

# Features

# Regulated Converters

- 6-Side Shielding
- External ON/OFF control
- 1.6kVDC Isolation
- UL/CSA/EN-60950-1 (Pending)
- 2:1 Input Voltage Range
- Continuous Short Circuit Protection
- Efficiency up to 90%
- Fixed Switching Frequency

## 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 <sup>(1)</sup> (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
REC30-2415D	36-75	±15	±1000	90.5	±500

### Notes:

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

## Model Numbering



### Notes:

Note2: **2:1**  
 12 = 9-18Vin  
 24 = 18-36Vin  
 48 = 36-75Vin

### Examples:

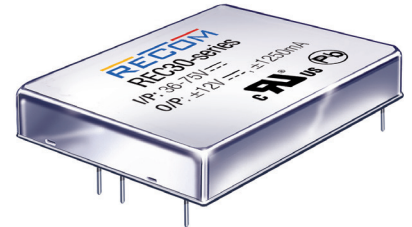
e.g. REC30-1212S, Single Output, 9-18Vin (2:1) and 12Vout  
 e.g. REC30-2412D, Dual Output, 18-36Vin (2:1) and ±12Vout

## REC30

30 Watt  
 2" x 1.6"



# Single and Dual Output



**CULUS**  
**E224736**

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

Refer to Applications Notes

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

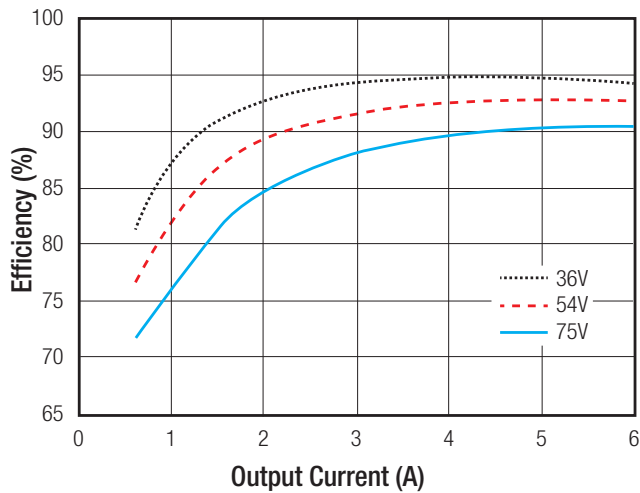
BASIC CHARACTERISTICS					
Parameter	Condition		Min.	Typ.	Max.
Input Voltage Range	12V		9VDC		18VDC
	24V		18VDC		36VDC
	48V		36VDC		75VDC
Start/up Time				10mS	
Under Voltage Lockout	12V	DC-DC ON		8.3VDC	
		DC-DC OFF		7.9VDC	
	24V	DC-DC ON		17.4VDC	
DC-DC OFF			16.7VDC		
48V	DC-DC ON		35.7VDC		
	DC-DC OFF		34.3VDC		
Remot ON/OFF	DC-DC ON DC-DC OFF				Open or $3V < V_r < 12V$ Short or $0V < V_r < 1.2V$
Operating Frequency				300kHz	
Minimum Load				0%	
Output Ripple and Noise <sup>(4)</sup>				100mVp-p	

**Notes:**

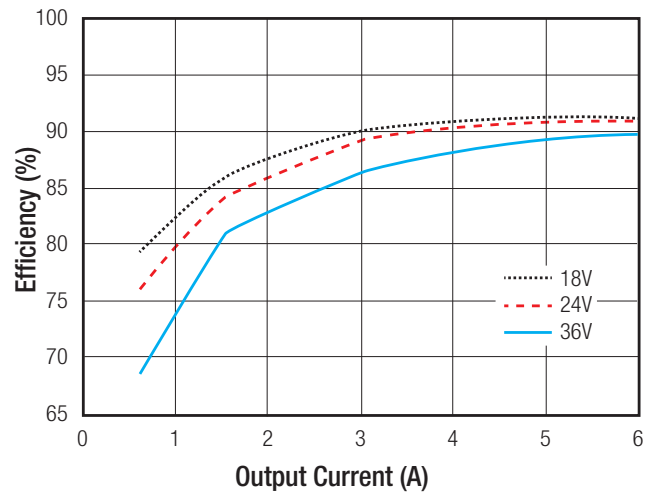
Note4: Ripple and Noise is measured with a 20MHz bandwidth and a 0.1 $\mu$ F ceramic capacitor.

**Efficiency vs. Load**

**REC30-485.1S**



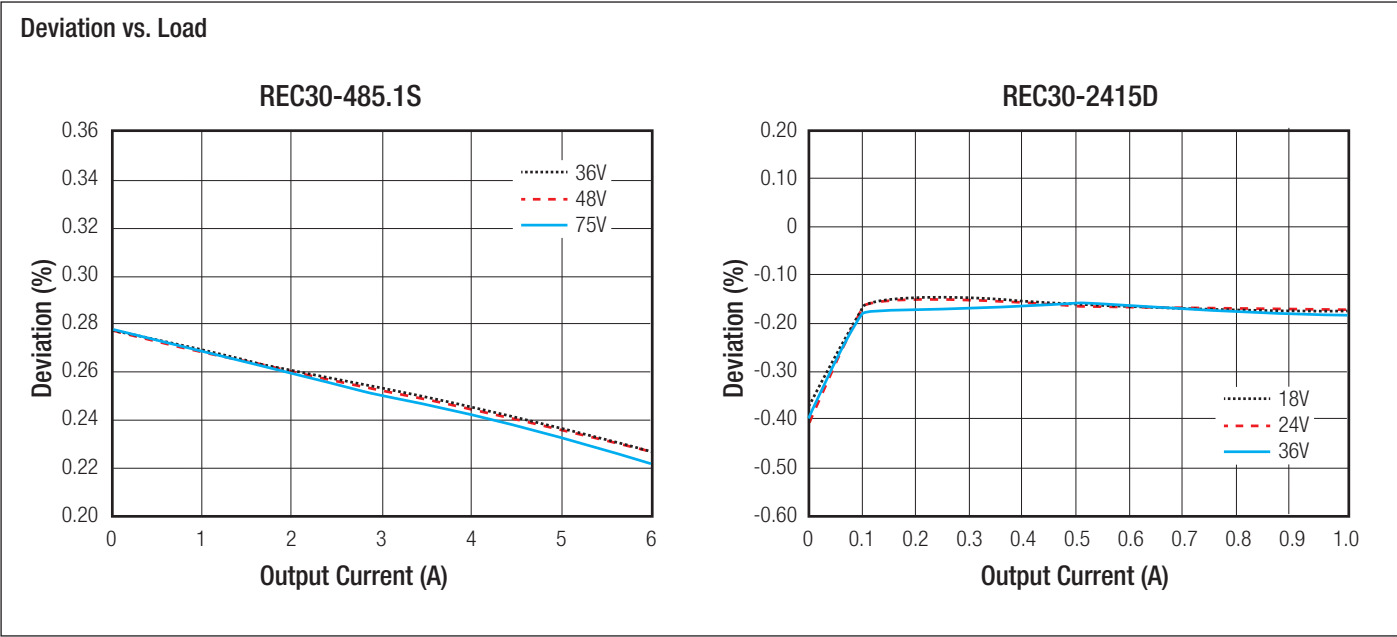
**REC30-2415D**



REGULATIONS				
Parameter	Condition	Type	Values	
Output Voltage Accuracy			±1% max.	
Voltage Adjustability			±10% max.	
Line Voltage Regulation	low line to high line, full load		±0.2% max.	
Load Voltage Regulation	10% 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 $\mu$ S typ.	

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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)



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		3300pF typ.
Isolation Resistance		1GΩ min.

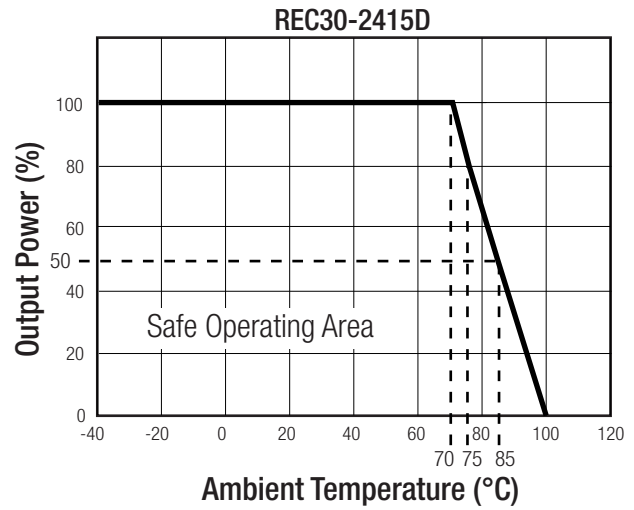
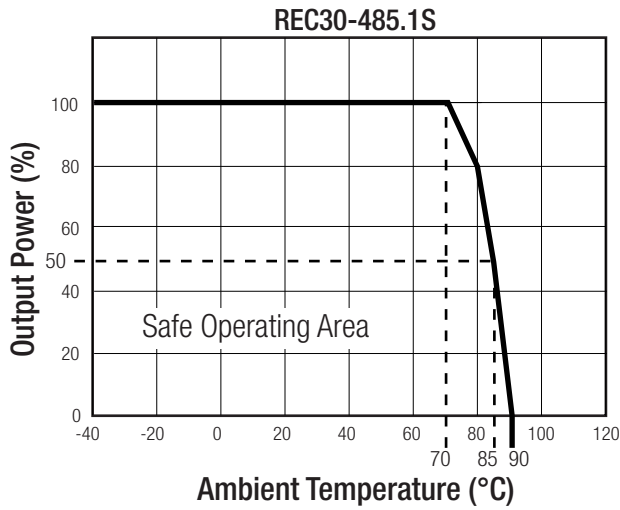
ENVIRONMENTAL		
Parameter	Condition	Value
Operating Temperature Range	with derating	-40°C to +85°C
Maximum Case Temperature		+105°C
Temperatur Coefficient		±0.05%/°C
Operating Altitude		5000m
Operating Humidity	non-condensing	5% - 95% RH max.
Vibration		MIL-STD-202G
MTBF	according to MIL-HDBK-217F, 25°C	529 x 10 <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](mailto:TechsupportAT@recom-power.com)

### SAFETY AND CERTIFICATIONS

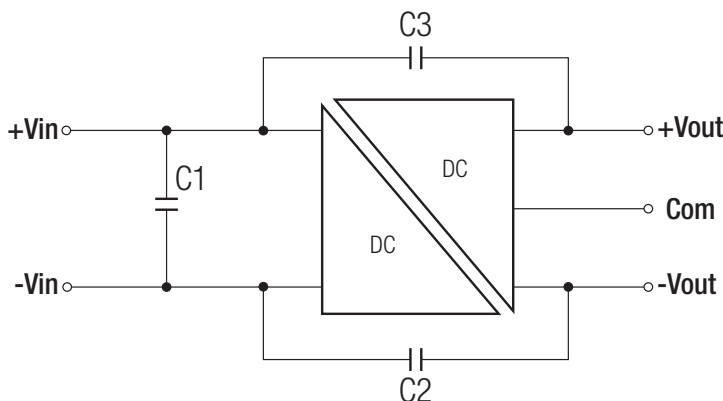
Certificate Type	Report / File Number	Standard
CB General Safety	(Pending)	IEC60950-1, 2nd Edition, 2013
UL General Safety		UL60950-1, 2nd Edition, 2014
EN General Safety		EN60950-1, 2nd Edition, 2013
CAN/CSA General Safety		C22.2 No. 60950-1-07, 2014

EMC Compliance	Condition	Standard / Criterion
EMI <sup>(6)</sup>	with external filter (see filter suggestions)	EN55022, Class A,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 <sup>(7)</sup>	$\pm 1\text{kV}$	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:**

Note7: An external MOV is required if the module has to meet EN61000-4-5. The MOV suggest: NichTek SV132-380

### EMC Filtering - Suggestions for Class A

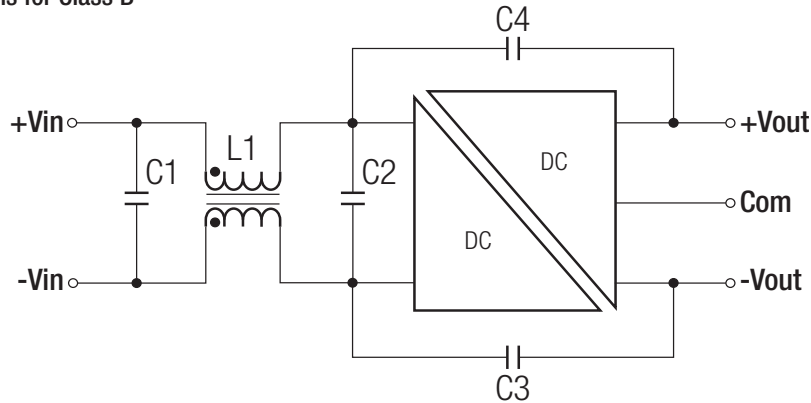


MODEL	C1	C2	C3
REC30-12xxS	330 $\mu\text{F}$ /50V	2200pF/3kV	NA
REC30-24xxS	330 $\mu\text{F}$ /50V	2200pF/3kV	NA
REC30-48xxS	330 $\mu\text{F}$ /100V	2200pF/3kV	NA
REC30-12xxD	330 $\mu\text{F}$ /50V	2200pF/3kV	2200pF/3kV
REC30-24xxD	330 $\mu\text{F}$ /50V	2200pF/3kV	2200pF/3kV
REC30-48xxD	330 $\mu\text{F}$ /100V	2200pF/3kV	2200pF/3kV

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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)

**EMC Filtering - Suggestions for Class B**

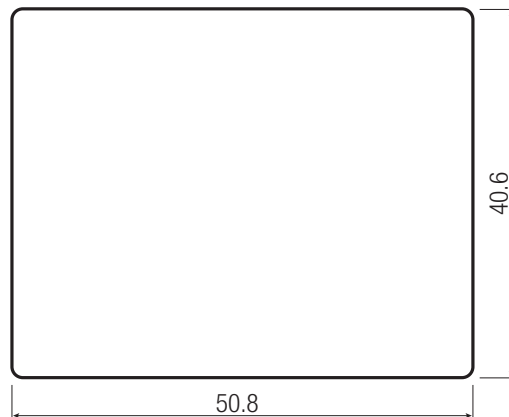


MODEL	C1	C2	L1	C3	C4
REC30-12xxS	330 $\mu\text{F}/50\text{V}$	10 $\mu\text{F}/50\text{V}$	1.3mH ref.:	2200pF/3kV	NA
REC30-24xxS	330 $\mu\text{F}/50\text{V}$	10 $\mu\text{F}/50\text{V}$	1.3mH ref.:	2200pF/3kV	NA
REC30-48xxS	330 $\mu\text{F}/100\text{V}$	10 $\mu\text{F}/100\text{V}$	1.3mH ref.:	2200pF/3kV	NA
REC30-12xxD	330 $\mu\text{F}/50\text{V}$	10 $\mu\text{F}/50\text{V}$	1.3mH ref.:	2200pF/3kV	2200pF/3kV
REC30-24xxD	330 $\mu\text{F}/50\text{V}$	10 $\mu\text{F}/50\text{V}$	1.3mH ref.:	2200pF/3kV	2200pF/3kV
REC30-48xxD	330 $\mu\text{F}/100\text{V}$	10 $\mu\text{F}/100\text{V}$	1.3mH ref.:	2200pF/3kV	2200pF/3kV

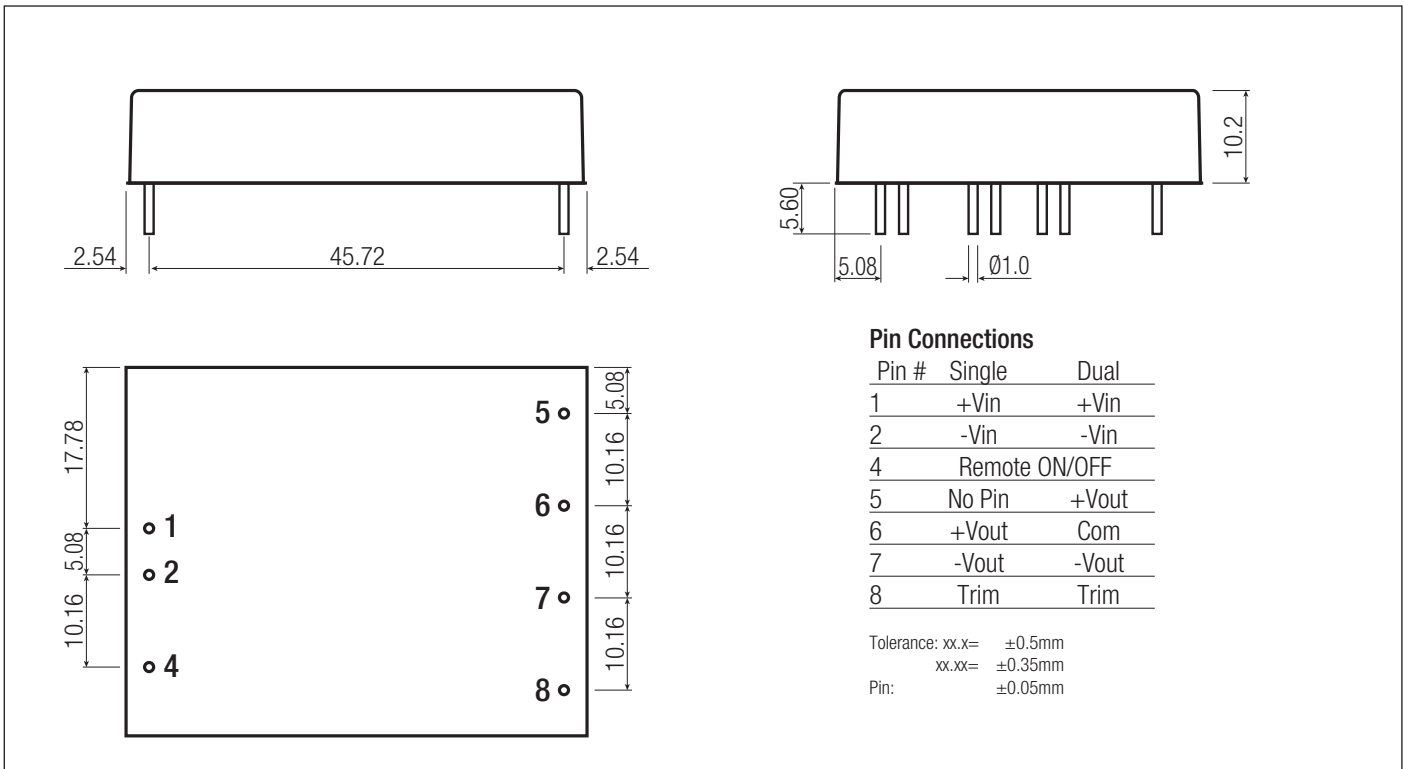
**DIMENSION and PHYSICAL CHARACTERISTICS**

Parameter	Type	Value
Material	Case Base Potting	Nickel plated copper non conductive black plastic (UL94V-0) Epoxy
Package Dimension (LxWxH)		50.8 x 40.6 x 10.2mm
Package Weight		48g

**Dimension Drawing (mm)**



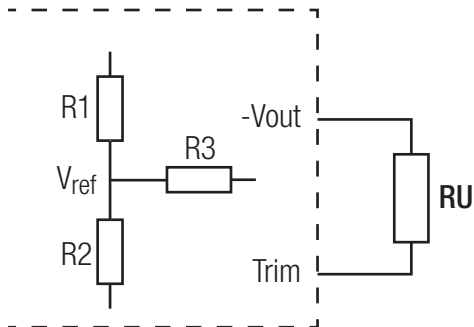
**Specifications** (measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm up unless otherwise specified)



**INSTALLATION and APPLICATION**

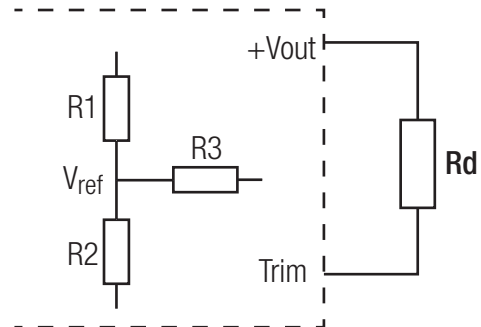
**External Output Voltage Trimming**

Trim up



$$RU = \frac{aR2}{R2-a} - R3 \quad a = \frac{Vref}{V0 - Vref} \times R1$$

Trim down



$$Rd = \frac{bR1}{R1-b} - R3 \quad b = \frac{Vref}{V0 - Vref} \times R2$$

**Notes:**

- Note8: RU and Rd is mean trim resistor, please check the formula.
- Note9: a & b: user define parameter, no actual meanings.
- Note10: V0 is mean trim up/down voltage.
- Notw11: Value for R1, R2, R3 and Vref refer to table.

Output Voltage	3.4V	5.1V	12V	15V
R1	2.1K	2.55K	9.53K	9.09K
R2	1.198561K	2.449341K	2.498617K	1.810845K
R3	6.8K	9.76K	16.9K	13K
Vref	1.240	2.500	2.500	2.500

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

**PACKAGING INFORMATION**

Packaging Dimension (LxWxH)	Tube	54.5 x 20.8 x 520.0mm
Packaging Quantity		11pcs
Storage Temperature Range		-55°C to +125°C

**Tube Dimension Drawing (mm)**

