

**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.

**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	$I_C$		2	A
Collector Current (Pulse)	$I_{CP}$		4	A
Collector Dissipation	$P_C$		1.2	W
		$T_c=25^\circ C$	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  $T_a = 25^\circ C$ 

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	$h_{FE}$	$V_{CE}=5V, I_C=1A$	1000	4000		
Gain-Bandwidth Product	$f_T$	$V_{CE}=5V, I_C=1A$		180		MHz
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=1A, I_B=4mA$		1.0	1.5	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=1A, I_B=4mA$			2.0	V

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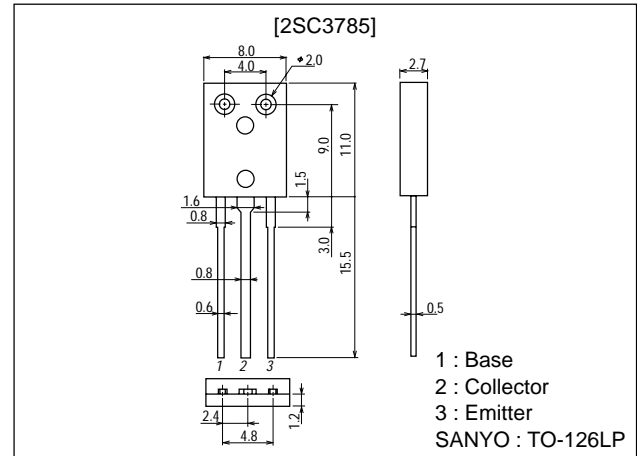
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**Package Dimensions**

unit:mm

2043B



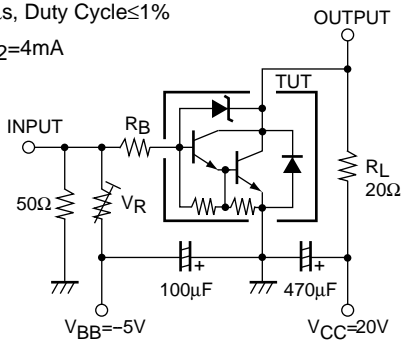
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Inductive Load Handling Capability	Es/b	L=100mH, R <sub>BE</sub> =100Ω	25			mJ
Collector-to-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =100μA, I <sub>E</sub> =0	50	60	70	V
Collector-to-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =1mA, R <sub>BE</sub> =∞	50	60	70	V
Turn-on Time	t <sub>on</sub>	See specified Test Circuit.		0.2		μs
Storage Time	t <sub>stg</sub>	See specified Test Circuit.		3.5		μs
Fall Time	t <sub>f</sub>	See specified Test Circuit.		0.5		μs

## Switching Time Test Circuit

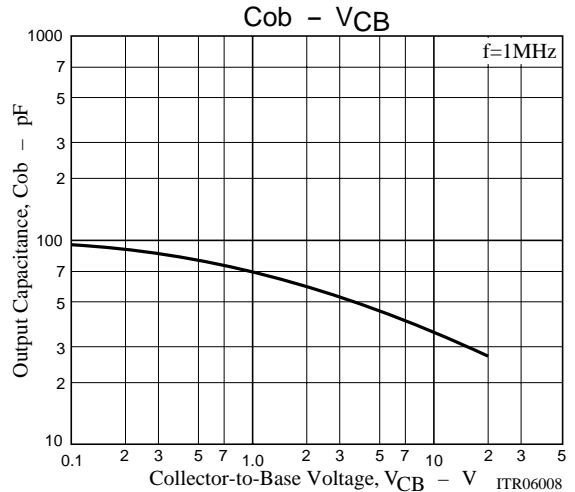
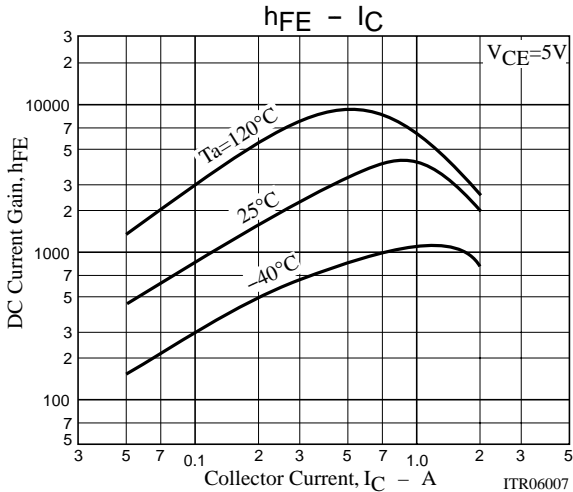
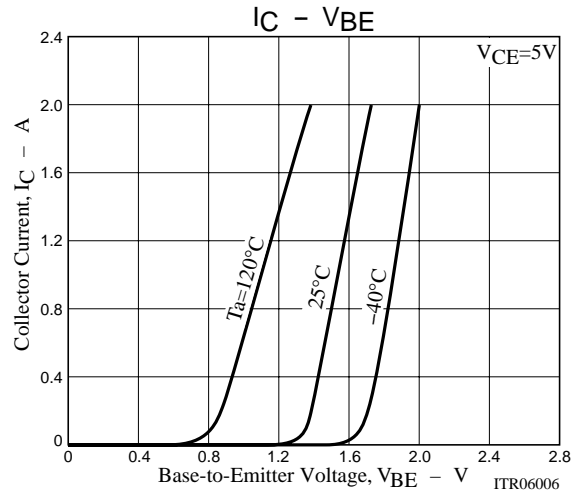
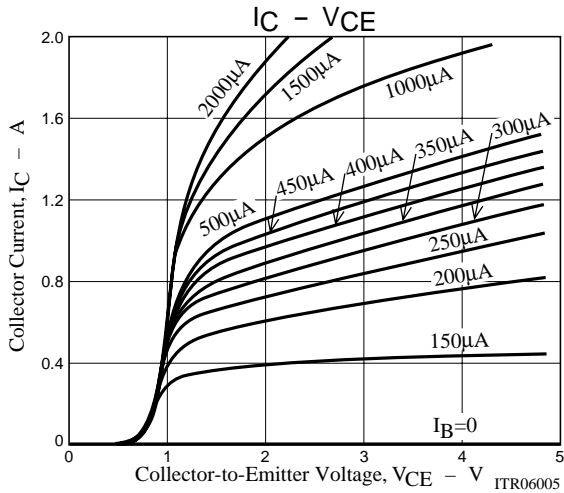
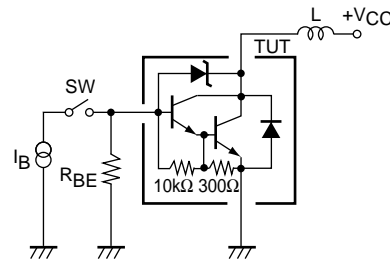
PW=50μs, Duty Cycle≤1%  
I<sub>B1</sub>=-I<sub>B2</sub>=4mA



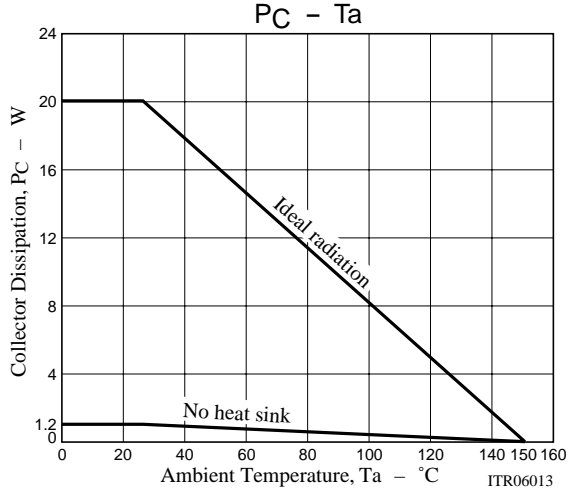
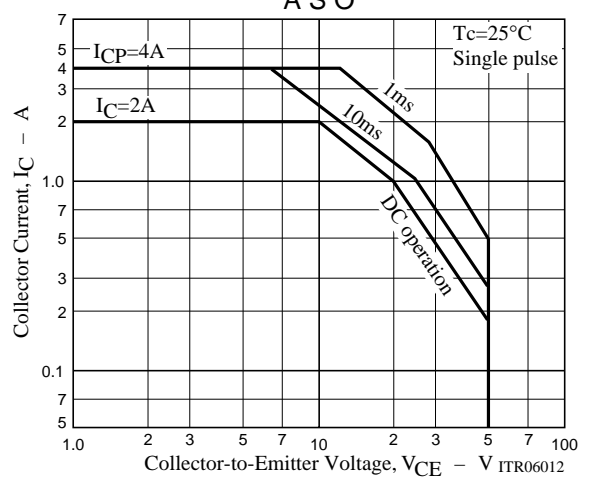
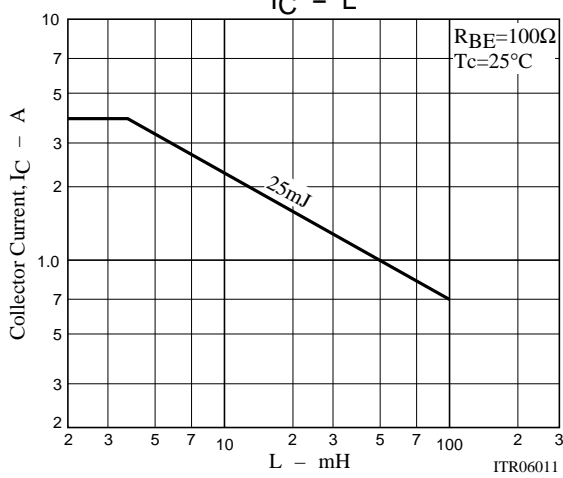
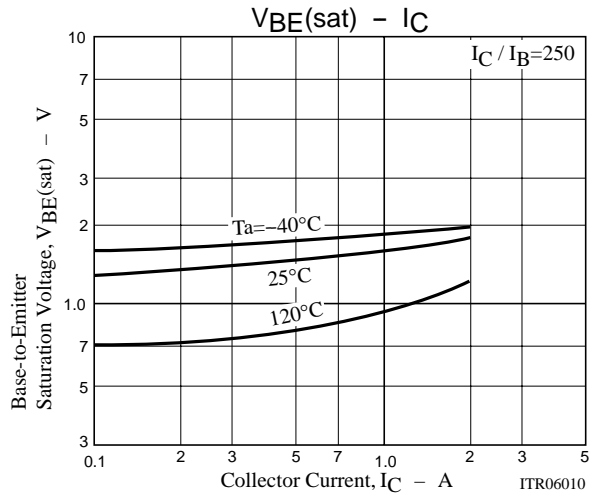
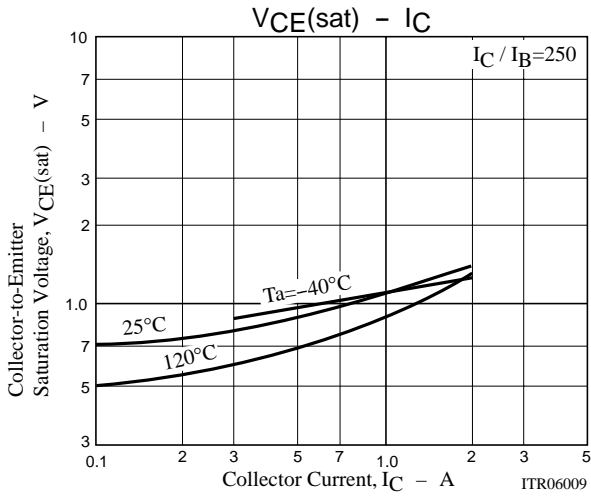
I<sub>C</sub>=250, I<sub>B1</sub>=-250, I<sub>B2</sub>=1A

## Es/b Test Circuit

V<sub>CC</sub>=20V, R<sub>BE</sub>=100Ω



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