



2.5Gbps FP/DFB Laser Drivers

SY88982L Evaluation Board

General Description

The SY88982L evaluation board is designed for fast evaluation of the SY88982L, SY88782L, and SY88932L laser drivers.

A picture of the board loaded with SY88982L is shown below.

All data sheets and support documentation can be found on Micrel's web site at: www.micrel.com.

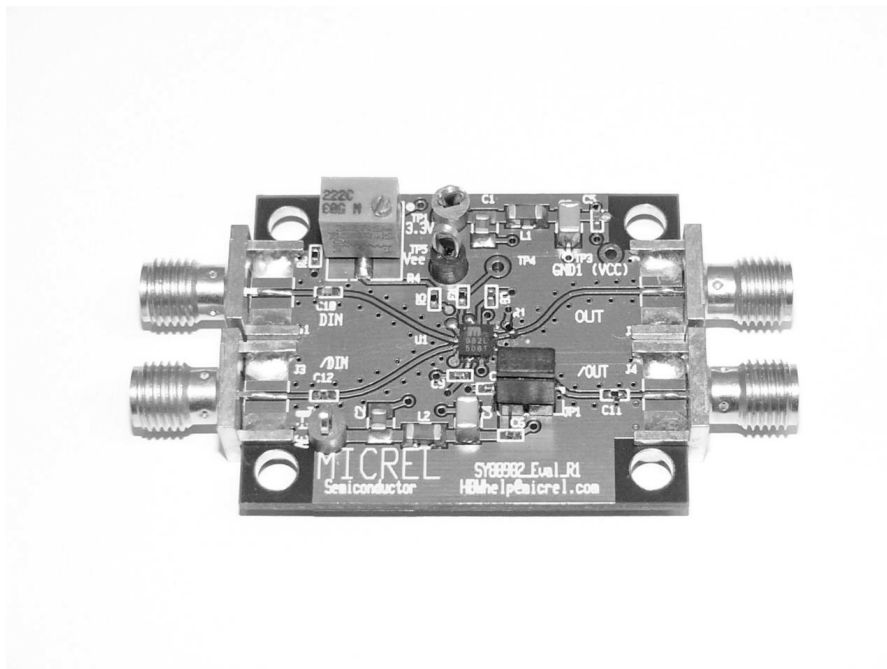
Features

- Single 3.3V supply voltage
- AC-coupled inputs
- AC/DC-coupled outputs
- Positive ground to allow for DC-coupling outputs to test equipment.
- AC/DC compliance voltage evaluation

Related Documentation

- SY88982L, 3.3V, 2.7Gbps High Current Low Power Laser Driver for FP/DFB Lasers

Evaluation Board



Evaluation Board Description and Setting

The evaluation board consists of a four-layer FR4 board. The inputs of the driver are AC-coupled and are accessible through SMA connectors. The board has a positive ground (VCC is the ground) that will allow for DC coupling to the scope if needed. There are two power supply connectors on the board, TP1 for VCC (Ground) and TP5 (VCC2) to be used for AC compliance voltage measurement only.

Board Setting

Jumper installed on JP1.

$R1 = R2 = 50\Omega$ to make a 25Ω load when the scope is connected to J3-4.

Board Operation

Use SMA connectors, J1-J2, to connect a signal to the driver's inputs. J3-J4 are the driver's outputs, to be connected to the scope.

Install a jumper on JP1 for normal operation.

Connect the power supply between TP1 (VCC1) and TP5 (VEE). TP2 (VCC2) is not connected for normal operation and is reserved for AC-compliance voltage measurement.

Adjust the modulation current with potentiometer R4.

The modulation current can be measured with one of the following methods:

1. Measure the output swing on the scope and divide it by the load ($R1 \parallel 50\Omega$ or $R2 \parallel 50\Omega$). The board comes with a 25Ω load ($50\Omega \parallel 50\Omega$).
2. Measure the IM_SET voltage at pin 2 (central pin) of the potentiometer (R4) and use the modulation gain curve below to deduce I_{MOD} .

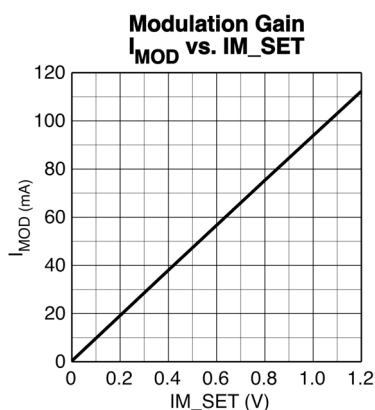


Figure 1. Modulation Gain vs. IM_SET

AC Compliance Voltage Measurement

Remove jumper from JP1 and apply a separate 3.3V variable voltage source (VCC2) on TP5.

Set modulation current to any value between 10mA and 90mA. For currents more than 70mA, a lower load, 15Ω for example ($22\Omega/\text{scope}$), must be used to avoid saturation of the driver's output.

Apply a valid signal at the input of the driver to get a clean eye at the output (MOD-), then decrease VCC2 slowly until the eye at MOD- starts to degrade. Record the value of VCC2 ($VCC2_{sat}$) just before the eye starts to degrade (the driver starts to saturate). The compliance voltage is the voltage V_{MOD-}_{sat} at MOD- given by:

$$V_{MOD-}_{sat} = (R1 \times VCC + 50 \times VCC2_{sat}) / (R1 + 50) - I_{MOD} \times 50 \times R1 / (R1 + 50).$$

Where 50 is the scope input impedance.

OFF Modulation Current Measurement

Set the board back to normal operation by disconnecting TP5 and installing a jumper on JP1.

Connect TP4 to VCC to disable the driver.

Measure the modulation current using methods described above (board operation section).

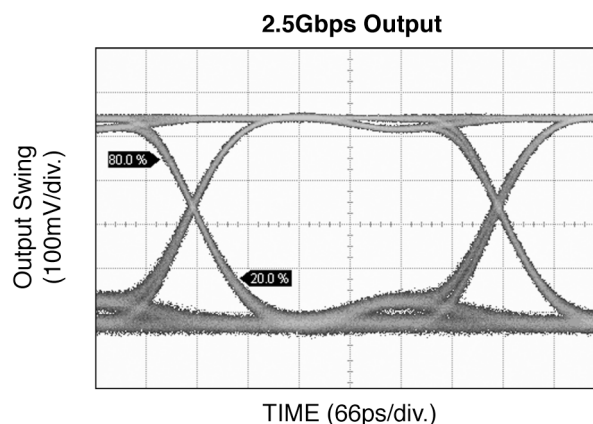
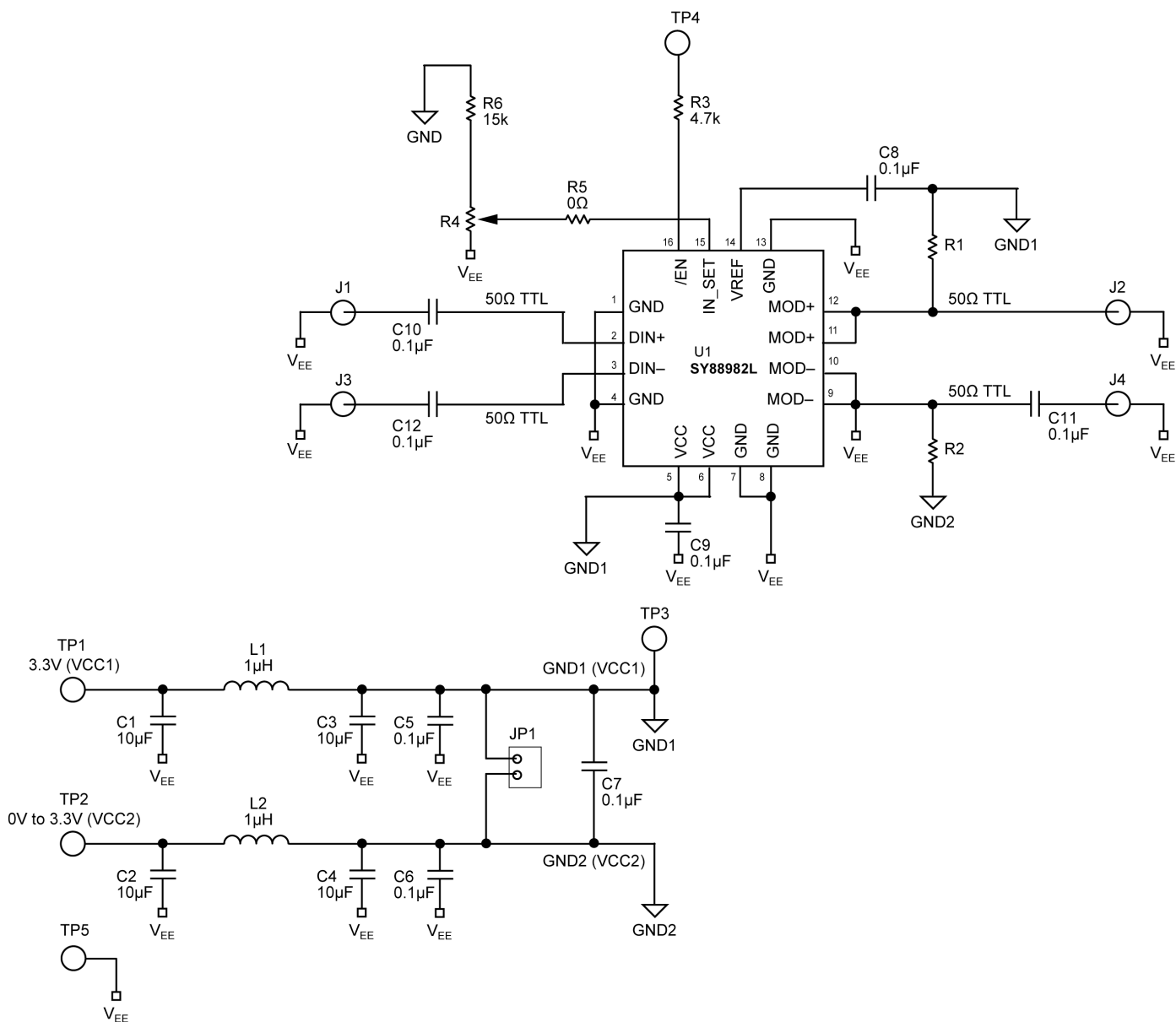


Figure 2. Example of Eye Diagram @ 2.5Gbps with 25Ω load

Evaluation Board Schematic



Bill of Materials

Item	Part Number	Manufacturer	Description	Qty.
C1-C4	ECSH0GY106R	Panasonic ⁽¹⁾	10 μ F, Y, Tantalum Solid Electrolytic Capacitor	4
C5-C7	VJ0603Y683KXXA	Vishay ⁽²⁾	0.1 μ F, Ceramic Capacitor, Size 0603	3
C8-C12	VG0402G104KXQ	Vishay ⁽²⁾	0.1 μ F, Ceramic Capacitor, Size 0402,	5
J1-J4	142-0711-821	Johnson Components ⁽³⁾	SMA End Launch Receptacle connector	4
JP1	TSW-1-4-07-G-S	Samtec ⁽⁴⁾	2 Position Header	1
L1, L2	IMC 0805 RK 122 J 01	Vishay ⁽²⁾	1 μ H Ferrite Bead Inductor	2
R1, R2	CRCW040249R9F	Vishay ⁽²⁾	49.9 Ω , 1% Resistor	2
R4	3269	Bourns ⁽⁵⁾	10k Ω Potentiometer	1
R5	CRCW040200R0F	Vishay ⁽²⁾	0 Ω , 1% Resistor	1
TP3, TP4	TSW-1-1-07-G-S	Samtec ⁽⁴⁾	1 Position Header	2
TP1, TP2	5010	Keystone ⁽⁶⁾	Color Coded PCB Test Point	2
TP5	5011	Keystone ⁽⁶⁾	Color Coded PCB Test Point	1
U1	SY88982L	Micrel⁽⁷⁾	3.3V, 2.7Gbps High Current, Low Power Laser Driver for FP/DFB Lasers	1

Notes:

1. Panasonic: www.panasonic.com.
2. Vishay: www.vishay.com.
3. Johnson Components: www.johnsoncomponents.com.
4. Samtec: www.samtec.com.
5. Bourns: www.bourns.com.
6. Keystone: www.keystone.com.
7. Micrel, Inc.: www.micrel.com.

Micrel Cross Reference

To find an equivalent Micrel part, go to Micrel's website at: <http://www.micrel.com> and follow the steps below:

1. Click on Dynamic Cross Reference.
2. Enter competitor's part number in the Dynamic Cross Reference field.
3. To download a PDF version of this information, click on the Cross Reference PDF tab.

HBW Support

Hotline: 408-955-1690

Email Support: HBWHelp@micrel.com

Application Hints and Notes

For application notes on high speed termination on PECL and LVPECL products, clock synthesizer products, SONET jitter measurement, and other High Bandwidth products go to Micrel's website at: <http://www.micrel.com/>. Once in Micrel's website, follow the steps below:

3. Click on "Product Info."
4. In the Applications Information Box, choose "Application Hints and Application Notes."

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