

FEATURES

- Up to 1.25Gbps operation
- 25mA peak drive current
- Separate modulation control
- Separate output enable for laser safety
- Differential inputs for data
- 75K Ω input pulldown resistor
- Single power supply
- Designed for use with SY88903 and SY88904
- Available in a tiny 10-pin (3mm) MSOP

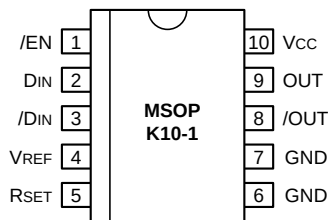
DESCRIPTION

The SY88902 is a high speed current switch for driving a semiconductor laser diode in optical transmission applications. The output current, or modulation current I_{MOD} , is DC current controlled by I_{RSET} , current through the resistor R_{SET} . The output OUT is HIGH when output enable is HIGH.

The device incorporates complementary open collector outputs with a capability of driving peak current of 25mA. The resistor R_{EXT} must be placed between $\overline{OUT}$ and V_{CC} to dissipate the worst case power. R_{SER} is recommended to compensate for laser diode matching issues.

The SY88902 utilizes the high performance bipolar ASSET™ technology.

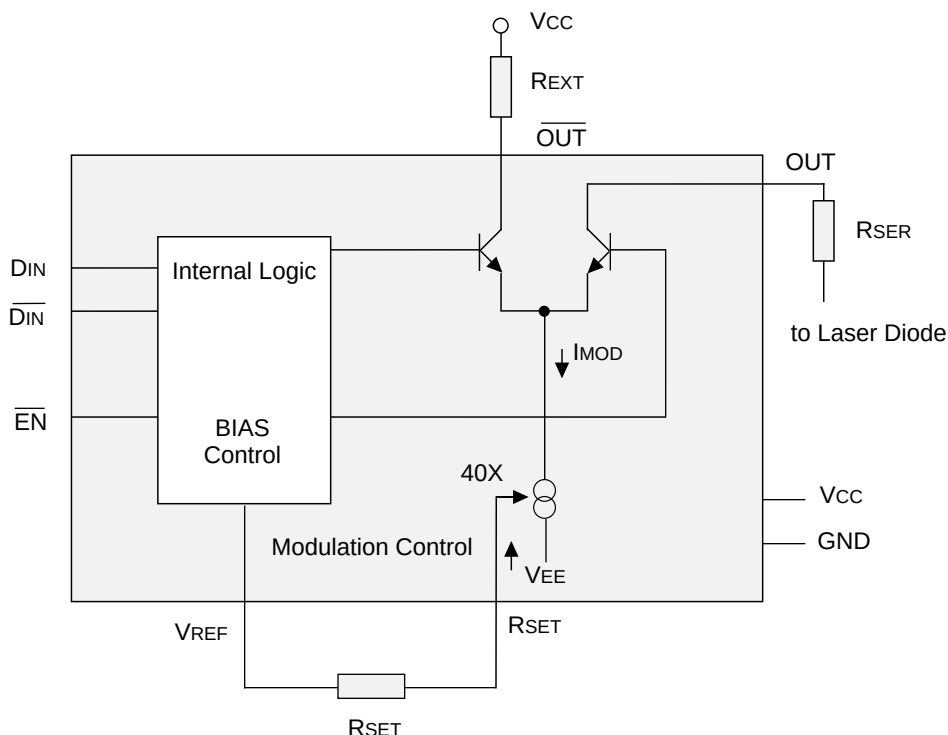
PIN CONFIGURATIONS



APPLICATIONS

- 1.25Gbps Gigabit Ethernet
- 531Mbps and 1062Mbps Fibre Channel
- 622Mbps SONET
- Gigabit Interface Converter

BLOCK DIAGRAM



PIN NAMES

Pin	Function
VCC	Most positive power supply input, +5V for PECL operation.
GND	Ground
DIN, /DIN	These differential PECL 100K compatible inputs receive NRZ data.
/EN	This PECL 100K compatible input enables Laser Driver. Modulation current goes to zero when asserted HIGH.
OUT, /OUT	Open collector outputs from the modulation buffer drive these differential current outputs.
VREF	Voltage reference for use with RSET.
RSET	An external resistor sets up the source current for modulation I_{mod} .

TRUTH TABLE⁽¹⁾

D	$\bar{D}$	/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. H = $I_{OUT} = 0\text{mA}$

ABSOLUTE MAXIMUM RATINGS⁽¹⁾

Symbol	Rating	Value	Unit
VCC	Power Supply Voltage	0 to +7.0	V
V _I	Input Voltage	0 to VCC	V
I _O	Output Current	25	mA
T _A	Operating Temperature Range	0 to +85	°C
T _{store}	Storage Temperature Range	-55 to +125	°C
P _{tot}	Power Dissipation	250	mW

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.

OPERATIONING CONDITIONS⁽¹⁾

Symbol	Rating	Value	Unit
VCC	Power Supply Voltage	+4.5 to +5.5	V
R _{EXT}	Resistor to Dissipate Power	10 to 50	Ω
R _{SER}	Laser Diode Serial Resistor	0 to 50	Ω
R _{SET}	Resistor to Adjust Current	1500 to 50,000	Ω
Θ_{JA}	Thermal Resistance of Package to Ambient ⁽²⁾	206	°C/W
C _{OUT}	Capacitance on OUT + /OUT	2.5 typical	pf

NOTES:

1. The voltage drop across R_{EXT} and R_{SER} plus Laser Diode should not be greater than 2V.
2. Still air without heatsink.

DC ELECTRICAL CHARACTERISTICS

GND = 0V; VCC = +5.0V $\pm 10\%$; TA = 0°C to + 85°C

Symbol	Parameter	TA = 0°C			TA = +25°C			TA = +85°C			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
VIH	Input HIGH Voltage (DIN, /DIN, /EN)	VCC-1165	—	VCC-880	VCC-1165	—	VCC-880	VCC-1165	—	VCC-880	mV
VIL	Input LOW Voltage (DIN, /DIN, /EN)	VCC-1810	—	VCC-1475	VCC-1810	—	VCC-1475	VCC-1810	—	VCC-1475	mV
VREF	Reference Voltage	—	3.12	—	—	3.00	—	—	2.80	—	V
IIL	Input LOW Current ⁽¹⁾ (DIN, /DIN, /EN)	0.5	—	—	0.5	—	—	0.5	—	—	uA
IIH	Input HIGH Current (DIN, /DIN, /EN)	—	—	100	—	—	100	—	—	100	uA
ICC	Supply Current ⁽²⁾	—	16	25	—	16	25	—	16	25	mA
IOL	Output LOW Current (/EN = HIGH)	—	—	500	—	—	500	—	—	500	uA
IOUT	Modulation Current	5	15	25	5	15	25	5	15	25	mA
IRSET	Modulation Control	0.125	—	0.625	0.125	—	0.625	0.125	—	0.625	mA
ARSET	=IOUT/IRSET	30	38	44	30	38	44	30	38	44	—

NOTES:

1. VI = VIL(Min.)
2. I_{MOD} = 25mA.

AC ELECTRICAL CHARACTERISTICS⁽¹⁾

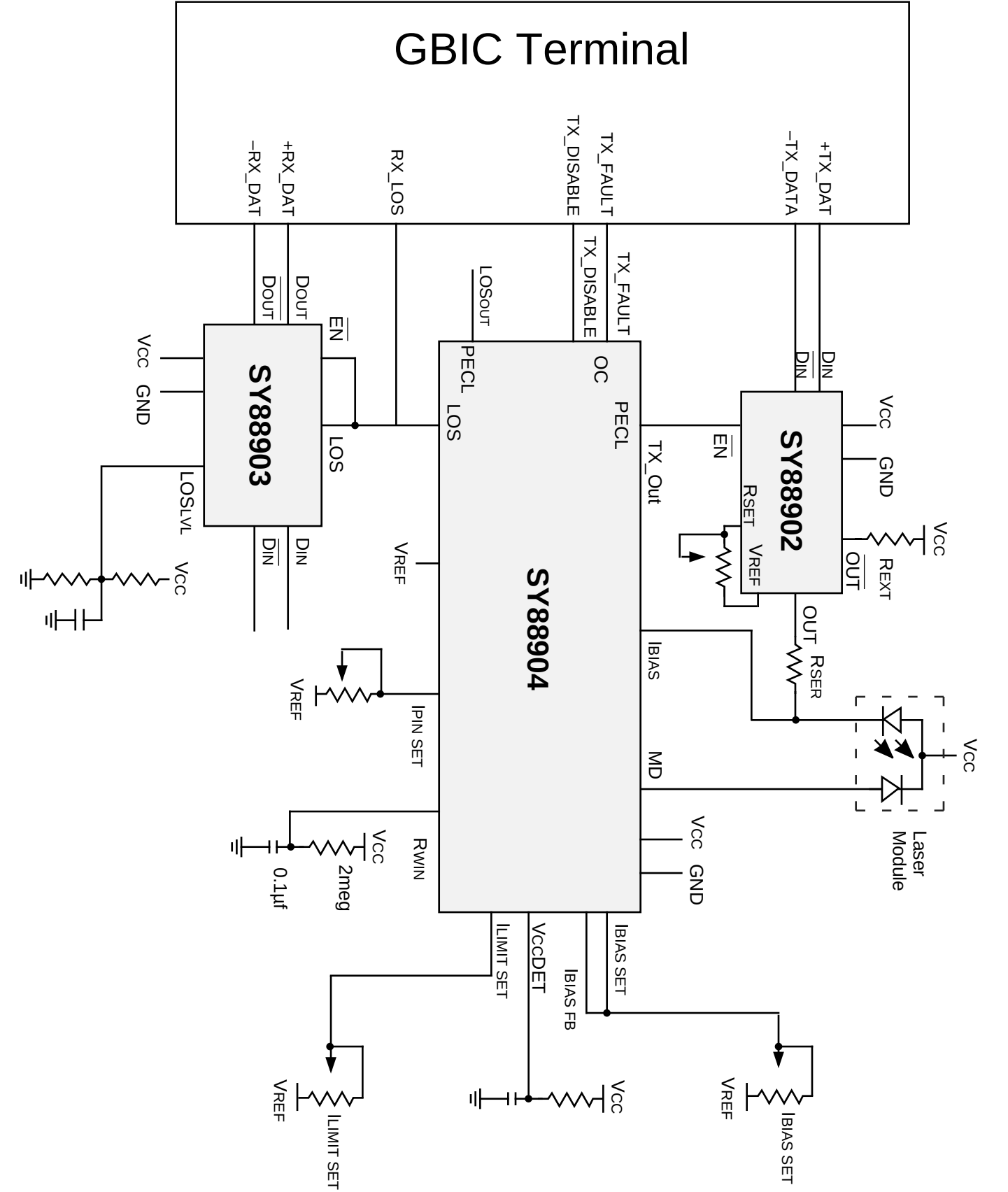
I_{MOD} = 10mA; GND = 0V; VCC = +5V $\pm 10\%$; TA = 0°C to + 85°C

Symbol	Parameter	TA = 0°C			TA = +25°C			TA = +85°C			Unit	Conditions
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		
t _{pd} D	Propagation Delay DIN - OUT	—	—	1000	—	500	1000	—	—	1000	ps	I _{MOD} = 10mA
t _{pd} EN	Propagation Delay /EN - OUT	—	—	1000	—	450	1000	—	—	1000	ps	I _{MOD} = 10mA
t _r t _f	Rise/Fall Time (20% to 80%)	—	200	—	—	200	—	—	200	—	ps	
I _{OR}	Output Current Ringing ⁽²⁾	—	—	10	—	—	10	—	—	10	%	

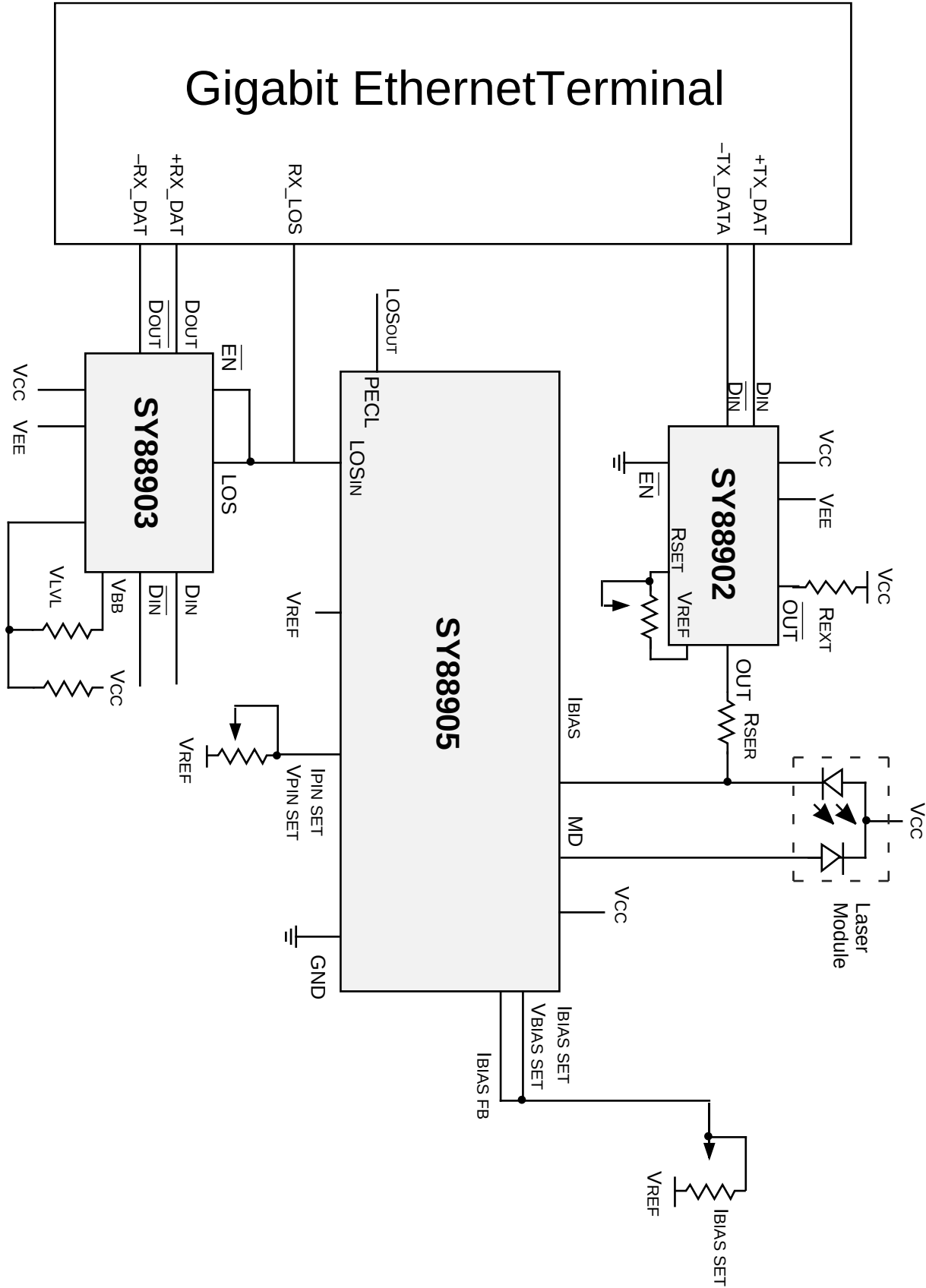
NOTES:

1. R_{EXT} = R_{SER} = 50Ω $\pm 1\%$, R_{SER} connects to VCC directly without Laser Diode.
2. I_{OH} = 5 to 25mA

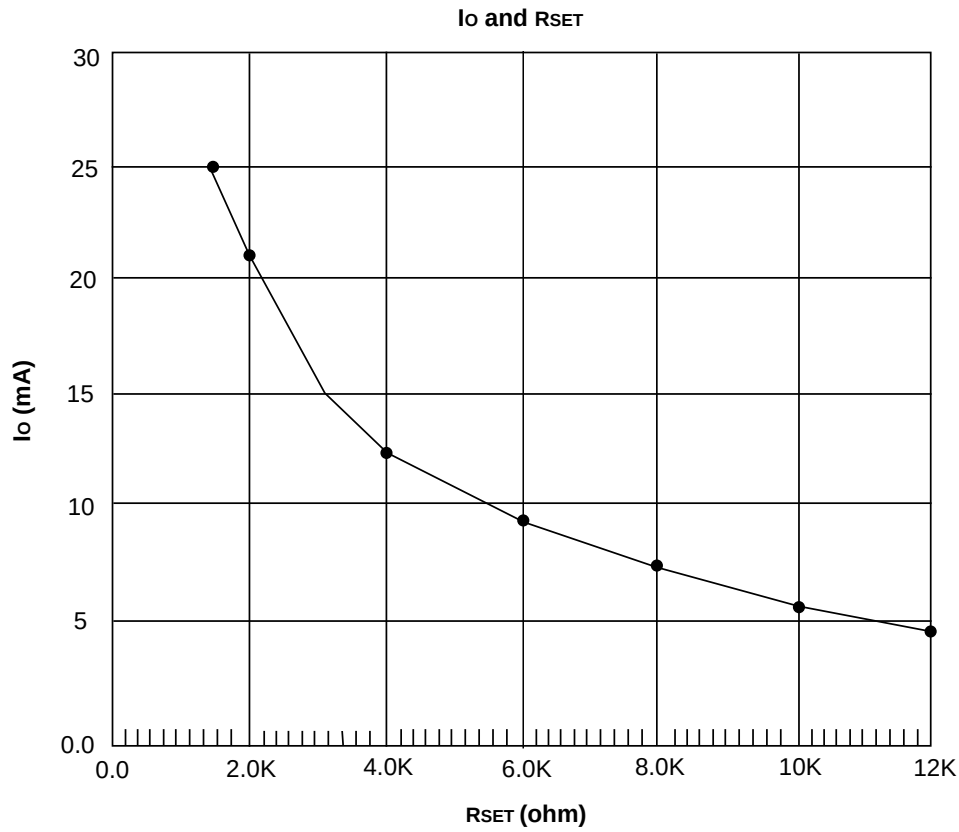
APPLICATION EXAMPLE FOR 3-CHIP SET SOLUTION



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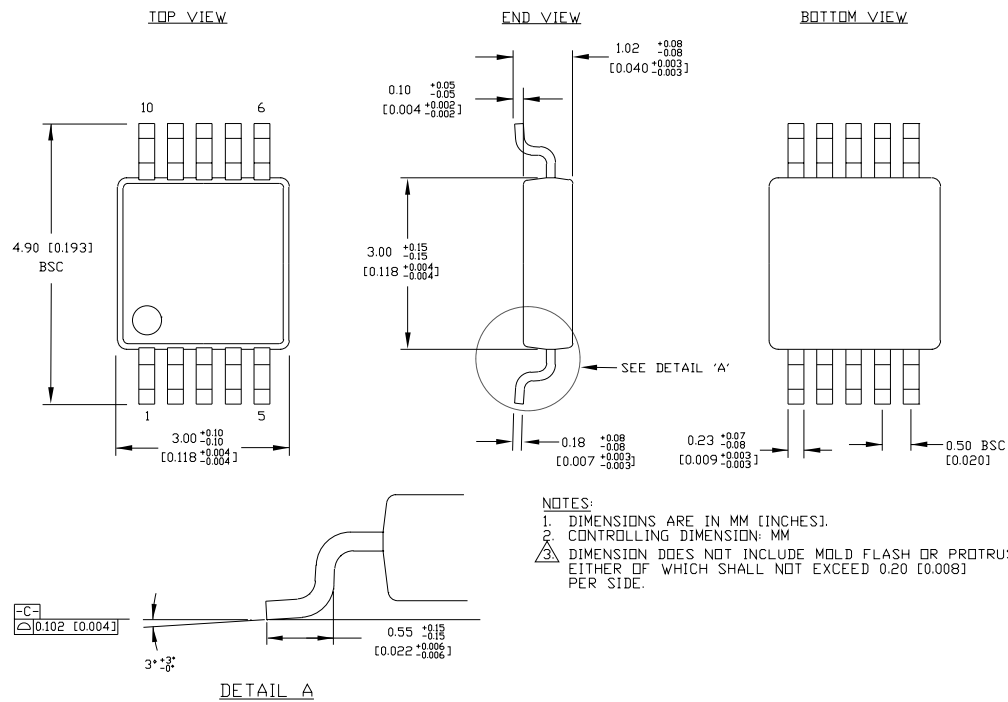
PERFORMANCE CURVES



PRODUCT ORDERING CODE

Ordering Code	Package Type	Operating Range
SY88902KC	K10-1	Commercial
SY88902KCTR	K10-1	Commercial

10 LEAD MSOP (K10-1)



Rev. 00

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