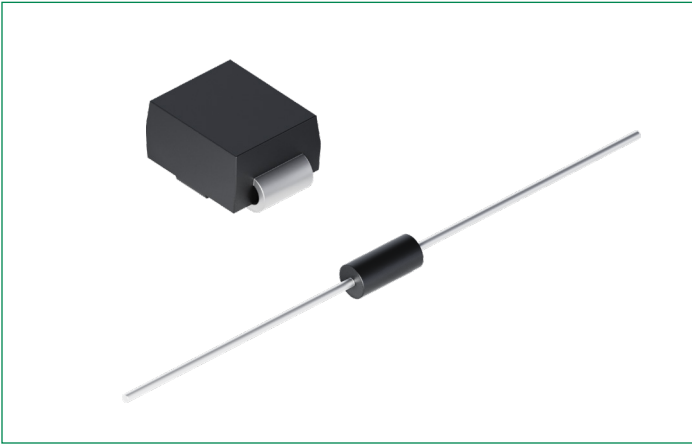


K2xx0yHU Series

High Energy Unidirectional SIDACs

RoHS

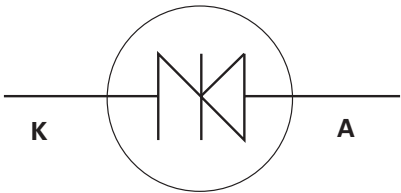


Pinout Diagram

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	μA
$I_{T(RMS)}$	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/ μs
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	$R_L = 100\text{ }\Omega$, 50/ 60 Hz Sine Wave	–	–	60	mA
$dv/dt_{(cr)}$	Critical Rate-of-rise of Off-stage Voltage	–	1500	–	–	V/ μs
R_S	Switching Resistance	50/ 60 Hz Sine Wave	100	–	–	Ω
I_{BO}	Breakover Current	50/ 60 Hz Sine Wave	–	–	500	μA
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 ¹	$t_p = 10\text{ }\mu\text{s}$	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

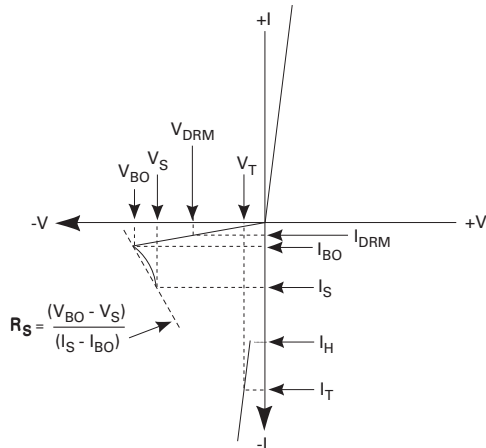


Fig. 2. Typical On-State Current vs. On-state Current

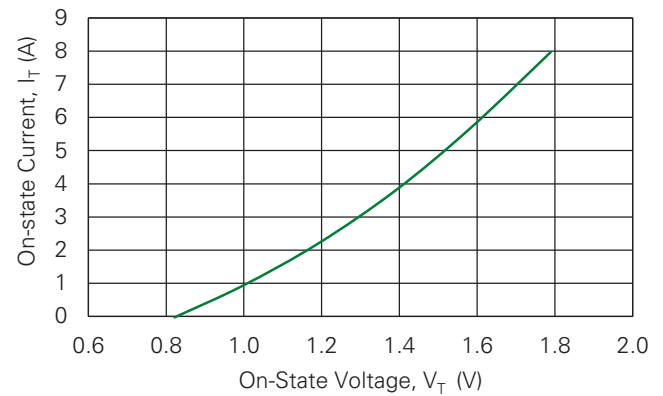


Fig. 3. Power Dissipation vs. Typical On-state Current

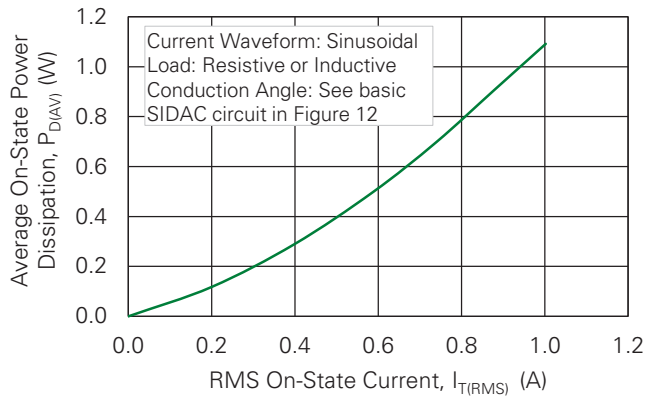


Fig. 4. Repetitive Peak On-state Current vs. Pulse Width at Various Frequencies

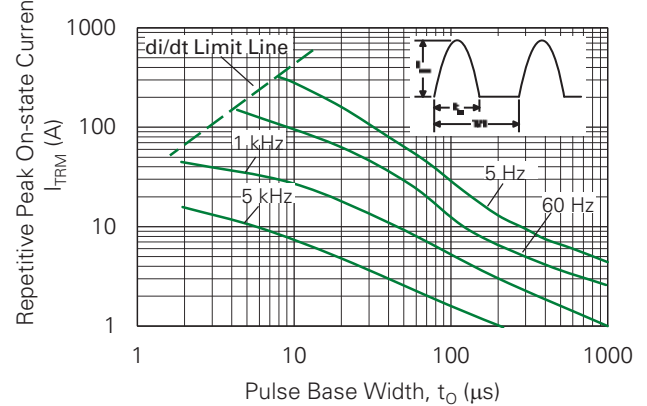


Fig. 5. Surge Peak On-state Current vs. Number of Cycles

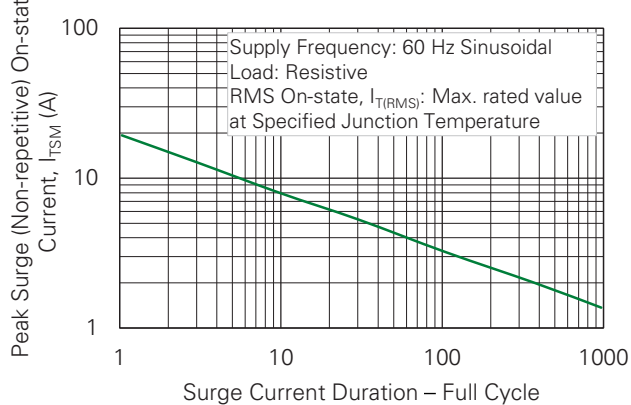
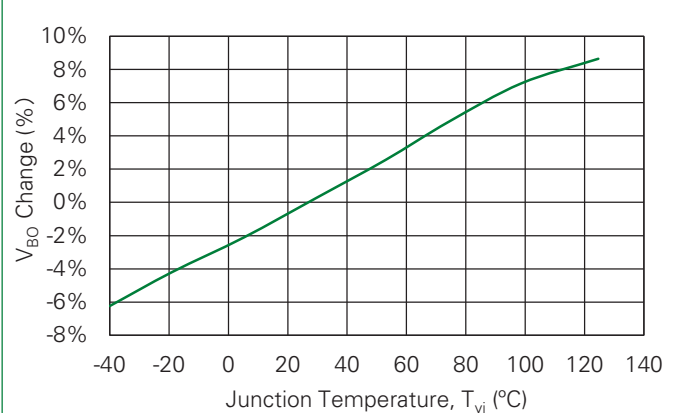


Fig. 6. Normalized V_{BO} Change vs. Junction Temperature



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

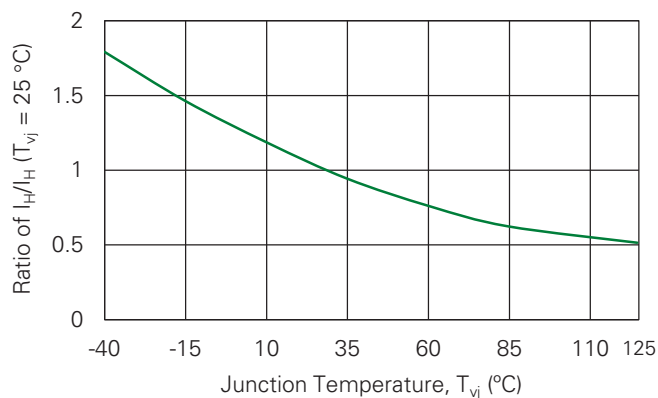


Fig. 8. Maximum Allowable Case Temperature vs. RMS On-state Current

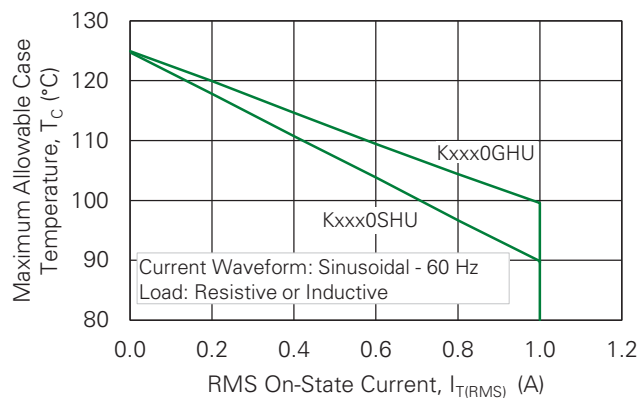


Fig. 9. Maximum Allowable Ambient Temperature vs. RMS On-state Current

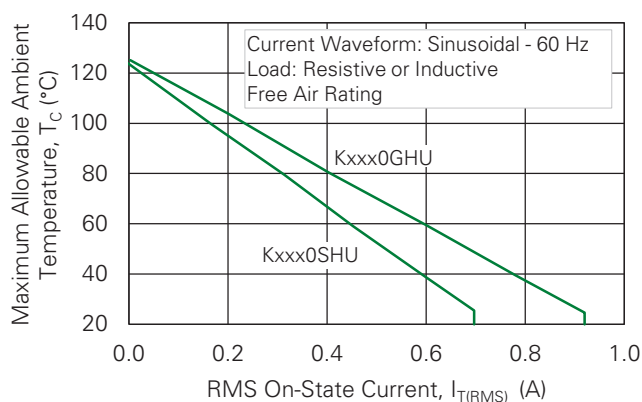


Fig. 10. Normalized V_{BO} Change vs. Junction Temperature

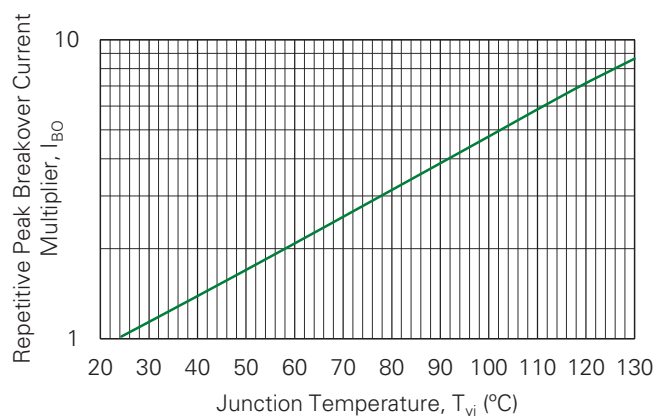


Figure 11. General Gas Ignitor Circuit

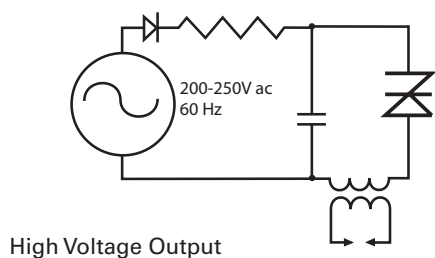
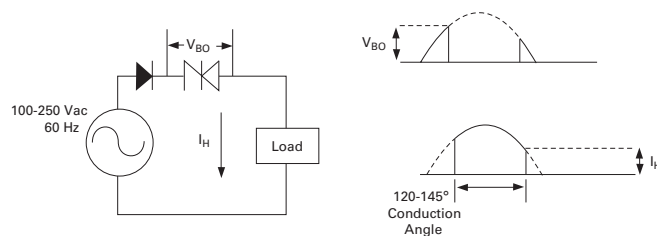


Figure 12. Basic SIDAC Circuit

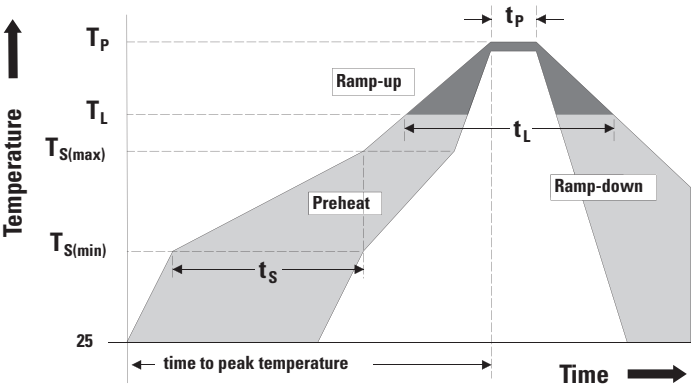


Soldering Parameters

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 ^{+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

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

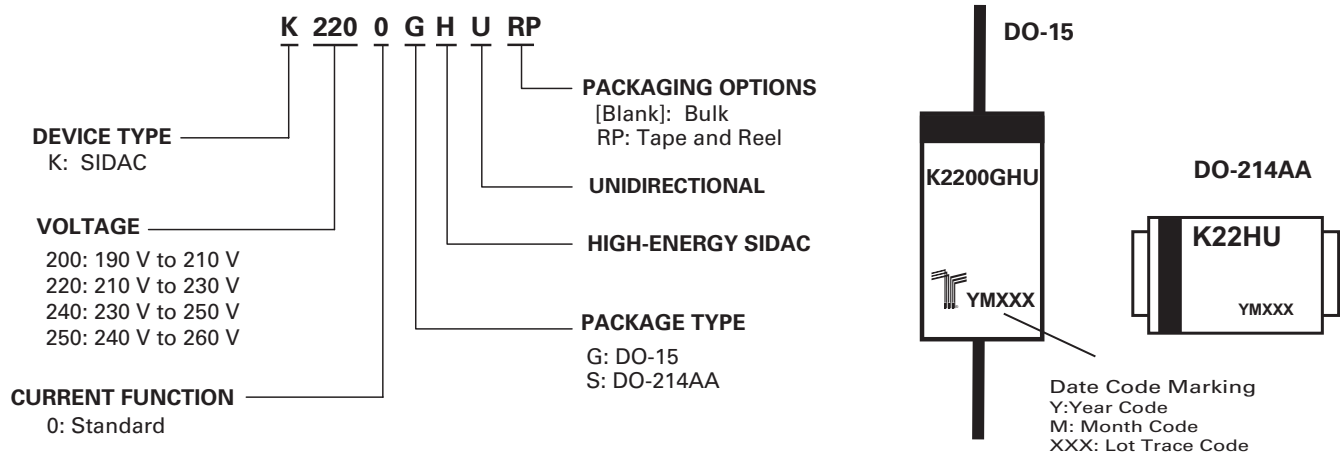
Part Number	Switching Voltage Range		Blocking Voltage	Package
	V _{BO} Minimum	V _{BO} Maximum	V _{DRM}	
K2000GHU	190 V	210 V	180 V	DO-15
K2000SHU	190 V	210 V	180 V	DO-214AA
K2200GHU	210 V	230 V	190 V	DO-15
K2200SHU	210 V	230 V	190 V	DO-214AA
K2400GHU	230 V	250 V	210 V	DO-15
K2400SHU	230 V	250 V	210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

Packing Options

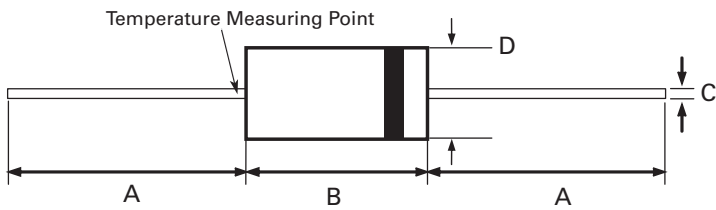
Part Number	Marking	Weight	Packing Mode	Base Quantity
K2xx0GHU	K2xx0GHU	0.38 g	Bulk	1000
K2xx0GHURP	K2xx0GHU	0.38 g	Reel Pack	5000
K2xx0SHURP	KxxHU	0.10 g	Reel Pack	2500

Note: xx = voltage

Part Numbering and Marking

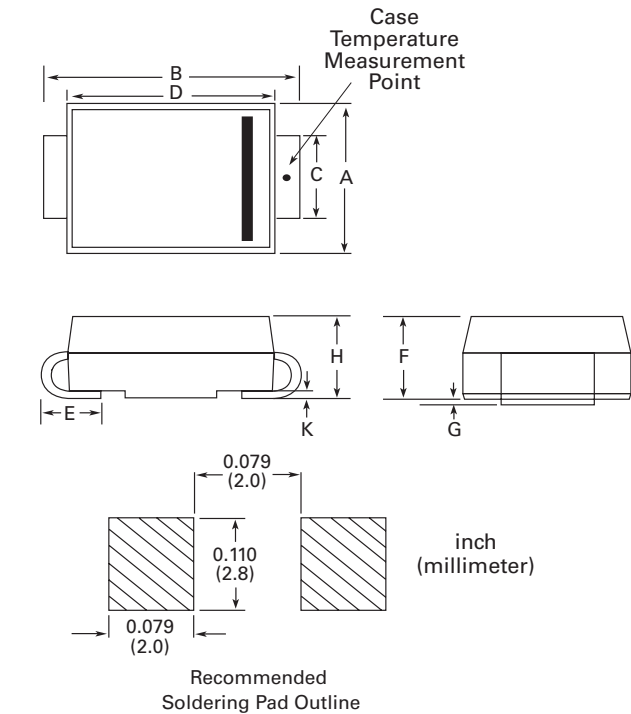


Package Dimensions DO-15



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

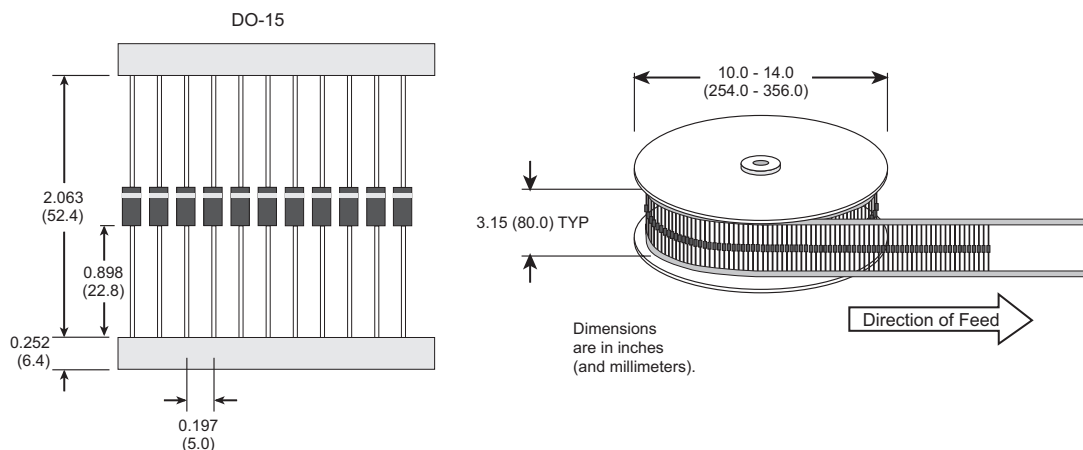
Package Dimensions DO-214AA



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

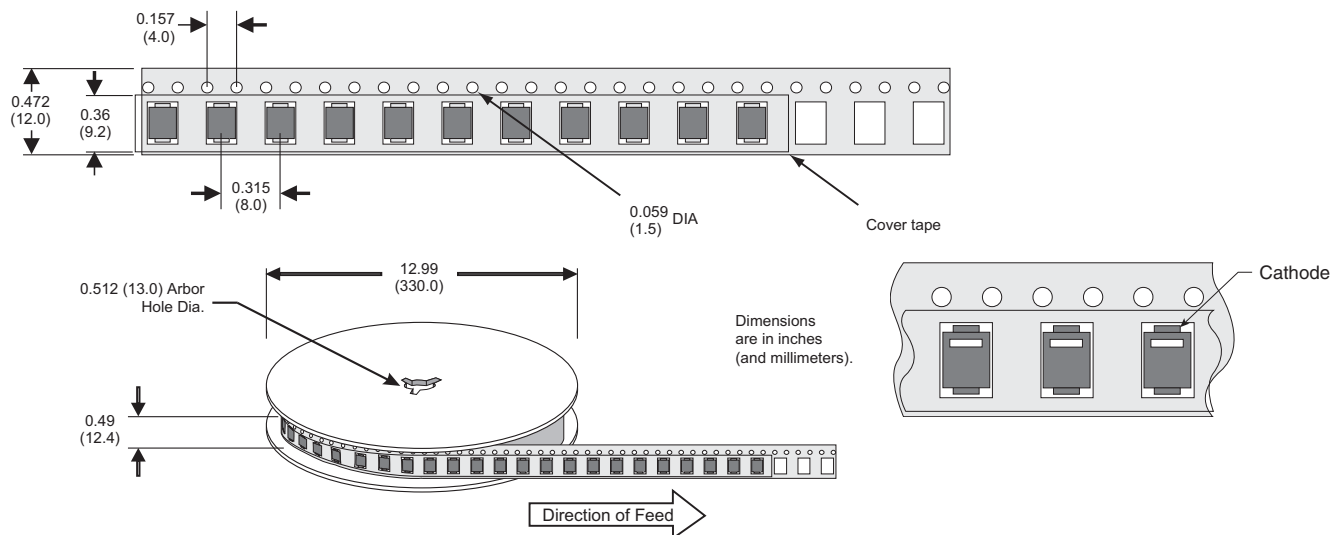
DO-15 Reel Pack (RP) Specifications

Meets all EIA-RS-296 Standards



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

Meets all EIA-481-1 Standards



Disclaimer Notice

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at <http://www.littelfuse.com/disclaimer-electronics>.



Part of:

