



THE DATASHEET OF FZT951TC



SOT223 PNP SILICON PLAN (HIGH PERFORMANCE) TRANSISTOR

ISSUE 3 - APRIL 2000

FEATURES

- * 5 Amps continuous current , up to 100V
- * Very low saturation voltages
- * Excellent gain characteristics specified over the full operating temperature range
- * $P_{tot} = 3 \text{ watts}$
- * FZT951 exhibits extremely low equivalent circuit capacitance

$R_{CE(sat)} = 55m\Omega$ at 4A

COMPLEMENTARY TYPES - FZT951 = PNP
FZT953 = NPN

PARTMARKING DETAILS - FZT951 = 951
FZT953 = 953

ABSOLUTE MAXIMUM RATINGS

PARAMETER
Collector-Base Voltage
Collector-Emitter Voltage
Emitter-Base Voltage
Peak Pulse Current
Continuous Collector Current
Power Dissipation at $T_{amb}=25^{\circ}C$
Operating and Storage Temperature Range

* The power which can be dissipated as a function of ambient temperature is shown in the P.C.B. with copper equal to 4 square inches.

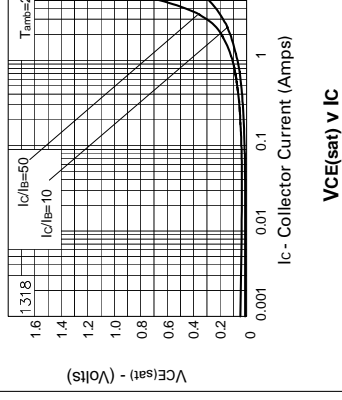
FZT951

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

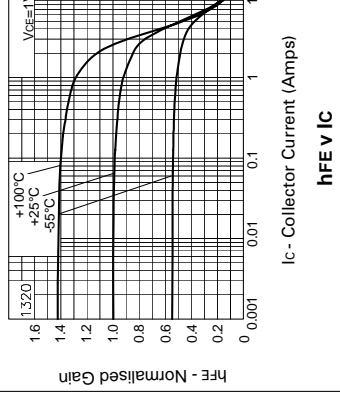
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-100	-140		V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	-100	-140		V	$I_C = -1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-60	-90		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 μA	$V_{CB} = -80\text{V}$ $V_{CB} = -80\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
Collector Cut-Off Current	I_{CER} $R \leq 1\text{k}\Omega$			-50 -1	nA μA	$V_{CB} = -80\text{V}$ $V_{CB} = -80\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
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	$I_C = -100\text{mA}$, $I_B = -10\text{mA}^*$ $I_C = -1\text{A}$, $I_B = -100\text{mA}^*$ $I_C = -2\text{A}$, $I_B = -200\text{mA}^*$ $I_C = -5\text{A}$, $I_B = -500\text{mA}^*$
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_{ob0}		74		pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}$
Switching Times	t_{on} t_{off}		82 350		ns ns	$I_C = -2\text{A}$, $I_B = -200\text{mA}$ $I_B = 200\text{mA}$, $V_{CC} = -10\text{V}$

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

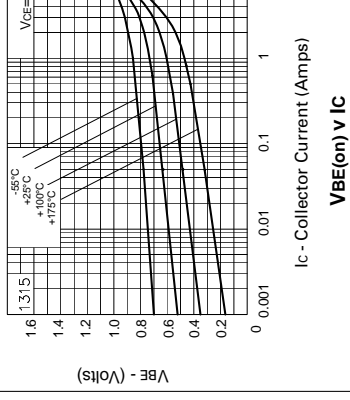
TYPICAL CHARACTERISTICS



$V_{CE(sat)}$ v I_C



h_{FE} v I_C



$V_{BE(on)}$ v I_C

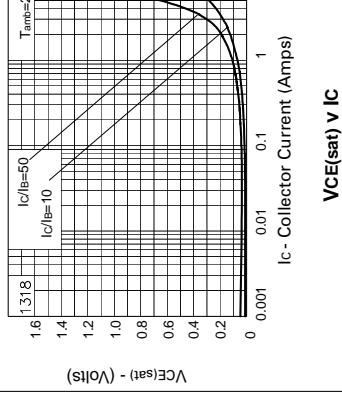
FZT951

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

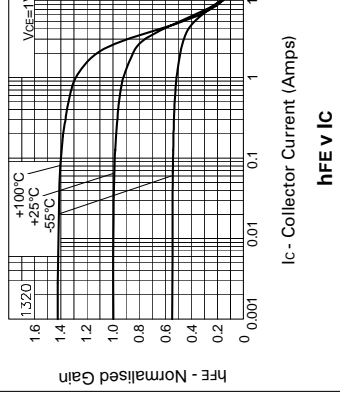
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-100	-140		V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	-100	-140		V	$I_C = -1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-60	-90		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 μA	$V_{CB} = -80\text{V}$ $V_{CB} = -80\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
Collector Cut-Off Current	I_{CER} $R \leq 1\text{k}\Omega$			-50 -1	nA μA	$V_{CB} = -80\text{V}$ $V_{CB} = -80\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
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	$I_C = -100\text{mA}$, $I_B = -10\text{mA}^*$ $I_C = -1\text{A}$, $I_B = -100\text{mA}^*$ $I_C = -2\text{A}$, $I_B = -200\text{mA}^*$ $I_C = -5\text{A}$, $I_B = -500\text{mA}^*$
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_{ob0}		74		pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}$
Switching Times	t_{on} t_{off}		82 350		ns ns	$I_C = -2\text{A}$, $I_B = -200\text{mA}$ $I_B = 200\text{mA}$, $V_{CC} = -10\text{V}$

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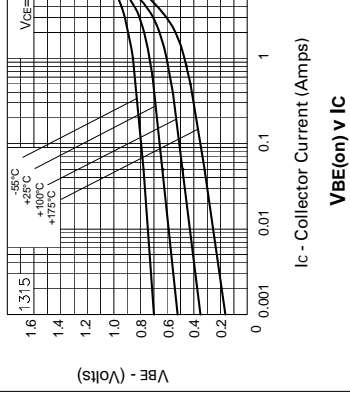
TYPICAL CHARACTERISTICS



VCE(sat) v IC



hFE v IC



VBE(on) v IC

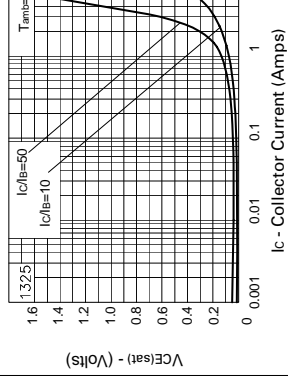
FZT953

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

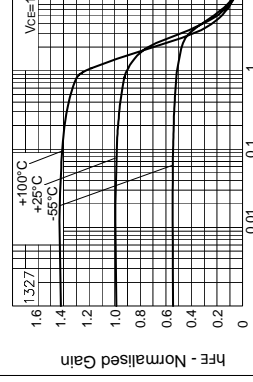
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-140	-170		V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	-140	-170		V	$I_C = -1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-100	-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 μA	$V_{CB} = -100\text{V}$ $V_{CE} = -100\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
Collector Cut-Off Current	I_{CER} $R \leq 1\text{k}\Omega$			-50 -1	nA μA	$V_{CB} = -100\text{V}$ $V_{CE} = -100\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
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	$I_C = -100\text{mA}$, $I_B = -10\text{mA}^*$ $I_C = -1\text{A}$, $I_B = -100\text{mA}^*$ $I_C = -2\text{A}$, $I_B = -200\text{mA}^*$ $I_C = -4\text{A}$, $I_B = -400\text{mA}^*$
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	$I_C = -2\text{A}$, $I_B = -200\text{mA}$ $I_B = -200\text{mA}$, $V_{CC} = -10\text{V}$

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

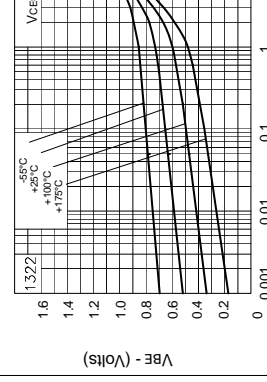
TYPICAL CHARACTERISTICS



$V_{CE(sat)}$ v I_C



h_{FE} v I_C



V_{BE} v I_C

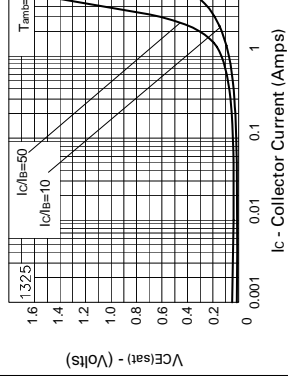
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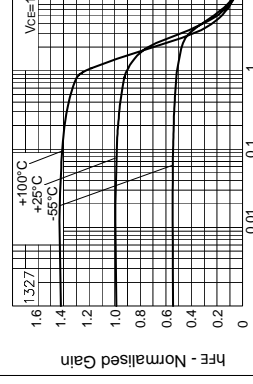
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Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-140	-170		V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	-140	-170		V	$I_C = -1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
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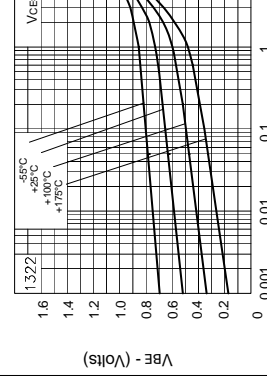
TYPICAL CHARACTERISTICS



$V_{CE(sat)}$ v I_C



h_{FE} v I_C



$V_{BE(on)}$ v I_C

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