



ZTX310 (BSV23)
 ZTX311 (BSV24)
 ZTX312 (BSV25)
 ZTX313 (BSV26)
 ZTX314 (BSV27)

NPN Silicon Planar High Speed Switching Transistors

358-034

DESCRIPTION

These are plastic encapsulated transistors specifically designed for high speed switching applications and are also useful where very short storage times and low capacitance are required.

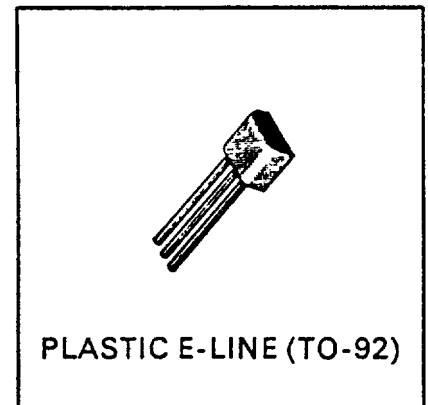
The E-line package is formed by injection moulding a SILICONE plastic specially selected to provide a rugged one-piece encapsulation resistant to severe environments and allow the high junction temperature operation normally associated with metal can devices.

E-line encapsulated devices are approved for use in military, industrial and professional equipments.

Alternative lead configurations are available as plug-in replacements of TO-5/39 and TO-18 metal can types, and for flat mounting.

The ZTX310 series transistors have been approved for use in military equipment and are identified by the following numbers:

BS 9365 F040 to F044 – Category P.



ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | ZTX310 | ZTX311 | ZTX312 | ZTX313 | ZTX314 | Unit |
|--|-----------|-------------|--------|--------|--------|--------|------------|
| Collector-Base Voltage | V_{CBO} | 25 | 20 | 30 | 40 | 40 | Volts |
| Collector-Emitter Voltage | V_{CEO} | 12 | 15 | 12 | 15 | 15 | Volts |
| Emitter-Base Voltage | V_{EBO} | 3 | 5 | 5 | 5 | 5 | Volts |
| Continuous Collector Current | I_C | 500 | 500 | 500 | 500 | 500 | mA |
| Base Current | I_B | 100 | 100 | 100 | 100 | 100 | mA |
| Power Dissipation (at $T_{amb} = 25^\circ C$) | P_{tot} | 300 | 300 | 300 | 300 | 300 | mW |
| Operating and Storage Temp. Range | | -55 to +175 | | | | | $^\circ C$ |

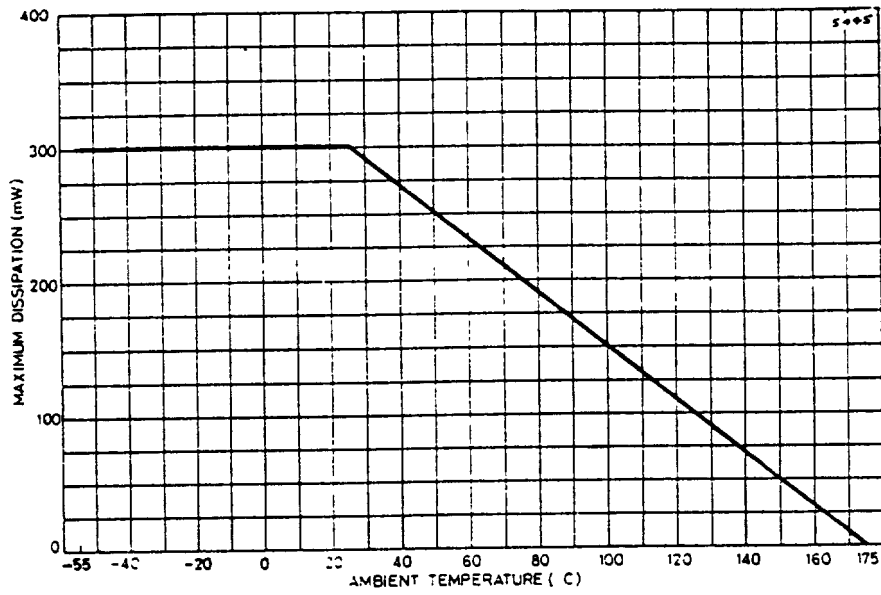
ZTX310 Series

CHARACTERISTICS (at 25°C ambient temperature unless otherwise stated).

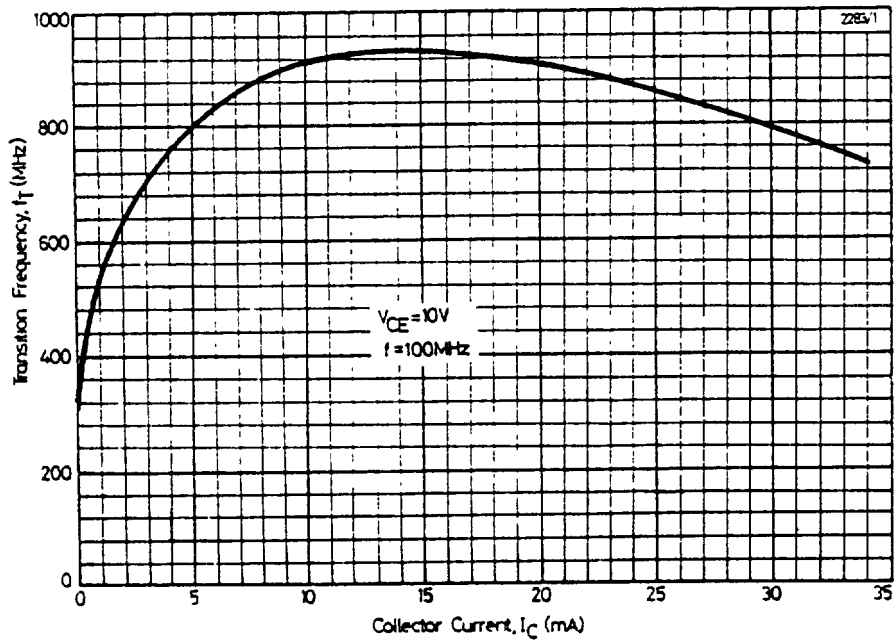
| Parameter | Symbol | ZTX310 (BSV23) | ZTX311 (BSV24) | ZTX312 (BSV25) | ZTX313 (BSV26) | ZTX314 (BSV27) | Unit | Conditions |
|---|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------|--|
| Max. Collector-base cut off current at $T_{amb} = 25^{\circ}\text{C}$ | I_{CBO} | 200 | 200 | 200 | 200 | 200 | nA | $V_{CB} = 15\text{V}$ (ZTX310, 311) $V_{CB} = 20\text{V}$ (ZTX312, 313 and 314) |
| at $T_{amb} = 100^{\circ}\text{C}$ | | 30 | 30 | 30 | 30 | 30 | μA | |
| Min. Collector-base breakdown voltage | $V_{(BR)CBO}$ | 25 | 20 | 30 | 40 | 40 | V | $I_C = 10\ \mu\text{A}$ |
| Min. Collector-emitter sustaining voltage | $V_{CEO(sus)}$ | 12 | 15 | 12 | 15 | 15 | V | $I_C = 10\ \text{mA}^*$ |
| Max. Collector-emitter saturation voltage | $V_{CE(sat)}$ | 0.6 | — | 0.24 | 0.24 | 0.2 | V | $I_C = 10\ \text{mA}$ $I_B = 1\ \text{mA}^*$ $I_C = 100\ \text{mA}$ $I_B = 10\ \text{mA}^*$ |
| | | — | — | — | — | 0.5 | V | |
| Base-emitter saturation voltage | $V_{BE(sat)}$ | 0.75 | 0.7 | 0.7 | 0.7 | 0.7 | V | $I_C = 10\ \text{mA}$ $I_B = 1\ \text{mA}^*$ $I_C = 100\ \text{mA}$ $I_B = 10\ \text{mA}^*$ |
| | | 0.9 | 0.9 | 0.85 | 0.85 | 0.85 | V | |
| | | — | — | — | — | 1.6 | V | |
| Static forward current transfer ratio : | h_{FE} | Min. | 20 | — | 40 | 40 | 40 | $I_C = 10\ \text{mA}$ $V_{CE} = 1\text{V}^*$ $I_C = 10\ \text{mA}$ $V_{CE} = 0.35\text{V}^*$ $I_C = 30\ \text{mA}$ $V_{CE} = 1\text{V}^*$ $I_C = 100\ \text{mA}$ $V_{CE} = 1\text{V}^*$ $I_C = 10\ \text{mA}$ $V_{CE} = 0.35\text{V}^*$ |
| | | Max. | — | — | — | 120 | 120 | |
| | | Min. | — | 50 | — | — | 40 | |
| | | Max. | — | 200 | — | — | 120 | |
| | | Min. | — | — | 35 | — | 30 | |
| | | Min. | — | — | — | 15 | 20 | |
| at $T_{amb} = -55^{\circ}\text{C}$ | Min. | — | — | 20 | — | — | | |
| Min. Transition frequency | f_T | 200 | 200 | 400 | 500 | 500 | MHz | $I_C = 10\ \text{mA}$ $V_{CE} = 10\text{V}$ $f = 100\ \text{MHz}$ |
| Max. Output capacitance | C_{obe} | 6 | 6 | 4 | 4 | 4 | pF | $V_{CB} = 5\text{V}$ $f = 1\ \text{MHz}$ |
| Max. Storage time | t_{stc} | 60 | 25 | 13 | 13 | 13 | ns | $I_C = I_{B1} = I_{B2}$ $= 10\ \text{mA}$ |
| Max. Turn-on time | t_{on} | — | — | 15 | 12 | 12 | ns | $I_C = 10\ \text{mA}$ $I_{B1} = 3\ \text{mA}$ |
| Max. Turn-off time | t_{off} | — | — | 20 | 18 | 18 | ns | $I_C = 10\ \text{mA}$ $I_{B1} = 3\ \text{mA}$ $I_{B2} = 1.5\ \text{mA}$ |

*Measured under pulsed conditions. Pulse width = 300 μs . Duty cycle $\leq 2\%$.

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DERATING CURVE

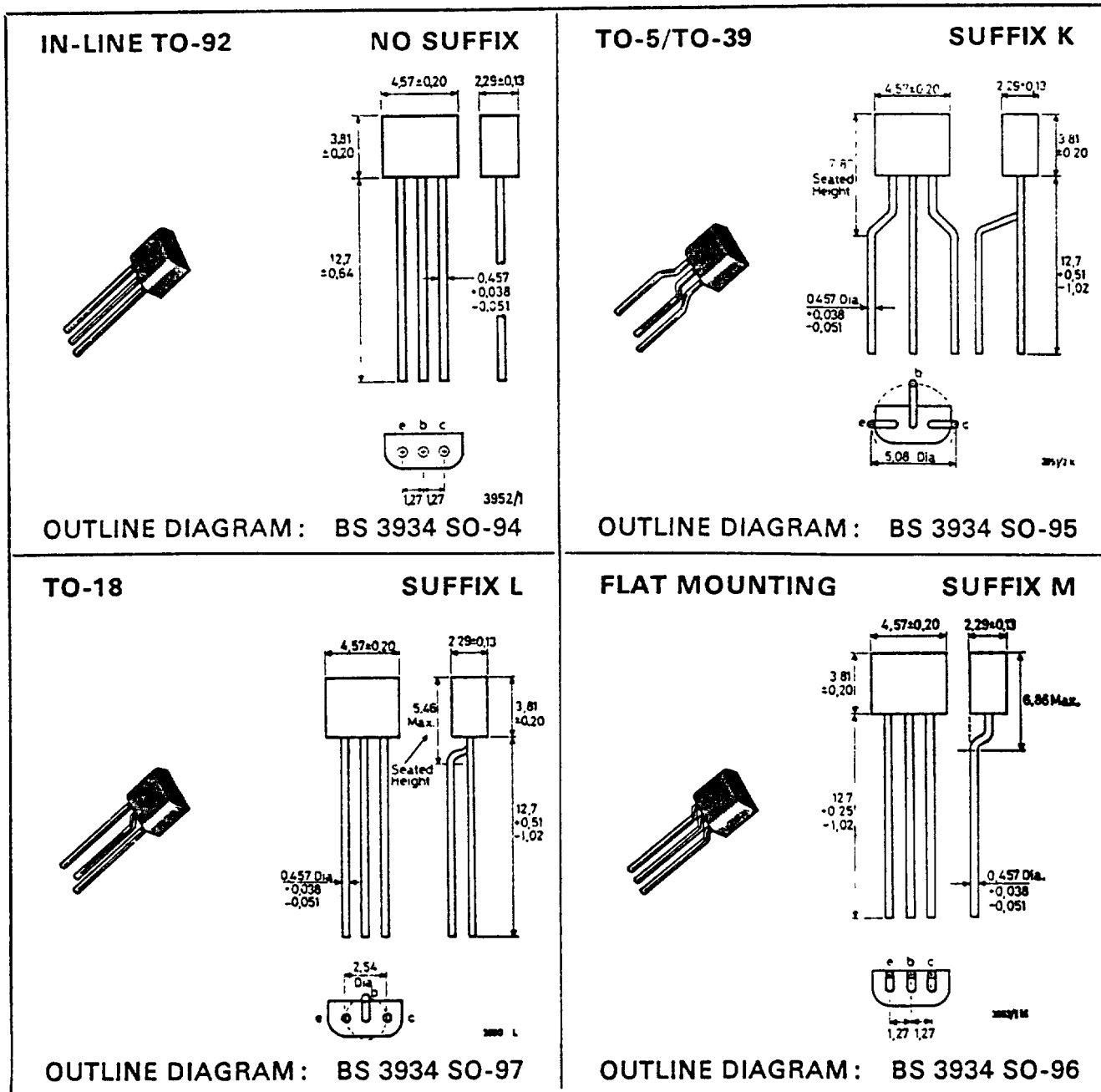


I_C/f_T (ZTX312)

ZTX310 Series

LEAD CONFIGURATIONS

Devices can be ordered with the following lead configurations by adding the indicated suffix to the part number.



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