

Silicon NPN Power Transistors

2SC3678

DESCRIPTION

- With TO-3PN package
- High voltage switching transistor

APPLICATIONS

- Switching regulator and general purpose applications

PINNING

PIN	DESCRIPTION
1	Base
2	Collector;connected to mounting base
3	Emitter

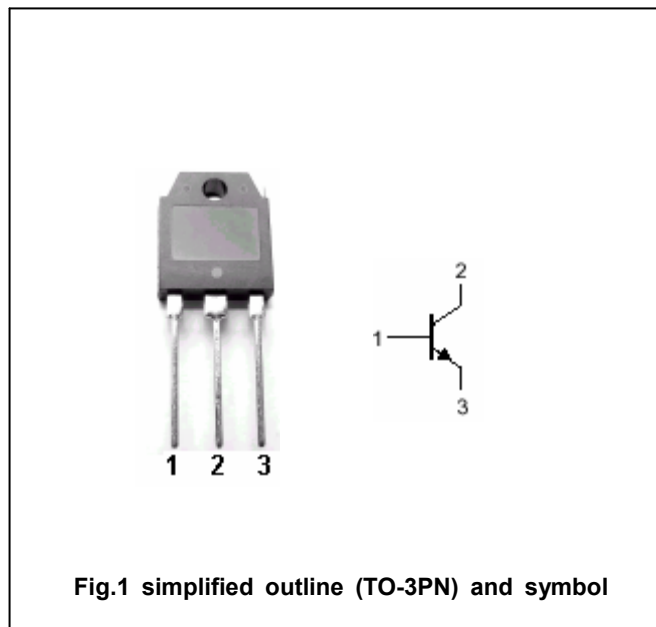


Fig.1 simplified outline (TO-3PN) and symbol

Absolute maximum ratings(Ta=□)

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
V_{CBO}	Collector-base voltage	Open emitter	900	V
V_{CEO}	Collector-emitter voltage	Open base	800	V
V_{EBO}	Emitter-base voltage	Open collector	7	V
I_C	Collector current		3	A
I_{CM}	Collector current-pulse		6	A
I_B	Base current		1.5	A
P_C	Collector power dissipation	$T_C=25^\circ$	80	W
T_j	Junction temperature		150	□
T_{stg}	Storage temperature		-55~150	□

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CHARACTERISTICS

T_j=25°C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
V _{(BR)CEO}	Collector-emitter breakdown voltage	I _C =10mA; I _B =0	800			V
V _{CEsat}	Collector-emitter saturation voltage	I _C =1A; I _B =0.2A			0.5	V
V _{BEsat}	Base-emitter saturation voltage	I _C =1A; I _B =0.2A			1.2	V
I _{CBO}	Collector cut-off current	V _{CB} =800V; I _E =0			100	μA
I _{EBO}	Emitter cut-off current	V _{EB} =7V; I _C =0			100	μA
h _{FE}	DC current gain	I _C =1A; V _{CE} =4V	10		30	
C _{ob}	Output capacitance	I _E =0; V _{CB} =10V; f=1MHz		50		pF
f _T	Transition frequency	I _E =-0.3A; V _{CE} =12V		6		MHz

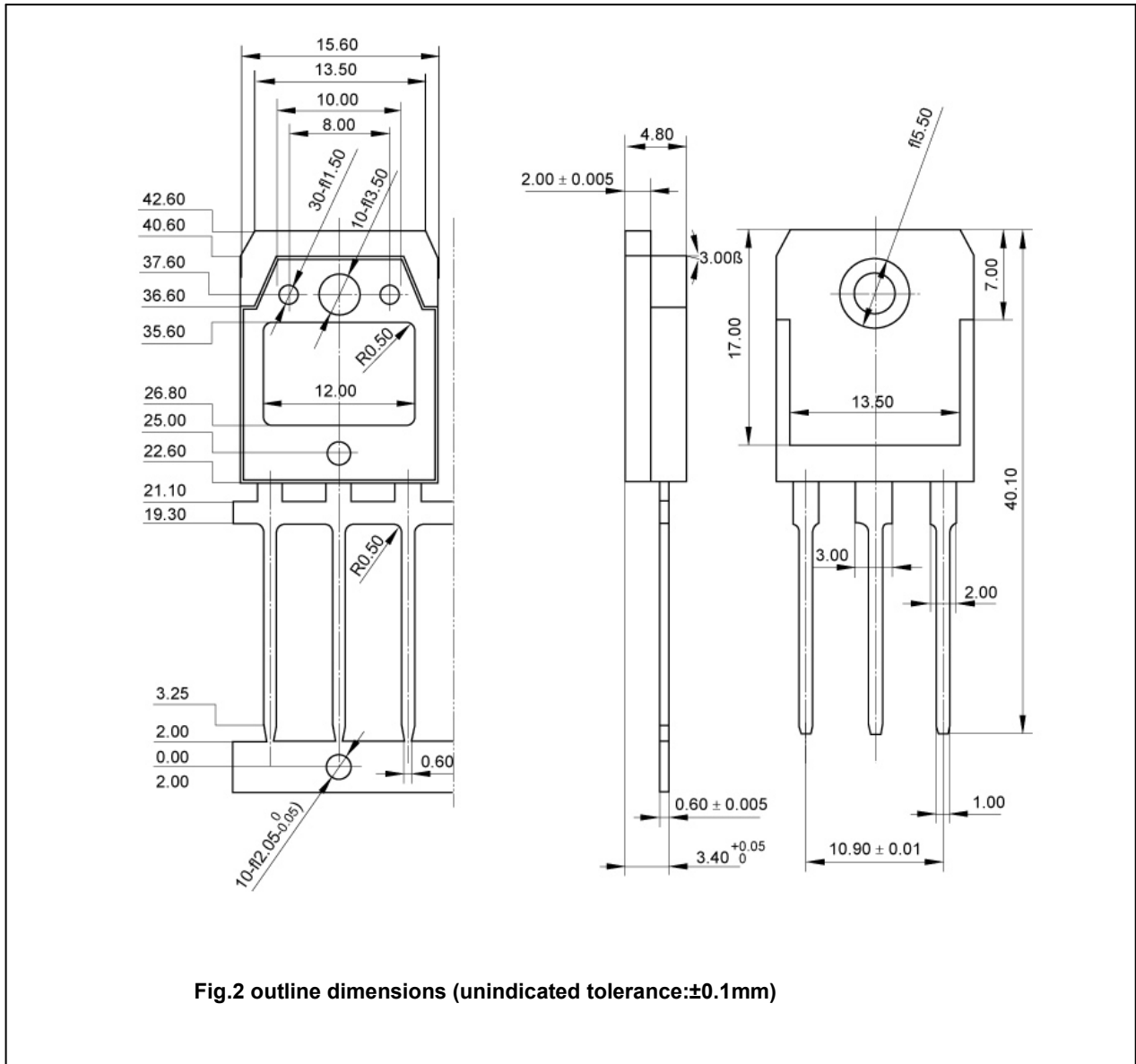
Switching times

t _{on}	Turn-on time	I _C =1A; I _{B1} =0.15A; I _{B2} =-0.5A R _L =250Ω, V _{CC} =250V			1.0	μs
t _s	Storage time				5.0	μs
t _f	Fall time				1.0	μs

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PACKAGE OUTLINE



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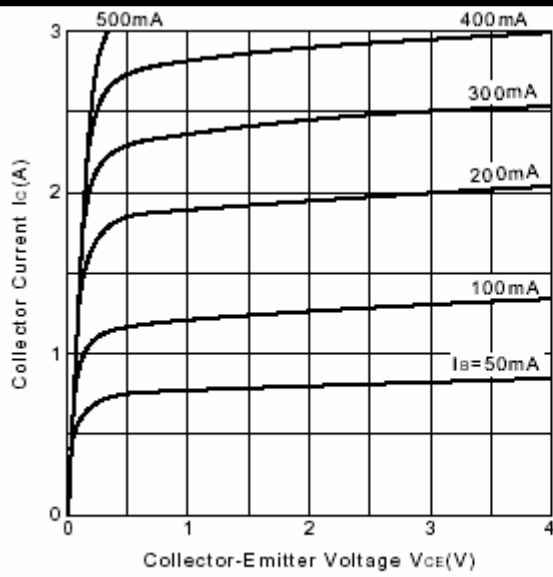


Fig.3 Static Characteristic

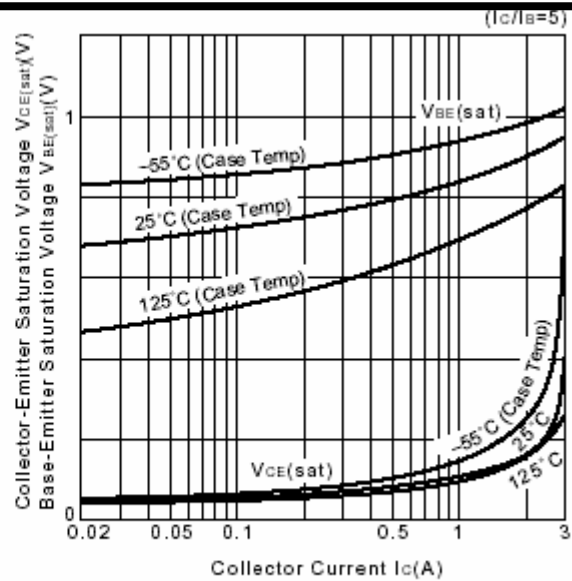


Fig.4 Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage

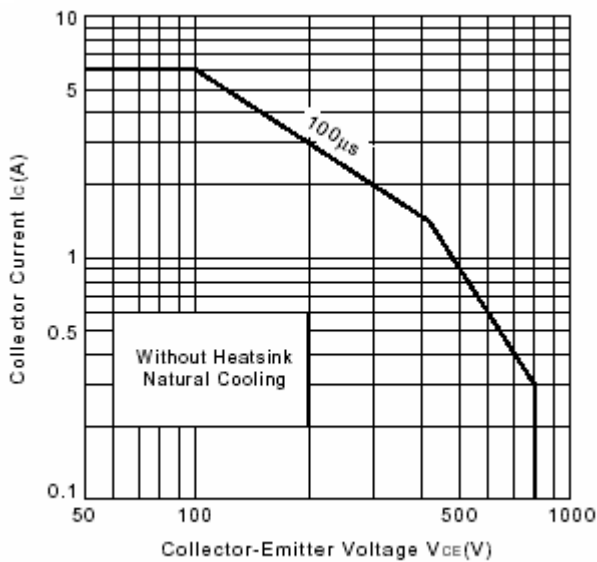


Fig.5 Safe Operating Area

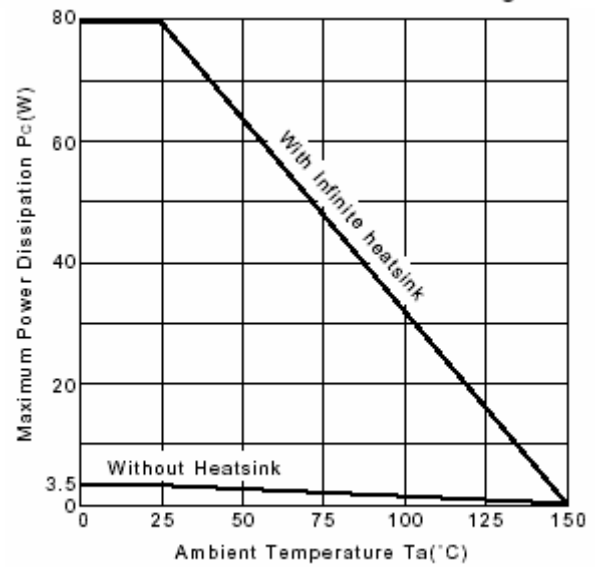


Fig.6 Pc-Ta Derating

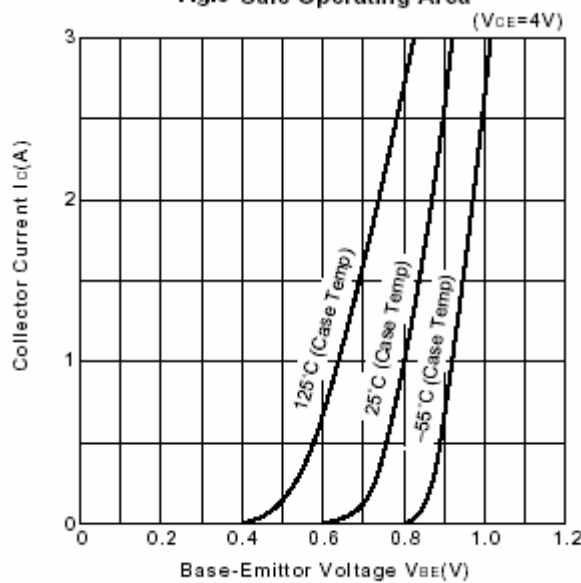


Fig.7 $I_c - V_{BE}$

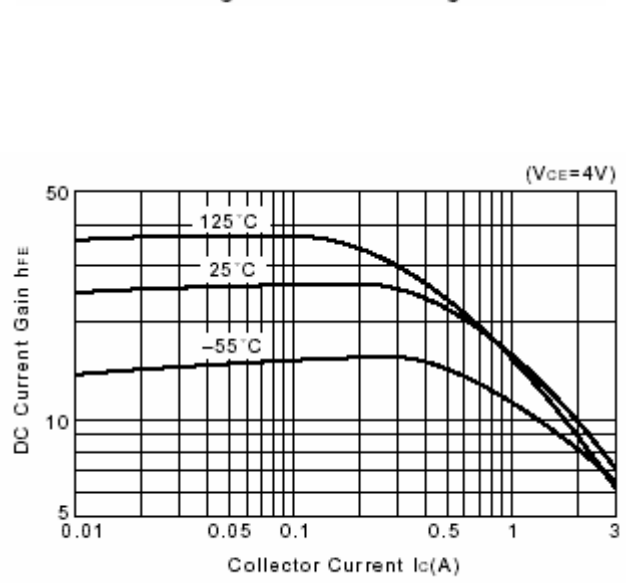


Fig.8 DC current Gain

2SC3678

Silicon NPN Triple Diffused Planar Transistor (High Voltage Switching Transistor)

Application : Switching Regulator and General Purpose

Absolute maximum ratings (Ta=25°C)

Symbol	2SC3678	Unit
V _{CB0}	900	V
V _{CE0}	800	V
V _{EBO}	7	V
I _c	3(Pulse6)	A
I _B	1.5	A
P _c	80(Tc=25°C)	W
T _J	150	°C
T _{stg}	-55 to +150	°C

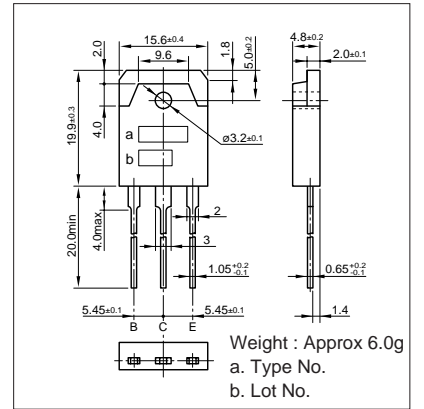
Electrical Characteristics (Ta=25°C)

Symbol	Conditions	2SC3678	Unit
I _{CB0}	V _{CB} =800V	100max	μA
I _{EBO}	V _{EB} =7V	100max	μA
V _{(BR)CEO}	I _c =10mA	800min	V
h _{FE}	V _{CE} =4V, I _c =1A	10 to 30	
V _{CE(sat)}	I _c =1A, I _B =0.2A	0.5max	V
V _{BE(sat)}	I _c =1A, I _B =0.2A	1.2max	V
f _r	V _{CE} =12V, I _E =-0.3A	6typ	MHz
COB	V _{CB} =10V, f=1MHz	50typ	pF

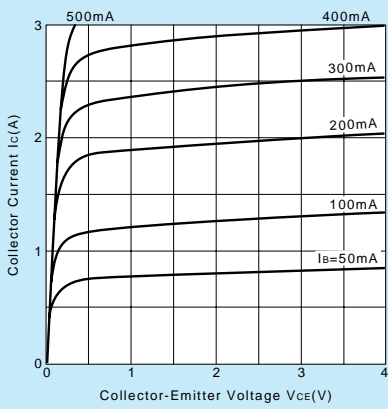
Typical Switching Characteristics (Common Emitter)

V _{CC} (V)	R _L (Ω)	I _c (A)	V _{BB1} (V)	V _{BB2} (V)	I _{B1} (A)	I _{B2} (A)	t _{on} (μs)	t _{stg} (μs)	t _r (μs)
250	250	1	10	-5	0.15	-0.5	1max	5max	1max

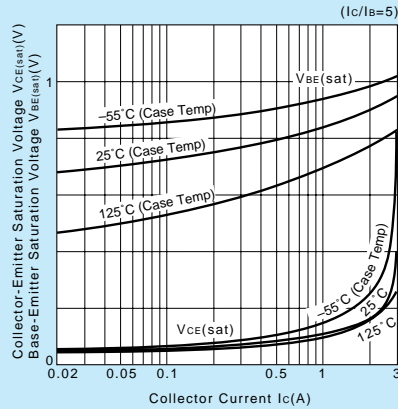
External Dimensions MT-100(TO3P)



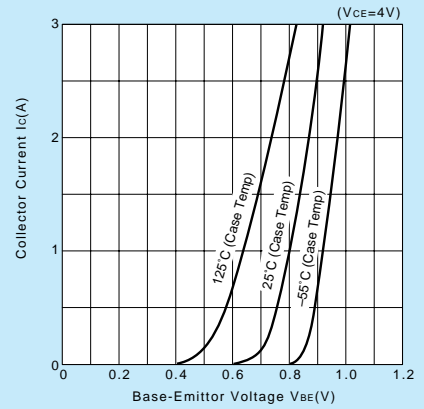
I_c-V_{CE} Characteristics (Typical)



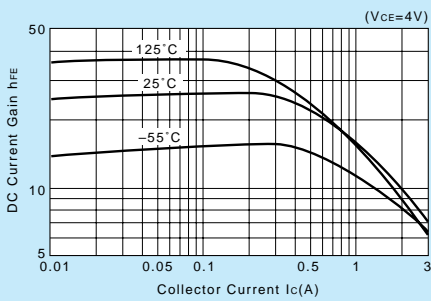
V_{CE(sat)}, V_{BE(sat)}-I_c Temperature Characteristics (Typical)



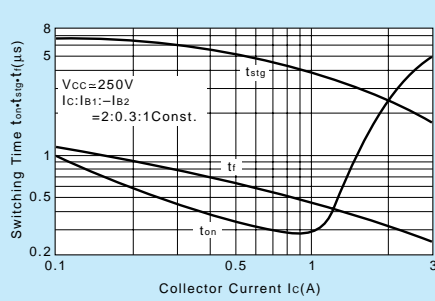
I_c-V_{BE} Temperature Characteristics (Typical)



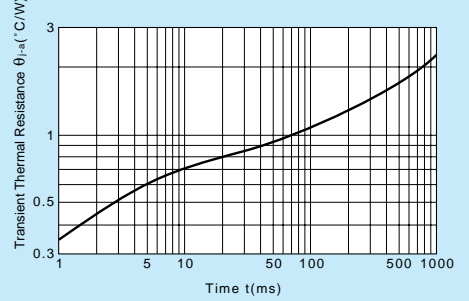
h_{FE}-I_c Characteristics (Typical)



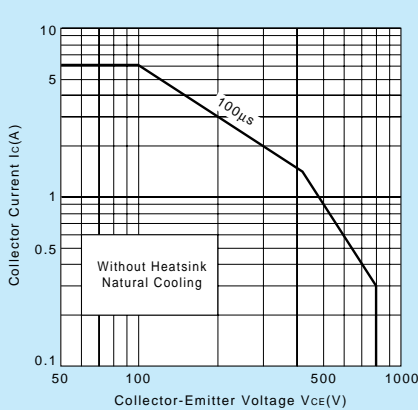
t_{on}•t_{stg}•t_r-I_c Characteristics (Typical)



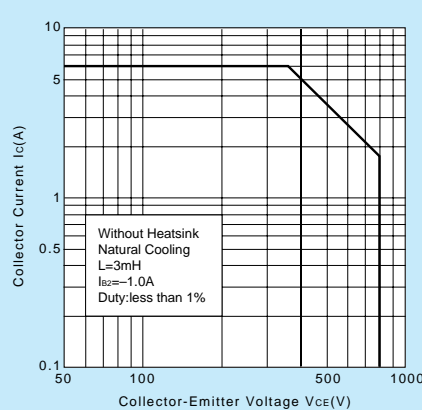
θ_{J-a}-t Characteristics



Safe Operating Area (Single Pulse)



Reverse Bias Safe Operating Area



P_c-T_a Derating

