Features

Regulated Converters

- 6-Side Shielding
- External ON/OFF control
- 1.6kVDC Isolation
- UL/CSA/EN-60950-1 Certified
- 2:1 Input Voltage Range
- Continuous Short Circuit Protection
- Efficiency up to 90.5%
- Fixed Switching Frequency

RECOM

DC/DC Converter

REC30

30 Watt 2“ x 1.6“ Single and Dual Output

3 YEAR warranty

Description

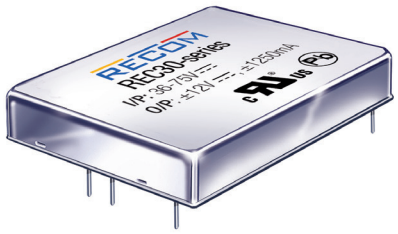
The REC30-xxxxS_D -series offer single and dual regulated outputs in a 2”x1.6” package with 1.6kVDC isolation and are suitable for higher power industrial applications. Remote on/off control is standard. The higher current outputs have raised output voltages to compensate for track losses as standard. 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]
REC30-123.4S	9-18	3.4	6000	85	10000
REC30-125.1S	9-18	5.1	6000	87	6800
REC30-1212S	9-18	12	2500	89	1800
REC30-1215S	9-18	15	2000	88	1000
REC30-1212D	9-18	±12	±1250	87	±800
REC30-1215D	9-18	±15	±1000	88	±500
REC30-243.4S	18-36	3.4	6000	87	10000
REC30-245.1S	18-36	5.1	6000	89	6800
REC30-2412S	18-36	12	2500	90	1800
REC30-2415S	18-36	15	2000	89	1000
REC30-2412D	18-36	±12	±1250	88	±800
REC30-2415D	18-36	±15	±1000	89	±500
REC30-483.4S	36-75	3.4	6000	87.5	10000
REC30-485.1S	36-75	5.1	6000	89.5	6800
REC30-4812S	36-75	12	2500	90	1800
REC30-4815S	36-75	15	2000	90.5	1000
REC30-4812D	36-75	±12	±1250	89	±800
REC30-4815D	36-75	±15	±1000	90.5	±500

Notes:

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



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E224736

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

Model Numbering

REC30-

nom. Input Voltage

Output Voltage

Single or **D**ual

Ordering Examples:

REC30-4812S, Single Output, 36-75Vin and 12Vout

REC30-2412D, Dual Output, 18-36Vin and ±12Vout

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

BASIC CHARACTERISTICS

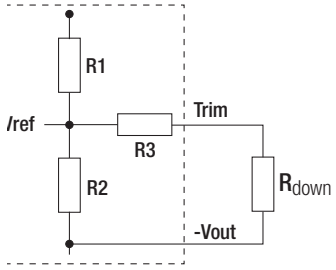
Parameter	Condition		Min.	Typ.	Max.
Input Voltage Range	nom. Vin= 12V nom. Vin= 24V nom. Vin= 48V		9VDC 18VDC 36VDC		18VDC 36VDC 75VDC
Start/up Time				10ms	
Under Voltage Lockout	nom. Vin= 12V	DC-DC ON DC-DC OFF		8.3VDC 7.9VDC	
	nom. Vin= 24V	DC-DC ON DC-DC OFF		17.4VDC 16.7VDC	
	nom. Vin= 48V	DC-DC ON DC-DC OFF		35.7VDC 34.3VDC	
Output Voltage Trimming	see calculation below				±10%
Remote ON/OFF	DC-DC ON DC-DC OFF				Open or 3V<Vr<12V Short or 0V<Vr<1.2V
Operating Frequency				300kHz	
Minimum Load				0%	
Output Ripple and Noise [2]				100mVp-p	

Notes:

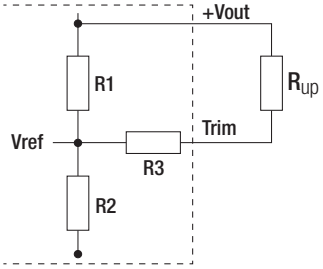
Note2: Ripple and Noise is measured with a 20MHz bandwidth and a 0.1µF ceramic capacitor.

Output Voltage Trimming

Trim UP



Trim DOWN



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

Trim Calculation

$$R_{up} = \left[\frac{a*R2}{R2 - a}\right] - R3 = k\Omega \qquad a = \left[\frac{Vref}{\Delta Vout - Vref}\right] * R1 = k\Omega$$

$$R_{down} = \left[\frac{b*R1}{R1 - b}\right] - R3 = k\Omega \qquad b = \left[\frac{\Delta Vout - Vref}{Vref}\right] * R2 = k\Omega$$

$\Delta Vout$ = Output Voltage Trim
R_{up} = trim up resistor
R_{down} = trim down resistor
a = trim up factor
b = trim down factor

Practical Example:

Trim Up:

Vout = 5.1V, ΔVout = 10% (5.61V), Vref= 2.5V

$$a = \left[\frac{2.5V}{5.61V - 2.5V}\right] * 2.55\ k\Omega = \mathbf{2.05k\Omega} \qquad R_{up} = \left[\frac{2.05k\Omega * 2.449k\Omega}{2.449k\Omega - 2.05k\Omega}\right] - 9.76\ k\Omega = \mathbf{2.826k\Omega}$$

Trim down:

Vout = 5.1V, ΔVout = -10% (4.59V), Vref= 2.5V

$$b = \left[\frac{4.59V - 2.5V}{2.5V}\right] * 2.449\ k\Omega = \mathbf{2.047k\Omega} \qquad R_{down} = \left[\frac{2.047k\Omega * 2.55k\Omega}{2.55k\Omega - 2.047k\Omega}\right] - 9.76\ k\Omega = \mathbf{0.617k\Omega}$$

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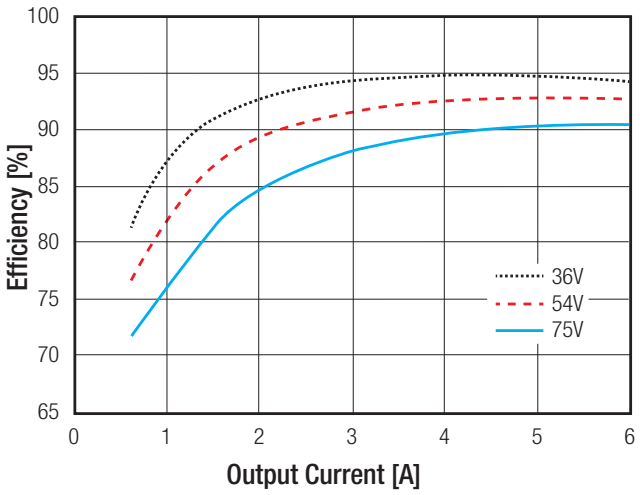
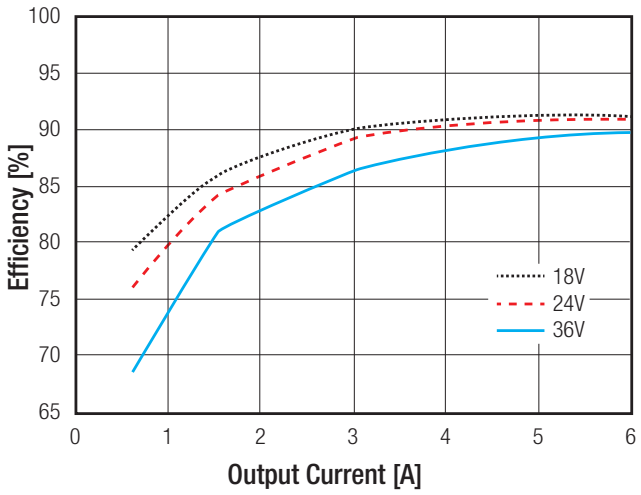
Specifications (measured at T_a= 25°C, nominal input voltage, full load and after warm up unless otherwise specified)

Efficiency vs. Load

REC30-485.1S



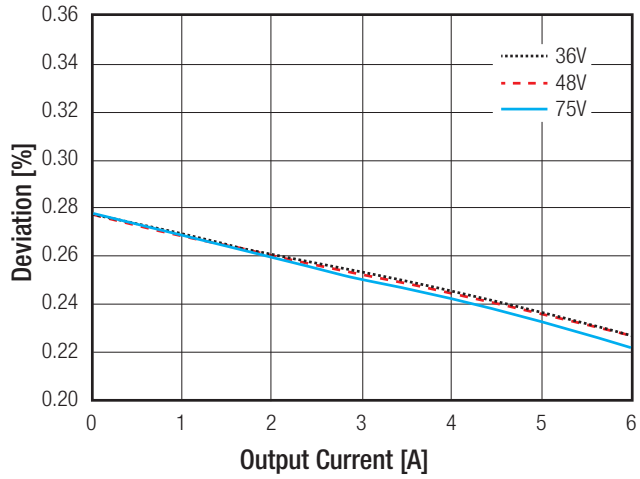
REC30-2415D



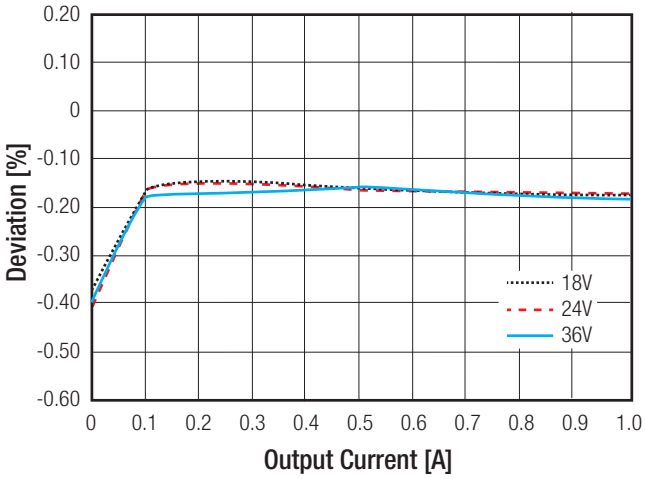
REGULATIONS			
Parameter	**Condition**	**Type**	**Values**
Output Voltage Accuracy			±1% max.
Line Voltage Regulation	low line to high line, full load		±0.2% max.
Load Voltage Regulation	10% to 100% load	single output dual output	±0.5% max. ±1% max.
Cross Regulation	25% to 100% load	dual output	±5% max.
Transient Response Recovery Time	25% load step change		250µS typ.

Deviation vs. Load

REC30-485.1S



REC30-2415D



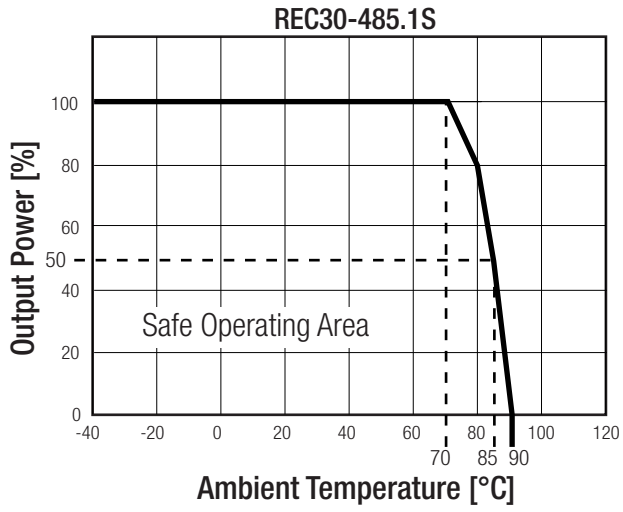
Specifications (measured at T_a= 25°C, nominal input voltage, full load and after warm up unless otherwise specified)

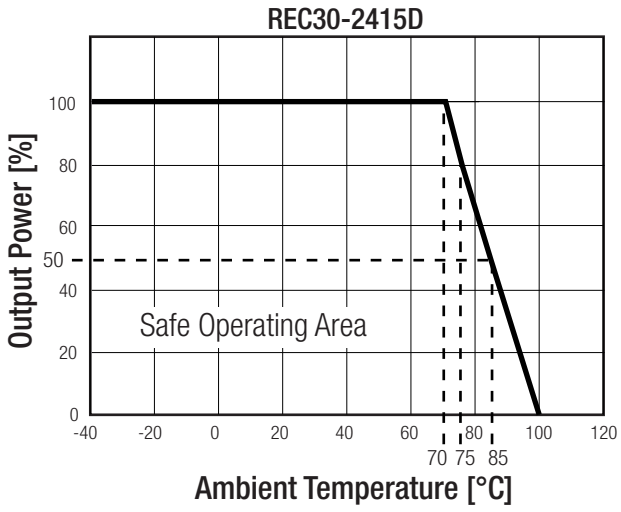
PROTECTIONS			
Parameter	**Condition**		**Value**
Short Circuit Protection (SCP)			continuous, automatic recovery
Over Voltage Protection (OVP)	Zener Diode Clamp	3.4Vout 5.1Vout 12Vout 15Vout	4VDC typ. 6.2VDC typ. 15VDC typ. 18VDC typ.
Over Load Protection (OLP)			180% typ.
Isolation Voltage	I/P to O/P		1.6kVDC / 1 minute
Isolation Capacitance			3300pF typ.
Isolation Resistance			1GΩ min.

ENVIRONMENTAL		
Parameter	**Condition**	**Value**
Operating Temperature Range	with derating	-40°C to +85°C
Maximum Case Temperature		+105°C
Temperatur Coefficient		±0.05%/°C
Thermal Impedance	natural convection	8°C/W
Operating Altitude		5000m
Operating Humidity	non-condensing	5% - 95% RH max.
Vibration		MIL-STD-202G
MTBF	according to MIL-HDBK-217F, 25°C	529 x 10^3 hours

Derating Graph

@ nominal input voltage, full load and natural convection (20LFM)





Notes:

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

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

SAFETY AND CERTIFICATIONS

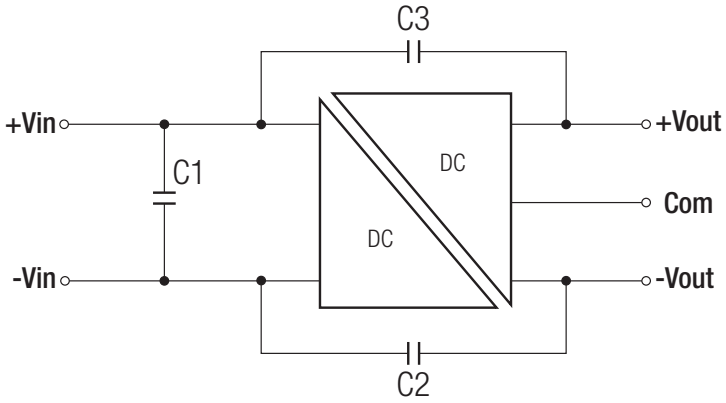
Certificate Type	Report / File Number	Standard
CB General Safety	E224736	IEC60950-1, 2nd Edition, 2013
UL General Safety		UL60950-1, 2nd Edition, 2014
EN General Safety		EN60950-1, 2nd Edition, 2013
CAN/CSA General Safety		C22.2 No. 60950-1-07, 2014

EMC Compliance	Condition	Standard / Criterion
EMI	with external filter (see filter suggestions)	EN55022, Class A,B
ESD	Air: ±8kV; Contact: 4kV	EN61000-4-2, Criteria B
Radiated Immunity	10V/m	EN61000-4-3, Criteria A
Fast Transient	±1kV	EN61000-4-4, Criteria B
Surge (4)	±1kV	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:

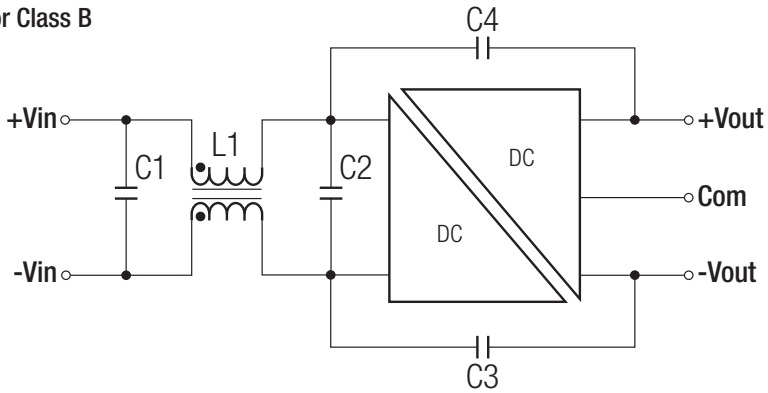
Note4: An external MOV is required if the module has to meet EN61000-4-5. The MOV suggest: NichTek SVI32-380

EMC Filtering - Suggestions for Class A



MODEL	C1	C2	C3
REC30-12xxS	330µF/50V	2200pF/3kV	NA
REC30-24xxS	330µF/50V	2200pF/3kV	NA
REC30-48xxS	330µF/100V	2200pF/3kV	NA
REC30-12xxD	330µF/50V	2200pF/3kV	2200pF/3kV
REC30-24xxD	330µF/50V	2200pF/3kV	2200pF/3kV
REC30-48xxD	330µF/100V	2200pF/3kV	2200pF/3kV

EMC Filtering - Suggestions for Class B



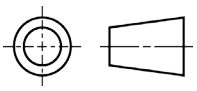
MODEL	C1	C2	L1	C3	C4
REC30-12xxS	330µF/50V	10µF/50V	1.3mH	2200pF/3kV	NA
REC30-24xxS	330µF/50V	10µF/50V	1.3mH	2200pF/3kV	NA
REC30-48xxS	330µF/100V	10µF/100V	1.3mH	2200pF/3kV	NA
REC30-12xxD	330µF/50V	10µF/50V	1.3mH	2200pF/3kV	2200pF/3kV
REC30-24xxD	330µF/50V	10µF/50V	1.3mH	2200pF/3kV	2200pF/3kV
REC30-48xxD	330µF/100V	10µF/100V	1.3mH	2200pF/3kV	2200pF/3kV

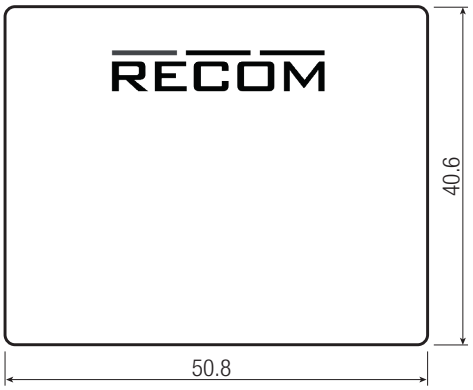
Specifications (measured at T_a= 25°C, nominal input voltage, full load and after warm up unless otherwise specified)

DIMENSION and PHYSICAL CHARACTERISTICS

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

Dimension Drawing (mm)

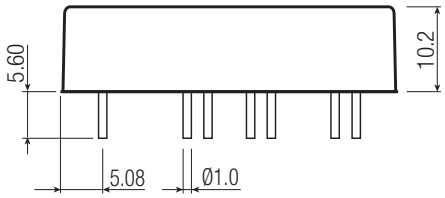


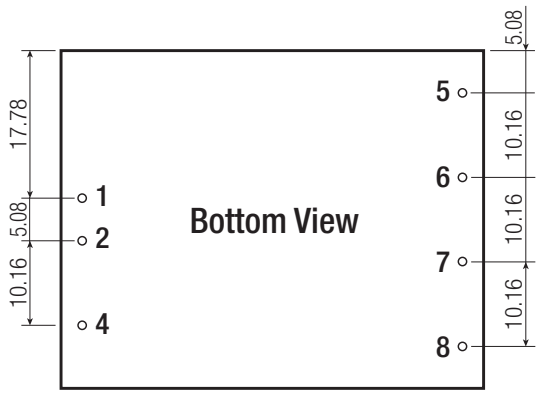


Pin Connections

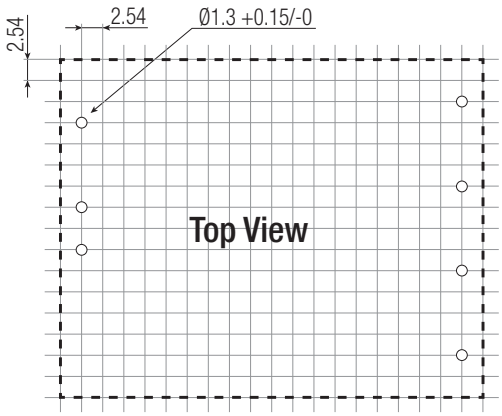
Pin #	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
4	Remote ON/OFF	
5	No Pin	+Vout
6	+Vout	Com
7	-Vout	-Vout
8	Trim	Trim

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