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## NPN MEDIUM POWER TRANSISTORS

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### Features

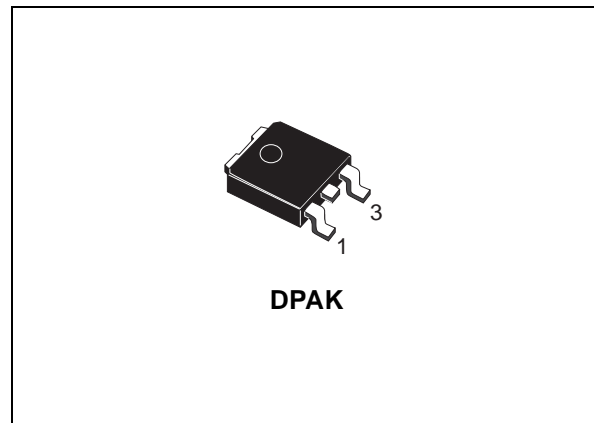
- SURFACE MOUNTING DEVICE IN MEDIUM POWER DPAK POWER PACKAGE
- AVAILABLE IN TAPE & REEL PACKING
- IN COMPLIANCE WITH THE 2002/93/EC EUROPEAN DIRECTIVE

### Applications

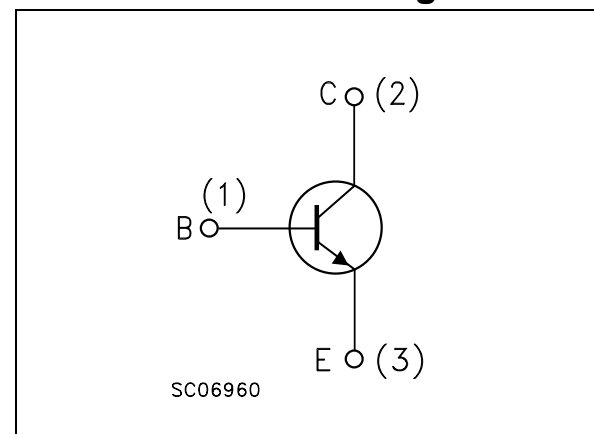
- VOLTAGE REGULATION
- RELAY DRIVER
- GENERIC SWITCH

### Description

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



### Internal Schematic Diagram



### Order codes

Part Number	Marking	Package	Packing
STD724T4	D724	DPAK	Tape & reel

# 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 $T_c = 25^\circ C$	15	W
$T_{STG}$	Storage Temperature	-65 to 150 150	°C
$T_J$	Max. Operating Junction Temperature		

**Table 2. Thermal Data**

Symbol	Parameter	Value	Unit
$R_{thj-amb}$	Thermal Resistance Junction-Amb Max	8.33	°C/W

## 2 Electrical Characteristics

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

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

1 Pulsed duration = 300  $\mu s$ , duty cycle  $\leq 1.5\%$ .

## 2.1 Electrical characteristics (curve)

Figure 1. DC Current Gain

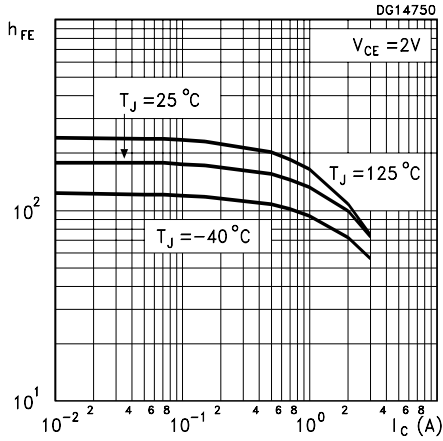


Figure 2. DC Current Gain

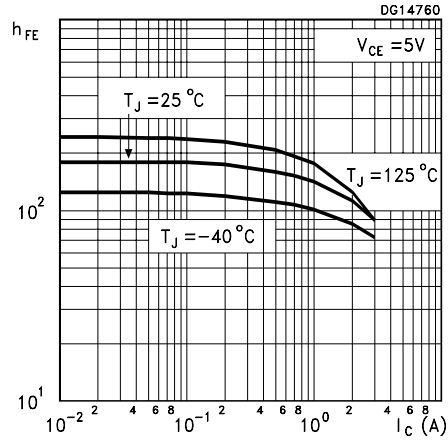


Figure 3. Collector-emitter saturation voltage Figure 4. Base-emitter saturation voltage

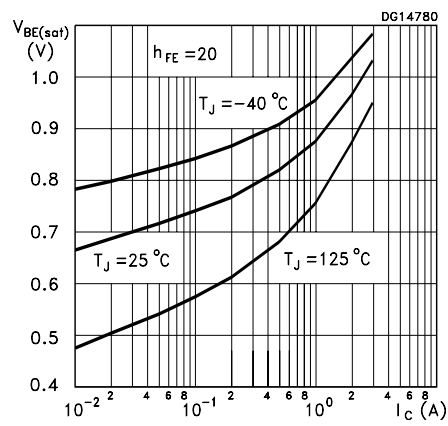
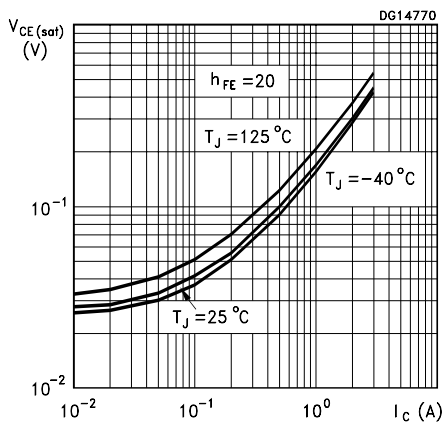


Figure 5. Switching times on resistive load

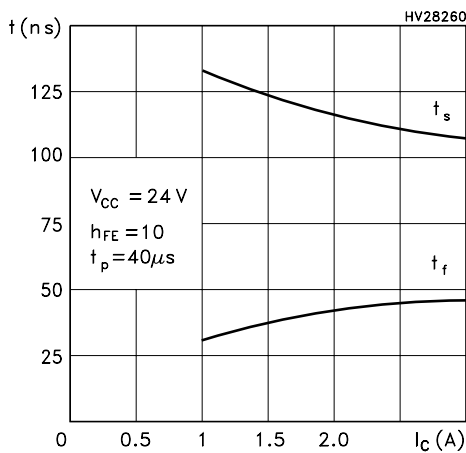


Figure 6. Switching times resistive on load

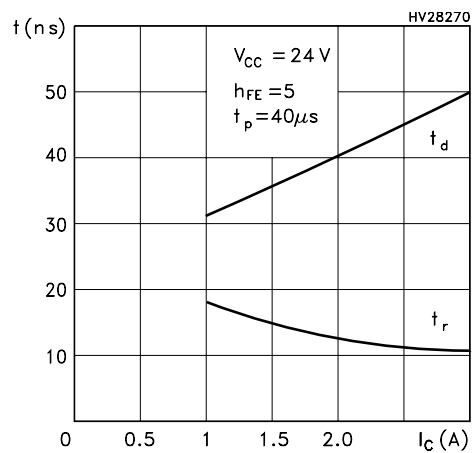
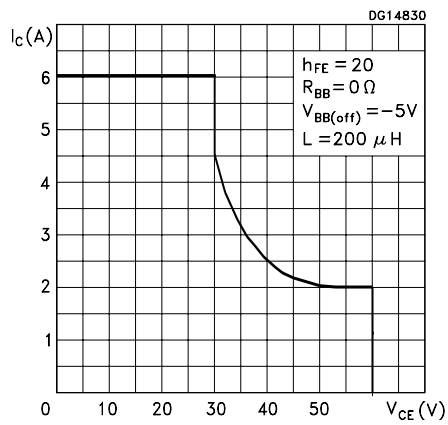


Figure 7. Reverse biased area

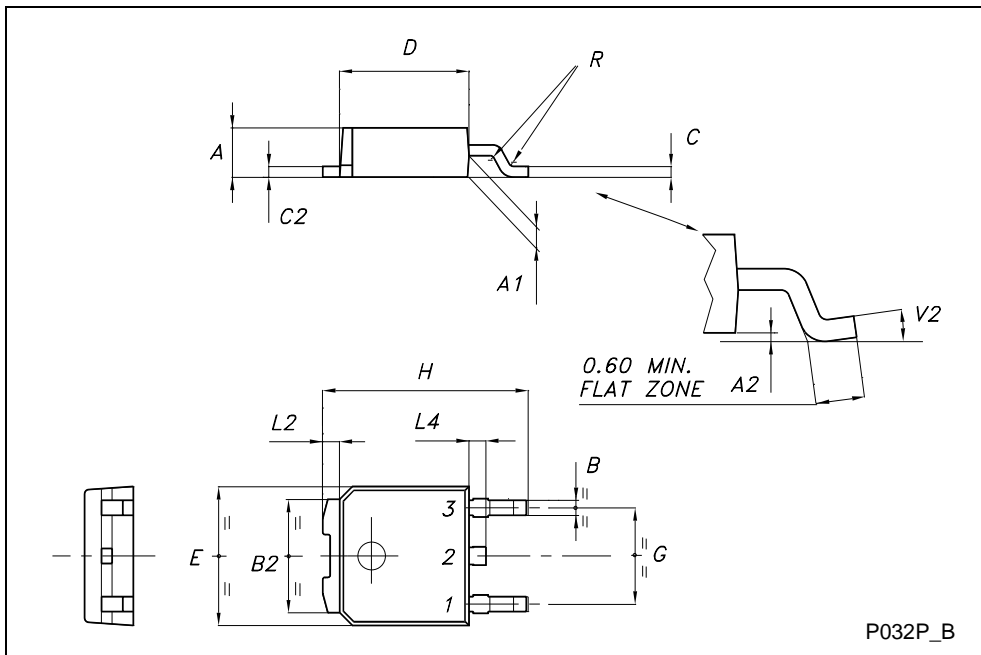


### 3 Package Mechanical Data

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](http://www.st.com)

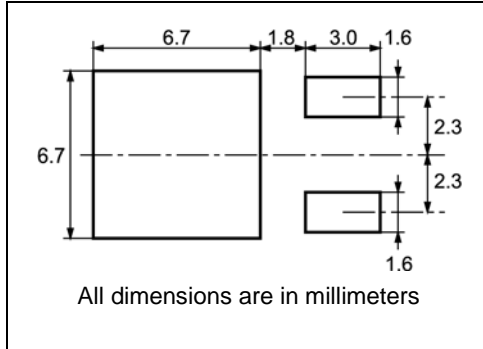
**TO-252 (DPAK) MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.20		2.40	0.087		0.094
A1	0.90		1.10	0.035		0.043
A2	0.03		0.23	0.001		0.009
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.213
C	0.45		0.60	0.018		0.024
C2	0.48		0.60	0.019		0.024
D	6.00		6.20	0.236		0.244
E	6.40		6.60	0.252		0.260
G	4.40		4.60	0.173		0.181
H	9.35		10.10	0.368		0.398
L2		0.8			0.031	
L4	0.60		1.00	0.024		0.039
V2	0°		8°	0°		0°



# 4 Packing Mechanical Data

## DPAK FOOTPRINT



## TAPE AND REEL SHIPMENT

40 mm min. Access hole at slot location

Full radius

Tape slot in core for tape start 2.5mm min. width

G measured at hub

### REEL MECHANICAL DATA

DIM.	mm		inch	
	MIN.	MAX.	MIN.	MAX.
A		330		12.992
B	1.5		0.059	
C	12.8	13.2	0.504	0.520
D	20.2		0.795	
G	16.4	18.4	0.645	0.724
N	50		1.968	
T		22.4		0.881

BASE QTY	BULK QTY
2500	2500

### TAPE MECHANICAL DATA

DIM.	mm		inch	
	MIN.	MAX.	MIN.	MAX.
A0	6.8	7	0.267	0.275
B0	10.4	10.6	0.409	0.417
B1		12.1		0.476
D	1.5	1.6	0.059	0.063
D1	1.5		0.059	
E	1.65	1.85	0.065	0.073
F	7.4	7.6	0.291	0.299
K0	2.55	2.75	0.100	0.108
P0	3.9	4.1	0.153	0.161
P1	7.9	8.1	0.311	0.319
P2	1.9	2.1	0.075	0.082
R	40		1.574	
W	15.7	16.3	0.618	0.641

For machine ref. only including draft and radii concentric around B0

10 pitches cumulative tolerance on tape +/- 0.2 mm

User Direction of Feed

FEED DIRECTION

Bending radius R min.



## 5 Revision History

Date	Revision	Changes
17-Oct-2005	2	Inserted curves

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