



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

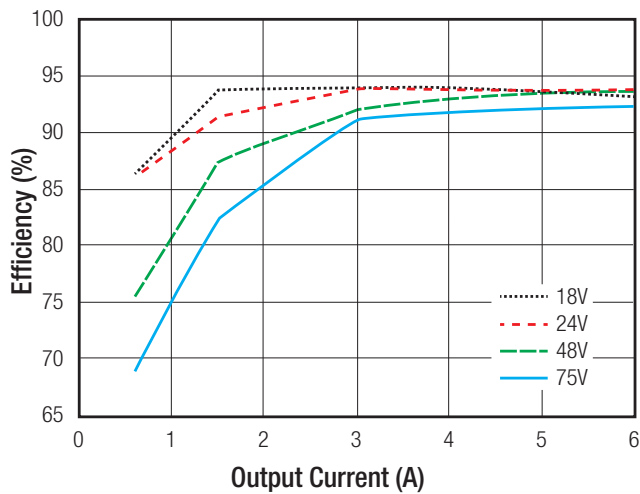
BASIC CHARACTERISTICS					
Parameter	Condition		Min.	Typ.	Max.
Input Voltage Range	24V 48V		9VDC 18VDC		36VDC 75VDC
Start/up Time				10mS	
Under Voltage Lockout	24V	DC-DC ON DC-DC OFF		9VDC 7.5VDC	
	48V	DC-DC ON DC-DC OFF		18VDC 16VDC	
Remot ON/OFF	DC-DC ON DC-DC OFF		Open or $2.5\text{V} < V_r < 12\text{V}$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

**Notes:**

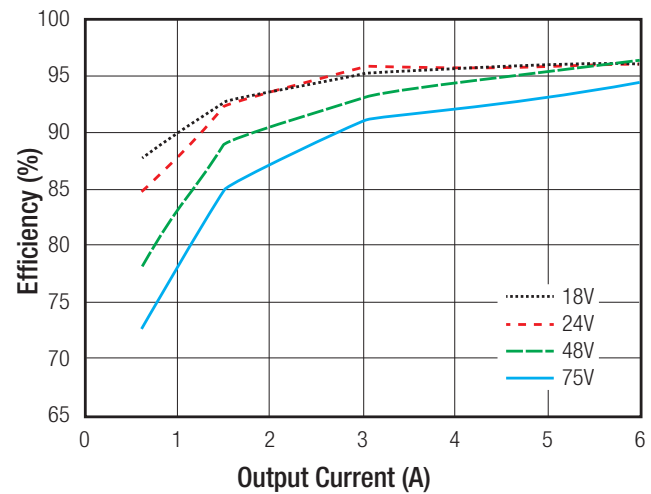
Note4: Ripple and Noise is measured with a 20MHz bandwidth and a 0.1 $\mu\text{F}$  ceramic capacitor.

**Efficiency vs. Load**

**REC20-485.1SZ**



**REC20-4815SZ**



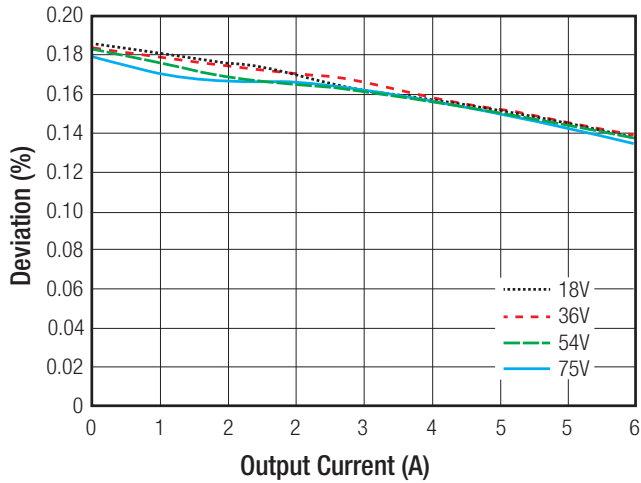
REGULATIONS				
Parameter	Condition	Type	Values	
Output Voltage Accuracy			±1% max.	
Voltage Adjustability			±10% typ.	
Line Voltage Regulation	low line to high line, full load		±0.2% max.	
Load Voltage Regulation	0% to 100% load	single output	±0.5% max.	
		dual output	±1% max.	
Cross Regulation	25%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

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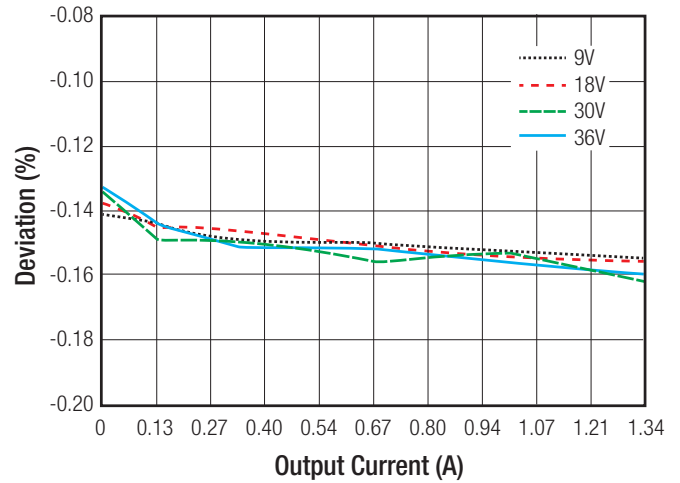
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Deviation vs. Load

REC20-485.1SZ



REC20-2415SZ



**PROTECTIONS**

Parameter	Condition	Value
Short Circuit Protection (SCP)		continuous, automatic recovery
Over Voltage Protection (OVP)	Zener Diode Clamp	3.4Vout
		5.1Vout
		12Vout
		15Vout
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**

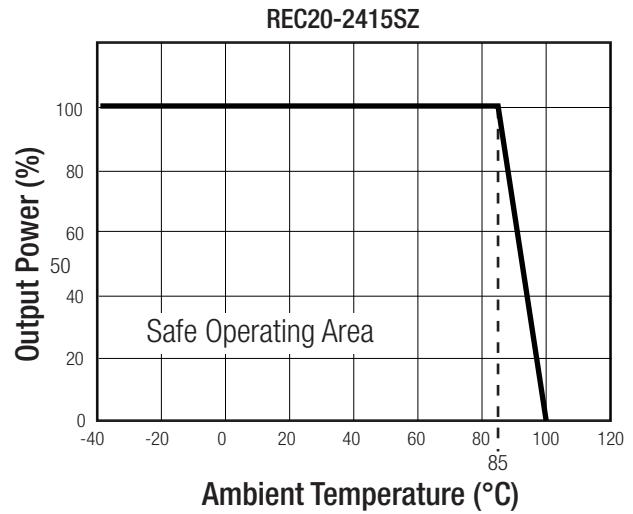
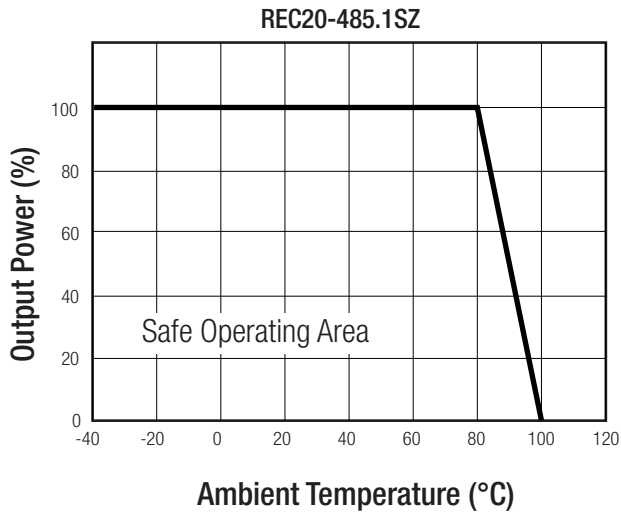
Parameter	Condition	Value
Operating Temperature Range	with derating	-40°C to +100°C
Maximum Case Temperature		+105°C
Temperature Coefficient		0.02%/°C typ.
Operating Humidity	non-condensing	5% - 95% RH max.
Vibration		MIL-STD-202G
MTBF	according to MIL-HDBK-217F, 25°C, referring to REC20-485.1SZ	1098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

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**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:**

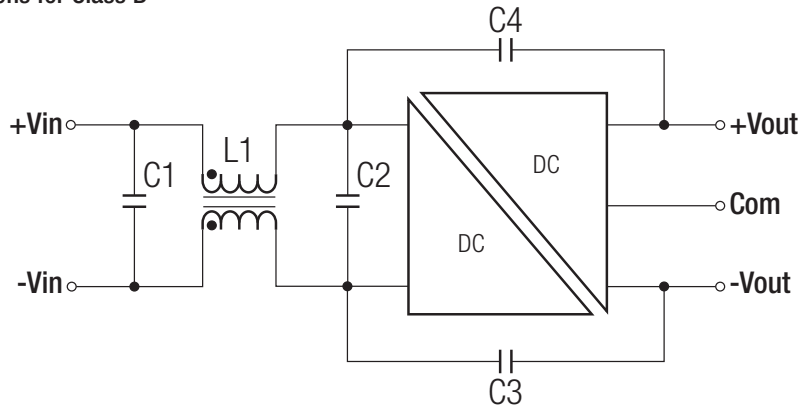
Note5: For more details, please contact our technical support service at TechsupportAT@recom-power.com

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 <sup>(6)</sup>	with external filter (see filter suggestions)	EN55022, Class A EN55022, Class 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 <sup>(7)</sup>	±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
<b>Notes:</b>		
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		

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EMC Filtering - Suggestions for Class B

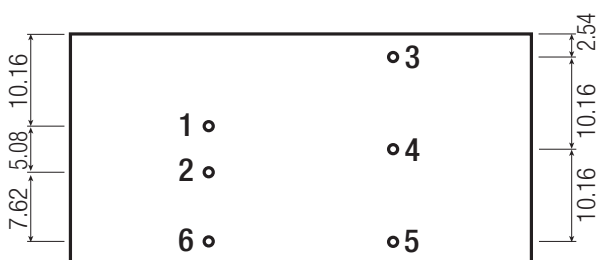
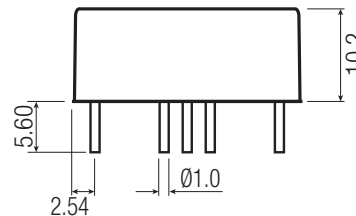
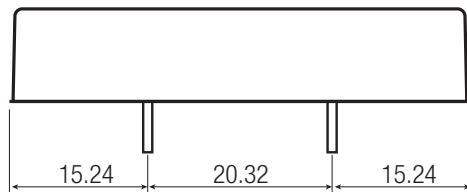
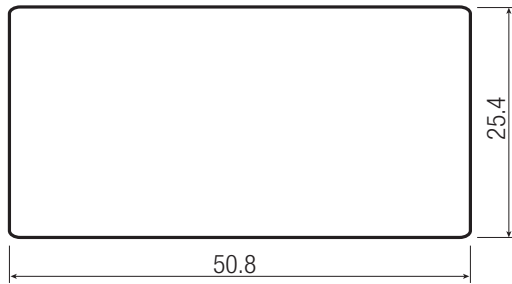
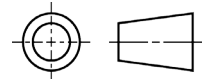


MODEL	C1	C2	L1	C3	C4
REC20-24xxS(D)Z	4.7 $\mu\text{F}$ /50V	4.7 $\mu\text{F}$ /50V	1.5mH	1000pF/2kV	1000pF/2kV
REC20-48xxS(D)Z	2.2 $\mu\text{F}$ /100V	2.2 $\mu\text{F}$ /100V	2.0mH	1000pF/2kV	1000pF/2kV

**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	

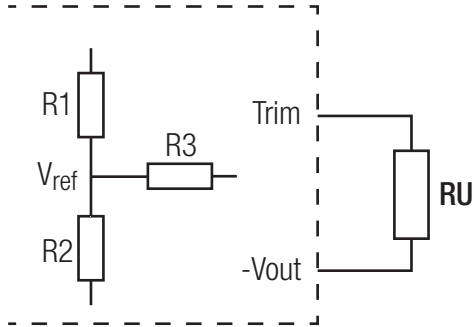
Tolerance: xx.x=  $\pm 0.5\text{mm}$   
 xx.xx=  $\pm 0.35\text{mm}$   
 Pin:  $\pm 0.05\text{mm}$

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**INSTALLATION and APPLICATION**

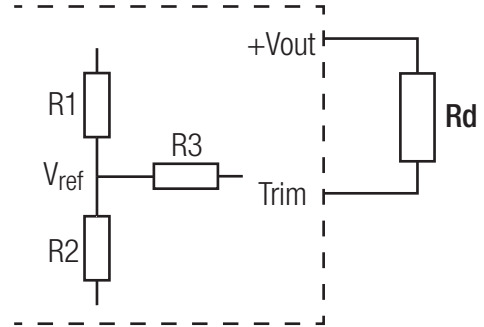
**External Output Voltage Trimming**

Trim up



$$RU = \frac{aR2}{R2-a} - R3 \quad a = \frac{V_{ref}}{V_0 - V_{ref}} \times R1$$

Trim down



$$Rd = \frac{bR1}{R1-b} - R3 \quad b = \frac{V_{ref}}{V_0 - V_{ref}} \times R2$$

**Notes:**

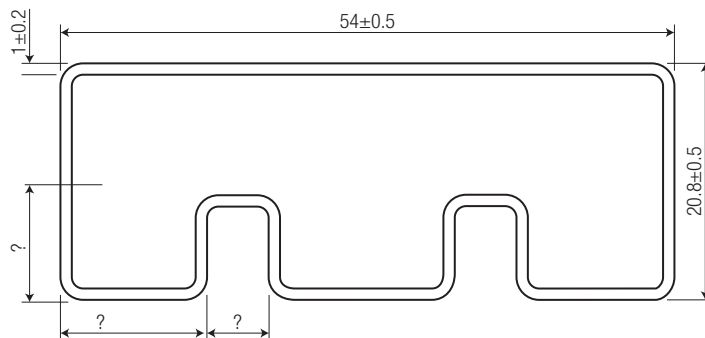
- Note8: RU and Rd is mean trim resistor, please check the formula.
- Note9: a & b: user define parameter, no actual meanings.
- Note10: V<sub>0</sub> is mean trim up/down voltage.
- Note11: Value for R1, R2, R3 and Vref refer to table.

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)**



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