

XCL248B0K1H2-G Evaluation Board User Manual

36V, 600mA Inductor Built-in Step-down “micro DC/DC” Converter

CAUTION

ENGINEERING EVALUATION PURPOSES ONLY

This evaluation board is made for the purpose of the product evaluation. It is strictly prohibited to use this evaluation board for any other purpose.

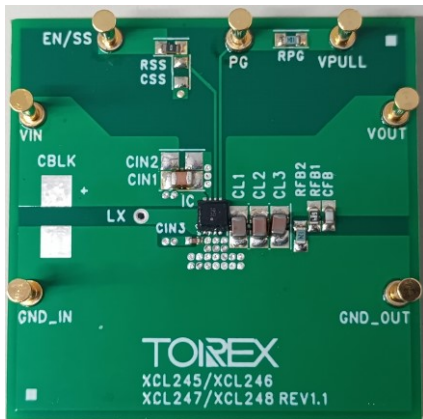
Torex Semiconductor does not guarantee that all samples will perform in exactly the same way and we recommend that you always consult our product data sheets for the minimum and maximum specifications.

It is also important that you evaluate all our products carefully before mass

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Evaluation Board Picture



Evaluation Board SPEC

						Ta=25°C
		CONDITON.	MIN.	TYP.	MAX.	UNIT
Vin	Input Voltage Range	-	3.0	-	36.0	V
Vout	Setting Output Voltage	-	-	5.0	-	V
Iout	Output Current	-	0.0	-	600.0	mA
fosc	Switching frequency	-	-	1.2	-	MHz

XCL247/XCL248 Series Features

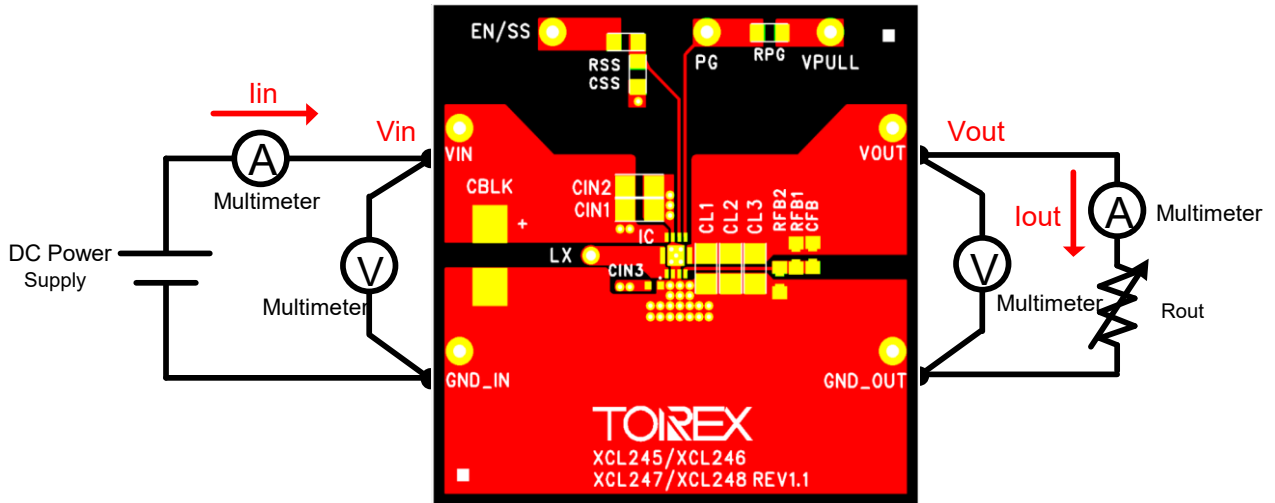
- Input Voltage Range 3.0V ~ 36.0V
- Output Voltage Range 1.0V ~ 6.0V
- Max Output Current 600mA max.
- Switching frequency 1.2MHz
- Max Duty Cycle 100%
- Small Solution Size

- Low EMI Noise
- Built-in Inductor
- Sequence Control is possible. (Power Good and Soft Start functions)

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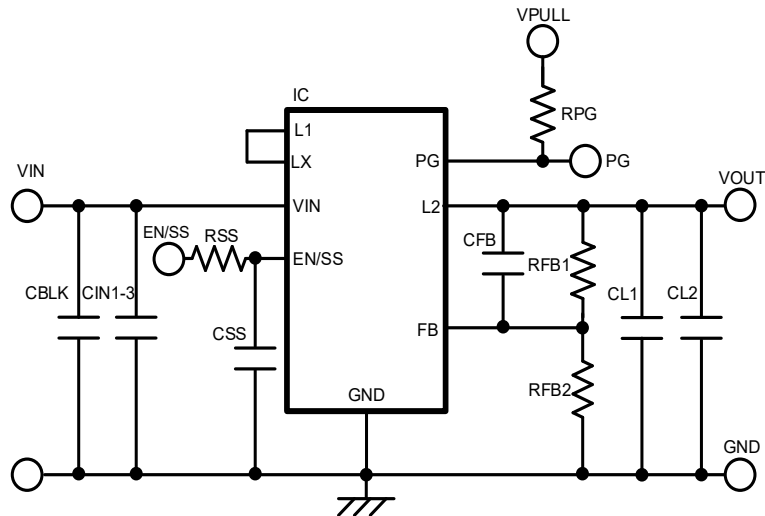
Quick Start Procedure



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Schematic



BOM

Required Circuit Component

Item	Value	Description	Size [mm]	Part Number	ManuFature
IC	-	Step-Down micro DC/DC Converters	DFN3030-10B	XCL248B0K1H2-G	TOREX
CIN1	4.7μF	Ceramic cap., 50V	2012	C2012X7R1H225K125AC	TDK
CIN2	-	-	-	-	-
CIN3	0.1μF	Ceramic cap., 50V	1608	CGA2B3X7R1H104K	TDK
CL1	22μF	Ceramic cap., 16V	2012	GRM21BC81C226ME44	Murata
CL2	22μF	Ceramic cap., 16V	2012	GRM21BC81C226ME44	Murata
CL3	22μF	Ceramic cap., 16V	2012	GRM21BC81C226ME44	Murata
RFB1	680kΩ	Resistor	1608	-	-
RFB2	120kΩ	Resistor	1608	-	-
CFB	24pF	Ceramic cap., 50V, CH	1608	-	-
RSS	Jumper	Resistor	-	-	-
CSS	-	-	-	-	-
RPG	100kΩ	Resistor	-	-	-

Additional Demo Board Circuit Components

Item	Value	Description	Size [mm]	Part Number	ManuFature
CBLK	-	-	-	-	-

Vout Setting Table

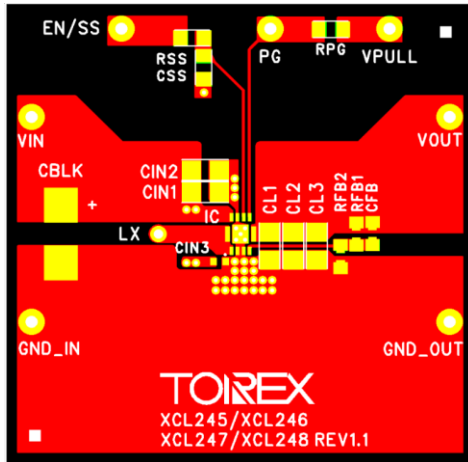
Vout Setting	RFB1	RFB2	CFB
3.3V	510kΩ	150kΩ	27pF
5.0V	680kΩ	120kΩ	24pF

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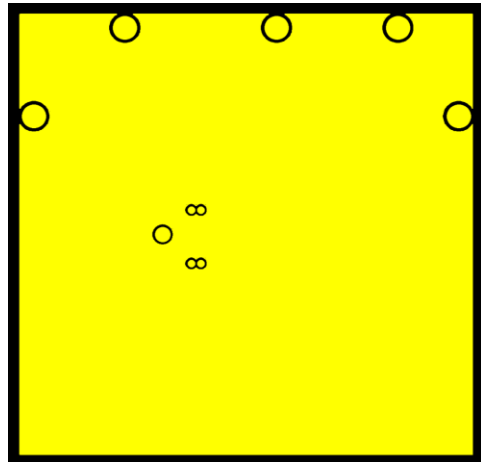
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PCB Layout

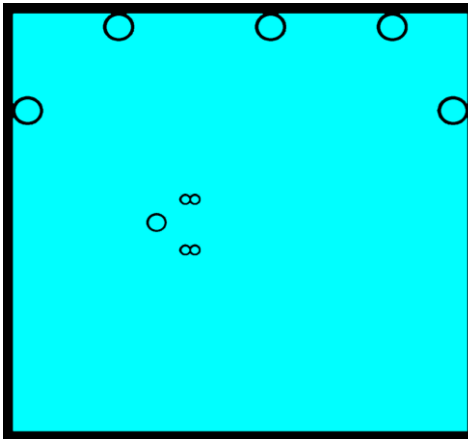
Layer 1



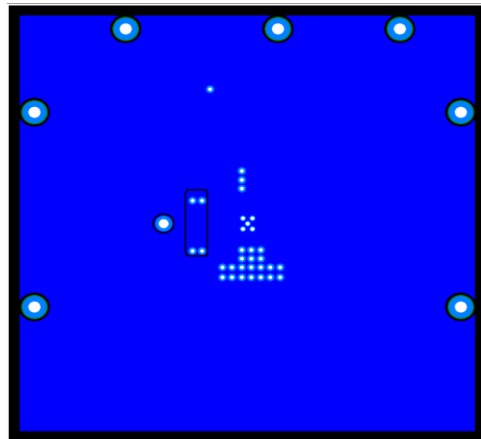
Layer 2



Layer 3



Layer 4

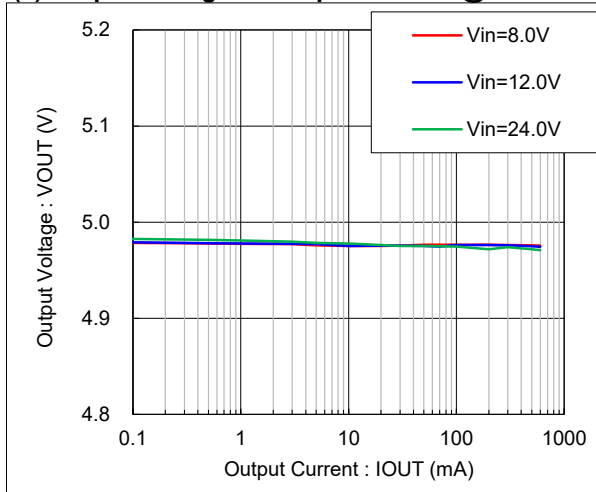


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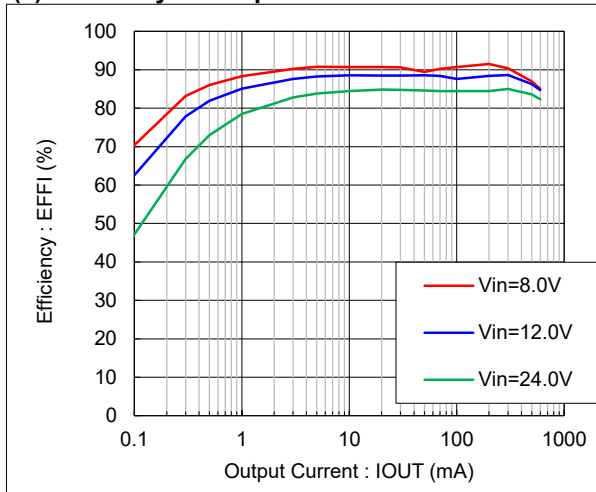
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Test Result

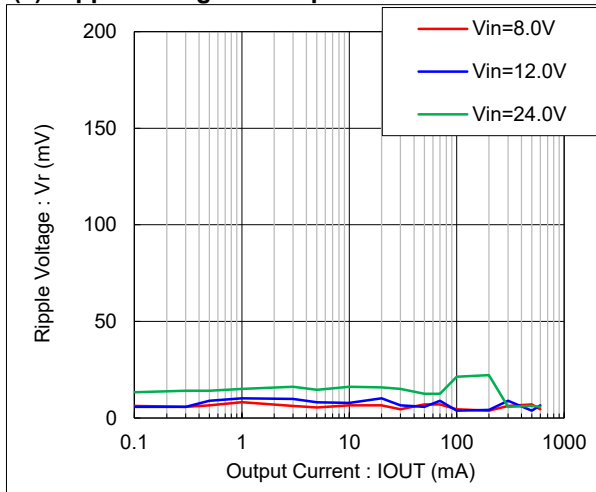
(1) Output Voltage vs Output Current @Ta=25°C



(2) Efficiency vs Output Current Ta=25°C



(3) Ripple Voltage vs Output Current Ta=25°C

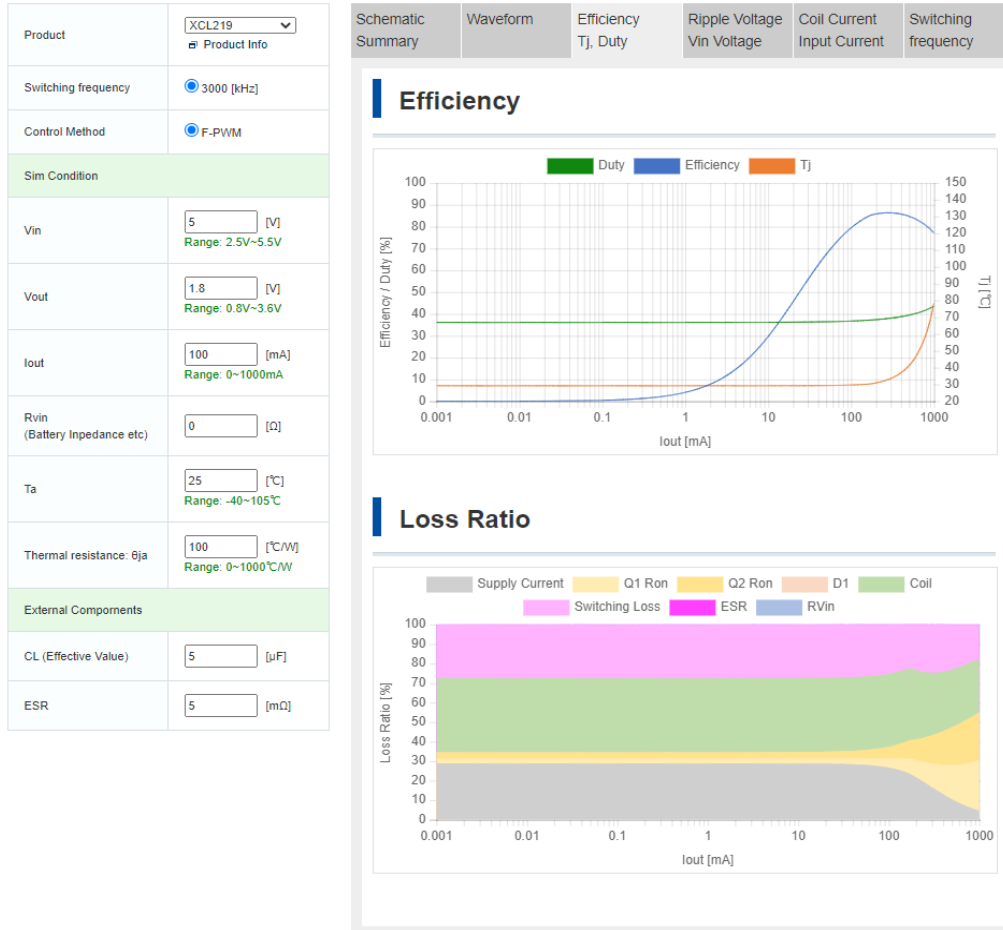


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【Appendix】 How to calculate DC/DC Converter or DC/DC Controller.

It can be calculated by the following "WEB DC/DC Simulation".



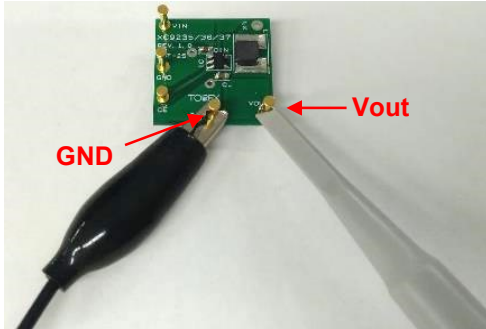
日本語 : <https://www.torex.co.jp/technical-support/dcdc-simulation/>
 English : <https://www.torexsemi.com/technical-support/dcdc-simulation/>
 简体中文 : <https://www.torex.com.cn/technical-support/dcdc-simulation/>

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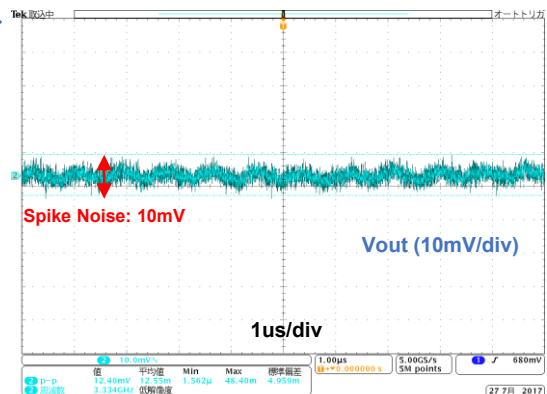
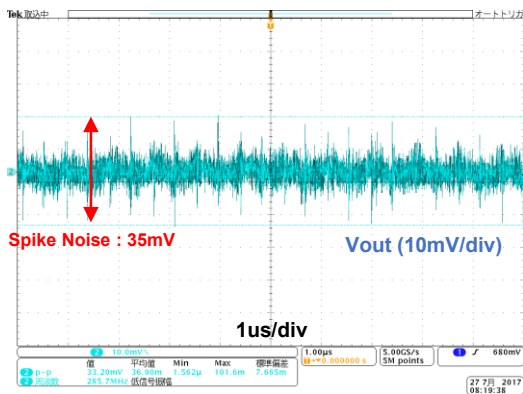
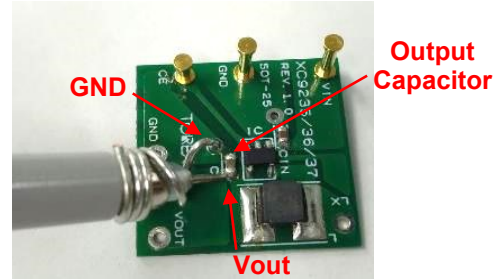
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[Appendix] How to reduce the spike noise caused by measurement (Probing method with oscilloscope)

Probing method : Before improvement



Probing method : After



* Condition : XC9236, Vin=3.6V/Vout=1.8V/100mA

English : <https://www.torexsemi.com/technical-support/tips/reduction-spike-noise/>

日本語 : <https://www.torex.co.jp/technical-support/tips/reduction-spike-noise/>