



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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Features

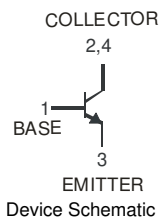
- Complementary PNP Type Available (DSS5540X)
- Ultra Low Collector-Emitter Saturation Voltage
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- Lead Free By Design/RoHS Compliant (Note 1)**
- "Green" Device (Note 2)**

Mechanical Data

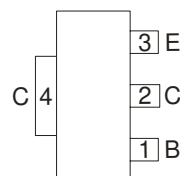
- Case: SOT89-3L
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish — Matte Tin annealed over Copper leadframe
(Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.072 grams (approximate)



Top View



Device Schematic



Pin Out Configuration

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	40	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Continuous Collector Current	I_C	4	A
Repetitive Collector Current (Note 3)	I_{CRM}	5	A
Peak Pulse Collector Current	I_{CM}	10	A
Continuous Base Current	I_B	1	A
Peak Pulse Base Current	I_{BM}	2	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4) @ $T_A = 25^\circ\text{C}$	P_D	0.9	W
Thermal Resistance, Junction to Ambient Air (Note 4) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	139	$^\circ\text{C/W}$
Power Dissipation (Note 5) @ $T_A = 25^\circ\text{C}$	P_D	2	W
Thermal Resistance, Junction to Ambient Air (Note 5) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Notes:

- No purposefully added lead.
- Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
- Operated under pulsed conditions: pulse width $\leq 10\text{ms}$; duty cycle ≤ 0.2 .
- Device mounted on FR-4 PCB with minimum recommended pad layout.
- Device mounted on FR-4 PCB with 1 inch² copper pad layout.

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	V _{(BR)CBO}	40	—	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 6)	V _{(BR)CEO}	40	—	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	6	—	—	V	I _E = 100μA
Collector-Base Cutoff Current	I _{CBO}	—	—	100	nA	V _{CB} = 30V, I _E = 0
		—	—	50	μA	V _{CB} = 30V, I _E = 0, T _A = 150°C
Collector-Emitter Cut-Off Current	I _{CES}	—	—	100	nA	V _{CE} = 30V, V _{BE} = 0V
Emitter-Base Cutoff Current	I _{EBO}	—	—	100	nA	V _{EB} = 5V, I _C = 0
ON CHARACTERISTICS (Note 6)						
DC Current Gain	h _{FE}	300	—	—	—	V _{CE} = 2V, I _C = 0.5A
		300	—	—	—	V _{CE} = 2V, I _C = 1A
		250	—	—	—	V _{CE} = 2V, I _C = 2A
		100	—	—	—	V _{CE} = 2V, I _C = 5A
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	—	—	90	mV	I _C = 0.5A, I _B = 5mA
		—	—	120	mV	I _C = 1A, I _B = 10mA
		—	80	150	mV	I _C = 2A, I _B = 200mA
		—	160	290	mV	I _C = 4A, I _B = 200mA
		—	185	355	mV	I _C = 5A, I _B = 500mA
Equivalent On-Resistance	R _{CE(SAT)}	—	37	71	mΩ	I _C = 5A, I _B = 500mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}	—	—	1.1	V	I _C = 4A, I _B = 200mA
		—	—	1.2	V	I _C = 5A, I _B = 500mA
Base-Emitter Turn-on Voltage	V _{BE(ON)}	—	—	1.1	V	V _{CE} = 2V, I _C = 2A
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f _T	70	—	—	MHz	V _{CE} = 10V, I _C = 0.1A, f = 100MHz
Collector Capacitance	C _c	—	—	75	pF	V _{CB} = 10V, I _E = 0A, f = 1MHz
SWITCHING CHARACTERISTICS						
Turn-On Time	t _{on}	—	135	—	ns	V _{CC} = 10V, I _C = 2A, I _{B1} = 40mA
Delay Time	t _d	—	60	—	ns	
Rise Time	t _r	—	75	—	ns	
Turn-Off Time	t _{off}	—	670	—	ns	V _{CC} = 10V, I _C = 2A, I _{B1} = I _{B2} = 40mA
Storage Time	t _s	—	570	—	ns	
Fall Time	t _f	—	100	—	ns	

Notes: 6. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤2%.

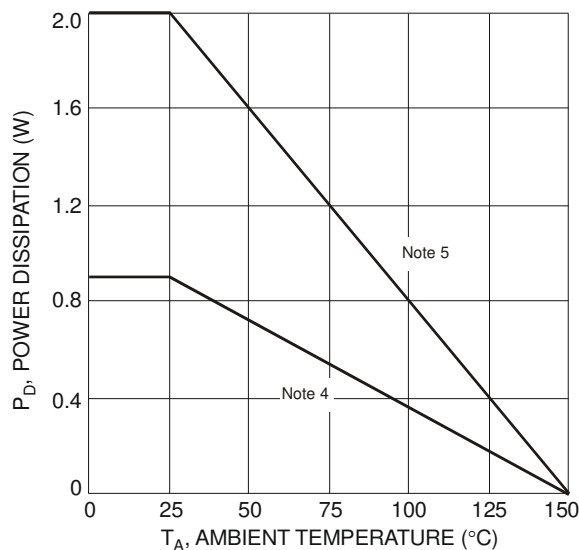


Fig. 1 Power Dissipation vs. Ambient Temperature

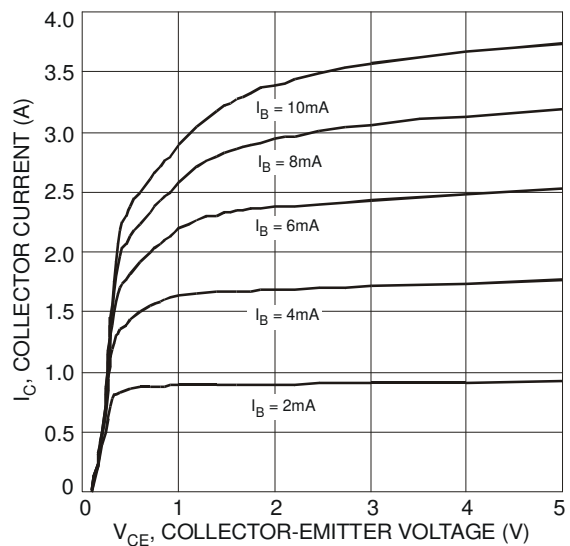


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

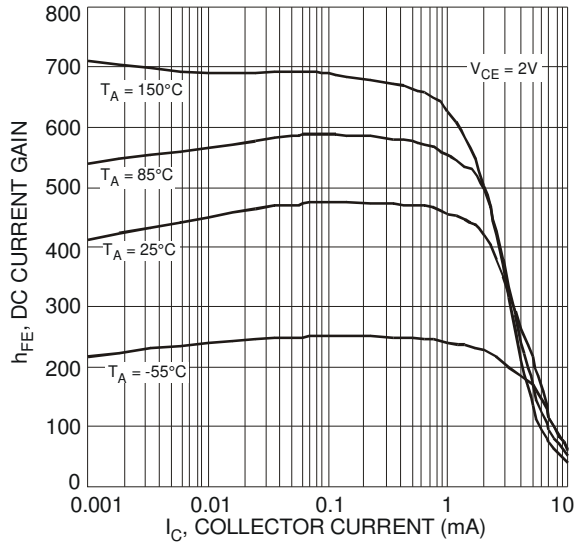


Fig. 3 Typical DC Current Gain vs. Collector Current

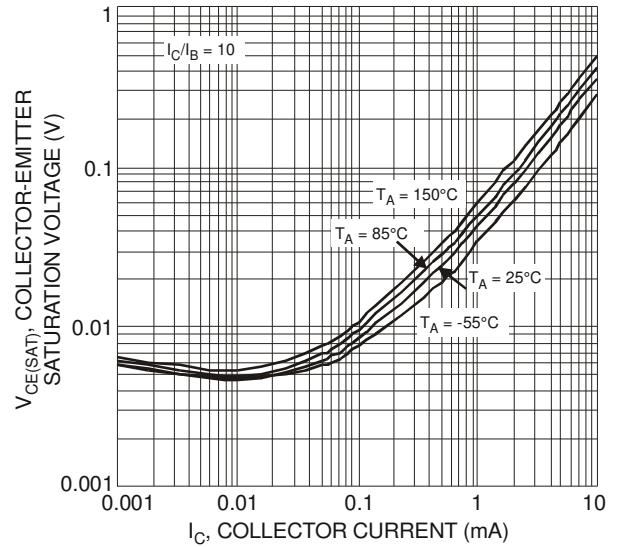


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

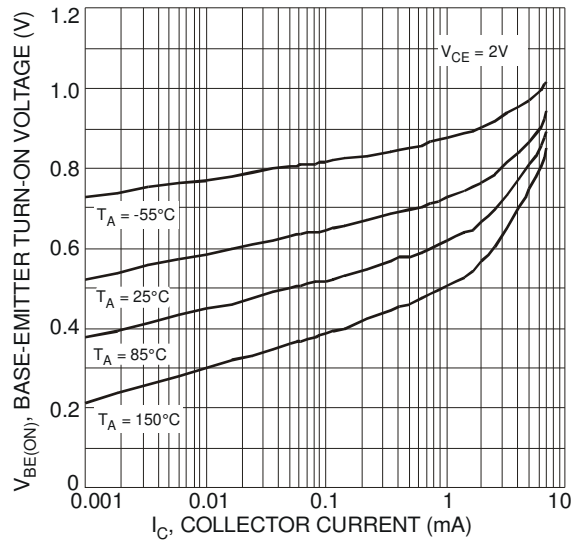


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

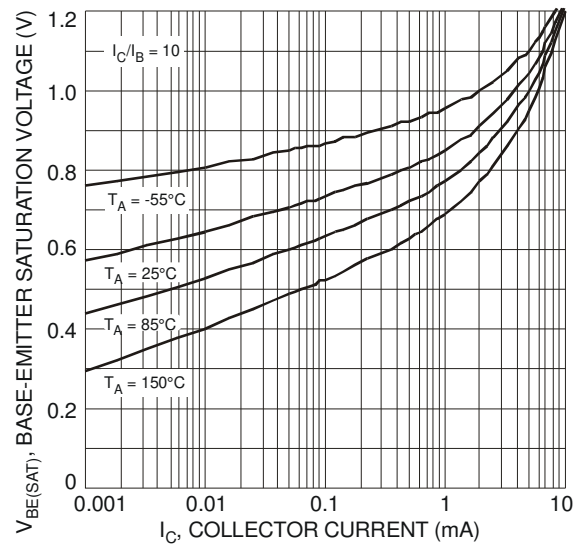


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

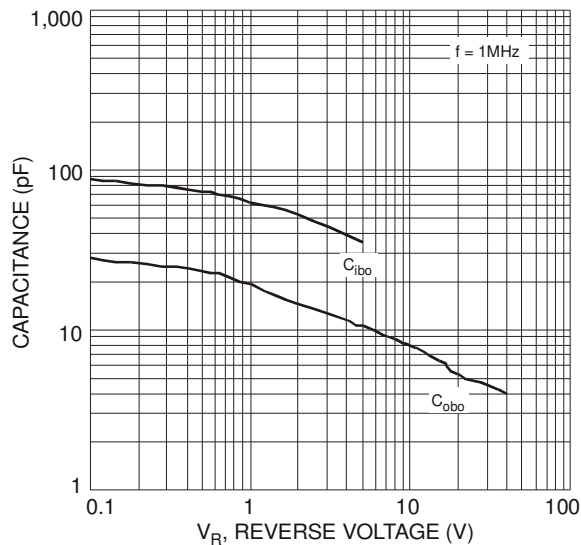


Fig. 7 Typical Capacitance Characteristics

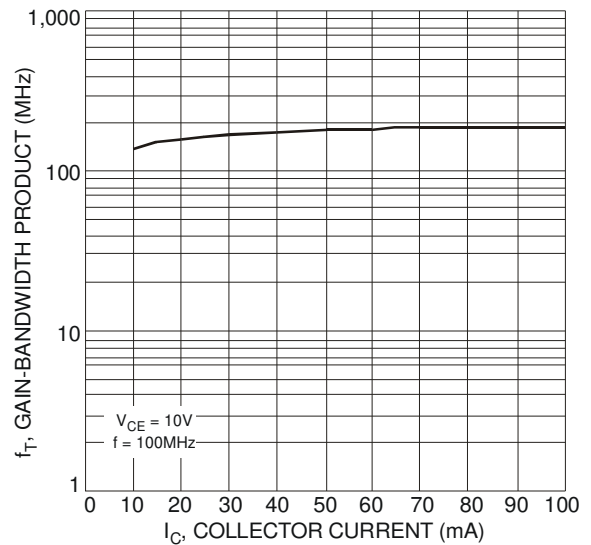


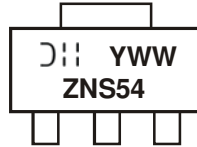
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

Ordering Information (Note 7)

Part Number	Case	Packaging
DSS4540X-13	SOT89-3L	2500/Tape & Reel

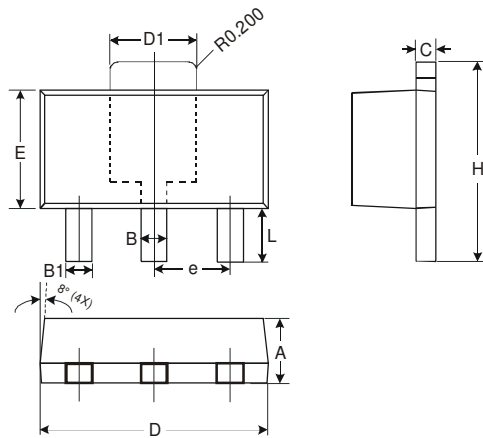
Notes: 7. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



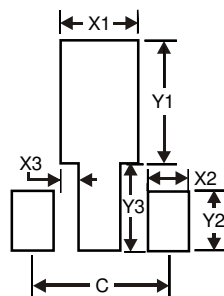
ZNS54 = Product Type Marking Code
 DII = Manufacturer's Code Marking
 YWW = Date Code Marking
 Y = Last digit of year (ex: 8 = 2008)
 WW = Week code 01 - 52

Package Outline Dimensions



SOT89-3L			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.45	0.55	0.50
B1	0.37	0.47	0.42
C	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.50	1.70	1.60
E	2.40	2.60	2.50
e	—	—	1.50
H	3.95	4.25	4.10
L	0.90	1.20	1.05
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
X1	1.7
X2	0.9
X3	0.4
Y1	2.7
Y2	1.3
Y3	1.9
C	3.0

IMPORTANT NOTICE

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