

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 $T_a = 25^\circ C$

Collector-to-Base Voltage	V_{CB0}	50 ※	V	unit
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	$^\circ C$	

$T_c = 25^\circ C$

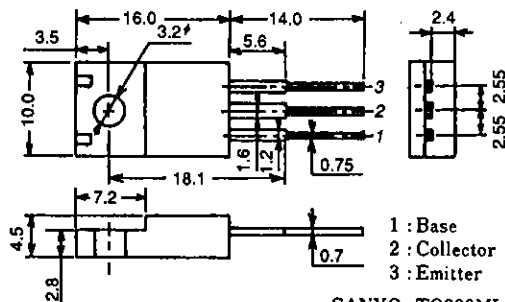
※ : With Zener diode ($60 \pm 10V$)

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

		min	typ	max	unit
Collector Cutoff Current	I_{CBO} $V_{CB} = 40V, I_E = 0$			10	μA
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

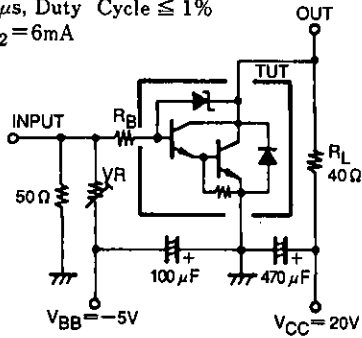
t_{on}
 t_{stg}
 t_f

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

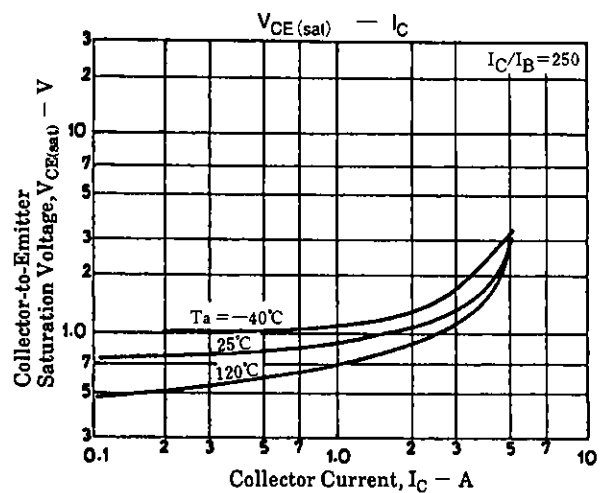
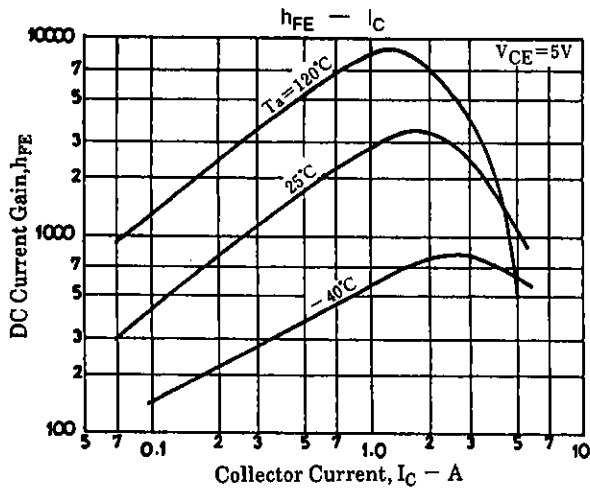
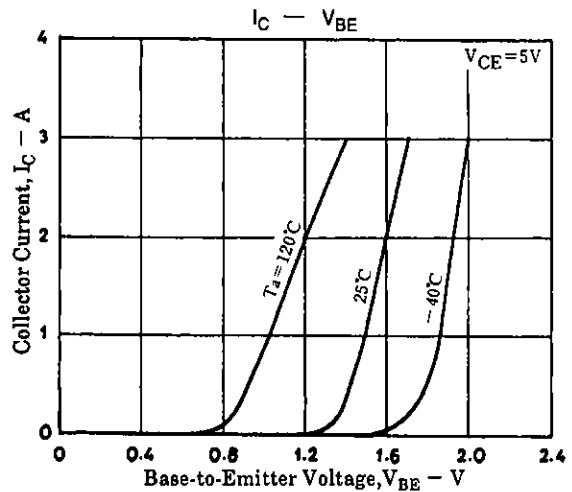
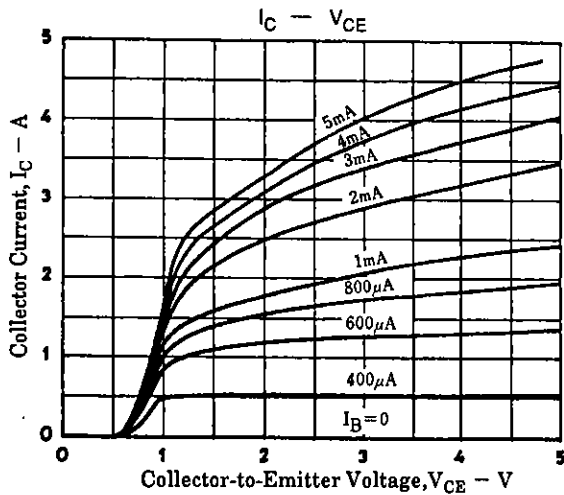
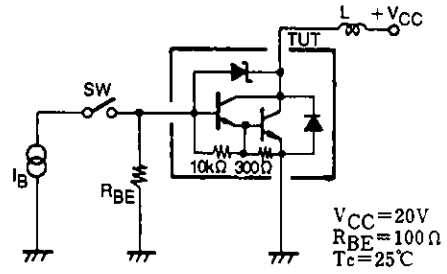
	min	typ	max	unit
Turn-ON Time		0.2		μs
Storage Time		3.0		μs
Fall Time		0.7		μs

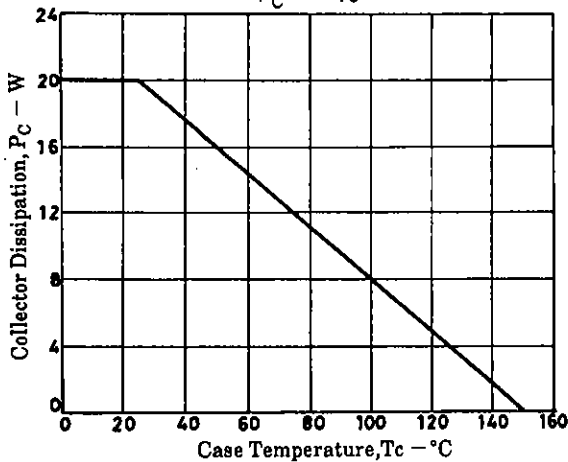
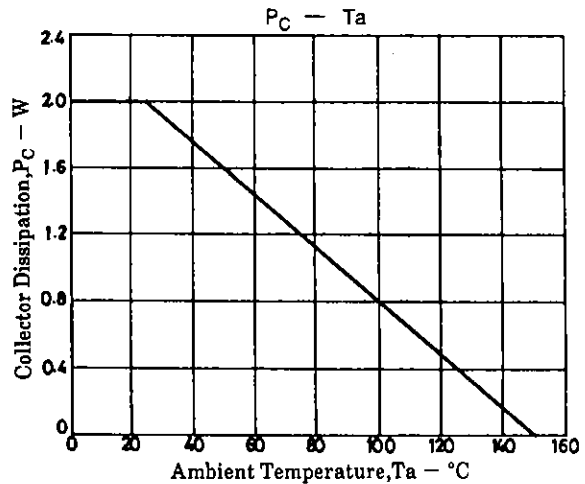
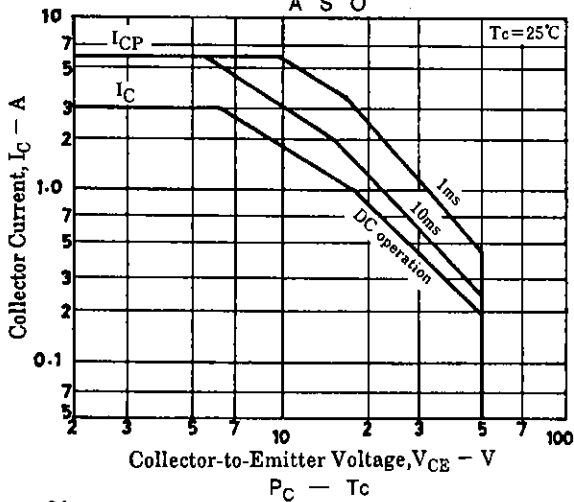
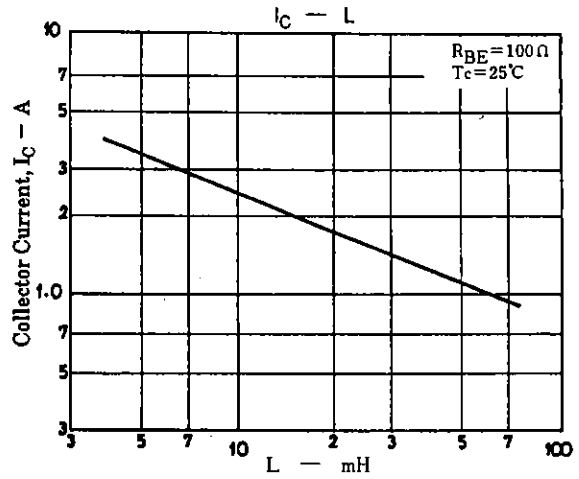
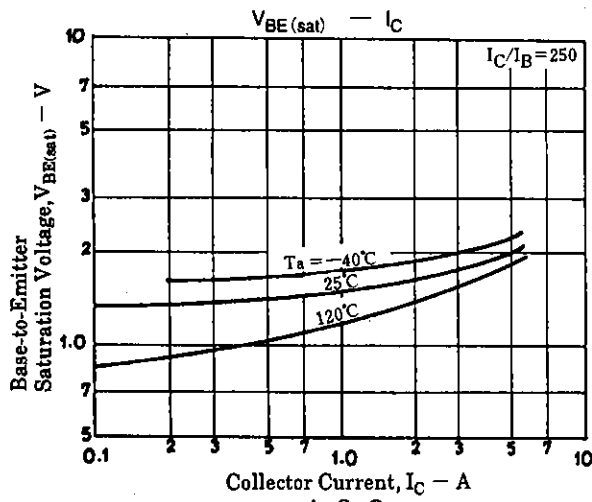
Switching Time Test Circuit

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



Es/b Test Circuit





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