

Bulletin PD-20568 rev.E 09/01

International
IR Rectifier

40L15CT
40L15CTS
40L15CT-1

SCHOTTKY RECTIFIER

2 x 20 Amps

Major Ratings and Characteristics


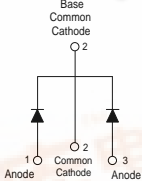

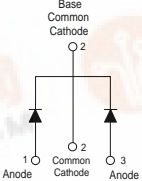

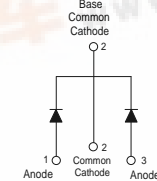
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	40	A
V_{RRM}	15	V
I_{FSM} @tp=5 μ s sine	700	A
V_F @19Apk, $T_J=125^\circ\text{C}$ (per leg, Typical)	0.25	V
T_J	-55 to 125	$^\circ\text{C}$

Description/Features

The center tap Schottky rectifier module has been optimized for ultra low forward voltage drop specifically for the OR-ing of parallel power supplies. The proprietary barrier technology allows for reliable operation up to 125 $^\circ\text{C}$ junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

- 125 $^\circ\text{C}$ T_J operation ($V_R < 5\text{V}$)
- Center tap module
- Optimized for OR-ing applications
- Ultra low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance

Case Styles

40L15CT	40L15CTS	40L15CT-1
  TO-220AB	  D ² PAK	  TO-262



Voltage Ratings

Part number	Values
V_R Max. DC Reverse Voltage (V) @ $T_J = 100^\circ\text{C}$	15
V_{RWM} Max. Working Peak Reverse Voltage (V) @ $T_J = 100^\circ\text{C}$	

Absolute Maximum Ratings

Parameters	Values	Units	Conditions
$I_{F(AV)}$ Max. Average Forward (Per Leg) Current * See Fig. 5 (Per Device)	20 40	A	50% duty cycle @ $T_C = 85^\circ\text{C}$, rectangular waveform
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	700 330	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RRM} applied
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	10	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 2\text{Amps}$, $L = 6\text{mH}$
I_{AR} Repetitive Avalanche Current (Per Leg)	2	A	Current decaying linearly to zero in 1 μsec Frequency limited by T_J max. $V_A = 1.5 \times V_R$ typical

Electrical Specifications

Parameters	Values	Units	Conditions
V_{FM} Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	Typ. Max.		
	- 0.41	V	@ 19A $T_J = 25^\circ\text{C}$
	- 0.52	V	@ 40A
	0.25 0.33 0.37 0.50	V	@ 19A @ 40A $T_J = 125^\circ\text{C}$
I_{RM} Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	- 10	mA	$T_J = 25^\circ\text{C}$
	- 600	mA	$T_J = 100^\circ\text{C}$ $V_R = \text{rated } V_R$
$V_{F(TO)}$ Threshold Voltage	0.182	V	$T_J = T_J \text{ max.}$
r_t Forward Slope Resistance	7.6	m Ω	
C_T Max. Junction Capacitance (Per Leg)	- 2000	pF	$V_R = 5V_{DC}$, (test signal range 100Khz to 1Mhz) 25°C
L_S Typical Series Inductance (Per Leg)	8 -	nH	Measured lead to lead 5mm from package body
dv/dt Max. Voltage Rate of Change (Rated V_R)	10,000	V/ μs	

(1) Pulse Width < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

Parameters	Values	Units	Conditions
T_J Max. Junction Temperature Range	-55 to 125	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
R_{thJC} Max. Thermal Resistance Junction to Case (Per Leg)	1.5	$^\circ\text{C/W}$	DC operation * See Fig. 4
R_{thCS} Typical Thermal Resistance Case to Heatsink	0.50	$^\circ\text{C/W}$	Mounting surface, smooth and greased Only for TO-220
R_{thJA} Max. Thermal Resistance Junction to Ambient	40	$^\circ\text{C/W}$	DC operation For D2Pak and TO-262
wt Approximate Weight	2(0.07)	g(oz.)	
T Mounting Torque	Min. 6(5)	Kg-cm (lbf-in)	Non-lubricated threads
	Max. 12(10)		

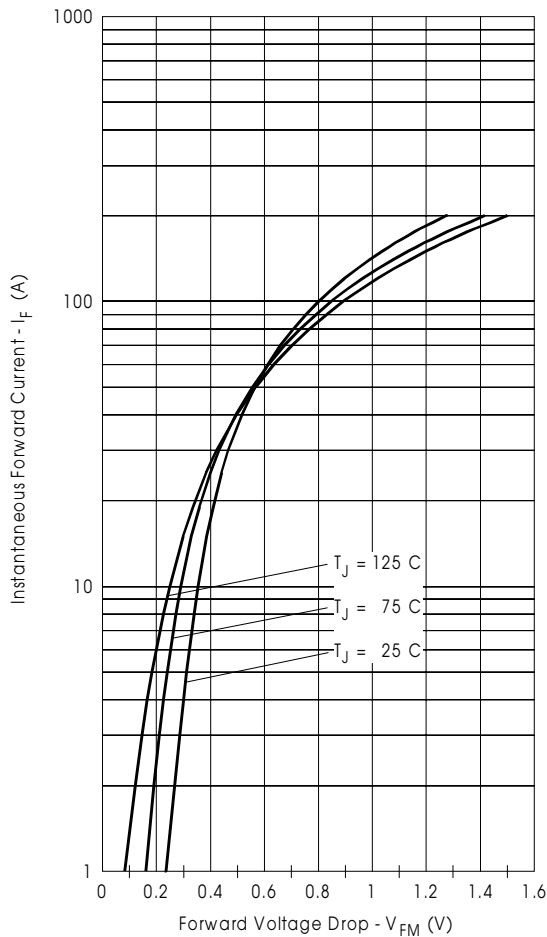


Fig. 1 - Maximum Forward Voltage Drop Characteristics

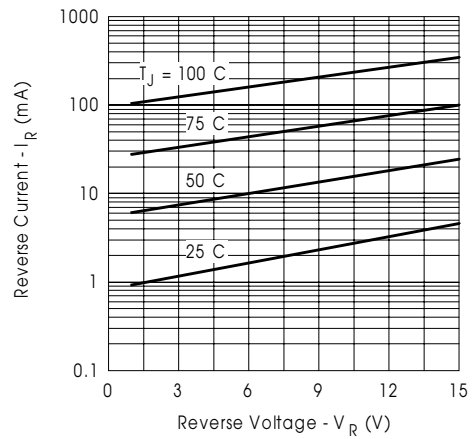


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

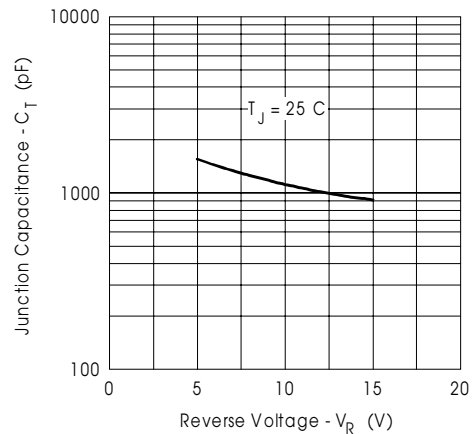


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

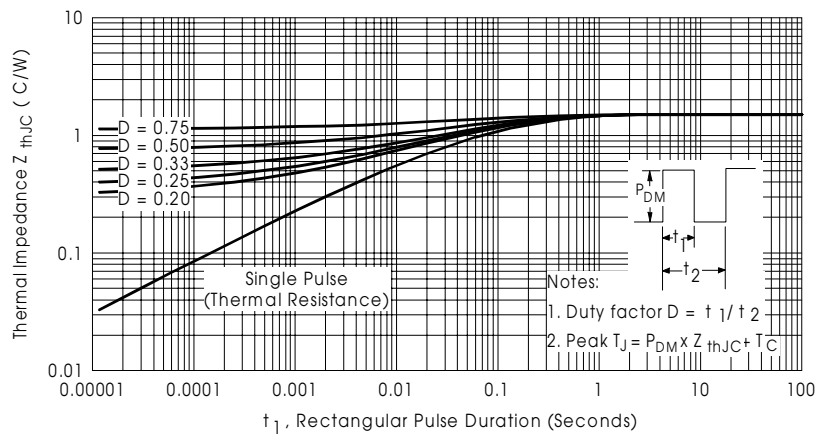


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

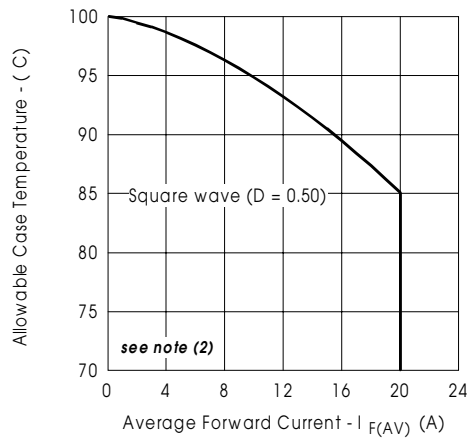


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

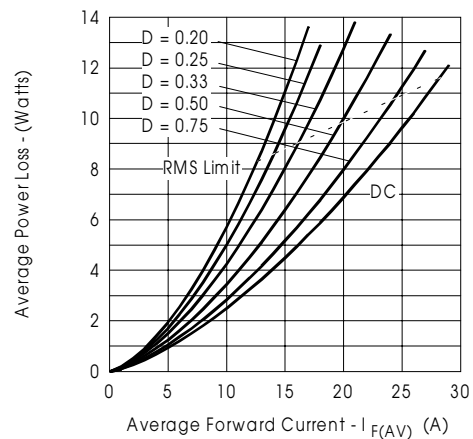


Fig. 6 - Forward Power Loss Characteristics

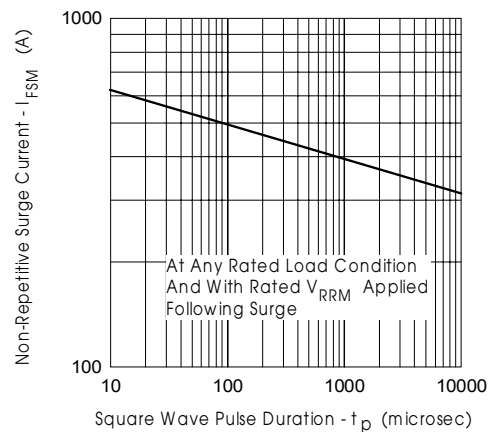


Fig. 7 - Maximum Non-Repetitive Surge Current

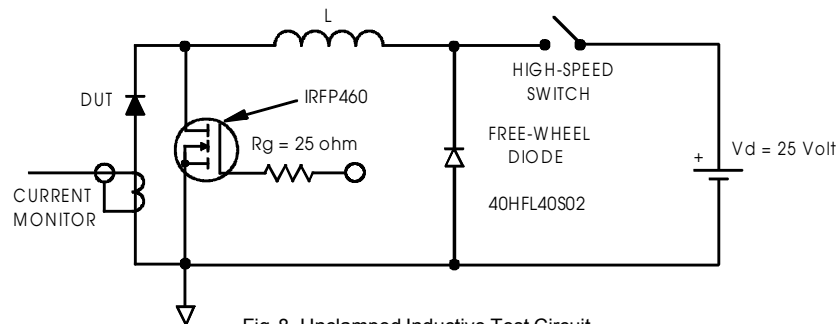


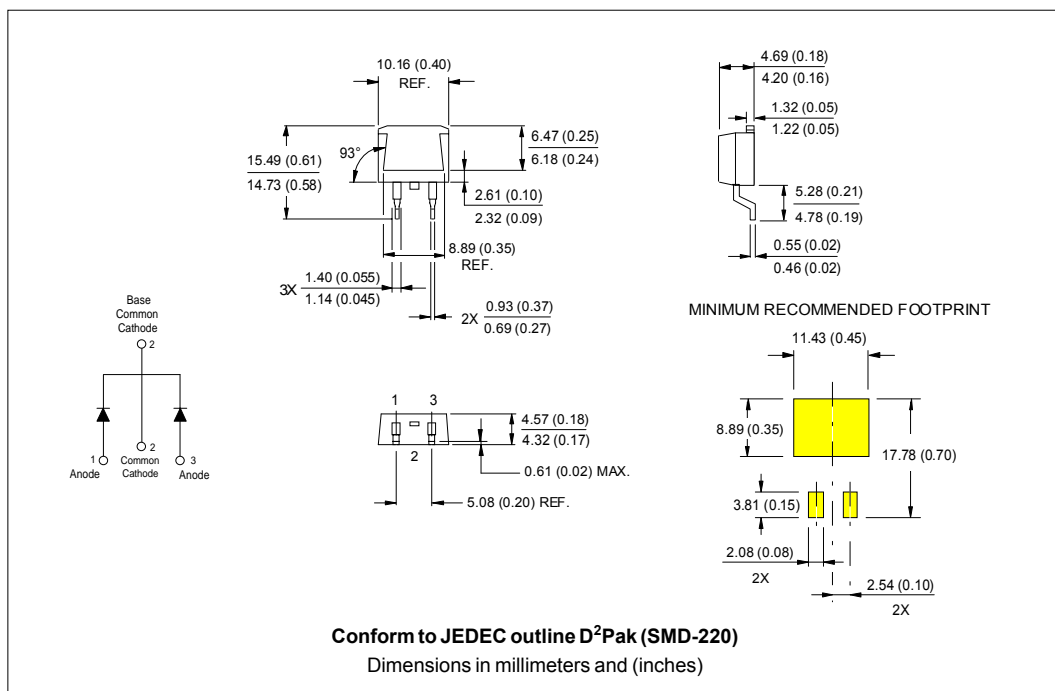
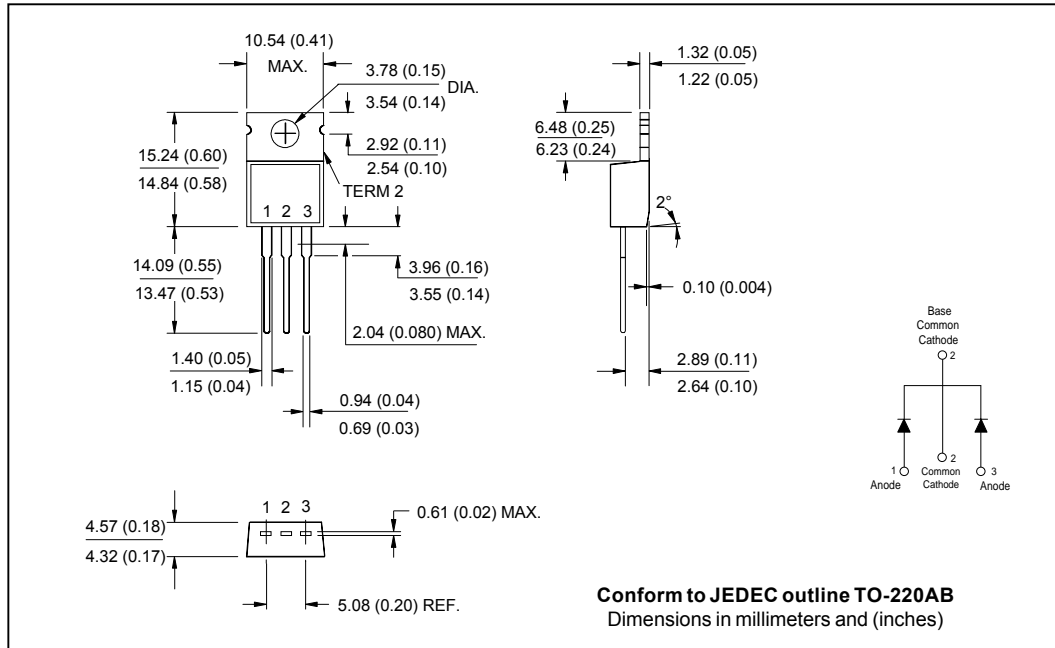
Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;

P_d = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

$P_{d_{REV}}$ = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 80\% \text{ rated } V_R$

Outline Table

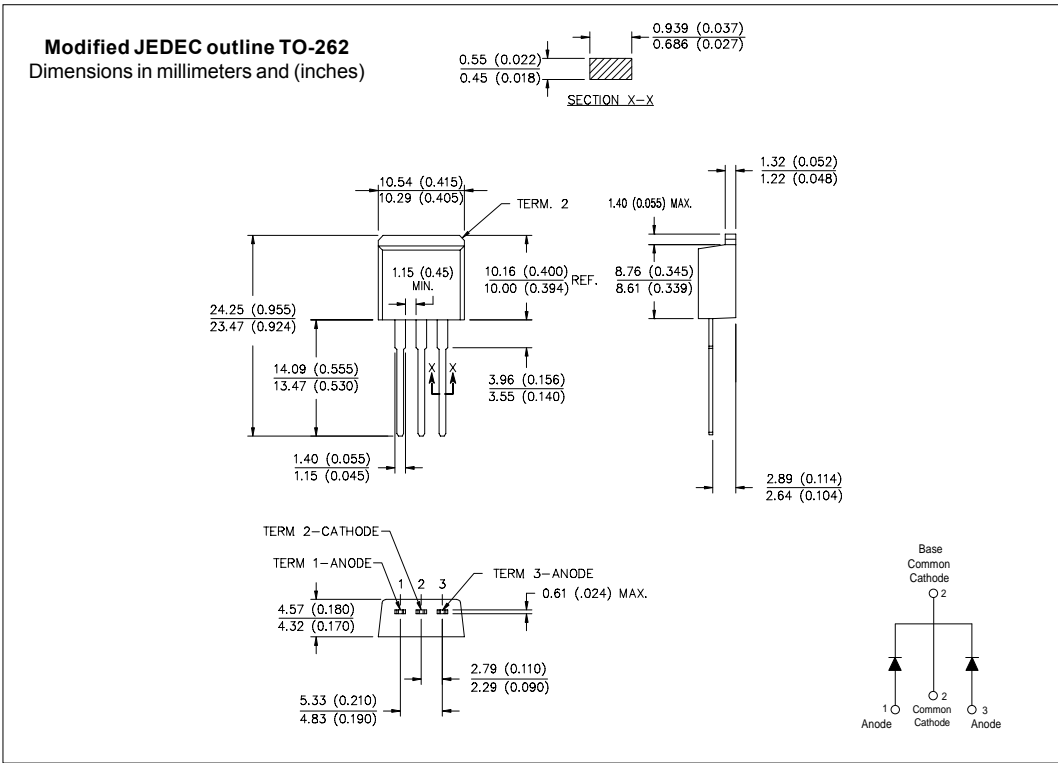


40L15CT, 40L15CTS, 40L15CT-1

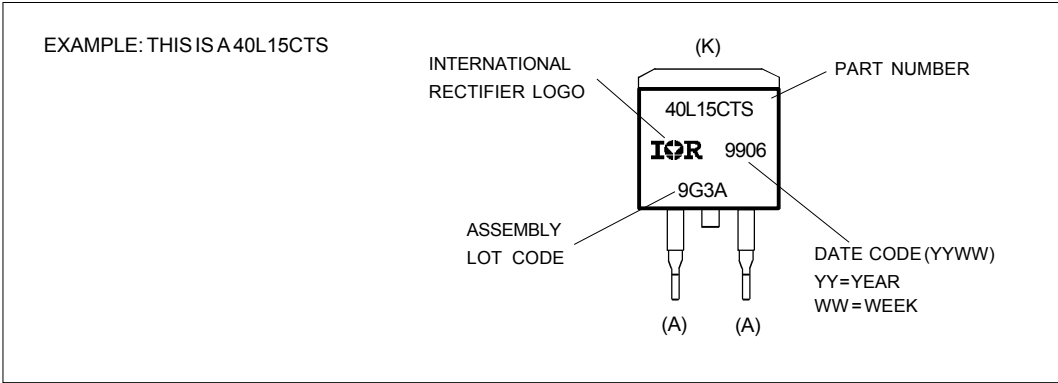
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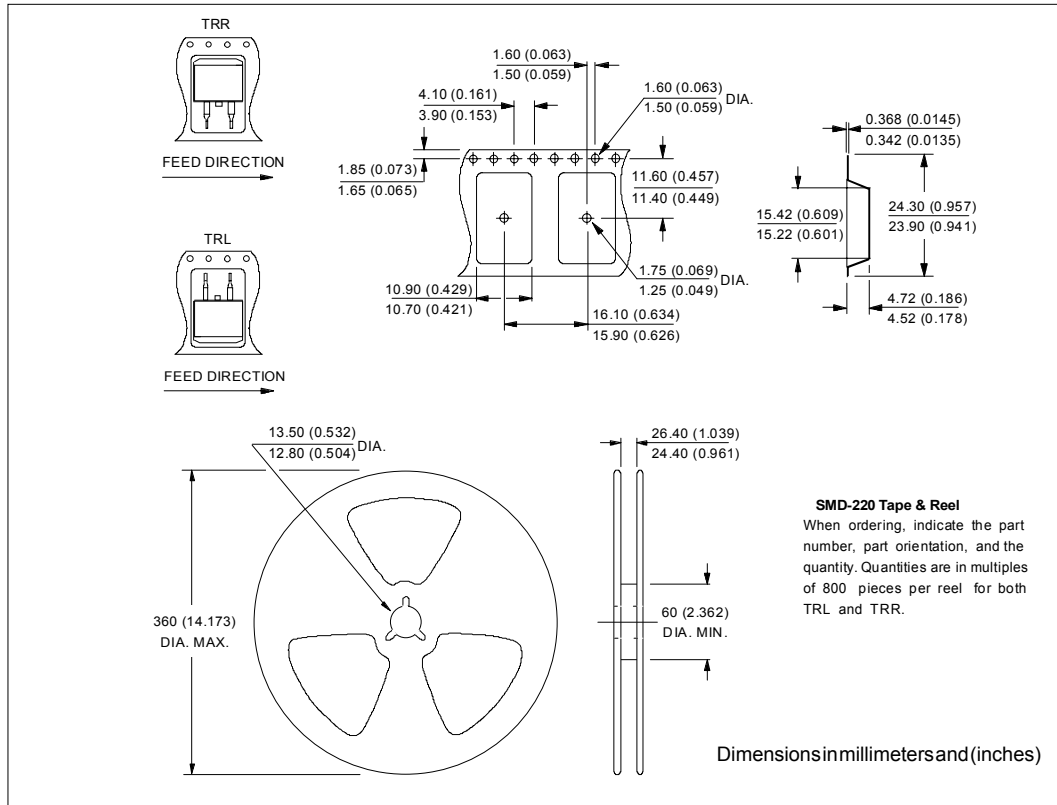
Outline Table



Marking Information



Tape & Reel Information



Ordering Information Table

Device Code					
40	L	15	C	T	-1
①	②	③	④	⑤	⑥
1	-	Current Rating: 40 = 40A			
2	-	L = Schottky L Series			
3	-	Voltage Rating: 15 = 15V			
4	-	C = Common Cathode			
5	-	T = TO-220			
6	-	-1 = TO-262 option			

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Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.

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