15 Watt 1.00x1.00 Inch Package C 2:1 Input Range

- **Efficiency up to 89%**
- **Wide Input Range**
- **Soft Start**
- **No Minimum Load Required**
- **Adjustable Output Voltage**
- **Remote ON/OFF Control**
- **Over Current Protection**
- **Over Voltage Protection**

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT (FULL LOAD)	INPUT CURRENT		%EFF	CAPACITOR LOAD
				NO LOAD	FULL LOAD MAX.		
15CRS12W3.3M	9-18 VDC	3.3 VDC	4000 mA	20 mA	1310 mA	85	1000 µF
15CRS12W5M		5 VDC	3000 mA		1471 mA	86	
15CRS12W12M		12 VDC	1300 mA		1494 mA	88	330 µF
15CRS12W15M		15 VDC	1000 mA		1420 mA	89	220 µF
15CRD12W5M		±5 VDC	±1500 mA		1488 mA	85	±470 µF
15CRD12W12M		±12 VDC	±625 mA		1420 mA	89	±220 µF
15CRD12W15M		±15 VDC	±500 mA		1437 mA	89	±100 µF
15CRS24W3.3M	18-36 VDC	3.3 VDC	4000 mA	15 mA	647 mA	86	1000 µF
15CRS24W5M		5 VDC	3000 mA		727 mA	87	
15CRS24W12M		12 VDC	1300 mA		747 mA	88	330 µF
15CRS24W15M		15 VDC	1000 mA		710 mA	89	220 µF
15CRD24W5M		±5 VDC	±1500 mA		744 mA	85	±470 µF
15CRD24W12M		±12 VDC	±625 mA		718 mA	88	±220 µF
15CRD24W15M		±15 VDC	±500 mA		710 mA	89	±100 µF
15CRS48W3.3M	36-75 VDC	3.3 VDC	4000 mA	10 mA	327 mA	85	1000 µF
15CRS48W5M		5 VDC	3000 mA		368 mA	86	
15CRS48W12M		12 VDC	1300 mA		374 mA	88	330 µF
15CRS48W15M		15 VDC	1000 mA		359 mA	88	220 µF
15CRD48W5M		±5 VDC	±1500 mA		377 mA	84	±470 µF
15CRD48W12M		±12 VDC	±625 mA		363 mA	87	±220 µF
15CRD48W15M		±15 VDC	±500 mA		359 mA	88	±100 µF

last up-date 07.06.2013

SPECIFICATIONS

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

INPUT SPECIFICATIONS		
Input Voltage Range		2:1
Undervoltage Lockout	12 V Models Module ON/OFF 24 V Models Module ON/OFF 48 V Models Module ON/OFF	8.5/7 VDC 17/15 VDC 35/34 VDC
Start up Time (Nominal Vin and constant resistive Load)		20 mS
Positive Logic Remote ON/OFF [1]	ON OFF OFF idle current	3.0 - 12 VDC or open circuit 0-1.2 VDC or Short Circuit Pin2 and Pin3 5 mA
Input Reflected Ripple Current [2]		20 mA p-p
Input Filter		Pi Type

OUTPUT SPECIFICATIONS		
Voltage Accuracy		±1%
Output Voltage Adjustability (Trim)		Single output ±10% max.
Maximum Output Current		see table
Minimum Output Current		0 mA
Ripple and Noise at 20 MHz BW[3]		100 mV p-p max.
Temperature Coefficient		±0.02%/°C
Transient Recovery Time[4]		250 µS
Transient Response Deviation[4]		±3% max.
Capacitive Load[5]		see table
Short Circuit Protection		Indefinite (hiccup) (Automatic Recovery)
Line Regulation		±0.2% max.
Load Regulation (Io=0% to 100%)	Single Dual	±0.5% max. ±1% max. (balanced load)
Cross Regulation (Dual Output)[6]		±5%
Over Voltage Protection (Zener Diode Clamp)	3.3 V 5 V 12 V 15 V ±5 V ±12 V ±15 V	3.9 V 6.2 V 15 V 18 V ±6.2 V ±15 V ±18 V
Over Current Protection		150% of FL.

NOTE:
1. The remote on/off control pin is referenced to -Vin (pin2).
2. Measured Input reflected ripple current with a simulated source inductance of 12 µH and a source capacitor Cin (47 µF, ESR <1.0 Ohm at 100 kHz).
3. Measured with a 1.0 µF ceramic capacitor and 10 µF tantalum capacitor.
4. Tested by normal Vin and 25% load step change (75%-50%-25% of Io).
5. Tested by minimal Vin and constant resistive load.
6. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.

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GENERAL SPECIFICATION		
Efficiency		see table
I/O Isolation Voltage (3 sec)	Input / Output Input / Case Output / Case	1600 VDC 1600 VDC 1600 VDC
Isolation Resistance		1000 MOhms min.
Isolation Capacitance		1200 pF max.
Switching Frequency		375 kHz
Operating Ambient Temperature		-40°C to +85°C (see derating curve) -40°C to +66°C (for 100% Load)
Maximum Case Temperature		+105°C
Storage Temperature		-40°C to +125°C
Cooling		Nature Convection
Humidity		95% rel H
Reliability Calculated MTBF (MIL-HDBK-217F)		>560 khrs
Safety Standard (designed to meet)		IEC/EN 60950-1
Radiated Emissions		EN55022 Class A
Conducted Emissions[7)]		EN55022 Class A
ESD		EN61000-4-2 Perf. Criteria B
RS		EN61000-4-3 Perf. Criteria A
EFT[8)]		EN61000-4-4 Perf. Criteria B
Surge[8)]		EN61000-4-5 Perf. Criteria B
CS		EN61000-4-6 Perf. Criteria A
PFMF		EN61000-4-8 Perf. Criteria A
Dimensions		1.00 x 1.00 x 0.40 Inches (25.4 x 25.4 x 10.16 mm)
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		18.0 g

NOTE:
7. Input filter components (C1, C2, 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.
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 Multitronik suggest: Nippon chemi-con KY series, 220 µF/100V.

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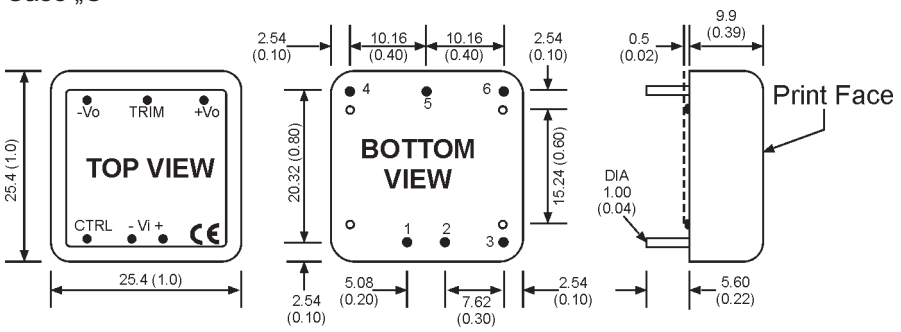
ABSOLUTE SPECIFICATIONS		
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.		
Input Surge Voltage (100 mS max.)	12 V 24 V 48 V	-0.7 to 36 VDC -0.7 to 50 VDC -0.7 to 100 VDC
Soldering Temperature (1.5 mm from case 10 sec. max.)		+260°C max.

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

MECHANICAL SPECIFICATIONS

Case „C“



All Dimensions are typical in mm (Inches)
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		
	Single	**Dual**
1	+INPUT	+INPUT
2	-INPUT	-INPUT
3	REMOTE CONTROL	REMOTE CONTROL
4	+OUTPUT	+OUTPUT
5	TRIM	COM
6	-OUTPUT	-OUTPUT

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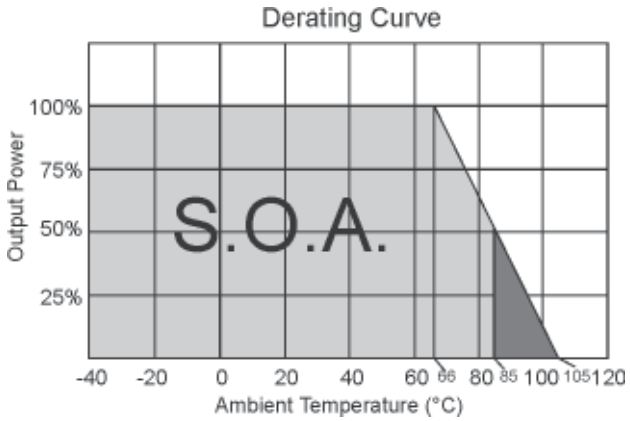
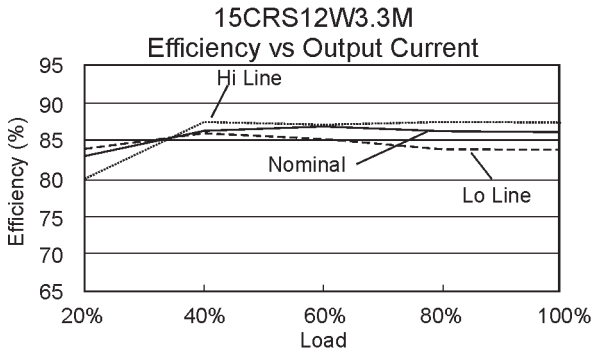
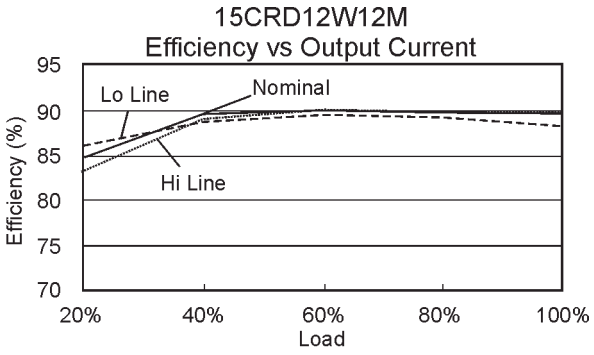
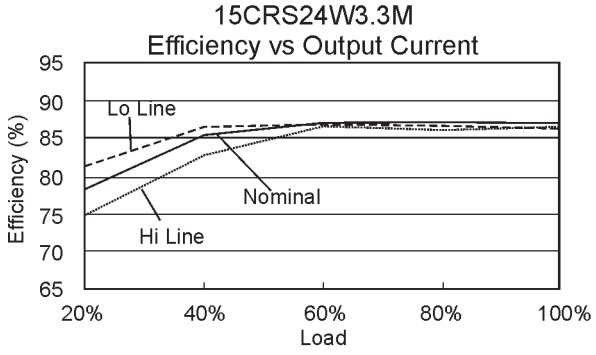
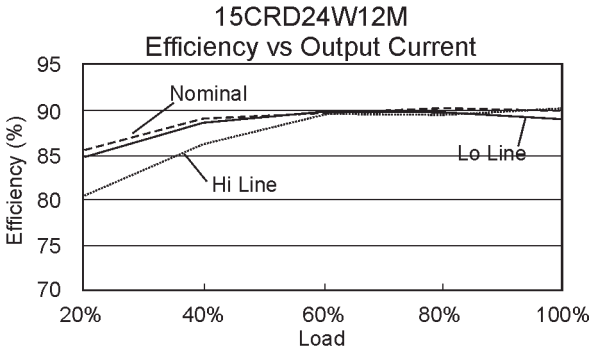
DIAGRAMS

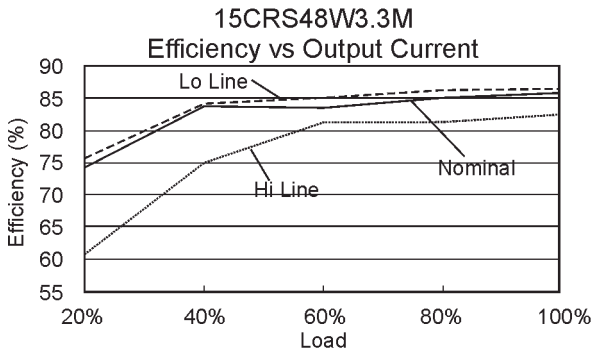


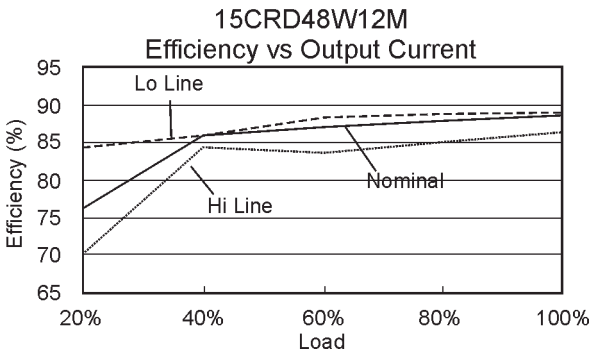












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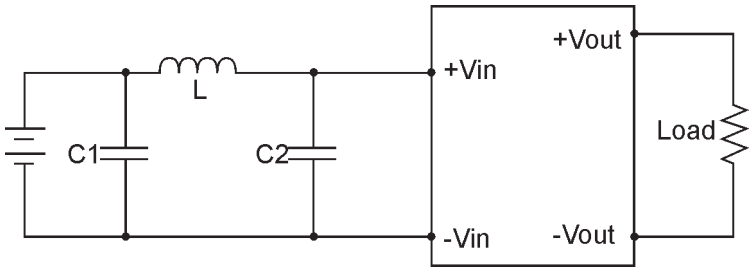
APPLICATION NOTES

EMI FILTER			
	C1	L	C2
15CRS/D12W...	1210, 2.2 µF/100V	12 µH	1210, 2.2 µF/100V
15CRS/D24W....	1210, 2.2 µF/100V	12 µH	1210, 2.2 µF/100V
15CRS/D48W...	1210, 2.2 µF/100V	12 µH	1210, 2.2 µF/100V



External Output Trimming

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

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.

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