



**ZXTN649F**

**NPN LOW  $V_{CE(sat)}$  TRANSISTOR IN SOT-23**

**Features**

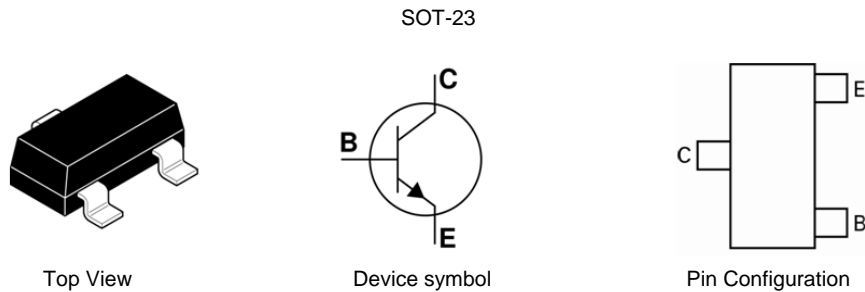
- $BV_{CEO} > 25V$
- $BV_{CBO} > 35V$
- $I_{C(cont)} = 3A$  Continuous Current
- $V_{CE(sat)} < 120mV @ 1A$
- $R_{CE(sat)} = 77 m\Omega$
- $P_D = 0.725W$
- 6A Peak Pulse Current
- 25V Forward Blocking Voltage
- Complementary part number ZXTP749F
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **“Green” Devices (Note 2)**

**Mechanical Data**

- Case: SOT-23
- Case material: molded Plastic. “Green” molding Compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.008 grams (approximate)

**Applications**

- MOSFET gate drivers
- Power switches
- Motor control

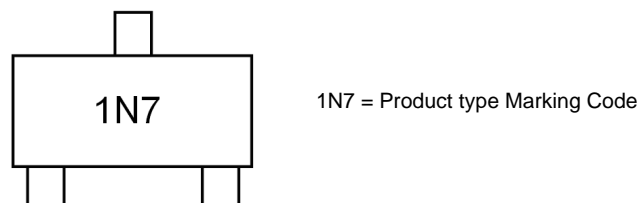


**Ordering Information**

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN649FTA	1N7	7	8mm	3000

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**



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

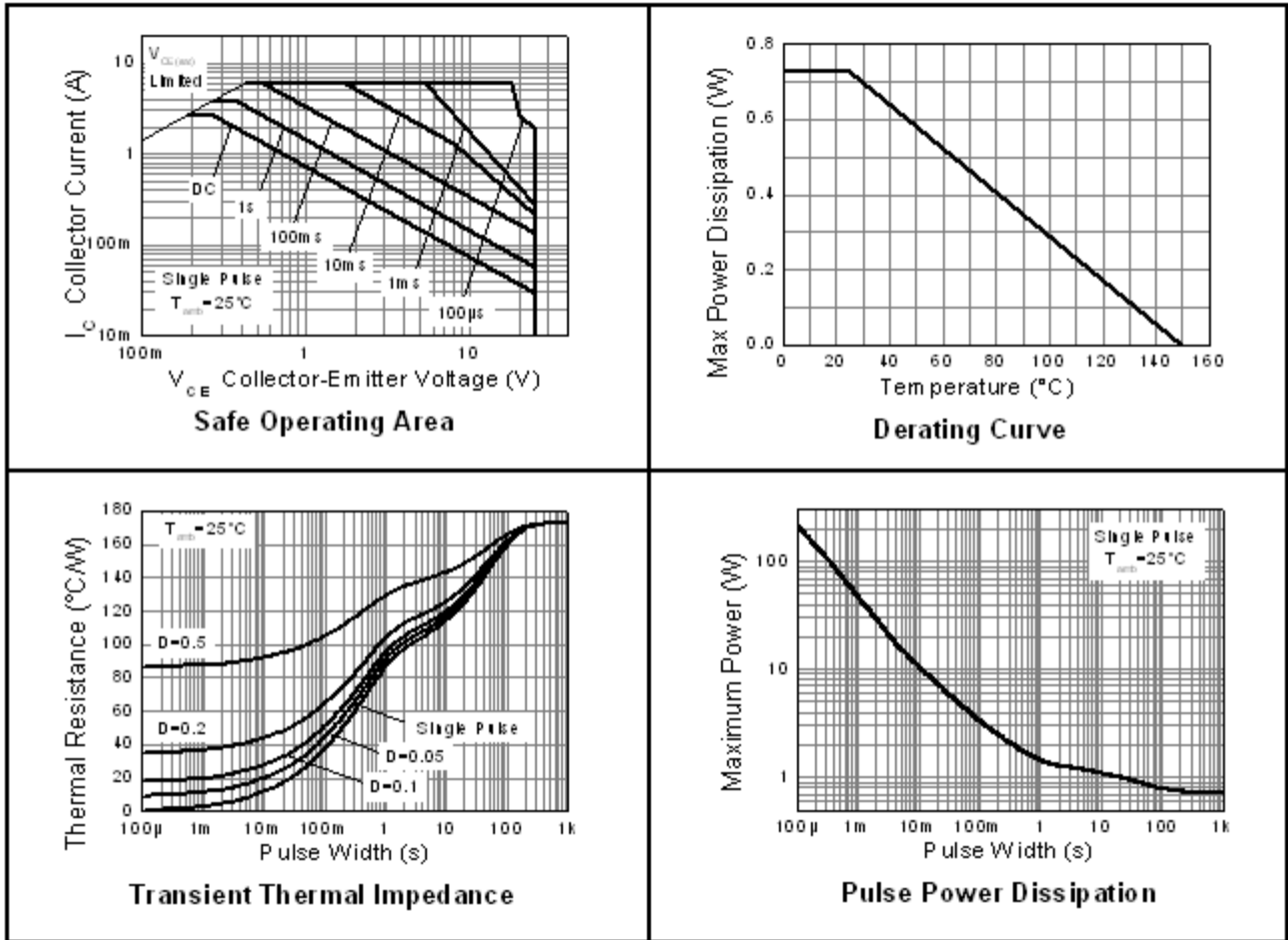
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	35	V
Collector-Emitter Voltage	$V_{CEO}$	25	V
Emitter-Base Voltage	$V_{EBO}$	7	V
Continuous Collector Current (Note 3)	$I_C$	3	A
Peak Pulse Current	$I_{CM}$	6	A
Base Current	$I_B$	500	mA

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation at $T_A = 25^\circ\text{C}$ (Note 4)	$P_D$	725	mW
Thermal Resistance, Junction to Ambient (Note 3) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	172	$^\circ\text{C/W}$
Thermal Resistance, Junction to Lead @ $T_A = 25^\circ\text{C}$	$R_{\theta JL}$	79	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

Notes: 3. For a device surface mounted on 15mm X 15mm X 1.6mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions  
4. For device mounted on FR4 PCB measured at  $t \leq 2$  Secs.

**Thermal Characteristics and Derating information**



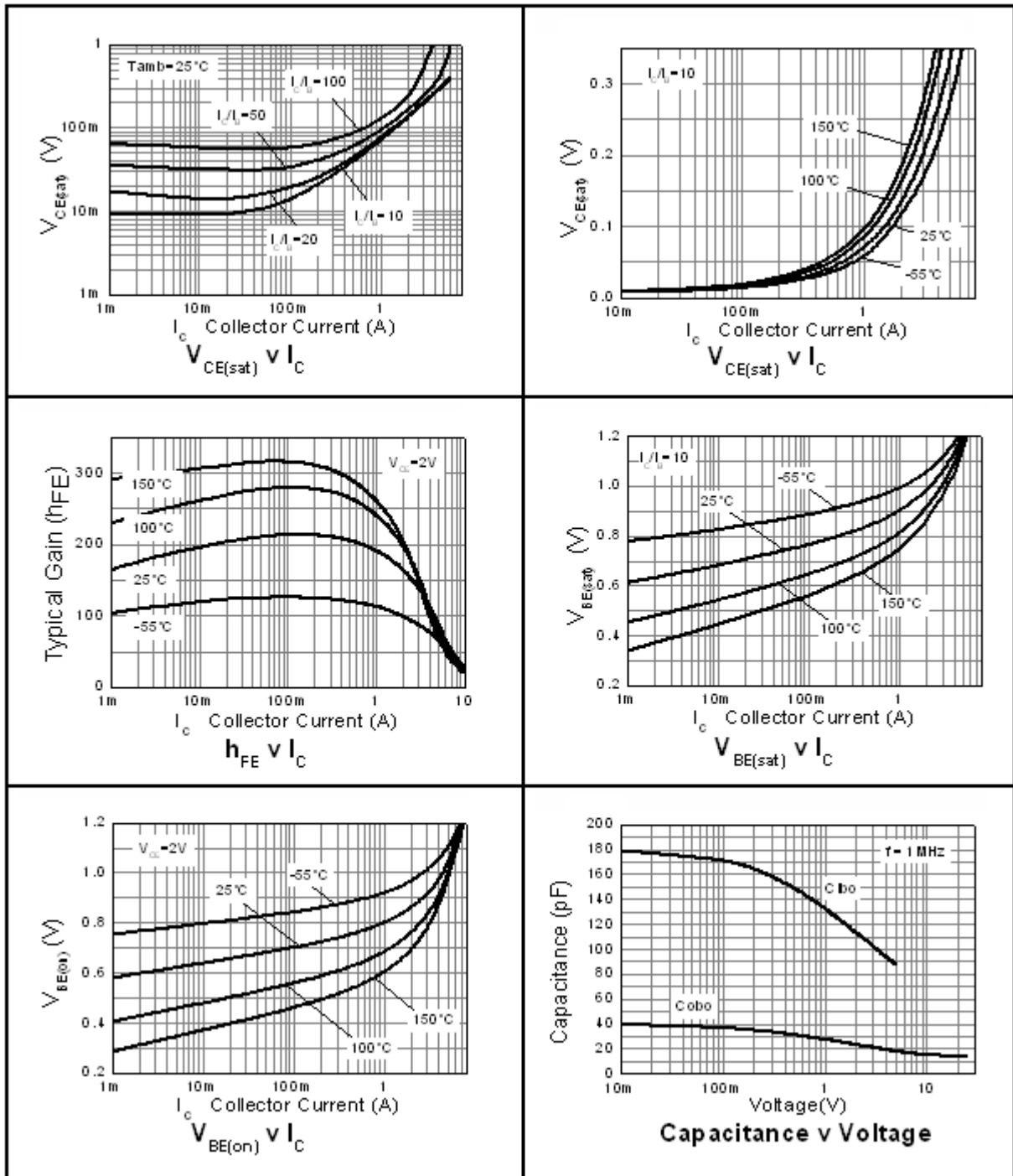
**NPN LOW  $V_{CE(sat)}$  TRANSISTOR IN SOT-23**

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	35	110		V	$I_C = 100 \mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 5)	$V_{(BR)CEO}$	25	35		V	$I_C = 10 \text{mA}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	7	8.1		V	$I_E = 100 \mu\text{A}$
Collector Cutoff Current	$I_{CBO}$		< 1	50 0.5	nA $\mu\text{A}$	$V_{CB} = 28\text{V}$ $V_{CB} = 28\text{V}, T_{amb}=100^\circ\text{C}$
Emitter Cutoff Current	$I_{EBO}$		< 1	50	nA	$V_{EB} = 5.6\text{V}$
Static Forward Current Transfer Ratio (Note 5)	$h_{FE}$	200 175 155 50	320 280 250 85	500		$I_C = 100\text{mA}, V_{CE} = 2\text{V}$ $I_C = 1\text{A}, V_{CE} = 2\text{V}$ $I_C = 2\text{A}, V_{CE} = 2\text{V}$ $I_C = 6\text{A}, V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage (Note 5)	$V_{CE(sat)}$		70 200	120 300	mV mV	$I_C = 1\text{A}, I_B = 100\text{mV}$ $I_C = 3\text{A}, I_B = 300\text{mV}$
Base-Emitter Turn-On Voltage (Note 5)	$V_{BE(on)}$		780	850	mV	$I_C = 1\text{A}, V_{CE} = 2\text{V}$
Base-Emitter Saturation Voltage (Note 5)	$V_{BE(sat)}$		900	1000	mV	$I_C = 1\text{A}, I_B = 100\text{mV}$

Notes: 5. Measured under pulsed conditions. Pulse width  $\leq 300 \mu\text{s}$ . Duty cycle  $\leq 2\%$

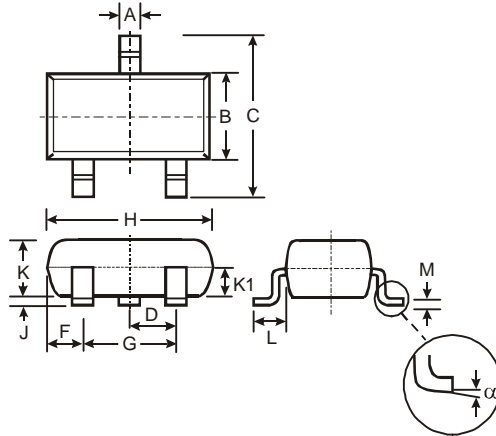
**Typical Characteristics**



**ZXTN649F**

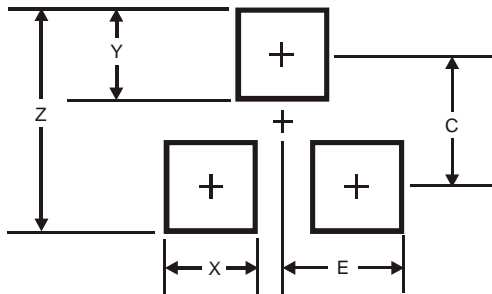
**NPN LOW  $V_{CE(sat)}$  TRANSISTOR IN SOT-23**

**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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