Ordering number : ENN1970B

NPN Triple Diffused Planar Silicon Transistor

2SC3751

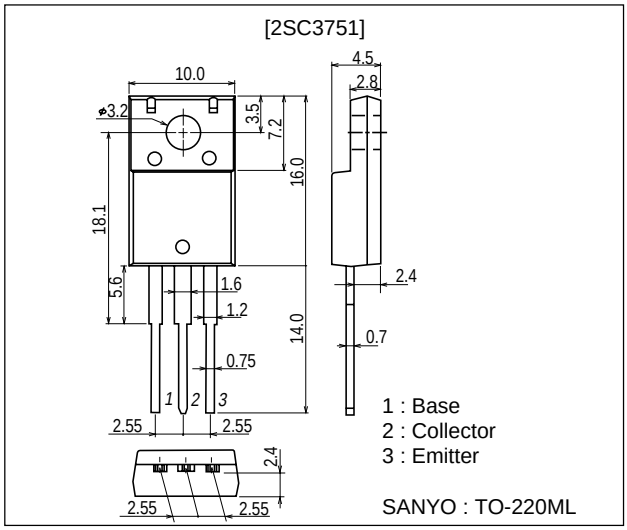
800V / 1.5A Switching Regulator Applications

Features

- High breakdown voltage and high reliability.
- Fast switching speed.
- Wide ASO.
- Adoption of MBIT process.
- Micaless package facilitating mounting.

Package Dimensions

unit : mm
2041A



Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		1100	V
Collector-to-Emitter Voltage	V_{CEO}		800	V
Emitter-to-Base Voltage	V_{EBO}		7	V
Collector Current	I_C		1.5	A
Collector Current (Pulse)	I_{CP}	PW≤300μs, Duty Cycle≤10%	5	A
Base Current	I_B		0.8	A
Collector Dissipation	P_C	Tc=25°C	25	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}=800V, I_E=0			10	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=5V, I_C=0			10	μA

Continued on next page.

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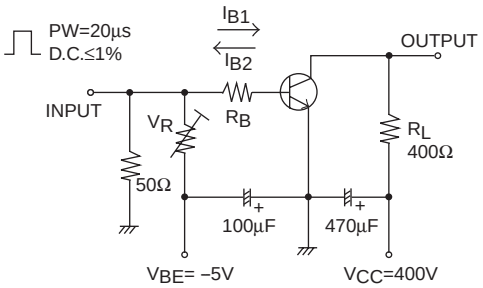
Continued from preceding page.

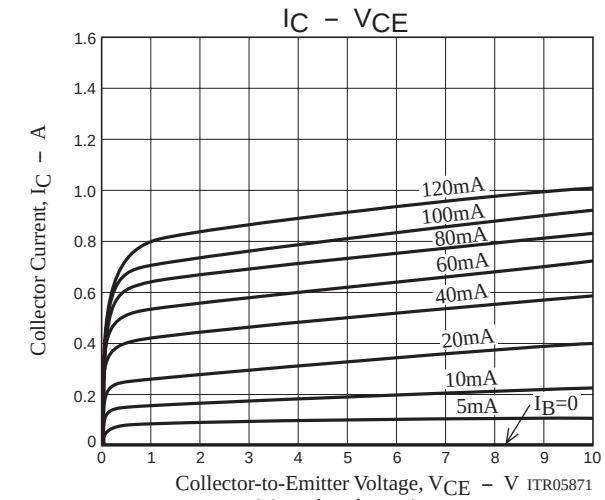
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	$h_{FE}1$	V_{CE}=5V, I_C=0.1A	10*		40*	
	$h_{FE}2$	V_{CE}=5V, I_C=0.5A	8			
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=0.1A		15		MHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		35		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=0.75A, I_B=0.15A			2.0	V
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=0.75A, I_B=0.15A			1.5	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=1mA, I_E=0	1100			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=5mA, R_{BE}=∞	800			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=1mA, I_C=0	7			V
Collector-to-Emitter Sustain Voltage	V_{CEX}(sus)	I_C=0.75A, I_{B1}=-I_{B2}=0.15A, L=5mH, clamped	800			V
Turn-On Time	t_{on}	V_{CC}=400V, 5I_{B1}=-2.5I_{B2}=I_C=1A, R_L=400Ω			0.5	μs
Storage Time	t_{stg}	V_{CC}=400V, 5I_{B1}=-2.5I_{B2}=I_C=1A, R_L=400Ω			3.0	μs
Fall Time	t_f	V_{CC}=400V, 5I_{B1}=-2.5I_{B2}=I_C=1A, R_L=400Ω			0.3	μs

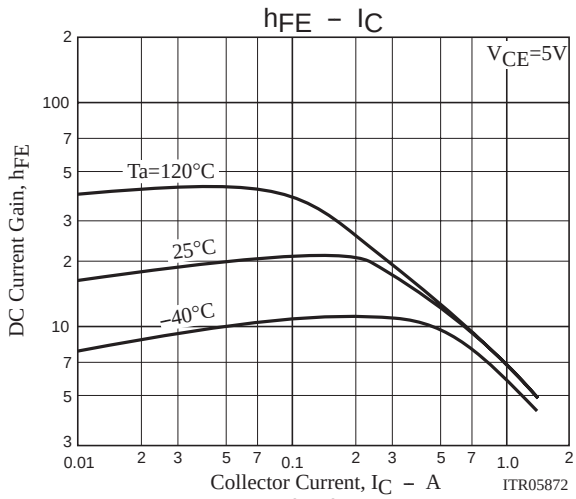
* : The $h_{FE}1$ of the 2SC3751 is classified as follows. When specifying the $h_{FE}1$ rank, specify two ranks or more in principle.

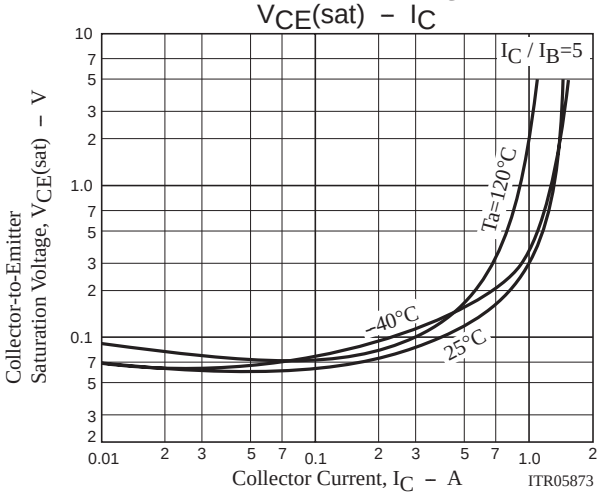
Rank	K	L	M
h_{FE}	10 to 20	15 to 30	20 to 40

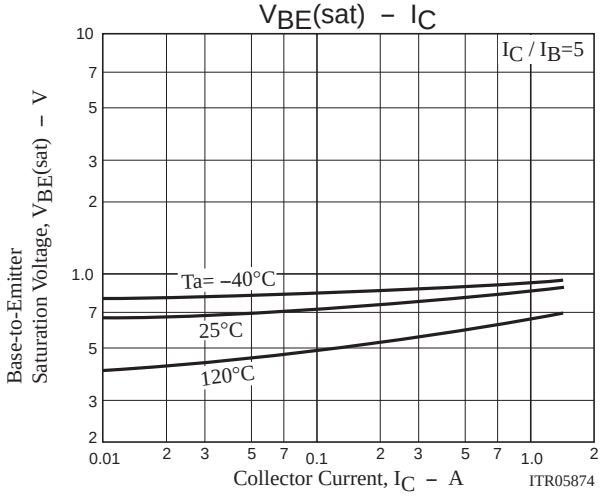
Switching Time Test Circuit

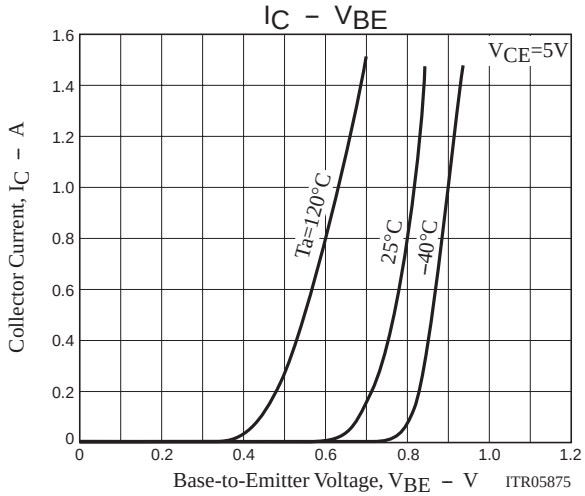


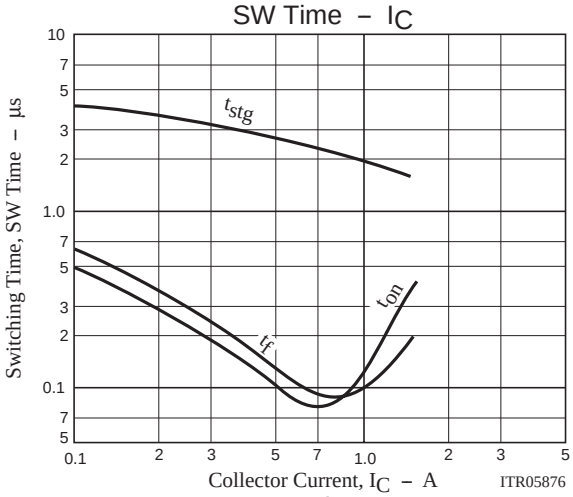


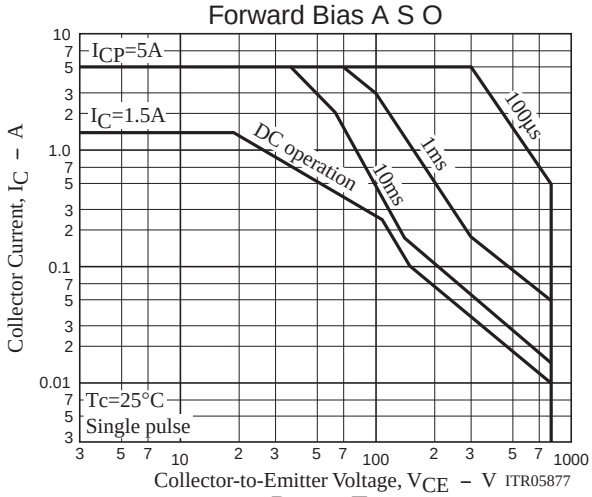


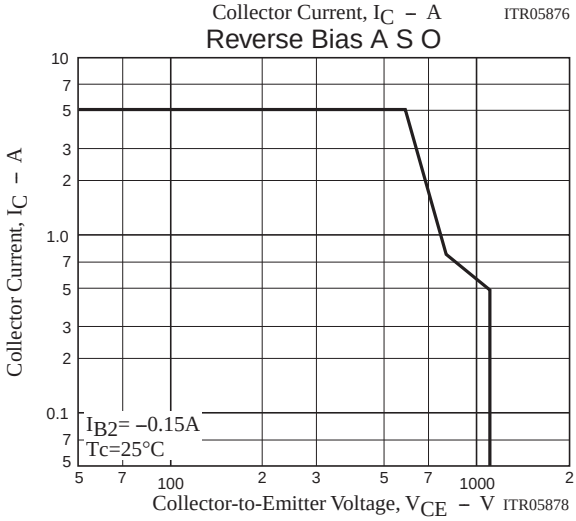


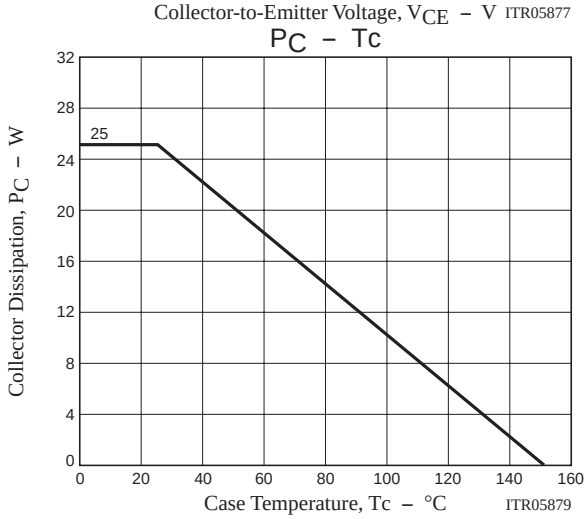



IC – VBE
VCE=5V
Ta=120°C
25°C
–40°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
ITR05875


SW Time – IC
tstg
tf
ton
Switching Time, SW Time – µs
Collector Current, IC – A
ITR05876


Forward Bias A S O
ICP=5A
IC=1.5A
DC operation
10ms
1ms
100µs
Tc=25°C
Single pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR05877


Reverse Bias A S O
IB2= –0.15A
Tc=25°C
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR05878


PC – Tc
25
Collector Dissipation, PC – W
Case Temperature, Tc – °C
ITR05879