

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

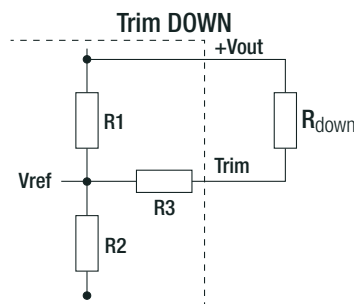
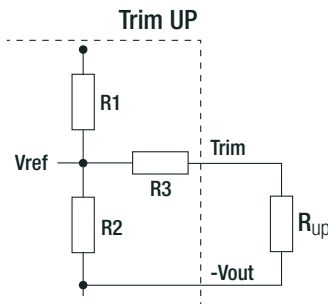
BASIC CHARACTERISTICS

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

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

$$R_{up} = q \frac{a \cdot R2}{R2 - a} r - R3 = k\Omega$$

$$R_{down} = q \frac{b \cdot R1}{R1 - b} r - R3 = k\Omega$$

$$a = q \frac{V_{ref}}{(V_{out} + \Delta V_{out}) - V_{ref}} r * R1 = k\Omega$$

$$b = q \frac{(V_{out} + \Delta V_{out}) - V_{ref}}{V_{ref}} r * R2 = k\Omega$$

Trim Up:

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

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

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

Trim down:

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

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

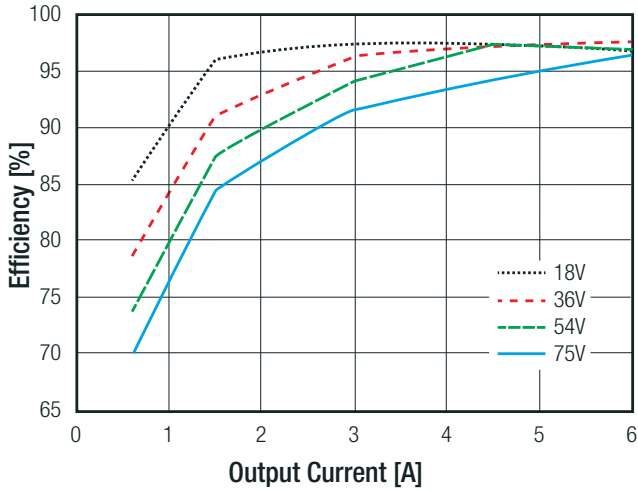
$$R_{down} = q \frac{2.047\text{k}\Omega * 2.55\text{k}\Omega}{2.55\text{k}\Omega - 2.047\Omega} r - 9.76\text{k}\Omega = \mathbf{0.627\text{k}\Omega}$$

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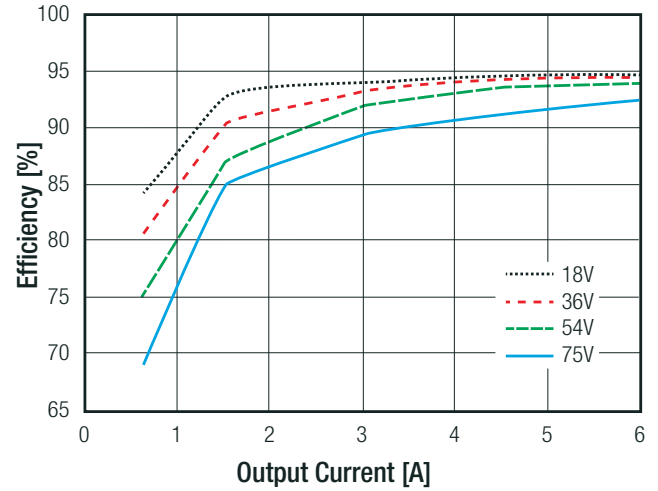
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Efficiency vs. Load

REC30-485.1SZ



REC30-4815DZ

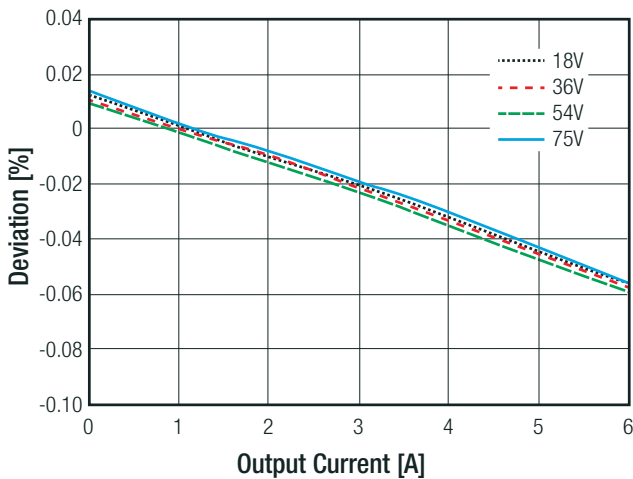


REGULATIONS

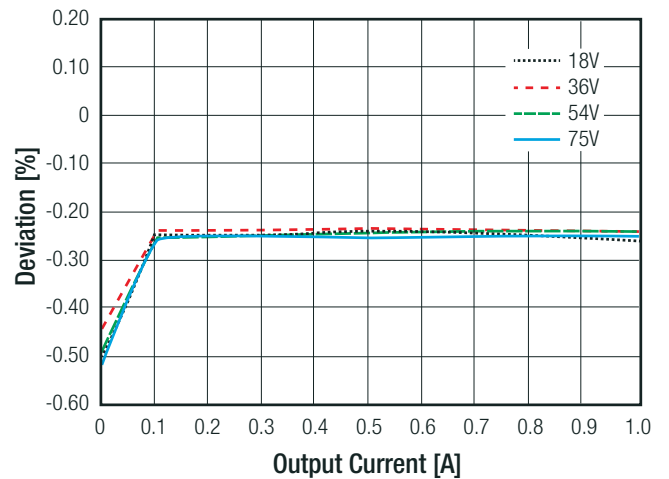
Parameter	Condition	Type	Values
Output Accuracy			$\pm 1.0\%$ max.
Line Regulation	low line to high line, full load		$\pm 0.2\%$ max.
Load Regulation	10% to 100% load	single output dual output	$\pm 0.5\%$ max. $\pm 1.0\%$ max.
Cross Regulation	25% to 100% load	dual output	$\pm 5.0\%$ max.
Transient Response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

Deviation vs. Load

REC30-485.1SZ



REC30-2415DZ



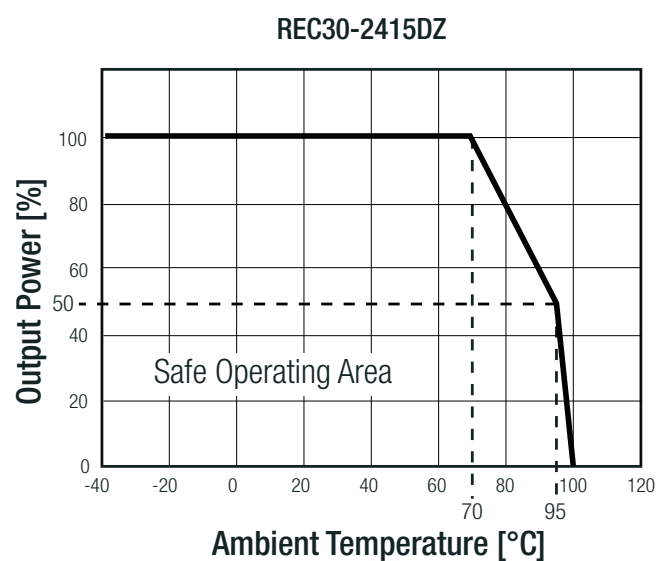
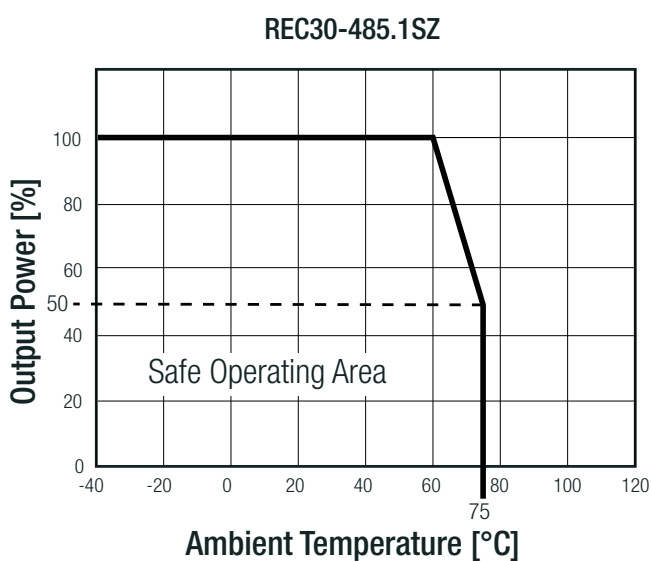
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PROTECTIONS			
Parameter	Condition		Value
Short Circuit Protection (SCP)	below 100mΩ		continuous, automatic recovery
Over Voltage Protection (OVP)	Zener Diode Clamp	3.4Vout	4VDC typ.
		5.1Vout	6.2VDC typ.
		12Vout	15VDC typ.
		15Vout	18VDC typ.
Over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

ENVIRONMENTAL			
Parameter	Condition		Value
Operating Temperature Range	with derating (see graph)		-40°C to +85°C
Maximum Case Temperature			+105°C
Temperature Coefficient			±0.05%/°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

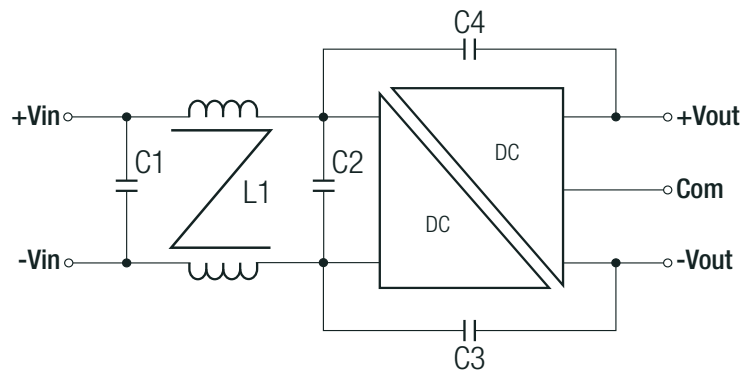
Certificate Type	Report / File Number	Standard
CB General Safety	E224736	IEC60950-1, 2nd Edition, 2013
UL General Safety		UL60950-1, 2nd Edition, 2014
EN General Safety		EN60950-1, 2nd Edition, 2013
CAN/CSA General Safety		C22.2 No. 60950-1-07, 2014

EMC Compliance	Condition	Standard / Criterion
EMI	without external filter	EN55022, Class A
	with external filter (see filter suggestions)	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

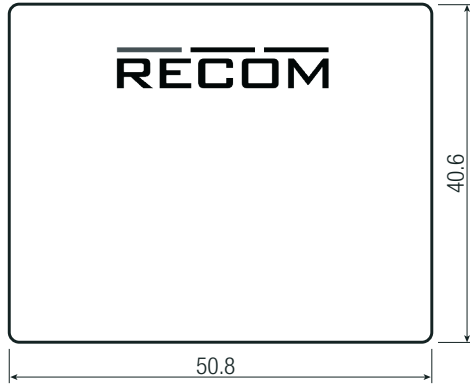
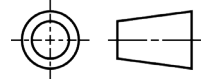
DIMENSION and PHYSICAL CHARACTERISTICS

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

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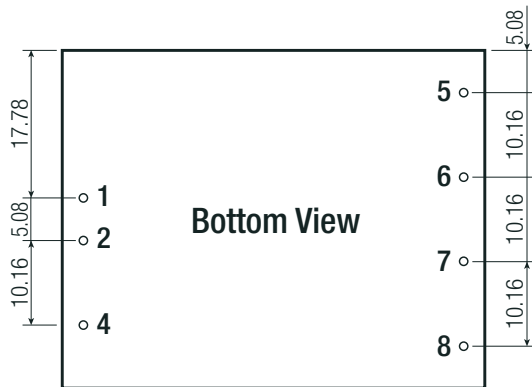
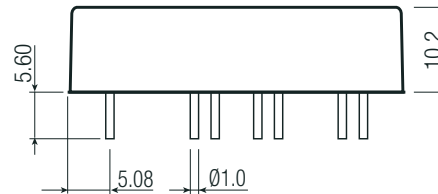
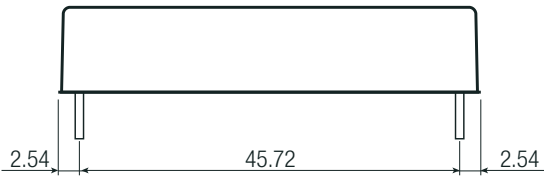
Dimension Drawing (mm)



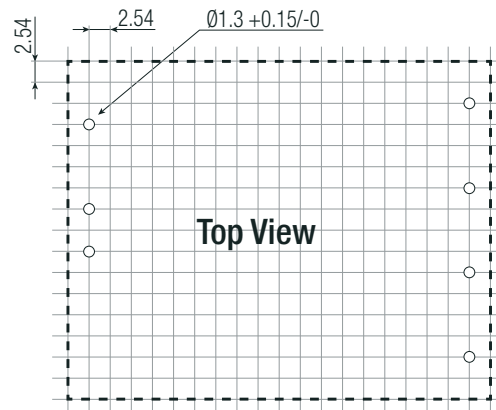
Pin Connections

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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