notes:

1. L = LOW, H = HIGH, X = don't care.

2. I_{OUT} ≤ I_{MOD_OFF} when /EN is HIGH.

ABSOLUTE MAXIMUM RATINGS⁽¹⁾

Symbol	Parameter	Value	Unit
V_{CC}	Power Supply Voltage	0 to +5.0	V
V_{IN}	Input Voltage	0 to V_{CC}	V
I_{OUT}	Output Current	65	mA
T_{store}	Storage Temperature	–55 to +125	°C
T_A	Operating Temperature	–40 to +85	°C
P_D	Power Dissipation	500	mW
$\theta_{JA}^{(2)}$	Package Thermal Resistance (Junction-to-Ambient) –Still-Air	59	°C/W
Ψ_{JB}	Package Thermal Resistance (Junction-to-Board)	32.1	°C/W

Note:

1. Permanent device damage may occur if 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 data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.
2. JEDEC standard test boards with DIE attach pads soldered to PCB.

OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V_{CC}	Power Supply Voltage	+3.15 to +3.45	V
$R_{EXT}^{(1)}$	Resistor to Dissipate Power	5 (Min.)	Ω
R_{SET}	Resistor to Set I_{MOD}	100 to 10,000	Ω

Note:

1. Refer to V_{OUT} specification.

DC ELECTRICAL CHARACTERISTICS

$V_{CC} = 3.15$ to $3.45V$; $GND = 0V$; $T_A = -40^{\circ}C$ to $+85^{\circ}C$

Symbol	Parameter	Min.	Typ. ⁽²⁾	Max.	Unit	Condition
I_{CC}	Power Supply Current ⁽¹⁾	—	65	80	mA	$I_{MOD} = 60mA$
I_{MOD}	Modulation Current Range	10	—	60	mA	
$I_{MOD\ OFF}$	Modulation Off Current ⁽²⁾	—	—	200	μA	$/EN = V_{IHEN}$
V_{IDDIN}	Input Differential Voltage, $D_{IN}, /D_{IN}$	200	—	1600	mV _{PP}	⁽³⁾
V_{IHDIN}	Input HIGH Voltage, $D_{IN}, /D_{IN}$	$V_{CC} - 1.7$	—	$V_{CC} - 0.1$	V	
V_{ILDIN}	Input LOW Voltage, $D_{IN}, /D_{IN}$	$V_{CC} - 1.9$	—	$V_{CC} - 0.3$	V	
V_{IHEN}	Input HIGH Voltage, $/EN$	$V_{CC} - 1165$	—	$V_{CC} - 880$	mV	
V_{ILEN}	Input LOW Voltage, $/EN$	$V_{CC} - 1810$	—	$V_{CC} - 1475$	mV	
V_{OUT}	Output Voltage, $OUT, /OUT$	$V_{CC} - 1.5$	—	V_{CC}	V	⁽⁴⁾
V_{REF}	Reference Voltage ^{1.5}	1.7	1.9	V		

Notes:

1. Excluding I_{MOD} . $I_{MOD} \leq 60mA$
2. Typical values are under $V_{CC} = 3.3V$ and $T_A = 25^{\circ}C$.
3. V_{IDDIN} is the voltage required to guarantee a stable logic level. For a logic "1", D_{IN} must be V_{IDDIN} above $/D_{IN}$. For stable logic "0", D_{IN} must be V_{IDDIN} below $/D_{IN}$.
4. OUT and $/OUT$ are current outputs. This specification defines the voltage range that the user must guarantee these pins remain within proper operation.

AC ELECTRICAL CHARACTERISTICS⁽¹⁾

$V_{CC} = 3.15$ to $3.45V$; $GND = 0V$; $T_A = -40^{\circ}C$ to $+85^{\circ}C$

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
D_J	Jitter Generation ^{(2),(3)}	—	—	20	ps	peak-to-peak
t_r, t_f	Rise/Fall Times ⁽²⁾ (20% to 80%)	—	65	—	ps	

Notes:

1. AC characteristics are guaranteed by design and characterization.
2. $I_{MOD} = 40mA$, 25Ω resistors each tied from OUT and $/OUT$ to V_{CC} .
3. $I_{MOD} = 40mA$, 2.5Gbps, 0-1 pattern, BW = 12KHz to 20MHz.

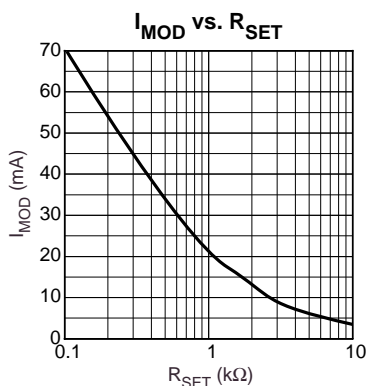
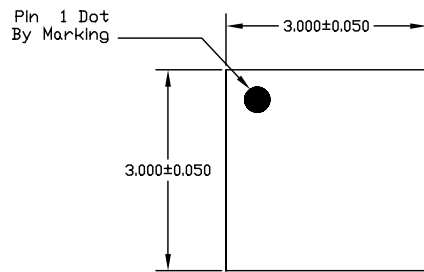
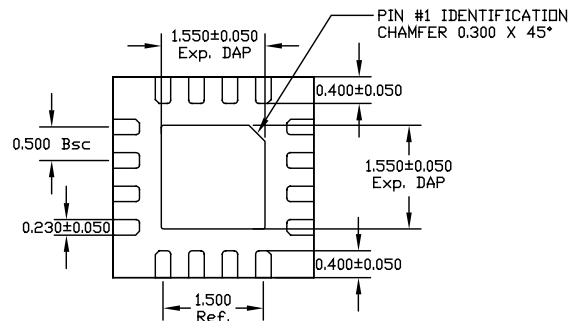
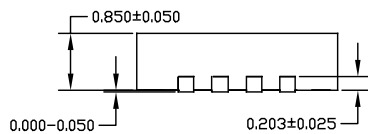


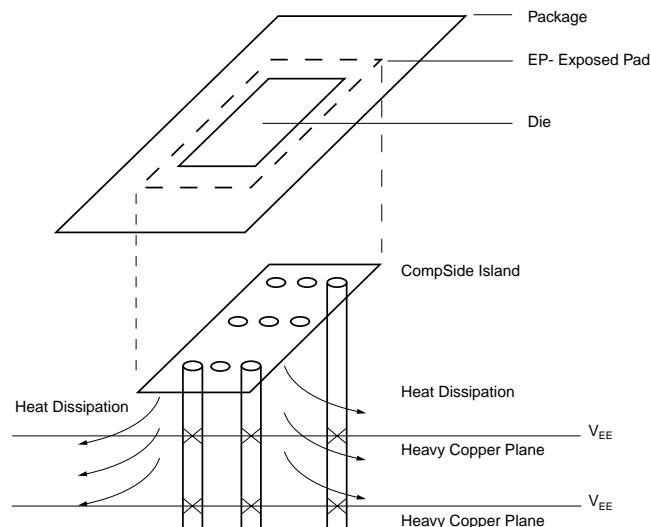
Figure 1. I_{MOD} vs. R_{SET}

16 LEAD EPAD-Micro LEADFRAME™ (MLF-16)TOP VIEWBOTTOM VIEWSIDE VIEW

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. MAX. PACKAGE WARPAGE IS 0.05 mm.
3. MAXIMUM ALLOWABLE BURRS IS 0.076 mm IN ALL DIRECTIONS.
4. PIN #1 ID ON TOP WILL BE LASER/INK MARKED.

Rev. 01

**PCB Thermal Consideration for 16-Pin MLF™ Package****MICREL, INC. 2180 FORTUNE DRIVE SAN JOSE, CA 95131 USA**TEL + 1 (408) 944-0800 FAX + 1 (408) 474-1000 WEB <http://www.micrel.com>

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