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.	CAPACI-TOR LOAD (µF)
				NO LOAD	FULL LAOD	NO LOAD	FULL LOAD		
30B1RS24X3.3M	9-36 VDC	3.3 VDC	-	0 mA	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	-	0 mA	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			
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	

last up-date 23.09.2011

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 5 VDC 5.1 VDC 12 VDC 15 VDC ±5 VDC ±12 VDC ±15 VDC	3.9 V 6.2 V 6.2 V 15 V 18 V ±6.2 V ±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] Transient Response Deviation [6]		250 µs ±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%) Dual (Io=0% to 100%) Triple (Io=10% to 100%)	±0.5% max. ±1.0% max. (balanced Load) ±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).

SPECIFICATIONS

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

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 Conducted Emissions [7)] ESD RS EFT [8)] Surge [8)] CS PFMF	EN55022 Class A EN55022 Class A EN61000-4-2 Perf. Criteria A EN61000-4-3 Perf. Criteria A EN61000-4-4 Perf. Criteria A EN61000-4-5 Perf. Criteria A EN61000-4-6 Perf. Criteria A 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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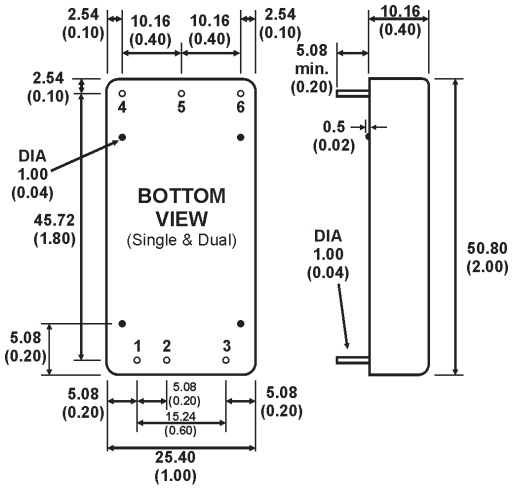
MECHANICAL SPECIFICATIONS

Case „B1“



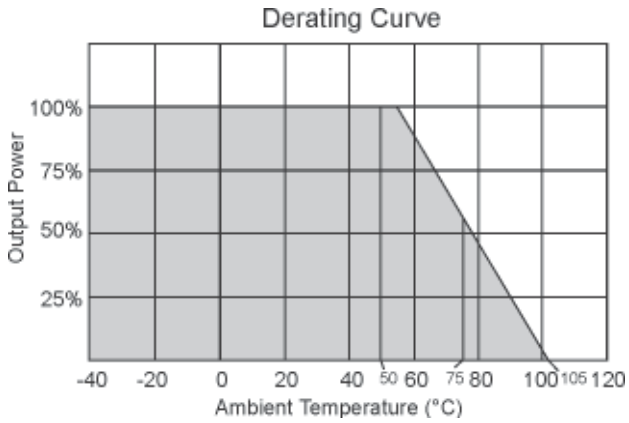
All Dimensions in mm (Inches)
Tolerance:
1. Pin Diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin Pitch Tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)
4. Stand-off Tolerance: ±0.1 (±0.004)

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



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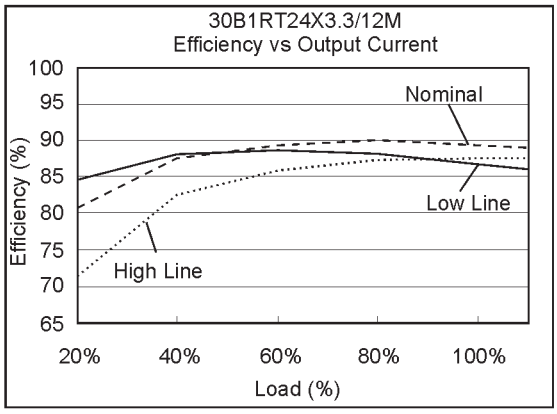
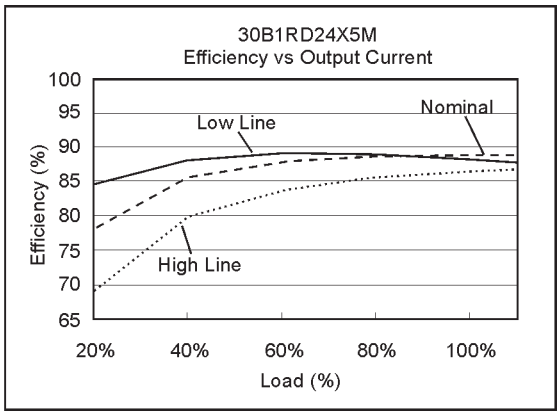
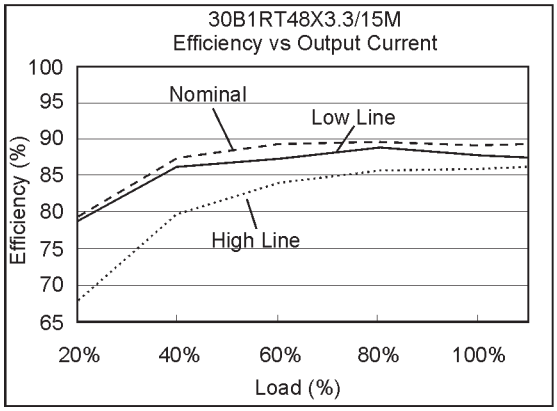
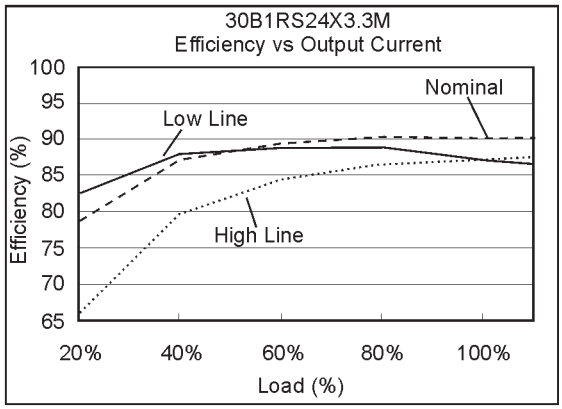
ELECTRICAL CHARACTERISTIC CURVES





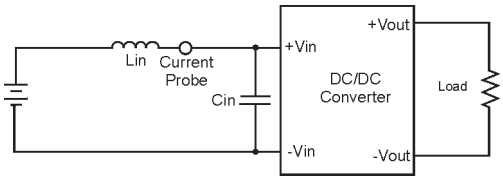




SINGLE & DUAL SERIES - TEST CONFIGURATIONS

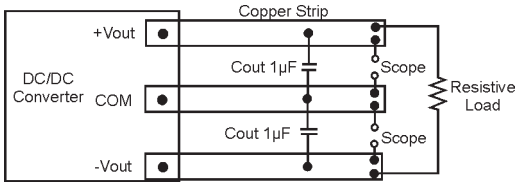
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor Lin (4.7 µH) and a source capacitor Cin (33 µF, ESR<1.0 Ω at 100 kHz) at nominal input and full load.



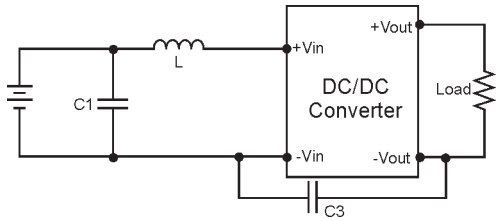
Output Ripple & Noise Measurement Test

Use a capacitor Cout (1.0 µF) measurement. The Scope measurement bandwidth is 0-20 MHz.



EMI Filter

Input filter components (C1, C3, L) are used to helpmeet 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 µF, 100V	12 µH	1206, 470 pF, 2 kV
30B1RS/D48X...	100 µF, 100V	12 µH	1206, 470 pF, 2 kV

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SPECIFICATIONS

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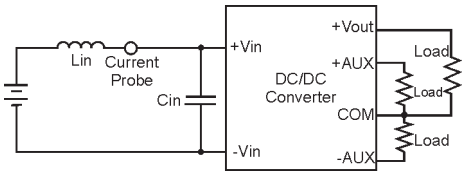
TRIPLE SERIES - TEST CONFIGURATIONS

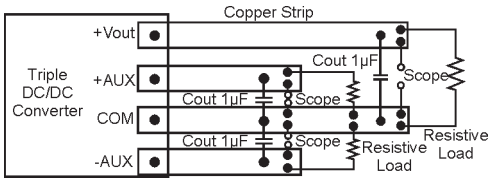
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor Lin (4.7 µH) and a source capacitor Cin (33 µF, ESR<1.0 Ω at 100 kHz) at nominal input and full load.



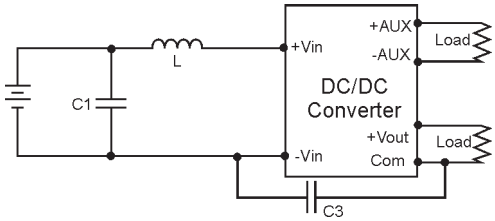
Output Ripple & Noise Measurement Test

Use a capacitor Cout (1.0 µF) measurement. The Scope measurement bandwidth is 0-20 MHz.



EMI Filter

Input filter components (C1, C3, L) are used to helpmeet 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 µF, 100V	12 µH	1206, 470 pF, 2 kV
30B1RT48X...	100 µF, 100V	12 µH	1206, 470 pF, 2 kV

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