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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	200	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	4.5	A
Peak Pulse Current	I_{CM}	10	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5) Linear derating factor	P_D	1.5 12	W mW/°C
Power Dissipation (Note 6) Linear derating factor	P_D	2.1 16.8	W mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	83	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	60	°C/W
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JL}$	3.23	°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:
5. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; device measured when operating in steady state condition.
6. Same as note (5), except the device is mounted on 50mm X 50mm single sided 1oz weight copper.
7. Thermal resistance from junction to solder-point (at the end of the collector lead).
8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

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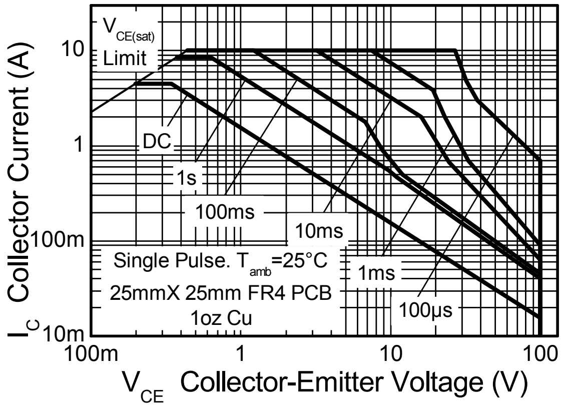
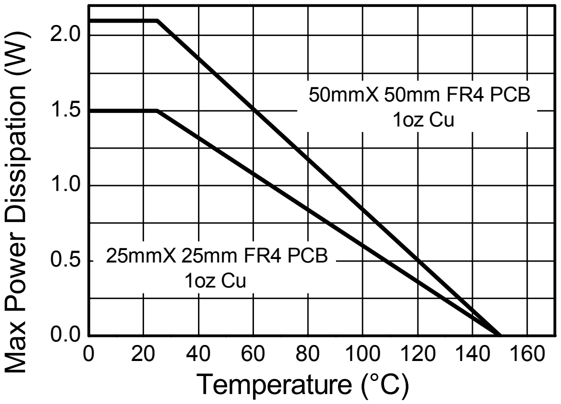
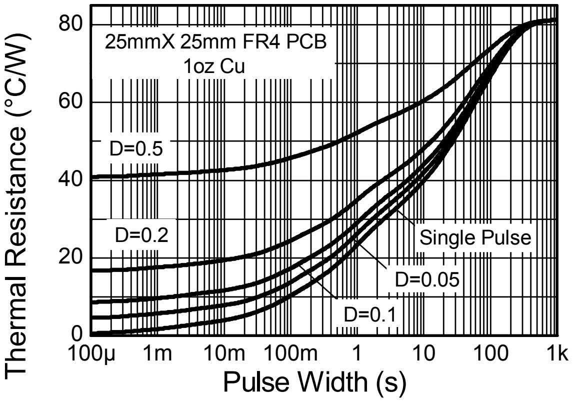
Thermal Characteristics and Derating Information



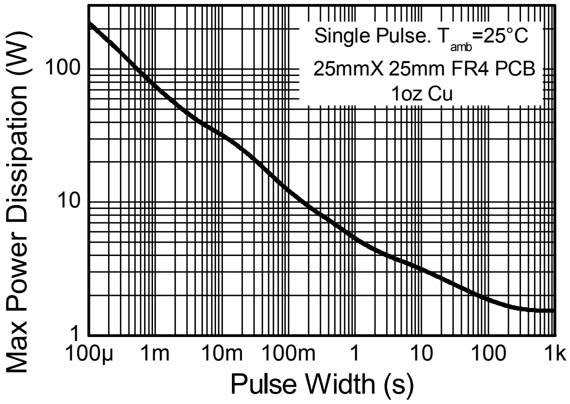
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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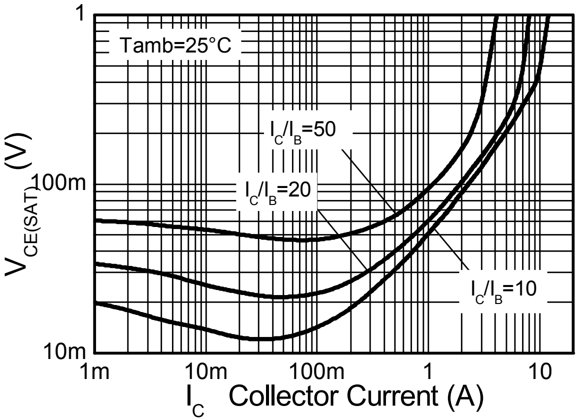
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

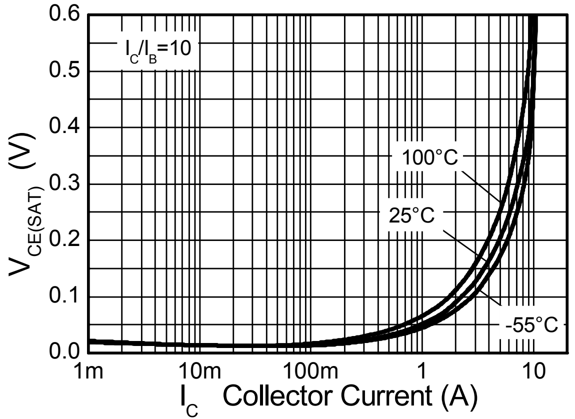
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	200	235	-	V	$I_C = 100\mu A$
Collector-Emitter Breakdown Voltage (Notes 9)	BV_{CER}	200	235	-	V	$I_C = 1\mu A$, $R_B \leq 1k\Omega$
Collector-Emitter Breakdown Voltage (Notes 9)	BV_{CEO}	100	115	-	V	$I_C = 1mA$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.1	-	V	$I_E = 100\mu A$
Collector Cutoff Current	I_{CBO}	- -	<1 -	50 500	nA nA	$V_{CB} = 150V$ $V_{CB} = 150V$, $T_A = +100°C$
Collector Cutoff Current	I_{CER} $R \leq 1k\Omega$	- -	<1 -	100 500	nA nA	$V_{CB} = 150V$ $V_{CB} = 150V$, $T_A = +100°C$
Emitter Cutoff Current	I_{EBO}	-	<1	10	nA	$V_{EB} = 6V$
DC Current Transfer Static Ratio (Notes 9)	h_{FE}	100	230	-	-	$I_C = 10mA$, $V_{CE} = 2V$
		100	200	300		$I_C = 2A$, $V_{CE} = 2V$
		30	60	-		$I_C = 5A$, $V_{CE} = 2V$
		10	20	-		$I_C = 10A$, $V_{CE} = 2V$
Collector-Emitter Saturation Voltage (Notes 9)	$V_{CE(sat)}$	-	20	30	mV	$I_C = 100mA$, $I_B = 5mA$
		-	45	60		$I_C = 1A$, $I_B = 100mA$
		-	85	115		$I_C = 2A$, $I_B = 100mA$
		-	155	195		$I_C = 5A$, $I_B = 500mA$
Base-Emitter Saturation Voltage (Notes 9)	$V_{BE(sat)}$	-	1000	1100	mV	$I_C = 5A$, $I_B = 500mA$
Base-Emitter Turn-on Voltage (Notes 9)	$V_{BE(on)}$	-	900	1000	mV	$I_C = 5A$, $V_{CE} = 2V$
Transitional Frequency	f_T	-	130	-	MHz	$I_C = 100mA$, $V_{CE} = 10V$, f = 50MHz
Output Capacitance	C_{obo}	-	26	-	pF	$V_{CB} = 10V$, f = 1MHz,
Switching Time	t_{on}	-	41	-	ns	$V_{CC} = 10V$, $I_C = 1A$, $I_{B1} = I_{B2} = 100mA$
	t_{off}		1010			

Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

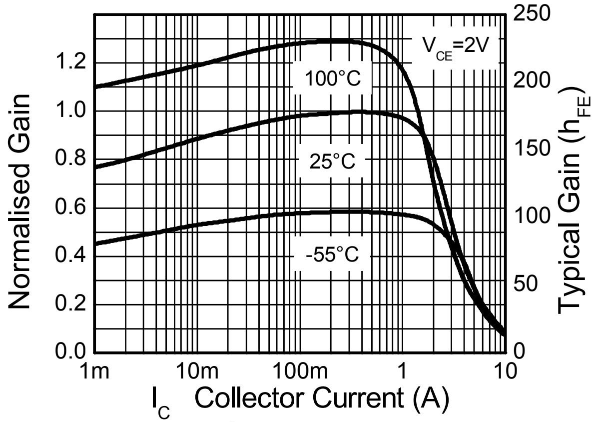
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



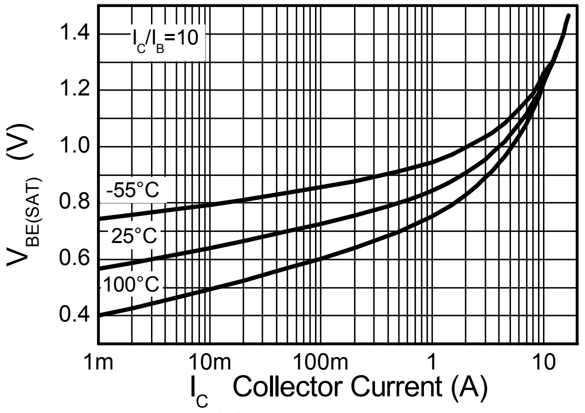
$V_{CE(SAT)}$ v I_C



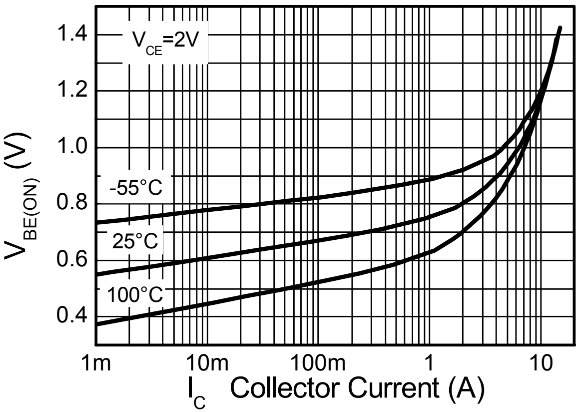
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

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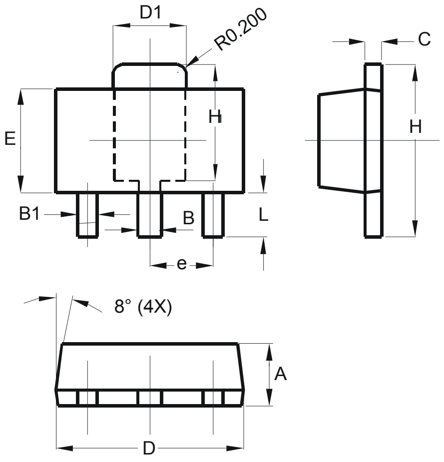
Package Outline Dimensions

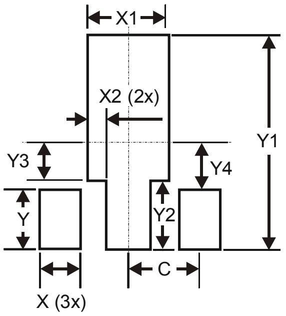
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SOT89		
Dim	**Min**	**Max**
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.44
D	4.40	4.60
D1	1.62	1.83
E	2.29	2.60
e	1.50 Typ	
H	3.94	4.25
H1	2.63	2.93
L	0.89	1.20
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)
X	0.900
X1	1.733
X2	0.416
Y	1.300
Y1	4.600
Y2	1.475
Y3	0.950
Y4	1.125
C	1.500

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