

**SANYO**

No.2221B

**2SC3987**

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.
- Micaless package facilitating mounting.

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

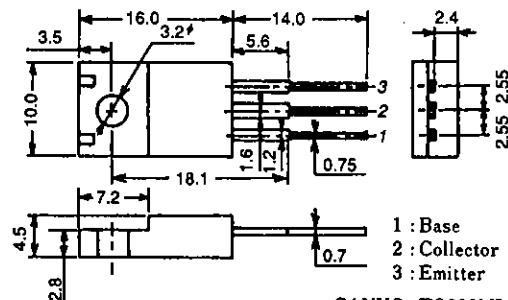
			unit
Collector-to-Base Voltage	$V_{CB0}$	50 ※	V
Collector-to-Emitter Voltage	$V_{CEO}$	50 ※	V
Emitter-to-Base Voltage	$V_{EBO}$	6	V
Collector Current	$I_C$	3	A
Collector Current (Pulse)	$I_{CP}$	6	A
Base Current	$I_B$	0.6	A
Collector Dissipation	$P_C$	2.0	W
		20	W
Junction Temperature	$T_j$	150	$^\circ C$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ C$

$T_c = 25^\circ C$

※ : With Zener diode ( $60 \pm 10V$ )**Electrical Characteristics at  $T_a = 25^\circ C$** 

			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	$h_{FE}$	$V_{CE} = 5V, I_C = 1.5A$	1000	4000		
Gain-Bandwidth Product	$f_T$	$V_{CE} = 5V, I_C = 1.5A$		180		MHz
C-E Saturation Voltage	$V_{CE(sat)}$	$I_C = 1.5A, I_B = 6mA$		1.0	1.5	V
B-E Saturation Voltage	$V_{BE(sat)}$	$I_C = 1.5A, I_B = 6mA$			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	$E_s/b$	$L = 100mH, R_{BE} = 100\Omega$	30			mJ

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**Package Dimensions 2041A**  
(unit: mm)

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Turn-ON Time  
Storage Time  
Fall Time

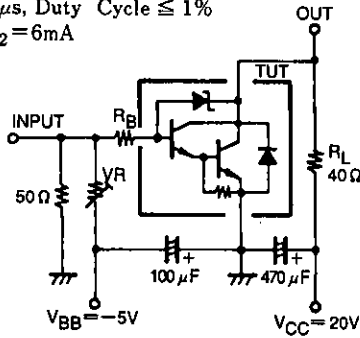
$t_{on}$   
 $t_{stg}$   
 $t_f$

See specified Test Circuit.  
 $V_{CC}=20V, I_C=1.5A,$   
 $I_{B1}=-I_{B2}=6mA$

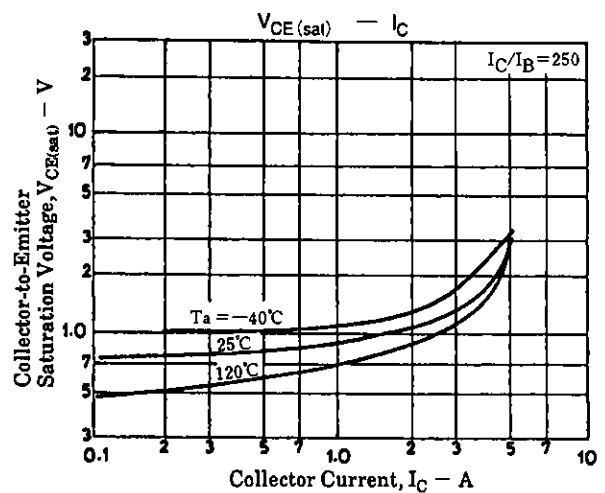
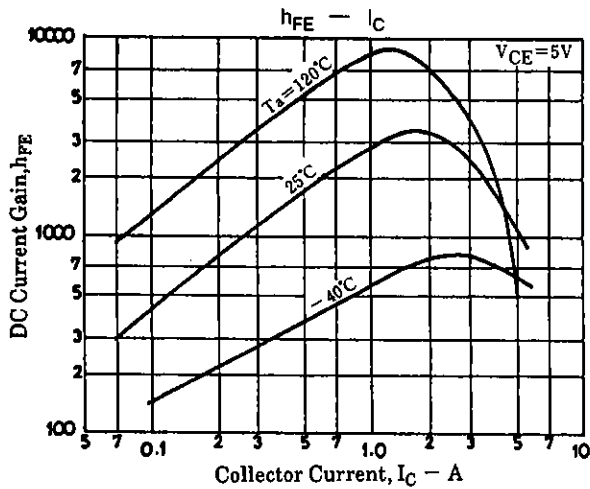
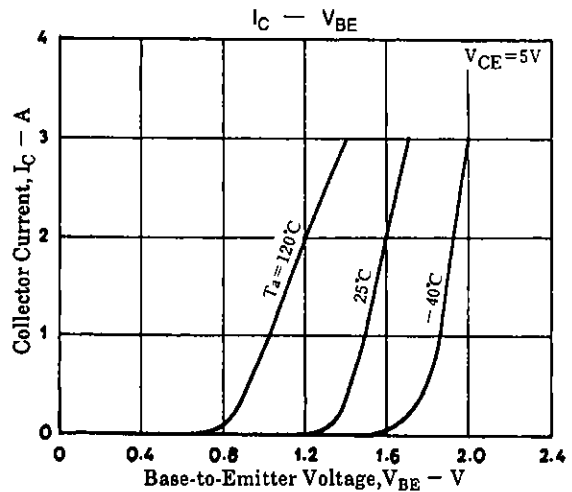
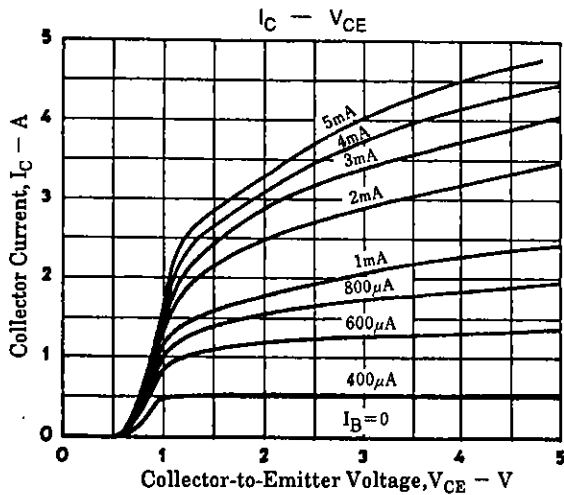
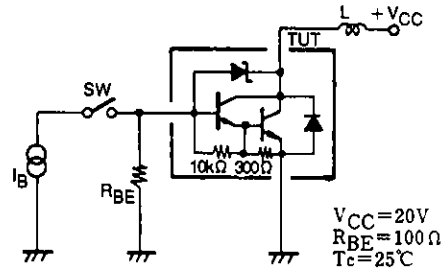
	min	typ	max	unit
Turn-ON Time		0.2		$\mu s$
Storage Time		3.0		$\mu s$
Fall Time		0.7		$\mu s$

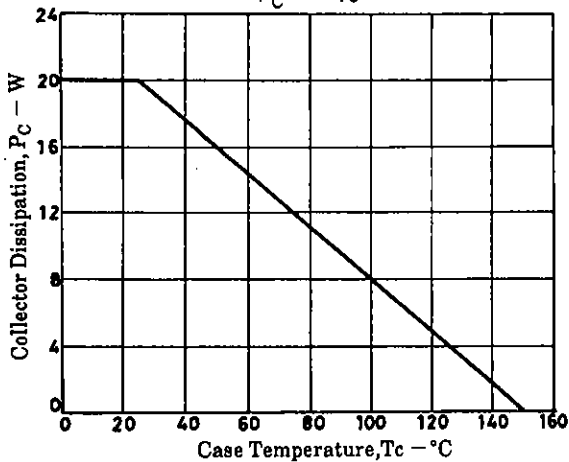
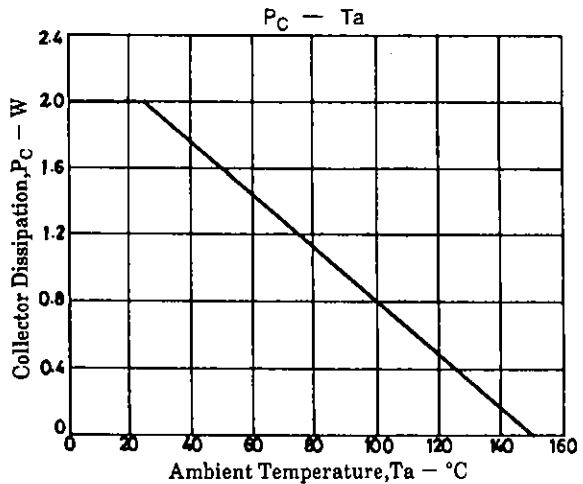
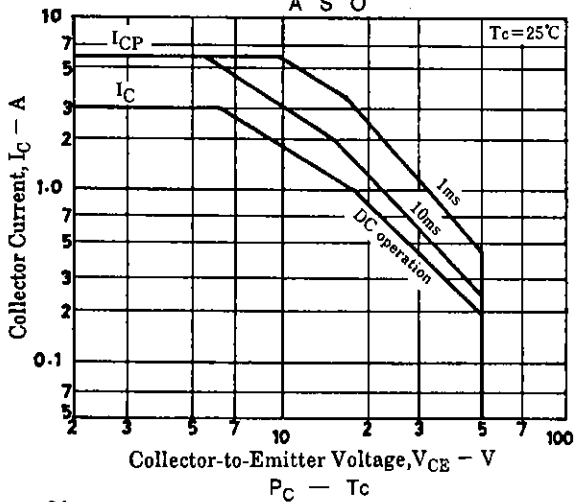
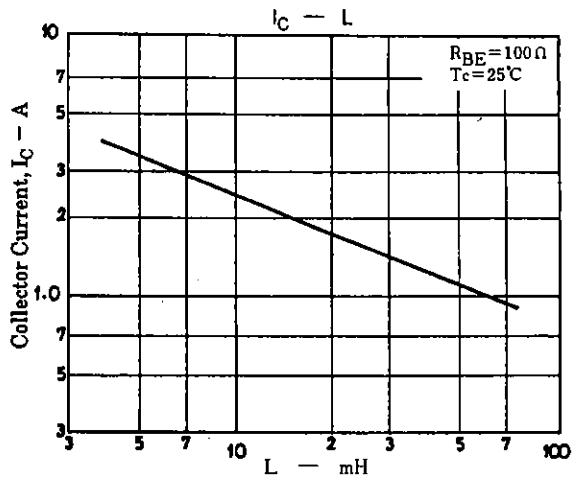
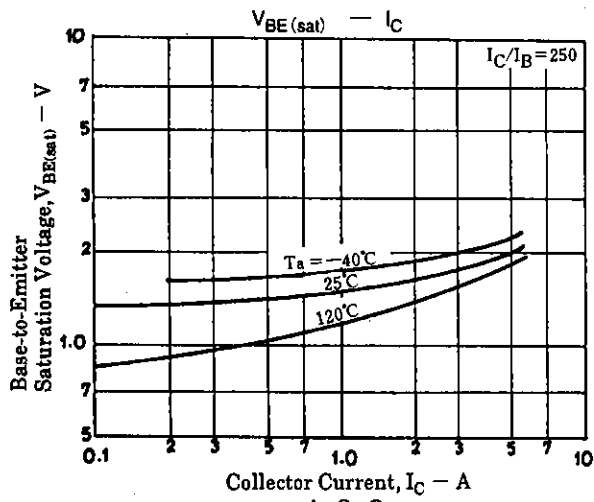
Switching Time Test Circuit

PW = 50 $\mu s$ , Duty Cycle  $\leq 1\%$   
 $I_{B1}=-I_{B2}=6mA$



Es/b Test Circuit





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