

GENERAL DESCRIPTION

The XRP6658 is a synchronous current mode PWM step down (buck) converter capable of delivering up to 1Amp of current and optimized for portable battery-operated applications.

Based on a current-mode 1.5MHz constant frequency PWM control scheme, the XRP6658 reduces the overall component count and solution footprint. It provides low output voltage ripple and excellent line and load regulation. It also implements a PFM mode to improve light load efficiency as well as a 100% duty cycle LDO mode. Output voltage is adjustable to as low as 0.6V with a better than 3% accuracy while a low quiescent current supports the most stringent battery operating conditions.

Built-in over temperature and under voltage lock-out protections insure safe operations under abnormal operating conditions.

The XRP6658 is offered in a RoHS compliant, "green"/halogen free 5-pin SOT23 package.

EVALUATION BOARD MANUAL



FEATURES

- **Guaranteed 1A Output Current**
 - Input Voltage: 2.5V to 5.5V
- **1.5MHz PWM Current Mode Control**
 - PFM Mode Operations at Light Load
 - 100% Duty Cycle LDO Mode Operations
 - Achieves 97% Efficiency
- **Adjustable Output Voltage Range**
 - As Low as 0.6V with $\pm 3\%$ Accuracy
- **Internal Compensation Network**
- **Over Temperature & UVLO Protection**

EVALUATION BOARD SCHEMATICS

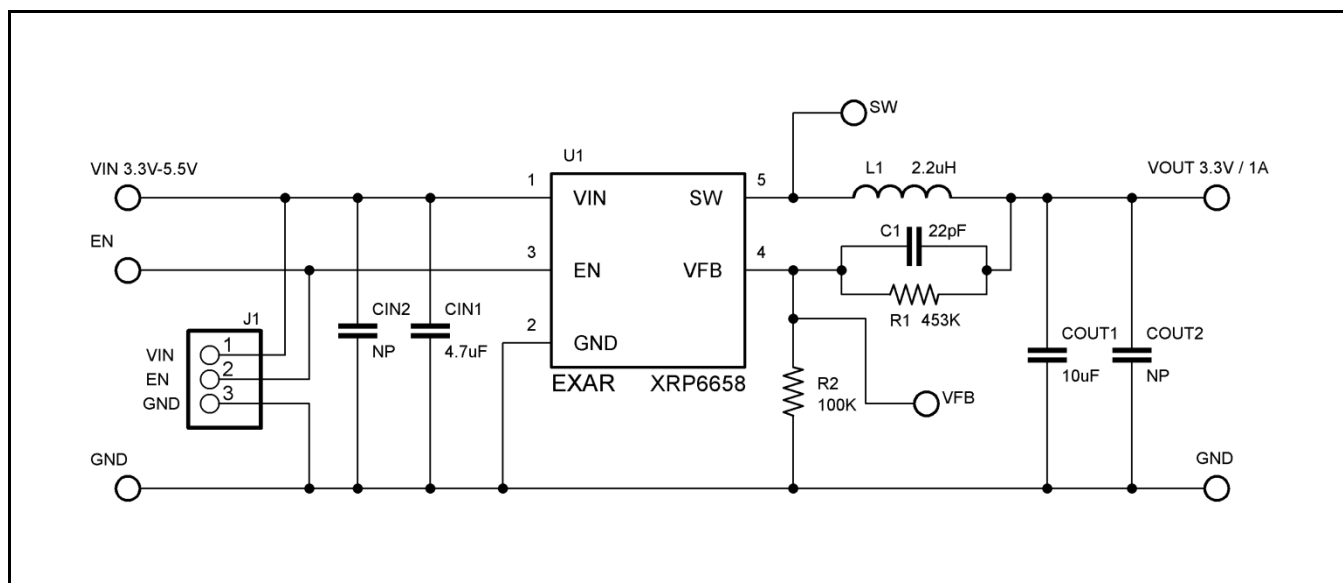


Fig. 1: XRP6658EVB Evaluation Board Schematics

PIN ASSIGNMENT

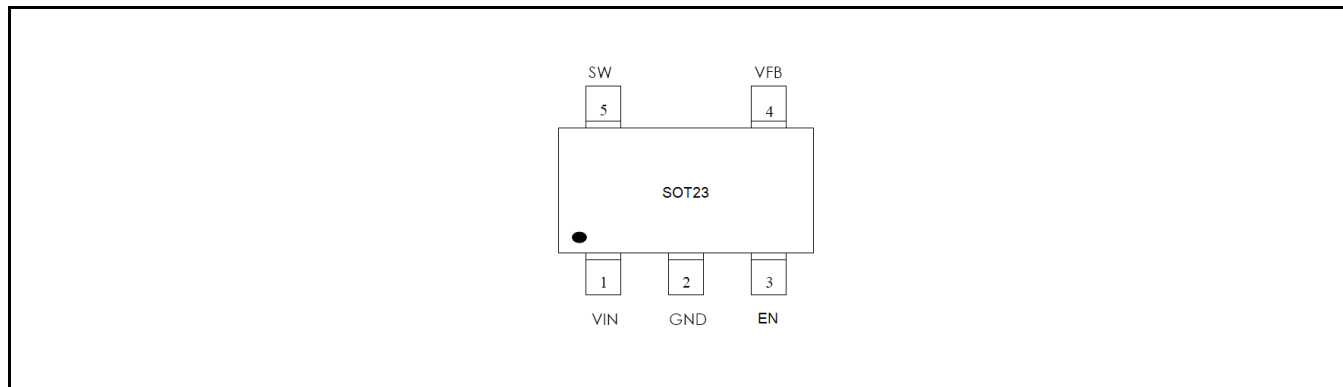


Fig. 2: XRP6658 Pin Assignment

PIN DESCRIPTION

Name	Pin Number	Description
VIN	1	Power Input Pin. Must be closely decoupled to GND pin with a 4.7 μ F or greater ceramic capacitor.
GND	2	Ground Signal
EN	3	Enable Pin. Minimum 1.2V to enable the device. Maximum 0.4V to shutdown the device.
VFB	4	Feedback Pin. Receives the feedback voltage from an external resistive divider across the output.
SW	5	Switch Pin. Must be connected to Inductor. This pin connects to the drains of the internal main and synchronous power MOSFET switches.

ORDERING INFORMATION

Refer to XRP6658's datasheet and/or www.exar.com for exact and up to date ordering information.

**USING THE EVALUATION BOARD****INITIAL SETUP**

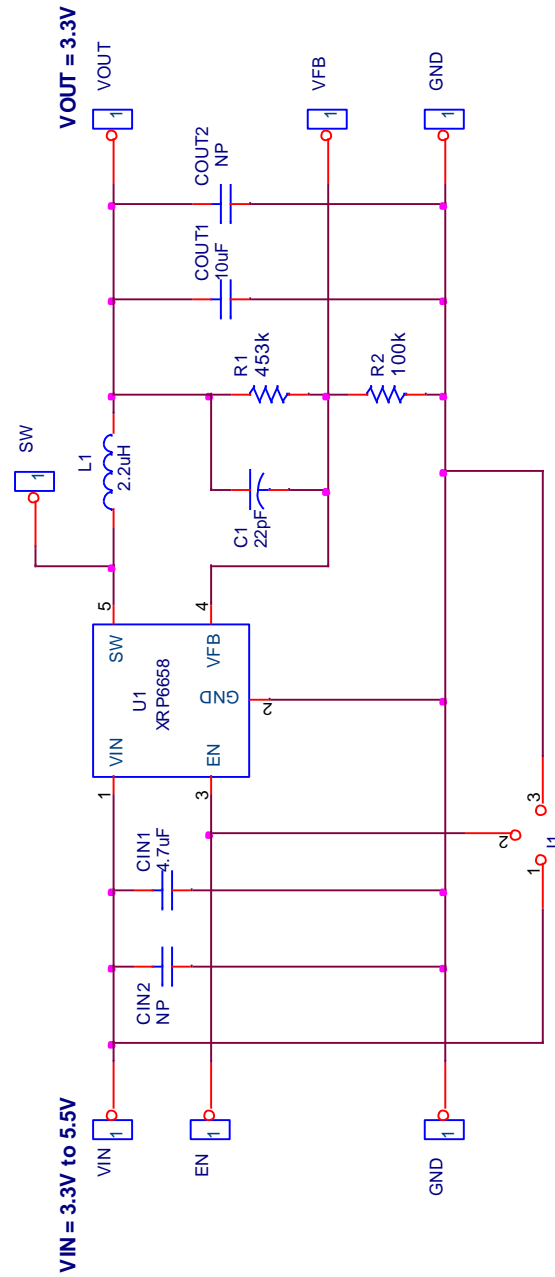
Set the input supply to a voltage between 2.5V to 5.5V and connect it to VIN and GND connectors on the left side of the evaluation board. Connect the load to the VOUT and GND connectors on the right hand side of the board. Check to make sure that jumper J1 is set to VIN. The board will power-up and regulate to the desired output voltage VOUT

set by the feedback resistors. The board will operate with a load current I_{OUT} of up to 1A and provide efficiency equal to figures 4 and 5 of XRP6658 datasheet.

JUMPER J1 FUNCTION

Jumper J1 can be used to either short EN pin to VIN or to GND. The Board is supplied from EXAR with the jumper set to connect EN to VIN.

EVALUATION BOARD SCHEMATICS



**BILL OF MATERIAL**

Ref.	Qty	Manufacturer	Part Number	Size	Component
EVAL BD	1	Exar Corp	146-6685-02		XRP6658 Evaluation Board
U1	1	Exar Corp	XRP6658	SOT 23-5	Synchronous Step-Down Regulator
CIN1	1	Murata	GRM21BR71C475KA73L	0805	Ceramic 4.7 μ F, 16V, X7R
CIN2	1				Not populated
COUT1	1	Murata	GRM21BR71A106KE51L	0805	Ceramic 10 μ F, 10V, X7R
COUT2	1				Not populated
C1	1	Murata	GRM1885C1H220JA01D	0603	Ceramic 22pF, 50V, C0G
L1	1	Würth Elektronik	7440430022	4.8mm x 4.8mm x 2.8mm	Inductor 2.2 μ H, 2.5A, 23m Ω
R1	1	Vishay	CRCW0603453KFKTA	0603	453K Ω Resistor, 0.1W, 1%
R2	1	Vishay	CRCW0603100KFKTA	0603	100K Ω Resistor, 0.1W, 1%
J1	1	Würth Elektronik	61303611121	0.64mm SQ x 6mm	3 Pin Header, 2.54mm pitch
J1 (Jumper)	1	Würth Elektronik	609002115121	0.1"	Jumper short
Test Point VIN, VOUT, EN, SW, GND, VFB	7	Mill-Max	0300-115-01-4727100	0.042" diameter	Test Point Post

EVALUATION BOARD LAYOUT

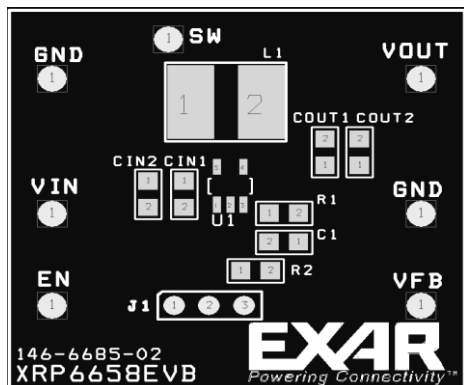


Fig. 3: Component Placement – Top Side

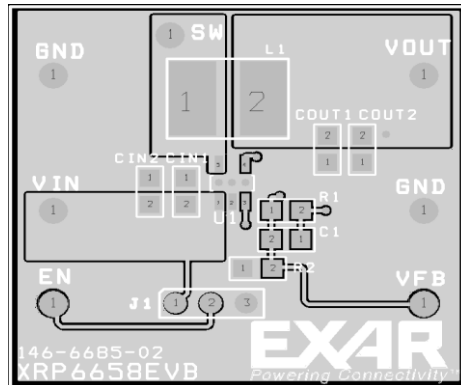


Fig. 4: Component Placement 2 – Top Side

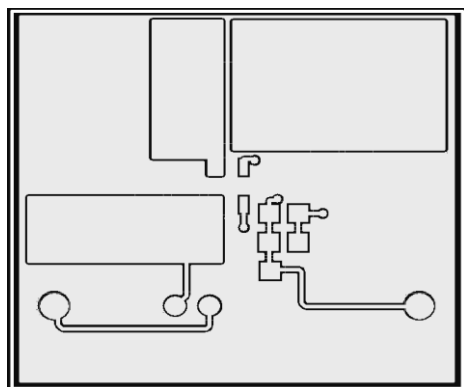


Fig. 5: Layout – Top Side

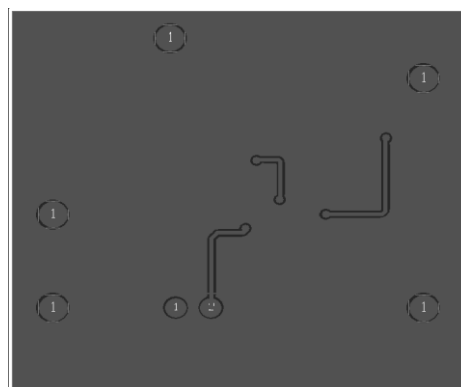


Fig. 6: Layout – Bottom Side



XRP6658EVB

1A 1.5MHz Synchronous Step-Down Converter

REVISION HISTORY

Revision	Date	Description
1.0.0	09/16/2010	Initial release of document
2.0.0	10/06/2010	Updated evaluation board schematics and lay out.
2.1.0	02/07/2012	Updated bill of material and schematics

FOR FURTHER ASSISTANCE

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Exar Technical Documentation:

<http://www.exar.com/TechDoc/default.aspx?>



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