



2STF1360 Low voltage fast-switching NPN power transistors

Features

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

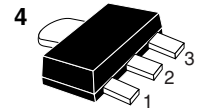
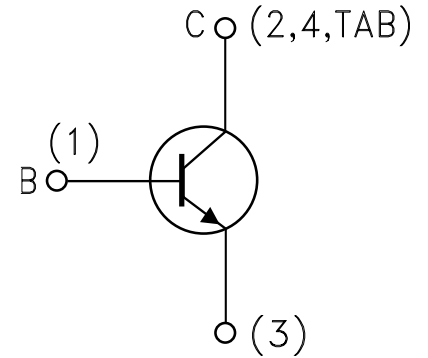
Applications

- Emergency lighting
- LED
- Voltage regulation
- Relay drive

Description

The devices are NPN transistors manufactured using new “PB-HDC” (power bipolar high density current) technology. The resulting transistor shows exceptional high gain performances coupled with very low saturation voltage.

Marking : 1360



SOT-89-3L

Absolute maximum ratings

Symbol	Parameter	Value			Unit
		2STD1360	2STF1360	2STN1360	
		DPAK	SOT-89	SOT-223	
V_{CBO}	Collector-base voltage ($I_E = 0$)	80			V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	60			V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	6			V
I_C	Collector current	3			A
I_{CM}	Collector peak current ($t_p < 5$ ms)	5			A
I_B	Base current	0.2			A
I_{BM}	Base peak current ($t_p < 5$ ms)	0.4			A
P_{TOT}	Total dissipation at $T_{amb} = 25$ °C	15	1.4	1.6	W
T_{stg}	Storage temperature	-65 to 150			°C
T_J	Max. operating junction temperature	150			°C

Thermal data

Symbol	Parameter		DPAK	SOT-89	SOT-223	Unit
$R_{thJA}^{(1)}$	Thermal resistance junction-ambient	Max	8.3	89	78	°C/W

1. Device mounted on a PCB area of 1 cm²



$T_{CASE} = 25^{\circ}C$; unless otherwise specified.

Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current ($I_E = 0$)	$V_{CB} = 80 V$			100	nA
I_{EBO}	Emitter cut-off current ($I_C = 0$)	$V_{EB} = 6 V$			100	nA
$V_{BE(on)}$	Base-emitter on voltage	$V_{CE} = 2 V$ $I_C = 100 mA$	630	650	730	mV
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 2 A$ $I_B = 100 mA$ $I_C = 3 A$ $I_B = 150 mA$		130 180	300 500	mV
$V_{BE(sat)}^{(1)}$	Base-emitter saturation voltage	$I_C = 2 A$ $I_B = 100 mA$		0.9	1.2	V
$h_{FE}^{(1)}$	DC current gain	$I_C = 100 mA$ $V_{CE} = 2 V$ $I_C = 1 A$ $V_{CE} = 2 V$	80 160		400	
t_d t_r t_s t_f	Resistive load Delay time Rise time Storage time Fall time	$I_C = 3 A$ $V_{CC} = 10 V$ $I_{B(on)} = - I_{B(off)} = 300 mA$ $V_{BE(off)} = - 5 V$		17 81 620 54	20 100 720 65	ns
f_T	Transition frequency	$I_C = 0.1 A$ $V_{CE} = 10 V$		130		MHz

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

Figure 2. DC current gain ($V_{CE} = 5 V$)

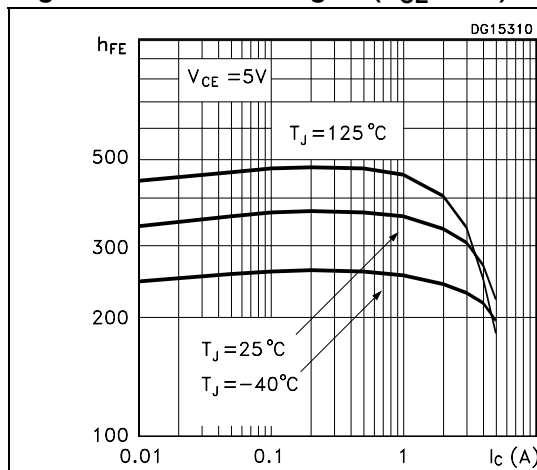


Figure 3. DC current gain ($V_{CE} = 2 V$)

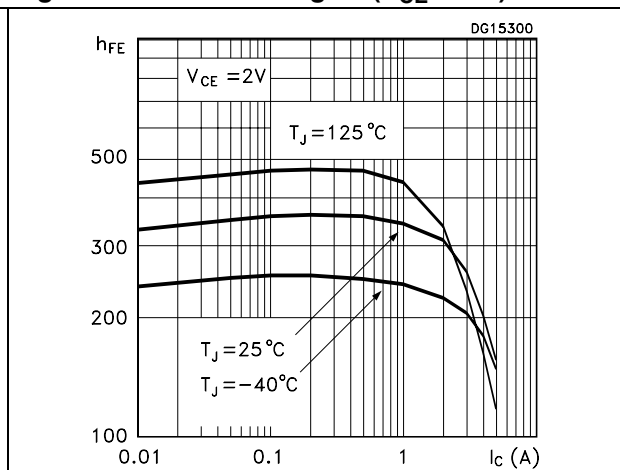




Figure 4. Collector emitter saturation voltage Figure 5. Base emitter saturation voltage

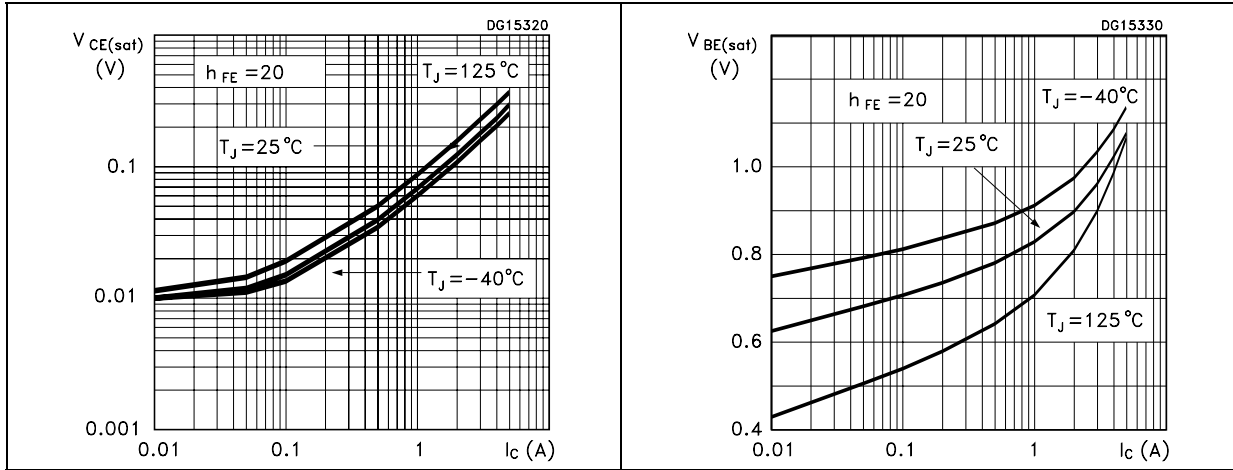


Figure 6. Resistive load switching on Figure 7. Resistive load switching off

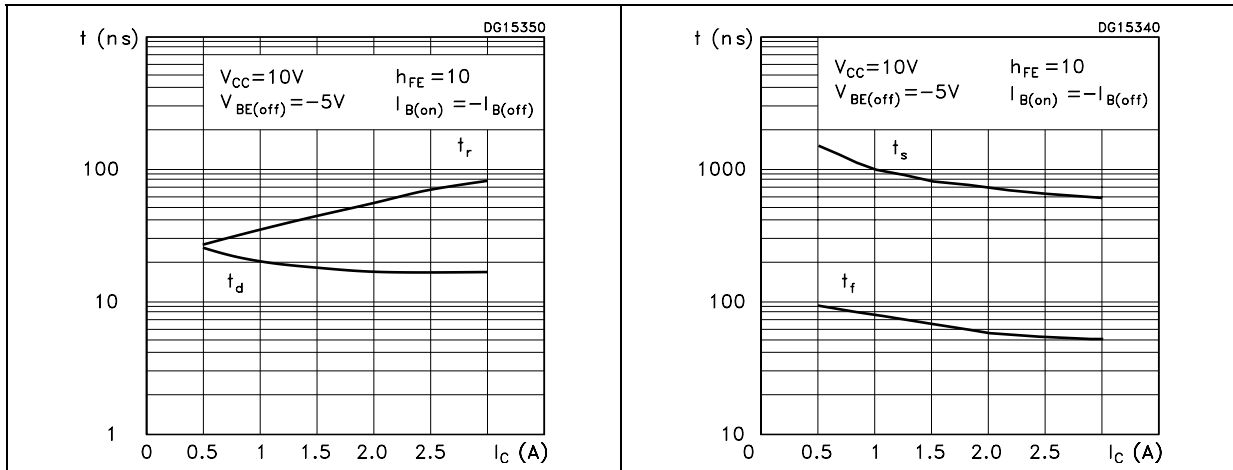


Figure 8. Capacitance

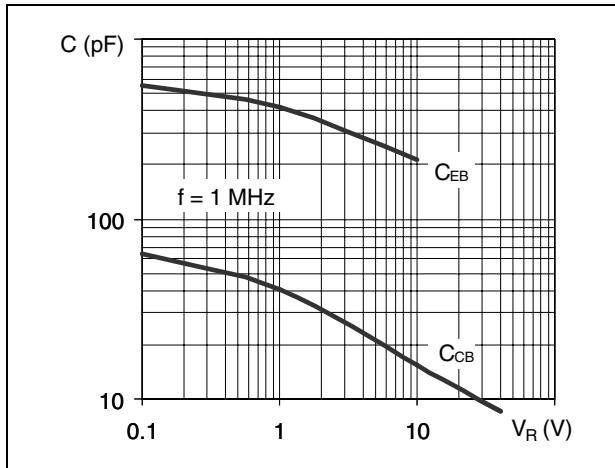
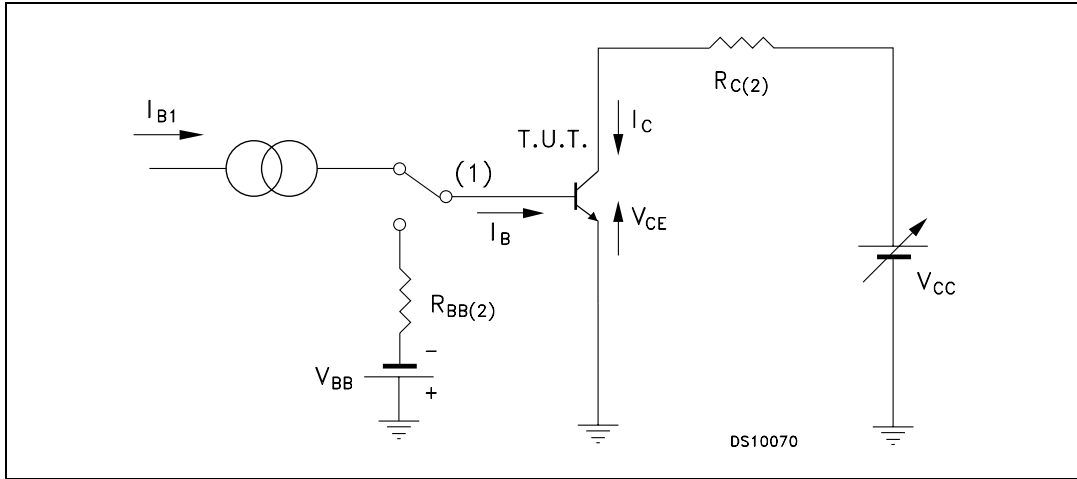




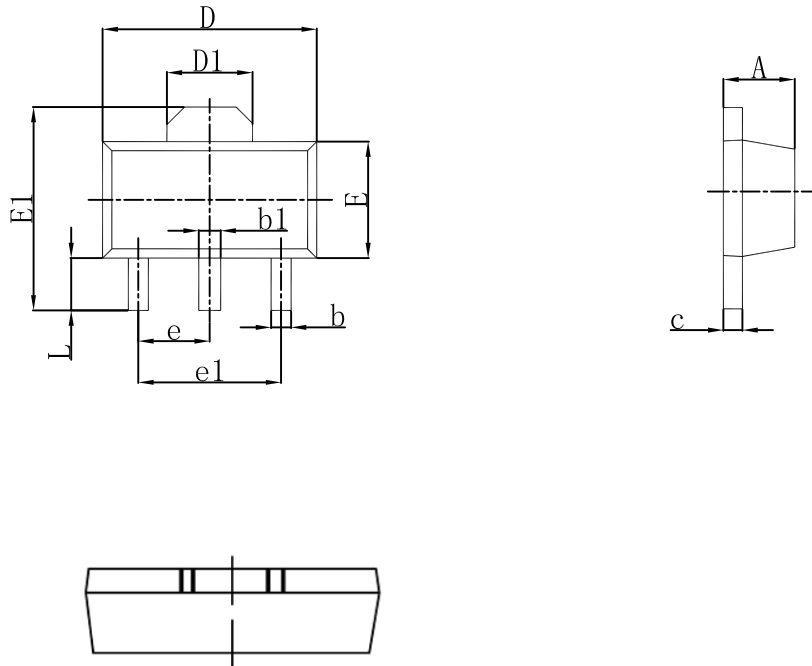
Figure 9. Resistive load switching



1. Fast electronic switch
2. Non-inductive resistor



SOT-89-3L Outlines Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047