

Features

Regulated Converters

- 6-Side Shielding
- External ON/OFF control
- 1.6kVDC Isolation
- UL/CSA/EN-60950-1 (Pending)
- Wide 4:1 Input Voltage Range
- Continuous Short Circuit Protection
- Efficiency up to 90.5%
- Fixed Switching Frequency

RECOM
DC/DC Converter

REC20-Z

20 Watt
2" x 1"
Single and Dual Output

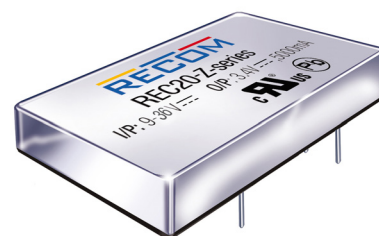


Description

The REC20-xxxxS_DZ -series offer single and dual regulated outputs in a 2"x1" 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 (μF)
REC20-243.4SZ	9-36	3.4	5000	88	13000
REC20-245.1SZ	9-36	5.1	4000	90	9600
REC20-2412SZ	9-36	12	1667	89.5	1650
REC20-2415SZ	9-36	15	1333	90	1050
REC20-2405DZ	9-36	±5	±2000	87	±4800
REC20-2412DZ	9-36	±12	±834	89	±625
REC20-2415DZ	9-36	±15	±667	89	±525
REC20-483.4SZ	18-75	3.4	5000	88	13000
REC20-485.1SZ	18-75	5.1	4000	90	9600
REC20-4812SZ	18-75	12	1667	89.5	1650
REC20-4815SZ	18-75	15	1333	90.5	1050
REC20-4805DZ	18-75	±5	±2000	87	±4800
REC20-4812DZ	18-75	±12	±835	90	±625
REC20-4815DZ	18-75	±15	±667	91	±525



UL
E224736

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

Model Numbering



Notes:

Note2: 24 = 9-36Vin
48 = 18-75Vin

Examples:

e.g. REC30-1212SZ, Single Output, 9-36Vin (4:1) and 12Vout
e.g. REC30-2412DZ, Dual Output, 18-75Vin (4:1) and ±12Vout

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

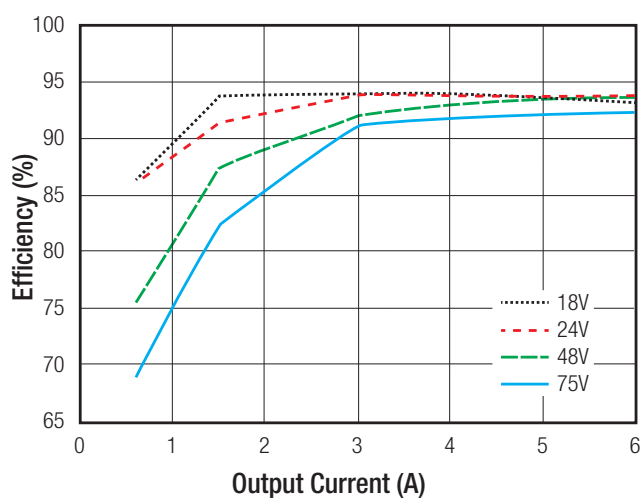
BASIC CHARACTERISTICS					
Parameter	Condition		Min.	Typ.	Max.
Input Voltage Range	24V 48V		9VDC 18VDC		36VDC 75VDC
Start/up Time				10mS	
Under Voltage Lockout	24V	DC-DC ON DC-DC OFF		9VDC 7.5VDC	
	48V	DC-DC ON DC-DC OFF		18VDC 16VDC	
Remot ON/OFF	DC-DC ON DC-DC OFF		Open or 2.5V<Vr<12V Short or 0V<Vr<1.2V		
Operating Frequency				300kHz	
Minimum Load				0%	
Output Ripple and Noise ⁽⁴⁾					100mVp-p

Notes:

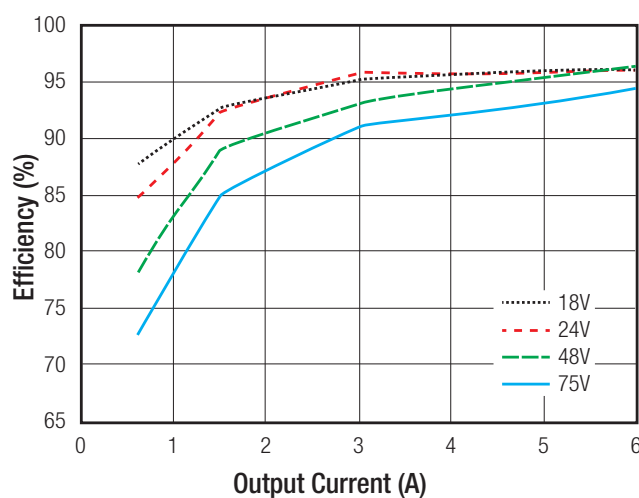
Note4: Ripple and Noise is measured with a 20MHz bandwidth and a 0.1 μF ceramic capacitor.

Efficiency vs. Load

REC20-485.1SZ



REC20-4815SZ

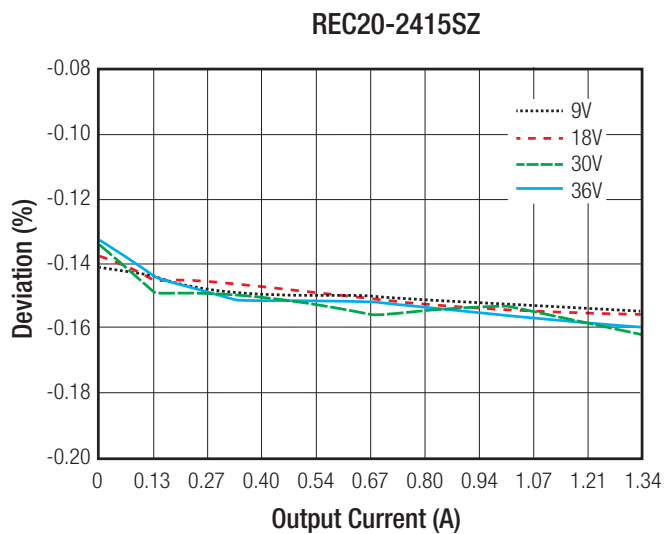
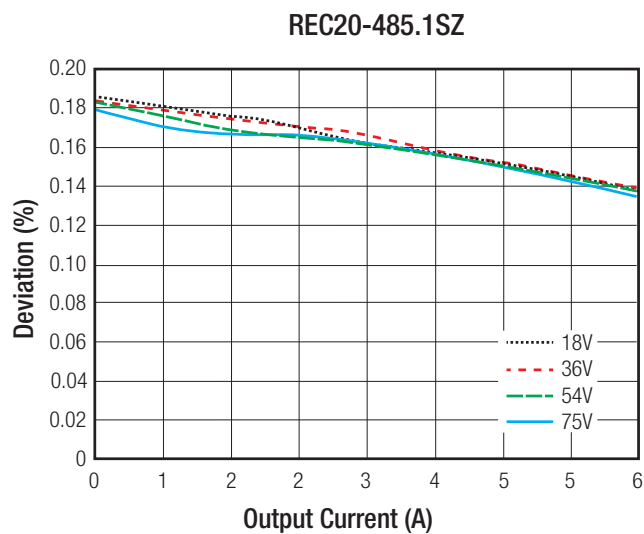


REGULATIONS				
Parameter	Condition	Type	Values	
Output Voltage Accuracy			$\pm 1\%$ max.	
Voltage Adjustability			$\pm 10\%$ typ.	
Line Voltage Regulation	low line to high line, full load		$\pm 0.2\%$ max.	
Load Voltage Regulation	0% to 100% load	single output	$\pm 0.5\%$ max.	
		dual output	$\pm 1\%$ max.	
Cross Regulation	25% to 100% load	dual output	$\pm 5\%$ max.	
Transient Response Recovery Time	25% load step change		250 μS typ.	

continued on next page

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

Deviation vs. Load



PROTECTIONS

Parameter	Condition	Value
Short Circuit Protection (SCP)		continuous, automatic recovery
Over Voltage Protection (OVP)	3.4Vout	4.5VDC typ.
	5.1Vout	7VDC typ.
	12Vout	16VDC typ.
	15Vout	20VDC typ.
Over Load Protection (OLP)		180% typ.
Isolation Voltage	I/P to O/P	1.6kVDC / 1 minute
Isolation Capacitance	2:1 Input	1200pF typ.
Isolation Resistance		1GΩ min.

ENVIRONMENTAL

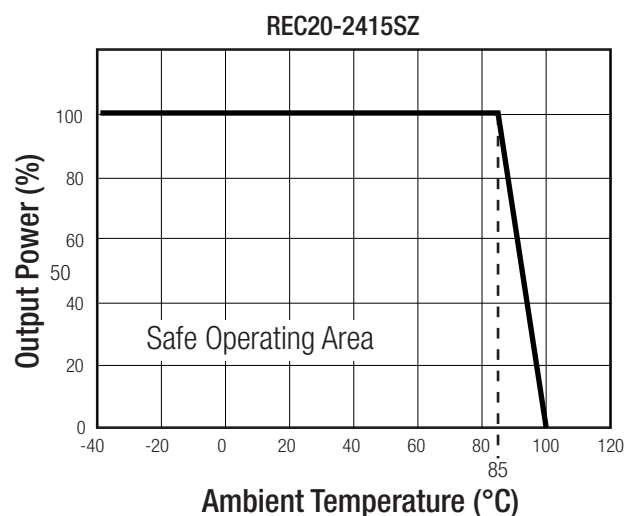
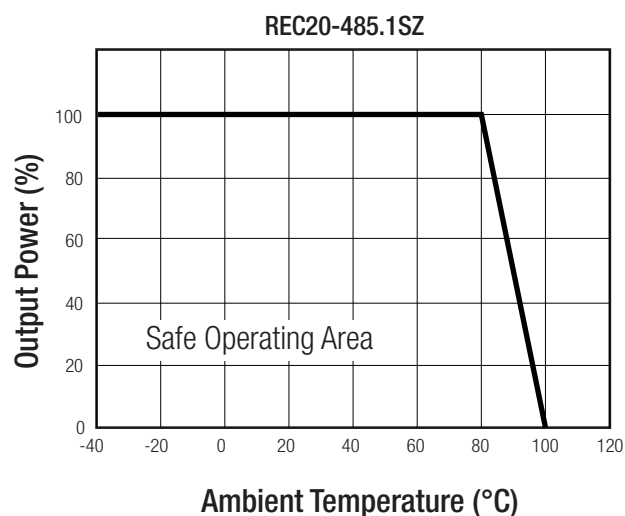
Parameter	Condition	Value
Operating Temperature Range	with derating	-40°C to +100°C
Maximum Case Temperature		+105°C
Temperature Coefficient		0.02%/°C typ.
Operating Humidity	non-condensing	5% - 95% RH max.
Vibration		MIL-STD-202G
MTBF	according to MIL-HDBK-217F, 25°C, referring to REC20-485.1SZ	1098 x 10 ³ hours

continued on next page

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

Derating Graph

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



Notes:

Note5: For more details, please contact our technical support service at TechsupportAT@recom-power.com

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 ⁽⁶⁾	with external filter (see filter suggestions)	EN55022, Class A EN55022, Class B
ESD	Air: $\pm 8\text{kV}$; Contact: 4kV	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 ⁽⁷⁾	$\pm 1\text{kV}$	EN61000-4-5, Criteria A
Conducted Immunity	10Vr.m.s	EN61000-4-6, Criteria A
Power Magnetic Field	$50\text{Hz } 1\text{A/m (r.m.s)}$	EN61000-4-8, Criteria A

Notes:

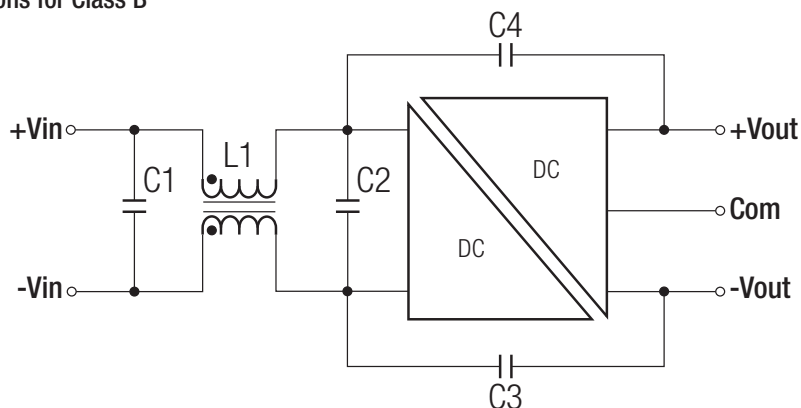
Note6: REC20-Z Series can meet EN55022 Class A without any external filter.

Note7: An external MOV is required if the module has to meet EN61000-4-5. The MOV suggest: NichTek SVI32-380

continued on next page

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

EMC Filtering - Suggestions for Class B

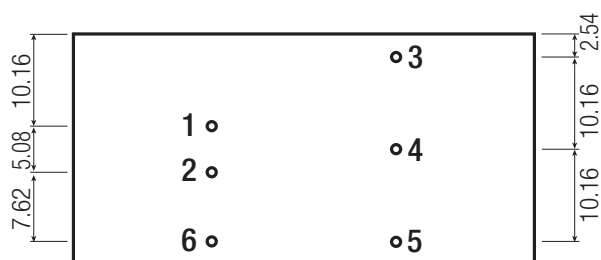
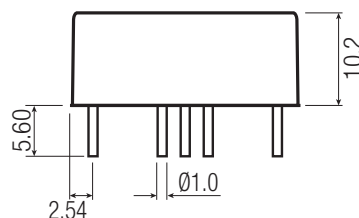
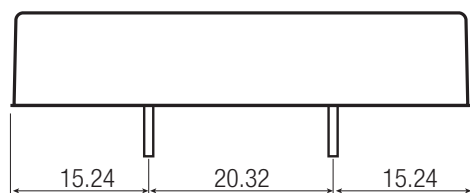
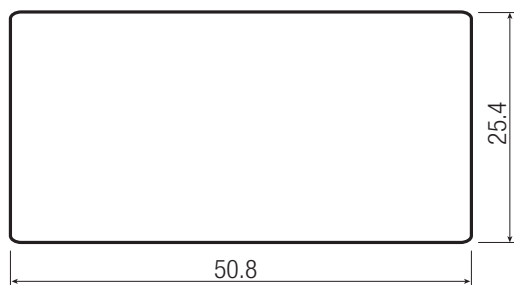
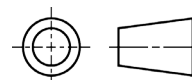


MODEL	C1	C2	L1	C3	C4
REC20-24xxS(D)Z	4.7 μF /50V	4.7 μF /50V	1.5mH	1000pF/2kV	1000pF/2kV
REC20-48xxS(D)Z	2.2 μF /100V	2.2 μF /100V	2.0mH	1000pF/2kV	1000pF/2kV

DIMENSION and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	Case Base Potting	Nickel plated copper FR4 PCB (UL94V-0) Silicone
Package Dimension (LxWxH)		50.8 x 25.4 x 10.2mm
Package Weight		27g

Dimension Drawing (mm)



Pin Connections

Pin #	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	Trim	Com
5	-Vout	-Vout
6	Remote On/Off	

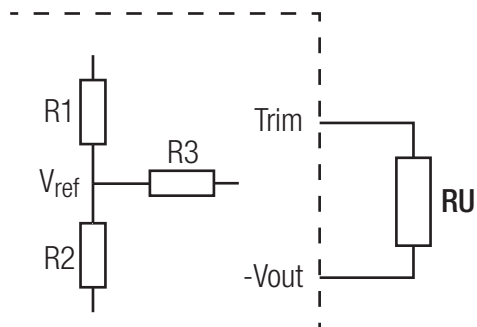
Tolerance: xx.x= $\pm 0.5\text{mm}$
xx.xx= $\pm 0.35\text{mm}$
Pin: $\pm 0.05\text{mm}$

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

INSTALLATION and APPLICATION

External Output Voltage Trimming

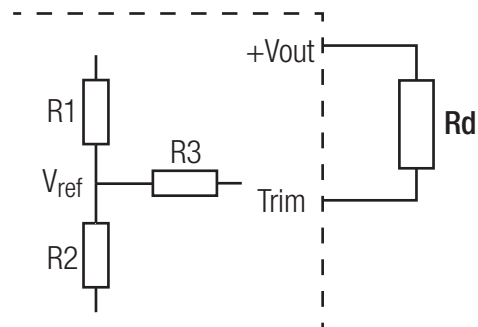
Trim up



$$R_U = \frac{aR_2}{R_2 - a} - R_3$$

$$a = \frac{V_{ref}}{V_o - V_{ref}} \times R_1$$

Trim down



$$R_d = \frac{bR_1}{R_1 - b} - R_3$$

$$b = \frac{V_{ref}}{V_o - V_{ref}} \times R_2$$

Notes:

Note8: R_U and R_d is mean trim resistor, please check the formula.

Note9: a & b : user define parameter, no actual meanings.

Note10: V_o is mean trim up/down voltage.

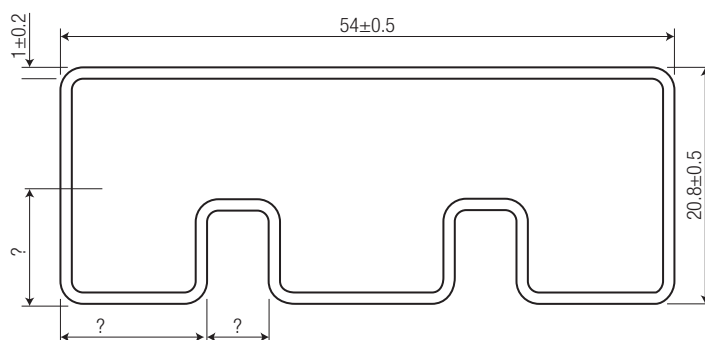
Notw11: Value for R_1 , R_2 , R_3 and V_{ref} refer to table.

Output Voltage	3.4V	5.1V	12V	15V
R1	4.715K	2.3K	19.43K	25.6K
R2	2.7K	2.2K	5.1K	5.1K
R3	15K	9.1K	36K	36K
Vref	1.24V	2.5V	2.5V	2.5V

PACKAGING INFORMATION

Packaging Dimension (LxWxH)	Tube	54.5 x 20.8 x 520.0mm
Packaging Quantity		18pcs
Storage Temperature Range		-55°C to +125°C

Tube Dimension Drawing (mm)



The product information and specifications are subject to change without prior notice. RECOM products are not authorized for use in safety-critical applications (such as life support) without RECOM's explicit written consent. A safety-critical application is defined as an application where a failure of a RECOM product may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The buyer shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.