

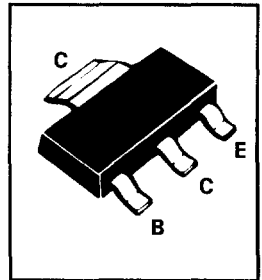
SOT223 NPN SILICON PLANAR HIGH CURRENT (HIGH PERFORMANCE) TRANSISTOR

FZT849

ISSUE 3 - JANUARY 1996

FEATURES

- * Extremely low equivalent on-resistance; $R_{CE(sat)}$ 36m Ω at 5A
- * **7 Amp** continuous collector current (20 Amp peak)
- * Very low saturation voltages
- * Excellent gain characteristics specified upto 20 Amp
- * P_{tot} =3 Watts



PARTMARKING DETAILS - FZT849

COMPLEMENTARY TYPE - FZT949

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CBO}	80	V
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Base Voltage	V_{EBO}	6	V
Peak Pulse Current	I_{CM}	20	A
Continuous Collector Current	I_C	7	A
Power Dissipation at $T_{amb}=25^{\circ}C$	P_{tot}	3	W
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	$^{\circ}C$

*The power which can be dissipated assuming the device is mounted in a typical manner on a P.C.B. with copper equal to 4 inch square minimum

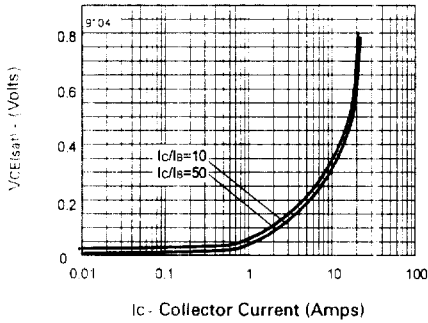
FZT849

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

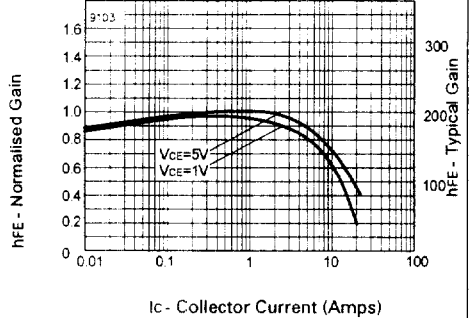
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	80	120		V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	80	120		V	$I_C=1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	30	40		V	$I_C=10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6	8		V	$I_E=100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}			50 1	nA μA	$V_{CB}=70\text{V}$ $V_{CB}=70\text{V}$, $T_{amb}=100^{\circ}\text{C}$
Collector Cut-Off Current	I_{CER} $R \leq 1\text{k}\Omega$			50 1	nA μA	$V_{CB}=70\text{V}$ $V_{CB}=70\text{V}$, $T_{amb}=100^{\circ}\text{C}$
Emitter Cut-Off Current	I_{EBO}			10	nA	$V_{EB}=6\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		35 67 168	50 110 215 350	mV mV mV mV	$I_C=0.5\text{A}$, $I_B=20\text{mA}^*$ $I_C=1\text{A}$, $I_B=20\text{mA}^*$ $I_C=2\text{A}$, $I_B=20\text{mA}^*$ $I_C=6.5\text{A}$, $I_B=300\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$			1.2	V	$I_C=6.5\text{A}$, $I_B=300\text{mA}$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$			1.13	V	$I_C=6.5\text{A}$, $V_{CE}=1\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	100 100 100 30	200 200 150 65	300		$I_C=10\text{mA}$, $V_{CE}=1\text{V}$ $I_C=1\text{A}$, $V_{CE}=1\text{V}^*$ $I_C=7\text{A}$, $V_{CE}=1\text{V}^*$ $I_C=20\text{A}$, $V_{CE}=2\text{V}^*$
Transition Frequency	f_T		100		MHz	$I_C=100\text{mA}$, $V_{CE}=10\text{V}$ $f=50\text{MHz}$
Output Capacitance	C_{obo}		75		pF	$V_{CB}=10\text{V}$, $f=1\text{MHz}^*$
Switching Times	t_{on} t_{off}		45 630		ns 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 μs . Duty cycle $\leq 2\%$
Spice parameter data is available upon request for this device

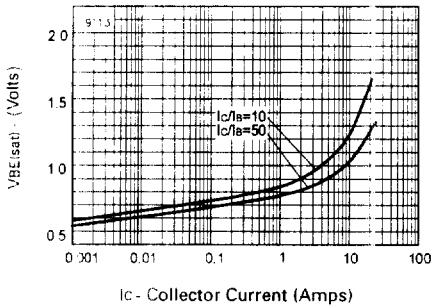
TYPICAL CHARACTERISTICS



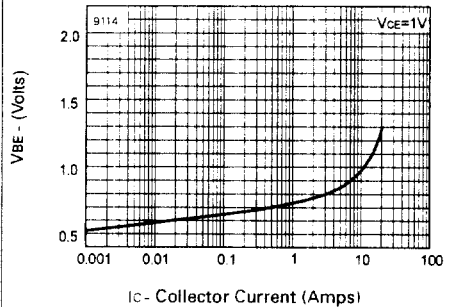
$V_{CE(sat)}$ v I_C



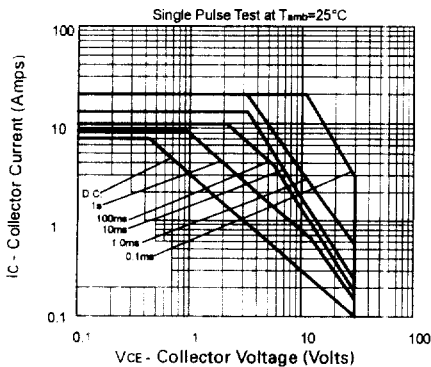
h_{FE} v I_C



$V_{BE(sat)}$ v I_C



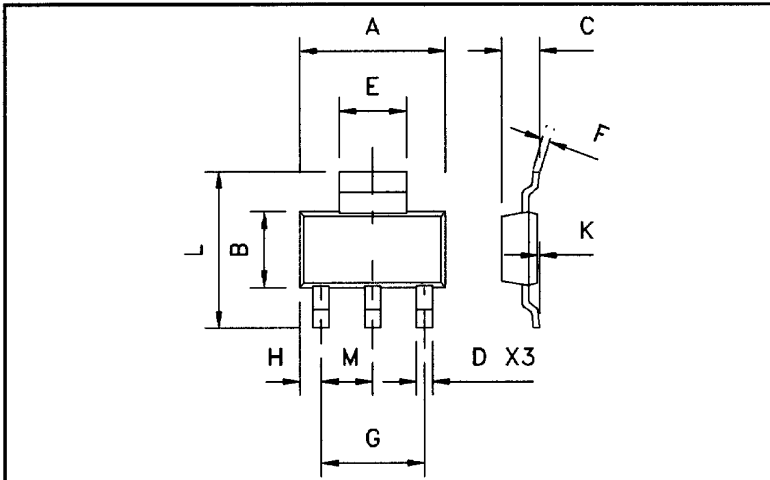
$V_{BE(on)}$ v I_C



Safe Operating Area

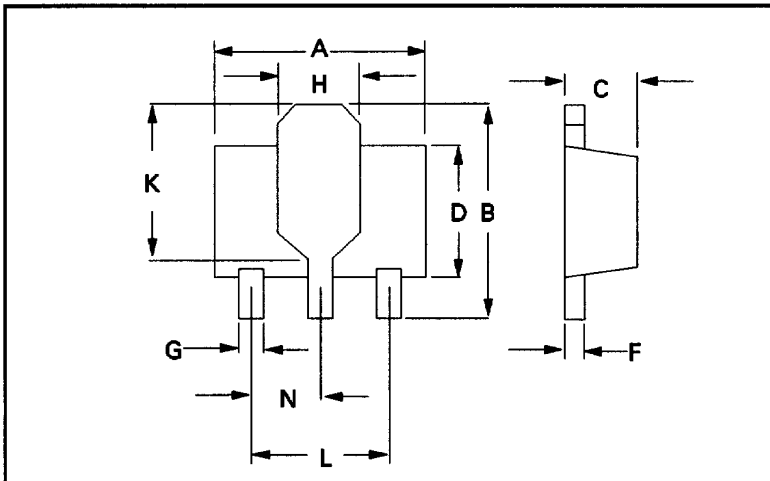
PACKAGE OUTLINE DETAILS

SOT223



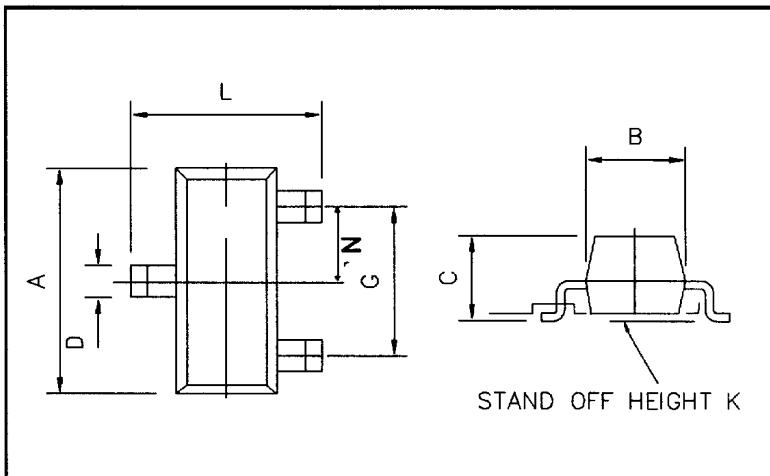
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	6.3	6.7	0.248	0.264
B	3.3	3.7	0.130	0.146
C	-	1.7	-	0.067
D	0.6	0.8	0.024	0.031
E	2.9	3.1	0.114	0.122
F	0.24	0.32	0.009	0.013
G	NOM 4.6		NOM 0.181	
H	0.85	1.05	0.033	0.041
K	0.02	0.10	0.0008	0.004
L	6.7	7.3	0.264	0.287
M	NOM 2.3		NOM 0.0905	

SOT89



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	4.40	4.60	0.173	0.181
B	3.75	4.25	0.150	0.167
C	1.40	1.60	0.550	0.630
D	-	2.60	-	0.102
F	0.28	0.45	0.011	0.018
G	0.38	0.55	0.015	0.022
H	1.50	1.80	0.060	0.072
K	2.60	2.85	0.102	0.112
L	2.90	3.10	0.114	0.122
N	1.40	1.60	0.055	0.063

SOT23



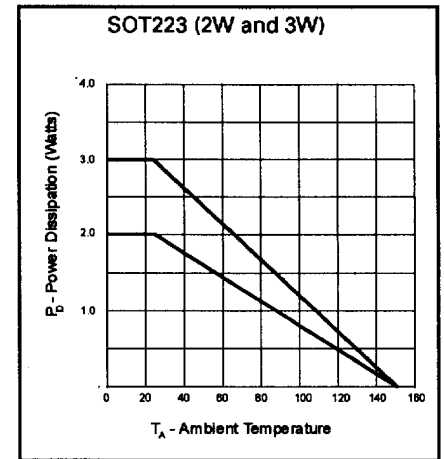
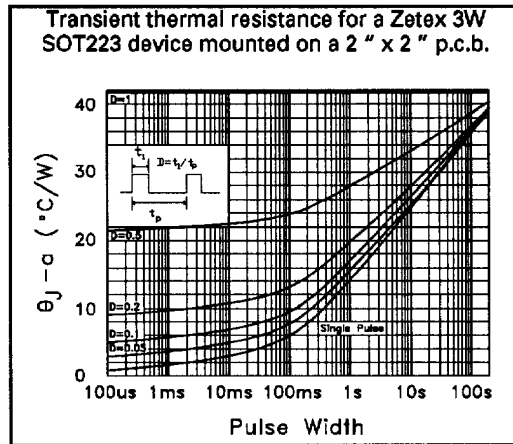
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	2.67	3.05	0.105	0.120
B	1.20	1.40	0.047	0.055
C	-	1.10	-	0.043
D	0.37	0.53	0.0145	0.021
F	0.085	0.15	0.0033	0.0059
G	NOM 1.9		NOM 0.075	
K	0.01	0.10	0.0004	0.004
L	2.10	2.50	0.0825	0.0985
N	NOM 0.95		NOM 0.37	

THERMAL RESISTANCE AND DERATING INFORMATION

A) SOT223 3 Watt devices

θ_{j-c} = 12°C/W Typical
 θ_{j-a} = 41.7°C/W Maximum

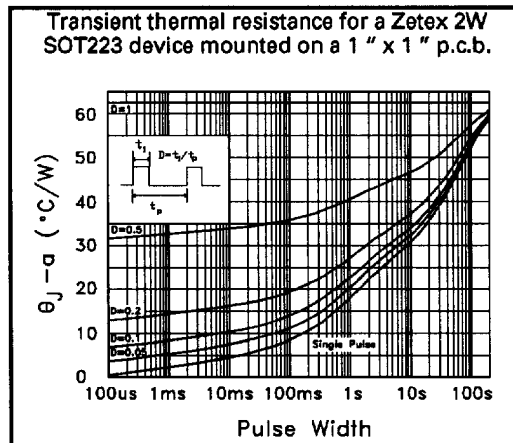
Mounted on a FR4 p.c.b. of 50mm²
 connected using 25mm x 0.5mm
 copper wire



B) SOT223 2 Watt devices

θ_{j-c} = 15°C/W Typical
 θ_{j-a} = 62.5°C/W Maximum

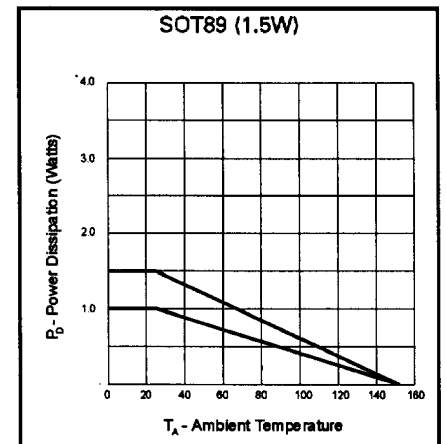
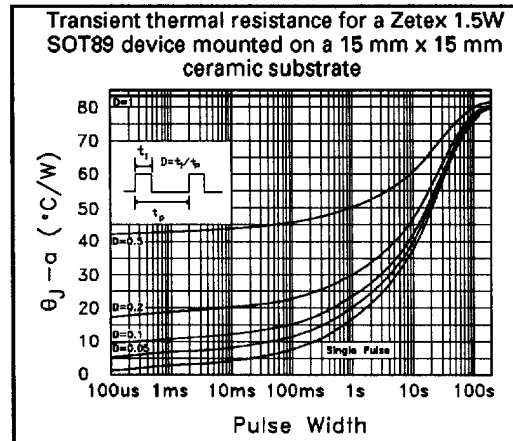
Mounted on a FR4 p.c.b. of 25mm
 x 25mm connected using 25mm x
 0.5mm copper wire



C) SOT89 1.5 Watt devices

θ_{j-a} = 83°C/W Maximum

Mounted on a 15 x 15 x 0.6 mm
 alumina ceramic substrate
 connected using 25mm x 0.5mm
 copper wire



*1W shown for reference only