PECL/ECL DIFFERENTIAL RECEIVER/BUFFER

Precision Edge™ SY89823/24L Evaluation Board

FEATURES

- **+3.3V core supply, +1.8V output supply for reduced power**
- **I/O interface includes onboard termination**
- **Fully assembled and tested**
- **Can be reconfigured for AC-coupled operation**

GENERAL DESCRIPTION

The SY89823L and SY89824L evaluation boards are designed for convenient setup and quick evaluation of the respective devices. They allow the user to evaluate the parts over their full voltage range without requiring any modifications to the board.

The evaluation board is configured to allow direct interface to a 50Ω compatible oscilloscope.

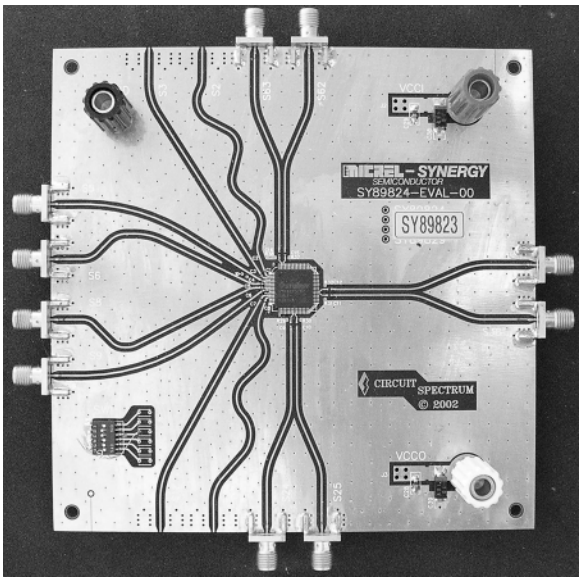
The boards are fully assembled and tested.

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

RELATED PRODUCT AND SUPPORT DOCUMENTATION

Part Number	Function	Data Sheet Link
SY89823L	3.3V, 500MHz 1:22 Differential HSTL (1.5V) Fanout Buffer/Translator	www.micrel.com/product-info/products/sy89823l.shtml
SY89824L	3.3V, 1:22 High-Performance, Low Voltage Bus Clock Driver	www.micrel.com/product-info/products/sy89824l.shtml

EVALUATION BOARD



SY89823/24L Evaluation Board

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EVALUATION BOARD DESCRIPTION

The SY89823L and SY89824L are packaged in a 64-pin EPAD-TQFP with the EPAD attached to a metal pad on the component side of the board for improved heat dissipation. The two high-speed clock inputs, HSTL_CLK and LVPECL_CLK are brought out to SMA connectors through matched length differential traces. Three of the outputs Q0, Q11 and Q17 are brought out through SMA connectors from three sides of the chip. These HSTL outputs are already DC-coupled for direct connection to an oscilloscope with a standard 50Ω termination to ground. The LVTTL/CMOS control inputs OE and CLK_SEL are connected to a dipswitch on the board to allow the different modes to be conveniently selected.

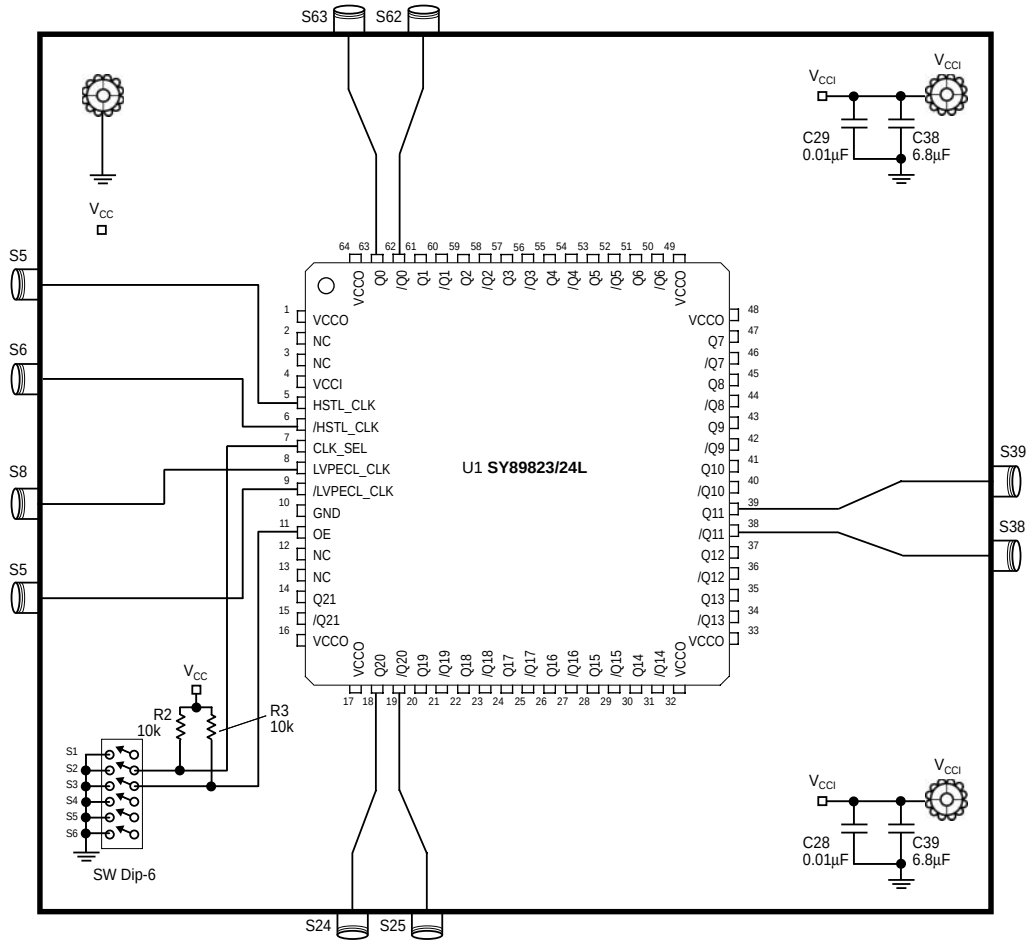

Figure 1. AC-Coupled Evaluation Board Schematic

I/O	V_{CCI}	V_{CCO}	GND
AC-coupled Input/DC-coupled Output	+3.3V	+1.8V	0V

Table 1. Evaluation Board Power Supply Connections

EVALUATION BOARD SET-UP

The following steps describe the procedure for setting-up the DC-coupled evaluation board.

1. Set-up two separate voltage sources, one for V_{CCI} and a second for V_{CCO}. Set the V_{CCI} supply for 3.3V and the V_{CCO} supply for 1.8V and turn off both supplies.
2. Connect the GND terminal to the negative sides of both power supplies. This is the 0V ground potential.
3. Connect the V_{CCI} terminal to the positive side of the 3.3V supply. Turn on the power supply and verify that the power supply current is <140mA.
4. Connect the V_{CCO} terminal to the positive side of the 1.8V supply Turn on the power supply and verify that the power supply current is <40mA.
5. Turn off both power supplies.
6. Using a differential signal source set the levels for the HSTL_CLK inputs to be V_{IL} = 0.4V and V_{IH} = 1.2V.
7. Turn off or disable the outputs of the signal source.
8. Using equal length 50Ω impedance coaxial cables, connect the signal source to the HSTL_CLK inputs on the evaluation board (S5 and S6).
9. Using a second differential signal source set the levels for the LVPECL_CLK inputs to be V_{IL} = 1.5V and V_{IH} = 2.3V. Turn off or disable the outputs of the signal source.
10. Using equal length 50Ω impedance coaxial cables, connect the signal source to the LVPECL_CLK inputs on the evaluation board (S8 and S9).
11. Using equal length 50Ω impedance coaxial cables, connect the outputs of the evaluation board (S24, S25, S38, S39, S62 and S63) to the oscilloscope or other measurement device that has an internal 50Ω termination. If not all outputs are to be monitored, the unused outputs must be terminated with 50Ω to ground.
12. Turn on the power.

EVALUATION BOARD LAYOUT

PC Board Layout

The evaluation boards are constructed with FRA material and are coplanar in design and fabricated to minimize noise, achieve high bandwidth and minimize crosstalk.

L1	Signal/GND
L2	Impedance GND
L3	V_{CCO} Power
L4	V_{CCI} Power
L5	GND
L6	Signal/GND

Table 2. Layer Stack

BILL OF MATERIALS

AC-Coupled Evaluation Board

Item	Part Number	Manufacturer	Description	Qty.
C3, C4, C5, C6	CRCW04020R00F	Vishay[1]	Replaces Capacitor with 0Ω, 1/16W, 1% Thick-film Resistor, Size 0402	4
C17, C18, C19, C20, C21, C22, C25, C26, C27	VJ0402V104M	Vishay[1]	0.1µF, 25V, 10% Ceramic Capacitor, Size 0402, X5R Dielectric	9
C28, C29		Vishay[1]	0.1µF, 20V, Tantalum Chip Capacitor, Size B	2
C38, C39	293D685X0010	Vishay[1]	6.8µF, 20V, Tantalum Chip Capacitor, Size B	2
J1	111-0703-001		GND Banana Jack, Black	1
J2	111-0703-001		VCCI Banana Jack, Red	1
J2	111-0703-001		VCCO Banana Jack, White	1
R2, R3	CRCW04021002F	Vishay[1]	10kΩ, 1/16W, 1% Thick-film Resistor, Size 0402	2
R27, R24	CRCW04020R00F	Vishay[1]	0Ω, 1/16W, 1% Thick-film Resistor, Size 0402	2
S5, S6, S8, S9, S24, S25, S38, S39, S62, S63	142-0701-851	Johnson Components[2]	Jack Assembly End Launch SMA	10
SW1			DIP-6 SPST Switch	1
U1	**SY89823L**	**Micrel, Inc.[3]**	3.3V, 500MHz 1:22 Differential HSTL (1.5V) Fanout Buffer/Translator	1
	SY89824L	**Micrel, Inc.[3]**	3.3V, 1:22 High-Performance, Low Voltage Bus Clock Driver	1

Notes:

1. Vishay: www.vishay.com.
2. Johnson Components: www.johnsoncomponents.com.
4. Micrel, Inc.: www.micrel.com.

HBW SUPPORT

Help Line

Micrel's HBW Applications helpline is available to assist you. Please call (408) 955-1690 or e-mail hbwhelp@micrel.com for assistance.

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. Or to download a PDF version of this information, click on the "Cross Reference" PDF tab.

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 product go to Micrel's website at http://www.micrel.com. Once in Micrel's website, follow the steps below:

1. Click on "Product Info."
2. In the "Applications Information Box," choose either "Application Hints" or "Application Notes."

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

TEL + 1 (408) 944-0800 FAX + 1 (408) 474-1000 WEB http://www.micrel.com