5V 622Mbps LASER DIODE DRIVER WITH OUTPUT ENABLE

SY88702

FEATURES

- **Up to 622Mbps operation**
- **Modulation current to 25mA**
- **PECL output enable**
- **Differential PECL inputs**
- **Single 5V power supply**
- **Available in a tiny 10-pin (3mm) MSOP**

APPLICATIONS

- **622Mbps SONET**

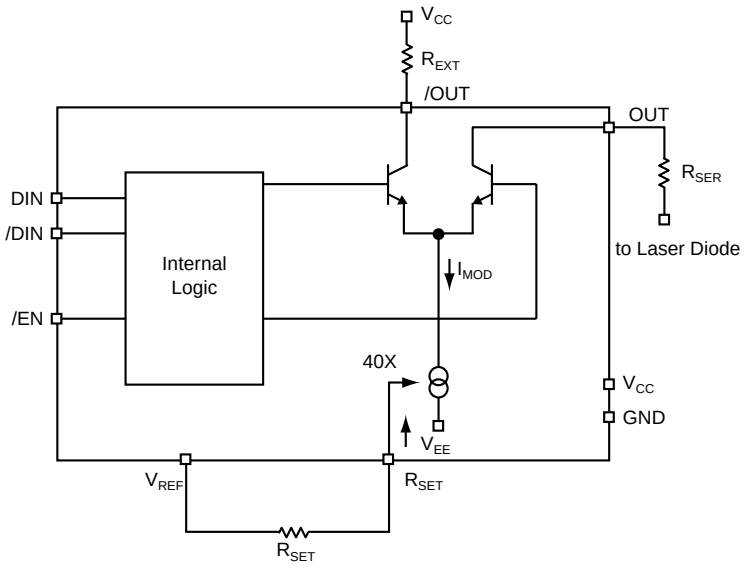
DESCRIPTION

The SY88702 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 25mA 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.

The SY88702 utilizes the high performance bipolar ASSET™ technology.

FUNCTIONAL BLOCK DIAGRAM



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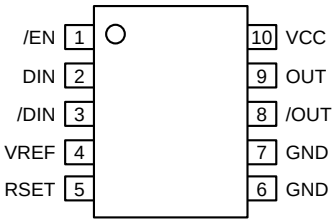
PACKAGE/ORDERING INFORMATION



10-Pin MSOP
(K10-1)

Ordering Information

Part Number	Package Type	Operating Range	Package Marking
SY88702KC	K10-1	Commercial	702
SY88702KCTR*	K10-1	Commercial	702
SY88702KI	K10-1	Industrial	702
SY88702KITR*	K10-1	Industrial	702

*Tape and Reel

PIN DESCRIPTION

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

TRUTH TABLE(1)

D	/D	/EN	OUT (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}) 25mA
Power Dissipation (P_D) 250mW
Storage Temperature Range (T_S) ..... –55°C to +125°C

Operating Ratings(Notes 2,3,4)

Supply Voltage (V_{CC}) ..... +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}) ..... 1500Ω to 50,000Ω
Package Thermal Resistance
MSOP
(θ_{JA}) Still-Air ..... 113°C/W
(ψ_{JB}) Still-Air ..... 74°C/W

DC ELECTRICAL CHARACTERISTICS

GND = 0V; V_{CC} = 5V ±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			3.00		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		16	25	mA
I_{OUT_OFF}	Output LOW Current (/EN = HIGH)				500	µA
I_{OUT}	Modulation Current		5	15	25	mA
A_{RSET}	I_{OUT}/I_{RSET}		30	38	44	—
V_{OUT}	Voltage at OUT, /OUT		V_{CC}–2.3		V_{CC}	V
C_{OUT}	Capacitance on OUT, /OUT			2.5		pF

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 2.3V.

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

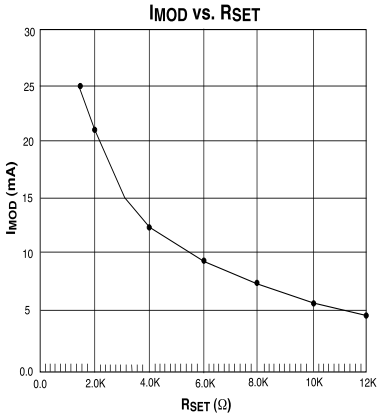
AC ELECTRICAL CHARACTERISTICS(Note 1)

GND = 0V; V_{CC} = 5V ±10%; T_A = –40°C to +85°C

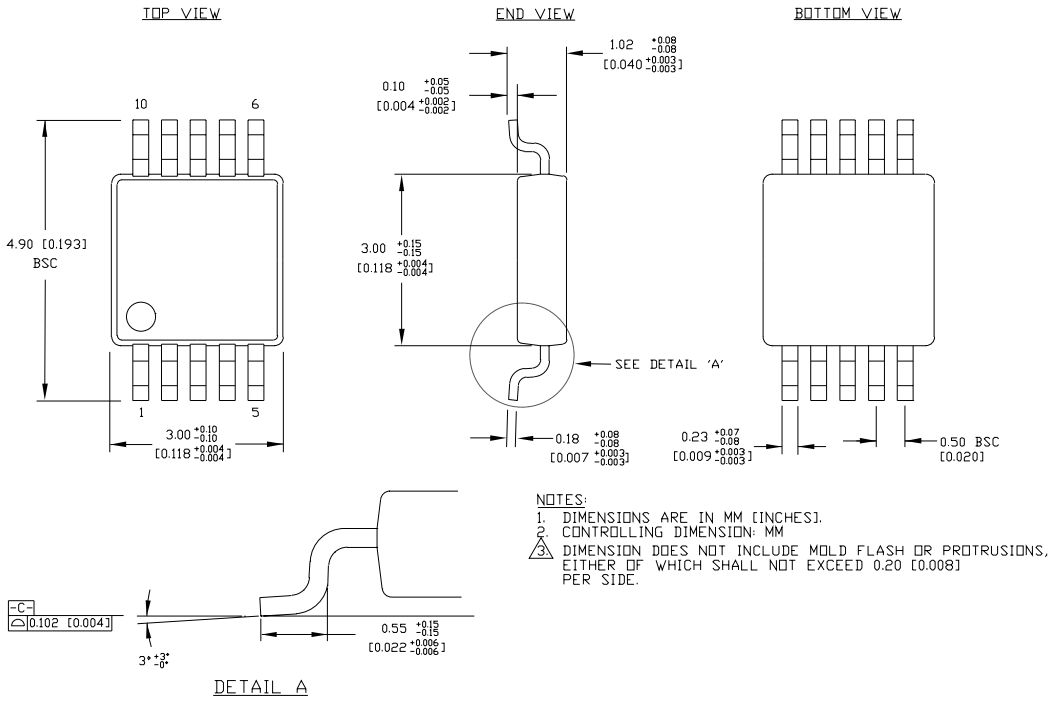
Symbol	Parameter	Condition	Min	Typ	Max	Units
t_{PHL}, t_{PLH} D	Propagation Delay D_{IN} – OUT	I_{OUT} = 10mA			1000	ps
t_{PHL}, t_{PLH} EN	Propagation Delay /EN – OUT	I_{OUT} = 10mA			1000	ps
t_r t_f	Rise/Fall Time (20% to 80%)				400	ps
I_{OR}	Output Current Ringing	I_{OUT} = 5 to 25mA			10	%

Note 1. R_{EXT} = R_{SER} = 50Ω ±1%; R_{SER} connected directly to V_{CC}.

TYPICAL OPERATING CHARACTERISTICS



10 LEAD MSOP (K10-1)



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