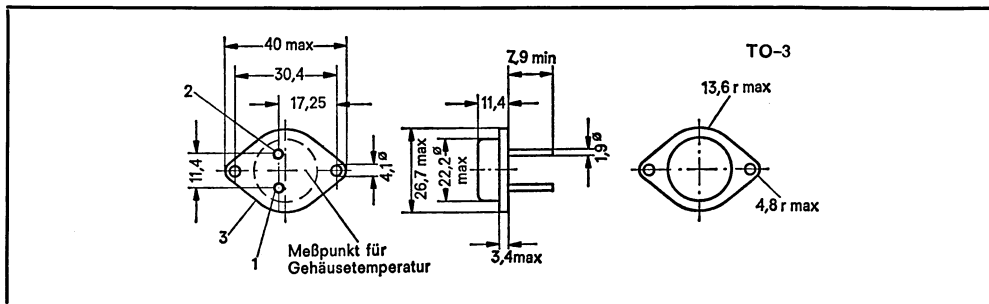


NPN-Silizium-Leistungstransistor

Für Horizontalablenk-Endstufen in Fernsehempfängern;
Sehr schnelle Schaltanwendungen bei hohen Strömen.

Mechanische Daten: Kollektor mit Gehäuse leitend verbunden.



1 — Basis, 2 — Emitter, 3 — Kollektor

Maße in mm

Absolute Grenzwerte bei $T_G = 25^\circ\text{C}$

Kollektor-Basis-Spannung (Bem. 1)	300 V
Kollektor-Emitter-Spannung (Bem. 2)	300 V
Kollektor-Emitter-Spannung (Bem. 3)	120 V
Emitter-Basis-Spannung	8 V
Kollektorstrom, Spitze (Bem. 5)	15 A
Dauer	10 A
Basisstrom, Spitze	5 A
Dauer	3 A
Gesamtdauerverlustleistung bei $T_G \leq 25^\circ\text{C}$ (Bem. 4)	50 W
Lagerungstemperaturbereich	-65°C bis $+175^\circ\text{C}$
Arbeitstemperaturbereich	-55°C bis $+150^\circ\text{C}$

Bemerkungen:

- bei $I_E = 0$.
- bei U_{BE} zwischen -2 V und -8 V .
- bei $I_B = 0$.
- $U_{CE} \leq 10\text{ V}$.
- bei $t_p \leq 500\ \mu\text{s}$; $d \leq 25\%$



TEXAS INSTRUMENTS Deutschland GmbH

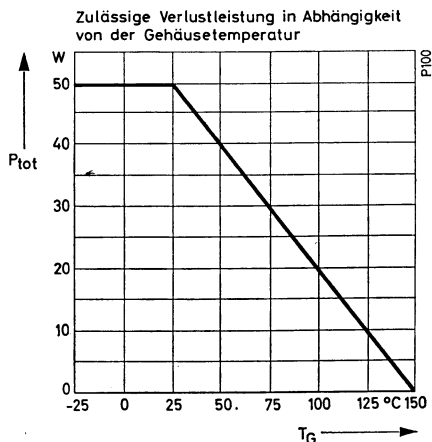
805 Freising, Haggerty-Straße

Elektrische Kennwerte bei $T_G = 25\text{ }^\circ\text{C}$ (wenn nicht anders angegeben)

Parameter	Prüfbedingungen	min	typ	max	Einheit
$U_{(BR)CBO}$	$I_C = 50\text{ mA}$, $I_E = 0$ (Bem. 6)	300			V
$U_{(BR)EBO}$	$I_E = 10\text{ mA}$, $I_C = 0$	8			V
U_{CEV}	$I_C = 50\text{ mA}$, $U_{BE} = -2\text{ V}$	300			V
U_{CEO}	$I_C = 100\text{ mA}$, $I_B = 0$ (Bem. 6)	120			
h_{FE}	$I_C = 7\text{ A}$, $U_{CE} = 1,5\text{ V}$ (Bem. 6)	5	10		
$U_{BE(sat)}$	$I_C = 7\text{ A}$, $I_B = 1,4\text{ A}$ (Bem. 6)		1,0	2,0	V
$U_{CE(sat)}$	$I_C = 7\text{ A}$, $I_B = 1,4\text{ A}$ (Bem. 6)		0,4	1,5	V
t_f	$I_C = 7\text{ A}$, $I_{B(on)} = 1,4\text{ A}$ $U_{CE} = 40\text{ V}$, $I_{B(off)} = 1,4\text{ A}$		0,4	1,0	μs
t_s	$I_C = 7\text{ A}$, $I_{B(on)} = 1,4\text{ A}$ $U_{CE} = 40\text{ V}$, $I_{B(off)} = 1,4\text{ A}$ $t_p = 10\text{ }\mu\text{s}$, $d \leq 2\%$		0,7	3,0	μs

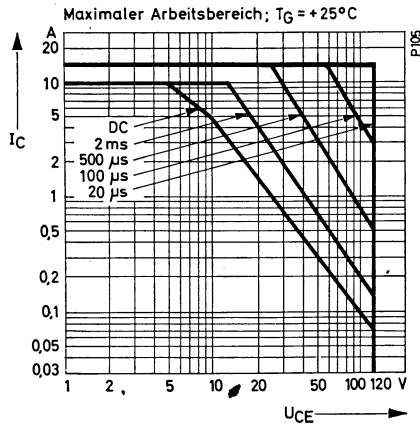
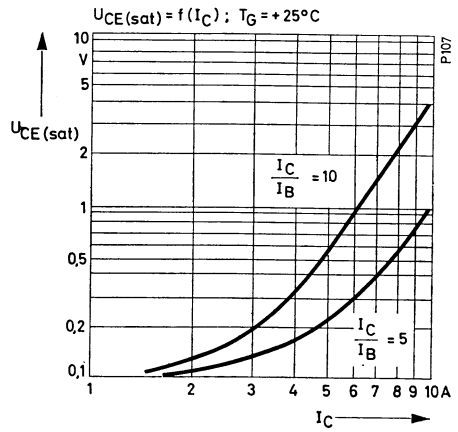
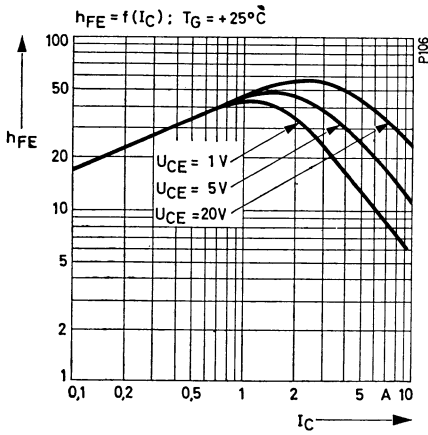
Bemerkungen:

6. Impulsmäßig gemessen; $t_p \leq 300\text{ }\mu\text{s}$, $d \leq 2\%$.



TEXAS INSTRUMENTS Deutschland GmbH
805 Freising, Haggerty-Straße

Typische Kennlinien

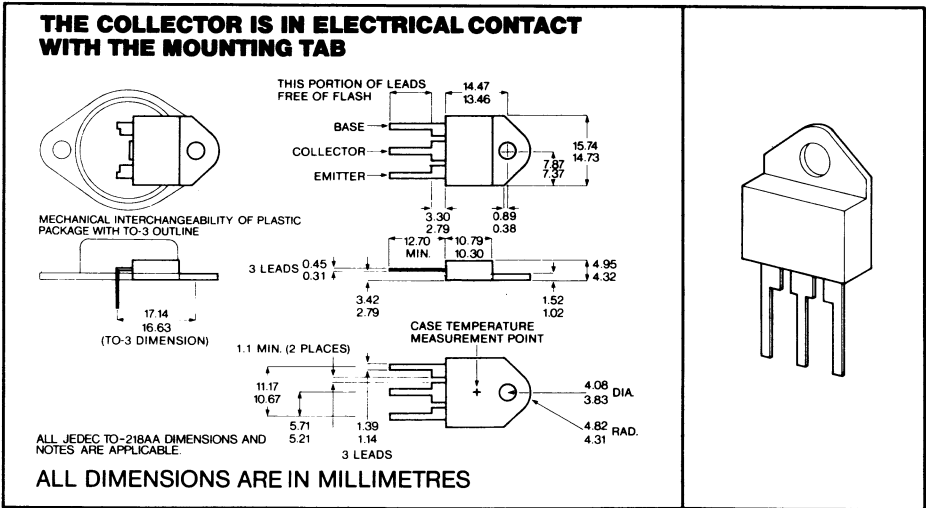


TEXAS INSTRUMENTS Deutschland GmbH
805 Freising, Haggerty-Straße

OCT 82

- Specifically designed for Portable TV Linescan Applications and other Switching Functions
- Plastic Package Compatible with Metal Can TO-3 layout
- 10A Continuous Collector Current, 400V VCBO
- 350V VCBO BU124, 400V VCBO BU124A.

mechanical specification



absolute maximum ratings (at 25°C case temperature)

	BU124	BU124A
VCBO Collector Base Voltage (IE = 0)	350V	400V
VCEO Collector Emitter Voltage (IB = 0)	150V	150V
VCEX Collector Emitter Voltage VBE = -2V	350V	400V
VEB Emitter Base Voltage	8V	8V
IB Continuous Base Current	3A	3A
IC Continuous Collector Current	10A	10A
IC (peak) Pulsed Collector Current (see note 1)	15A	15A
Ptot Continuous Dissipation (Tcase = 25°C)	50W	50W
TJ Operating Junction Temperature Range	-55°C to 150°C	

Note 1. Pulse Width = 1mS Duty Cycle 25%.

BU124, BU124A

NPN SILICON POWER TRANSISTOR

electrical characteristics at T case = 25°C (unless otherwise stated)

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
I _{CBO} Collector-base leakage current	V _{CB} = 300V (BU124) V _{CB} = 350V (BU124A)			500	μA
V _{(BR)CEO} Collector-emitter breakdown voltage	I _C = 50 mA, I _B = 0.	150			V
V _{(BR)EBO} Emitter-base breakdown voltage	I _E = 10mA, I _C = 0	8			V
V _{(BR)CBO} Collector-base breakdown voltage	I _C = 1mA	BU124	350		V
		BU124A	400		V
V _{CE(sat)} Collector-emitter saturation voltage	I _C = 4A I _B = 0.5A (see note 2)			0.5	V
				1.0	V
V _{BE(sat)} Base-emitter saturation voltage	I _C = 4A I _B = 0.5A (see note 2)			1.2	V
				1.4	V
h _{FE} Static forward current transfer ratio	I _C = 4A V _{CE} = 10V (see note 2)		12		
			20		
t _s Storage time (see Fig. 1)	I _C = 4A I _{B(ond)} = 0.5A		2.7		μs
t _f Fall time (see Fig. 1)	I _C = 4A I _{B(ond)} = 0.5A			1.0	μs
f _t Transition frequency	I _C = 0.5A V _{CE} = 5V f = 1MHz		6.0		MHz
			60		pF
C _{obo} Common-base output capacitance	V _{CB} = 20V I _E = 0 f = 1MHz				
R _{θjc} Junction-to-case thermal resistance				2.5	°C/W

NOTE 2. Measured using pulse techniques
pulse width, t_p = 300μs
duty cycle, d = 2%

TEXAS INSTRUMENTS

BU124, BU124A NPN SILICON POWER TRANSISTOR

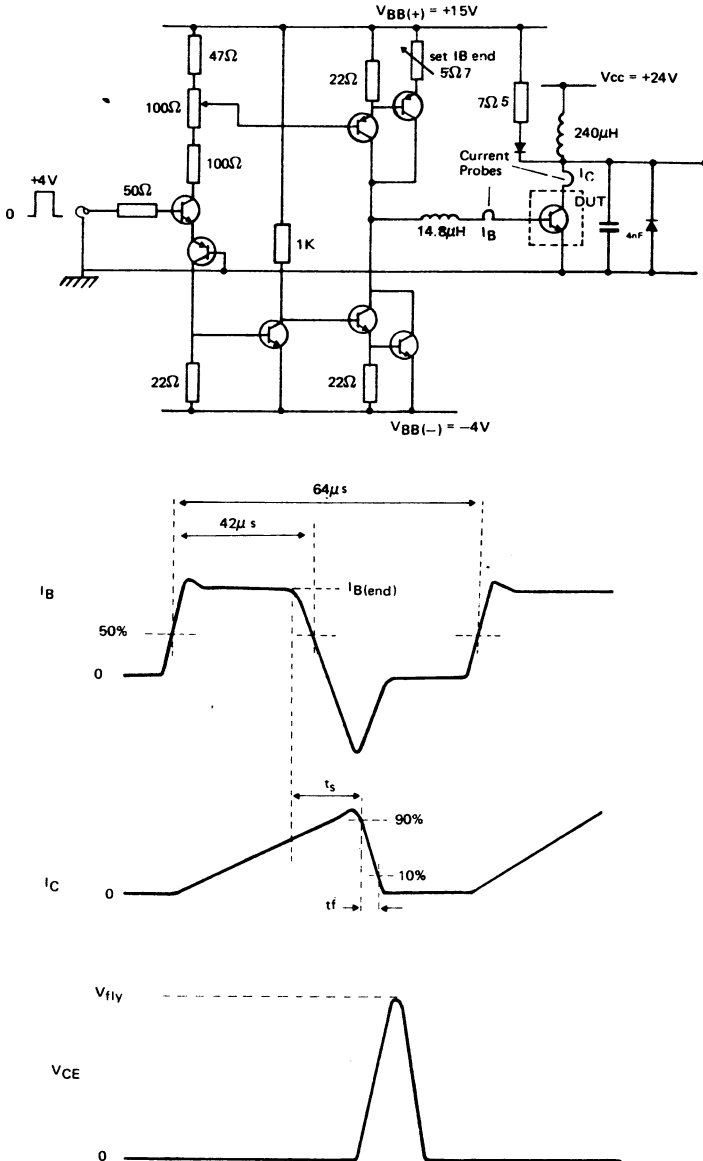


FIGURE 1. DETAILS FOR THE MEASUREMENT OF SWITCHING PARAMETERS.

TEXAS INSTRUMENTS

BU124, BU124A

NPN SILICON POWER TRANSISTOR

FIGURE 2. D.C. F.S.A. — FORWARD BIASED SAFE AREA OF OPERATION AT $T_{case} = 25^{\circ}C$

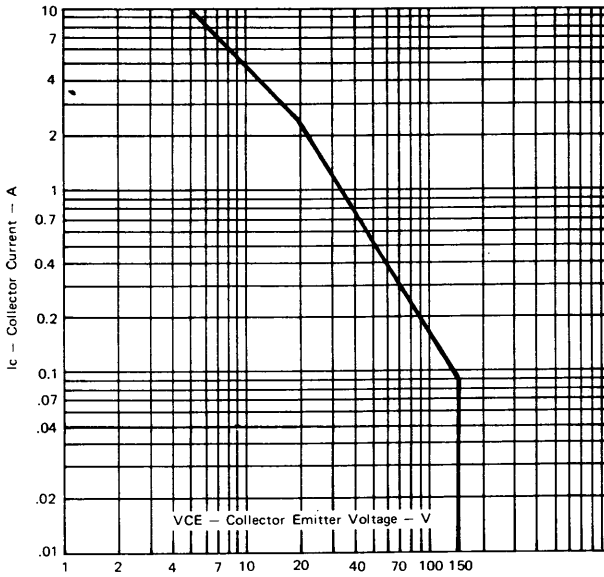
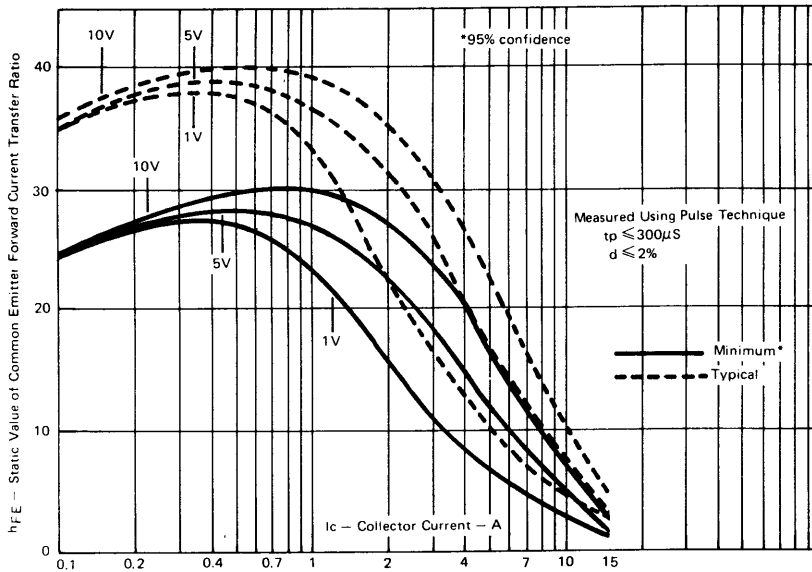


FIGURE 3. MINIMUM* AND TYPICAL h_{FE} AS A FUNCTION OF I_c AND V_{CE} . $T_J = 25^{\circ}C$



TEXAS INSTRUMENTS

BU124, BU 124A NPN SILICON POWER TRANSISTOR

FIGURE 4. TYPICAL h_{FE} AS A FUNCTION OF I_C AND JUNCTION TEMPERATURE AT $V_{CE} = 5V$

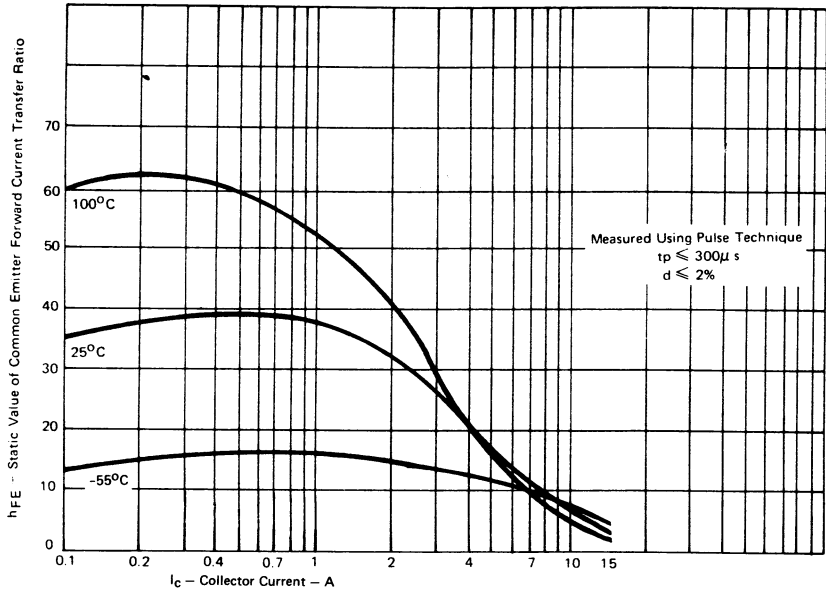
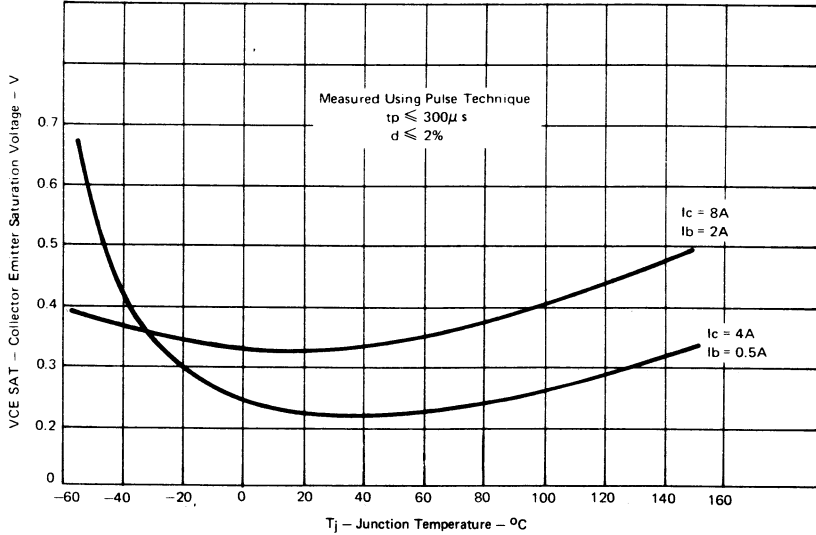


FIGURE 5. TYPICAL $V_{CE(SAT)}$ AS A FUNCTION OF JUNCTION TEMPERATURE



TEXAS INSTRUMENTS

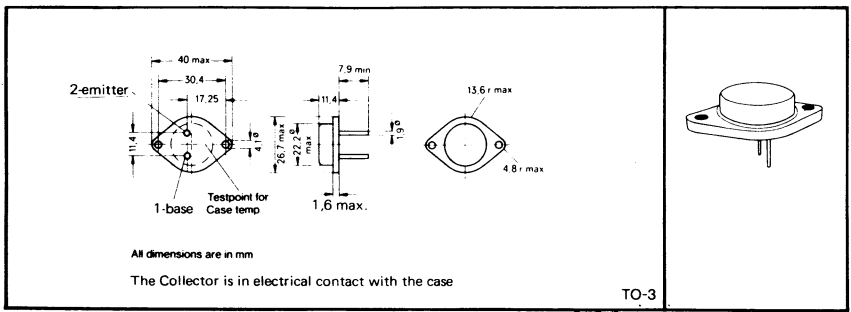
BU137, BU137A NPN SILICON POWER TRANSISTORS

SEPTEMBER 1977

DESIGNED FOR SWITCHING MODE POWER SUPPLIES, HORIZONTAL DEFLECTION AND INDUCTIVE SWITCHING IN INDUSTRIAL AND CONSUMER APPLICATIONS.

GAIN IS SPECIFIED AT UP TO 12 AMPS, AND BU137A FEATURES A COLLECTOR-EMITTER VOLTAGE RATING OF 500 VOLTS.

mechanical specifications



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

	BU137	BU137A
Collector-base voltage	1000 V	1200 V
Collector-emitter voltage (base open-circuit)	400 V	500 V
Emitter-base voltage		7 V
Continuous collector current		12 A
Peak collector current		15 A
Continuous base current		5 A
Continuous dissipation (see figure 2)		70 W
Peak dissipation (see note 1)		1125 W
Case operating temperature		-55 °C to +200 °C

OTE 1: Pulse width 500 μs, V_{CE} = 75 V

BU137, BU137A NPN SILICON POWER TRANSISTORS

electrical characteristics (at $T_C = 25^\circ\text{C}$ unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
I_{CBO}	Collector-Base Leakage current	BU137: $V_{CB} = 1000\text{ V}$ BU137A: $V_{CB} = 1200\text{ V}$			200	μA
I_{CEX}	Collector-emitter Leakage current	BU137: $V_{CE} = 1000\text{ V}$ BU137A: $V_{CE} = 1200\text{ V}$ $T_C = 100^\circ\text{C}$			200 2	μA mA
$V_{CEO(sus)}$	Collector-emitter Sustaining voltage	$I_C = 100\text{ mA}$ $L = 10\text{ mH}$ BU137: BU137A:		400 500		V
BV_{EBO}	Emitter-base breakdown voltage	$I_E = 10\text{ mA}$		7		V
h_{FE}	Forward current transfer ratio	$I_C = 500\text{ mA}$, $V_{CE} = 5\text{ V}$ $I_C = 5.5\text{ A}$, $V_{CE} = 10\text{ V}$ $I_C = 12\text{ A}$, $V_{CE} = 10\text{ V}$ (Note 2)		15 10 4		
$V_{CE(sat)}$	Collector-emitter Saturation voltage	$I_C = 5.5\text{ A}$, $I_B = 1.7\text{ A}$ $I_C = 10\text{ A}$, $I_B = 2.5\text{ A}$ (Note 2)			1.2 4	V
$V_{BE(sat)}$	Base-emitter Saturation voltage	$I_C = 5.5\text{ A}$, $I_B = 1.7\text{ A}$ $I_C = 10\text{ A}$, $I_B = 2.5\text{ A}$ (Note 2)			1.25 1.4	V
t_f	Fall time	$I_C = 5.5\text{ A}$, $I_B = 1.7\text{ A}$ (Figure 1)			800	ns
C_{OBO}	Capacitance	$V_{CB} = 5\text{ V}$, $f = 1\text{ MHz}$		250		pF
f_T	Transit frequency	$V_{CE} = 5\text{ V}$, $I_C = 1\text{ A}$		5		MHz
Θ_{J-C}	Thermal resistance junction to case				1.785	$^\circ\text{C/W}$

NOTE 2: Pulse Test. Pulse duration 300 μs

SWITCHING TIME MEASUREMENT

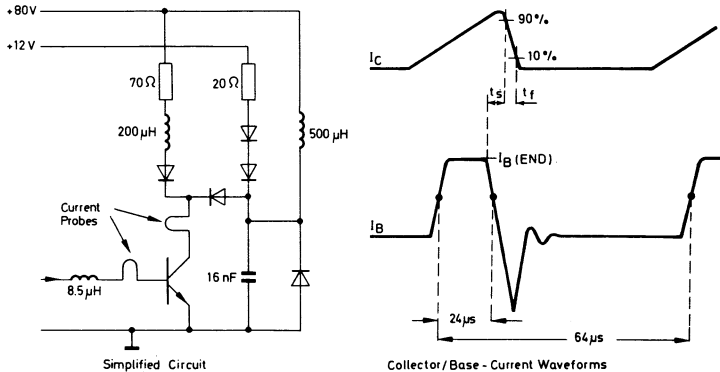


FIGURE 1

TEXAS INSTRUMENTS

BU137, BU137A NPN SILICON POWER TRANSISTORS

TYPICAL CHARACTERISTICS

CASE TEMPERATURE DISSIPATION
DERATING CURVE

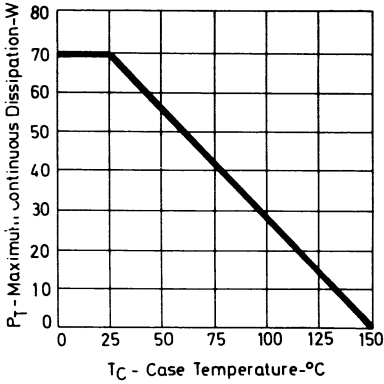


FIGURE 2

TYPICAL COLLECTOR-BASE LEAKAGE CURRENT vs
CASE TEMPERATURE (AT MAXIMUM RATED V_{CB})

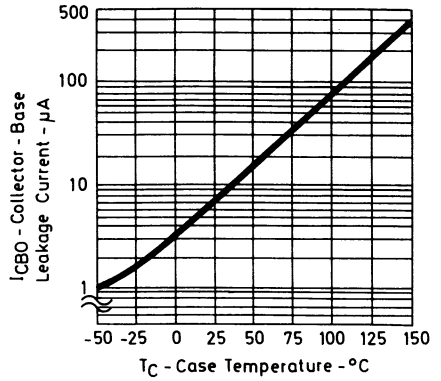


FIGURE 3

FORWARD BIASED SAFE AREA OF OPERATION
($T_C = 25^\circ C$, DC AND NON-REPETITIVE PULSES)

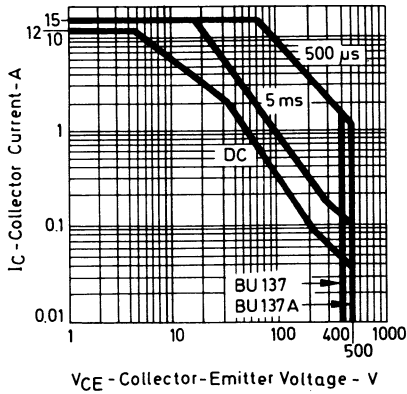


FIGURE 4

BU137, BU137A NPN SILICON POWER TRANSISTORS

TYPICAL CHARACTERISTICS

STATIC FORWARD CURRENT TRANSFER RATIO vs
COLLECTOR CURRENT/COLLECTOR-EMITTER VOLTAGE

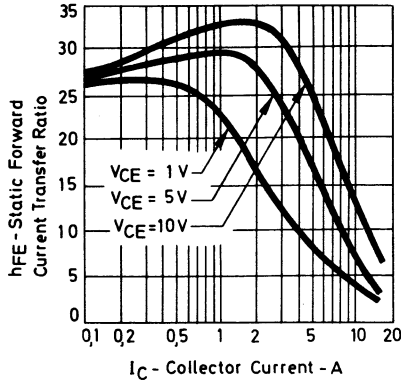


FIGURE 5

COLLECTOR-EMITTER SATURATION VOLTAGE vs
CASE TEMPERATURE/COLLECTOR CURRENT

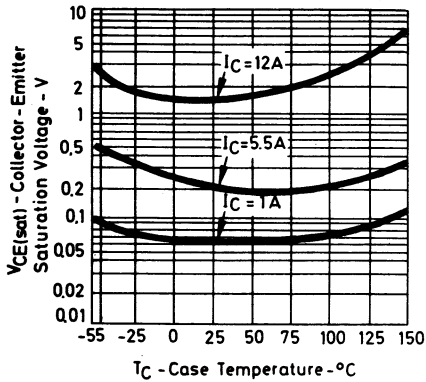


FIGURE 6

BASE-EMITTER SATURATION VOLTAGE vs
COLLECTOR CURRENT/ h_{FE}

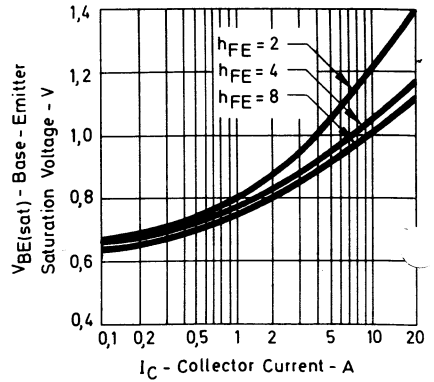


FIGURE 7

BU137, BU137A NPN SILICON POWER TRANSISTORS

TYPICAL CHARACTERISTICS

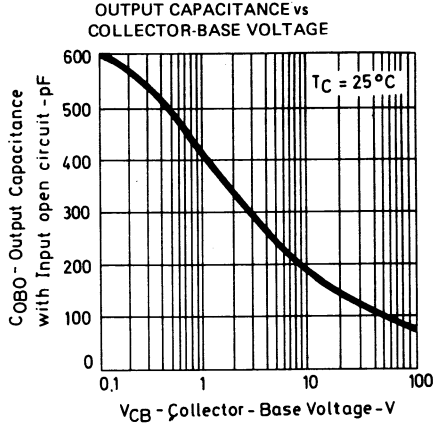


FIGURE 8

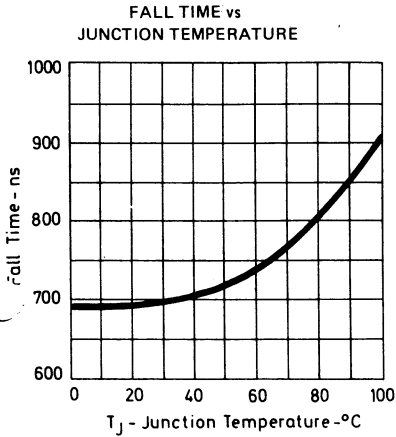


FIGURE 9

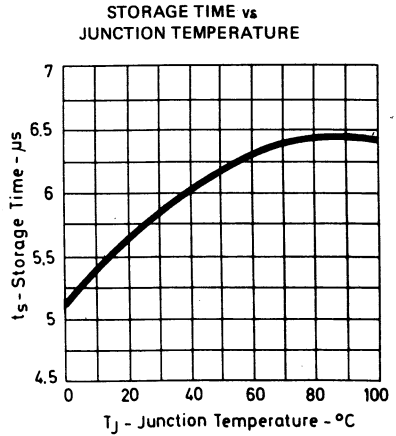
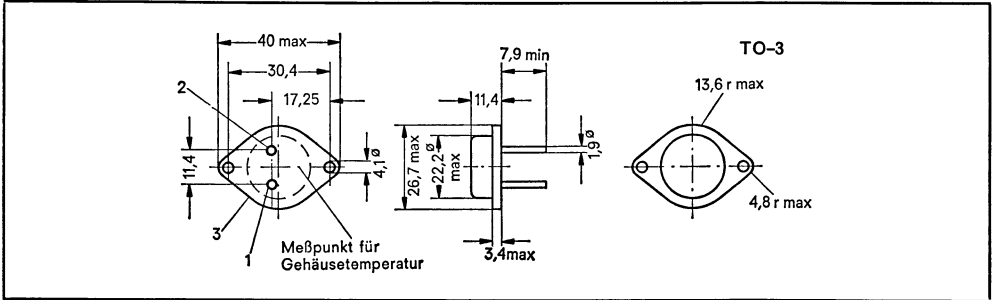


FIGURE 10

NPN-Silizium-Leistungs-Transistoren

Hohe Durchbruchsspannung bis 450 V; hoher Spitzenstrom bis 15 A
Anwendung als schneller Schalter

Mechanische Daten: Kollektor mit Gehäuse leitend verbunden



1 — Basis, 2 — Emitter, 3 — Kollektor

Maße in mm

Absolute Grenzwerte bei $T_G = +25^\circ C$

	BUY20	BUY21	BUY22
Kollektor-Basis-Spannung (Bem. 1)	200 V	300 V	450 V
Kollektor-Emitter-Spannung (Bem. 2)	200 V	300 V	450 V
Kollektor-Emitter-Spannung (Bem. 3)	120 V	180 V	230 V
Emitter-Basis-Spannung	←	8 V	→
Kollektorstrom, Spitze (Bem. 4)	←	15 A	→
Dauer	←	10 A	→
Basisstrom, Spitze	←	5 A	→
Dauer	←	3 A	→
Gesamtdauerverlustleistung bei $T_G \leq 25^\circ C$ (Bem. 5)	←	85 W	→
Lagerungs- und Sperrschichttemperaturbereich	←	-65 °C bis +175 °C	→

Bemerkungen:

1. bei $I_E = 0$ / 2. bei $U_{BE} = -2 V$ bis $-8 V$ / 3. bei $I_B = 0$ / 4. bei $t_p \leq 500 \mu s$; $d \leq 25\%$ / 5. bei $U_{CE} \leq 17 V$;
Bild 1, 2, 3.



TEXAS INSTRUMENTS Deutschland GmbH
805 Freising, Haggerty-Straße

BUY20 bis BUY22

Elektrische Kennwerte bei $T_U = +25^\circ\text{C}$ (wenn nicht anders angegeben).

Parameter	Prüfbedingungen	Typ	min	typ	max	Einh.
$U_{(BR)CBO}$ Kollektor-Basis-Durchbruchsspannung	$I_C = 50\text{ mA}$, $I_E = 0$ (Bem. 6)	BUY20	200			V
		BUY21	300			V
		BUY22	450			V
$U_{(BR)EBO}$ Emitter-Basis-Durchbruchsspannung	$I_E = 10\text{ mA}$, $I_C = 0$	Alle	8			V
U_{CEVL} Kollektor-Emitter-Latching-Spannung	$I_C = 50\text{ mA}$, $U_{BE} = -2\text{ V}$	BUY20	200			V
		BUY21	300			V
		BUY22	450			V
U_{CEOL} Kollektor-Emitter-Latching-Spannung	$I_C = 50\text{ mA}$, $I_B = 0$ (Bem. 6)	BUY20	120			V
		BUY21	180			V
		BUY22	230			V
I_{CBO} Kollektor-Basis-Reststrom	$U_{CB} = 40\text{ V}$, $I_E = 0$	Alle			100	μA
h_{FE} Gleichstromverstärkung	$I_C = 3\text{ A}$, $U_{CE} = 5\text{ V}$ (Bem. 6)	Alle	20	40	300	
$U_{CE(sat)}$ Kollektor-Emitter-Sättigungsspannung	$I_C = 7\text{ A}$, $I_B = 1,4\text{ A}$ (Bem. 6)	Alle		0,4	1,5	V
$U_{BE(sat)}$ Basis-Emitter-Sättigungsspannung	$I_C = 7\text{ A}$, $I_B = 1,4\text{ A}$ (Bem. 6)	Alle		1,0	2,0	V
f_T Transitfrequenz	$I_C = 0,25\text{ A}$, $U_{CE} = 10\text{ V}$, $f = 10\text{ MHz}$	Alle	15	25		MHz
C_{ob} Leerlaufausgangskapazität in Basisschaltung	$U_{CB} = 20\text{ V}$, $I_E = 0$, $f = 1\text{ MHz}$	Alle			200	pF
t_f Kollektorstrom-Abfallzeit	$I_C = 7\text{ A}$, $I_{B(on)} = 1,4\text{ A}$	Alle		0,4	1,0	μs
t_s Speicherzeit	$U_{CE} = 18\text{ V}$, $I_{B(off)} = 1,4\text{ A}$	Alle		0,7	3,0	μs
t_{on} Einschaltzeit	(Bem. 7)	Alle		1,0		μs

Bemerkungen:

6. Impulsmäßig gemessen: $t_p \leq 300\ \mu\text{s}$; $d \leq 2\%$

7. siehe Bild 12



TEXAS INSTRUMENTS Deutschland GmbH
805 Freising, Haggerty-Straße

Typische Änderungen der Gleichstromverstärkung

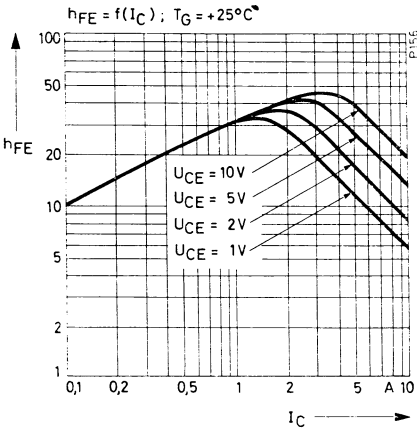


Bild 1

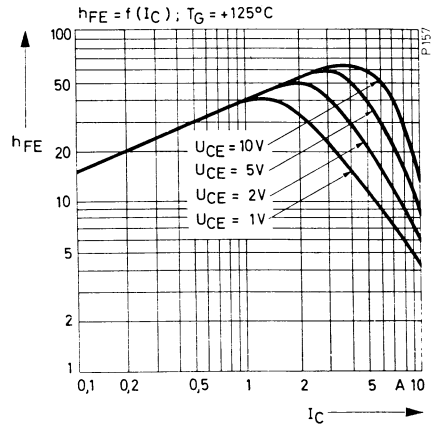


Bild 2

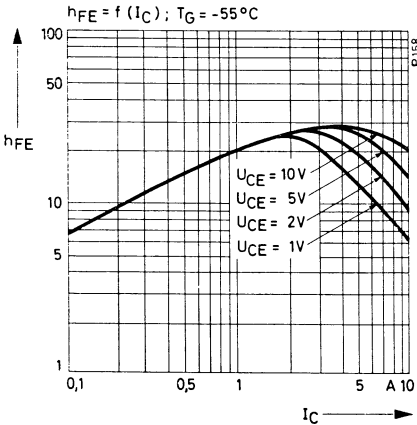


Bild 3

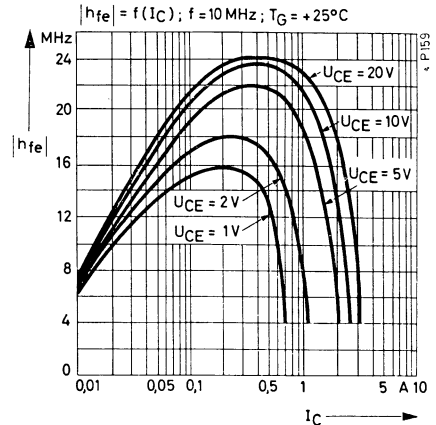


Bild 4



TEXAS INSTRUMENTS Deutschland GmbH

805 Freising, Haggerty-Straße

BUY20 bis BUY22

Das Diagramm (Bild 5) gilt für Einzel-Rechteckimpulse ($T_G = +25^\circ\text{C}$)

Bei Gehäusetemperatur von über 25°C erhält man den Betrag des zulässigen Stromes, indem man aus Bild 6 die Abnahme der Verlustleistung entnimmt. Bei Betrieb mit periodischen Impulsen geht man folgendermaßen vor: Zuerst ermittelt man die Energie des Impulses durch graphische Integration und errechnet dann den gleichwertigen Rechteckimpuls, indem man die Pulsdauer und die angelegte Spitzenspannung zugrunde legt. Dabei muß sichergestellt sein, daß der errechnete Impuls innerhalb des zulässigen Arbeitsbereiches liegt.

Des weiteren muß überprüft werden, ob die über die Periodendauer gemittelte Verlustleistung innerhalb des Bereiches für DC zu liegen kommt. (Bei höheren Gehäusetemperaturen als 25°C ist P_{tot} nach Bild 6 zu reduzieren).

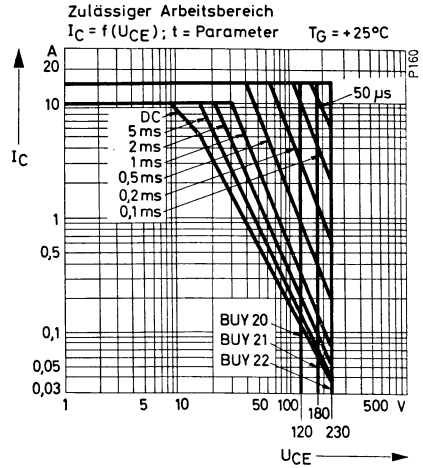


Bild 5

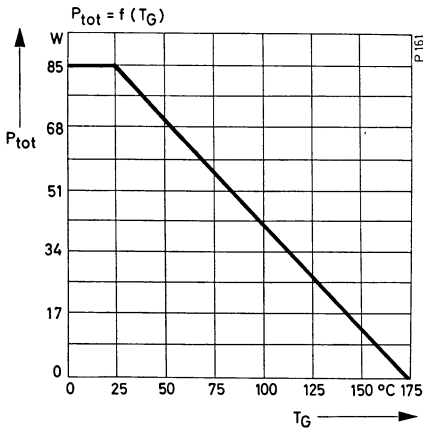


Bild 6

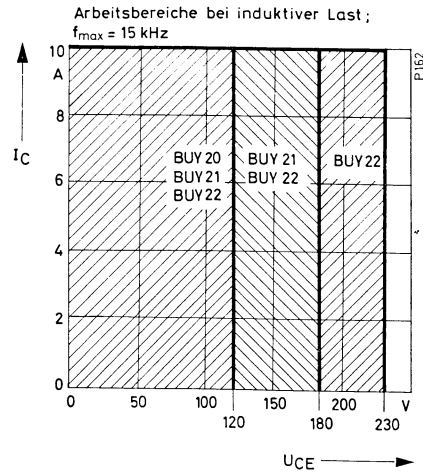


Bild 7

Bild 7 zeigt den zulässigen Arbeitsbereich für das Schalten von induktiven Lasten, es gibt die max. Grenzen von Kollektor-Emitter-Spannung und Kollektorstrom. (max. Impulsfolgefrequenz = 15 kHz)



TEXAS INSTRUMENTS Deutschland GmbH

805 Freising, Haggerty-Straße

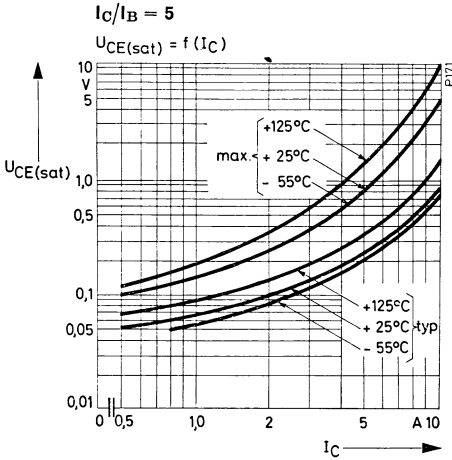


Bild 8

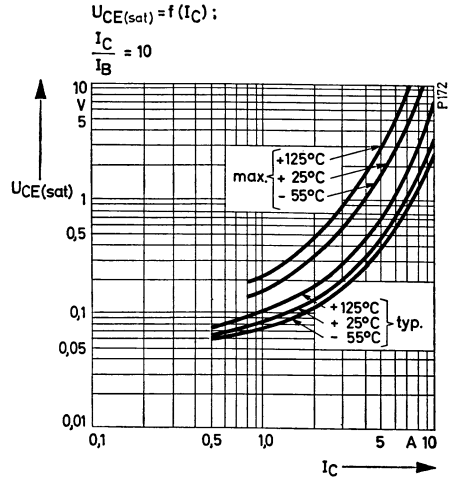


Bild 9

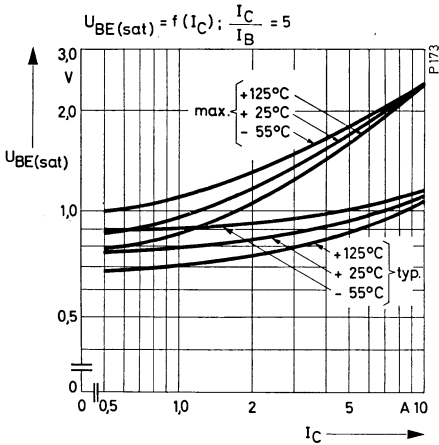


Bild 10

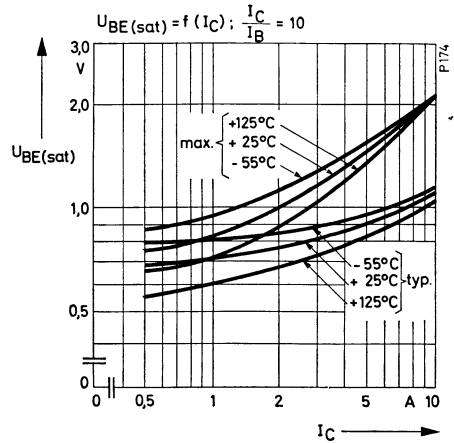


Bild 11



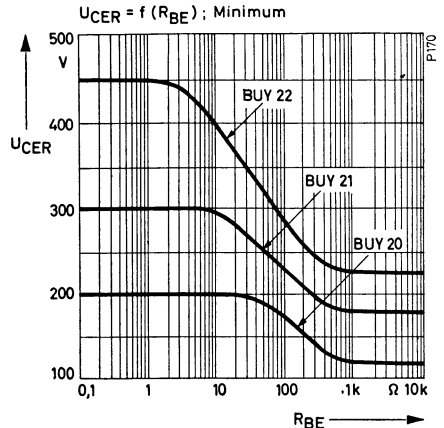
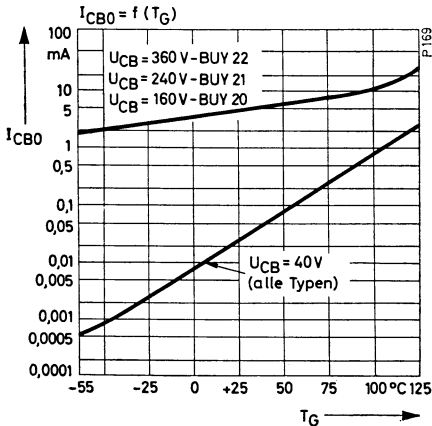
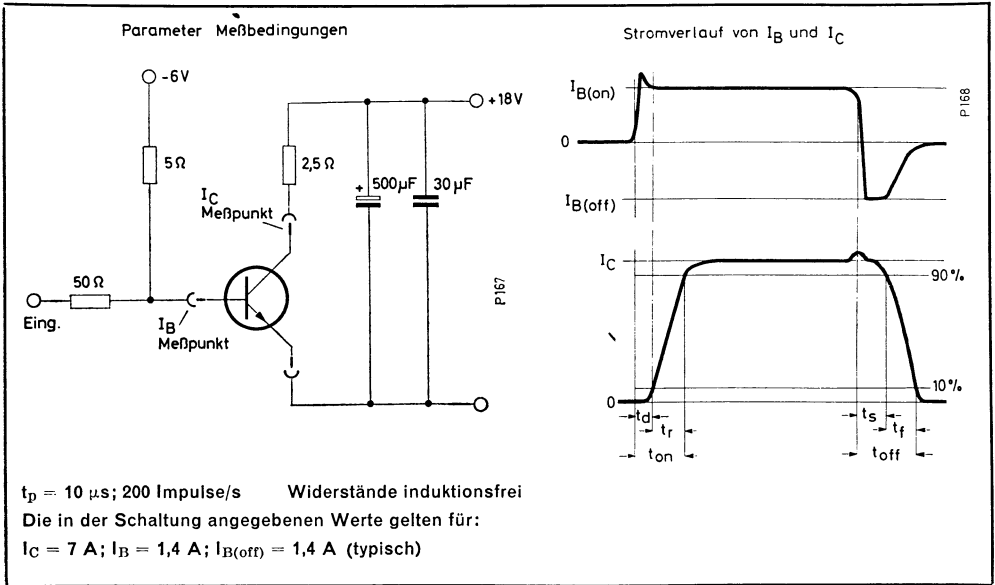
TEXAS INSTRUMENTS Deutschland GmbH

805 Freising, Haggerty-Straße

BUY20 bis BUY22

Schaltzeit-Meßschaltung

Bild 12



TEXAS INSTRUMENTS Deutschland GmbH
 805 Freising, Haggerty-Straße

Typische Änderung der Schaltzeiten in Abhängigkeit vom Kollektorstrom

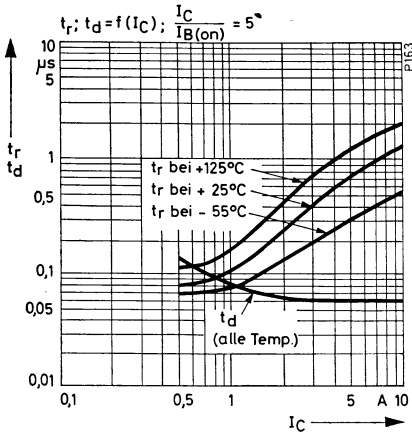


Bild 15

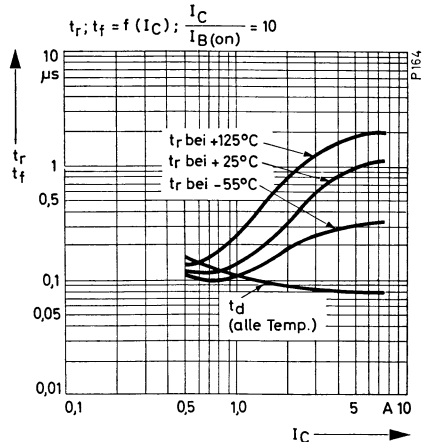


Bild 16

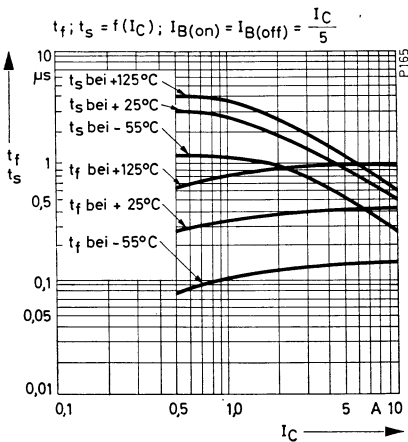


Bild 17

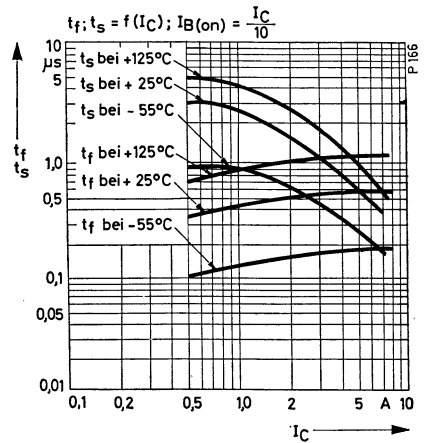


Bild 18



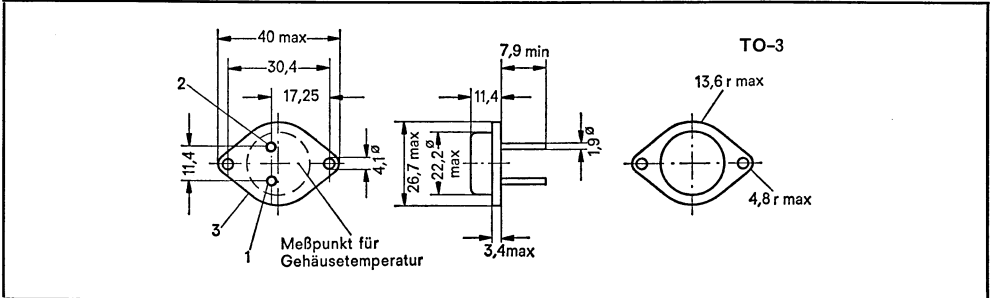
TEXAS INSTRUMENTS Deutschland GmbH

805 Freising, Haggerty-Straße

NPN-Silizium-Leistungs-Transistoren

Transistoren für Fernseh Anwendungen mit hoher U_{CE} -Spannung
 f_T typ. = 25 MHz; t_f typ. = 400 ns bei $I_C = 6$ A

Mechanische Daten: Kollektor mit Gehäuse leitend verbunden



1 — Basis, 2 — Emitter, 3 — Kollektor

Maße in mm

Absolute Grenzwerte bei $T_G = +25$ °C

	BUY23	BUY23A
Kollektor-Basis-Spannung (Bem. 1)	600 V	700 V
Kollektor-Emitter-Spannung (Bem. 2)	600 V	700 V
Kollektor-Emitter-Spannung (Bem. 3)	250 V	300 V
Kollektor-Dauerstrom	← 10 A →	
Emitter-Basis-Spannung	← -8 V →	
Kollektor-Spitzenstrom (Bem. 4)	← 15 A →	
Basis-Dauerstrom	← 3 A →	
Basis-Spitzenstrom	← 5 A →	
Gesamtverlustleistung bei $T_G \leq 25$ °C (Bem. 5)	← 85 W →	
Arbeitstemperaturbereich (T_j)	-65 °C bis +175 °C	
Lagerungstemperaturbereich	-65 °C bis +175 °C	

Bemerkungen:

1. bei $I_E = 0$.
2. bei U_{BE} zwischen -2 V und -8 V.
3. bei $I_B = 0$.
4. Dies ist für max. $t_p \leq 500 \mu s$; $d \leq 25\%$ zulässig.
5. $U_{CE} \leq 17$ V; Bild 5, 6, 7.



TEXAS INSTRUMENTS Deutschland GmbH

805 Freising, Haggerty-Straße

BUY23, BUY23A

Elektrische Kennwerte bei $T_G = +25^\circ\text{C}$

Parameter		Prüfbedingungen	Typ	min	typ	max	Einh.
I_{CBO}	Kollektor-Basis-Reststrom	$U_{CB} = 600\text{ V}, I_E = 0$	BUY23			2	mA
		$U_{CB} = 700\text{ V}, I_E = 0$	BUY23A			2	mA
I_{CEV}	Kollektor-Emitter-Reststrom	$U_{CE} = 600\text{ V}, U_{BE} = -2\text{ V}$	BUY23			2	mA
		$U_{CE} = 700\text{ V}, U_{BE} = -2\text{ V}$	BUY23A			2	mA
$U_{CEO(L)}$	Kollektor-Emitter-Latching-Spannung	$I_C = 100\text{ mA}, I_B = 0$	BUY23	250			V
		(Bem. 6)	BUY23A	300			V
$U_{CER(L)}$	Kollektor-Emitter-Latching-Spannung	$I_C = 100\text{ mA}, R_{BE} = 100\ \Omega$	BUY23	350			V
		(Bem. 6)	BUY23A	400			V
$U_{(BR)EBO}$	Emitter-Basis-Durchbruchsspannung	$I_E = 10\text{ mA}, I_C = 0$	Alle	8			V
h_{FE}	Gleichstromverstärkung	$I_C = 2,5\text{ A}, U_{CE} = 5\text{ V}$ (Bem. 6)	Alle	20	50	200	
$U_{CE(sat)}$	Kollektor-Emitter-Sättigungsspannung	$I_C = 2,5\text{ A}, I_B = 0,25\text{ A}$ (Bem. 6)	Alle		0,3	0,7	V
		$I_C = 6\text{ A}, I_B = 1,2\text{ A}$ (Bem. 6)	Alle		0,4	1,5	V
$U_{BE(sat)}$	Basis-Emitter-Sättigungsspannung	$I_C = 2,5\text{ A}, I_B = 0,25\text{ A}$ (Bem. 6)	Alle		0,9	1,3	V
		$I_C = 6,0\text{ A}, I_B = 1,2\text{ A}$ (Bem. 6)	Alle		1,1	2,0	V
f_T	Transitfrequenz	$I_C = 0,25\text{ A}, U_{CE} = 10\text{ V}, f = 10\text{ MHz}$	Alle	15	25		MHz
C_{ob}	Ausgangs-Kapazität	$U_{CB} = 20\text{ V}, I_E = 0, f = 1\text{ MHz}$	Alle		90	150	pF

Schaltzeiten bei $T_G = +25^\circ\text{C}$

Parameter		Prüfbedingungen	typ	max	Einh.
t_f	Abfallzeit	$I_C = 6\text{ A}, I_{B(on)} = 1,2\text{ A}, I_{B(off)} = -1,2\text{ A};$ $U_{CE} = 60\text{ V}$ (Bild 1)	0,4	1,0	μs
t_s	Speicherzeit				
t_{on}	Einschaltzeit				

Bemerkung:

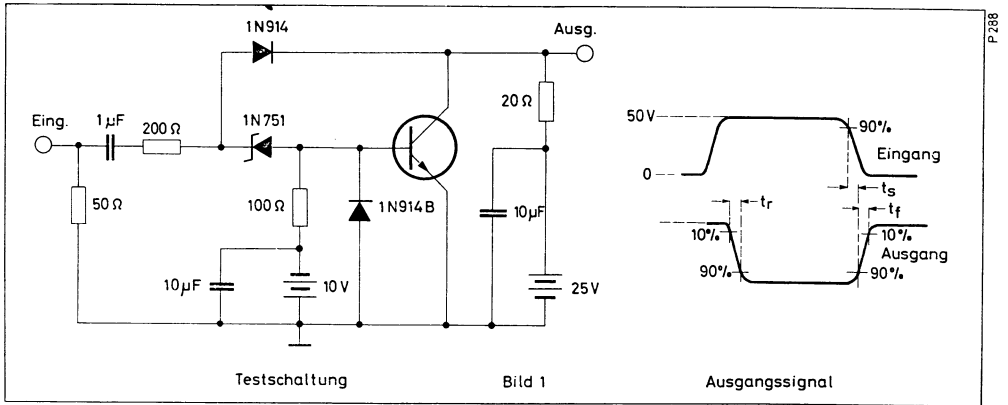
6. Impulsmäßig gemessen: $t_p \leq 300\ \mu\text{s}; d \leq 2\%$.



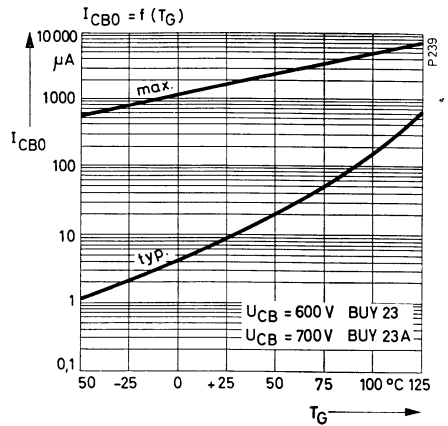
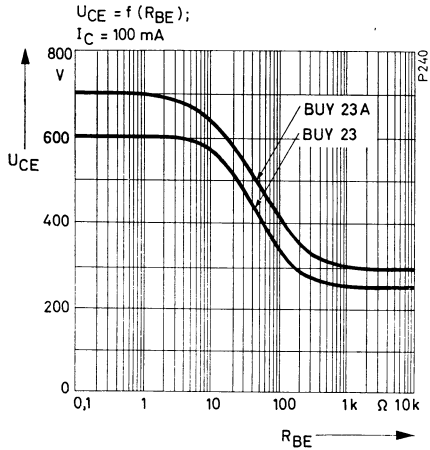
TEXAS INSTRUMENTS Deutschland GmbH

805 Freising, Haggerty-Straße

Schaltzeit-Meßschaltung



Typische Kennlinien



TEXAS INSTRUMENTS Deutschland GmbH
805 Freising, Haggerty-Straße

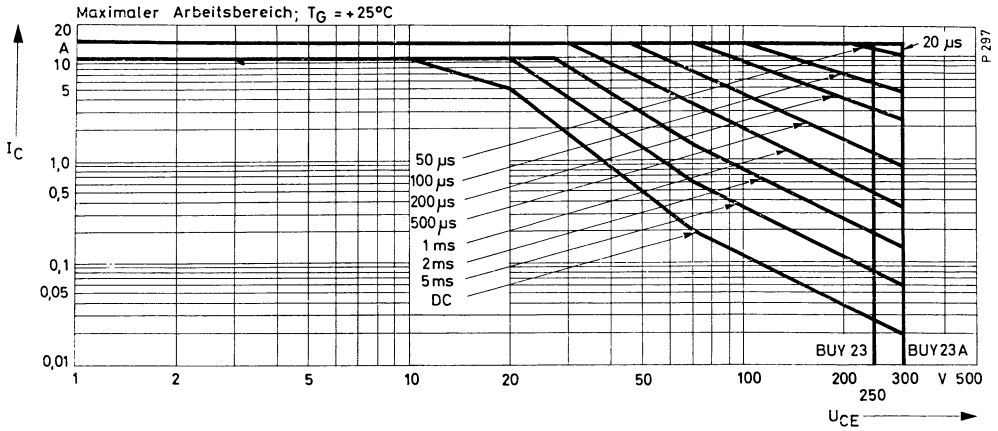


Bild 4

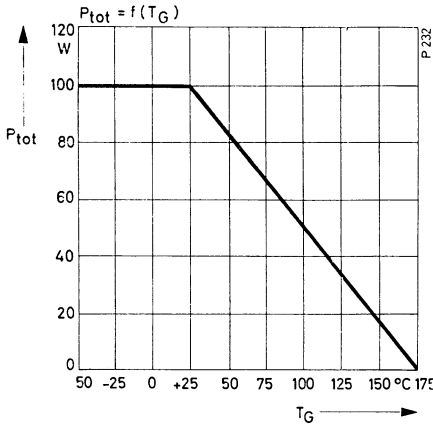


Bild 5

Das Diagramm (Bild 4) gilt für Einzel-Rechteckimpulse ($T_G = +25^\circ\text{C}$)

Bei Gehäusetemperatur von über 25°C erhält man den Betrag des zulässigen Stroms, indem man aus Bild 5 die Abnahme der Verlustleistung entnimmt. Bei Betrieb mit periodischen Impulsen geht man folgendermaßen vor: Zuerst ermittelt man die Energie des Impulses durch graphische Integration und errechnet dann den gleichwertigen Rechteckimpuls, indem man die Pulsdauer und die angelegte Spitzenspannung zugrunde legt. Dabei muß sichergestellt sein, daß der errechnete Impuls innerhalb des zulässigen Arbeitsbereichs liegt. Des weiteren muß überprüft werden, ob die über die Periodendauer gemittelte Verlustleistung innerhalb des Bereichs für DC zu liegen kommt. (Bei höheren Gehäusetemperaturen als 25°C ist P_{tot} nach Bild 6 zu reduzieren).



TEXAS INSTRUMENTS Deutschland GmbH

805 Freising, Haggerty-Straße

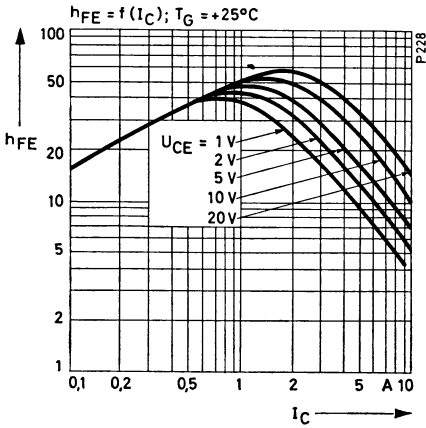


Bild 6

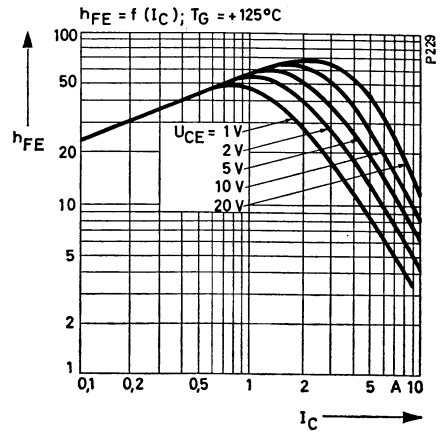


Bild 7

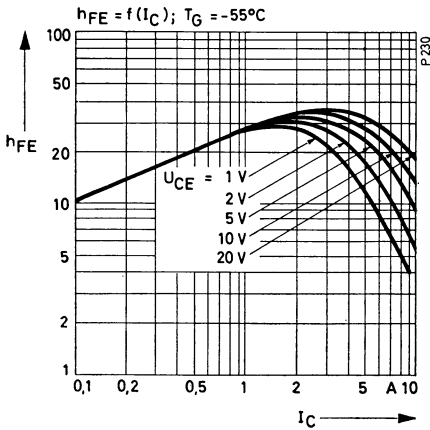


Bild 8

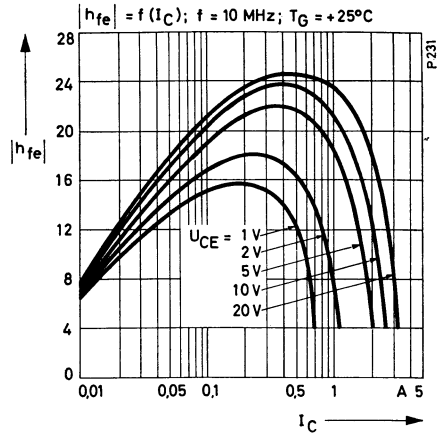


Bild 9



TEXAS INSTRUMENTS Deutschland GmbH
 805 Freising, Haggerty-Straße

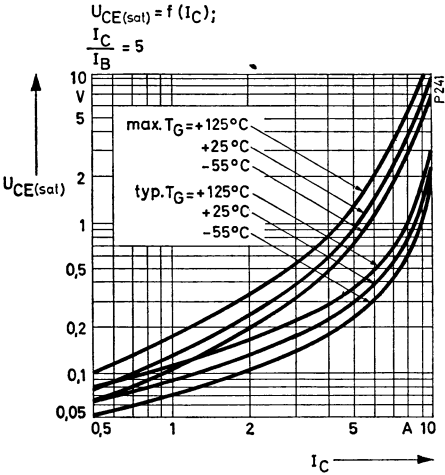


Bild 10

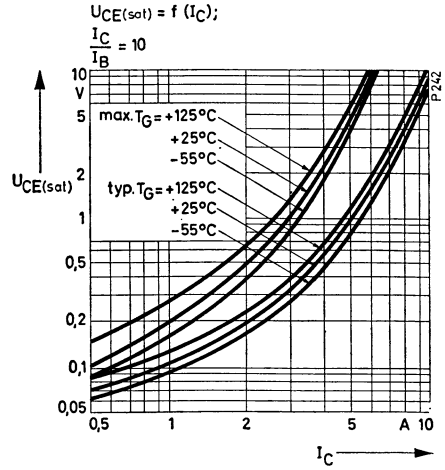


Bild 11

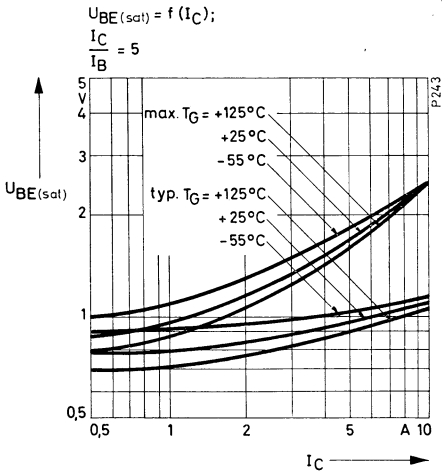


Bild 12

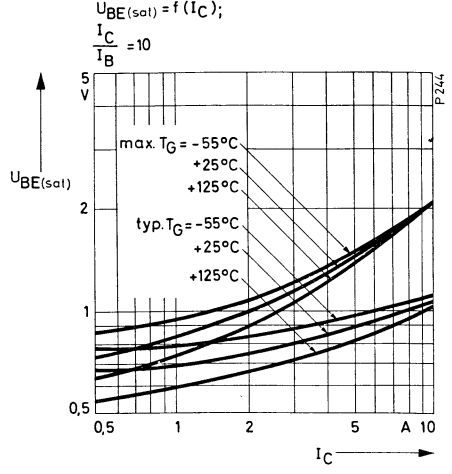


Bild 13



TEXAS INSTRUMENTS Deutschland GmbH

805 Freising, Haggerty-Straße

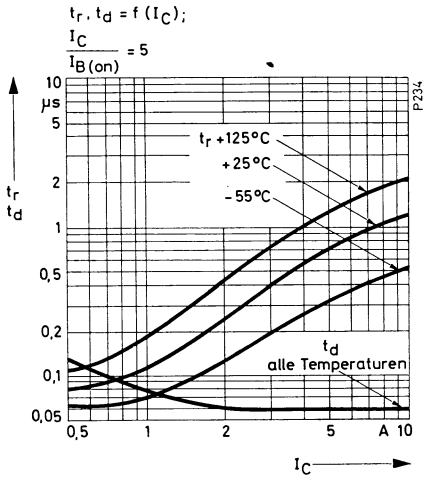


Bild 14

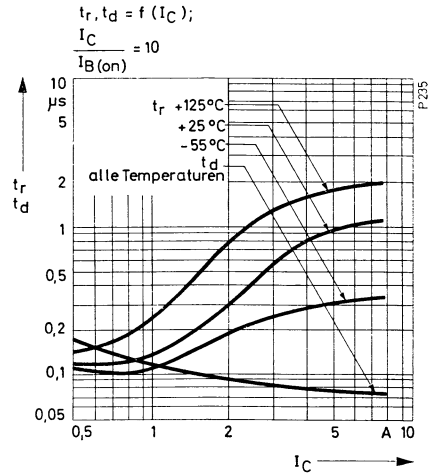


Bild 15

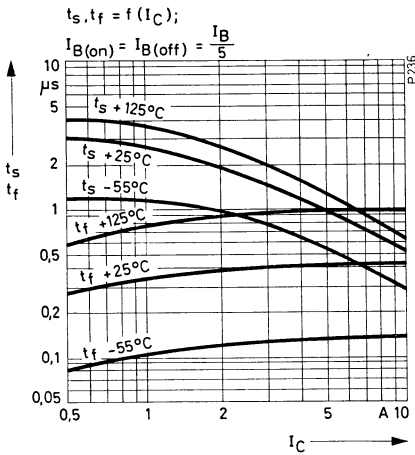


Bild 16

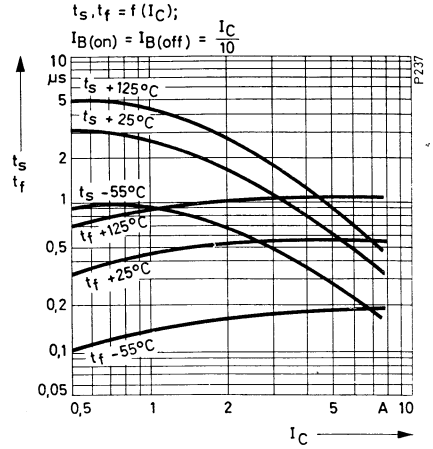


Bild 17

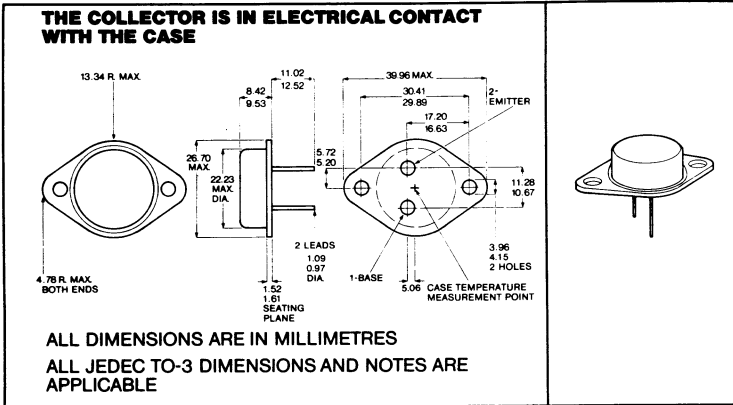


BUY70 SERIES NPN SILICON POWER TRANSISTORS

OCT 82

BUY70 Series Transistors are designed for use in;
Switching Mode Power Supplies, Inverters and C.R.T. Scanning Systems.
They feature High Voltage and Peak Current Capability together with Fast Switching and a High Degree of Robustness.

Mechanical Specification



Absolute Maximum Ratings (at 25°C case temperature)

	BUY70A	BUY70B	BUY70C	UNITS
Collector-Base Voltage ($I_E = 0$)	1000	800	500	V
Collector-Emitter Voltage ($I_B = 0$)	400	325	200	V
Emitter-Base Voltage	8	8	8	V
Collector Current Peak (See Note 1)	15	15	15	A
Collector Current Continuous	10	10	10	A
Continuous Base Current	3	3	3	A
Continuous Dissipation ($V_{CE} \leq 17V$) (See Note 2)	75	75	75	W
Operating Temperature Range	-65°C to +200°C			

- NOTES: 1. Pulse Width $\leq 500 \mu\text{Sec}$. Duty Cycle $\leq 25\%$
 2. Refer to Safe Operating and Dissipation Derating Curves
 3. Pulsed Test. Pulse Width $\leq 300 \mu\text{Sec}$. Duty Cycle $\leq 2\%$

TEXAS INSTRUMENTS

BUY70 SERIES

NPN SILICON POWER TRANSISTORS

Electrical Characteristics at 25°C case temperature (unless otherwise noted)

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
BV_{CBO} Collector-Base Breakdown Voltage	$I_C = 1\text{mA}$ BUY70A $I_E = 0$ BUY70B Note 2 BUY70C	1000 800 500			V
LV_{CEO} Collector-Emitter Latching Voltage	$I_C = 50\text{mA}$ BUY70A $I_B = 0$ BUY70B BUY70C	400 325 200			V
BV_{EBO} Emitter-Base Breakdown Voltage	$I_B = 10\text{mA}$ ALL	8			V
I_{CEX} Collector-Emitter Leakage Current	$V_{CE} = 1000\text{V}$ BUY70A $V_{CE} = 800\text{V}$ BUY70B $V_{CE} = 500\text{V}$ BUY70C $V_{BE} = -2\text{V}$			1.0 1.0 1.0	mA
H_{FE} DC Current Gain	$I_C = 1.0\text{A}$ $V_{CE} = 10\text{V}$ Note 2 ALL	15			
$V_{BE(sat)}$ Base-Emitter Saturation Voltage	$I_C = 4.0\text{A}$ $I_B = 0.8\text{A}$ Note 2 ALL			1.5	V
$V_{CE(sat)}$ Collector-Emitter Saturation Voltage	$I_C = 4.0\text{A}$ $I_B = 0.8\text{A}$ Note 2 ALL			5.0	V
t_f Collector-Current Fall Time	$I_C = 4.0\text{A}$ $V_{CE} = 40\text{V}$ ALL $I_{B(on)} = 0.8\text{A}$ $I_{B(off)} = 0.8\text{A}$			1.0	μs
f_T Transition Frequency	$V_{CE} = 10\text{V}$ $I_C = 0.5\text{A}$ ALL		6		MHz
C_{obo} Output Capacitance	$V_{CB} = 20\text{V}$ $I_C = 0$ ALL			150	pF
$R\theta_{jc}$ Thermal Resistance Junction Case				2.3	°C/W

TEXAS INSTRUMENTS

BUY 70 SERIES

NPN SILICON POWER TRANSISTORS

FIGURE 1 switching time measurement

1. R_{CC} and R_{BB} adjusted to give I_C and I_B .
2. Input resistor should correctly terminate pulse generator (normally 50Ω). Input pulse 25 V , pulse width $10 \mu\text{s}$, duty cycle 2%.
3. Oscilloscope rise-time less than 20 ns .
4. Recommended current probe Tektronix P6019, P6020 or P6042.
5. For typical variation of switching time with collector current, see Figures 9 and 10.

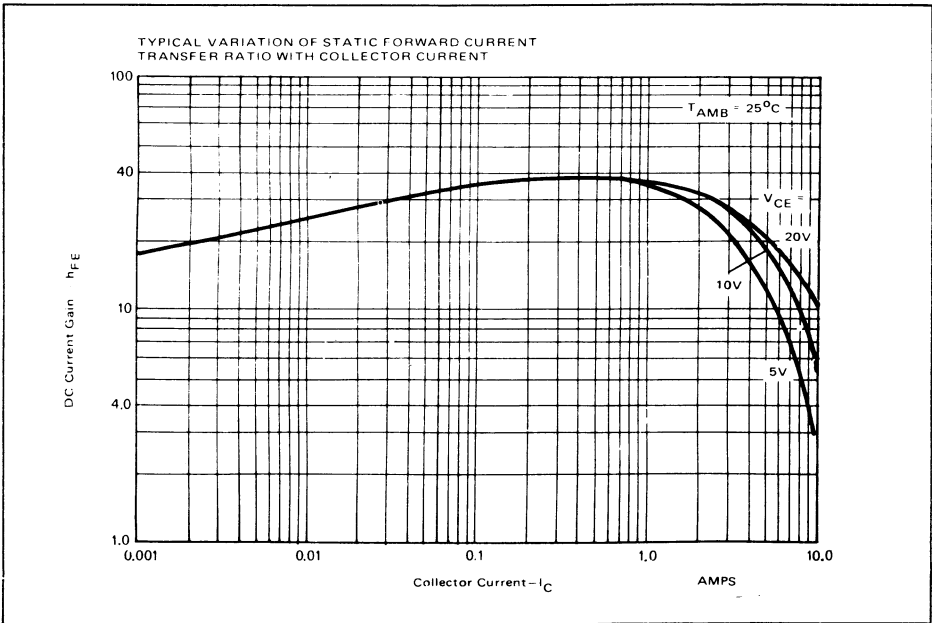
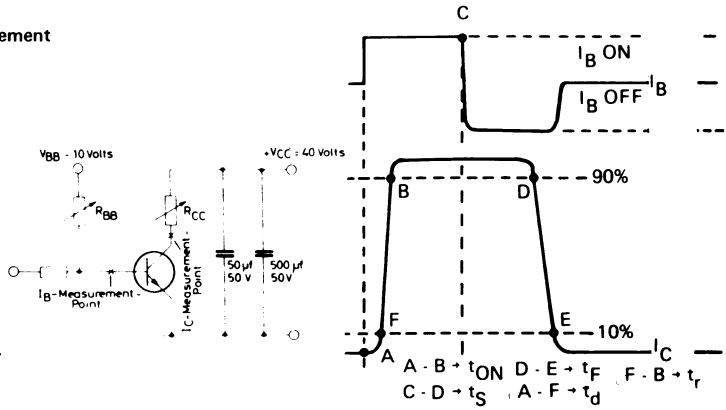
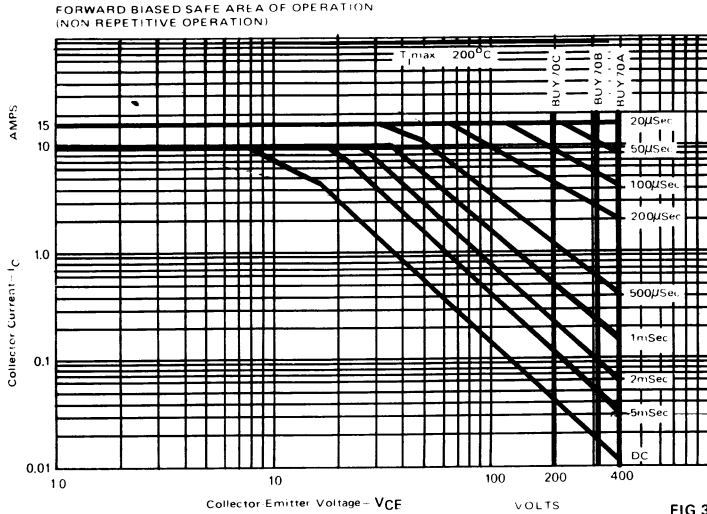


FIG 2

TEXAS INSTRUMENTS

BUY 70 SERIES NPN SILICON POWER TRANSISTORS

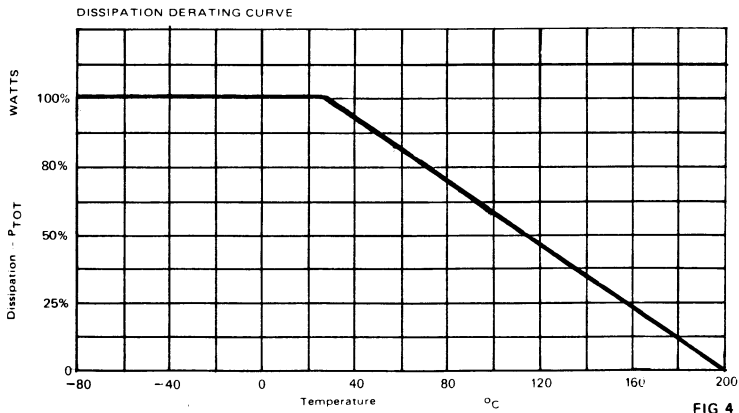


The graph of Forward Biased Safe Area of Operation is for single non-repetitive rectangular power pulses, with a case temperature held at $25^\circ C$.

For operation at case temperature above $25^\circ C$ derate the value of current indicated in figure 3 by the power derating factor, determined from the derating curve.

For repetitive pulse operation the following procedure should be followed. Work out the energy of the power pulse by graphical integration and determine the equivalent rectangular power pulse, using the pulse duration and the peak voltage applied. Ensure that the equivalent power pulse, as determined, is within the safe operating area, applying a derating factor for the case temperature as indicated from the derating curve.

Also calculate the average power dissipation and ensure that it falls within the steady state (DC) condition for the peak voltage applied, having first derated the steady state condition for the effect of case temperature.



TEXAS INSTRUMENTS

BUY70 SERIES NPN SILICON POWER TRANSISTORS

TYPICAL VARIATION OF COLLECTOR
EMITTER SATURATION VOLTAGE WITH
COLLECTOR CURRENT

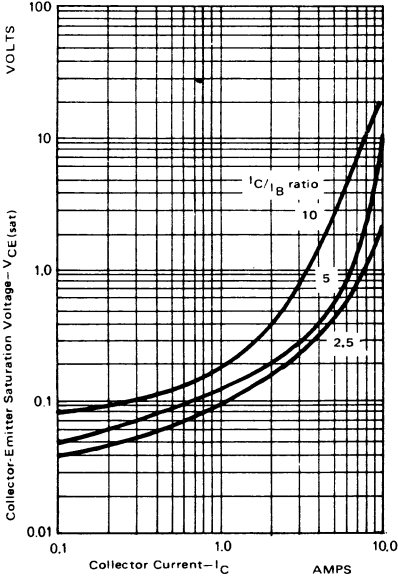


FIG 5

TYPICAL VARIATION OF STORAGE AND
FALL TIMES WITH COLLECTOR CURRENT

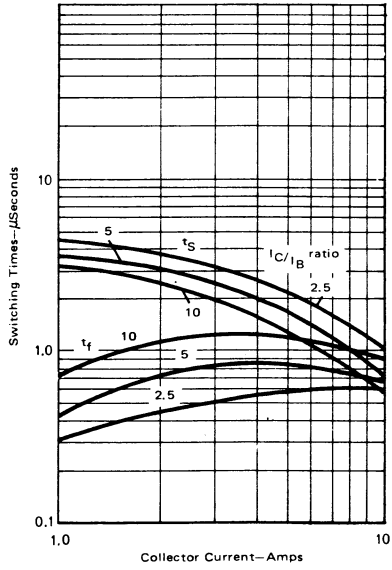


FIG 6

TYPICAL AND MAXIMUM* VARIATION OF I_{CBO}
WITH TEMPERATURE

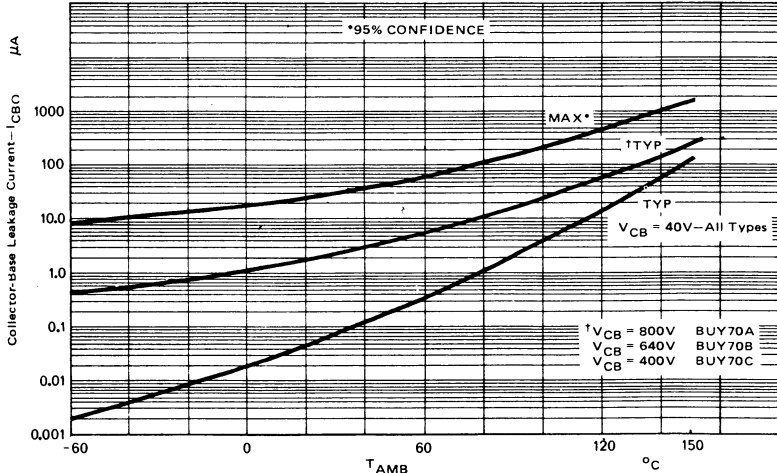


FIG 7

TEXAS INSTRUMENTS

