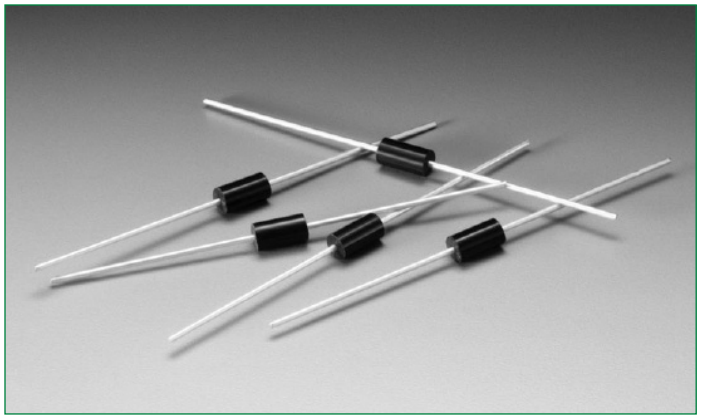
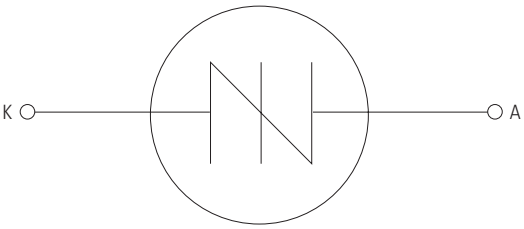
Kxxx1G SIDAC Series

Multipulse™ SIDACs Thyristor

RoHS



Pinout Diagram



K: Cathode; **A:** Anode

Description

The Multipulse™ SIDAC is a robust solid-state voltage switch designed for lamp igniter circuits in metal-halide and high-pressure sodium lighting systems. It supports operation at ambient temperatures up to 90 °C and junction temperatures up to 125 °C, while its fast commutation characteristics enable multiple ignition pulses per AC line half cycle. The device is offered in a DO-15 axial-leaded package.

The Kxxx1G series provides a minimum V_{DRM} range of 180 V to 270 V and incorporates glass-passivated junctions for reliable high-voltage blocking performance.best reliability. Package is compound encapsulation with tin-plated copper alloy leads.

Features:

- AC circuit oriented
- Triggering voltage range: 200 V to 380 V
- Fast commutation time upto 100 µs
- High-temperature operation up to 125 °C
- Glass-passivated junctions
- High dv/dt capability of 1500 v/µs

Benefits:

- Reliable lamp ignition performance
- Supports multiple ignition pulses per line cycle
- Robust operation in harsh environments
- Improved blocking stability and device reliability
- Enhanced immunity to electrical transients

Applications:

- Metal-Halide lamp ignition circuit
- High pressure sodium lamp ignition circuit

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Maximum Ratings (T_{vj} = 25 °C unless otherwise specified)

Symbol	Characteristics	Conditions	Value	Units
t_{com}	Commutation Time[1]	T_{vj} < 125 °C	100	µs
I_{BO}	Breakover Current	50 / 60 Hz Sine Wave	10	µA
I_{TSM}	Non-Repetitive Surge On-State Current	60 Hz	20.0	A
		50 Hz	16.7	
T_{stg}	Storage Temperature Range	–	-40 to +125	°C
T_{vj}	Virtual Junction Temperature Range	–	-40 to +125	°C

Note 1 : See test circuit and waveform in Fig. 9

Electrical Characteristics - Static (T_{vj} = 25 °C unless otherwise specified)

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
I_H	Holding current	R_L = 100 Ω, 50 / 60 Hz Sine Wave	–	–	150	mA
V_{BO}	Breakover Voltage	K2201G	200	–	230	V
		K2401G	220	–	250	
		K2501G	240	–	280	
		K3601G	340	–	380	
V_{RRM} / V_{DRM}	Repetitive Peak Reverse / Peak Off-State Voltage	K2201G	180	–	–	V
		K2401G	190	–	–	
		K2501G	200	–	–	
		K3601G	270	–	–	
$I_{T(RMS)}$	R.M.S On-State Current	R = 100 Ω, 50 / 60Hz Sine Wave	–	120	–	mA
R_S	Switching Resistance[1]	50 / 60 Hz Sine Wave	100	–	–	Ω

Note 1 : $R_S = \frac{(V_{BO} - V_S)}{(I_S - I_{BO})}$

Electrical Characteristics - Dynamic (T_{vj} = 25 °C unless otherwise specified)

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
dv/dt	Rate Of Rise Of Off-State Voltage	–	–	–	1500	V/µs
di/dt	Rate Of Rise Of Off-State Current	–	–	–	150	A/µs

Thermal Characteristics

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
$R_{th(j-l)}$	Thermal Resistance Junction to Lead	–	–	–	18	K/W

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Characteristic Curves

Fig. 1. I-V Characteristics

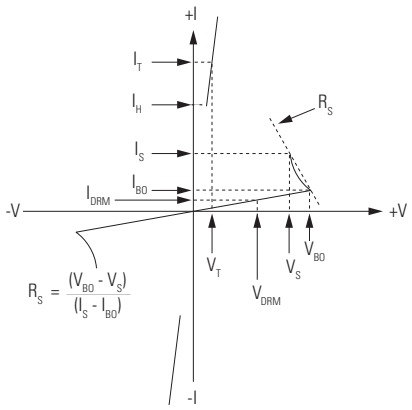


Fig. 2. Maximum Allowable Lead Temperature vs. On-State Current

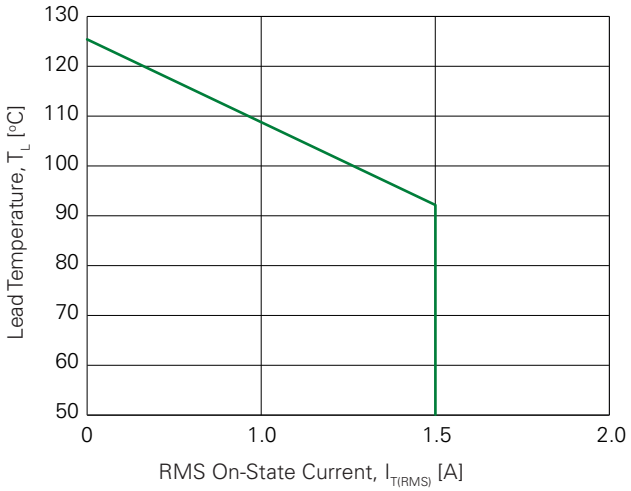


Fig. 3. Typical On-State Power Dissipation vs. RMS On-State Current

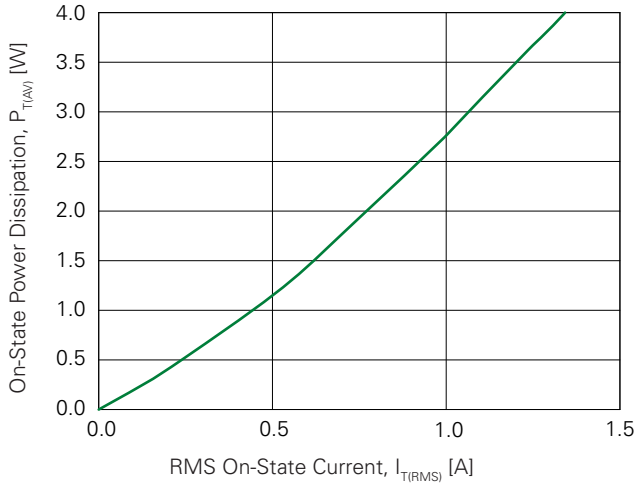


Fig. 4. Normalized V_{BO} change vs. Virtual Junction Temperature

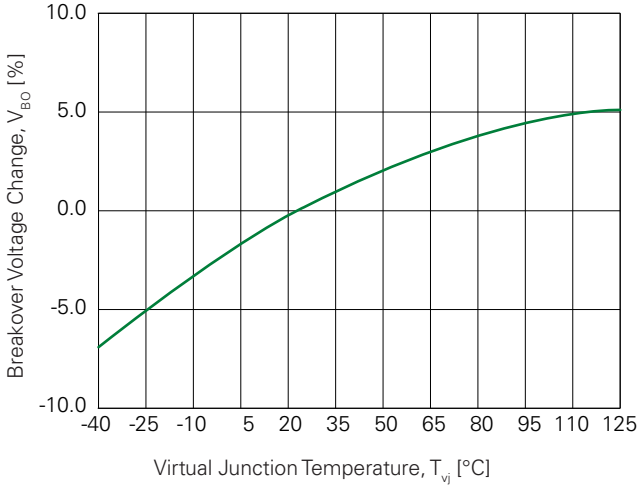


Fig. 5. Pulse On-State Current Rating

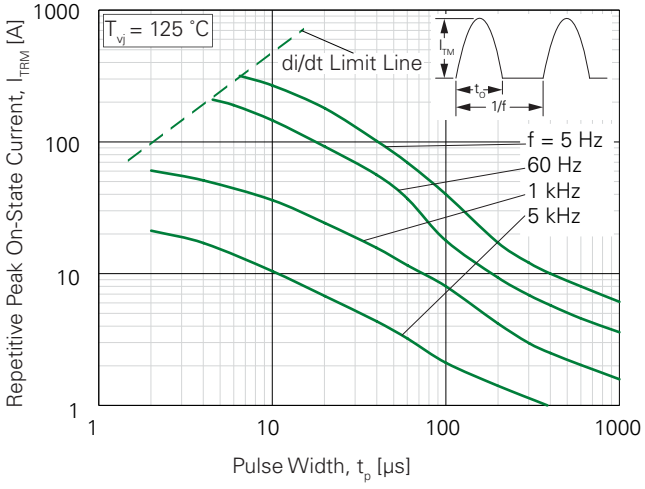
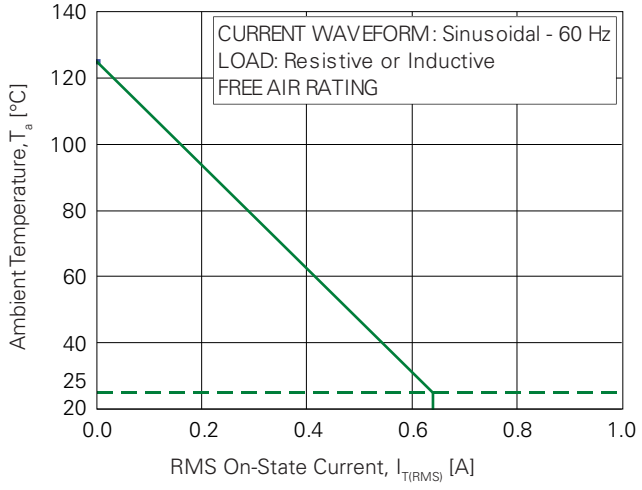


Fig. 6. Maximum Allowable Ambient Temperature vs. RMS On-State Current



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Characteristic Curves

Fig. 7. Non-Repetitive Surge Peak On-State Current vs. Number of Cycles

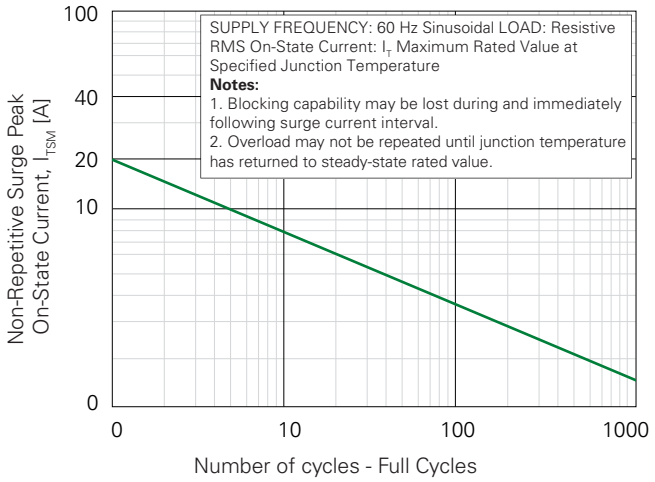


Fig. 8. Typical On-State Voltage vs On-State Current

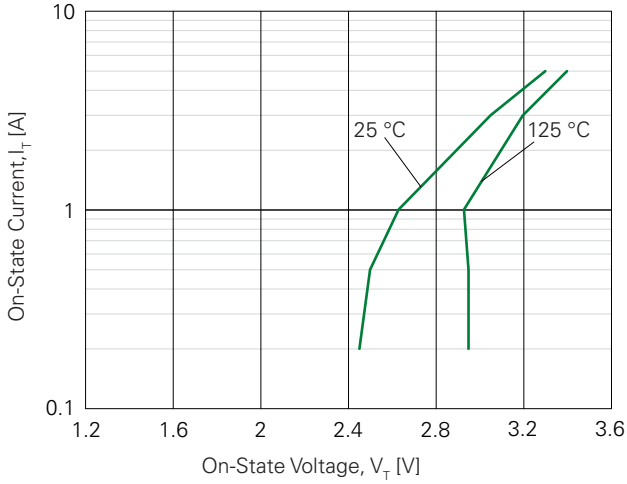


Fig. 9. Multipulse™ SIDAC t_{COMM}, Commutation Time

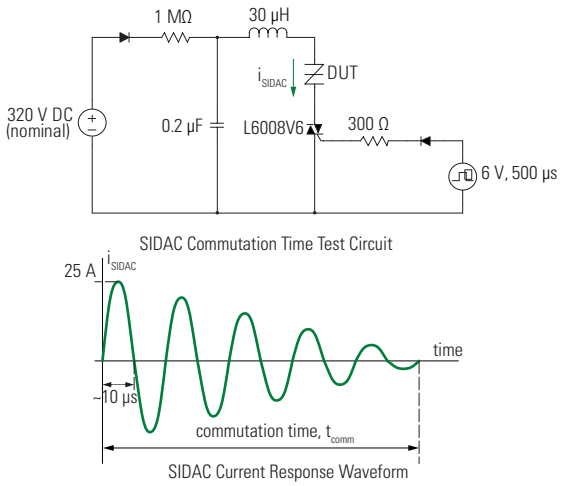
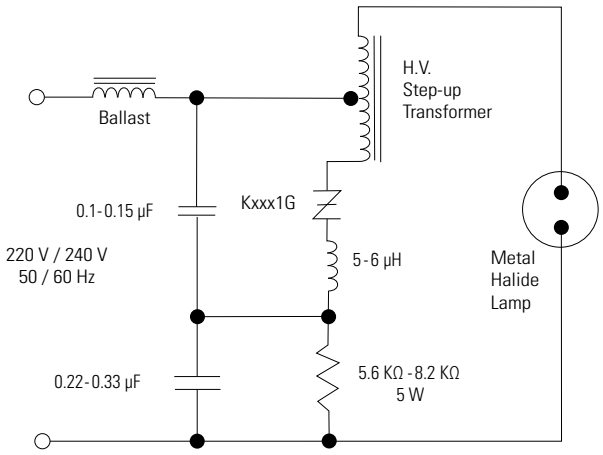


Fig. 10. Typical Metal Halide Ignitor Circuit

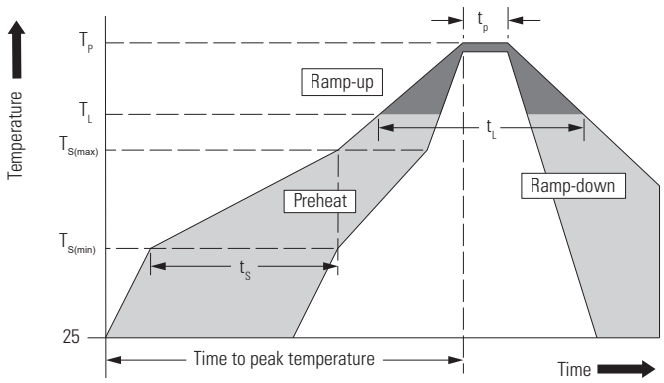


Note: With proper component selection, this circuit will produce three pulses for ignition of metal halide lamp that requires a minimum of three pulses at 4 kV magnitude and > 1µSec duration each at a minimum repetition rate of 3.3k Hz.

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Soldering Parameters

Reflow Condition		Pb – Free assembly
Pre Heat	-Temperature Min ($T_{s(min)}$)	150 °C
	-Temperature Max ($T_{s(max)}$)	200 °C
	-Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp) (T_L) to peak		5 K/s max
$T_{S(max)}$ to T_L - Ramp-up Rate		5 K/s max
Reflow	-Temperature (T_L) (Liquidus)	217 °C
	-Time (t_L)	60 – 150 seconds
Peak Temperature (T_P)		$260^{+0/-5}$ °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		5 K/s max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		280 °C



Physical Specifications

Terminal Material	100% Matte Tin Plated
Body Material	UL Recognized compound meeting flammability rating V-0
Lead Material	Copper Alloy

Package	**Weight / unit (mg)**
DO-15	385

Design Considerations

Careful selection of the correct component for the application's operating parameters and environment will go a long way toward extending the operating life of the Thyristor. Overheating and surge currents are the main killers of SIDACs. Correct mounting, soldering, and forming of the leads also help protect against component damage.

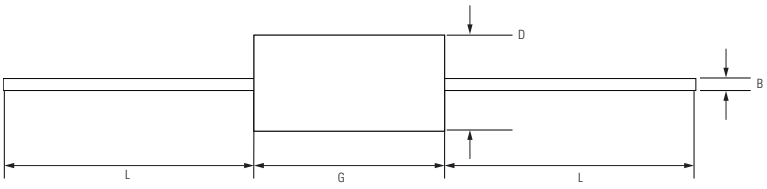
Realiability / Environmental Tests

Test	Specifications and Conditions
High Temperature Voltage Blocking	MIL-STD-750: Method 1040, Condition A Rated V_{DRM} (VAC-peak), 125 °C, 1008 hours
Temperature Cycling	MIL-STD-750: Method 1051, 100 cycles; -40 °C to 150 °C, 15-minute dwell time
Temperature & Humidity	EIA/JEDEC: JESD22-A101 1008 hours; 160 V - DC: 85 °C; 85 % relative humidity
High Temp Storage	MIL-STD-750: Method 1031 150 °C, 1008 hours
Low-Temp Storage	-40 °C, 1008 hours
Thermal Shock	MIL-STD-750: Method 1056 10 cycles; 0 °C to 100 °C; 5-minute dwelltime at each temperature; 10-sec (max) transfer time between temperature
Autoclave (Pressure Cooker Test)	EIA/JEDEC: JESD22-A102 168 hours (121°C at 2 ATMs) and 100% RH
Resistance to Solder Heat	MIL-STD-750: Method 2031 260 °C, 10 seconds
Solderability	ANSI/J-STD-002: Category 3, Test A
Repetitive Surge Life Testing	Multi firings per half cycle at 60 Hz in application circuit for 168 hours minimum

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Dimensions - DO-15 (G Package)



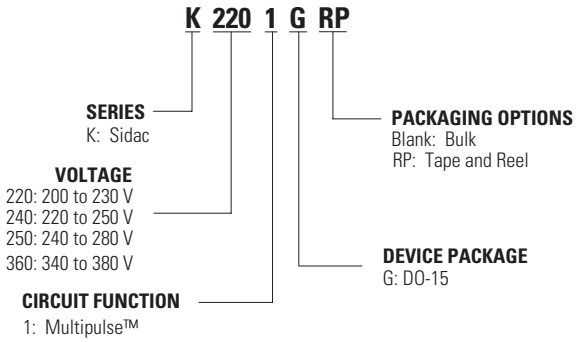
Dimension	Inches		Millimeters	
	Min	Max	Min	Max
B	0.028	0.034	0.711	0.864
D	0.120	0.140	3.048	3.556
G	0.235	0.270	5.969	6.858
L	1.000	–	25.400	–

Product Selector

Part Number	Switching Voltage Range		Blocking Voltage	Packages
	V_{BO} Minimum	V_{BO} Maximum	V_{DRM}	
K2201G	200 V	230 V	180 V	DO-15
K2401G	220 V	250 V	190 V	DO-15
K2501G	240 V	280 V	200 V	DO-15

Part Marking and Numbering





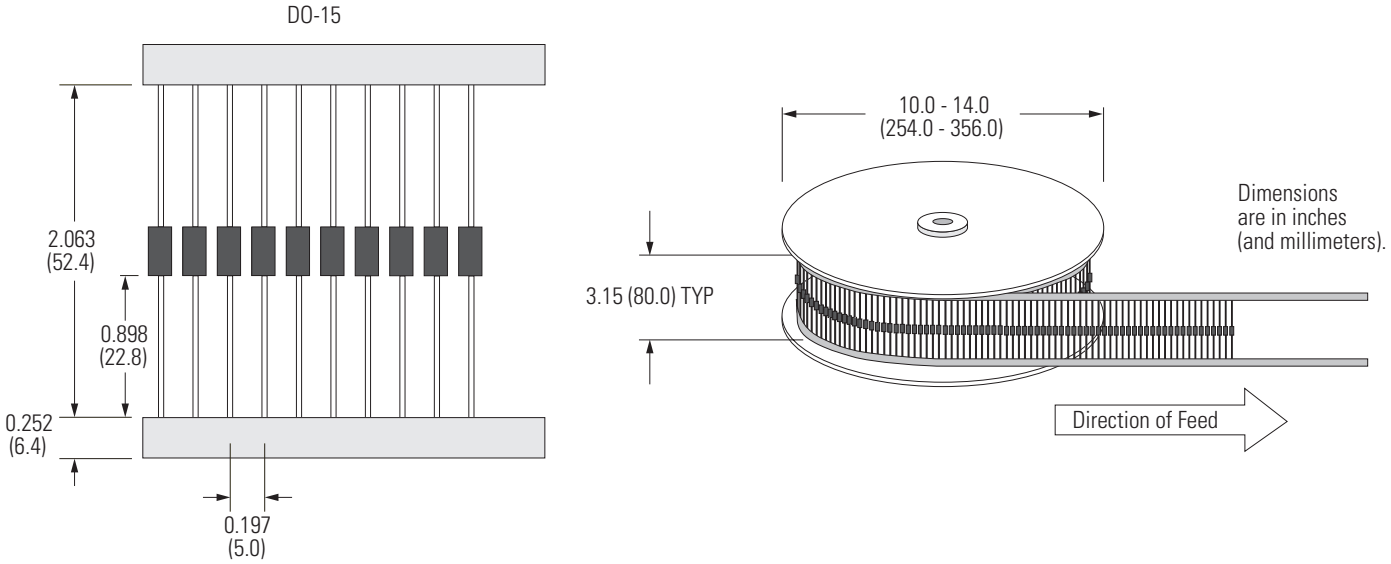
Packing Options

Part Number	Package	Package Mode	Base Quantity
Kxxx1G	DO-15	Bulk	1000
Kxxx1GRP	DO-15	Reel Pack	5000

Note: xxx = voltage

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DO-15 Embossed Carrier RP Specifications (Meets all EIA RS-29-6 Standards)



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