RDL10W SERIES

10W DC DC CONVERTER

DIMENSIONS:

0.87 x 0.47 x 0.38"
(22.0 x 12.0 x 9.6 mm)

EN50155
IEC/UL/EN62368-1

WIDE INPUT 4:1

SINGLE & DUAL OUTPUTS

REMOTE ON-OFF

-40 to 105°C OPERATION

MIL-STD-810F

Part numbers

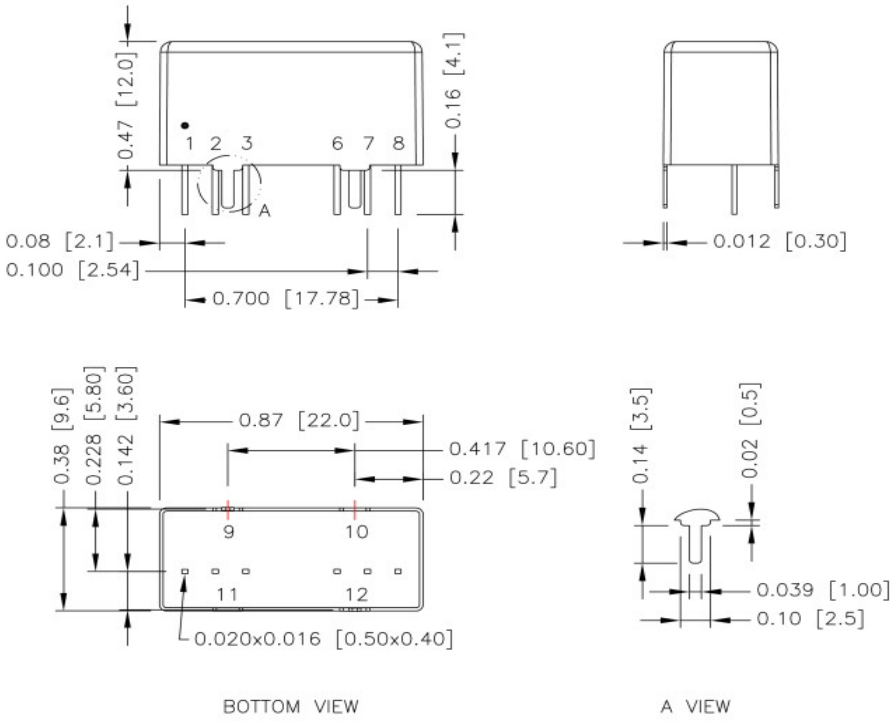
RDL	10	-	24	S	12	W
Series	Power (W)		Input voltage	Number of outputs	Output voltage	Input range
			24 = 9-36VDC 48 = 18-75VDC 110 = 40-160VDC	S = Single	3P3 = 3.3VDC 05 = 5VDC 12 = 12VDC 15 = 15VDC 24 = 24VDC	4:1
				D = Dual	05 = ±5VDC 12 = ±12VDC 15 = ±15VDC	

Key specifications

Input range	Safety certification	Efficiency	Environmental performance
9-36VDC 18-75VDC 40-160VDC	UL/IEC/EN 62368-1, EN50155, EN45545-2 (all pending)	<89%	Operational: -40 to 105°C

RDL10W SERIES

Mechanical



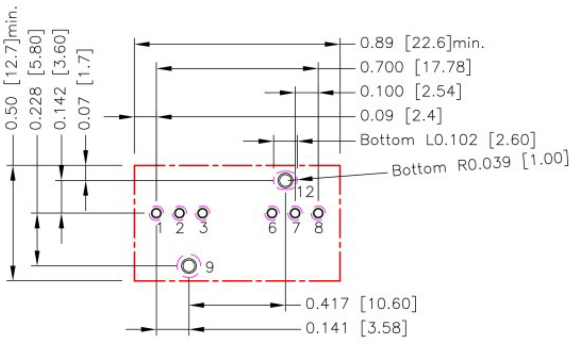
Pin	Pin/Function Single	Pin/Function Dual
1	-Vin	-Vin
2	+Vin	+Vin
3	Ctrl	Ctrl
6	+Vout	+Vout
7	-Vout	Common
8	NC	-Vout
9	Case	Case
10	Stand off	Stand off
11	Stand off	Stand off
12	Case	Case

Notes
1. All dimensions in inch (mm) 2. Tolerance: x.xx±0.02 (x.x±0.5) x.xxx±0.01 (x.xx±0.25) 3. Pin dimension tolerance ±0.004(0.10) 4. Case material copper 5. Potting material Silicone UL94 V-0 # 6. 24V 2A slow blow fuse 48V 1.25A slow blow fuse 110V 0.63A slow blow fuse

Weight	7.2g

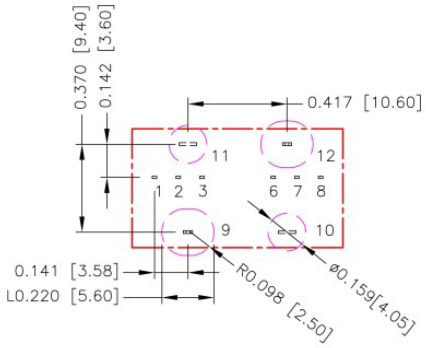
Mechanical

Recommended Pad Layout



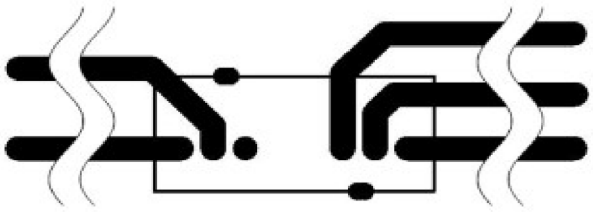
Notes

All dimensions in inch (mm)
Pad size (lead free recommended)
Through hole 1,2,3,6,7,8: ø0.035(0.90)
Through hole 9,12: ø0.051(1.30)
Top view pad 1,2,3,6,7,8: ø0.43(1.10)
Top view pad 9,12: ø0.064(1.63)
Bottom view pad 1,2,3,6,7,8:ø0.63(1.60)
Bottom view pad 9:ø0.0102(2.60)
Bottom view pad 12:Groove R0.039(1.00) L0.102(2.60)



Notes

Area 9,10,11,12 don't layout
Area 10,11 size:ø0.159(4.05)
Area 9,12 size:Groove R0.098(2.50)L0.220(5.60)
The layout distance between Pin 3 and Pin 6 is at least 3mm
It is recommended putting PCB trace on bottom side 25.4x12.7mm 2oz copper on the top side for thermal considerations and placing >2mm PCB trace on the bottom side.



RDL10W SERIES

Models & Ratings

Model Number	Input Voltage	Output Voltage	Output current	No Load Current	Efficiency	Maximum Capacitive
RDL10-24S3P3W	9-36VDC	3.3VDC	2500mA	8mA	87%	3600uF
RLD10-24S05W	9-36VDC	5VDC	2000mA	8mA	88%	1800uF
RDL10-24S12W	9-36VDC	12VDC	840mA	8mA	89%	680uF
RDL10-24S15W	9-36VDC	15VDC	670mA	8mA	89%	680uF
RDL10-24S24W	9-36VDC	24VDC	420mA	8mA	89%	300uF
RDL10-24D05W	9-36VDC	±5VDC	±1000mA	8mA	86%	±1100uF
RDL10-24D12W	9-36VDC	±12VDC	±420mA	8mA	89%	±560uF
RDL10-24D15W	9-36VDC	±15VDC	±336mA	8mA	89%	±300uF
RDL10-48S3P3W	18-75VDC	3.3VDC	2500mA	4mA	87%	3600uF
RDL10-48S05W	18-75VDC	5VDC	2000mA	4mA	88%	1800uF
RDL10-48S12W	18-75VDC	12VDC	840mA	4mA	89%	680uF
RDL10-48S15W	18-75VDC	15VDC	670mA	4mA	89%	680uF
RDL10-48S24W	18-75VDC	24VDC	420mA	4mA	89%	300uF
RDL10-48D05W	18-75VDC	±5VDC	±1000mA	4mA	86%	±1100uF
RDL10-48D12W	18-75VDC	±12VDC	±420mA	4mA	89%	±560uF
RDL10-48D15W	18-75VDC	±15VDC	±336mA	4mA	89%	±300uF
RDL10-110S3P3W	40-160VDC	3.3VDC	2500mA	3.5mA	86%	3600uF
RDL10-110S05W	40-160VDC	5VDC	2000mA	3mA	87%	1800uF
RDL10-110S12W	40-160VDC	12VDC	840mA	3mA	88%	680uF
RDL10-110S15W	40-160VDC	15VDC	670mA	3mA	88%	680uF
RDL10-110S24W	40-160VDC	24VDC	420mA	3mA	88%	300uF
RDL10-110D05W	40-160VDC	±5VDC	±1000mA	3mA	85%	±1100uF
RDL10-110D12W	40-160VDC	±12VDC	±420mA	3mA	88%	±560uF
RDL10-110D15W	40-160VDC	±15VDC	±336mA	3mA	88%	±300uF

Input

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Input voltage	9	24	36	VDC	24Vin
	18	48	75		48Vin
	40	110	160		110Vin
Max start up voltage	9	18	40	VDC	24,48,110Vin
Shutdown voltage	6.2	7.2	8.2	VDC	24Vin
	12.5	14.5	16.4		48Vin
	31.8	33.8	35.6		110Vin
Start up time		50	75	ms	Constant resistive load, power up, remote on/off
Input surge voltage	50	100	200	VDC	1 second max. 24V 48V and 110V respectively
Remote on-off	0		0.8	VDC	On or open ref -Vin
	3		12	VDC	Off ref -Vin
	0.5		2.5	mA	Current draw for control
		2.5		mA	Standby input current

Output

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Set point tolerance			±1	%	
Load regulation	±0.5		±1	%	No load to full load. Single ±0.5. Dual ±1
Line regulation	±0.2		±0.5	%	Low line to high line at full load. Single ±0.2. Dual ±0.5
Cross regulation			±5	%	Dual. Asymmetrical load 25-100% FL
Temperature coefficient			±0.02	%/°C	
Noise and Ripple		75		mVp-p	All models measured with 0.1uF/50V X7R MLCC. 20 MHz bandwidth. 3.3-5V 50 mVp-p. 12,15 & 24 75 mVp-p
Transient response		250		uS	25% step load

Protections

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Overload		160		%	Automatic recovery
Short circuit					Continuous. Automatic recovery

Safety

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Safety standards	UL/IEC/EN 62368-1, EN50155, EN45545-2				Pending approval
Isolation	3000			VDC	110V units
	2250			VDC	24 and 48V units
	1500			VDC	Input to chassis
Isolation resistance	1			GΩ	At 500VDC
Isolation capacitance			600	pF	

EMC: Emissions

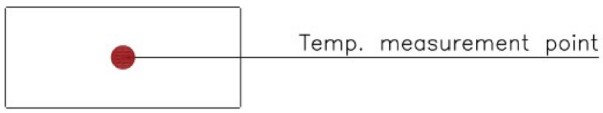
	Standard	Test level	Criteria	Notes/Conditions
Conducted / radiated	EN55032 /EN50121-3-2	A / B		With external components

EMC: Immunity

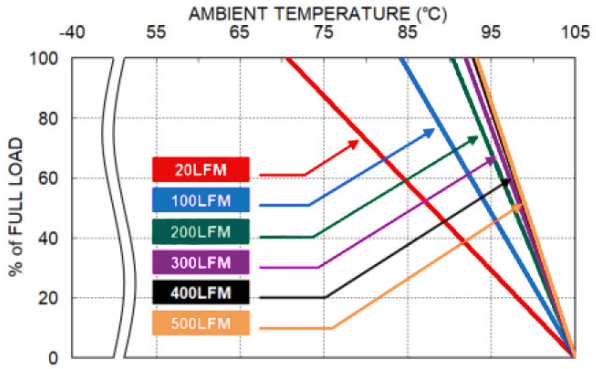
	Standard	Test level	Criteria	Notes/Conditions
ESD	EN61000-4-2	3	A	Contact: ±6kV, Air: ±8kV
Radiated	EN61000-4-3	3	A	20V/m, 80MHz-2700MHz, 1KHz 80% AM modulation
EFT & Surge	EN61000-4-4/5	3	A	±2kV 24V units require Nippon chemi-con KZN 820uF/50V and TVS SMDJ70A 70V 3KW 48V units require Nippon chemi-con KZN 330uF/100V and TVS SMDJ120A 120V 3KW 110V units require Nippon chemi-con ZXJ 330uF/200V and TVS SMDJ200A 200V 3KW
Conducted	EN61000-4-6	3	A	10Vrms
PFMF	EN61000-4-8	5	A	100A/m / 1000A/m 1sec

Environmental

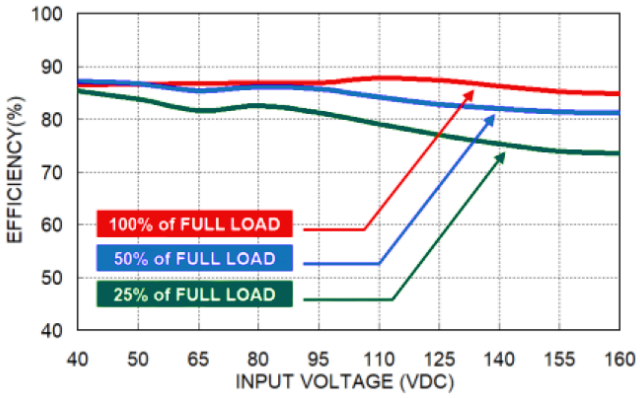
Parameter	Min	Typical	Max	Unit	Notes/Conditions
Operating temperature	-40		105	°C	See derating curve. Assumes 20LFM not still air.
Storage temperature	-55		125	°C	
Max case temperature			105	°C	
Thermal impedance		25		°C/W	Shock and vibration as per MIL-STD-810F
MTBF	2.021			MHrs	As per MIL-HDBK-217F, full load
Humidity	5		95	% RH	



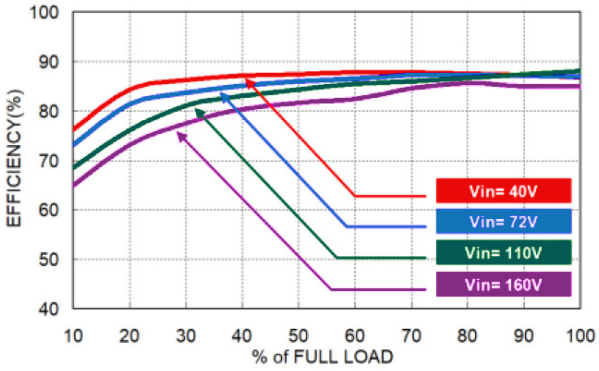
RDL10-110S 12W Derating Curve
with Recommended PCB Layout



RDL10-110S 12W Efficiency
vs. Input Voltage



RDL10-110S 12W Efficiency
vs. Output Load



16th September 2024