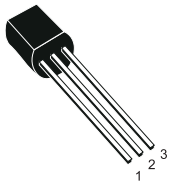
# STX724

## NPN MEDIUM POWER TRANSISTORS

## Features

- TO-92 PACKAGE SUITABLE FOR THROUGH-HOLE PCB ASSEMBLY
- IN COMPLIANCE WITH THE 2002/93/EC EUROPEAN DIRECTIVE




**TO-92**

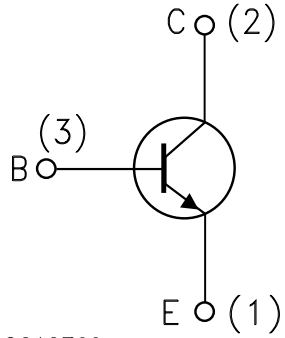
## Applications

- VOLTAGE REGULATION
- RELAY DRIVER
- GENERIC SWITCH

## Description

The STX724 is a NPN transistor manufactured using planar Technology resulting in rugged high performance devices.

## Internal Schematic Diagram




## Order codes

| Part Number | Marking | Package | Packing |
|---|---|---|---|
| STX724 | X724 | TO-92 | BULK |

# 1 Electrical Ratings

**Table 1. Absolute Maximum Rating**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage ($I_E$ = 0) | 60 | V |
| $V_{CEO}$ | Collector-Emitter Voltage ($I_B$ = 0) | 30 | V |
| $V_{EBO}$ | Collector-Base Voltage ($I_C$ = 0) | 5 | V |
| $I_C$ | Collector Current | 3 | A |
| $I_{CM}$ | Collector Peak Current ($t_P$ < 5ms) | 6 | A |
| $I_B$ | Base Current | 1 | A |
| $I_{BM}$ | Base Peak Current ($t_P$ < 5ms) | 2 | A |
| $P_{TOT}$ | Total dissipation at $T_c$ = 25°C | 0.9 | W |
| $T_{STG}$ | Storage Temperature | -65 to 150 | °C |
| $T_J$ | Max. Operating Junction Temperature | 150 | |

**Table 2. Thermal Data**

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $R_{thj\text{-}case}$ | Thermal Resistance Junction-Case | Max | 44.6 | °C/W |
| $R_{thj\text{-}amb}$ | Thermal Resistance Junction-Amb | Max | 139 | °C/W |

# 2 Electrical Characteristics

**Table 3. Electrical Characteristics** ($T_{CASE}$ = 25°C; unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{CES}$ | Collector Cut-off Current ($V_{BE}$ = 0) | $V_{CE}$ = 60V | | | 10 | µA |
| $I_{CEO}$ | Collector Cut-off Current ($I_B$ = 0) | $V_{CE}$ = 30V | | | 100 | µA |
| $I_{EBO}$ | Emitter Cut-off Current ($I_C$ = 0) | $V_{EB}$ = 5V | | | 10 | µA |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage ($I_E$ = 0) | $I_C$ = 100µA | 60 | | | V |
| $V_{(BR)CEO}$ *Note 1* | Collector-Emitter Breakdown Voltage ($I_B$ = 0) | $I_C$ = 10 mA | 30 | | | V |
| $V_{(BR)EBO}$ | Collector-Emitter Breakdown Voltage ($I_C$ = 0) | $I_E$ = 100 µA | 5 | | | V |
| $V_{CE(sat)}$ *Note 1* | Collector-Emitter Saturation Voltage | $I_C$ = 1 A $I_B$ = 50 mA<br>$I_C$ = 2 A $I_B$ = 100 mA<br>$I_C$ = 3 A $I_B$ = 150 mA | | | 0.4<br>0.7<br>1.1 | V<br>V<br>V |
| $V_{BE(sat)}$ *Note 1* | Base-Emitter Saturation Voltage | $I_C$ = 2 A $I_B$ = 100 mA | | | 1.2 | V |
| $h_{FE}$ | DC Current Gain | $I_C$ = 100 mA $V_{CE}$ = 2 V<br>$I_C$ = 1 A $V_{CE}$ = 2 V<br>$I_C$ = 3 A $V_{CE}$ = 2 V | 100<br>80<br>30 | | 300 | |
| $f_T$ | Transistor Frequency | $V_{CE}$ = 10 V $I_c$= 0.1 A | | 100 | | MHz |

*1 Pulsed duration = 300 µs, duty cycle ≤1.5%.*

## 2.1 Electrical characteristics (curve)

**Figure 1. DC Current Gain**

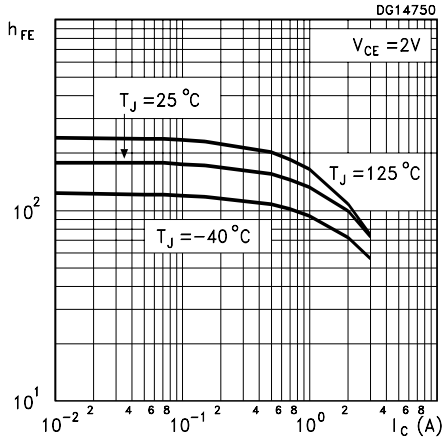



**Figure 2. DC Current Gain**

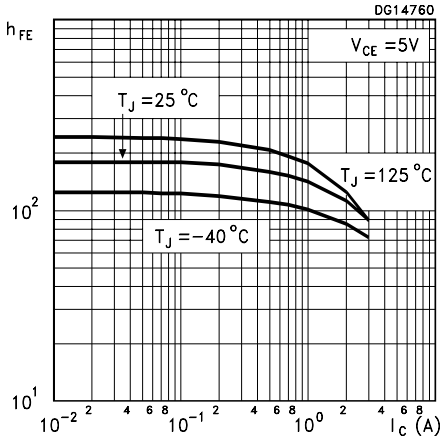



**Figure 3. Collector-emitter saturation voltage**

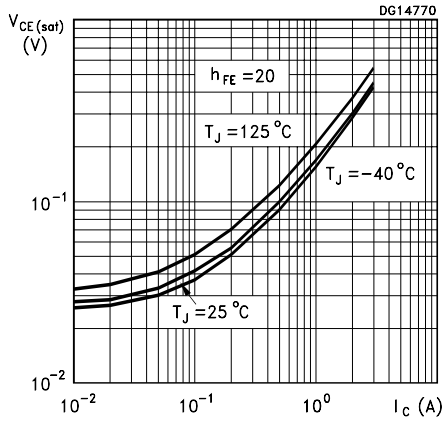



**Figure 4. Base-emitter saturation voltage**

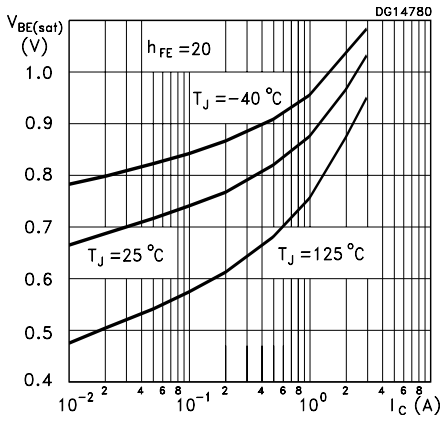



**Figure 5. Switching times on resistive load**

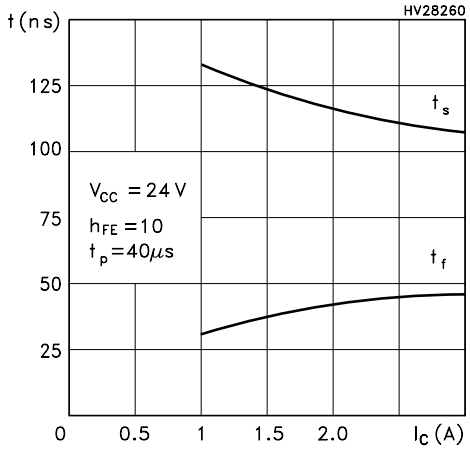



**Figure 6. Switching times resistive on load**

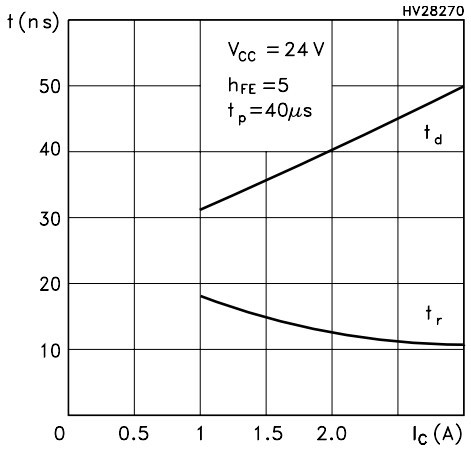
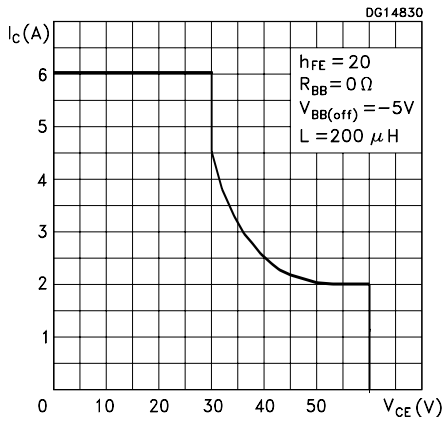


**Figure 7. Reverse biased area**

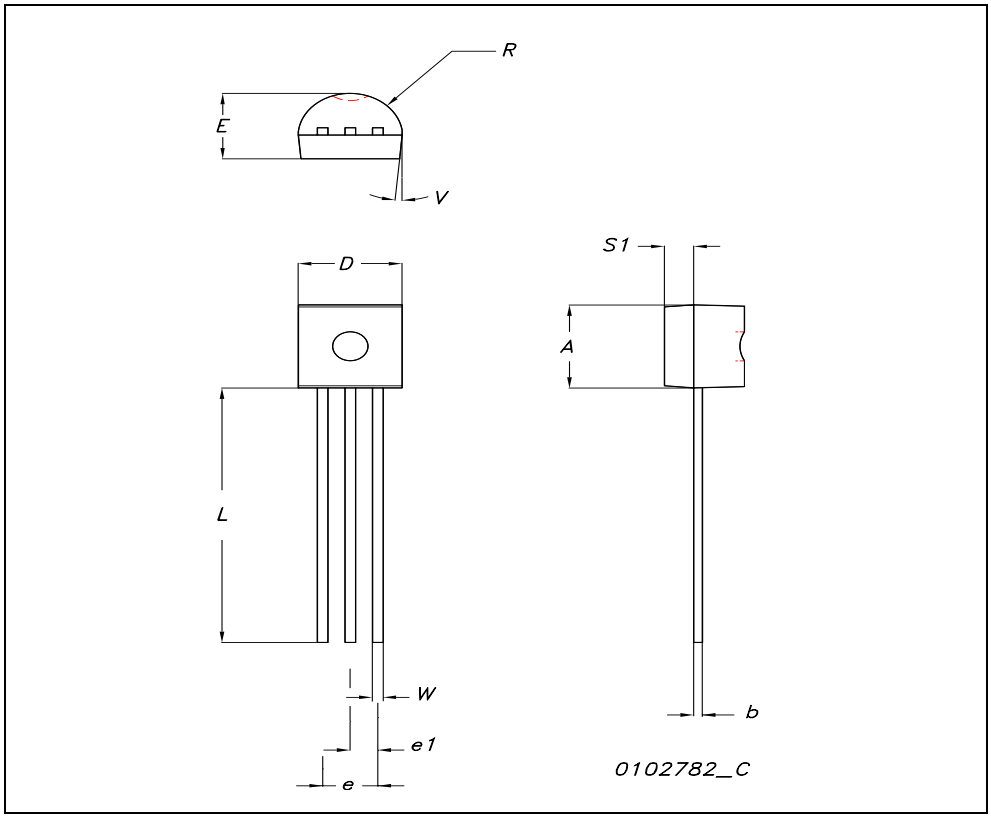


# 3 Package Mechanical Data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

## TO-92 MECHANICAL DATA

| DIM. | mm. | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP | MAX. | MIN. | TYP. | MAX. |
| A | 4.32 | | 4.95 | 0.170 | | 0.194 |
| b | 0.36 | | 0.51 | 0.014 | | 0.020 |
| D | 4.45 | | 4.95 | 0.175 | | 0.194 |
| E | 3.30 | | 3.94 | 0.130 | | 0.155 |
| e | 2.41 | | 2.67 | 0.094 | | 0.105 |
| e1 | 1.14 | | 1.40 | 0.044 | | 0.055 |
| L | 12.70 | | 15.49 | 0.50 | | 0.610 |
| R | 2.16 | | 2.41 | 0.085 | | 0.094 |
| S1 | 0.92 | | 1.52 | 0.036 | | 0.060 |
| W | 0.41 | | 0.56 | 0.016 | | 0.022 |
| V | | 5° | | | 5° | |



# 4 Revision History

| Date | Revision | Changes |
|---|---|---|
| 17-Oct-2005 | 1 | First release |