

Features and Benefits

- $BV_{CEO} > -60V$
- $I_C = -6A$ Continuous Collector Current
- Low Saturation Voltage (-95mV max @ -1A)
- $R_{SAT} = 40m\Omega$ for a low equivalent On-Resistance
- hFE specified up to -10A for a high gain hold up
- **RoHS Compliant**
- **Halogen and Antimony Free. "Green" Device (Note 1)**
- Qualified to AEC-Q101 Standards for High Reliability

Applications

- Motor driving
- DC-DC modules
- Backlight inverters
- Actuator, relay, and solenoid drivers

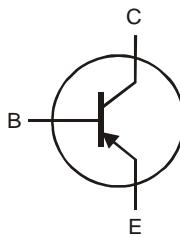
Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Copper Leadframe
- Weight: 0.112 grams (Approximate)

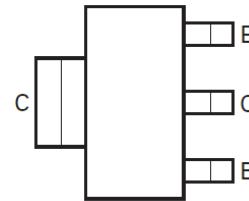
SOT223



Top View



Device Symbol



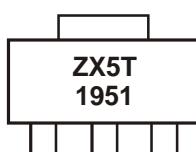
Top View
Pin-Out

Ordering Information (Note 2)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZX5T1951GTA	ZX5T1951	7	12	1,000

Notes: 1. Diodes Inc's "Green" Policy can be found on our website at <http://www.diodes.com>
2. For Packaging Details, go to our website at <http://www.diodes.com>.

Marking Information



ZX5T1951 = Product type Marking Code

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-90	V
Collector-Emitter Voltage	V_{CES}	-90	V
Collector-Emitter Voltage	V_{CEO}	-60	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current (Note 3)	I_C	-6	A
Peak Pulse Current	I_{CM}	-15	A
Base Current	I_B	-1	A

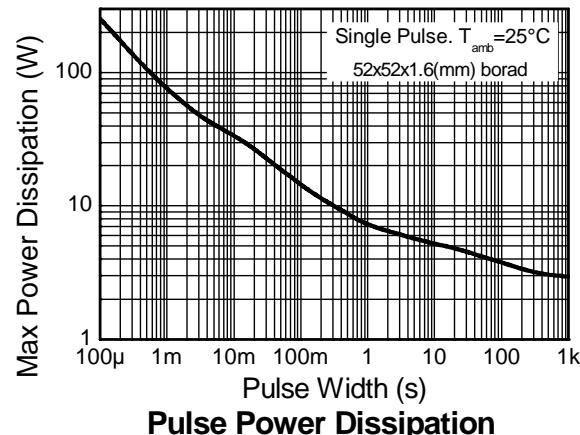
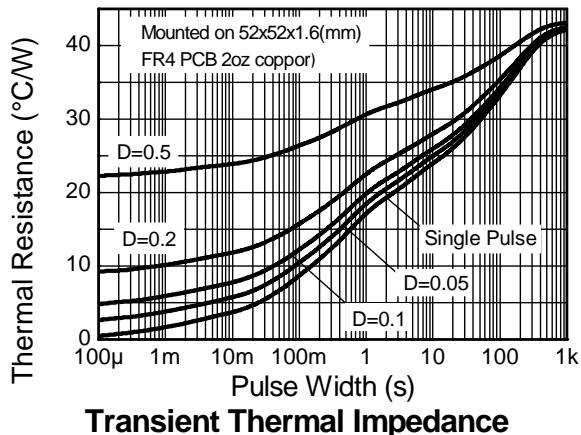
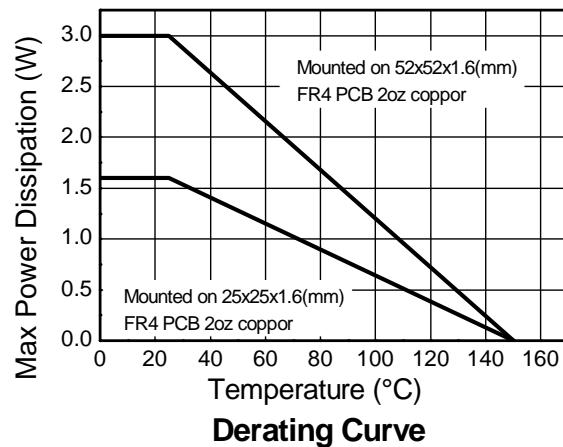
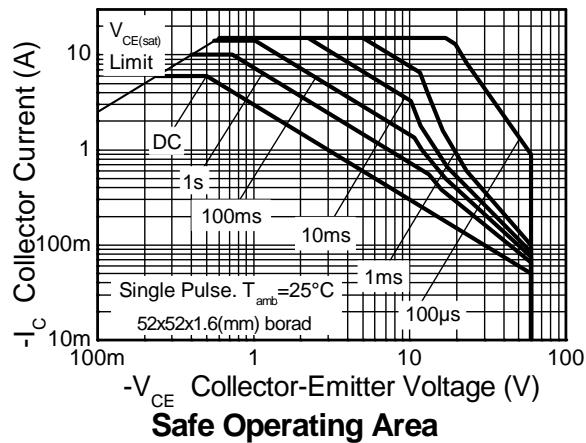
Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation Linear derating factor	P_D	3.0	W mW /°C
		24	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	1.6	°C/W
		12.8	
Thermal Resistance Junction to Lead	$R_{\theta JL}$	12.3	
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes:

3. For a device surface mounted on 52mm x 52mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
4. Same as note (3), except the device is surface mounted on 25mm x 25mm with 1oz copper.
5. Thermal resistance from junction to solder-point (at the end of the collector lead).

Thermal Characteristics

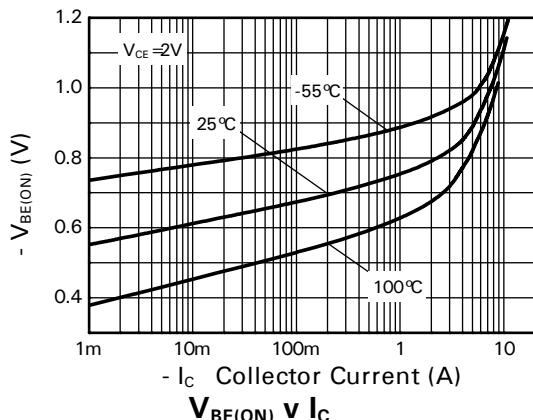
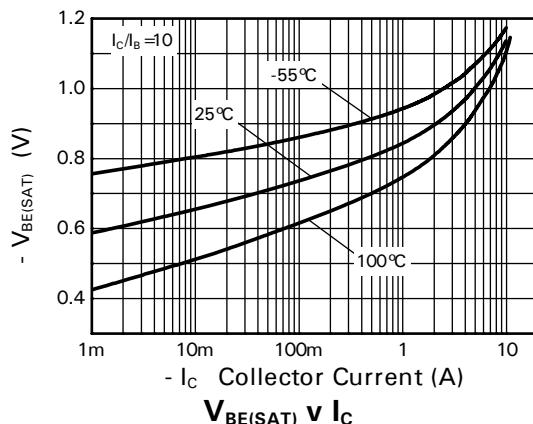
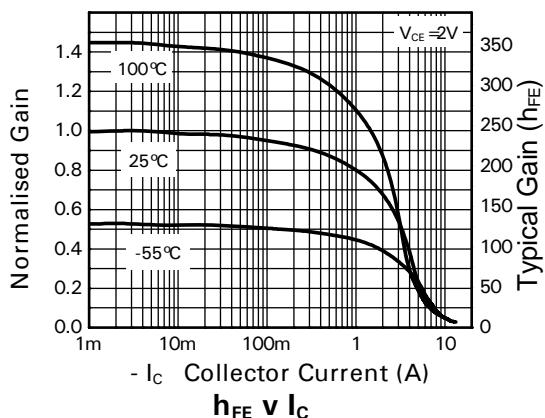
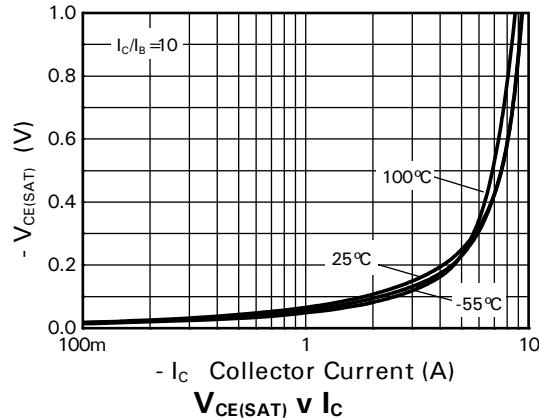
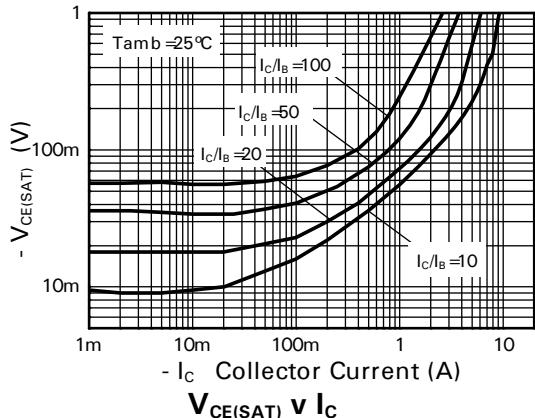


Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

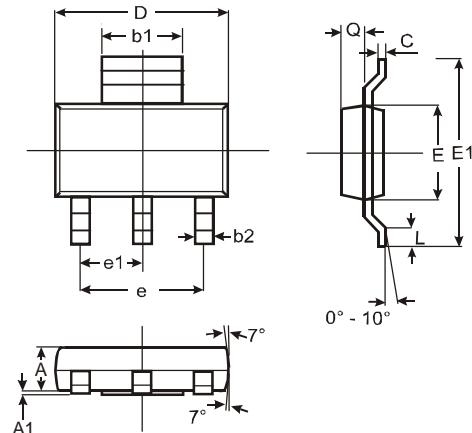
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-90	-120	-	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	BV_{CES}	-90	-120	-	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 6)	BV_{CEO}	-60	-80	-	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8	-	V	$I_E = -100\mu\text{A}$
Collector-Base Cutoff Current	I_{CBO}	-	<1	-50	nA	$V_{\text{CB}} = -72\text{V}$
Collector-Emitter Cutoff Current	I_{CES}	-	<1	-50	nA	$V_{\text{CB}} = -72\text{V}$
Emitter Cutoff Current	I_{EBO}	-	<1	-10	nA	$V_{\text{EB}} = -6\text{V}$
Static Forward Current Transfer Ratio (Note 6)	h_{FE}	100	240	-	-	$I_C = -10\text{mA}, V_{\text{CE}} = -2\text{V}$
		100	180	300		$I_C = -2\text{A}, V_{\text{CE}} = -2\text{V}$
		40	70	-		$I_C = -5\text{A}, V_{\text{CE}} = -2\text{V}$
		5	14	-		$I_C = -10\text{A}, V_{\text{CE}} = -2\text{V}$
Collector-Emitter Saturation Voltage (Note 6)	$V_{\text{CE}(\text{sat})}$	-	-16	-30	mV	$I_C = -100\text{mA}, I_B = -10\text{mA}$
		-	-55	-95		$I_C = -1\text{A}, I_B = -100\text{mA}$
		-	-85	-130		$I_C = -2\text{A}, I_B = -200\text{mA}$
		-	-200	-260		$I_C = -5\text{A}, I_B = -500\text{mA}$
Base-Emitter Saturation Voltage (Note 6)	$V_{\text{BE}(\text{sat})}$	-	-1	-1.15	V	$I_C = -5\text{A}, I_B = -500\text{mV}$
Base-Emitter Turn-On Voltage (Note 6)	$V_{\text{BE}(\text{on})}$	-	-0.89	-1.0	V	$I_C = -5\text{A}, V_{\text{CE}} = -2\text{V}$
Output Capacitance (Note 6)	C_{obo}	-	33	70	pF	$V_{\text{CB}} = -10\text{V}, f = 1\text{MHz}$
Transition Frequency	f_T	-	120	-	MHz	$V_{\text{CE}} = -10\text{V}, I_C = -100\text{mA}$ $f = 50\text{MHz}$
Switching Time	t_{on}	-	33	80	ns	$V_{\text{CC}} = -10\text{V}, I_C = -2\text{A}$
	t_{off}	-	215	300		$I_{B1} = -I_{B2} = -200\text{mA}$

Notes: 6. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$

Typical Electrical Characteristics



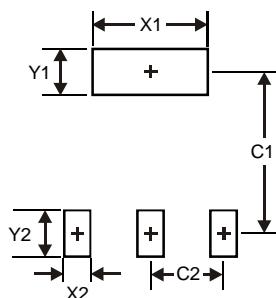
Package Outline Dimensions



SOT223			
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



Dimensions	Value (in mm)
X1	3.3
X2	1.2
Y1	1.6
Y2	1.6
C1	6.4
C2	2.3

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