

RT6266 Step-Down Converter Evaluation Board

Purpose

The RT6266 is a high-efficiency, monolithic asynchronous step-down DC/DC converter with load line Compensation. This document explains the function and use of the RT6266 evaluation board (EVB) and provides information to enable operation and modification of the evaluation board and circuit to suit individual requirements.

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Introduction

General Product Description

The RT6266 is a high-efficiency, monolithic asynchronous step-down DC/DC converter that can deliver up to 2.4A output current from a 7.5V to 36V input supply. The RT6266's current mode architecture with internal compensation is optimized for 5V car charger application over a wide range of loads and output capacitors. Cycle-by-cycle current limit provides protection against shorted outputs and soft-start eliminates input current surge during start-up. The RT6266 also provides output over voltage protection output under voltage protection and thermal shutdown protection. The low current (<3 μ A) shutdown mode provides output disconnect, enabling easy power management in battery-powered systems. The RT6266 is available in a SOP-8 (Exposed Pad) package.

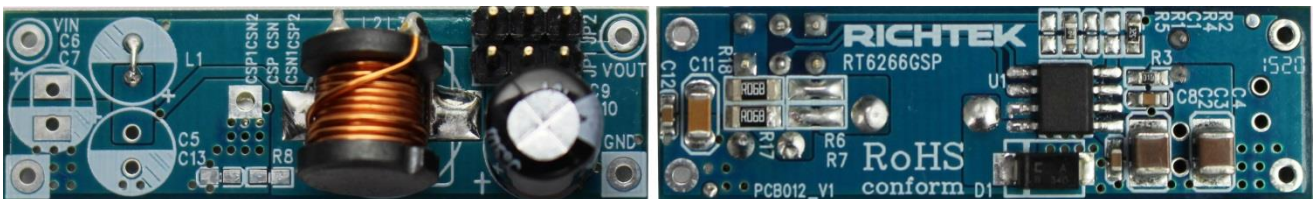
Product Features

- $\pm 2\%$ High Accuracy Feedback Voltage
- 7.5V to 36V Input Voltage Range
- 2.4A Continuous Output Current (2.7A Peak)
- CC/CV Mode Control
- Adjustable Load Line Compensation
- Short Circuit Protection
- Integrated N-MOSFET Switches
- Current Mode Control
- Fixed Frequency Operation : 100kHz
- Programmable Output Current Limit
- 110m Ω Internal Power MOSFET Switch
- Low EMI
- Up to 95% Efficiency
- Cycle-by-Cycle Over Current Protection
- Input Under Voltage Lockout
- Output Under Voltage Protection
- Thermal Shutdown Protection

Application

- USB Power Supplies
- Automotive Cigarette Lighter Adapters
- Power Supply for Linear Chargers
- DC/DC Converters with Current Limited

Evaluation Board



Please carefully inspect the EVB IC and external components, comparing them to the following Bill of Materials, to ensure that all components are installed and undamaged. If any components are missing or damaged during transportation, please contact the distributor or send e-mail to evb_service@richtek.com

Test Points

The EVB is provided with the test points and pin names listed in the table below.

Test point/Pin name	Signal	Comment (expected waveforms or voltage levels on test points)
VIN	Input voltage	Input voltage range = 7.5V to 36V
VOUT	Output voltage	Output voltage = 5V
CSP	Current Sense Positive Input.	In this RT6266 EVB original setting, the CSP pin of JP1 should be connected short with CSN1 by jumper for normal operation.
CSN	Current Sense Negative Input.	In this RT6266 EVB original setting, the CSN pin of JP2 should be connected short with CSN2 by jumper for normal operation.

Power-up & Measurement Procedure

1. Connect input power (7.5V < VIN < 36V) and input ground to VIN pin.
2. Connect positive end and negative end of load to VOUT pin.
3. The output voltage of (Vout) can be set by R1 and R2.

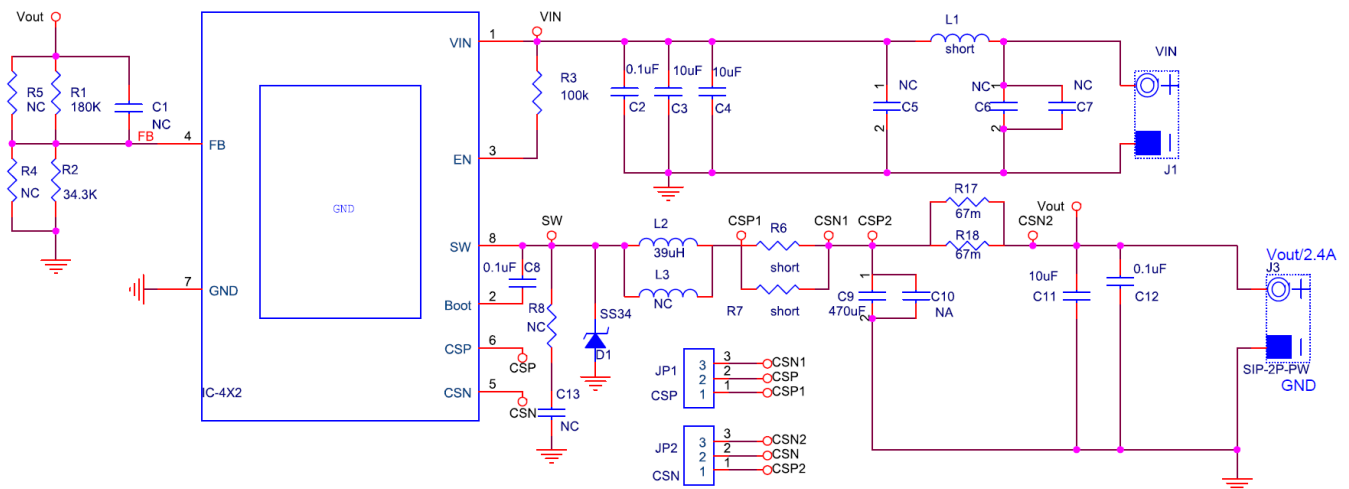
$$V_{out} = V_{REF} * (1 + R1/R2)$$

where V_{REF} = 0.8V (typ.)

Specification

Parameter	Symbol	Min	Typ.	Max	Units
Input Voltage Range	V _{IN}	7.5		36	V
Output Voltage	V _{OUT}		5		V
Oscillator Frequency	f _{osc}	85	100	115	kHz
Output Current	I _{OUT}			2.4	A
Upper Switch Current Limit	I _{LIM}		4.4		A

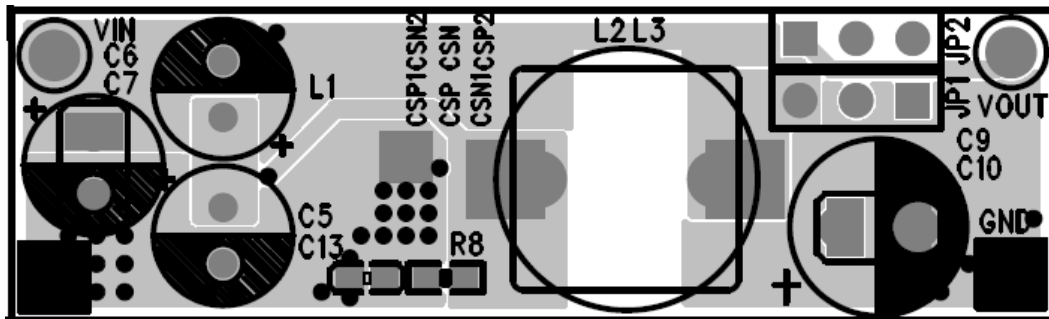
Schematic



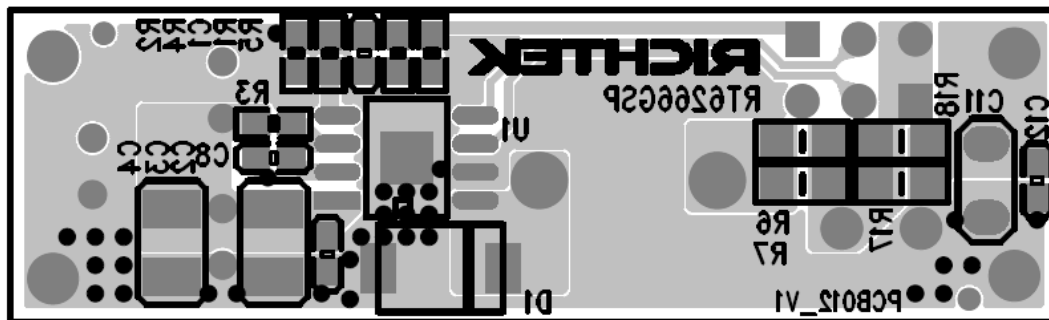
BOM

Reference	Q'ty	P/N	Description	Package	Manufacture
U1	1	RT6266GSP	Step-down converter	SOP-8	RICHTEK
C2, C8, C12	3	C1608X7R1H104K080AA	0.1μF/±10%/50V/X7R	C-0603	TDK
C3, C4	2	C3216X5R1H106K160AB	10μF/±10%/50V/X5R	C-1206	TDK
C1, C5, C6, C7, C10, C13	6		NC		
C9	1	GR, E-Cap	470μF/16V		CHI LI TEH
C11	1	C3216X7R1E106K	10uF/±10%/25V/X7R	C-1206	TDK
L1	1		Short		
L2	1	MCD110C-390K-LV	39uH		MAG.LAYERS
L3	1		NC		
D1	1	CDBA340-G	3A/40V		Comchip
R1	1		180k		
R2	1		34.3k		
R3	1		100k		
R6, R7	2		Short		
R17, R18	2		67m		
R4, R5, R8	3		NC		

PCB Layout

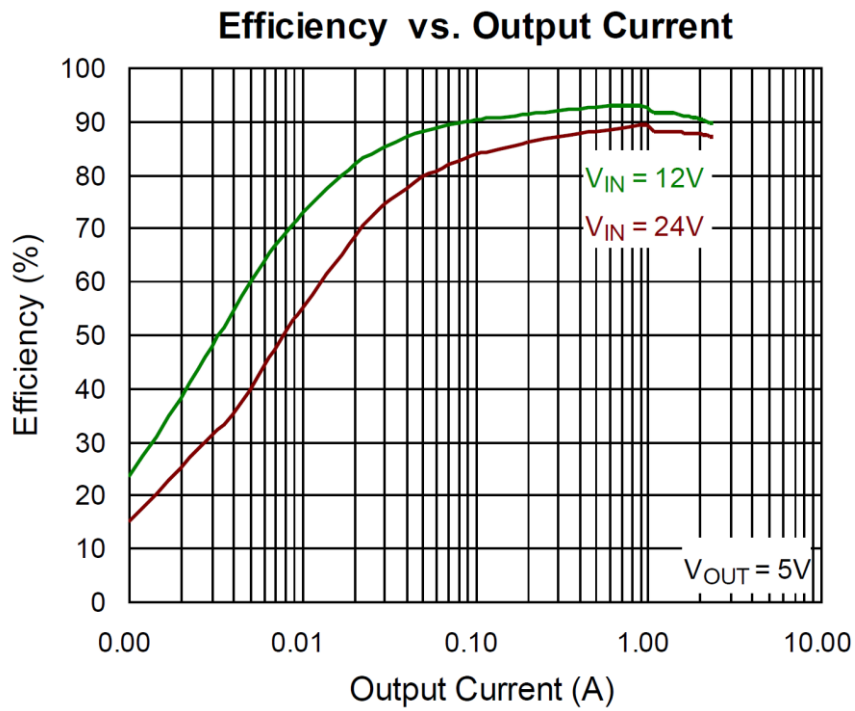


Top View



Bottom View

Step-Down Converter Efficiency Test



More Information

For more information, please find the related datasheet or application notes from Richtek website <http://www.richtek.com>.

Important Notice for Richtek Evaluation Board

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