

FEATURES

- Diffused ballast resistors
- Hermetical ceramic package

APPLICATIONS

SSB or CW telecommunications
in HF or VHF frequency bands

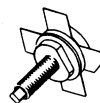
$f = 30 \text{ MHz}$
 $P_{OUT} = 25 \text{ W PEP}$
 $G_p \geq 18 \text{ dB}$
 $\eta_c \geq 35 \%$
 $V_{CC} = 28 \text{ V}$
 $IMD^* \leq -30 \text{ dB}$

THA 13



CB-298
(.380 4L STUD)

THB 13



CB-293
(.500 4L STUD)

ABSOLUTE RATINGS (LIMITING VALUES)	Symbols	Values	Units
Emitter-base (d.c.) voltage	VEBO	4	V
Collector-base (d.c.) voltage	VCBO	65	V
Collector-emitter (d.c.) voltage	VCEO	36	V
Collector current (d.c.)	IC	3	A
Total power dissipation	Ptot	70	W
Storage and junction temperatures	T _{stg} T _j	- 65 → + 200 + 200	°C °C

Thermal resistance (junction-case)	R _{th} (j-c)	2,5	°C/W
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* 2 tones

STATIC CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$

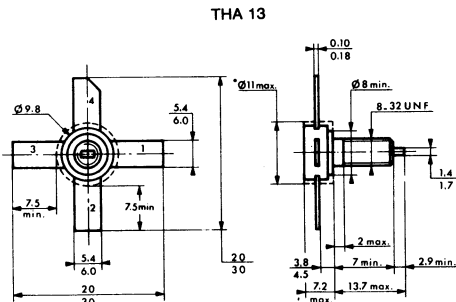
Symbols	Values			Units	Test conditions
	min.	typ.	max.		
$V_{(BR)EBO}$	4			V	$I_B = 10\text{ mA}$ $I_C = 0$
$V_{(BR)CBO}$	65			V	$I_C = 50\text{ mA}$ $I_B = 0$
$V_{(BR)CEO}$	36			V	$I_C = 50\text{ mA}$ $I_B = 0$
HFE	10	40	100		$I_C = 1\text{ A}$ $V_{CE} = 5\text{ V}$
C_{cb}		50	65	pF	$V_{CB} = 30\text{ V}$ $f = 1\text{ MHz}$

DYNAMIC CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$

Symbols	Values			Units	Test conditions
	min.	typ.	max.		
GP	18			dB	AB class $f_1 = 30\text{ MHz}$ $f_2 = 30,001\text{ MHz}$ $V_{CC} = 28\text{ V}$ $I_{CQ} = 25\text{ mA}$ POUT = 25 W PEP
η_c	35			%	
IMD*			-30	dB	
GP		17		dB	C class $f = 70\text{ MHz}$ $V_{CC} = 28\text{ V}$ POUT = 25 W
η_c		60		%	

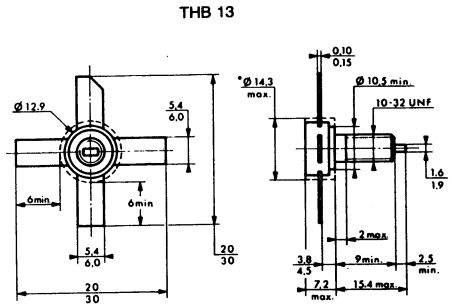
*2 tones

CASE DESCRIPTION



* Outputs must not be bent, cut or used in this area

CB-298
(.380 4L STUD)



* Outputs must not be bent, cut or used in this area

CB-293
(.500 4L STUD)

Dimensions in millimeters

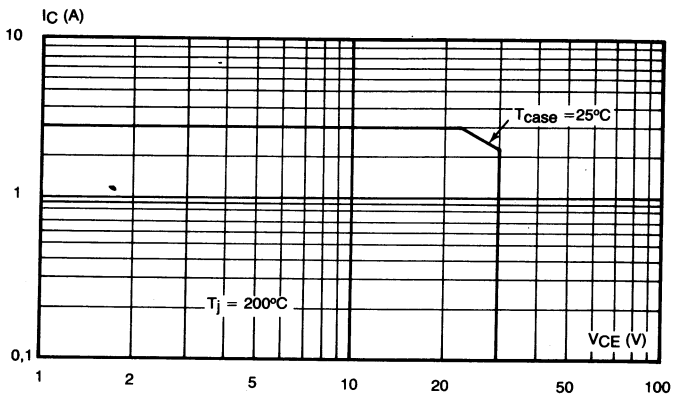


Fig. 1 — Safe operating area.

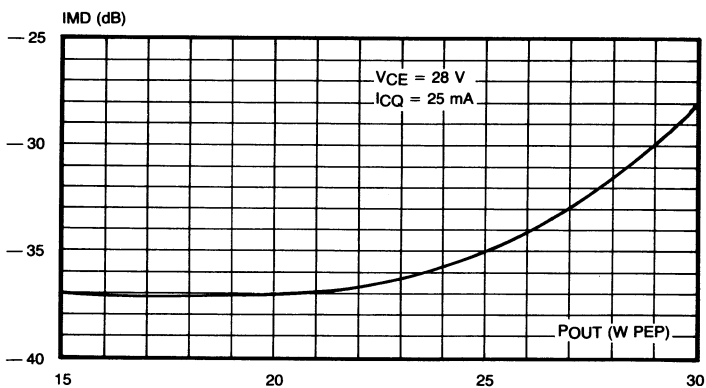
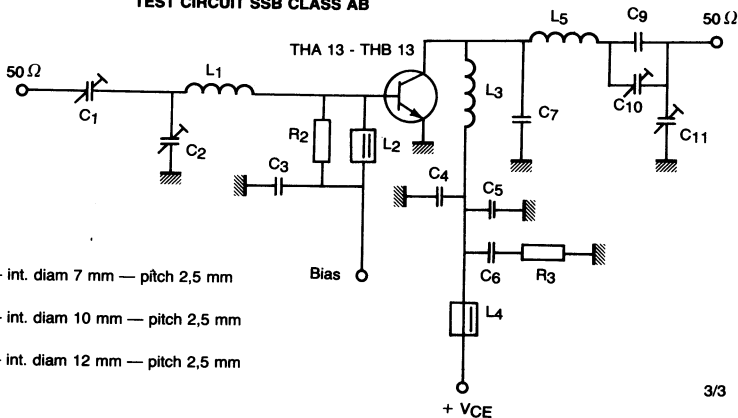


Fig. 2 — Intermodulation distortion versus output peak envelope power.

TEST CIRCUIT SSB CLASS AB



- C 1 = 20 — 500 pF
- C 2 = 50 — 500 pF
- C 3 = C 4 = 3,9 nF
- C 5 = 100 nF
- C 6 = 2,2 μF
- C 7 = 56 pF
- C 9 = 100 pF
- C 10 = 20 — 150 pF
- C 11 = 20 — 500 pF

- L 1 = 3 turns (ø wire 1,5 mm) — int. diam 7 mm — pitch 2,5 mm
- L 2 = 22 μH choke coil
- L 3 = 4 turns (ø wire 1,5 mm) — int. diam 10 mm — pitch 2,5 mm
- L 4 = Ferrox cube choke coil
- L 5 = 7 turns (ø wire 1,5 mm) — int. diam 12 mm — pitch 2,5 mm

- R 2 = 33 Ω
- R 3 = 4,7 Ω

FEATURES

- Diffused ballast resistors
- Hermetical ceramic package

APPLICATIONS

Class C for FM mobile telecommunications
in 130 - 175 MHz frequency band.

 $f = 175 \text{ MHz}$
 $POUT = 25 \text{ W}$
 $GP = 9 \text{ dB}$
 $\eta_c = 60 \%$
 $VCC = 28 \text{ V}$


Case : CB-298 (.380 4L STUD)

ABSOLUTE RATINGS (LIMITING VALUES)		Symbols	Values	Units
Emitter-base (d.c.) voltage		VEBO	4	V
Collector-base (d.c.) voltage		VCBO	65	V
Collector-emitter (d.c.) voltage		VCEO	36	V
Collector current	— d.c.	IC	3	A
	— peak	ICM	9	
Total power dissipation		Ptot	70*	W
Storage and junction temperatures		Tstg	- 65 → + 200	°C
		Tj		+ 200

Thermal resistance (junction-case)	Rth (j-c)	2,8	°C/W
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 * $f > 1 \text{ MHz}$

September 1981

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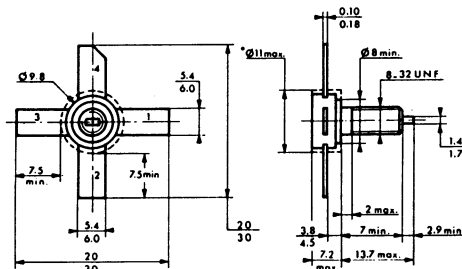
STATIC CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$

Symbols	Values			Units	Test conditions	
	min.	typ.	max.			
$V_{(BR)EBO}$	4			V	$I_B = 10\text{ mA}$	$I_C = 0$
$V_{(BR)CBO}$	65			V	$I_C = 50\text{ mA}$	$I_B = 0$
$V_{(BR)CEO}$	36			V	$I_C = 50\text{ mA}$	$I_B = 0$
HFE	10		120		$I_C = 1\text{ A}$	$V_{CE} = 5\text{ V}$
C_{cb}		50	65	pF	$V_{CB} = 30\text{ V}$	$f = 1\text{ MHz}$

DYNAMIC CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$

Symbols	Values			Units	Test conditions		
	min.	typ.	max.				
G_p	9			dB	C class $f = 175\text{ MHz}$ $V_{CC} = 28\text{ V}$ $PO_{UT} = 25\text{ W}$		
η_c	60			%			
f_T		500		MHz	$V_{CE} = 20\text{ V}$	$I_C = 3\text{ A}$	

CASE DESCRIPTION



Dimensions in millimeters

* Outputs must not be bent, cut or used in this area

CB-298
(.380 4L STUD)

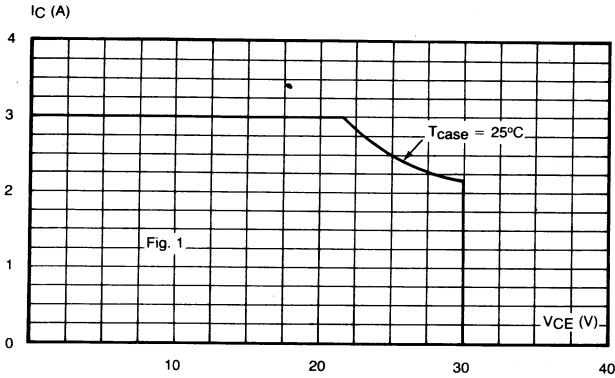


Fig. 1 — Safe operating area.

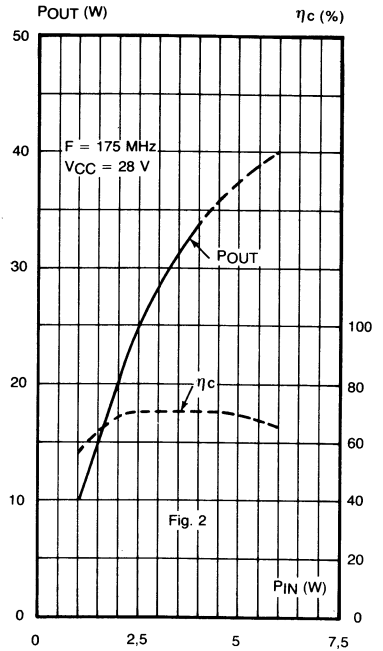


Fig. 2 — Output power and collector efficiency versus input power.

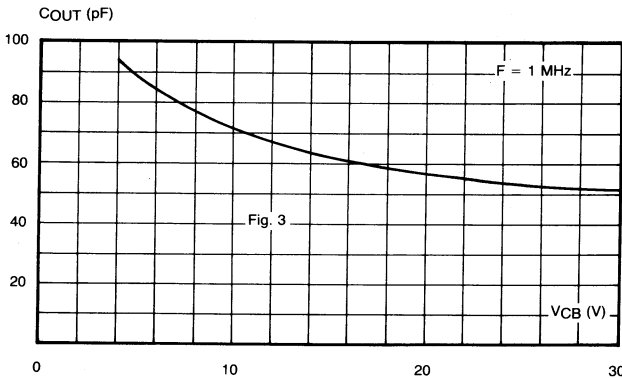
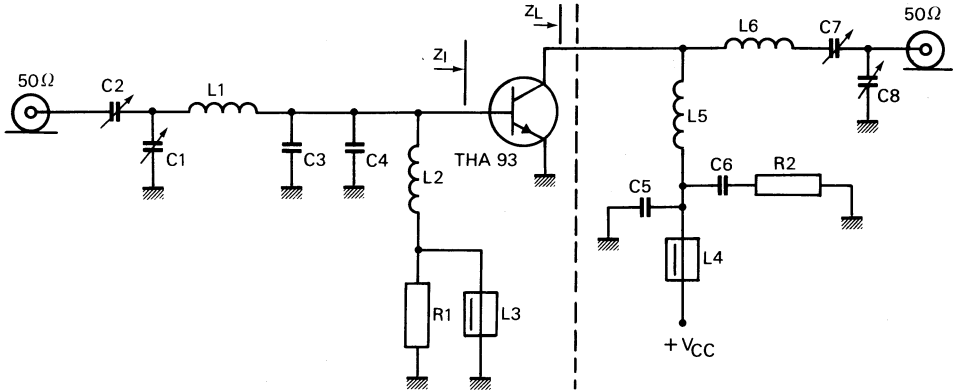


Fig. 3 — Output capacitance versus collector-base voltage.

TEST CIRCUIT FOR 175 MHz



- C 1 = 4 to 44 pF film dielectric trimmer
- C 2 = 2 to 22 pF film dielectric trimmer
- C 3 = C 4 = 47 pF ceramic
- C 5 = 100 pF ceramic
- C 6 = 150 nF polyester
- C 7 = 4 to 104 pF film dielectric trimmer
- C 8 = 4 to 64 pF film dielectric trimmer

- L 1 = 0,5 turn enamelled Cu wire (1,5 mm); int. diam 6 mm; leads 2 × 6 mm
- L 2 = 6 turns closely wound enamelled Cu wire (0,7 mm); int. diam. 4 mm; leads 2 × 4 mm
- L 3 = L 4 = ferrox cube choke
- L 5 = 3,5 turns enamelled Cu wire (1,5 mm); int. diam 6 mm; leads 2 × 6 mm
- L 6 = 1,5 turns enamelled Cu wire (1,5 mm); int. diam 6 mm; leads 2 × 6 mm

R 1 = R 2 = 10 Ω carbon

FEATURES

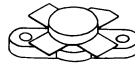
- Diffused ballast resistors
- Hermetical ceramic package

APPLICATIONS

Class C for FM mobile telecommunications
in 130-175 MHz frequency band

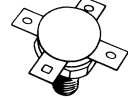
$f = 175 \text{ MHz}$
 $POUT = 50 \text{ W}$
 $GP = 7 \text{ dB}$
 $\eta_c = 65 \%$
 $V_{CC} = 28 \text{ V}$

THB 94



CB-290
(.500 4L FL)

THY 94



CB-291
(.550 4L STUD)

ABSOLUTE RATINGS (LIMITING VALUES)

	Symbols	Values	Units
Emitter-base (d.c.) voltage	VEBO	4	V
Collector-base (d.c.) voltage	VCBO	65	V
Collector-emitter (d.c.) voltage	VCEO	36	V
Collector current	— d.c.	IC	6
	— peak	ICM	12
Total power dissipation	Ptot	110*	W
Storage and junction temperatures	Tstg	- 65 → + 200	°C
	Tj	+ 200	°C

Thermal resistance (junction-case)

Rth (j-c)

1,55

°C/W

* $f > 1 \text{ MHz}$

STATIC CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$

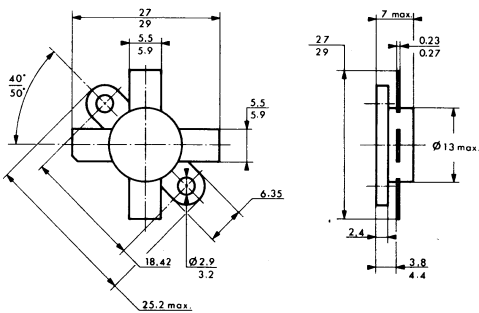
Symbols	Values			Units	Test conditions	
	min.	typ.	max.			
$V_{(BR)EBO}$	4			V	$I_B = 25\text{ mA}$	$I_C = 0$
$V_{(BR)CBO}$	65			V	$I_C = 100\text{ mA}$	$I_B = 0$
$V_{(BR)CEO}$	36			V	$I_C = 100\text{ mA}$	$I_B = 0$
HFE	10		120		$I_C = 1\text{ A}$	$V_{CE} = 5\text{ V}$
C_{cb}			130	pF	$V_{CB} = 30\text{ V}$	$f = 1\text{ MHz}$

DYNAMIC CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$

Symbols	Values			Units	Test conditions		
	min.	typ.	max.				
GP	7			dB	C class		
η_c	65			%	$f = 175\text{ MHz}$	$V_{CC} = 28\text{ V}$	$POUT = 50\text{ W}$
f_T		500		MHz	$V_{CE} = 20\text{ V}$	$I_C = 6\text{ A}$	

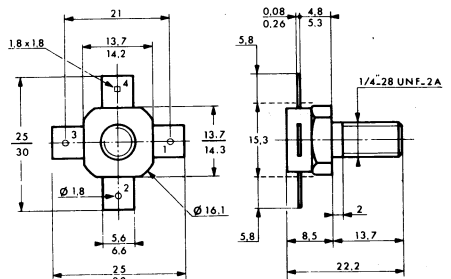
CASE DESCRIPTION

THB 94



CB-290
(.500 4L FL)

THY 94



CB-291
(.550 4L STUD)

Dimensions in millimeters

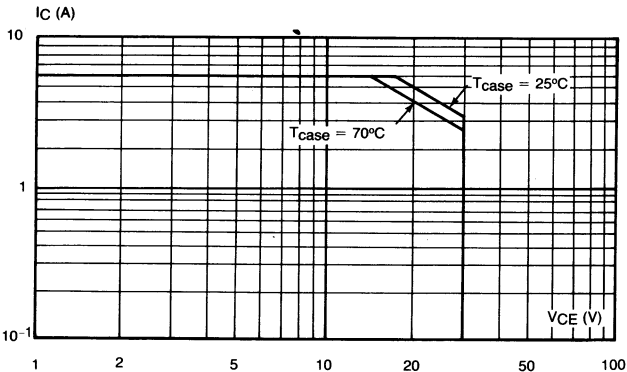


Fig. 1 — Safe operating area.

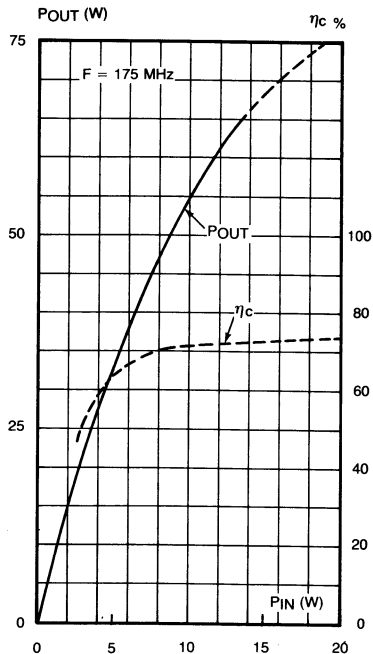


Fig. 2 — Output power and collector efficiency versus input power.

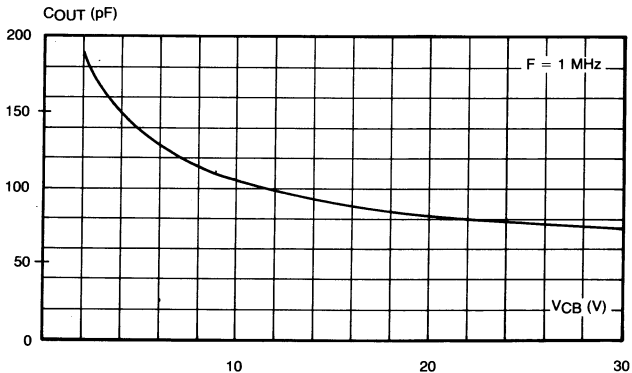
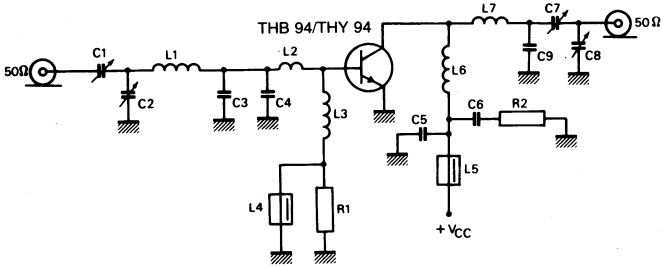


Fig. 3 — Output capacitance versus collector-base voltage.

TEST CIRCUIT FOR 175 MHz



List of components :

- C 1 = 2 to 20 pF film dielectric trimmer
- C 2 = 4 to 40 pF film dielectric trimmer
- C 3 = C4 = 56 pF ceramic
- C 5 = 100 pF ceramic
- C 6 = 100 nF polyester
- C 7 = 4 to 60 pF film dielectric trimmer
- C 8 = 4 to 100 pF film dielectric trimmer
- C 9 = 6.8 pF ceramic

L₁ = 36 nH; 2 turns of enamelled copper wire (1,5 mm); int. diam 7 mm; length 5 mm; lead length 2 × 5 mm

L₂ = formed by the metallisation on the p.c. board

L₃ = 100 nH; 7 turns of closely wound enamelled copper wire (0,5 mm); int. diam. 3 mm; lead length 2 × 5 mm

L₄ = L₅ = ferrox cube choke

L₆ = 53 nH; 2 turns of enamelled copper wire (1,5 mm); int. diam 10 mm; length 5,2 mm; lead length 2 × 5 mm

L₇ = 46 nH; 2 turns of enamelled copper wire (1,5 mm); int. diam. 9 mm; length 5,4 mm; lead length 2 × 5 mm

R₁ = R₂ = 10.Ω carbon

**UHF LINEAR TRANSISTOR
FOR BANDS 4 AND 5 TV TRANSPOSER**
FEATURES

- NPN silicon transistor
- Gold metallization
- Diffused emitter ballast resistors structure
- Ceramic cap flange package
- Internal input matching

APPLICATIONS

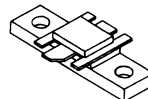
Linear high power high gain transistor
for TV applications bands 4 and 5

$$f = 860 \text{ MHz}$$

$$P_{OUT} = 3 \text{ W}$$

$$GP = 12 \text{ dB}$$

$$IMD^* = -60 \text{ dB}$$



Case : CB-302 (.230 6L FL)

ABSOLUTE RATINGS (LIMITING VALUES)	Symbols	Values	Units
Emitter-base (d.c.) voltage	VEBO	3,5	V
Collector-base (d.c.) voltage	VCBO	40	V
Collector-emitter (d.c.) voltage	VCEO	27	V
Peak collector current	ICM	4	A
Total power dissipation (at 70°C heatsink temperature)	P _{tot}	25	W
Storage and junction temperatures	T _{stg}	- 65 → + 200	°C
	T _j	+ 200	°C

Thermal resistance	— Junction-case	R _{th (j-c)}	4,8	°C/W
	— Case-heatsink	R _{th (c-h)}	0,4	°C/W

* 3 tones test

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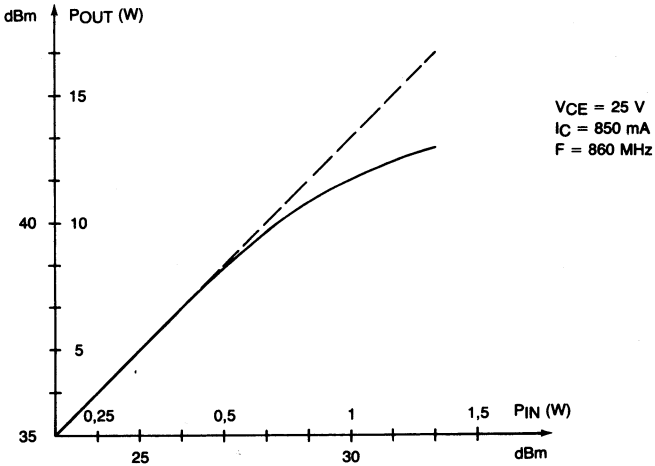
STATIC CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$

Symbols	Values			Units	Test conditions
	min.	typ.	max.		
V(BR)EBO	3,5			V	$I_E = 5 \text{ mA}$
V(BR)CBO	40			V	$I_C = 50 \text{ mA}$ $I_B = 0$
V(BR)CEO	27			V	$I_C = 50 \text{ mA}$ $I_B = 0$
HFE	20	50			$I_C = 1 \text{ A}$ $V_{CE} = 5 \text{ V}$
Ccb		18	28	pF	$V_{CB} = 25 \text{ V}$ $f = 1 \text{ MHz}$

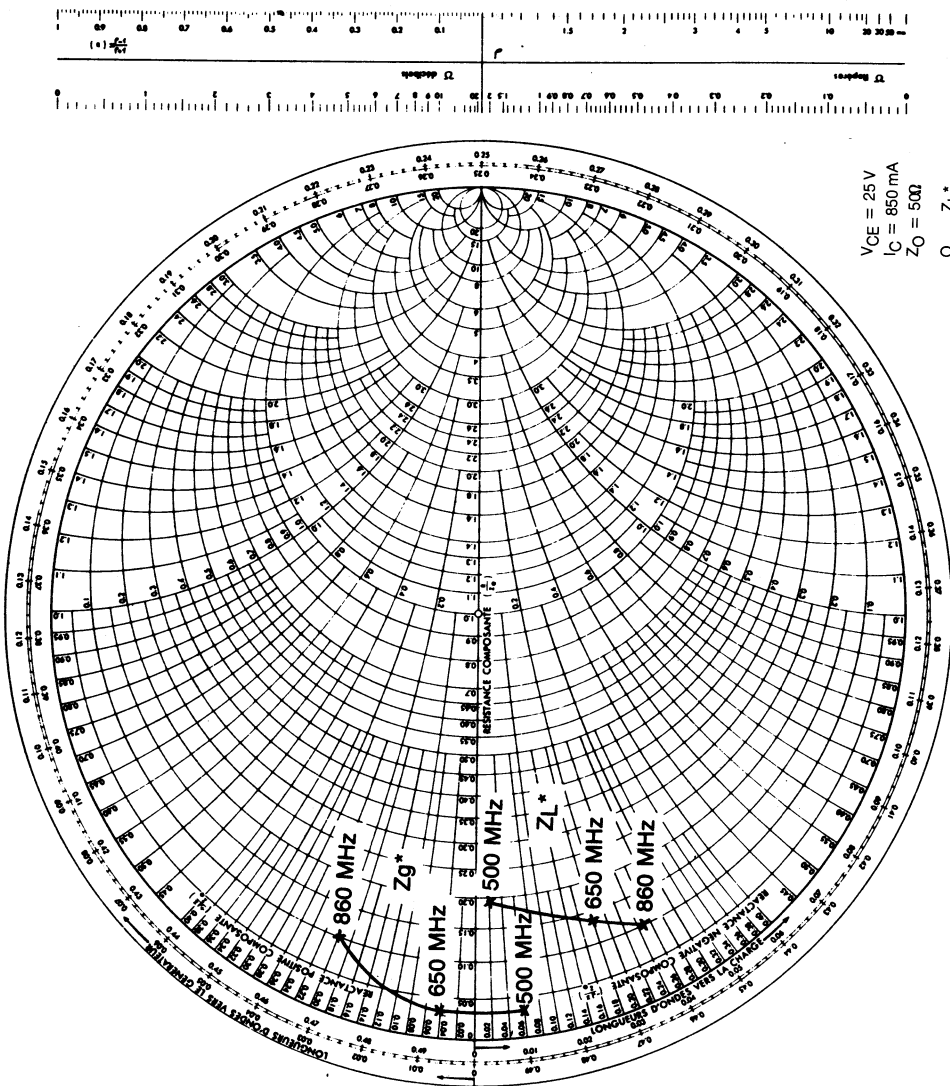
DYNAMIC CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$

Symbols	Values			Units	Test conditions
	min.	typ.	max.		
Gp		12		dB	$f = 860 \text{ MHz}$ $V_{CE} = 25 \text{ V}$ $P_{OUT} = 3 \text{ W}$ $I_C = 1 \text{ A}$
IMD*			- 60	dB	$P_{OUT} = 3 \text{ W}$ $I_C = 1 \text{ A}$ $f = 860 \text{ MHz}$
			- 54		$P_{OUT} = 5 \text{ W}$ $I_C = 0,85 \text{ A}$ $V_{CE} = 25 \text{ V}$
fT		2		GHz	$V_{CE} = 25 \text{ V}$ $I_C = 1 \text{ A}$

* 3 tones test - Vision carrier - 8dB/ref
 Sound carrier - 7dB/ref
 Sideband carrier -16dB/ref



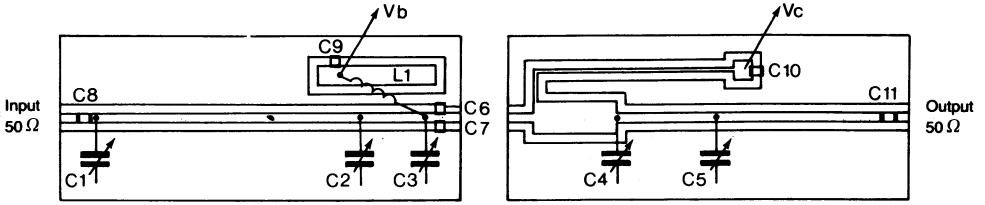
Output power versus input power.



VCE = 25 V
 IC = 850 mA
 ZO = 50Ω

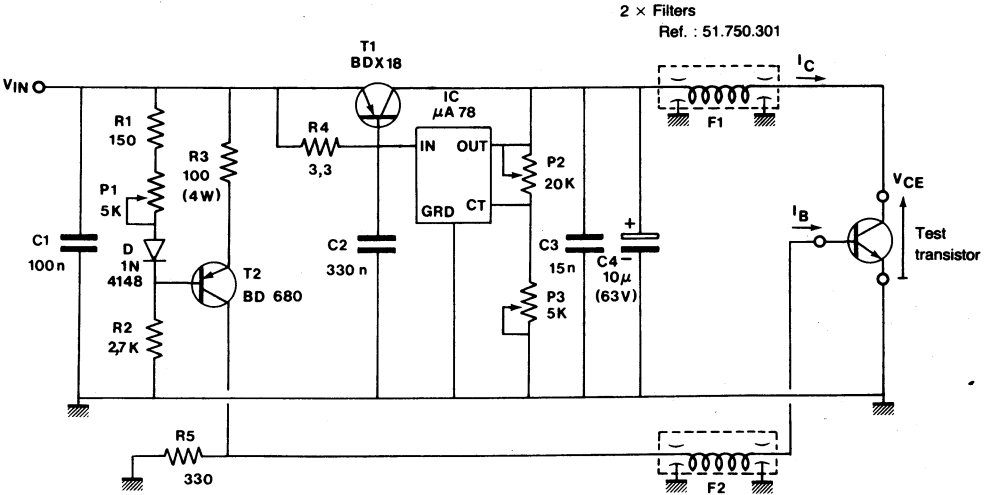
O ZL*
 X Zg*

Smith h chart



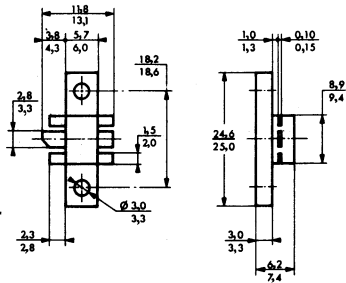
- C1 : Variable air capacitor at 5751 (1-10 pF)
- C2-C3-C4-C5 : Variable air capacitors at 5501 (1-20 pF)
- C6-C7 : Chips 6,8 pF
- C8-C9-C10-C11 : Chips 470 pF
- L1 : Self - Copper wire : 0,7 mm - 13 turns \varnothing 6
- Substrate : Cu double glass teflon - $\epsilon_r = 2,35$ and thickness = 0,8 mm

SUPPLY CIRCUIT



2 x Filters
Ref.: 51.750.301

CASE DESCRIPTION



Dimensions in millimeters

CB-302
(.230 6L FL)