STF724
STN724

NPN medium power transistors

Features

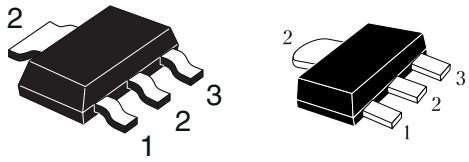
- Surface mounting devices in medium power SOT-223 and SOT-89 packages
- Available in tape and reel packaging

Applications

- Voltage regulation
- Relay driver
- Generic switch

Description

The STF724 and STN724 are NPN transistors manufactured using Planar technology resulting in rugged high performance devices.



SOT-223 SOT-89

Figure 1. Internal schematic diagram

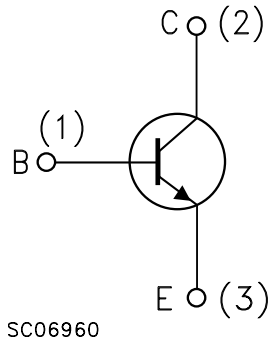


Table 1. Device summary

Order code	Marking	Package	Packaging
STF724	724	SOT-89	Tape & reel
STN724	N724	SOT-223	

Contents

1 Electrical ratings

Table 2. 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}	Emitter-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_{amb} = 25°C	1.4	1.6	W
T_{stg}	Storage temperature	-65 to 150		°C
T_J	Max. operating junction temperature	150		°C

Table 3. Thermal data

Symbol	Parameter	Value		Unit
		SOT-89	SOT-223	
$R_{thj\text{-}amb}$	Thermal resistance junction-ambient (1) max	89	78	°C/W

1. Device mounted on PCB area of 1 cm^2.

2 Electrical characteristics

(T_{case} = 25°C unless otherwise specified)

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cut-off current (V_{BE} = 0)	V_{CE} = 60 V			10	µA
I_{CEO}	Collector cut-off current (I_B = 0)	V_{CE} = 30 V			100	µA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = 5 V			10	µA
$V_{(BR)CBO}$	Collector-base breakdown voltage (I_E = 0)	I_C = 100 µA	60			V
$V_{(BR)CEO}$(1)	Collector-emitter breakdown voltage (I_B = 0)	I_C = 10 mA	30			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage (I_C = 0)	I_E = 100 µA	5			V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = 1 A I_B = 50 mA I_C = 2 A I_B = 100 mA I_C = 3 A I_B = 15 0mA			0.4 0.7 1.1	V V V
$V_{BE(sat)}$ (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 I_C = 1 A V_{CE} = 2 V I_C = 3 A V_{CE} = 2 V	100 80 30		300	
f_T	Transition 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 (curves)

Figure 2. DC Current Gain

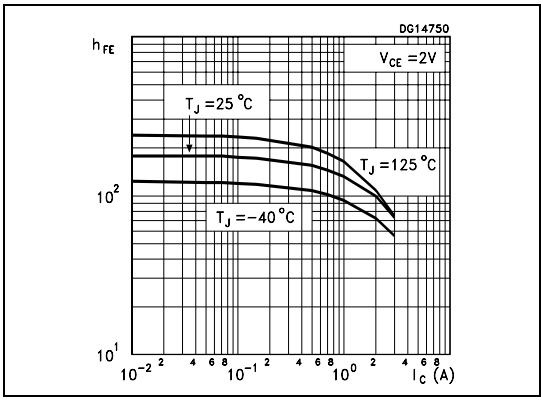


Figure 3. DC Current Gain

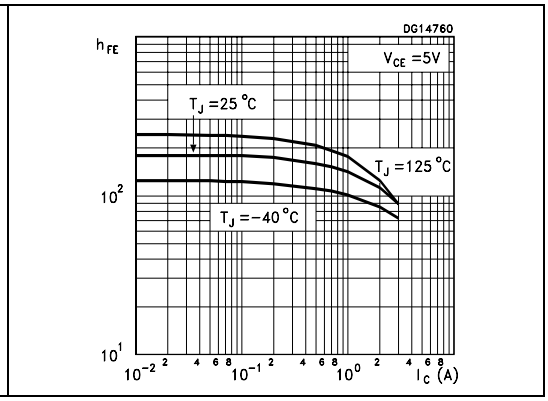


Figure 4. Collector-emitter saturation voltage

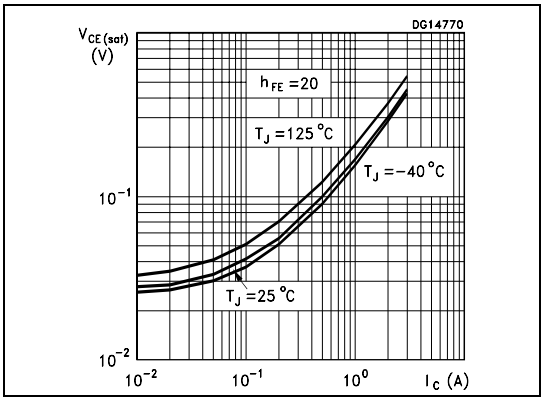


Figure 5. Base-emitter saturation voltage

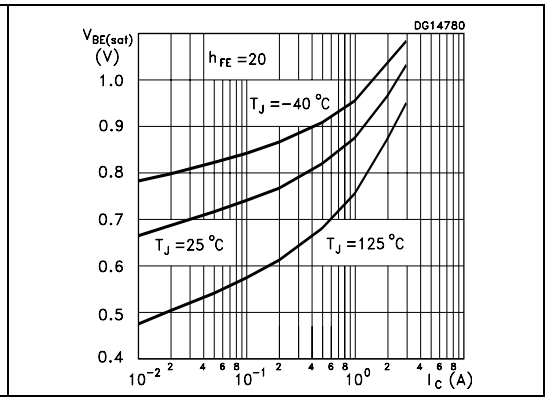


Figure 6. Switching times on resistive load

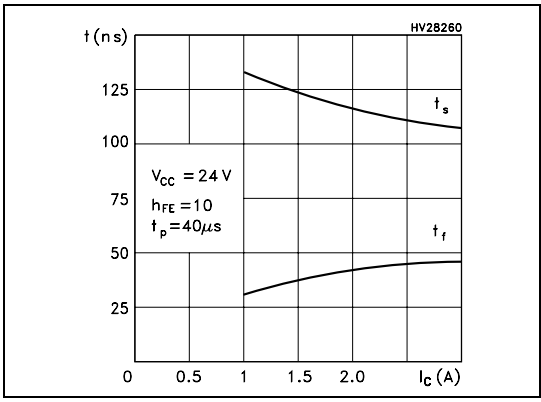


Figure 7. Switching times on resistive load

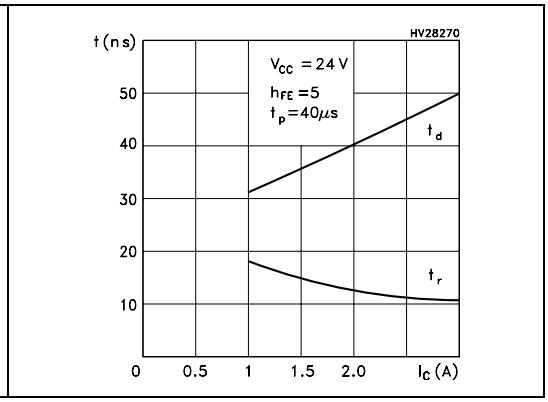
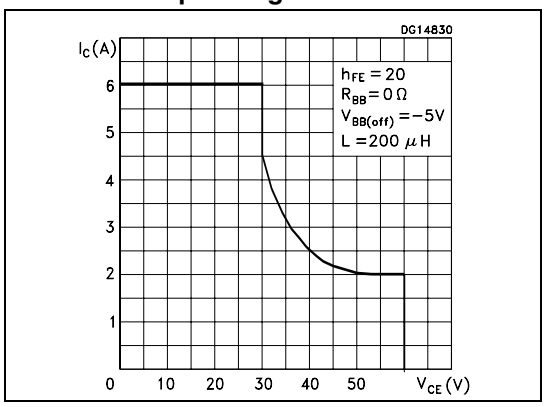


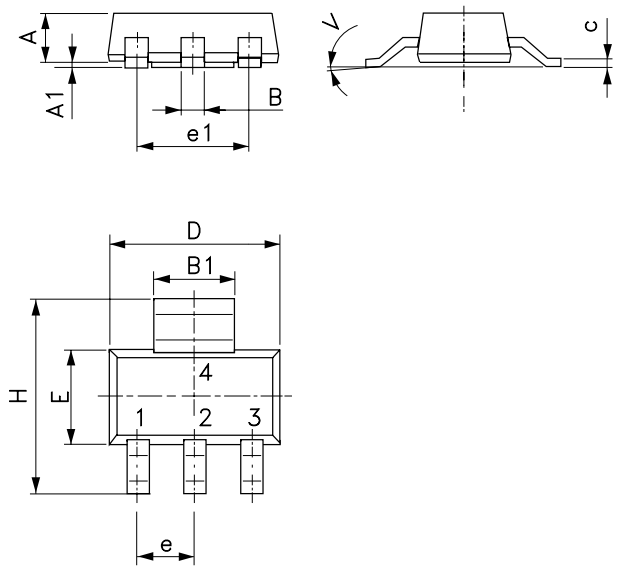
Figure 8. Reverse biased safe operating area



3 Package mechanical data

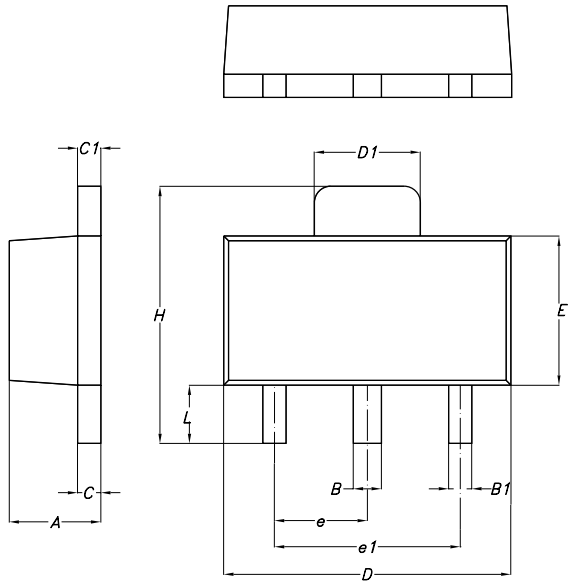
In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings 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-223 mechanical data			
DIM.	mm.		
	min.	typ	max.
A			1.80
A1	0.02		0.1
B	0.60	0.70	0.85
B1	2.90	3.00	3.15
c	0.24	0.26	0.35
D	6.30	6.50	6.70
e		2.30	
e1		4.60	
E	3.30	3.50	3.70
H	6.70	7.00	7.30
V			10 ^{o}



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



P025H

4 Revision history

Table 5. Document revision history

Date	Revision	Changes
29-Mar-2005	1	Initial release.
12-Oct-2005	2	Added new graphics
17-Jul-2006	3	New template
04-Apr-2008	4	SOT-223 mechanical data updated.

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