



2STX1360

LOW VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

Features

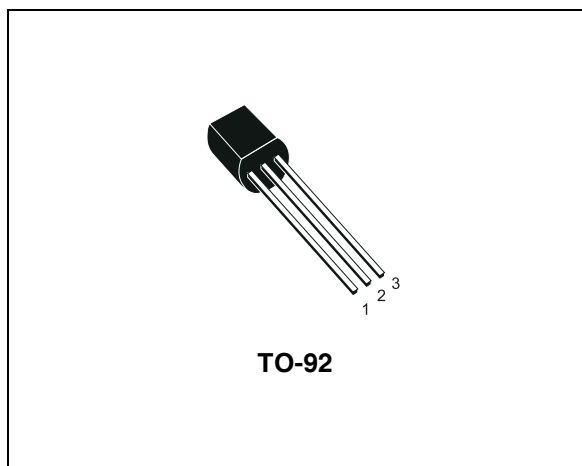
- VERY LOW COLLECTOR-EMITTER SATURATION VOLTAGE
- HIGH CURRENT GAIN CHARACTERISTIC
- FAST-SWITCHING SPEED
- IN COMPLIANCE WITH THE 2002/93/EC EUROPEAN DIRECTIVE

Applications

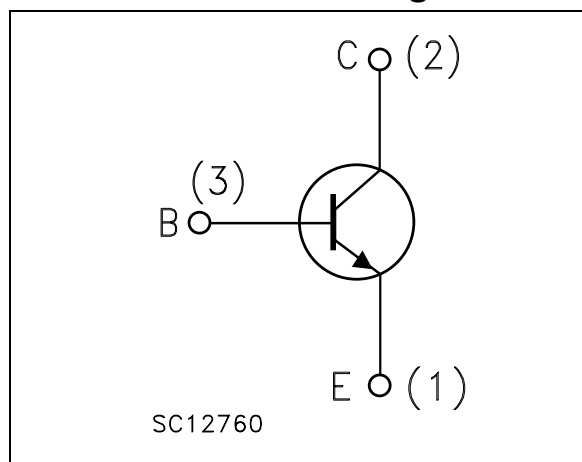
- EMERGENCY LIGHTING
- LED
- CCFL DRIVERS (BACK LIGHTING)
- VOLTAGE REGULATION
- RELAY DRIVER

Description

The 2STX1360 is a NPN transistor 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.



Internal Schematic Diagram



Order Codes

Part Number	Marking	Package	Packing
2STX1360	X1360	TO-92	Bulk

1 Absolute Maximum Ratings

Table 1. Absolute Maximum Rating

Symbol	Parameter	Value	Unit
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 ($t_P < 5\text{ms}$)	5	A
I_B	Base Current	0.2	A
I_{BM}	Base Peak Current ($t_P < 5\text{ms}$)	0.4	A
P_{TOT}	Total dissipation at $T_C = 25^\circ\text{C}$	1	W
T_{stg}	Storage Temperature	-65 to 150	$^\circ\text{C}$
T_J	Max. Operating Junction Temperature	150	$^\circ\text{C}$

Table 2. Thermal Data

Symbol	Parameter	Value	Unit
$R_{thJ-case}$	Thermal Resistance Junction-Case Max	44.6	$^\circ\text{C/W}$
$R_{thJ-amb}$	Thermal Resistance Junction-Ambient Max	125	$^\circ\text{C/W}$

2 Electrical Characteristics

Table 3. Electrical Characteristics ($T_{CASE} = 25^{\circ}C$; unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current ($I_E = 0$)	$V_{CB} = 80\text{ V}$			100	nA
I_{EBO}	Emitter Cut-off Current ($I_C = 0$)	$V_{EB} = 6\text{ V}$			100	nA
V_{BE}	Base-Emitter Voltage	$V_{CE} = 2\text{ V}$ $I_C = 100\text{ mA}$	630	670	730	mV
$V_{CE(sat)}$ <i>Note: 1</i>	Collector-Emitter Saturation Voltage	$I_C = 2\text{ A}$ $I_B = 100\text{ mA}$		150	300	mV
		$I_C = 3\text{ A}$ $I_B = 150\text{ mA}$		210	500	mV
$V_{BE(sat)}$ <i>Note: 1</i>	Base-Emitter Saturation Voltage	$I_C = 2\text{ A}$ $I_B = 100\text{ mA}$		0.89	1.2	V
h_{FE} <i>Note: 1</i>	DC Current Gain	$I_C = 100\text{ mA}$ $V_{CE} = 2\text{ V}$	80			
		$I_C = 1\text{ A}$ $V_{CE} = 2\text{ V}$	160	280	400	
t_d	RESISTIVE LOAD Delay Time	$V_{CC} = 10\text{ V}$ $I_C = 3\text{ A}$ $I_{B1} = -I_{B2} = 300\text{ mA}$ (see figure 8)		17	20	ns
t_r	Rise Time			81	100	ns
t_s	Storage Time			620	720	ns
t_f	Fall Time			54	65	ns
f_T	Transition Frequency	$I_C = 0.1\text{ A}$ $V_{CE} = 10\text{ V}$		130		MHz

Note: 1 Pulsed duration = 300 μ s, duty cycle $\leq 1.5\%$.

2.1 Typical Characteristics

Figure 1. DC Current Gain

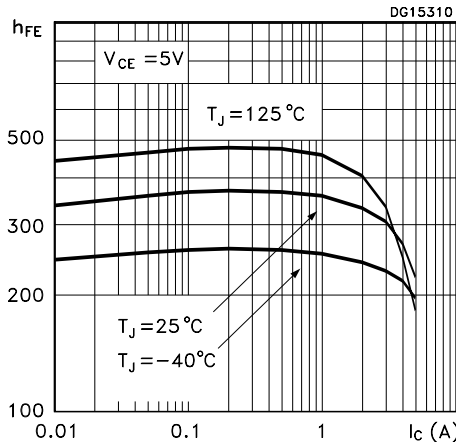


Figure 2. DC Current Gain

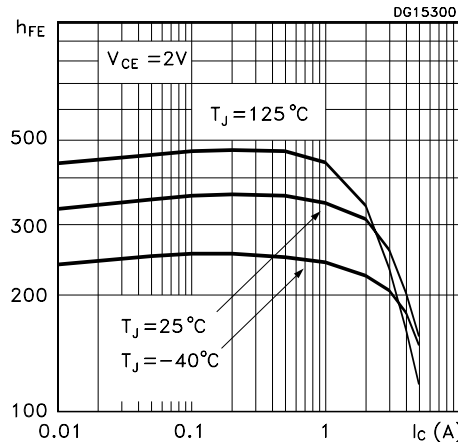


Figure 3. Collector Emitter Saturation Voltage Figure 4. Base Emitter Saturation Voltage

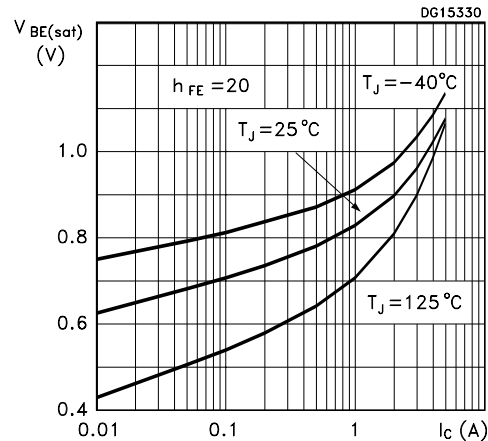
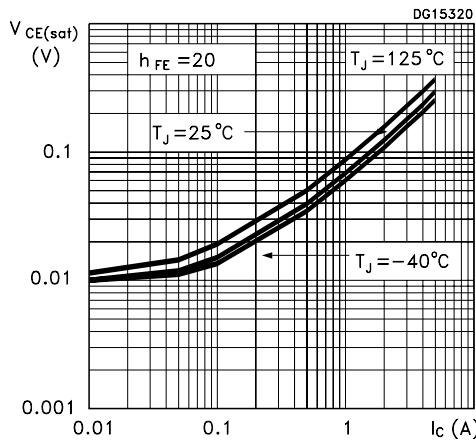


Figure 5. Resistive Load Switching Times

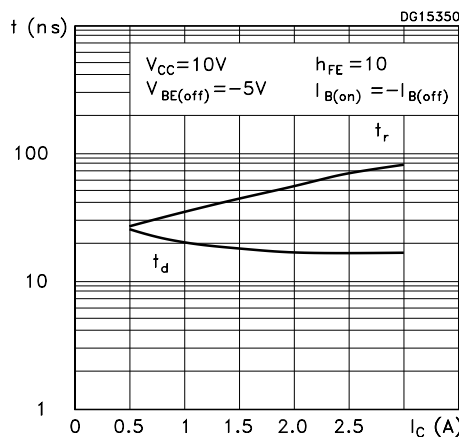


Figure 6. Resistive Load Switching Times

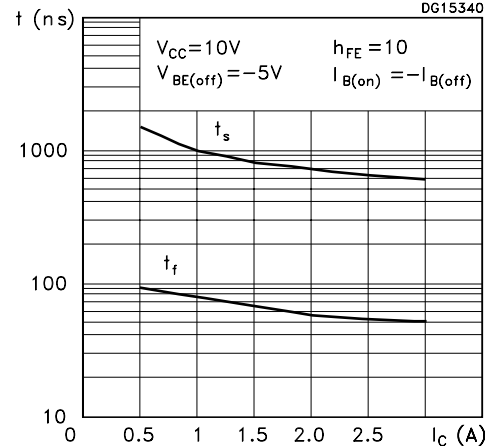
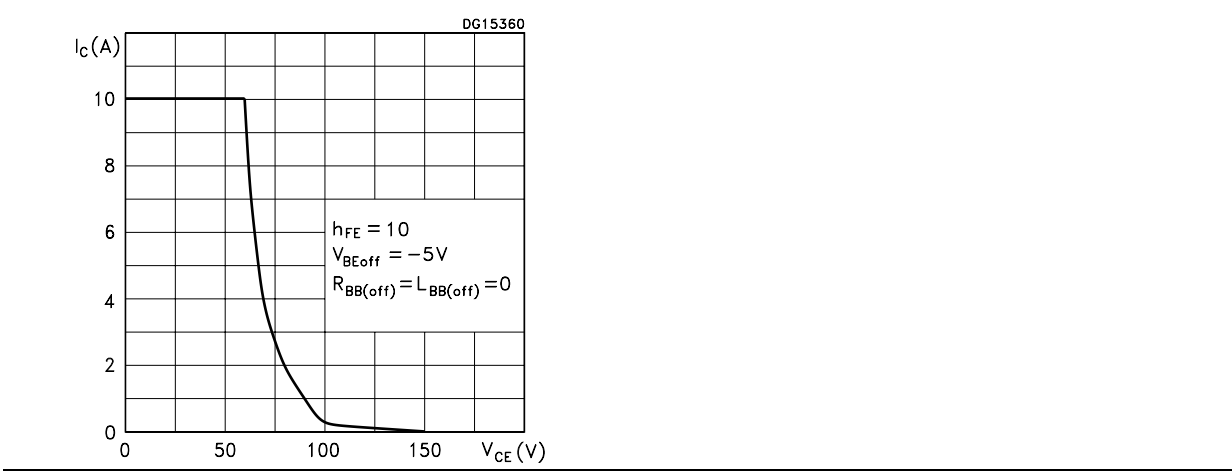
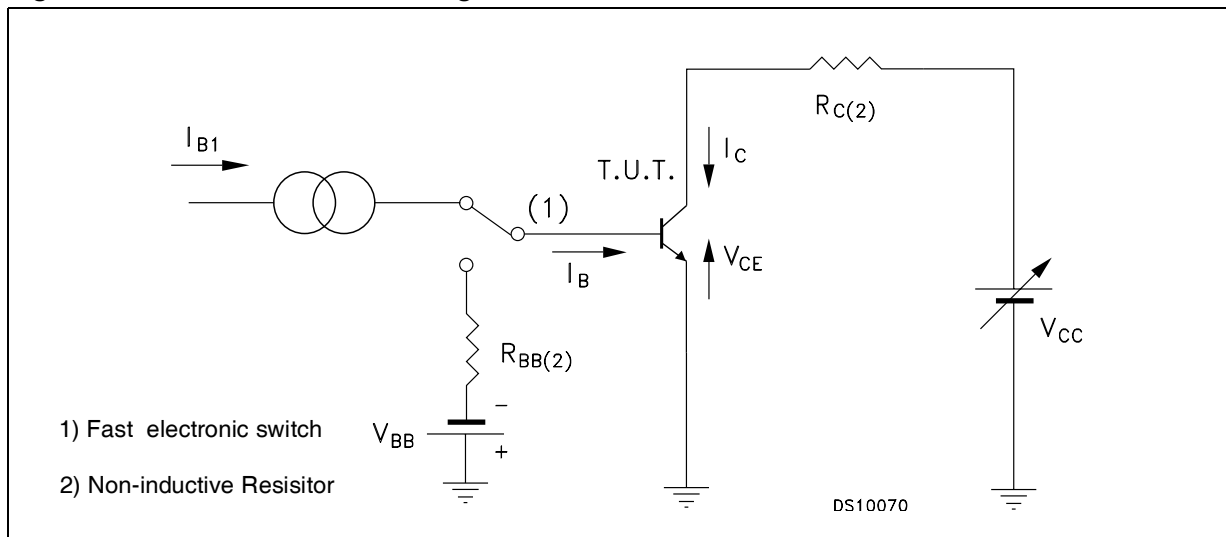


Figure 7. Reverse Bised SOA



3 Test Circuits

Figure 8. Resistive Load Switching Test Circuit

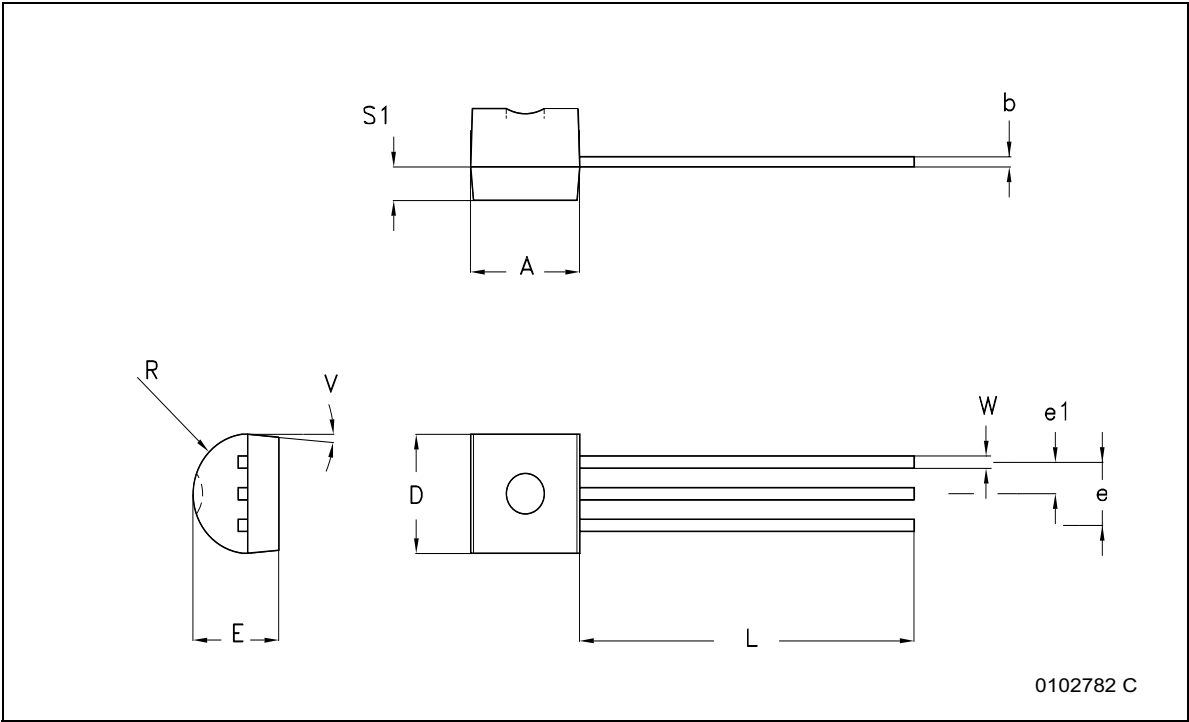


4 Package Mechanical Data

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

TO-92 BULK SHIPMENT MECHANICAL DATA

DIM.	mm.		
	MIN.	TYP	MAX.
A	4.32		4.95
b	0.36		0.51
D	4.45		4.95
E	3.30		3.94
e	2.41		2.67
e1	1.14		1.40
L	12.70		15.49
R	2.16		2.41
S1	0.92		1.52
W	0.41		0.56
V		5 °	



5 Revision History

Date	Revision	Changes
17-Nov-2005	1	Initial Release

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics.
All other names are the property of their respective owners

© 2005 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com