LOW $V_{CE(SAT)}$ NPN SURFACE MOUNT TRANSISTOR

Features

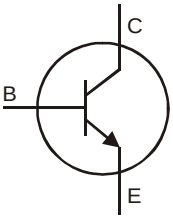
- Ideal for Medium Power Amplification and Switching
- Ultra Low Collector-Emitter Saturation Voltage
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **ESD rating: 400V-MM, 8KV-HBM**

Mechanical Data

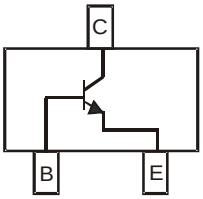
- Case: SOT-23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.008 grams (approximate)



Top View



Device Symbol



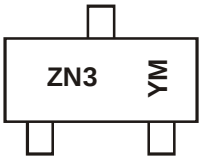
Pin Configuration

Ordering Information

Part Number	Case	Packaging
DSS30101L-7	SOT-23	3000/Tape & Reel

Notes: 1. No purposefully added lead. Halogen and Antimony Free.
2. Diodes Inc's "Green" Policy can be found on our website at http://www.diodes.com

Marking Information



ZN3 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: V = 2008)
M = Month (ex: 9 = September)

Date Code Key

Year	2008	2009	2010	2011	2012	2013	2014	2015
Code	V	W	X	Y	Z	A	B	C

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

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Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Base Voltage	V_{EBO}	5	V
Peak Pulse Current	I_{CM}	2	A
Continuous Collector Current	I_C	1	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3) @ T_A = 25°C	P_D	600	mW
Thermal Resistance, Junction to Ambient Air (Note 3) @ T_A = 25°C	$R_{\theta JA}$	209	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 3. Device mounted on FR-4 PCB MRP

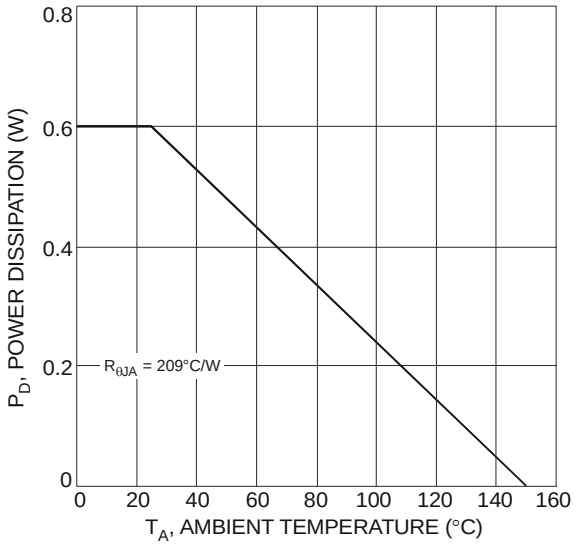


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

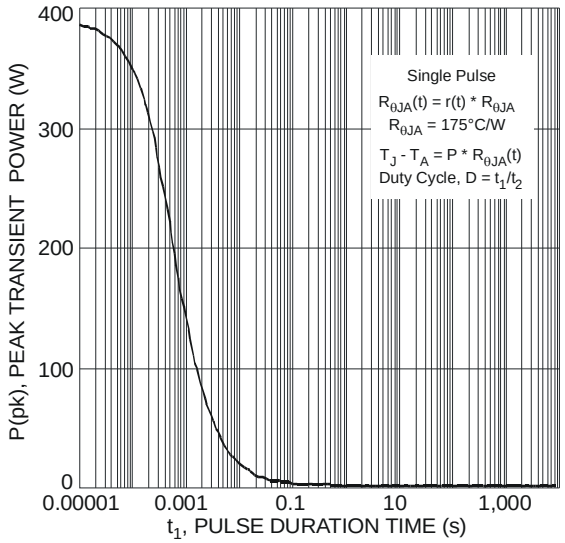


Fig. 2 Single Pulse Maximum Power Dissipation

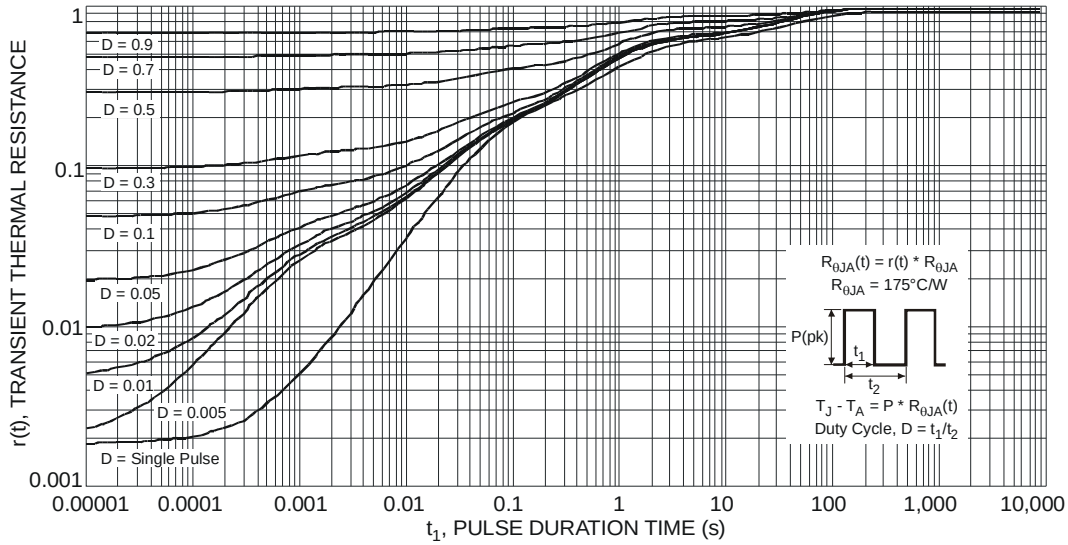


Fig. 3 Transient Thermal Response

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Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	50	—	—	V	I_C = 100μA
Collector-Emitter Breakdown Voltage (Note 4)	$V_{(BR)CEO}$	30	—	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	—	—	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
Emitter-Base Cutoff Current	I_{EBO}	—	—	100	nA	V_{EB} = 4V, I_C = 0
DC Current Gain (Note 4)	h_{FE}	300	—	—	—	V_{CE} = 5V, I_C = 50mA
		300	450	900		V_{CE} = 5V, I_C = 0.5A
		200	—	—		V_{CE} = 5V, I_C = 1A
Collector-Emitter Saturation Voltage (Note 4)	$V_{CE(sat)}$	—	—	75	mV	I_C = 0.1A, I_B = 1mA
		—	—	125		I_C = 0.5A, I_B = 50mA
		—	—	200		I_C = 1.0A, I_B = 100mA
Equivalent On-Resistance (Note 4)	$R_{CE(sat)}$	—	—	200	mΩ	I_E = 1A, I_B = 100mA
Base-Emitter Saturation Voltage (Note 4)	$V_{BE(sat)}$	—	0.93	1.1	V	I_C = 1A, I_B = 100mA
Base-Emitter Turn-on Voltage (Note 4)	$V_{BE(on)}$	—	0.80	1.1	V	V_{CE} = 2V, I_C = 1A
Transition Frequency	f_T	100	250	—	MHz	V_{CE} = 5V, I_C = 100mA, f = 100MHz
Output Capacitance	C_{obo}	—	9	15	pF	V_{CB} = 10V, f = 1MHz
Input Capacitance	C_{ibo}	—	65	—	pF	V_{EB} = 5V, f = 1MHz
Turn-On Time	t_{on}	—	57	—	ns	V_{CC} = 5V, I_C = 500mA, I_{B1} = -I_{B2} = 50mA
Delay Time	t_d	—	19	—	ns	
Rise Time	t_r	—	38	—	ns	
Turn-Off Time	t_{off}	—	340	—	ns	
Storage Time	t_s	—	315	—	ns	
Fall Time	t_f	—	25	—	ns	

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

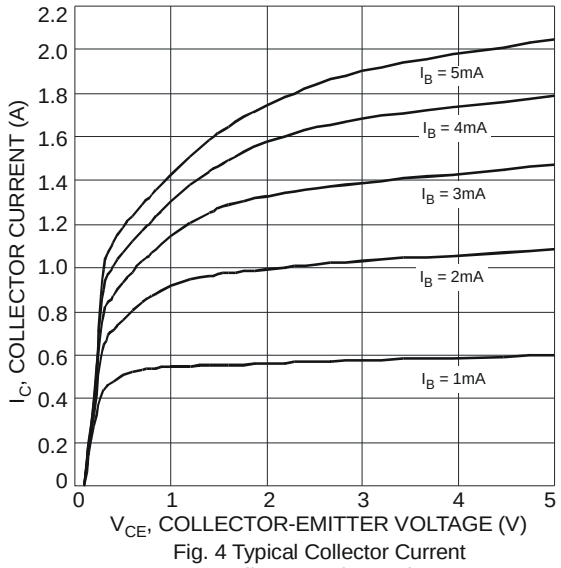


Fig. 4 Typical Collector Current vs. Collector-Emitter Voltage

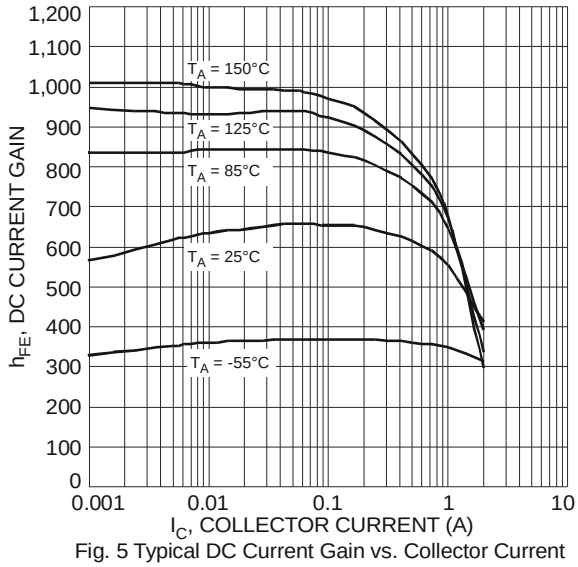


Fig. 5 Typical DC Current Gain vs. Collector Current

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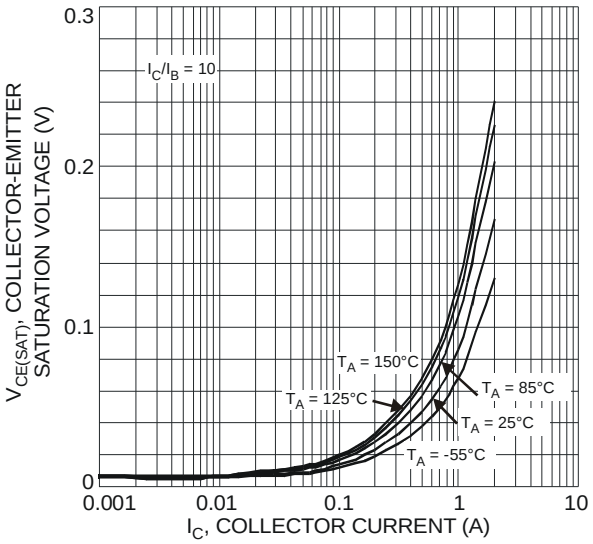


Fig. 6 Typical Collector-Emitter Saturation Voltage vs. Collector Current

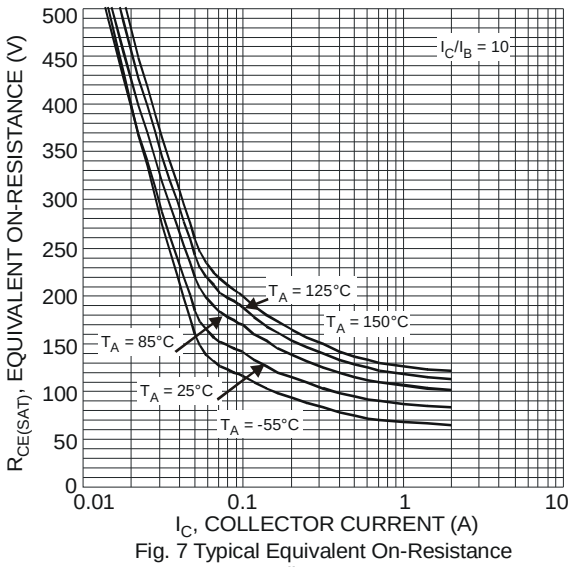


Fig. 7 Typical Equivalent On-Resistance vs. Collector Current

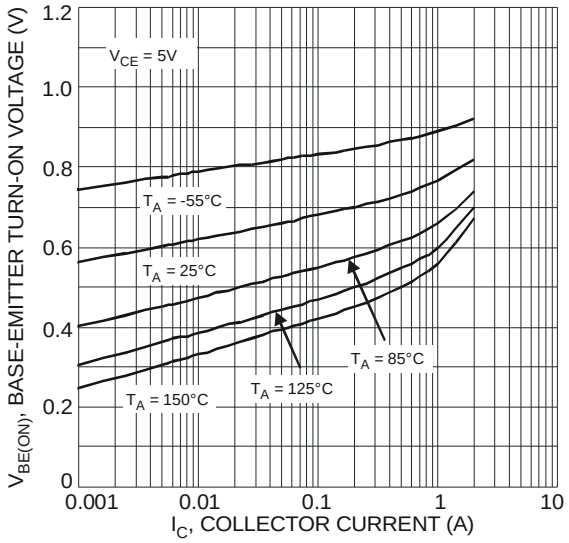


Fig. 8 Typical Base-Emitter Turn-On Voltage vs. Collector Current

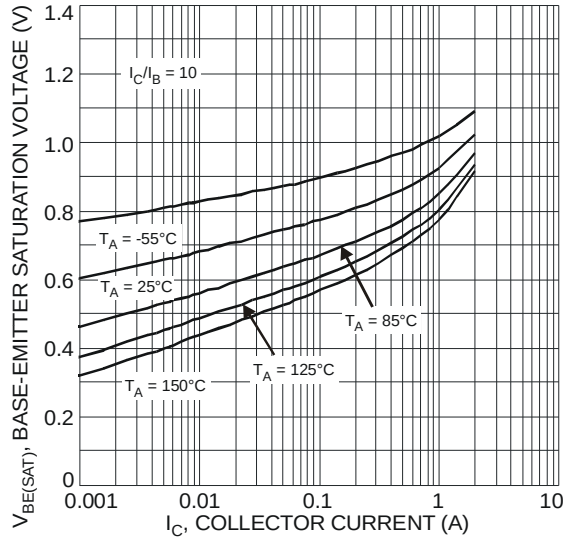


Fig. 9 Typical Base-Emitter Saturation Voltage vs. Collector Current

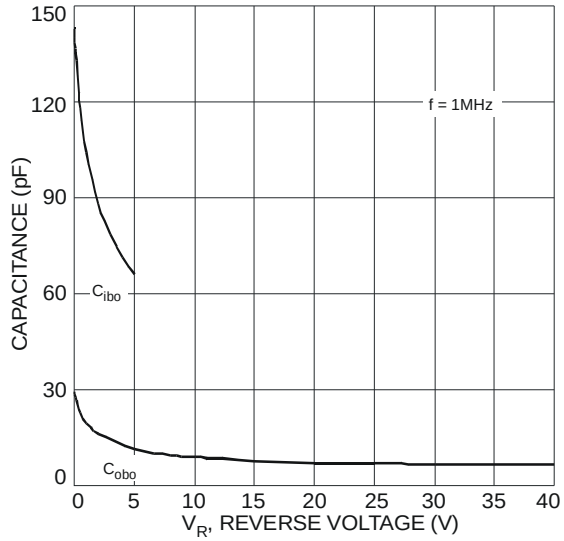
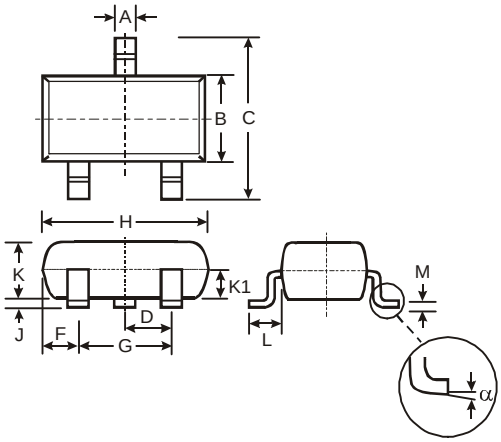


Fig. 10 Typical Capacitance Characteristics

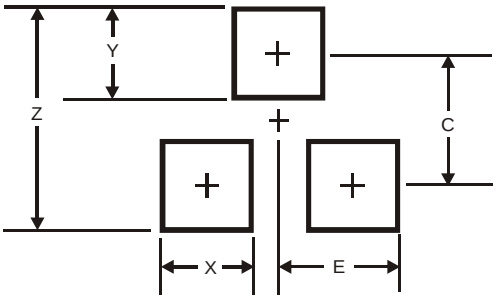
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Package Outline Dimensions



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

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