



**THE DATASHEET OF  
DZT658-13**

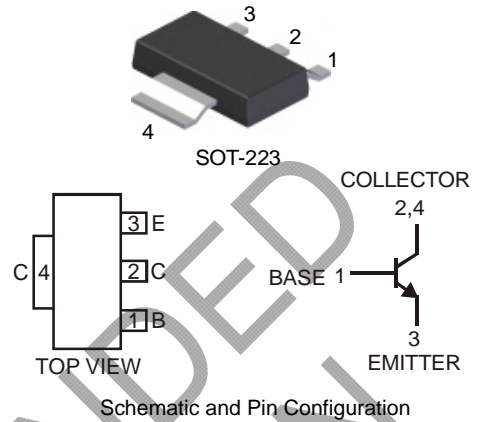


### Features

- Epitaxial Planar Die Construction
- 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 Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.115 grams



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	400	V
Collector-Emitter Voltage	$V_{CEO}$	400	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Continuous Collector Current	$I_C$	0.5	A
Peak Pulse Current	$I_{CM}$	1	A

### Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation @ <sub>T<sub>A</sub></sub> = 25°C (Note 3)	$P_D$	1	W
Thermal Resistance, Junction to Ambient Air (Note 3) @ <sub>T<sub>A</sub></sub> = 25°C	$R_{\theta JA}$	125	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

### Electrical Characteristics @<sub>T<sub>A</sub></sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>Off Characteristics</b>						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	400	—	—	V	$I_C = 100\mu A, I_E = 0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	400	—	—	V	$I_C = 10mA, I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	—	—	V	$I_E = 100\mu A, I_C = 0$
Collector Cutoff Current	$I_{CBO}$	—	—	100	nA	$V_{CB} = 320V, I_E = 0$
Emitter Cutoff Current	$I_{EBO}$	—	—	100	nA	$V_{EB} = 4V, I_C = 0$
<b>On Characteristics (Note 4)</b>						
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	0.075	0.3	V	$I_C = 20mA, I_B = 1mA$
		—	0.06	0.25	V	$I_C = 50mA, I_B = 5mA$
		—	0.08	0.5	V	$I_C = 100mA, I_B = 10mA$
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	—	0.9	V	$I_C = 100mA, I_B = 10mA$
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	—	—	1	V	$V_{CE} = 5V, I_C = 100mA$
DC Current Gain	$h_{FE}$	50	110	—	—	$V_{CE} = 5V, I_C = 1mA$
		50	100	—	—	$V_{CE} = 5V, I_C = 100mA$
		40	85	—	—	$V_{CE} = 10V, I_C = 200mA$
<b>AC Characteristics</b>						
Transition Frequency	$f_T$	50	—	—	MHz	$V_{CE} = 20V, I_C = 30mA, f = 30MHz$
Output Capacitance	$C_{obo}$	—	—	10	pF	$V_{CB} = 20V, f = 1MHz$
Switching Times	$t_{on}$	—	138	—	ns	$V_{CC} = 100V, I_C = 100mA$
	$t_{off}$	—	175	—	ns	$I_{B1} = 10mA, I_{B2} = -20mA$

- 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 3 or in Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  4. Pulse Test: Pulse width  $\leq 300\mu s$ . Duty cycle  $\leq 2.0\%$ .

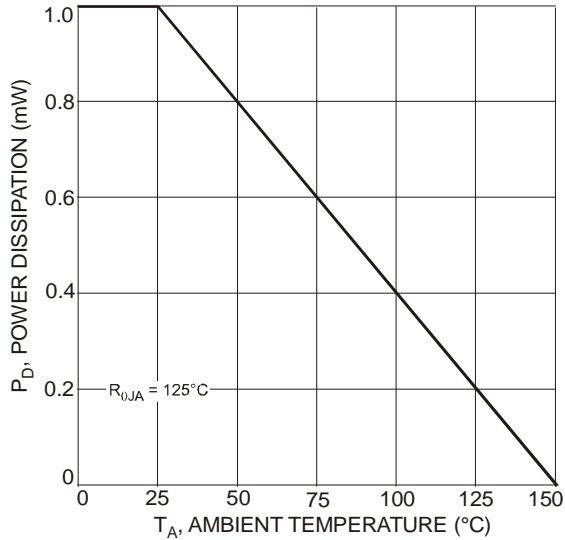


Fig. 1 Max Power Dissipation vs. Ambient Temperature

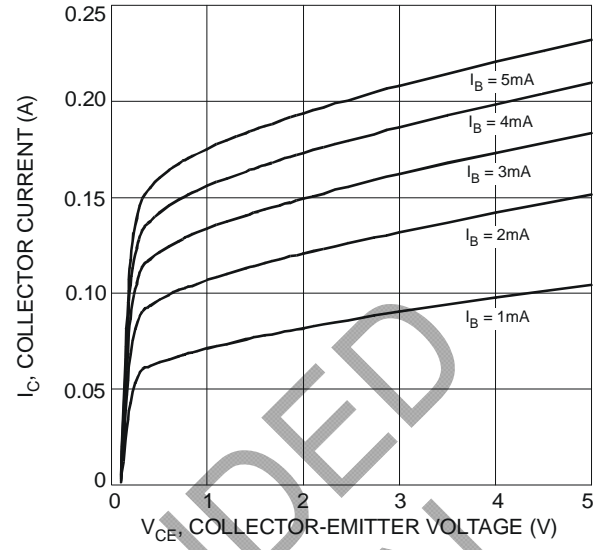


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

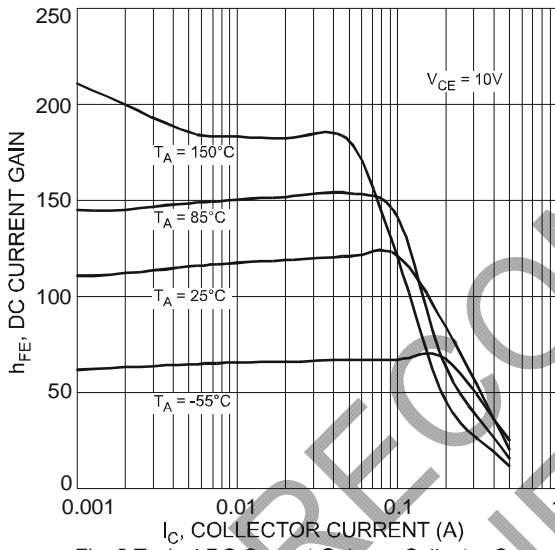


Fig. 3 Typical DC Current Gain vs. Collector Current

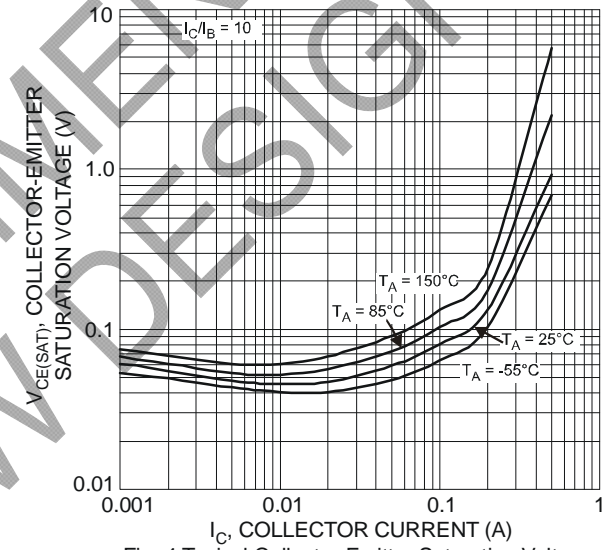


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

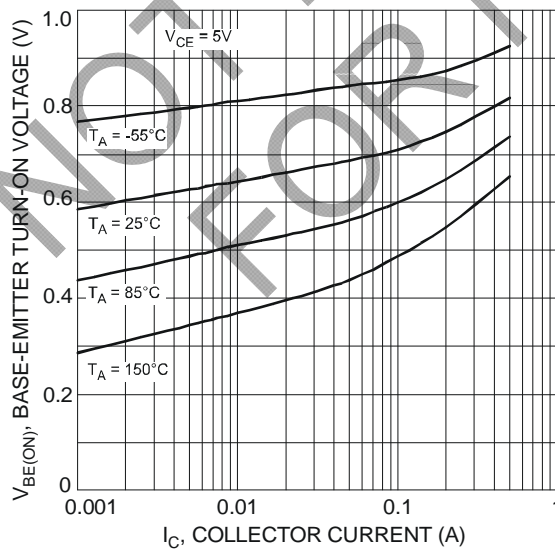


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

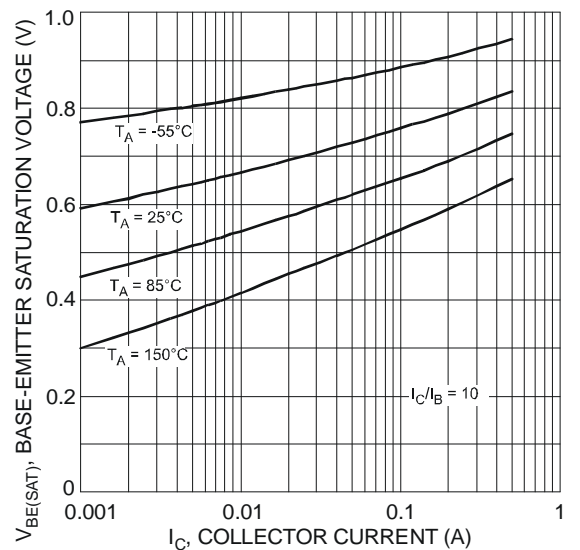


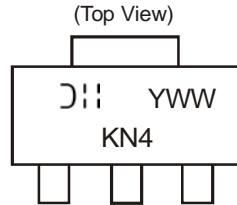
Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

### Ordering Information (Note 5)

Device	Packaging	Shipping
DZT658-13	SOT-223	2500/Tape & Reel

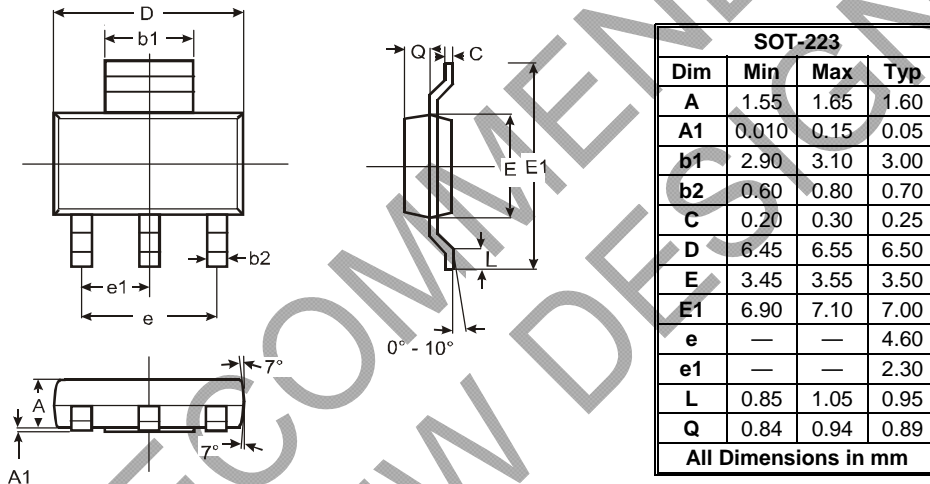
Notes: 5. For packaging details, go to our website at <http://www.diodes.com/ap2007.pdf>.

### Marking Information

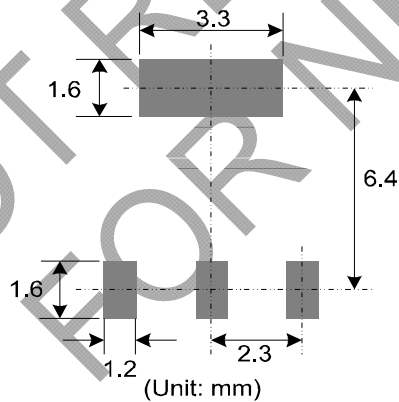


KN4 = Product Type Marking Code  
 YWW = Date Code Marking  
 Y = Last digit of year ex: 7 = 2007  
 WW = Week code 01 - 52

### Package Outline Dimensions



### Suggested Pad Layout:



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