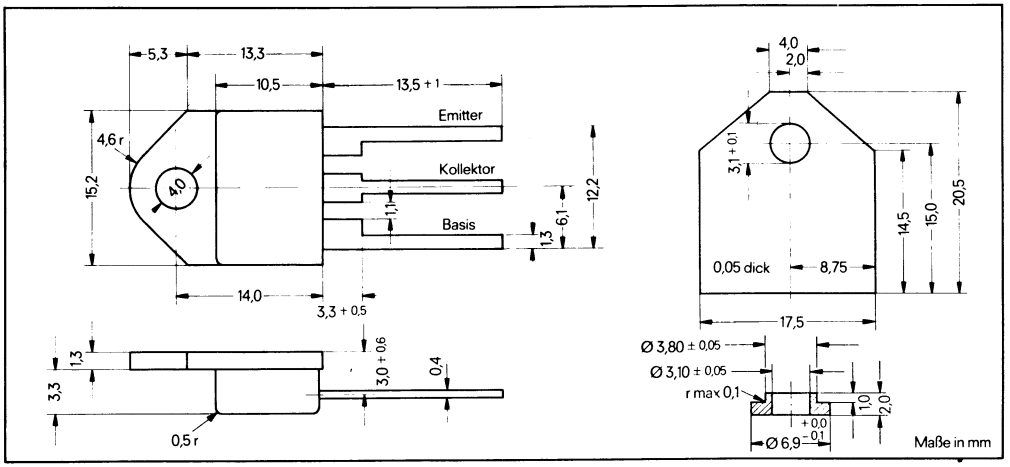
NPN - einfach diffundierter Siliziumtransistor mit Epi - Basis

Leistungstransistor für Verstärker- und Schaltanwendungen
Komplementärtyp zu BD246, BD246A, BD246B, BD246C

Mechanische Daten:



Abbiegen der Zuleitungen:

Das Biegen der Anschlußdrähte wird nur innerhalb der schmalen Zone empfohlen. Die Biegerichtung muß in der Ebene liegen, die durch die Längsachse des Anschlußdrahtes geht und senkrecht auf der Transistorbodenplatte steht. Ein Verdrehen oder Spreizen der Zuleitungen wird nicht empfohlen.

Montage des Transistors:

Bei der Montage des Transistors ist die elektrisch leitende Verbindung von Kollektor und Transistorbodenplatte zu beachten. Für isolierten Aufbau werden das Glimmerplättchen 01-07-005 und die Isolierbuchse 01-07-004 auf Anforderung kostenlos mitgeliefert.

TEXAS INSTRUMENTS
DEUTSCHLAND GMBH
8050 Freising, Haggerty - Str. 1

Absolute Grenzwerte

	BD245	BD245A	BD245B	BD245C
Kollektor-Basis-Spannung	45 V	60 V	80 V	100 V
Kollektor-Emitter-Spannung (Bem. 1)	45 V	60 V	80 V	100 V
Emitter-Basis-Spannung	←	5 V		→
Kollektor-Dauerstrom	←	10 A		→
Basis-Dauerstrom	←	3 A		→
Gesamtdauerverlustleistung bei $T_U \leqslant 25$ °C (siehe Bild 2)	←	3 W		→
Gesamtdauerverlustleistung bei $T_G \leqslant 25$ °C (siehe Bild 2)	←	80 W		→
Lagerungstemperaturbereich	←	−65 °C bis +150 °C		→
Drahttemperatur im Abstand von 4 mm vom Gehäuse für 5 sec	←	250 °C		→

Elektrische Kennwerte bei T_G = +25 °C (wenn nicht anders angegeben)

Parameter		Prüfbedingungen		Typ	min	typ	max	Einh.
$U_{(BR)CEO}$	Kollektor-Emitter Durchbruchsspannung	I_C = 200 mA,	I_B = 0 (Bem. 2)	BD245	45			V
				BD245A	60			V
				BD245B	80			V
				BD245C	100			V
I_{CES}	Kollektor-Emitter-Reststrom	U_{CE} = 45 V,	U_{BE} = 0	BD245			0,4	mA
		U_{CE} = 60 V,	U_{BE} = 0	BD245A			0,4	mA
		U_{CE} = 80 V,	U_{BE} = 0	BD245B			0,4	mA
		U_{CE} = 100 V,	U_{BE} = 0	BD245C			0,4	mA
I_{CEO}	Kollektor-Emitter-Reststrom	U_{CE} = 30 V,	I_B = 0				0,7	mA
I_{EBO}	Emitter-Basis-Reststrom	U_{EB} = 5 V,	I_C = 0				1	mA
h_{FE}	Gleichstromverstärkung (Bem. 2 u. 3)	U_{CE} = 4 V,	I_C = 1 A		25			
		U_{CE} = 4 V,	I_C = 3 A		12			
		U_{CE} = 4 V,	I_C = 10 A		4			
U_{BE}	Basis-Emitter-Spannung (Bem. 2 u. 3)	U_{CE} = 4 V,	I_C = 3 A				1,6	V
		U_{CE} = 4 V,	I_C = 10 A				3	V

Elektrische Kennwerte bei T_G = +25 °C (wenn nicht anders angegeben)

Parameter		Prüfbedingungen	Typ	min	typ	max	Einh.
$U_{CE(sat)}$	Kollektor-Emitter-Sättigungsspannung	I_B = 300 mA, I_C = 3 A (Bem. 2 u. 3)				1	V
		I_B = 2,5 A, I_C = 10 A				4	V
h_{fe}	Kleinsignal-Stromverstärkung	U_{CE} = 10 V, I_C = 0,5 A, f = 1 kHz		20			
h_{fe}	Kleinsignal-Stromverstärkung	U_{CE} = 10 V, I_C = 0,5 A, f = 1 MHz		3			
t_{on}	Einschaltzeit	I_C = 1 A, $I_{B(1)}$ = 100 mA			0,3		µs
		$I_{B(2)}$ = −100 mA, R_L = 20 Ω					
t_{off}	Ausschaltzeit	$U_{BE(off)}$ = 3,7 V, Bild 1			1,0		µs

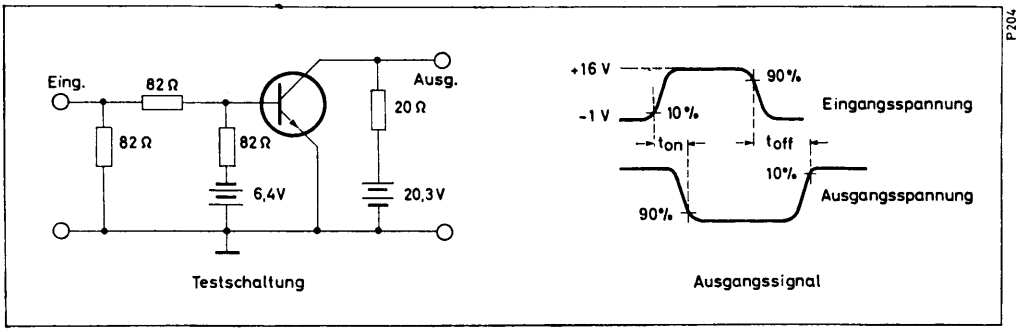
Thermische Kennwerte

Parameter		max	Einh.
R_{thJ-G}	Thermischer Widerstand, Sperrschicht-Gehäuse	1,6	°C/W
R_{thJ-U}	Thermischer Widerstand, Sperrschicht-Umgebung	42	°C/W

Bemerkungen:

1. Dies gilt bei offener Basis.
2. Impulsmäßig gemessen: $t_p \leqslant 300\ \mu s$; $d \leqslant 2\%$.
3. Strom- und Spannungskreis müssen getrennt sein.

Meßschaltung für Schaltzeitmessung



Bemerkungen:

a) Der Generator hat die Eigenschaft $t_r \leqslant 15$ ns, $t_f \leqslant 15$ ns, $Z_{out} = 50\ \Omega$, $t_p = 10\ \mu s$, $d \leqslant 2\ \%$.
b) Der Oszillograph: $t_r \leqslant 15$ ns, $R_{in} \geqslant 10\ M\Omega$, $C_{in} \leqslant 11{,}5$ pF.
c) Widerstand ohne induktivität.
d) Die Spannungsversorgung muß gut abgeblockt sein.

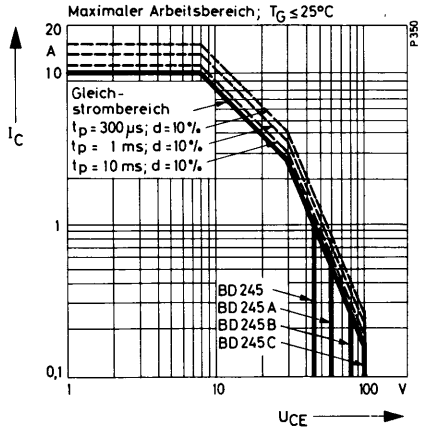


Bild 1

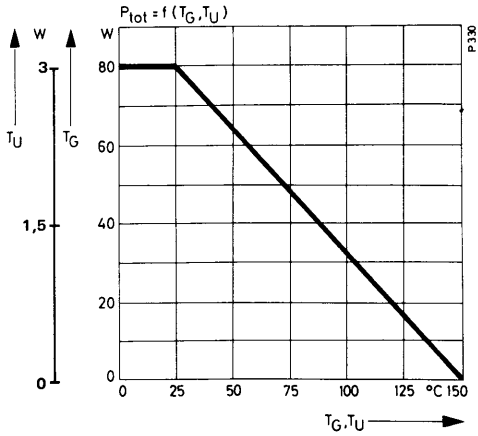


Bild 2

Typische Kennlinien

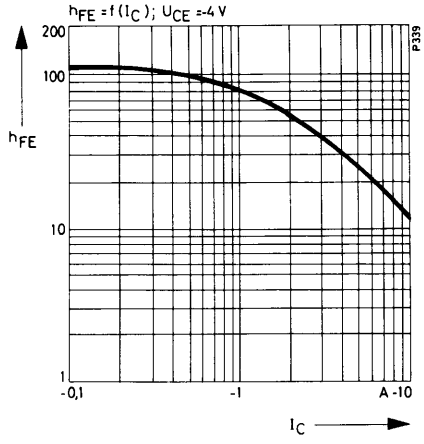


Bild 3

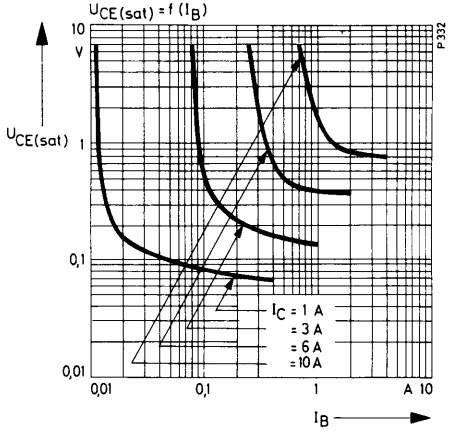


Bild 4

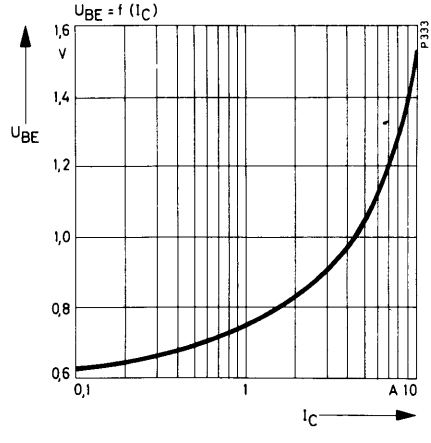
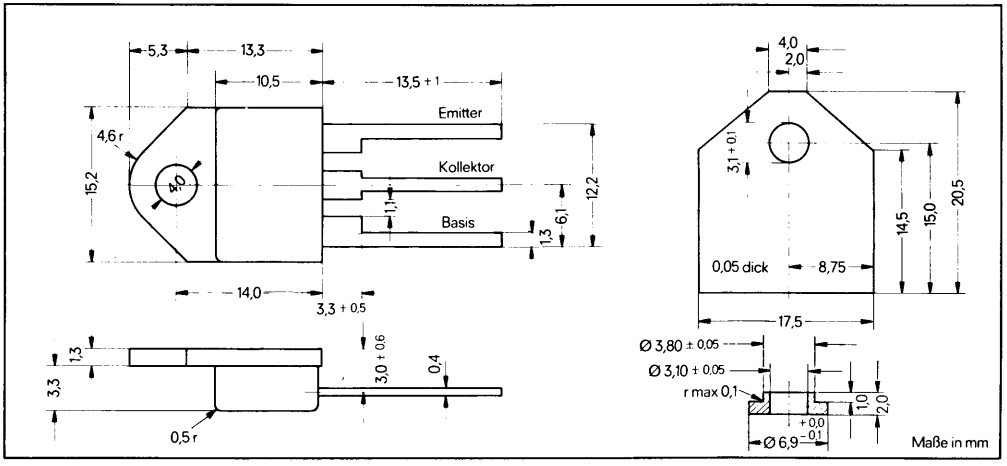


Bild 5

PNP-einfach diffundierter Siliziumtransistor mit Epi-Basis

Leistungstransistor für Verstärker- und Schaltanwendungen
Komplementärtyp zu BD245, BD245A, BD245B, BD245C

Mechanische Daten:



Abbiegen der Zuleitungen:

Das Biegen der Anschlußdrähte wird nur innerhalb der schmalen Zone empfohlen. Die Biegerichtung muß in der Ebene liegen, die durch die Längsachse des Anschlußdrahtes geht und senkrecht auf der Transistorbodenplatte steht. Ein Verdrehen oder Spreizen der Zuleitungen wird nicht empfohlen.

Montage des Transistors:

Bei der Montage des Transistors ist die elektrisch leitende Verbindung von Kollektor und Transistorbodenplatte zu beachten. Für isolierten Aufbau werden das Glimmerplättchen 01-07-005 und die Isolierbuchse 01-07-004 auf Anforderung kostenlos mitgeliefert.

TEXAS INSTRUMENTS
DEUTSCHLAND GMBH
8050 Freising, Haggerty - Str. 1

Absolute Grenzwerte

	BD246	BD246A	BD246B	BD246C
Kollektor-Basis-Spannung	−45 V	−60 V	−80 V	−100 V
Kollektor-Emitter-Spannung (Bem. 1)	−45V	−60 V	−80 V	−100 V
Emitter-Basis-Spannung	←	−5 V		→
Kollektor- Dauerstrom	←	−10 A		→
Basis-Dauerstrom	←	−3 A		→
Gesamtdauerverlustleistung bei $T_U \leqslant 25$ °C (siehe Bild 2)	←	3 W		→
Gesamtdauerverlustleistung bei $T_G \leqslant 25$ °C (siehe Bild 2)	←	80 W		→
Lagerungstemperaturbereich	←	−65 °C bis +150 °C		→
Drahttemperatur im Abstand von 4 mm vom Gehäuse für 5 sec	←	250 °C		→

Elektrische Kennwerte bei T_U = +25 °C (wenn nicht anders angegeben)

Parameter		Prüfbedingungen	Typ	min	typ	max	Einh.
$U_{(BR)CEO}$	Kollektor-Emitter-Durchbruchsspannung	I_C = −200 mA, I_B = 0 (Bem. 2)	BD246	−45			V
			BD246A	−60			V
			BD246B	−80			V
			BD246C	−100			V
I_{CES}	Kollektor-Emitter-Reststrom	U_{CE} = −45V, U_{BE} = 0	BD246			−0,4	mA
		U_{CE} = −60 V, U_{BE} = 0	BD246A			−0,4	mA
		U_{CE} = −80 V, U_{BE} = 0	BD246B			−0,4	mA
		U_{CE} = −100 V, U_{BE} = 0	BD246C			−0,4	mA
I_{CEO}	Kollektor-Emitter-Reststrom	U_{CE} = −30 V, I_B = 0				−0,7	mA
I_{EBO}	Emitter-Basis-Reststrom	U_{EB} = −5 V, I_C = 0				−1	mA
$\lvert h_{FE} \rvert$	Gleichstromverstärkung (Bem. 2 u. 3)	U_{CE} = −4 V, I_C = −1 A		25			
		U_{CE} = −4 V, I_C = −3 A		12			
		U_{CE} = −4 V, I_C = −10 A		4			

TEXAS INSTRUMENTS
DEUTSCHLAND GMBH
8050 Freising, Haggerty - Str. 1

Elektrische Kennwerte bei T_G = +25 °C (wenn nicht anders angegeben)

Parameter		Prüfbedingungen	Typ	min	typ	max	Einh.
U_{BE}	Basis-Emitter-Spannung (Bem. 2 u. 3)	U_{CE} = −4 V, I_C = −3 A				−1,6	V
		U_{CE} = −4 V, I_C = −10 A				−3	V
$U_{CE(sat)}$	Kollektor-Emitter-Sättigungsspannung (Bem. 2u.3)	I_B = −300 mA, I_C = −3 A				−1	V
		I_B = −2,5 A, I_C = −10 A				−4	V
h_{fe}	Kleinsignal-Stromverstärkung	U_{CE} = −10 V, I_C = −0,5 A, f = 1 kHz		20			
$\|h_{fe}\|$	Kleinsignal-Stromverstärkung	U_{CE} = −10 V, I_C = −0,5 A, f = 1 MHz		3			
t_{on}	Einschaltzeit	I_C = −1 A, $I_{B(1)}$ = −100 mA, $U_{BE(off)}$ = 3,7 V			0,2		µs
t_{off}	Ausschaltzeit	$I_{B(2)}$ = 100 mA, R_L = 20 Ω			0,8		µs

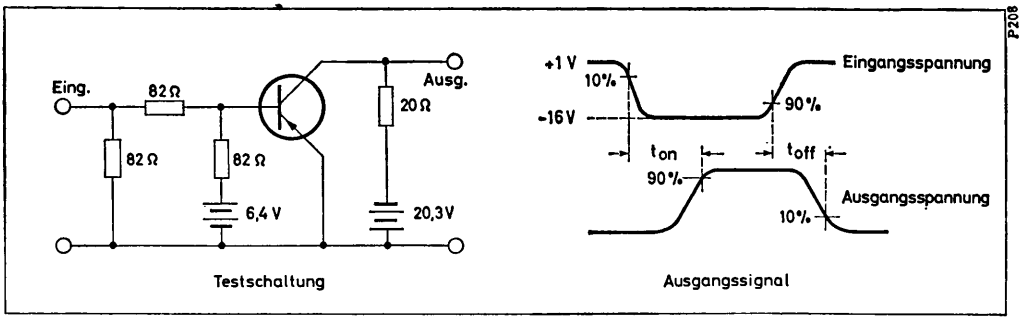
Thermische Kennwerte

Parameter		max	Einh.
R_{thJ-G}	Thermischer Widerstand, Sperrschicht-Gehäuse	1,6	°C/W
R_{thJ-U}	Thermischer Widerstand, Sperrschicht-Gehäuse	42	°C/W

Bemerkungen:

1. Dies gilt bei offener Basis.
2. Impulsmäßig gemessen: $t_p \leqslant 300$ µs; $d \leqslant 2\%$.
3. Strom- und Spannungsmeßkreis müssen getrennt sein.

Meßschaltung für Schaltzeitmessung



Bemerkungen:

a) Der Generator hat die Eigenschaft $t_r \leqslant 15$ ns, $t_f \leqslant 15$ ns, $Z_{out} = 50\ \Omega$, $t_p = 10\ \mu$s, d $\leqslant 2$ %.
b) Der Oszillograph: $t_r \leqslant 15$ ns, $R_{ein} \geqslant M\Omega$, $C_{ein} \leqslant 11{,}5$ pF.
c) Widerstand ohne Induktivität.
d) Die Spannungsversorgung muß gut abgeblockt sein.

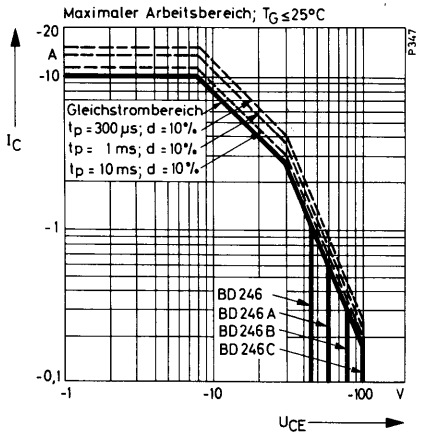


Bild 1

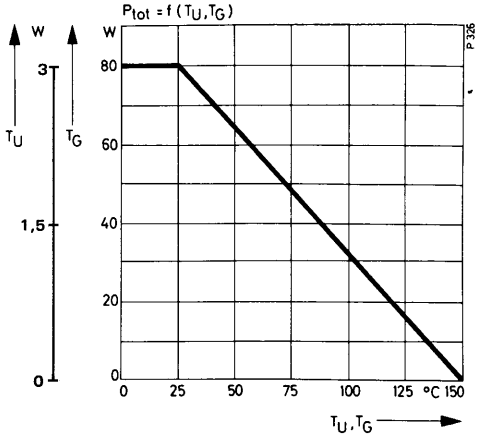


Bild 2

TEXAS INSTRUMENTS
DEUTSCHLAND GMBH
8050 Freising, Haggerty - Str. 1

Typische Kennlinien

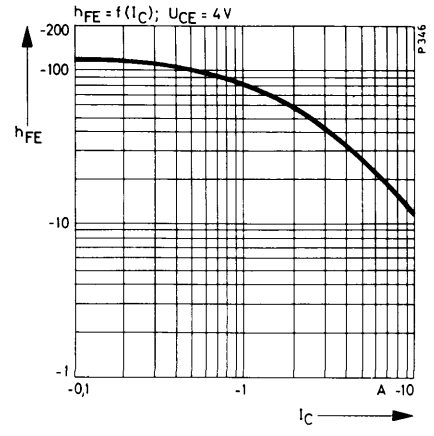


Bild 3

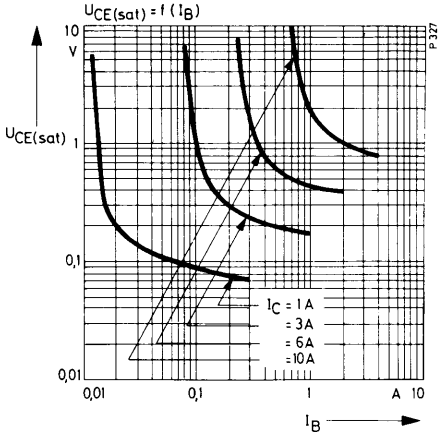


Bild 4

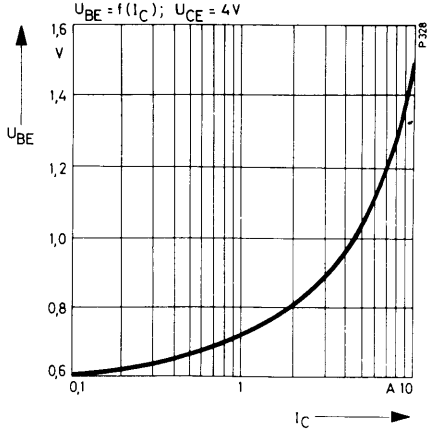
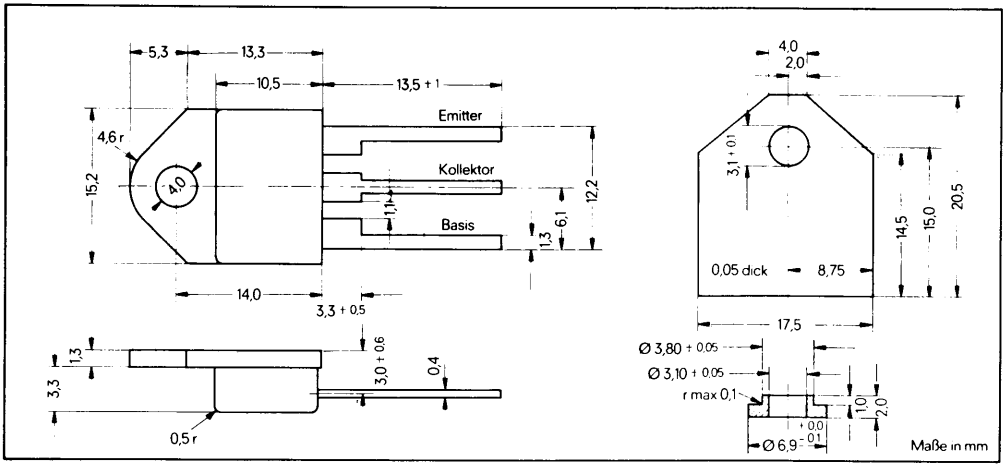


Bild 5

NPN - einfach diffundierter Siliziumtransistor mit Epi-Basis

Leistungstransistor für Verstärker- und Schaltanwendungen
Komplementärtyp zu BD250, BD250A, BD250B, BD250C

Mechanische Daten:



Abbiegen der Zuleitungen:

Das Biegen der Anschlußdrähte wird nur innerhalb der schmalen Zone empfohlen. Die Biegerichtung muß in der Ebene liegen, die durch die Längsachse des Anschlußdrahtes geht und senkrecht auf der Transistorbodenplatte steht. Ein Verdrehen oder Spreizen der Zuleitungen wird nicht empfohlen.

Montage des Transistors:

Bei der Montage des Transistors ist die elektrisch leitende Verbindung von Kollektor und Transistorbodenplatte zu beachten. Für isolierten Aufbau werden das Glimmerplättchen 01-07-005 und die Isolierbuchse 01-07-004 auf Anforderung kostenlos mitgeliefert.

Absolute Grenzwerte

	BD249	BD249A	BD249B	BD249C
Kollektor-Basis-Spannung	45 V	60 V	80 V	100 V
Kollektor-Emitter-Spannung (Bem. 1)	45 V	60 V	80 V	100 V
Emitter-Basis-Spannung	←	5 V		→
Kollektor-Dauerstrom	←	25 A		→
Basis-Dauerstrom	←	5 A		→
Gesamtdauerverlustleistung bei $T_U \leqslant 25$ °C (siehe Bild 2)	←	3 W		→
Gesamtverlustleistung bei $T_U \leqslant 25$ °C (siehe Bild 2)	←	125 W		→
Lagerungstemperaturbereich	←	–65 °C bis +150 °C		→
Drahttemperatur im Abstand von 4 mm vom Gehäuse für 5 sec	←	250 °C		→

Eleltrische Kennwerte bei T_U = +25 °C (wenn nicht anders angegeben)

Parameter		Prüfbedingungen		Typ	min	typ	max	Einh.
$U_{(BR)CEO}$	Kollektor-Emitter Durchbruchsspannung	I_C = 200 mA,	I_B = 0 (Bem. 2)	BD249	45			V
				BD249A	60			V
				BD249B	80			V
				BD249C	100			V
I_{CES}	Kollektor-Emitter-Reststrom	U_{CE} = 45 V,	U_{BE} = 0	BD249			0,7	mA
		U_{CE} = 60 V,	U_{BE} = 0	BD249A			0,7	mA
		U_{CE} = 80 V,	U_{BE} = 0	BD249B			0,7	mA
		U_{CE} = 100 V,	U_{BE} = 0	BD249C			0,7	mA
I_{CEO}	Kollektor-Emitter-Reststrom	U_{CE} = 30 V,	I_B = 0				1	mA
I_{EBO}	Emitter-Basis-Reststrom	U_{EB} = 5 V,	I_C = 0				1	mA
h_{FE}	Statische Stromverstärkung (Bem. 2)	U_{CE} = 4 V,	I_C = 5 A		20			
		U_{CE} = 4 V,	I_C = 15 A		10			
		U_{CE} = 4 V,	I_C = 25 A		5			
U_{BE}	Basis-Emitter-Spannung (Bem. 2)	U_{CE} = 4 V,	I_C = 15 A				2	V
		U_{CE} = 4 V,	I_C = 25 A				4	V

Elektrische Kennwerte bei T_U = +25 °C (wenn nicht anders angegeben)

Parameter		Prüfbedingungen	Typ	min	typ	max	Einh.
$U_{CE(sat)}$	Kollektor-Emitter-Sättigungsspannung	I_B = 1,5 A, I_C = 15 A				1,8	V
		I_B = 5 A, I_C = 25 A				4	V
h_{fe}	Kleinsignal-Stromverstärkung	U_{CE} = 10 V, I_C = 1 A, f = 1 kHz		25			
$\|h_{fe}\|$	Kleinsignal-Stromverstärkung	U_{CE} = 10 V, I_C = 1 A, f = 1 MHz		3			
t_{on}	Einschaltzeit	I_C = 5 A, $I_{B(1)}$ = 500 mA, $U_{BE(off)}$ = −5 V			0,3		µs
t_{off}	Ausschaltzeit	$I_{B(2)}$ = 500 mA, R_L = 5 Ω					

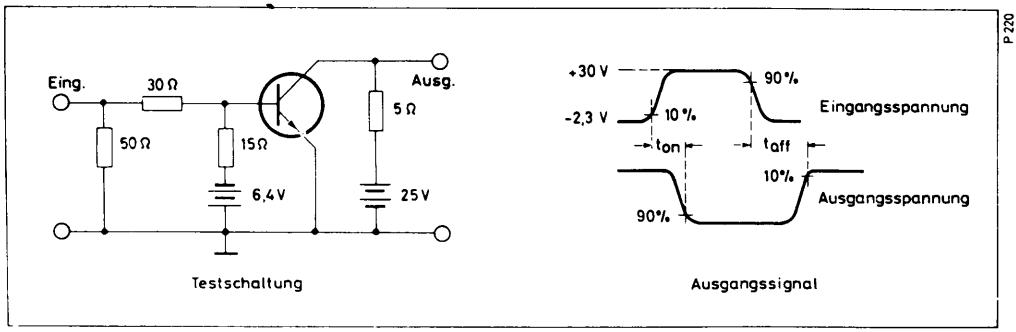
Thermische Kennwerte

Parameter		max	Einh.
R_{thJ-G}	Thermischer Widerstand, Sperrschicht-Gehäuse	1	°C/W
R_{thJ-U}	Thermischer Widerstand, Sperrschicht-Umgebung	42	°C/W

Bemerkungen:

1. Dies gilt bei offener Basis.
2. Impulsmäßig gemessen: t_p = 300 µs, d ⩽ 2%.

Meßschaltung für Schaltzeitmessung



Bemerkungen:

a) Der Generator hat die Eigenschaft $t_r \leqslant 15$ ns, $t_f \leqslant 15$ ns, $Z_{out} = 50\ \Omega$, $t_p = 10\ \mu$s, d $\leqslant 2$ %.
b) Der Oszillograph: $t_r \leqslant 15$ ns, $R_{in} \geqslant 10$ MΩ, $C_{in} \leqslant 11{,}5$ pF.
c) Widerstand ohne Induktivität.
d) Die Spannungsversorgung muß gut abgeblockt sein.

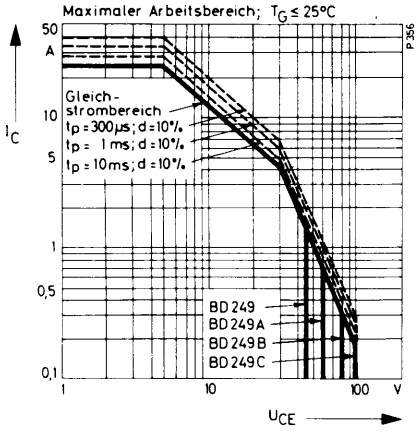


Bild 1

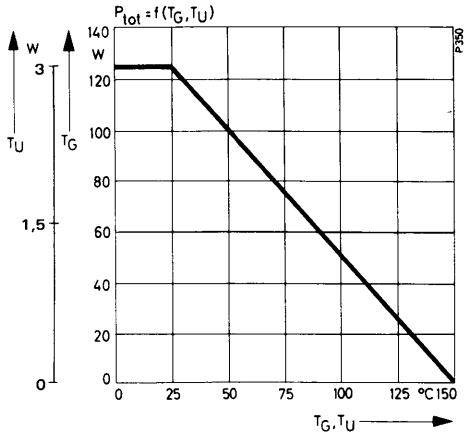


Bild 2

TEXAS INSTRUMENTS
DEUTSCHLAND GMBH
8050 Freising, Haggerty - Str. 1

Typische Kennlinien

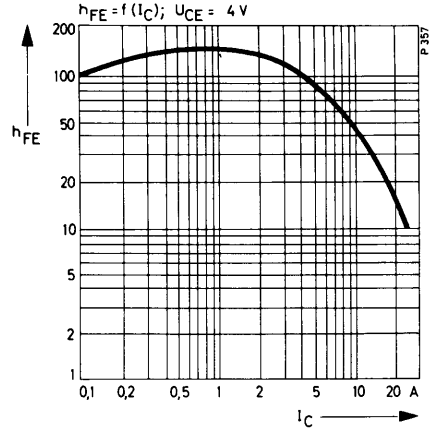


Bild 3

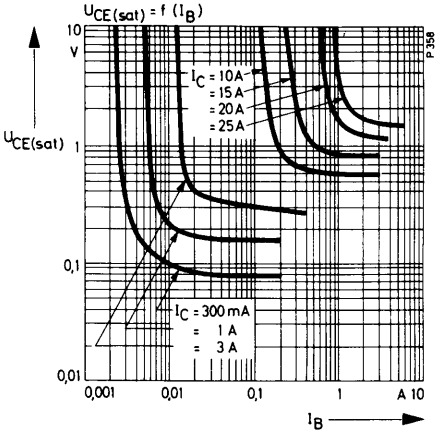


Bild 4

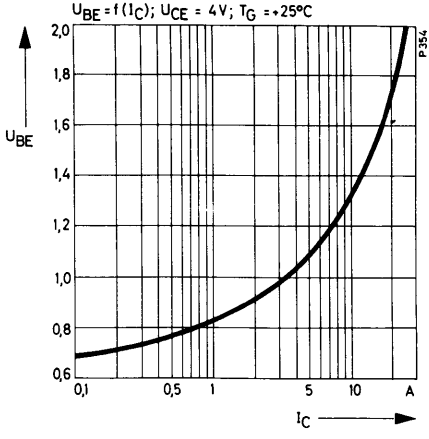


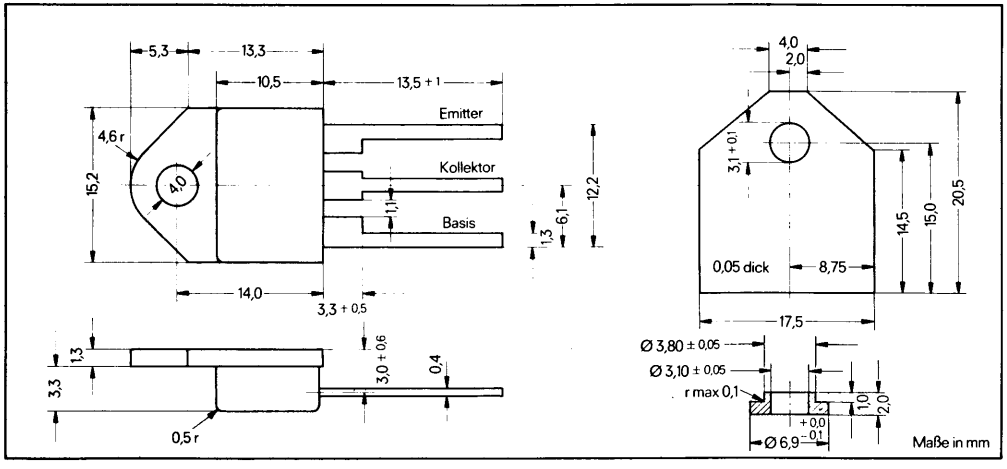
Bild 5

TEXAS INSTRUMENTS
DEUTSCHLAND GMBH
8050 Freising, Haggerty - Str. 1

PNP-einfach diffundierter Siliziumtransistor mit Epi-Basis

Leistungstransistor für Verstärker- und Schaltanwendungen
Komplementärtyp zu BD249, BD249A, BD249B, BD249C

Mechanische Daten:



Abbiegen der Zuleitungen:

Das Biegen der Anschlußdrähte wird nur innerhalb der schmalen Zone empfohlen. Die Biegerichtung muß in der Ebene liegen, die durch die Längsachse des Anschlußdrahtes geht und senkrecht auf der Transistorbodenplatte steht. Ein Verdrehen oder Spreizen der Zuleitungen wird nicht empfohlen.

Montage des Transistors:

Bei der Montage des Transistors ist die elektrisch leitende Verbindung von Kollektor und Transistorbodenplatte zu beachten. Für isolierten Aufbau werden das Glimmerplättchen 01-07-005 und die Isolierbuchse 01-07-004 auf Anforderung kostenlos mitgeliefert.

TEXAS INSTRUMENTS
DEUTSCHLAND GMBH
8050 Freising, Haggerty - Str. 1

Absolute Grenzwerte

	BD250	BD250A	BD250B	BD250C
Kollektor-Basis-Spannung	−45 V	−60 V	−80 V	−100 V
Kollektor-Emitter-Spannung (Bem. 1)	−45 V	−60 V	−80 V	−100 V
Emitter-Basis-Spannung	←	−5 V		→
Kollektor-Dauerstrom	←	−25 A		→
Basis Dauerstrom	←	−5 A		→
Gesamtdauerverlustleistung bei $T_U \leqslant 25$ °C (siehe Bild 2)	←	3 W		→
Gesamtverlustleistung bei $T_G \leqslant 25$ °C (siehe Bild 2)	←	125 W		→
Lagerungstemperaturbereich	←	−65 °C bis +150 °C		→
Drahttemperatur im Abstand von 4 mm vom Gehäuse für 5 sec	←	250 °C		→

Elektrische Kennwerte bei T_U = +25 °C (wenn nicht anders angegeben)

Parameter		Prüfbedingungen	Typ	min	typ	max	Einh.
$U_{(BR)CEO}$	Kollektor-Emitter-Durchbruchsspannung	I_C = −200 mA, I_B = 0 (Bem.2)	BD250	−45			V
			BD250A	−60			V
			BD250B	−80			V
			BD250C	−100			V
I_{CES}	Kollektor-Emitter-Reststrom	U_{CE} = −45 V, U_{BE} = 0	BD250			−0,7	mA
		U_{CE} = −60 V, U_{BE} = 0	BD250A			−0,7	mA
		U_{CE} = −80 V, U_{BE} = 0	BD250B			−0,7	mA
		U_{CE} = −100 V, U_{BE} = 0	BD250C			−0,7	mA
I_{CEO}	Kollektor-Emitter-Reststrom	U_{CE} = −30 V, I_B = 0				−1	mA
I_{EBO}	Emitter-Basis-Reststrom	U_{EB} = −5 V, I_C = 0				−1	mA
h_{FE}	Statische Stromverstärkung (Bem. 2)	U_{CE} = −4 V, I_C = −5 A		20			
		U_{CE} = −4 V, I_C = −15 A		10			
		U_{CE} = −4 V, I_C = −25 A		5			
U_{BE}	Basis-Emitter-Spannung (Bem. 2)	U_{CE} = −4 V, I_C = −15 A				−2	V
		U_{CE} = −4 V, I_C = −25 A				−4	V

Elektrische Kennwerte bei T_U = +25 °C (wenn nicht anders angegeben)

Parameter		Prüfbedingungen	Typ	min	typ	max	Einh.
$U_{CE(sat)}$	Kollektor-Emitter-Sättigungsspannung	I_B = –1,5 A, I_C = –15 A				–1,8	V
		I_B = –5 A, I_C = –25 A				–4	V
h_{fe}	Kleinsignal-Stromverstärkung	U_{CE} = –10 V, I_C = –1 A, f = 1 kHz		25			
$\|h_{fe}\|$	Kleinsignal-Stromverstärkung	U_{CE} = –10 V, I_C = –1 A, f = 1 MHz		3			
t_{on}	Einschaltzeit	I_C = –5 A, $I_{B(1)}$ = 500 mA, $U_{BE(off)}$ = 5 V			0,2		µs
t_{off}	Ausschaltzeit	$I_{B(2)}$ = 500 mA, R_L = 5 Ω			0,4		µs

Thermische Kennwerte

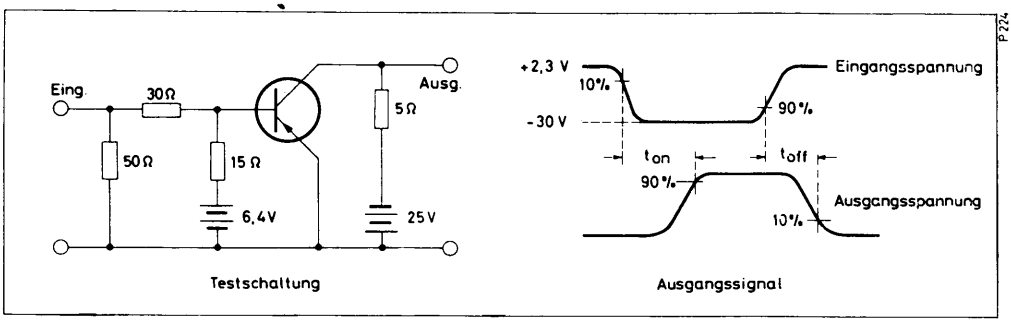
Parameter		max	Einh.
R_{thJ-G}	Thermischer Widerstand, Sperrschicht-Gehäuse	1	°C/W
R_{thJ-U}	Thermischer Widerstand, Sperrschicht-Umgebung	42	°C/W

Bemerkungen:

1. Dies gilt bei offener Basis.
2. Diese Parameter müssen mit Impulsen gemessen werden, t_p = 300 µs, d ⩽ 2 %.

TEXAS INSTRUMENTS
DEUTSCHLAND GMBH
8050 Freising, Haggerty - Str. 1

Meßschaltung für Schaltzeitmessung



Bemerkungen:

a) Der Generator hat die Eigenschaft $t_r \leqslant 15$ ns, $t_f \leqslant 15$ ns, $Z_{out} = 50\ \Omega$, $t_p = 10\ \mu$s, $d \leqslant 2\ \%$.
b) Der Oszillograph: $t_r \leqslant 15$ ns, $R_{in} \geqslant 10\ M\Omega$, $C_{in} \leqslant 11{,}5$ pF.
c) Widerstand ohne Induktivität.
d) Die Spannungsversorgung muß gut abgeblockt sein.

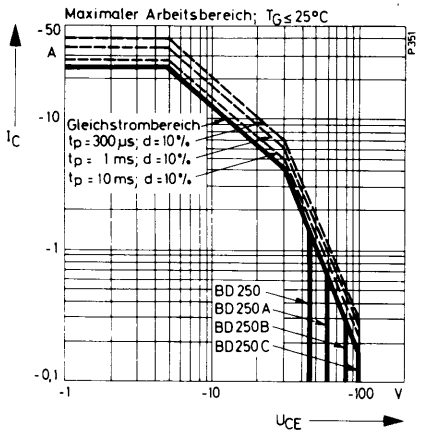


Bild 1

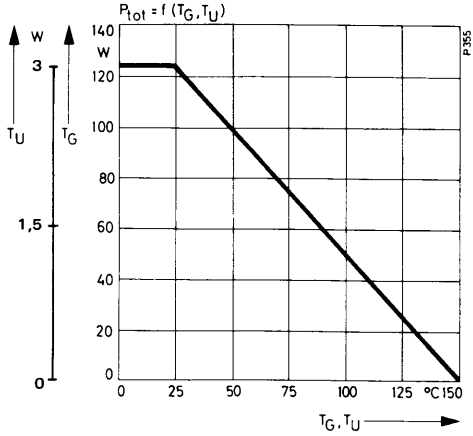


Bild 2

TEXAS INSTRUMENTS
DEUTSCHLAND GMBH
8050 Freising, Haggerty - Str. 1

Typische Kennlinien

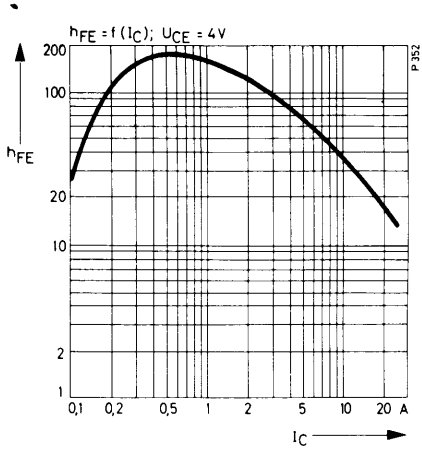


Bild 3

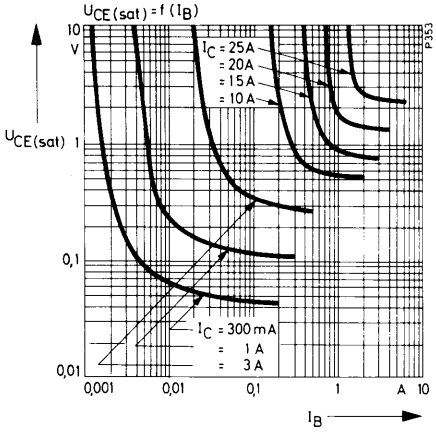


Bild 4

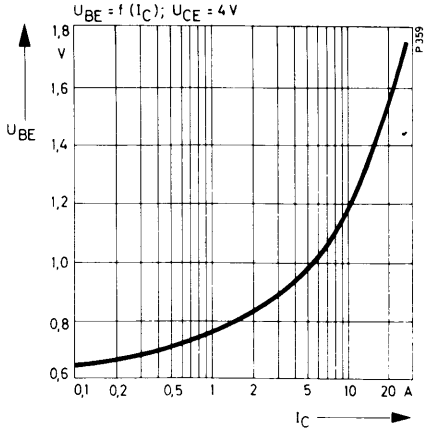


Bild 5

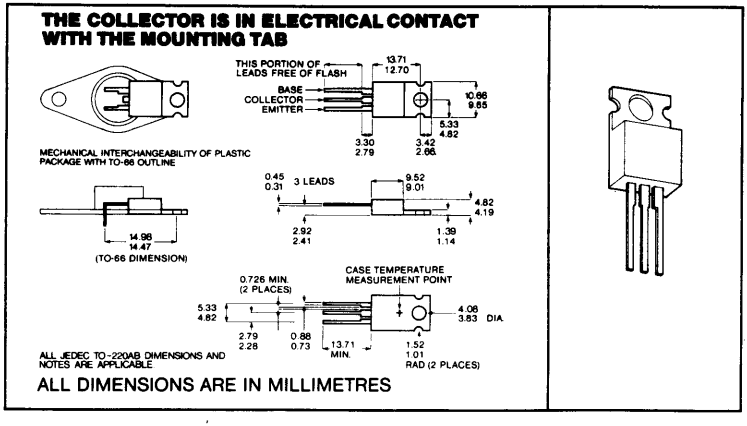
BD539 SERIES
NPN SINGLE DIFFUSED SILICON POWER TRANSISTORS

Designed for Medium Power Linear Amplifiers and Switching in Consumer, Automotive and Industrial Applications

features

- Low Saturation Voltages $V_{CE(sat)}$ = 0.8V max @ I_C = 3A
- Complimentary to PNP Types BD540 Series
- 5A Rated Collector Current
- 45W at 25°C Case Temperature
- Up to 120V V_{CEO} rating

mechanical specification



absolute maximum ratings at 25°C case temperature (unless otherwise noted)

	BD539	BD539A	BD539B	BD539C	BD539D
Collector-Base Voltage	40V	60V	80V	100V	120V
Collector-Emitter Voltage (See Note 1)	40V	60V	80V	100V	120V
Emitter-Base Voltage	← 5V →				
Continuous Collector Current	← 5A →				
Safe Operating Region at (or below) 25°C Case Temperature	← See Figure 2 →				
Continuous Device Dissipation at (or below) 25°C Case Temperature (See Note 2)	← 45W →				
Continuous Device Dissipation at (or below) 25°C Free Air Temperature (See Note 3)	← 2W →				
Operating Collector Junction Temperature Range	← −65°C to 150°C →				
Storage Temperature Range	← −65°C to 150°C →				
Lead Temperature 3.2mm from Case for 10 Seconds	← 260°C →				

NOTES: 1. This value applies when the base-emitter diode is open-circuited
2. Derate linearly to 150°C Case Temperature at the rate of 0.36W/°C
3. Derate linearly to 150°C Free-Air Temperature at the rate of 16mW/°C

BD539 SERIES
NPN SINGLE DIFFUSED SILICON POWER TRANSISTORS

electrical characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS		BD539		BD539A		BD539B		BD539C		BD539D		UNITS
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
$V_{(BR)CEO}$	I_C=30mA See Note 4	I_B=0	40		60		80		100		120		V
I_{CEO}	V_{CE}=30V V_{CE}=60V V_{CE}=90V	I_B=0 I_B=0 I_B=0		0.3		0.3		0.3		0.3		0.3	mA
I_{CES}	V_{CE}=40V V_{CE}=60V V_{CE}=80V V_{CE}=100V V_{CE}=120V	V_{BE}=0 V_{BE}=0 V_{BE}=0 V_{BE}=0 V_{BE}=0		0.2		0.2		0.2		0.2		0.2	mA
I_{EBO}	V_{EB}=5V	I_C=0		1		1		1		1		1	mA
h_{FE}*	I_C=0.5A I_C=1.0A I_C=3.0A	V_{CE}=4V V_{CE}=4V V_{CE}=4V	40 30 12		40 30 12		40 30 12		40 30 12		40 30 12		
$V_{BE(act)}$*	I_C=3.0A	V_{CE}=4V		1.25		1.25		1.25		1.25		1.25	V
$V_{CE(sat)}$*	I_C=1.0A I_C=3.0A I_C=5.0A	I_B=125mA I_B=375mA I_B=1.0A		0.25 0.8 1.5		0.25 0.8 1.5		0.25 0.8 1.5		0.25 0.8 1.5		0.25 0.8 1.5	V
h_{fc}	V_{CE}=10V f=1kHz	I_C=0.5A	20		20		20		20		20		
$\|h_{fe}\|$	V_{CE}=10V f=1MHz	I_C=0.5A	3		3		3		3		3		

*See Notes 4 & 5

NOTES: 4. These parameters must be measured using pulse techniques, t_w = 300μs, duty cycle ≤2%
5. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts

thermal characteristics

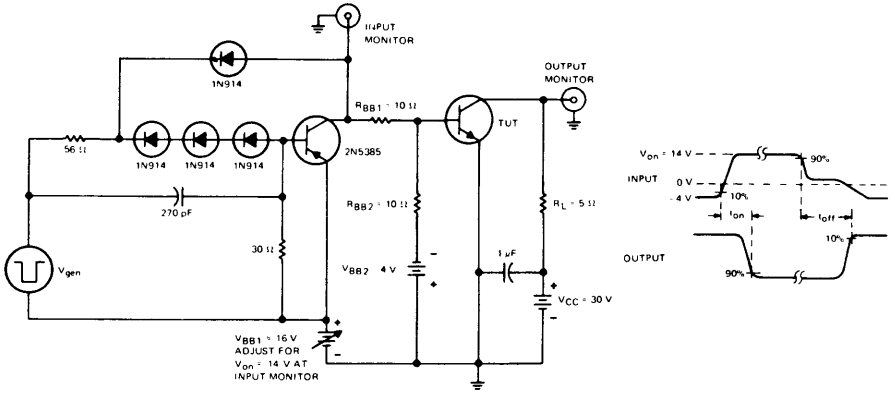
	PARAMETER	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance	2.78	°C/W
$R_{\theta JA}$	Junction-to-Free-Air Thermal Resistance	62.5	

switching characteristics at 25°C case temperature

	PARAMETER	TEST CONDITIONS†			TYP	UNIT
t_{ON}	Turn-On Time	I_C = 1A	$I_{B(1)}$ = 100mA	$I_{B(2)}$ = −100mA	0.5	μsec.
t_{OFF}	Turn-Off Time	$V_{BE(off)}$=−4.3V R_L = 30Ω		See Figure 1	2.0	

†Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT **VOLTAGE WAVEFORMS**

NOTES: A. V_{gen} is a −30-V pulse (from 0 V) into a 50-Ω termination.
B. The V_{gen} waveform is supplied by a generator with the following characteristics: $t_r \leq 15$ ns, $t_f \leq 15$ ns, $Z_{out} = 50\ \Omega$, $t_w = 20\ \mu s$, duty cycle ≤ 2%.
C. Waveforms are monitored on an oscilloscope with the following characteristics: $t_r \leq 15$ ns, $R_{in} \geq 10\ M\Omega$, $C_{in} \leq 11.5$ pF.
D. Resistors must be noninductive types.
E. The d-c power supplies may require additional bypassing in order to minimize ringing.

FIGURE 1

MAXIMUM SAFE OPERATING REGION

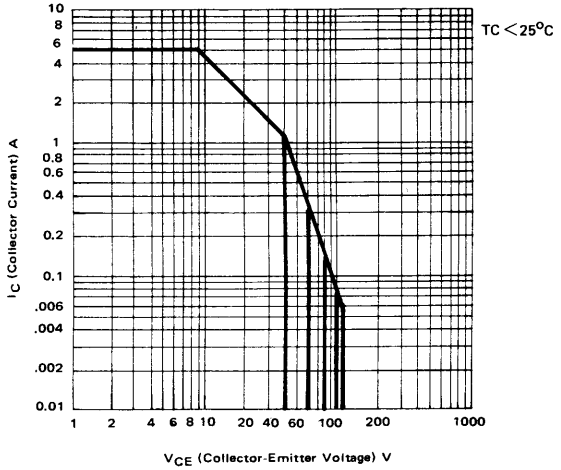


FIGURE 2.

BD540 SERIES
PNP SINGLE DIFFUSED SILICON POWER TRANSISTORS

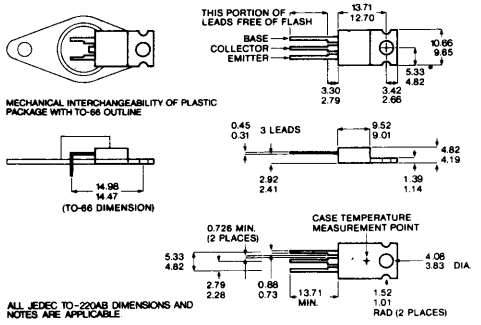
Designed for Medium Power Linear Amplifiers and Switching in Consumer, Automotive and Industrial Applications

features

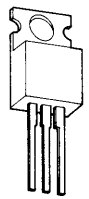
- Low Saturation Voltages $V_{CE(sat)}$ = 0.8V max @ I_C = 3A
- Complimentary to NPN Types BD539 Series
- 5A Rated Collector Current
- 45W at 25°C Case Temperature
- Up to 120V V_{CEO} rating

mechanical specification

THE COLLECTOR IS IN ELECTRICAL CONTACT WITH THE MOUNTING TAB



ALL DIMENSIONS ARE IN MILLIMETRES



absolute maximum ratings at 25°C case temperature (unless otherwise noted)

	BD540	BD540A	BD540B	BD540C	BD540D
Collector-Base Voltage	−40V	−60V	−80V	−100V	−120V
Collector-Emitter Voltage (See Note 1)	−40V	−60V	−80V	−100V	−120V
Emitter-Base Voltage	← −5V →				
Continuous Collector Current	← −5A →				
Safe Operating Region at (or below) 25°C Case Temperature	← See Figure 2 →				
Continuous Device Dissipation at (or below) 25°C Case Temperature (See Note 2)	← 45W →				
Continuous Device Dissipation at (or below) 25°C Free Air Temperature (See Note 3)	← 2W →				
Operating Collector Junction Temperature Range	← −65°C to 150°C →				
Storage Temperature Range	← −65°C to 150°C →				
Lead Temperature 3.2mm from Case for 10 Seconds	← 260°C →				

NOTES: 1. This value applies when the base-emitter diode is open-circuited
2. Derate linearly to 150°C Case Temperature at the rate of 0.36W/°C
3. Derate linearly to 150°C Free-Air Temperature at the rate of 16mW/°C

electrical characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS		BD540		BD540A		BD540B		BD540C		BD540D		UNITS
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
$V_{(BR)CEO}$	I_C=−30mA See Note 4	I_B=0	−40		−60		−80		−100		−120		V
I_{CEO}	V_{CE}=−30V V_{CE}=−60V V_{CE}=−90V	I_B=0 I_B=0 I_B=0		−0.3		−0.3		−0.3		−0.3		−0.3	mA
I_{CES}	V_{CE}=−40V V_{CE}=−60V V_{CE}=−80V V_{CE}=−100V V_{CE}=−120V	V_{BE}=0 V_{BE}=0 V_{BE}=0 V_{BE}=0 V_{BE}=0		−0.2		−0.2		−0.2		−0.2		−0.2	mA
I_{EBO}	V_{EB}=−5V	I_C=0		−1		−1		−1		−1		−1	mA
h_{FE}*	I_C=−0.5A I_C=−1.0A I_C=−3.0A	V_{CE}=−4V V_{CE}=−4V V_{CE}=−4V	40 30 12		40 30 12		40 30 12		40 30 12		40 30 12		
$V_{BE(act)}$*	I_C=−3.0A	V_{CE}=−4V		−1.25		−1.25		−1.25		−1.25		−1.25	V
$V_{CE(sat)}$*	I_C=−1.0A I_C=−3.0A I_C= −5.0A	I_B=−125mA I_B=−375mA I_B = −1.0A		−0.25 −0.8 −1,5		−0.25 −0.8 −1.5		−0.25 −0.8 −1.5		−0.25 −0.8 −1.5		−0.25 −0.8 −1.5	V
h_{fe}	V_{CE}=−10V f=1kHz	I_C=−0.5A	20		20		20		20		20		
$\|h_{fe}\|$	V_{CE}=−10V f=1MHz	I_C=−0.5A	3		3		3		3		3		

*See Notes 4 & 5

NOTES: 4. These parameters must be measured using pulse techniques, t_w = 300μs, duty cycle ≤2%
5. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts

thermal characteristics

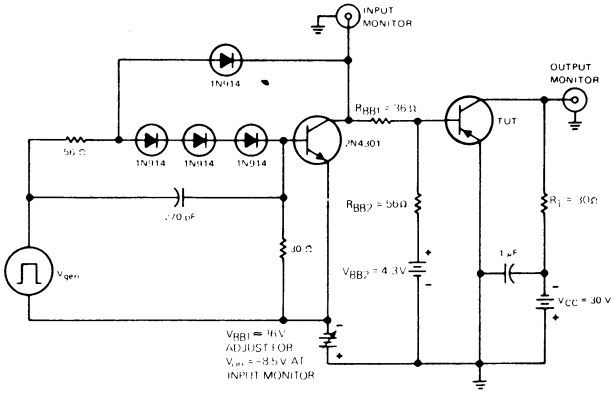
	PARAMETER	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance	2.78	°C/W
$R_{\theta JR}$	Junction-to-Free-Air Thermal Resistance	62.5	

switching characteristics at 25°C case temperature

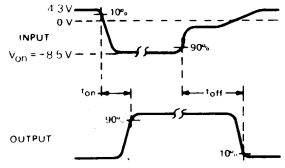
	PARAMETER	TEST CONDITIONS†			TYP	UNIT
t_{ON}	Turn-On Time	I_C = −1A	$I_{B(1)}$ = −100mA	$I_{B(2)}$ = −100mA	0.3	μsec
t_{OFF}	Turn-Off Time	$V_{BE(off)}$ = 4.3V	R_L = 30Ω	See Figure 1	1.0	

†Voltage and current values shown are nominal; exact values vary slightly with transistor parameters

PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



VOLTAGE WAVEFORMS

NOTES: A. V_{gen} is a 30-V pulse (from 0 V) into a 50-Ω termination.
B. The V_{gen} waveform is supplied by a generator with the following characteristics: $t_r \leq 15$ ns, $t_f \leq 15$ ns, $Z_{out} = 50\ \Omega$, $t_w = 20\ \mu s$, duty cycle ≤ 2%.
C. Waveforms are monitored on an oscilloscope with the following characteristics: $t_r \leq 15$ ns, $R_{in} \geq 10\ M\Omega$, $C_{in} \leq 11.5$ pF.
D. Resistors must be noninductive types.
E. The d-c power supplies may require additional bypassing in order to minimize ringing.

FIGURE 1

MAXIMUM SAFE OPERATING REGION

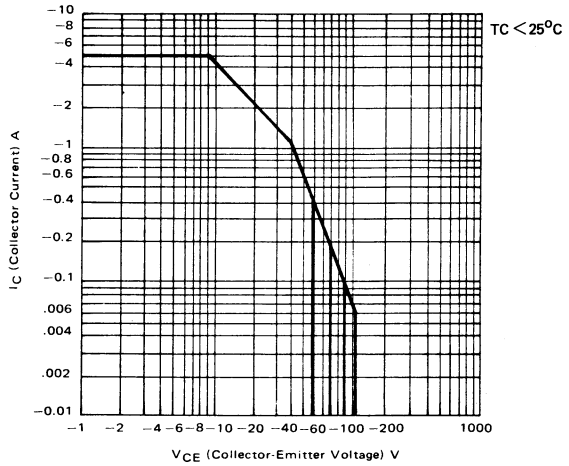


FIGURE 2.

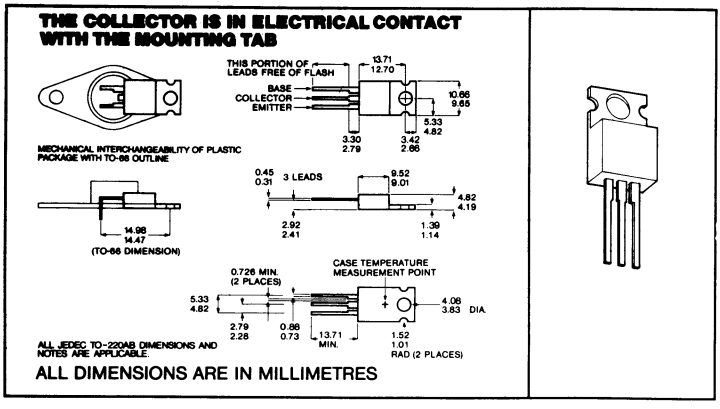
BD 543 SERIES
NPN SINGLE DIFFUSED SILICON POWER TRANSISTORS

Designed for Medium Power Linear Amplifiers and Switching in Consumer Automotive and Industrial Applications

features

- Low Saturation Voltages $V_{CE(sat)}$ = 0.5V max @ I_C = 5A
- Complimentary to PNP Types BD544 Series
- 8A Rated Collector Current
- 70W at 25°C Case Temperature
- Up to 120V V_{CEO} Rating

mechanical specification



absolute maximum ratings at 25°C case temperature (unless otherwise noted)

	BD543	BD543A	BD543B	BD543C	BD543D
Collector-Base Voltage	40V	60V	80V	100V	120V
Collector-Emitter Voltage (See Note 1)	40V	60V	80V	100V	120V
Emitter-Base Voltage	← 5V →				
Continuous Collector Current	← 8A →				
Peak Collector Current (See Note 2)	← 10A →				
Safe Operating Region at (or below) 25°C Case Temperature	← See Figure 2 →				
Continuous Device Dissipation at (or below) 25°C Case Temperature (See Note 3)	← 70W →				
Continuous Device Dissipation at (or below) 25°C Free Air Temperature (See Note 4)	← 2W →				
Operating Collector Junction Temperature Range	← −65°C to 150°C →				
Storage Temperature Range	← −65°C to 150°C →				
Lead Temperature 3.2mm from Case for 10 Seconds	← 260°C →				

NOTES: 1. This value applies when the base-emitter diode is open-circuited
2. This value applies for $t_w \leqslant 0.3$ms, duty cycle $\leqslant 10\%$
3. Derate linearly to 150°C Case Temperature at the rate of 0.56W/°C
4. Derate linearly to 150°C Free-Air Temperature at the rate of 16mW/°C

BD 543 SERIES
NPN SINGLE DIFFUSED SILICON POWER TRANSISTORS

electrical characteristics at 25°C case temperature (unless otherwise noted)

PARAMETER	TEST CONDITIONS		BD543		BD543A		BD543B		BD543C		BD543D		UNITS
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
$V_{(BR)CEO}$	I_C=30mA See Note 5	I_B=0	40		60		80		100		120		V
I_{CEO}	V_{CE}=30V V_{CE}=60V V_{CE}=90V	I_B=0 I_B=0 I_B=0		0.7		0.7		0.7		0.7		0.7	mA
I_{CES}	V_{CE}=40V V_{CE}=60V V_{CE}=80V V_{CE}=100V V_{CE}=120V	V_{BE}=0 V_{BE}=0 V_{BE}=0 V_{BE}=0 V_{BE}=0		0.4		0.4		0.4		0.4		0.4	mA
I_{EBO}	V_{EB}=5V	I_C=0		1		1		1		1		1	mA
h_{FE}*	I_C=1A I_C=3A I_C=5A	V_{CE}=4V V_{CE}=4V V_{CE}=4V	60 40 15		60 40 15		60 40 15		60 40 15		60 40 15		
$V_{BE(act)}$*	I_C=5A	V_{CE}=4V		1.4		1.4		1.4		1.4		1.4	V
$V_{CE(sat)}$*	I_C=3A I_C=5A I_C=8A	I_B=300mA I_B=1A I_B=1.6A		0.5 0.5 1.0		0.5 0.5 1.0		0.5 0.5 1.0		0.5 0.5 1.0		0.5 0.5 1.0	V
h_{fe}	V_{CE}=10V f=1kHz	I_C=0.5A	20		20		20		20		20		
$\|h_{fe}\|$	V_{CE}=10V f-1MHz	I_C=0.5A	3		3		3		3		3		

*See Notes 5 & 6

NOTES: 5. These parameters must be measured using pulse techniques, t_w = 300μs, duty cycle $\leqslant$2%
6. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts

thermal characteristics

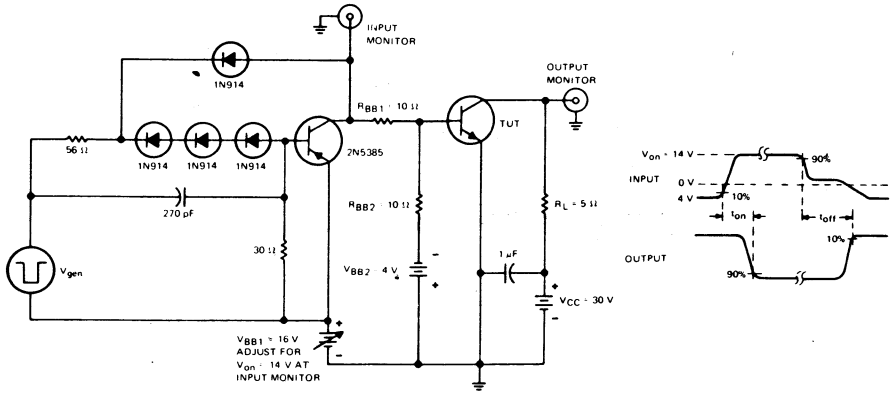
	PARAMETER	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance	1.79	°C/W
$R_{\theta JR}$	Junction-to-Free-Air Thermal Resistance	62.5	

switching characteristics at 25°C case temperature

	PARAMETER	TEST CONDITIONS†			TYP	UNIT
t_{ON}	Turn-On Time	I_C = 6A	$I_{B(1)}$ = 0.6A	$I_{B(2)}$ = −0.6A	0.6	μsec
t_{OFF}	Turn-Off Time	$V_{BE(off)}$ = −4V	R_L = 5Ω	See Figure 1	1	

†Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT

VOLTAGE WAVEFORMS

NOTES: A. V_{gen} is a −30-V pulse (from 0 V) into a 50-Ω termination.

B. The V_{gen} waveform is supplied by a generator with the following characteristics: $t_r \leq 15$ ns, $t_f \leq 15$ ns, $Z_{out} = 50\ \Omega$, $t_w = 20\ \mu s$, duty cycle ≤ 2%.

C. Waveforms are monitored on an oscilloscope with the following characteristics: $t_r \leq 15$ ns, $R_{in} \geq 10\ M\Omega$, $C_{in} \leq 11.5$ pF.

D. Resistors must be noninductive types.

E. The d-c power supplies may require additional bypassing in order to minimize ringing.

FIGURE 1

MAXIMUM SAFE OPERATING REGION

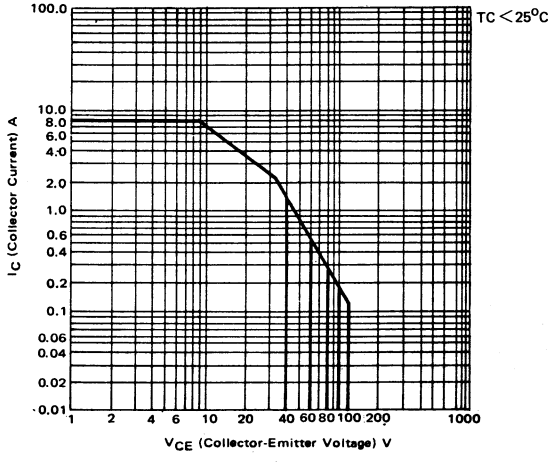


FIGURE 2.

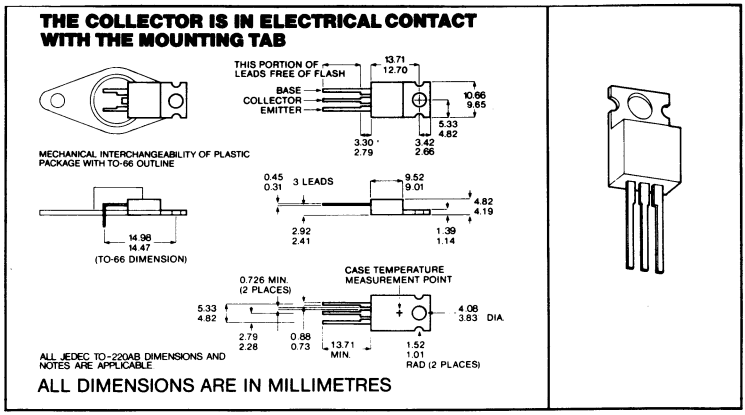
BD544 SERIES
PNP SINGLE DIFFUSED SILICON POWER TRANSISTORS

Designed for Medium Power Linear Amplifiers and Switching in Consumer, Automotive and Industrial Applications

features

- Low Saturation Voltages $V_{CE(sat)}$ = 0.5V max @ I_C = 5A
- Complimentary to NPN Types BD543 Series
- 8A Rated Collector Current
- 70W at 25°C Case Temperature
- Up to 120V V_{CEO} Rating

mechanical data



absolute maximum ratings at 25°C case temperature (unless otherwise noted)

	BD544	BD544A	BD544B	BD544C	BD544D
Collector-Base Voltage	−40V	−60V	−80V	−100V	−120V
Collector-Emitter Voltage (See Note 1)	−40V	−60V	−80V	−100V	−120V
Emitter-Base Voltage	← −5V →				
Continuous Collector Current	← −8A →				
Peak Collector Current (See Note 2)	← −10A →				
Safe Operating Region at (or below) 25°C Case Temperature	← See Figure 2 →				
Continuous Device Dissipation at (or below) 25°C Case Temperature (See Note 3)	← 70W →				
Continuous Device Dissipation at (or below) 25°C Free Air Temperature (See Note 4)	← 2W →				
Operating Collector Junction Temperature Range	← −65°C to 150°C →				
Storage Temperature Range	← −65°C to 150°C →				
Lead Temperature 3.2mm from Case for 10 Seconds	← 260°C →				

NOTES: 1. This value applies when the base-emitter diode is open-circuited
2. This value applies for $t_w \leqslant 0.3$ms, duty cycle $\leqslant 10\%$
3. Derate linearly to 150°C Case Temperature at the rate of 0.56W/°C
4. Derate linearly to 150°C Free-Air Temperature at the rate of 16mW/°C

electrical characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS		BD544		BD544A		BD544B		BD544C		BD544D		UNITS
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
$V_{(BR)CEO}$	I_C=−30mA See Note 5	I_B=0	−40		−60		−80		−100		−120		V
I_{CEO}	V_{CE}=−30V V_{CE}=−60V V_{CE}=−90V	I_B=0 I_B=0 I_B=0		−0.7		−0.7		−0.7		−0.7		−0.7	mA
I_{CES}	V_{CE}=−40V V_{CE}=−60V V_{CE}=−80V V_{CE}=−100V V_{CE}=−120	V_{BE}=0 V_{BE}=0 V_{BE}=0 V_{BE}=0 V_{BE}=0		−0.4		−0.4		−0.4		−0.4		−0.4	mA
I_{EBO}	V_{EB}=−5V	I_C=0		−1		−1		−1		−1		−1	mA
h_{FE}*	I_C=−1A I_C=−3A I_C=−5A	V_{CE}=−4V V_{CE}=−4V V_{CE}=−4V	60 40 15		60 40 15		60 40 15		60 40 15		60 40 15		
$V_{BE(act)}$*	I_C=−5A	V_{CE}=−4V		−1.4		−1.4		−1.4		−1.4		−1.4	V
$V_{CE(sat)}$*	I_C=−3A I_C=−5A I_C=−8A	I_B=−300mA I_B=−1A I_B=−1.6A		−0.5 −0.5 −1.0		−0.5 −0.5 −1.0		−0.5 −0.5 −1.0		−0.5 −0.5 −1.0		−0.5 −0.5 −1.0	V
h_{fe}	V_{CE}=−10V f=1kHz	I_C=−0.5A	20		20		20		20		20		
$\|h_{fe}\|$	V_{CE}=−10V f=1MHz	I_C=−0.5A	3		3		3		3		3		

*See Notes 5 & 6

NOTES: 5. These parameters must be measured using pulse techniques, t_w = 300μs, duty cycle ≤2%
6. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts

thermal characteristics

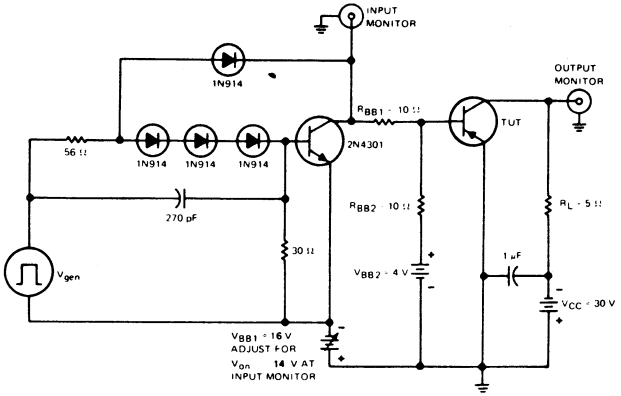
	PARAMETER	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance	1.79	°C/W
$R_{\theta JA}$	Junction-to-Free-Air Thermal Resistance	62.5	

switching characteristics at 25°C case temperature

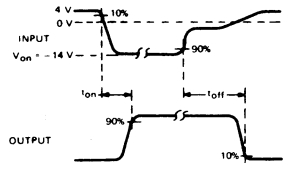
	PARAMETER	TEST CONDITIONS†			TYP	UNIT
t_{ON}	Turn-On Time	I_C = −6A	$I_{B(1)}$ = −0.6A	$I_{B(2)}$ = +0.6A	0.4	μsec
t_{OFF}	Turn-Off Time	$V_{BE(off)}$ = 4V	R_L = 5Ω	See Figure 1	0.7	

†Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



VOLTAGE WAVEFORMS

NOTES: A. V_{gen} is a 30-V pulse (from 0 V) into a 50-Ω termination.
B. The V_{gen} waveform is supplied by a generator with the following characteristics: $t_r \leq 15$ ns, $t_f \leq 15$ ns, $Z_{out} = 50\ \Omega$, $t_w = 20\ \mu s$, duty cycle ≤ 2%.
C. Waveforms are monitored on an oscilloscope with the following characteristics: $t_r \leq 15$ ns, $R_{in} \geq 10\ M\Omega$, $C_{in} \leq 11.5$ pF.
D. Resistors must be noninductive types.
E. The d-c power supplies may require additional bypassing in order to minimize ringing.

FIGURE 1

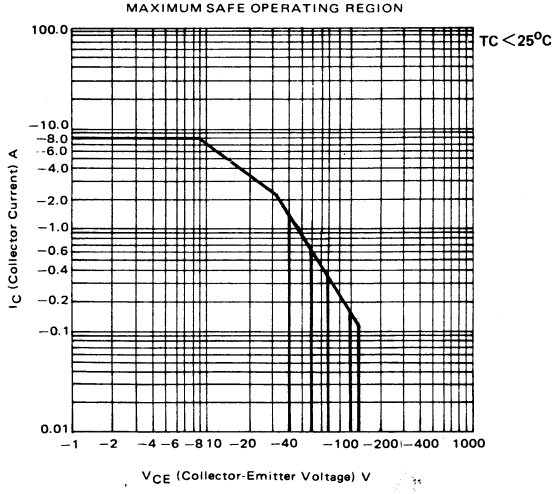


FIGURE 2

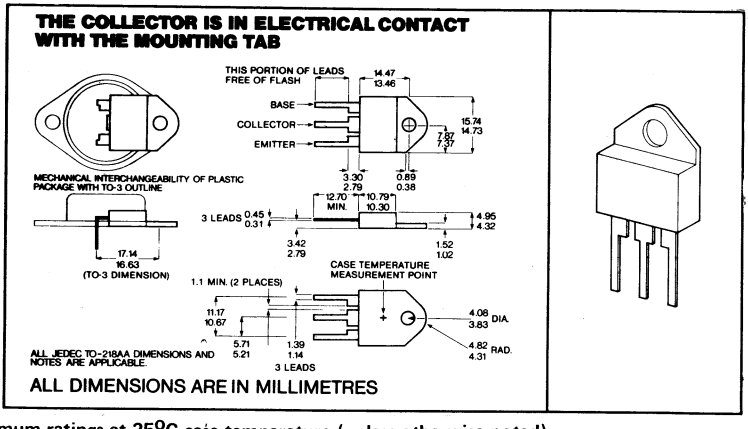
BD545 SERIES
NPN SINGLE DIFFUSED SILICON POWER TRANSISTORS

Designed for Power Linear Amplifiers and Switching in Consumer, Automotive and Industrial Applications

features

- Low Saturation Voltages $V_{CE(sat)}$ = 1V max @ I_C = 10A
- Complimentary to BD546 Series
- 15A Rated Collector Current
- 85W at 25°C Case Temperature
- Up to 120V V_{CEO}

mechanical specification



absolute maximum ratings at 25°C case temperature (unless otherwise noted)

	BD545	BD545A	BD545B	BD545C	BD545D
Collector-Base Voltage	40V	60V	80V	100V	120V
Collector-Emitter Voltage (See Note 1)	40V	60V	80V	100V	120V
Emitter-Base Voltage	5V				
Continuous Collector Current	15A				
Safe Operating Region at (or below) 25°C Case Temperature	See Figure 2				
Continuous Device Dissipation at (or below) 25°C Case Temperature (See Note 2)	85W				
Continuous Device Dissipation at (or below) 25°C Free Air Temperature (See Note 3)	3.5W				
Operating Collector Junction Temperature Range	−65°C to 150°C				
Storage Temperature Range	−65°C to 150°C				
Lead Temperature 3.2mm from Case for 10 Seconds	260°C				

NOTES: 1. This value applies when the base-emitter diode is open-circuited
2. Derate linearly to 150°C Case Temperature at the rate of 0.68W/°C
3. Derate linearly to 150°C Free-Air Temperature at the rate of 28mW/°C

BD545 SERIES
NPN SINGLE DIFFUSED SILICON POWER TRANSISTORS

electrical characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS		BD545		BD545A		BD545B		BD545C		BD545D		UNITS
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
$V_{(BR)CEO}$	I_C=30mA See Note 4	I_B=0	40		60		80		100		120		V
I_{CEO}	V_{CE}=30V V_{CE}=60V V_{CE}=90V	I_B=0		0.7		0.7		0.7		0.7		0.7	mA
I_{CES}	V_{CE}=40V V_{CE}=60V V_{CE}=80V V_{CE}=100V V_{CE}=120V	V_{BE}=0 V_{BE}=0 V_{BE}=0 V_{BE}=0 V_{BE}=0		0.4		0.4		0.4		0.4		0.4	mA
I_{EBO}	V_{EB}=5V	I_C=0		1		1		1		1		1	mA
h_{FE}*	I_C=1A I_C=5A I_C=10A	V_{CE}=4V V_{CE}=4V V_{CE}=4V	60 25 10		60 25 10		60 25 10		60 25 10		60 25 10		
$V_{BE(act)}$*	I_C=10A	V_{CE}=4V		1.8		1.8		1.8		1.8		1.8	V
$V_{CE(sat)}$*	I_C=5A I_C=10A	I_B=625mA I_B=2A		0.8 1		0.8 1		0.8 1		0.8 1		0.8 1	V
h_{fe}	V_{CE}=10V f=1kHz	I_C=0.5A	20		20		20		20		20		
$\|h_{fe}\|$	V_{CE}=10V f-1MHz	I_C=0.5A	3		3		3		3		3		

*See Notes 4 & 5

NOTES: 4. These parameters must be measured using pulse techniques, t_w = 300μs, duty cycle ≤2%
5. These parameters are measured with voltage sensing contacts separate from the current carrying contacts.

thermal characteristics

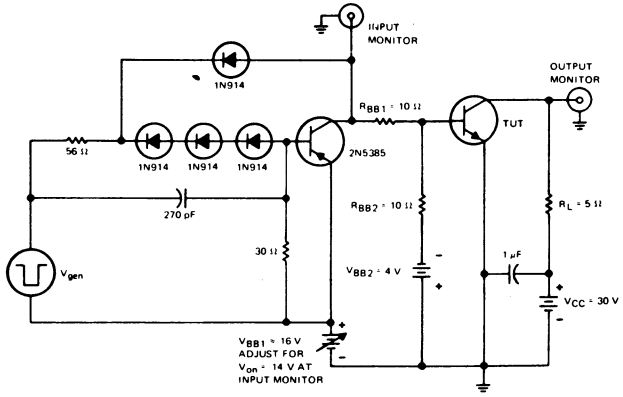
	PARAMETER	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance	1.47	°C/W
$R_{\theta JR}$	Junction-to-Free-Air Thermal Resistance	35.7	

switching characteristics at 25°C case temperature

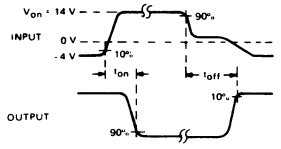
	PARAMETER	TEST CONDITIONS†			TYP	UNIT
t_{ON}	Turn-On Time	I_C = 6A	$I_{B(1)}$ = 0.6A	$I_{B(2)}$ = −0.6A	0.6	μsec
t_{OFF}	Turn-Off Time	$V_{BE(off)}$ = −4V	R_L - 5Ω	See Figure 1	1	

†Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



VOLTAGE WAVEFORMS

NOTES: A. V_{gen} is a −30-V pulse (from 0 V) into a 50-Ω termination.
B. The V_{gen} waveform is supplied by a generator with the following characteristics: $t_r \leq 15$ ns, $t_f \leq 15$ ns, $Z_{out} = 50\ \Omega$, $t_w = 20\ \mu s$, duty cycle ≤ 2%.
C. Waveforms are monitored on an oscilloscope with the following characteristics: $t_r \leq 15$ ns, $R_{in} \geq 10\ M\Omega$, $C_{in} \leq 11.5$ pF.
D. Resistors must be noninductive types.
E. The d-c power supplies may require additional bypassing in order to minimize ringing.

FIGURE 1

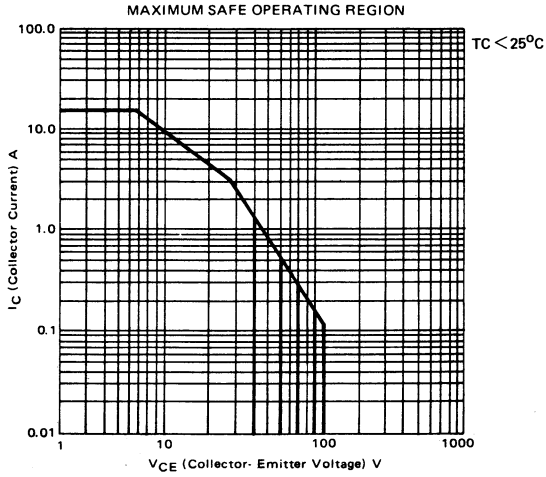


FIGURE 2.

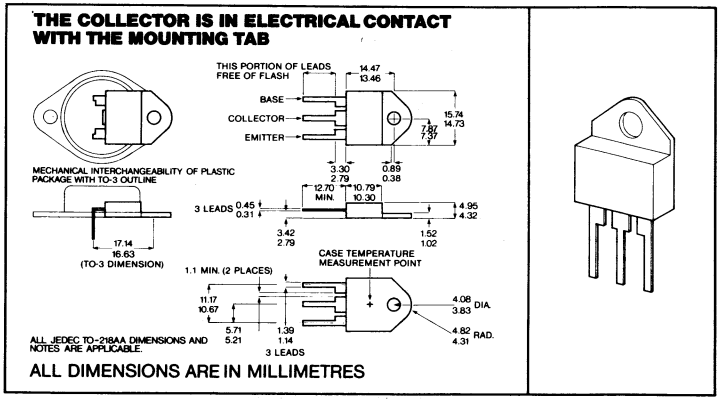
BD546 SERIES
PNP SINGLE DIFFUSED SILICON POWER TRANSISTORS

Designed for Power Linear Amplifiers and Switching in Consumer, Automotive and Industrial Applications

Features

- Low Saturation Voltages $V_{CE(sat)}$ = 1V max @ 10A
- Complimentary to BD545 Series
- 15A Rated Collector Current
- 85W at 25°C Case Temperature
- Up to 120V V_{CEO}

mechanical specification



absolute maximum ratings at 25°C case temperature (unless otherwise noted)

	BD546	BD546A	BD546B	BD546C	BD546D
Collector-Base Voltage	−40V	−60V	−80V	−100V	−120V
Collector-Emitter Voltage (See Note 1)	−40V	−60V	−80V	−100V	−120V
Emitter-Base Voltage	← −5V →				
Continuous Collector Current	← −15A →				
Safe Operating Region at (or below) 25°C Case Temperature	← See Figure 2 →				
Continuous Device Dissipation at (or below) 25°C Case Temperature (See Note 2)	← 85W →				
Continuous Device Dissipation at (or below) 25°C Free Air Temperature (See Note 3)	← 3.5W →				
Operating Collector Junction Temperature Range	← −65°C to 150°C →				
Storage Temperature Range	← −65°C to 150°C →				
Lead Temperature 3.2mm from Case for 10 Seconds	← 260°C →				

NOTES: 1. This value applies when the base-emitter diode is open-circuited
2. Derate linearly to 150°C Case Temperature at the rate of 0.68W/°C.
3. Derate linearly to 150°C Free-Air Temperature at the rate of 28mW/°C.

electrical characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS		BD546		BD546A		BD546B		BD546C		BD546D		UNITS
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
$V_{(BR)CEO}$	I_C=−30mA (See Note 4)	I_B=0	−40		−60		−80		−100		−120		V
I_{CEO}	V_{CE}=−30V V_{CE}=−60V V_{CE}=−90V	I_B=0 I_B=0 I_B=0		−0.7		−0.7		−0.7		−0.7		−0.7	mA
I_{CES}	V_{CE}=−40V V_{CE}=−60V V_{CE}=−80V V_{CE}=−100V V_{CE}=−120V	V_{BE}=0 V_{BE}=0 V_{BE}=0 V_{BE}=0 V_{BE}=0		−0.4		−0.4		−0.4		−0.4		−0.4	mA
I_{EBO}	V_{EB}=−5V	I_C=0		−1		−1		−1		−1		−1	mA
h_{FE}*	I_C=−1A I_C=−5A I_C=−10A	V_{CE}=−4V V_{CE}=−4V V_{CE}=−4V	60 25 10		60 25 10		60 25 10		60 25 10		60 15 8		
$V_{BE(act)}$*	I_C=−10A	V_{CE}=−4V		−1.8		−1.8		−1.8		−1.8		−1.8	V
$V_{CE(sat)}$*	I_C=−5A I_C=−10A	I_B=−625mA I_B=−2A		−0.8 −1		−0.8 −1		−0.8 −1		−0.8 −1		−0.8	V
h_{fe}	V_{CE}=−10V L=1kHz	I_C=−0.5A	20		20		20		20		20		
$\|h_{fe}\|$	V_{CE}=−10V f=1MHz	I_C=−0.5A	3		3		3		3		3		

*See Notes 4 & 5

NOTES: 4. These parameters must be measured using pulse techniques, t_w=300μs, duty cycle ≤2%
5. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts

thermal characteristics

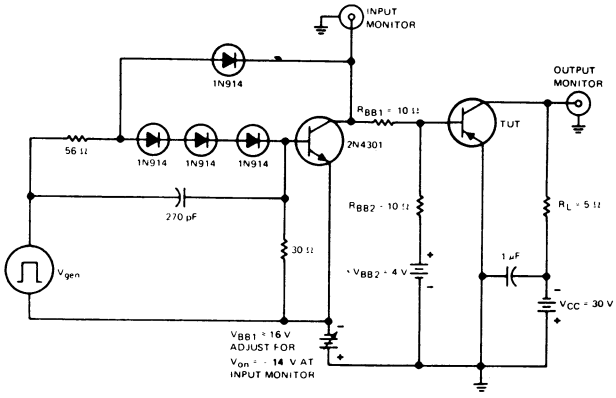
	PARAMETER	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance	1.47	°C/W
$R_{\theta JA}$	Junction-to-Free-Air Thermal Resistance	35.7	

switching characteristics at 25°C case temperature

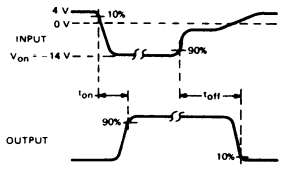
	PARAMETER	TEST CONDITIONS†			TYP	UNIT
t_{ON}	Turn-On Time	I_C = −6A	$I_{B(1)}$ = −0.6A	$I_{B(2)}$ = 0.6A	0.4	μsec
t_{OFF}	Turn-Off Time	$V_{BE(off)}$ = 4V	R_L = 5Ω	See Figure 1	0.7	

†Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



VOLTAGE WAVEFORMS

NOTES: A. V_{gen} is a 30-V pulse (from 0 V) into a 50-Ω termination.
B. The V_{gen} waveform is supplied by a generator with the following characteristics: $t_r \leq 15$ ns, $t_f \leq 15$ ns, $Z_{out} = 50\ \Omega$, $t_w = 20\ \mu s$, duty cycle ≤ 2%.
C. Waveforms are monitored on an oscilloscope with the following characteristics: $t_r \leq 15$ ns, $R_{in} \geq 10\ M\Omega$, $C_{in} \leq 11.5$ pF.
D. Resistors must be noninductive types.
E. The d-c power supplies may require additional bypassing in order to minimize ringing.

FIGURE 1

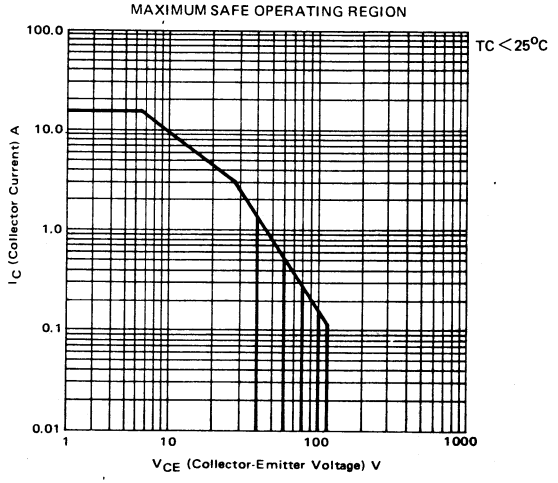


FIGURE 2.