

## Features

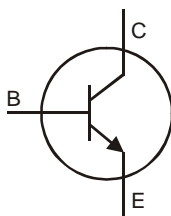
- Ideal for Medium Power Amplification and Switching
- Ultra Low Collector-Emitter Saturation Voltage
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **ESD rating: 400V-MM, 8KV-HBM**

## Mechanical Data

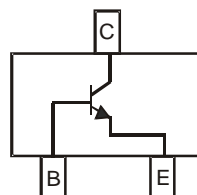
- Case: SOT-23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.008 grams (approximate)



Top View



Device Symbol



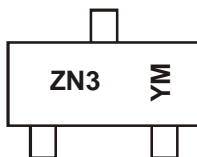
Pin Configuration

## 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

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  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) @ $T_A = 25^\circ\text{C}$	$P_D$	600	mW
Thermal Resistance, Junction to Ambient Air (Note 3) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	209	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

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

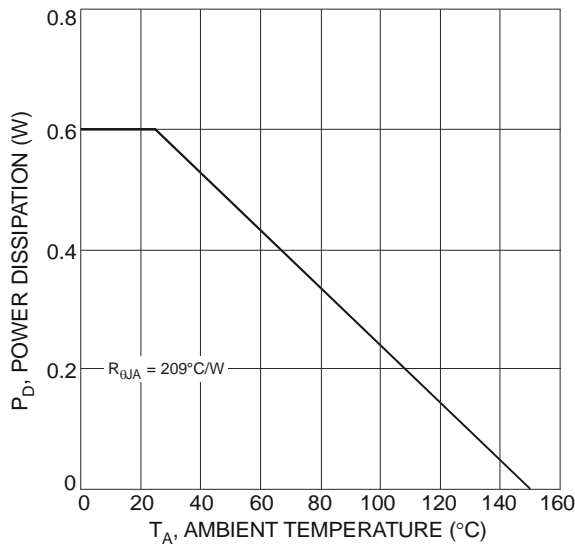


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

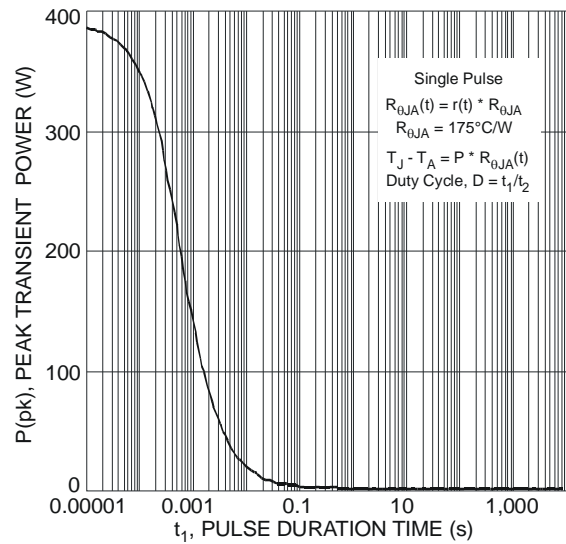


Fig. 2 Single Pulse Maximum Power Dissipation

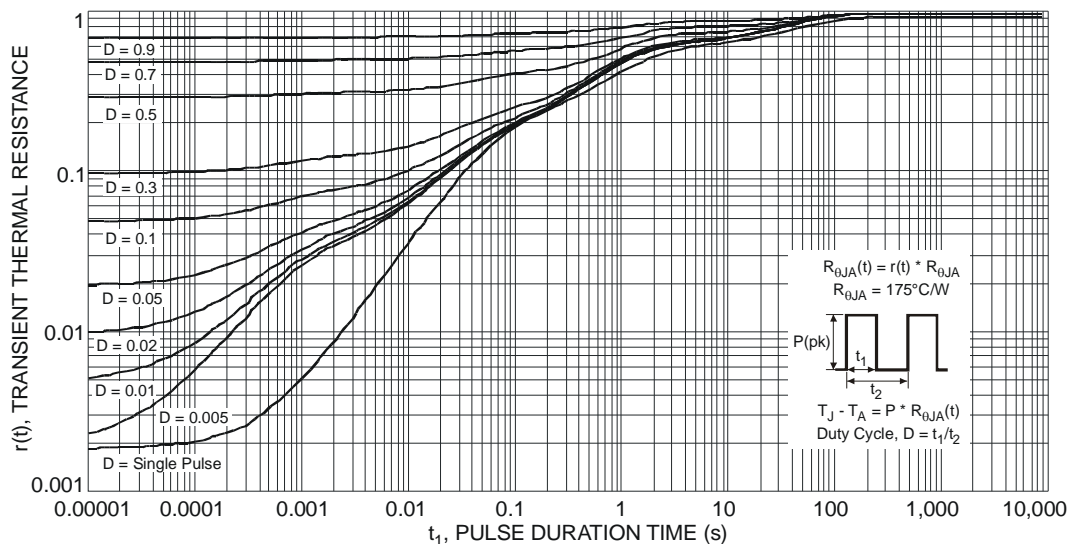


Fig. 3 Transient Thermal Response

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	50	—	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 4)	$V_{(BR)CEO}$	30	—	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	—	—	V	$I_E = 100\mu\text{A}$
Collector-Base Cutoff Current	$I_{CBO}$	—	—	100	nA	$V_{CB} = 30\text{V}, I_E = 0$
		—	—	50	$\mu\text{A}$	$V_{CB} = 30\text{V}, I_E = 0, T_A = 150^\circ\text{C}$
Emitter-Base Cutoff Current	$I_{EBO}$	—	—	100	nA	$V_{EB} = 4\text{V}, I_C = 0$
DC Current Gain (Note 4)	$h_{FE}$	300	—	—	—	$V_{CE} = 5\text{V}, I_C = 50\text{mA}$
		300	450	900		$V_{CE} = 5\text{V}, I_C = 0.5\text{A}$
		200	—	—		$V_{CE} = 5\text{V}, I_C = 1\text{A}$
Collector-Emitter Saturation Voltage (Note 4)	$V_{CE(sat)}$	—	—	75	mV	$I_C = 0.1\text{A}, I_B = 1\text{mA}$
		—	—	125		$I_C = 0.5\text{A}, I_B = 50\text{mA}$
		—	—	200		$I_C = 1.0\text{A}, I_B = 100\text{mA}$
Equivalent On-Resistance (Note 4)	$R_{CE(sat)}$	—	—	200	m $\Omega$	$I_E = 1\text{A}, I_B = 100\text{mA}$
Base-Emitter Saturation Voltage (Note 4)	$V_{BE(sat)}$	—	0.93	1.1	V	$I_C = 1\text{A}, I_B = 100\text{mA}$
Base-Emitter Turn-on Voltage (Note 4)	$V_{BE(on)}$	—	0.80	1.1	V	$V_{CE} = 2\text{V}, I_C = 1\text{A}$
Transition Frequency	$f_T$	100	250	—	MHz	$V_{CE} = 5\text{V}, I_C = 100\text{mA}, f = 100\text{MHz}$
Output Capacitance	$C_{obo}$	—	9	15	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Input Capacitance	$C_{ibo}$	—	65	—	pF	$V_{EB} = 5\text{V}, f = 1\text{MHz}$
Turn-On Time	$t_{on}$	—	57	—	ns	$V_{CC} = 5\text{V}, I_C = 500\text{mA}, I_{B1} = -I_{B2} = 50\text{mA}$
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 = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

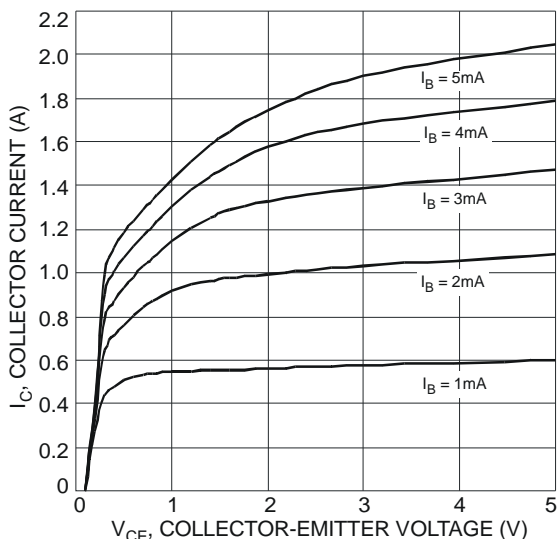


Fig. 4 Typical Collector Current vs. Collector-Emitter Voltage

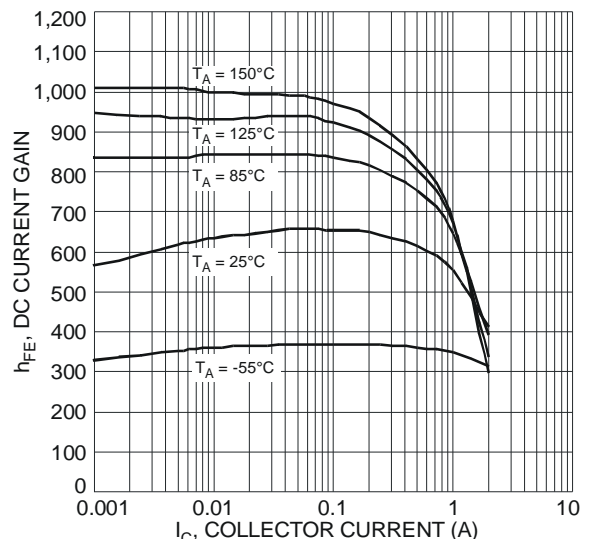


Fig. 5 Typical DC Current Gain vs. Collector Current

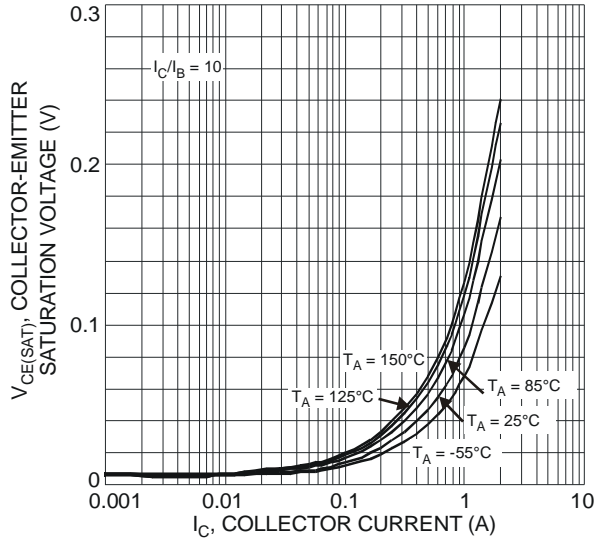


Fig. 6 Typical Collector-Emitter Saturation Voltage vs. Collector Current

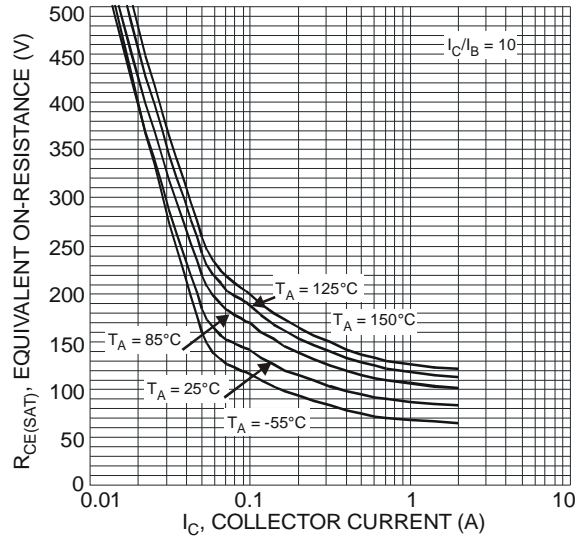


Fig. 7 Typical Equivalent On-Resistance vs. Collector Current

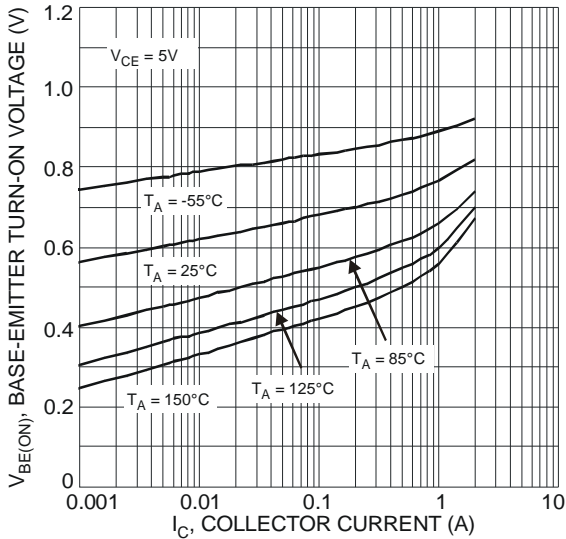


Fig. 8 Typical Base-Emitter Turn-On Voltage vs. Collector Current

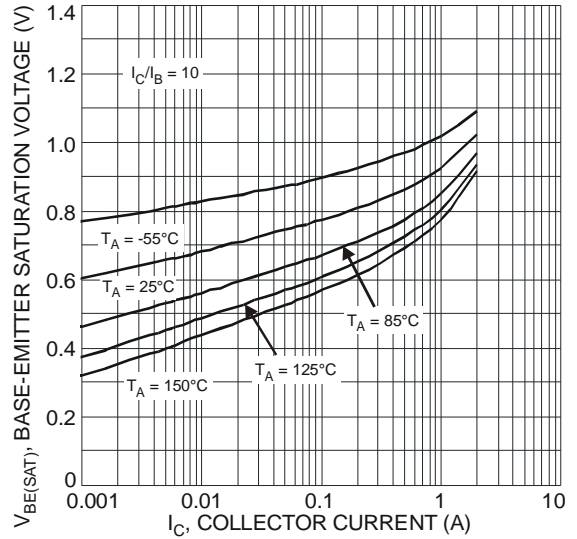


Fig. 9 Typical Base-Emitter Saturation Voltage vs. Collector Current

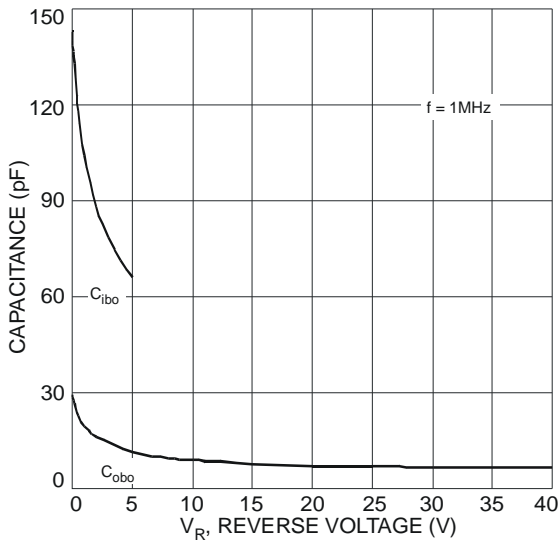
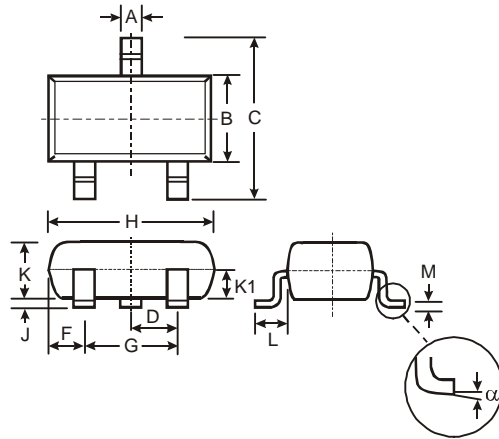


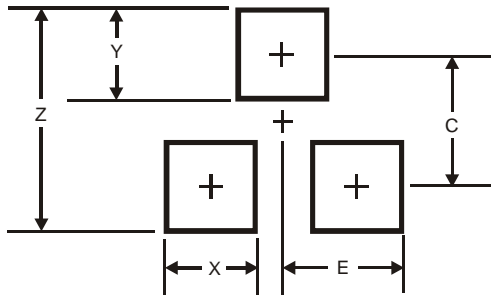
Fig. 10 Typical Capacitance Characteristics

**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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