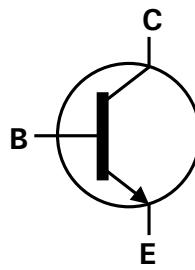
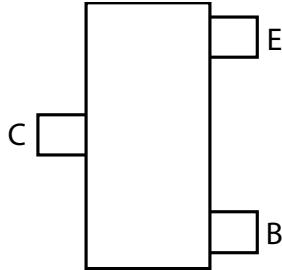


**NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR IN SOT323**
**Features**

- Low saturation voltage
- 500mW power dissipation
- $I_C = 1A$  high Continuous Current
- Ideally suited for space / weight critical applications
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

**Mechanical Data**

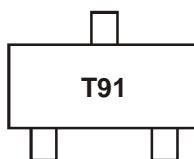
- Case: SOT323
- Case material: molded plastic. "Green" molding compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.006 grams (Approximate)


**Top View**

**Device Symbol**

**Top View  
Pin Out**
**Ordering Information** (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZUMT491TA	T91	7	8	3,000

Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See <http://www.diodes.com> for more information about Diodes Incorporated's definitions of Halogen and Antimony free, "Green" and Lead-Free.
3. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at <http://www.diodes.com>

**Marking Information**

**T91 = Product Type Marking Code**

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	80	V
Collector-Emitter Voltage	$V_{CEO}$	60	V
Emitter-Base Voltage	$V_{EBO}$	7	V
Continuous Collector Current	$I_C$	1	A
Peak Pulse Current	$I_{CM}$	2	A
Base Current	$I_B$	200	mA

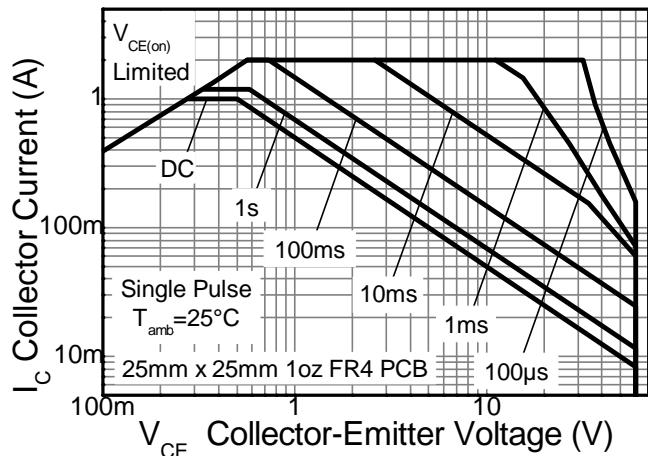
**Thermal Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	$P_D$	500	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta,JA}$	250	°C/W
Thermal Resistance, Junction to Leads (Note 6)	$R_{\theta,JL}$	350	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

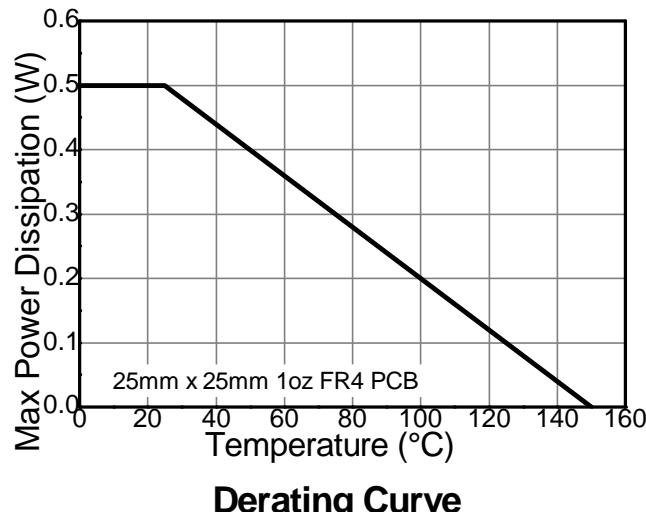
Notes:

- 5. For a device surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; device measured when operating in steady state condition.
- 6. Thermal resistance from junction to solder-point (at the end of the leads).

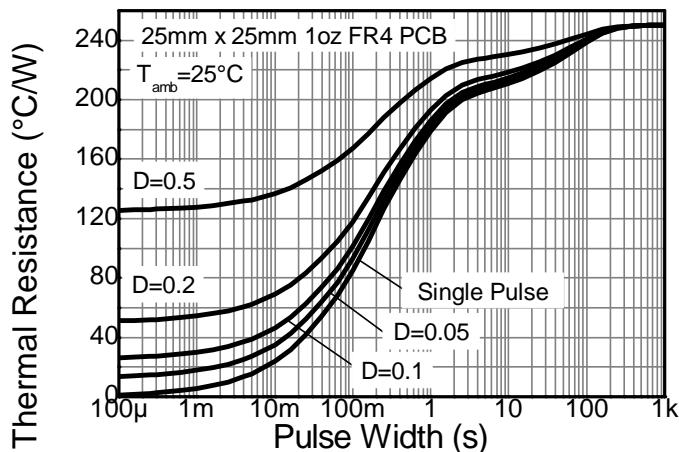
## Thermal Characteristics and Derating Information



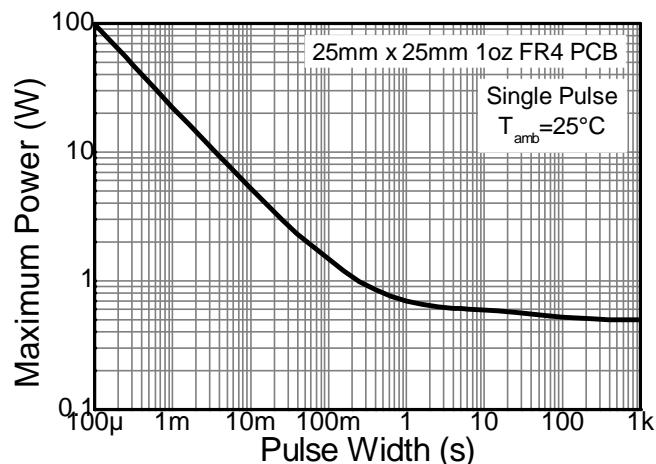
**Safe Operating Area**



**Derating Curve**



**Transient Thermal Impedance**



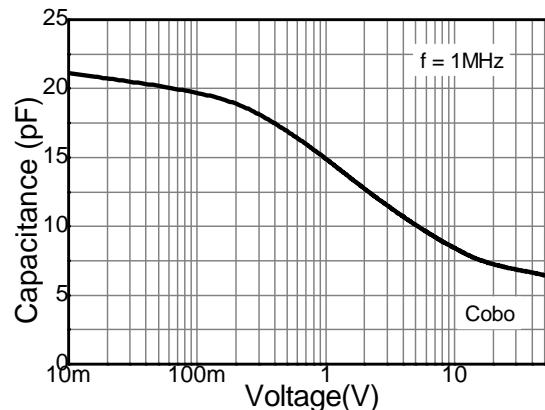
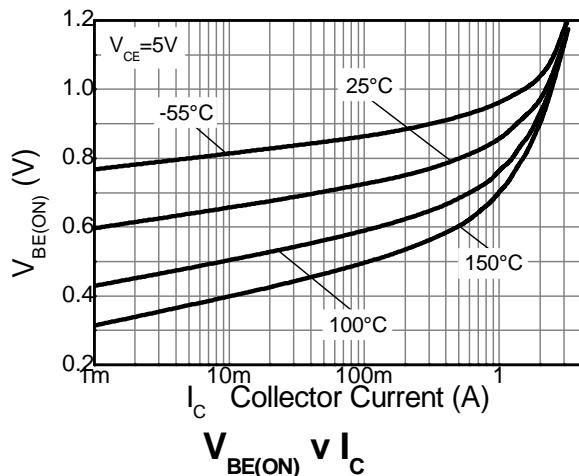
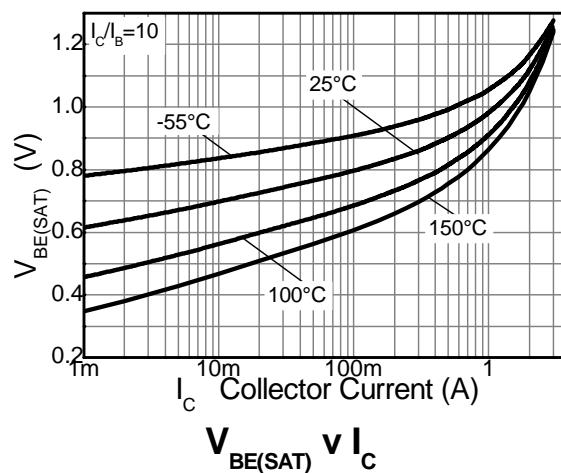
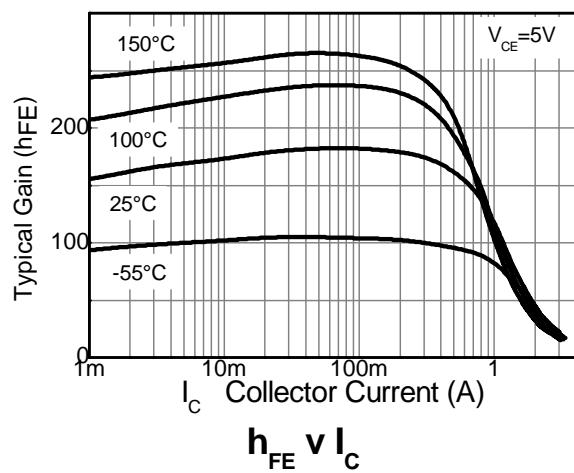
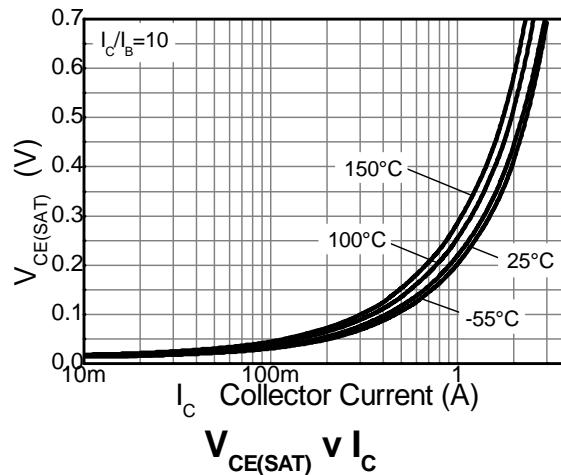
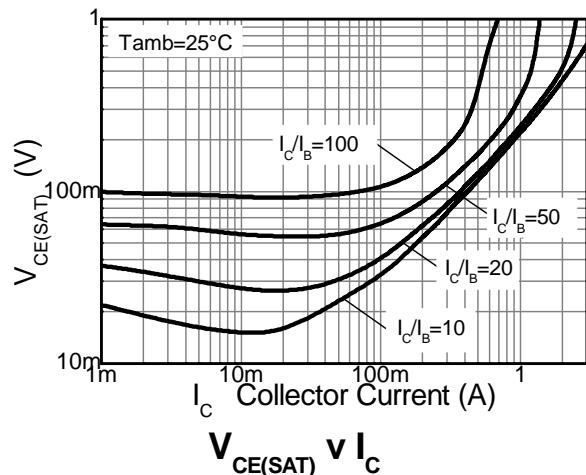
**Pulse Power Dissipation**

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>					
Collector-Base Breakdown Voltage	$\text{BV}_{\text{CBO}}$	80	—	V	$I_C = 100\mu\text{A}$ , $I_E = 0$
Collector-Emitter Breakdown Voltage (Note 7)	$\text{BV}_{\text{CEO}}$	60	—	V	$I_C = 10\text{mA}$ , $I_B = 0$
Emitter-Base Breakdown Voltage	$\text{BV}_{\text{EBO}}$	7	—	V	$I_E = 100\mu\text{A}$ , $I_C = 0$
Collector Cutoff Current	$I_{\text{CBO}}$	—	100	nA	$V_{\text{CB}} = 60\text{V}$
Collector Cutoff Current	$I_{\text{CES}}$	—	100	nA	$V_{\text{CE}} = 60\text{V}$
Emitter Cutoff Current	$I_{\text{EBO}}$	—	100	nA	$V_{\text{EB}} = 5\text{V}$
<b>ON CHARACTERISTICS</b> (Note 7)					
DC Current Gain	$h_{\text{FE}}$	100	—	—	$I_C = 1\text{mA}$ , $V_{\text{CE}} = 5.0\text{V}$
		100	300	—	$I_C = 500.0\text{mA}$ , $V_{\text{CE}} = 5.0\text{V}$
		80	—	—	$I_C = 1.0\text{A}$ , $V_{\text{CE}} = 5.0\text{V}$
Collector-Emitter Saturation Voltage	$V_{\text{CE}(\text{sat})}$	—	250 500	mV	$I_C = 500\text{mA}$ , $I_B = 50\text{mA}$ $I_C = 1.0\text{A}$ , $I_B = 100\text{mA}$
Base-Emitter Saturation Voltage	$V_{\text{BE}(\text{sat})}$	—	1100	mV	$I_C = 1.0\text{A}$ , $I_B = 100\text{mA}$
Base-Emitter Turn On Voltage	$V_{\text{BE}(\text{on})}$	—	1000	mV	$I_C = 1.0\text{A}$ , $V_{\text{CE}} = 5.0\text{V}$

Notes: 7. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

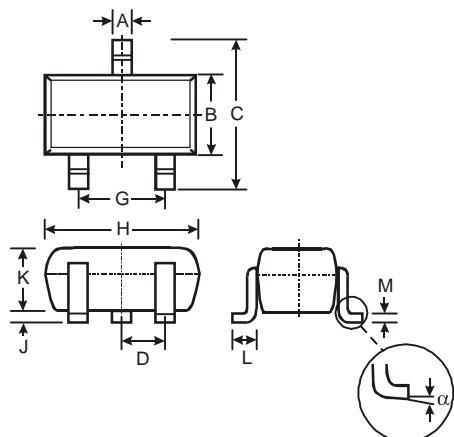


**Capacitance v Voltage**

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## Package Outline Dimensions

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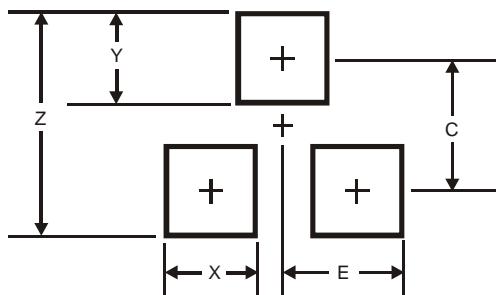
SOT323			
Dim	Min	Max	Typ
A	0.25	0.40	0.30
B	1.15	1.35	1.30
C	2.00	2.20	2.10
D	-	-	0.65
G	1.20	1.40	1.30
H	1.80	2.20	2.15
J	0.0	0.10	0.05
K	0.90	1.00	1.00
L	0.25	0.40	0.30
M	0.10	0.18	0.11
$\alpha$	0°	8°	-

All Dimensions in mm

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## Suggested Pad Layout

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Dimensions	Value (in mm)
Z	2.8
X	0.7
Y	0.9
C	1.9
E	1.0

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