

Features

Regulated Converters

- 6-Side Shielding
- External ON/OFF control
- 1.6kVDC Isolation
- UL/CSA/EN-60950-1 Certified
- 4:1 Input Voltage Range
- Continuous Short Circuit Protection
- Efficiency up to 89.5%
- Fixed Switching Frequency

Description

The REC30-xxxxS_DZ -series offer single and dual regulated outputs in a 2"x1.6" package with 1.6kVDC isolation and are suitable for higher power industrial applications. Remote on/off control is standard. The higher current outputs have raised output voltages to compensate for track losses as standard. The converter is fully certified to UL/EN/IEC safety standards.

Selection Guide

Part Number	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. [%]	max. Capacitive Load ⁽¹⁾ [μF]
REC30-243.4SZ	9-36	3.4	6000	86.5	10000
REC30-245.1SZ	9-36	5.1	6000	87.5	6800
REC30-2412SZ	9-36	12	2500	88.5	1800
REC30-2415SZ	9-36	15	2000	89	1000
REC30-2412DZ	9-36	±12	±1250	88.5	±800
REC30-2415DZ	9-36	±15	±1000	89	±500
REC30-483.4SZ	18-75	3.4	6000	87	10000
REC30-485.1SZ	18-75	5.1	6000	88	6800
REC30-4812SZ	18-75	12	2500	89	1800
REC30-4815SZ	18-75	15	2000	89.5	1000
REC30-4812DZ	18-75	±12	±1250	88	±800
REC30-4815DZ	18-75	±15	±1000	88.5	±500

Notes:

Note1: Max. capacitive load is tested at nominal input voltage and full load.

Model Numbering



Ordering Examples:

REC30-4812SZ, Single Output, 18-75Vin (4:1) and 12Vout

REC30-2412DZ, Dual Output, 9-36Vin (4:1) and ±12Vout

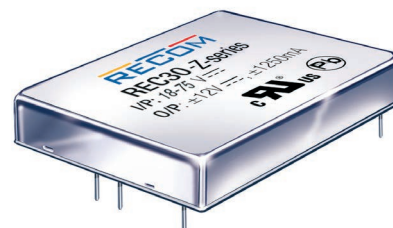
RECOM
DC/DC Converter

REC30-Z

30 Watt

2" x 1.6"

Single and Dual Output



UL
E224736

IEC/EN60950-1 Certified
UL60950 Certified
CSA C22.2 NO. 60950 Certified
EN55022 Certified

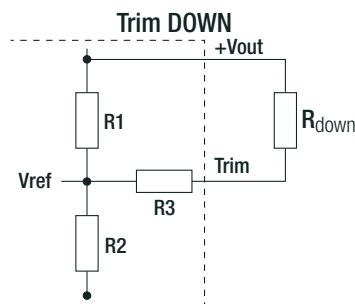
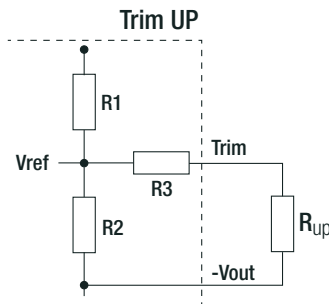
Specifications (measured @ $t_a = 25^\circ\text{C}$, nominal input voltage, full load and after warm up unless otherwise specified)

BASIC CHARACTERISTICS				
Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range	nom. $V_{in} = 24\text{V}$ nom. $V_{in} = 48\text{V}$	9VDC 18VDC		36VDC 75VDC
Start/up Time			20ms	
Under Voltage Lockout (UVLO)	nom. $V_{in} = 24\text{V}$ DC-DC ON DC-DC OFF		8.3VDC 7.9VDC	
	nom. $V_{in} = 48\text{V}$ DC-DC ON DC-DC OFF		17.4VDC 16.7VDC	
Output Voltage Trimming	see calculation below			$\pm 10\%$
CTRL ON/OFF	DC-DC ON DC-DC OFF			Open or $3\text{V} < V_r < 12\text{V}$ Short or $0\text{V} < V_r < 1.2\text{V}$
Operating Frequency			350kHz	
Minimum Load		0%		
Output Ripple and Noise ⁽²⁾				100mVp-p

Notes:

Note2: Ripple and Noise is measured with a 20MHz bandwidth and a 0.1 μF ceramic capacitor.

Output Voltage Trimming



Vout	3.4V	5.1V	12V	15V
R1	2.1 k Ω	2.55 k Ω	9.53 k Ω	9.09 k Ω
R2	1.198 k Ω	2.449 k Ω	2.498 k Ω	1.810 k Ω
R3	6.8 k Ω	9.76 k Ω	16.9 k Ω	13 k Ω
Vref	1.24 V	2.5 V		

Trim Calculation

V_{out} = nom. output voltage

ΔV_{out} = output voltage trim

R_{up} = trim up resistor

R_{down} = trim down resistor

a = trim up factor

b = trim down factor

$$\Delta V_{out} = V_{out} - V_{out_{trimmed}}$$

$$R_{up} = q \frac{a \cdot R_2}{R_2 - a} \cdot R_3 = k\Omega$$

$$R_{down} = q \frac{b \cdot R_1}{R_1 - b} \cdot R_3 = k\Omega$$

$$a = q \frac{V_{ref}}{(V_{out} + \Delta V_{out}) - V_{ref}} \cdot R_1 = k\Omega$$

$$b = q \frac{(V_{out} + \Delta V_{out}) - V_{ref}}{V_{ref}} \cdot R_2 = k\Omega$$

Trim Up:

$V_{out} = 5.1\text{V}$, $\Delta V_{out} = 0.51\text{V}$ (10%), $V_{ref} = 2.5\text{V}$

$$a = q \frac{2.5\text{V}}{(5.1\text{V} + 0.51\text{V}) - 2.5\text{V}} \cdot 2.55\text{k}\Omega = 2.043\text{k}\Omega$$

$$R_{up} = q \frac{2.043\text{k}\Omega \cdot 2.449\text{k}\Omega}{2.449\text{k}\Omega - 2.043\text{k}\Omega} \cdot 9.76 = 2.573\text{k}\Omega$$

Trim down:

$V_{out} = 5.1\text{V}$, $\Delta V_{out} = -0.51\text{V}$ (-10%), $V_{ref} = 2.5\text{V}$

$$b = q \frac{[5.1\text{V} + (-0.51\text{V})] - 2.5\text{V}}{2.5\text{V}} \cdot 2.449\text{k}\Omega = 2.047\text{k}\Omega$$

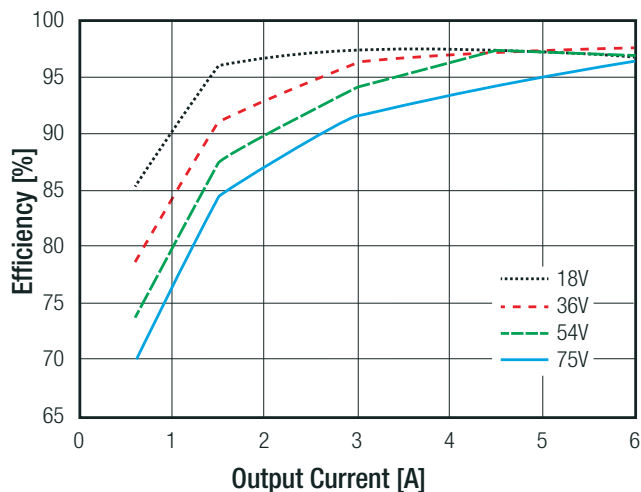
$$R_{down} = q \frac{2.047\text{k}\Omega \cdot 2.55\text{k}\Omega}{2.55\text{k}\Omega - 2.047\text{k}\Omega} \cdot 9.76\text{k}\Omega = 0.627\text{k}\Omega$$

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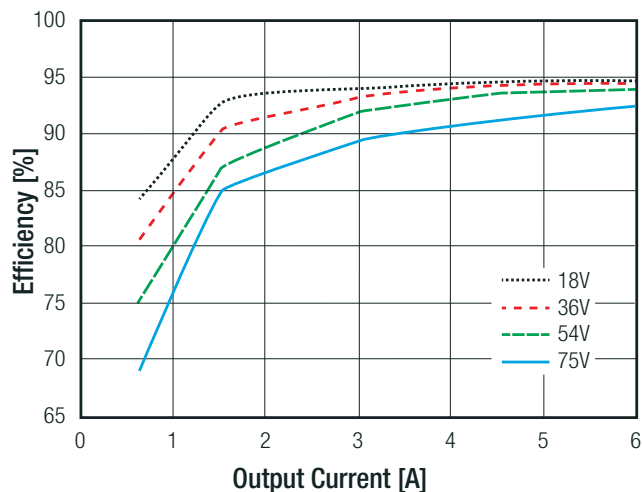
Specifications (measured @ $t_a = 25^\circ\text{C}$, nominal input voltage, full load and after warm up unless otherwise specified)

Efficiency vs. Load

REC30-485.1SZ



REC30-4815DZ

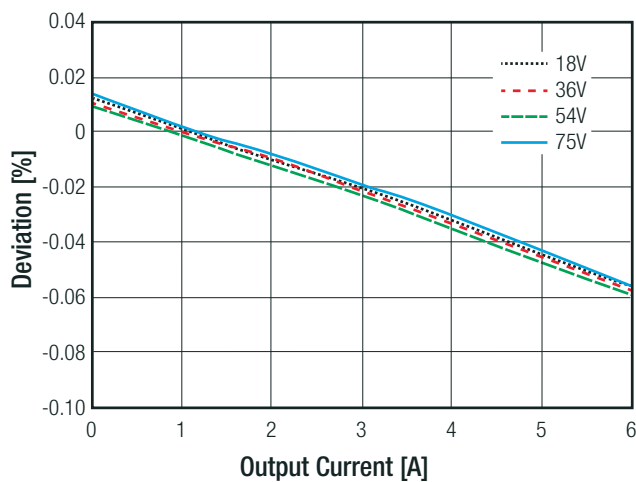


REGULATIONS

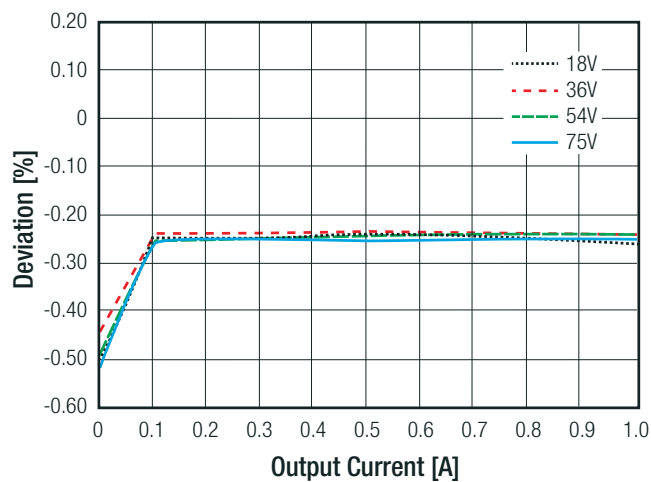
Parameter	Condition	Type	Values
Output Accuracy			$\pm 1.0\%$ max.
Line Regulation	low line to high line, full load		$\pm 0.2\%$ max.
Load Regulation	10% to 100% load	single output	$\pm 0.5\%$ max.
		dual output	$\pm 1.0\%$ max.
Cross Regulation	25% to 100% load	dual output	$\pm 5.0\%$ max.
Transient Response Recovery Time	25% load step change		250 μs typ.

Deviation vs. Load

REC30-485.1SZ



REC30-2415DZ



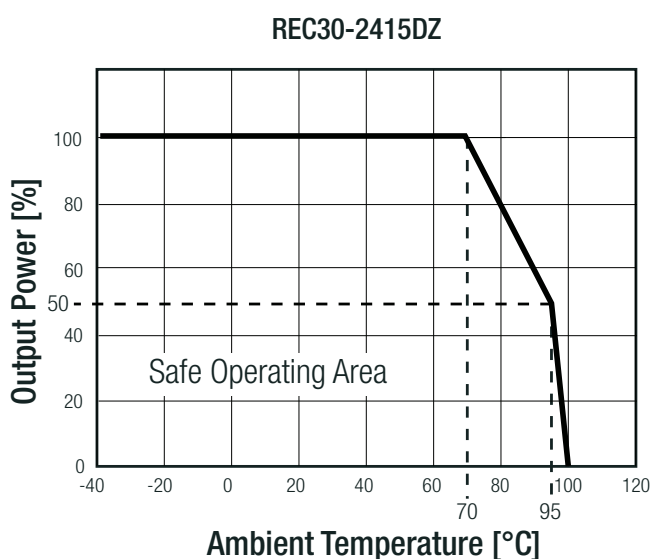
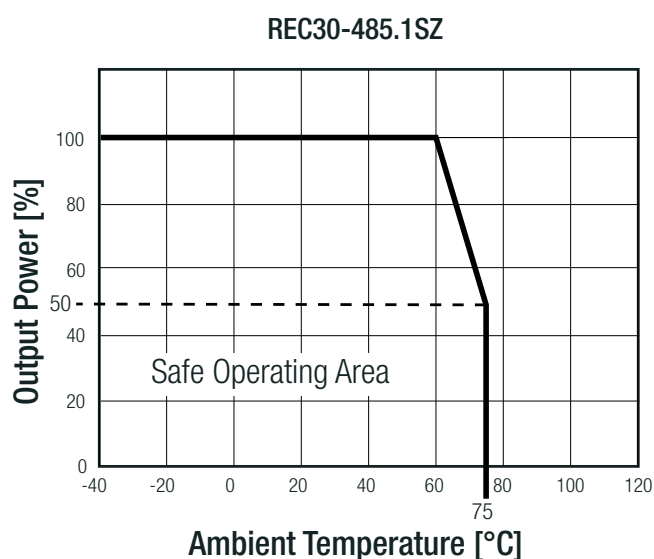
Specifications (measured @ $t_a = 25^\circ\text{C}$, nominal input voltage, full load and after warm up unless otherwise specified)

PROTECTIONS			
Parameter	Condition		Value
Short Circuit Protection (SCP)	below 100m Ω		continuous, automatic recovery
Over Voltage Protection (OVP)	Zener Diode Clamp	3.4V _{out} 5.1V _{out} 12V _{out} 15V _{out}	4VDC typ. 6.2VDC typ. 15VDC typ. 18VDC typ.
Over Load Protection (OLP)			180% typ.
Isolation Voltage	I/P to O/P	tested for 1 minute	1.6kVDC
Isolation Capacitance			3900pF typ.
Isolation Resistance			1G Ω min.

ENVIRONMENTAL			
Parameter	Condition		Value
Operating Temperature Range	with derating (see graph)		-40°C to +85°C
Maximum Case Temperature			+105°C
Temperatur Coefficient			$\pm 0.05\%/^\circ\text{C}$
Thermal Impedance	natural convection (0.1m/s)		8°C/W
Operating Altitude			5000m
Operating Humidity	non-condensing		5% - 95% RH max.
Vibration			MIL-STD-202G
MTBF	according to MIL-HDBK-217F G.B., +25°C, referring to REC30-2415DZ		1541 x 10 ³ hours

Derating Graph

@ nominal input voltage, full load and natural convection (0.1m/s)



Notes:

Note3: For more details, please contact our technical support service at TechsupportAT@recom-power.com

Specifications (measured @ $t_a = 25^\circ\text{C}$, nominal input voltage, full load and after warm up unless otherwise specified)

SAFETY AND CERTIFICATIONS

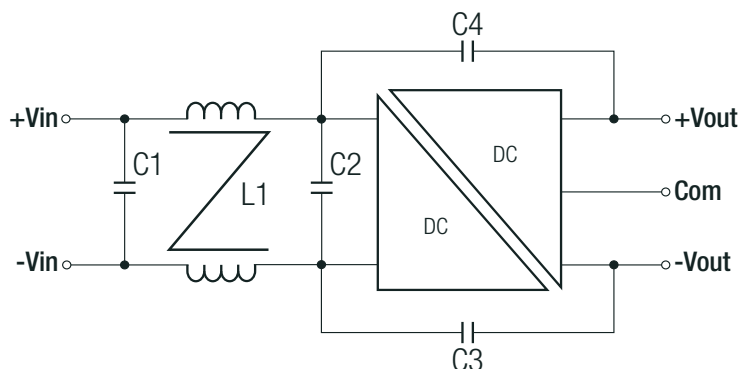
Certificate Type	Report / File Number	Standard
CB General Safety	E224736	IEC60950-1, 2nd Edition, 2013
UL General Safety		UL60950-1, 2nd Edition, 2014
EN General Safety		EN60950-1, 2nd Edition, 2013
CAN/CSA General Safety		C22.2 No. 60950-1-07, 2014

EMC Compliance	Condition	Standard / Criterion
EMI	without external filter with external filter (see filter suggestions)	EN55022, Class A EN55022, Class B
ESD	Air: $\pm 8\text{kV}$; Contact: $\pm 4\text{kV}$	EN61000-4-2, Criteria B
Radiated Immunity	10V/m	EN61000-4-3, Criteria A
Fast Transient	$\pm 1\text{kV}$	EN61000-4-4, Criteria B
Surge ⁽⁴⁾	$\pm 1\text{kV}$	EN61000-4-5, Criteria A
Conducted Immunity	10Vr.m.s	EN61000-4-6, Criteria A
Power Magnetic Field	50Hz 1A/m (r.m.s)	EN61000-4-8, Criteria A

Notes:

Note4: An external MOV is required if the module has to meet EN61000-4-5. The MOV suggest: NichTek SVI32-380

EMC Filtering - Suggestions for Class B



MODEL	C1	C2	L1	C3	C4
REC30-24xxSZ	330 μF /50V	10 μF /50V	1.3mH CMC	2200pF/3kV	NA
REC30-48xxSZ	330 μF /100V	10 μF /100V	1.3mH CMC	2200pF/3kV	NA
REC30-24xxDZ	330 μF /50V	10 μF /50V	1.3mH CMC	2200pF/3kV	2200pF/3kV
REC30-48xxDZ	330 μF /100V	10 μF /100V	1.3mH CMC	2200pF/3kV	2200pF/3kV

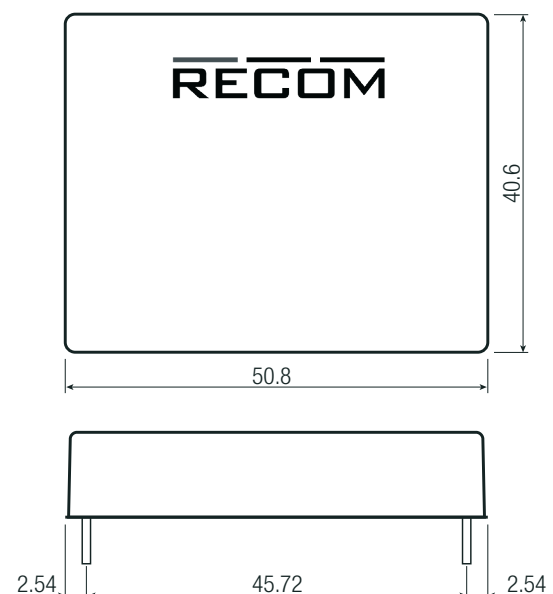
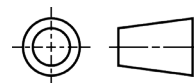
DIMENSION and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	Case Base PCB Potting	nickel plated copper non conductive black plastic FR4 epoxy (UL94 V-0)
Package Dimension (LxWxH)		50.8 x 40.6 x 10.2mm
Package Weight		48g typ.

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Specifications (measured at T_a= 25°C, nominal input voltage, full load and after warm up unless otherwise specified)

Dimension Drawing (mm)



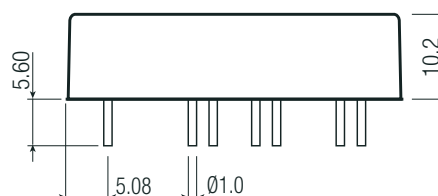
Pin Connections

Pin #	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
4	CTRL ON/OFF	
5	No Pin	+Vout
6	+Vout	Com
7	-Vout	-Vout
8	Trim	Trim

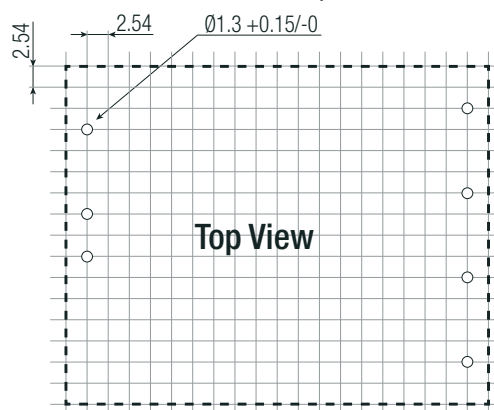
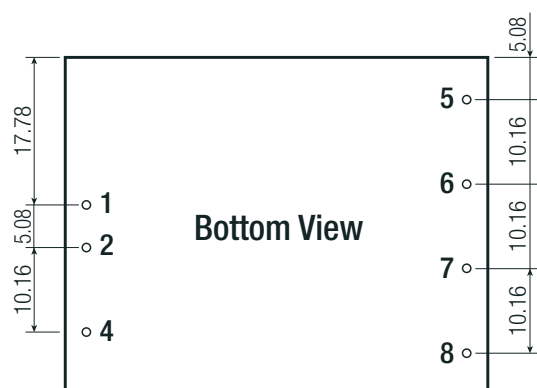
Tolerance: xx.x= ±0.5mm

xx.xx= ±0.35mm

Pin dimension: ±0.05mm



Recommended Footprint Details



PACKAGING INFORMATION

Packaging Dimension (LxWxH)	tube	520.0 x 54.5 x 21.0mm
Packaging Quantity		11pcs
Storage Temperature Range		-55°C to +125°C

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