

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

- o Efficiency up to 90%
- o Wide Input Range
- o Soft Start
- o No Minimum Load Required
- o Adjustable Output Voltage
- o Remote ON/OFF Control
- o Over Current Protection
- o Over Voltage Protection



MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT (FULL LOAD)	INPUT CURRENT		%EFF	CAPACITOR LOAD
				NO LOAD	FULL LOAD		
20CRS12W3.3M	9-18 VDC	3.3 VDC	4500 mA	60 mA	1439 mA	86	7000 µF
20CRS12W5M		5 VDC	4000 mA		1852 mA	90	5000 µF
20CRS12W12M		12 VDC	1670 mA	30 mA	1873 mA	89	850 µF
20CRS12W15M		15 VDC	1330 mA				700 µF
20CRD12W12M		±12 VDC	±833 mA				±470 µF
20CRD12W15M		±15 VDC	±667 mA				±330 µF
20CRS24W3.3M	18-36 VDC	3.3 VDC	4500 mA	35 mA	720 mA	86	7000 µF
20CRS24W5M		5 VDC	4000 mA	25 mA	936 mA	89	5000 µF
20CRS24W12M		12 VDC	1670 mA				850 µF
20CRS24W15M		15 VDC	1330 mA	700 µF			
20CRD24W12M		±12 VDC	±833 mA	±470 µF			
20CRD24W15M		±15 VDC	±667 mA	30 mA	±330 µF		
20CRS48W3.3M	36-75 VDC	3.3 VDC	4500 mA	25 mA	360 mA	86	7000 µF
20CRS48W5M		5 VDC	4000 mA	15 mA	468 mA	89	5000 µF
20CRS48W12M		12 VDC	1670 mA		850 µF		
20CRS48W15M		15 VDC	1330 mA	463 mA	90	700 µF	
20CRD48W12M		±12 VDC	±833 mA	20 mA	468 mA	89	±470 µF
20CRD48W15M		±15 VDC	±667 mA				±330 µF

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	8.6/7.9 VDC
	24 V Models	Module ON/OFF	17.8/15.5 VDC
	48 V Models	Module ON/OFF	33.5/30.5 VDC
Start up Time (Nominal Vin and constant resistive Load)			30 mS
Input Current (No-Load)			see table max.
Input Current (Full-Load)			see table
Input Reflected Ripple Current ¹⁾			30 mA p-p
Positive Logic Remote ON/OFF ²⁾		ON	3.0 - 12 VDC or open circuit
		OFF	0-1.2 VDC or Short Circuit Pin2 and Pin3
		OFF idle current	5 mA
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
Cross Regulation (Dual Output) ³⁾			±5%
Ripple and Noise at 20 MHz BW ⁴⁾		3.3, 5 V	75 mV p-p max.
		12, 15, ±12, ±15 V	100 mV p-p max.
Temperature Coefficient			±0.02%/°C
Capacitive Load ⁵⁾			see table
Transient Recovery Time ⁶⁾			250 µS
Short Circuit Protection			Indefinite (hiccup) (Automatic Recovery)
Line Regulation			±0.5% max.
Load Regulation (Io=0% to 100%)	Single		±0.5% max.
	Dual		±1% max. (balanced load)
Over Voltage Protection (Zener Diode Clamp)	3.3 V		3.9 V
	5 V		6.2 V
	12 V		15 V
	15 V		18 V
	±12 V		±15 V
	±15 V		±18 V
Over Current Protection			150% of FL.

NOTE:

1. 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).
2. The remote on/off control pin is referenced to -Vin (pin2).
3. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
4. Measured with a 1.0 µF ceramic capacitor and 10 µF tantalum 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
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		1500 pF max.
Switching Frequency		330 kHz
Operating Ambient Temperature		-40°C to +75°C (see derating curve) -40°C to +55°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		IEC55022 Class A
Conducted Emissions ⁷⁾		IEC55022 Class A
ESD		IEC61000-4-2 Perf. Criteria A
RS		IEC61000-4-3 Perf. Criteria A
EFT ⁸⁾		IEC61000-4-4 Perf. Criteria A
Surge ⁸⁾		IEC61000-4-5 Perf. Criteria A
CS		IEC61000-4-6 Perf. Criteria A
PFMF		IEC61000-4-8 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		19.0 g

NOTE:

7. Input filter meets EN55022 Class A without external components.

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.

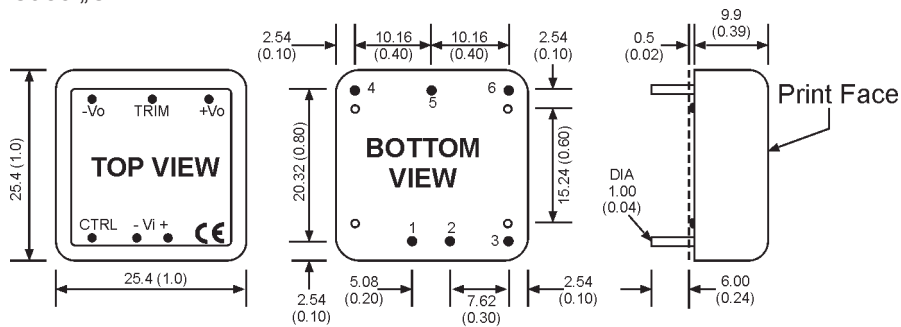
Input Voltage (100 mS)	12 V	-0.7 to 25 VDC
	24 V	-0.7 to 50 VDC
	48 V	-0.7 to 100 VDC
Soldering Temperature (1.5 mm from case 10 sec. max.)		+260°C max.

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)

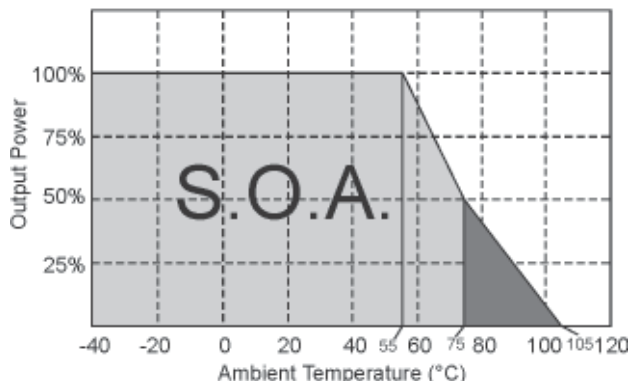
PIN CONNECTIONS		
	Single	Dual
1	+INPUT	+INPUT
2	-INPUT	-INPUT
3	REMOTE CONTROL	REMOTE CONTROL
4	+OUTPUT	+OUTPUT
5	TRIM	COM
6	-OUTPUT	-OUTPUT

SPECIFICATIONS

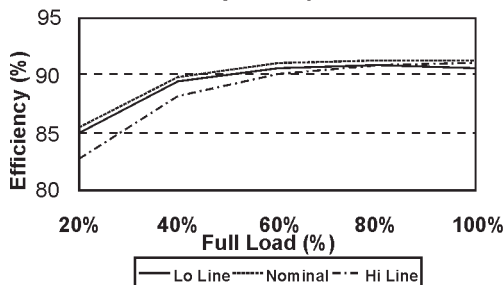
All Specifications Typical At Nominal Line, Full Load, and 25°C Unless Otherwise Noted

DIAGRAMS

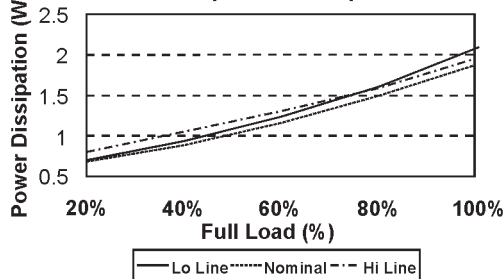
Derating Curve



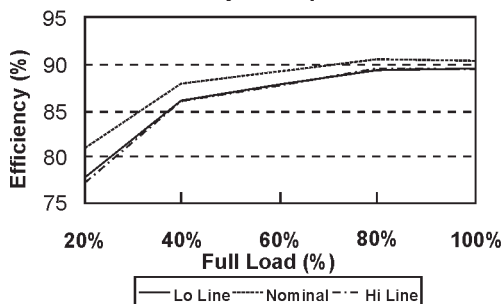
20CRS24W12M
Efficiency vs Output Current



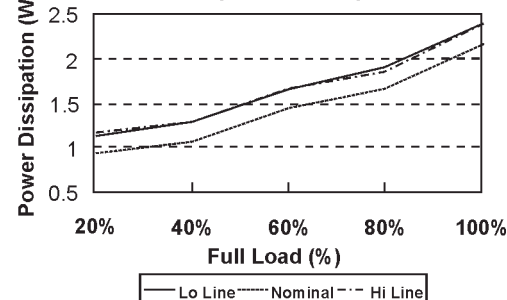
20CRS24W12M
Power Dissipation vs Output Current



20CRD48W12M
Efficiency vs Output Current

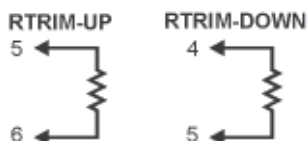


20CRD48W12M
Power Dissipation vs Output Current



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.