

RO-MIL-2213

20A DC-DC Converter

28V INPUT, 3.3/5V OUTPUT

Basic Data

Variant	Input	Regulated Output
RO-MIL-2213-A	28V	3.3V 20A
RO-MIL-2213-B	28V	5V 20A
W x D x H: 76.3 x 38.2 x 10.2mm		
Weight: 60g max		
Operating Temperature: -55°C to +85°C		



Description

RO-MIL-2213 is a compact, high current, high efficiency, single-rail DC-DC converter. Operating from a 28V input it has a wide input voltage range of 16 to 40V and operates over the military temperature range without derating. The unit is unconditionally stable and does not require any external components for correct operation.

The compact size and high efficiency are achieved by applying innovative techniques.

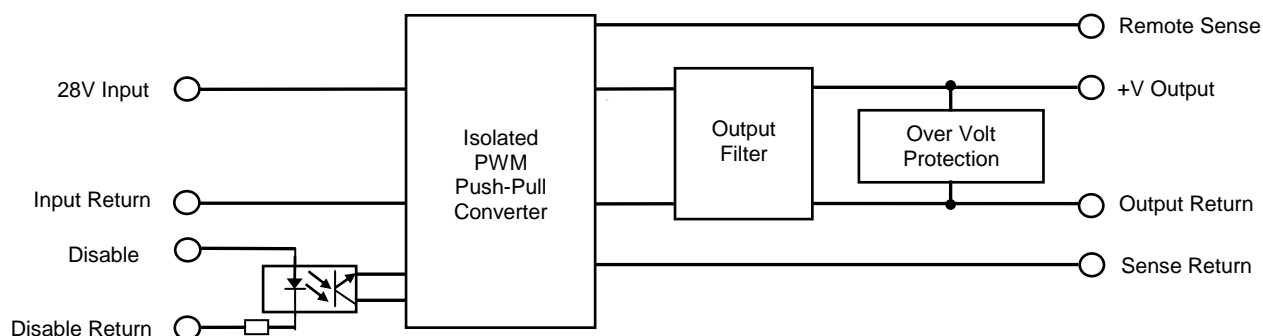
Energy for the output is provided by an isolated high frequency PWM push-pull converter. Short-circuit and overvoltage protection is included as well as remote voltage sensing and a remote disable facility. See application notes on page 5.

Although they do not have to be connected for the unit to function, the remote sense terminals allow the output voltage to be regulated directly at the load. This compensates for the losses of the output power leads and provides optimum regulation.

The unit is housed in a conversion coated machined box. Screw fixings are provided to secure the unit.

All units are manufactured on site in accordance with Roband's approved Quality Management System.

Block Diagram



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Specification

($T_{case} = 25^{\circ}\text{C}$, $V_{in} = 28V_{dc} \pm 2\%$, Load = 100%, unless otherwise specified)

PARAMETER	RO-MIL-2213-A			RO-MIL-2213-B			UNITS
	MIN	TYP	MAX	MIN	TYP	MAX	
Input							
Nominal Voltage	14.5	28	40	12	28	40	V_{dc}
Surge Rating (100ms) ⁽¹⁾	–	–	50	–	–	50	V_{dc}
Enable Signal	5V, 5mA sink			5V, 5mA sink			
Output							
Voltage ⁽²⁾	3.27	3.3	3.33	4.95	5	5.05	V_{dc}
Current Rating (cont.)	2	–	20	2	–	20	A
Output Power	–	–	66	–	–	100	W
Ripple and Noise ⁽³⁾	–	50	80	–	50	80	mV_{p-p}
Line Regulation (16-40V _{in})	–	0	5	–	0	5	mV
Load Regulation ⁽⁴⁾	–	5	10	–	5	10	mV
Remote Sense							
Loss Compensation ⁽⁵⁾	–	–	500	–	–	500	mV
Efficiency	75	78	–	78	81	–	%
Temperature							
T_{case} (Operating)	-55	–	+85	-55	–	+85	$^{\circ}\text{C}$
T_{case} (Storage)	-55	–	+125	-55	–	+125	$^{\circ}\text{C}$
Coefficient	–	50	–	–	50	–	ppm per $^{\circ}\text{C}$
Dynamic Characteristics							
Load Step Transient ⁽⁶⁾	–	–	350	–	–	350	mV_{pk}
Load Step Recovery	–	–	350	–	–	350	μs
Line Step Transient ⁽⁷⁾	–	–	400	–	–	400	mV_{pk}
Line Step Recovery	–	–	450	–	–	450	μs
Start up Time	–	–	120	–	–	120	ms
Isolation (at 500V)							
Input to Output	100	–	–	100	–	–	$M\Omega$
Input to Chassis	100	–	–	100	–	–	$M\Omega$
Output to Chassis	100	–	–	100	–	–	$M\Omega$
Isolated Enable Pins	100	–	–	100	–	–	$M\Omega$
Protection							
Current Limit ⁽⁸⁾	20.5	25	28	20.5	25	28	A
Overvoltage	4.3V surge arresting diode			6.2V surge arresting diode			

⁽¹⁾ 80V surge option also available

⁽²⁾ Measured at the point of remote sense connection

⁽³⁾ DC to 20MHz, including spikes

⁽⁴⁾ 1.5A to maximum load

⁽⁵⁾ Maximum allowable voltage loss in power lines

⁽⁶⁾ 50% to 100% or 100% to 50% load change

⁽⁷⁾ $V_{in} = 16V$ to 40V or 40V to 16V

⁽⁸⁾ Fold-back characteristic

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Specification (cont.)

(Applicable to both variants)

Environmental	Method	Procedure
To MIL-STD 810G		
Temperature Shock	503.5	(-55°C to +85°C)
High Temperature	501.5	(+85°C Operate)
Low Temperature	502.5	(-55°C Operate)
Low Pressure	500.5	(40.000ft Operate)
Vibration	514.6	(10g, 9 Hours)
Humidity	507.5	(95% Operate)
Fungus	508.6	
Salt Fog	509.5	
Sand and Dust	510.5	

Power Dissipation

Maximum 25 Watts
(Full load & Maximum V_{in})

Reliability

To MIL-STD-217F

Environment A.I.F. at 70°C
MTBF >90,000 Hours

Enclosure

Size 76.3 x 38.2 x 10.2mm
Weight 60g max
Material Aluminium Alloy
Finish SurTec 650

Lead Soldering

Temperature 300°C max for 5 seconds max

Caution

Unit must be treated as a static sensitive device.

Regulations

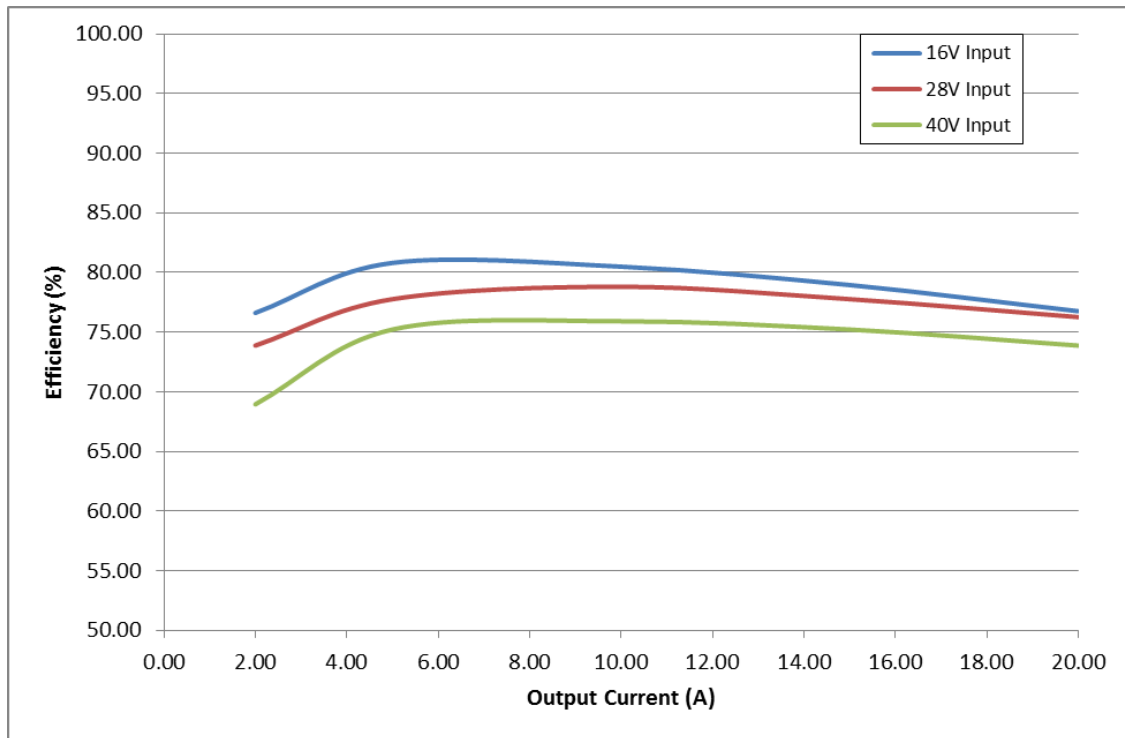
RoHS compliant
REACH compliant

RO-MIL-2213

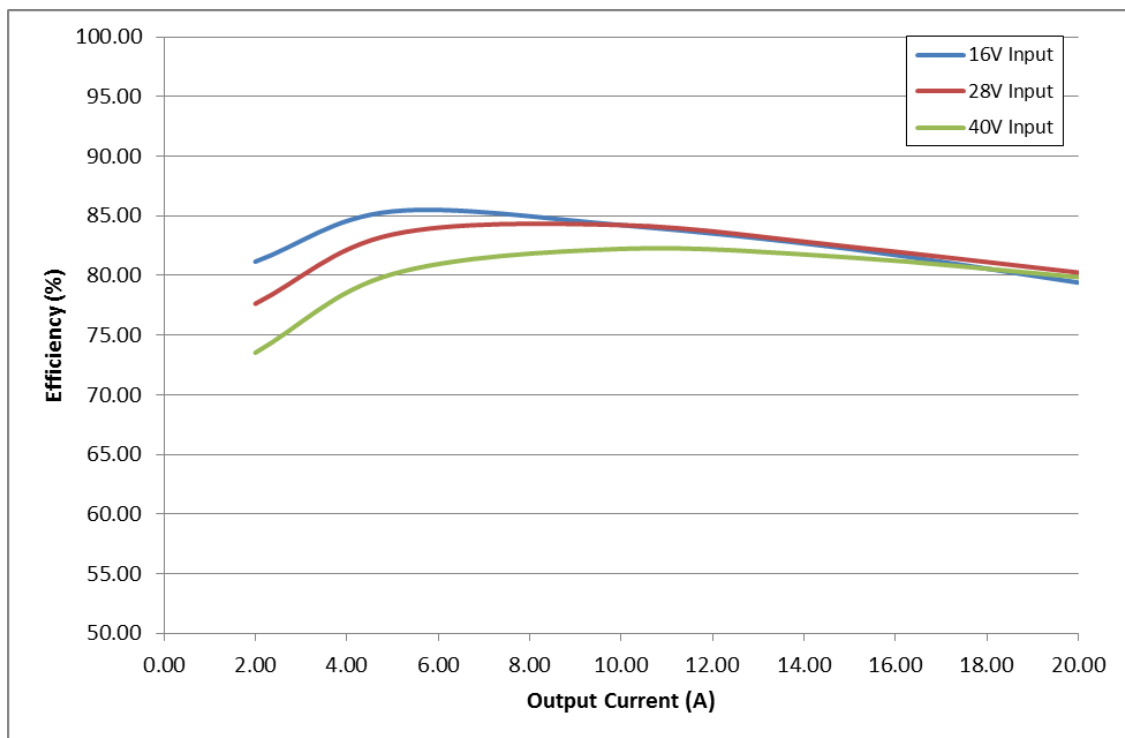
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Efficiency Data



RO-MIL-2213-A – 3.3V Output



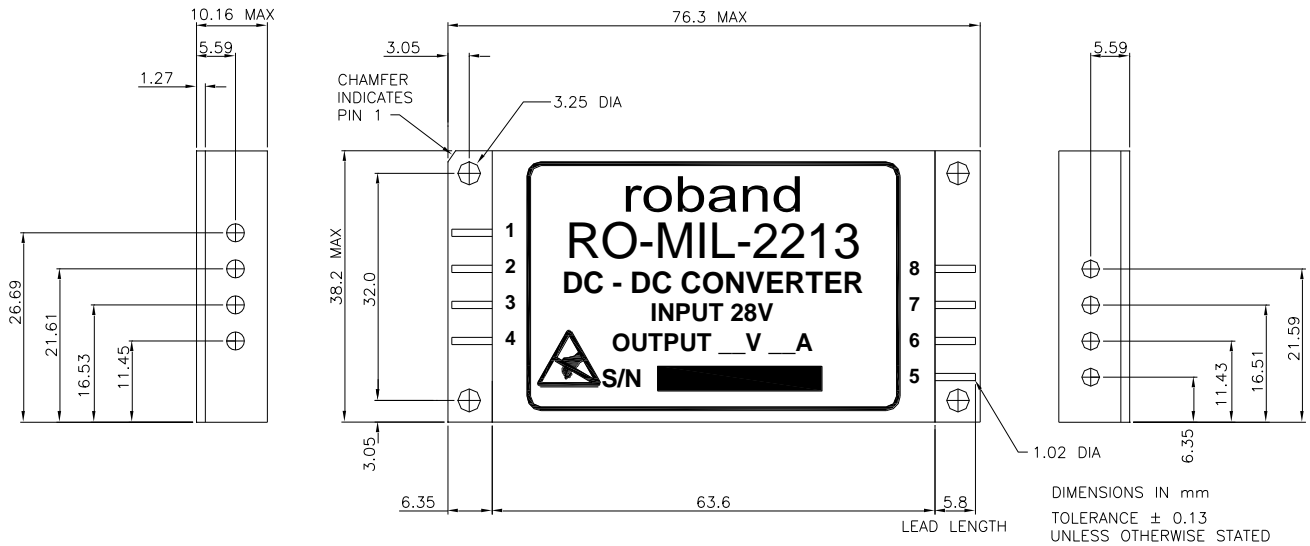
RO-MIL-2213-B – 5V Output

RO-MIL-2213

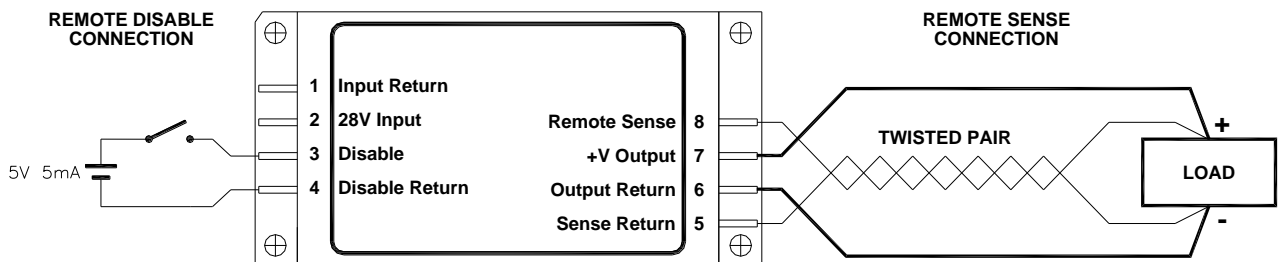
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Outline Drawing



Application Notes: Pin Allocation, Enable and Remote Sense



Notes

The unit's default state is "ON". To disable the unit, apply a 5V, 5mA source between pin 3 and pin 4 as shown above.

If the sense leads are left unconnected, the output voltage will be regulated through internal 100 Ohm resistors, producing approximately 101% of rated voltage. To avoid this, it is recommended that when not required, each sense terminal is shorted to its respective power terminal.

Caution

To avoid the possibility of damage to the converter, never allow the remote voltage sense leads to be connected to the load when one or both power leads is disconnected.

The remote sense feature will only compensate for a maximum of 500mV voltage drop in the power lines.

The seller reserves the right to amend or alter the specification without notice.
Roband recognizes that different applications may require specific amendments to the unit.
Whenever possible we will accommodate these special requirements seamlessly.