

2SD1047

High power NPN epitaxial planar bipolar transistor

Features

- High breakdown voltage V_{CEO} = 140 V
- Typical f_t = 20 MHz
- Fully characterized at 125 °C

Application

Power supply

Description

The device is a NPN transistor manufactured using new BiT-LA (Bipolar transistor for linear amplifier) technology. The resulting transistor shows good gain linearity behaviour.

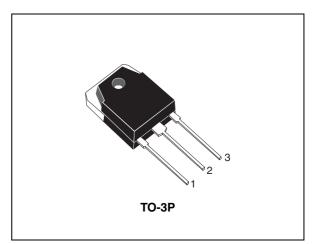


Figure 1. Internal schematic diagram

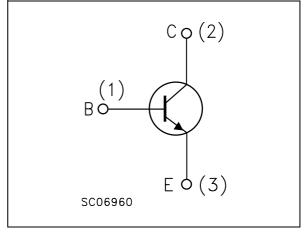


Table 1.	Device summary
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Order code	Marking	Package	Packaging
2SD1047	2SD1047	TO-3P	Tube

Doc ID 018729 Rev 1

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V _{CBO}	Collector-base voltage ($I_E = 0$)	200	V
V _{CEO}	Collector-emitter voltage (I _B = 0)	140	V
V _{EBO}	Emitter-base voltage (I _C = 0)	6	V
۱ _C	Collector current	12	А
I _{CM}	Collector peak current (t _P < 5 ms)	20	Α
P _{tot}	Total dissipation at $T_c = 25 \text{ °C}$	100	W
T _{stg}	Storage temperature	-65 to 150	°C
TJ	Max. operating junction temperature	150	°C

Table 3. Thermal data

Symbol	Parameter	Value	Unit	
R _{thj-case}	Thermal resistance junction-case	max	1.25	°C/W



2 Electrical characteristics

(T_{case} = 25 °C; unless otherwise specified)

Table 4.	Electrical	characteristics

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
I _{CBO}	Collector cut-off current $(I_E = 0)$	V _{CB} = 200 V			0.1	μA
I _{EBO}	Emitter cut-off current $(I_{\rm C} = 0)$	V _{EB} = 6 V			0.1	μA
V _{(BR)CEO} ⁽¹⁾	Collector-emitter breakdown voltage (I _B = 0)	I _C = 50 mA	140			V
V _{(BR)CBO}	Collector-base breakdown voltage (I _E = 0)	I _C = 100 μA	200			V
V _{(BR)EBO} ⁽¹⁾	Emitter-base breakdown voltage (I _C = 0)	I _E = 1 mA	6			V
V _{CE(sat)} ⁽¹⁾	Collector-emitter saturation voltage	$I_{C} = 5 \text{ A} \qquad I_{B} = 500 \text{ mA}$ $I_{C} = 7 \text{ A} \qquad I_{B} = 700 \text{ mA}$			0.5 0.7	V V
V _{BE}	Base-emitter voltage	$V_{CE} = 5 V$ $I_C = 5 A$			1.3	V
h _{FE}	DC current gain	$ I_{C} = 1 A V_{CE} = 5 V I_{C} = 5 A V_{CE} = 4 V $	60 50		200	
f _T	Transition frequency	$I_{\rm C} = 0.5 \ {\rm A}$ $V_{\rm CE} = 12 \ {\rm V}$		20		MHz
C _{CBO}	Collector-base capacitance (I _E = 0)	V _{CB} = 10 V f = 1 MHz		150		pF
	Resistive Load					
t _{on}	Turn-on time	$V_{CC} = 60 V$ $I_{C} = 5 A$		0.22		μs
t _{stg}	Storage time	I _{B1} = -I _{B2} = 0.5 A		4.3		μs
t _f	Fall time			0.5		μs

1. Pulse duration = 300 μ s, duty cycle \leq 1.5 %



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2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

Figure 3. Output characteristics

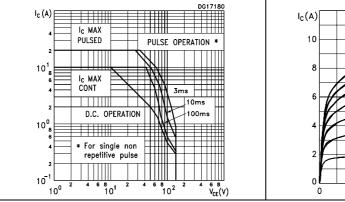


Figure 4. DC current gain

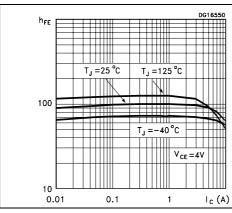


Figure 6. Base-emitter voltage

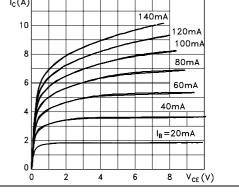


Figure 5. Collector-emitter saturation voltage

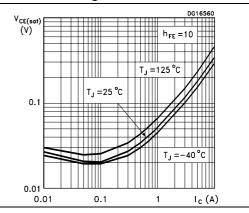
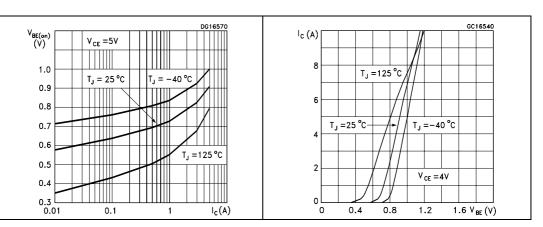
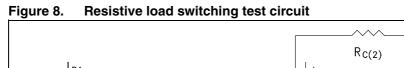


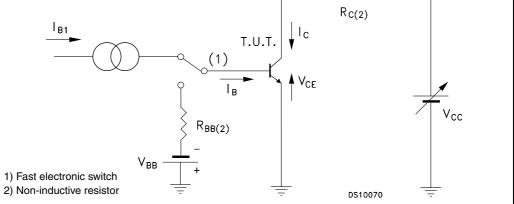
Figure 7. Base-emitter voltage





2.2 Test circuit



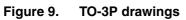


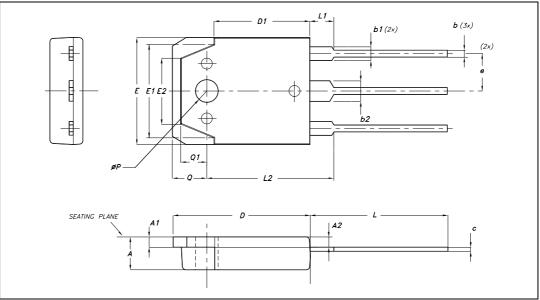


Dim.		mm	
Dim.	Min.	Тур.	Max.
А	4.6		5
A1	1.45	1.50	1.65
A2	1.20	1.40	1.60
b	0.80	1	1.20
b1	1.80		2.20
b2	2.80		3.20
с	0.55	0.60	0.75
D	19.70	19.90	20.10
D1		13.90	
E	15.40		15.80
E1		13.60	
E2		9.60	
е	5.15	5.45	5.75
L	19.50	20	20.50
L1		3.50	
L2	18.20	18.40	18.60
Р	3.10		3.30
Q		5	
Q1		3.80	

Table 5.TO-3P mechanical data









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3 Package mechanical data

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4 Revision history

Table 6.Document revision history

Date	Revision	Changes
12-Apr-2011	1	Initial release.



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