

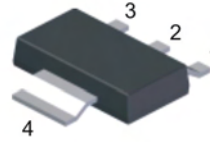


**THE DATASHEET OF  
DZT851-13**



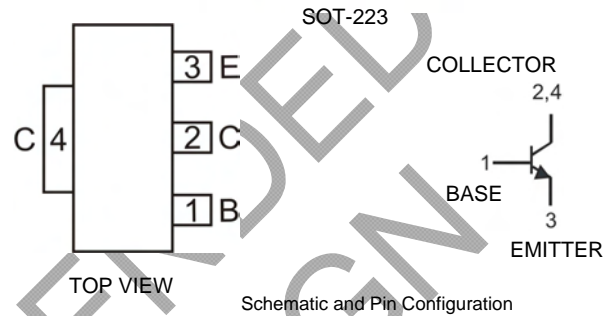
## Features

- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DZT951)
- 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: SOT-223
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish - Matte Tin annealed over Copper Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Marking & Type Code Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.115 grams (approximate)



## Maximum Ratings @<sub>T<sub>A</sub></sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	150	V
Collector-Emitter Voltage	$V_{CEO}$	60	V
Emitter-Base Voltage	$V_{EBO}$	6	V
Continuous Collector Current	$I_C$	6	A
Power Dissipation	$P_{tot}$	1 (Note 3) 3 (Note 4)	W
Operating and Storage Temperature Range	$T_j, T_{STG}$	-55 to +150	°C

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  3. Device mounted on FR-4 PCB, pad layout as shown on page 4.
  4. The power which can be dissipated, assuming the device is mounted in a typical manner on a PCB with copper equal to 4 square inch minimum.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	150	—	—	V	$I_C = 100\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	60	—	—	V	$I_C = 10\text{mA}^*, I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6	—	—	V	$I_E = 100\mu\text{A}, I_C = 0$
Collector Cutoff Current	$I_{CBO}$	—	—	50 1	nA $\mu\text{A}$	$V_{CB} = 120\text{V}, I_E = 0$ $V_{CB} = 120\text{V}, I_E = 0, T_A = 100^\circ\text{C}$
Emitter Cutoff Current	$I_{EBO}$	—	—	10	nA	$V_{EB} = 6\text{V}, I_C = 0$
<b>ON CHARACTERISTICS</b>						
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	—	50 100 170 375	mV	$I_C = 0.1\text{A}, I_B = 5\text{mA}^*$ $I_C = 1\text{A}, I_B = 50\text{mA}^*$ $I_C = 2\text{A}, I_B = 50\text{mA}^*$ $I_C = 6\text{A}, I_B = 300\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	—	1200	mV	$I_C = 6\text{A}, I_B = 300\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	—	—	1150	mV	$I_{CE} = 6\text{A}, V_{CE} = 1\text{V}^*$
DC Current Gain	$h_{FE}$	100 100 75 25	—	— — — —	—	$I_C = 10\text{mA}, V_{CE} = 1\text{V}^*$ $I_C = 2\text{A}, V_{CE} = 1\text{V}^*$ $I_C = 5\text{A}, V_{CE} = 1\text{V}^*$ $I_C = 10\text{A}, V_{CE} = 1\text{V}^*$
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Current Gain-Bandwidth Product	$f_T$	—	130	—	MHz	$I_C = 100\text{mA}, V_{CE} = 10\text{V}, f = 50\text{MHz}$
Output Capacitance	$C_{obo}$	—	45	—	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Switching Times	$t_{on}$ $t_{off}$	—	45 1100	—	ns	$I_C = 1\text{A}, I_{B1} = 100\text{mA}$ $I_{B2} = 100\text{mA}, V_{CC} = 10\text{V}$

\* Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$

### Typical Characteristics @ $T_{amb} = 25^\circ\text{C}$ unless otherwise specified

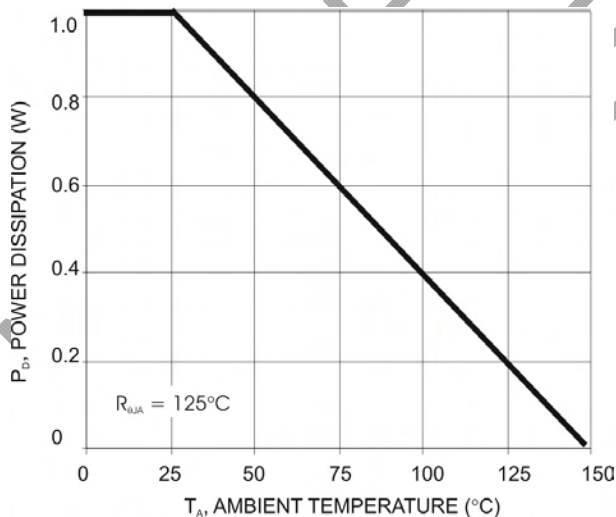


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

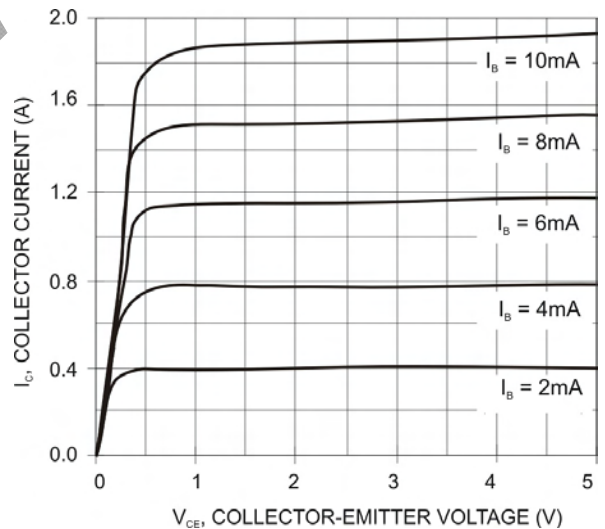


Fig. 2 Collector Current vs. Collector Emitter Voltage

Notes: 3. Device mounted on FR-4 PCB, pad layout as shown on page 4.

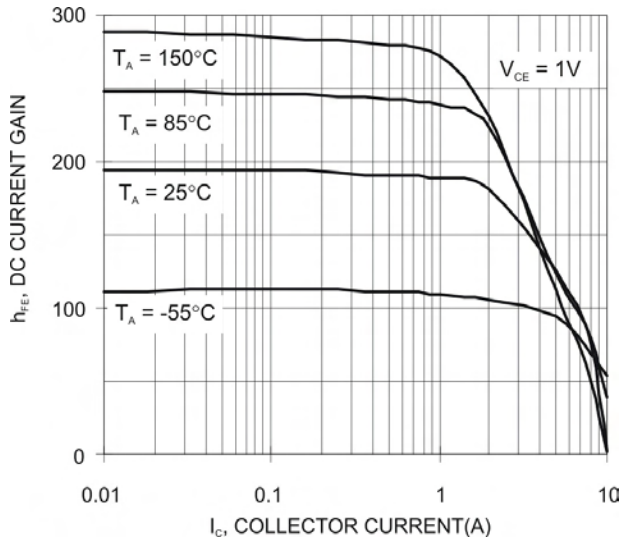


Fig. 3 Typical DC Current Gain vs. Collector Current

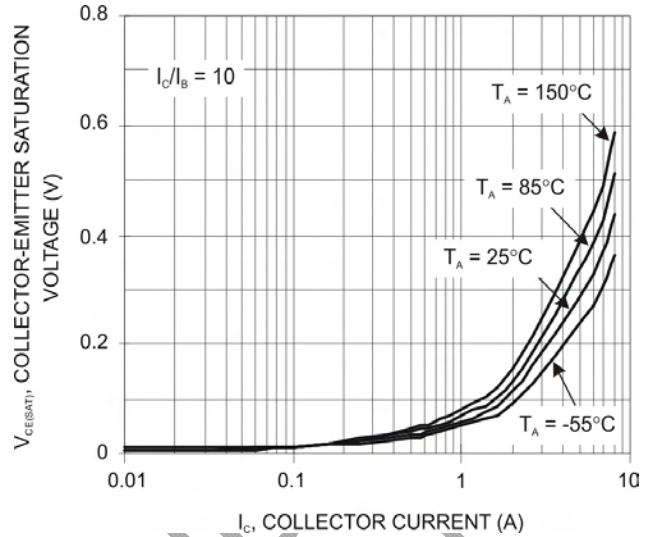


Fig. 4 Collector-Emitter Saturation Voltage vs. Collector Current

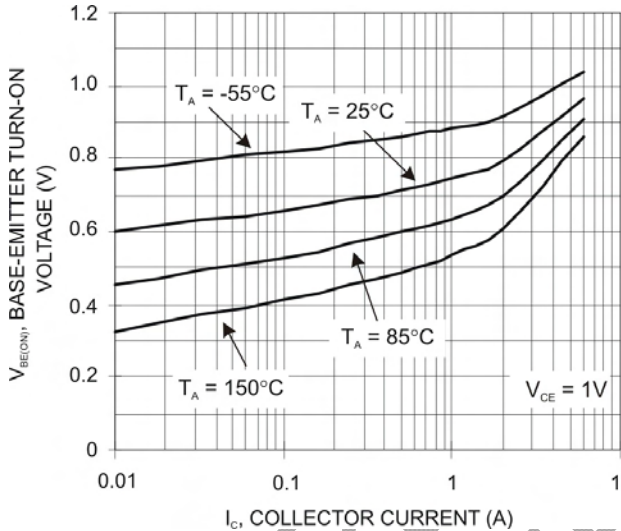


Fig. 5 Base-Emitter Turn-On Voltage vs. Collector Current

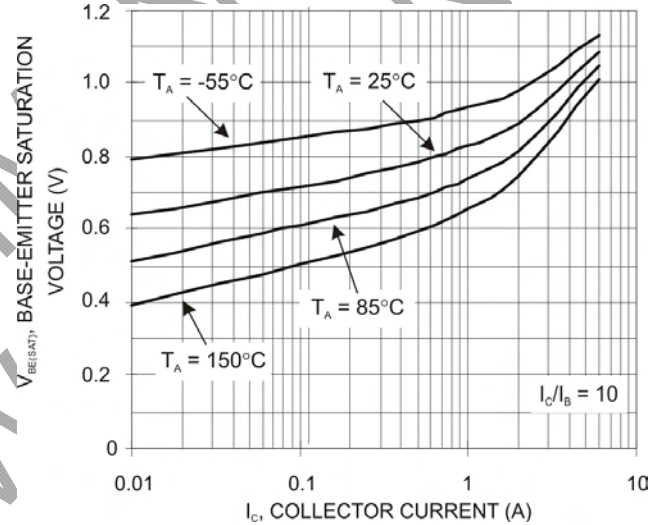


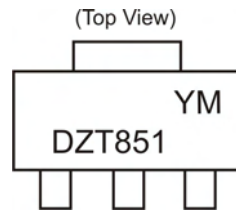
Fig. 6 Base-Emitter Saturation Voltage vs. Collector Current

**Ordering Information** (Note 5)

Device	Packaging	Shipping
DZT851-13	SOT-223	2500/Tape & Reel

Notes: 5. Packaging Details as shown on page 4, or go to our website at <http://www.diodes.com/ap2007.pdf>.

**Marking Information**



DZT851 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year ex: T = 2006  
 M = Month ex: 9 = September

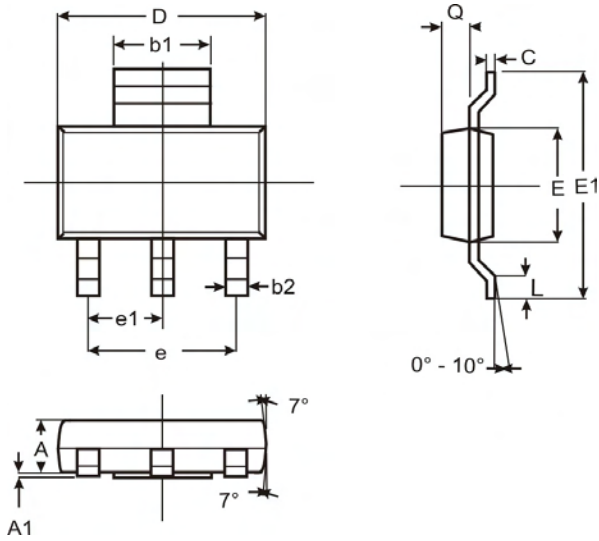
Date Code Key

Year	2006	2007	2008	2009	2010	2011	2012
Code	T	U	V	W	X	Y	Z

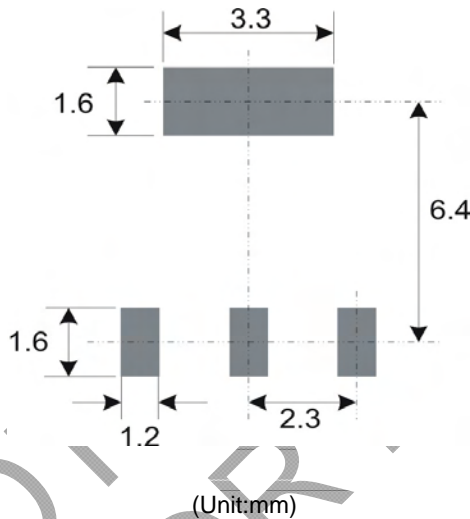
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

### Package Outline Dimensions



SOT-223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b1	2.90	3.10	3.00
b2	0.60	0.80	0.70
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	—	—	4.60
e1	—	—	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

### Suggested Pad Layout: (Based on IPC-SM-782)



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