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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	160	V
Collector-Emitter Voltage (Forward Blocking)	V_{CEX}	160	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Collector Voltage (Reverse Blocking)	V_{ECO}	6	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	5.5	A
Peak Pulse Current	I_{CM}	12	A
Base Current	I_B	1	A

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

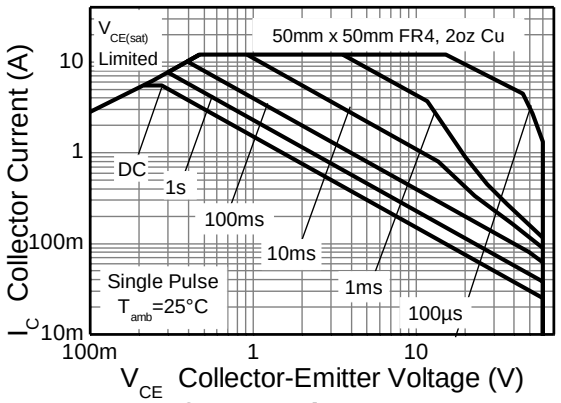
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P_D	0.84 6.72	W mW/°C
	(Note 6)		1.34 10.72	
	(Note 7)		1.50 12.0	
	(Note 8)		2.0 16.0	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	149	°C/W
	(Note 6)		93	
	(Note 7)		83	
	(Note 8)		60	
Thermal Resistance, Junction to Lead	(Note 9)	$R_{\theta JL}$	43.8	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 10)

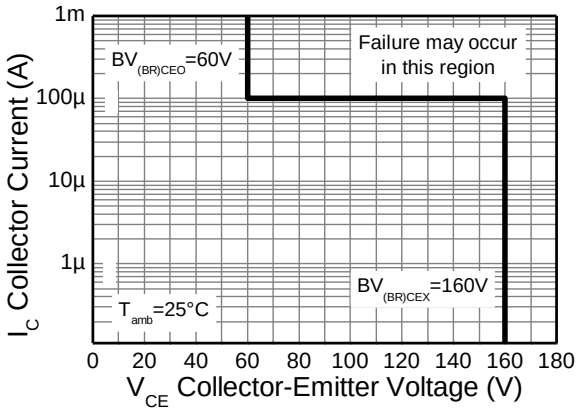
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Same as Note 5, except the device is mounted on 25mm x 25mm 2oz copper.
7. Same as Note 5, except the device is mounted on 50mm x 50mm 2oz copper.
8. Same as Note 7, whilst measured at t < 5 seconds.
9. Thermal resistance from junction to solder-point (at the end of the collector lead).
10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

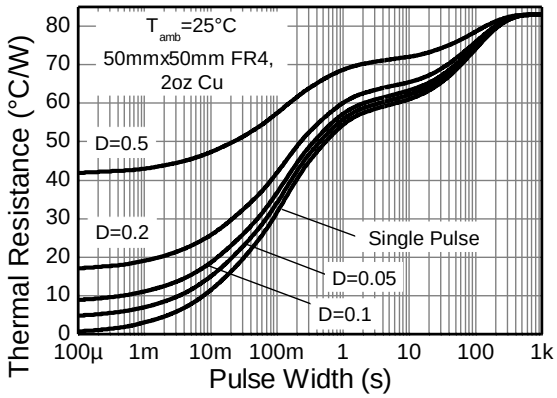
Thermal Characteristics and Derating Information



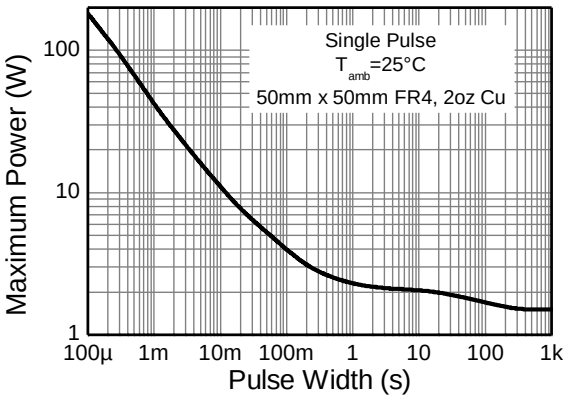
Safe Operating Area



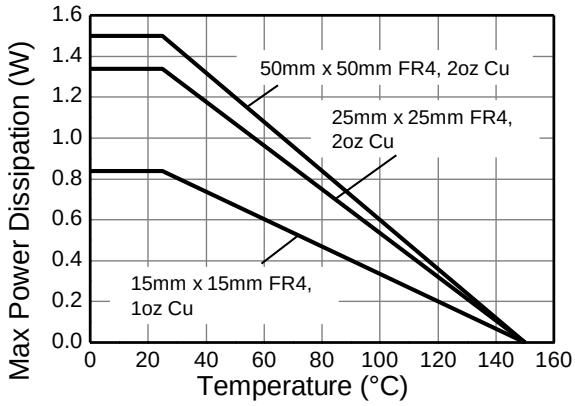
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



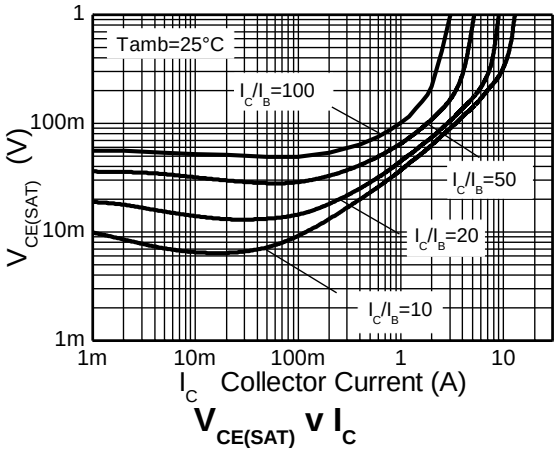
Derating Curve

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

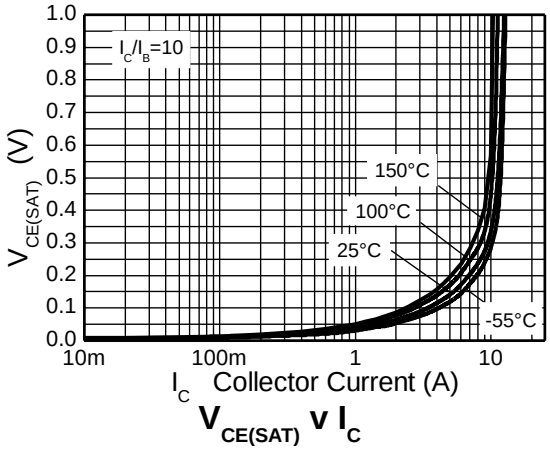
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	160	200	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Forward Blocking)	BV_{CEX}	160	200	—	V	I_C = 100µA, R_{BE} < 1kΩ or -1V < V_{BE} < 0.25V
Collector-Emitter Breakdown Voltage (Base Open) (Note 11)	BV_{CEO}	60	75	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.3	—	V	I_E = 100µA
Emitter-Collector Breakdown Voltage (Reverse Blocking)	BV_{ECX}	6	7	—	V	I_E = 100µA, R_{BC} < 1kΩ or 0.25V < V_{BC} < -0.25V
Emitter-Collector Breakdown Voltage (Base Open)	BV_{ECO}	6	7	—	V	I_E = 100µA
Collector-Base Cutoff Current	I_{CBO}	—	<1 —	50 0.5	nA µA	V_{CB} = 160V V_{CB} = 160V, T_A = +100°C
Emitter-Base Cutoff Current	I_{EBO}	—	<1	50	nA	V_{EB} = 5.6V
ON CHARACTERISTICS (Note 11)						
Static Forward Current Transfer Ratio	h_{FE}	200 160 30	350 280 50	500 — —	—	I_C = 100mA, V_{CE} = 2V I_C = 2A, V_{CE} = 2V I_C = 6A, V_{CE} = 2V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	36 105 105 145	45 150 135 175	mV	I_C = 1A, I_B = 100mA I_C = 1A, I_B = 10mA I_C = 2A, I_B = 40mA I_C = 5.5A, I_B = 550mA
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	1,000	1,100	mV	I_C = 5.5A, I_B = 550mA
Base-Emitter On Voltage	$V_{BE(ON)}$	—	880	1,000	mV	I_C =5.5A, V_{CE} = 2V
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	—	130	—	MHz	I_C = 50mA, V_{CE} = 10V, f = 50MHz
Input Capacitance	C_{IBO}	—	310	—	pF	V_{EB} = 0.5V, f = 1MHz
Output Capacitance	C_{OBO}	—	19.3	25	pF	V_{CB} = 10V, f = 1MHz
Delay Time	t_D	—	27.3	—	ns	V_{CC} = 10V, I_C = 500mA, I_{B1} = I_{B2} = 50mA
Rise Time	t_R	—	13.2	—	ns	
Storage Time	t_S	—	682	—	ns	
Fall Time	t_F	—	90.9	—	ns	

Note: 11. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%

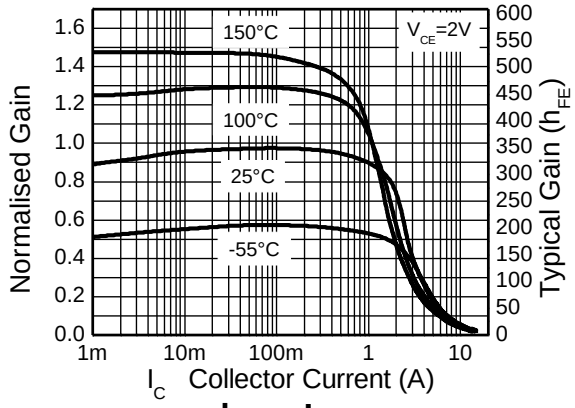
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



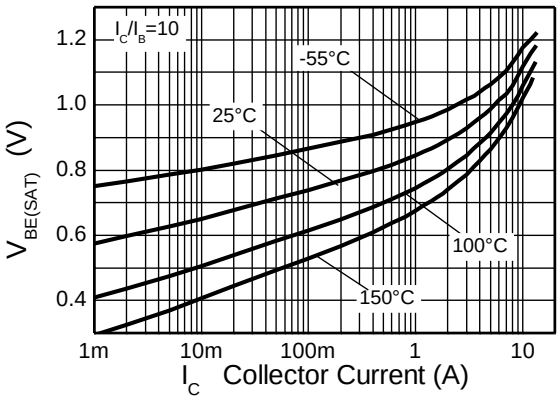
$V_{CE(SAT)}$ v I_C



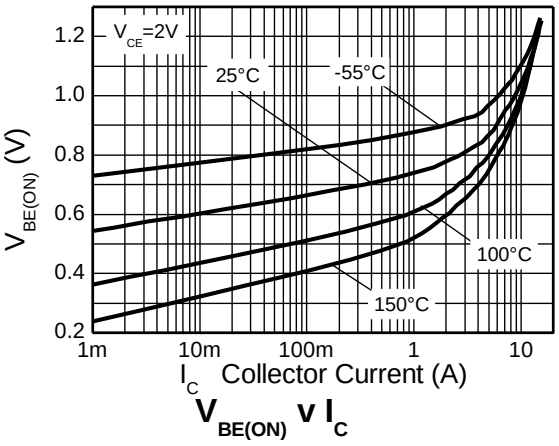
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C

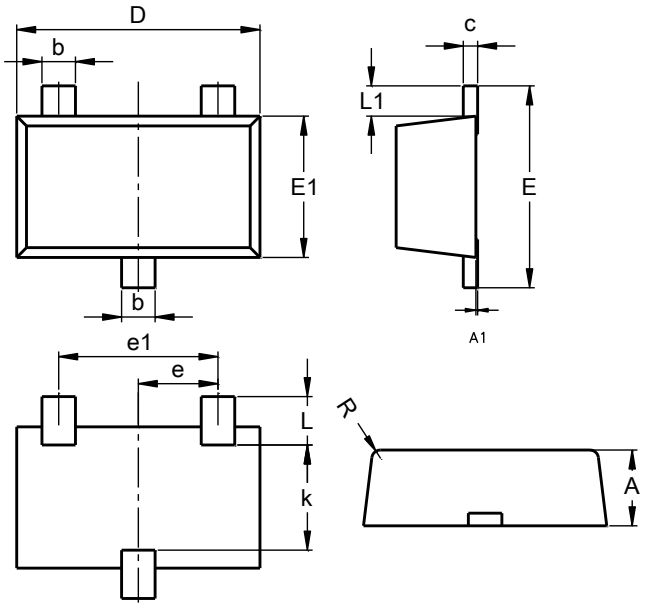


$V_{BE(ON)}$ v I_C

Package Outline Dimensions

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

SOT23F

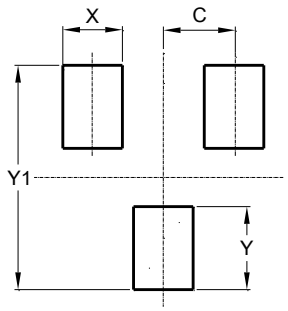


SOT23F			
Dim	**Min**	**Max**	**Typ**
A	0.80	1.00	0.90
b	0.35	0.50	0.44
c	0.10	0.20	0.16
D	2.80	3.00	2.90
e	0.95 REF		
e1	0.190 REF		
E	2.30	2.50	2.40
E1	1.50	1.70	1.65
k	1.20	-	-
L	0.30	0.65	0.50
L1	0.30	0.50	0.40
R	0.05	0.15	-
All Dimensions in mm			

Suggested Pad Layout

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

SOT23F



Dimensions	Value (in mm)
C	0.95
X	0.80
Y	1.110
Y1	3.000

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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