



# THE DATASHEET OF FZT958TA



# SOT223 PNP SILICON PLANAR (HIGH PERFORMANCE) TRANSISTOR

ISSUE 3 - JANUARY 1996

## FEATURES

- \* 1 Amp continuous current
- \* Up to 2 Amps peak current
- \* Very low saturation voltage
- \* Excellent gain characteristics specified

COMPLEMENTARY TYPES - FZT957 -  
FZT958 -

PARTMARKING DETAILS - DEVICE T

## 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 Figure 1. P.C.B. with copper equal to 4 square inches.

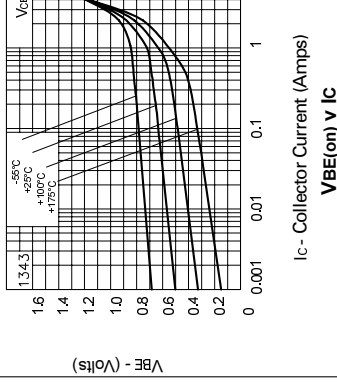
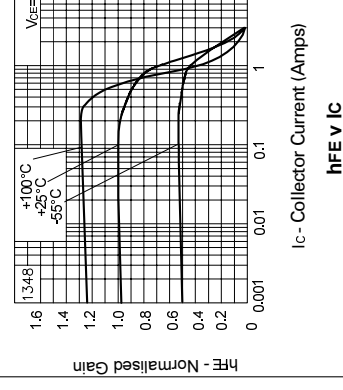
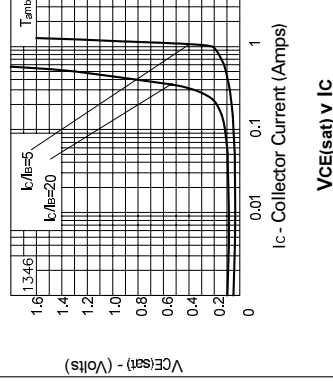
# FZT957

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-330	-440		V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	-330	-440		V	$I_C = 1\mu\text{A}$ , $R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-300	-400		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 $\mu\text{A}$	$V_{CE} = 300\text{V}$ $V_{CE} = 300\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Collector Cut-Off Current	$I_{CER}$ $R \leq 1\text{k}\Omega$			-50 -1	nA $\mu\text{A}$	$V_{CE} = 300\text{V}$ $V_{CE} = 300\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Emitter Cut-Off Current	$I_{EBO}$			-10	nA	$V_{EB} = 6\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-60 -110 -170	-100 -165 -240	mV mV mV	$I_C = 100\text{mA}$ , $I_B = 10\text{mA}^*$ $I_C = 500\text{mA}$ , $I_B = 100\text{mA}^*$ $I_C = 1\text{A}$ , $I_B = 300\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-910	-1150	mV	$I_C = 1\text{A}$ , $I_B = 300\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-750	-1020	mV	$I_C = 1\text{A}$ , $V_{CE} = 10\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	100 100 90	200 200 170 10	300		$I_C = 10\text{mA}$ , $V_{CE} = 10\text{V}^*$ $I_C = 0.5\text{A}$ , $V_{CE} = 10\text{V}^*$ $I_C = 1\text{A}$ , $V_{CE} = 10\text{V}^*$ $I_C = 2\text{A}$ , $V_{CE} = 10\text{V}^*$
Transition Frequency	$f_T$		85		MHz	$I_C = 100\text{mA}$ , $V_{CE} = 10\text{V}$ $f = 50\text{MHz}$
Output Capacitance	$C_{ob0}$		23		pF	$V_{CE} = 20\text{V}$ , $f = 1\text{MHz}$
Switching Times	$t_{on}$ $t_{off}$		108 2500		ns ns	$I_C = 500\text{mA}$ , $I_B = 50\text{mA}$ $I_B = 50\text{mA}$ , $V_{CC} = 100\text{V}$

\*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



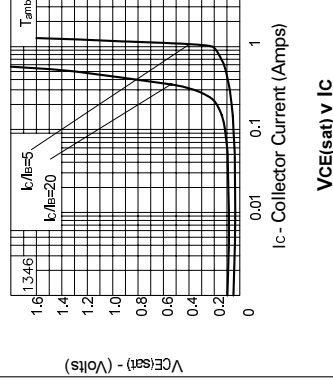
# FZT957

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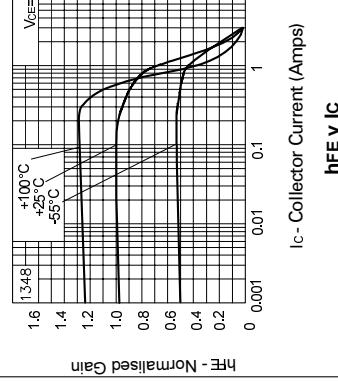
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Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	-330	-440		V	$I_C = 1\mu\text{A}$ , $R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-300	-400		V	$I_C = 10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-6	-8		V	$I_E = 100\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$			-50 -1	nA $\mu\text{A}$	$V_{CE} = 300\text{V}$ $V_{CE} = 300\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Collector Cut-Off Current	$I_{CER}$ $R \leq 1\text{k}\Omega$			-50 -1	nA $\mu\text{A}$	$V_{CE} = 300\text{V}$ $V_{CE} = 300\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Emitter Cut-Off Current	$I_{EBO}$			-10	nA	$V_{EB} = 6\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-60 -110 -170	-100 -165 -240	mV mV mV	$I_C = 100\text{mA}$ , $I_E = 10\text{mA}^*$ $I_C = 500\text{mA}$ , $I_E = 100\text{mA}^*$ $I_C = 1\text{A}$ , $I_E = 300\text{mA}^*$
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Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-750	-1020	mV	$I_C = 1\text{A}$ , $V_{CE} = 10\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	100 100 90	200 200 170 10	300		$I_C = 10\text{mA}$ , $V_{CE} = 10\text{V}^*$ $I_C = 0.5\text{A}$ , $V_{CE} = 10\text{V}^*$ $I_C = 1\text{A}$ , $V_{CE} = 10\text{V}^*$ $I_C = 2\text{A}$ , $V_{CE} = 10\text{V}^*$
Transition Frequency	$f_T$		85		MHz	$I_C = 100\text{mA}$ , $V_{CE} = 10\text{V}$ $f = 50\text{MHz}$
Output Capacitance	$C_{ob0}$		23		pF	$V_{CE} = 20\text{V}$ , $f = 1\text{MHz}$
Switching Times	$t_{on}$ $t_{off}$		108 2500		ns ns	$I_C = 500\text{mA}$ , $I_{B1} = 50\text{mA}$ $I_{B2} = 50\text{mA}$ , $V_{CC} = 100\text{V}$

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$   
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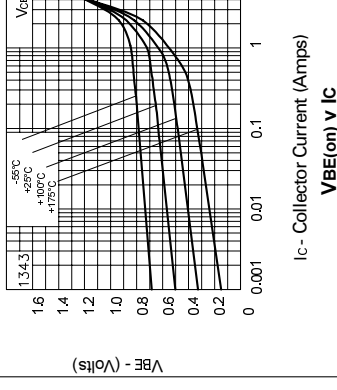
## TYPICAL



$V_{CE(sat)}$  v  $I_C$



$h_{FE}$  v  $I_C$



$V_{BE(on)}$  v  $I_C$

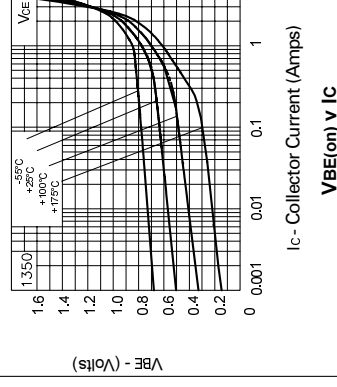
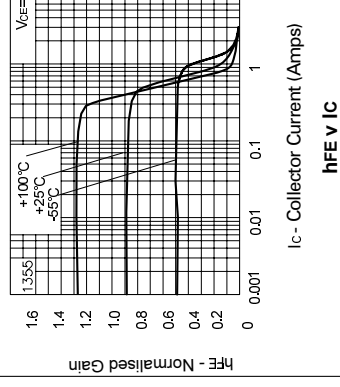
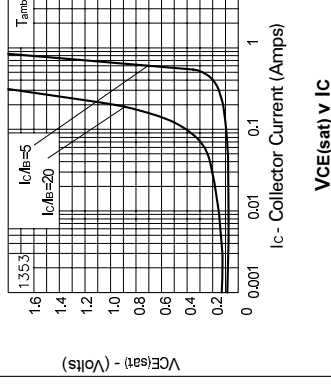
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## ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-400	-600		V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	-400	-600		V	$I_C = 1\mu\text{A}$ , $R_B \leq 1k\Omega$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-400	-550		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 $\mu\text{A}$	$V_{CB} = 300\text{V}$ $V_{CE} = 300\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Collector Cut-Off Current	$I_{CER}$ $R \leq 1k\Omega$			-50 -1	nA $\mu\text{A}$	$V_{CB} = 300\text{V}$ $V_{CE} = 300\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Emitter Cut-Off Current	$I_{EBO}$			-10	nA	$V_{EB} = 6\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-100 -150 -340	-150 -200 -400	mV mV mV	$I_C = 10\text{mA}$ , $I_B = 1\text{mA}^*$ $I_C = 100\text{mA}$ , $I_B = 10\text{mA}^*$ $I_C = 500\text{mA}$ , $I_B = 100\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-830	-950	mV	$I_C = 500\text{mA}$ , $I_B = 100\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-725	-840	mV	$I_C = 500\text{mA}$ , $V_{CE} = 10\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	100 100 10	200 200 20	300		$I_C = 10\text{mA}$ , $V_{CE} = 10\text{V}^*$ $I_C = 500\text{mA}$ , $V_{CE} = 10\text{V}^*$ $I_C = 1\text{A}$ , $V_{CE} = 10\text{V}^*$
Transition Frequency	$f_T$		85		MHz	$I_C = 100\text{mA}$ , $V_{CE} = 10\text{V}$ $f = 50\text{MHz}$
Output Capacitance	$C_{obo}$		19		pF	$V_{CB} = 20\text{V}$ , $f = 1\text{MHz}$
Switching Times	$t_{on}$ $t_{off}$		104 2400		ns ns	$I_C = 500\text{mA}$ , $I_B = 50\text{mA}$ $I_B = 50\text{mA}$ , $V_{CC} = 100\text{V}$

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$   
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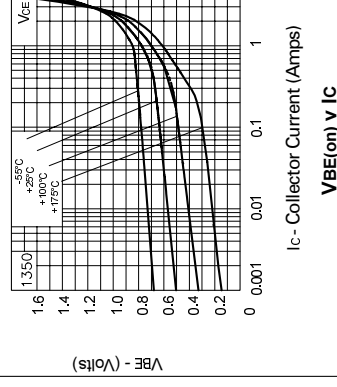
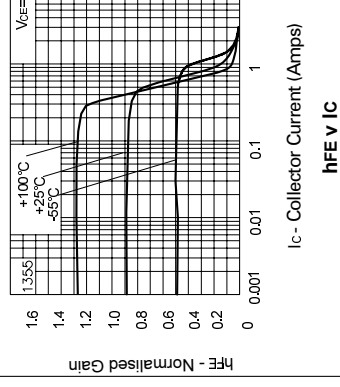
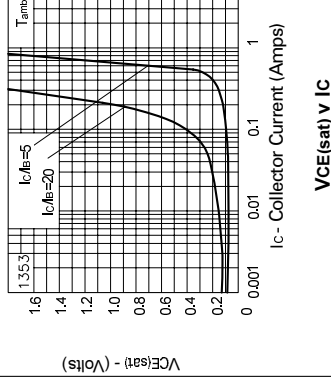
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\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$   
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## TYPICAL



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