



# THE DATASHEET OF ZTX696B



# ZTX696B

## NPN SILICON PLANAR MEDIUM GAIN TRANSISTOR

ISSUE 3 - NOVEMBER 1995

### FEATURES

- \* 180 Volt  $V_{CE0}$
- \* Gain of 500 at  $I_C=100\text{mA}$
- \* Very low saturation voltage

### APPLICATIONS

- \* Darlington replacement
- \* Battery powered circuits
- \* Motor drivers
- \* Relay / solenoid drivers

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	LIMIT
Collector-Base Voltage	$V_{CB0}$
Collector-Emitter Voltage	$V_{CE0}$
Emitter-Base Voltage	$V_{EB0}$
Peak Pulse Current	$I_{CP}$
Continuous Collector Current	$I_C$
Practical Power Dissipation *	$P_{D(amb)}$
Power Dissipation at $T_{amb}=25^\circ\text{C}$	$P_{D(25)}$
Operating and Storage Temperature Range	$T_{stg}$

\*The power which can be dissipated as P.C.B. with copper equal to 1 inch square

### ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	UNIT
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	V
Collector Cut-Off Current	$I_{CBO}$	$\mu\text{A}$
Emitter Cut-Off Current	$I_{EBO}$	$\mu\text{A}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	V
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	V
Static Forward Current Transfer Ratio	$h_{FE}$	

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Transition Frequency	$f_T$	70			MHz	$I_C=50\text{mA}, V_{CE}=5\text{V}, f=50\text{MHz}$
Input Capacitance	$C_{ibo}$		200		pF	$V_{EB}=0.5\text{V}, f=1\text{MHz}$
Output Capacitance	$C_{obo}$		6		pF	$V_{CE}=10\text{V}, f=1\text{MHz}$
Switching Times	$t_{on}$ $t_{off}$		80 4400		ns	$I_C=100\text{mA}, I_B=10\text{mA}, V_{CE}=50\text{V}$

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

### THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	MAX.	UNIT
Thermal Resistance: Junction to Ambient	$R_{th(j-amb)1}$	175	$^\circ\text{C/W}$
Junction to Ambient	$R_{th(j-amb)2}$ †	116	$^\circ\text{C/W}$
Junction to Case	$R_{th(j-case)}$	70	$^\circ\text{C/W}$

† Device mounted on P.C.B. with copper equal to 1 sq. Inch minimum.

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PARAMETER	LIMIT
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Collector-Emitter Voltage	$V_{CE0}$
Emitter-Base Voltage	$V_{EB0}$
Peak Pulse Current	$I_{CP}$
Continuous Collector Current	$I_C$
Practical Power Dissipation *	$P_D$
Power Dissipation at $T_{amb}=25^\circ\text{C}$	$P_{D25}$
Operating and Storage Temperature Range	$T_{stg}$

\*The power which can be dissipated as P.C.B. with copper equal to 1 inch square

### ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	UNIT
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	V
Collector Cut-Off Current	$I_{CBO}$	$\mu\text{A}$
Emitter Cut-Off Current	$I_{EBO}$	$\mu\text{A}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	V
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	V
Static Forward Current Transfer Ratio	$h_{FE}$	

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Output Capacitance	$C_{obo}$		6		pF	$V_{CE}=10\text{V}, f=1\text{MHz}$
Switching Times	$t_{on}$ $t_{off}$		80 4400		ns	$I_C=100\text{mA}, I_{B1}=10\text{mA}, I_{B2}=10\text{mA}, V_{CC}=50\text{V}$

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

### THERMAL CHARACTERISTICS



PARAMETER	SYMBOL	MAX.	UNIT
Thermal Resistance: Junction to Ambient	$R_{th(j-a)1}$	175	$^\circ\text{C/W}$
Junction to Ambient	$R_{th(j-a)2}$ †	116	$^\circ\text{C/W}$
Junction to Case	$R_{th(j-c)}$	70	$^\circ\text{C/W}$

† Device mounted on P.C.B. with copper equal to 1 sq. Inch minimum.



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