

Silicon NPN Power Transistors

2SC4004

DESCRIPTION

- With TO-220Fa package
- Satisfactory linearity of forward current transfer ratio h_{FE}
- Wide area of safe operation (ASO)
- High-speed switching
- High collector to base voltage V_{CBO}

APPLICATIONS

- For high breakdown voltage high-speed switching

PINNING

PIN	DESCRIPTION
1	Base
2	Collector
3	Emitter

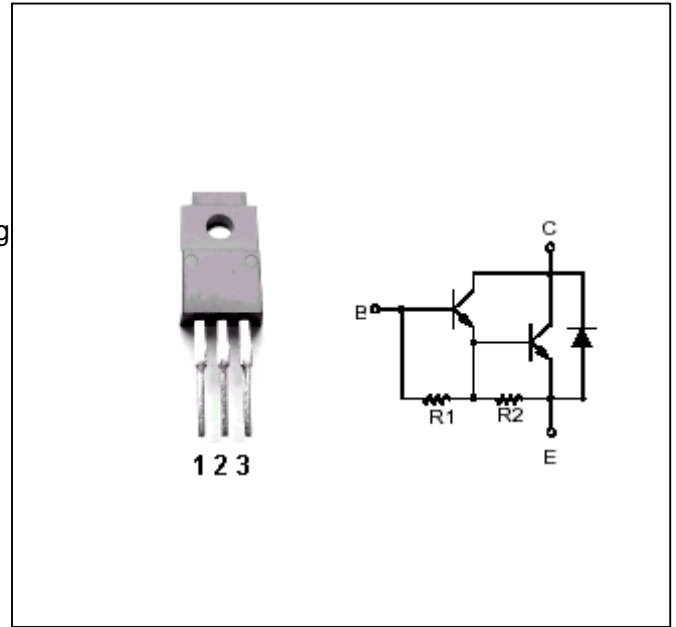


Fig.1 simplified outline (TO-220Fa) and symbol

ABSOLUTE MAXIMUM RATINGS AT $T_c=25$

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
V_{CBO}	Collector-base voltage	Open emitter	900	V
V_{CEO}	Collector-emitter voltage	Open base	900	V
V_{CES}			800	V
V_{EBO}	Emitter-base voltage	Open collector	7	V
I_C	Collector current (DC)		1	A
I_{CM}	Collector current-Peak		2	A
I_B	Base current		0.3	A
P_C	Collector power dissipation	$T_c=25$	30	W
		$T_a=25$	2	W
T_j	Junction temperature		150	
T_{stg}	Storage temperature		-55-150	

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CHARACTERISTICS

T_j=25

unless

otherwise

specified

Symbol	Conditions	min	typ	max	Unit
I _{CBO}	V _{CB} = 900V, I _E = 0			50	μA
I _{EBO}	V _{EB} = 7V, I _C = 0			50	μA
V _{CEO}	I _C = 1mA, I _B = 0	800			V
h _{FE1}	V _{CE} = 5V, I _C = 0.05A	6			
h _{FE2}	V _{CE} = 5V, I _C = 0.5A	3			
V _{CE(sat)}	I _C = 0.2A, I _B = 0.04A			1.5	V
V _{BE(sat)}	I _C = 0.2A, I _B = 0.04A			1.0	V
f _T	V _{CE} = 10V, I _C = 0.05A, f = 1MHz		4		MHz
t _{on}	I _C = 0.2A, I _{B1} = 0.04A, I _{B2} = -0.04A, V _{CC} = 250V			1.0	μs
t _{stg}				3.0	μs
t _f				1.0	μs

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
V _{CEO}	Collector-emitter breakdown voltage	I _C =1mA, I _B =0	800			V
V _{CEsat}	Collector-emitter saturation voltage	I _C =0.2A I _B =0.04A			1.5	V
V _{BEsat}	Base-emitter saturation voltage	I _C =0.2A I _B =0.04A			1.0	V
I _{CBO}	Collector cut-off current	V _{CB} =900V I _E =0			50	μA
I _{EBO}	Emitter cut-off current	V _{EB} =7V; I _C =0			50	μA
h _{FE-1}	DC current gain	I _C =0.05A; V _{CE} =5V	6			
h _{FE-2}	DC current gain	I _C =0.5A; V _{CE} =5V	3			
f _T	Transition frequency	I _C =0.05A; V _{CE} =10V;f=1MHz		4		MHz

Switching times

t _{on}	Turn-on time	I _C =0.2A; I _{B1} =0.04A I _{B2} =-0.04A; V _{CC} =250V			1.0	μs
t _s	Storage time				3.0	μs
t _f	Fall time				1.0	μs

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PACKAGE OUTLINE

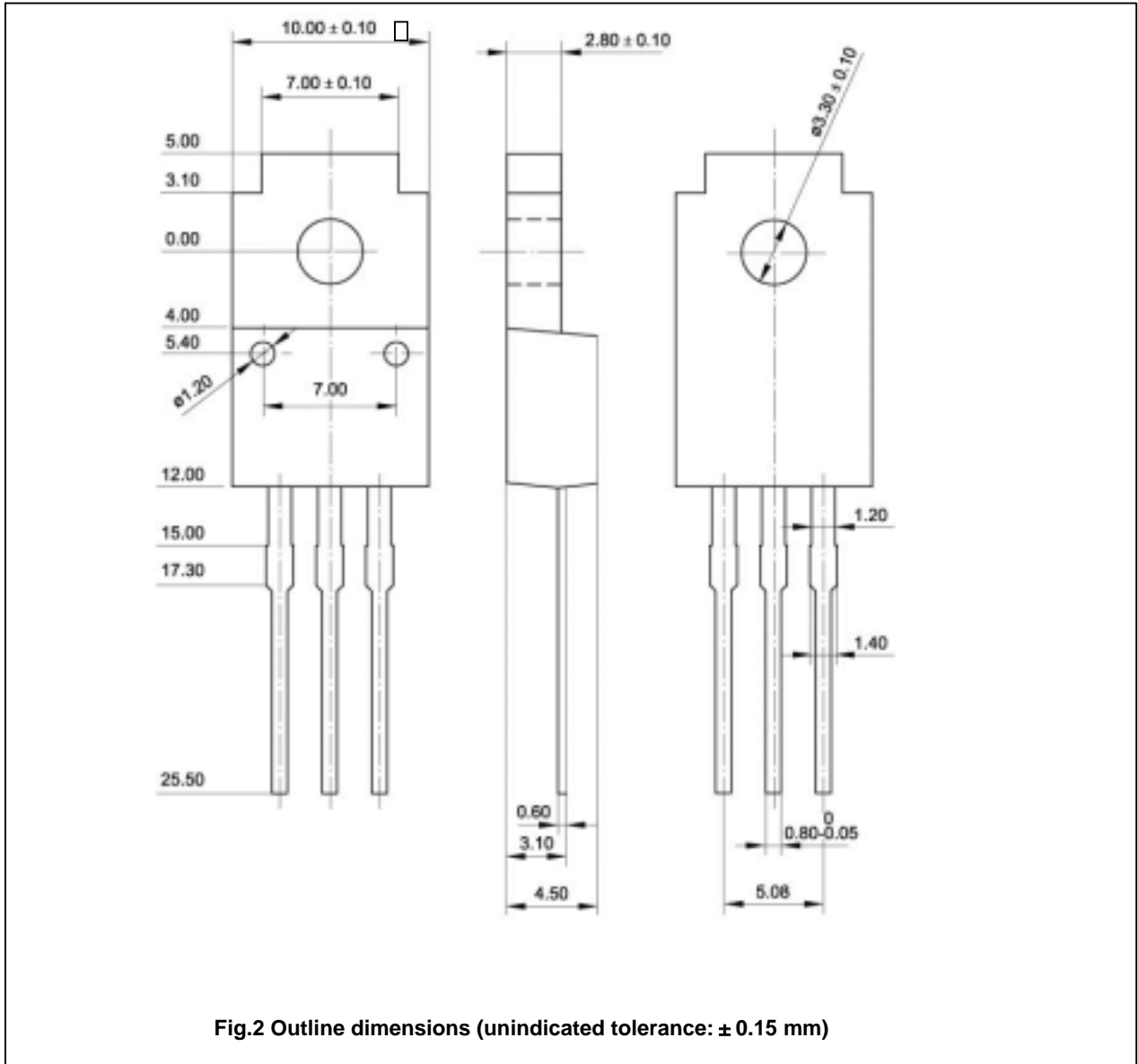


Fig.2 Outline dimensions (unindicated tolerance: ± 0.15 mm)