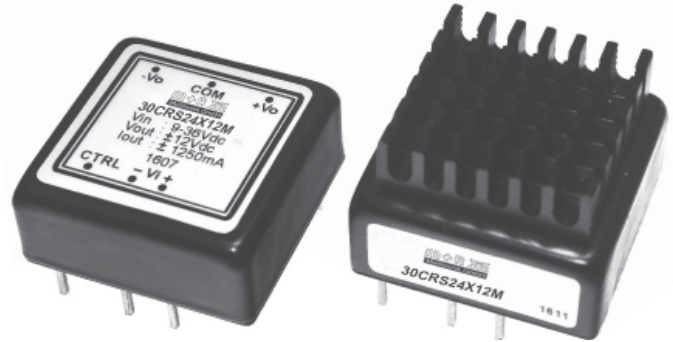


30 Watt

1.00x1.00 Inch Package C 4:1 Input Range



- o Efficiency up to 92%
- o Wide Input Range
- o Low Input Current at No Load
- o Regulated Outputs
- o Input under-voltage Protection
- o Remote ON/OFF Control
- o Over Current Protection
- o Continuous Short Circuit Protection
- o Over Temperature Protection



MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT MAX. @ FULL LOAD	INPUT CURRENT		%EFF	CAPACITOR LOAD MAX. ¹⁾
				NO LOAD	FULL LOAD		
30CRS24X3.3M	9-36 VDC	3.3 VDC	7000 mA	10 mA	1093.75 mA	88	10000 µF
30CRS24X5M		5 VDC	6000 mA		1404.49 mA	89	7200 µF
30CRS24X12M		12 VDC	2500 mA		1373.62 mA	91	1200 µF
30CRS24X15M		15 VDC	2000 mA		1404.49 mA	89	±750 µF
30CRD24X12M		±12 VDC	±1250 mA		1373.62 mA	91	±500 µF
30CRD24X15M		±15 VDC	±1000 mA				
30CRS48X3.3M	18-75 VDC	3.3 VDC	7000 mA	8 mA	540.73 mA	89	10000 µF
30CRS48X5M		5 VDC	6000 mA		694.44 mA	90	7200 µF
30CRS48X12M		12 VDC	2500 mA		679.34 mA	92	1000 µF
30CRS48X15M		15 VDC	2000 mA		694.44 mA	90	±750 µF
30CRD48X12M		±12 VDC	±1250 mA		686.81 mA	91	±500 µF
30CRD48X15M		±15 VDC	±1000 mA				

1. Tested by minimal Vin and constant resistive load.

SPECIFICATIONS

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

INPUT SPECIFICATIONS

Input Voltage Range		4:1
Undervoltage Lockout	24 Vin module ON	8.6 V
	24 Vin module OFF	7.6 V
	48 Vin module ON	17.5 V
	48 Vin module OFF	16.5 V
Start Up Time (nominal Vin and constant resistive load)		30 mS
Input Reflected Ripple Current ¹⁾		30 mA p-p
Positive Logic Remote ON/OFF Control ²⁾	Module ON	3.0 to 12 VDC or Open Circuit
	Module OFF	0 to 1.2 VDC or Short Circuit Pin2 and Pin3
	OFF idle current	2 mA
Input Filter		Pi Type

OUTPUT SPECIFICATIONS

Output Voltage Accuracy		±1%
Output Voltage Adjustability (trim)	Single	±10% max.
Transient Recovery Time ⁴⁾		250 µF
Transient Response Deviation ⁴⁾	Single Output 3.3 V	±3% max. ±5% max.
Ripple and Noise, 20MHz BW	with a 10 µF/25 V X7R MLCC	Single: 75 mV p-p max.
	with a 10 µF/25 V X7R MLCC for each output	Dual: 60 mV p-p max.
Temperature Coefficient		±0.02%/°C
Short Circuit Protection		Indefinite (hiccup) (Automatic Recovery)
Over Voltage Protection (Zener Diode Clamp)	3.3 VDC	3.9 V
	5 VDC	6.2 V
	12 VDC	15 V
	15 VDC	18 V
	±12 VDC	±15 V
	±15 VDC	±18 V
Over Current Protection		170% of FL
Cross Regulation ³⁾	Dual	±5%
Line Regulation		±0.5% max.
Load Regulation (Io= 0% to 100%) ¹⁾	Single	±0.5% max.
	Dual	±1% max. (balanced load)

1. Measured Input reflected ripple current with a simulated source inductance of 12 µH and a source capacitor Cin (47 µF, ESR <1.0 Ohms 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. Tested by normal Vin and 25% load step change (75%-50%-25% of Io).

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)	24 V	50 VDC max.
	48 V	100 VDC max.
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.

SPECIFICATIONS

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

GENERAL SPECIFICATION		
Efficiency		see table
I/O Isolation Voltage (60 sec)	Input / Output Input / Case Output / Case	1600 VDC 1600 VDC 1600 VDC
Isolation Resistance		1000 MOhms min.
Isolation Capacitance		2000 pF max.
Switching Frequency	3.3, 5 V Other	270 kHz 330 kHz
Operating Ambient Temperature		-40°C to +100°C (see Derating Curve) -40°C to +55°C (For 100% Load)
Maximum Case Temperature		+105°C
Thermal Impedance	Without Heat-sink With Heat-sink	13°C/W min. 12°C/W min.
Storage Temperature		-55°C to +125°C
Over Temperature Protection (Case)		+115°C
Cooling ⁵⁾		Natural Convection
Humidity		95% rel H
Reliability Calculated MTBF (MIL-HDBK-217F)		>370 khrs
Safety Standard (designed to meet)		IEC/EN 60950-1
Radiated Emissions		EN55032 Class A
Conducted Emissions ⁶⁾		EN55032 Class A
ESD		IEC61000-4-2 Perf. Criteria A
RS		IEC61000-4-3 Perf. Criteria A
EFT ⁷⁾		IEC61000-4-4 Perf. Criteria A
Surge ⁷⁾		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 10.4 mm)
Case Material		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 g

NOTE:

5. "Nature Convection" is usually about 30-65 LFM but is not equal to still air (0 LFM).

6. Input filter components are used to help meet conducted emissions, which application refer to the EMI Filter of design & feature configuration.

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

The 30CRS/D24X-M recommended an aluminum electrolytic capacitor (Nippon chemi-con KY series, 330 µF/100V) and a TVS (SMDJ58A, 58 V, 3000 Watt peak pulse power) to connect in parallel.

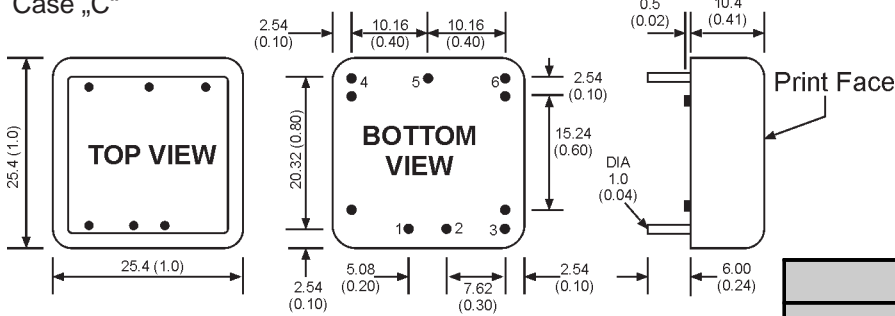
The 30CRS/D48X-M recommended an aluminum electrolytic capacitor (Nippon chemi-con KY series, 330 µF/100 V) and a TVS (SMDJ120A, 120 V, 3000 Watt peak pulse power) to connect in parallel.

SPECIFICATIONS

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

MECHANICAL SPECIFICATIONS

Case „C“



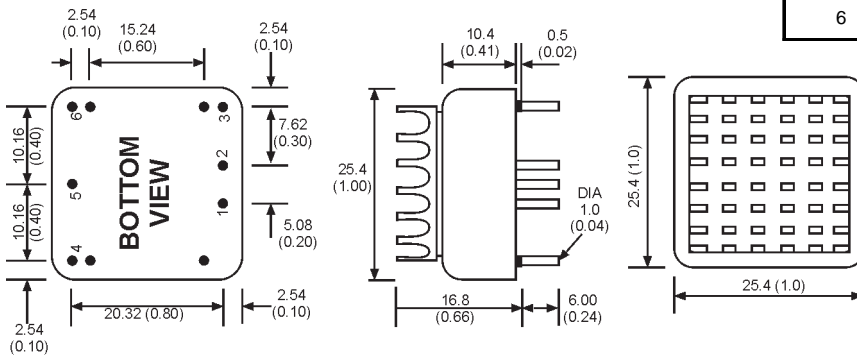
All Dimensions are typical in mm (Inches)

Tolerances:

- 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 CTRL	REMOTE CTRL
4	+OUTPUT	+OUTPUT
5	TRIM	COMMON
6	-OUTPUT	-OUTPUT

With Heat-sink (Suffix „HS“)



Heat Sink, Thermal Pad

Material: Aluminum

Finish: Anodic Treatment (black)

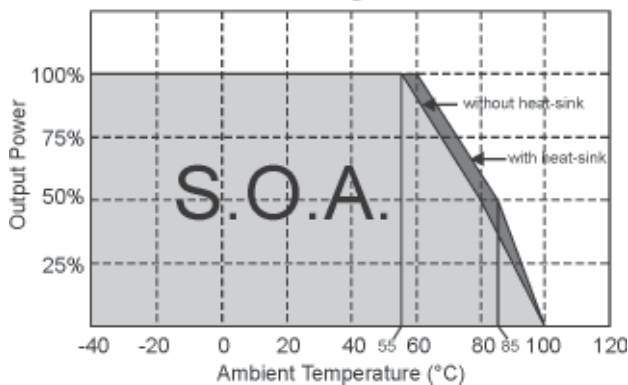
Weight: 2.9 g (0.1 oz) (without converter)

NOTE:

- 1. Converters will be supplied with heat-sinks already mounted.
Please contact M+R Multitronik for quotation.

DIAGRAMS

Derating Curve



External Output Trimming

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



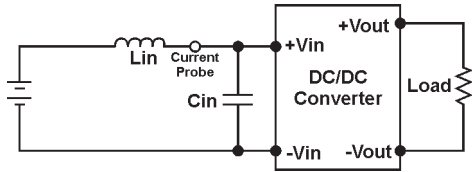
SPECIFICATIONS

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

TEST CONFIGURATIONS

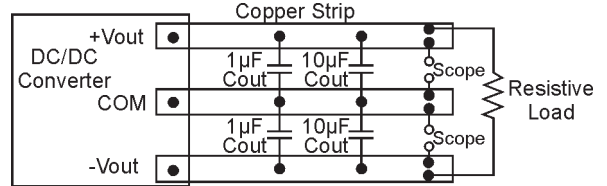
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor L_{in} (12 μ H) and a source capacitor C_{in} (47 μ F, ESR <1.0 Ohms at 100 kHz) at nominal input and full load.



Output Ripple & Noise Measured Test

To reduce ripple and noise, it is recommended to use a 1 μ F ceramic disk capacitor and a 10 μ F ceramic disk capacitor at the output.



DESIGN & FEATURE CONFIGURATIONS

Over Voltage Protection

The module includes an internal output over voltage protection circuit, which monitors the voltage on the output terminals. If this voltage exceeds the over voltage set point, the module will activate the control loop of internal circuit to clamp the output voltage.

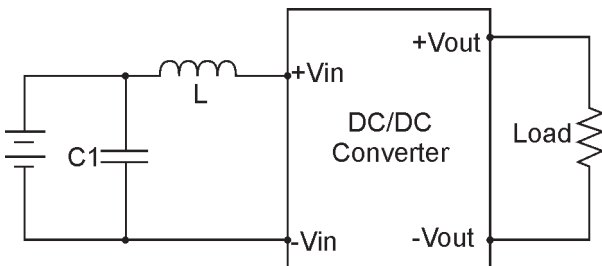
Over Temperature Protection

The over temperature protection consists of circuitry that provides protection from thermal damage. If the temperature exceeds the over temperature threshold the module will shut down.

The module will try to restart after shutdown, if the over temperature condition still exists during restart, the module will shut down again. This restart trial will continue until the temperature is within specification.

EMI Filter

Input filter components (C1,L) are used to help meet conducted emissions. 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
30CRS/D24X-M	1206, 3.3 μ F/100V	0.82 μ H
30CRS/D48X-M	1206, 1 μ F/100V	2.2 μ H

Over Current Protection

The module includes an internal over current protection circuit, which will endure current limiting for an unlimited duration during output over load condition. If the output current exceeds the OCP set point, the module will shut down automatically (hiccup).

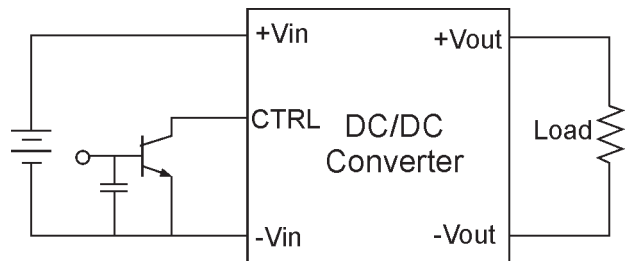
The module will try to restart after shut down. If the over load condition still exists, the module will shut down again.

CTRL Module ON/OFF

Positive logic turns on the module during high logic and off during low logic.

Ctrl module on/off can be controlled by an external switch between the ctrl terminal and -Vin terminal. The switch can be an open collector or open drain.

For positive logic if the ctrl feature is not used, please leave the ctrl pin floating.



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.