5V/3.3V 622Mbps LASER DIODE DRIVER WITH OUTPUT ENABLE

SY88722V

FEATURES

- **Single 3.3V or 5V power supply**
- **Up to 622Mbps operation**
- **Modulation current to 30mA**
- **PECL output enable**
- **Differential PECL inputs**
- **Available in a tiny 10-pin (3mm) MSOP**

DESCRIPTION

The SY88722V is a high speed current switch for driving a semiconductor laser diode in optical transmission applications. The modulation current (I_{OUT}) is controlled by the current (I_{RSET}) through the external resistor R_{SET}. The output OUT is HIGH and no current flows through OUT when output enable is HIGH.

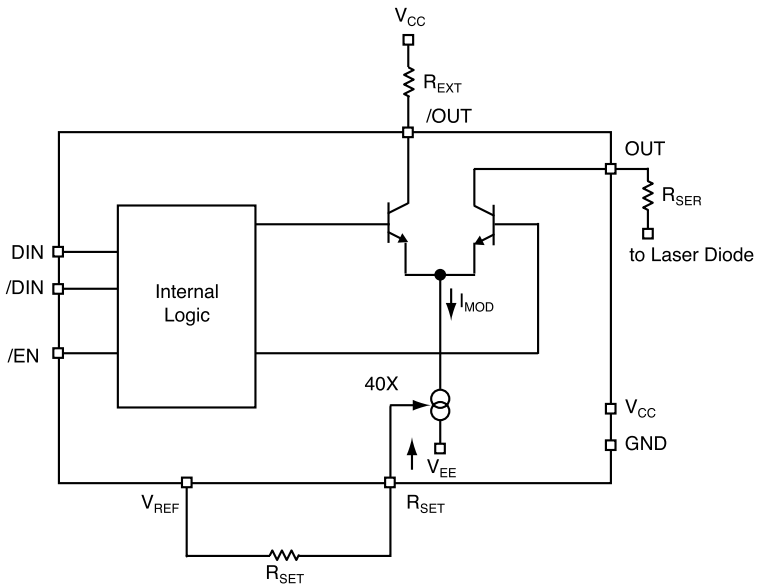
The device incorporates complementary open collector outputs with a 30mA maximum current driving capability. The external resistor R_{EXT} must be placed between /OUT and V_{CC} to dissipate the worst case power. R_{SER} is recommended to compensate for laser diode matching issues. Pins 9 and 10 should be connected to achieve better performance.

The SY88722V utilizes the high performance bipolar ASSET™ technology.

APPLICATIONS

- **622Mbps SONET**

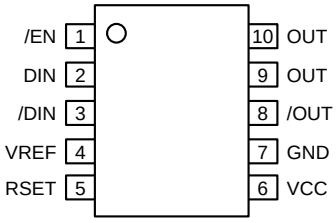
FUNCTIONAL BLOCK DIAGRAM



ASSET is a trademark of Micrel, Inc.

Rev.: A Amendment: /0
Issue Date: March 2003

PACKAGE/ORDERING INFORMATION



10-Pin MSOP
(K10-1)

Ordering Information

Part Number	Package Type	Operating Range	Package Marking
SY88722VKC	K10-1	Commercial	722V
SY88722VKCTR*	K10-1	Commercial	722V
SY88722VKI	K10-1	Industrial	722V
SY88722VKITR*	K10-1	Industrial	722V

*Tape and Reel

PIN DESCRIPTION

Pin Number	Pin Name	Pin Function
1	/EN	100k PECL compatible input with 75kΩ pulldown resistor. Modulation current goes to zero when deasserted high.
2, 3	DIN, /DIN	Differential 100k PECL compatible input with 75kΩ pulldown resistors.
4	VREF	Voltage reference for use with R_{SET}.
5	RSET	An external resistor from here to V_{REF} sets the reference current for I_{OUT}.
6	VCC	Positive power supply.
7	GND	Device ground.
8, 9, 10	/OUT, OUT	Differential open collector current outputs.

TRUTH TABLE(Note 1)

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

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

Note 2. H = I_{OUT} = 0mA.

Absolute Maximum Ratings(Note 1)

Power Supply Voltage (V_{CC}) ..... 0V to +7.0V
Input Voltage (V_{IN}) ..... 0V to V_{CC}
Output Current (I_{OUT}) 30mA
Power Dissipation (P_D) 250mW
Storage Temperature Range (T_S) ..... –55°C to +125°C

Operating Ratings(Notes 2, 3, 4)

Supply Voltage (V_{IN}) ..... +3.0V to +3.6V
..... or +4.5V to +5.5V
Ambient Temperature (T_A), **Note 5** ..... –40°C to +85°C
Junction Temperature (T_J), **Note 5** ..... –40°C to 100°C
Resistor to Dissipate Power (R_{EXT}) ..... 10Ω to 50Ω
Laser Diode Serial Resistor (R_{SER}) ..... 0Ω to 50Ω
Resistor to Adjust Current (R_{SET}), **Note 6** . 700Ω to 20,000Ω
Package Thermal Resistance
MSOP
(θ_{JA}) Still-Air ..... 113°C/W
(ψ_{JB}) Still-Air ..... 74°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.

Note 2. The data sheet limits are not guaranteed if the device is operated beyond the operating ratings.

Note 3. The device is guaranteed to meet the DC specifications, shown in the table above, after thermal equilibrium has been established. The device is tested in a socket such that transverse airflow of ≥500lfpm is maintained.

Note 4. The voltage drop across R_{EXT} and R_{SER} plus Laser Diode must not be greater than 1.4V.

Note 5. Commercial devices are guaranteed from 0°C to +85°C ambient temperature.

Note 6. R_{SET} minimum 430Ω.

DC ELECTRICAL CHARACTERISTICS(Note 1)

GND = 0V; V_{CC} = 3.3V ±10% or V_{CC} = 5.0V ±10%; T_A = –40°C to +85°C

Symbol	Parameter	Condition	Min	Typ	Max	Units
V_{IH}	Input HIGH Voltage (D_{IN}, /D_{IN}, /EN)		V_{CC}–1.165		V_{CC}–0.880	V
V_{IL}	Input LOW Voltage (D_{IN}, /D_{IN}, /EN)		V_{CC}–1.810		V_{CC}–1.475	V
V_{REF}	Reference Voltage		1.7	2.0	2.3	V
I_{IL}	Input LOW Current (D_{IN}, /D_{IN}, /EN)	$V_{IN} = V_{IL(min)}$	0.5			µA
I_{IH}	Input HIGH Current (D_{IN}, /D_{IN}, /EN)				100	µA
I_{CC}	Supply Current	I_{MOD} = 25mA			25	mA
I_{OUT_OFF}	Output LOW Current (/EN = HIGH)			450	1000	µA
I_{OUT}	Modulation Current				30	mA
A_{RSET}	I_{OUT}/I_{RSET}		30	38	44	—
V_{OUT}	Voltage at OUT, /OUT		V_{CC}–1.4		V_{CC}	V
C_{OUT}	Capacitance on OUT, /OUT			2.5		pF

Note 1. Specification for packaged product only.

AC ELECTRICAL CHARACTERISTICS(Note 1, 2)

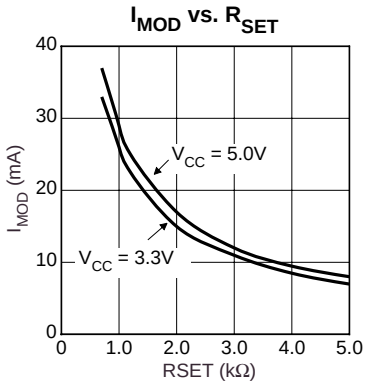
I_{MOD} =10mA; GND = 0V; V_{CC} = 3.3V ±10% or V_{CC} = 5.0V ±10%; T_A = 0°C to +85°C

Symbol	Parameter	Condition	Min	Typ	Max	Units
t_{PHL},t_{PLH} D	Propagation Delay D_{IN} – OUT	I_{OUT} = 10mA			1000	ps
t_{PHL},t_{PLH} EN	Propagation Delay /EN – OUT	I_{OUT} = 10mA			1000	ps
t_r, t_f	Rise/Fall Time (20% to 80%)				400	ps
I_{OR}	Output Current Ringing	I_{OUT} = 5 to 30mA			10	%

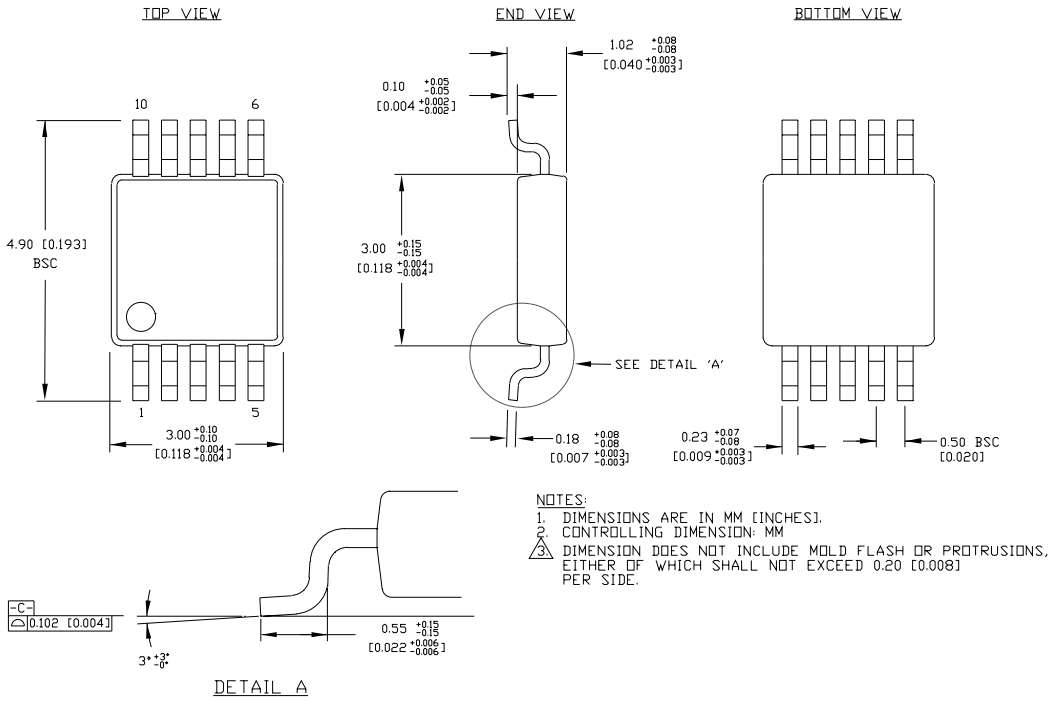
Note 1. Specification for packaged product only.

Note 2. R_{EXT} = R_{SER} = 25Ω ±1%; R_{SER} connected directly to V_{CC}.

TYPICAL OPERATING CHARACTERISTICS



10 LEAD MSOP (K10-1)



Rev. 00

MICREL, INC. 1849 FORTUNE DRIVE SAN JOSE, CA 95131 USA

TEL + 1 (408) 944-0800 FAX + 1 (408) 944-0970 WEB http://www.micrel.com