V.H.F. POWER TRANSISTORS

Silicon planar n-p-n high frequency medium power transistors primarily intended for class-B operation in v.h.f. amplifiers. The collector is electrically connected to the case.

QUICK REFERENCE DATA

			BLY33	BLY34	
Collector-emitter voltage					
(peak r.f. ⩾ 1 MHz); $V_{BE} = 0$	V_{CESM}	max.	66	40	V
open base	V_{CEO}	max.	33	20	V
Collector current (peak r.f. ⩾ 1 MHz)	I_{CM}	max.	1,5	1,5	A
Total power dissipation up to T_{case} = 100 °C	P_{tot}	max.	2,0	2,0	W
Junction temperature	T_j	max.	150	150	°C
Transition frequency at f = 100 MHz	f_T	>	250	250	MHz

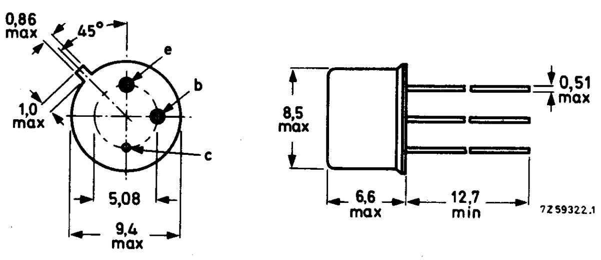
R.F. performance in a 175 MHz common-emitter amplifier

type number	mode of operation	V_{CC} V	P_o W	G_p dB	η %
BLY33	a.m.	13,8	2,0	typ. 8,0	typ. 80
BLY34	f.m.	13,8	3,0	typ. 8,0	typ. 80

MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-39; collector connected to case.



Maximum lead diameter is guaranteed only for 12,7 mm.
Accessories: 56245 (distance disc).

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

			BLY33	BLY34	
Collector-emitter voltage					
(peak r.f. ⩾ 1 MHz); $V_{BE} = 0$	V_{CESM}	max.	66	40	V
open base	V_{CEO}	max.	33	20	V
Emitter-base voltage (open collector)	V_{EBO}	max.	4,0		V
Collector current					
d.c.	I_C	max.	0,5		A
(peak value); f < 1 MHz	I_{CM}	max.	0,5		A
(peak value); f ⩾ 1 MHz	I_{CM}	max.	1,5		A
Total power dissipation (see also Figs 4, 5 and 6)					
f < 1 MHz; T_{case} = 25 °C	P_{tot}	max.	4,0		W
f ⩾ 1 MHz; T_{case} = 25 °C	P_{tot}	max.	5,0		W
Storage temperature	T_{stg}		–65 to +150		°C
Junction temperature					
continuous operation	T_j	max.	150		°C
intermittent operation, total duration 200 hours	T_j	max.	200		°C

THERMAL RESISTANCE

From junction to case	$R_{th\ j\text{-}c}$	=	25	K/W*

CHARACTERISTICS

T_j = 25 °C unless otherwise specified

Collector cut-off current				
$V_{BE} = 0$; $V_{CE} = V_{CEOmax}$	I_{CES}	typ.	0,02	mA
		<	0,5	mA
$V_{BE} = 0$; $V_{CE} = V_{CESMmax}$	I_{CES}	typ.	0,10	mA
		<	5,0	mA
Emitter cut-off current				
$I_C = 0$; V_{EB} = 4,0 V	I_{EBO}	typ.	0,2	µA
		<	0,5	mA
D.C. current gain				
I_C = 0,2 A; V_{CE} = 5,0 V	h_{FE}	>	10	
		typ.	60	
Transition frequency at f = 100 MHz				
I_C = 0,2 A; V_{CE} = 5,0 V; T_{amb} = 25 °C	f_T	>	250	MHz
		typ.	450	MHz
Collector capacitance at f = 0,5 MHz				
$I_E = I_e = 0$; V_{CB} = 10 V	C_c	typ.	11	pF
		<	15	pF
Emitter capacitance at f = 0,5 MHz				
$I_C = I_c = 0$; $V_{EB} = 0$	C_e	typ.	65	pF
			45 to 90	pF

* K/W is SI unit for °C/W.

RECOMMENDED OPERATING CONDITIONS

As a medium power amplifier for the output stage of a small transmitter, or as a driver for larger output stages.

f = 175 MHz

			BLY33		BLY34	
	mode of operation		a.m.	f.m.	f.m.	
Supply voltage	V_{CC}	nom.	13,8	28	13,8	V
		<	16,5	32	16,5	V
Base bias voltage	V_B		0	0	0	V
Output power	P_o		2,0	3,0	3,0	W
Input power	P_i	typ.	0,32	0,28	0,5	W
		<	0,40	0,40	0,6	W
Supply current	I_{CC}	typ.	180	160	270	mA
Efficiency	η	typ.	80	65	80	%

Notes

1. For a.m. telephony, collector modulation of the output and driver stages is recommended.
2. A heatsink of thermal resistance 20 K/W is recommended for operation in ambient temperatures up to 65 °C. At temperatures > 65 °C, derating is necessary.
3. Under the recommended a.m. operating condition and without modulation, the transistor can withstand any load mismatch. With modulation applied, operation into an extreme mismatch may adversely affect the life of the transistor and care should be excercized to keep the device within its ratings.

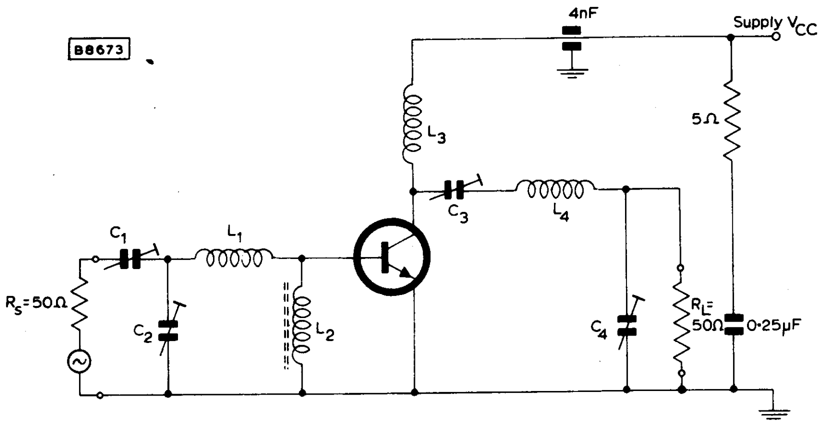


Fig. 2 Basic v.h.f. amplifier circuit.

Component values for 175 MHz amplifier circuit:

C_1 to C_4 = 30 pF concentric trimmer capacitors

L_1 = 1″ of straight 18 s.w.g.
L_2 = 3 turns of 24 s.w.g. on ferrite FX1115
L_3 = 5 turns of 18 s.w.g.; internal diameter 3/8″; length 3/8″
L_4 = 3 turns of 18 s.w.g.; internal diameter 3/8″; length 3/8″

Note

To obtain optimum gain performance the emitter lead length should not exceed 1,6 mm.

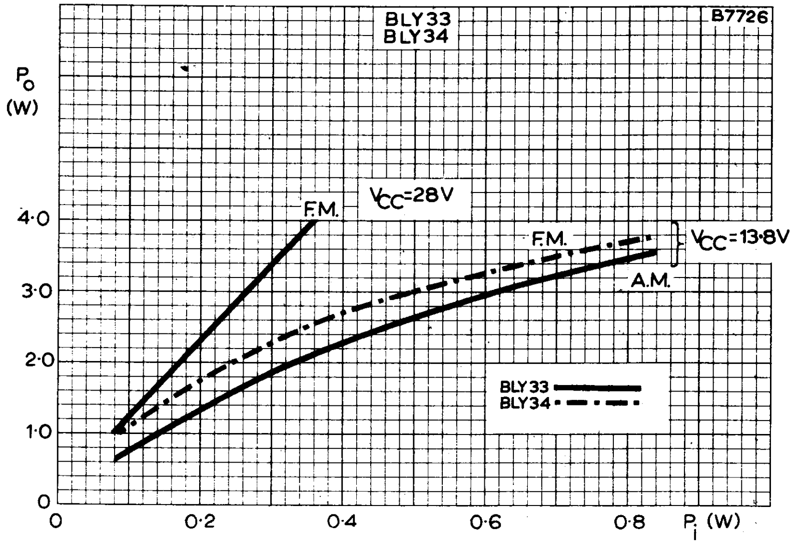


Fig. 3 Typical variation of output power with input power for v.h.f. amplifier (see recommended operating conditions on page 3).

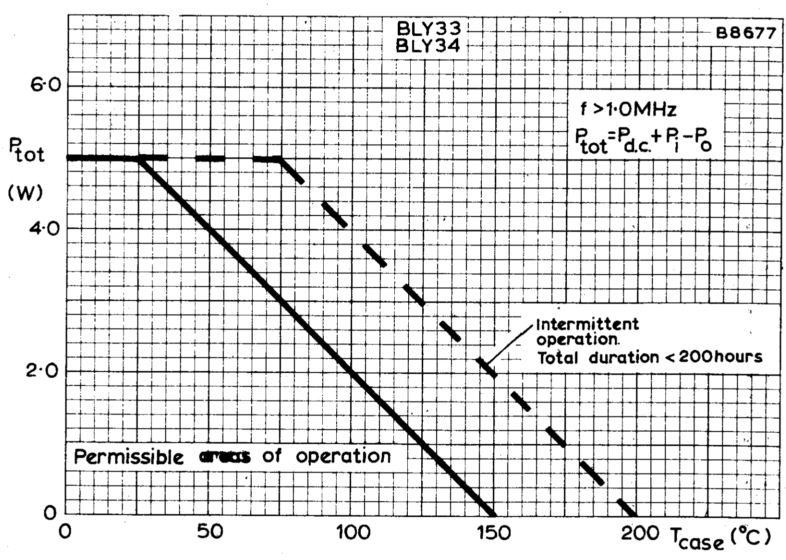


Fig. 4 Maximum permissible power dissipation plotted against case temperature for frequencies > 1,0 MHz.

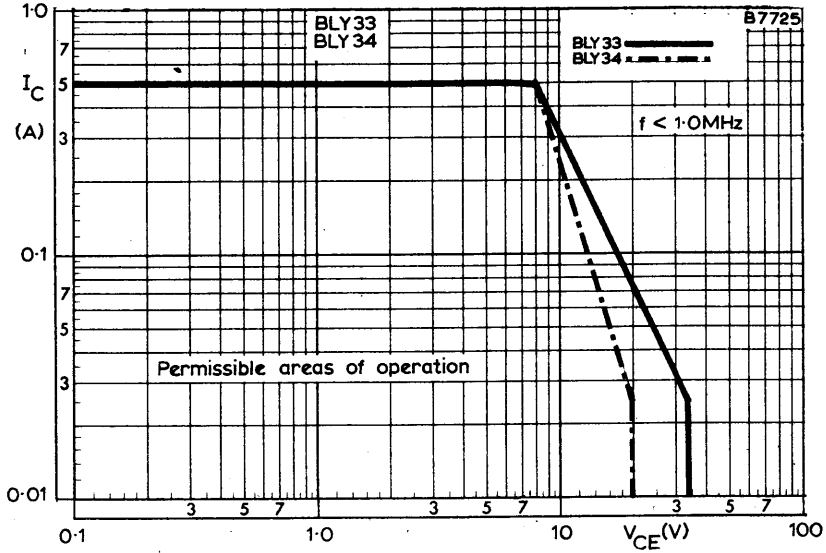


Fig. 5 Permissible areas of operation for frequencies < 1,0 MHz.

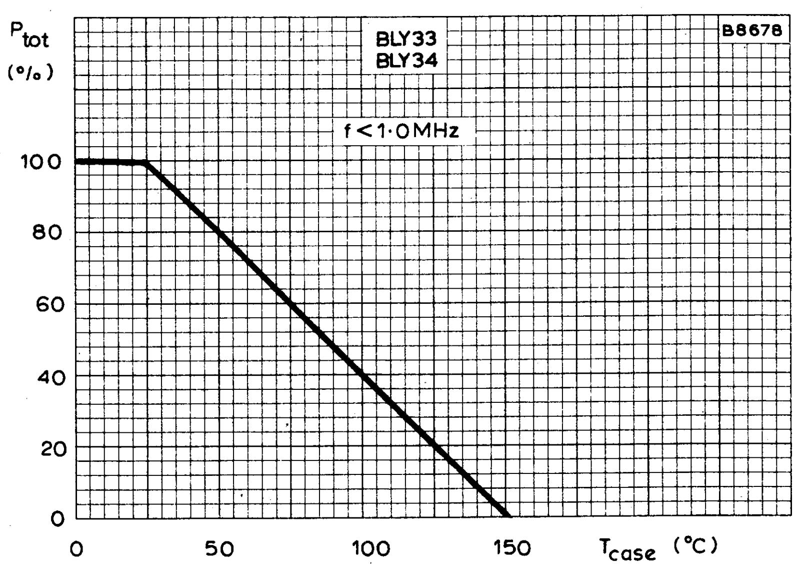


Fig. 6 Percentage power derating plotted against case temperature
for frequencies < 1,0 MHz.

V.H.F. POWER TRANSISTORS

Silicon planar n-p-n transistors for v.h.f. mobile operation in class-B. The BLY35 is mounted in a TO-60 envelope and the BLY83 is mounted in a plastic, capstan stripline encapsulation.

The transistors are primarily intended for a.m. operation at 13,8 V but are also suitable for f.m. operation at 24 V.

QUICK REFERENCE DATA

mode of operation	V_{CC} V	f MHz	P_L (carrier) W	P_L into 50 Ω W	η %	m %	d_{tot} %
a.m. class-B	13,8	175	typ. 7,0	–	typ. 77	80	< 5
a.m. class-B	13,8	80	typ. 7,5	–	typ. 77	80	< 5
c.w. class-B	24	175	–	typ. 13	typ. 65	–	–

MECHANICAL DATA

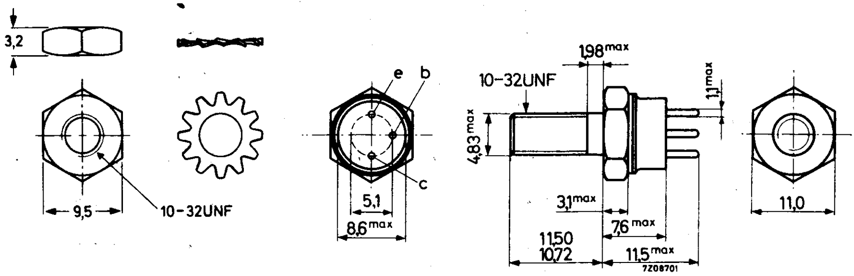
TO-60 (BLY35) (see Fig. 1a)
(BLY83) (see Fig. 1b)

CAUTION These devices incorporate beryllium oxide, the dust of which is toxic. The devices are entirely safe provided that the BeO disc is not damaged.

MECHANICAL DATA

Dimensions in mm

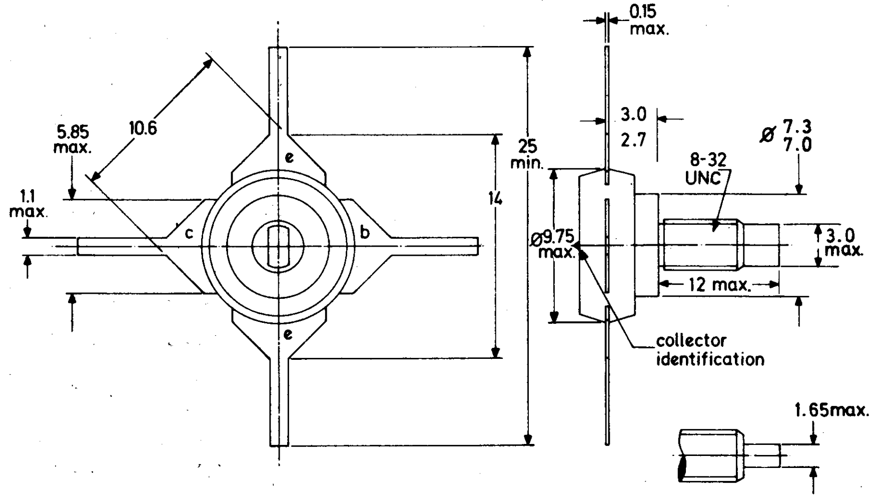
Fig. 1a TO-60 (**BLY35**).



Accessories: Nut and lock washer supplied with device.

Torque on nut: min. 0,8 Nm (8 kg cm)
max. 1,7 Nm (17 kg cm)

Fig. 1b (**BLY83**).



Accessories: Nut and lock washer supplied with device.

Torque on nut: min. 0,75 Nm (7,5 kg cm)
max. 0,85 Nm (8,5 kg cm)

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Collector-base voltage (open emitter)					
peak value		V_{CBOM}	max.	66	V
Collector-emitter voltage					
peak value; $V_{BE} = 0$		V_{CESM}	max.	66	V
open base		V_{CEO}	max.	33	V
Emitter-base voltage (open collector)		V_{EBO}	max.	4,0	V
Collector current					
d.c.		I_C	max.	2,5	A
(peak value); $f < 1$ MHz		I_{CM}	max.	2,5	A
(peak value); $f \geq 1$ MHz		I_{CM}	max.	7,5	A
Total power dissipation up to $T_h = 90\ ^oC$ ($f \geq 1$ MHz)		P_{tot}	max.	12	W
Storage temperature	BLY35	T_{stg}		−65 to + 200	^oC
	BLY83	T_{stg}		−65 to + 150	^oC

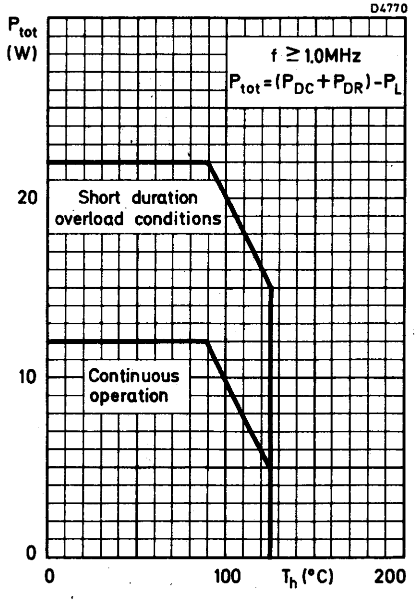


Fig. 2 Maximum permissible power dissipation plotted against heatsink temperature for frequencies ≥ 1,0 MHz.

CHARACTERISTICS

T_j = 25 °C unless otherwise specified

Collector-base breakdown voltage				
open emitter; I_C = 10 mA	$V_{(BR)CBO}$	>	66	V
Collector-emitter breakdown voltage				
V_{BE} = 0; I_C = 10 mA	$V_{(BR)CES}$	>	66	V
open base; I_C = 50 mA	$V_{(BR)CEO}$	>	33	V
Emitter-base breakdown voltage				
open collector; I_E = 1,0 mA	$V_{(BR)EBO}$	>	4,0	V
D.C. current gain				
I_C = 1,0 A; V_{CE} = 5,0 V	h_{FE}		10 to 220	
		typ.	60	
Transition frequency at f = 100 MHz				
I_C = 1,0 A; V_{CE} = 5,0 V; T_{amb} = 25 °C	f_T	>	250	MHz
		typ.	450	MHz
Collector capacitance at f = 1 MHz				
$I_E = I_e$ = 0; V_{CB} = 10 V	C_c	typ.	34	pF
		<	45	pF
Emitter capacitance at f = 1 MHz				
$I_C = I_c$ = 0; V_{EB} = 0	C_e	>	100	pF
		typ.	155	pF

APPLICATION INFORMATION

R.F. performance in a 7,0 W a.m. transmitter at f = 175 MHz, $f_{mod.}$ = 1 kHz

V_{CC} V	P_{DR} W	P_L (carrier) W	I_C (driver) A	I_C (amplifier) A	G_p dB	η %	m %	d_{tot} %
13,8	0,35	typ. 7,0	typ. 0,22	typ. 0,66	13	typ. 77	80	< 5

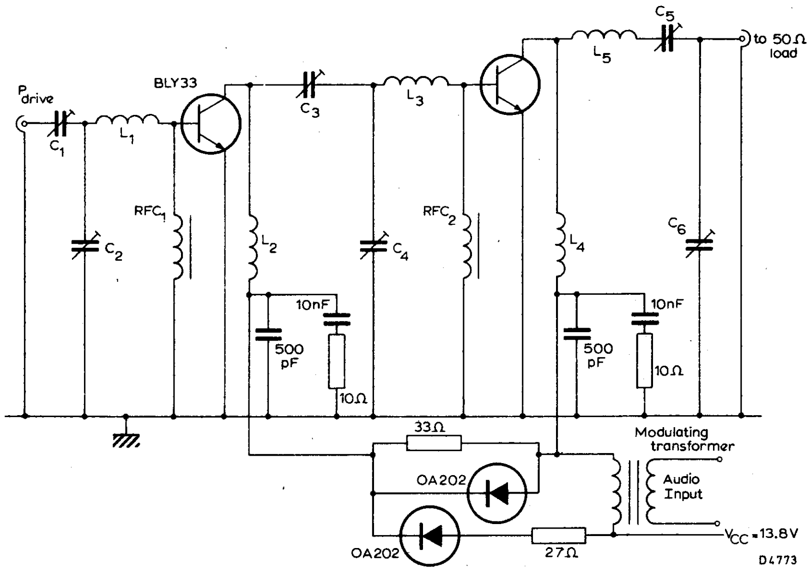


Fig. 3 175 MHz transmitter circuit.

Component values for 175 MHz transmitter circuit:

C_1 to C_6 = 4 to 29 pF concentric trimmer capacitors

L_1 = L_3 = 3 turns of 1,2 mm enamelled Cu wire; int. dia. = 6,4 mm; length = 5,0 mm
L_2 = L_4 = 5 turns of 1,2 mm enamelled Cu wire; int. dia. = 6,4 mm; length = 10 mm
L_5 = 3 turns of 1,7 mm enamelled Cu wire, int. dia. = 10 mm; length = 10 mm
RFC_1 = RFC_2 = 2 turns of 0,4 mm enamelled Cu wire on ferrite FX1115

R.F. performance in a 7,0 W a.m. transmitter at f = 80 MHz, $f_{mod.}$ = 1 kHz

V_{CC} V	P_{DR} W	P_L (carrier) W	I_C (driver) A	I_C (amplifier) A	G_p dB	η %	m %	d_{tot} %
13,8	0,06	typ. 7,5	typ. 0,06	typ. 0,7	21	typ. 70	80	< 5

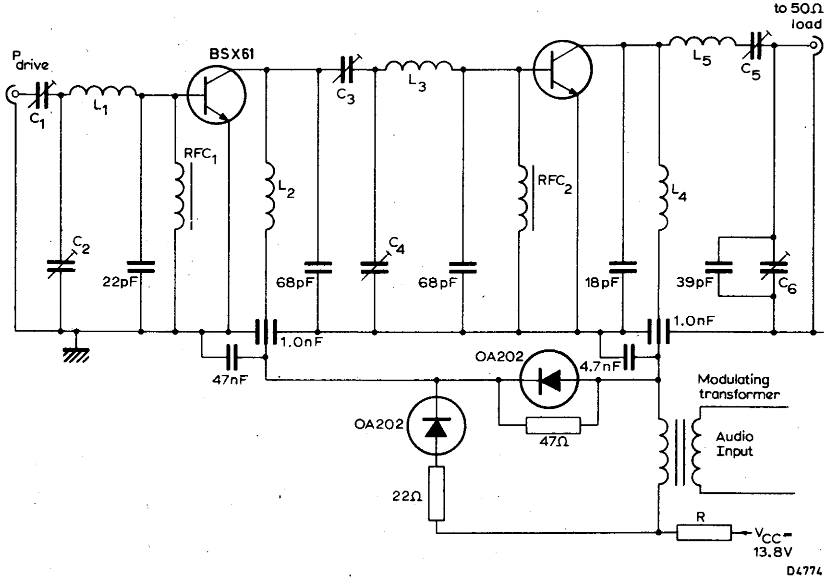


Fig. 4 80 MHz transmitter circuit.

Component values for 80 MHz transmitter circuit:

C_1 to C_6 = 4 to 29 pF concentric trimmer capacitors

L_1 = L_3 = 5 turns of 1,2 mm enamelled Cu wire; int. dia. = 6,3 mm; length = 9,0 mm
L_2 = L_4 = 3 turns of 1,2 mm enamelled Cu wire; int. dia. = 7,0 mm; length = 6,0 mm
L_5 = 6 turns of 2,0 mm enamelled Cu wire; int. dia. = 10 mm; length = 13 mm
RFC_1 = RFC_2 = 1 turn of 0,4 mm enamelled Cu wire on ferrite FX1115

R This resistor is incorporated to reduce the carrier level to 8 W or below.

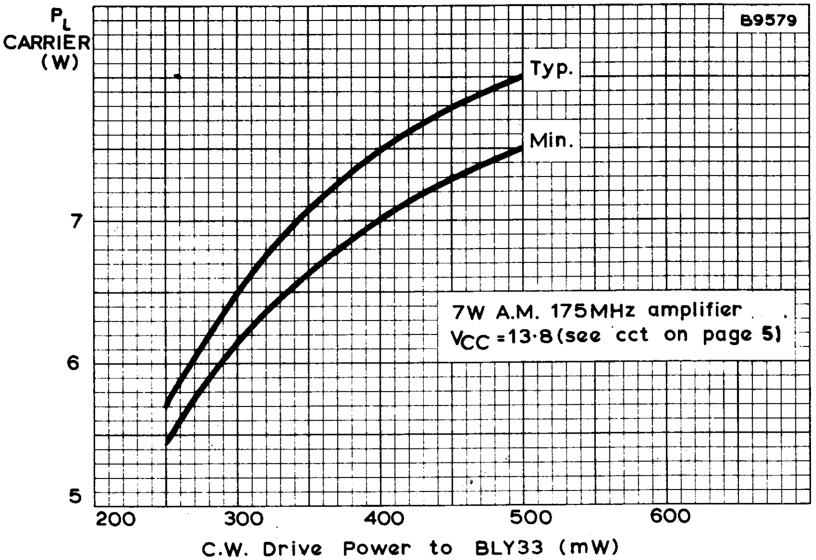


Fig. 5 Aerial carrier power plotted against c.w. drive power for the 7 W a.m. 175 MHz amplifier (see page 5).

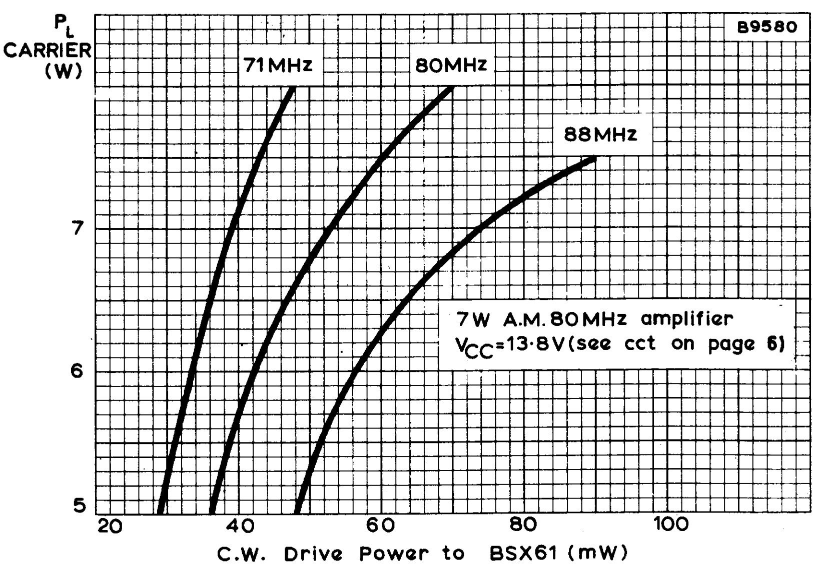


Fig. 6 Aerial carrier power plotted against c.w. drive power for the 7 W a.m. 80 MHz amplifier (see page 6).

R.F. performance in c.w. operation at f = 175 MHz, T_h up to 40 °C

V_{CC} V	P_{DR} W	P_L into 50 Ω W	η %	G_p dB
24	1,35	typ. 13	typ. 65	9,8
13,8	1,35	typ. 7,5		

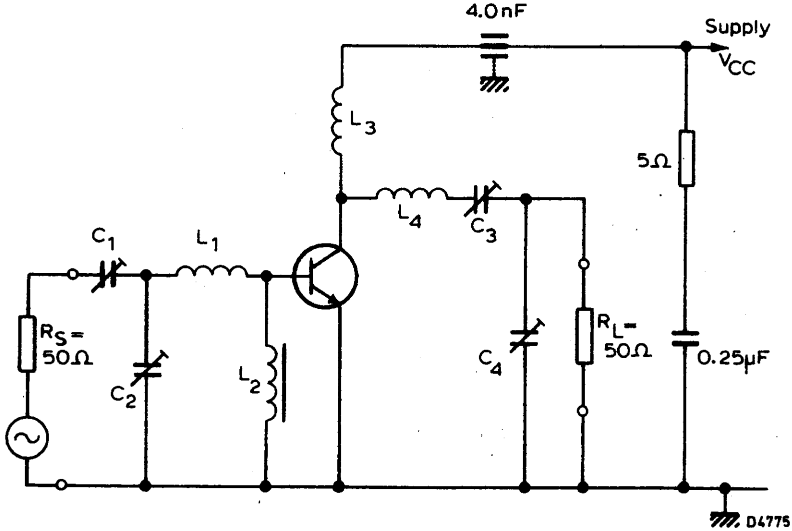


Fig. 7 175 MHz amplifier circuit.

Component values for 175 MHz amplifier circuit:

$C_1 = C_3 = C_4$ = 30 pF max. concentric trimmer capacitors
C_2 = 60 pF max. concentric trimmer capacitor
L_1 = 25,4 mm of straight 1,7 mm Cu wire
L_2 = 3 turns of 0,5 mm Cu wire on ferrite FX1115
L_3 = 3 turns of 1,7 mm Cu wire; int. dia. = 9,5 mm; length = 9,5 mm
L_4 = 2 turns of 2,0 mm Cu wire; int. dia. = 12,7 mm; length = 9,5 mm

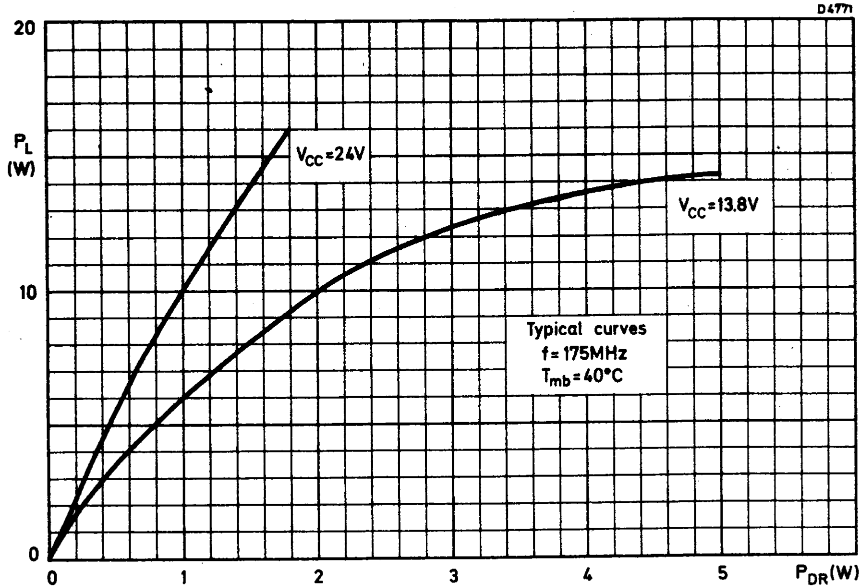


Fig. 8 Load power plotted against drive power.

R.F. performance in c.w. operation at f = 80 MHz up to T_h = 40 °C.

V_{CC} V	P_{DR} W	P_L into 50 Ω W
13,8	0,5	typ. 12,5
6,9	0,5	typ. 5,0

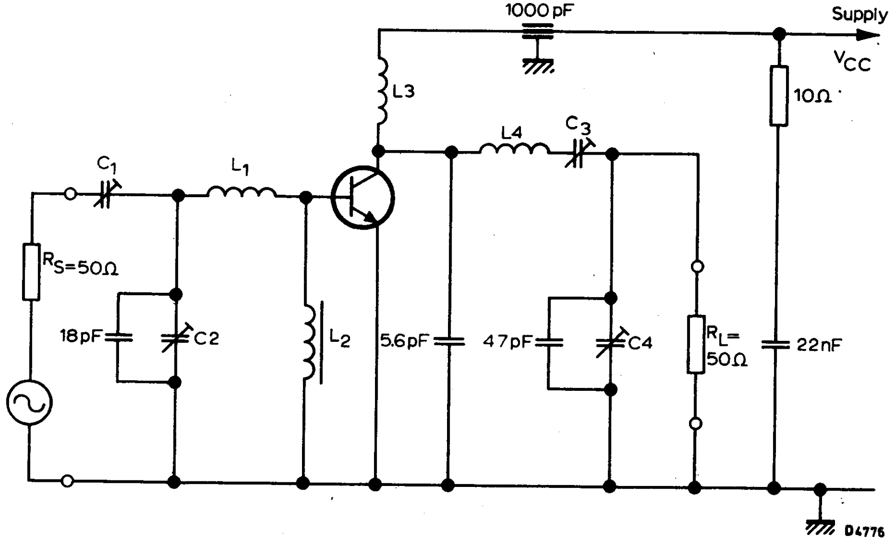


Fig. 9 80 MHz amplifier circuit.

Component values for 80 MHz amplifier circuit:

C_1 to C_4 = 4 to 29 pF concentric trimmer capacitors

L_1 = 4 turns of 1,2 mm Cu wire; int. dia. 6,3 mm; length 8,0 mm
L_2 = 2 turns of 0,35 mm Cu wire on ferrite FX1115
L_3 = 5 turns of 1,2 mm Cu wire; int. dia. 6,3 mm; close wound
L_4 = 5 turns of 1,7 mm Cu wire; int. dia. 9,6 mm; length 12 mm

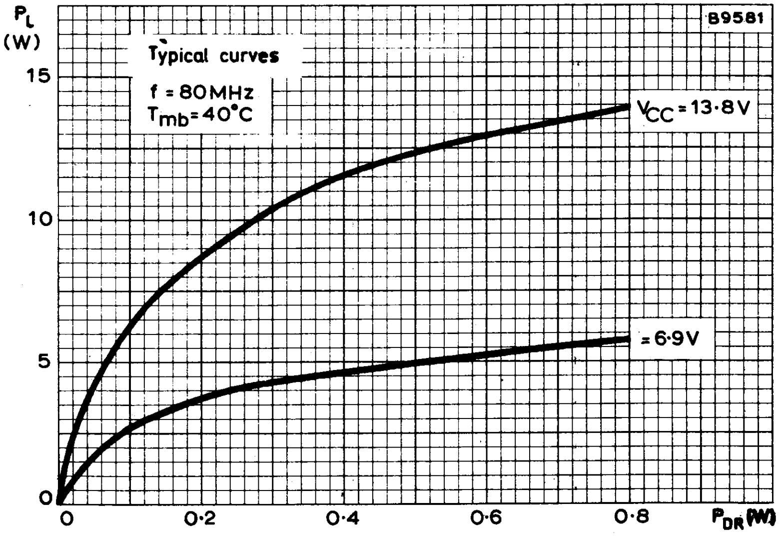


Fig. 10 Load power plotted against drive power.

V.H.F. POWER TRANSISTORS

Silicon planar n-p-n transistors for v.h.f. mobile operation in class-B. The BLY36 is mounted in a TO-60 envelope and the BLY84 is mounted in a plastic, capstan stripline encapsulation.

The transistors are primarily intended for f.m. operation at 13,8 V.

QUICK REFERENCE DATA

R.F. performance in an unneutralized common-emitter class-B circuit

V_{CC} V	f MHz	P_{DR} W	P_L into 50 Ω W	η %
13,8	175	1,2	typ. 7,0	typ. 77
13,8	175	3,4	typ. 13,2	typ. 79
13,8	80	0,5	typ. 13,5	typ. 80

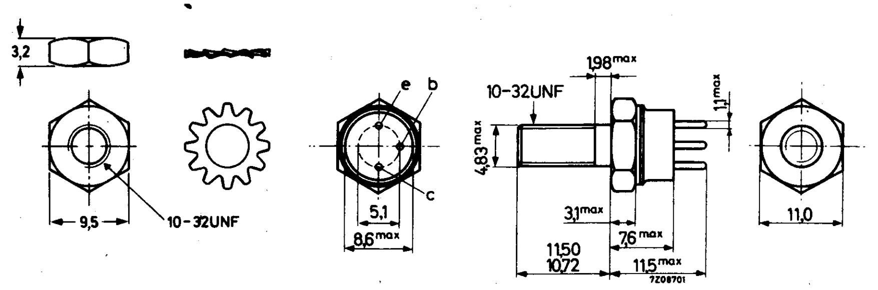
MECHANICAL DATA

TO-60 (BLY36) (see Fig. 1a)
(BLY84) (see Fig. 1b)

CAUTION These devices incorporate beryllium oxide, the dust of which is toxic. The devices are entirely safe provided that the BeO disc is not damaged.

MECHANICAL DATA Dimensions in mm

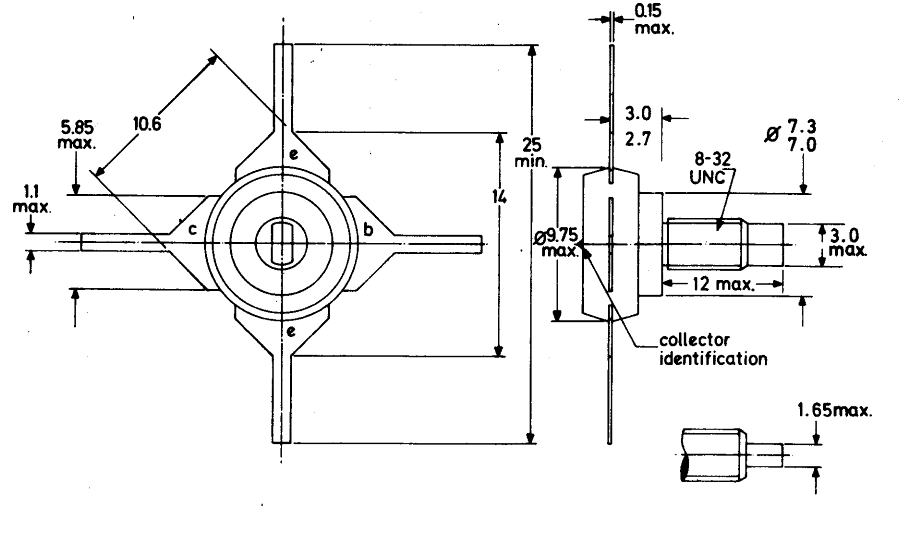
Fig. 1a TO-60 (**BLY36**).



Accessories: Nut and lock washer supplied with device.

Torque on nut: min. 0,8 Nm (8 kg cm)
max. 1,7 Nm (17 kg cm)

Fig. 1b (**BLY84**).



Accessories: Nut and lock washer supplied with device.

Torque on nut: min. 0,75 Nm (7,5 kg cm)
max. 0,85 Nm (8,5 kg cm)

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Collector-base voltage (open emitter)					
peak value		V_{CBOM}	max.	40	V
Collector-emitter voltage					
peak value; $V_{BE} = 0$		V_{CESM}	max.	40	V
open base		V_{CEO}	max.	20	V
Emitter-base voltage (open collector)		V_{EBO}	max.	4,0	V
Collector current					
d.c.		I_C	max.	2,5	A
(peak value); $f < 1$ MHz		I_{CM}	max.	2,5	A
(peak value); $f \geqslant 1$ MHz		I_{CM}	max.	7,5	A
Total power dissipation up to $T_h = 90$ °C ($f \geqslant 1$ MHz)		P_{tot}	max.	12	W
Storage temperature	BLY36	T_{stg}		−65 to + 200	°C
	BLY84	T_{stg}		−65 to + 150	°C

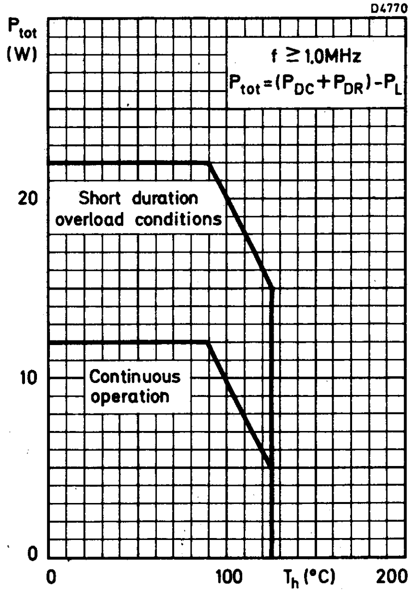


Fig. 2 Maximum permissible power dissipation plotted against heatsink temperature for frequencies ⩾ 1 MHz.

CHARACTERISTICS

T_j = 25 °C unless otherwise specified

Collector-base breakdown voltage open emitter; I_C = 10 mA	$V_{(BR)CBO}$	>	40	V
Collector-emitter breakdown voltage V_{BE} = 0; I_C = 10 mA	$V_{(BR)CES}$	>	40	V
open base; I_C = 50 mA	$V_{(BR)CEO}$	>	20	V
Emitter-base breakdown voltage open collector; I_E = 1,0 mA	$V_{(BR)EBO}$	>	4,0	V
D.C. current gain I_C = 1,0 A; V_{CE} = 5,0 V	h_{FE}	> typ.	10 60	
Transition frequency at f = 100 MHz I_C = 1,0 A; V_{CE} = 5,0 V; T_{amb} = 25 °C	f_T	> typ.	250 450	MHz MHz
Collector capacitance at f = 1 MHz $I_E = I_e$ = 0; V_{CB} = 10 V	C_c	typ. <	37 45	pF pF
Emitter capacitance at f = 1 MHz $I_C = I_c$ = 0; V_{EB} = 0	C_e	> typ.	100 155	pF pF

APPLICATION INFORMATION

R.F. performance in c.w. operation at f = 175 MHz up to T_h = 40 °C

V_{CC} V	P_{DR} W	P_L into 50 Ω W	η %	G_p dB
13,8	1,2	typ. 7,0	typ.77	7,6
13,8	3,4	typ. 13,2	typ.79	5,8

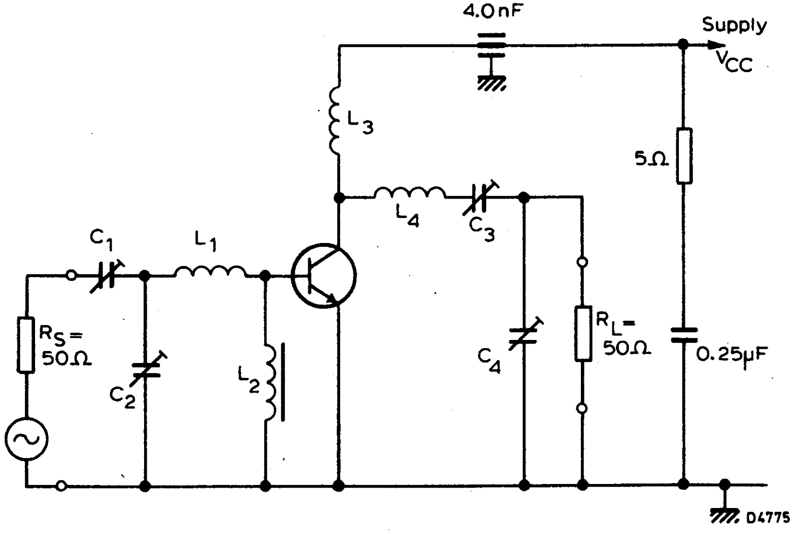


Fig. 3 175 MHz amplifier circuit.

Component values for 175 MHz amplifier circuit:

$C_1 = C_3 = C_4$ = 30 pF max. concentric trimmer capacitors
C_2 = 60 pF max. concentric trimmer capacitor

L_1 = 25,4 mm of straight 1,7 mm Cu wire
L_2 = 3 turns of 0,5 mm Cu wire on ferrite FX1115
L_3 = 3 turns of 1,7 mm Cu wire; int. dia. 9,5 mm; length 9,5 mm
L_4 = 2 turns of 2,0 mm Cu wire; int. dia. 12,7 mm; length 9,5 mm

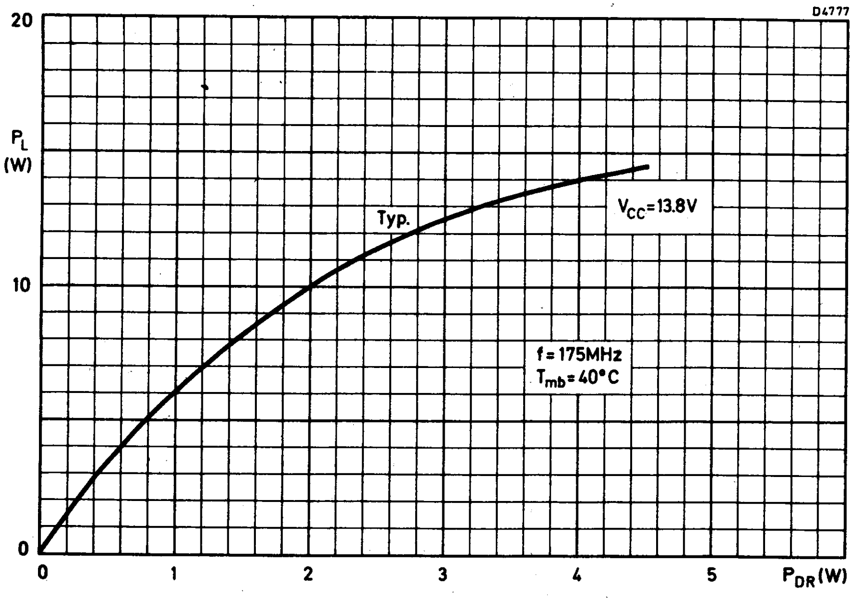


Fig. 4 Load power plotted against drive power.

R.F. performance in c.w. operation at f = 80 MHz up to T_h = 40 °C

V_{CC} V	P_{DR} W	P_L into 50 Ω W	η %	G_p dB
13,8	0,5	typ. 13,5	typ. 80	14,2
6,9	0,5	typ. 5,5	typ. 80	10,3

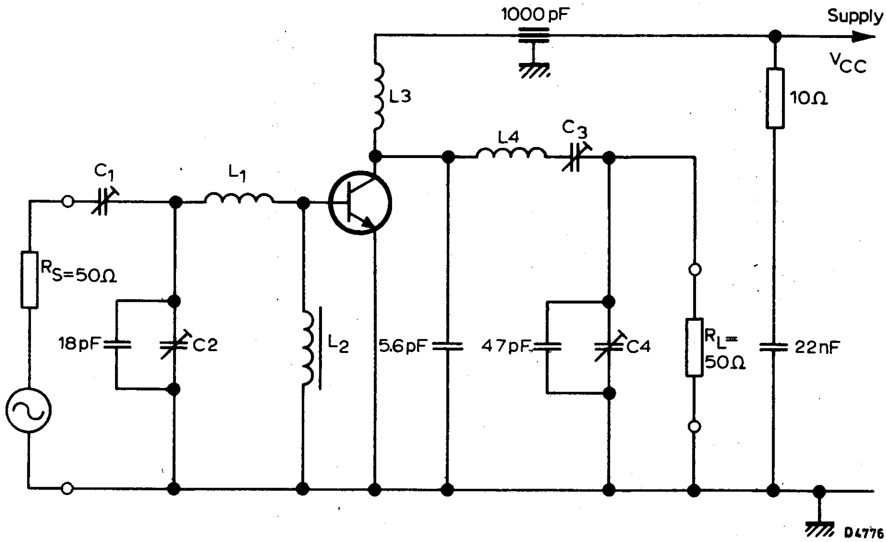


Fig. 5 80 MHz amplifier circuit.

Component values for 80 MHz amplifier circuit:

C_1 to C_4 = 4 to 29 pF concentric trimmer capacitors

L_1 = 4 turns of 1,2 mm Cu wire; int. dia. 6,3 mm; length 8,0 mm
L_2 = 2 turns of 0,35 mm Cu wire on ferrite FX1115
L_3 = 5 turns of 1,2 mm Cu wire; int. dia. 6,3 mm; close wound
L_4 = 5 turns of 1,7 mm Cu wire; int. dia. 9,6 mm; length 12 mm

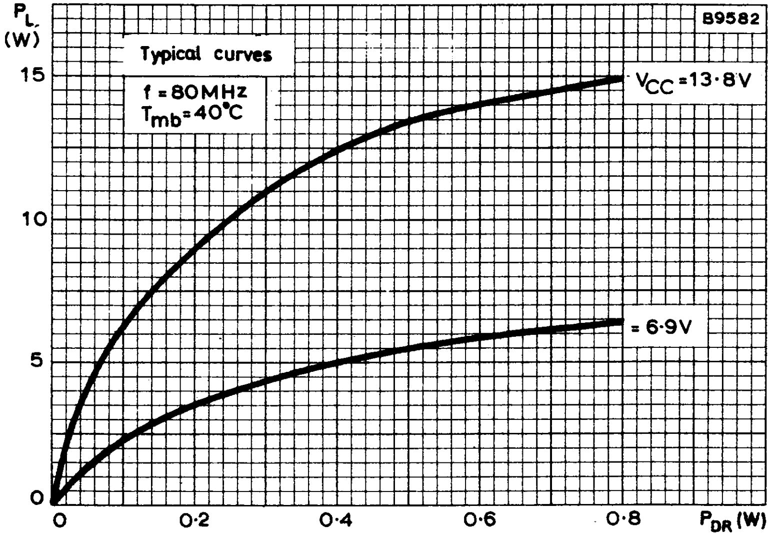


Fig. 6 Load power plotted against drive power.

BLY 37
BLY 38
BLY 53
BLY 76

SILIZIUM - NPN - PLANAR - EPITAXIAL -

HF - LEISTUNGSTRANSISTOREN

für FM-Senderanwendungen bei 470 MHz

BLY 37 für Endstufen) bei 28 V
BLY 76 für Treiberstufen) Speisespannung

BLY 53 für Endstufen) bei 13,8 V
BLY 38 für Treiberstufen) Speisespannung

Mechanische Daten:

Gehäuse: Kunststoff mit Gewindestutzen (SOT-36)

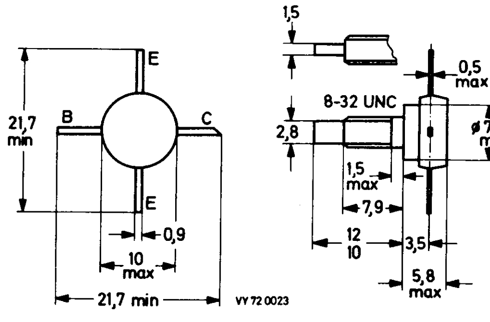
Alle Elektroden sind vom Gewindestutzen isoliert.

Die Transistoren werden mit Mutter SW 8,6 x 5 geliefert.

Drehmoment bei Befestigung $M_D = 8,0 \pm 0,5$ cm kp

Bohrung im Kühlblech max. 4,17 mm ∅

Maßangaben in mm.



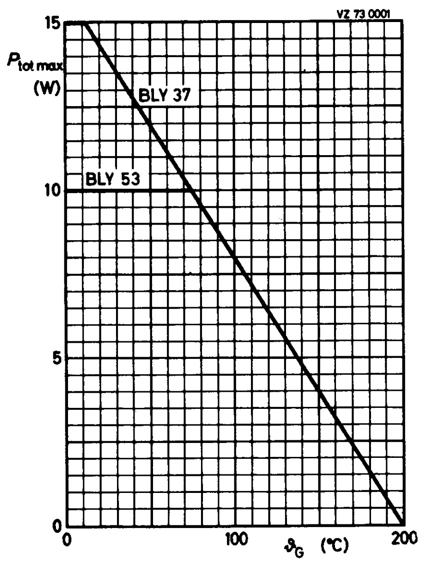
Kurzdaten:			BLY 37	BLY 38	BLY 53	BLY 76	
Kollektor-Sperrspannung	U_{CB0M}	= max.	65	36	36	65	V
Kollektor-Emitter-Sperrspannung	U_{CE0}	= max.	36	18	18	36	V
Kollektorstrom, Scheitelwert	I_{CM}	= max.	2,5	1,5	4,0	1,0	A
Gesamtverlustleistung bei $\vartheta_G = 100^\circ C$	P_{tot}	= max.	8,0	3,2	8,0	3,2	W
Sperrschichttemperatur	ϑ_J	= max.	200	200	200	200	°C
Transit-Frequenz bei $U_{CE} = 5$ V	f_T	=	800	1000	800	900	MHz
Ausgangsleistung	P_2	≥	6	2	6	2	W
Wirkungsgrad	η	≥	60	60	60	60	%

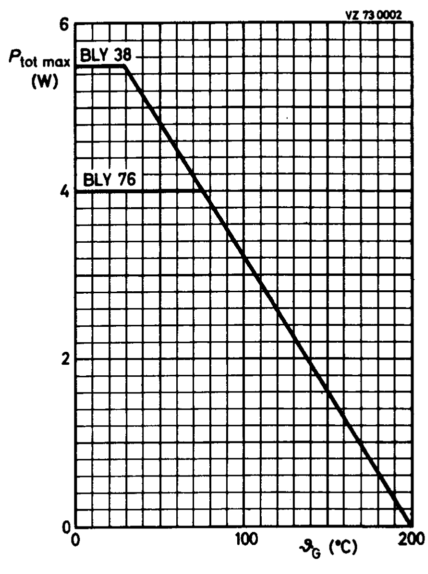
BLY 37
BLY 38
BLY 53
BLY 76

Absolute Grenzwerte: (gültig bis $\vartheta_{J\,max}$)			BLY 37	BLY 38	BLY 53	BLY 76	
Kollektor-Sperrspannung, Scheitelwert bei $I_E = 0$, $I_C = 10$ mA:	$U_{CB\,0\,M}$	= max.	65	36	36	65	V
Kollektor-Emitter-Sperrspannung bei $I_B = 0$, $I_C = 10$ mA:	$U_{CE\,0}$	= max.	36	18	18	36	V
Emitter-Sperrspannung bei $I_C = 0$, $I_E = 10$ mA:	$U_{EB\,0}$	= max.	4	4	4	4	V
Kollektorstrom, Mittelwert:	$I_{C\,AV}$	= max.	0,75	0,5	1,3	0,3	A
Kollektorstrom, Scheitelwert:	$I_{C\,M}$	= max.	2,5	1,5	4,0	1,0	A
Emitterstrom, Scheitelwert:	$-I_{E\,M}$	= max.	2,5	1,5	4,0	1,0	A
Gesamtverlustleistung bei f ≧ 1 MHz:	P_{tot}	= max.	10	5,5	15	4,0	W
Sperrschichttemperatur:	ϑ_J	= max.	200	200	200	200	°C
Lagerungstemperatur:	ϑ_S	= min.	-30	-30	-30	-30	°C
	ϑ_S	= max.	200	200	200	200	°C

Wärmewiderstand:

zwischen Sperrschicht und Gewindestutzen:	$R_{th\,G}$	≦	12,5	31	12,5	31	grd/W





Kennwerte: (bei $\vartheta_J = 25^oC$)			BLY 37	BLY 38	BLY 53	BLY 76	
Gleichstromverstärkung							
bei $U_{CE} = 5$ V, $I_C = 250$ mA:	B	=		70		30	
bei $U_{CE} = 5$ V, $I_C = 500$ mA:	B	=	35		50		
Basisspannung [1]							
bei $U_{CE} = 5$ V, $I_C = 250$ mA:	U_{BE}	$\leqq$		1,5		1,5	V
bei $U_{CE} = 5$ V, $I_C = 500$ mA:	U_{BE}	$\leqq$	1,5		1,5		V
Kollektor-Emitter-Restspannung							
bei $I_C = 250$ mA, $I_B = 50$ mA:	$U_{CE\ sat}$	$\leqq$		0,5		0,5	V
bei $I_C = 500$ mA, $I_B = 100$ mA:	$U_{CE\ sat}$	$\leqq$	0,5		0,5		V
Transit-Frequenz bei $f_M = 100$ MHz							
bei $U_{CE} = 5$ V, $I_C = 250$ mA:	f_T	=		1000		900	MHz
bei $U_{CE} = 5$ V, $I_C = 500$ mA:	f_T	=	800		800		MHz
Kollektorkapazität bei f = 1 MHz							
bei $U_{CB} = 13,8$ V, $I_E = 0$:	C_c	=		5,5	10		pF
bei $U_{CB} = 28$ V, $I_E = 0$:	C_c	=	8			3,5	pF
Kollektor-Gehäuse-Kapazität:	$C_{C/G}$	=	2	2	2	2	pF
Vierpol-Koeffizienten bei f = 470 MHz							
bei $U_{CE} = 5$ V, $I_C = 250$ mA:	$Re(h_{11e})$	=		8		6	Ω
	$Im(h_{11e})$	=		11		12	Ω
bei $U_{CE} = 5$ V, $I_C = 500$ mA:	$Re(h_{11e})$	=	4		4		Ω
	$Im(h_{11e})$	=	13		13		Ω

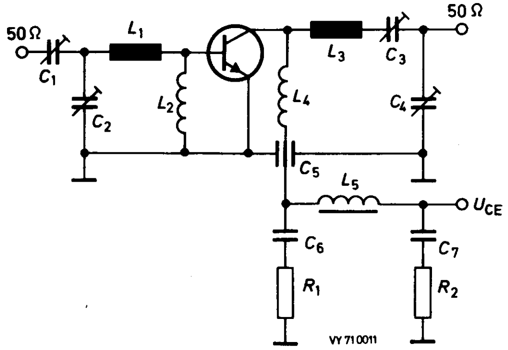
[1] $\Delta U_{BE}/\Delta\vartheta_J \approx -1,5$ mV/grd

BLY 37
BLY 38
BLY 53
BLY 76

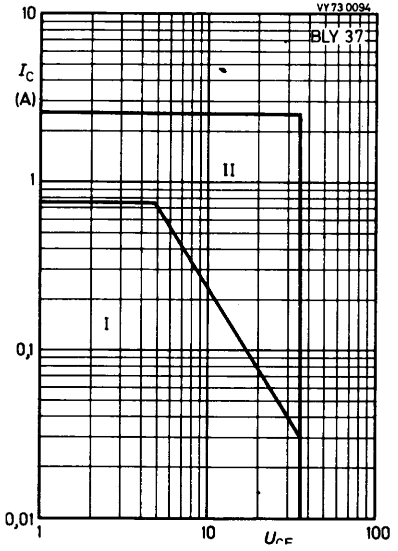
HF-Leistungsverstärker in Emitterschaltung bei f = 470 MHz, $\vartheta_G = 25^oC$:

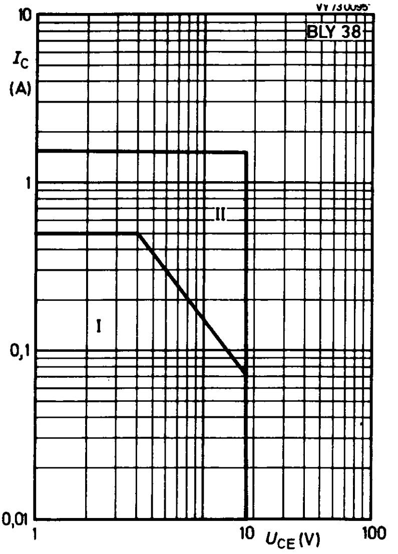
			BLY 37	BLY 38	BLY 53	BLY 76	
Speisespannung:	U_{CE}	=	28	13,8	13,8	28	V
Ausgangsleistung:	P_2	=	6	2	6	2	W
Eingangsleistung:	P_1	$\leq$	1,5	0,5	2,0	0,4	W
Leistungsverstärkung:	V_p	$\geq$	6	6	4,7	7	dB
Wirkungsgrad:	η	$\geq$	60	60	60	60	%

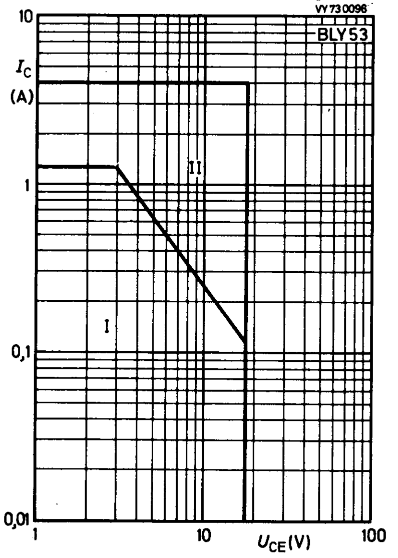
Die Transistoren sind bei einem Welligkeitsfaktor s $\leq$ 50 geprüft.

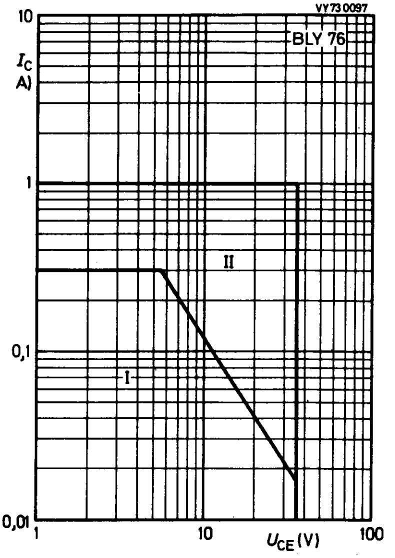


R_1 = 10 Ω		L_1:	Kupferband 35 mm x 6 mm
R_2 = 10 Ω		L_2:	5 Wdgn. 0,6 mm CuL, Innen-Ø 8 mm
C_1 = 1...17 pF	Luft-trimmer	L_3:	Kupferdraht 25 mm x 1,5 mm Ø
C_2 = 1...17 pF		L_4:	3 Wdgn. 1 mm Cu, Abstand 2 mm, Innen-Ø 3,5 mm, Zuleitung 2 x 10 mm
C_3 = 1...17 pF		L_5:	FXC-Drossel 4312 020 36641
C_4 = 1...17 pF			
C_5 = 100 pF	Keramik		
C_6 = 10 nF			
C_7 = 10 nF			



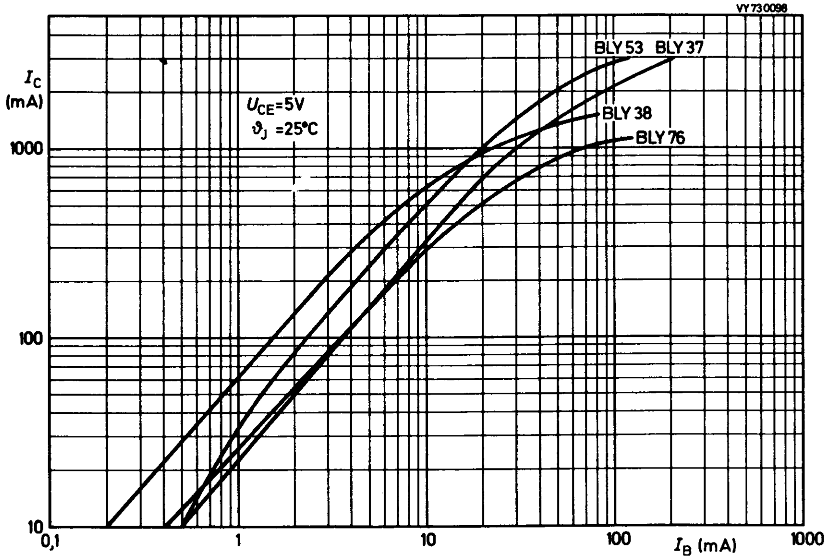


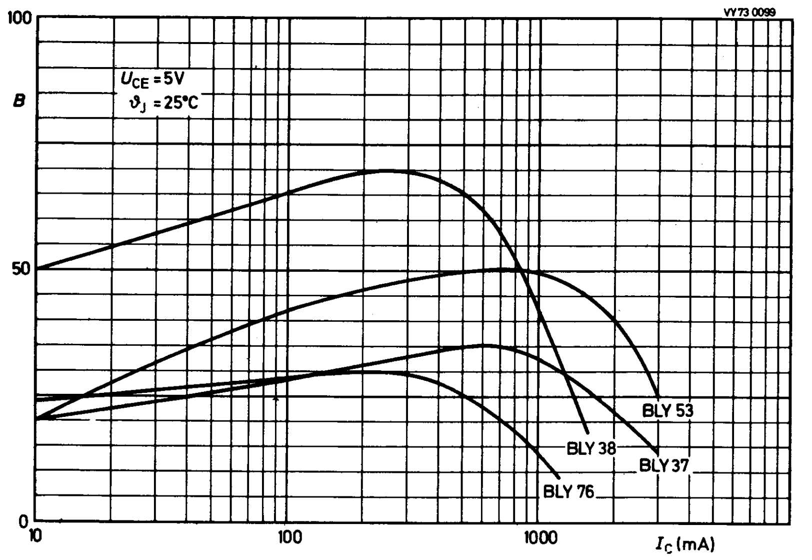


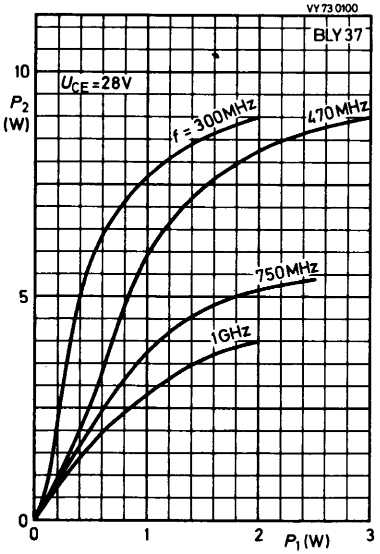


Bereich I: für alle Betriebsarten bei beliebigem Basis-Abschluß

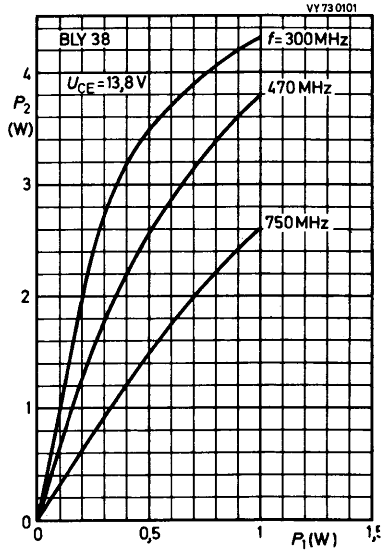
Bereich II: nur für Aussteuerung mit f $\geq$ 1 MHz


VY 73 0098
I_C (mA)
U_{CE}=5V
ϑ_J =25°C
BLY 53
BLY 37
BLY 38
BLY 76
1000
100
10
0,1
1
10
100
I_B (mA)
1000

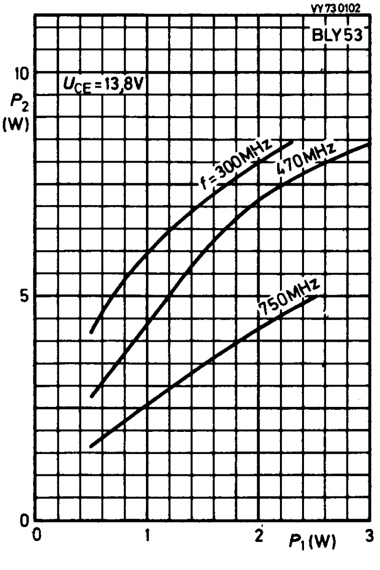

VY 73 0099
100
B
U_{CE} =5V
ϑ_J = 25°C
50
0
BLY 53
BLY 38
BLY 37
BLY 76
10
100
1000
I_C (mA)



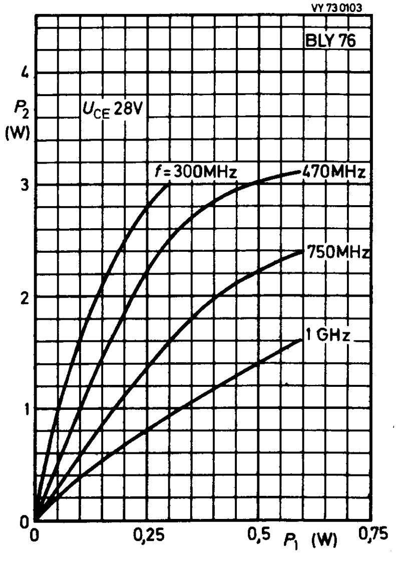
VY 73 0100
BLY 37
U_{CE} = 28V
10
P_2
(W)
f = 300MHz
470 MHz
750MHz
1GHz
5
0
0
1
2
P_1 (W)
3



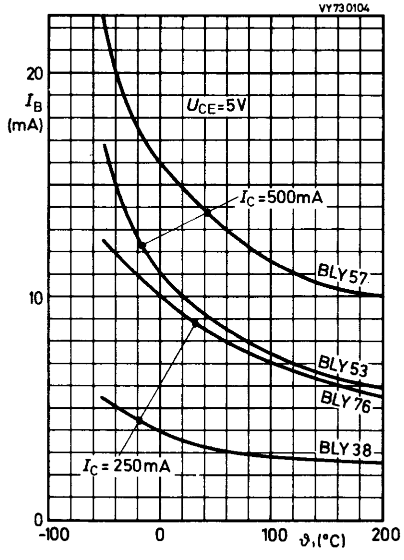
VY 73 0101
BLY 38
U_{CE} = 13,8 V
f = 300MHz
470 MHz
750MHz
4
P_2
(W)
3
2
1
0
0
0,5
1
P_1 (W)

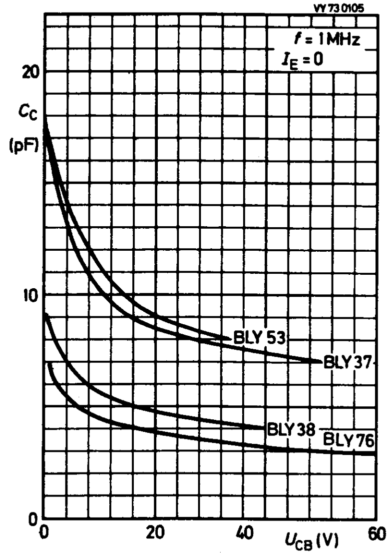


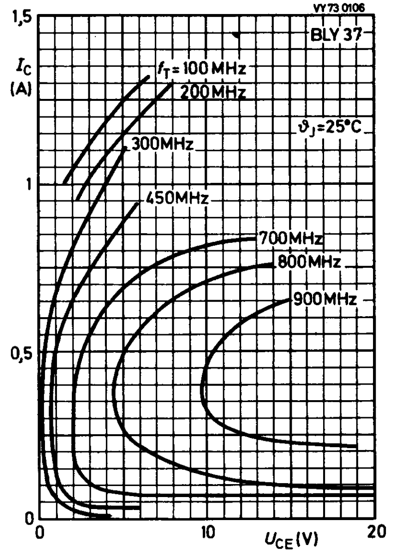
VY 73 0102
BLY53
U_{CE} = 13,8V
f = 300MHz
470MHz
750MHz
10
P_2
(W)
5
0
0
1
2
P_1 (W)
3

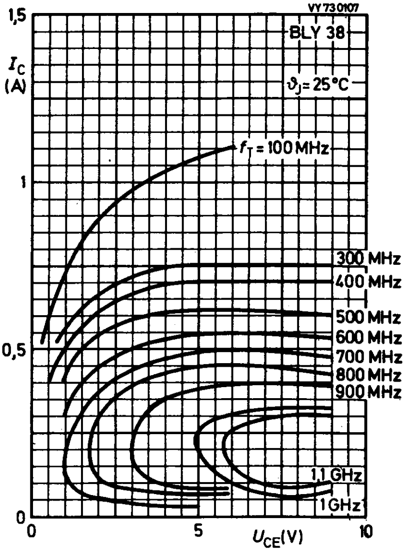


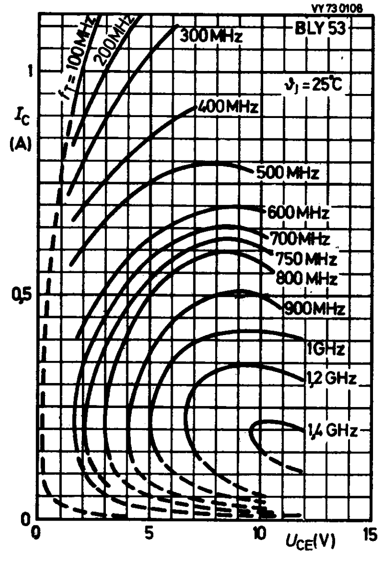
VY 73 0103
BLY 76
U_{CE} 28V
f = 300MHz
470MHz
750MHz
1 GHz
4
P_2
(W)
3
2
1
0
0
0,25
0,5
P_1 (W)
0,75

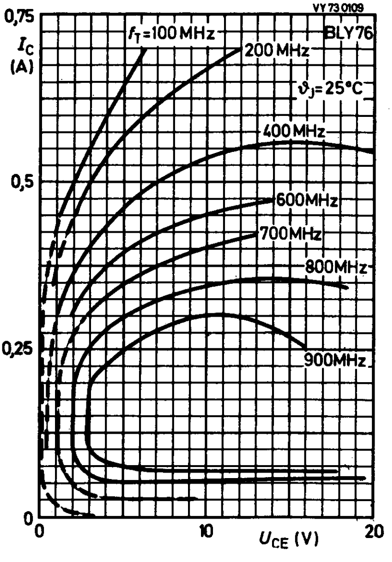

VY 73 0104
20
I_B
(mA)
U_{CE}=5V
I_C =500mA
BLY 57
10
BLY 53
BLY 76
BLY 38
I_C = 250mA
0
-100
0
100
ϑ_j (°C)
200

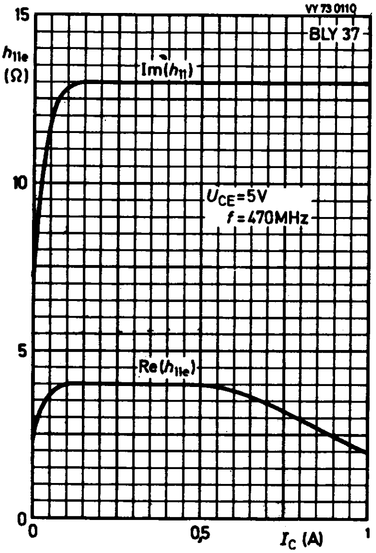

VY 73 0105
f = 1MHz
I_E = 0
20
C_C
(pF)
10
BLY 53
BLY 37
BLY 38
BLY 76
0
0
20
40
U_{CB} (V)
60


VY 73 0106
BLY 37
I_C (A)
f_T = 100 MHz
200 MHz
300MHz
450MHz
700MHz
800MHz
900MHz
ϑ_j = 25°C
1,5
1
0,5
0
10
20
U_{CE} (V)

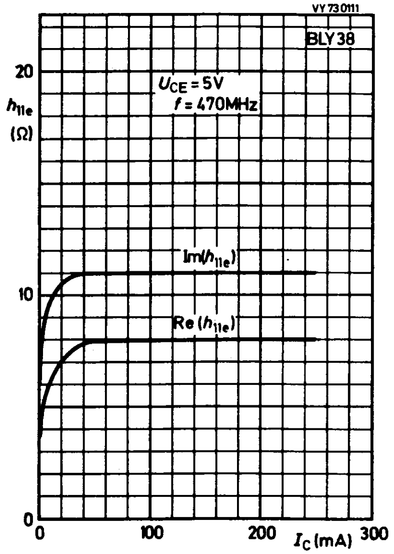

VY 73 0107
BLY 38
I_C (A)
ϑ_j = 25°C
f_T = 100 MHz
300 MHz
400 MHz
500 MHz
600 MHz
700 MHz
800 MHz
900 MHz
1,1 GHz
1 GHz
1,5
1
0,5
0
5
10
U_{CE} (V)


VY 73 0108
BLY 53
I_C (A)
ϑ_j = 25°C
f_T = 100 MHz
200 MHz
300 MHz
400 MHz
500 MHz
600 MHz
700 MHz
750 MHz
800 MHz
900 MHz
1 GHz
1,2 GHz
1,4 GHz
1
0,5
0
5
10
15
U_{CE} (V)

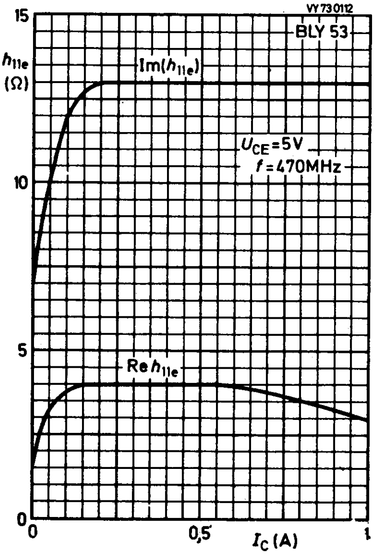

VY 73 0109
BLY 76
I_C (A)
ϑ_j = 25°C
f_T = 100 MHz
200 MHz
400 MHz
600MHz
700MHz
800MHz
900MHz
0,75
0,5
0,25
0
10
20
U_{CE} (V)



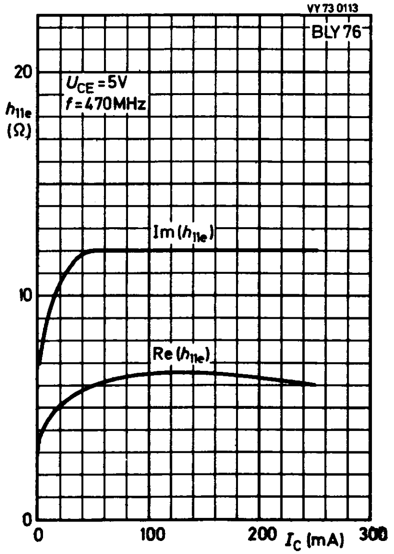
VY 73 0110
BLY 37
h_{11e} (Ω)
Im(h_{11})
U_{CE}=5V
f=470MHz
Re(h_{11e})
15
10
5
0
0
0,5
1
I_C (A)



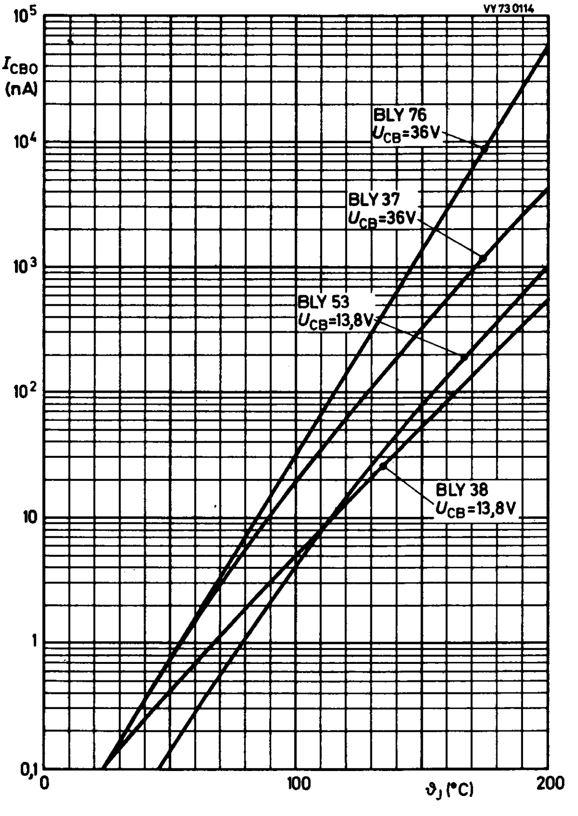
VY 73 0111
BLY 38
U_{CE}=5V
f=470MHz
h_{11e} (Ω)
Im(h_{11e})
Re(h_{11e})
20
10
0
0
100
200
300
I_C (mA)



VY 73 0112
BLY 53
h_{11e} (Ω)
Im(h_{11e})
U_{CE}=5V
f=470MHz
Re h_{11e}
15
10
5
0
0
0,5
1
I_C (A)



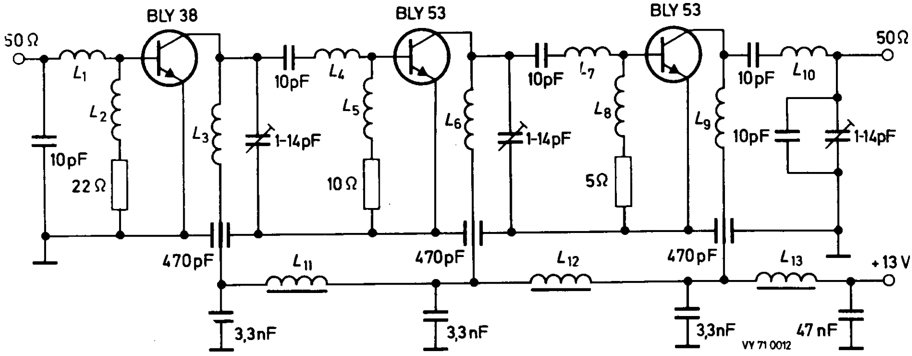
VY 73 0113
BLY 76
U_{CE}=5V
f=470MHz
h_{11e} (Ω)
Im(h_{11e})
Re(h_{11e})
20
10
0
0
100
200
300
I_C (mA)


VY 73 0114
10^5
I_{CBO} (nA)
10^4
10^3
10^2
10
1
0,1
0
100
200
ϑ_j (°C)
BLY 76 U_{CB}=36V
BLY 37 U_{CB}=36V
BLY 53 U_{CB}=13,8V
BLY 38 U_{CB}=13,8V

BLY 37
BLY 38
BLY 53
BLY 76

Schaltungsbeispiel eines dreistufigen Verstärkers für f = 470 MHz:

Speisespannung:	U_{CE} = 13 V	Ausgangsleistung:	P_2 = 8 W
Eingangsleistung:	P_1 = 0,3 W	Wirkungsgrad:	η = 47 %



L_1: 30 nH
L_2: 3 Wdgn. 0,5 mm CuL, Innen-Ø 4 mm
L_3: 3 Wdgn. 0,5 mm CuL, Innen-Ø 4 mm
L_4: 25 nH
L_5: 3 Wdgn. 0,5 mm CuL, Innen-Ø 4 mm
L_6: 4 Wdgn. 0,5 mm CuL, Innen-Ø 4 mm
L_7: 18 nH
L_8: 4 Wdgn. 0,5 mm CuL, Innen-Ø 4 mm
L_9: 4 Wdgn. 0,5 mm CuL, Innen-Ø 4 mm
L_{10}: 8 nH
L_{11}: FXC-Drossel 4312 020 36700
L_{12}: FXC-Drossel 4312 020 36700
L_{13}: FXC-Drossel 4312 020 36700

BLY 53 A

SILIZIUM - NPN - PLANAR - EPITAXIAL -
HF - LEISTUNGSTRANSISTOR
für Senderanwendungen
bei 470 MHz und 175 MHz

Mechanische Daten:

Gehäuse: Kunststoff
mit Gewindestutzen,
SOT-48/3

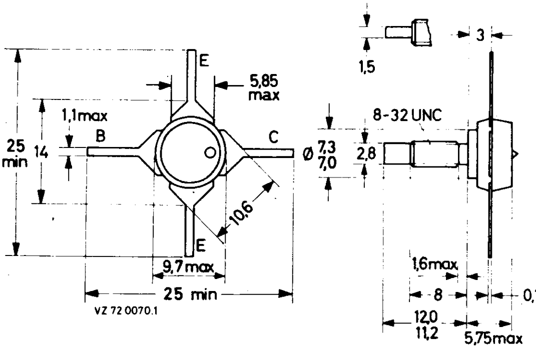
Alle Elektroden sind vom Gewindestutzen isoliert.

Maßangaben in mm.

Der Transistor wird mit Mutter SW 8,6 geliefert.

Drehmoment
bei Befestigung:
M_D = 0,8 ± 0,05 Nm
(8 ± 0,5 cm kp)

Bohrungs-Durchmesser
im Kühlblech:
ø = max. 4,17 mm

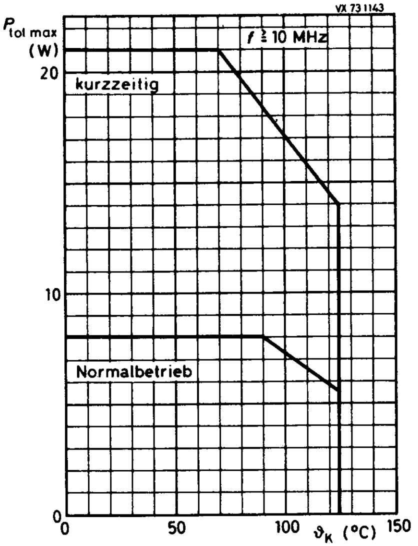


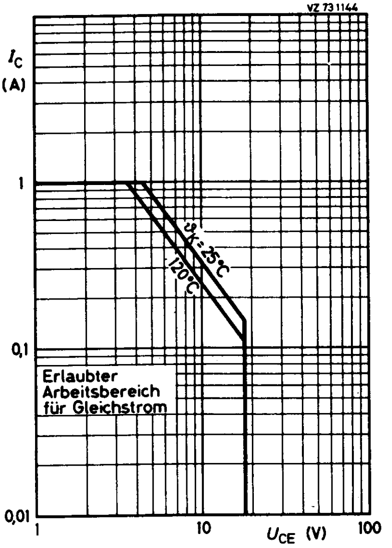
Kurzdaten:

Kollektor-Emitter-Sperrspannung	$U_{CE\,0}$	= max.	18	V
Kollektorstrom, Scheitelwert bei f > 1 MHz	I_{CM}	= max.	4	A
Gesamtverlustleistung bei f > 10 MHz, $\vartheta_K \leq 90°C$	P_{tot}	= max.	8	W
Ausgangsleistung als B-FM-Sender				
bei U_{CE} = 13,8 V, f = 470 MHz	P_L	=	7,8	W
bei U_{CE} = 13,8 V, f = 175 MHz	P_L	=	8,3	W

Absolute Grenzwerte:

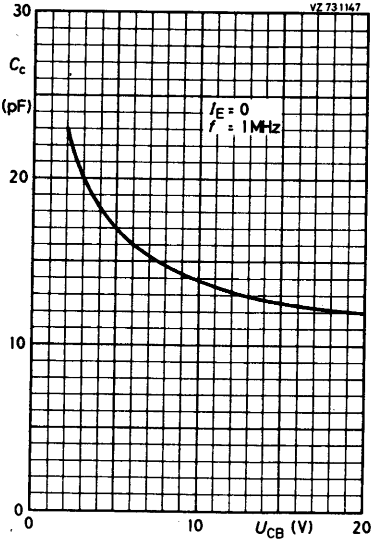
Kollektor-Sperrspannung bei $I_E = 0$, Scheitelwert:	$U_{CB\,0\,M}$	= max.	36	V
Kollektor-Emitter-Sperrspannung bei $R_{BE} = 0$, Scheitelwert:	$U_{CE\,S\,M}$	= max.	36	V
bei $I_B = 0$:	$U_{CE\,0}$	= max.	18	V
Emitter-Sperrspannung bei $I_C = 0$:	$U_{EB\,0}$	= max.	4	V
Kollektorstrom, Mittelwert:	$I_{C\,AV}$	= max.	1	A
Kollektorstrom, Scheitelwert bei f > 1 MHz:	$I_{C\,M}$	= max.	4	A
Gesamtverlustleistung bei f > 10 MHz, $\vartheta_K \leq 90\,^oC$:	P_{tot}	= max.	8	W
Lagerungstemperatur:	ϑ_S	= min.	-65	^oC
	ϑ_S	= max.	150	^oC





Kennwerte: (bei ϑ_J = 25°C)

Kollektor-Durchbruchspannung bei I_E = 0, I_C = 10 mA:	$U_{(BR)\,CB\,0}$	≧	36	V
Kollektor-Emitter-Durchbruchspannung bei R_{BE} = 0, I_C = 10 mA:	$U_{(BR)\,CE\,S}$	≧	36	V
bei I_B = 0, I_C = 25 mA:	$U_{(BR)\,CE\,0}$	≧	18	V
Emitter-Durchbruchspannung bei I_C = 0, I_E = 1 mA:	$U_{(BR)\,EB\,0}$	≧	4	V
Kollektor-Emitter-Restspannung bei I_C = 0,5 A, I_B = 0,1 A:	$U_{CE\,sat}$	=	0,2	V
Gleichstromverstärkung bei U_{CE} = 5 V, I_C = 0,5 A:	B	=	40 (≧ 10)	
Transit-Frequenz bei U_{CE} = 5 V, I_C = 0,5 A, f_M = 100 MHz:	f_T	=	800	MHz
Kollektorkapazität bei U_{CB} = 10 V, I_E = 0, f = 1 MHz:	C_c	=	14 (≦ 20)	pF
Emitterkapazität bei U_{EB} = 0 V, I_C = 0, f = 1 MHz:	C_e	=	65	pF
Kapazität Kollektor / Gewindestutzen:	$C_{C/G}$	=	2	pF



BLY 53A

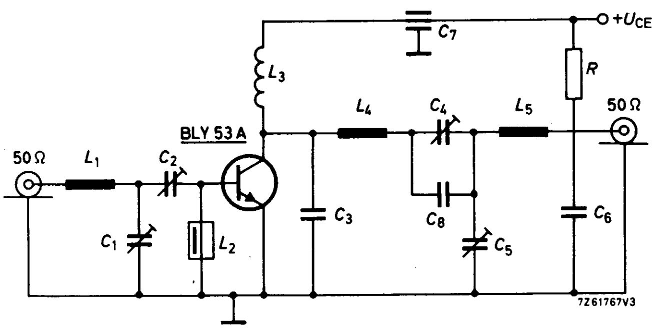
Schaltungsbeispiel: B-FM-Leistungsverstärker, f = 470 MHz, ϑ_K = 25°C:

Speisespannung:	U_{CE} =	13,8	13,8	12,5	V
Ausgangsleistung:	P_L =	7,8	> 7	> 7	W
Steuerleistung:	P_S =	2,0	2,0	2,2	W
Wirkungsgrad:	η =	70	65	65	%

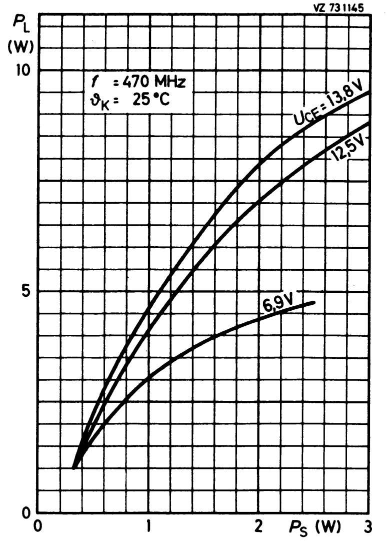
Eingangswiderstand des Transistors:	Z_i = 2,3 + j6,3	Ω
Lastleitwert am Kollektor:	Y_L = 50 - j36	mS

Der Transistor verträgt einen Welligkeitsfaktor bis s = 50 durch alle Phasen bei $U_{CE} \leq$ 16,5 V und $\vartheta_K \leq$ 70°C.

Bei ϑ_K = 25...90°C verringert sich die Ausgangsleistung um 10 mW pro Grad.

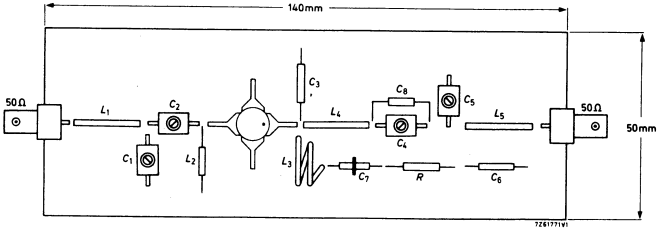


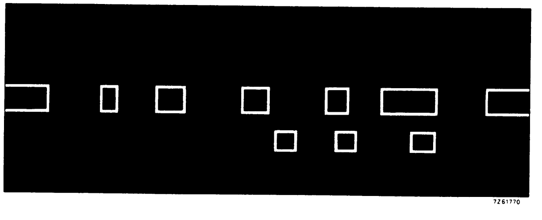
$C_1 = C_2 = C_4 = C_5$:	18 pF	Folientrimmer
C_3:	6,8 pF	Keramik-Kondensator
C_6:	0,1 µF	Keramik-Kondensator
C_7:	4 nF	Durchführungs-Kondensator
C_8:	10 pF	Keramik-Kondensator
R:	10 Ω	
$L_1 = L_4 = L_5$:	20 mm langer Cu-Draht 1,2 mm	
L_2:	FXC-Drossel 0,47 µH	
L_3:	1,5 Wdgn. 1,6 mm CuL, Innen-Ø 10 mm	



Aufbauvorschlag für 470 MHz - B - FM - Leistungsverstärker:

Die dunkel dargestellten Teile der Platinen-Vorderseite sind kupferkaschiert, die Rückseite ist völlig kupferkaschiert.

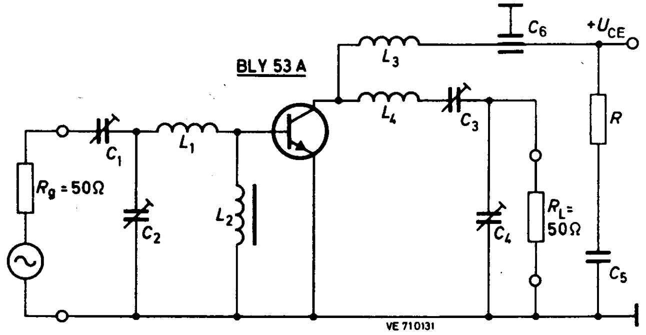




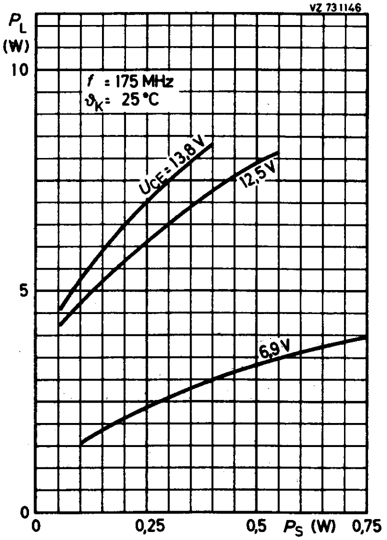
BLY 53 A

Schaltungsbeispiel: B-FM-Leistungsverstärker, f = 175 MHz, ϑ_K = 25°C:

Speisespannung:	U_{CE} = 13,8 V	Steuerleistung:	P_S = 0,4 W
Ausgangsleistung:	P_L = 8,3 W	Wirkungsgrad:	η = 65 %



C_1:	30 pF	Lufttrimmer
C_2:	60 pF	Lufttrimmer
C_3:	30 pF	Lufttrimmer
C_4:	30 pF	Lufttrimmer
C_5:	0,25 µF	Keramik-Kondensator
C_6:	4 nF	Durchführungs-Kondensator
R:	10 Ω	
L_1:	25 mm langer Cu-Draht 1,2 mm	
L_2:	3 Wdgn. 0,5 mm CuL auf FXC-Kern	
L_3:	5 Wdgn. 1,2 mm CuL Innen-Ø 10 mm, Länge 10 mm	
L_4:	3 Wdgn. 1,2 mm CuL Innen-Ø 10 mm, Länge 10 mm	



BLY 57/2 N 3926
BLY 58/2 N 3927

SILIZIUM - NPN - PLANAR - EPITAXIAL - HF - LEISTUNGSTRANSISTOREN
für Senderanwendungen bei 13,5 V Speisespannung

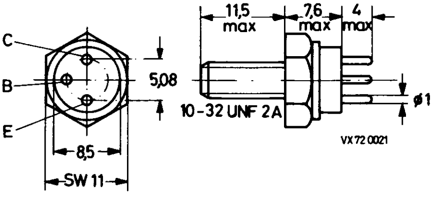
Mechanische Daten:

Gehäuse: Metall, JEDEC TO-60

Der Emitter ist mit dem Gehäuse leitend verbunden.

Die Transistoren werden mit Federscheibe und Mutter SW 9,5 x 3,2 geliefert.

Maßangaben in mm.



Kurzdaten:

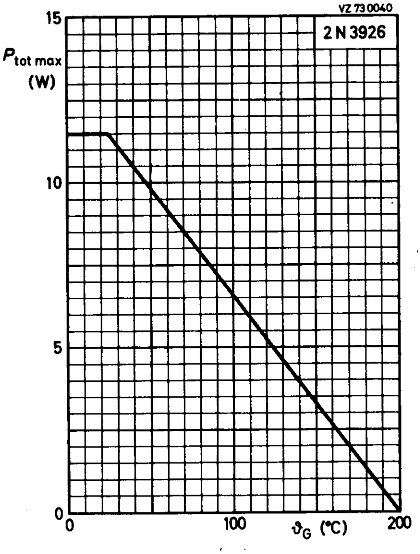
			BLY 57 2 N 3926	BLY 58 2 N 3927	
Kollektor-Sperrspannung	$U_{CB\,0}$	= max.	36		V
Kollektor-Emitter-Sperrspannung	$U_{CE\,0}$	= max.	18		V
Kollektorstrom, Scheitelwert	$I_{C\,M}$	= max.	3,0	4,5	A
Gesamtverlustleistung bei $\vartheta_G = 25^{o}C$	P_{tot}	= max.	11,6	23,0	W
Sperrschichttemperatur	ϑ_J	= max.	200		^{o}C
Transit-Frequenz					
bei U_{CE} = 13,5 V, I_C = 100 mA	f_T	$\geq$	250		MHz
bei U_{CE} = 13,5 V, I_C = 200 mA	f_T	$\geq$		200	MHz
Ausgangsleistung					
bei U_{CE} = 13,5 V, f = 175 MHz	P_2	$\geq$	7	12	W

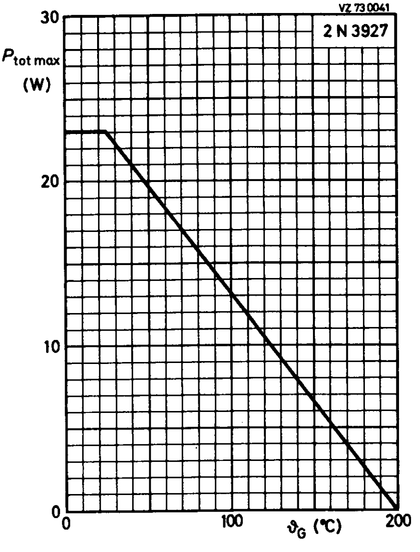
BLY 57/2 N 3926
BLY 58/2 N 3927

Absolute Grenzwerte: (gültig bis $\vartheta_{J\ max}$)			2 N 3926	2 N 3927	
Kollektor-Sperrspannung bei $I_E = 0$:	$U_{CB\ 0}$	= max.	36		V
Kollektor-Emitter-Sperrspannung bei $-U_{BE} = 1{,}5$ V:	$U_{CE\ V}$	= max.	36		V
bei $I_B = 0$:	$U_{CE\ 0}$	= max.	18		V
Emitter-Sperrspannung bei $I_C = 0$:	$U_{EB\ 0}$	= max.	4		V
Kollektorstrom, Mittelwert:	$I_{C\ AV}$	= max.	1,0	1,5	A
Kollektorstrom, Scheitelwert:	$I_{C\ M}$	= max.	3,0	4,5	A
Gesamtverlustleistung:	P_{tot}	= max.	11,6	23,0	W
Sperrschichttemperatur:	ϑ_J	= max.	200		°C
Lagerungstemperatur:	ϑ_S	= min.	-65		°C
	ϑ_S	= max.	200		°C

Wärmewiderstand:

			2 N 3926	2 N 3927	
zwischen Sperrschicht und Gehäuse:	$R_{th\ G}$	$\leqq$	15	7,6	grd/W
zwischen Gehäuse und Kühlkörper:	$R_{th\ G/K}$	$\leqq$	0,6		grd/W





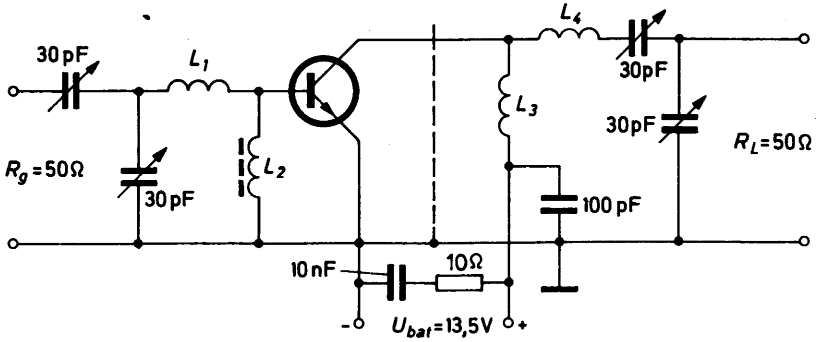
BLY 57/2 N 3926
BLY 58/2 N 3927

Kennwerte: (bei ϑ_J = 25°C, sofern nicht anders angegeben)

			2 N 3926	2 N 3927	
Kollektor-Emitter-Reststrom					
bei U_{CE} = 15 V, I_B = 0:	$I_{CE\,0}$	$\leqq$	100	250	µA
bei U_{CE} = 15 V, I_B = 0, ϑ_J = 150°C:	$I_{CE\,0}$	$\leqq$	5		mA
Kollektor-Durchbruchspannung					
bei I_C = 250 µA, I_E = 0:	$U_{(BR)\,CB\,0}$	$\geqq$	36		V
Kollektor-Emitter-Durchbruchspannung					
bei $I_C \leqq$ 400 mA, $-U_{BE}$ = 1,5 V, R_{BE} = 33 Ω:	$U_{(BR)\,CE\,V}$	$\geqq$	36		V
bei $I_C \leqq$ 400 mA, I_B = 0:	$U_{(BR)\,CE\,0}$	$\geqq$	18		V
Emitter-Durchbruchspannung					
bei I_E = 250 µA, I_C = 0:	$U_{(BR)\,EB\,0}$	$\geqq$	4		V
Kollektor-Emitter-Restspannung					
bei I_C = 500 mA, I_B = 100 mA:	$U_{CE\,sat}$	$\leqq$	0,75		V
bei I_C = 1000 mA, I_B = 200 mA:	$U_{CE\,sat}$	$\leqq$		1,0	V
Basisspannung					
bei U_{CE} = 5 V, I_C = 500 mA:	U_{BE}	$\leqq$	1,5		V
bei U_{CE} = 5 V, I_C = 1000 mA:	U_{BE}	$\leqq$		1,5	V
Gleichstromverstärkung					
bei U_{CE} = 5 V, I_C = 500 mA:	B	=	5...150		
bei U_{CE} = 5 V, I_C = 1000 mA:	B	=		5...150	
Transit-Frequenz					
bei U_{CE} = 13,5 V, I_C = 100 mA:	f_T	$\geqq$	250		MHz
bei U_{CE} = 13,5 V, I_C = 200 mA:	f_T	$\geqq$		200	MHz
Kollektorkapazität					
bei U_{CB} = 13,5 V, I_E = 0, f = 1 MHz:	C_c	$\leqq$	20	45	pF
Kollektor-Gehäuse-Kapazität:	$C_{C/G}$	=	5		pF
Realteil des Eingangswiderstandes					
bei U_{CE} = 13,5 V, I_C = 100 mA, f = 200 MHz:	$1/g_{11e}$	$\leqq$	20		Ω
bei U_{CE} = 13,5 V, I_C = 200 mA, f = 200 MHz:	$1/g_{11e}$	$\leqq$		20	Ω

BLY 57/2 N 3926
BLY 58/2 N 3927

Betriebsdaten als HF-Verstärker, f = 175 MHz:



L_1: 1 Wdg. 1,0 mm CuL, Innen-Ø 10 mm, Zuleitung 2 x 10 mm

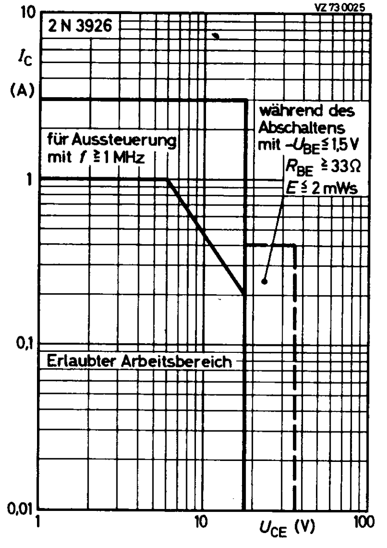
L_2: FXC-Drossel 4312 020 36641

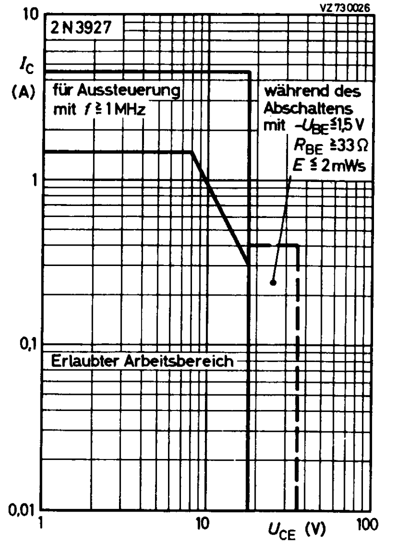
L_3: 15 Wdgn. 0,7 mm CuL, Innen-Ø 4 mm

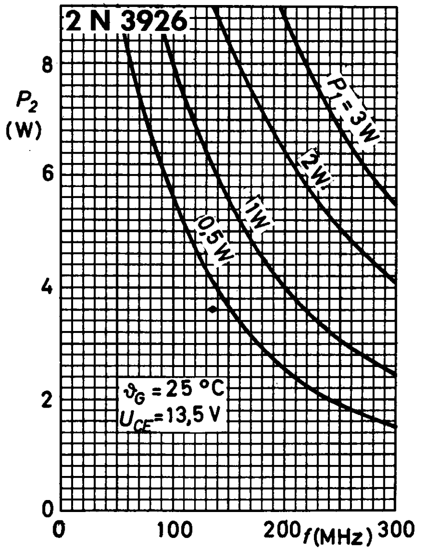
L_4: 2 Wdgn. 1,5 mm CuL, Innen-Ø 8,5 mm, Zuleitung 2 x 20 mm

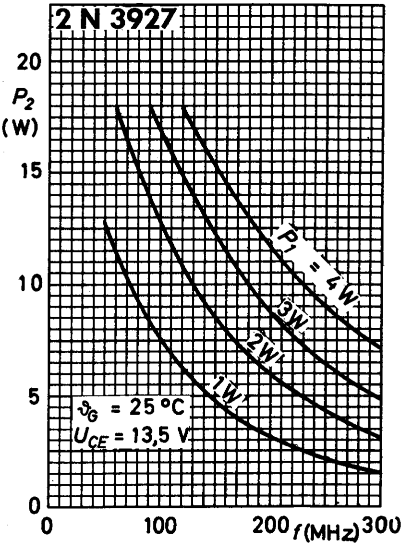
Ausgangsleistung und Wirkungsgrad bei U_{CE} = 13,5 V, f = 175 MHz, ϑ_G = 25°C

			2 N 3926	2 N 3927	
und	P_1	=	2	4	W
	I_C	$\leqq$	740	1100	mA
	P_2	$\geqq$	7	12	W
	η	$\geqq$	70	80	%

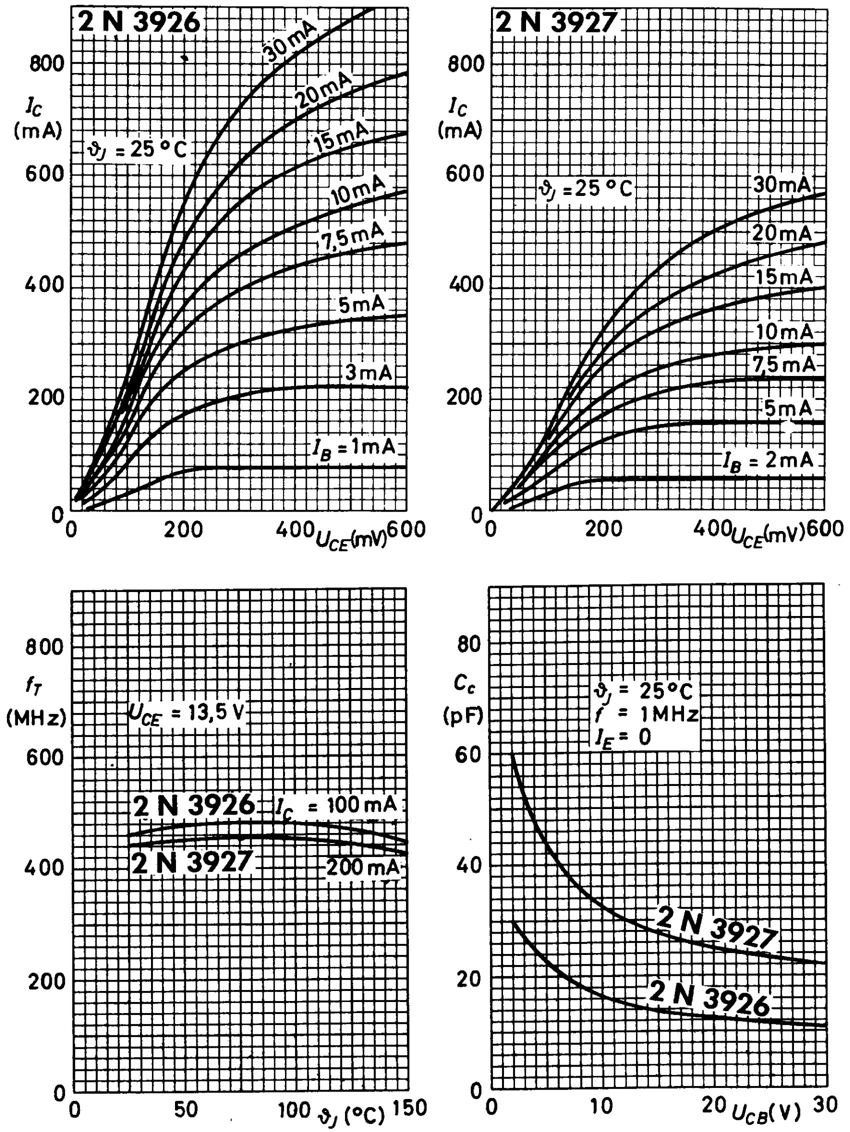

VZ 73 0025
2 N 3926
I_C
(A)
10
1
0,1
0,01
für Aussteuerung
mit f ≧ 1 MHz
während des
Abschaltens
mit $-U_{BE}$ ≦ 1,5 V
R_{BE} ≧ 33 Ω
E ≦ 2 mWs
Erlaubter Arbeitsbereich
1
10
U_{CE} (V)
100

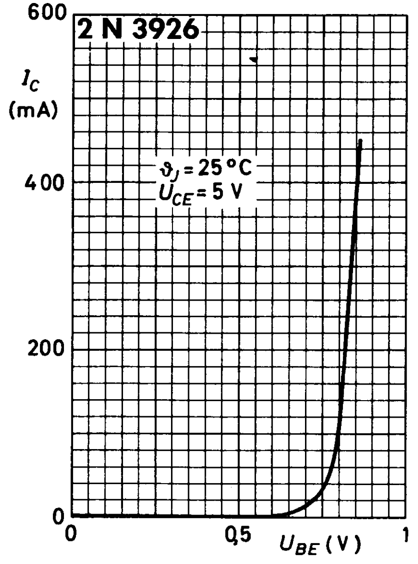

VZ 73 0026
2 N 3927
I_C
(A)
10
1
0,1
0,01
für Aussteuerung
mit f ≧ 1 MHz
während des
Abschaltens
mit $-U_{BE}$ ≦ 1,5 V
R_{BE} ≧ 33 Ω
E ≦ 2 mWs
Erlaubter Arbeitsbereich
1
10
U_{CE} (V)
100


2 N 3926
P_2
(W)
8
6
4
2
0
P_1 = 3 W
2 W
1 W
0,5 W
ϑ_G = 25 °C
U_{CE} = 13,5 V
0
100
200
f (MHz)
300

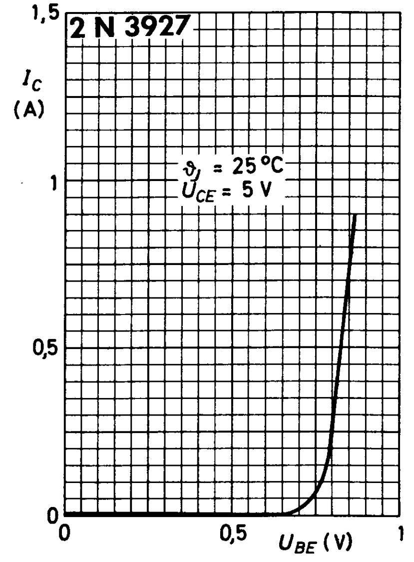

2 N 3927
P_2
(W)
20
15
10
5
0
P_1 = 4 W
3 W
2 W
1 W
ϑ_G = 25 °C
U_{CE} = 13,5 V
0
100
200
f (MHz)
300

BLY 57/2 N 3926
BLY 58/2 N 3927

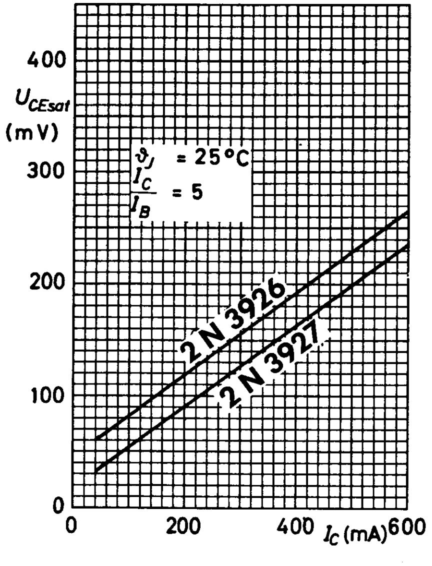




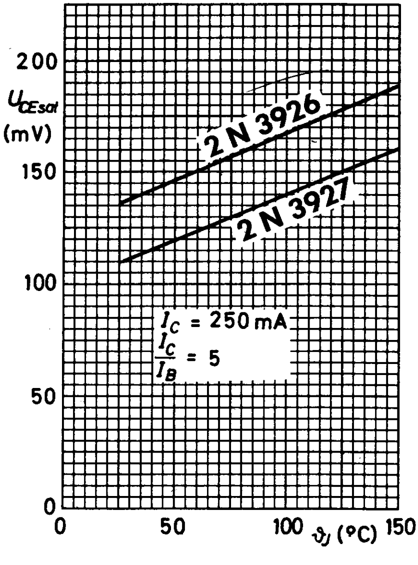
2 N 3926
600
400
200
0
I_C (mA)
ϑ_j = 25 °C
U_{CE} = 5 V
0
0,5
1
U_{BE} (V)



2 N 3927
1,5
1
0,5
0
I_C (A)
ϑ_j = 25 °C
U_{CE} = 5 V
0
0,5
1
U_{BE} (V)

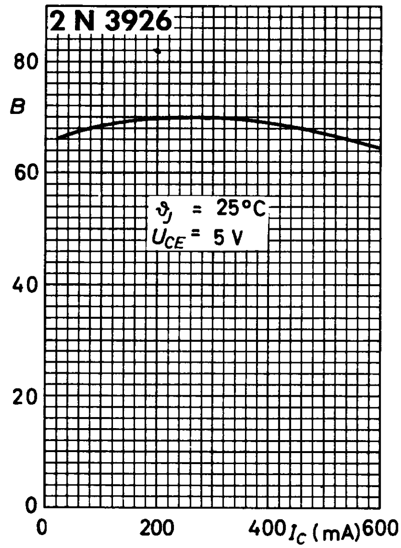


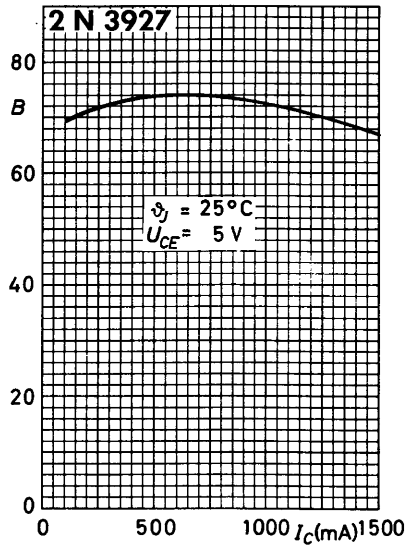
400
300
200
100
0
U_{CEsat} (mV)
ϑ_j = 25 °C
$\frac{I_C}{I_B}$ = 5
2 N 3926
2 N 3927
0
200
400
600
I_C (mA)

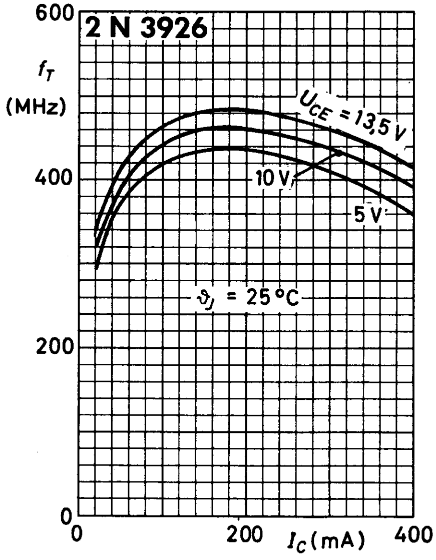


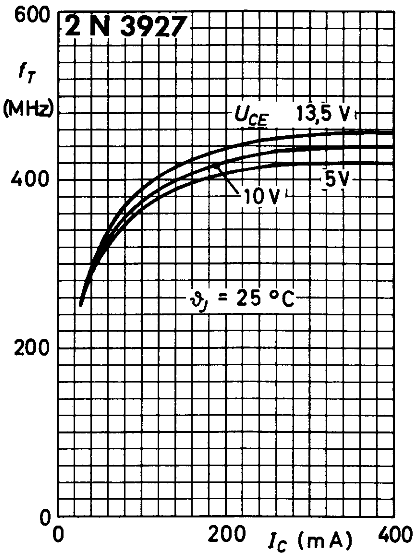
200
150
100
50
0
U_{CEsat} (mV)
2 N 3926
2 N 3927
I_C = 250 mA
$\frac{I_C}{I_B}$ = 5
0
50
100
150
ϑ_j (°C)

BLY 57/2 N 3926
BLY 58/2 N 3927









BLY 59/2 N 3375
BLY 60/2 N 3632

SILIZIUM - NPN - PLANAR - EPITAXIAL - HF - LEISTUNGSTRANSISTOREN

für Senderanwendungen bei 28 V Speisespannung

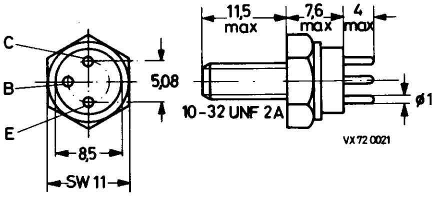
<u>Mechanische Daten</u>:

Gehäuse: Metall, JEDEC TO-60

Alle Elektroden sind vom Gehäuse isoliert.

Die Transistoren werden mit Federscheibe und Mutter SW 9,5 x 3,2 geliefert.

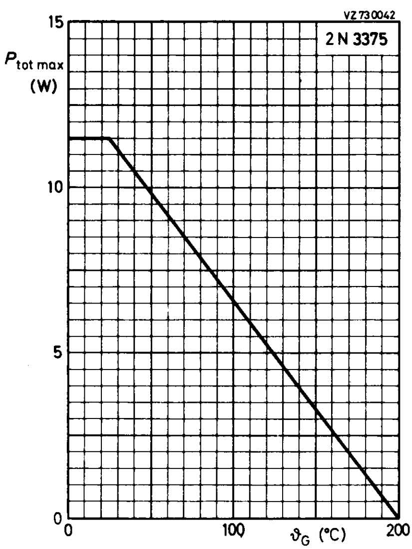
Maßangaben in mm.

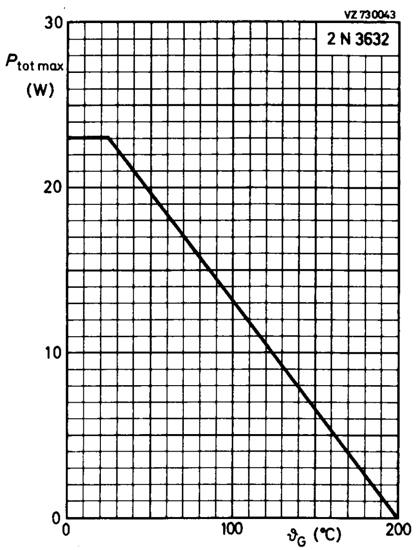


<table>
<tr><th><u>Kurzdaten</u>:</th><th></th><th></th><th>BLY 59
2 N 3375</th><th>BLY 60
2 N 3632</th><th></th></tr>
<tr><td>Kollektor-Sperrspannung</td><td>$U_{CB\,0}$</td><td>= max.</td><td colspan="2">65</td><td>V</td></tr>
<tr><td>Kollektor-Emitter-Sperrspannung</td><td>$U_{CE\,0}$</td><td>= max.</td><td colspan="2">40</td><td>V</td></tr>
<tr><td>Kollektorstrom, Scheitelwert</td><td>$I_{C\,M}$</td><td>= max.</td><td>1,5</td><td>3,0</td><td>A</td></tr>
<tr><td>Gesamtverlustleistung bei $\vartheta_G = 25^oC$</td><td>P_{tot}</td><td>= max.</td><td>11,6</td><td>23,0</td><td>W</td></tr>
<tr><td>Sperrschichttemperatur</td><td>ϑ_J</td><td>= max.</td><td colspan="2">200</td><td>^oC</td></tr>
<tr><td>Transit-Frequenz</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>bei $U_{CE} = 28$ V, $I_C = 125$ mA</td><td>f_T</td><td>=</td><td>500</td><td></td><td>MHz</td></tr>
<tr><td>bei $U_{CE} = 28$ V, $I_C = 250$ mA</td><td>f_T</td><td>=</td><td></td><td>400</td><td>MHz</td></tr>
<tr><td>Ausgangsleistung</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>bei $U_{CE} = 28$ V, f = 100 MHz</td><td>P_2</td><td>$\geq$</td><td>7,5</td><td></td><td>W</td></tr>
<tr><td>bei $U_{CE} = 28$ V, f = 175 MHz</td><td>P_2</td><td>$\geq$</td><td></td><td>13,5</td><td>W</td></tr>
<tr><td>bei $U_{CE} = 28$ V, f = 400 MHz</td><td>P_2</td><td>$\geq$</td><td>3,0</td><td></td><td>W</td></tr>
</table>

BLY 59/2 N 3375
BLY 60/2 N 3632

<table>
<tr><th><u>Absolute Grenzwerte</u>: (gültig bis $\vartheta_{J\,max}$)</th><th></th><th></th><th>2 N 3375</th><th>2 N 3632</th><th></th></tr>
<tr><td>Kollektor-Sperrspannung bei $I_E = 0$:</td><td>$U_{CB\,0}$</td><td>= max.</td><td colspan="2">65</td><td>V</td></tr>
<tr><td>Kollektor-Emitter-Sperrspannung
bei $-U_{BE} = 1,5$ V:</td><td>$U_{CE\,V}$</td><td>= max.</td><td colspan="2">65</td><td>V</td></tr>
<tr><td>bei $I_B = 0$:</td><td>$U_{CE\,0}$</td><td>= max.</td><td colspan="2">40</td><td>V</td></tr>
<tr><td>Emitter-Sperrspannung bei $I_C = 0$:</td><td>$U_{EB\,0}$</td><td>= max.</td><td colspan="2">4</td><td>V</td></tr>
<tr><td>Kollektorstrom, Mittelwert:</td><td>$I_{C\,AV}$</td><td>= max.</td><td>0,5</td><td>1,0</td><td>A</td></tr>
<tr><td>Kollektorstrom, Scheitelwert:</td><td>$I_{C\,M}$</td><td>= max.</td><td>1,5</td><td>3,0</td><td>A</td></tr>
<tr><td>Gesamtverlustleistung:</td><td>P_{tot}</td><td>= max.</td><td>11,6</td><td>23,0</td><td>W</td></tr>
<tr><td>Sperrschichttemperatur:</td><td>ϑ_J</td><td>= max.</td><td colspan="2">200</td><td>^oC</td></tr>
<tr><td>Lagerungstemperatur:</td><td>ϑ_S</td><td>= min.</td><td colspan="2">-65</td><td>^oC</td></tr>
<tr><td></td><td>ϑ_S</td><td>= max.</td><td colspan="2">200</td><td>^oC</td></tr>
<tr><td><u>Wärmewiderstand</u>:</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>zwischen Sperrschicht und Gehäuse:</td><td>$R_{th\,G}$</td><td>$\leqq$</td><td>15</td><td>7,6</td><td>grd/W</td></tr>
<tr><td>zwischen Gehäuse und Kühlkörper:</td><td>$R_{th\,G/K}$</td><td>$\leqq$</td><td colspan="2">0,6</td><td>grd/W</td></tr>
</table>





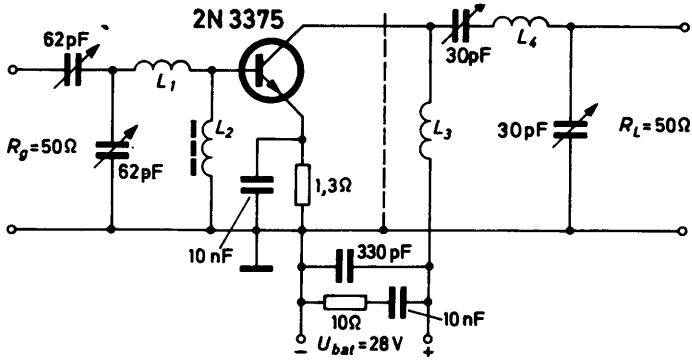
BLY 59/2 N 3375
BLY 60/2 N 3632

Kennwerte: (bei ϑ_J = 25 °C)

			2 N 3375		2 N 3632	
Kollektor-Emitter-Reststrom bei U_{CE} = 30 V, I_B = 0:	$I_{CE\,0}$	$\leq$	100		250	µA
Kollektor-Durchbruchspannung bei I_C = 250 µA, I_E = 0:	$U_{(BR)\,CB\,0}$	$\geq$		65		V
Kollektor-Emitter-Durchbruchspannung bei $I_C \leq$ 200 mA und I_B = 0:	$U_{(BR)\,CE\,0}$	$\geq$		40		V
$-U_{BE}$ = 1,5 V:	$U_{(BR)\,CE\,V}$	$\geq$		65		V
Emitter-Durchbruchspannung bei I_E = 250 µA, I_C = 0:	$U_{(BR)\,EB\,0}$	$\geq$		4		V
Kollektor-Emitter-Restspannung bei I_C = 500 mA, I_B = 100 mA:	$U_{CE\,sat}$	$\leq$	1,0			V
bei I_C = 1000 mA, I_B = 200 mA:	$U_{CE\,sat}$	$\leq$			1,0	V
Basisspannung bei U_{CE} = 5 V und I_C = 500 mA:	U_{BE}	$\leq$	1,5			V
I_C = 1000 mA:	U_{BE}	$\leq$			1,5	V
Gleichstromverstärkung bei U_{CE} = 5 V und I_C = 125 mA:	B	=	15...200			
I_C = 250 mA:	B	=	10...100		10...150	
I_C = 1000 mA:	B	=			5...110	
Transit-Frequenz bei U_{CE} = 28 V und I_C = 125 mA:	f_T	=	500			MHz
I_C = 250 mA:	f_T	=			400	MHz
Kollektorkapazität bei U_{CE} = 28 V, I_E = 0, f = 1 MHz:	C_c	$\leq$	10		20	pF
Kollektor-Gehäuse-Kapazität:	$C_{C/G}$	$\leq$		6		pF
Realteil des Eingangswiderstandes bei U_{CE} = 28V, I_C = 125 mA, f = 200 MHz:	$\frac{1}{g_{11\,e}}$	$\leq$	20			Ω
bei U_{CE} = 28V, I_C = 250 mA, f = 200 MHz:	$\frac{1}{g_{11\,e}}$	$\leq$			20	Ω

BLY 59/2 N 3375
BLY 60/2 N 3632

Betriebsdaten als HF-Verstärker (f = 100 MHz)



L_1: 2 Wdgn. 1,5 mm CuL, 10 mm ∅

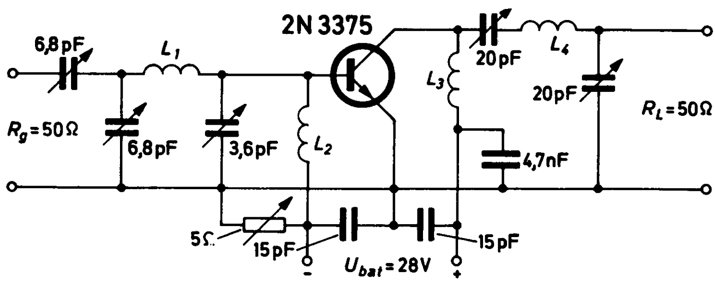
L_2: FXC-Drossel 4312 020 36641, Z = 700 Ω bei f = 100 MHz

L_3: 23 Wdgn. 0,7 mm CuL, 6 mm ∅

L_4: 5 Wdgn. 1,5 mm CuL, 12 mm ∅

Ausgangsleistung	bei ϑ_G = 25 °C	P_2 ≧	7,5 W
Wirkungsgrad	P_1 = 1 W I_C ≦ 410 A:	η ≧	65 %

Betriebsdaten als HF-Verstärker (f = 400 MHz)



L_1: 1,5 mm CuL, 20 mm lang, Chassisabstand 8 mm

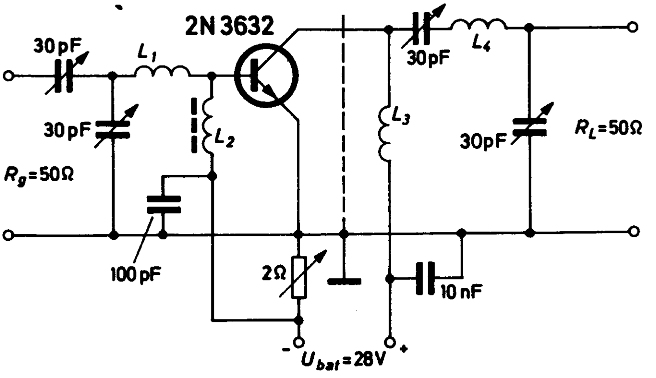
L_2: 17 Wdgn. 0,5 mm CuL, 3 mm ∅

L_3: 7 Wdgn. 0,5 mm CuL, 3 mm ∅

L_4: 1 Wdg. 1,5 mm CuL,10 mm ∅

Ausgangsleistung	bei ϑ_G = 25 °C	P_2 ≧	3 W
Wirkungsgrad	P_1 = 1 W I_C = 270 mA:	η ≧	40 %

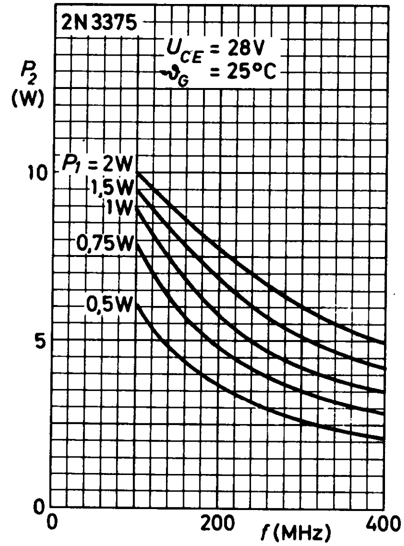
Betriebsdaten als HF-Verstärker (f = 175 MHz)

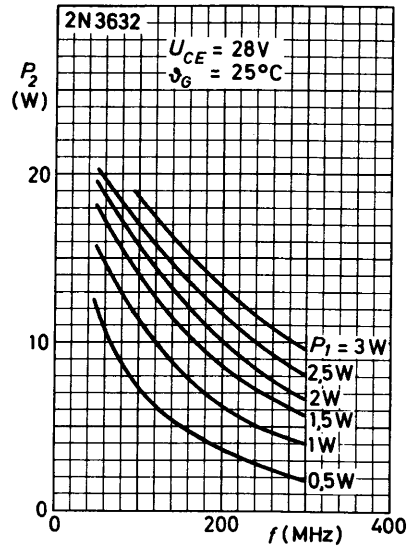


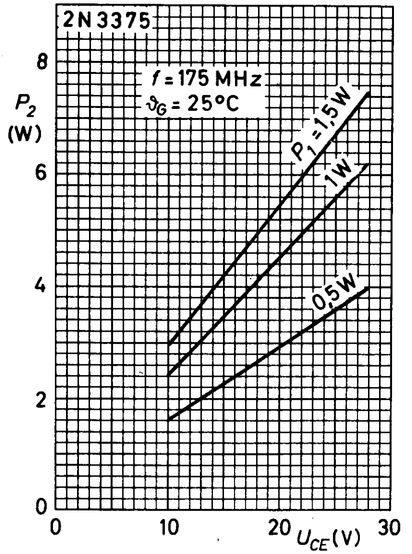
L_1: 1 Wdg. 1,0 mm CuL, 10 mm ø
L_2: FXC-Drossel 4312 020 36641
L_3: 15 Wdgn. 0,7 mm CuL, 4 mm ø
L_4: 3 Wdgn. 1,5 mm CuL, 12 mm ø

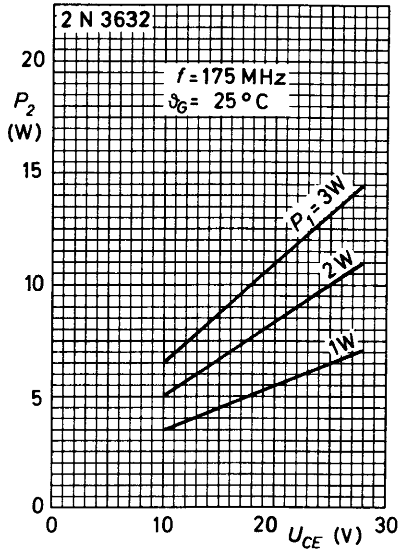
Ausgangsleistung	bei ϑ_G = 25 °C, P_1 = 3,5 W, I_C = 690 mA:	P_2	≧ 13,5 W
Wirkungsgrad		η	≧ 70 %

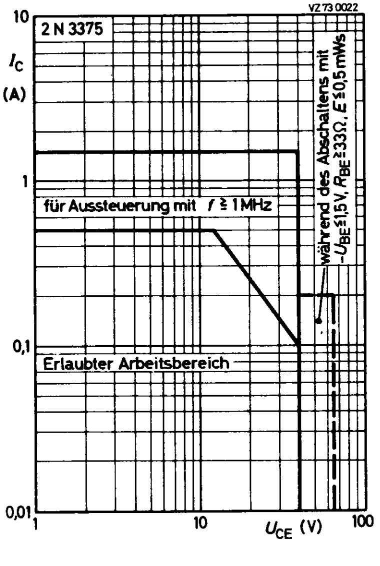
BLY 59/2 N 3375
BLY 60/2 N 3632

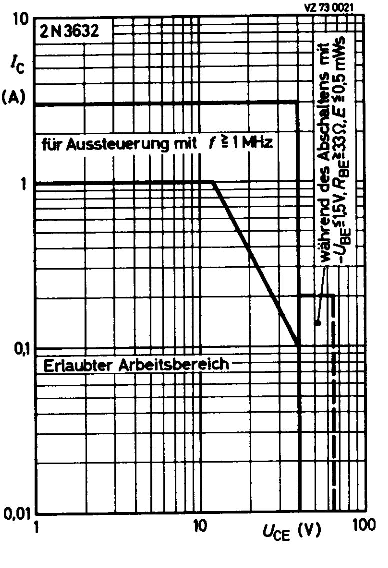




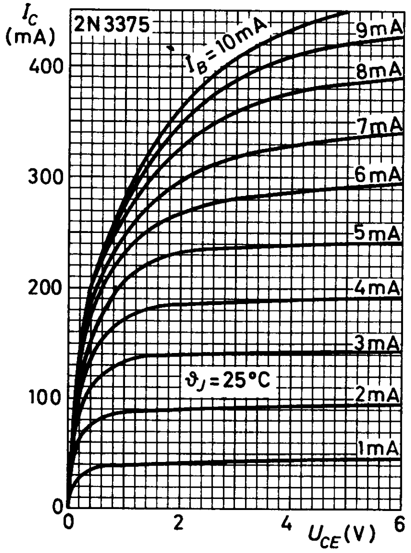


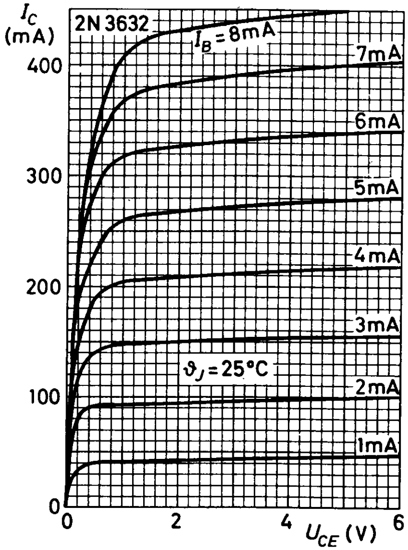


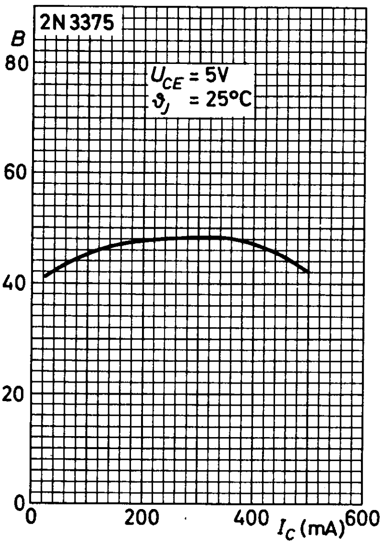

VZ 73 0022
2 N 3375
I_C
(A)
für Aussteuerung mit $f \geq 1$ MHz
Erlaubter Arbeitsbereich
während des Abschaltens mit $-U_{BE} \leq 1{,}5$ V, $R_{BE} \geq 33\Omega$, $E \leq 0{,}5$ mWs
10
1
0,1
0,01
1
10
100
U_{CE} (V)

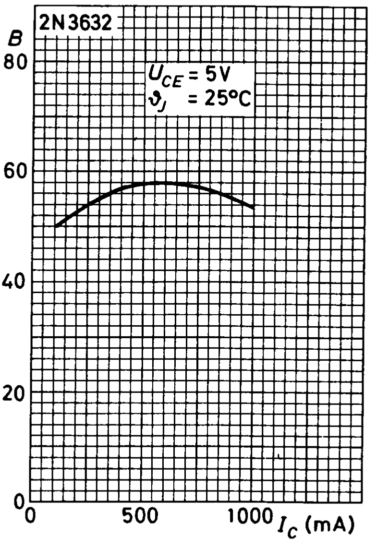

VZ 73 0021
2N3632
I_C
(A)
für Aussteuerung mit $f \geq 1$ MHz
Erlaubter Arbeitsbereich
während des Abschaltens mit $-U_{BE} \leq 1{,}5$ V, $R_{BE} \geq 33\Omega$, $E \leq 0{,}5$ mWs
10
1
0,1
0,01
1
10
100
U_{CE} (V)

BLY 59/2 N 3375
BLY 60/2 N 3632

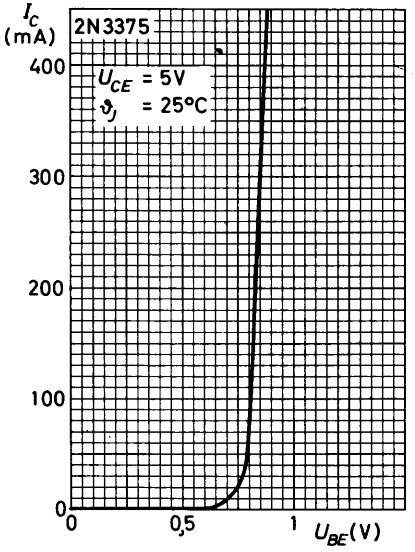


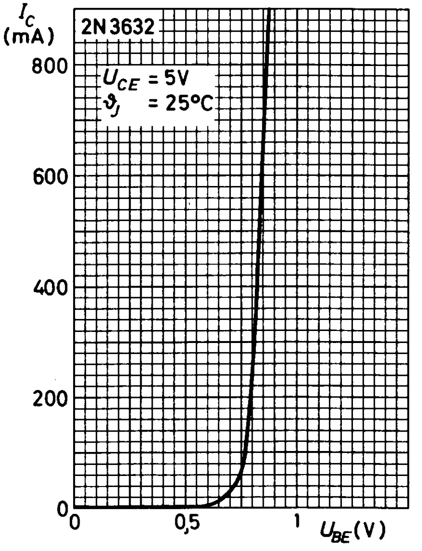


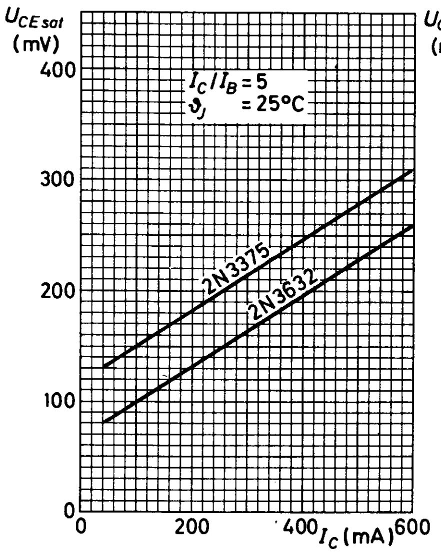


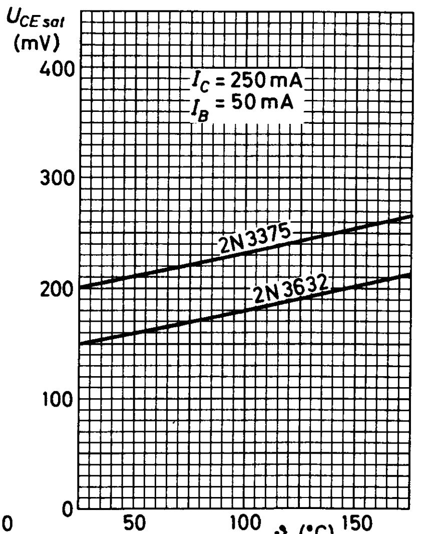


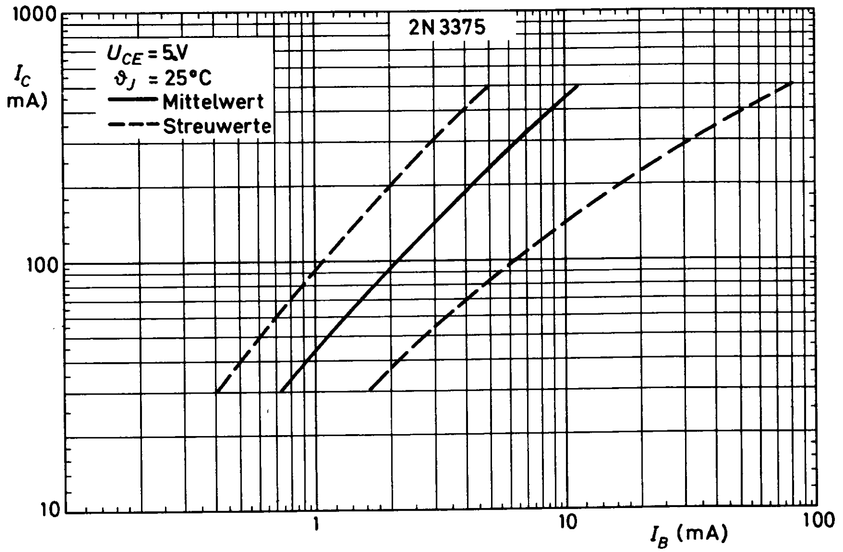
BLY 59/2 N 3375
BLY 60/2 N 3632



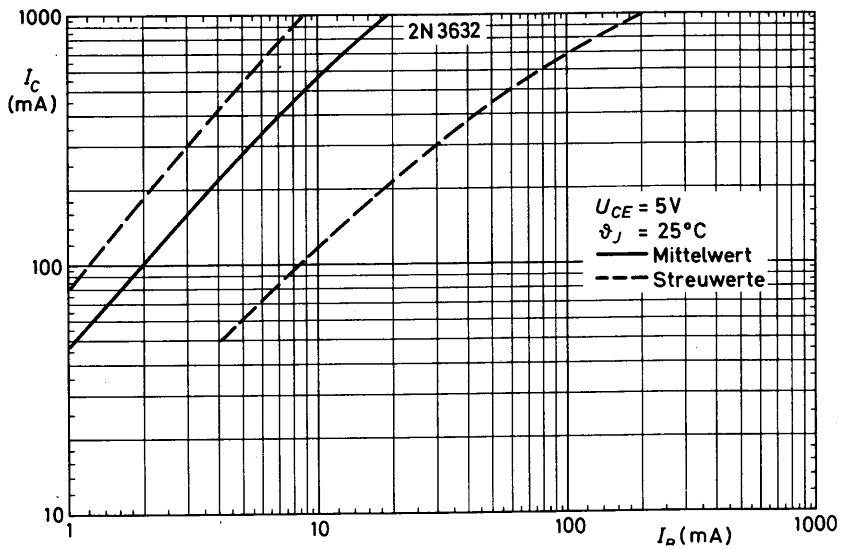




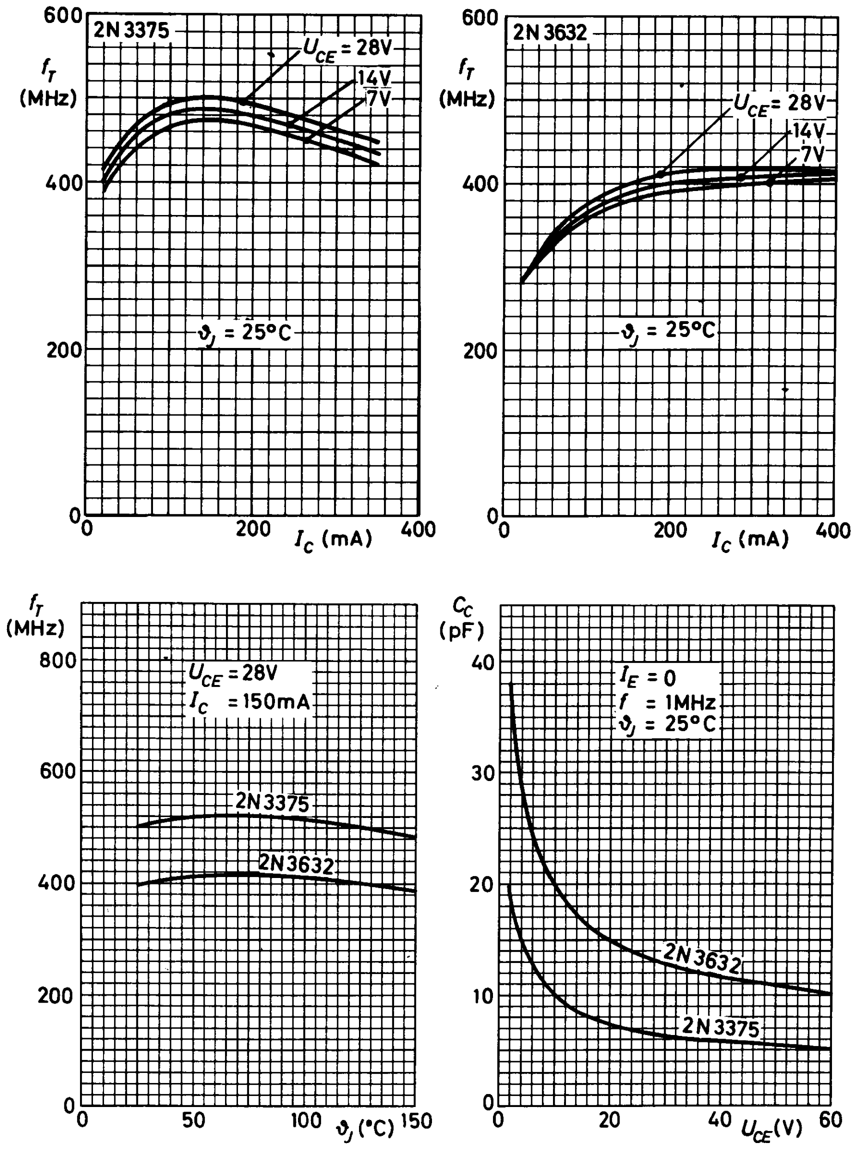




2N 3375
I_C (mA)
U_{CE} = 5V
ϑ_J = 25°C
Mittelwert
Streuwerte
1000
100
10
1
10
100
I_B (mA)



2N 3632
I_C (mA)
U_{CE} = 5V
ϑ_J = 25°C
Mittelwert
Streuwerte
1000
100
10
1
10
100
1000
I_B (mA)


2N 3375
f_T (MHz)
U_{CE} = 28V
14V
7V
ϑ_j = 25°C
I_C (mA)
2N 3632
f_T (MHz)
U_{CE} = 28V
14V
7V
ϑ_j = 25°C
I_C (mA)
f_T (MHz)
U_{CE} = 28V
I_C = 150mA
2N 3375
2N 3632
ϑ_j (°C)
C_C (pF)
I_E = 0
f = 1MHz
ϑ_j = 25°C
2N 3632
2N 3375
U_{CE}(V)

V.H.F. POWER TRANSISTORS

The BLY85 and BLY97 are silicon planar n-p-n transistors primarily intended for class-B operation in the v.h.f. driver stages of mobile transmitters. The BLY85 is designed for 4 W f.m. operation at 13,8 V supply and the BLY97 for 4 W f.m. operation at 24 V supply.

QUICK REFERENCE DATA

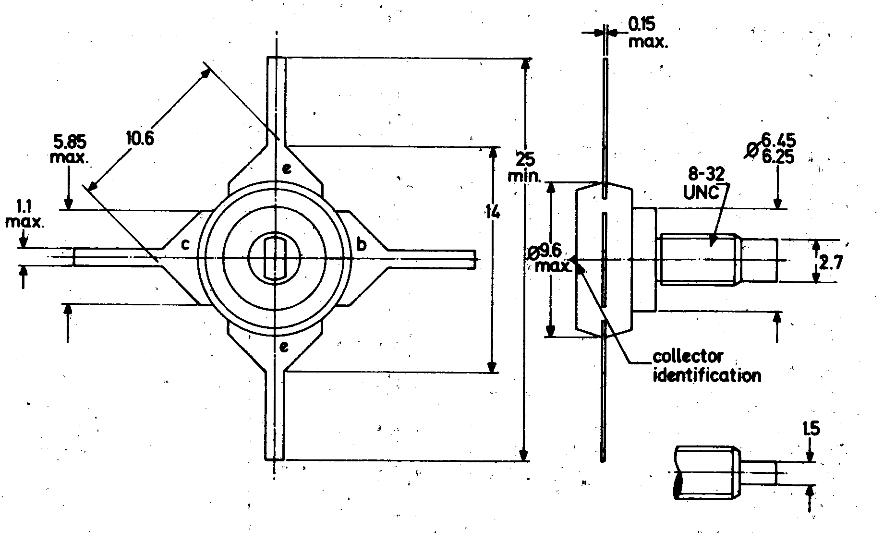
Typical c.w. performance up to T_{mb} = 40 °C

type number	V_{CC} V	f MHz	P_{DR} W	P_L W	η %
BLY85	13,8	175	0,2	4,0	64
BLY97	24	175	0,14	4,0	52

MECHANICAL DATA

Dimensions in mm

Fig. 1.



Accessories: Nut and lock washer supplied with device.

Torque on nut: min. 0,75 Nm (7,5 kg cm)
max. 0,85 Nm (8,5 kg cm)

CAUTION These devices incorporate beryllium oxide, the dust of which is toxic. The devices are entirely safe provided that the BeO disc is not damaged.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

			BLY85	BLY97	
Collector-emitter voltage					
peak value (f ≥ 1 MHz); $V_{BE} = 0$	V_{CESM}	max.	40	66	V
open base	V_{CEO}	max.	20	33	V
Emitter-base voltage (open collector)	V_{EBO}	max.	4,0		V
Collector current					
d.c.	I_C	max.	1,0		A
(peak value); f < 1 MHz	I_{CM}	max.	1,0		A
(peak value); f ≥ 1 MHz	I_{CM}	max.	3,0		A
Total power dissipation up to $T_{mb} = 25\ ^oC$					
f < 1 MHz	P_{tot}	max.	8,0		W
f ≥ 1 MHz	P_{tot}	max.	10		W
Storage temperature	T_{stg}		−30 to + 150		^oC
Junction temperature					
continuous operation	T_j	max.	150		^oC
short duration overload conditions	T_j	max.	200		^oC

THERMAL RESISTANCE

From junction to mounting base	$R_{th\ j\text{-}mb}$	=	12,5	K/W*

CHARACTERISTICS

$T_j = 25\ ^oC$ unless otherwise specified

Collector cut-off current				
$V_{BE} = 0$; $V_{CE} = 20$ V	I_{CES}	<	0,5	mA
$V_{BE} = 0$; $V_{CE} = V_{CESM}$ max	I_{CES}	<	5,0	mA
Emitter cut-off current				
$I_C = 0$; $V_{EB} = 4,0$ V	I_{EBO}	<	0,5	mA
D.C. current gain				
$I_C = 0,2$ A; $V_{CE} = 5,0$ V	h_{FE}	>	10	
Transition frequency at f = 100 MHz				
$I_C = 0,2$ A; $V_{CE} = 5,0$ V; $T_{amb} = 25\ ^oC$	f_T	>	250	MHz
Collector capacitance at f = 0,5 MHz				
$I_E = I_e = 0$; $V_{CB} = 10$ V	C_c	<	15	pF
Emitter capacitance at f = 0,5 MHz				
$I_C = I_c = 0$; $V_{EB} = 0$	C_e		45 to 90	pF

* K/W is SI unit for $^oC/W$.

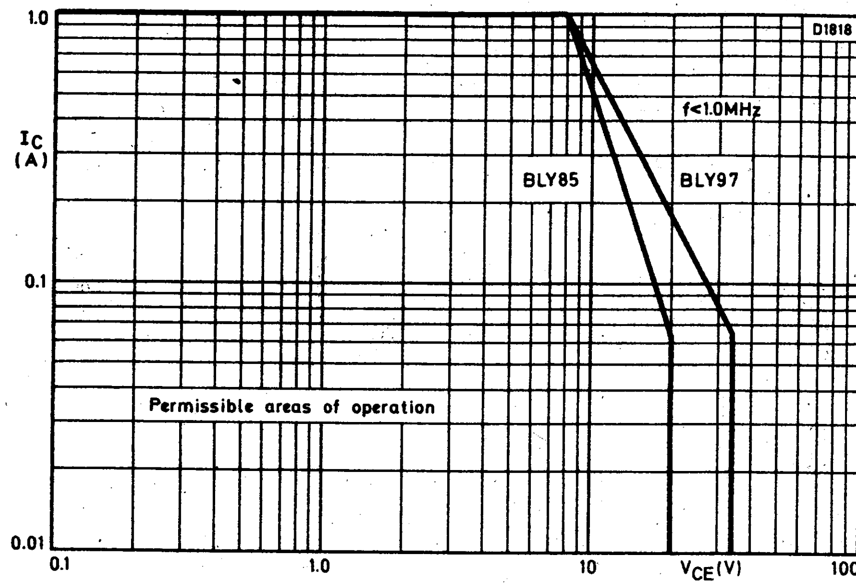


Fig. 2.

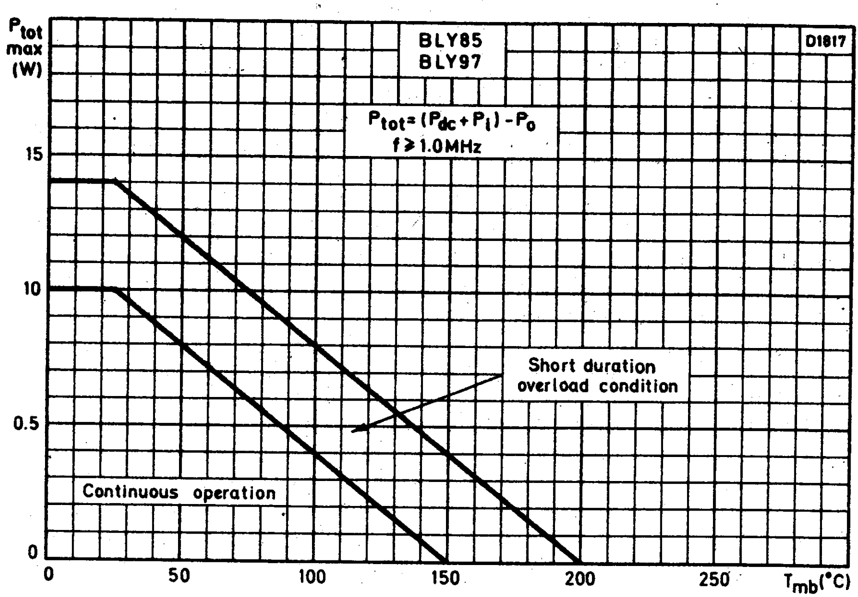


Fig. 3 Maximum permissible power dissipation plotted against mounting base temperature for frequencies ≥ 1 MHz.

APPLICATION INFORMATION

R.F. performance in c.w. operation up to T_{mb} = 40 °C

type number	V_{CC} V	f MHz	P_{DR} W	P_L W	I_C mA	G_p dB	η %
BLY85	nom. 13,8 max. 16,5	175	0,4	4,0	< 480	> 10	> 60
BLY97	nom. 24 max. 28	175	0,2	4,0	< 278	> 13	> 50

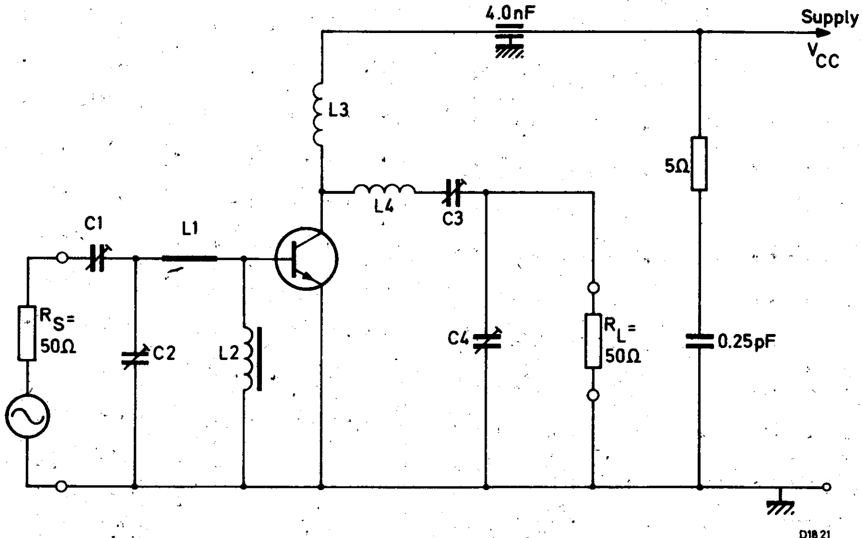


Fig. 4 Basic v.h.f. amplifier circuit.

Component values for 175 MHz amplifier circuit:

C1 = C3 = C4 = 30 pF max. concentric trimmer capacitors
C2 = 60 pF max. concentric trimmer capacitor

L1 = 1" of straight 18 s.w.g.
L2 = 3 turns of 24 s.w.g. on ferrite FX1115
L3 = 5 turns of 18 s.w.g.; d = 3/8"; length 3/8"
L4 = 3 turns of 18 s.w.g.; d = 3/8"; length 3/8"

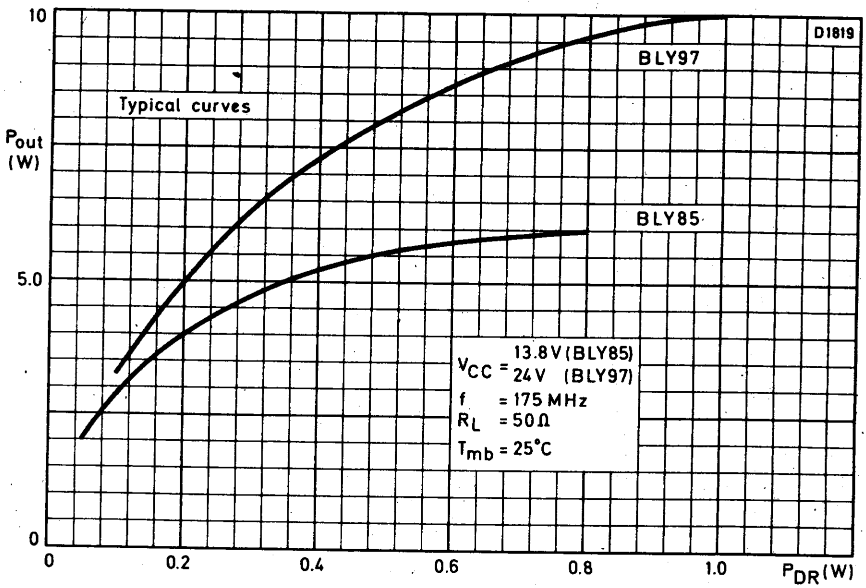


Fig. 5 Output power plotted against drive power.

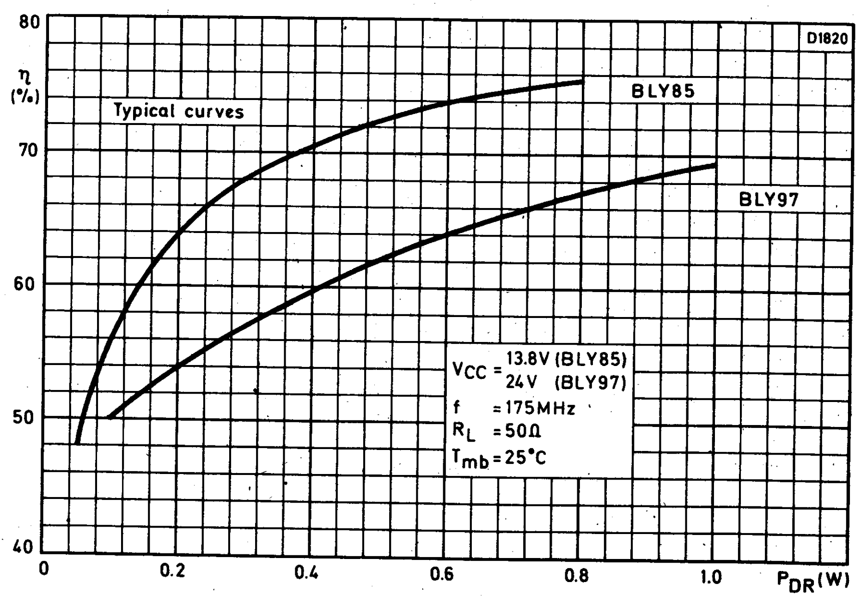


Fig. 6 Efficiency plotted against drive power.