60V NPN MEDIUM POWER TRANSISTOR IN SOT23

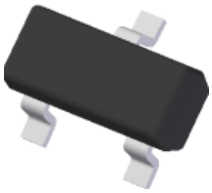
Features

- BV_{CEO} > 60V
- BV_{CEX} > 150V
- BV_{ECO} > 6V
- I_C = 3.5A high Continuous Collector Current
- $V_{CE(SAT)}$ < 65mA @1A
- $R_{CE(SAT)}$ = 43mΩ @1A
- 1.25W Power Dissipation
- Complementary PNP Type: ZXTP25060BFH
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

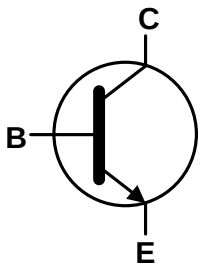
Mechanical Data

- Case: SOT23
- UL Flammability Rating 94V-0
- Case Material: Molded Plastic. "Green" Molding Compound.
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.008 grams (Approximate)

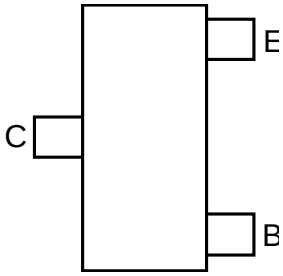
SOT23



Top View



Device Symbol



Top View
Pin-Out

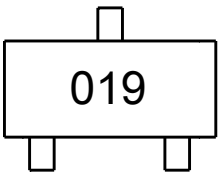
Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ZXTN25060BFHTA	AEC-Q101	019	7	8	3,000

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See http://www.diodes.com/quality/lead_free/ 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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information

SOT23



019 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	150	V
Collector-Emitter Voltage (Forward Blocking)	V_{CEX}	150	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	3.5	A
Peak Pulse Current	I_{CM}	10	A
Base Current	I_B	200	mA

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

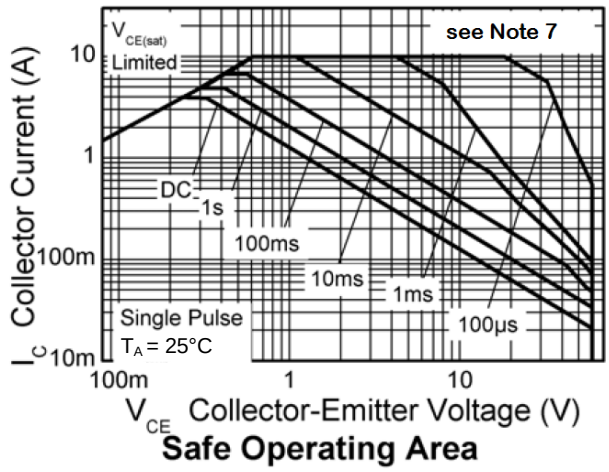
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5) Linear Derating Factor	P_D	0.73 5.84	W mW/°C
Power Dissipation (Note 6) Linear Derating Factor	P_D	1.05 8.4	W mW/°C
Power Dissipation (Note 7) Linear Derating Factor	P_D	1.25 9.6	W mW/°C
Power Dissipation (Note 8) Linear Derating Factor	P_D	1.81 14.5	W mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	171	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	119	°C/W
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	100	°C/W
Thermal Resistance, Junction to Ambient (Note 8)	$R_{\theta JA}$	69	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 9)

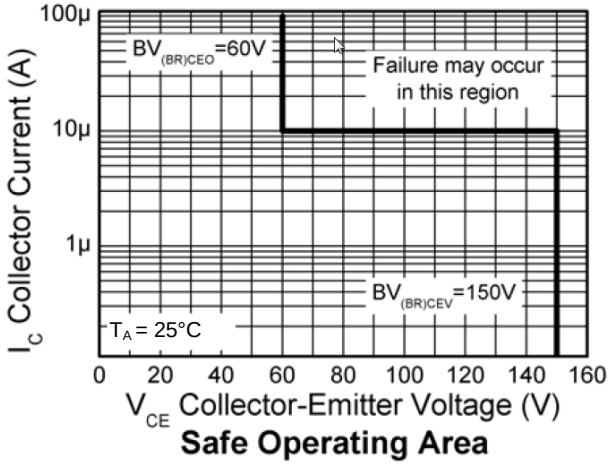
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
5. For a device surface mounted on 15mm X 15mm X 1.6mm FR-4 PCB with high coverage of single sided 1 oz copper, in still air conditions.
6. Mounted on 25mm X 25mm X 1.6mm FR-4 PCB with high coverage of single sided 2 oz copper, in still air conditions.
7. Mounted on 50mm X 50mm X 1.6mm FR-4 PCB with high coverage of single sided 2 oz copper, in still air conditions.
8. As (7) above measured at t<5s.
9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

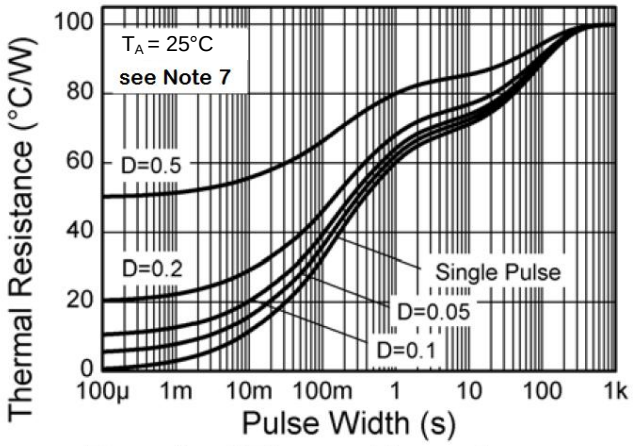
Thermal Characteristics and Derating Information



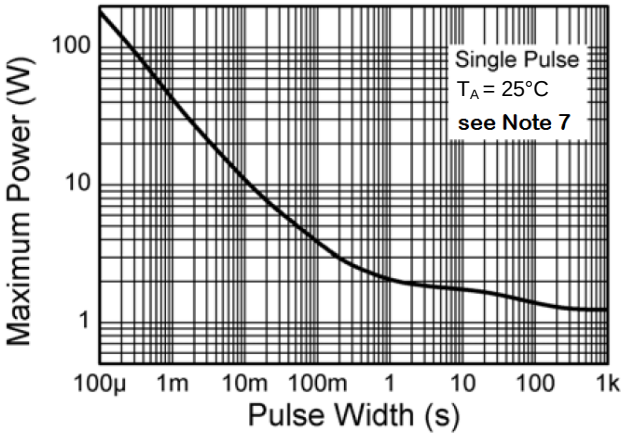
Safe Operating Area



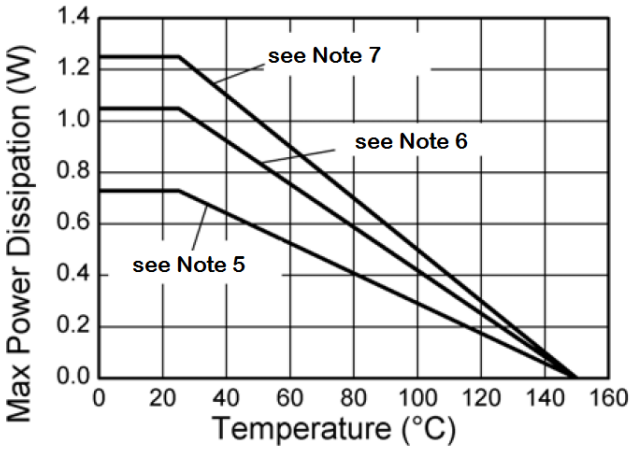
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



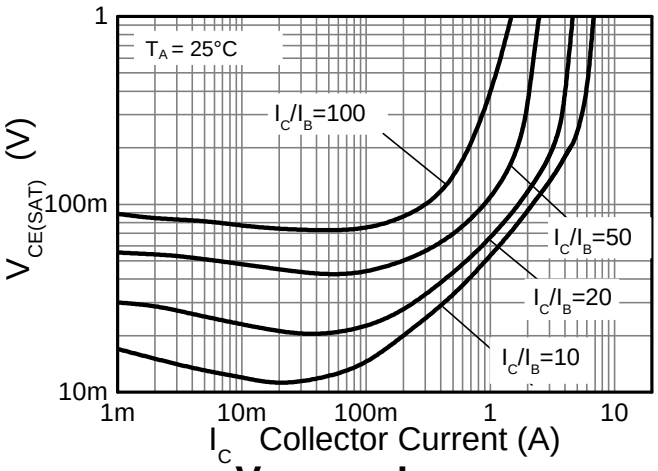
Derating Curve

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

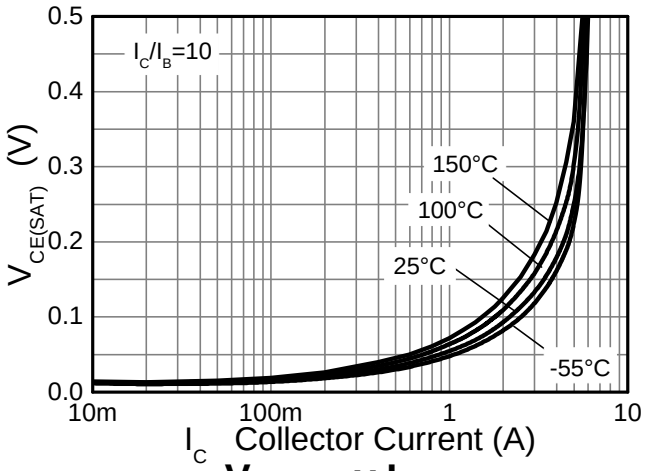
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	150	190	—	V	I_C = 100µA
Collector Emitter Breakdown Voltage (Forward Blocking)	BV_{CEX}	150	190	—	V	I_C = 100µA, R_{BE} ≤ 1kΩ or -1V < V_{BE} < 0.25V
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	60	80	—	V	I_C = 10mA
Emitter-Collector Breakdown Voltage (Reverse Blocking)	BV_{ECX}	6	8	—	V	I_E = 100µA, R_{BE} ≤ 1kΩ or -1V < V_{BC} < 0.25V
Emitter-Collector Breakdown Voltage (Base Open)	BV_{ECO}	6	7	—	V	I_E = 100µA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8	—	V	I_E = 100µA
Collector Cutoff Current	I_{CBO}	—	<1 —	50 20	nA µA	V_{CB} = 120V V_{CB} = 120V, T_A = +100°C
Collector Emitter Cutoff Current	I_{CEX}	—	—	100	nA	V_{CE} = 120V, R_{BE} ≤ 1kΩ or -1V < V_{BE} < 0.25V
Emitter Cutoff Current	I_{EBO}	—	<1	50	nA	V_{EB} = 5.6V
Static Forward Current Transfer Ratio (Note 10)	h_{FE}	100 90 25	200 180 40	300 — —	—	I_C = 10mA, V_{CE} = 2V I_C = 1A, V_{CE} = 2V I_C = 3.5A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(SAT)}$	—	33 73 50 150	40 95 65 175	mV mV mV mV	I_C = 0.5A, I_B = 50mA I_C = 0.5A, I_B = 10mA I_C = 1A, I_B = 100mA I_C = 3.5A, I_B = 350mA
Base-Emitter Turn-On Voltage (Note 10)	$V_{BE(ON)}$	—	865	950	mV	I_C = 3.5mA, V_{CE} = 2V
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(SAT)}$	—	960	1050	mV	I_C = 3.5mA, I_B = 350mA
Output Capacitance (Note 10)	C_{obo}	—	11.5	20	pF	V_{CB} = 10V, f = 1MHz
Transition Frequency	f_T	—	185	—	MHz	V_{CE} = 5V, I_C = 100mA, f = 100MHz
Turn-On Time	t_{ON}	—	34	—	ns	V_{CC}=10V, I_C = 500mA I_{B1} = - I_{B2} = 50mA
Turn-Off Time	t_{OFF}	—	566	—	ns	

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

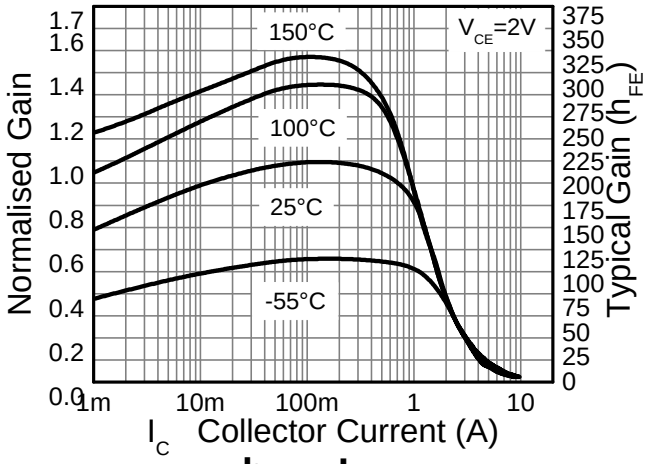
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



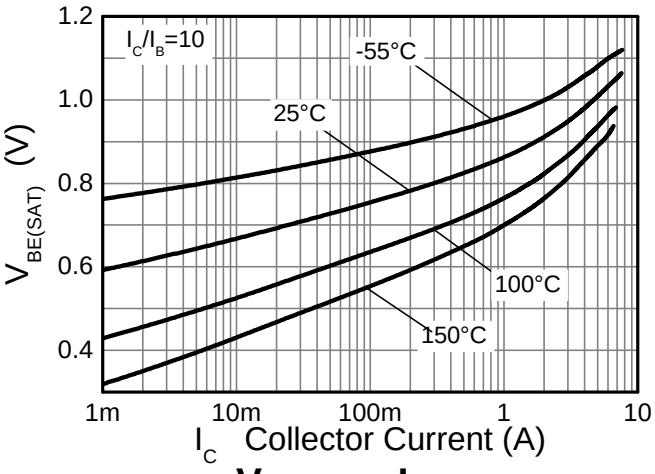
$V_{CE(SAT)}$ v I_C



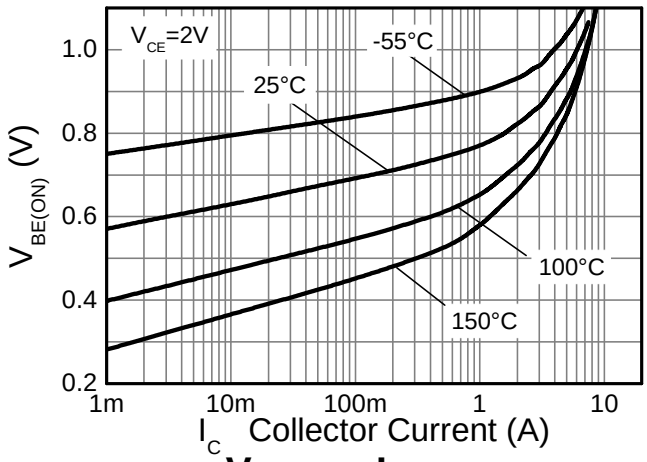
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C

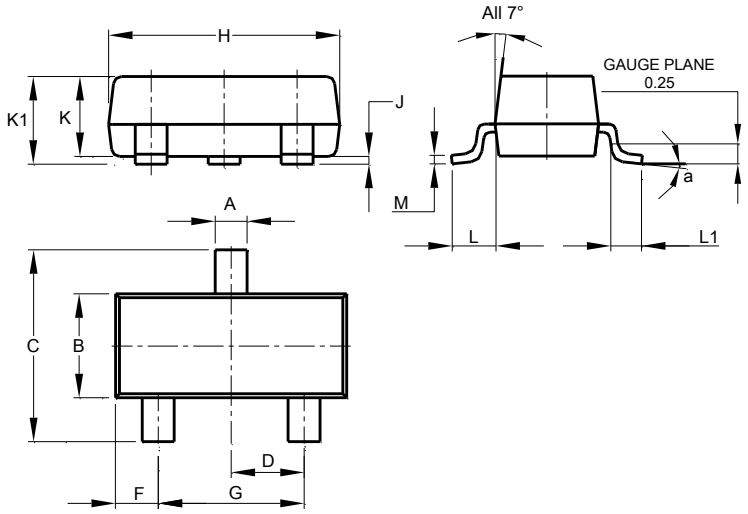


$V_{BE(ON)}$ v I_C

Package Outline Dimensions

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

SOT23

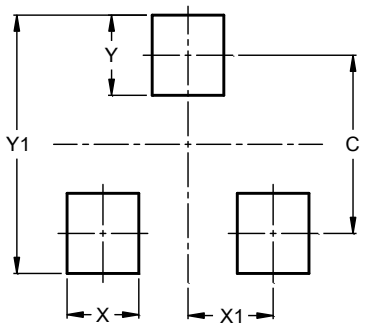


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	–
All Dimensions in mm			

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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