RBT20W series

2.0A

DC-DC converters

The RBT20W series of non-isolated switching regulators provide an output current up to 2A, operating from a wide DC input range.

Featuring a compact SIP3 design, the RBT20W 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 2A
- 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

17.5 x 8.5 x 11.5mm (0.69” x 0.33” x 0.45”)

More resources

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Models & ratings

Model number	Input voltage	Output voltage	Output current	Ripple & Noise[1]	Efficiency[2]		Maximum capacitive load
					Min Vin	Max Vin	
RBT20W24S1V8	4.75-36VDC	1.8VDC	2000mA	50mVp-p	91.0%	78.0%	3300µF
RBT20W24S2V5	4.75-36VDC	2.5VDC	2000mA	50mVp-p	91.0%	82.5%	2300µF
RBT20W24S3V3	4.75-36VDC	3.3VDC	2000mA	50mVp-p	93.0%	86.0%	1800µF
RBT20W24S05	6.5-36VDC	5.0VDC	2000mA	75mVp-p	94.0%	89.0%	820µF
RBT20W24S09	11-36VDC	9.0VDC	2000mA	75mVp-p	95.0%	92.0%	620µF
RBT20W24S12	15-36VDC	12.0VDC	2000mA	75mVp-p	96.0%	93.5%	470µF
RBT20W24S15	18-36VDC	15.0VDC	2000mA	75mVp-p	96.0%	94.5%	470µF

Notes:

1. Measured with a 0.1µF MLCC across output (low ESR).
2. Typical value at full load

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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		±2		%	Full load
Minimum load					No minimum load required,
Line regulation		±0.5	±1	%	LL to HL at full load, minimum to maximum input voltage at full load
Load regulation		±1		%	0% to full load
Ripple & noise			75	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

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General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency					See models & ratings table
Isolation: input to output					Non isolated
Switching frequency		460		kHz	Full load
Mean time between failure	1500	4000		kHrs	MIL-HDBK-217F, +25°C GB
Weight		4.0 (0.009)		g (lb)	
Case material	Black plastic, flame retardant UL94V-0				
Pin material	Phospher 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
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

EMC: emissions

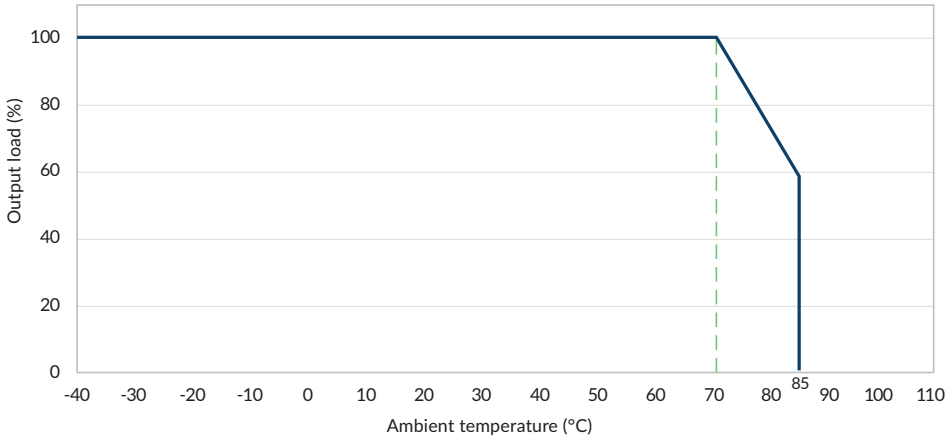
Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55032	Class A/B	See application notes
Radiated	EN55032	Class A/B	See application notes

EMC: immunity

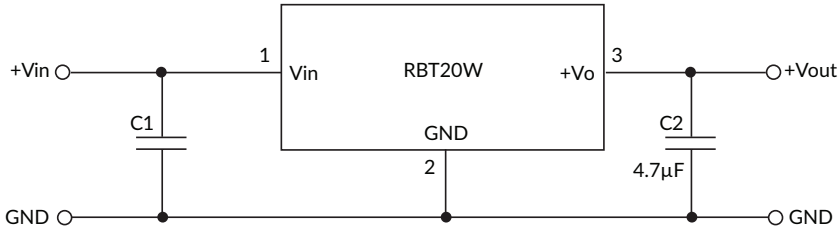
Phenomenon	Standard	Test level	Criteria	Notes & conditions
ESD immunity	EN61000-4-2	3	A	±6kV contact, ±8kV air discharge
Radiated	EN61000-4-3	10V/m	A	
EFT/burst	EN61000-4-4	3	A	±2kV (line to line) External components required, see application notes
Surges	EN61000-4-5	3	A	±2kV (line to line) External components required, see application notes
Conducted	EN61000-4-6	10V	A	
Magnetic field	EN61000-4-8	10A/m	A	

Application notes

Derating curve (nominal input voltage)

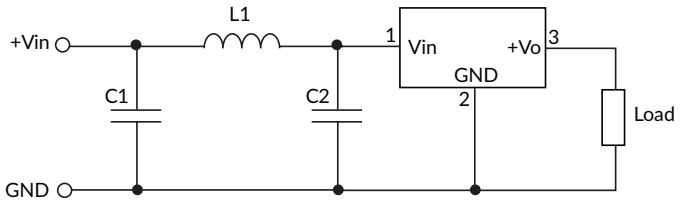


Typical application



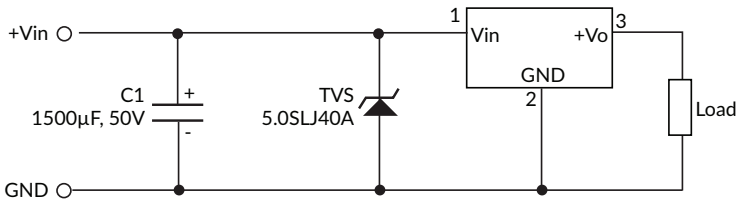
C1 is optional. To reduce input voltage spike, value is between 4.7µF to 10µF

EMI (Class A/B) compliance circuit

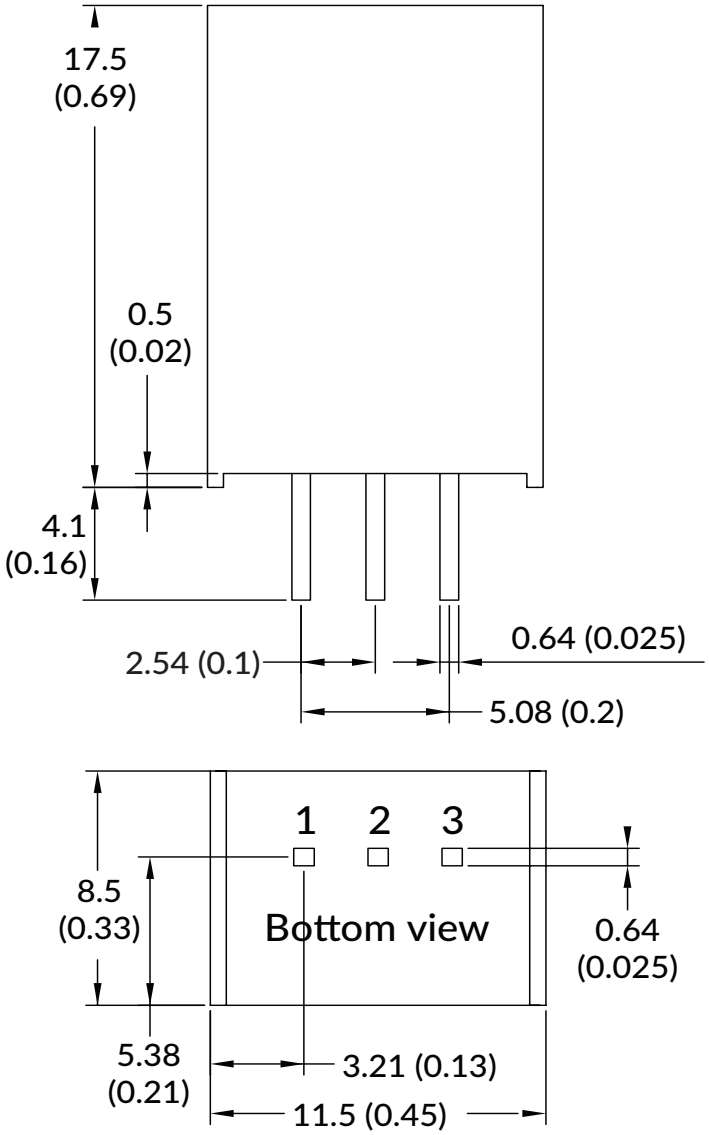


EMI	L1	C1	C2
Class A	3.3µH	4.7µF/50V	1µF/50V
Class B	10µH	47µF/50V	1µF/50V

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: 4.0g (0.009lbs) typical
3. Pin diameter tolerance: ±0.1 (±0.004)
4. Pin pitch tolerance: ±0.25 (±0.01)
5. Case tolerance: ±0.5 (±0.02)