

## 0.5A



The RBT05W series of non-isolated switching regulators provide an output current up to 0.5A, operating from a wide DC input range.

Featuring a compact SIP3 design, the RBT05W series offers output voltages from 1.8VDC to 15VDC, high efficiency, industrial safety approvals and a wide operating temperature range, ideal for industrial, instrumentation and technology applications.



### Features

- ▶ Non isolated switching regulator
- ▶ Output current up to 0.5A
- ▶ Regulated single outputs from 1.8V to 15VDC
- ▶ Wide 4.75V to 36VDC input range
- ▶ Compact SIP3 package
- ▶ Pin compatible with 78 series regulators
- ▶ High efficiency, up to 96%
- ▶ EN62368-1 safety approval
- ▶ Continuous short circuit protection
- ▶ -40°C to +85°C operating temperature
- ▶ 3 year warranty

### Applications



Industrial



Instrumentation



Robotics



Technology

### Dimensions

11.6 x 7.6 x 10.2mm (0.46" x 0.30" x 0.40")

### More resources

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→ [xppower.com](https://www.xppower.com)



### Models & ratings

Model number	Input voltage	Output voltage	Output current	Ripple & Noise <sup>(1)</sup>	Efficiency <sup>(2)</sup>		Maximum capacitive load
					Min Vin	Max Vin	
RBT05W24S1V8	4.75-36VDC	1.8VDC	500mA	50mVp-p	90.0%	73.0%	470μF
RBT05W24S3V3	4.75-36VDC	3.3VDC	500mA	50mVp-p	94.5%	82.5%	470μF
RBT05W24S05	6.5-36VDC	5.0VDC	500mA	50mVp-p	95.5%	86.0%	470μF
RBT05W24S6V5	8-36VDC	6.5VDC	500mA	60mVp-p	96.5%	87.5%	470μF
RBT05W24S09	11-36VDC	9.0VDC	500mA	70mVp-p	96.5%	90.0%	470μF
RBT05W24S12	15-36VDC	12.0VDC	500mA	70mVp-p	96.5%	91.0%	330μF
RBT05W24S15	18-36VDC	15.0VDC	500mA	70mVp-p	96.5%	93.5%	270μF

#### Notes:

1. At minimum input voltage, loading is only 75mA, ripple & noise will be 150mVp-p max.

2. Typical value at full load

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage range	4.75	24.0	36.0	VDC	See models & ratings table
Input filter	Internal capacitors				
No load input current		2		mA	

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	1.8		15	VDC	See models & ratings table
Initial set accuracy	-3		+3	%	Full load
Minimum load	1			%	
Line regulation		±0.2	±0.4	%	Minimum to maximum input voltage at full load
Load regulation		±0.8/±0.4	±1/±0.6	%	1.8VDC / others output from 10% to full load.
Ripple & noise			70	mV pk-pk	Measured with 20MHz bandwidth, see models & ratings table
Transient response			±2	%	For 25% load change, recovery in 100µs
Short circuit protection	Continuous, with autorecovery				
Maximum capacitive load	See models & ratings table				
Temperature coefficient		±0.02		%/ °C	Full load

## General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency					See models & ratings table
Isolation: input to output					Non isolated
Switching frequency		410		kHz	Full load
Mean time between failure	7	14		MHrs	MIL-HDBK-217F, +25°C GB
Weight		1.85 (0.004)		g (lb)	
Case material	Black plastic, flame retardant UL94V-0				
Pin material	Phosphor bronze				
Solder profile	IPC/JEDEC J-STD-020D.1				
Water wash	Non-soaking water wash with de-ionised water. Dry thoroughly.				
Potting material	Epoxy UL94V-0 rated				

## Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-40		+85	°C	See derating curve
Storage temperature	-55		+125	°C	
Maximum case temperature			+110	°C	
Humidity			95	%RH	Non-condensing
Cooling	Natural convection				

## Safety approvals

Safety Agency	Standard	Notes & Conditions
TUV	EN62368-1	
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

## EMC: emissions

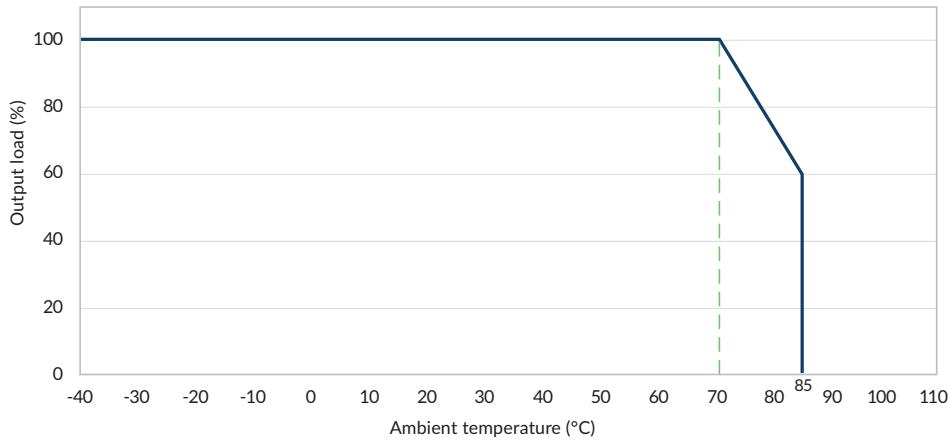
Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55032	Class A/B	See application notes
Radiated	EN55032	Class A/B	See application notes

## EMC: immunity

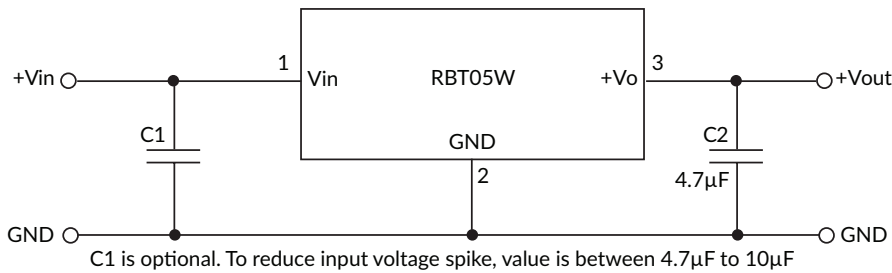
Phenomenon	Standard	Test level	Criteria	Notes & conditions
ESD immunity	EN61000-4-2	3	A	±6kV contact, ±8kV air discharge
Radiated	EN61000-4-3	3V/m	A	
EFT/burst	EN61000-4-4	3	A	±2kV (line to line) External components required, see application notes
Surges	EN61000-4-5	3	A	±2kV (line to line) External components required, see application notes
Conducted	EN61000-4-6	3V	A	
Magnetic field	EN61000-4-8	1A/m	A	

Application notes

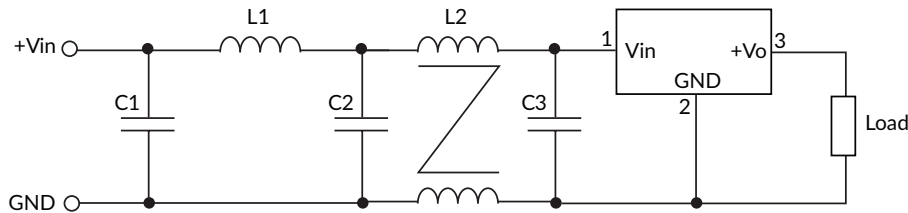
Derating curve (nominal input voltage)



Typical application

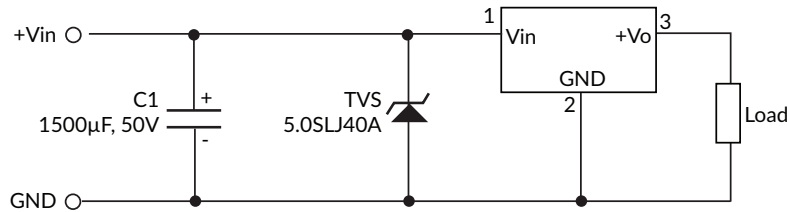


EMI (Class A/B) compliance circuit

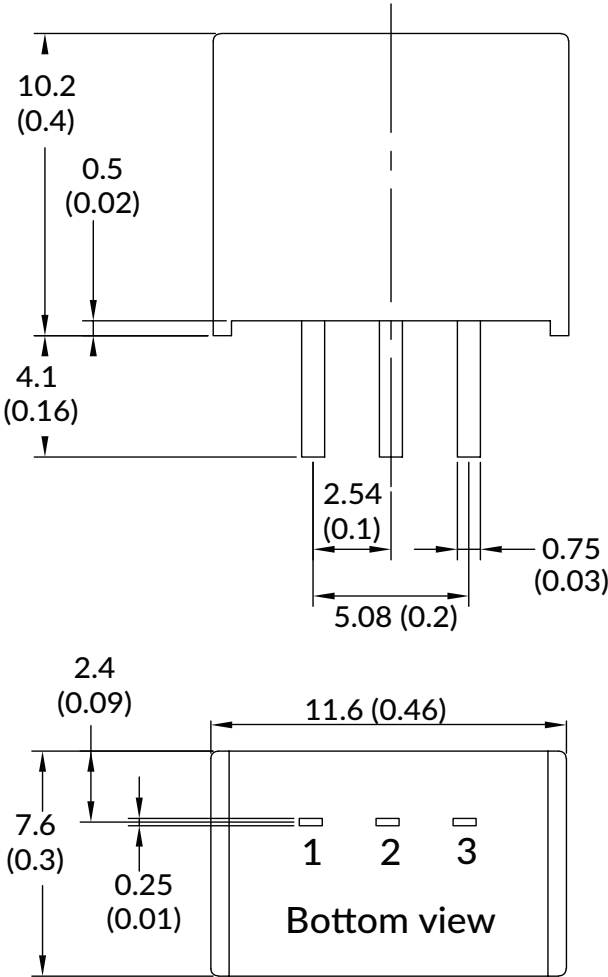


EMI	L1	L2	C1	C2	C3
Class A	10µH	-	4.7µF/50V	4.7µF/50V	-
Class B	22µH	200µH	10µF/50V	10µF/50V	10µF/50V

EFT & surge external components



Mechanical details



Pin connections	
Pin	Function
1	+vin
2	GND
3	+Vout

- Notes:**
- 1. All dimensions are in mm (inches)
  - 2. Weight: 1.85g (0.004lbs ) typical
  - 3. Pin diameter: 0.05 ±0.1 (0.02 ±0.004)  
Pin diameter tolerance: ±0.1 (±0.004)
  - 4. Pin pitch tolerance: ±0.25 (±0.01)
  - 5. Case tolerance: ±0.5 (±0.02)