

# 2.5GHz 2 × 2 CROSSPOINT SWITCH

## FEATURES

- DC-coupled and terminated CML inputs
- DC-coupled CML outputs
- Positive ground
- Selects set through on-board DIP switch
- All data and select inputs and all outputs accessible via SMA connectors

#### **EVALUATION BOARD COMPONENTS**

- SY55854U evaluation board
- SY55854U data sheet and this document
- Various pairs of length-matched SMA cables (user supplied)

## DESCRIPTION

The SY55854U is a  $2 \times 2$  crosspoint switch optimized for high-speed data and/or clock applications (up to 2.5Gbps or 2.5GHz) where low jitter and skew are critical. Each of the SY55854U inputs routes to any output, and thus can distribute or multiplex a clock or data stream.

This document provides a detailed description of the evaluation board, and how to use it. Complete information in this document includes:

- 1. Measuring an eye
- 2. Board schematic
- 3. Bill of materials



#### Measuring an Eye with SY55854U

This section describes how to obtain an eye diagram using the SY55854U evaluation board.

You will need:

- An SY55854U evaluation board
- A power supply
- A digital signal source capable of generating pseudorandom patterns at up to 2.5Gbps
- An oscilloscope capable of showing eye patterns
- Two pairs of length-matched SMA cables
- Four 50Ω termination SMA

The following steps allow the user to generate an eye diagram using the SY55854U evaluation board.

1. Connect Power Source: The power supply must be set to about 3.3V. Current consumption will be under 100mA. Connect the positive power supply to the bottom pin of the power supply header, marked " $V_{CC}$ ," and having a ground symbol. Connect the negative power supply to the top pin of the power supply header.

2. Connect Data Source: Set your data source to generate a pseudo-random data stream. Any pattern  $2^7-1$  PRBS or better will do. If there is a choice, use  $2^{23}-1$  PRBS. Set the data rate to 2.5Gbps. Set the output high level to be +0V, and the output low level to be -400mV.

Using one pair of length matched SMA cables, connect the differential output of the signal generator to the "D0" and the "/D0" SMA connectors.

3. Connect Data Output: Using another pair of length matched SMA cables, connect "Q0," and "/Q0" SMA connectors to the oscilloscope. Connect a trigger output from the digital generator to the trigger input of the oscilloscope.

4. Terminate Unused Inputs and Outputs: Cap the "D1," "/D1," "Q1," and "/Q1" SMA connectors with  $50\Omega$  terminators.

5. Configure the SY55854U Evaluation Board: Ensure that the "S0, "and "/S0," SMA connectors are open. For further information regarding how to select various inputs, please refer to Table 1.

6. *View the Eye:* Adjust the oscilloscope to show the eye diagram.

v <sub>cc</sub>	Connection	Function
2.3V to 3.0V	"S0" open and "/S0" has a 50 $\Omega$ cap	"Q0" sources "D0"
3.0V to 5.7V	"S0" open and "/S0" open	"Q0" sources "D0"
2.3V to 5.7V	"S0" has a 50 $\Omega$ cap and "/S0" open	"Q0" sources "D1"
2.3V to 3.0V	"S1" open and "/S1" has a 50 $\Omega$ cap	"Q1" sources "D0"
3.0V to 5.7V	"S1" open and "/S1" open	"Q1" sources "D0"
2.3V to 5.7V	"S1" has a 50 $\Omega$ cap and "/S1" open	"Q1" sources "D1"

Table 1. Select Settings

# **EVALUATION BOARD SCHEMATICS**



Figure 1. SY55854U Evaluation Board Schematic

# **BILL OF MATERIALS**

Item	Part Number	Manufacturer	Description	Qty.
C1			22μF, 16V Size "C" Tantalum Electrolytic Capacitor	1
C2–C6, C19, C20			100nF, 10V X7R, Size 0603 Ceramic Capacitor	
No Designator			3-Pin 0.1 Inch Header with Ceramic Pin Removed	1
No Designator			SMA Edge Launch Connector	12
R1–R3, R9–R11 R17, R18			100Ω, 1% Size 0603, 1/10W Resistor	8
U1	SY55854U	Micrel Semiconductor	2.5Gbps 2 × 2 Crosspoint Switch	1

# **TECHNICAL SUPPORT INFORMATION**

# **ORDERING INFORMATION**

Telephone Number	1 (408) 914-7671	
Email	hbwhelp@micrel.com	

Evaluation Board Part#	IC Package	Operating Range
SY55854U-EVAL	TQFP	–40°C to +85°C

#### 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

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