Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

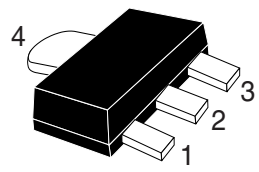
Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

3STF1640

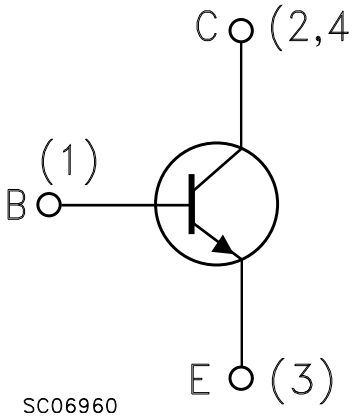
Low voltage high performance NPN power transistor

Datasheet - preliminary data



SOT-89

Figure 1. Internal schematic diagram



Features

- Very low collector-emitter saturation voltage
- High current gain characteristic
- Fast switching speed

Applications

- Power management
- DC-DC converters
- Automotive

Description

This device is a NPN transistor manufactured using new low voltage planar technology with double metal process. The result is a transistor which boasts exceptionally high gain performance coupled with very low saturation voltage.

Table 1. Device summary

Order codes	Marking	Package	Packaging
3STF1640	1640	SOT-89	Tape and reel

Contents

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CES}	Collector-emitter voltage (V_{BE} = 0)	40	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	40	V
V_{EBO}	Emitter-base voltage (I_C = 0)	7	V
I_C	Collector current	6	A
I_{CM}	Collector peak current (t_P < 1 ms)	20	A
P_{tot}	Total dissipation at T_{amb} = 25 °C	1.5	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
R_{thJA}(1)	Thermal resistance junction-ambient max	83	°C/W

1. Device mounted on PCB area of 1 cm²

2 Electrical characteristics

T_{case} = 25 °C unless otherwise specified.

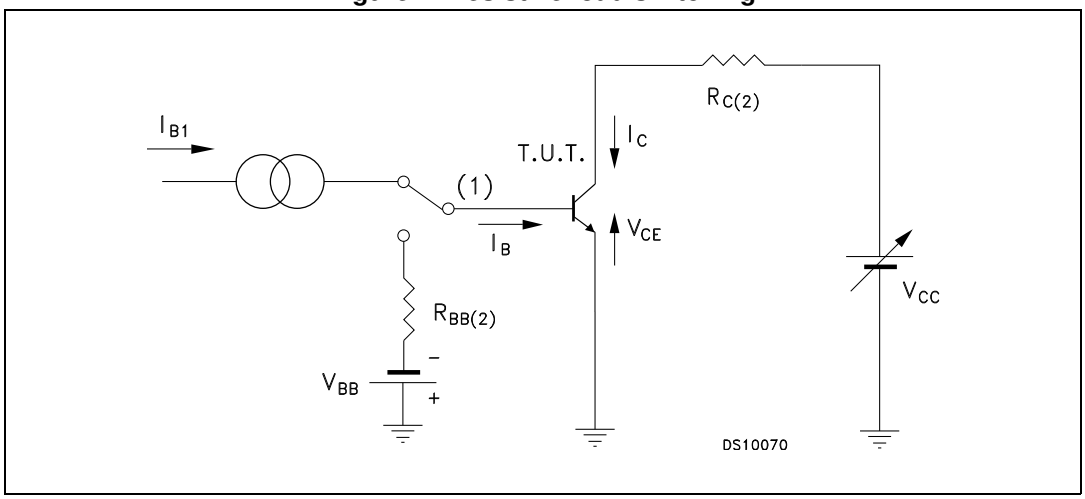
Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current (I_E = 0)	V_{CB} = 40 V			0.1	µA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = 5 V			0.1	µA
$V_{(BR)CBO}$	Collector-base breakdown voltage (I_E = 0)	I_C = 100 µA	40			V
$V_{(BR)CEO}$ (1)	Collector-emitter breakdown voltage (I_B = 0)	I_C = 10 mA	40			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage (I_C = 0)	I_E = 100 µA	7			V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = 1 A, I_B = 20 mA		50		mV
		I_C = 1 A, I_B = 100 mA		40		mV
		I_C = 6 A, I_B = 300 mA		170		mV
$V_{BE(sat)}$ (1)	Base-emitter saturation voltage	I_C = 6 A, I_B = 6 mA			1.1	V
h_{FE} (1)	DC current gain	I_C = 1 A, V_{CE} = 1 V		350		
		I_C = 6 A, V_{CE} = 1 V		100		
		I_C = 20 A, V_{CE} = 1 V		20		
f_T	Transition frequency	I_C = 0.1 A V_{CE} = 10 V f = 100 MHz		100		MHz
C_{CBO}	Collector-base capacitance (I_E = 0)	f = 1 MHz V_{CB} = 10 V		30		pF
t_{on}	Resistive load Turn-on time	I_C = 1.5 A V_{CC} = 10 V		TBD		ns
t_{off}	Turn-off time	$I_{B(on)}$ = - $I_{B(off)}$ = 150 mA $V_{BB(off)}$ = - 5 V		TBD		ns

1. Pulse test: pulse duration ≤ 300 µs, duty cycle ≤ 2 %

2.1 Test circuits

Figure 2. Resistive load switching



1. Fast electronic switch
2. Non-inductive resistor

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.

Table 5. 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
D3		0.90	
E	2.29		2.60
e	1.42		1.57
e1	2.92		3.07
H	3.94		4.25
H1	2.70		3.10
K	1°		8°
L	0.89		1.20
R		0.25	
β		90°	

Figure 3. SOT-89 drawings

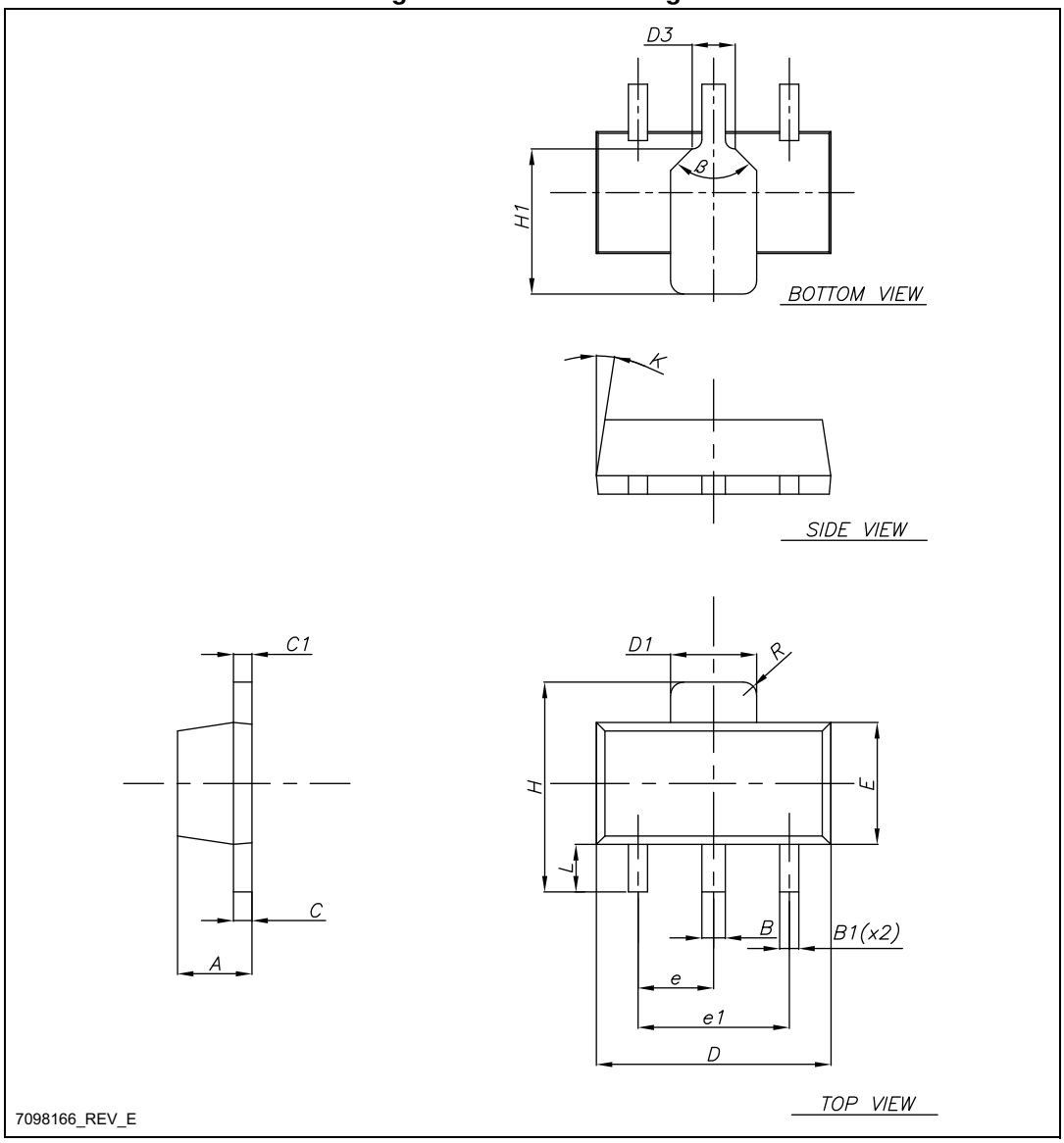
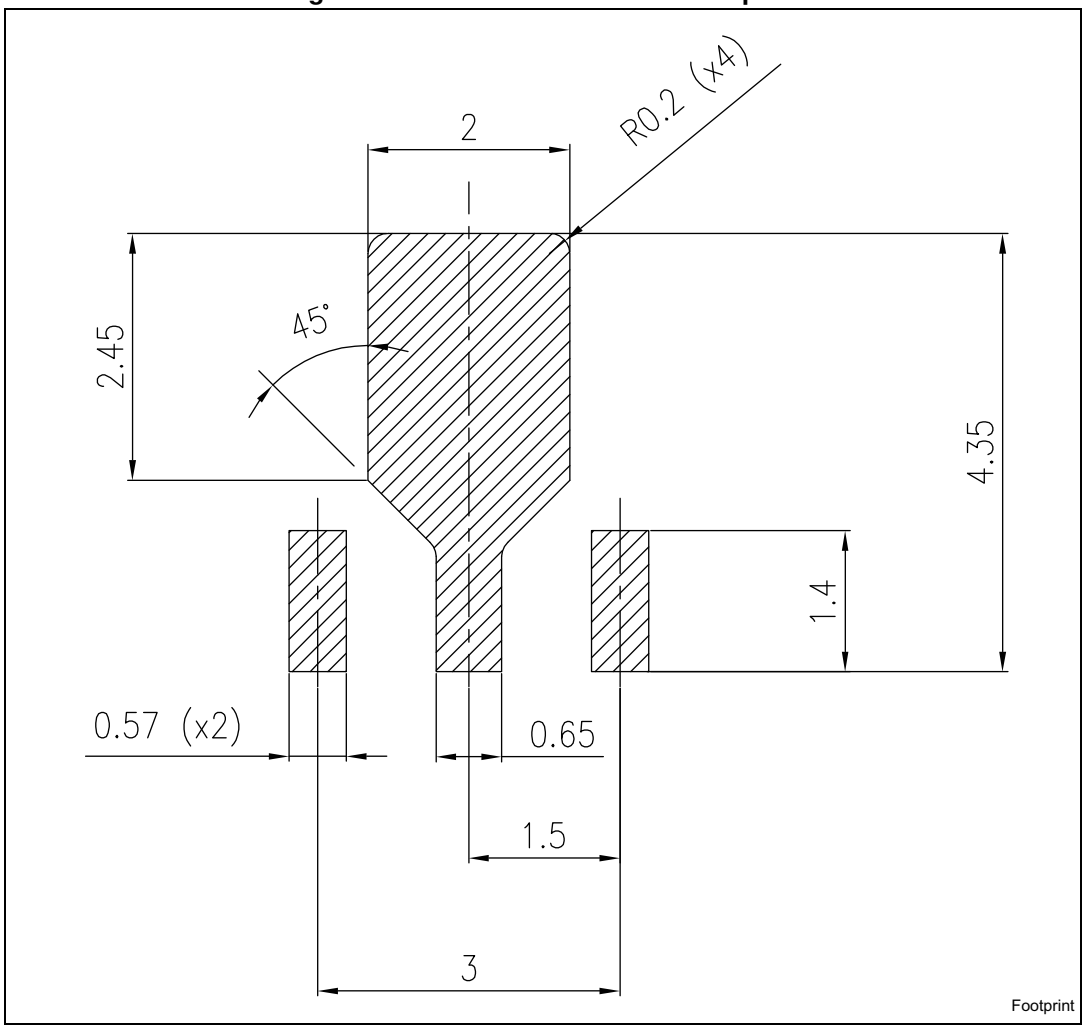


Figure 4. SOT-89 recommended footprint



4 Packaging mechanical data

Table 6. SOT-89 carrier tape dimensions

Dim.	mm.	
	Values	Tolerance
Ao	4.52	± 0.10
Bo	4.91	± 0.10
Ko	1.90	± 0.10
F	5.50	± 0.10
E	1.75	± 0.10
W	12	± 0.30
P2	2	± 0.10
Po	4	± 0.10
P1	8	± 0.10
T	0.30	± 0.10
D	∅ 1.55	± 0.05
D1	∅ 1.60	± 0.10

Figure 5. SOT-89 carrier tape drawing

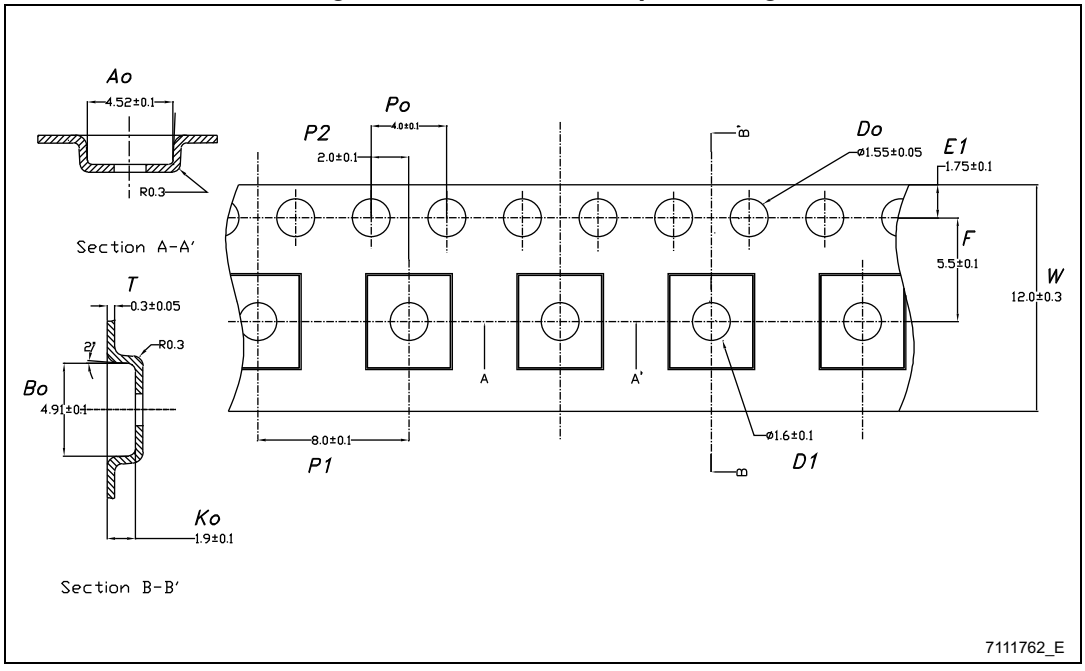
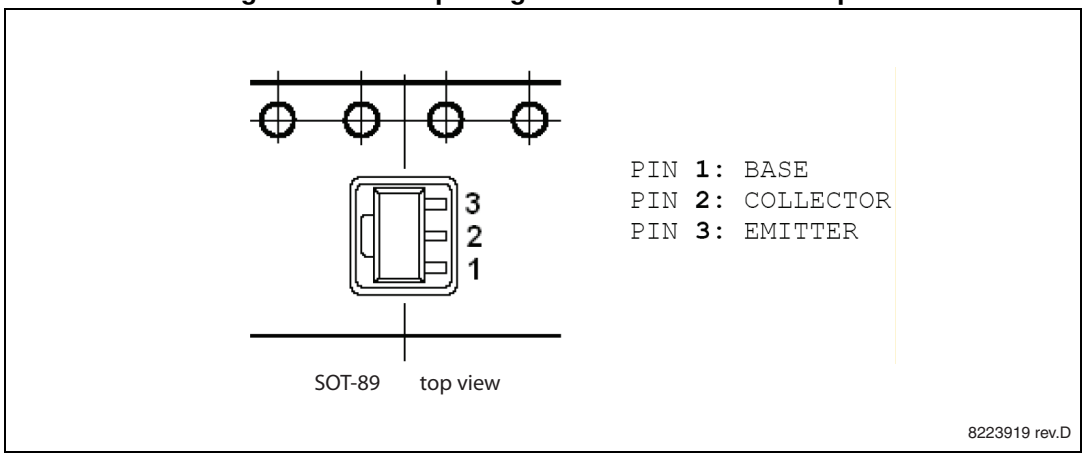


Figure 6. SOT-89 package orientation in carrier tape



5 Revision history

Table 7. Document revision history

Date	Revision	Changes
11-Sep-2012	1	Initial release.
31-Oct-2012	2	Updated title and description on the cover page. Document status promoted from target to preliminary data.
10-Apr-2013	3	*Applications* and *Description* have been modified in cover page.