Ordering number:EN2221B

NPN Planar Silicon Darlington Transistor

2SC3987

Driver Applications

Applications

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

Features

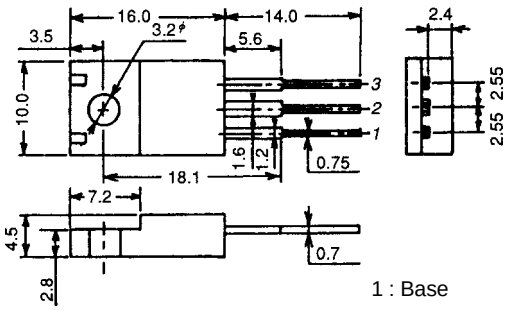
· High DC current gain.
· Large current capacity and wide ASO.
· On-chip Zener diode of 60±10V between collector and base.
· Uniformity in collector-to-base breakdown voltage due to the adoption of an accurate impurity diffusion process.
· High inductive load handling capability.
· Micaless package facilitating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

Package Dimensions

unit:mm

2041A

[2SC3987]



1 : Base
2 : Collector
3 : Emitter
SANYO : TO-220ML

Specifications

Absolute Maximum Ratings at Ta = 25˚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
		Tc=25˚C	20	W
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–55 to +150	˚C

* : With Zener diode (60±10V)

Electrical Characteristics at Ta = 25˚C

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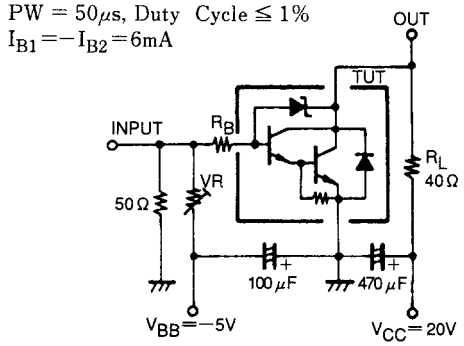
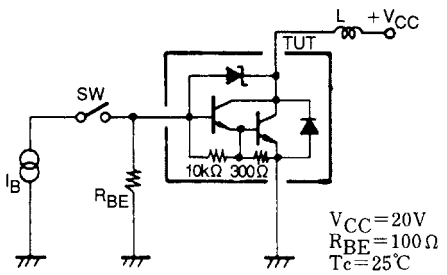
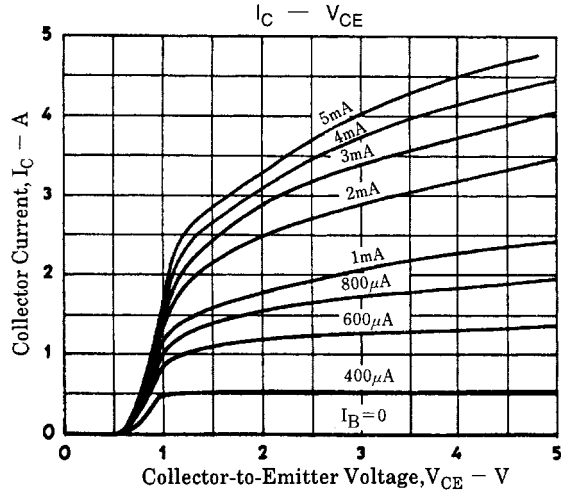
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=0.1mA, I_E=0	50	60	70	V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=1mA, R_{BE}=∞	50	60	70	V
Inductive Load Handling Capability	Es/b	L=100mH, R_{BE}=100Ω	30			mJ
Turn-ON Time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

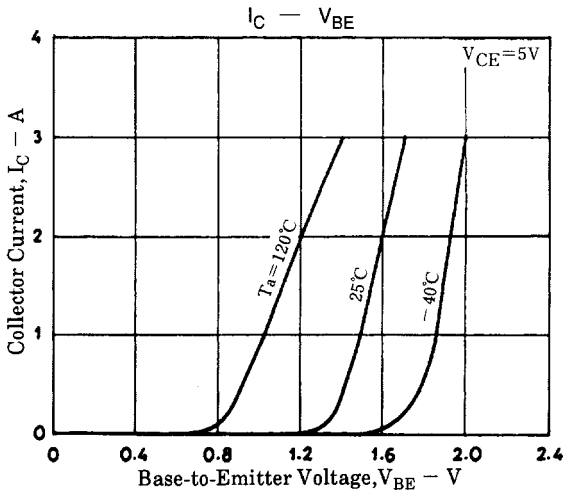
Switching Time Test Circuit

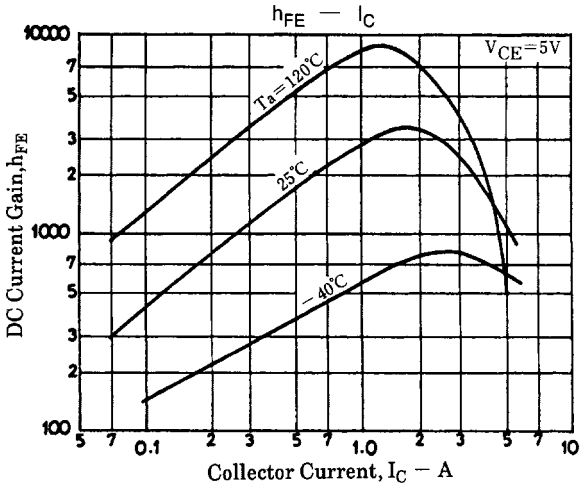


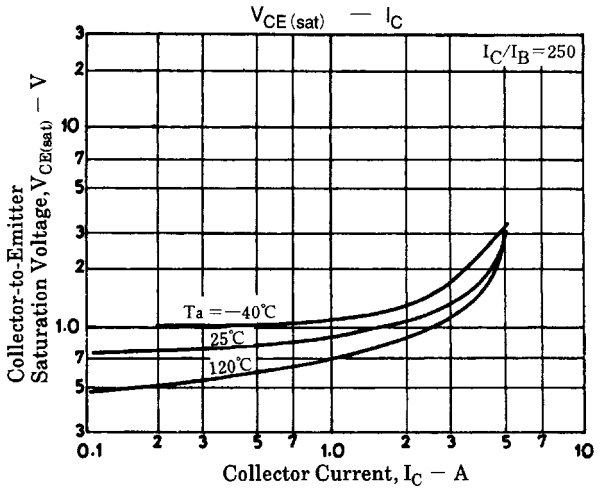
Es/b Test Circuit



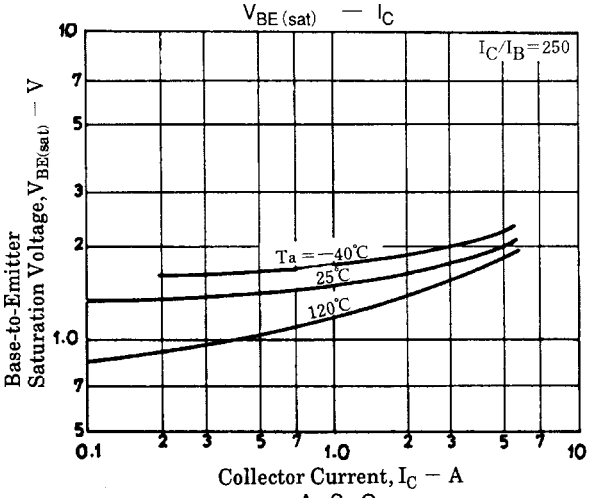




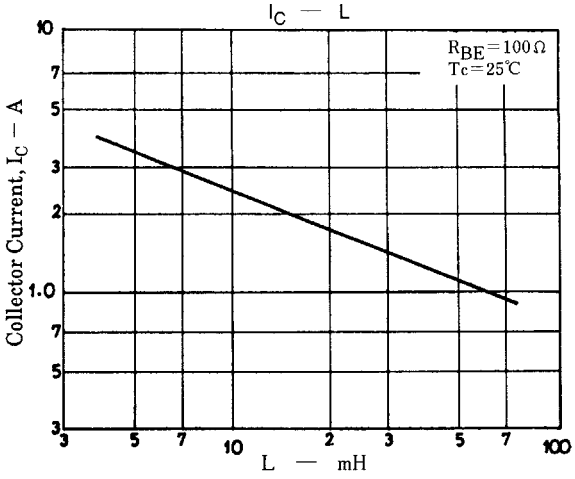




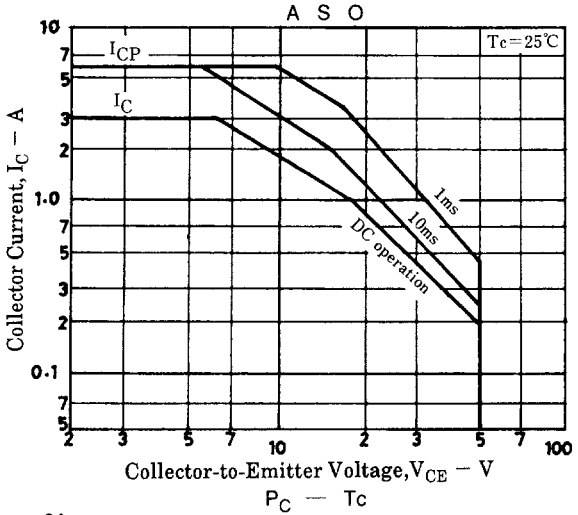
$V_{BE(sat)}$ — I_C



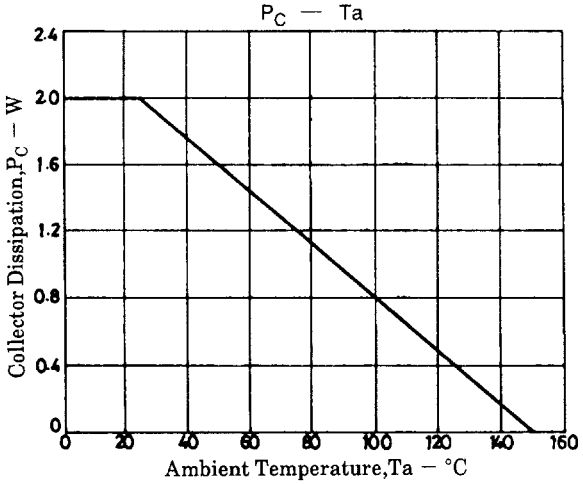
I_C — L



A S O



P_C — Ta



P_C — Tc