

<b>SANYO</b>	No.1333C	2SC3293
		NPN Planar Silicon Darlington Transistor

Driver Applications

**Applications**

- Suitable for use in switching of L load (motor drivers, printer hammer drivers, relay drivers).

**Features**

- High DC current gain.
- Large current capacity and wide ASO.
- On-chip Zener diode of  $60 \pm 10V$  between collector and base.
- Uniformity in collector-to-base breakdown voltage due to the adoption of an accurate impurity diffusion process.
- High inductive load handling capability.

**Absolute Maximum Ratings at  $T_a = 25^\circ C$**

Parameter	Symbol	Value	Unit
Collector-to-Base Voltage	$V_{CB0}$	50 ※	V
Collector-to-Emitter Voltage	$V_{CEO}$	50 ※	V
Emitter-to-Base Voltage	$V_{EBO}$	6	V
Collector Current	$I_C$	2	A
Collector Current (Pulse)	$I_{CP}$	4	A
Base Current	$I_B$	0.4	A
Collector Dissipation	$P_C$	20	W
Junction Temperature	$T_j$	150	$^\circ C$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ C$

$T_c = 25^\circ C$

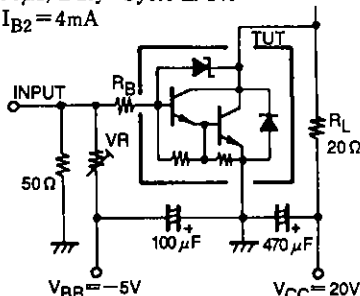
※ : With Zener diode ( $60 \pm 10V$ )

**Electrical Characteristics at  $T_a = 25^\circ C$**

Parameter	Symbol	Test Conditions	min	typ	max	unit
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 40V, I_E = 0$			10	$\mu A$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 5V, I_C = 0$			2	mA
DC Current Gain	$h_{FE}$	$V_{CE} = 5V, I_C = 1A$	1000	4000		
Gain-Bandwidth Product	$f_T$	$V_{CE} = 5V, I_C = 1A$		180		MHz
C-E Saturation Voltage	$V_{CE(sat)}$	$I_C = 1A, I_B = 4mA$		1.0	1.5	V
B-E Saturation Voltage	$V_{BE(sat)}$	$I_C = 1A, I_B = 4mA$			2.0	V
C-B Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 0.1mA, I_E = 0$	50	60	70	V
C-E Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1mA, R_{BE} = \infty$	50	60	70	V
Inductive Load Handling Capability	$E_s/b$	$L = 100mH, R_{BE} = 100\Omega$	25			mJ
Turn-ON Time	$t_{on}$	$V_{CC} = 20V, I_C = 1A,$ $I_{B1} = -I_{B2} = 4mA$		0.2		$\mu s$
Storage Time	$t_{stg}$			3.5		$\mu s$
Fall Time	$t_f$			0.5		$\mu s$

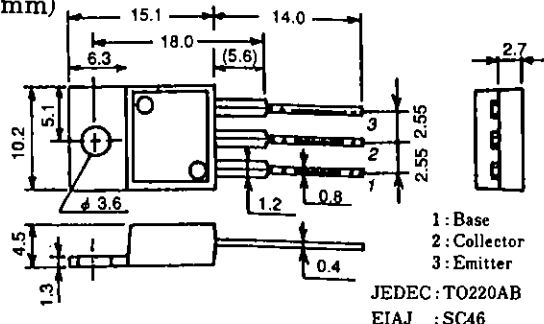
**Switching Time Test Circuit**

$PW = 50\mu s, Duty\ Cycle \leq 1\%$   
 $I_{B1} = -I_{B2} = 4mA$



**Package Dimensions 2010C**

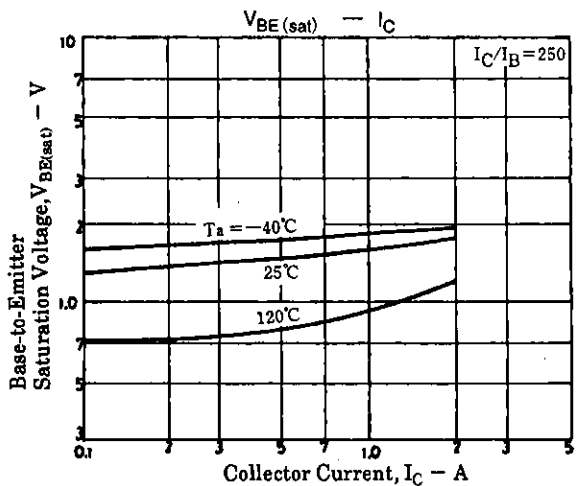
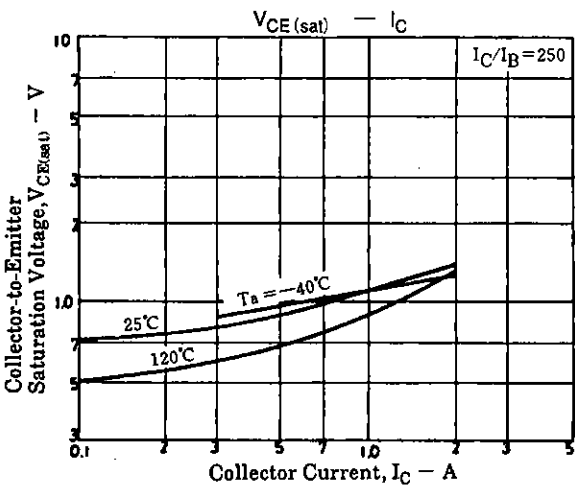
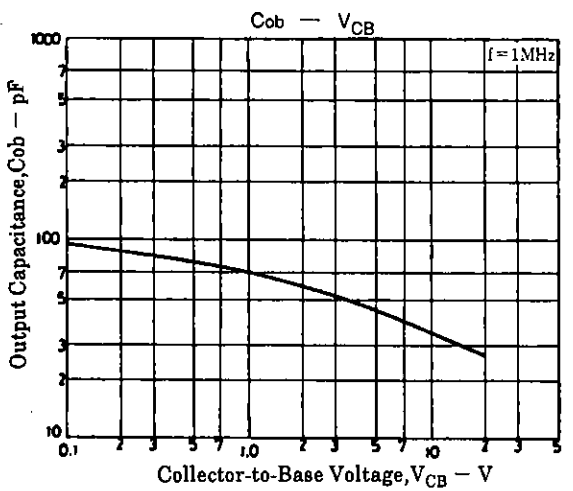
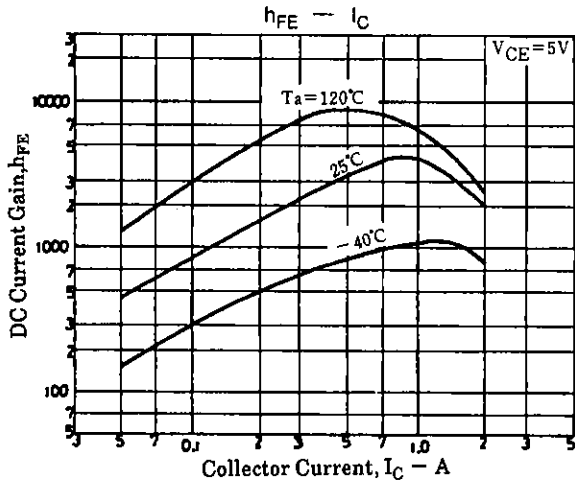
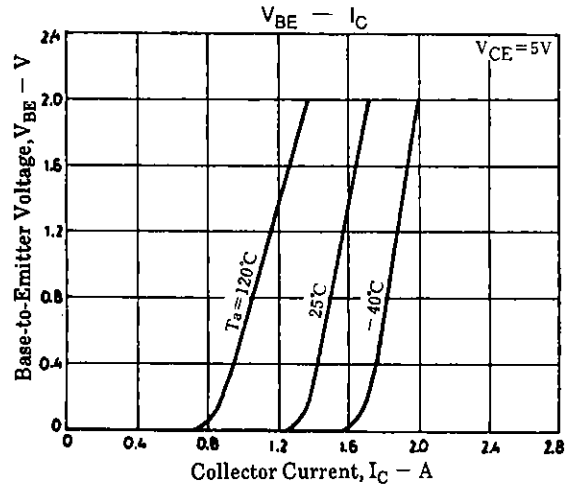
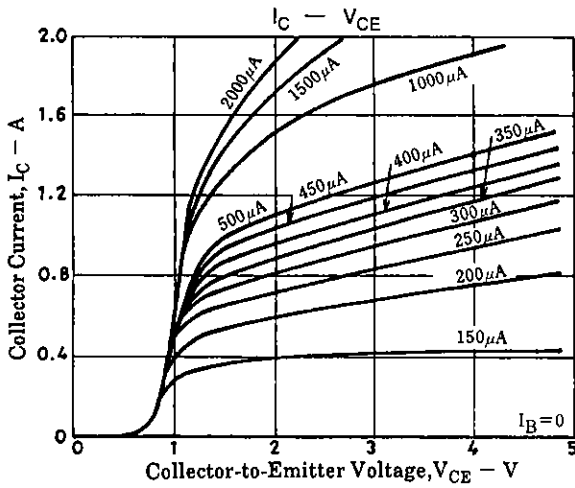
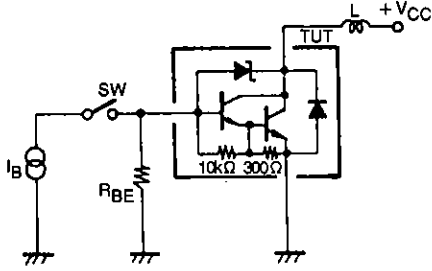
(unit: mm)

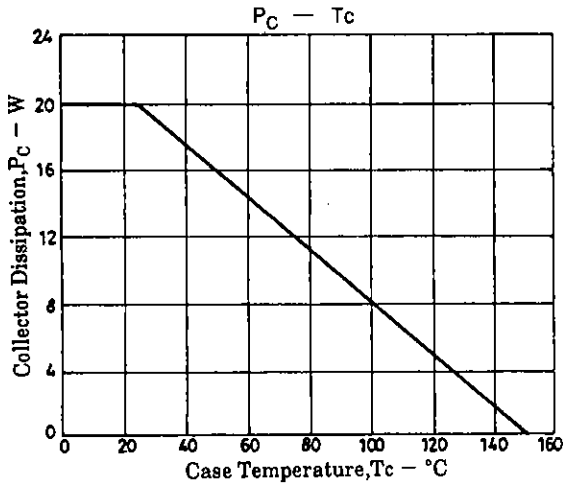
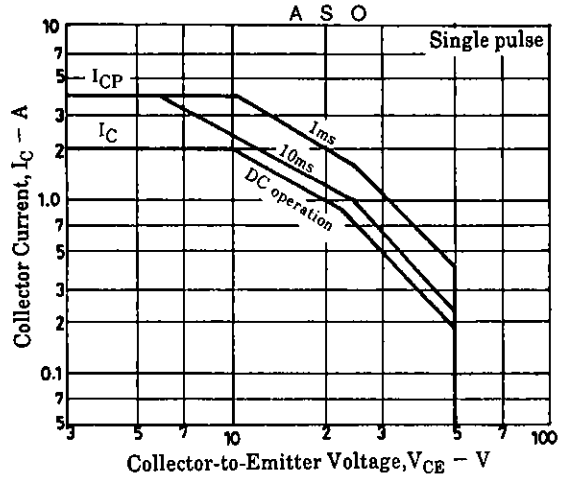
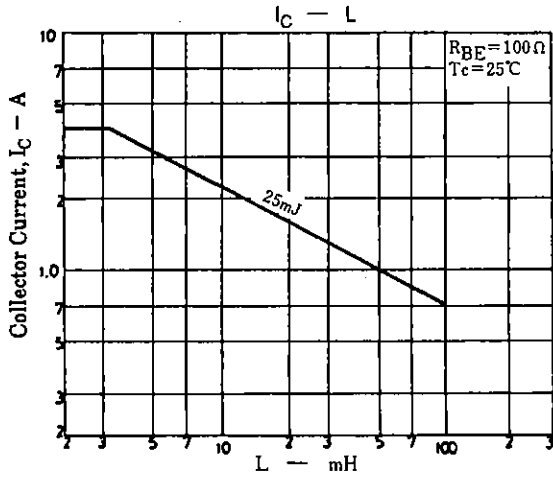


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Es/b Test Circuit

$V_{CC}=20V, R_{BE}=100\Omega$





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