

# NPN SILICON PLANAR

## MEDIUM POWER TRANSISTORS

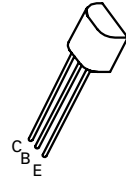
ISSUE 2 – JULY 94

### FEATURES

- \* 150 Volt  $V_{CE0}$
- \* 1 Amp continuous current
- \* Low saturation voltage
- \*  $P_{tot} = 1$  Watt

# ZTX654

# ZTX655



**E-Line**  
**TO92 Compatible**

### ABSOLUTE MAXIMUM RATINGS.

| PARAMETER                                  | SYMBOL         | ZTX654      | ZTX655 | UNIT        |
|--------------------------------------------|----------------|-------------|--------|-------------|
| Collector-Base Voltage                     | $V_{CBO}$      | 125         | 150    | V           |
| Collector-Emitter Voltage                  | $V_{CEO}$      | 125         | 150    | V           |
| Emitter-Base Voltage                       | $V_{EBO}$      | 5           |        | V           |
| Peak Pulse Current                         | $I_{CM}$       | 2           |        | A           |
| Continuous Collector Current               | $I_C$          | 1           |        | A           |
| Power Dissipation at $T_{amb}=25^{\circ}C$ | $P_{tot}$      | 1           |        | W           |
| Operating and Storage Temperature Range    | $T_j; T_{stg}$ | -55 to +200 |        | $^{\circ}C$ |

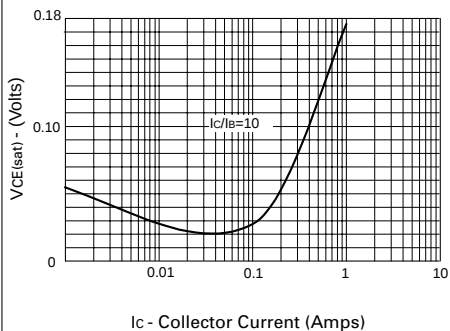
### ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}C$ unless otherwise stated).

| PARAMETER                             | SYMBOL        | ZTX654         |            | ZTX655         |            | UNIT   | CONDITIONS.                                                                |
|---------------------------------------|---------------|----------------|------------|----------------|------------|--------|----------------------------------------------------------------------------|
|                                       |               | MIN.           | MAX.       | MIN.           | MAX.       |        |                                                                            |
| Collector-Base Breakdown Voltage      | $V_{(BR)CBO}$ | 125            |            | 150            |            | V      | $I_C=100\mu A, I_E=0$                                                      |
| Collector-Emitter Breakdown Voltage   | $V_{(BR)CEO}$ | 125            |            | 150            |            | V      | $I_C=10mA, I_B=0^*$                                                        |
| Emitter-Base Breakdown Voltage        | $V_{(BR)EBO}$ | 5              |            | 5              |            | V      | $I_E=100\mu A, I_C=0$                                                      |
| Collector Cut-Off Current             | $I_{CBO}$     |                | 100        |                | 100        | nA     | $V_{CB}=100V, I_E=0$<br>$V_{CB}=125V, I_E=0$                               |
| Emitter Cut-Off Current               | $I_{EBO}$     |                | 100        |                | 100        | nA     | $V_{EB}=3V, I_C=0$                                                         |
| Collector-Emitter Saturation Voltage  | $V_{CE(sat)}$ |                | 0.5<br>0.5 |                | 0.5<br>0.5 | V<br>V | $I_C=500mA, I_B=50mA^*$<br>$I_C=1A, I_B=200mA^*$                           |
| Base-Emitter Saturation Voltage       | $V_{BE(sat)}$ |                | 1.1        |                | 1.1        | V      | $I_C=500mA, I_B=50mA^*$                                                    |
| Base-Emitter Turn-On Voltage          | $V_{BE(on)}$  |                | 1.0        |                | 1.0        | V      | $I_C=500mA, V_{CE}=5V^*$                                                   |
| Static Forward Current Transfer Ratio | $h_{FE}$      | 50<br>50<br>20 |            | 50<br>50<br>20 |            |        | $I_C=10mA, V_{CE}=5V$<br>$I_C=500mA, V_{CE}=5V^*$<br>$I_C=1A, V_{CE}=5V^*$ |
| Transition Frequency                  | $f_T$         | 30             |            | 30             |            | MHz    | $I_C=10mA, V_{CE}=20V$<br>$f=20MHz$                                        |
| Output Capacitance                    | $C_{obo}$     |                | 20         |                | 20         | pF     | $V_{CB}=20V, f=1MHz$                                                       |

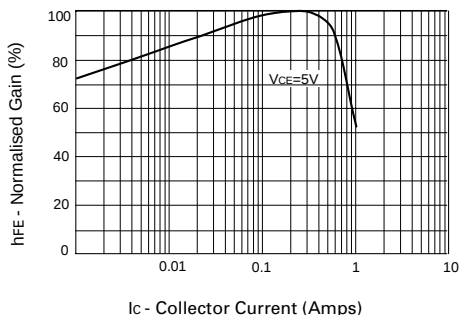
# ZTX654

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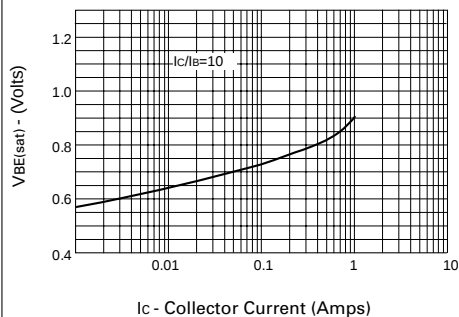
## TYPICAL CHARACTERISTICS



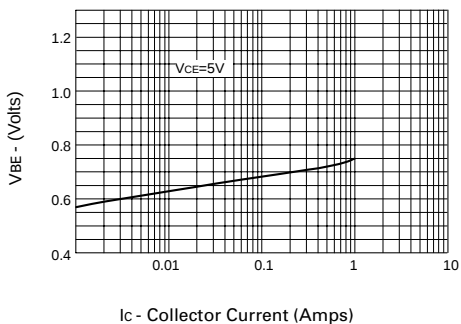
**$V_{CE(sat)}$  v  $I_C$**



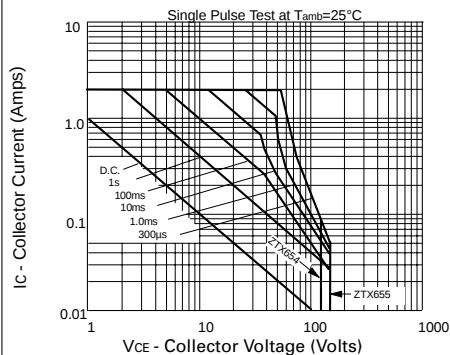
**$hFE$  v  $I_C$**



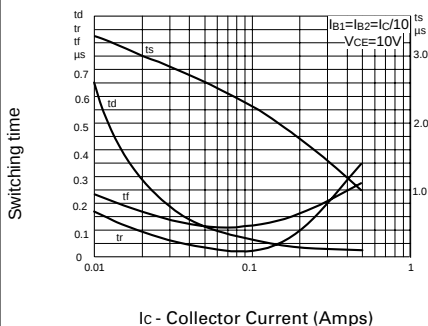
**$V_{BE(sat)}$  v  $I_C$**



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



**Safe Operating Area**



**Switching Speeds**