THOMSON-CSF

DIVISION SEMICONDUCTEURS DISCRETS

TH 519

NPN POWER TRANSISTOR FOR VHF APPLICATIONS

FEATURES

- Gold metallizations
- Emitter ballast resistors
- Common emitter structure
- Internally input matched

APPLICATIONS

Wideband 80-500 MHz class C
for ECM and radiolinks applications

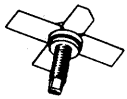
f = 500 MHz

P_{OUT} = 60 W

$G_P \geqslant$ 7 dB

$\eta c \geqslant$ 60 %

V_{CC} = 28 V



Case : CB-286 (.375 4L STUD (B))

ABSOLUTE RATINGS (LIMITING VALUES)	Symbols	Values	Units
Emitter-base (d.c.) voltage	V_{EBO}	3,5	V
Collector-base (d.c.) voltage	V_{CBO}	60	V
Collector-emitter (d.c.) voltage	V_{CEO}	35	V
Collector (d.c.) current	I_C	8	A
Total power dissipation	P_{tot}	100	W
Storage and junction temperatures	T_{stg} T_j	− 55 ⟶ + 200 + 200	°C °C

Thermal resistance (junction-case)	$R_{th\ (j-c)}$	1,75	°C/W

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September 1981 1/6

THOMSON-CSF COMPOSANTS

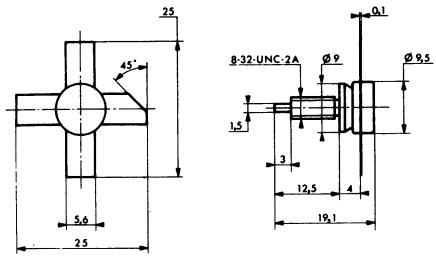
STATIC CHARACTERISTICS at T_{amb} = 25°C

Symbols	Values			Units	Test conditions	
	min.	typ.	max.			
$V_{(BR)EBO}$	3,5			V	I_C = 20 mA	
$V_{(BR)CBO}$	60			V	I_C = 50 mA	I_B = 0
$V_{(BR)CEO}$	35			V	I_C = 50 mA	I_B = 0
H_{21E}	10				I_C = 8 mA	V_{CE} = 5 V
C_{cob}			50	pF	V_{CB} = 28 V	f = 1 MHz

DYNAMIC CHARACTERISTICS at T_{amb} = 25°C

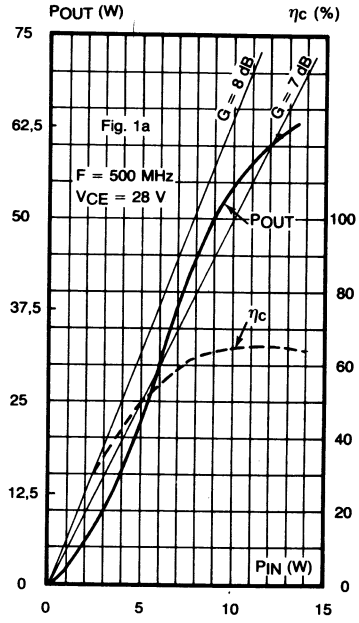
Symbols	Values			Units	Test conditions	
	min.	typ.	max.			
G_P	7			dB	f = 500 MHz	V_{CC} = 28 V P_{OUT} = 60 W
	8				f = 400 MHz	
	17				f = 80 MHz	
η_C	60			%	80 MHz < f < 500 MHz	V_{CC} = 28 V P_{OUT} = 60 W

CASE DESCRIPTION



Dimensions in millimeters

CB-286
(.375 4L STUD (B))



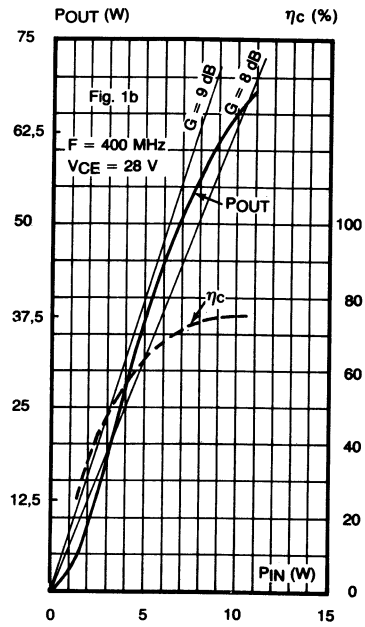


Fig. 1a-1b — Output power and collector efficiency versus input power.

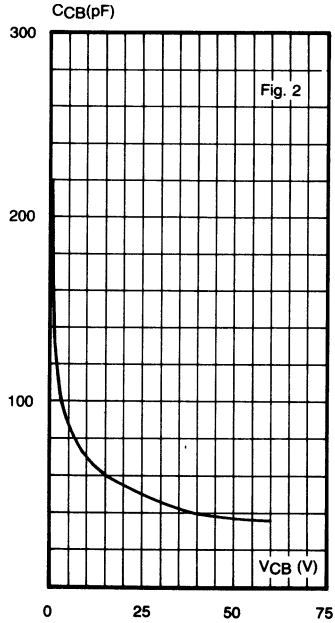
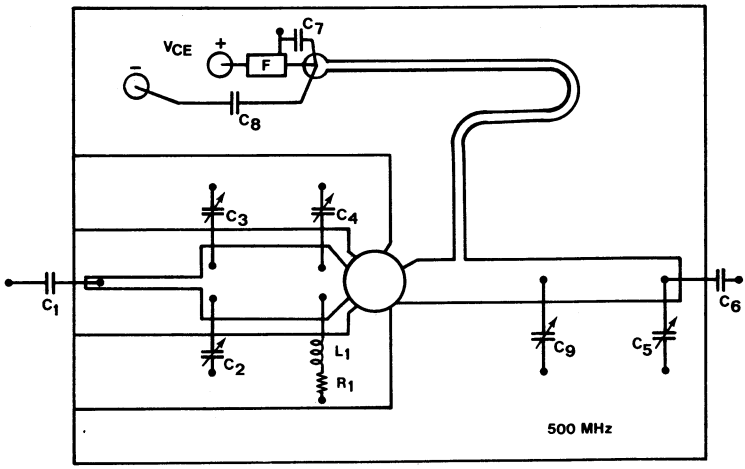


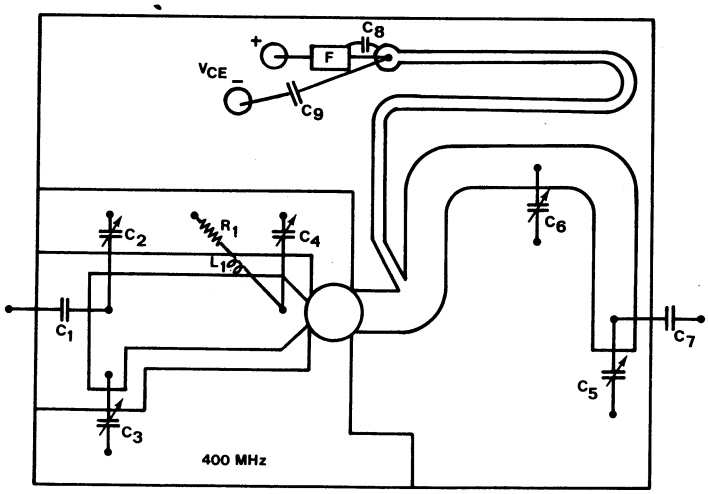
Fig. 2 — Collector-base capacity versus collector-base voltage.

TEST MOUNTING AT 500 MHz



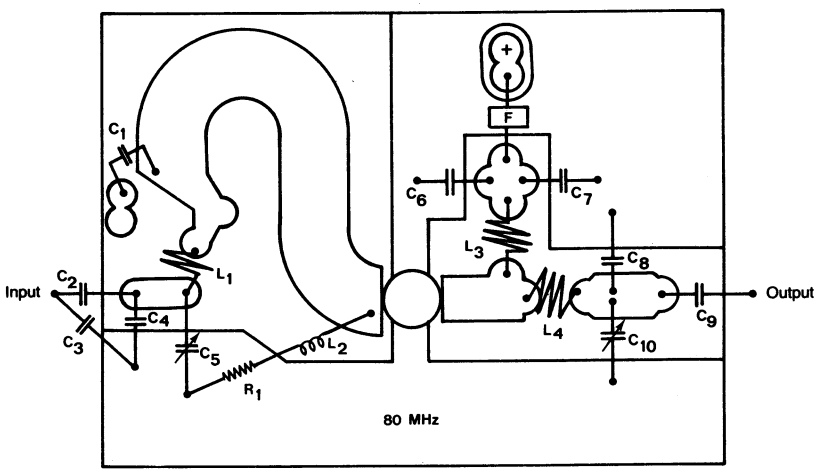
C_1	:	16,8 pF
$C_9 = C_2 = C_3$	:	variable capacitors 1 to 10 pF
$C_4 = C_5$	:	variable capacitors 1,4 to 16 pF
C_6	:	82 pF
C_7	:	10 pF
C_8	:	470 nF
F	:	filter
R_1	:	1Ω
L_1	:	0,1 nH
Substrate	:	glass teflon $\varepsilon = 2,55$ and thickness 0,8 mm

TEST MOUNTING AT 400 MHz



C_1	:	5,6 pF
$C_2 = C_3 = C_5$	:	variable capacitors 1 to 10 pF
C_4	:	10 pF + variable capacitor 1 to 10 pF
C_6	:	6,8 pF + variable capacitor 1 to 10 pF
C_7	:	82 pF
C_8	:	10 nF
C_9	:	470 nF
R_1	:	1 Ω
L_1	:	0,1 nH
F	:	filter
Substrate	:	glass teflon ε = 2,55 and thickness 0,8 mm

TEST MOUNTING AT 80 MHz



C_1 = 220 pF
C_2 = 100 pF
C_3 = 82 pF
C_4 = 58 pF
C_5 = 10 pF + variable capacitor 1 to 30 pF
C_6 = 4,7 nF
C_7 = 0,1 μF
C_8 = 68 pF
C_9 = 330 pF
C_{10} = variable capacitor 1 to 30 pF

R_1 = 12 Ω (1W)
R_2 = 1Ω

L_1 = 2 turns ø int 5 mm - length 11 mm
ø wire : 1,5 mm

L_2 = 0,22 nH

L_3 = 3 turns ø int 8 mm - length 16 mm
ø wire : 1,5 mm # 70 nH

L_4 = 2 turns ø int 8 mm - length 13 mm
ø wire : 1,5 mm # 50 nH

F = filter

Substrate : glass teflon ε = 2,55 and
thickness 0,8 mm

THOMSON-CSF

DIVISION SEMICONDUCTEURS DISCRETS

TH 525

NPN POWER TRANSISTOR FOR VHF APPLICATIONS

ADVANCE INFORMATION

FEATURES

— Gold metallizations
— Emitter ballast resistors

APPLICATIONS

Wideband 80-500 MHz class C
for ECM and radiolinks applications

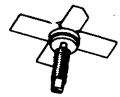
f = 500 MHz

P_{OUT} = 14 W

$G_P \geqslant$ 8 dB

$\eta_c \geqslant$ 65 %

V_{CC} = 28 V



Case : CB-289 (.280 4L STUD (C))

ABSOLUTE RATINGS (LIMITING VALUES)	Symbols	Values	Units
Emitter-base (d.c.) voltage	V_{EBO}	3,5	V
Collector-base (d.c.) voltage	V_{CBO}	55	V
Collector-emitter (d.c.) voltage	V_{CEO}	35	V
Collector (d.c.) current	I_C	2	A
Total power dissipation	P_{tot}	25	W
Storage and junction temperatures	T_{stg} T_j	− 55 → + 200 + 200	°C °C

Thermal resistance (junction-case)	$R_{th\ (j-c)}$	7	°C/W

September 1981 1/2

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THOMSON-CSF COMPOSANTS

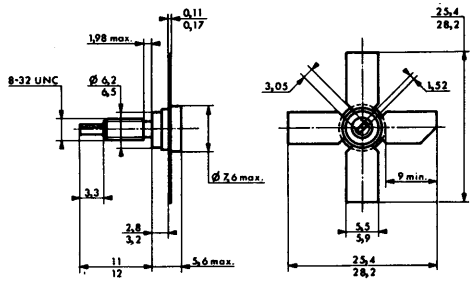
STATIC CHARACTERISTICS at T_{amb} = 25°C

Symbols	Values			Units	Test conditions	
	min.	typ.	max.			
$V_{(BR)EBO}$	3,5			V	I_C = 5 mA	
$V_{(BR)CEO}$	35			V	I_C = 50 mA	I_B = 0
$V_{(BR)CES}$	55			V	I_C = 50 mA	
H_{21E}	15		90		I_C = 100 mA	V_{CE} = 5 V
C_{ccob}			12	pF	V_{CB} = 28 V	f = 1 MHz

DYNAMIC CHARACTERISTICS at T_{amb} = 25°C

Symbols	Values			Units	Test conditions	
	min.	typ.	max.			
G_P	8			dB	f = 500 MHz	V_{CC} = 28 V
η_c	65			%	P_{OUT} = 14 W	

CASE DESCRIPTION



Dimensions in millimeters

CB-289
(.280 4L STUD (C))

THOMSON-CSF
DIVISION SEMICONDUCTEURS DISCRETS

TH 526

NPN POWER TRANSISTOR FOR VHF APPLICATIONS

FEATURES

- Gold metallizations
- Emitter ballast resistors
- Common emitter structure
- Internally input matched

APPLICATIONS

Wideband 80-500 MHz class C
for radiolinks applications

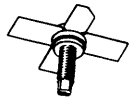
f = 500 MHz

P_{OUT} = 30 W

$G_P \geqslant$ 7 dB

$\eta_c \geqslant$ 60 %

V_{CC} = 28 V



Case : CB-286 (.375 4L STUD (B))

ABSOLUTE RATINGS (LIMITING VALUES)	Symbols	Values	Units
Emitter-base (d.c.) voltage	V_{EBO}	3,5	V
Collector-base (d.c.) voltage	V_{CBO}	60	V
Collector-emitter (d.c.) voltage	V_{CEO}	35	V
Collector (d.c.) current	I_C	4	A
Total power dissipation	P_{tot}	58	W
Storage and junction temperatures	T_{stg} T_j	$-55 \longrightarrow +200$ + 200	°C °C

Thermal resistance (junction-case)	$R_{th\ (j-c)}$	3	°C/W

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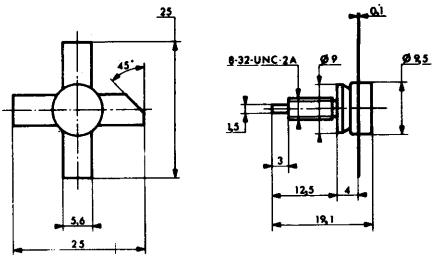
STATIC CHARACTERISTICS at T_{amb} = 25°C

Symbols	Values			Units	Test conditions	
	min.	typ.	max.			
V(BR)EBO	3,5			V	I_C = 10 mA	
V(BR)CBO	60			V	I_C = 50 mA	I_B = 0
V(BR)CEO	35			V	I_C = 50 mA	I_B = 0
H_{21E}	10				I_C = 4 mA	V_{CE} = 5 V
C_{ob}		26	28	pF	V_{CB} = 28 V	f = 1 MHz

DYNAMIC CHARACTERISTICS at T_{amb} = 25°C

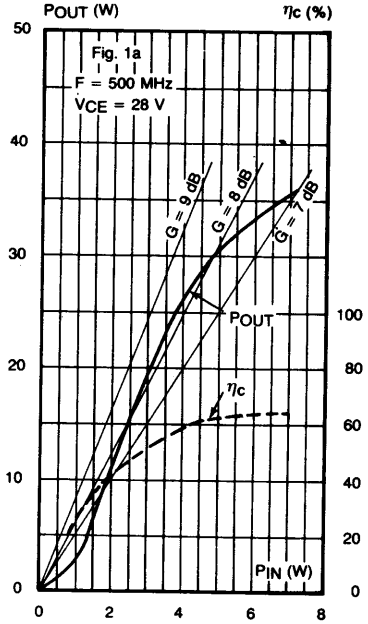
Symbols	Values			Units	Test conditions	
	min.	typ.	max.			
Gp	7			dB	f = 500 MHz	V_{CC} = 28 V P_{OUT} = 30 W
	8	10			f = 400 MHz	
	17				f = 80 MHz	
η_c	60			%	80 MHz < f < 500 MHz V_{CC} = 28 V P_{OUT} = 30 W	

CASE DESCRIPTION



Dimensions in millimeters

CB-286
(.375 4L STUD (B))



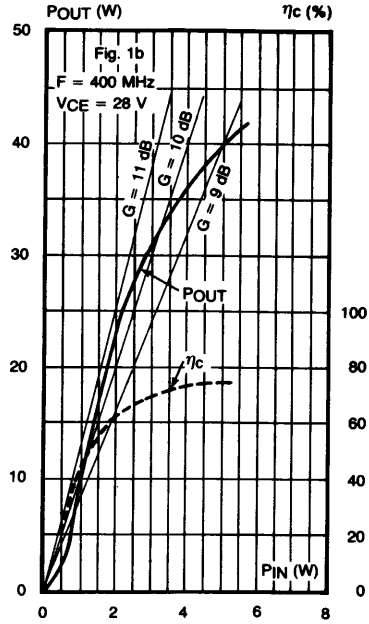


Fig. 1a-1b — Output power and collector efficiency versus input power.

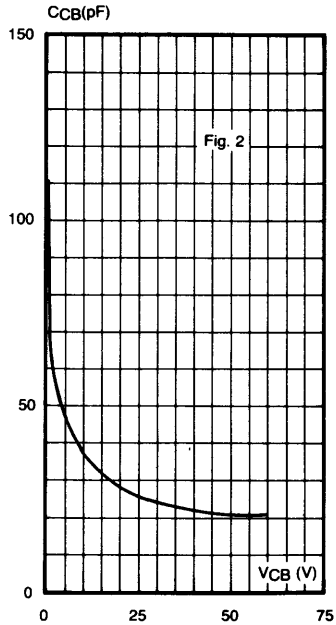
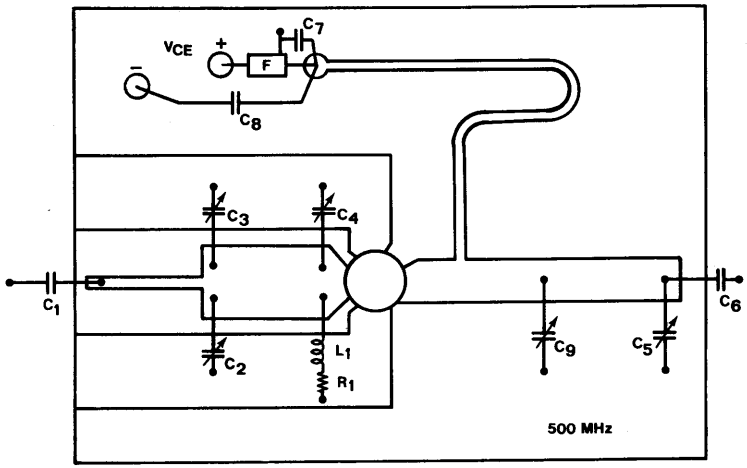


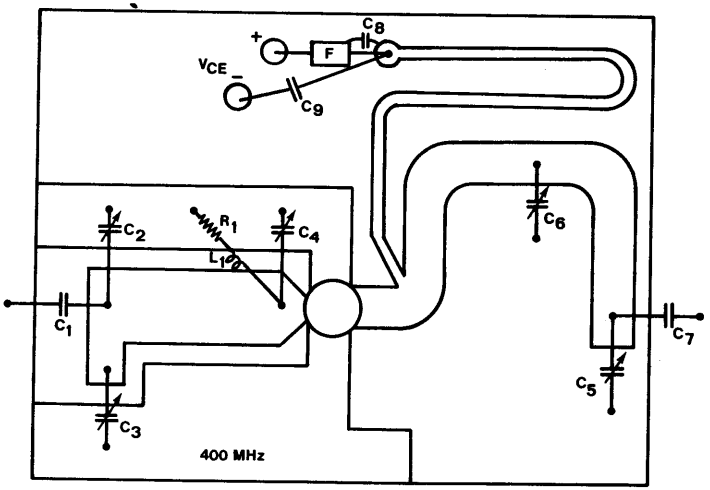
Fig. 2 — Collector-base capacity versus collector-base voltage.

TEST MOUNTING AT 500 MHz



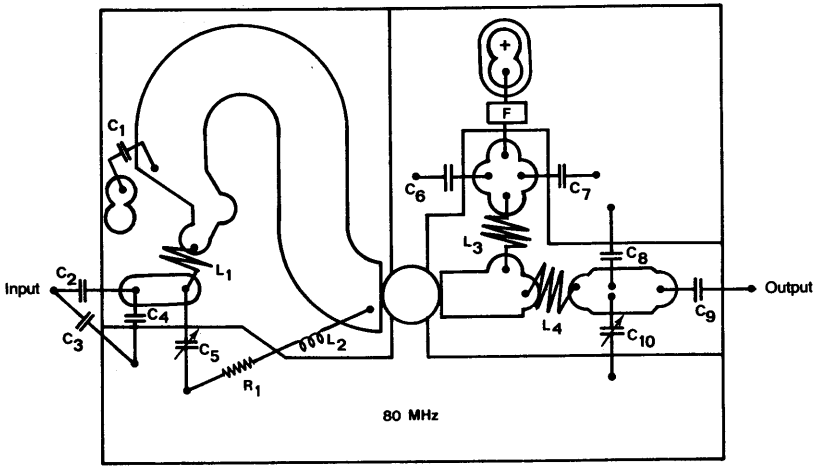
C_1	:	16,8 pF
$C_9 = C_2 = C_3$	:	variable capacitors 1 to 10 pF
$C_4 = C_5$	:	variable capacitors 1,4 to 16 pF
C_6	:	82 pF
C_7	:	10 pF
C_8	:	470 nF
F	:	filter
R_1	:	1 Ω
L_1	:	0,1 nH
Substrate	:	glass teflon ε = 2,55 and thickness 0,8 mm

TEST MOUNTING AT 400 MHz



C_1	:	5,6 pF
$C_2 = C_3 = C_5$	:	variable capacitors 1 to 10 pF
C_4	:	10 pF + variable capacitor 1 to 10 pF
C_6	:	6,8 pF + variable capacitor 1 to 10 pF
C_7	:	82 pF
C_8	:	10 nF
C_9	:	470 nF
R_1	:	1Ω
L_1	:	0,1 nH
F	:	filter
Substrate	:	glass teflon $\varepsilon = 2,55$ and thickness 0,8 mm

TEST MOUNTING AT 80 MHz



C_1 = 220 pF
C_2 = 100 pF
C_3 = 82 pF
C_4 = 58 pF
C_5 = 10 pF + variable capacitor 1 to 30 pF
C_6 = 4,7 nF
C_7 = 0,1 μF
C_8 = 68 pF
C_9 = 330 pF
C_{10} = variable capacitor 1 to 30 pF

R_1 = 12 Ω (1W)
R_2 = 1Ω
L_1 = 2 turns ø int 5 mm - length 11 mm
ø wire : 1,5 mm
L_2 = 0,22 nH
L_3 = 3 turns ø int 8 mm - length 16 mm
ø wire : 1,5 mm # 70 nH
L_4 = 2 turns ø int 8 mm - length 13 mm
ø wire : 1,5 mm # 50 nH
F = filter
Substrate : glass teflon ε = 2,55 and
thickness 0,8 mm

THOMSON-CSF
DIVISION SEMICONDUCTEURS DISCRETS

TH 531/TH 532

NPN POWER TRANSISTOR FOR UHF APPLICATIONS

DESCRIPTION

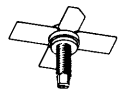
These devices are 28 Volts gold metallized epitaxial silicon NPN planar transistors designed for UHF military and commercial equipments.
They utilize diffused emitter resistors to achieve infinite VSWR at rated operating conditions.

FEATURES

* Designed for UHF military and commercial applications.
* 30 Watts (min.) with greater than 7.5dB gain.
* Gold metallization for high reliability applications.

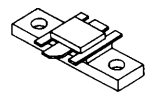
f = 400 MHz
$P_{OUT} \geqslant 30$ W
$G_P \geqslant 7.8$ dB
$\eta_c \geqslant 60$ %
$V_{CC} = 28$ V

TH 531



CB-312
(.280 4L STUD (B))

TH 532



CB-302
(.230 6L FL)

ABSOLUTE RATINGS (LIMITING VALUES)	Symbols	Values	Units
Emitter-base (d.c.) voltage	V_{EBO}	4	V
Collector-base (d.c.) voltage	V_{CBO}	55	V
Collector-emitter (d.c.) voltage	V_{CEO}	30	V
Collector current (d.c.)	I_C	5	A
Total power dissipation $T_C = 25°C$ $T_C = 75°C$	P_{tot}	70 50	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

October 1981 1/3

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THOMSON-CSF
COMPOSANTS

STATIC CHARACTERISTICS at T_{amb} = 25°C

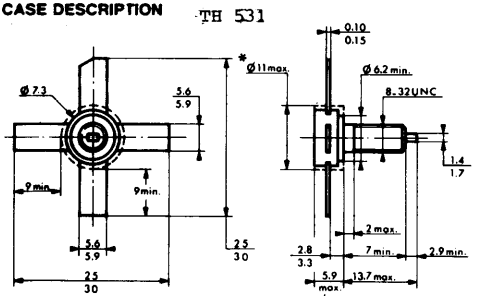
Symbols	Values			Units	Test conditions
	min.	typ.	max.		
$V_{(BR)EBO}$	4			V	I_E = 10 mA I_C = 0
$V_{(BR)CES}$	55			V	I_C = 20 mA V_{BE} = 0
$V_{(BR)CEO}$	30			V	I_C = 50 mA I_B = 0
H_{FE}	10		150		I_C = 2 A V_{CE} = 5 V
C_{ob}			32	pF	V_{CB} = 28 V f = 1 MHz
I_{CES}			10	mA	V_{CE} = 30 V

DYNAMIC CHARACTERISTICS at T_{amb} = 25°C

Symbols	Values			Units	Test conditions
	min.	typ.	max.		
G_P	7.8			dB	F = 400 MHz V_{CB} = 28 V P_{IN} = 5 W
η_c	60			%	
P_{OUT}	30			W	
Z_S		1.0 + j 0.1		Ω	F = 400 MHz V_{CB} = 28 V P_{OUT} = 30 W
Z_{CL}		9.0 + j 8.0		Ω	
Z_S		1.0 - j 1.5		Ω	F = 225 MHz V_{CB} = 28 V P_{OUT} = 30 W
Z_{CL}		8.0 + j 7.0		Ω	

CASE DESCRIPTION

TH 531

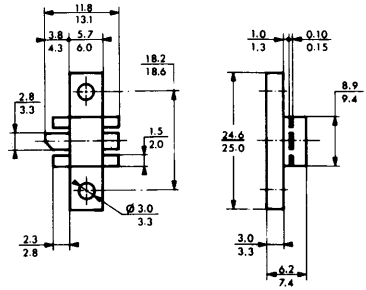


* Outputs must not be bent, cut or used in this area

CB-312

(.280 4L STUD (B))

TH 532



CB-302

(.230 6L FL)

Dimensions in millimeters

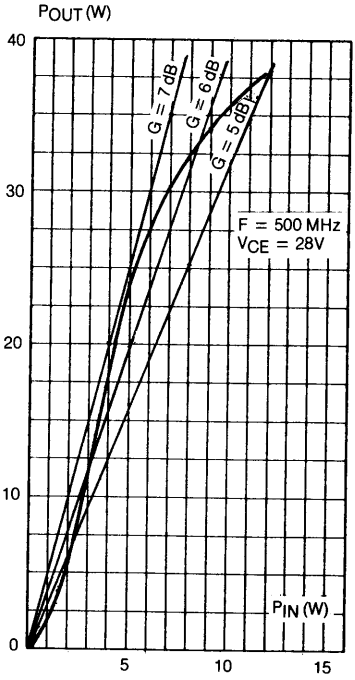


Fig. 1 — Output power versus input power

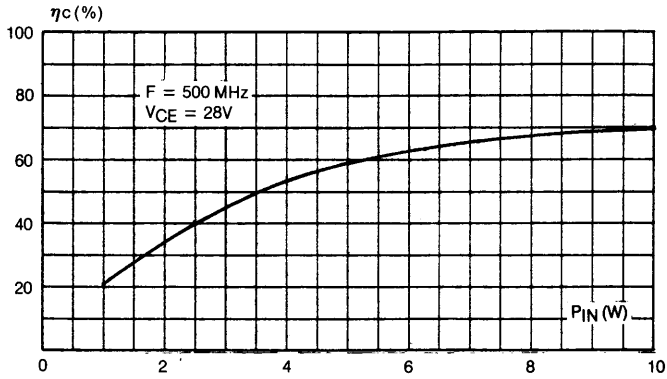


Fig. 2 - Collector efficiency versus input power