

High voltage fast-switching NPN power transistor

Datasheet - production data

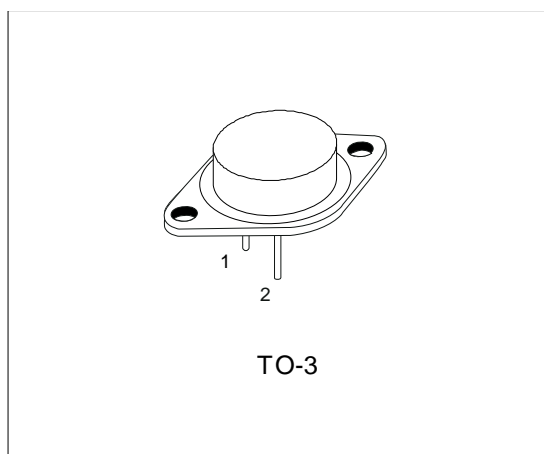
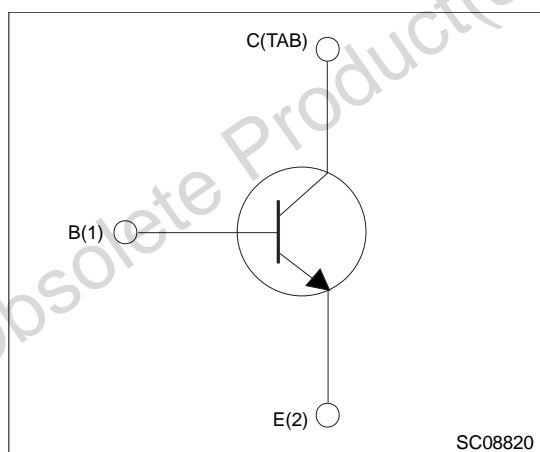


Figure 1: Internal schematic diagram



Features

- NPN transistor
- High voltage capability
- High current capability
- Fast switching speed

Applications

- Switched mode power supplies
- Flyback and forward single transistor low power converters

Description

The 2N6547 is a high voltage Multiepitaxial Mesa NPN transistor mounted in a TO-3 metal case. It is particularly suited for switching and industrial applications from single and three-phase mains.

Table 1: Device summary

Order code	Marking	Packages	Packaging
2N6547	2N6547	TO-3	Bag

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1 Electrical ratings

Table 2: Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CER}	Collector-emitter voltage ($R_{BE} = 50 \Omega$)	850	V
V_{CES}	Collector-emitter voltage ($V_{BE} = 0$)	850	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	400	V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	9	V
I_C	Collector current	15	A
I_{CM}	Collector peak current	30	A
I_B	Base current	10	A
I_{BM}	Base peak current	20	A
P_{TOT}	Total dissipation at $T_c = 25^\circ\text{C}$	175	W
T_{STG}	Storage temperature	-65 to 200	$^\circ\text{C}$
T_J	Max. operating junction temperature	200	$^\circ\text{C}$

Table 3: Thermal data

Symbol	Parameter	Value	Unit
$R_{thj-case}$	Thermal resistance junction-case max.	1	$^\circ\text{C/W}$

2 Electrical characteristics

Table 4: Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cut-off current ($V_{BE} = 0$)	$V_{CE} = 850\text{ V}$			1	mA
		$V_{CE} = 850\text{ V}$, $T_c = 100\text{ }^{\circ}\text{C}$			4	mA
I_{CER}	Collector cut-off current ($R_{BE} = 10\text{ }\Omega$)	$V_{CE} = 850\text{ V}$, $T_c = 100\text{ }^{\circ}\text{C}$			5	mA
I_{EBO}	Emitter cut-off current ($I_C = 0$)	$V_{EB} = 9\text{ V}$			1	mA
$V_{CEO(sus)}^{(1)}$	Collector-emitter sustaining voltage ($I_B = 0$)	$I_C = 100\text{ mA}$	400			V
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 10\text{ A}$, $I_B = 2\text{ A}$			1.5	V
		$I_C = 15\text{ A}$, $I_B = 3\text{ A}$			5	V
		$I_C = 10\text{ A}$, $I_B = 2\text{ A}$, $T_c = 100\text{ }^{\circ}\text{C}$			2.5	V
$V_{BE(sat)}^{(1)}$	Base-emitter saturation voltage	$I_C = 10\text{ A}$, $I_B = 2\text{ A}$			1.6	V
		$I_C = 10\text{ A}$, $I_B = 2\text{ A}$, $T_c = 100\text{ }^{\circ}\text{C}$			1.6	V
$h_{FE}^{(1)}$	DC current gain	$I_C = 5\text{ A}$, $V_{CE} = 2\text{ V}$	12		30	
		$I_C = 10\text{ A}$, $V_{CE} = 2\text{ V}$	6			
$f_T^{(1)}$	Transition frequency	$I_C = 0.5\text{ A}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ MHz}$		3		MHz
C_{CBO}	Collector-base capacitance ($I_E = 0$)	$V_{CB} = 10\text{ V}$, $f = 1\text{ MHz}$			360	pF

Notes:

⁽¹⁾Pulse test: pulse duration $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

Table 5: Resistive load

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
t_{on}	Turn-on time	$V_{CC} = 250\text{ V}$, $I_C = 10\text{ A}$ $I_{B1} = -I_{B2} = 2\text{ A}$, $T_p \geq 25\text{ }\mu\text{s}$	-	-	1	μs
t_s	Storage time		-	-	4	μs
t_f	Fall time		-	-	0.7	μs

Table 6: Inductive load

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
t_s	Storage time	$V_{CL} = 450\text{ V}$, $I_C = 10\text{ A}$, $L_C = 180\text{ mH}$, $I_{B1} = 2\text{ A}$, $V_{BE} = -5\text{ V}$, $T_C = 100\text{ }^\circ\text{C}$	-	-	5	μs
t_f	Fall time		-	-	1.5	μs

3 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK[®] packages, depending on their level of environmental compliance. ECOPACK[®] specifications, grade definitions and product status are available at: **www.st.com**. ECOPACK[®] is an ST trademark.

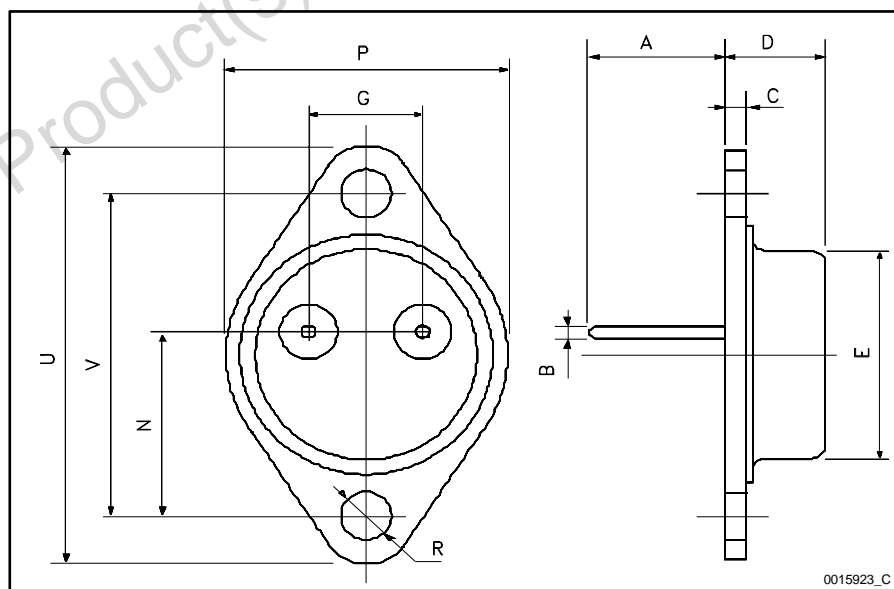
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3.1 TO-3 mechanical data

Table 7: TO-3 mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	11.00	-	13.10
B	0.97		1.15
C	1.50		1.65
D	8.32		8.92
E	19.00		20.00
G	10.70		11.10
N	16.50		17.20
P	25.00		26.00
R	4.00		4.09
U	38.50		39.30
V	30.00		30.30

Figure 2: TO-3 mechanical data drawing



4 Revision history

Table 8: Revision history

Date	Revision	Changes
12-Dec-2012	3	Changed F_T value in electrical characteristics table.

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