

## Features

## Unregulated Converters

- Triple Outputs (-24V, -48V & -72V)
- Input/Output 1kVDC Isolation
- Industrial Temperature Range
- UL94V-0 Package Material
- Internal SMD Construction
- No External Components required
- Efficiency to 80%

**INNOLINE**  
DC/DC-Converter

# RxxTR... Series

### Selection Guide 5V and 12V Input Types

Part Number	Nom. Input Voltage (VDC)	Output	Rated Output Voltage (VDC)	Output Current <sup>1)</sup>		Output Current <sup>2)</sup>	
				Min Load (mA)	Full Load (mA)	Min Load (mA)	Full Load (mA)
R05TR244872	5	Vo1	-24	1.4	42	4.2	126
		Vo2	-48	0.7	21	2.1	63
		Vo3	-72	0.5	14	1.4	42
R12TR244872	12	Vo1	-24	1.4	42	4.2	126
		Vo2	-48	0.7	21	2.1	63
		Vo3	-72	0.5	14	1.4	42

1)- Assuming all 3 channels are equally loaded.

2)- Assuming only 1 channel is loaded.

### Absolute Maximum Ratings

Input Voltage $V_{IN}$	05V types 12V types	7VDC 15VDC
Short Circuit Duration <sup>3)</sup>		1 s
Control Voltage, SD		$V_{IN}$
Operating Temperature Range (all output types)		-40°C min. to +85°C
Lead Temperature 1.5mm from Case for 10 seconds		300°C
Output Power Delivery		3W

<sup>3)</sup> Supply voltage must be discontinued at the end of the short circuit duration.

### Specifications (measured at $T_A=25^\circ\text{C}$ ,

at nominal input voltage and rated output current unless otherwise specified)

Input Voltage Range $V_{IN}$ (continuous operation)	5V types 12V types	4.5VDC min. / 5.5VDC max. 10.8VDC min. / 13.2VDC max.
Ripple Current ( $I_{RIPPLE}$ )	5V types 12V types	85mA 66mA
Zero Load Input Current ( $I_{CCZL}$ )	5V types, 0% output load 12V types, 0% output load	50mA typ. / 80mA max. 27.5mA typ. / 50mA max.
Internal Power Dissipation ( $P_{DISS}$ )	5V types, 0% output load 12V types, 0% output load	250mA typ. / 400mA max. 490mA typ. / 600mA max.
Shut Down Operating Threshold	Switch voltage ( $V_{SD}$ ) Sink current ( $I_{SD}$ )	1.30V min. / 1.90V max. 170µA min. / 300µA max.
Shut Down Pin Current Sink (SD Pin: 0V Vsd: OFF, >Vsd or open: ON)	5V types, $V_{SD} = 5.0V$ 12V types, $V_{SD} = 12.0V$	0.80mA min. / 1.10mA max. 2.20mA min. / 3.00mA max.
Input Quiescent Current During Shut Down	5V types, $V_{SD} = 5.0V$ 12V types, $V_{SD} = 12.0V$	9mA typ. / 14mA max. 7mA typ. / 15mA max.
Total Rated Power ( $P_{OUT}$ ) Total of all outputs or any single output		0.1W min. / 3.0W max.
Output Current ( $I_{OUT}$ ) From any single 24V output		4.2mA min. / 126mA max.
Single Channel Voltage Setpoint Accuracy	$P_{OUT} = 100mW$ $P_{OUT} = 3mW$	0% min. / 10% max. 7.5% min. / 2.5% max.

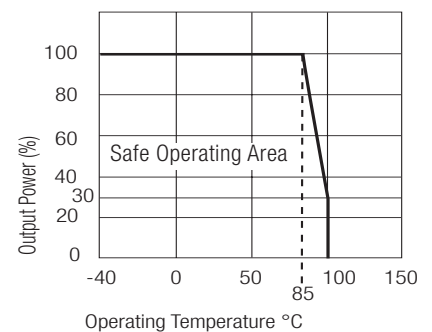
continued on next page

## 3 Watt SIP8 Triple Output



**RECOM**

## Derating-Graph (Ambient Temperature)



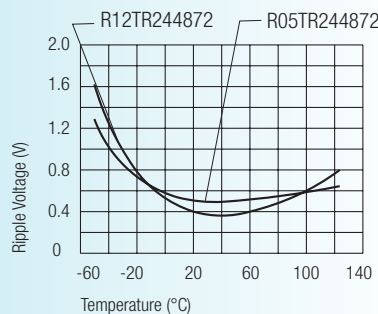
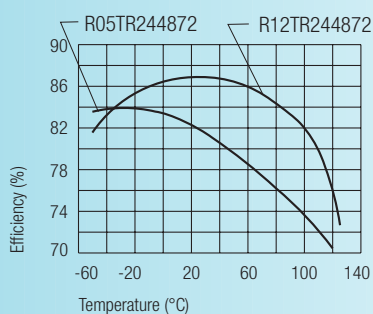
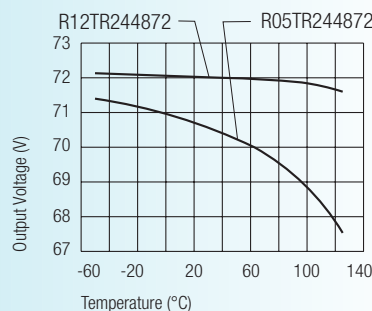
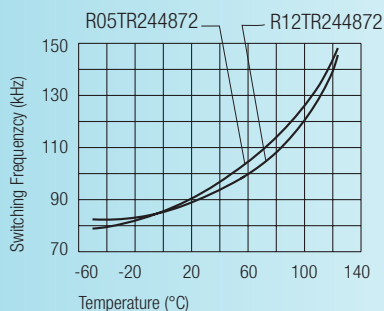
**Specifications** (measured at  $T_A=25^\circ\text{C}$ , at nominal input voltage and rated output current unless otherwise specified)

Output Voltage ( $V_{OUT}$ ) - Vo1	$P_{OUT} = 100\text{mW}$ $P_{OUT} = 3\text{W}$	24.0V min. / 26.4V max. 22.2 Vmin. / 24.6V max.
Output Voltage ( $V_{OUT}$ ) - Vo2	$P_{OUT} = 100\text{mW}$ $P_{OUT} = 3\text{W}$	48.0V min. / 52.8V max. 44.4V min. / 49.2V max.
Output Voltage ( $V_{OUT}$ ) - Vo3	$P_{OUT} = 100\text{mW}$ $P_{OUT} = 3\text{W}$	72.0V min. / 79.2V max. 66.6V min. / 73.8V max.
Line Regulation ( $V_{IN} = 90\%$ to 110% of nominal)		1.01% typ. / 1.2% max.
Load Regulation (10% to 100% full load)	$P_{OUT} = 100\text{mW}$ to 3W	6% typ. / 15% max.
Ripple and Noise (DC to 20MHz single channel, 24V)		0mVp-p min. / 400mVp-p max.
Isolation Voltage ( $V_{ISOL}$ ) (flash tested for 1 second)		1000VDC min.
Isolation Capacitance ( $C_{ISOL}$ )	5V types, 1 MHz, 1V 12V types, 1 MHz, 1V	65pF 130pF
Insulation Resistance (1000VDC test)		1 G $\Omega$ min. /10 G $\Omega$ typ.
Leakage Current ( $I_L$ )	5V types, 220V AC, 50Hz 12V types, 220V AC, 50Hz	4.5 $\mu\text{A}$ 10.4 $\mu\text{A}$
Efficiency (all channels or any single channel)		75% min.
Switching Frequency ( $f_{OSC}$ )		50kHz min.
Oscillator Voltage Coefficient ( $f_{VCO}$ )	$V_{IN} = 90\%$ to 110% of nominal	20%
Package Weight		3.85 g
Case Temperature Rise Above Ambient	1 litre static air chamber	27°C typ
Output Voltage Temperature Coefficient ( $V_{TCO}$ )	$T_A = -40^\circ\text{C}$ to $T_A = +85^\circ\text{C}$	15mV/°C typ.
Oscillator Temperature Coefficient ( $f_{TCO}$ )	$T_A = -40^\circ\text{C}$ to $T_A = +85^\circ\text{C}$	300Hz/°C typ.
Operating Temperature ( $T_A$ )		-40°C min. / +85°C max.
Storage Temperature Range		-50°C to +125°C max.
MTBF (depending on the type) <sup>1)</sup>	-40°C +25°C +85°C	<i>Detailed Information see Application Notes chapter "MTBF"</i> 174kHrs min. / 174kHrs max. 145kHrs min. / 145kHrs max. 121kHrs min. / 121kHrs max.

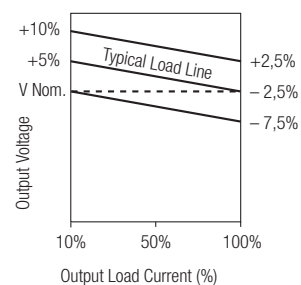
<sup>1)</sup>. Calculated using MIL-HDBK-217F with nominal input voltage at full load. Please contact us, if you need exact parameters for the converter you have selected.

**Typical Characteristics, Tolerance Envelope**

**Thermal Characterisation**

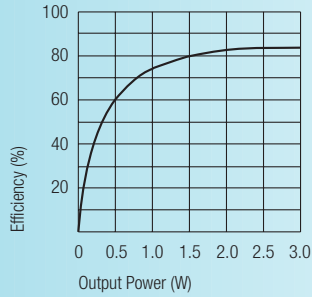


**Tolerance Envelope**

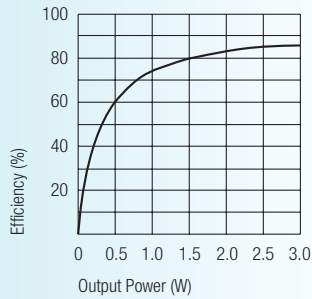


## Typical Characteristics

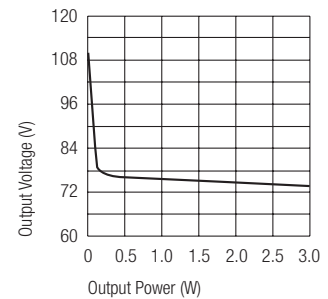
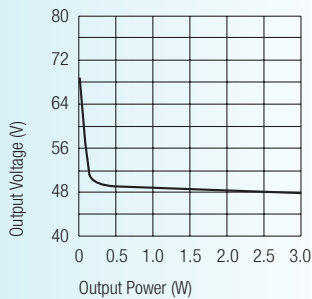
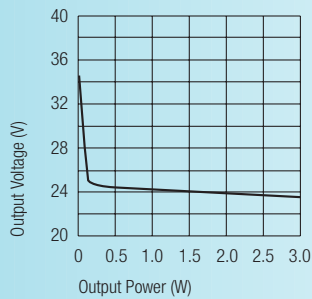
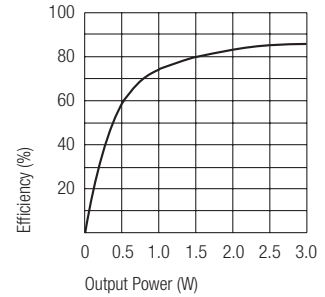
Channel V<sub>O1</sub> (nominal 24V)



Channel V<sub>O2</sub> (nominal 48V)

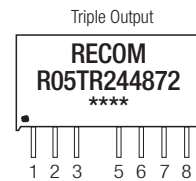
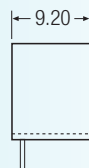
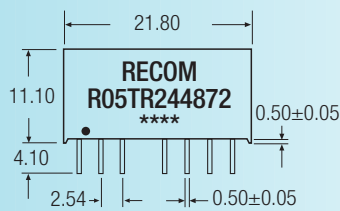


Channel V<sub>O3</sub> (nominal 72V)

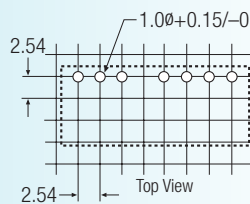
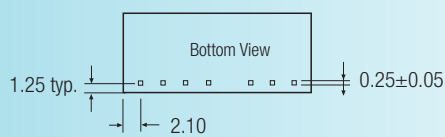


## Package Style and Pinning (mm)

8 PIN SIP Package



Recommended Footprint Details



Pin Connections

Pin #	Triple
1	+Vin
2	-Vin
3	SD (Shut Down)
5	Com
6	Vo1
7	Vo2
8	Vo3

NC = No Connection  
XX.X ± 0.5 mm  
XX.XX ± 0.25 mm