

NPN low voltage transistors

Features

- Low voltage small devices for surface mounting
- High ruggedness

Applications

- Voltage regulation
- Relay driver
- Generic switch

Description

Both STF715 and STN715 are NPN transistors manufactured using planar technology. They are housed in surface mounting power packages.

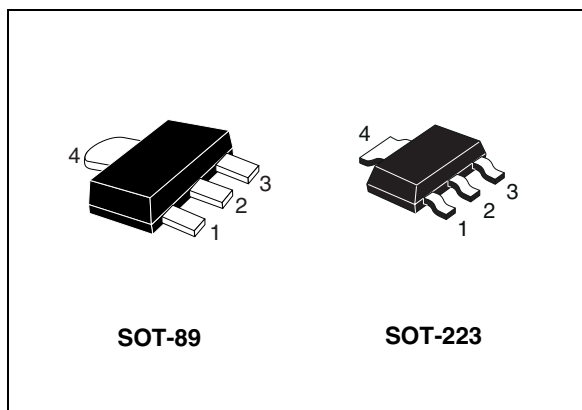


Figure 1. Internal schematic diagram

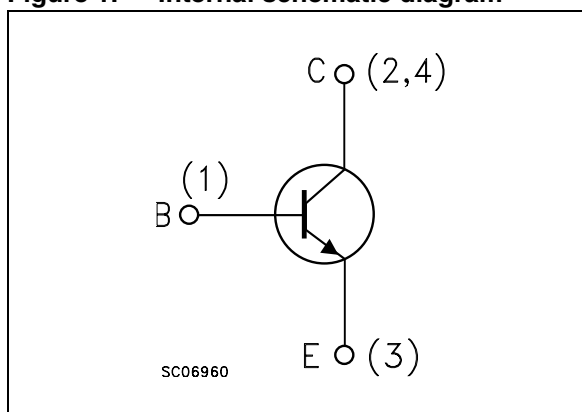


Table 1. Device summary

Order codes	Marking	Packages	Packaging
STF715	715	SOT-89	Tape and reel
STN715	N715	SOT-223	Tape and reel

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage ($I_E = 0$)	140	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	80	V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	5	V
I_C	Collector current	1.5	A
I_{CM}	Collector peak current ($t_P < 5$ ms)	2	A
I_B	Base current	0.3	A
I_{BM}	Base peak current ($t_P < 5$ ms)	0.6	A
P_{TOT}	Total dissipation at $T_{amb} = 25$ °C for STF715	1.4	W
	Total dissipation at $T_{amb} = 25$ °C for STN715	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	SOT-89	SOT-223	Unit
$R_{thJA}^{(1)}$	Thermal resistance junction-ambient max	89	78	°C/W

1. Device mounted on PCB area of 1 cm²

2 Electrical characteristics

$T_{\text{case}} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified.

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cut-off current ($V_{\text{BE}} = 0$)	$V_{\text{CE}} = 140\text{ V}$			500	μA
I_{CEO}	Collector cut-off current ($I_{\text{B}} = 0$)	$V_{\text{CE}} = 80\text{ V}$			1	mA
I_{EBO}	Emitter cut-off current ($I_{\text{C}} = 0$)	$V_{\text{EB}} = 5\text{ V}$			100	μA
$V_{\text{CEO(sus)}}$	Collector-emitter sustaining voltage ($I_{\text{B}} = 0$)	$I_{\text{C}} = 10\text{ mA}$	80			V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 100\text{ mA}$ $I_{\text{B}} = 10\text{ mA}$ $I_{\text{C}} = 1\text{ A}$ $I_{\text{B}} = 100\text{ mA}$			0.25 0.5	V V
$V_{\text{BE(sat)}}^{(1)}$	Base-emitter saturation voltage	$I_{\text{C}} = 100\text{ mA}$ $I_{\text{B}} = 10\text{ mA}$ $I_{\text{C}} = 1\text{ A}$ $I_{\text{B}} = 100\text{ mA}$			1 1.1	V V
$h_{\text{FE}}^{(1)}$	DC current gain	$I_{\text{C}} = 100\text{ }\mu\text{A}$ $V_{\text{CE}} = 2\text{ V}$ $I_{\text{C}} = 500\text{ mA}$ $V_{\text{CE}} = 2\text{ V}$ $I_{\text{C}} = 1\text{ A}$ $V_{\text{CE}} = 2\text{ V}$	140 80 40			
f_{T}	Transition frequency	$I_{\text{C}} = 100\text{ mA}$ $V_{\text{CE}} = 10\text{ V}$		50		MHz

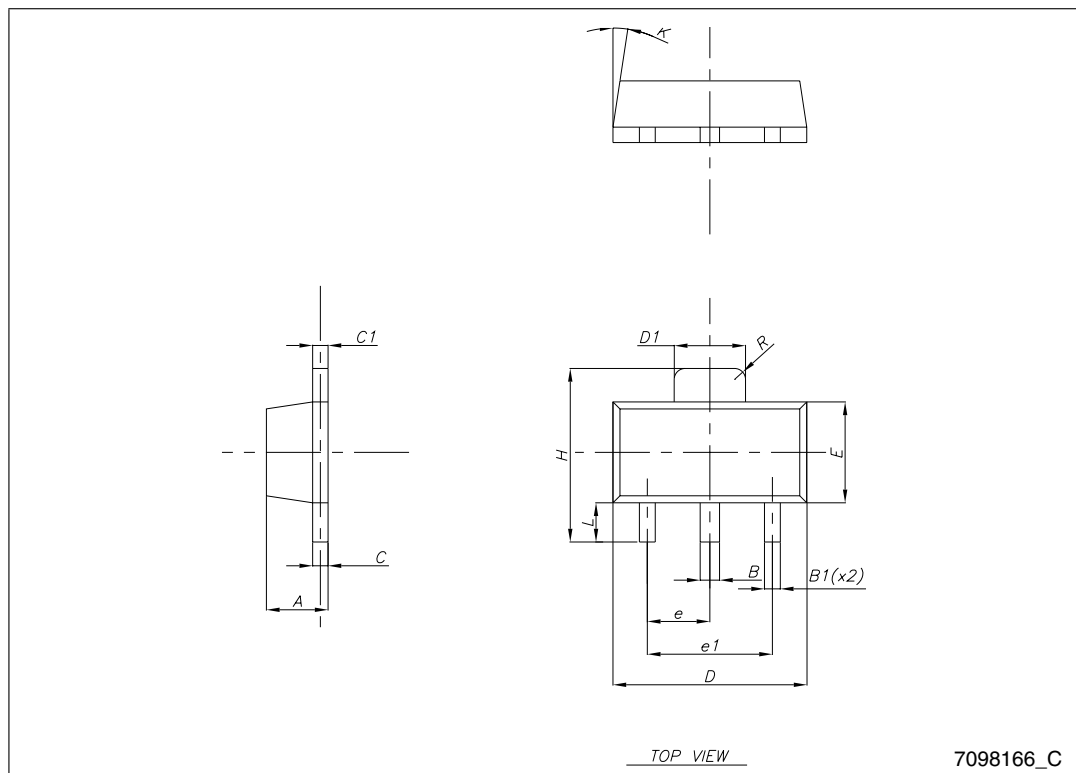
1. Pulse test: pulse duration $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK[®] packages, depending on their level of environmental compliance. ECOPACK[®] specifications, grade definitions and product status are available at: www.st.com. ECOPACK[®] is an ST trademark.

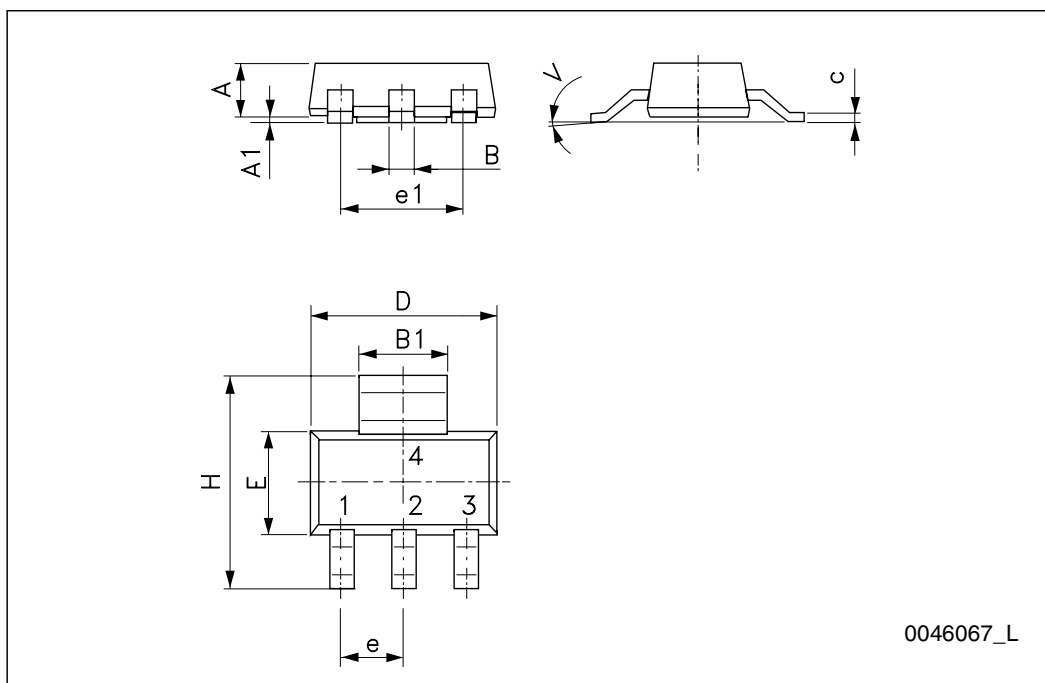
SOT-89 mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	1.40		1.60
B	0.44		0.56
B1	0.36		0.48
C	0.35		0.44
C1	0.35		0.44
D	4.40		4.60
D1	1.62		1.83
E	2.29		2.60
e	1.42		1.57
e1	2.92		3.07
H	3.94		4.25
K	1°		8°
L	0.89		1.20
R		0.25	



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°



4 Document revision history

Table 5. Document revision history

Date	Revision	Changes
21-Jun-2004	1	Initial release
08-Feb-2010	2	Updated package mechanical data

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