

**SANYO**

No.2299A

2 S C 3 7 8 6

NPN Epitaxial Planar Type Silicon Transistor

DRIVER APPLICATIONS

**Applications**

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

**Features**

- High DC current gain
- Wide ASO
- On-chip zener diode of  $60 \pm 10V$  between collector and base
- Uniformity in collector to base breakdown voltage
- Large inductive load handling capability

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

			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	
Peak Collector Current	$i_{cp}$	6	A	
Collector Dissipation	$P_C$	1.2	W	
	$P_C$	$T_c=25^\circ C$	20	W
Junction Temperature	$T_j$	150	$^\circ C$	
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ C$	

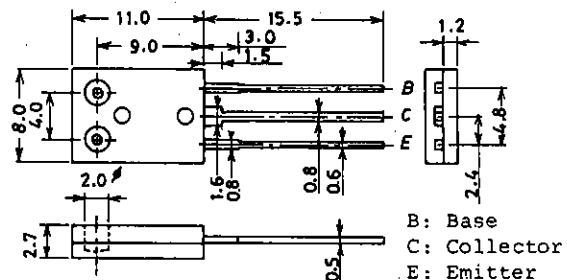
\*: On-chip zener diode ( $60 \pm 10V$ )

**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
Inductive Load	E s/b	$L=100mH, R_{BE}=100ohms$	25			mJ
Handling Capability						
C-B Breakdown Voltage	$V_{(BR)CBO}$	$I_C=100\mu A, I_E=0$	50	60	70	V
C-E Breakdown Voltage	$V_{(BR)CEO}$	$I_C=1mA, R_{BE}=\infty$	50	60	70	V

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**Package Dimensions 2043A  
(unit: mm)**



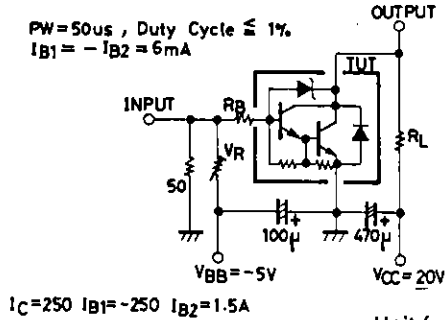
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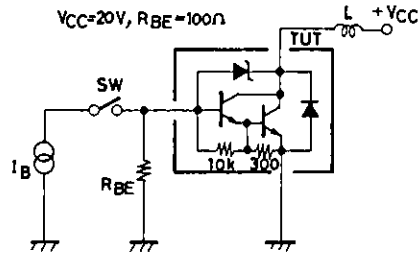
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			min	typ	max	unit
Turn-on Time	$t_{on}$	See specified Test Circuit.		0.2		us
Storage Time	$t_{stg}$	"		3.5		us
Fall Time	$t_f$	"		0.7		us

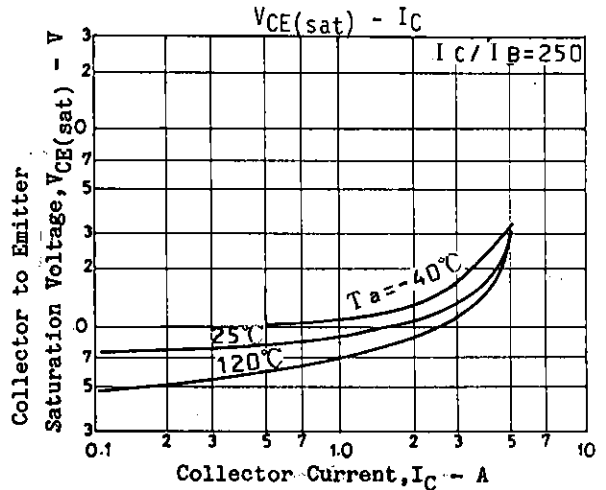
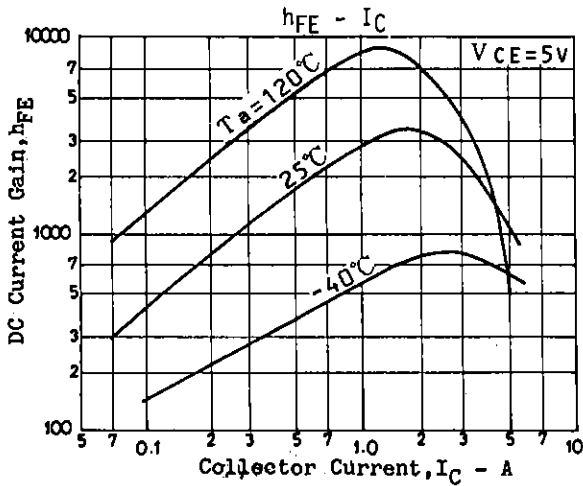
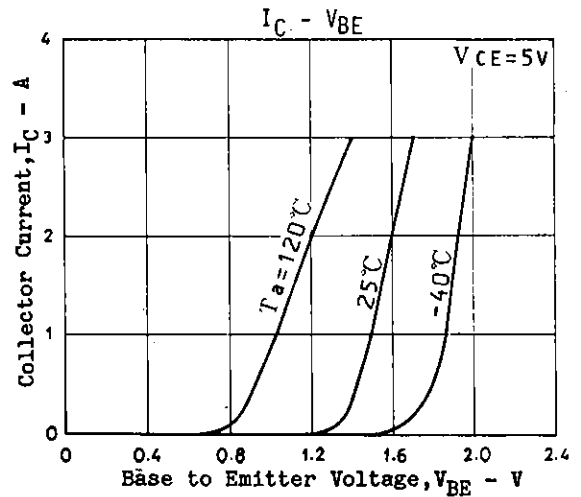
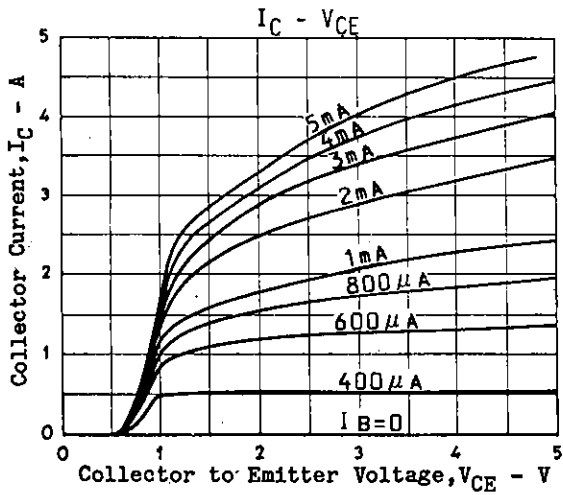
**Switching Time Test Circuit**

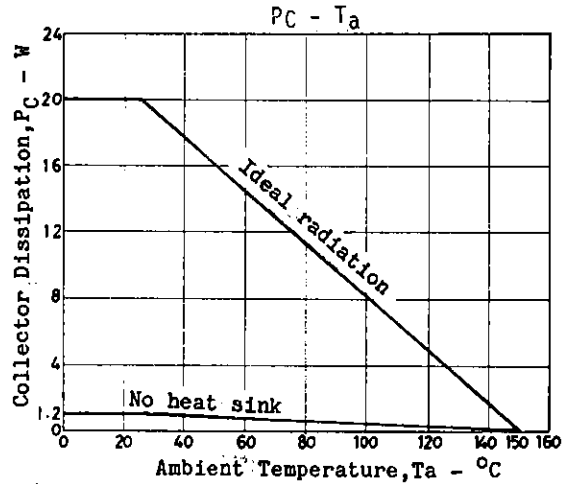
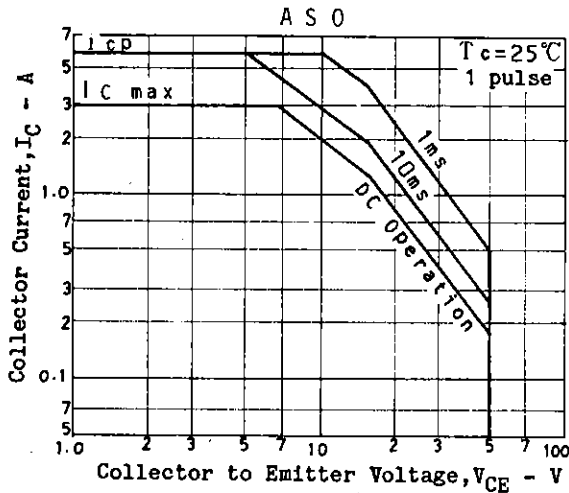
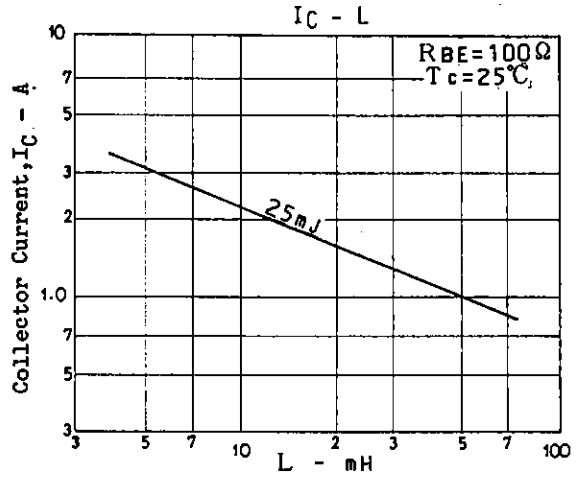
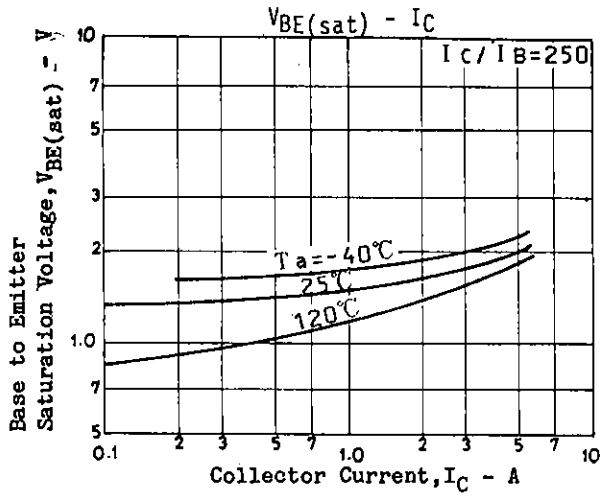


**Es/b Test Circuit**



Unit (resistance:  $\Omega$ , capacitance: F)





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