

**2SC3987****Driver Applications****Applications**

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

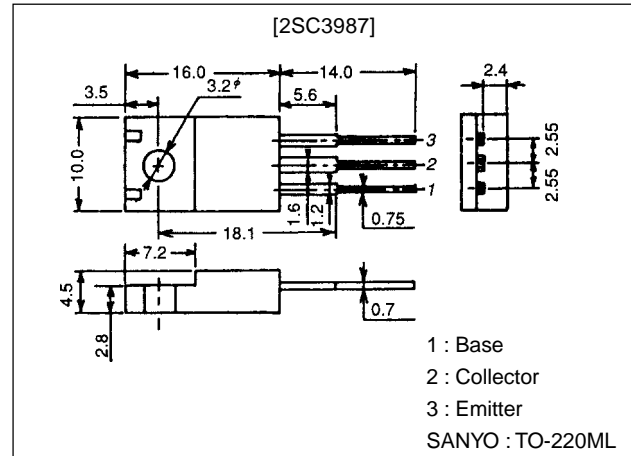
**Features**

- 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.

**Package Dimensions**

unit:mm

2041A

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CBO}$		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
		$T_c=25^\circ C$	20	W
Junction Temperature	$T_j$		150	$^\circ C$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ C$

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
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
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=1.5A, I_B=6mA$		1.0	1.5	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=1.5A, I_B=6mA$			2.0	V

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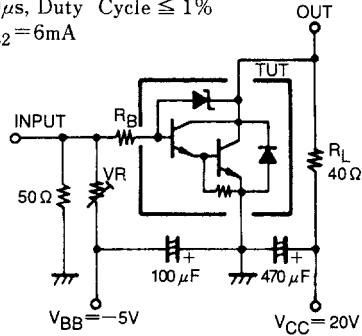
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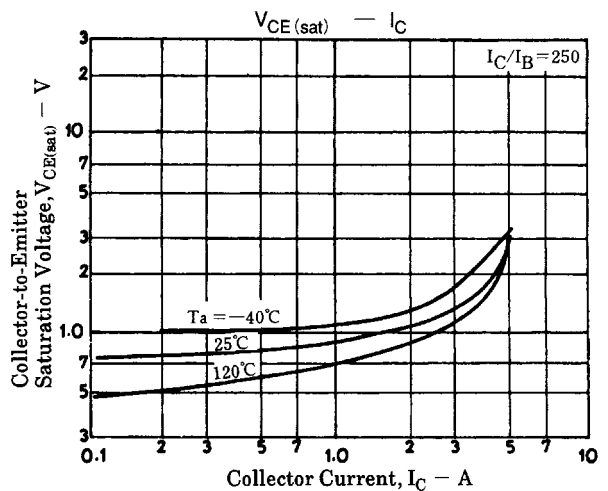
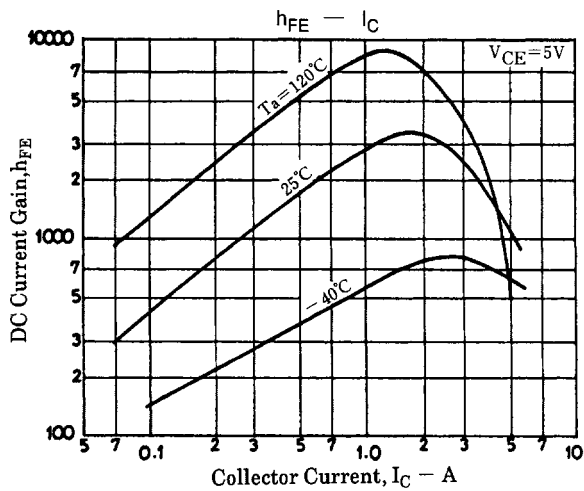
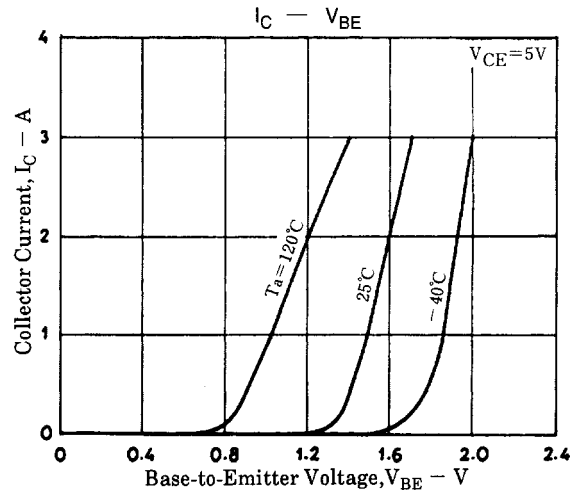
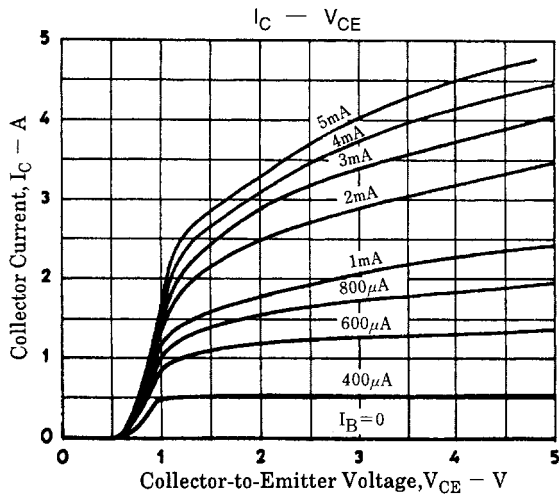
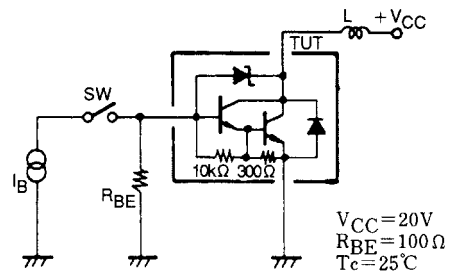
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=0.1mA, I_E=0$	50	60	70	V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=1mA, R_{BE}=\infty$	50	60	70	V
Inductive Load Handling Capability	Es/b	$L=100mH, R_{BE}=100\Omega$	30			mJ
Turn-ON Time	$t_{on}$	See specified Test Circuit. $V_{CC}=20V, I_C=1.5A, I_{B1}=-I_{B2}=6mA$		0.2		$\mu s$
Storage Time	$t_{stg}$	See specified Test Circuit. $V_{CC}=20V, I_C=1.5A, I_{B1}=-I_{B2}=6mA$		3.0		$\mu s$
Fall Time	$t_f$	See specified Test Circuit. $V_{CC}=20V, I_C=1.5A, I_{B1}=-I_{B2}=6mA$		0.7		$\mu s$

## Switching Time Test Circuit

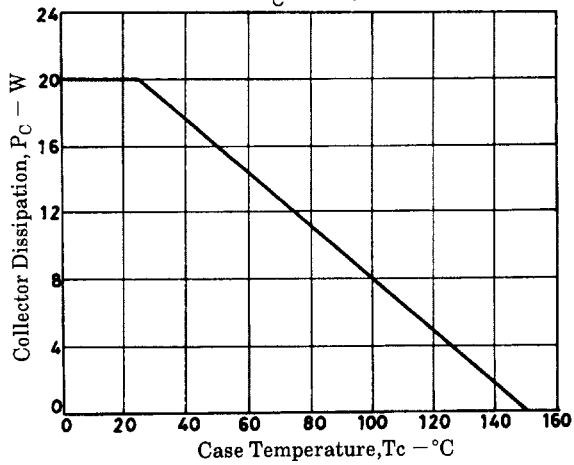
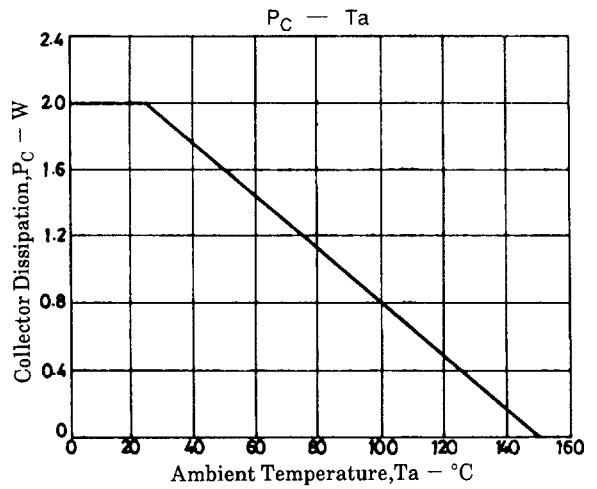
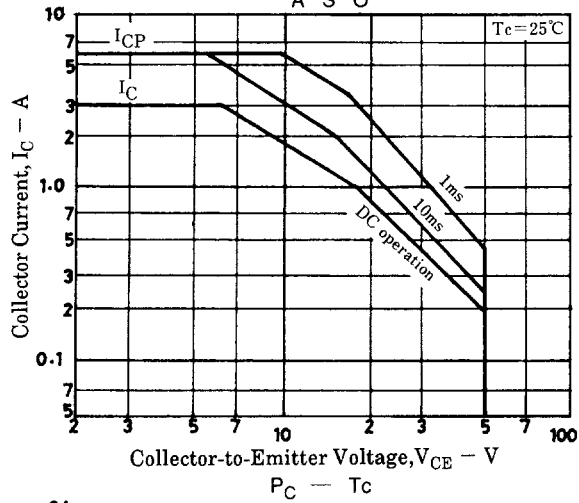
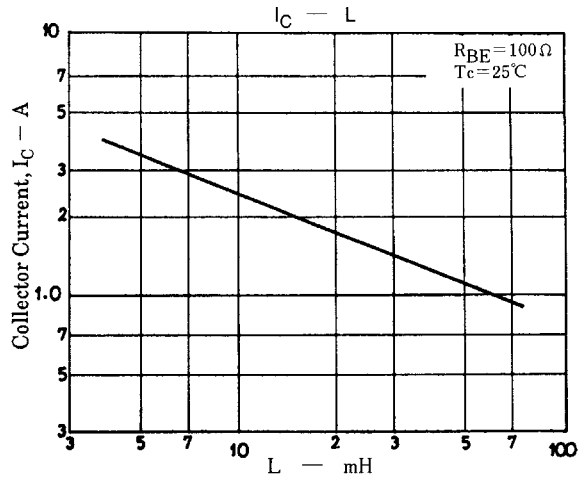
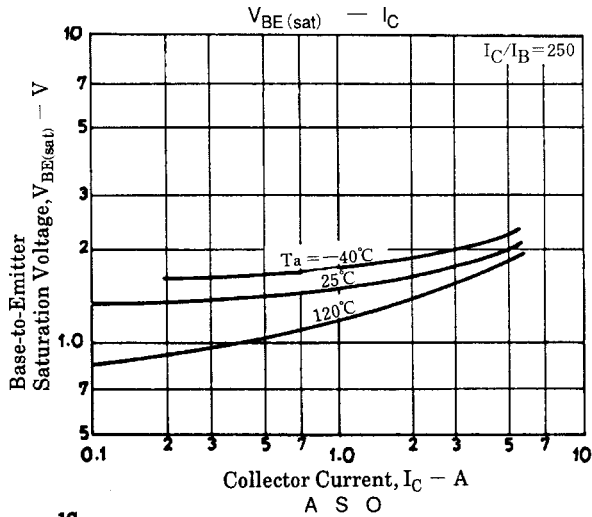
PW = 50  $\mu s$ , Duty Cycle  $\leq 1\%$   
 $I_{B1} = -I_{B2} = 6mA$



## Es/b Test Circuit



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