



A New Direction in Mixed-Signal

**GENERAL DESCRIPTION**

The Exar XRP2523 Evaluation board (EVB) is a full assembled and tested surface-mount PCB that demonstrates the XRP2523 single-channel integrated high-side power distribution switches.

Optimized for USB  $V_{BUS}$  power distribution, the XRP2523 is compliant with the latest USB 3.0 specification and can be used in any self or bus powered USB applications. It is provided with an enable pin while an error flag is available to indicate fault conditions.

XRP2523 is offered in a RoHS compliant "green"/halogen free 5-pin SOT-23 package.

**STANDARD CONFIGURATION**

The XRP7659EVB evaluation board is configured to operate under the following conditions and parameters:

- Input voltage range  $V_{IN}$ : 3.2V – 6.5V
- Output current/load range: 0 – 1.5A

EVALUATION BOARD MANUAL



**FEATURES**

- **1.5A Single Channel Current Switch**
  - 1.5A continuous load current
  - 1.6A Over-current Limit
- **3.2V to 6.5V Input Voltage Range**
- **USB 2.0 and USB 3.0 Compliant**
- **Active High Enable**
- **Soft Start**
- **Channel Fault Flag Indicator**
  - 9ms Blanking Time
- **UVLO, Reverse Current, Short circuit and Thermal Shutdown Protection**

**EVALUATION BOARD SCHEMATICS**

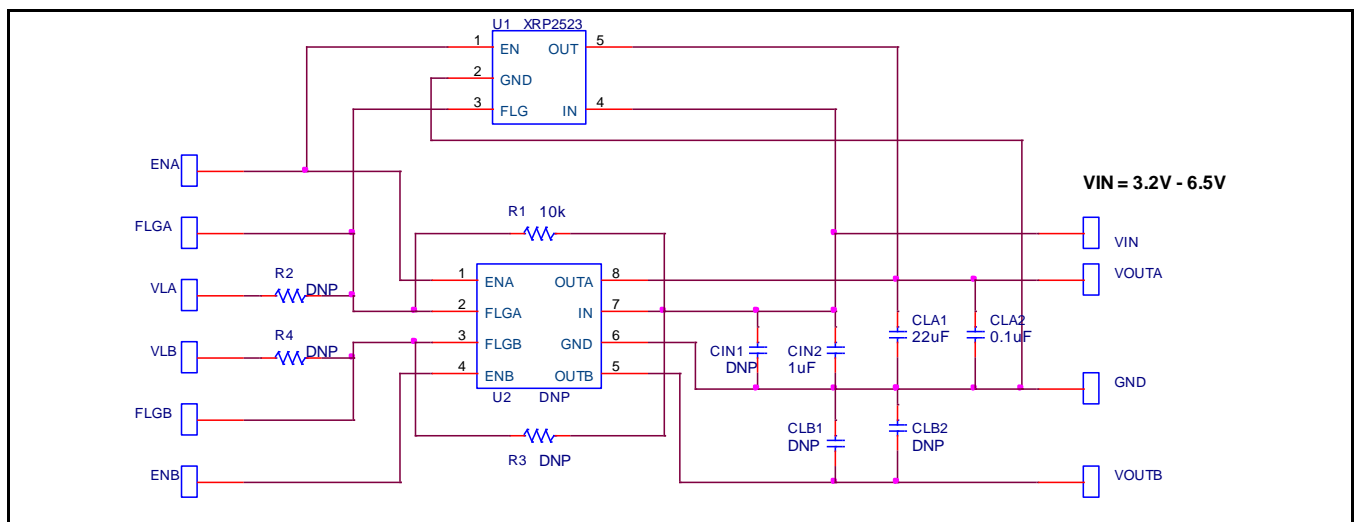


Fig. 1: XRP2523 Evaluation Board Schematic

**PIN ASSIGNMENT**

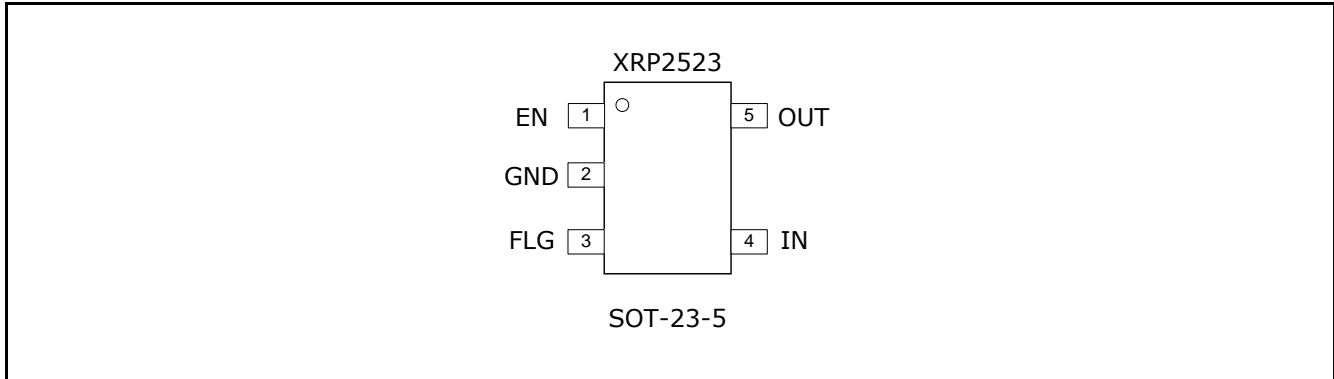


Fig. 2: XRP2523 Pin Assignment

**PIN DESCRIPTION – XRP2523**

Name	Pin Number	Description
EN	1	Channel Enable Input
GND	2	Ground Signal
FLG	3	Error Flag Signal Active low open drain output. Active on over-current, over-temperature, short-circuit or UVLO conditions.
IN	4	Voltage Input Pin
OUT	5	Voltage Output Pin

**ORDERING INFORMATION**

Refer to XRP2523’s datasheet and/or [www.exar.com](http://www.exar.com) for exact and up to date ordering information.

**1.5A Single Channel USB 3.0 Power Distribution Switch**

**USING THE EVALUATION BOARD**

Note: The XRP2523 evaluation board is common with Exar's XRP2524 and XRP2526 evaluation boards.

**INITIAL SETUP**

The Board is supplied from EXAR with the XRP2523 device. Set the input supply to a voltage between 3.2V to 6.5V and connect it to VIN and GND connectors on the right side of the evaluation board.

Enable pin must be pulled up HIGH to enable the IC. Connect the load to the VOUT and

PGND connectors on the right hand side of the board.

Flag pin is pulled up to VIN through a 10kΩ resistor (provided by default on the board) or can be instead connected to a separate external power supply voltage VLA.

The board will power-up upon turning on the input supply and reach the desired output voltage. The board can operate with a load current I<sub>OUT</sub> of up to 1.5A.

**TYPICAL PERFORMANCE CHARACTERISTICS**

All data taken at V<sub>IN</sub> = 5V, C<sub>IN</sub> = 1μF, C<sub>OUT</sub> = 22μF//0.1μF, T<sub>J</sub> = T<sub>A</sub> = 25°C, unless otherwise specified - Schematic and BOM from Application Information section of this datasheet.

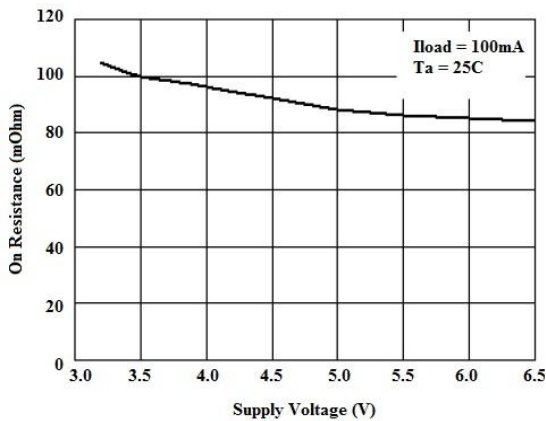


Fig. 3: Output On-Resistance vs. Supply Voltage

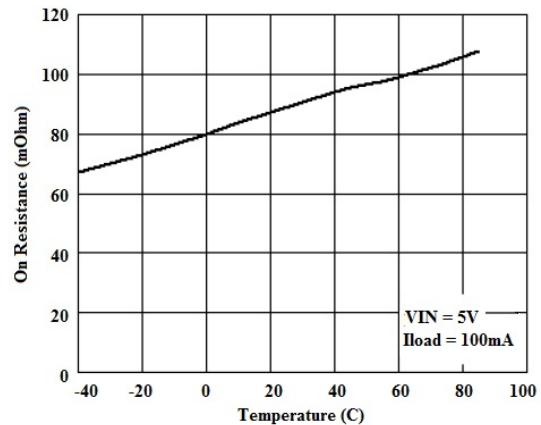


Fig. 4: Output On-Resistance vs. Temperature

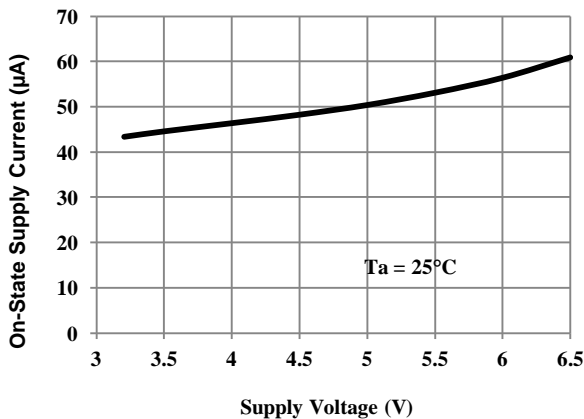


Fig. 5: ON-State Supply Current vs. Supply Voltage

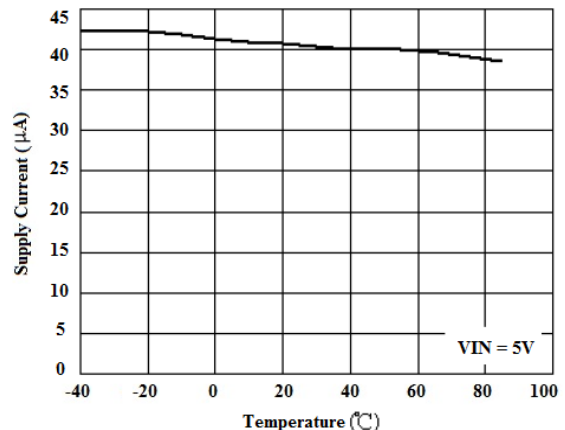


Fig. 6: ON-State Supply Current vs. Temperature

1.5A Single Channel USB 3.0 Power Distribution Switch

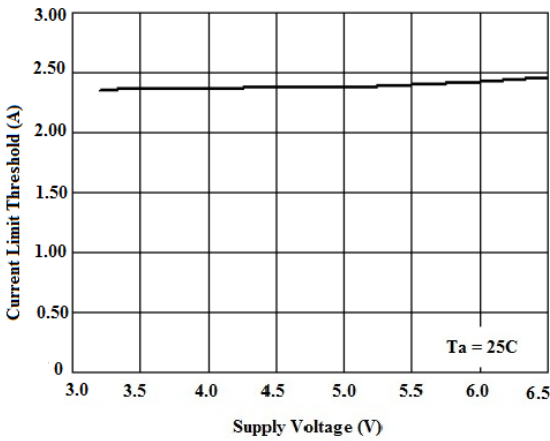


Fig. 7: Current Limit Threshold vs. Supply Voltage

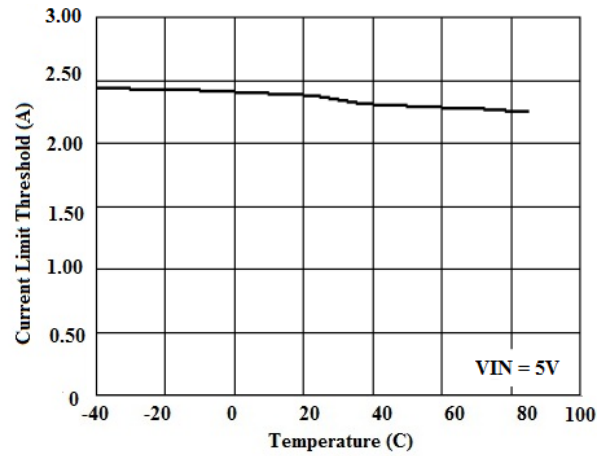


Fig. 8: Current Limit Threshold vs. Temperature

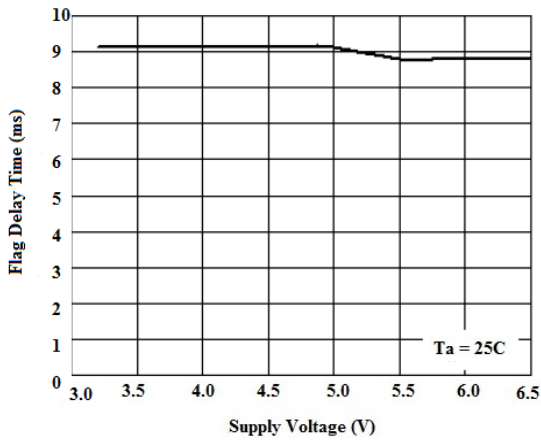


Fig. 9: Flag Delay Time vs. Supply Voltage

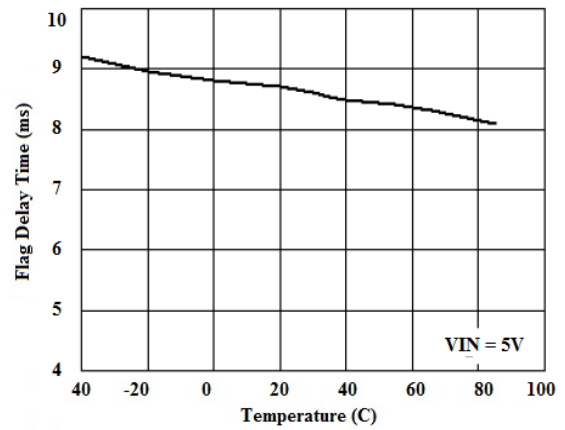


Fig. 10: Flag Delay Time vs. Temperature

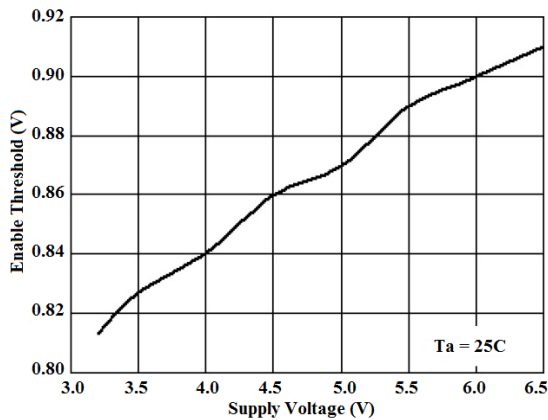


Fig. 11: Enable Threshold vs. Supply Voltage

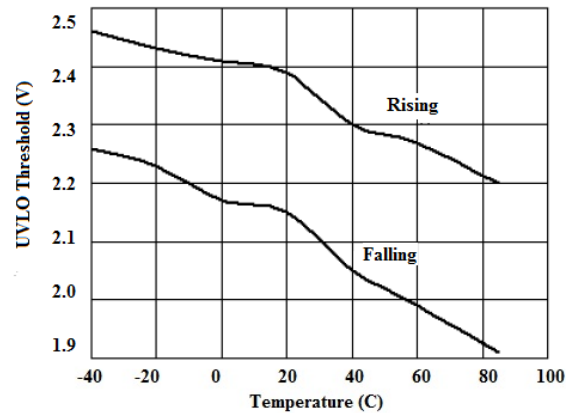


Fig. 12: UVLO Threshold Voltage vs. Temperature

1.5A Single Channel USB 3.0 Power Distribution Switch

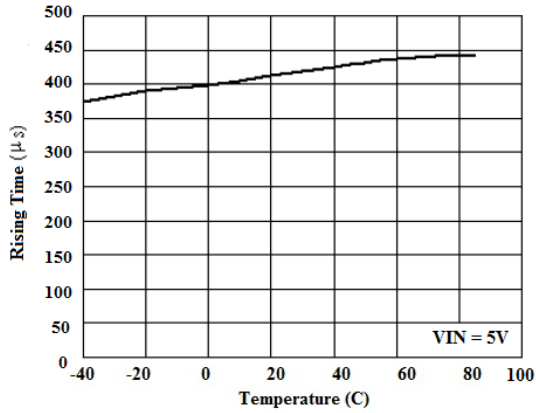


Fig. 13: Output Rising Time vs. Temperature

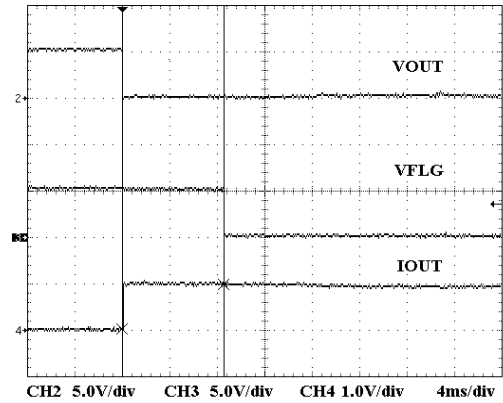


Fig. 14: Short circuit protection, VIN = 5.0V

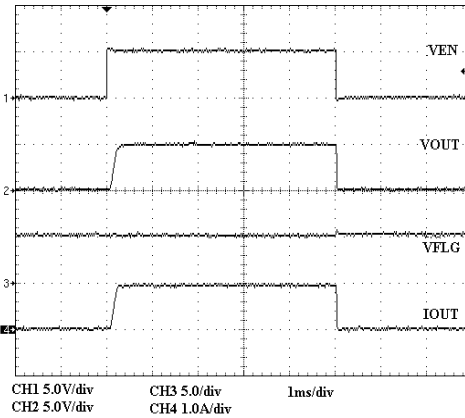
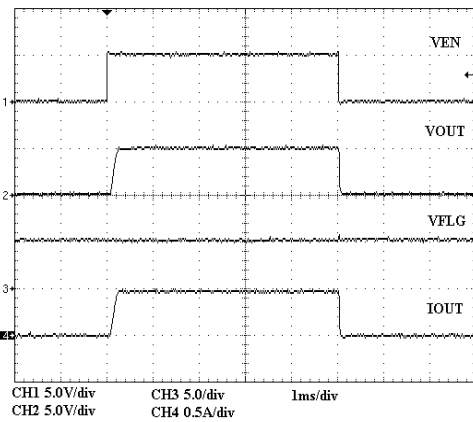


Fig. 15: Turn-On/Off Characteristics: COUT=1µF, Load=10Ω Fig. 16: Turn-On/Off Characteristics: COUT=1µF, Load=5.1Ω

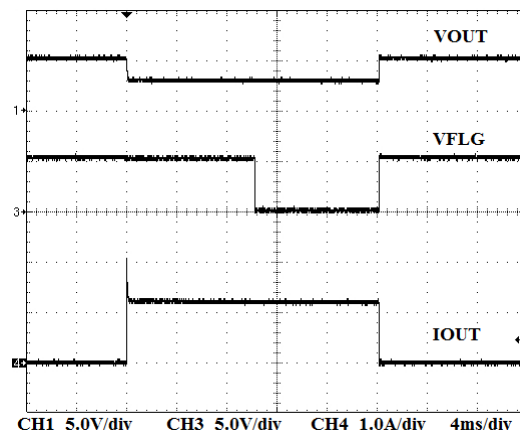
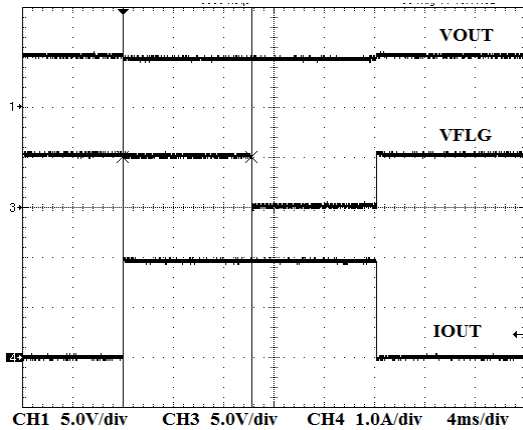
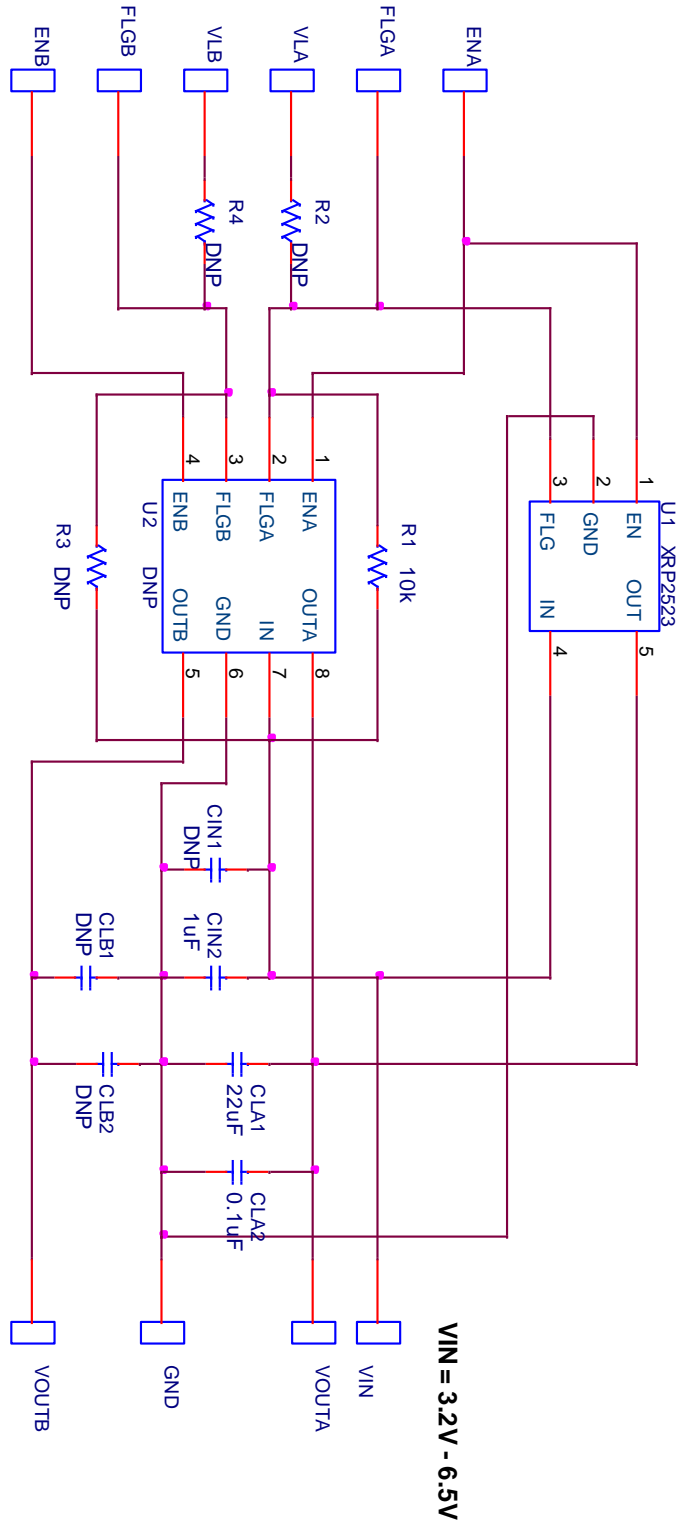


Fig. 17: Current Limit Operation: VIN = 5V, Load = 2.5Ω

Fig. 18: Current Limit Operation: VIN = 5.2V, Load = 2.5Ω

1.5A Single Channel USB 3.0 Power Distribution Switch

EVALUATION BOARD SCHEMATICS



**BILL OF MATERIAL**

Ref.	Qty	Manufacturer	Part Number	Size	Component
EVAL BD	1	Exar Corp.	146-6693-01		XRP2523 Evaluation Board
U1	1	Exar Corp.	XRP2523	5-pin SOT-23	XRP2523
U2					Not populated
CIN1, CLB1, CLB2					Not populated
CIN2	1	Murata Corp.	GRM188R71E105KA12D	0603	Ceramic 1uF, 25V, X7R
CLA1	1	Murata Corp.	GRM31CR61C226KE15L	1206	Ceramic 22uF, 16V, X5R
CLA2	1	Murata Corp.	GRM188R71H104KA93D	0603	Ceramic 0.1uF, 50V, X7R
R1	1	Panasonic Corp.	ERJ-3EKF1002V	0603	Resistor 10KΩ, 1/10W, 1%
R2, R3, R4					Not populated
Test Point, VIN, GND, PGND, VOUTA, VOUTB, ENA, ENB, FLGA, FLGB, VLA, VLB	12	VECTOR	K24C/M	0.042" diameter	Test Point Post

**EVALUATION BOARD LAYOUT**

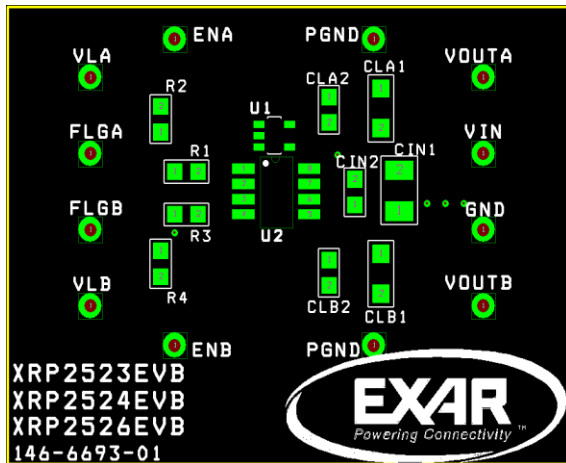


Fig. 19: Component Placement – Top Side

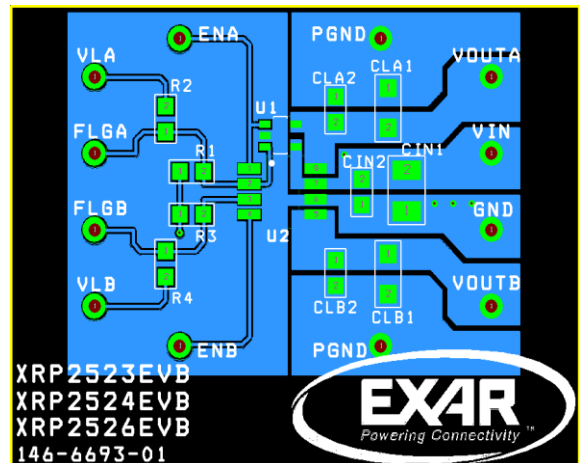


Fig. 20: Top Side Layout

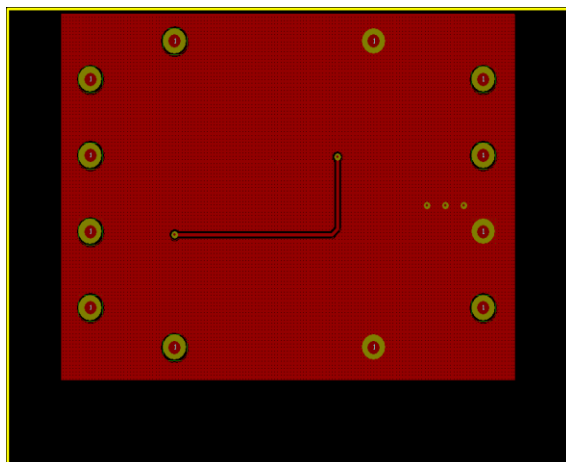


Fig. 21: Bottom Side Layout



1.5A Single Channel USB 3.0 Power Distribution Switch

DOCUMENT REVISION HISTORY

Table with 3 columns: Revision, Date, Description. Row 1: 1.0.0, 10/10/2012, Initial release of evaluation board manual.

BOARD REVISION HISTORY

Table with 3 columns: Board Revision, Date, Description. Row 1: 146-6693-01, 10/10/2012, Initial release of evaluation board.

FOR FURTHER ASSISTANCE

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Exar Technical Documentation:

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