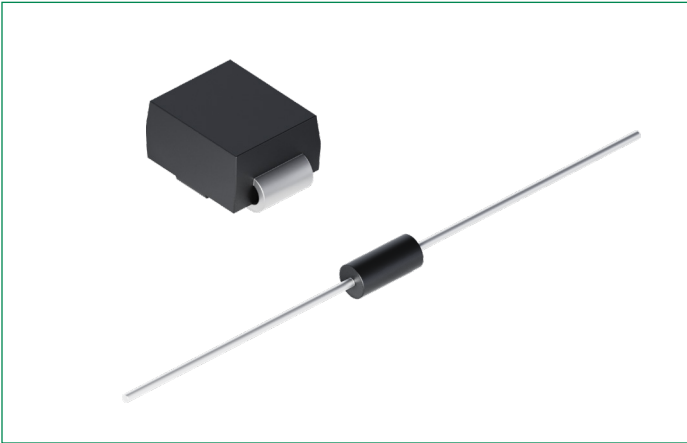


# K2xx0yHU Series

## High Energy Unidirectional SIDACs

RoHS

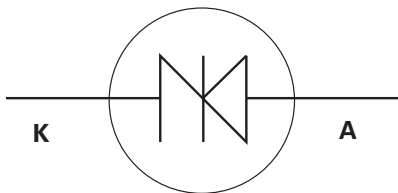


### Pinout Diagram

DO-15



DO-214



**K:** Cathode; **A:** Anode

### Description

The K2xx0yHU device is a high-energy SIDAC switch for gas ignition applications that require a high pulse current, especially at a low repetition rate. It is offered in a DO-15 leaded package and a DO-214AA surface mount package.

Voltage activation of this solid-state switch is accomplished with peak voltage level of 190–260 V. SIDAC is a silicon bilateral voltage-triggered thyristor switch that switches on through a negative resistance region to a low on-state voltage. Conduction continues until the current is interrupted or lowered below the minimum holding current of the device.

### Features

- AC circuit-oriented
- Triggering voltage of 190–260 V
- Unidirectional
- 280 A pulse current capability
- RoHS-compliant

### Applications

The K2xx0yHU series is suitable for applications such as high voltage power supplies, natural gas igniters, and Xenon flash ignition.

### Product Summary

Characteristic	Value	Unit
$V_{BO}$	190 to 260	V
$I_{BO}$	500	$\mu$ A
$I_{T(RMS)}$	1	A

## Maximum Ratings

Symbol	Characteristics	Conditions	Value	Units
$I_{T(RMS)}$	On-state RMS Current	50/ 60 Hz, $T_{vj} < 125\text{ }^{\circ}\text{C}$	1	A
di/dt	Critical Rate of Rise of On-state Current	–	220	A/ $\mu\text{s}$
$T_{stg}$	Storage Temperature Range	–	–40 to 150	$^{\circ}\text{C}$
$T_{vj}$	Virtual Junction Temperature Range	–	–40 to 125	$^{\circ}\text{C}$

## Electrical Characteristics ( $T_{vj} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
$I_H$	Holding Current	$R_L = 100\ \Omega$ , 50/ 60 Hz Sine Wave	–	–	60	mA
dv/dt <sub>(cr)</sub>	Critical Rate-of-rise of Off-stage Voltage	–	1500	–	–	V/ $\mu\text{s}$
$R_S$	Switching Resistance	50/ 60 Hz Sine Wave	100	–	–	$\Omega$
$I_{BO}$	Breakover Current	50/ 60 Hz Sine Wave	–	–	500	$\mu\text{A}$
$V_{BO}$	Breakover/Trigger Voltage	K2000yHU	190	–	210	V
		K2200yHU	210	–	230	
		K2400yHU	230	–	250	
		K2500yHU	240	–	260	
$V_{DRM}$	Repetitive Peak Off-state Voltage	K2000yHU	180	–	–	V
		K2200yHU	190	–	–	
		K2400yHU	210	–	–	
		K2500yHU	220	–	–	

Note: y = package

## Static Characteristics ( $T_{vj} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

Symbol	Characteristics	Conditions	Maximum Value	Units	
$V_{TM}$	Peak On-state Voltage	$I_T = 1\text{ A}$	1.5	V	
$I_{TRM}$	Peak Repetitive Pulse Current <sup>1</sup>	$t_p = 10\ \mu\text{s}$	60 Hz	120	A
			5 Hz	280	

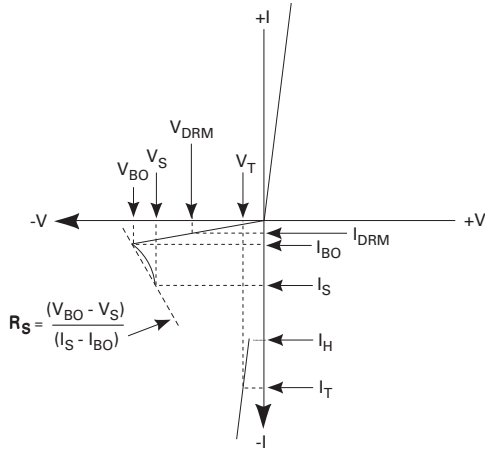
Note 1: Refer to Figure 4

## Thermal Characteristics

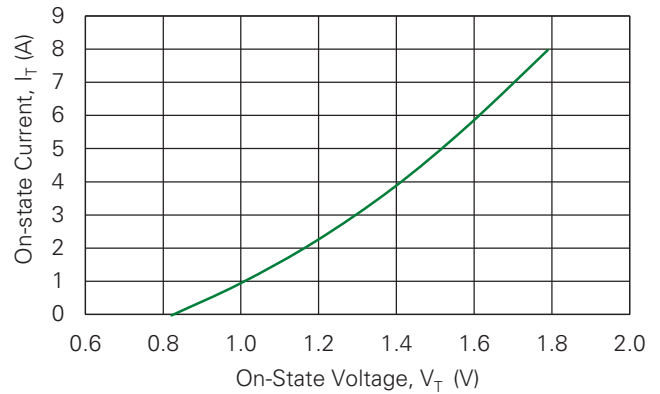
Symbol	Characteristics	Conditions	Value	Units
$R_{th(j-l)}$	Thermal Resistance, Junction to Lead	DO-15	18	K/W
		DO-214AA	30	
$R_{th(j-a)}$	Thermal Resistance, Junction to Ambient	DO-15	75	K/W

**Characteristic Curves**

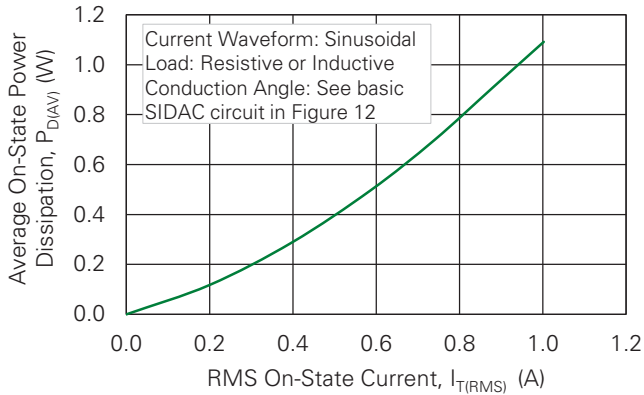
**Figure 1. V-I Characteristics**



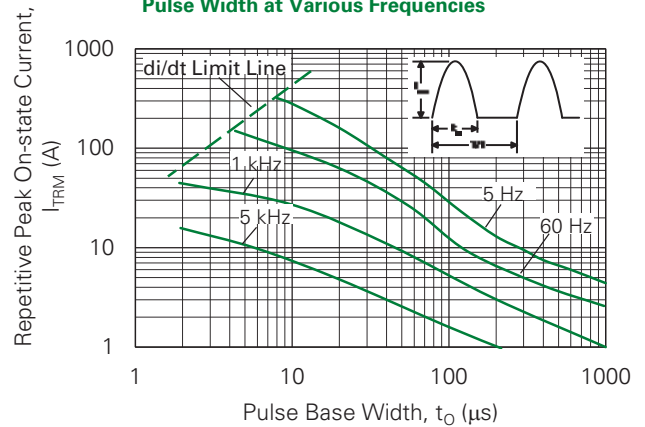
**Fig. 2. Typical On-State Current vs. On-state Voltage**



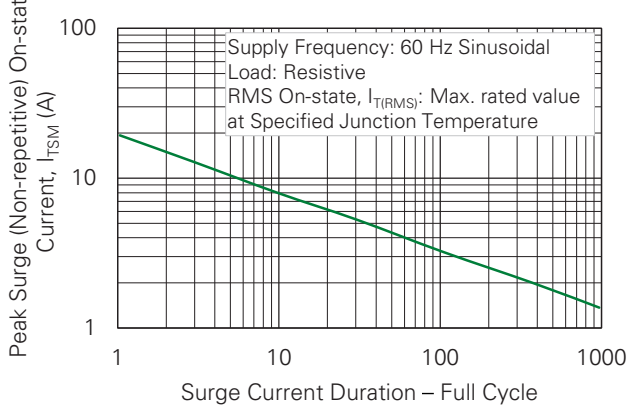
**Fig. 3. Power Dissipation vs. Typical On-state Current**



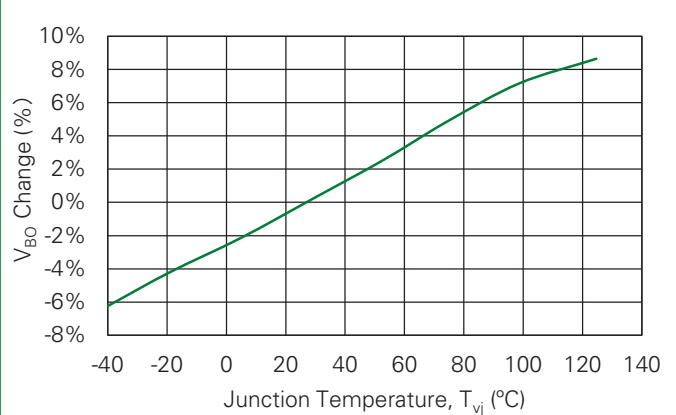
**Fig. 4. Repetitive Peak On-state Current vs. Pulse Width at Various Frequencies**



**Fig. 5. Surge Peak On-state Current vs. Number of Cycles**

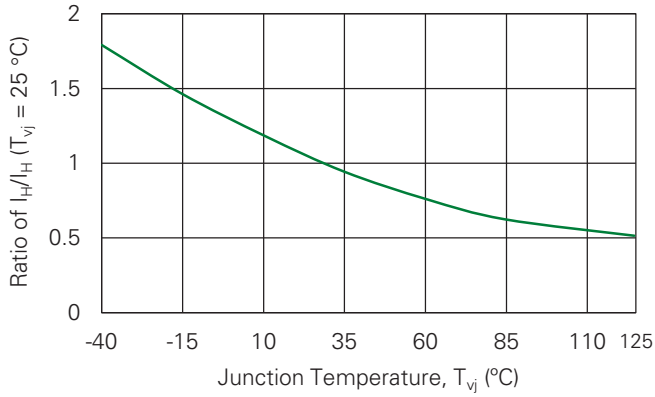


**Fig. 6. Normalized V\_BO Change vs. Junction Temperature**

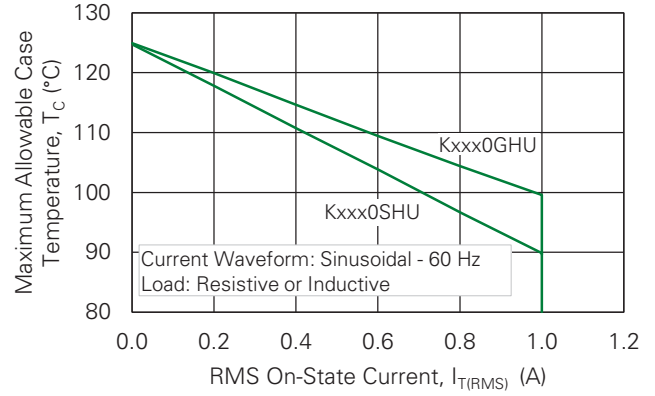


- Notes:
1. Blocking capability may be lost during and immediately following surge current interval.
  2. Overload should not be repeated until junction temperature has returned to steady-state rated value.

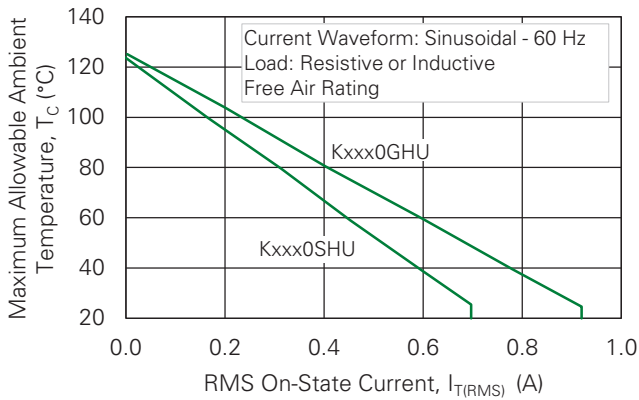
**Fig. 7. Normalized DC Holding Current vs. Junction Temperature**



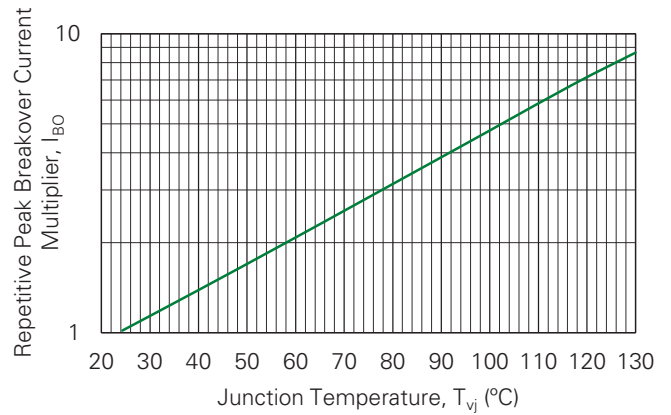
**Fig. 8. Maximum Allowable Case Temperature vs. RMS On-state Current**



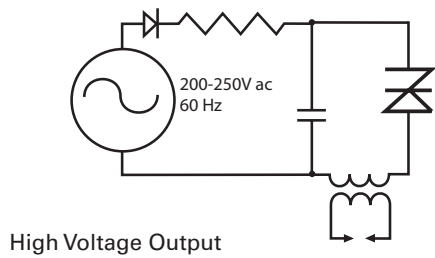
**Fig. 9. Maximum Allowable Ambient Temperature vs. RMS On-state Current**



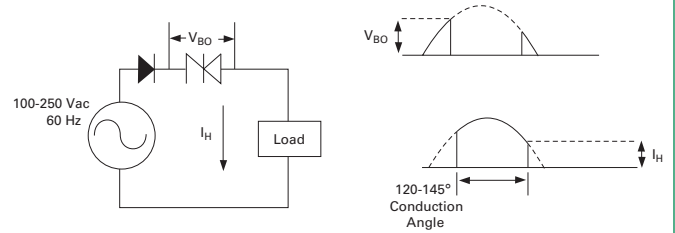
**Fig. 10. Normalized  $V_{BO}$  Change vs. Junction Temperature**



**Figure 11. General Gas Ignitor Circuit**



**Figure 12. Basic SIDAC Circuit**

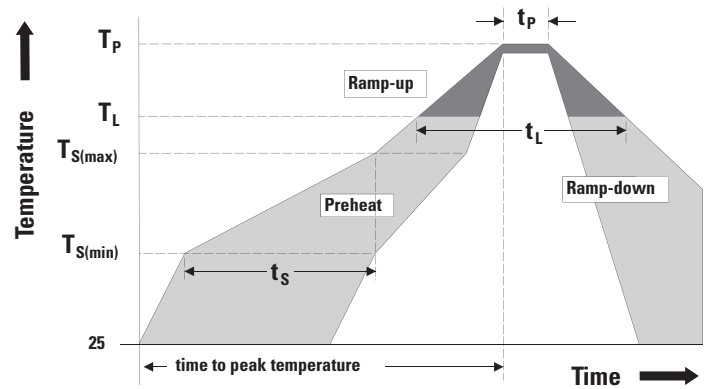


## Soldering Parameters

Characteristic		Value
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
	Time ( $t_L$ )	60 – 150 seconds
Peak Temperature ( $T_P$ )		260 <sup>+0/-5</sup> °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

## Environmental Specifications

Test	Specifications and Conditions
High Temperature Voltage-Blocking	MIL-STD-750, M-1040, Condition A Rated $V_{DRM}$ (VAC-peak), 125 °C, 1008 hours
Temperature Cycling	MIL-STD-750, M-1051, 100 cycles; -40 °C to +150 °C; 15-min dwell-time
Biased Temperature and Humidity	EIA/JEDEC: JESD22-A101 (VDC), 85 °C, 85 %RH, 1008 hours
High-temperature Storage	MIL-STD-750, M-1031, 1008 hours; 150 °C
Low-temperature Storage	1008 hours; -40 °C
Thermal Shock	MIL-STD-750: Method 1056, 0 °C to 100 °C, 5-minute dwell, 10-second transfer, 10 cycles
Autoclave (Pressure Cooker Test)	EIA/JEDEC: JESD22-A102, 121 °C, 100 %RH, 2 atm, 168 hours
Resistance to Solder Heat	MIL-STD-750: Method 2031, 260 °C, 10 seconds
Solderability	ANSI/J-STD-002: category 3
Repetitive Surge Life Testing	MIL-STD-750, M-2036, Condition E



## Physical Specifications

Characteristic	Value
Terminal Finish	100 % Matte Tin-plated
Body Material	UL Recognized compound meeting flammability rating 94V-0
Terminal Material	Copper Alloy

## Product Selector

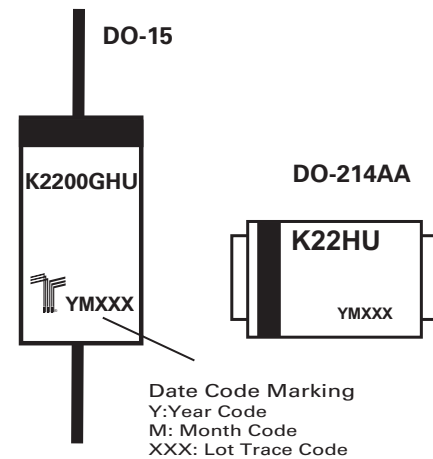
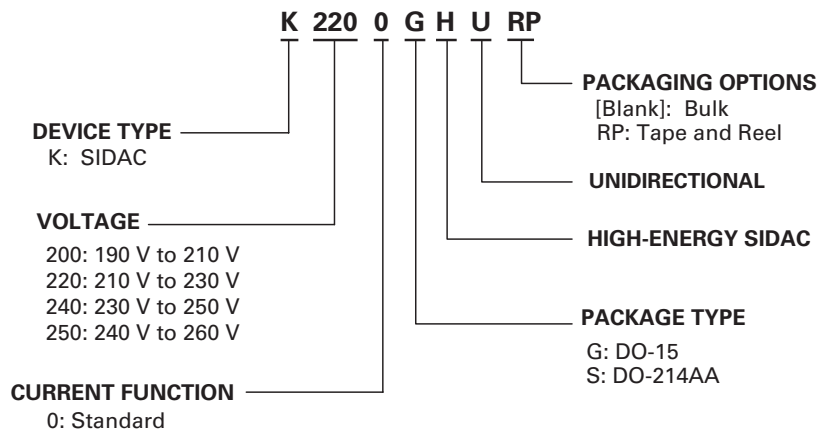
Part Number	Switching Voltage Range		Blocking Voltage	Package
	V <sub>BO</sub> Minimum	V <sub>BO</sub> Maximum	V <sub>DRM</sub>	
K2000GHU	190 V	210 V	180 V	DO-15
K2000SHU	190 V	210 V	180 V	DO-214AA
K2200GHU	210 V	230 V	190 V	DO-15
K2200SHU	210 V	230 V	190 V	DO-214AA
K2400GHU	230 V	250 V	210 V	DO-15
K2400SHU	230 V	250 V	210 V	DO-214AA
K2500GHU	240 V	260 V	220 V	DO-15
K2500SHU	240 V	260 V	220 V	DO-214AA

## Packing Options

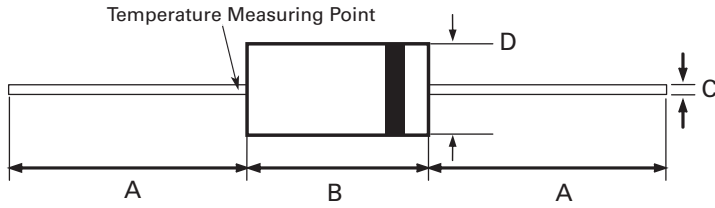
Part Number	Marking	Weight	Packing Mode	Base Quantity
K2xx0GHU	K2xx0GHU	0.38 g	Bulk	1000
K2xx0GHURP	K2xx0GHU	0.38 g	Reel Pack	5000
K2xx0SHURP	KxxHU	0.10 g	Reel Pack	2500

Note: xx = voltage

## Part Numbering and Marking

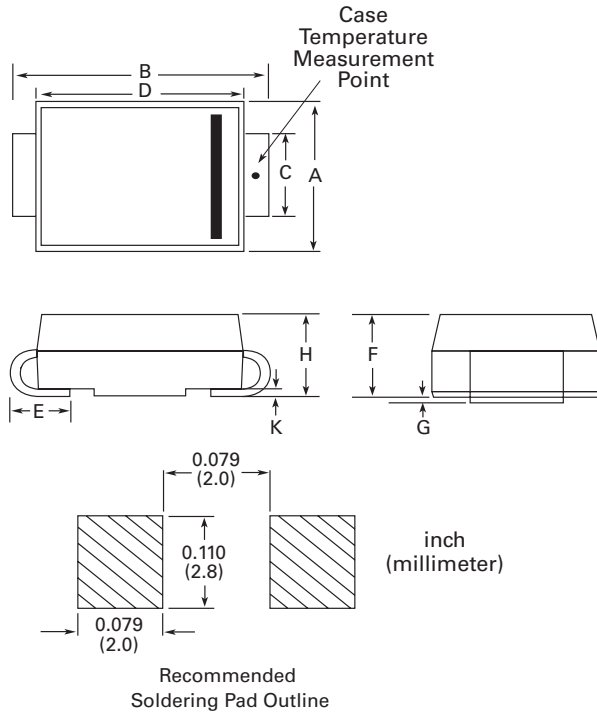


**Package Dimensions** DO-15



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	25.40	–	1.000	–
B	5.80	7.60	0.230	0.300
C	0.71	0.86	0.028	0.034
D	2.60	3.60	0.104	0.140

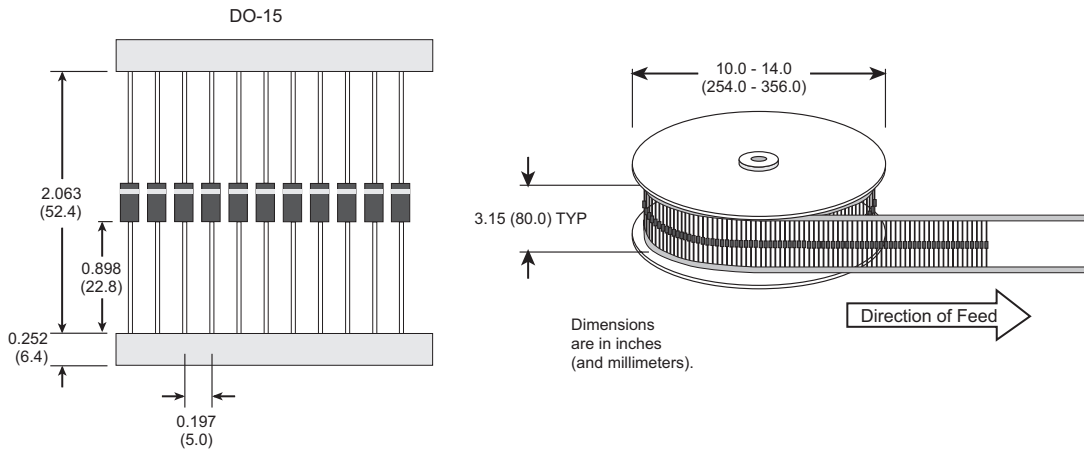
**Package Dimensions** DO-214AA



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	3.30	3.95	0.130	0.156
B	5.10	5.60	0.201	0.220
C	1.95	2.20	0.077	0.087
D	4.05	4.60	0.159	0.181
E	0.75	1.60	0.030	0.063
F	1.90	2.45	0.075	0.096
G	0.05	0.20	0.002	0.008
H	1.95	2.65	0.077	0.104
K	0.15	0.41	0.006	0.016

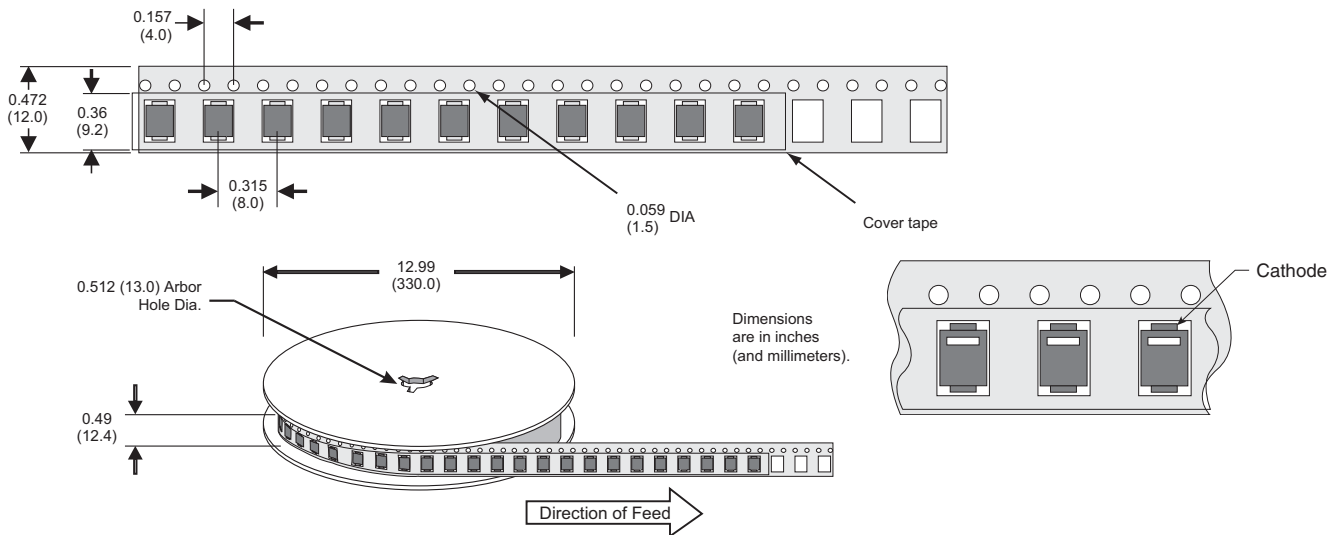
### DO-15 Reel Pack (RP) Specifications

Meets all EIA-RS-296 Standards



### DO-214AA Embossed Carrier Reel Pack (RP) Specifications

Meets all EIA-481-1 Standards



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