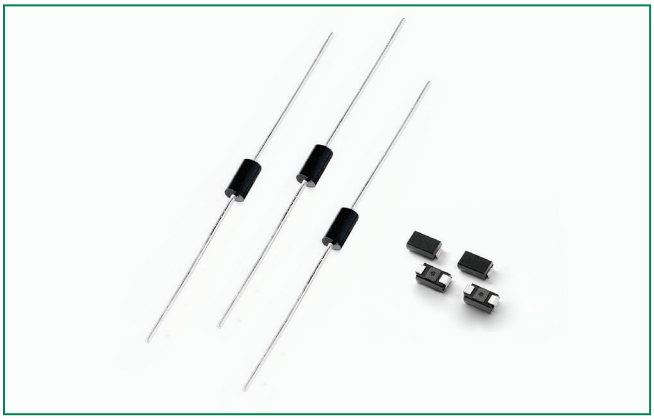
# Kxxx0yU SIDAC Series

RoHS



## Schematic Symbol

## Description

The SIDAC is a silicon unilateral voltage triggered switch. Upon application of a voltage exceeding the SIDAC breakover voltage point, the SIDAC switches on through a negative resistance region to a low on-state voltage. Conduction continues until the current is interrupted or drops below the minimum holding current of the device.

SIDACs feature glass-passivated junctions to ensure a rugged and dependable device capable of withstanding harsh environments.

## Features

- Rectified AC/DC Circuit Oriented
- Triggering Voltage of 75V to 260V
- RoHS Compliant

## Applications

Suitable for capacitor-discharge HV generator circuit

## Electrical Specifications ($T_J$ = 25°C, unless otherwise specified)

| Symbol | Parameters | Test Conditions | min | max | Unit |
|---|---|---|---|---|---|
| $V_{BO}$ | Breakover/Trigger Voltage | K0820yURP | 75 | 90 | V |
| | | K0900yURP | 79 | 97 | |
| | | K1050yURP | 95 | 110 | |
| | | K1100yURP | 104 | 118 | |
| | | K1200yURP | 110 | 125 | |
| | | K1300yURP | 120 | 138 | |
| | | K1400yURP | 130 | 146 | |
| | | K1500yURP | 142 | 157 | |
| | | K2000yURP | 190 | 210 | |
| | | K2200yURP | 210 | 230 | |
| | | K2300yURP | 220 | 240 | |
| | | K2400yURP | 230 | 250 | |
| | | K2500yURP | 240 | 260 | |
| $V_{DRM}$ | Repetitive Peak Off-state Voltage | K0820yURP | 70 | | V |
| | | K0900yURP | 70 | | |
| | | K1050yURP | 90 | | |
| | | K1100yURP | 90 | | |
| | | K1200yURP | 100 | | |
| | | K1300yURP | 110 | | |
| | | K1400yURP | 115 | | |
| | | K1500yURP | 120 | | |
| | | K2000yURP | 170 | | |
| | | K2200yURP | 190 | | |
| | | K2300yURP | 200 | | |
| | | K2400yURP | 210 | | |
| | | K2500yURP | 220 | | |



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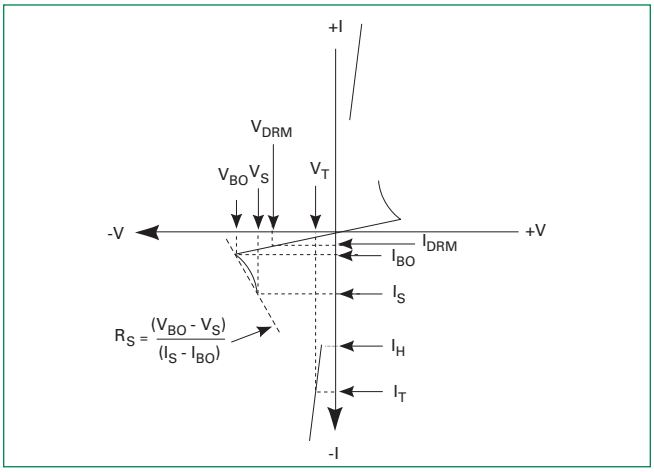
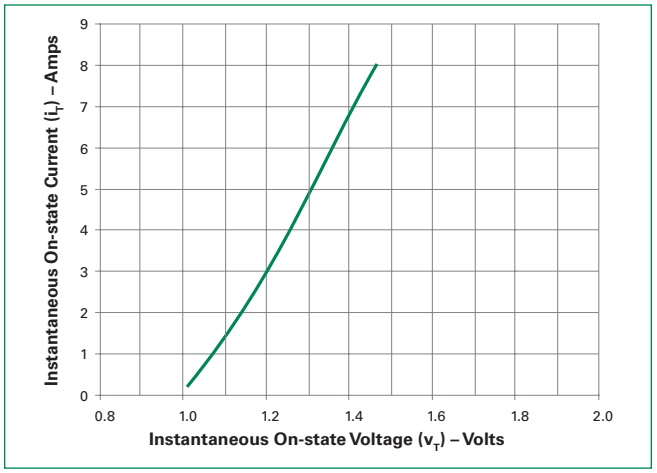
## Electrical Specifications ($T_J$ = 25°C, unless otherwise specified)

| Symbol | Parameters | Test Conditions | | | Min | Max | Unit |
|---|---|---|---|---|---|---|---|
| $I_{T(RMS)}$ | On-state RMS Current | 50/60Hz | | | | 1 | A |
| $I_{DRM}$ | Repetitive Peak Off-state Current | $V = V_{DRM}$ 50/60Hz Sine Wave | | | | 5 | µA |
| $V_{TM}$ | Peak On-state Voltage | $I_T$ = 1A | | | | 1.2 | V |
| $I_H$ | Dynamic Holding Current | $R_L$ = 100Ω 50/60Hz Sine Wave | | | 10 | 80 | mA |
| $R_S$ | Switching Resistance, $R_S = \frac{(V_{BO} - V_S)}{(I_S - I_{BO})}$ | 50/60Hz Sine Wave | | | 100 | | Ω |
| $I_{BO}$ | Breakover Current | 50/60Hz Sine Wave | | | | 10 | µA |
| $I_{TRM}$ | Peak Repetitive Pulse Current (refer to figure 4) | K0820yU~ K0900yU | $T_P$=10µs $T_A$=125C | 60Hz | | 80 | A |
| | | | | 5Hz | | 160 | |
| | | K1050yU~ K2000yU | $T_P$=10µs $T_A$=125C | 60Hz | | 120 | |
| | | | | 5Hz | | 280 | |
| | | K2200yU~ K2500yU | $T_P$=10µs $T_A$=135C | 60Hz | | 120 | |
| | | | | 5Hz | | 280 | |
| $I_{TSM}$ | Peak Non-repetitive Surge Current (refer to figure 5) | Single Cycle | | 60Hz | | 20 | A |
| | | | | 50Hz | | 16.7 | |
| di/dt | Critical Rate of Rise of On-state Current | | | | | 150 | A/µs |
| dv/dt | Critical Rate of Rise of Off-state Voltage | | | | 1500 | | V/µs |
| $T_S$ | Storage Temperature Range | | | | -40 | 150 | °C |
| $T_J$ | Junction Temperature Range | K0820yU~K2000yU | | | -40 | 125 | °C |
| | | K2200yU~K2500yU | | | -40 | 150 | |
| $R_{\theta JL}$ | Thermal Resistance, Junction to Lead | DO-214 | | | | 30 | °C/W |
| | | DO-15 | | | | 18 | |

### Figure 1: V-I Characteristics




### Figure 2: On-state Current vs. On-state Voltage (Typical)



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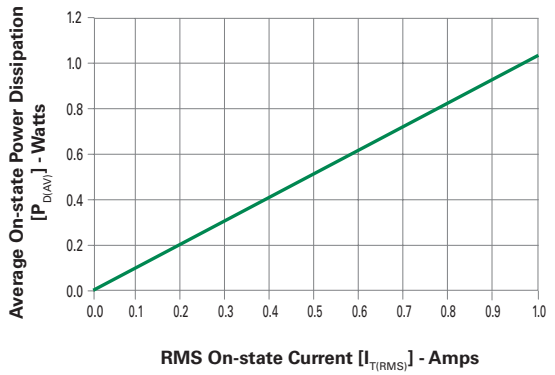
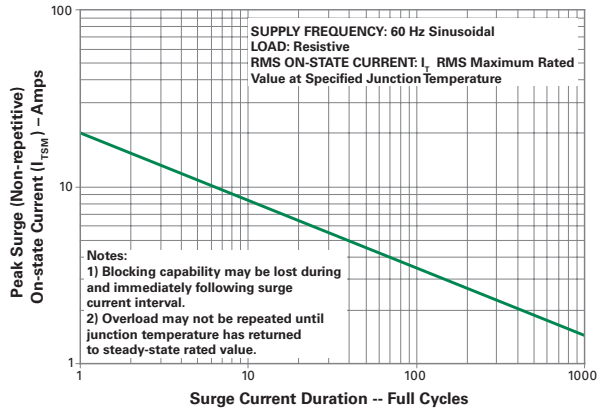
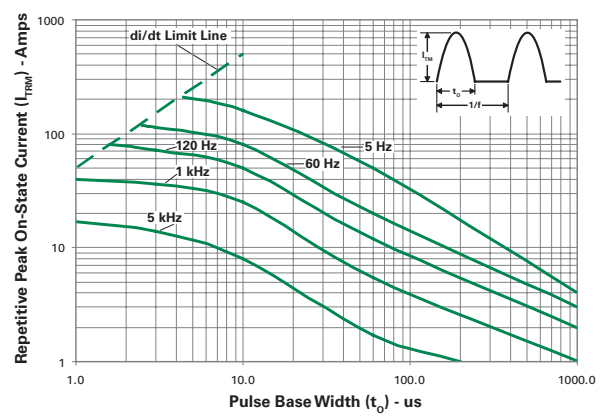
## Figure 3: Power Dissipation vs. On-state Current (Typical)



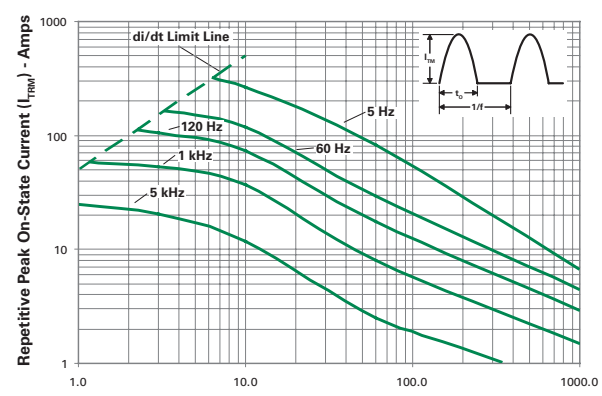

## Figure 4: Peak Non-repetitive Surge Current ($I_{TSM}$) vs. Number of Cycles



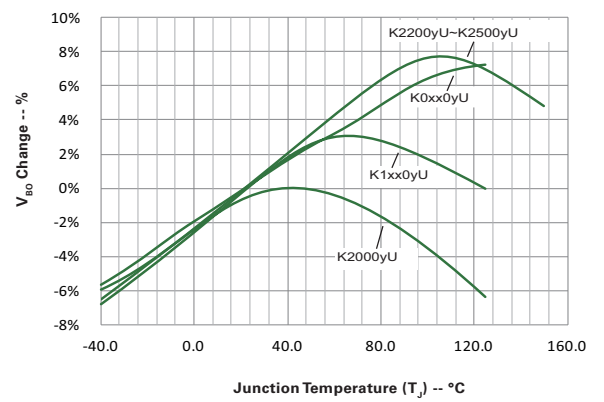

## Figure 5: Repetitive Peak On-state Current(ITRM) vs. Pulse Width at Various Frequencies of K0820yU/K0900yU



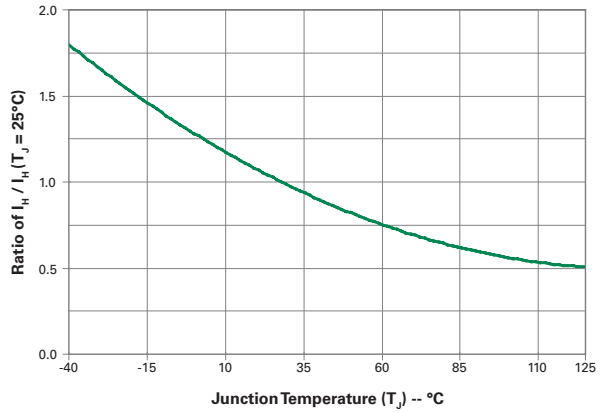

## Figure 6: Repetitive Peak On-state Current (ITRM) vs. Pulse Width at Various Frequencies of K1050yU~K2500yU




## Figure 7: Normalized $V_{BO}$ Change vs. Junction Temperature




## Figure 8: Normalized DC Holding Current vs. Junction Temperature



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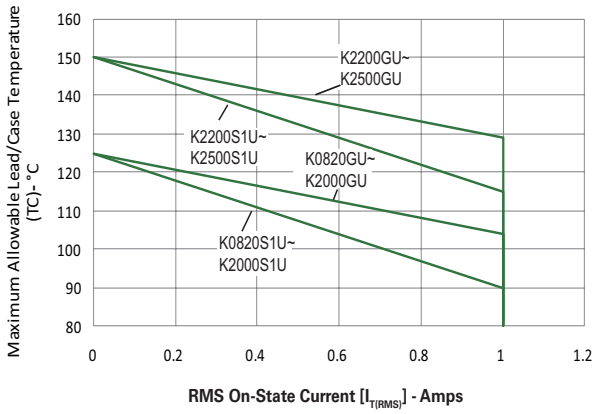
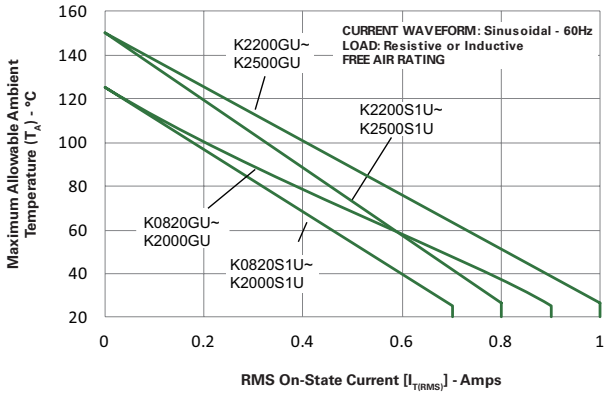
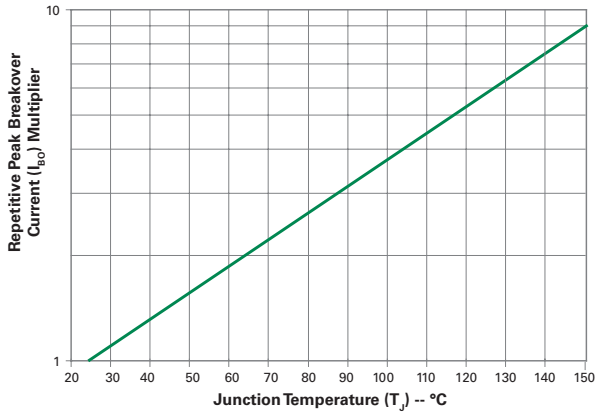
## Figure 9: Maximum Allowable Case Temperature vs. RMS On-State Current



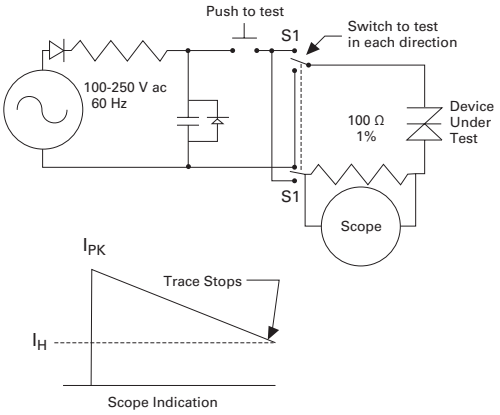

## Figure 10: Maximum Allowable Ambient Temperature vs. RMS On-State Current



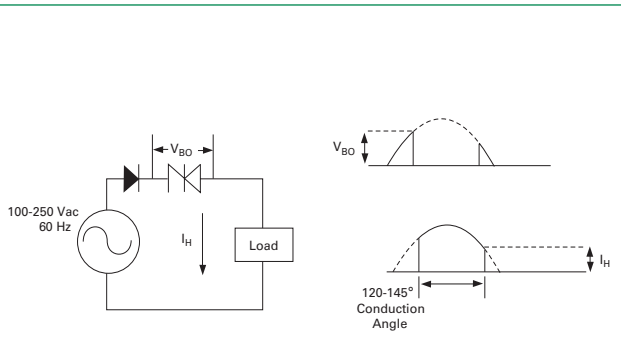

## Figure 11: Normalized Repetitive Peak Breakover Current ($I_{BO}$) vs. Junction Temperature



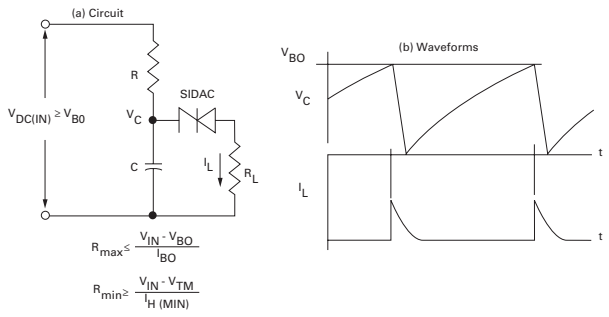

## Figure 12: Dynamic Holding Current Test Circuit for SIDACs




## Figure 13: Basic SIDAC Circuit




## Figure 14: Relaxation Oscillator Using a SIDAC



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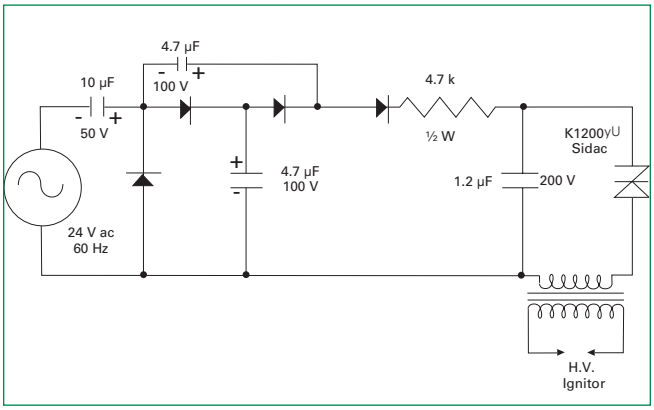
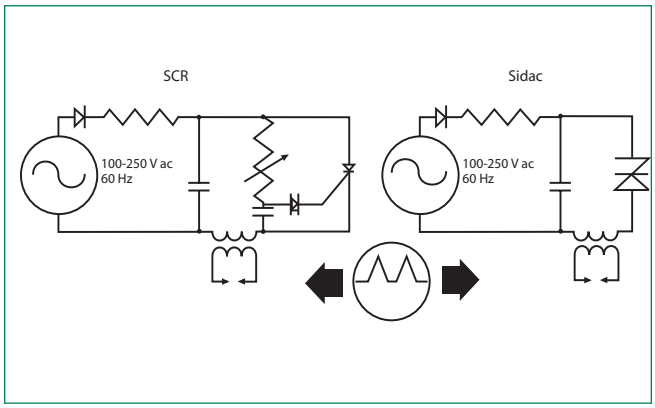
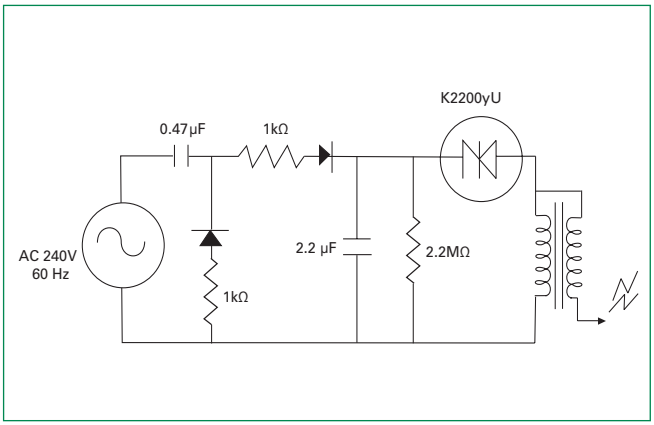
## Figure 15: Low-voltage Input Circuit for Gas Ignition



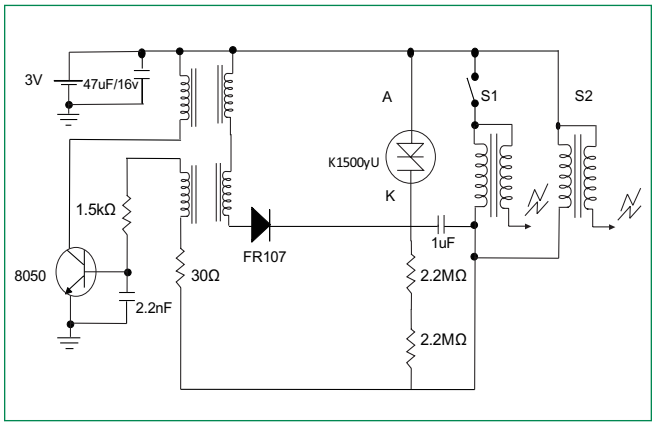

## Figure 16: Comparison of SIDAC versus SCR for Gas Ignitor Circuit




## Figure 17: SIDAC Circuit for High-power Igniter

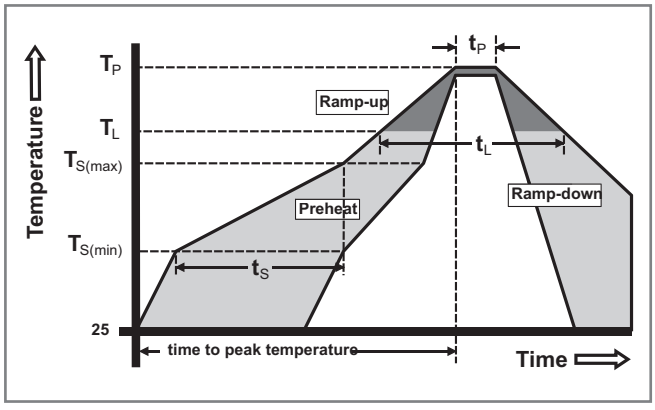



## Figure 18: SIDAC Circuit for Gas Ignition




## 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°C/second max |
| $T_{S(max)}$ to $T_L$ - Ramp-up Rate | | 5°C/second max |
| Reflow | -Temperature ($T_L$) (Liquidus) | 217°C |
| | -Temperature ($t_L$) | 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°C/second max |
| Time 25°C to peak Temperature ($T_P$) | | 8 minutes Max. |
| Do not exceed | | 280°C |



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## Physical Specifications

| | |
|---|---|
| **Terminal Finish** | 100% Matte Tin Plated |
| **Body Material** | UL recognized epoxy meeting flammability classification 94V-0 |
| **Lead Material** | Copper Alloy |

## Design Considerations

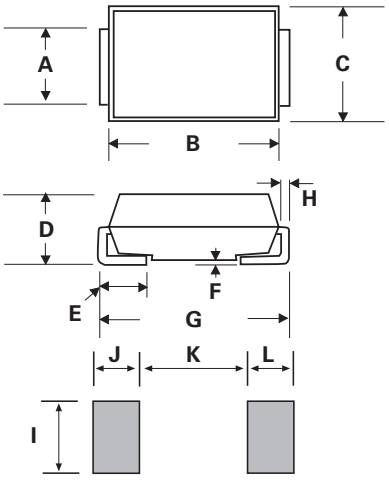
Careful selection of the correct device for the application's operating parameters and environment will go a long way toward extending the operating life of the Thyristor. Overheating and surge currents are the main killers of SIDACs. Correct mounting, soldering, and forming of the leads also help protect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

## Reliability/Environmental Tests

| Test | Specifications and Conditions |
|---|---|
| **High Temperature Voltage Blocking** | MIL-STD-750: Method 1040, Condition A Rated $V_{DRM}$ (Rectified VAC-peak), $T_J$, 504 hours |
| **Temperature Cycling** | MIL-STD-750: Method 1051 -40°C to 150°C, 15-minute dwell, 100 cycles |
| **Biased Temperature & Humidity** | EIA/JEDEC: JESD22-A101 80% min $V_{BO}$ ($V_{DC}$), 85°C, 85%RH, 1008 hours |
| **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 0°C to 100°C, 5-minute dwell, 10-second transfer, 10 cycles |
| **Resistance to Solder Heat** | MIL-STD-750: Method 2031 260°C, 10 seconds |
| **Solderability** | ANSI/J-STD-002: Category 3 |
| **Lead Bend** | MIL-STD-750: Method 2036, Condition E |

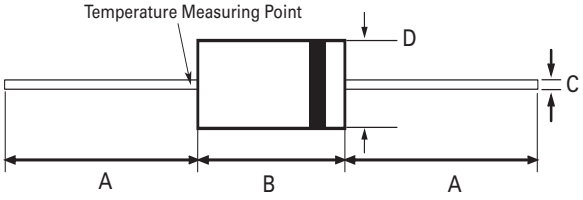
## Dimensions

**DO-214AC (SMA)**




| Dimensions | Inches | | Millimeters | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.049 | 0.065 | 1.250 | 1.650 |
| B | 0.157 | 0.177 | 3.990 | 4.500 |
| C | 0.100 | 0.110 | 2.540 | 2.790 |
| D | 0.078 | 0.090 | 1.980 | 2.290 |
| E | 0.030 | 0.060 | 0.780 | 1.520 |
| F | - | 0.008 | - | 0.203 |
| G | 0.194 | 0.208 | 4.930 | 5.280 |
| H | 0.006 | 0.012 | 0.152 | 0.305 |
| I | 0.070 | - | 1.800 | - |
| J | 0.082 | - | 2.100 | - |
| K | - | 0.090 | - | 2.300 |
| L | 0.082 | - | 2.100 | - |

## Dimensions — DO-15




| Dimension | Inches | | Millimeters | |
|---|---|---|---|---|
| | Max | Max | Min | Max |
| A | 1.000 | - | 25.40 | - |
| B | 0.230 | 0.300 | 5.80 | 7.60 |
| C | 0.028 | 0.034 | 0.71 | 0.86 |
| D | 0.104 | 0.140 | 2.60 | 3.60 |



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# Teccor® brand Thyristors
## Standard Unidirectional SIDACs

## Product Selector

| Part Number | Switching Voltage Range | | Blocking Voltage | Packages | |
|---|---|---|---|---|---|
| | $V_{BO}$ Minimum | $V_{BO}$ Maximum | $V_{DRM}$ | DO-15 | DO-214 |
| K0820yURP | 75 | 90 | 70 | K0820GURP | K0820S1URP |
| K0900yURP | 79 | 97 | 70 | K0900GURP | K0900S1URP |
| K1050yURP | 95 | 110 | 90 | K1050GURP | K1050S1URP |
| K1100yURP | 104 | 118 | 90 | K1100GURP | K1100S1URP |
| K1200yURP | 110 | 125 | 100 | K1200GURP | K1200S1URP |
| K1300yURP | 120 | 138 | 110 | K1300GURP | K1300S1URP |
| K1400yURP | 130 | 146 | 115 | K1400GURP | K1400S1URP |
| K1500yURP | 142 | 157 | 120 | K1500GURP | K1500S1URP |
| K2000yURP | 190 | 210 | 170 | K2000GURP | K2000S1URP |
| K2200yURP | 210 | 230 | 190 | K2200GURP | K2200S1URP |
| K2300yURP | 220 | 240 | 200 | K2300GURP | K2300S1URP |
| K2400yURP | 230 | 250 | 210 | K2400GURP | K2400S1URP |
| K2500yURP | 240 | 260 | 220 | K2500GURP | K2500S1URP |

## Packing Options

| Part Number | Marking | Weight | Package Mode | Packages | Base Quantity |
|---|---|---|---|---|---|
| Kxxx0S1URP | Kxxx | 0.062g | Reel Pack | DO-214AC | 5000 |
| Kxxx0GURP | Kxxx | 0.38g | Reel Pack | DO-15 | 5000 |

## Part Numbering System

K xxx 0 S1 U RP

**DEVICE TYPE**
K: Sidac

**MEDIAN VOLTAGE**
082: 75V~ 90V
090: 79V~ 97V
105: 95V~110V
110: 104V~118V
120: 110V~125V
130: 120V~138V
140: 130V~146V
150: 142V~157V
200: 190V~210V
220: 210V~230V
230: 220V~240V
240: 230V~250V
250: 240V~260V

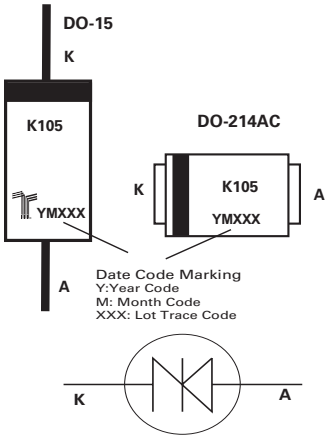
**PACKAGING OPTION**
RP: Tape and Reel

**UNIDIRECTIONAL**

**PACKAGE TYPE**
S1: DO-214AC package
G: DO-15 package

**CONSTRUCTION VARIABLE**
0: Single chip SIDAC

## Part Marking System



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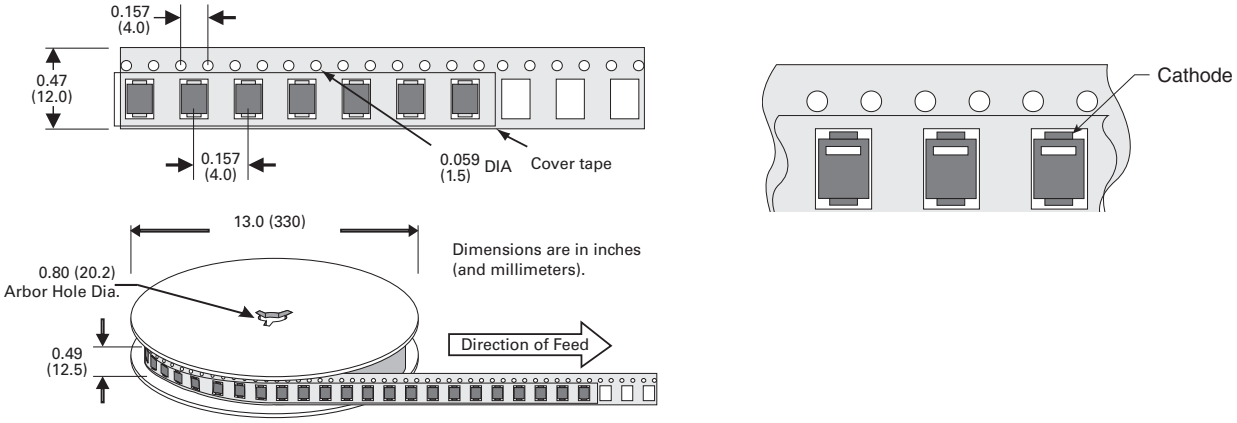
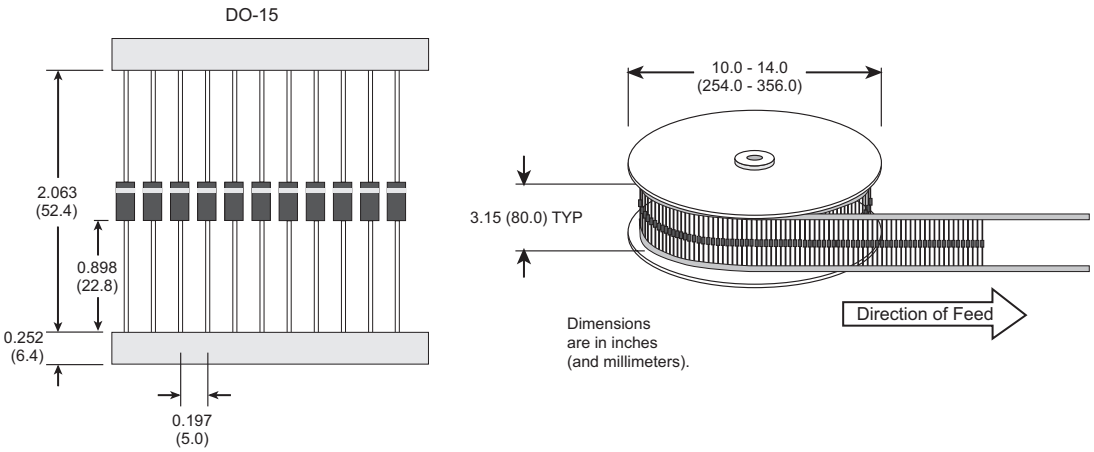
## Tape and Reel Specification — DO-214AC




## DO-15 Reel Pack (RP) Specifications

### Meets all EIA RS-296 Standards



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- *Специальные условия для постоянных клиентов.*
- *Подбор аналогов.*
- *Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.*

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- *Поставку компонентов, требующих военную и космическую приемку.*
- *Входной контроль качества.*
- *Наличие сертификата ISO.*

*В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.*

*Конструкторский отдел помогает осуществить:*

- *Регистрацию проекта у производителя компонентов.*
- *Техническую поддержку проекта.*
- *Защиту от снятия компонента с производства.*
- *Оценку стоимости проекта по компонентам.*
- *Изготовление тестовой платы монтаж и пусконаладочные работы.*

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