Ordering number : ENN2959B

SANYO Semiconductors
DATA SHEET

NPN Triple Diffused Planar Silicon Transistor

2SC4003 — High-Voltage Driver Applications

Features

- High breakdown voltage.
- Adoption of MBIT process.
- Excellent h_{FE} linearity.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		400	V
Collector-to-Emitter Voltage	V_{CEO}		400	V
Emitter-to-Base Voltage	V_{EBO}		5	V
Collector Current	I_C		200	mA
Collector Current (Pulse)	I_{CP}		400	mA
Collector Dissipation	P_C		1	W
		Tc=25°C	10	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=300V, I_E=0			0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=4V, I_C=0			0.1	μA
DC Current Gain	h_{FE}	V_{CE}=10V, I_C=50mA	60*		200*	
Gain-Bandwidth Product	f_T	V_{CE}=30V, I_C=10mA		70		MHz
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=50mA, I_B=5mA			0.6	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=50mA, I_B=5mA			1.0	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=10μA, I_E=0	400			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=1mA, R_{BE}=∞	400			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=10μA, I_C=0	5			V

* : The 2SC4003 is classified by 50mA h_{FE} as follows :

Rank	D	E
h_{FE}	60 to 120	100 to 200

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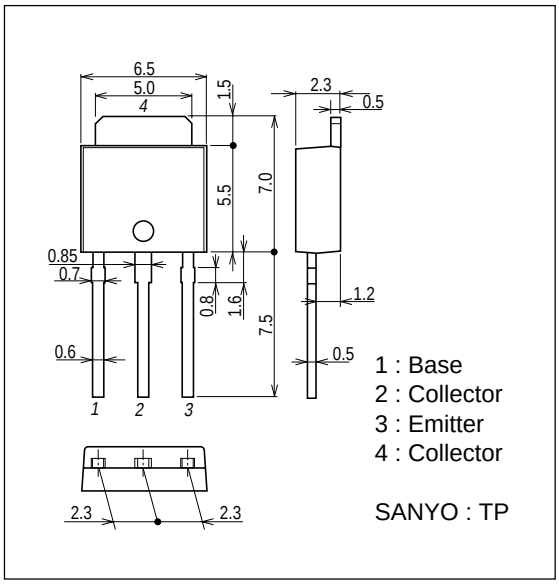
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output Capacitance	C_{ob}	V_{CB}=30V, f=1MHz		4		pF
Reverse Transfer Capacitance	C_{re}	V_{CB}=30V, f=1MHz		3		pF
Turn-ON Time	t_{on}	See specified test circuit.		0.25		µs
Turn-OFF Time	t_{off}	See specified test circuit.		5.0		µs

Package Dimensions

unit : mm

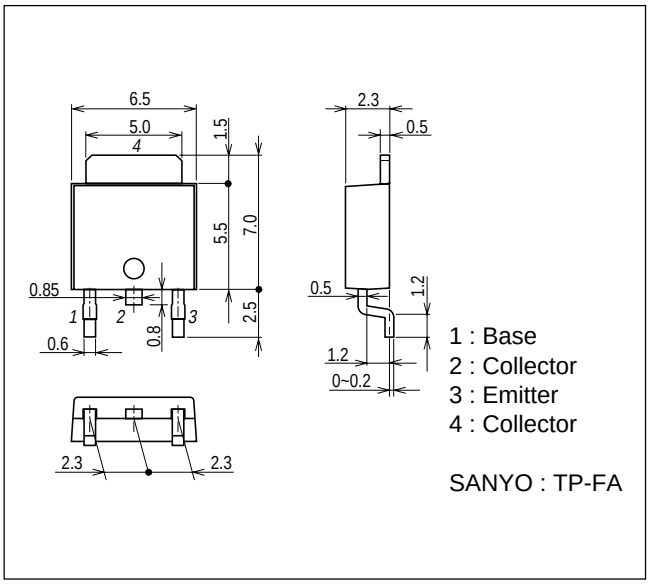
2045B



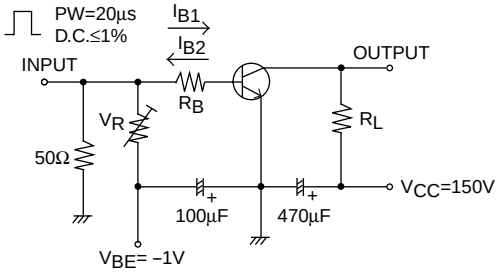
Package Dimensions

unit : mm

2044B

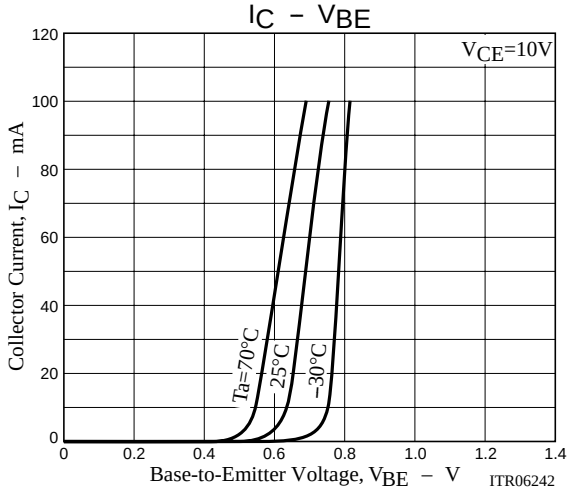


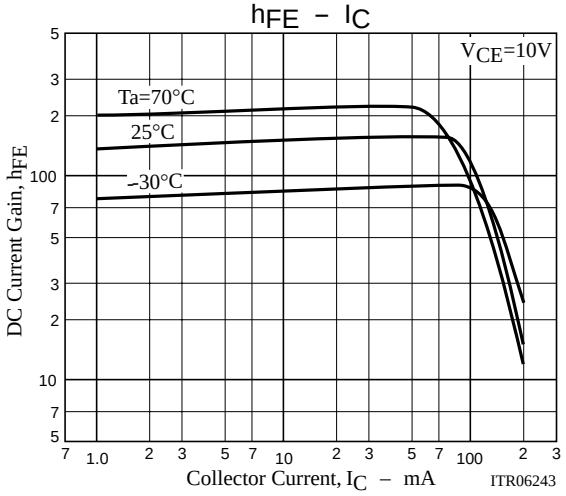
Switching Time Test Circuit

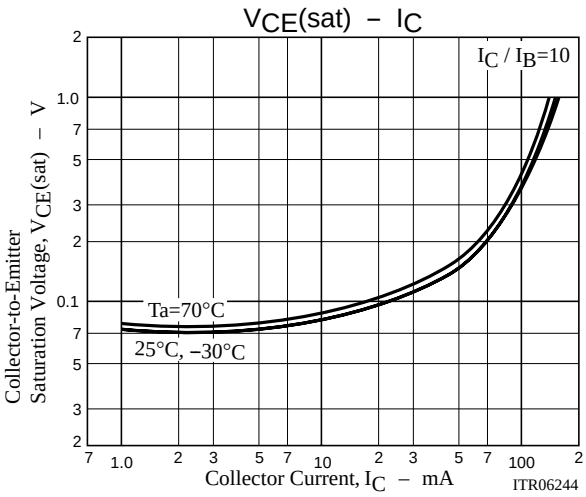


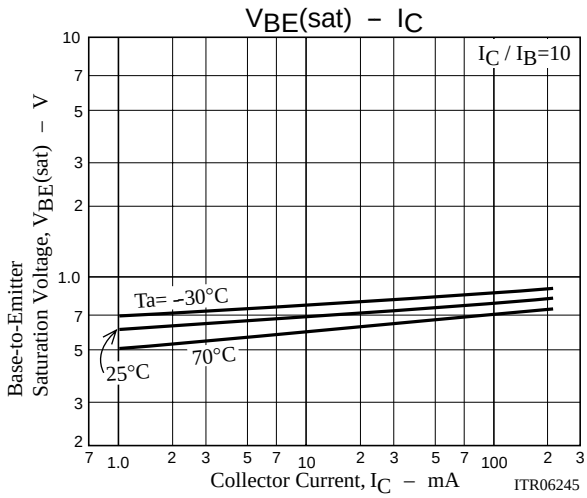
$10I_{B1} = -10I_{B2} = I_C = 50mA$

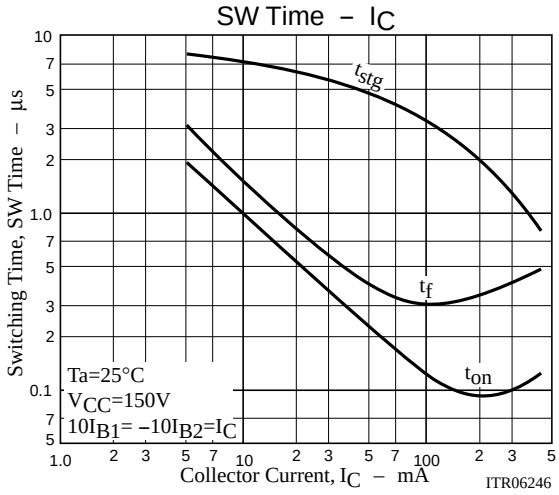
$R_L = 3k\Omega$, $R_B = 200\Omega$ at $I_C = 50mA$

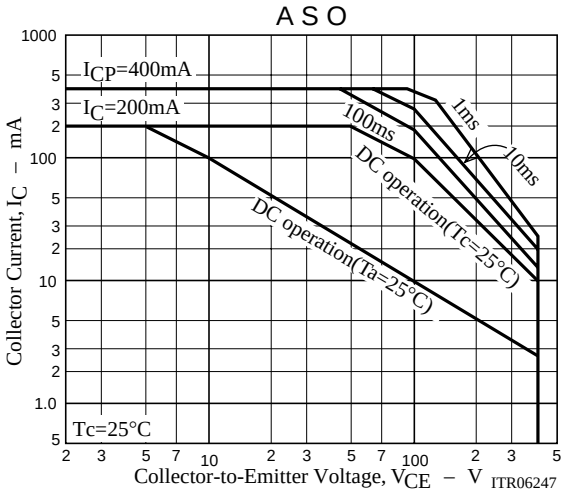


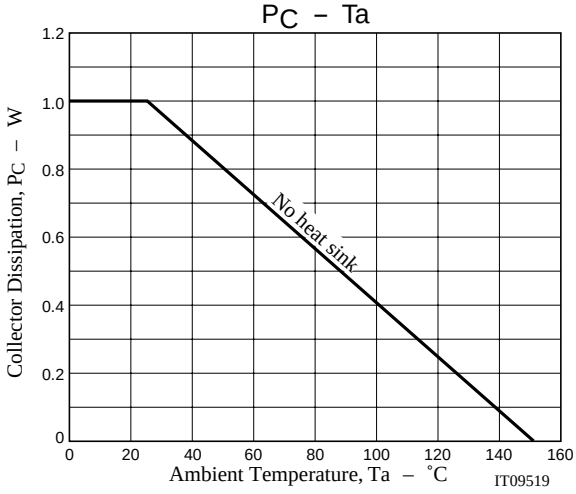


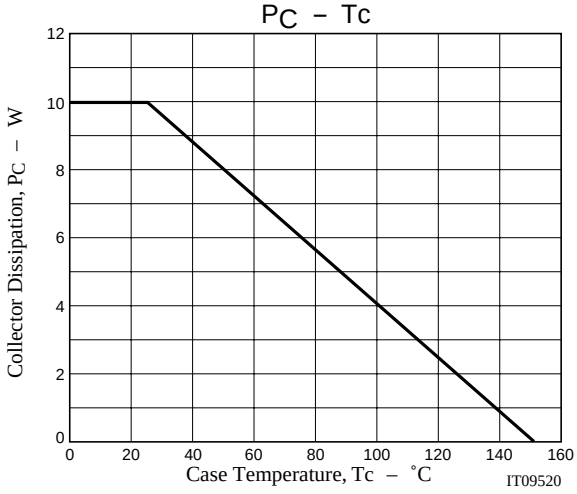

VCE(sat) – IC
IC / IB=10
Ta=70°C
25°C, –30°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – mA
ITR06244


VBE(sat) – IC
IC / IB=10
Ta= –30°C
25°C
70°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – mA
ITR06245


SW Time – IC
tstg
tf
ton
Ta=25°C
VCC=150V
10IB1= –10IB2=IC
Switching Time, SW Time – µs
Collector Current, IC – mA
ITR06246


A S O
ICP=400mA
IC=200mA
1ms
10ms
100ms
DC operation(Tc=25°C)
DC operation(Ta=25°C)
Tc=25°C
Collector Current, IC – mA
Collector-to-Emitter Voltage, VCE – V
ITR06247


PC – Ta
No heat sink
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT09519


PC – Tc
Collector Dissipation, PC – W
Case Temperature, Tc – °C
IT09520