

XC9145B33CER-G Evaluation Board User Manual

400nA Ultra-Low Quiescent, 0.8A, PWM/PFM Step-up DC/DC Converters

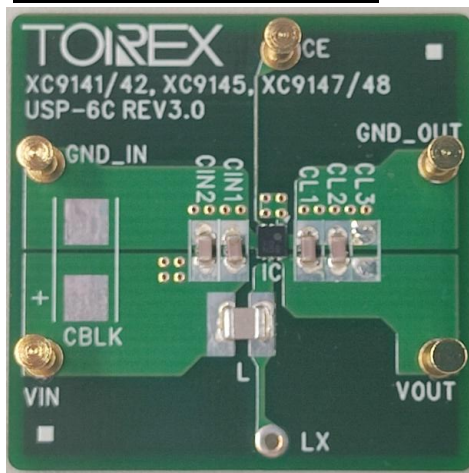
CAUTION

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

XC9145B33CER-G Evaluation Board*400nA Ultra-Low Quiescent, 0.8A, PWM/PFM Step-up DC/DC Converters***Evaluation Board Picture****Evaluation Board SPEC**

Ta=25°C

		CONDITON.	MIN.	TYP.	MAX.	UNIT
Vin	Input Voltage Range	-	0.65	-	5.5	V
	Operation Start Voltage	-	-	-	1.6	V
Vout	Setting Output Voltage	-	-	3.3	-	V
Iout	Output Current	-	Refer to Graph 7			mA
fosc	Switching frequency	-	-	1.2	-	MHz

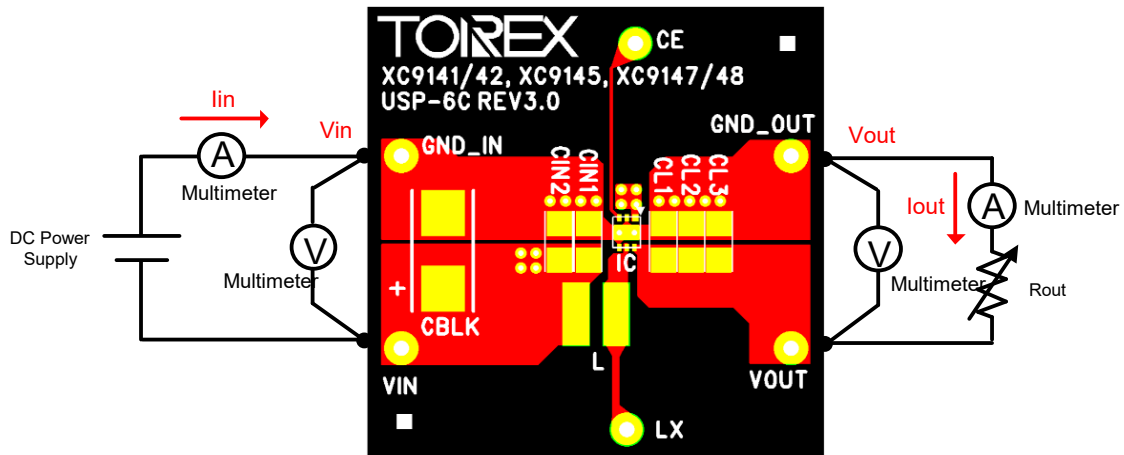
XC9145 Series Features

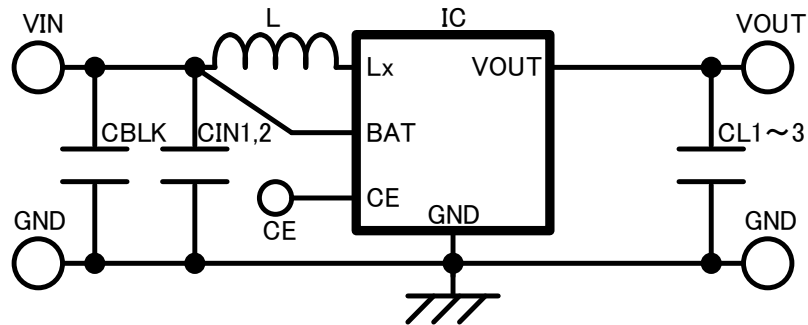
- Input Voltage Range 0.65V ~ 5.5V
- Operation Start Voltage 1.6V
- Output Voltage Range 3.0V ~ 5.5V (step 0.1V)
- Switching frequency 1.2MHz
- Ultra Low Power Solution

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Quick Start Procedure



XC9145B33CER-G Evaluation Board*400nA Ultra-Low Quiescent, 0.8A, PWM/PFM Step-up DC/DC Converters***Schematic****BOM****Required Circuit Component**

Item	Value	Description	Size [mm]	Part Number	Manufacturer
IC	-	Step-up DC/DC converter	USP-6C	XC9145B33CER-G	TOREX
L	4.7uF	Inductor, Isat=2.1A	2520	DFE252012F-4R7M	Murata
CIN1	10uF	Ceramic cap., 16V/10uF	1608	GRM188R61C106MA73	Murata
CIN2	-	-	-	-	-
CL1	10uF	Ceramic cap., 16V/10uF	1608	GRM188R61C106MA73	Murata
CL2	10uF	Ceramic cap., 16V/10uF	1608	GRM188R61C106MA73	Murata
CL3	-	-	-	-	-

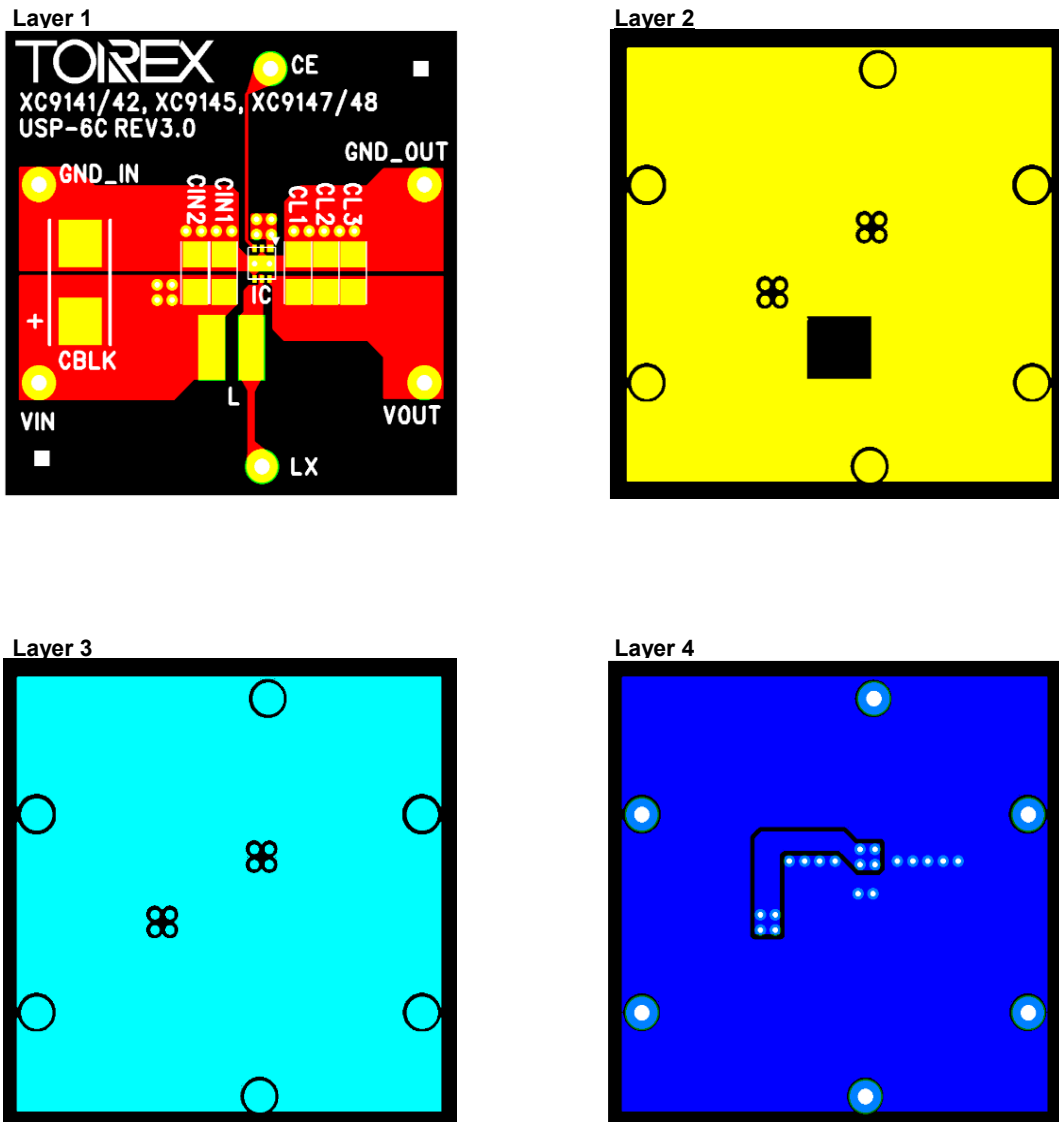
Additional Demo Board Circuit Components

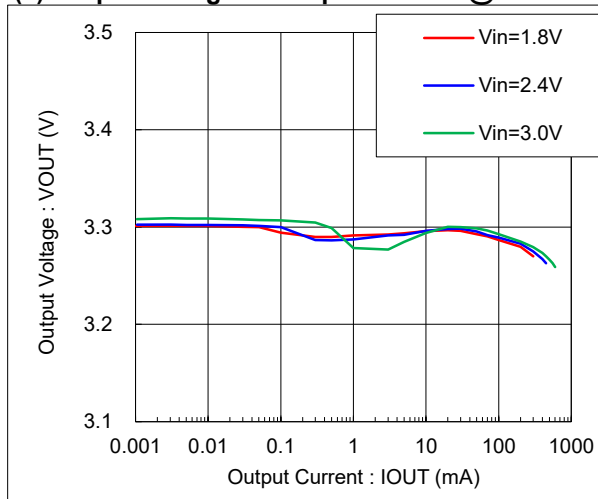
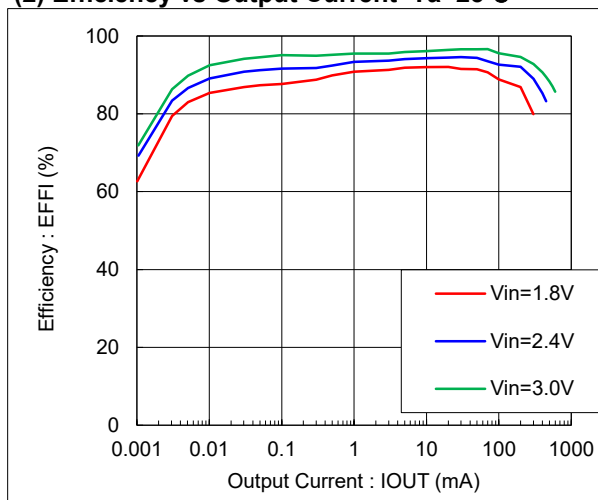
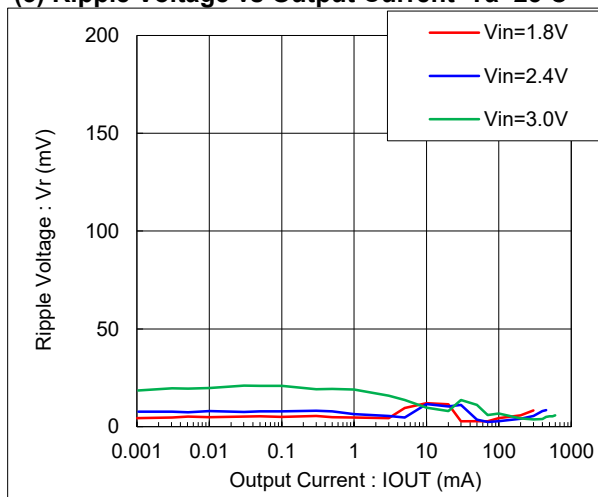
Item	Value	Description	Size [mm]	Part Number	Manufacturer
CBLK	-	-	-	-	-

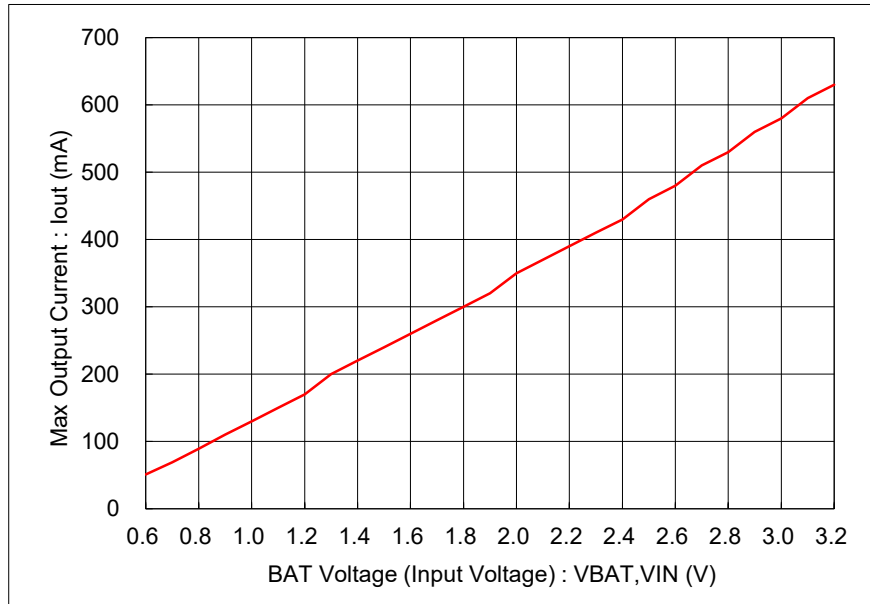
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PCB Layout



XC9145B33CER-G Evaluation Board*400nA Ultra-Low Quiescent, 0.8A, PWM/PFM Step-up DC/DC Converters***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**

XC9145B33CER-G Evaluation Board*400nA Ultra-Low Quiescent, 0.8A, PWM/PFM Step-up DC/DC Converters***(4) Max Output Current vs BAT Voltage(Input Voltage) @ Ta=25°C**

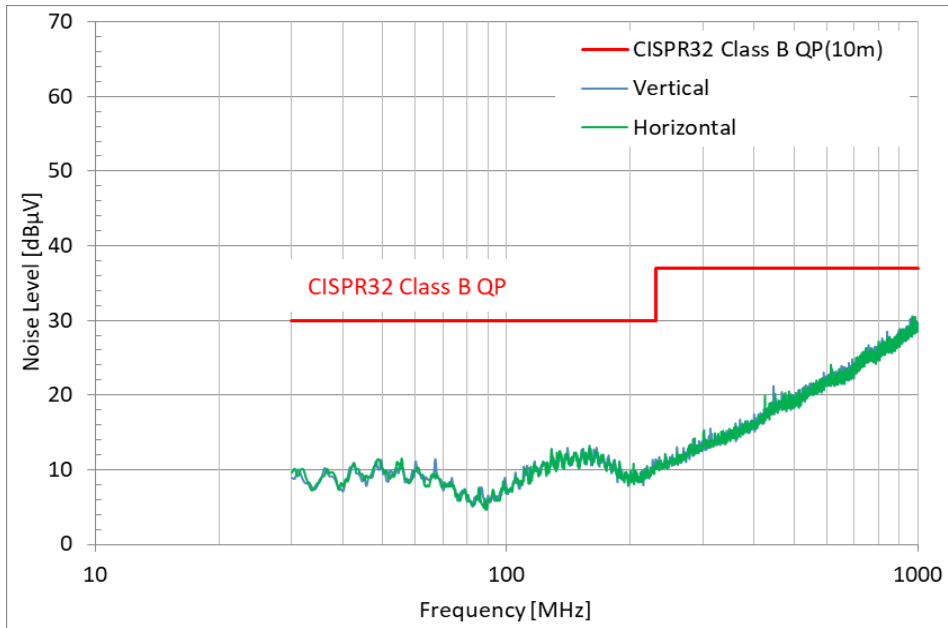
XC9145B33CER-G Evaluation Board*400nA Ultra-Low Quiescent, 0.8A, PWM/PFM Step-up DC/DC Converters***(5) Radiation EMI : CISPR-32/VCCI 10m Peak****Condition**

IC : XC9145B33CER-G

Vin : 2.4V

Vout : 3.3V

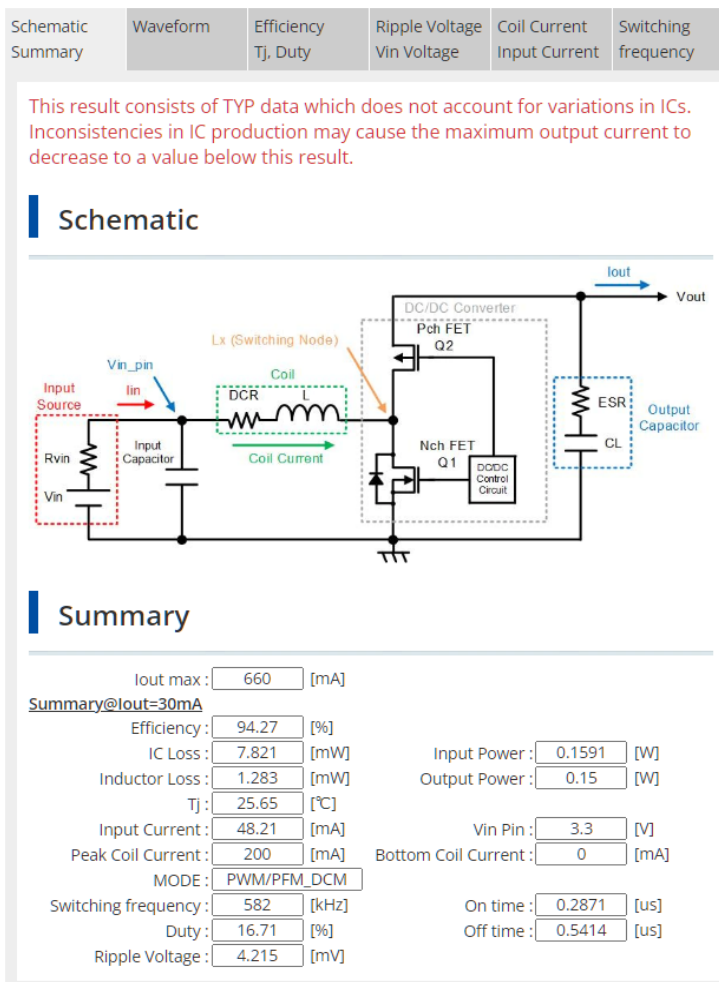
Iout : 100mA



XC9145B33CER-G Evaluation Board*400nA Ultra-Low Quiescent, 0.8A, PWM/PFM Step-up DC/DC Converters***【Appendix】 How to calculate DC/DC Converter or DC/DC Controller.**

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

Product	XC9145 Product Info
Switching frequency	1200 [kHz]
Control Method	PWM/PFM
Sim Condition	
Vin	3.3 [V] Range: 0.65V~5.5V
Vout	5 [V] Range: 3V~5.5V
Iout	30 [mA] Range: 0mA~
Rvin (Battery Impedance etc)	0 [Ω]
Ta	25 [°C] Range: -40~105°C
Thermal resistance: θja	83.33 [°C/W] Range: 0~1000°C/W
External Components	
L	4.7 [μH]
DCR	28.5 [mΩ]
CL (Effective Value)	10 [μF]
ESR	2.5 [mΩ]



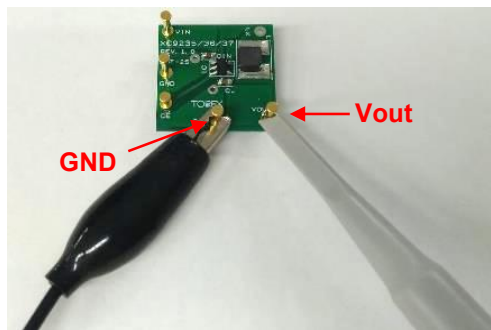
日本語 : <https://www.torex.co.jp/technical-support/dcdc-simulation/>
 English : <https://www.torexsemi.com/technical-support/dcdc-simulation/>
 简体中文 : <https://www.torex.com.cn/technical-support/dcdc-simulation/>

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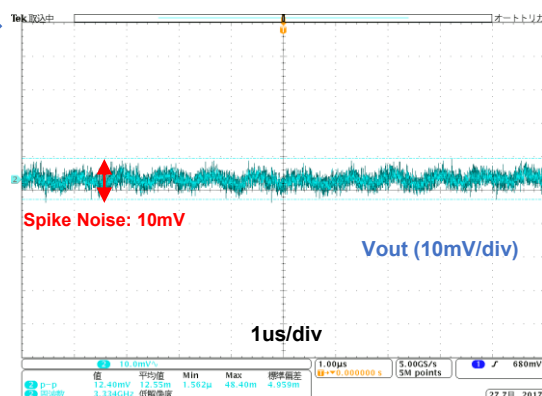
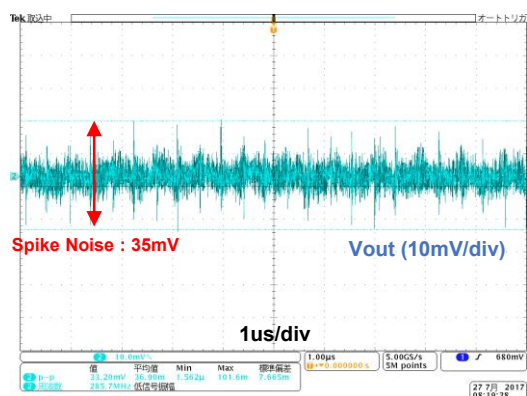
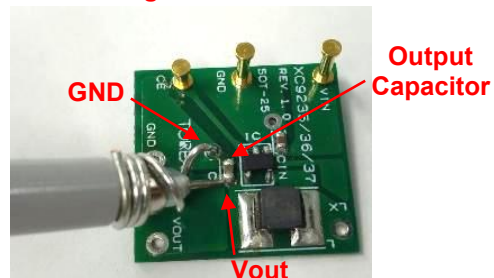
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【Appendix】 How to reduce the spike noise caused by measurement (Probing method with oscilloscope)

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/>