

NPN MEDIUM POWER TRANSISTORS

Features

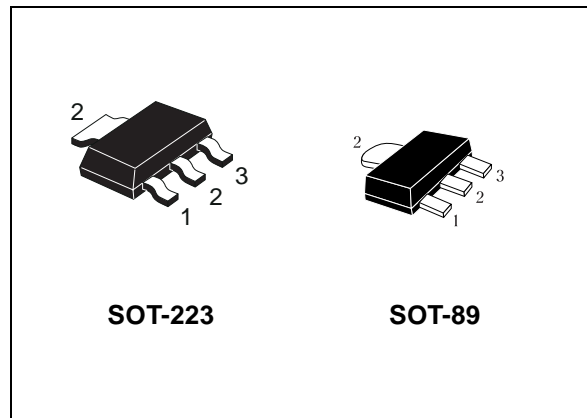
- SURFACE MOUNTING DEVICES IN MEDIUM POWER SOT-223 AND SOT-89 PACKAGE
- AVAILABLE IN TAPE & REEL PACKING
- IN COMPLIANCE WITH THE 2002/93/EC EUROPEAN DIRECTIVE

Applications

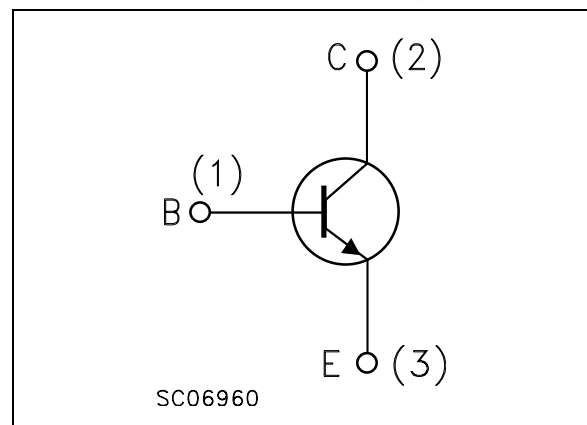
- VOLTAGE REGULATION
- RELAY DRIVER
- GENERIC SWITCH

Description

The STF724 and STN724 are PNP transistors manufactured using planar Technology resulting in rugged high performance devices.



Internal Schematic Diagram



Order codes

Part Number	Marking	Package	Packing
STF724	724	SOT-89	Tape & reel
STN724	N724	SOT-223	Tape & reel

1 Absolute Maximum Ratings

Table 1. Absolute Maximum Rating

Symbol	Parameter	Value		Unit
		STF724	STN724	
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 ($t_p < 5\text{ms}$)	6		A
I_B	Base Current	1		A
I_{BM}	Base Peak Current ($t_p < 5\text{ms}$)	2		A
P_{TOT}	Total dissipation at $T_C = 25^\circ\text{C}$	1.4	1.6	W
T_{STG}	Storage Temperature	-65 to 150		°C
T_J	Max. Operating Junction Temperature	150		

Table 2. Thermal Data

Symbol	Parameter		Value		Unit
			SOT-89	SOT-223	
$R_{thj-amb}$ <i>Note: 1</i>	Thermal Resistance Junction-Amb	Max	89	78	°C/W

Note: 1 Device mounted on a PCB area of 1 cm².

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	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 ($I_E = 0$)	$I_C = 100\mu A$	60			V
$V_{(BR)CEO}$ <i>Note 2</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 2</i>	Collector-Emitter Saturation Voltage	$I_C = 1\text{ A}$ $I_C = 2\text{ A}$ $I_C = 3\text{ A}$	$I_B = 50\text{ mA}$ $I_B = 100\text{ mA}$ $I_B = 150\text{ mA}$		0.4 0.7 1.1	V V V
$V_{BE(sat)}$ <i>Note 2</i>	Base-Emitter Saturation Voltage	$I_C = 2\text{ A}$	$I_B = 100\text{ mA}$		1.2	V
h_{FE}	DC Current Gain	$I_C = 100\text{ mA}$ $I_C = 1\text{ A}$ $I_C = 3\text{ A}$	$V_{CE} = 2\text{ V}$ $V_{CE} = 2\text{ V}$ $V_{CE} = 2\text{ V}$	100 80 30	300	
f_T	Transistor Frequency	$V_{CE} = 10\text{ V}$	$I_C = 0.1\text{ A}$		100	MHz

2 Pulsed duration = 300 μs , duty cycle $\leq 1.5\%$.

2.1 Electrical characteristics (curve)

Figure 1. DC Current Gain

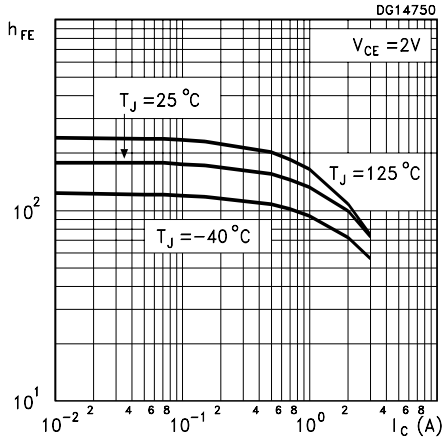


Figure 2. DC Current Gain

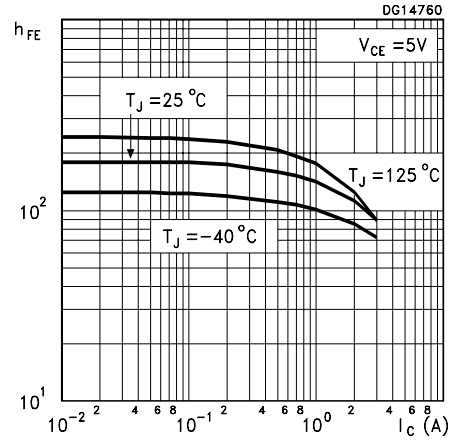


Figure 3. Collector-emitter saturation voltage Figure 4. Base-emitter saturation voltage

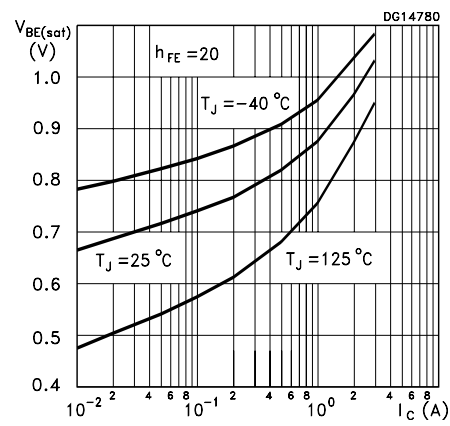
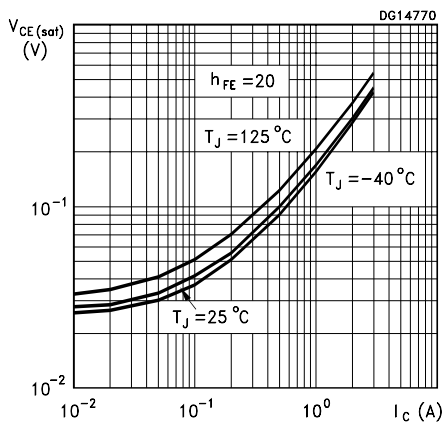


Figure 5. Switching times on resistive load

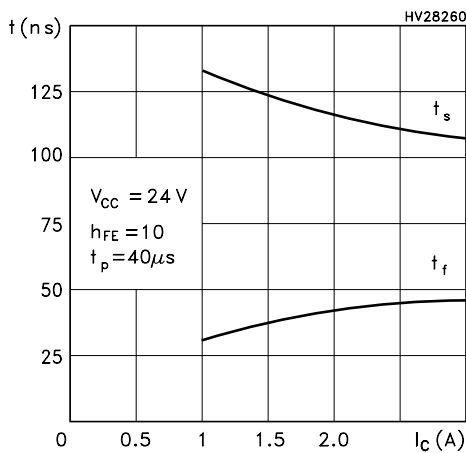


Figure 6. Switching times resistive on load

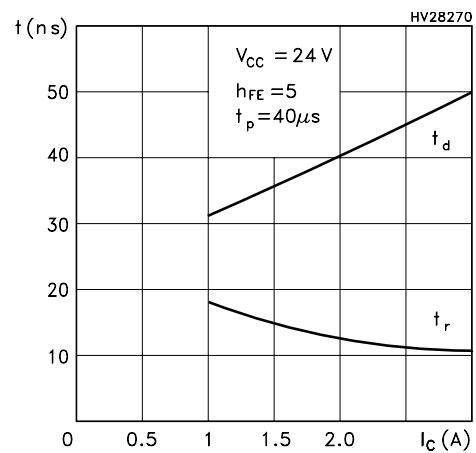
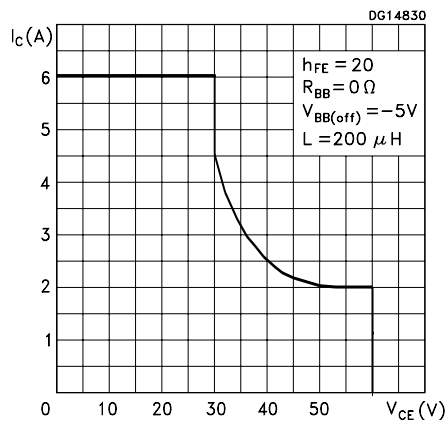


Figure 7. Reverse biased area

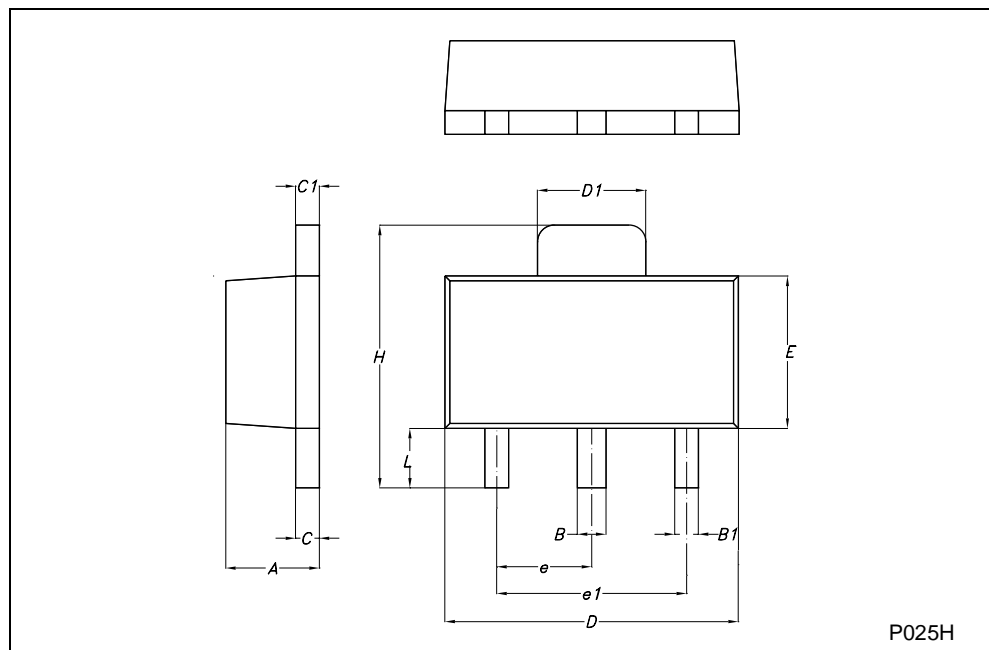


3 Package Mechanical Data

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

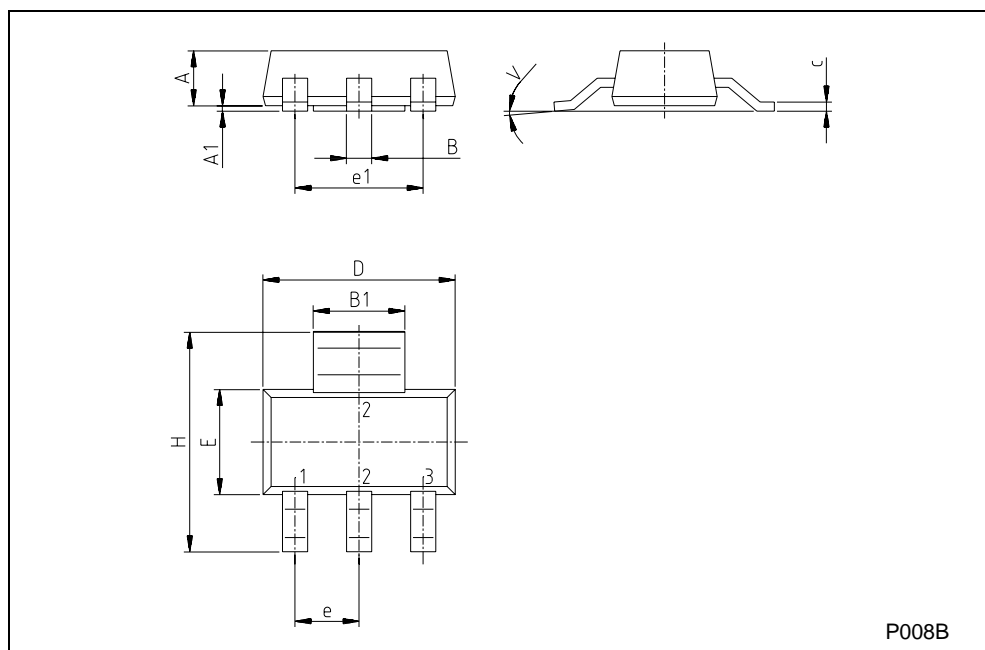
SOT-89 MECHANICAL DATA

DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	1.4		1.6	55.1		63.0
B	0.44		0.56	17.3		22.0
B1	0.36		0.48	14.2		18.9
C	0.35		0.44	13.8		17.3
C1	0.35		0.44	13.8		17.3
D	4.4		4.6	173.2		181.1
D1	1.62		1.83	63.8		72.0
E	2.29		2.6	90.2		102.4
e	1.42		1.57	55.9		61.8
e1	2.92		3.07	115.0		120.9
H	3.94		4.25	155.1		167.3
L	0.89		1.2	35.0		47.2



SOT-223 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.80			0.071
B	0.60	0.70	0.80	0.024	0.027	0.031
B1	2.90	3.00	3.10	0.114	0.118	0.122
c	0.24	0.26	0.32	0.009	0.010	0.013
D	6.30	6.50	6.70	0.248	0.256	0.264
e		2.30			0.090	
e1		4.60			0.181	
E	3.30	3.50	3.70	0.130	0.138	0.146
H	6.70	7.00	7.30	0.264	0.276	0.287
V			10°			10°
A1		0.02				



4 Revision History

Date	Revision	Changes
12-Oct-2005	1	Initial release.

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