

CRW-25W Series

25W Ultra Wide Input Range Regulated Single output



Features

- Ultra Wide Input Range
- 3000 VDC Isolation
- Efficiency up to 85%
- Operating Temperature Range -40 ~ 100°C max.
- Adjustable Output Voltage
- Remote ON/OFF Control (CTRL)
- Continuous Short Circuit Protection
- Over Load Protection
- Over Voltage Protection
- Over Temperature Protection
- Under Voltage lock-out circuit
- EN50155 approval for Railway applications



PART NUMBER STRUCTURE

CRW - **72** **05** **S** **25** **K**
(1) (2) (3) (4) (5) (6)

(1) Series

(2) Input Voltage Range

72 - 16-160 V

(4) Output Type

S - Single Output

(3) Output Voltage

05 - 5.0 V

12 - 12 V

15 - 15 V

24 - 24 V

(5) 25 Watt

(6) K- Heat sink case

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ALL SPECIFICATIONS ARE TYPICAL AT 25°C, NOMINAL INPUT AND FULL LOAD UNLESS OTHERWISE NOTED

Model Number	Input Voltage Range (VDC)	Input Current		Output Voltage (VDC)	Output Current		Efficiency @FL (% , typ.)	Capacitive Load @FL (μF , max.)
		No-Load (mA, max.)	Full Load (mA, typ.)		Min. load (mA)	Full load (mA)		
CRW-7205S25K	16 ~ 160	10	413	5	0	5000	84	6800
CRW-7212S25K	16 ~ 160	10	413	12	0	2080	84	1000
CRW-7215S25K	16 ~ 160	10	408	15	0	1670	85	820
CRW-7224S25K	16 ~ 160	10	406	24	0	1040	85.5	470

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INPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	72V Input		16	72	160	VDC
Under Voltage Protection	72V Input	Module ON		13.8		VDC
		Module OFF		12		
Input Filter	Pi Type					
Input Reflected Ripple Current (1)				20		mApk-pk
Start up Time	Nominal Vin and constant resistive load			60		ms
Remote ON/OFF Control (2)	Module ON (Open Circuit)		3.0		12	VDC
	Module OFF (Short circuit pin 2 and pin 3)		0		1.2	
	OFF idle current			3.0		mA
Recommended input fuse (slow blow)	72V Input		3			A

Note :

1. Measured with a simulated source inductance of 12 μ H and a source capacitor Cin (47 μ F, ESR<1.0 Ω at 100kHz).
2. The remote ON/OFF control pin is referenced to -Vin (pin2).

OUTPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			-1.0		+1.0	%
Output Voltage Adjustability (Trim)	For Single Output		-10		+10	%
Line Regulation			-0.2		+0.2	%
Load Regulation	From 0% to 100% Load		-0.5		+0.5	%
Ripple & Noise (1)	20MHz bandwidth				100	mVpk-pk
Over Voltage Protection (Zener diode clamp)	5V Output			6.2		VDC
	12V Output			15		
	15V Output			18		
	24V Output			30		
Over Current Protection				150		% of FL
Short Circuit Protection	Indefinite (hiccup) (Automatic Recovery)					
Temperature Coefficient			-0.02		+0.02	%/°C
Maximum Capacitive Load	Minimum Vin and constant resistive load		See Table			
Transient Recovery Time	Nominal Vin and 25% load step change (75%-50%-25% of Io)	For All models		500		μ s
Transient Response Deviation			-4		+4	%

Note :

1. Measured with a 10 μ F MLCC.

ABSOLUTE MAXIMUM RATINGS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (100 ms)	72V Input			176	VDC
Soldering Temperature	1.5mm from case 10sec max.			260	°C

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

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GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, and rated for 60sec	3000			VDC
	Case-I/O, and rated for 60sec	1600			
Isolation Resistance	Input-output	1000			MΩ
Isolation Capacitance	Input-output		2000		pF
Switching Frequency	72V Models		250		kHz
MTBF	MIL-HDBK-217 F @ 25°C	230			k hours
Safety Approval	IEC / EN / UL 62368-1	Designed to meet			
Environmental compliance		RoHS			

ENVIRONMENT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating Ambient Temperature	See the Derating Curve	-40		100	°C
Maximum Case Temperature				105	°C
Thermal Impedance		11.5			°C/W
Over Temperature Protection	Case Temperature		115		°C
Storage Humidity				95	% rel. H
Storage Temperature		-55		125	°C
Cooling	Natural Convection	30-65 LFM			

EMC SPECIFICATIONS

Parameter	Standard	Condition	Criterion
Conducted Emissions	EN50121-3-2	99dBuV from 0.15-0.5MHz , 93dBuV from 0.5-30MHz	
Radiated Emissions	EN50121-3-2	40dBuV from 30-230MHz , 47dBuV from 230-1000MHz	
ESD	IEC 61000-4-2	Contact: ± 6kV	A
RS	IEC 61000-4-3	20V/m	A
EFT	IEC 61000-4-4	±2kV with external components	A
Surge	IEC 61000-4-5	±2kV with external components	A
CS	IEC 61000-4-6	10Vrms	A
PFMF	IEC 61000-4-8	100A/m	A

PHYSICAL SPECIFICATIONS

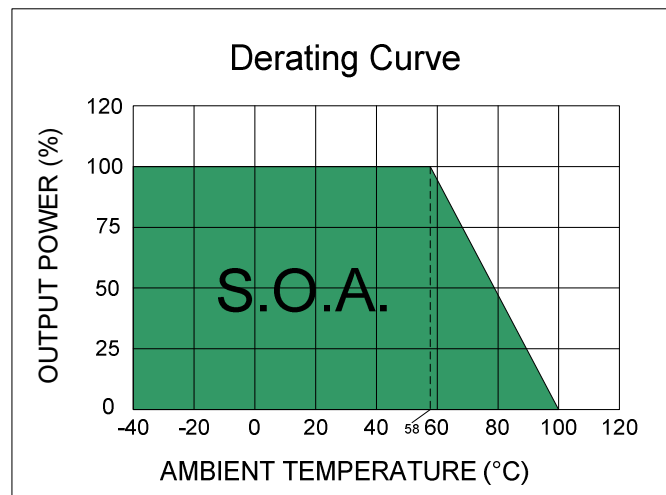
Parameter	Value
Case Material	Aluminum
Base Material	Nonconductive Black Plastic (UL94V-0 rated)
Pin Material	Ø1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	48.0g, typ.
Dimensions	2.09" x 1.09" x 0.65"

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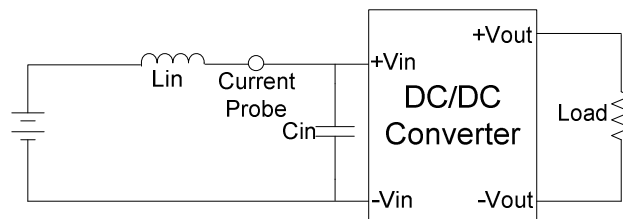
ELECTRICAL CHARACTERISTIC CURVES



TEST CONFIGURATIONS

Input Reflected Ripple Current Test Step

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



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DESIGN & FEATURE CONFIGURATIONS

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.

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 Test

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 shut down, 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.

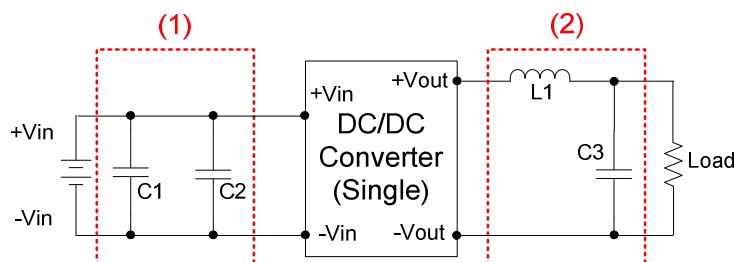
Remote Module ON / OFF

Positive logic turns on the module during high logic and off during low logic. Remote module ON/OFF can be controlled by an external switch between the CTRL terminal and -Vin terminal. For positive logic if the remote feature is not used, please leave the CTRL pin floating.

DESIGN & FEATURE CONFIGURATIONS

EMS Filter

The part (1) Circuit is used to meet Surge & EFT test, and the part (2) Circuit is used to meet EMI test.



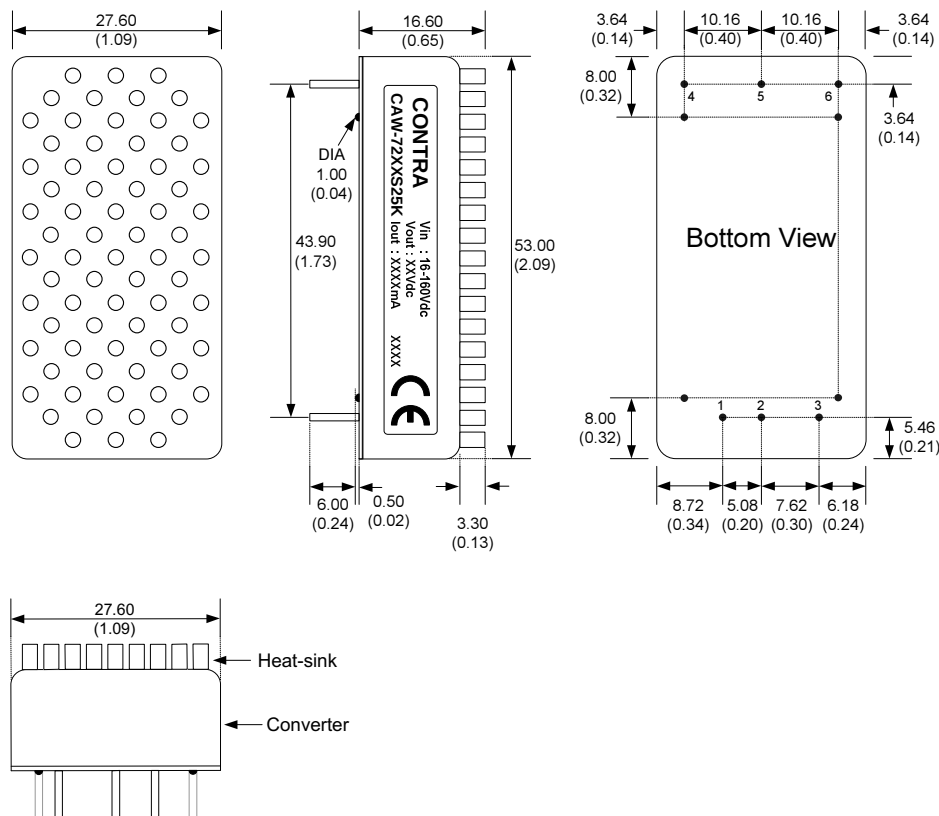
	C1, C2	L1	C3
CRW-72XXS25	Ruby-con BXF series 100 μ F, 250V	4.7 μ H	Ruby-con YXF series 22 μ F, 100V

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MECHANICAL SPECIFICATIONS



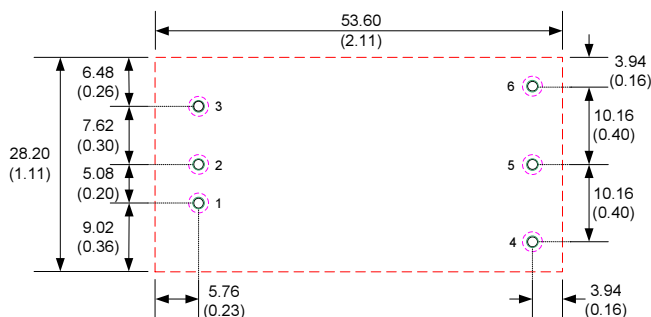
PIN CONNECTIONS	
PIN NUMBER	SINGLE
1	+Vin
2	-Vin
3	CTRL
4	+Vout
5	-Vout
6	Trim

EXTERNAL OUTPUT TRIMMING	
Output can be externally trimmed by using the method as below. (single output models only)	
Rtrim-up	Rtrim-down
6	6
5	4

Notes : All dimensions are typical in millimeters (inches).

1. Pin diameter: 1.0 ± 0.05 (0.04 ± 0.002)
2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
3. Case tolerance: ± 0.5 (± 0.02)
4. Stand-off tolerance: ± 0.1 (± 0.004)

RECOMMENDED FOOTPRINT DETAILS



- Notes : 1. All dimensions are typical in millimeters (inches).
- Through hole (black) 1~6: $\varnothing 1.3$ (0.051)
 - Top view pad (green) 1~6: $\varnothing 1.5$ (0.059)
 - Bottom view pad (pink) 1~6: $\varnothing 2.6$ (0.102)