

## Absolute Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-40	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-40	V
Emitter-Base Voltage	V <sub>EBO</sub>	-5	V
Peak Pulse Collector Current	I <sub>CM</sub>	-3	A
Continuous Collector Current	I <sub>C</sub>	-2	A
Base Current	I <sub>B</sub>	-300	mA

## Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

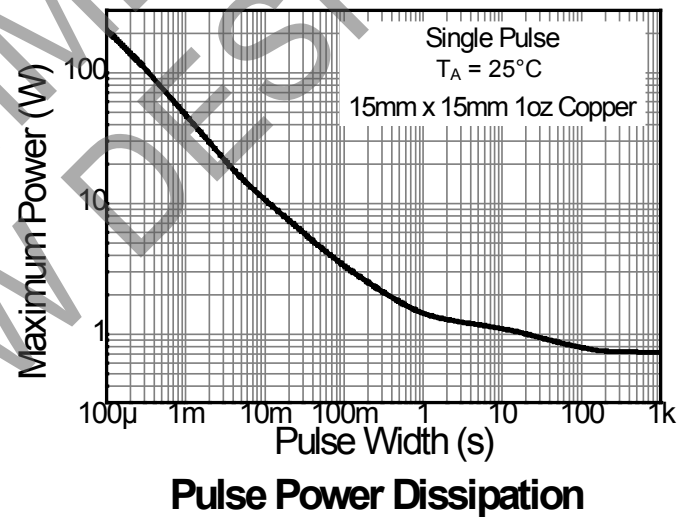
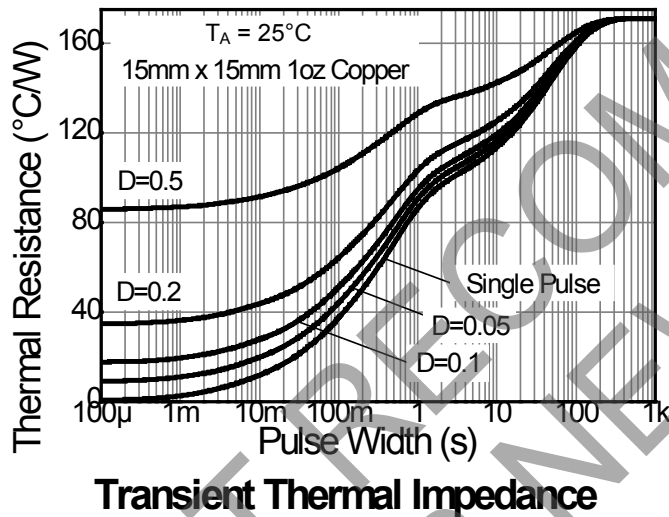
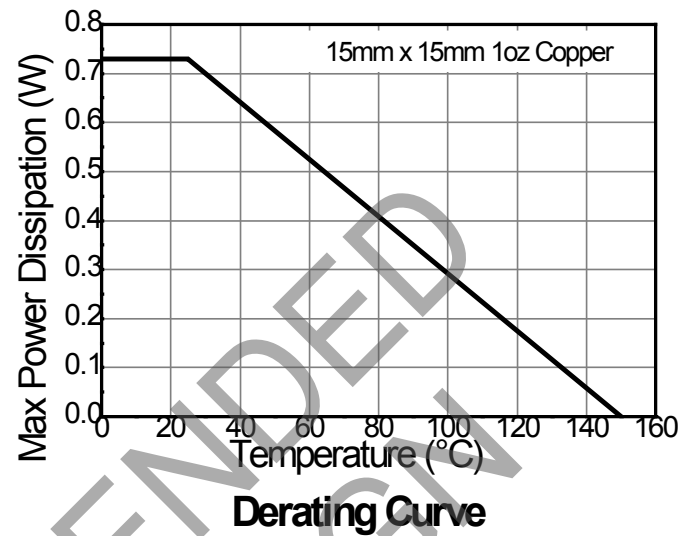
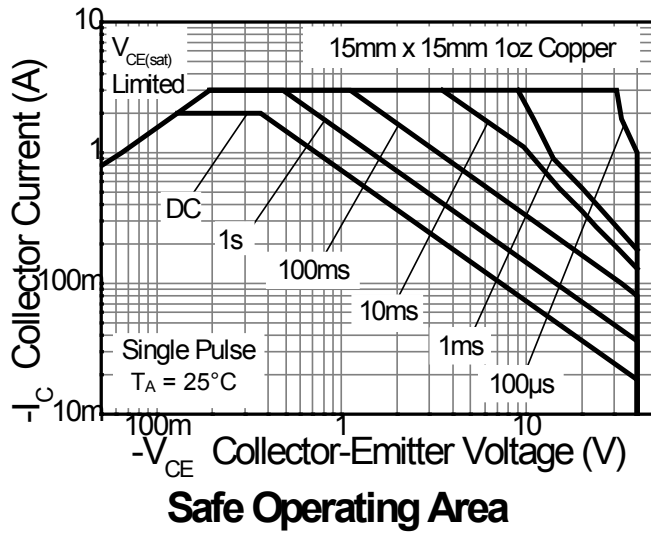
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P <sub>D</sub>	730	mW
Power Dissipation (Note 7)	P <sub>D</sub>	600	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	R <sub>θJA</sub>	171	°C/W
Thermal Resistance, Junction to Ambient Air (Note 7)	R <sub>θJA</sub>	209	°C/W
Thermal Resistance, Junction to Lead (Note 8)	R <sub>θJL</sub>	75	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

## ESD Ratings (Note 9)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge—Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge—Machine Model	ESD MM	400	V	C

- Notes:
6. For a device mounted with the collector lead on 15mm × 15mm 1oz copper that is on a single-sided 1.6mm FR-4 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 minimum recommended pad layout.
  8. Thermal resistance from junction to solder-point (at the end of the collector lead).
  9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

## Thermal Characteristics and Derating Information



**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-40	—	—	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 10)	BV <sub>CEO</sub>	-40	—	—	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-5	—	—	V	I <sub>E</sub> = -100μA
Collector-Base Cutoff Current	I <sub>CBO</sub>	—	—	-100	nA	V <sub>CB</sub> = -30V, I <sub>E</sub> = 0
		—	—	-50	μA	V <sub>CB</sub> = -30V, I <sub>E</sub> = 0, T <sub>A</sub> = +150°C
Emitter-Base Cutoff Current	I <sub>EBO</sub>	—	—	-100	nA	V <sub>EB</sub> = -4V, I <sub>C</sub> = 0
<b>ON CHARACTERISTICS (Note 10)</b>						
DC Current Gain	h <sub>FE</sub>	300	—	—	—	V <sub>CE</sub> = -2V, I <sub>C</sub> = -0.1A
		260	—	—	—	V <sub>CE</sub> = -2V, I <sub>C</sub> = -0.5A
		210	—	—	—	V <sub>CE</sub> = -2V, I <sub>C</sub> = -1A
		100	—	—	—	V <sub>CE</sub> = -2V, I <sub>C</sub> = -2A
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	—	—	-100	mV	I <sub>C</sub> = -100mA, I <sub>B</sub> = -1mA
		—	-45	-110	mV	I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA
		—	—	-225	mV	I <sub>C</sub> = -750mA, I <sub>B</sub> = -15mA
		—	—	-225	mV	I <sub>C</sub> = -1A, I <sub>B</sub> = -50mA
		—	—	-350	mV	I <sub>C</sub> = -2A, I <sub>B</sub> = -200mA
Equivalent On-Resistance	R <sub>CE(SAT)</sub>	—	90	220	mΩ	I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	—	—	-1.1	V	I <sub>C</sub> = -2A, I <sub>B</sub> = -200mA
Base-Emitter Turn-on Voltage	V <sub>BE(ON)</sub>	—	—	-0.75	V	V <sub>CE</sub> = -2V, I <sub>C</sub> = -100mA
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Transition Frequency	f <sub>T</sub>	100	—	—	MHz	V <sub>CE</sub> = -10V, I <sub>C</sub> = -100mA, f = 100MHz
Output Capacitance	C <sub>obo</sub>	—	—	28	pF	V <sub>CB</sub> = -10V, f = 1MHz

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

**Typical Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

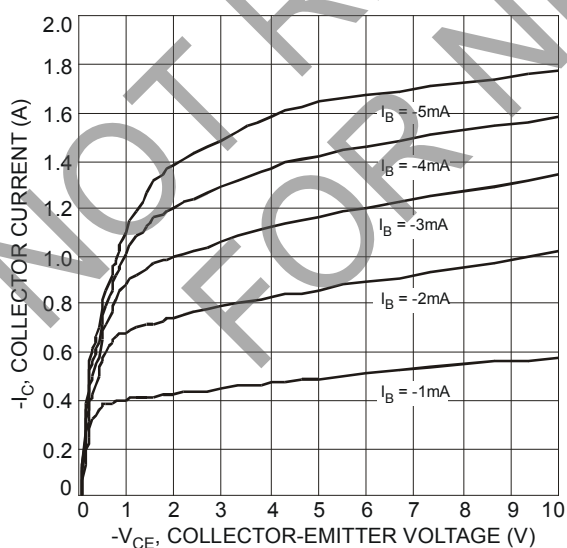


Figure 1 Typical Collector Current vs. Collector-Emitter Voltage

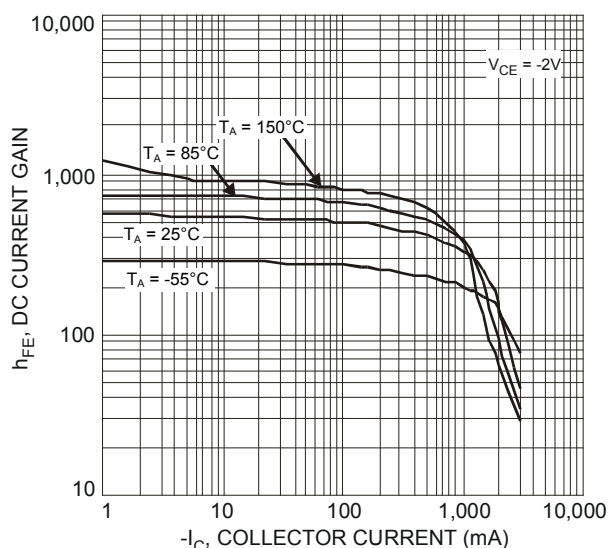


Figure 2 Typical DC Current Gain vs. Collector Current

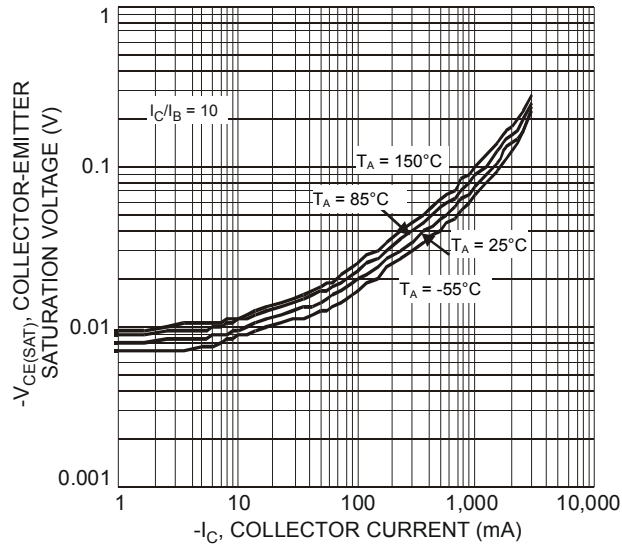


Figure 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

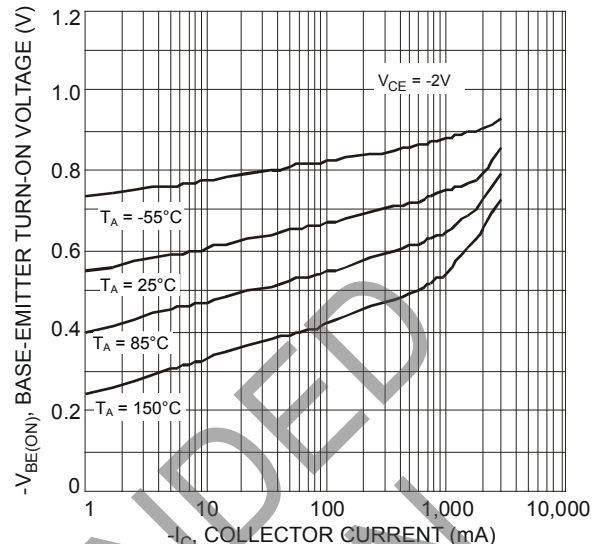


Figure 4 Typical Base-Emitter Turn-On Voltage vs. Collector Current

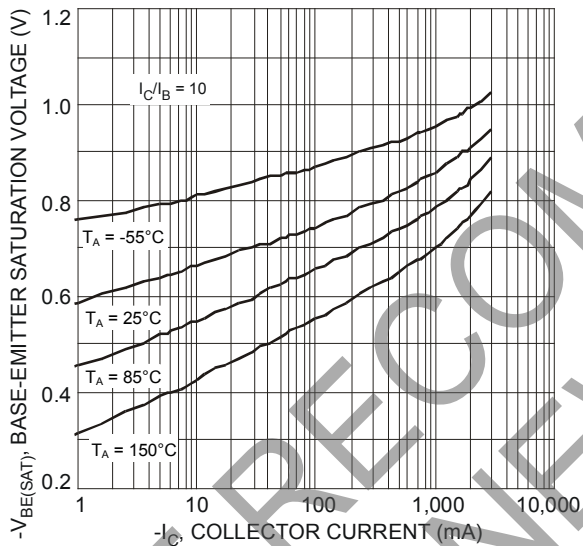


Figure 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

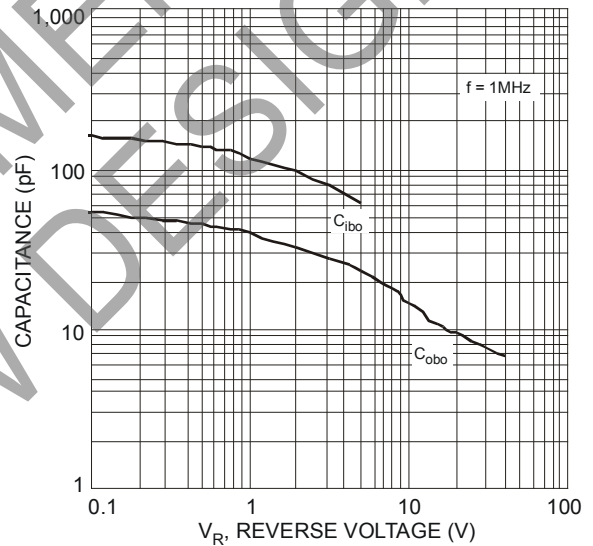


Figure 6 Typical Capacitance Characteristics

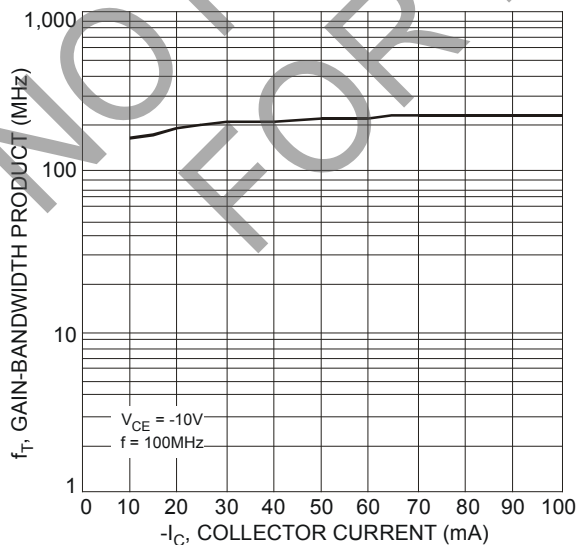
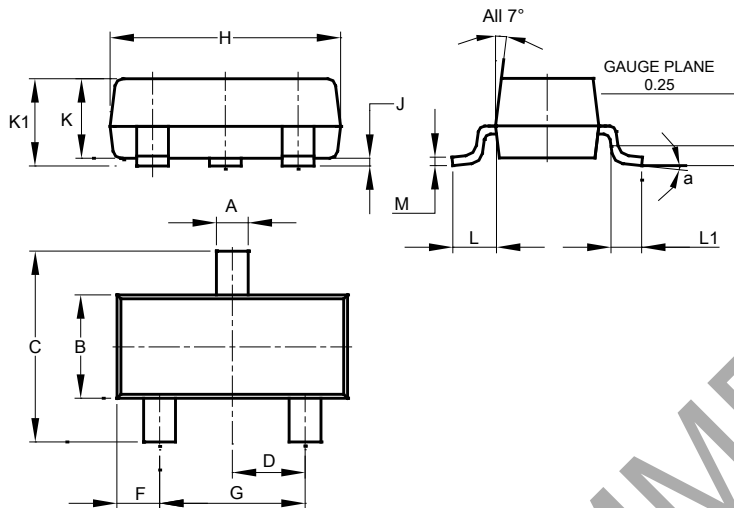


Figure 7 Typical Gain-Bandwidth Product vs. Collector Current

## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT23**

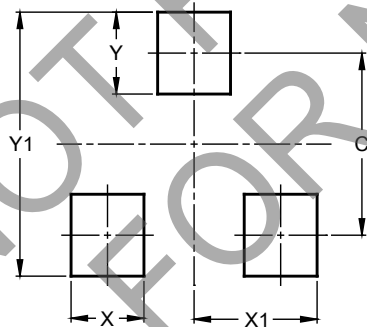


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	—
All Dimensions in mm			

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT23**



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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