

# 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

## 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
REC30-4815D	36-75	±15	±1000	90.5	±500

### Notes:

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

## Model Numbering

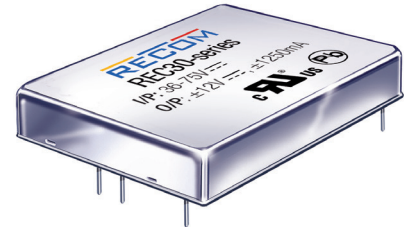


### Ordering Examples:

REC30-4812S, Single Output, 36-75Vin and 12Vout  
 REC30-2412D, Dual Output, 18-36Vin and ±12Vout

## REC30

**30 Watt**  
**2" x 1.6"**  
**Single and Dual Output**



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

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

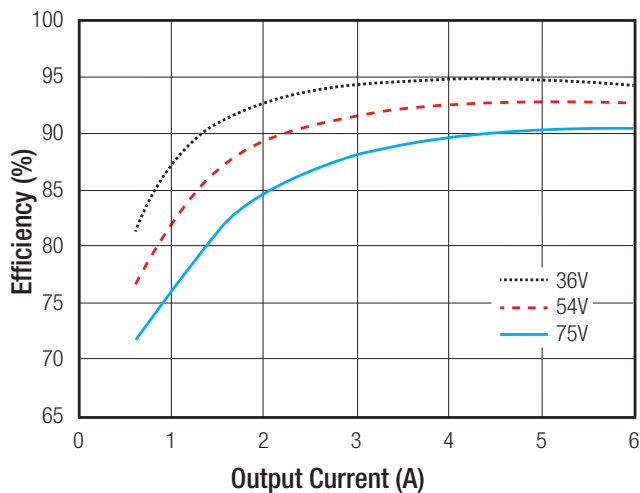
BASIC CHARACTERISTICS					
Parameter	Condition		Min.	Typ.	Max.
Input Voltage Range	nom. Vin= 12V nom. Vin= 24V nom. Vin= 48V		9VDC 18VDC 36VDC		18VDC 36VDC 75VDC
Start/up Time				10ms	
Under Voltage Lockout	nom. Vin= 12V	DC-DC ON DC-DC OFF		8.3VDC 7.9VDC	
	nom. Vin= 24V	DC-DC ON DC-DC OFF		17.4VDC 16.7VDC	
	nom. Vin= 48V	DC-DC ON DC-DC OFF		35.7VDC 34.3VDC	
Remote 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				300kHz	
Minimum Load				0%	
Output Ripple and Noise <sup>(2)</sup>				100mVp-p	

**Notes:**

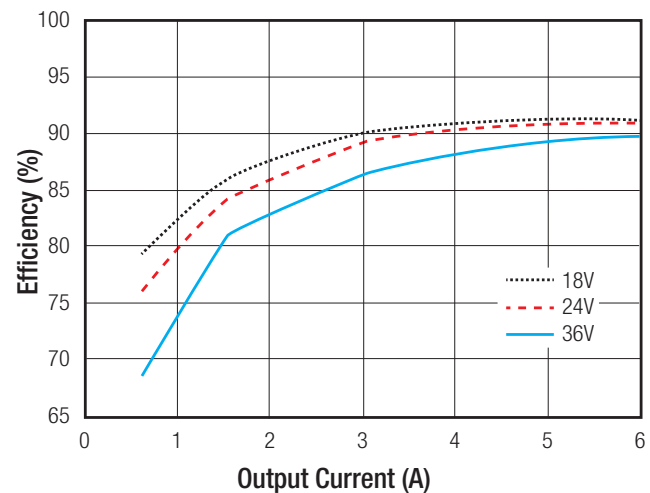
Note2: Ripple and Noise is measured with a 20MHz bandwidth and a 0.1 $\mu\text{F}$  ceramic capacitor.

**Efficiency vs. Load**

**REC30-485.1S**



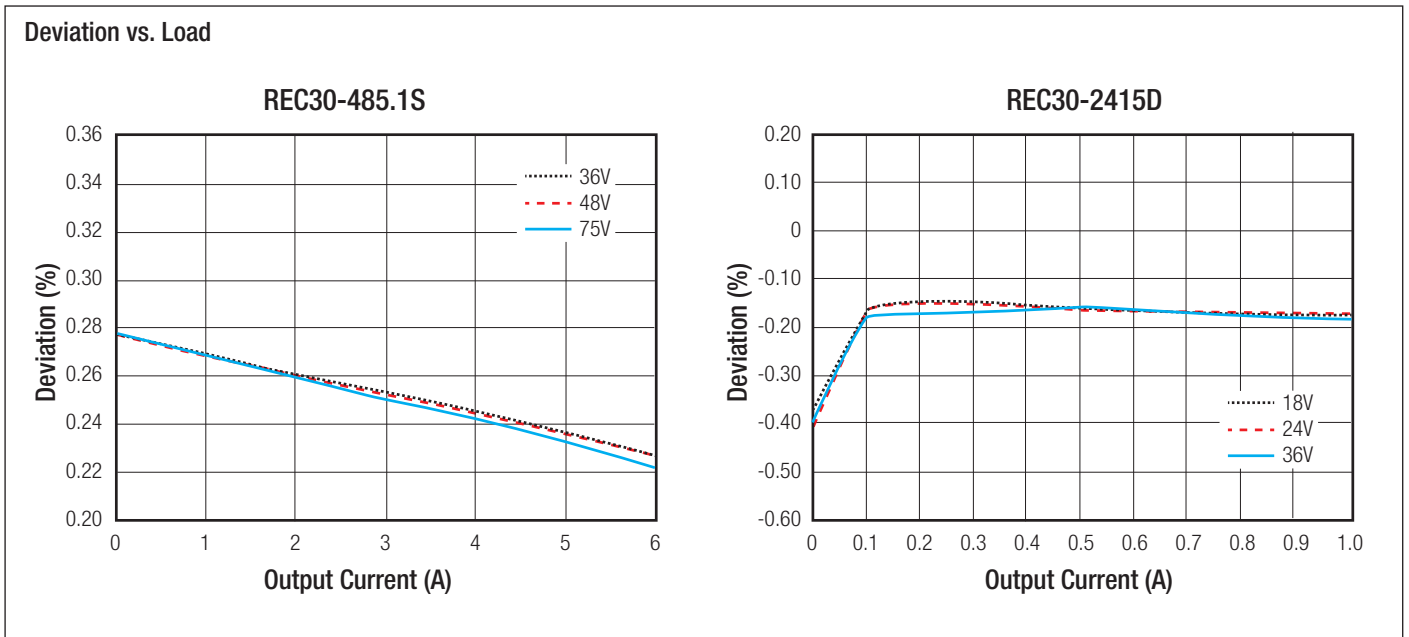
**REC30-2415D**



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 $\mu\text{s}$ 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**

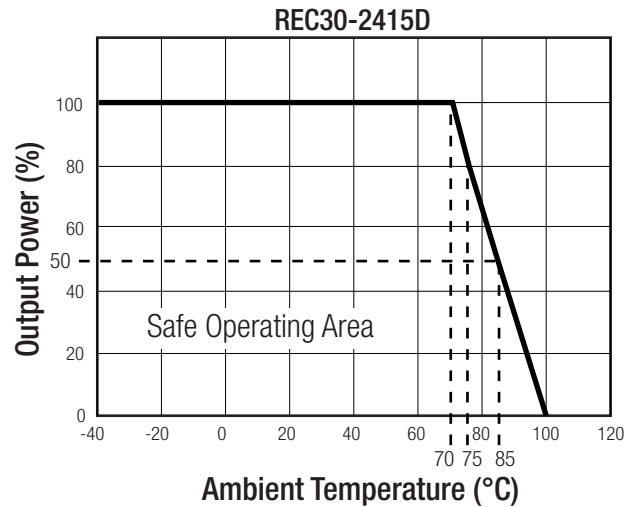
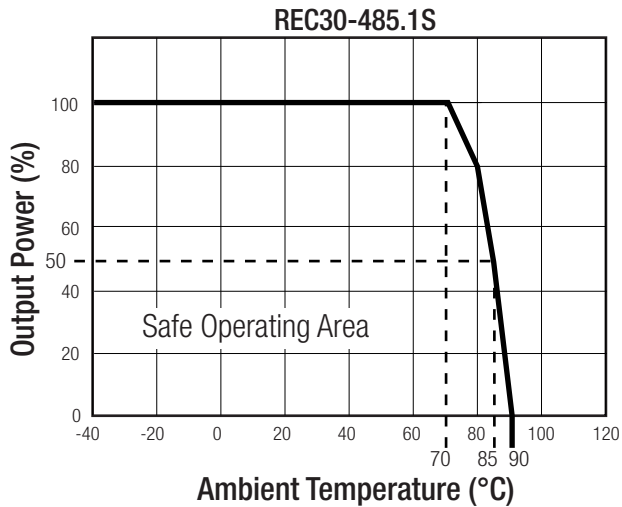
Parameter	Condition	Value
Operating Temperature Range	with derating	-40°C to +85°C
Maximum Case Temperature		+105°C
Temperatur Coefficient		±0.05%/°C
Thermal Impedance	natural convection	8°C/W
Operating Altitude		5000m
Operating Humidity	non-condensing	5% - 95% RH max.
Vibration		MIL-STD-202G
MTBF	according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

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

### SAFETY AND CERTIFICATIONS

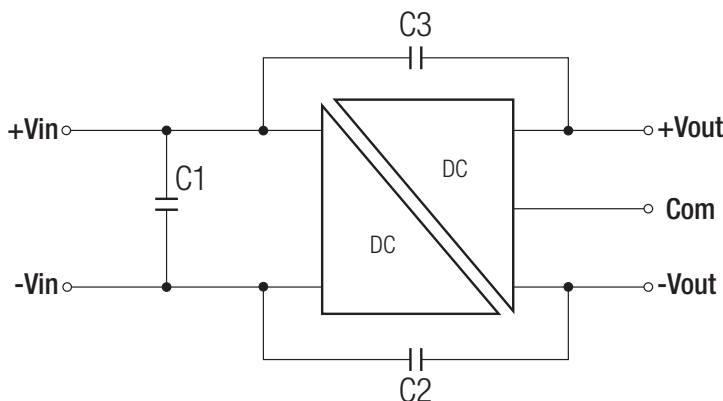
Certificate Type	Report / File Number	Standard
CB General Safety	E224736	IEC60950-1, 2nd Edition, 2013
UL General Safety	E224736	UL60950-1, 2nd Edition, 2014
EN General Safety	E224736	EN60950-1, 2nd Edition, 2013
CAN/CSA General Safety	E224736	C22.2 No. 60950-1-07, 2014

EMC Compliance	Condition	Standard / Criterion
EMI	with external filter (see filter suggestions)	EN55022, Class A,B
ESD	Air: $\pm 8\text{kV}$ ; 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>(4)</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:**

Note4: 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

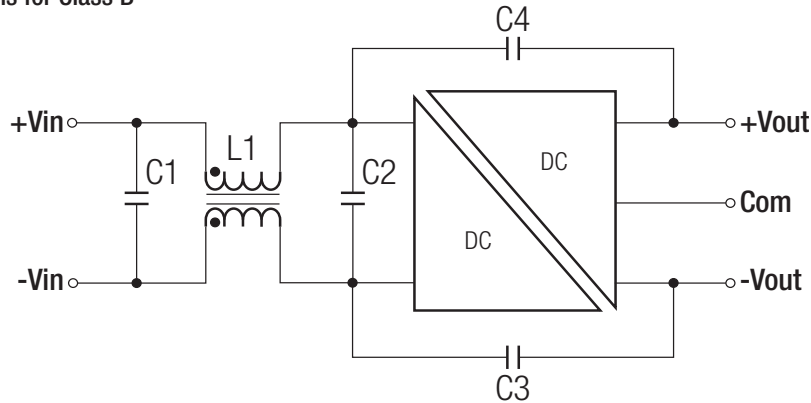


MODEL	C1	C2	C3
REC30-12xxS	330 $\mu\text{F}$ /50V	2200pF/3kV	NA
REC30-24xxS	330 $\mu\text{F}$ /50V	2200pF/3kV	NA
REC30-48xxS	330 $\mu\text{F}$ /100V	2200pF/3kV	NA
REC30-12xxD	330 $\mu\text{F}$ /50V	2200pF/3kV	2200pF/3kV
REC30-24xxD	330 $\mu\text{F}$ /50V	2200pF/3kV	2200pF/3kV
REC30-48xxD	330 $\mu\text{F}$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

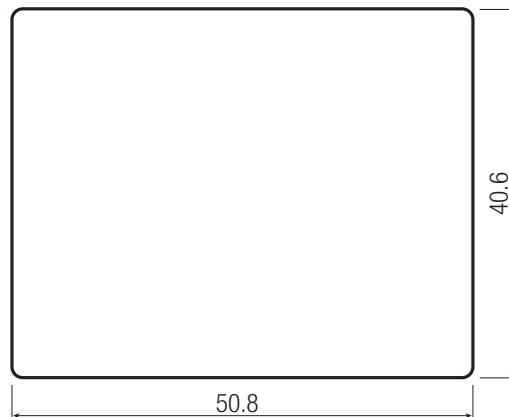


MODEL	C1	C2	L1	C3	C4
REC30-12xxS	330 $\mu$ F/50V	10 $\mu$ F/50V	1.3mH ref.:	2200pF/3kV	NA
REC30-24xxS	330 $\mu$ F/50V	10 $\mu$ F/50V	1.3mH ref.:	2200pF/3kV	NA
REC30-48xxS	330 $\mu$ F/100V	10 $\mu$ F/100V	1.3mH ref.:	2200pF/3kV	NA
REC30-12xxD	330 $\mu$ F/50V	10 $\mu$ F/50V	1.3mH ref.:	2200pF/3kV	2200pF/3kV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

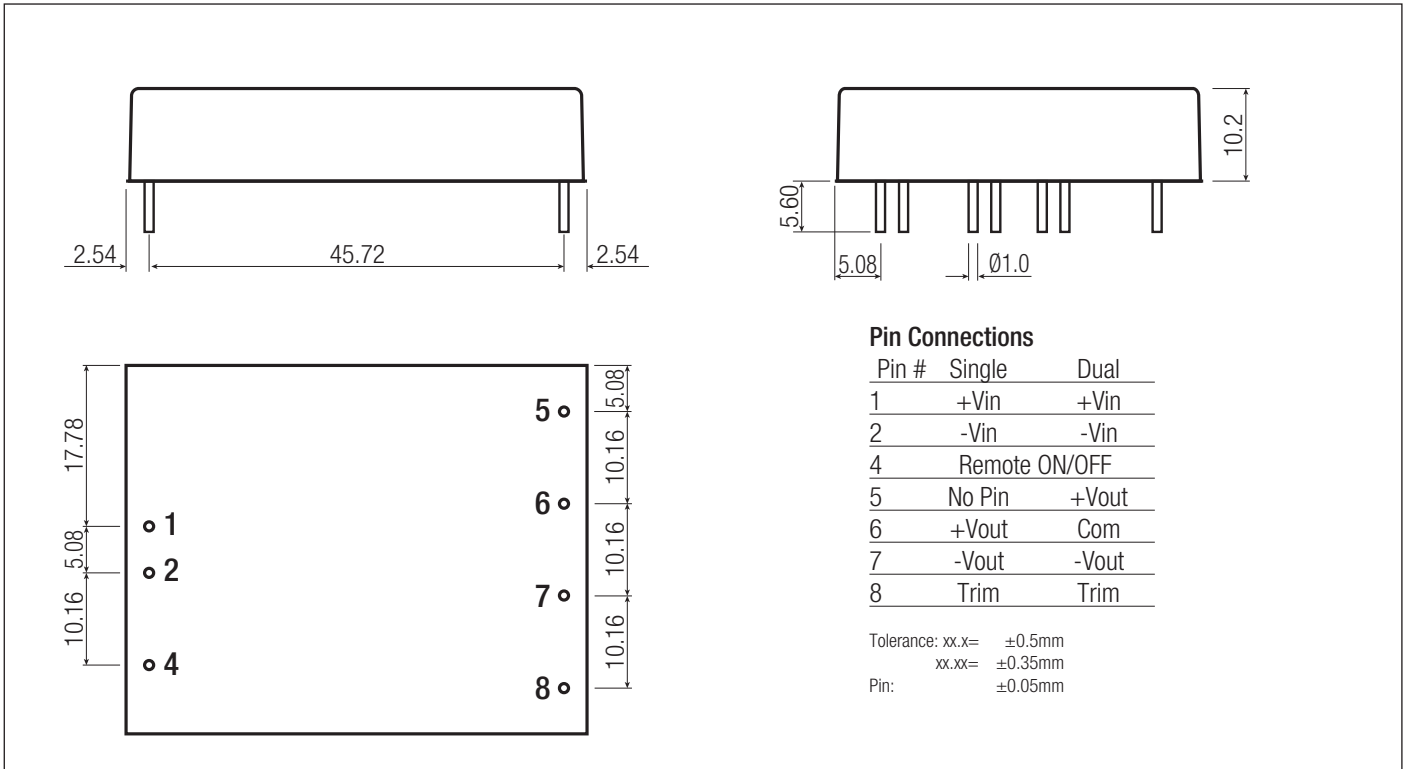
**DIMENSION and PHYSICAL CHARACTERISTICS**

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)



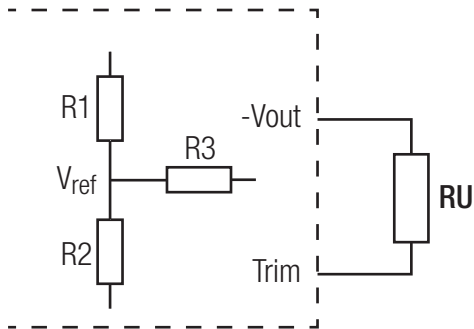
**Specifications** (measured at  $T_a = 25^\circ\text{C}$ , nominal input voltage, full load and after warm up unless otherwise specified)



**INSTALLATION and APPLICATION**

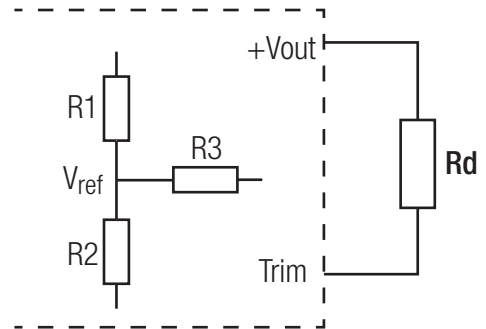
**External Output Voltage Trimming**

Trim up



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

Trim down



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

**Notes:**

- Note5: RU and Rd is mean trim resistor, please check the formula.
- Note6: a & b: user define parameter, no actual meanings.
- Note7: V<sub>0</sub> is mean trim up/down voltage.
- Note8: Value for R1, R2, R3 and V<sub>ref</sub> 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	520.0 x 54.5 x 21.0mm
Packaging Quantity		11pcs
Storage Temperature Range		-55°C to +125°C