125V NPN MEDIUM POWER TRANSISTOR IN SOT23

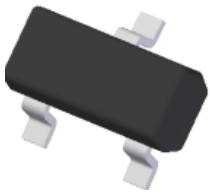
Features

- BV_{CEO} > 125V
- I_C = 800mA High Continuous Collector Current
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

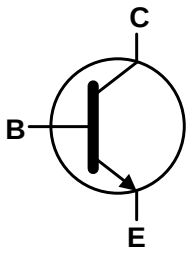
Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- 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)

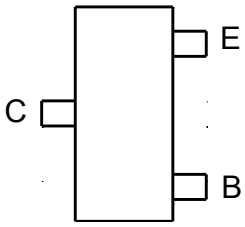
SOT23



Top View



Device Symbol



Top View
Pin-Out

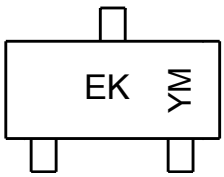
Ordering Information (Note 5)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
BCX41TA	AEC-Q101	EK	7	8	3000

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 https://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, see https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information

SOT23



EK = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: E = 2017)
M or $\overline{M}$ = Month (ex: 9 = September)

Date Code Key

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	F	G	H	I	J	K	L	M	N	O	P	Q

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	125	V
Collector-Emitter Voltage	V_{CEO}	125	V
Emitter-Base Voltage	V_{EBO}	5	V
Continuous Collector Current	I_C	800	mA
Peak Pulse Current	I_{CM}	1	A
Base Current	I_B	100	mA

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

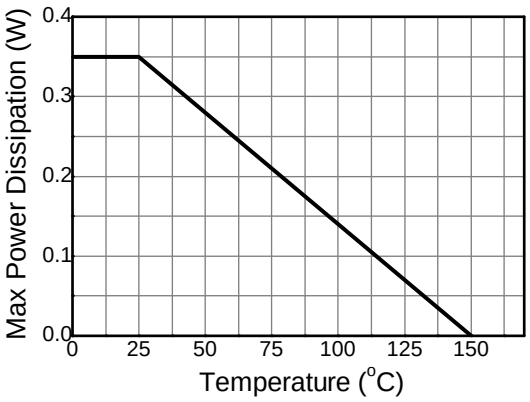
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	310	mW
	(Note 6)		350	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\Theta JA}$	403	°C/W
	(Note 6)		357	
Thermal Resistance, Junction to Leads	(Note 7)	$R_{\Theta JL}$	350	°C/W
Operating and Storage Temperature Range		T_J,T_{STG}	-55 to +150	°C

ESD Ratings (Note 8)

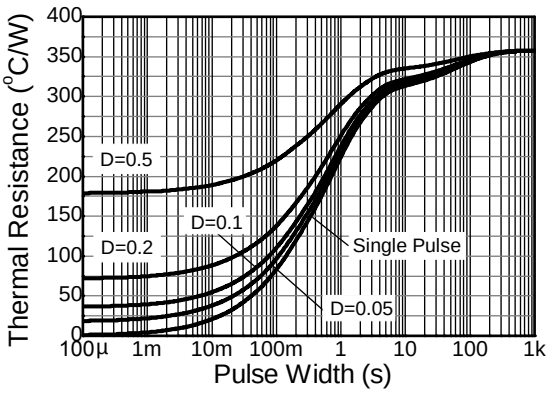
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge—Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge—Machine Model	ESD MM	400	V	C

Notes:
5. For the device mounted on minimum recommended pad layout FR-4 PCB with high coverage of single sided 1oz copper in still air condition; the device is measured when operating in a steady-state condition.
6. Same as note (6), except the device is mounted on 15mm × 15mm FR-4 PCB.
7. Thermal resistance from junction to solder-point (at the end of the leads).
8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

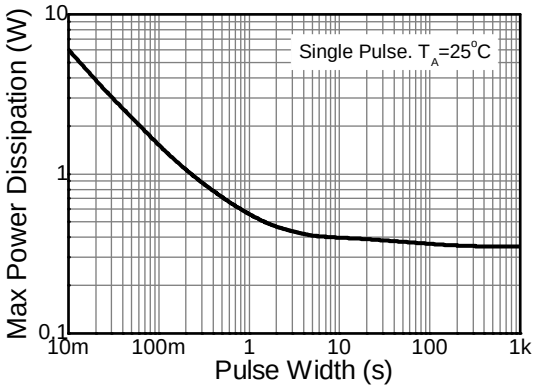
Thermal Characteristics and Derating Information (@T_A = +25°C, unless otherwise specified.)



Derating Curve



Transient Thermal Impedance



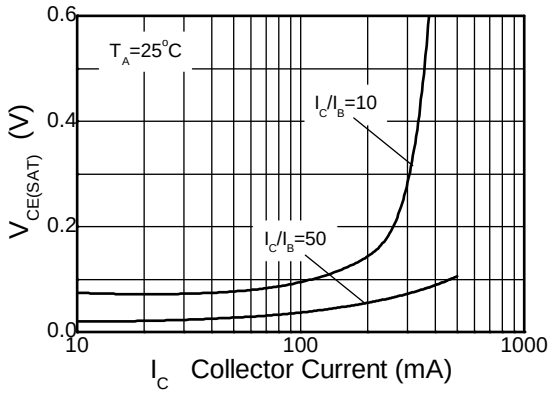
Pulse Power Dissipation

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

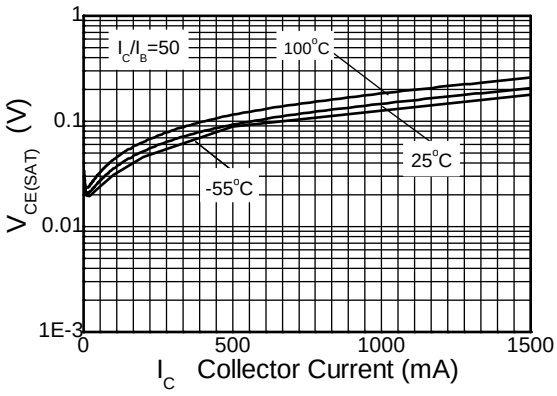
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage	BV_{CES}	125	—	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	125	—	—	V	I_{CEO} = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	—	—	V	I_{EBO} = 10µA
Collector-Base Cut-Off Current	I_{CES}	— —	— —	100 10	nA µA	V_{CB} = 100V V_{CB} = 100V, T_A = +150°C
Collector Cut-Off Current	I_{CEX}	— —	— —	10 75	µA µA	V_{CE} = 100V, V_{BE} = 0.2V, T_A = +85°C V_{CE} = 100V, V_{BE} = 0.2V, T_A = +125°C
Emitter-base Cut-off Current	I_{EBO}	—	—	100	nA	V_{EB} = 5.6V
ON CHARACTERISTICS (Note 10)						
Static Forward Current Transfer Ratio	h_{FE}	25 63 40	—	—	—	I_C = 100µA, V_{CE} = 1V I_C = 100mA, V_{CE} = 1V I_C = 200mA, V_{CE} = 1V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	—	0.9	V	I_C = 300mA, I_B = 30mA
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	—	1.4	V	I_C = 300mA, I_B = 30mA
SMALL SIGNAL CHARACTERISTICS (Note 9)						
Transition Frequency	f_T	—	100	—	MHz	I_C = 10mA, V_{CE} = 5V, f = 20MHz
Output Capacitance	C_{OBO}	—	12	—	pF	V_{CB} = 10V, f = 1MHz

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

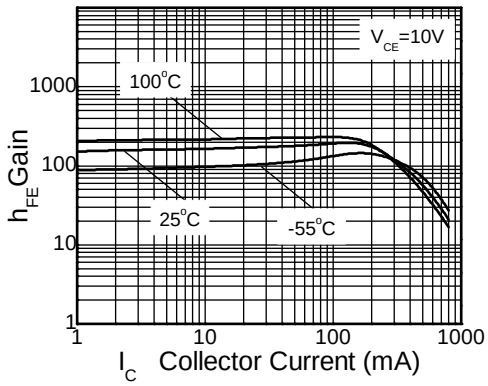
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



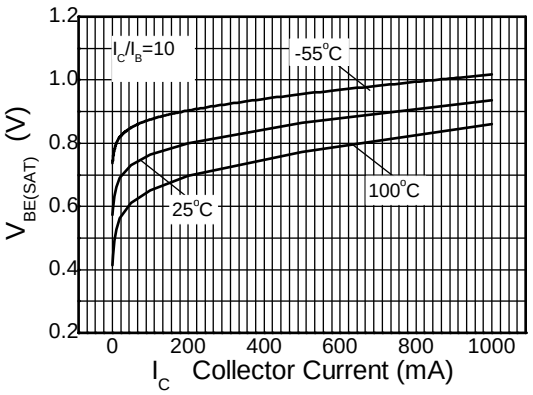
$V_{CE(SAT)}$ v I_C



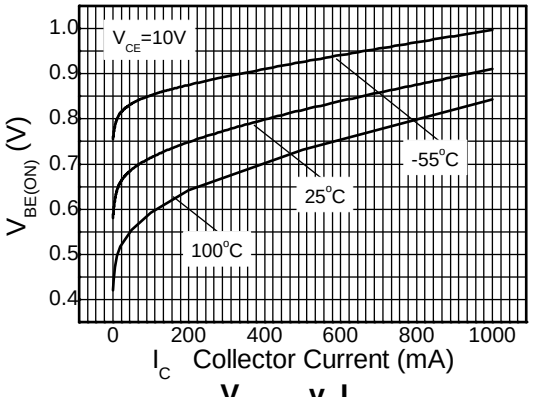
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C

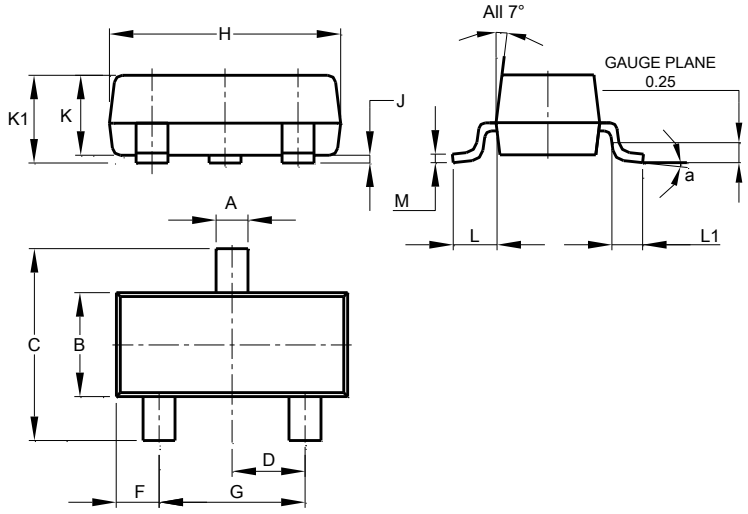


$V_{BE(ON)}$ v I_C

Package Outline Dimensions

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

SOT23

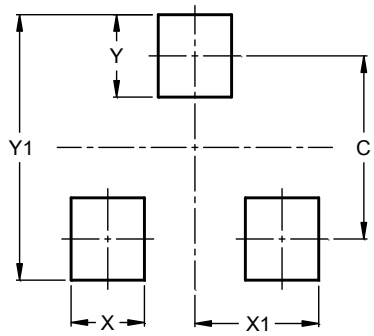


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	—
All Dimensions in mm			

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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