

30 Watt

2.0x1.0 Inch Package B1 4:1 Input Range



- o Efficiency up to 91%
- o 1600 VDC Isolation
- o 4:1 Wide Input Range
- o Adjustable Output Voltage
- o Remote ON/OFF-Control
- o Continuous Short Circuit Protection
- o Over Current Protection
- o Over Voltage Protection
- o Over Temperature Protection
- o Soft Start

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT AUXILIARY	OUTPUT CURRENT		INPUT CURRENT		% EFF.	CAPACITOR LOAD (µF)			
				NO LOAD	FULL LAOD	NO LOAD	FULL LOAD					
30B1RS24X3.3M	9-36 VDC	3.3 VDC	- mA	0	7500 mA	60 mA	1185 mA	89	20000			
30B1RS24X5M		5 VDC			6000 mA	100 mA	1420 mA	91	14000			
30B1RS24X5.1M		5.1 VDC				90 mA	1448 mA					
30B1RS24X12M		12 VDC			2500 mA	30 mA	1436 mA	90	2000			
30B1RS24X15M		15 VDC					2000 mA			1420 mA	91	
30B1RD24X5M		±5 VDC			±3000 mA	120 mA	1437 mA	90	±3000			
30B1RD24X12M		±12 VDC			±1250 mA	30 mA	1453 mA	89	±1300			
30B1RD24X15M		±15 VDC			±1000 mA	40 mA	1437 mA					
30B1RT24X3.3/12M		3.3 VDC			±12 VDC	500/±42 mA	5000/±420 mA			80 mA	1287 mA	15000/±220
30B1RT24X3.3/15M		3.3 VDC			±15 VDC	500/±33 mA	5000/±330 mA	90 mA	1279 mA			
30B1RT24X5/12M		5 VDC			±12 VDC	400/±42 mA	4000/±420 mA	100 mA	1440 mA	8000/±220		
30B1RT24X5/15M		5 VDC			±15 VDC	400/±33 mA	4000/±330 mA	110 mA	1431 mA	90		
30B1RS48X3.3M		18-75 VDC			3.3 VDC	- mA	0	7500 mA	50 mA	593 mA	89	20000
30B1RS48X5M					5 VDC			6000 mA	60 mA	702 mA	91	14000
30B1RS48X5.1M	5.1 VDC		724 mA									
30B1RS48X12M	12 VDC		2500 mA	30 mA	718 mA			90	2000			
30B1RS48X15M	15 VDC				2000 mA					710 mA		
30B1RD48X5M	±5 VDC		±3000 mA	70 mA	710 mA			91	±3000			
30B1RD48X12M	±12 VDC		±1250 mA	30 mA	718 mA			90	±1300			
30B1RD48X15M	±15 VDC		±1000 mA	40 mA	718 mA							
30B1RT48X3.3/12M	3.3 VDC		±12 VDC	500/±42 mA	5000/±420 mA			50 mA	636 mA	89	15000/±220	
30B1RT48X3.3/15M	3.3 VDC		±15 VDC	500/±33 mA	5000/±330 mA				640 mA			
30B1RT48X5/12M	5 VDC		±12 VDC	400/±42 mA	4000/±420 mA			60 mA	712 mA	91	8000/±220	
30B1RT48X5/15M	5 VDC		±15 VDC	400/±33 mA	4000/±330 mA				707 mA	90		

SPECIFICATIONS

All Specifications Typical At Nominal Line, Full Load, and 25°C Unless Otherwise Noted

INPUT SPECIFICATIONS		
Input Voltage Range		4:1
Under Voltage Lockout	Module ON/OFF 24 V Module ON/OFF 48 V	8.6 VDC/7.9 VDC 17.8 VDC/16 VDC
Start up Time (Nominal Vin and constant resistive load)		30 mS
Input Filter		Pi Type
Maximum Input Current (No-Load)		see table
Input Current (Full-Load)		see table
Input Reflected Ripple Current ¹⁾		20 mA p-p
Remote ON/OFF (CTRL) ²⁾	ON: 3 - 12 VDC or open Circuit OFF: 0 - 1.2 VDC or Short Circuit Pin2 and Pin3 OFF idle Current: 5 mA	

OUTPUT SPECIFICATIONS		
Voltage Accuracy	Single & Dual Triple	±1% ±1%/±5% (main/auxiliary)
Voltage Adjustability	(Single Output Only)	±10% max.
Maximum Output Current		see table
Cross Regulation ³⁾	Dual/Triple	±5%
Over Voltage Protection (Zener Diode Clamp)	3.3 VDC	3.9 V
	5 VDC	6.2 V
	5.1 VDC	6.2 V
	12 VDC	15 V
	15 VDC	18 V
	±5 VDC	±6.2 V
	±12 VDC ±15 VDC	±15 V ±18 V
Over Load Protection		150% of FL.
Ripple and Noise ⁴⁾	Single & Dual Triple	100 mV p-p max. 50/75 mV p-p max. (main/auxiliary)
Temperature Coefficient		±0.02%/°C
Capacitive Load ⁵⁾		see table
Transient Recovery Time ⁶⁾		250 µs
Transient Response Deviation ⁶⁾		±3% max.
Short Circuit Protection		Indefinite (hiccup) (Automatic Recovery)
Line Regulation	Single & Dual Triple	±0.5% max. ±1%/±5% max. (main/auxiliary)
Load Regulation	Single (Io=0% to 100%)	±0.5% max.
	Dual (Io=0% to 100%)	±1.0% max. (balanced Load)
	Triple (Io=10% to 100%)	±1%/±5% max. (main/auxiliary)

NOTE:

1. Measured Input reflected ripple current with a simulated source inductance of 12 µH.
2. The Remote ON/OFF Control Pin is referenced to -Vin (Pin2).
3. Dual: One Load is 25% to 100% Load, the other Load is 100% Load, the output Voltage variable rate is within ±5%.
Triple: Main Output 100% Load, auxiliary 100%, other auxiliary 25% to 100%. Auxiliary outputs (+Aux and -Aux): main Output 100% Load, auxiliary 100%, other auxiliary 25% to 100% or main Output 25%, auxiliary 25%, other auxiliary 25% to 100%.
4. Measured with 20 MHz bandwidth and 1.0 µF ceramic Capacitor.
5. Tested by minimal Vin and constant resistive load.
6. Tested by normal Vin and 25% Load step change (75%-50%-25% of Io).

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GENERAL SPECIFICATION		
Efficiency		see table
Isolation Voltage (3 sec)	Input / Output Case/Input & Output	1600 VDC 1600 VDC
Isolation Resistance		1000 MOhms min.
Isolation Capacitance		1500 pF
Switching Frequency		330 kHz
Operating Ambient Temperature		-40°C to +75°C (see Derating Curve) -40°C to +50°C (for 100% Load)
Case Temperature		+105°C max.
Storage Temperature Range		-40°C to +125°C
Over Temperature Protection (Case)		+115°C
Cooling		Nature Convection
Humidity		95% rel H
Safety Standard (designed to meet)		IEC/EN 60950-1
EMC Characteristics	Radiated Emissions	EN55022 Class A
	Conducted Emissions ⁷⁾	EN55022 Class A
	ESD	EN61000-4-2 Perf. Criteria A
	RS	EN61000-4-3 Perf. Criteria A
	EFT ⁸⁾	EN61000-4-4 Perf. Criteria A
	Surge ⁸⁾	EN61000-4-5 Perf. Criteria A
	CS	EN61000-4-6 Perf. Criteria A
	PFMF	EN61000-4-8 Perf. Criteria A
Reliability Calculated MTBF (MIL-HDBK-217F)	Single & Dual Triple	>435 khrs >320 khrs
Dimensions		50.8 x 25.4 x 10.16 mm (2.00 x 1.00 x 0.4 Inches)
Case Material		Nickel-coated Copper
Base Material		Non-conductive Black Plastic (UL94V-0 rated)
Pin Material		Ø1.0 mm Brass Solder-coated
Potting Material		Epoxy (UL94V-0 rated)
Weight		31 g

NOTE:

7. The 30B1RS/D/T-Series can meet EN55022 Class A with an external filter in parallel with the input pins.

8. An external filter capacitor is required if the module has to meet EN61000-4-4 and EN61000-4-5.

The filter capacitor M+R suggest: Nippon chemi-con KY series, 220µF/100V.

ABSOLUTE SPECIFICATIONS

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Voltage (100 mS)	24 V 48 V	-0.7 VDC to 50 VDC -0.7 VDC to 100 VDC
Soldering Temperature (1.5 mm from case 10 sec. max.)		+260°C max.

NOTE:

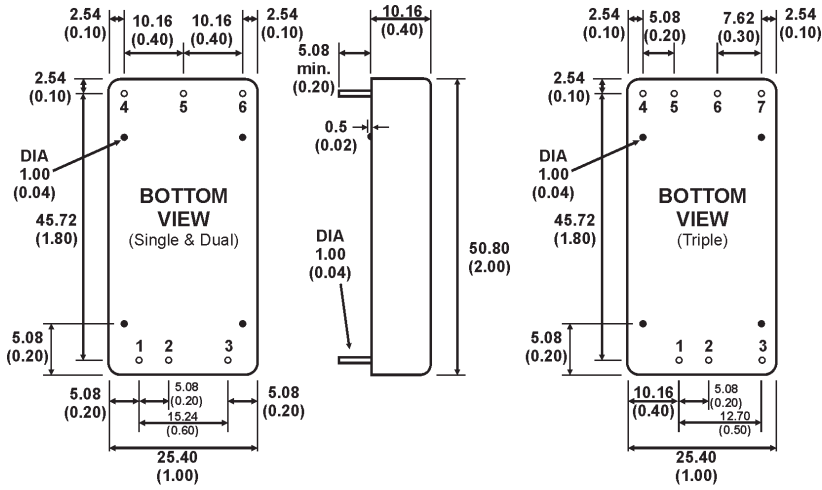
Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.

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MECHANICAL SPECIFICATIONS

Case „B1“



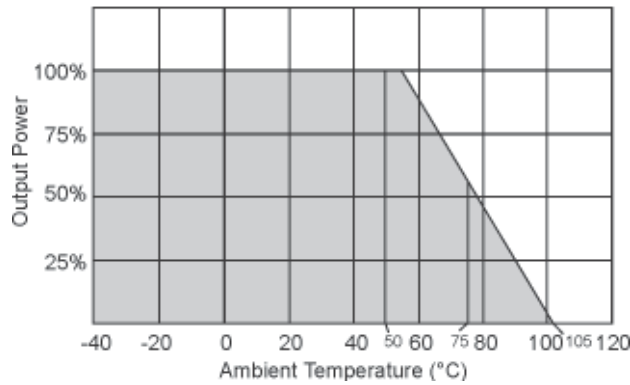
- All Dimensions in mm (Inches)
 Tolerance:
 1. Pin Diameter: 1.0 ±0.05 (0.04 ±0.002)
 2. Pin Pitch Tolerance: ±0.35 (±0.014)
 3. Case Tolerance: ±0.5 (±0.02)
 4. Stand-off Tolerance: ±0.1 (±0.004)

PIN CONNECTIONS			
PIN	SINGLE	Dual	Triple
1	+INPUT	+INPUT	+INPUT
2	-INPUT	-INPUT	-INPUT
3	REMOTE CTRL.	REMOTE CTRL.	REMOTE CTRL.
4	+OUTPUT	+OUTPUT	+AUX
5	-OUTPUT	COMMON	-AUX
6	TRIM	-OUTPUT	COMMON
7	NO PIN	NO PIN	+OUTPUT

External Output Trimming
 Output can be externally trimmed by using the method as below.
 (Single output models only)

DIAGRAMS

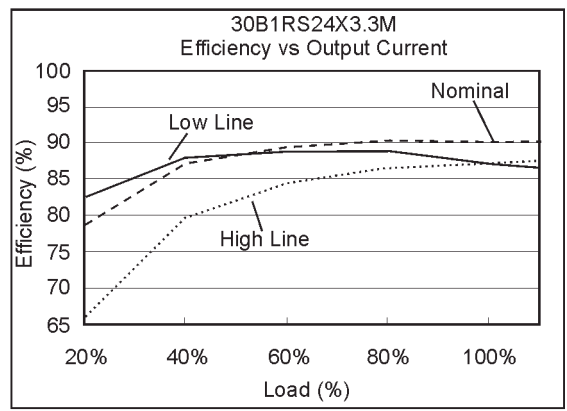
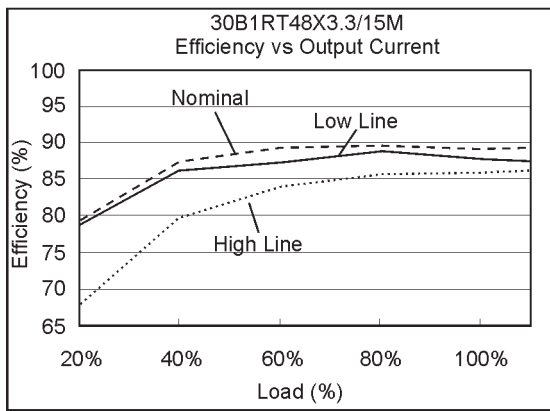
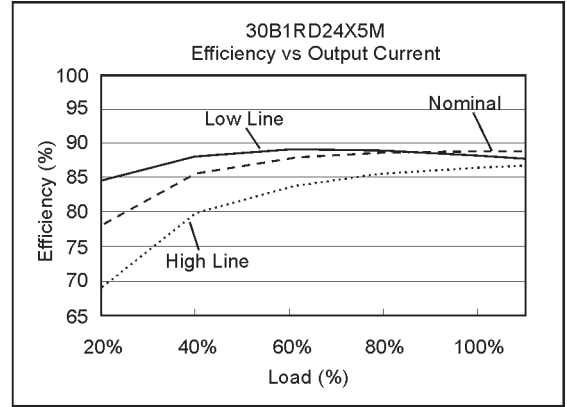
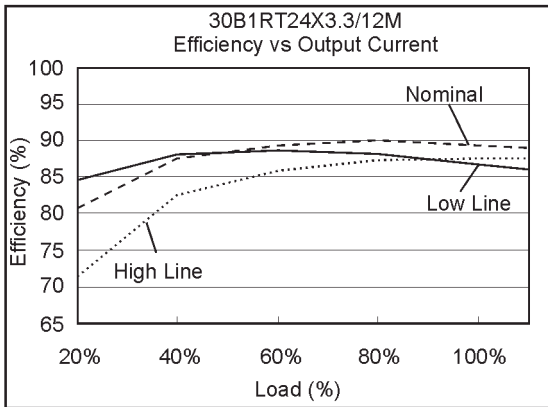
Derating Curve



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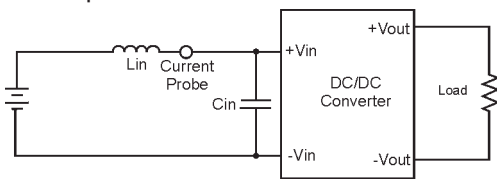
ELECTRICAL CHARACTERISTIC CURVES



SINGLE & DUAL SERIES - TEST CONFIGURATIONS

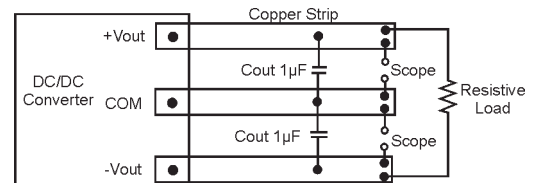
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor L_{in} (4.7 μ H) and a source capacitor C_{in} (33 μ F, ESR<1.0 Ω at 100 kHz) at nominal input and full load.



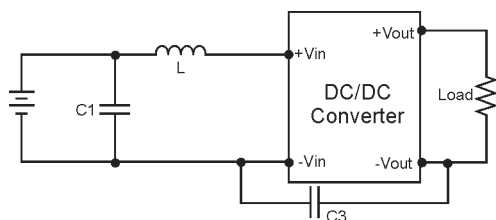
Output Ripple & Noise Measurement Test

Use a capacitor C_{out} (1.0 μ F) measurement. The Scope measurement bandwidth is 0-20 MHz.



EMI Filter

Input filter components ($C1$, $C3$, L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



EMI FILTER			
	C1	L	C3
30B1RS/D24X...	100 μ F, 100V	12 μ H	1206, 470 pF, 2 kV
30B1RS/D48X...	100 μ F, 100V	12 μ H	1206, 470 pF, 2 kV

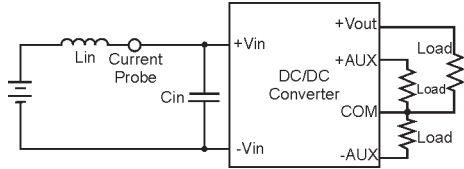
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TRIPLE SERIES - TEST CONFIGURATIONS

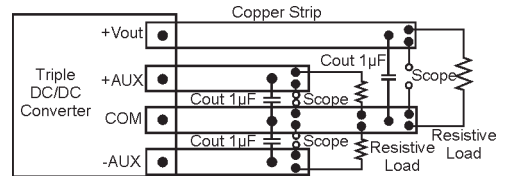
Input Reflected Ripple Current Test Setup

Input reflected ripple current is measured through a source inductor L_{in} (4.7 μ H) and a source capacitor C_{in} (33 μ F, ESR<1.0 Ω at 100 kHz) at nominal input and full load.



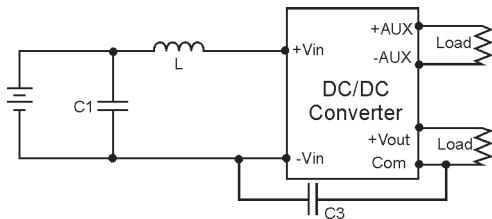
Output Ripple & Noise Measurement Test

Use a capacitor C_{out} (1.0 μ F) measurement. The Scope measurement bandwidth is 0-20 MHz.



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Input filter components ($C1$, $C3$, L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



EMI FILTER			
	C1	L	C3
30B1RT24X...	100 μ F, 100V	12 μ H	1206, 470 pF, 2 kV
30B1RT48X...	100 μ F, 100V	12 μ H	1206, 470 pF, 2 kV

NOTICE:
 The information in this document has been carefully checked. However, no responsibility is assumed for inaccuracies!
 Specifications can be changed without notice. The latest and most complete information can be found on our website.