

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	60	V
Collector-Emitter Voltage	V _{CEO}	40	V
Emitter-Base Voltage	V _{EBO}	6.0	V
Collector Current	I _C	600	mA
Peak Collector Current	I _{CM}	1	A
Peak Base Current	I _{BM}	200	mA

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

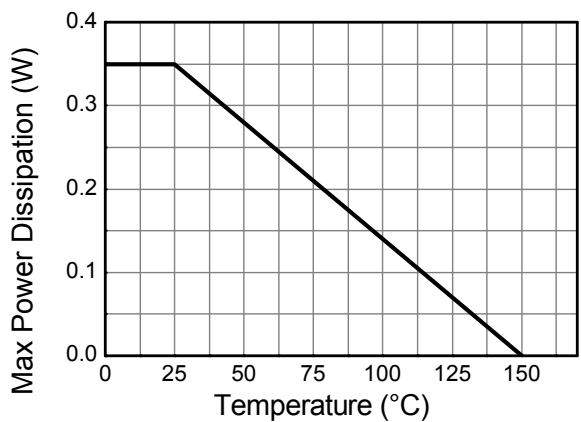
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	310	mW
		350	
Thermal Resistance, Junction to Ambient	R _{θJA}	403	°C/W
		357	
Thermal Resistance, Junction to Leads	R _{θJL}	350	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 9)

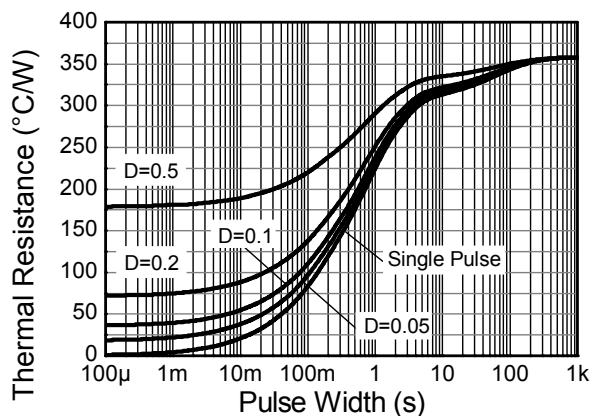
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
6. For a device mounted on minimum recommended pad layout 1oz copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 7. Same as note (6), except the device is mounted on 15 mm x 15mm 1oz copper.
 8. Thermal resistance from junction to solder-point (at the end of the leads).
 9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

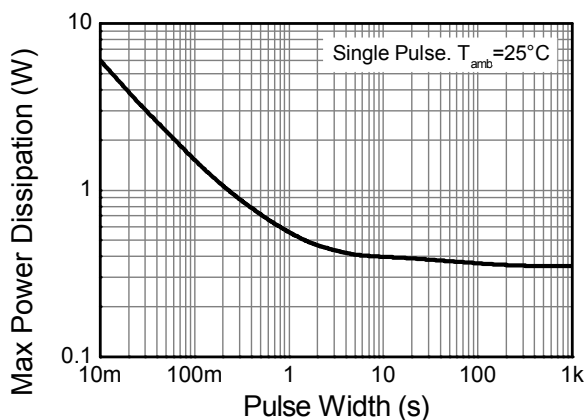
Thermal Characteristics and Derating Information



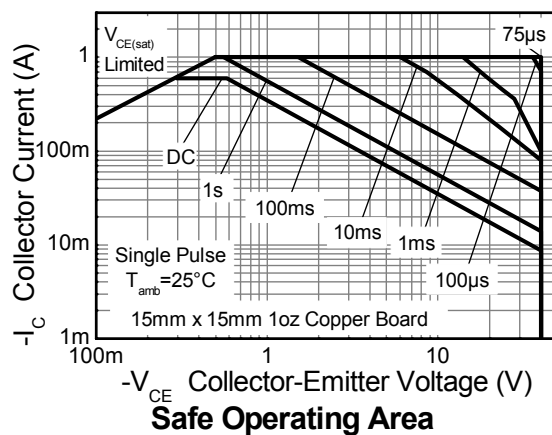
Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation



Safe Operating Area

Electrical Characteristics (@T_A = +25°C unless otherwise specified)

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS					
Collector-Base Breakdown Voltage	BV _{CBO}	60	—	V	I _C = 100μA, I _E = 0
Collector-Emitter Breakdown Voltage(Note 10)	BV _{CEO}	40	—	V	I _C = 10.0mA, I _B = 0
Emitter-Base Breakdown Voltage	BV _{EBO}	6.0	—	V	I _E = 100μA, I _C = 0
Collector Cutoff Current	I _{CEX}	—	100	nA	V _{CE} = 35V, V _{EB(OFF)} = 0.4V
Base Cutoff Current	I _{BL}	—	100	nA	V _{CE} = 35V, V _{EB(OFF)} = 0.4V
ON CHARACTERISTICS (Note 10)					
DC Current Gain	h _{FE}	20	—	—	I _C = 100μA, V _{CE} = 1.0V
		40	—		I _C = 1.0mA, V _{CE} = 1.0V
		80	—		I _C = 10mA, V _{CE} = 1.0V
		100	300		I _C = 150mA, V _{CE} = 1.0V
		40	—		I _C = 500mA, V _{CE} = 2.0V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	—	0.40 0.75	V	I _C = 150mA, I _B = 15mA I _C = 500mA, I _B = 50mA
Base-Emitter Saturation Voltage	V _{BE(sat)}	0.75 —	0.95 1.2	V	I _C = 150mA, I _B = 15mA I _C = 500mA, I _B = 50mA
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C _{cb}	—	6.5	pF	V _{CB} = 5.0V, f = 1.0MHz, I _E = 0
Input Capacitance	C _{eb}	—	30	pF	V _{EB} = 0.5V, f = 1.0MHz, I _C = 0
Input Impedance	h _{ie}	1.0	15	kΩ	V _{CE} = 10V, I _C = 1.0mA, f = 1.0kHz
Voltage Feedback Ratio	h _{re}	0.1	8.0	x 10 ⁻⁴	
Small Signal Current Gain	h _{fe}	40	500	—	
Output Admittance	h _{oe}	1.0	30	μS	
Current Gain-Bandwidth Product	f _T	250	—	MHz	V _{CE} = 10V, I _C = 20mA, f = 100MHz
SWITCHING CHARACTERISTICS					
Delay Time	t _d	—	15	ns	V _{CC} = 30V, I _C = 150mA, V _{BE(off)} = 2.0V, I _{B1} = 15mA
Rise Time	t _r	—	20	ns	
Storage Time	t _s	—	225	ns	V _{CC} = 30V, I _C = 150mA, I _{B1} = -I _{B2} = 15mA
Fall Time	t _f	—	30	ns	

Note: 10. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

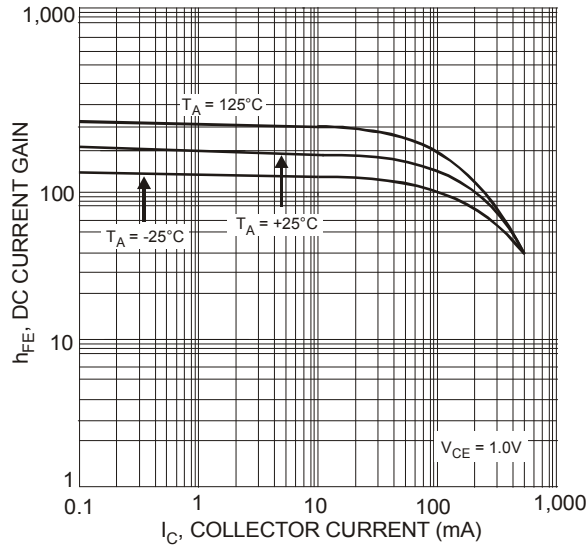


Figure 1 Typical DC Current Gain vs. Collector Current

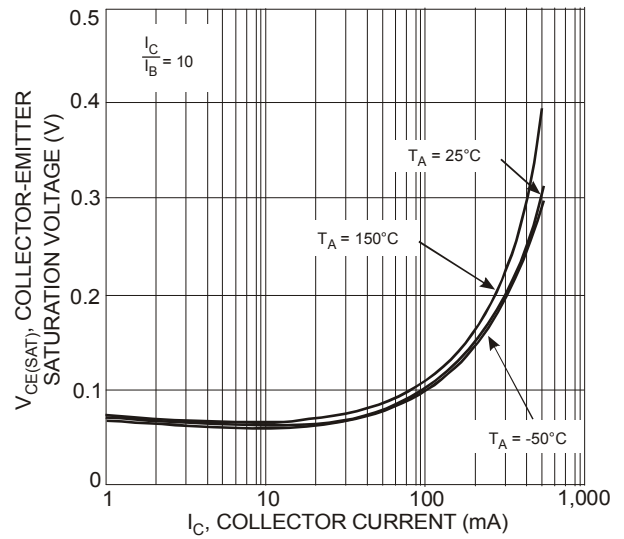


Figure 2 Collector-Emitter Saturation Voltage vs. Collector Current

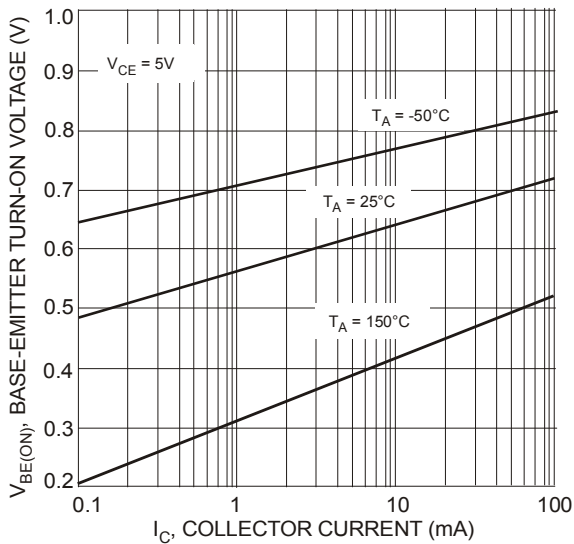


Figure 3 Typical Base-Emitter Turn-On Voltage vs. Collector Current

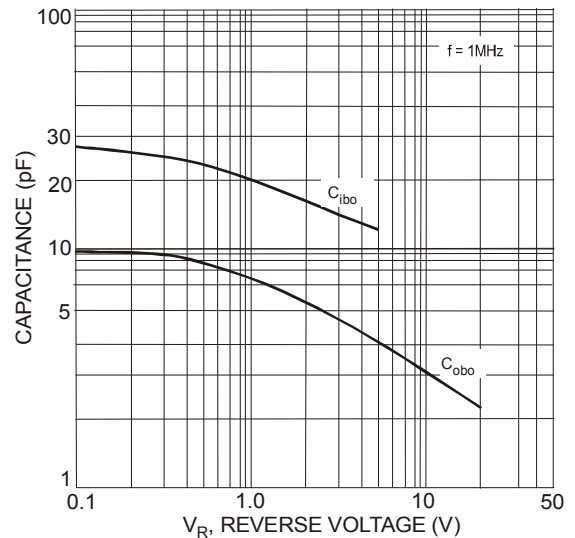


Figure 4 Typical Capacitance Characteristics

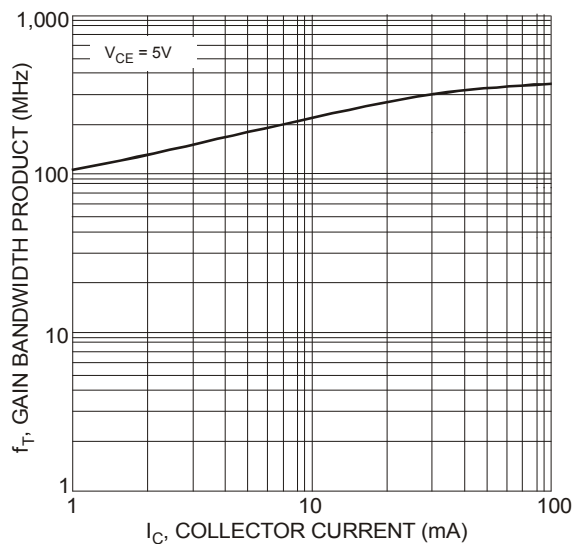


Figure 5 Typical Gain Bandwidth Product vs. Collector Current

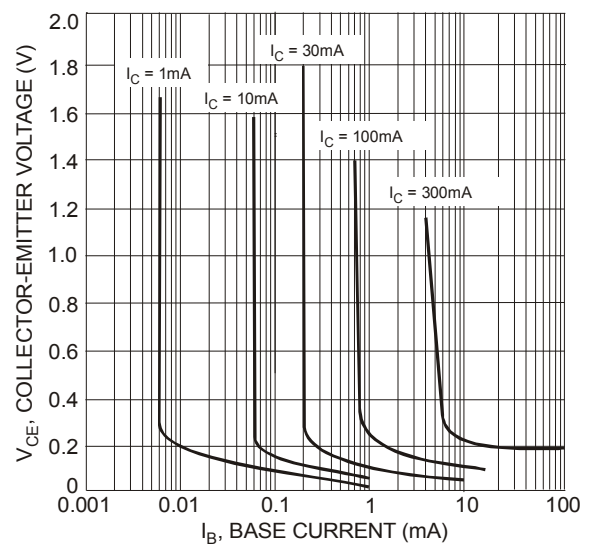
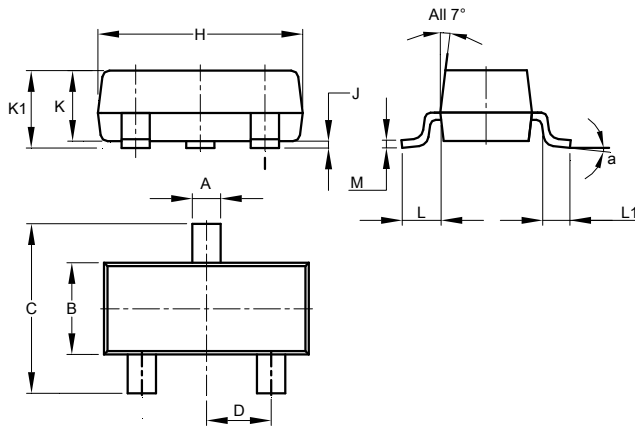


Figure 6 Typical Collector Saturation Region

Package Outline Dimensions

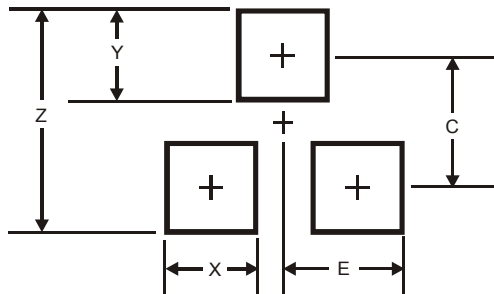
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°		
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)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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