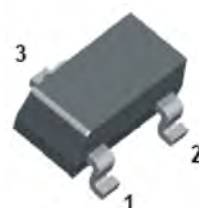


Features

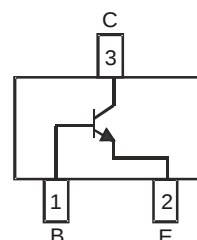
- Low Deviation in Base-Emitter Voltage
- Surface Mount Package
- Ideally Suited for Automated Assembly Processes
- **Lead Free by Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOT-23
- Case material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminal Connections: See Diagram
- Terminals: Finish - Matte Tin annealed over Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.008 grams (approximate)



SOT-23



Schematic & Pin Configuration

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	50	V
Collector-Emitter Voltage	V _{CE0}	45	V
Emitter-Base Voltage	V _{EB0}	6	V
Output Current - Continuous (Note 3)	I _C	200	mA
Peak Collector Current	I _{CM}	200	mA
Peak Emitter Current	I _{EM}	200	mA
Power Dissipation (Note 3)	P _d	300	mW
Power Deration	P _{der}	2.4	mW/°C

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Ambient Air (Note 3)	R _{θJA}	417	°C/W
Operating and Storage Junction Temperature Range	T _j , T _{STG}	-55 to +150	°C

- Notes:
1. No purposefully added lead.
 2. Diode's Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
 3. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on page 4 or on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

Electrical Characteristics: NPN Transistor @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)						
Collector-Base Breakdown Voltage	V _{(BR)CBO}	50	—	—	V	I _C = 10μA, I _E = 0
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	45	—	—	V	I _C = 1.0mA, I _B = 0
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	6	—	—	V	I _E = 10μA, I _C = 0
Collector Cutoff Current	I _{CEX}	—	—	15	nA	V _{CE} = 50V, V _{EB(OFF)} = 3.0V
Base Cutoff Current (I _{BEX})	I _{BL}	—	—	15	nA	V _{CE} = 40V, V _{EB(OFF)} = 3.0V
Collector-Base Cut Off Current	I _{CBO}	—	—	15	nA	V _{CB} = 40V, I _E = 0
				5	μA	V _{CB} = 30V, T _A = 150°C
Collector-Emitter Cut Off Current, I _{O(OFF)}	I _{CEO}	—	—	50	nA	V _{CE} = 40V, I _B = 0
Emitter-Base Cut Off Current	I _{EBO}	—	—	50	nA	V _{EB} = 5V, I _C = 0
ON CHARACTERISTICS (Note 4)						
DC Current Gain	h _{fe}	180	—	—	—	V _{CE} = 5V, I _C = 100μA
		150	—	—	—	V _{CE} = 5V, I _C = 500μA
		220	—	—	—	V _{CE} = 5V, I _C = 1mA
		220	—	—	—	V _{CE} = 5V, I _C = 2mA
		150	—	—	—	V _{CE} = 5V, I _C = 5mA
		150	—	—	—	V _{CE} = 5V, I _C = 10mA
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	—	0.09	0.18	V	I _C = 10mA, I _B = 0.5mA
		—	0.2	0.4	V	I _C = 100mA, I _B = 5mA
Base-Emitter Turn-On Voltage	V _{BE(ON)}	647	657	667	mV	V _{CE} = 5V, I _C = 2mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}	—	—	0.8	V	I _C = 10mA, I _B = 0.5mA
		—	—	0.9	V	I _C = 100mA, I _B = 5mA
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C _{OBO}	—	3	—	pF	V _{CB} = 5.0V, f = 1.0 MHz, I _E = 0
Input Impedance	h _{ie}	—	4.5	—	KΩ	V _{CE} = 5.0V, I _C = 2mA, f = 1.0KHz
Voltage Feedback Ratio	h _{re}	—	2	—	x 10E-4	
Small Signal Current Gain	h _{fe}	—	200	—	—	
Output Admittance	h _{oe}	—	30	—	μS	
Current Gain-Bandwidth Product	f _T	100	—	—	MHz	V _{CE} = 20V, I _C = 10 mA, f = 100 MHz
Noise Figure	NF	—	—	10	dB	V _{CE} = 5V, I _C = 100μA, R _S = 1KΩ, f = 1kHz

Notes: 4. Short duration pulse test used to minimize self-heating effect.

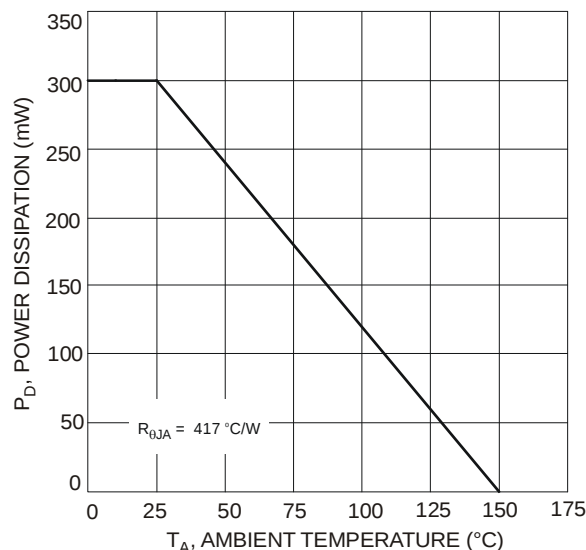


Fig. 1 Maximum Power Dissipation vs. Ambient Temperature

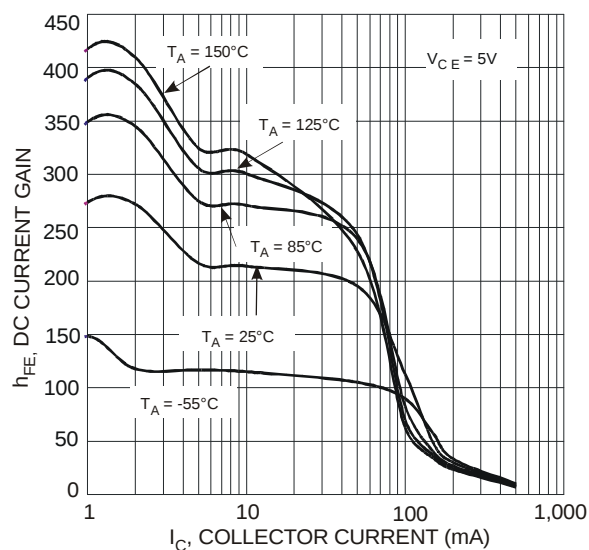
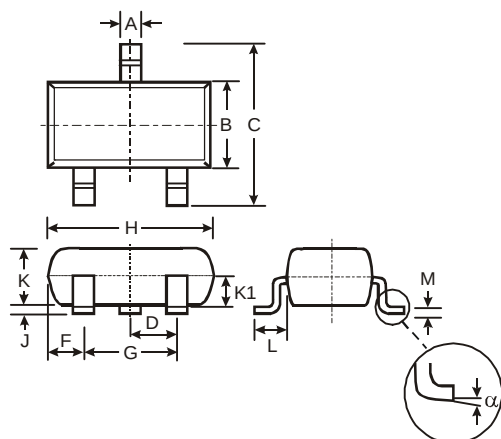


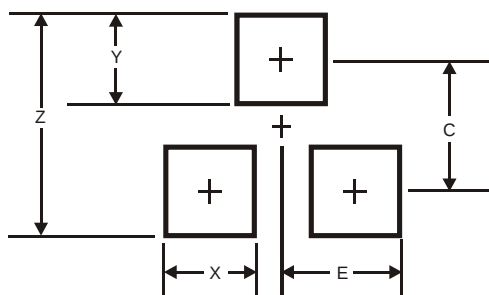
Fig. 2 Typical h_{FE} vs. I_C

Mechanical Details



SOT-23			
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	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

IMPORTANT NOTICE

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. Diodes Incorporated does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on our website, harmless against all damages.

LIFE SUPPORT

Diodes Incorporated products are not authorized for use as critical components in life support devices or systems without the expressed written approval of the President of Diodes Incorporated.