

SERIES: PRQ150B | DESCRIPTION: DC-DC CONVERTER

FEATURES

- 150 W isolated output
- industry standard 1/4 brick package
- 8:1 input range (9~75 Vdc)
- over current, over temperature, over voltage, short circuit, and input UVLO protections
- remote on/off control, output voltage trim, and output remote voltage sense
- wide operating temperature range (-40 ~ 105°C)
- positive and negative logic options
- certified to IEC/EN 62368-1



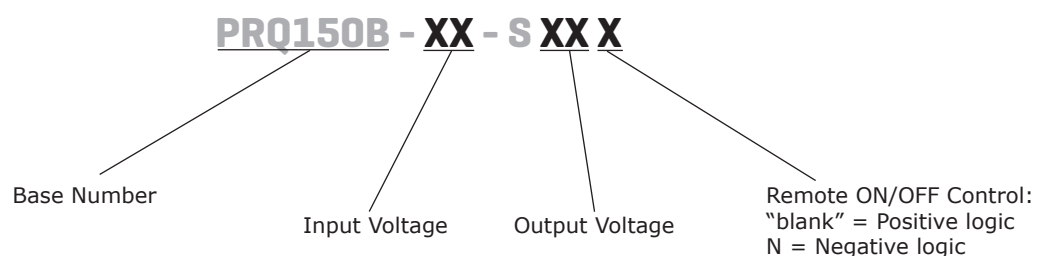
MODEL

	input voltage		output voltage	output current	output power	ripple and noise ¹	efficiency ²
	typ (Vdc)	range (Vdc)	typ (Vdc)	max (A)	max (W)	max (mVp-p)	typ (%)
PRQ150B-48-S5	48	9~75	5	20.0	100	120	87
PRQ150B-48-S12	48	9~75	12	12.5	150	150	89
PRQ150B-48-S15	48	9~75	15	10.0	150	150	89
PRQ150B-48-S24	48	9~75	24	6.25	150	240	86
PRQ150B-48-S48	48	9~75	48	3.125	150	480	87

Notes:

1. Ripple & Noise is measured with 20 MHz BW at Vin range 15%~100% load with X7R MLCC 22μF x 6pcs/25V+1μF/25V for 5V/12V/15V output models. Ripple & Noise is measured with 20 MHz BW at Vin range 15%~100% load with X7R MLCC 1μF/100V +4.7μF/100V x 6 for 24V/48V output models.
2. Efficiency is measured at nominal input and full load.
3. All specifications valid at nominal input voltage, full load and 25°C after warm-up time unless otherwise stated.

PART NUMBER KEY



INPUT

parameter	conditions/description	min	typ	max	units
operating input voltage		9	48	75	Vdc
no load input current				50	mA
start-up time	at full load, nominal input			100	ms
start-up voltage	0~100% load		9		Vdc
under voltage lockout	0~100% load		7		Vdc
surge voltage	for maximum 0.1 second			80	Vdc
remote on/off (CTRL)	module ON module OFF	CTRL pin open or pulled high (3~12 Vdc) CTRL pin pulled low to GND (0~1.2 Vdc)			
	module ON module OFF	CTRL pin pulled low to GND (0~1.2 Vdc) CTRL pin open or pulled high (3~12 Vdc)			

OUTPUT

parameter	conditions/description	min	typ	max	units
maximum capacitive load	5 Vdc output models			7,000	μF
	12 Vdc & 15 Vdc output models			5,000	μF
	24 Vdc output models			2,000	μF
	48 Vdc output models			1,000	μF
line regulation	low line to high line			±0.2	%
load regulation	0~100% load			±0.5	%
voltage accuracy	0~100% load			±1	%
voltage adjustability	48 Vdc output model	-10		15	%
	all other outputs	-10		10	%
transient response	25% load step change (75%~100% load)		500		μs
temperature coefficient	full load			0.05	%/°C

PROTECTIONS

parameter	conditions/description	min	typ	max	units
over voltage protection	5 Vdc output model	5.8		8.5	Vdc
	12 Vdc output model	13.7		19.2	Vdc
	15 Vdc output model	17.1		24.0	Vdc
	24 Vdc output model	26.9		38.4	Vdc
	48 Vdc output model	59.0		76.8	Vdc
over current protection			170		%
short circuit protection	continuous, auto recovery				
over temperature protection	case temperature (Tc)		110		°C

SAFETY AND COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	input to output for 1 min, 1 mA max	2,250			Vdc
	input to output for 1 min, 5 mA max	1,600			Vac
	input or output to case for 1 minute, 1 mA max	1,600			Vdc
	input or output to case for 1 minute, 5 mA max	1,000			Vac
isolation capacitance				3,500	pF
safety approvals	certified to 62368-1: EN, IEC				
conducted emissions	EN 55032 CLASS A/B (with external filter)				
radiated emissions	EN 55032 CLASS A/B (with external filter)				
ESD	EN 61000-4-2 air: ±8 kV, contact: ±6 kV, perf. Criteria A				

SAFETY AND COMPLIANCE (CONTINUED)

parameter	conditions/description	min	typ	max	units
radiated immunity	EN61000-4-3 10 V/m, perf. Criteria A				
EFT/burst ⁴	EN61000-4-4 ±2 kV, perf. Criteria A				
surge ⁴	EN61000-4-5 ±2 kV, perf. Criteria A				
conducted immunity	EN61000-4-6 10 Vrms, perf. Criteria A				
magnetic field immunity	EN61000-4-8 10 A/m, perf. Criteria A				
MTBF	MIL-HDBK-217 at 25°C	1,500			kHours
RoHS	yes				

Notes: 4. External input capacitor required 1000µF/100V

ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature	see derating curve	-40		105	°C
storage temperature		-55		125	°C
storage humidity	non-condensing	5		95	%
maximum cas temperature	at full load, nominal input			105	°C
altitude				2,000	m

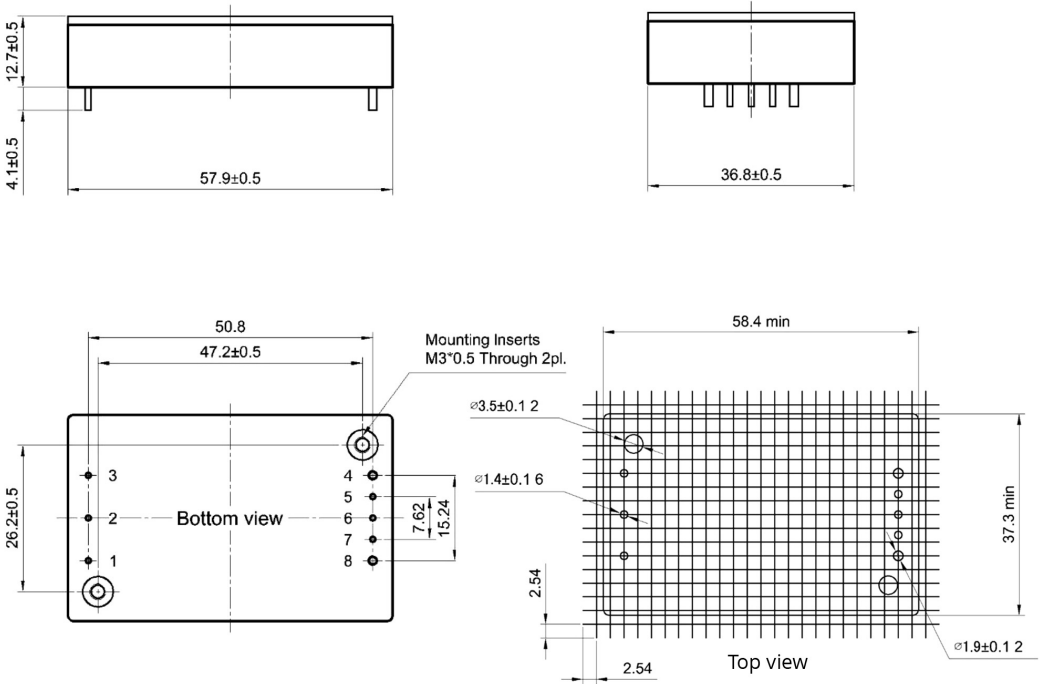
MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	57.9 x 36.8 x 12.7				mm
case material	aluminum baseplate with plastic case				
potting material	silicone				
weight			75		g
cooling method	natural convection				

MECHANICAL DRAWING

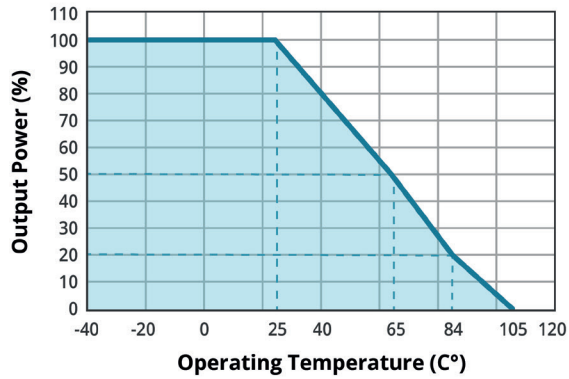
units: mm
pin 1~3 and 5~7 diameter: 1.00 [0.01]
pin 4 and 8 diameter: 1.50 [0.1]
pin diameter tolerance: ±0.10 [±0.004]
general tolerance: ±0.25

PIN CONNECTIONS	
PIN	FUNCTION
1	+Vin
2	CTRL
3	-Vin
4	-Vo
5	Sense-
6	Trim
7	Sense+
8	+Vo

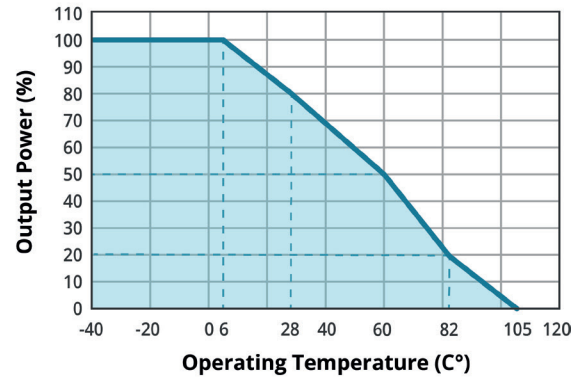


DERATING CURVES

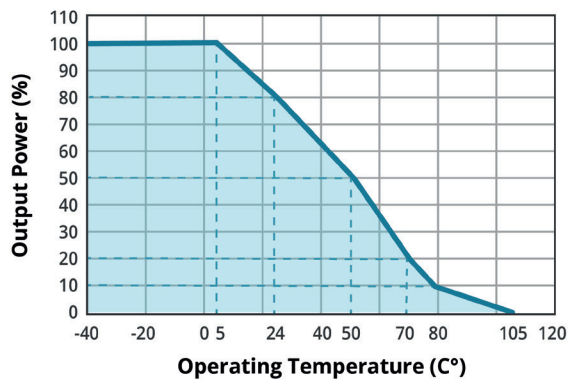
**TEMPERATURE DERATING CURVE
PRQ150B-48-S5**



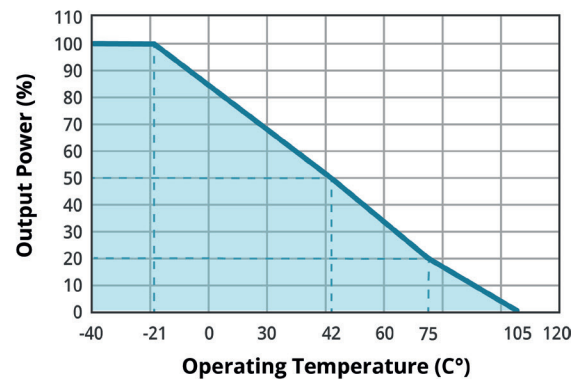
**TEMPERATURE DERATING CURVE
PRQ150B-48-S12**



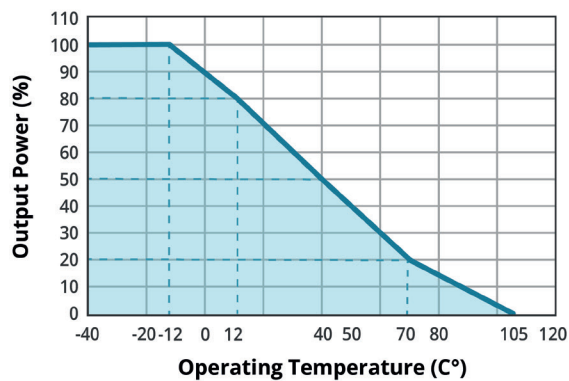
**TEMPERATURE DERATING CURVE
PRQ150B-48-S15**



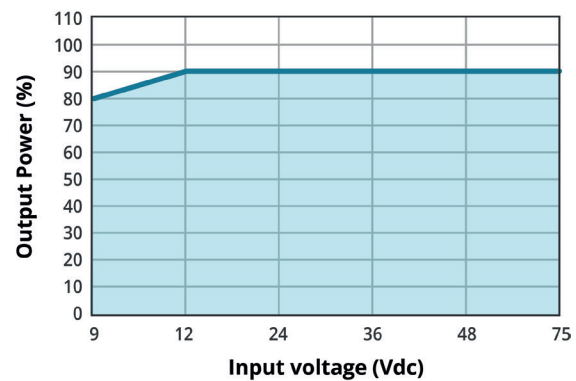
**TEMPERATURE DERATING CURVE
PRQ150B-48-S24**



**TEMPERATURE DERATING CURVE
PRQ150B-48-S48**

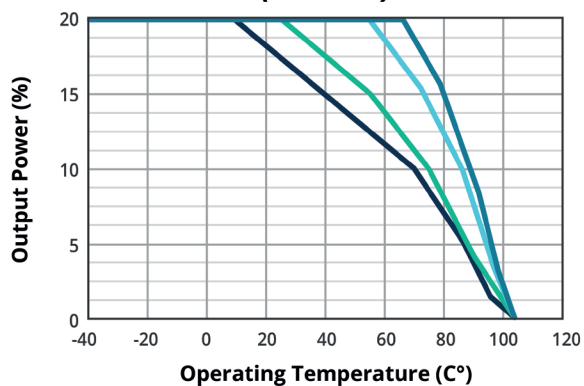


INPUT VOLTAGE DERATING

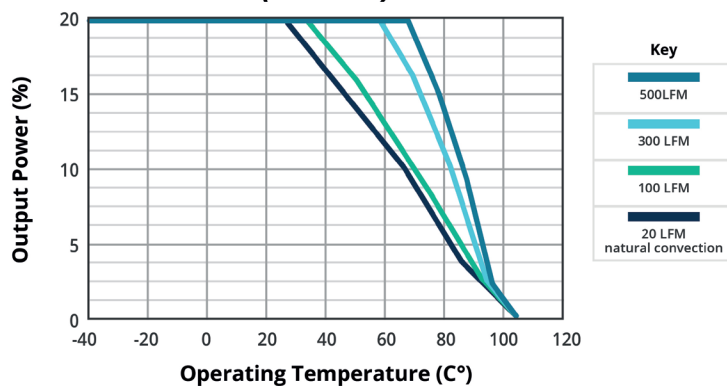


DERATING CURVES (CONTINUED)

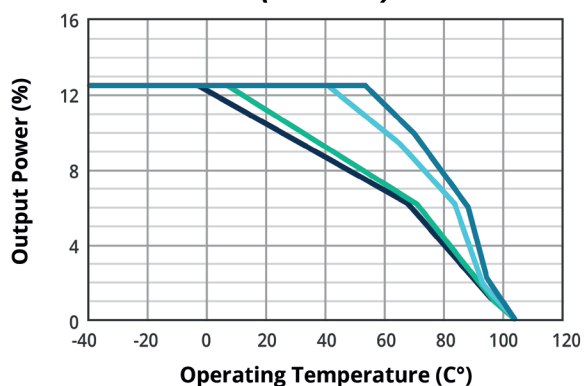
TEMPERATURE DERATING CURVE
PRQ150B-48-S5
($V_{in} = 24\text{ V}$)



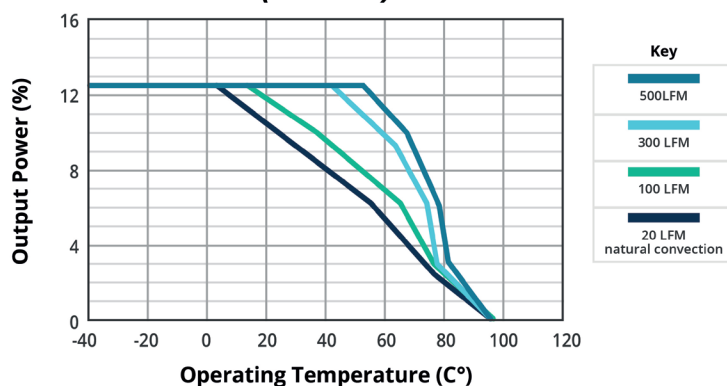
TEMPERATURE DERATING CURVE
PRQ150B-48-S5
($V_{in} = 48\text{ V}$)



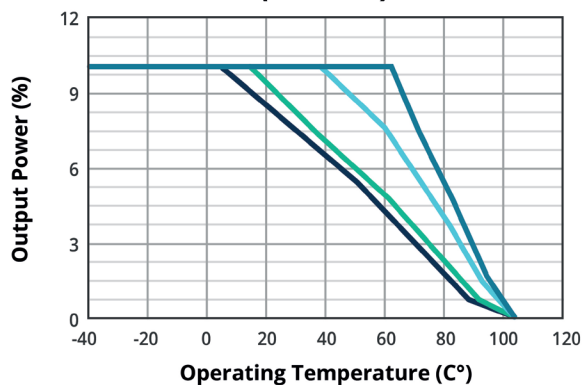
TEMPERATURE DERATING CURVE
PRQ150B-48-S12
($V_{in} = 24\text{ V}$)



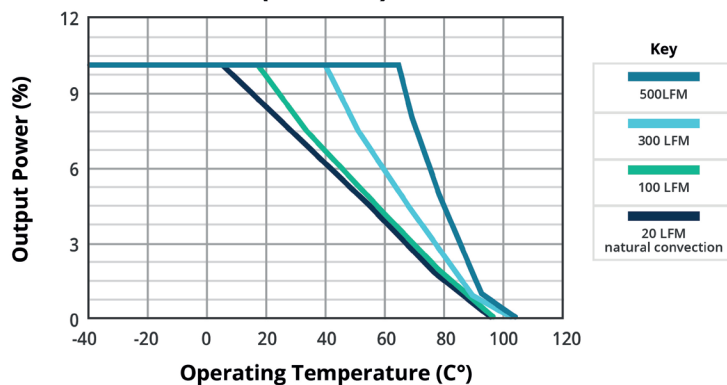
TEMPERATURE DERATING CURVE
PRQ150B-48-S12
($V_{in} = 48\text{ V}$)



TEMPERATURE DERATING CURVE
PRQ150B-48-S15
($V_{in} = 24\text{ V}$)

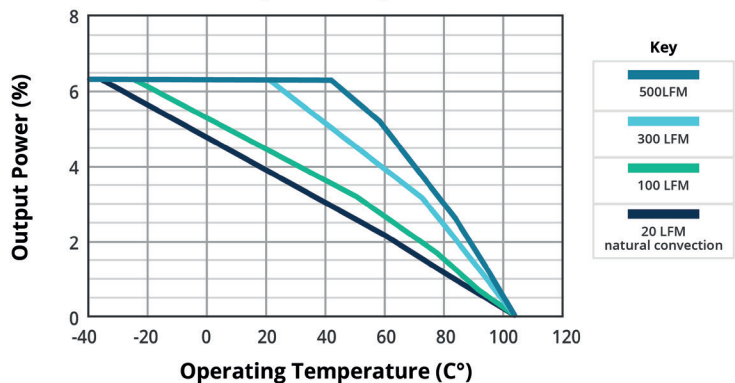


TEMPERATURE DERATING CURVE
PRQ150B-48-S15
($V_{in} = 48\text{ V}$)

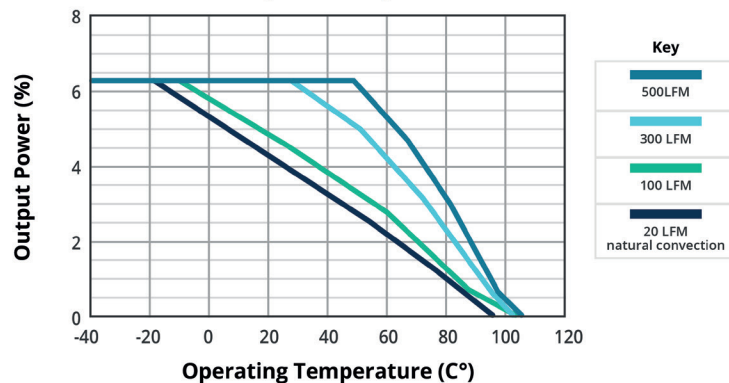


DERATING CURVES (CONTINUED)

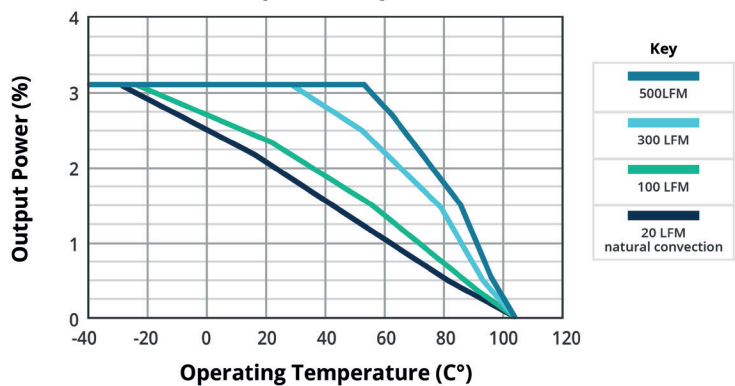
TEMPERATURE DERATING CURVE
PRQ150B-48-S24
(Vin = 24 V)



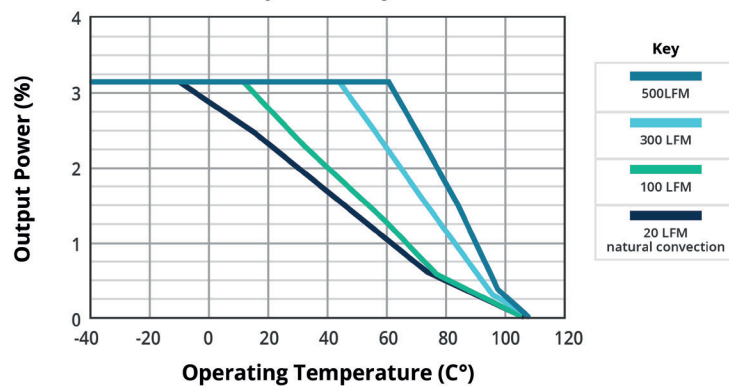
TEMPERATURE DERATING CURVE
PRQ150B-48-S24
(Vin = 48 V)



TEMPERATURE DERATING CURVE
PRQ150B-48-S48
(Vin = 24 V)

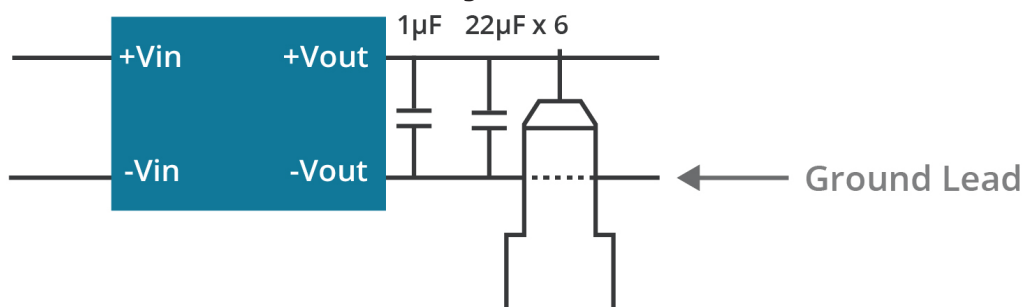


TEMPERATURE DERATING CURVE
PRQ150B-48-S48
(Vin = 48 V)



RIPPLE AND NOISE MEASUREMENT METHOD

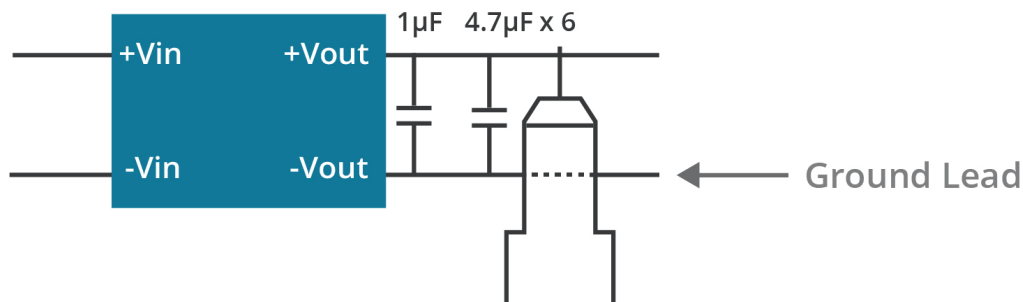
Figure 1



Measured with 20MHz bandwidth at Vin range 15%~100% load with X7R MLCC 22μF x 6pcs/25V+1μF/25V for output 5V/12V/15V.

RIPPLE AND NOISE MEASUREMENT METHOD (CONTINUED)

Figure 2



Measured with 20MHz bandwidth at Vin range 15%~100% load with X7R MLCC 1µF/100V +4.7µF/100V x 6 for output 24V/48V.

REMOTE SENSE

The PRQ150B series includes a Remote Sense feature designed to compensate for voltage drops between the converter's output terminals and the load. Since the Sense wires are not part of the main current path, they carry minimal current. To minimize electrical noise and inductive interference, it is recommended to use twisted pair wires or shielded cables for the +Sense and -Sense connections. If the Remote Sense feature is not utilized, the +S and -S pins should be directly connected to +Vout and -Vout, respectively.

Figure 3
With Remote Sense

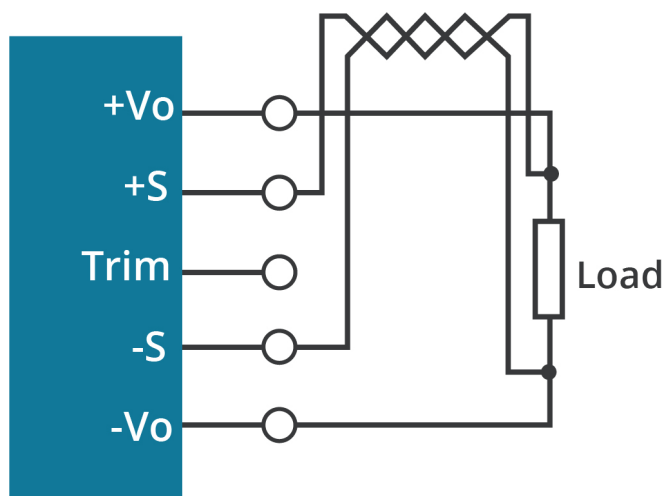
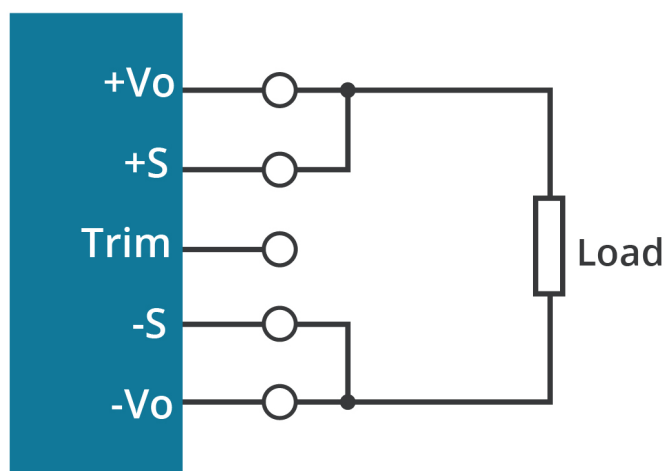


Figure 4
Without Remote Sense



EMC RECOMMENDED CIRCUIT FOR EN55032 CLASS A

Figure 5

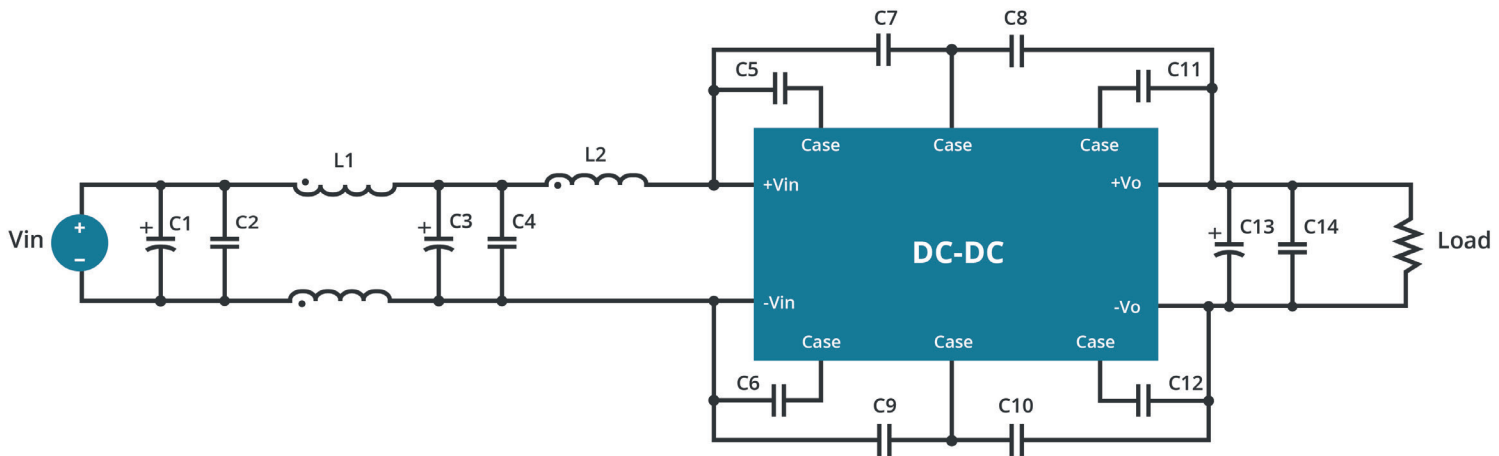


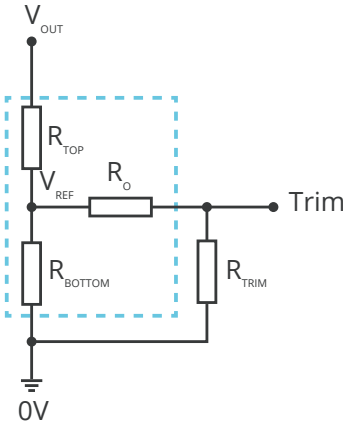
Table 1

Components	Recommended Component value				
Vout	5V	12V	15V	24V	48V
C1	220 μ F	220 μ F	220 μ F	220 μ F	220 μ F
C2	2.2 μ F	2.2 μ F	2.2 μ F	2.2 μ F	2.2 μ F
L1	2.2 mH	2.2 mH	2.2 mH	2.2 mH	2.2 mH
C3	220 μ F	220 μ F	220 μ F	220 μ F	220 μ F
C4	2.2 μ F	2.2 μ F	2.2 μ F	2.2 μ F	2.2 μ F
L2	2.2 μ H	2.2 μ H	2.2 μ H	2.2 μ H	2.2 μ H
C5	2200 pF x 5	2200 pF x 5	2200 pF x 5	2200 pF x 5	2200 pF x 5
C6	2200 pF x 5	2200 pF x 5	2200 pF x 5	2200 pF x 5	2200 pF x 5
C7	2200 pF x 2	2200 pF x 2	2200 pF x 2	2200 pF x 2	2200 pF x 2
C8	2200 pF x 2	2200 pF x 2	2200 pF x 2	2200 pF x 2	2200 pF x 2
C9	2200 pF x 2	2200 pF x 2	2200 pF x 2	2200 pF x 2	2200 pF x 2
C10	2200 pF x 2	2200 pF x 2	2200 pF x 2	2200 pF x 2	2200 pF x 2
C11	2200 pF x 5	2200 pF x 5	2200 pF x 5	2200 pF x 5	2200 pF x 5
C12	2200 pF x 5	2200 pF x 5	2200 pF x 5	2200 pF x 5	2200 pF x 5
C13	22 μ F/25 V x 6	22 μ F/25 V x 6	22 μ F/25 V x 6	4.7 μ F/100 V x 2	4.7 μ F/100 V x 2
C14	1 μ F	1 μ F	1 μ F	1 μ F	1 μ F

OUTPUT TRIM RESISTOR

Figure 3

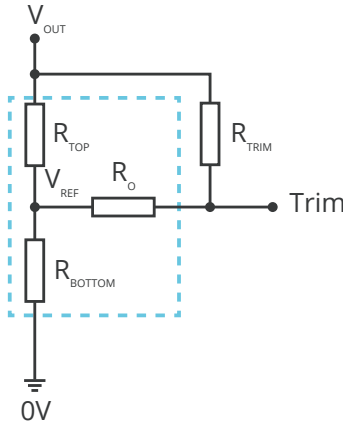
Trim up



$$R_{TRIM} = \frac{a \cdot R_{BOTTOM}}{R_{BOTTOM} - a} - R_O$$
$$a = \frac{V_{REF}}{V_{OUT} - V_{REF}} \cdot R_{TOP}$$

Formula for Trim up

Trim down



$$R_{TRIM} = \frac{a \cdot R_{TOP}}{R_{TOP} - a} - R_O$$
$$a = \frac{V_{OUT} - V_{REF}}{V_{REF}} \cdot R_{BOTTOM}$$

Formula for Trim down

Table 2

V _{NOM}	R _{TOP}	R _{BOTTOM}	R _O	V _{REF}
(Vdc)	(kΩ)	(kΩ)	(kΩ)	(V)
5	15.47	5.1	33.0	1.24
12	38.0	10.0	68.0	2.5
15	50.0	10.0	73.2	2.5
24	86.0	10.0	76.8	2.5
48	182.0	10.0	56.0	2.5

Note: Value for R_{TOP}, R_{BOTTOM}, R_O, and V_{REF} refer to Table 2 (fixed internal values).
R_{TRIM}: Trim resistance
a: User-defined parameter, no actual meanings
V_{NOM}: Nominal output voltage
V_{OUT}: Target output voltage

REVISION HISTORY

rev.	description	date
1.0	initial release	09/22/2025

The revision history provided is for informational purposes only and is believed to be accurate.



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