



DO-214AB PACKAGE

## APPLICATIONS

- Automotive

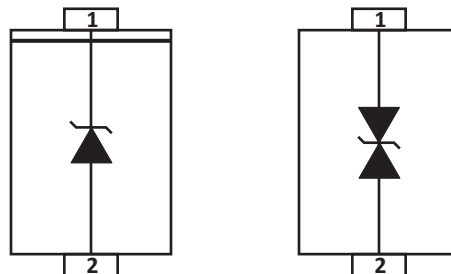
## FEATURES

- *AEC-Q101 Qualified*
- UL Registered
- IEC Compatibility 61000-4-2 (ESD)
- IEC Compatibility 61000-4-4 (EFT)
- IEC Compatibility 61000-4-5 (Surge)
- Glass Passivated Chip
- 5000 Watts Peak Pulse Power per Line ( $t_p = 10/1000\mu s$ )
- 28,000 Watts Peak Pulse Power per Line ( $t_p = 8/20\mu s$ )
- Low Leakage Current
- Unidirectional & Bidirectional Configurations
- Excellent Clamping Capability
- Very Fast Response Time
- RoHS Compliant
- REACH Compliant

## MECHANICAL CHARACTERISTICS

- Molded JEDEC DO-214AB Package
- Approximate Weight: 0.248 grams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:  
Pure-Tin - Sn, 100: 260-270°C
- 16mm Tape and Reel Per EIA Standard 481
- Terminal: Solderable per MIL-STD-750, Method 2026
- Flammability Rating UL 94V-0

## PIN CONFIGURATIONS



## TYPICAL DEVICE CHARACTERISTICS

## RTCA DO-160G COMPLIANT PRODUCT

## MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

PARAMETER	SYMBOL	VALUE	UNITS
Operating Temperature	$T_J$	-55 to 150	°C
Storage Temperature	$T_{STG}$	-55 to 150	°C
Peak Pulse Power (tp =10/1000µs) - See Figure 1 and Note 2	$P_{PP}$	5000	Watts
Peak Pulse Power (tp =8/20µs) - See Figure 1 and Note 2	$P_{PP}$	28000	Watts
Power Dissipation on Infinite Heatsink at $T_L = 75^\circ\text{C}$	$P_D$	6.5	Watts
Peak Forward Surge Current, 8.3ms single half sinewave - Unidirectional Only (Note 2)	$I_{FSM}$	500	Amps
Maximum Instantaneous Forward Voltage at 100A - Unidirectional Only	$V_F$	3.5	V

## NOTE

1. Non-repetitive current pulse per Figure 2 and derated above  $T_A = 25^\circ\text{C}$  per Figure 2.
2. Measured on 8.3ms single half sinewave or equivalent square wave, duty cycle = 4 pulses per minute maximum.

## ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER (Note 1)	DEVICE MARKING		REVERSE STAND-OFF VOLTAGE  $V_{RWM}$ VOLTS	BREAKDOWN VOLTAGE  $V_{(BR)}$ @ $I_T$ VOLTS		TEST CURRENT  @ $I_T$ mA	MAXIMUM CLAMPING VOLTAGE (Fig. 2)  @ $I_P$ $V_C$ VOLTS	MAXIMUM REVERSE SURGE CURRENT  @ $I_{PP}$ AMPS	MAXIMUM REVERSE LEAKAGE CURRENT  @ $V_{RWM}$ $I_R$ µA
	UNI	BI		MIN	MAX				
PAM33DOAB6.0CA		5DDG	6.0	6.67	7.37	50	10.3	485	2000
PAM33DOAB11A	5PDX	5BDX	11.0	12.20	13.50	1	18.2	278	800
PAM33DOAB12A	5PDZ	5BDZ	12.0	13.30	14.70	1	19.9	254	800
PAM33DOAB13A	5PEE	5BEE	13.0	14.40	15.90	1	21.5	235	500
PAM33DOAB14A	5PEG	5BEG	14.0	15.60	17.20	1	23.2	218	200
PAM33DOAB15A	5PEK	5BEK	15.0	16.70	18.50	1	24.4	207	100
PAM33DOAB16A	5PEM	5BEM	16.0	17.80	19.70	1	26.0	194	50
PAM33DOAB17A	5PEP	5BEP	17.0	18.90	20.90	1	27.6	183	20
PAM33DOAB18A	5PER	5BER	18.0	20.00	22.10	1	29.2	173	10
PAM33DOAB19A	5PET	5BET	19.0	21.10	23.30	1	30.8	164	10
PAM33DOAB20A	5PEV	5BEV	20.0	22.20	24.50	1	32.4	156	5
PAM33DOAB22A	5PEX	5BEX	22.0	24.40	26.90	1	35.5	142	5
PAM33DOAB24A	5PEZ	5BEZ	24.0	26.70	29.50	1	38.9	130	5
PAM33DOAB26A	5PFE	5BFE	26.0	28.90	31.90	1	42.1	120	5
PAM33DOAB28A	5PFG	5BFG	28.0	31.10	34.40	1	45.4	111	5
PAM33DOAB30A	5PFK	5BFK	30.0	33.30	36.80	1	48.4	104	5
PAM33DOAB33A	5PFM	5BFM	33.0	36.70	40.60	1	53.3	94.8	5
PAM33DOAB36A	5PFP	5BFP	36.0	40.00	44.20	1	58.1	86.9	5
PAM33DOAB40A	5PFR	5BFR	40.0	44.40	49.10	1	64.5	78.3	5
PAM33DOAB43A	5PFT	5BFT	43.0	47.80	52.80	1	69.4	72.8	5
PAM33DOAB45A	5PFV	5BFV	45.0	50.00	55.30	1	72.7	69.5	5

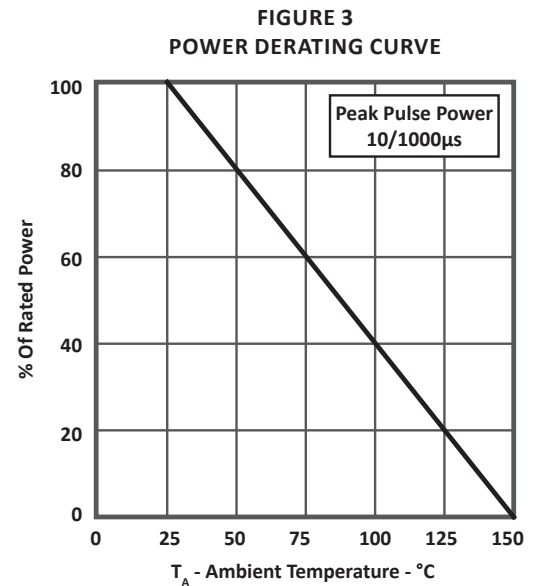
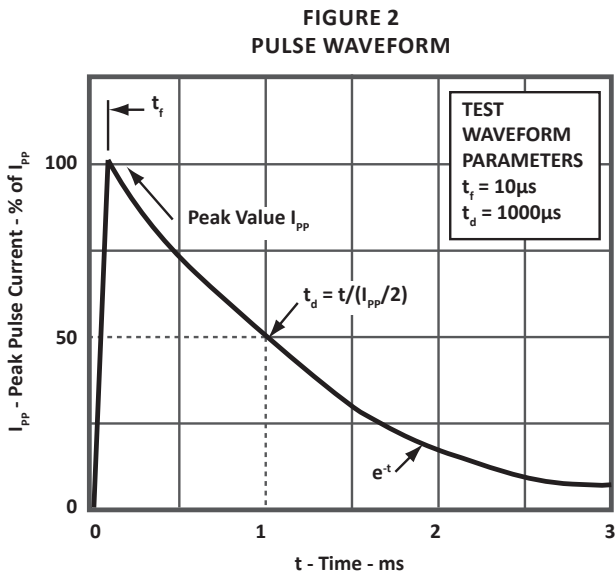
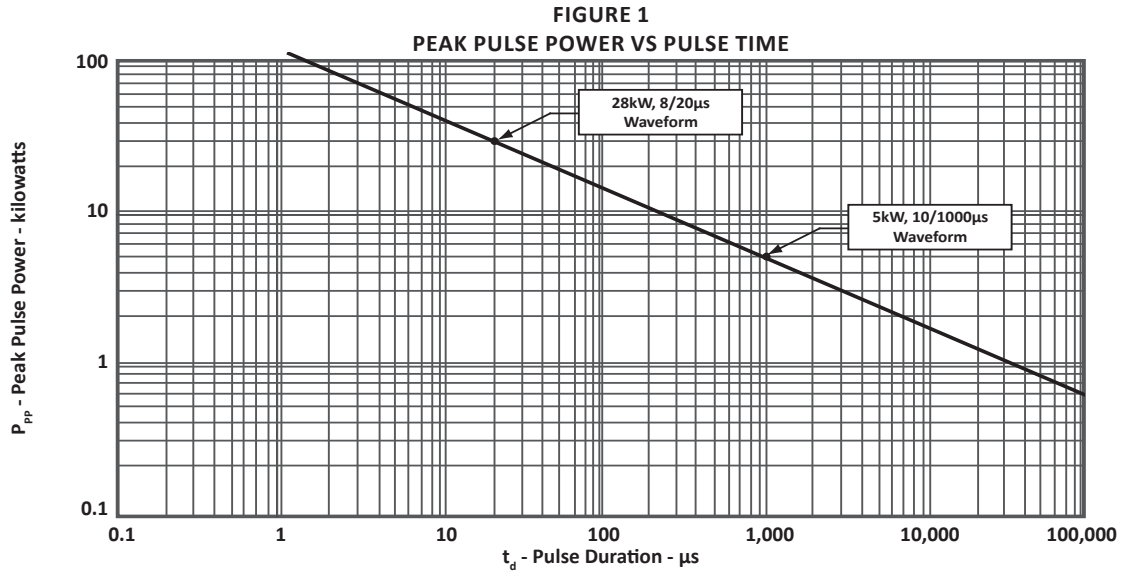
## TYPICAL DEVICE CHARACTERISTICS

## ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

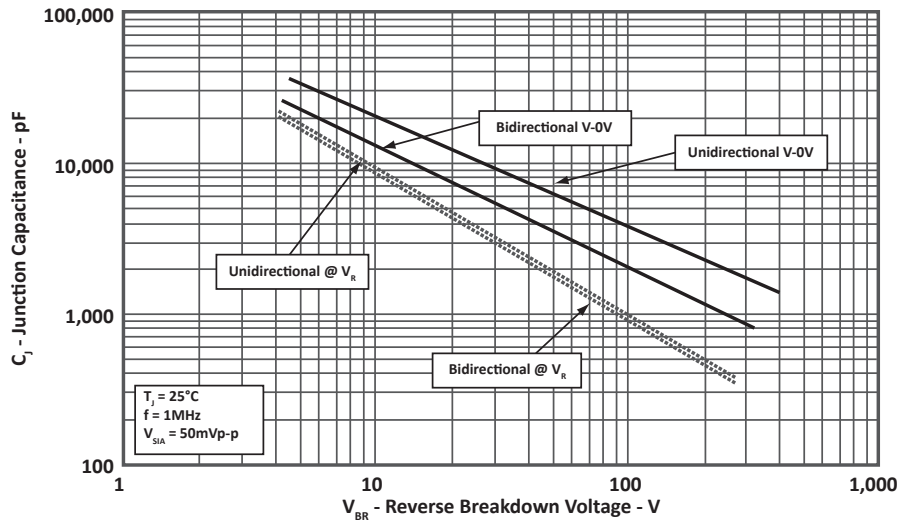
PART NUMBER (Note 1)	DEVICE MARKING		REVERSE STAND-OFF VOLTAGE  $V_{RWM}$ VOLTS	BREAKDOWN VOLTAGE  $V_{(BR)} @ I_T$ VOLTS		TEST CURRENT  @ $I_T$ mA	MAXIMUM CLAMPING VOLTAGE (Fig. 2)  @ $I_p$ $V_c$ VOLTS	MAXIMUM REVERSE SURGE CURRENT  @ $I_{PP}$ AMPS	MAXIMUM REVERSE LEAKAGE CURRENT  @ $V_{RWM}$ $I_R$ $\mu A$
	UNI	BI		MIN	MAX				
	PAM33DOAB48A	5PFX	5BFX	48.0	53.30	58.90	1	77.4	65.3
PAM33DOAB51A	5PFZ	5BFZ	51.0	56.70	62.70	1	82.4	61.3	5
PAM33DOAB54A	5PGE	5BGE	54.0	60.00	66.30	1	87.1	58.0	5
PAM33DOAB58A	5PGG	5BGG	58.0	64.40	71.20	1	93.6	54.0	5
PAM33DOAB60A	5PGK	5BGK	60.0	66.70	73.70	1	96.8	52.2	5
PAM33DOAB64A	5PGM	5BGM	64.0	71.10	78.60	1	103.0	49.0	5
PAM33DOAB70A	5PGP	5BGP	70.0	77.80	86.00	1	113.0	44.7	5
PAM33DOAB75A	5PGR	5BGR	75.0	83.30	92.10	1	121.0	41.7	5
PAM33DOAB78A	5PGT	5BGT	78.0	86.70	95.80	1	126.0	40.1	5
PAM33DOAB80A	5PGB	5BGB	80.0	88.80	97.60	1	129.6	39.0	5
PAM33DOAB85A	5PGV	5BGV	85.0	94.40	104.00	1	137.0	36.9	5
PAM33DOAB90A	5PGX	5BGX	90.0	100.00	111.00	1	146.0	34.6	5
PAM33DOAB100A	5PGZ	5BGZ	100.0	111.0	123.00	1	162.0	31.2	5
PAM33DOAB110A	5PHE	5BHE	110.0	122.00	135.00	1	177.0	28.5	5
PAM33DOAB120A	5PHG	5BHG	120.0	133.00	147.00	1	193.0	26.2	5
PAM33DOAB130A	5PHK	5BHK	130.0	144.00	159.00	1	209.0	24.2	5
PAM33DOAB140A	5PHB	5BHB	140.0	155.00	171.00	1	226.8	22.3	5
PAM33DOAB150A	5PHM	5BHM	150.0	167.0	185.00	1	243.0	20.8	5
PAM33DOAB160A	5PHP	5BHP	160.0	178.00	197.00	1	259.0	19.5	5
PAM33DOAB170A	5PHR	5BHR	170.0	189.00	209.00	1	275.0	18.4	5
PAM33DOAB180A	5PHT	5BHT	180.0	200.00	220.0	1	291.6	17.3	5
PAM33DOAB190A	5PHV	5BHV	190.0	211.00	232.00	1	307.8	16.4	5
PAM33DOAB200A	5PHW	5BHW	200.0	224.00	247.00	1	324.0	15.4	5
PAM33DOAB220A	5PHX	5BHX	220.0	246.00	272.00	1	356.0	14.0	5
PAM33DOAB250A	5PHZ	5BHZ	250.0	279.00	309.00	1	405.0	12.4	5
PAM33DOAB300A	5PJE	5BJE	300.0	335.00	371.00	1	486.0	10.3	5
PAM33DOAB350A	5PJG	5BJG	350.0	391.00	432.00	1	567.0	8.8	5
PAM33DOAB400A	5PKJ	5BJK	400.0	447.00	494.00	1	648.0	7.7	5
PAM33DOAB440A	5PJM	5BJM	440.0	492.00	543.00	1	713.0	7.0	5

## NOTE

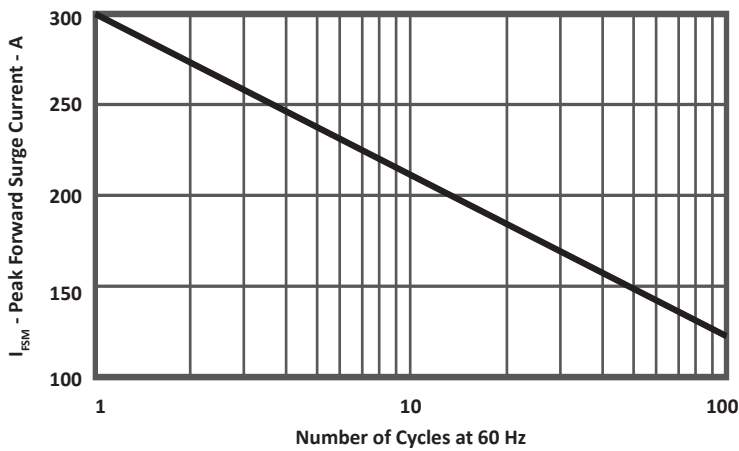
1. Add suffix "CA" after part number to specify a bidirectional device - for example, PAM33DOAB440CA.



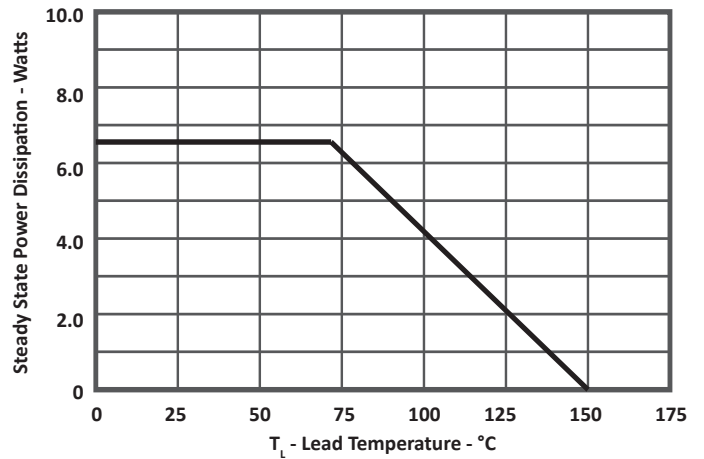
**FIGURE 4**  
TYPICAL JUNCTION CAPACITANCE



**FIGURE 5**  
MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT



**FIGURE 6**  
STEADY STATE POWER DERATING CURVE



## PACKAGE INFORMATION

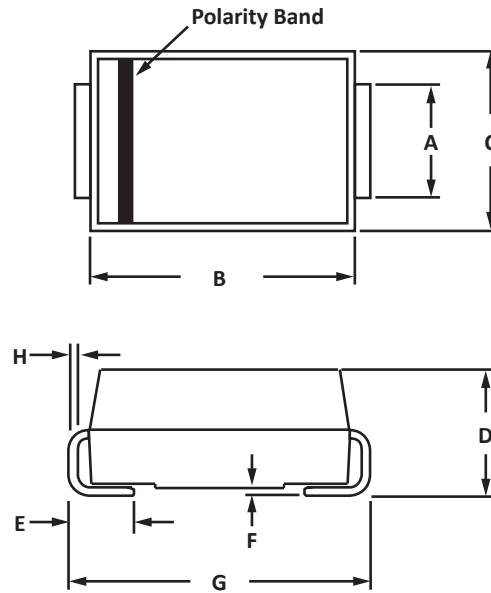
## RTCA DO-160G COMPLIANT PRODUCT

## OUTLINE DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.75	3.25	0.108	0.128
B	6.90	7.40	0.272	0.291
C	5.75	6.25	0.226	0.246
D	2.15	2.62	0.085	0.103
E	0.95	1.52	0.037	0.060
F	0.051	0.203	0.002	0.008
G	7.70	8.20	0.303	0.323
H	0.15	0.31	0.006	0.012

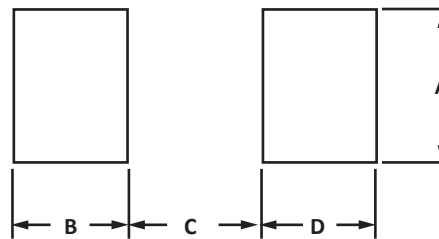
## NOTES

1. Dimensions are exclusive of mold flash and metal burrs.



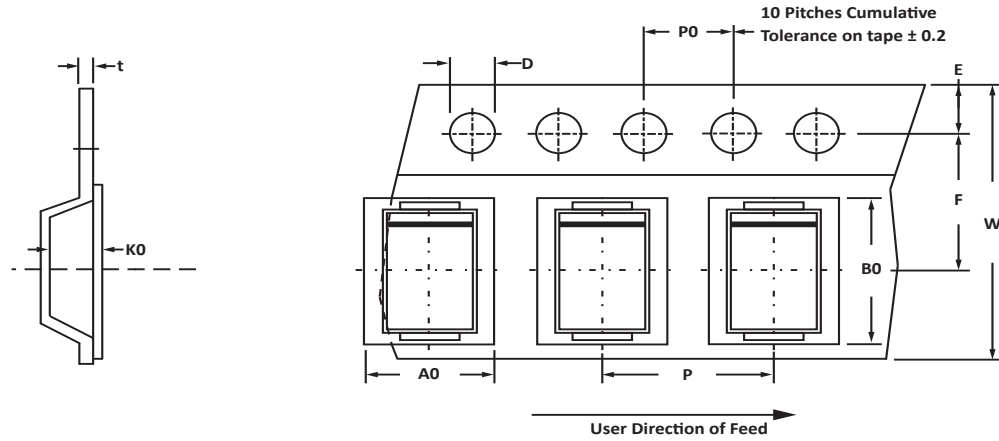
## PAD LAYOUT DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	3.30	-	0.130	-
B	2.40	-	0.094	-
C	-	4.20	-	0.165
D	2.40	-	0.094	-



## TAPE AND REEL

## RTCA DO-160G COMPLIANT PRODUCT



## SPECIFICATIONS

REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P	tmax
330mm (13")	16mm	6.05 ± 0.30	8.31 ± 0.30	2.54 ± 0.10	1.55 ± 0.05	1.75 ± 0.10	7.5 ± 0.10	16.00 ± 0.30	4.00 ± 0.10	8.00 ± 0.10	0.4

## NOTES

- Dimensions are in millimeters.
- Surface mount product is taped and reeled in accordance with EIA-481.
- Marking on Part - marking code (see page 2), date code, logo and cathode defined by polarity band.

## ORDERING INFORMATION

BASE PART NUMBER (Voltage = xx)	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
PAM33DOABxxA	N/A	-T13	3,000	13"	N/A
PAM33DOABxxCA	N/A	-T13	3,000	13"	N/A
PAM33DOABxxA	N/A	-T500	500	7"	N/A
PAM33DOABxxCA	N/A	-T500	500	7"	N/A

This device is only available in a Lead-Free configuration.

**COMPANY INFORMATION****RTCA DO-160G COMPLIANT PRODUCT****COMPANY PROFILE**

In business more than 25 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection and overcurrent protection components. These include transient voltage suppressor array (TVS arrays) avalanche breakdown diode, steering diode TVS array and electronics SMD chip fuses. These components deliver circuit protection in electronic systems from numerous overvoltage and overcurrent events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices also offers LED wafer die for ESD protection and related high frequency products. ProTek Devices is an ISO 9001 certified company.

**CONTACT US****Corporate Headquarters**

2929 South Fair Lane  
Tempe, Arizona 85282  
USA

**By Telephone**

General: 602-431-8101  
Sales: & Marketing: 602-414-5109  
Customer Service: 602-414-5114  
Product Technical Support: 602-414-5107

**By Fax**

General: 602-431-2288

**By E-mail:**

Asia Sales: [asiasales@protekdevices.com](mailto:asiasales@protekdevices.com)  
Europe Sales: [europesales@protekdevices.com](mailto:europesales@protekdevices.com)  
U.S. Sales: [ussales@protekdevices.com](mailto:ussales@protekdevices.com)  
Distributor Sales: [distysales@protekdevices.com](mailto:distysales@protekdevices.com)  
Customer Service: [service@protekdevices.com](mailto:service@protekdevices.com)  
Technical Support: [support@protekdevices.com](mailto:support@protekdevices.com)

**ProTek Devices (Asia Pacific) Pte. Ltd.**

8 Ubi Road 2, #06-19  
Zervex  
Singapore - 408538  
Tel: +65-67488312  
Fax: +65-67488313

**Web**

[www.protekdevices.com](http://www.protekdevices.com)

COPYRIGHT © ProTek Devices 2017 - This literature is subject to all applicable copyright laws and is not for resale in any manner.

SPECIFICATIONS: ProTek reserves the right to change the electrical and or mechanical characteristics described herein without notice.

DESIGN CHANGES: ProTek reserves the right to discontinue product lines without notice and that the final judgement concerning selection and specifications is the buyer's and that in furnishing engineering and technical assistance. ProTek assumes no responsibility with respect to the selection or specifications of such products. ProTek makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ProTek assume any liability arising out of the application or use of any product or circuit and specifically disclaims any and all liability without limitation special, consequential or incidental damages.

LIFE SUPPORT POLICY: ProTek Devices products are not authorized for use in life support systems without written consent from the factory.