

Features

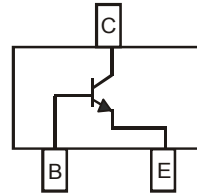
- Epitaxial Planar Die Construction
- Low Collector-Emitter Saturation Voltage, $V_{CE(SAT)}$
- Complementary PNP Type Available (DSS5160U)
- Ultra-Small Surface Mount Package
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green Device" (Note 2)**

Mechanical Data

- Case: SOT-323
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish — Matte Tin annealed over Copper Plated Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.006 grams (approximate)



Top View



Device Schematic

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	80	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current - Continuous	I_C	1	A
Peak Pulse Collector Current	I_{CM}	2	A
Base Current (DC)	I_B	300	mA
Peak Base Current	I_{BM}	1	A

Thermal Characteristics

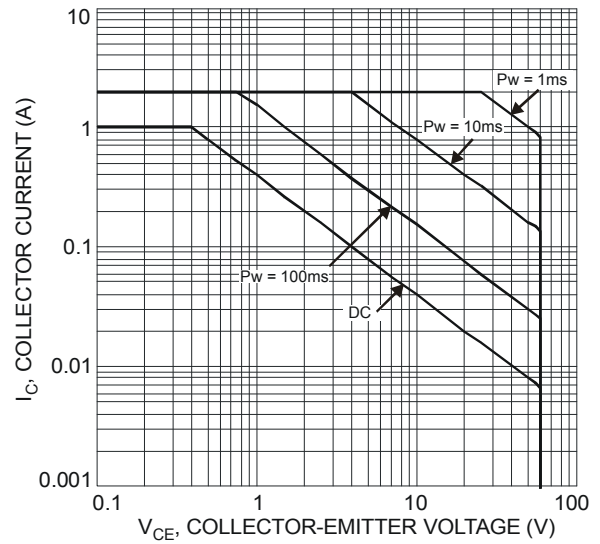
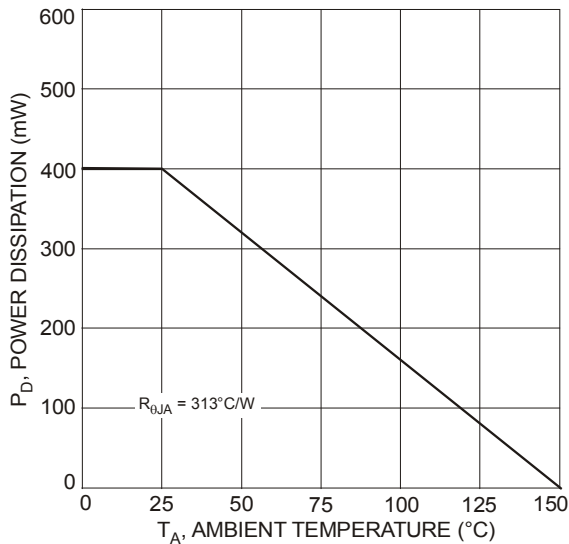
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3) @ $T_A = 25^\circ\text{C}$	P_D	400	mW
Thermal Resistance, Junction to Ambient (Note 3) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	313	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

- 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 with minimum recommended pad layout.

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	V _{(BR)CBO}	80	—	—	V	I _C = 100μA, I _E = 0
Collector-Emitter Breakdown Voltage (Note 4)	V _{(BR)CEO}	60	—	—	V	I _C = 10mA, I _B = 0
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	5	—	—	V	I _E = 100μA, I _C = 0
Collector Cutoff Current	I _{CBO}	—	—	100 50	nA μA	V _{CB} = 60V, I _E = 0 V _{CB} = 60V, I _E = 0, T _A = 150°C
Collector Cutoff Current	I _{CES}	—	—	100	nA	V _{CE} = 60V, V _{BE} = 0
Emitter Cutoff Current	I _{EBO}	—	—	100	nA	V _{EB} = 5V, I _C = 0
ON CHARACTERISTICS (Note 4)						
DC Current Gain	h _{FE}	250 200 100	— — —	— — —	—	V _{CE} = 5V, I _C = 1mA V _{CE} = 5V, I _C = 500mA V _{CE} = 5V, I _C = 1A
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	— — —	— — —	115 150 280	mV	I _C = 100mA, I _B = 1mA I _C = 500mA, I _B = 50mA I _C = 1A, I _B = 100mA
Collector-Emitter Saturation Resistance	R _{CE(SAT)}	—	—	280	mΩ	I _C = 1A, I _B = 100mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}	—	—	1.1	V	I _C = 1A, I _B = 50mA
Base-Emitter Turn On Voltage	V _{BE(ON)}	—	—	0.9	V	V _{CE} = 5V, I _C = 1A
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C _{obo}	—	—	10	pF	V _{CB} = 10V, f = 1.0MHz
Current Gain-Bandwidth Product	f _T	150	—	—	MHz	V _{CE} = 10V, I _C = 50mA, f = 100MHz
SWITCHING CHARACTERISTICS						
Turn-On Time	t _{on}	—	63	—	ns	V _{CC} = 10V I _C = 0.5A, I _{B1} = I _{B2} = 25mA
Delay Time	t _d	—	33	—	ns	
Rise Time	t _r	—	30	—	ns	
Turn-Off Time	t _{off}	—	420	—	ns	
Storage Time	t _s	—	380	—	ns	
Fall Time	t _f	—	40	—	ns	

Notes: 4. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤2%.



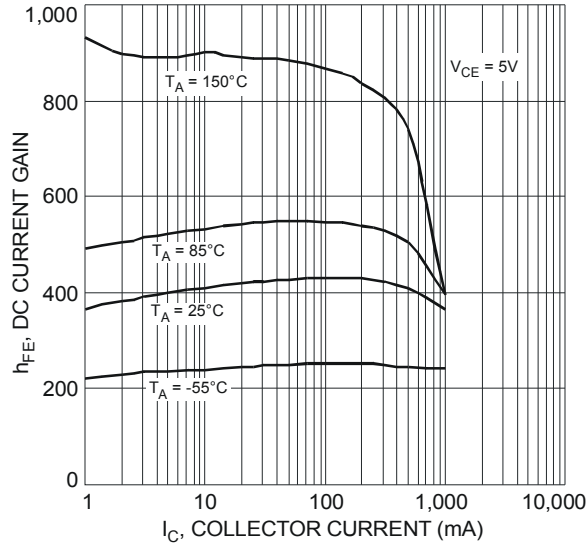


Fig. 3 Typical DC Current Gain vs. Collector Current

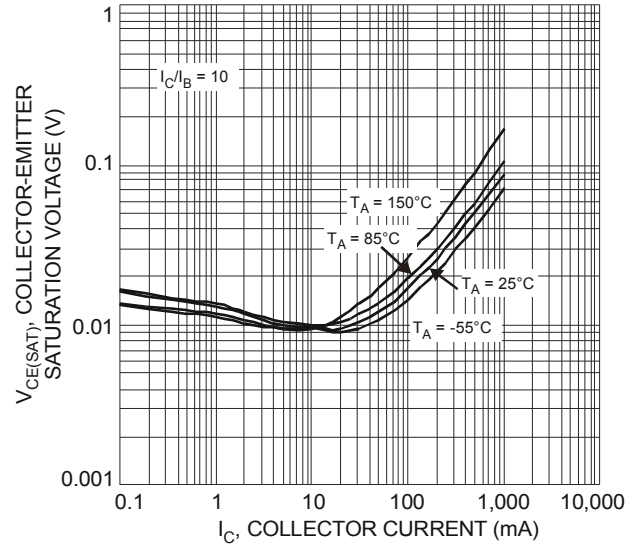


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

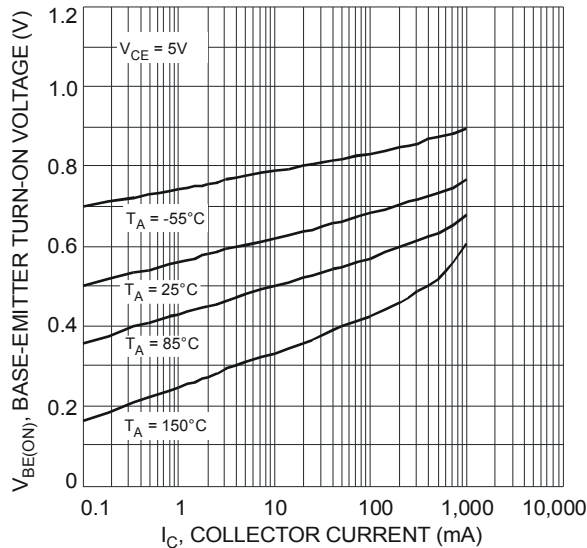


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

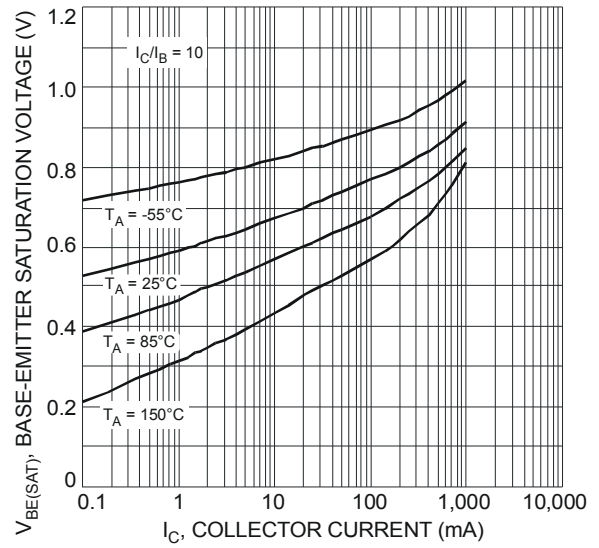


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

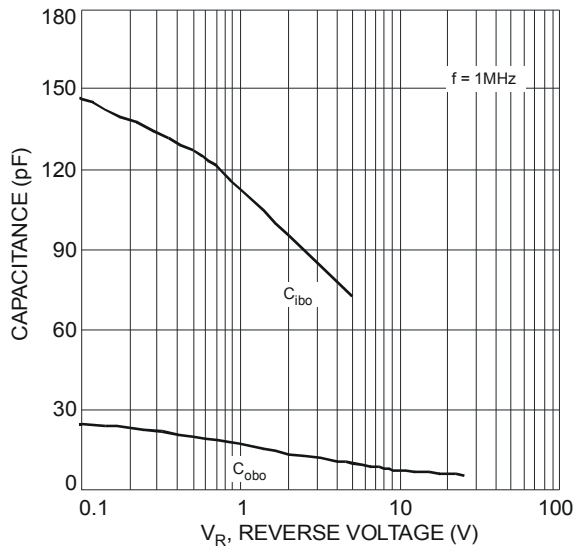
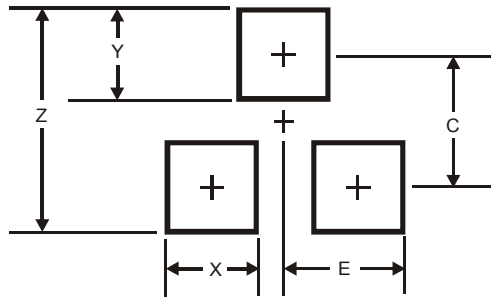


Fig. 7 Typical Capacitance Characteristics

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.8
X	0.7
Y	0.9
C	1.9
E	1.0

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