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100V COMPLEMENTARY MEDIUM POWER TRANSISTOR IN SM-8

Features

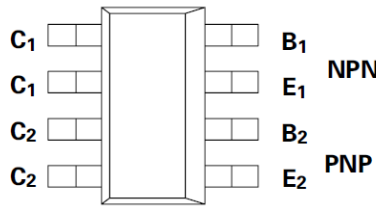
- NPN Transistor
 - $BV_{CEO} > 100$
 - $I_C = 2A$ High Continuous Current
 - Low Saturation Voltage $V_{CE(sat)} < 300mV @ 1A$
- PNP Transistor
 - $BV_{CEO} > -100V$
 - $I_C = -2A$ High Continuous Current
 - Low Saturation Voltage $V_{CE(sat)} < -300mV @ -1A$
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

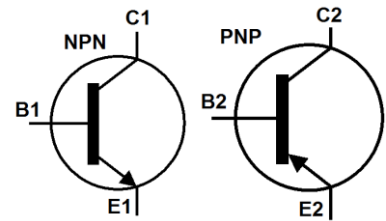
- Case: SM-8 (8 LEAD SOT223)
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 (Ⓢ)
- Weight: 0.117 grams (Approximate)



Top View



Top View
Pin Out



Equivalent Circuit

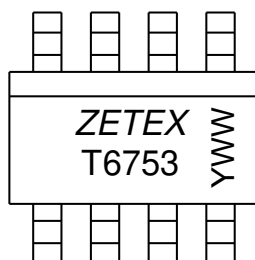
Ordering Information (Note 4)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZDT6753TA	T6753	7	12	1,000
ZDT6753TC	T6753	13	12	4,000

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information

SM-8



T6753 = Product Type Marking Code
 YWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 5= 2015)
 WW or $\bar{W}W$ = Week Code (01~53)

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	NPN	PNP	Unit
Collector-Base Voltage	V _{CBO}	120	-120	V
Collector-Emitter Voltage	V _{CEO}	100	-100	V
Emitter-Base Voltage	V _{EBO}	7	-7	V
Continuous Collector Current	I _C	2	-2	A
Peak Pulse Current (Note 5)	I _{CM}	6	-6	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

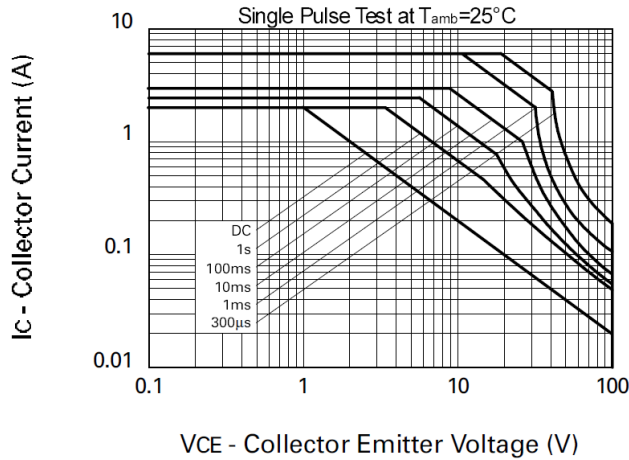
Characteristic	Symbol	Value	Unit
Collector Power Dissipation	P _D	2.25	W
		2.75	
Thermal Resistance, Junction to Ambient	R _{θJA}	55.6	°C/W
		45.5	
Thermal Resistance, Junction to Leads	R _{θJL}	30.7	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 8)

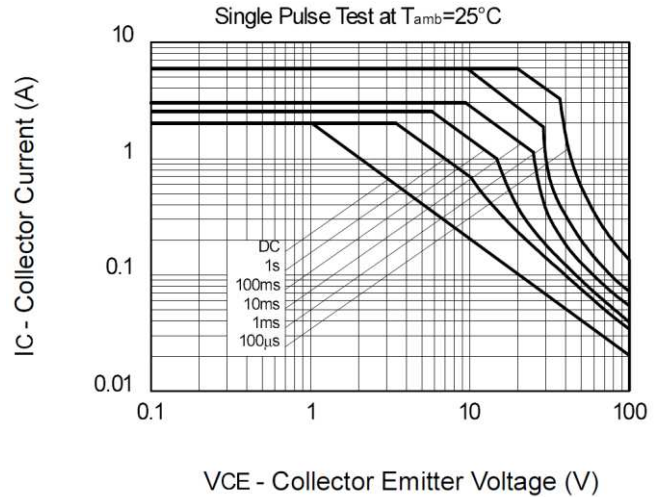
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
- For a device with any single die active and mounted with the collector lead on 25mm x 25mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady-state.
 - Same as Note 5, except both die are active and equally sharing power.
 - Thermal resistance from junction to solder-point (at the end of the collector lead).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

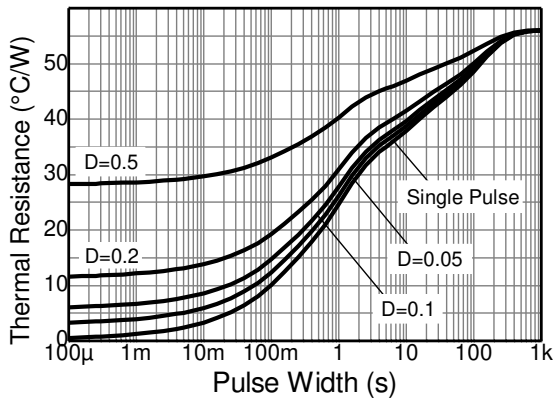
Thermal Characteristics and Derating Information



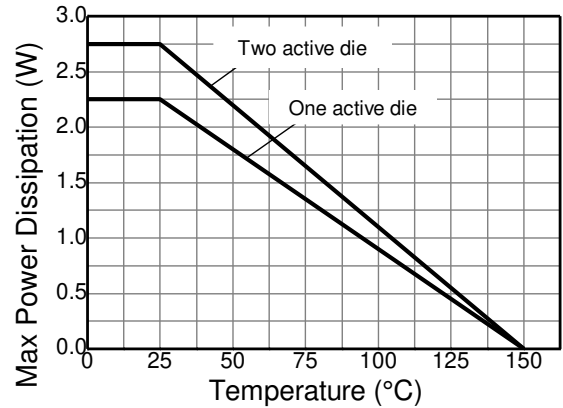
Safe Operating Area



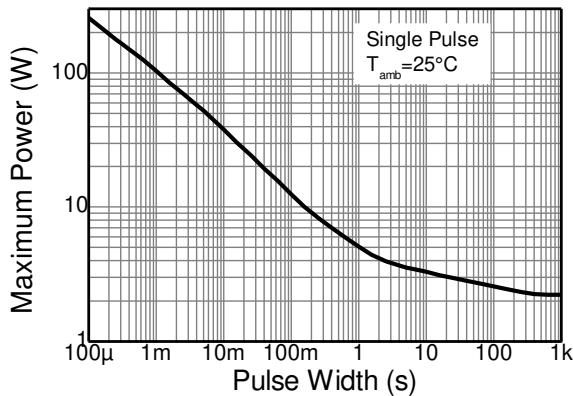
Safe Operating Area



Transient Thermal Impedance



Derating Curve



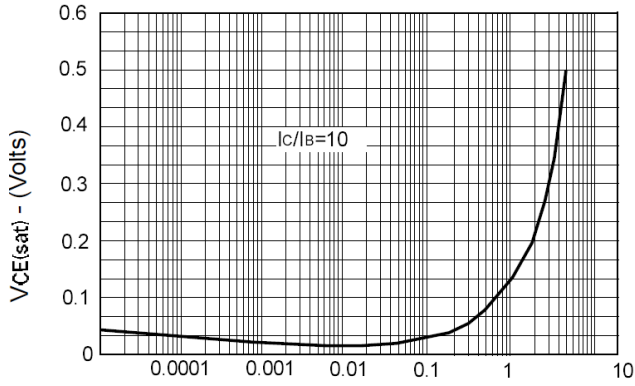
Pulse Power Dissipation

NPN - Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	120	—	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	100	—	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	—	—	V	I _E = 100μA
Collector Cut-Off Current	I _{CBO}	—	< 1	0.1	μA	V _{CB} = 100V
		—	—	10	μA	V _{CB} = 100V, T _A = +125°C
Emitter Cut-Off Current	I _{EBO}	—	< 1	0.1	μA	V _{EB} = 5.6V
DC Current Transfer Static Ratio (Note 9)	h _{FE}	70	200	—	—	I _C = 50mA, V _{CE} = 2V
		100	200	300		I _C = 500mA, V _{CE} = 2V
		55	110	—		I _C = 1A, V _{CE} = 2V
		25	55	—		I _C = 2A, V _{CE} = 2V
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(sat)}	—	0.13	0.30	V	I _C = 1A, I _B = 100mA
		—	0.23	0.50		I _C = 2A, I _B = 200mA
Base-Emitter Saturation Voltage (Note 9)	V _{BE(sat)}	—	0.9	1.25	V	I _C = 1A, I _B = 100mA
Base-Emitter Turn-on Voltage (Note 9)	V _{BE(on)}	—	0.8	1.0	V	I _C = 1A, V _{CE} = 2V
Transitional Frequency	f _T	140	175	—	MHz	I _C = 100mA, V _{CE} = 5V, f = 100MHz
Output Capacitance	C _{obo}	—	—	30	pF	V _{CB} = 10V, f = 1MHz
Switching Time	t _{on}	—	80	—	Ns	V _{CC} = 10V, I _C = 500mA, I _{B1} = -I _{B2} = 50mA
	t _{off}	—	1200	—	ns	

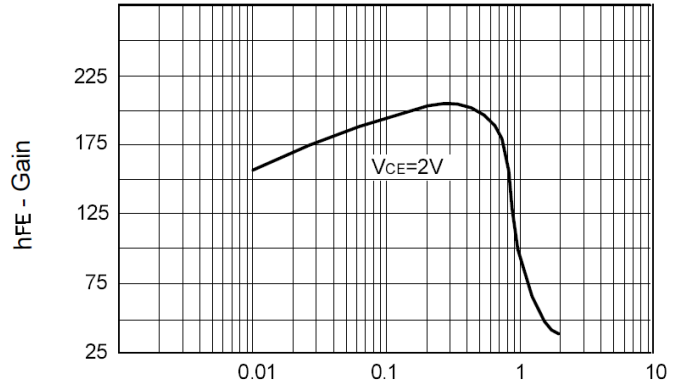
Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

NPN – Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



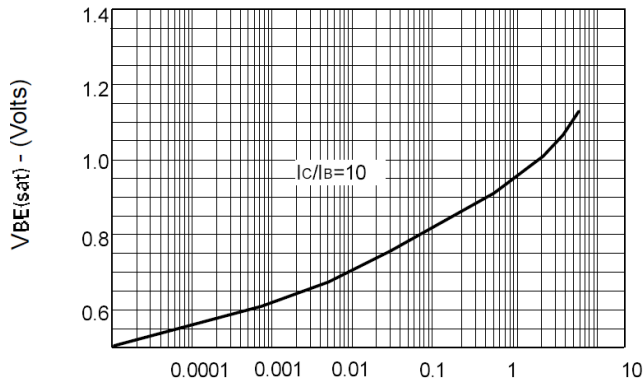
IC - Collector Current (Amps)

VCE(sat) v IC



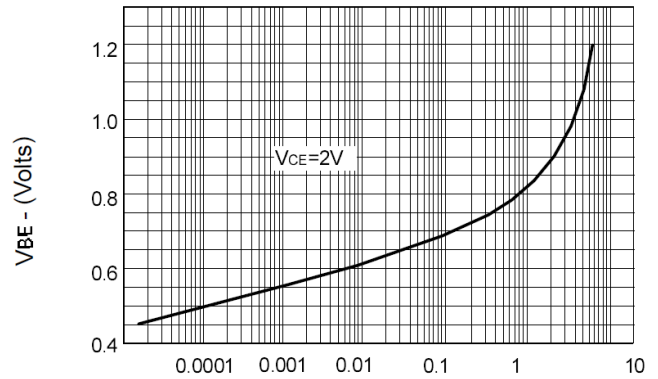
IC - Collector Current (Amps)

hFE v IC



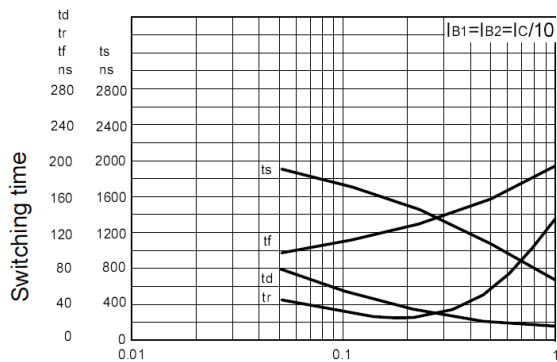
IC - Collector Current (Amps)

VBE(sat) v IC



IC - Collector Current (Amps)

VBE(on) v IC



IC - Collector Current (Amps)

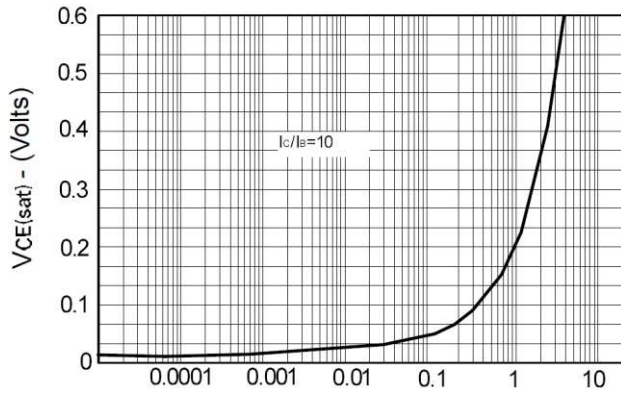
Switching Speeds

PNP - Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-120	—	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	-100	—	—	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	—	—	V	I _E = -100μA
Collector Cut-Off Current	I _{CBO}	—	< 1	-0.1	μA	V _{CB} = -100V
		—	—	-10	μA	V _{CB} = -100V, T _A = +125°C
Emitter Cut-Off Current	I _{EBO}	—	< 1	-0.1	μA	V _{EB} = -5.6V
DC Current Transfer Static Ratio (Note 8)	h _{FE}	70	200	—	—	I _C = -50mA, V _{CE} = -2V
		100	200	300		I _C = -500mA, V _{CE} = -2V
		55	170	—		I _C = -1A, V _{CE} = -2V
		25	55	—		I _C = -2A, V _{CE} = -2V
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(sat)}	—	-0.17	-0.30	V	I _C = -1A, I _B = -100mA
		—	-0.30	-0.50		I _C = -2A, I _B = -200mA
Base-Emitter Saturation Voltage (Note 9)	V _{BE(sat)}	—	-0.90	-1.25	V	I _C = -1A, I _B = -100mA
Base-Emitter Turn-On Voltage (Note 9)	V _{BE(on)}	—	-0.80	-1.0	V	I _C = -1A, V _{CE} = -2V
Transitional Frequency	f _T	100	140	—	MHz	I _C = -100mA, V _{CE} = -5V, f = 100MHz
Output Capacitance	C _{obo}	—	—	30	pF	V _{CB} = -10V, f = 1MHz,
Switching Time	t _{on}	—	35	—	ns	V _{CC} = -10V, I _C = -500mA, I _{B1} = -I _{B2} = -50mA
	t _{off}		600		ns	

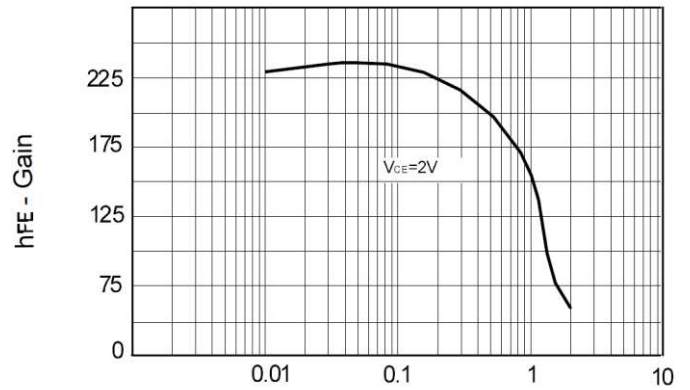
Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

PNP – Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



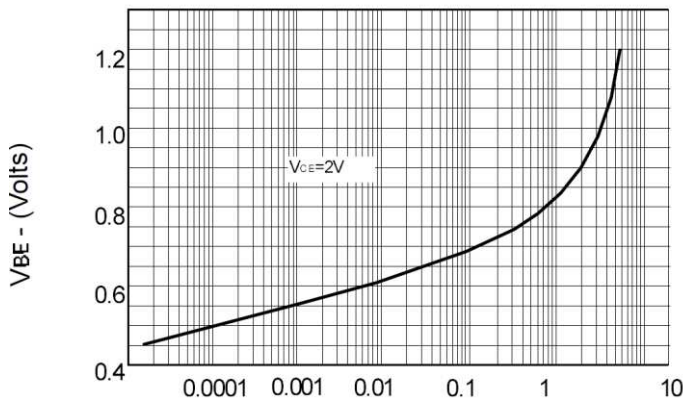
IC - Collector Current (Amps)

VCE(sat) v IC



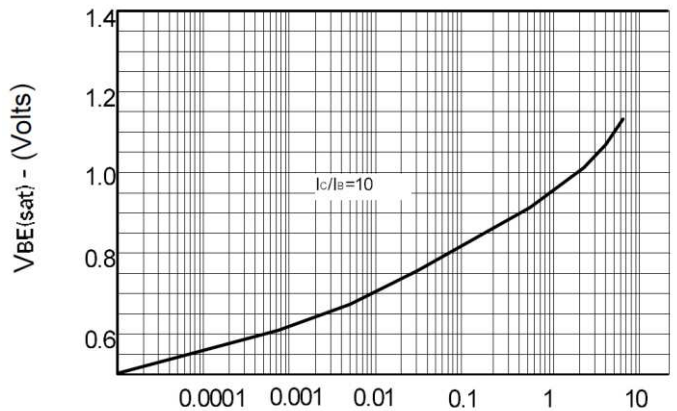
IC - Collector Current (Amps)

hFE v IC



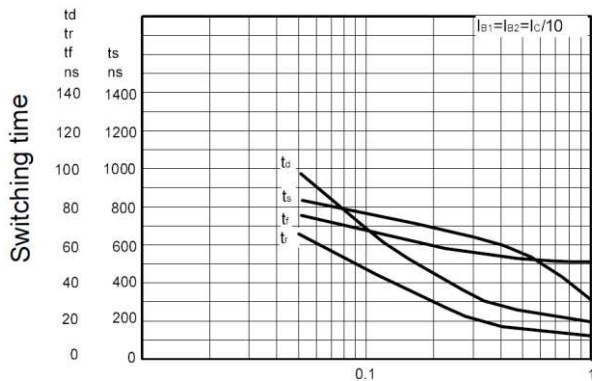
IC - Collector Current (Amps)

VBE(on) v IC



IC - Collector Current (Amps)

VBE(sat) v IC

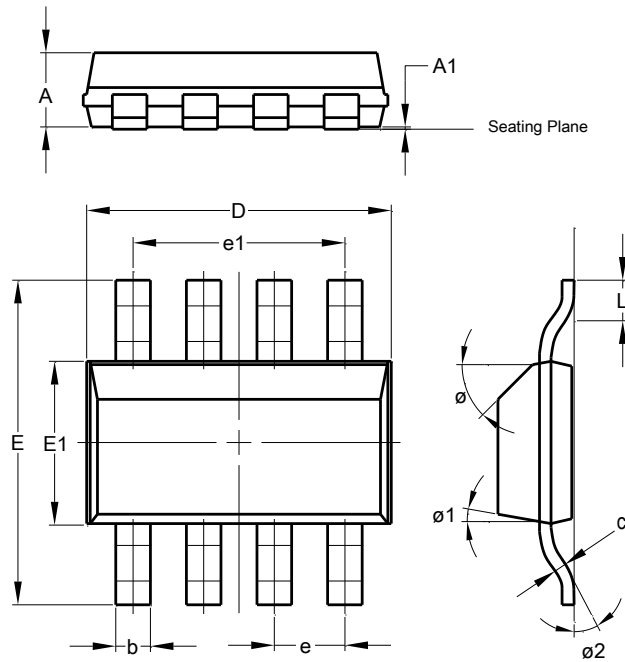


IC - Collector Current (Amps)

Switching Speeds

Package Outline Dimensions

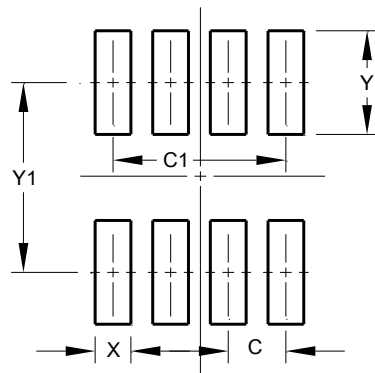
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SM-8			
Dim	Min	Max	Typ
A	--	1.70	1.60
A1	0.02	0.10	0.04
b	0.70	0.90	0.80
c	0.24	0.32	0.28
D	6.30	6.70	6.60
e	1.53 REF		
e1	4.59 REF		
E	6.70	7.30	7.00
E1	3.30	3.70	3.50
L	0.75	1.00	0.90
Ø	--	--	45°
Ø1	--	15°	--
Ø2	--	--	10°
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
C	1.52
C1	4.6
X	0.95
Y	2.80
Y1	6.80

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device terminals and PCB tracking.

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