

NPN Silicon Planar Medium Power Power Transistor

ZTX649

FEATURES

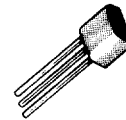
- 1.5W power dissipation at $T_{amb} = 25^{\circ}\text{C}^*$
- 2A continuous I_C
- Excellent gain characteristics up to 6A (pulsed)
- Low saturation voltages
- Fast switching
- PNP complementary type available

DESCRIPTION

A high performance transistor encapsulated in the popular E-line (TO-92) plastic package.

The 1.5W performance and outstanding electrical characteristics permit use in a wide range of industrial and consumer applications including lamp and solenoid drivers.

In addition the excellent gain characteristics at



Plastic E-Line
(TO-92 Compatible)

high collector current levels makes the device ideal in pulsed applications.

The specially selected silicone encapsulation provides resistance to severe environments comparable with metal can devices.

Complementary to the ZTX749

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	ZTX649	Unit
Collector-base voltage	V_{CBO}	35	V
Collector-emitter voltage	V_{CEO}	25	V
Emitter-base voltage	V_{EBO}	5	V
Peak pulse current (see note below)	I_{CM}	6	A
Continuous collector current	I_C	2	A
Practical power dissipation*	P_{totP}	1.5	W
Power dissipation: at $T_{amb} = 25^{\circ}\text{C}$ derate above 25°C	P_{tot}	1 5.7	W mW/ $^{\circ}\text{C}$
Operating & storage temperature range		- 55 to + 200	$^{\circ}\text{C}$

Note: Consult Safe Operating Area guide for conditions.

*The power which can be dissipated assuming device mounted in typical manner on P.C.B. with copper equal to 1sq.inch minimum.

ZTX649

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

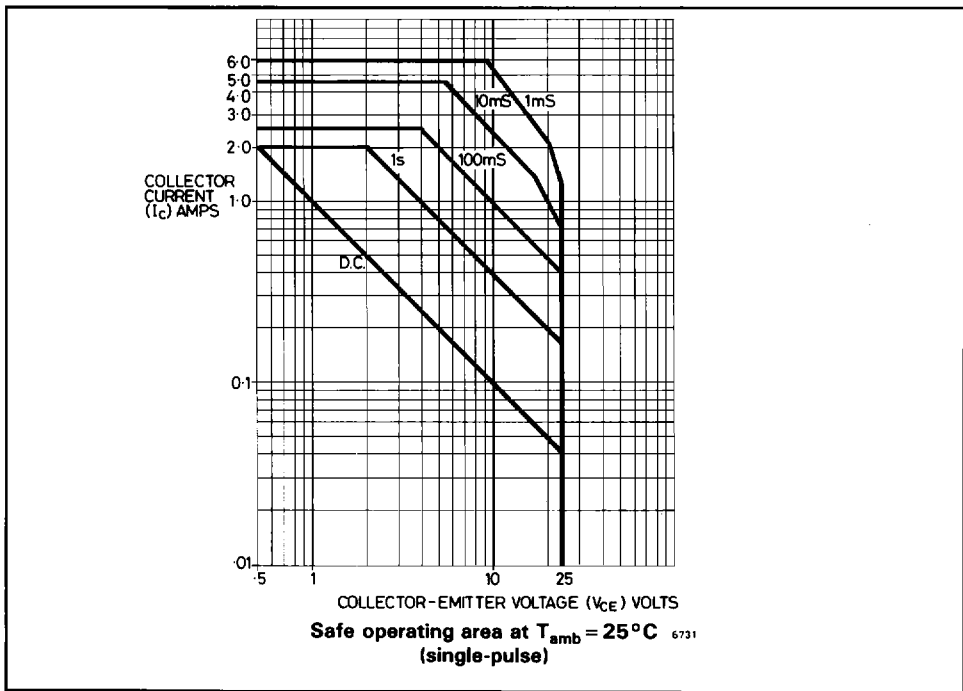
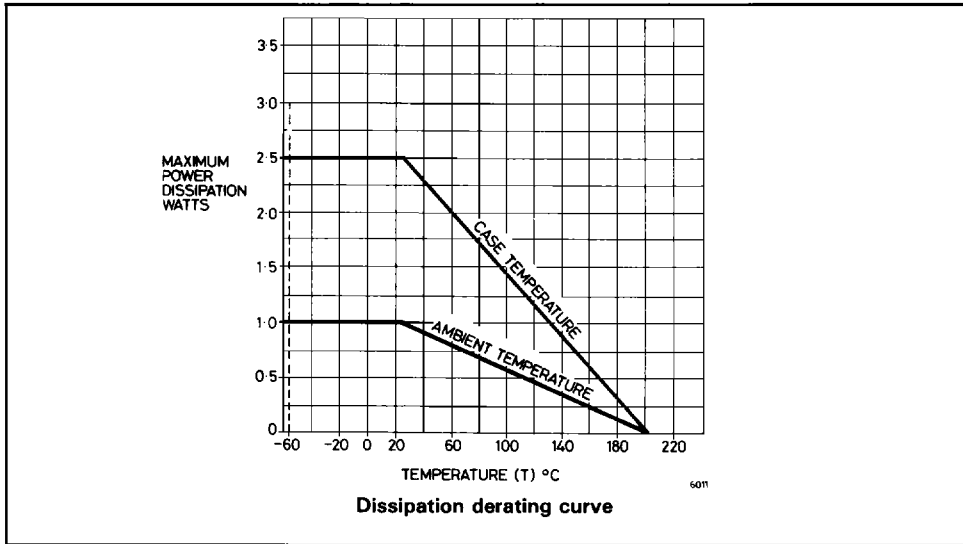
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$V_{(BR)CBO}$	35	–	–	V	$I_C = 100\mu\text{A}$
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	25	–	–	V	$I_C = 10\text{mA}$
Emitter-base breakdown voltage	$V_{(BR)EBO}$	5	–	–	V	$I_E = 100\mu\text{A}$
Collector cut-off current	I_{CBO}			0.1	μA	$V_{CB} = 30\text{V}$
		–	–	10	μA	$V_{CB} = 30\text{V}, T_{amb} = 100^{\circ}\text{C}$
Emitter cut-off current	I_{EBO}			0.1	μA	$V_{EB} = 4\text{V}$
Collector-emitter saturation voltage	$V_{CE(SAT)}$		0.12	0.3	V	$I_C = 1\text{A}, I_B = 100\text{mA}^*$
		–	0.23	0.5	V	$I_C = 2\text{A}, I_B = 200\text{mA}^*$
Base-emitter saturation voltage	$V_{BE(SAT)}$	–	0.9	1.25	V	$I_C = 1\text{A}, I_B = 100\text{mA}^*$
Base-emitter turn on voltage	$V_{BE(ON)}$	–	0.8	1	V	$I_C = 1\text{A}, V_{CE} = 2\text{V}^*$
Static forward current transfer ratio	h_{FE}	70	200	–		$I_C = 50\text{mA}, V_{CE} = 2\text{V}^*$
		100	200	300		$I_C = 1\text{A}, V_{CE} = 2\text{V}^*$
		75	150	–		$I_C = 2\text{A}, V_{CE} = 2\text{V}^*$
		15	50	–		$I_C = 6\text{A}, V_{CE} = 2\text{V}^*$
Transition frequency	f_T	150	240	–	MHz	$I_C = 100\text{mA}, V_{CE} = 5\text{V}$ $f = 100\text{MHz}$
Output capacitance	C_{obo}	–	25	50	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Switching times	T_{on}	–	55	–	ns	$I_C = 500\text{mA}, V_{CC} = 10\text{V}$ $I_{B1} = I_{B2} = 50\text{mA}$
	T_{off}	–	300	–	ns	

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

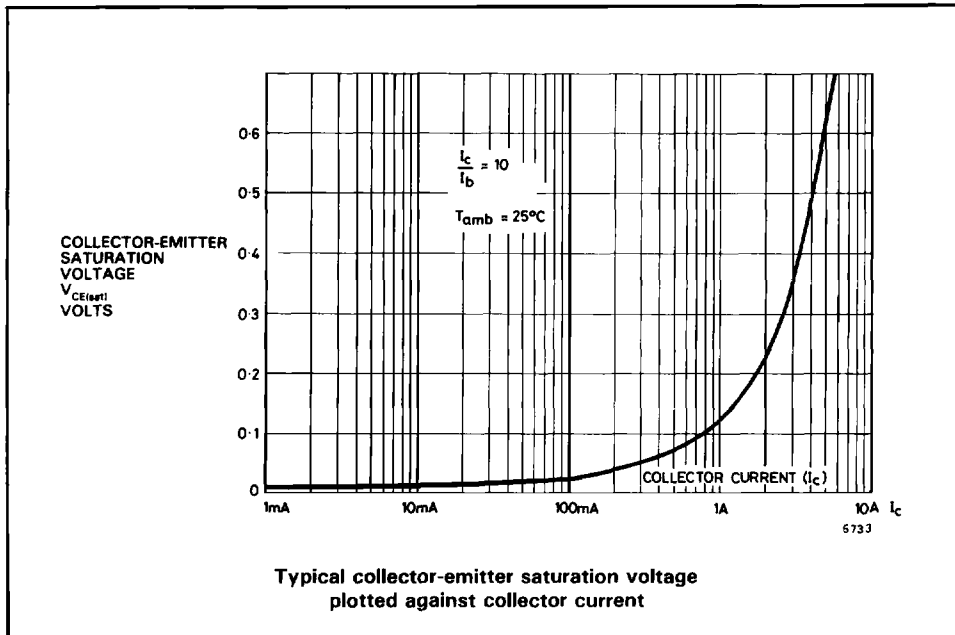
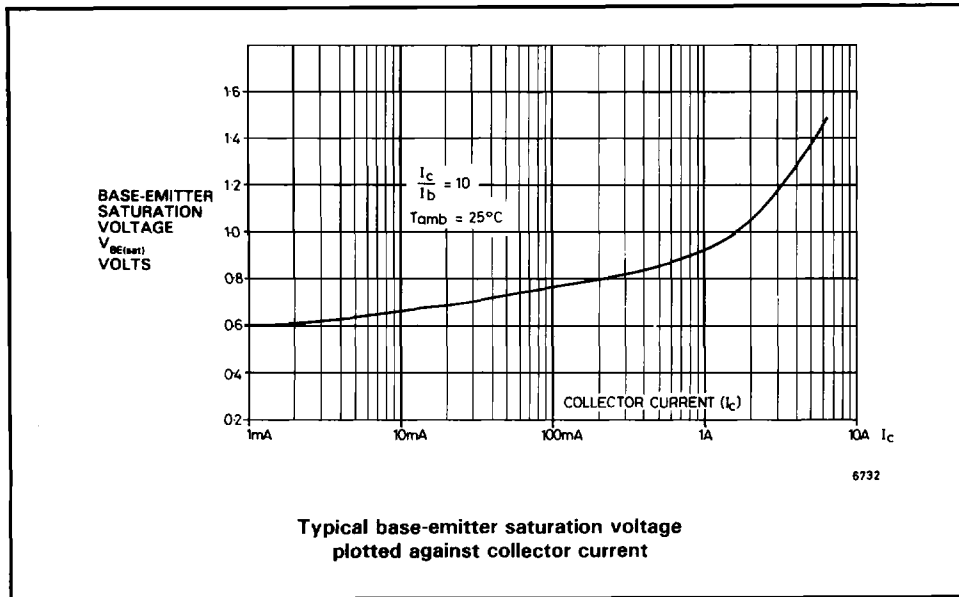
THERMAL CHARACTERISTICS

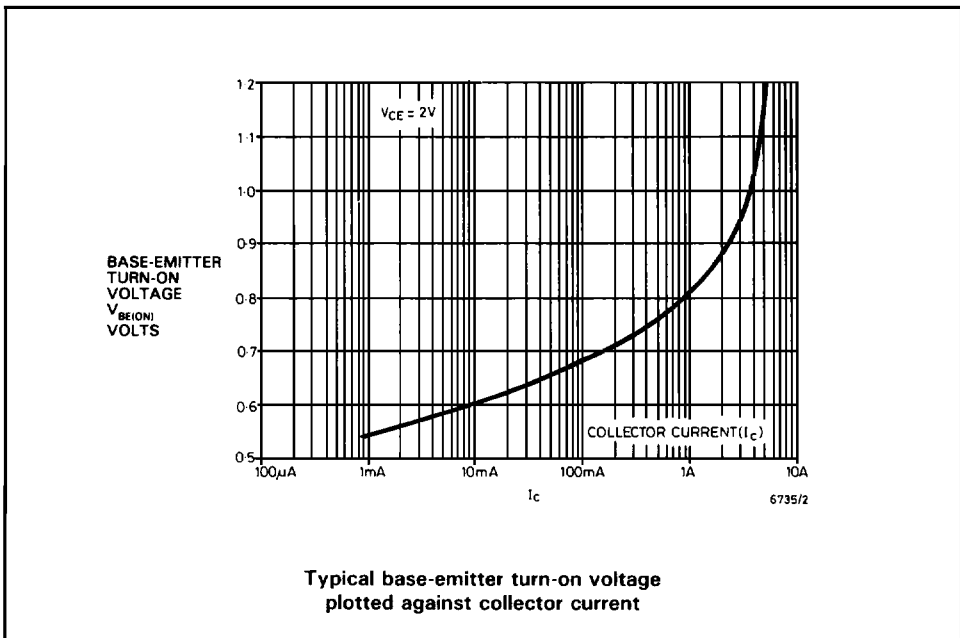
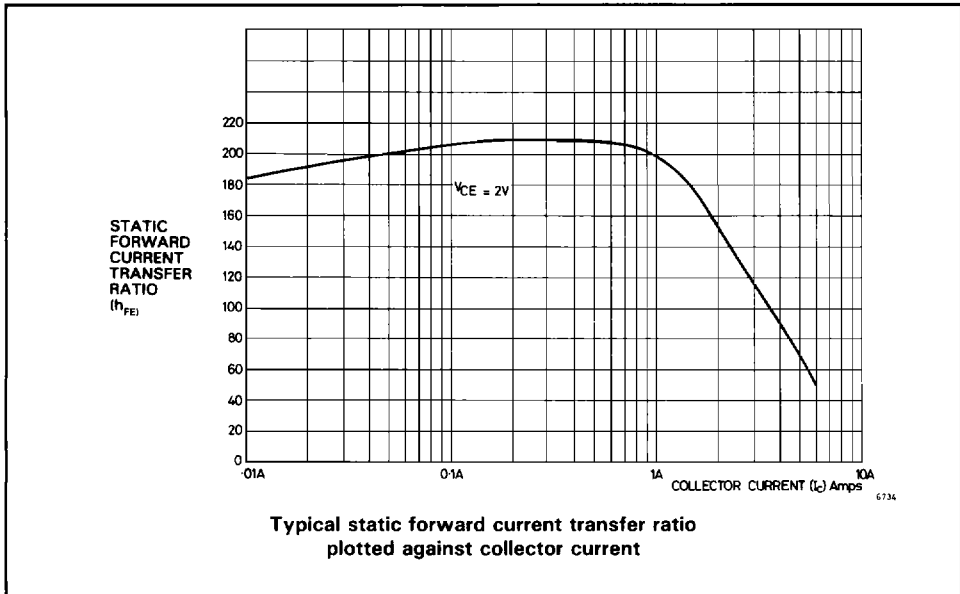
Parameter	Symbol	Maximum	Unit
Thermal Resistance: Junction to ambient ₁	$R_{th(j-amb)_1}$	175	$^{\circ}\text{C/W}$
Junction to ambient ₂	$R_{th(j-amb)_2}^{\dagger}$	116	$^{\circ}\text{C/W}$
Junction to case	$R_{th(j-case)}$	70	$^{\circ}\text{C/W}$

\dagger Device mounted on P.C.B. with copper equal to 1sq.inch minimum.



ZTX649





ZTX649

