

# SOT223 PNP SILICON PLANAR HIGH CURRENT (HIGH PERFORMANCE) TRANSISTORS

**FZT951**  
**FZT953**

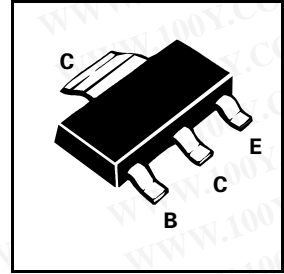
ISSUE 3 - APRIL 2000

## FEATURES

- \* 5 Amps continuous current , up to 15 Amps peak current
- \* Very low saturation voltages
- \* Excellent gain characteristics specified up to 10 Amps
- \* **P<sub>tot</sub> = 3 watts**
- \* FZT951 exhibits extremely low equivalent on resistance;  
**R<sub>CE(sat)</sub> 55mΩ at 4A**

COMPLEMENTARY TYPES - FZT951 = FZT851  
FZT953 = FZT853

PARTMARKING DETAILS - DEVICE TYPE IN FULL



## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	FZT951	FZT953	UNIT
Collector-Base Voltage	V <sub>CBO</sub>	-100	-140	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-60	-100	V
Emitter-Base Voltage	V <sub>EBO</sub>	-6		V
Peak Pulse Current	I <sub>CM</sub>	-15	-10	A
Continuous Collector Current	I <sub>C</sub>	-5		A
Power Dissipation at T <sub>amb</sub> =25°C	P <sub>tot</sub>	3		W
Operating and Storage Temperature Range	T <sub>j</sub> ;T <sub>stg</sub>	-55 to +150		°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 square inch minimum

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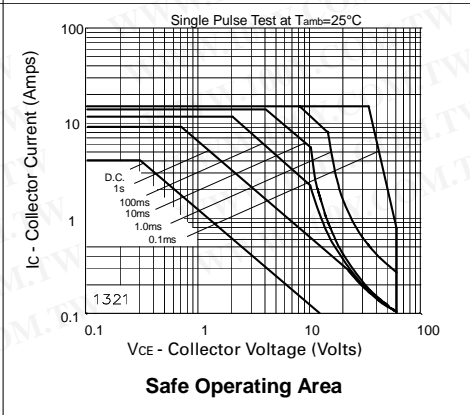
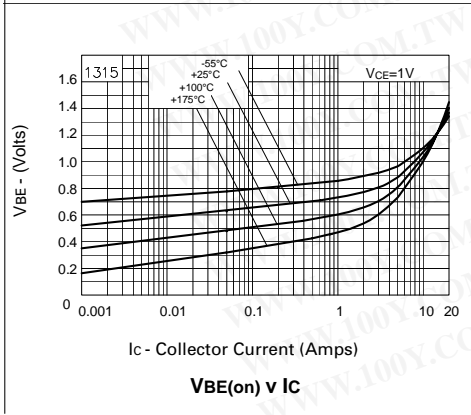
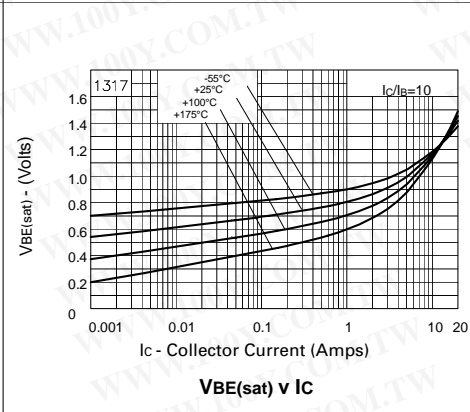
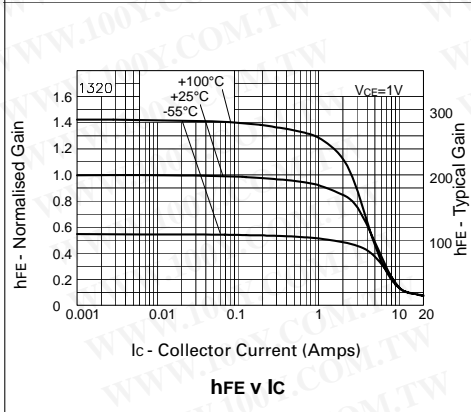
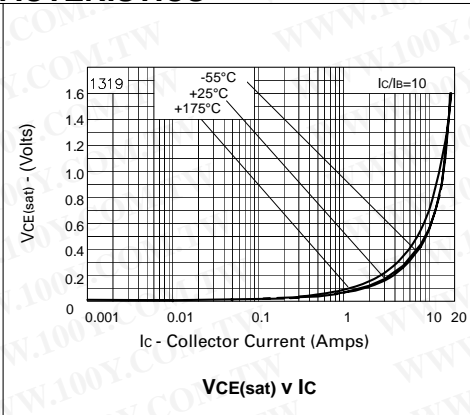
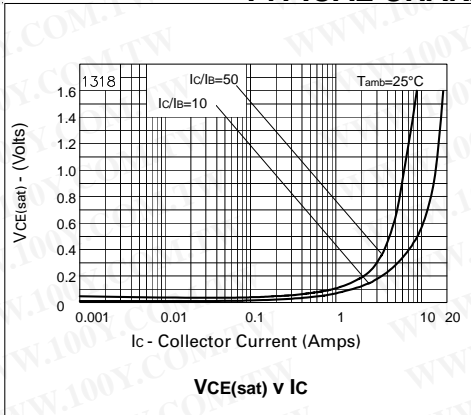
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**ELECTRICAL CHARACTERISTICS (at  $T_{amb} = 25^{\circ}\text{C}$  unless otherwise stated)**

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-100	-140		V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	-100	-140		V	$I_C = -1\mu\text{A}$ , $R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-60	-90		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 $\mu\text{A}$	$V_{CB} = -80\text{V}$ $V_{CB} = -80\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Collector Cut-Off Current	$I_{CER}$ $R \leq 1\text{k}\Omega$			-50 -1	nA $\mu\text{A}$	$V_{CB} = -80\text{V}$ $V_{CB} = -80\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Emitter Cut-Off Current	$I_{EBO}$			-10	nA	$V_{EB} = -6\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-20 -85 -155 -370	-50 -140 -210 -460	mV mV mV mV	$I_C = -100\text{mA}$ , $I_B = -10\text{mA}^*$ $I_C = -1\text{A}$ , $I_B = -100\text{mA}^*$ $I_C = -2\text{A}$ , $I_B = -200\text{mA}^*$ $I_C = -5\text{A}$ , $I_B = -500\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-1080	-1240	mV	$I_C = -5\text{A}$ , $I_B = -500\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-935	-1070	mV	$I_C = -5\text{A}$ , $V_{CE} = -1\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	100 100 75 10	200 200 90 25	300		$I_C = -10\text{mA}$ , $V_{CE} = -1\text{V}^*$ $I_C = -2\text{A}$ , $V_{CE} = -1\text{V}^*$ $I_C = -5\text{A}$ , $V_{CE} = -1\text{V}^*$ $I_C = -10\text{A}$ , $V_{CE} = -1\text{V}^*$
Transition Frequency	$f_T$		120		MHz	$I_C = -100\text{mA}$ , $V_{CE} = -10\text{V}$ $f = 50\text{MHz}$
Output Capacitance	$C_{obo}$		74		pF	$V_{CB} = -10\text{V}$ , $f = 1\text{MHz}$
Switching Times	$t_{on}$ $t_{off}$		82 350		ns ns	$I_C = -2\text{A}$ , $I_{B1} = -200\text{mA}$ $I_{B2} = 200\text{mA}$ , $V_{CC} = -10\text{V}$

\* Measured under pulsed conditions. Pulse width = 300 $\mu\text{s}$ . duty cycle  $\leq 2\%$   
 Spice parameter data is available upon request for this device

## TYPICAL CHARACTERISTICS



**FZT953**

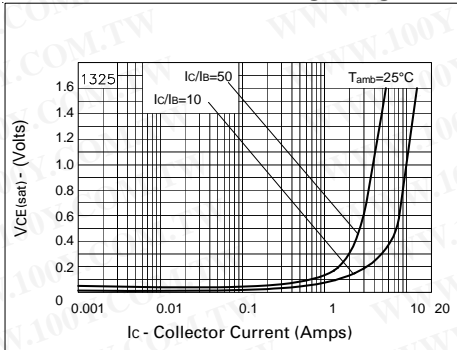
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**ELECTRICAL CHARACTERISTICS (at  $T_{amb} = 25^{\circ}\text{C}$  unless otherwise stated)**

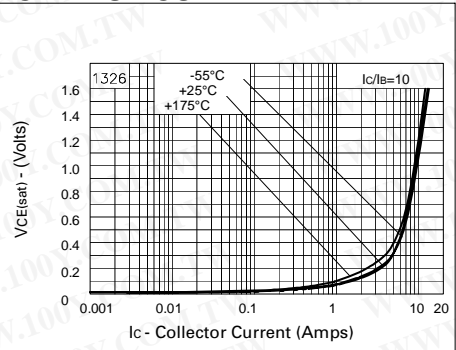
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-140	-170		V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	-140	-170		V	$I_C = -1\mu\text{A}$ , $R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-100	-120		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 $\mu\text{A}$	$V_{CB} = -100\text{V}$ $V_{CB} = -100\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Collector Cut-Off Current	$I_{CER}$ $R \leq 1\text{k}\Omega$			-50 -1	nA $\mu\text{A}$	$V_{CB} = -100\text{V}$ $V_{CB} = -100\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Emitter Cut-Off Current	$I_{EBO}$			-10	nA	$V_{EB} = -6\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-20 -90 -160 -300	-50 -115 -220 -420	mV mV mV mV	$I_C = -100\text{mA}$ , $I_B = -10\text{mA}^*$ $I_C = -1\text{A}$ , $I_B = -100\text{mA}^*$ $I_C = -2\text{A}$ , $I_B = -200\text{mA}^*$ $I_C = -4\text{A}$ , $I_B = -400\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-1010	-1170	mV	$I_C = -4\text{A}$ , $I_B = -400\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-925	-1160	mV	$I_C = -4\text{A}$ , $V_{CE} = -1\text{V}^*$
Static Forward Current Transfer	$h_{FE}$	100 100 50 30	200 200 90 50 15	300		$I_C = -10\text{mA}$ , $V_{CE} = -1\text{V}^*$ $I_C = -1\text{A}$ , $V_{CE} = -1\text{V}^*$ $I_C = -3\text{A}$ , $V_{CE} = -1\text{V}^*$ $I_C = -4\text{A}$ , $V_{CE} = -1\text{V}^*$ $I_C = -10\text{A}$ , $V_{CE} = -1\text{V}^*$
Transition Frequency	$f_T$		125		MHz	$I_C = -100\text{mA}$ , $V_{CE} = -10\text{V}$ $f = 50\text{MHz}$
Output Capacitance	$C_{obo}$		65		pF	$V_{CB} = -10\text{V}$ , $f = 1\text{MHz}$
Switching Times	$t_{on}$ $t_{off}$		110 460		ns ns	$I_C = -2\text{A}$ , $I_{B1} = -200\text{mA}$ $I_{B2} = 200\text{mA}$ , $V_{CC} = -10\text{V}$

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$   
 Spice parameter data is available upon request for this device

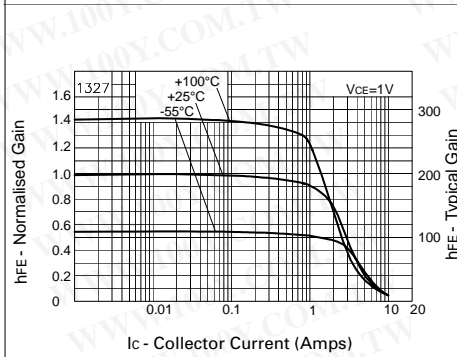
**TYPICAL CHARACTERISTICS**



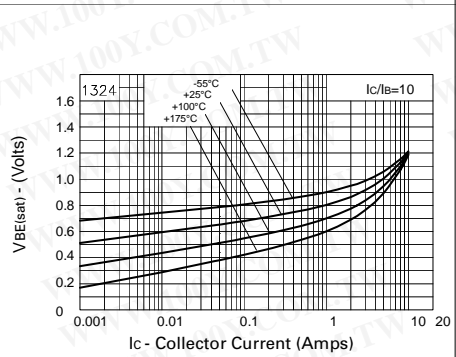
**V<sub>CE(sat)</sub> v IC**



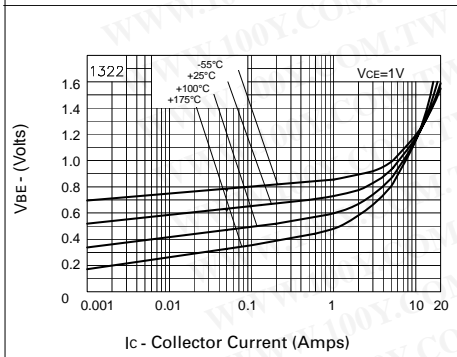
**V<sub>CE(sat)</sub> v IC**



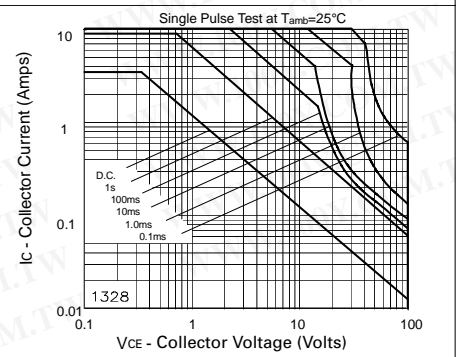
**hFE v IC**



**V<sub>BE(sat)</sub> v IC**



**V<sub>BE(on)</sub> v IC**



**Safe Operating Area**