

ISOLATED 3W REGULATED SINGLE OUTPUT DC/DC CONVERTERS
FEATURE

- n RoHS compliant
- n High efficiency to 82%
- n 2:1 Wide range voltage input
- n Short circuit protection
- n No Heatsink required
- n Fully encapsulated
- n 1kV input to output isolation
- n Power density 0.90W/cm³
- n Operating temperature range -40 °C to 85 °C
- n Internal SMD construction
- n Low profile 24pin case



Order Code	Input Voltage(Vdc)	Input Current(mA)		Output Voltage(Vdc)	Output Current(mA)	%Eff. (Typ)	Cap. Load max.(uF)
		0% Load	100% Load				
RY05S05D3	4.5-9.0(2:1)	125	615	5	400-600	65.9	680
RY05S09D3	4.5-9.0(2:1)	125	563	9	222-333	71.8	560
RY05S12D3	4.5-9.0(2:1)	125	548	12	166-250	70.8	330
RY05S15D3	4.5-9.0(2:1)	125	533	15	133-200	73.1	220
RY12S05D3	9-18(2:1)	62	362	5	600	71.3	680
RY12S09D3	9-18(2:1)	62	320	9	333	77.7	560
RY12S12D3	9-18(2:1)	62	316	12	250	78.3	330
RY12S15D3	9-18(2:1)	62	308	15	200	78.9	220
RY24S03D3	18-36(2:1)	45	178	3.3	909	70.1	820
RY24S05D3	18-36(2:1)	45	174	5	600	69.9	680
RY24S09D3	18-36(2:1)	45	156	9	333	77.8	560
RY24S12D3	18-36(2:1)	45	154	12	250	80	330
RY24S15D3	18-36(2:1)	45	150	15	200	81.9	220
RY48S03D3	36-75(2:1)	23	87	3.3	909	71	820
RY48S05D3	36-75(2:1)	23	87	5	600	73.2	680
RY48S09D3	36-75(2:1)	23	78	9	333	79.7	560
RY48S12D3	36-75(2:1)	23	77	12	250	81.1	330
RY48S15D3	36-75(2:1)	23	76	15	200	81.3	220

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INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage range	5V input types	4.5	5	9	Vdc
	12V input types	9	12	18	
	24V input types	18	24	36	
	48V input types	36	48	72	
Reflected ripple current	RY24S03		180	360	mA p-p
	RY48S03		140	290	
	5V input types		400	500	
	12V input types		150	170	
	All other 24V input types		290	360	
	All other 48V input types		100	127	

OUTPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Voltage set point accuracy	With external input/output capacitors		±1	±5	%
Line regulation	Low line to high line, 3.3V output with external input/output capacitors		0.05	0.25	%
	Low line to high line, other types with external input/output capacitors		0.05	0.5	
Load regulation	25% load to 100% load, 3.3V output with external input/output capacitors		0.6	1.0	%
	25% load to 100% load, other types with external input/output capacitors		0.2	0.5	
Ripple	BW = 20Hz to 300kHz, 3.3V output with external input/output capacitors		80	120	mV rms
	BW = 20Hz to 300kHz, other types with external input/output capacitors		5	10	
Noise	BW = DC to 100MHz, 3.3V output with external input/output capacitors			180	mV p-p
	BW = DC to 100MHz, other types with external input/output capacitors		50	100	

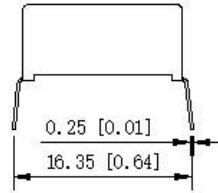
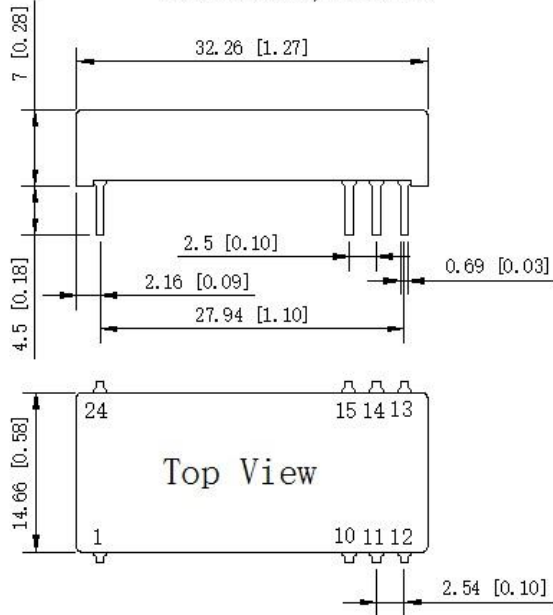
GENERAL CHARACTERISTICS

Isolation Voltage	1000VDC min.	
Isolation Resistance	10 ⁸ Ohms min.	
Isolation Capacitance	40pF typ.	
Switching frequency	100% load Vin nominal 3.3V output	160-220 kHz
	25% load Vin nominal 3.3V output	290-560 kHz
	100% load Vin nominal, all other types	80-220 kHz
	25% load Vin nominal, all other types	290-560 kHz
Operation Ambient Temperature Range	-40°C ~85°C	
Derating	See Derating Curve	
Case Temperature	110°C max	
Cooling	Natural Convection	
Storage Temperature Range	-50°C to +130°C	
Humidity	95%RH max. Non condensing	
MTBF	MIL-STD-217F TBD	
Dimensions	32.3x14.7x7.0mm (1.27x0.58x0.28 inches)	
Case Material	Non-Conductive Black Plastic	
Weight	9.0 g	

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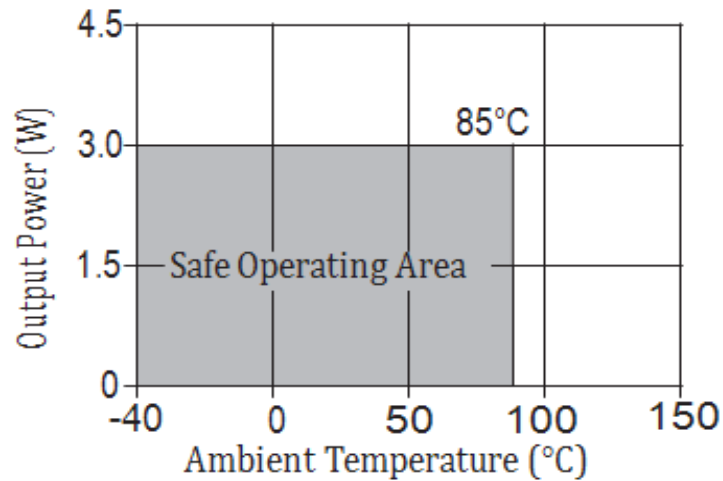
MECHANICAL DIMENSIONS & PIN CONNECTION

All Dimensions In Millimeters [Inches]
 Tolerance Millimeters: X=±1.0, .XX=±.25
 Inches: .XX=±.04, .XXX=±.010



PIN CONNECTION	
Pin	Function
1, 24	+VIN
10, 15	-VOUT
11, 14	+VOUT
12, 13	-VIN

RY-3 Series Derating Curve



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NOTE

1. Measured From High Line to Low Line.
2. Measured From Full Load to min. Load.
3. Maximum case temperature under any operating condition should Not be exceeded 85°C.
4. The output ripple and noise is measured with 10uF tantalum and 1uF Ceramic capacitor across output.
5. All Specifications Typical At Nominal Line, Full Load, and 25°C Unless Otherwise Noted.
6. The minimum load to meet datasheet specification is 10% of the full rated load across the specified input voltage range. Lower than 10% minimum loading will result in an increase in output voltage, which may rise to typically double the specified output voltage if the output load falls to less than 5%.

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