

U.H.F./V.H.F. POWER TRANSISTOR

N-P-N silicon transistor for use in class-B and C operated mobile, industrial and military transmitters with a supply voltage of 13,8 V.

It has a capstan envelope with a moulded cap. All leads are isolated from the stud.

QUICK REFERENCE DATA

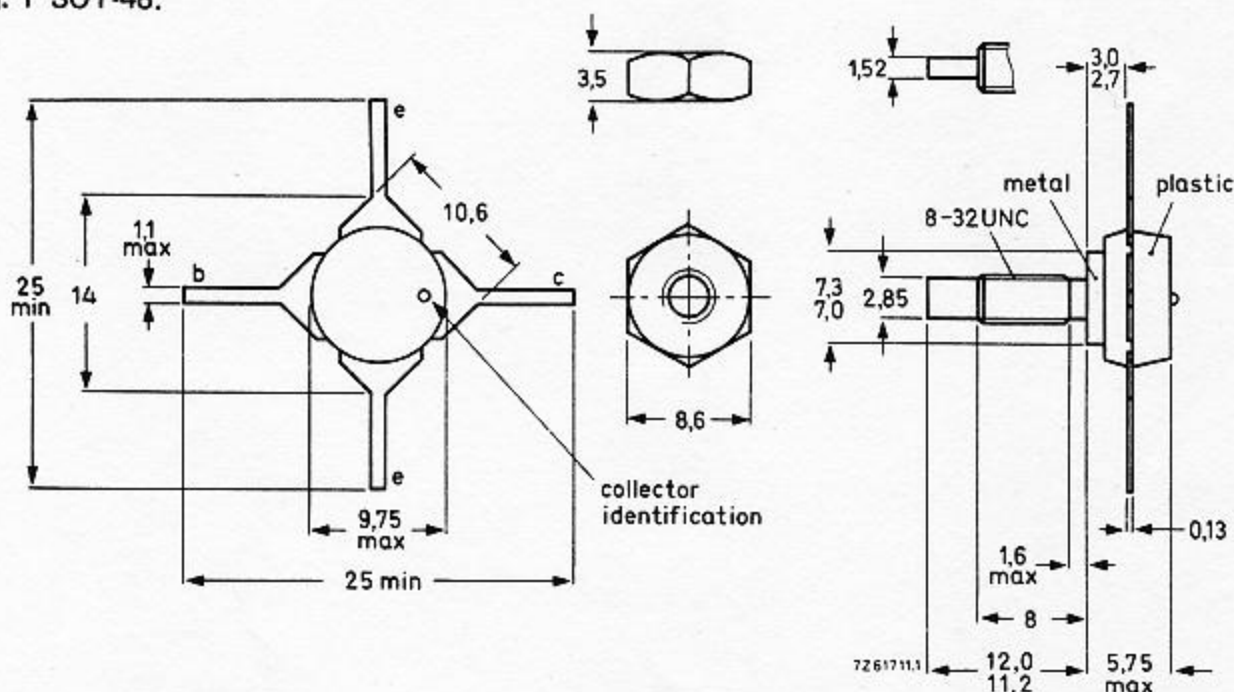
R.F. performance up to $T_h = 25^\circ\text{C}$ in an unneutralized common-emitter class-B circuit

mode of operation	V_{CE} V	f MHz	P_S W	P_L W	I_C A	G_p dB	η %	$\bar{z}_i$ Ω	$\bar{Y}_L$ mA/V
c.w.	13,8	470	typ. 0,15	1,5	typ. 0,17	typ. 10	typ. 65	—	—
c.w.	13,8	470	typ. 0,35	3,0	typ. 0,28	typ. 9,3	typ. 79	$2,9 + j5,1$	$27 - j21$
c.w.	12,5	470	< 0,35	2,5	< 0,31	> 8,5	> 65	—	—
c.w.	12,5	175	typ. 0,03	3,0	typ. 0,29	typ. 20	typ. 84	—	—

MECHANICAL DATA

Dimensions in mm

Fig. 1 SOT-48.



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

Diameter of clearance hole in heatsink: max. 4,2 mm.
Mounting hole to have no burrs at either end.
De-burring must leave surface flat; do not chamfer or countersink either end of hole.

When locking is required an adhesive is preferred instead of a lock washer.

CAUTION This device incorporates beryllium oxide, the dust of which is toxic. The device is entirely safe provided that the BeO disc is not damaged.

RATINGS Limiting values in accordance with the Absolute Maximum System (IEC134)

Voltages

Collector-base voltage (open emitter)
peak value

V_{CBOM} max. 36 V

Collector-emitter voltage ($R_{BE} = 0$)
peak value

V_{CESM} max. 36 V

Collector-emitter voltage (open base)

V_{CEO} max. 18 V

Emitter-base voltage (open collector)

V_{EBO} max. 4 V

Currents

Collector current (average)

$I_{C(AV)}$ max. 0.7 A

Collector current (peak value) $f > 1$ MHz

I_{CM} max. 2.0 A

Power dissipation

Total power dissipation up to $T_h = 90^\circ\text{C}$
 $f > 10$ MHz

P_{tot} max. 4.5 W

Temperature

Storage temperature

T_{stg} -65 to +150 $^\circ\text{C}$

Junction temperature

T_j max. 150 $^\circ\text{C}$

THERMAL RESISTANCE

From junction to mounting base

$R_{th\ j-mb} = 12^\circ\text{C/W}$

From mounting base to heatsink

$R_{th\ mb-h} = 0.6^\circ\text{C/W}$

CHARACTERISTICS

 $T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise specifiedBreakdown voltages

Collector-base voltage

open emitter, $I_C = 10\text{ mA}$

$$V_{(BR)CBO} > 36\text{ V}$$

Collector-emitter voltage

 $V_{BE} = 0$; $I_C = 10\text{ mA}$

$$V_{(BR)CES} > 36\text{ V}$$

Collector-emitter voltage

open base, $I_C = 25\text{ mA}$

$$V_{(BR)CEO} > 18\text{ V}$$

Emitter-base voltage

open collector, $I_E = 1,0\text{ mA}$

$$V_{(BR)EBO} > 4\text{ V}$$

Collector-emitter saturation voltage $I_C = 100\text{ mA}$; $I_B = 20\text{ mA}$

$$V_{CEsat} \text{ typ. } 0,1\text{ V}$$

D.C. current gain $I_C = 100\text{ mA}$; $V_{CE} = 5\text{ V}$

$$h_{FE} > 10$$

$$\text{typ. } 40$$

Transition frequency $I_C = 0,2\text{ A}$; $V_{CE} = 5\text{ V}$; $f = 500\text{ MHz}$

$$f_T \text{ typ. } 1400\text{ MHz}$$

Collector capacitance at $f = 1\text{ MHz}$ $I_E = I_e = 0$; $V_{CB} = 10\text{ V}$

$$C_c \text{ typ. } 6,5\text{ pF}$$

$$< 9,0\text{ pF}$$

Feedback capacitance at $f = 1\text{ MHz}$ $I_C = 20\text{ mA}$; $V_{CE} = 10\text{ V}$

$$C_{re} \text{ typ. } 4,8\text{ pF}$$

Collector-stud capacitance

$$C_{cs} \text{ typ. } 2\text{ pF}$$

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

Voltages

Collector-base voltage (open emitter)
peak value

V_{CBOM} max. 36 V

Collector-emitter voltage ($R_{BE} = 0$)
peak value

V_{CESM} max. 36 V

Collector-emitter voltage (open base)

V_{CEO} max. 18 V

Emitter-base voltage (open collector)

V_{EBO} max. 4 V

Currents

Collector current (average)

$I_{C(AV)}$ max. 1.0 A

Collector current (peak value) $f > 1$ MHz

I_{CM} max. 4.0 A

Power dissipation

Total power dissipation up to $T_h = 70^\circ\text{C}$
 $f > 10$ MHz

P_{tot} max. 10 W

Temperatures

Storage temperature

T_{stg} -65 to +150 $^\circ\text{C}$

Junction temperature

T_j max. 150 $^\circ\text{C}$

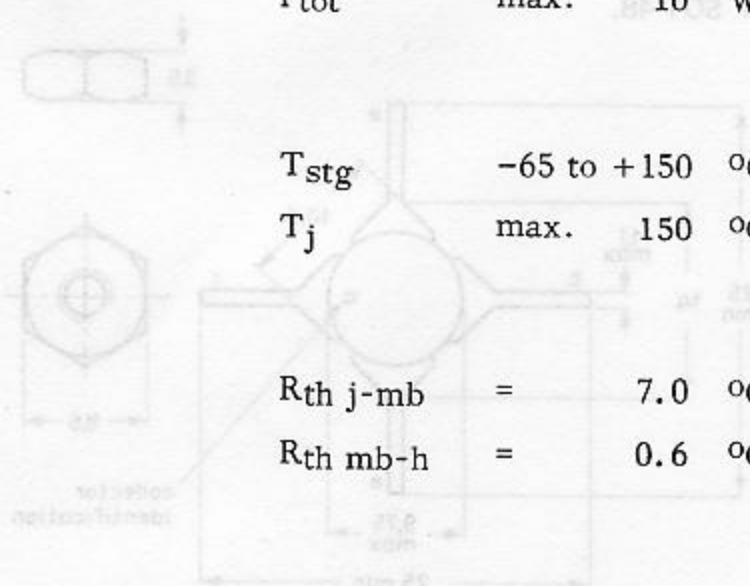
THERMAL RESISTANCE

From junction to mounting base

$R_{th\ j-mb}$ = 7.0 $^\circ\text{C/W}$

From mounting base to heatsink

$R_{th\ mb-h}$ = 0.6 $^\circ\text{C/W}$



CAUTION: This device contains perfluorinated compounds, the dust of which is toxic. The device is entirely safe provided that the BGA disc is not damaged.

When locking is required an adhesive is preferred instead of a lock washer.

U.H.F. POWER TRANSISTOR

N-P-N silicon planar epitaxial transistor for use in class-A, B and C operated mobile, industrial and military transmitters with a supply voltage of 13,5 V. The transistor is resistance stabilized and is guaranteed to withstand severe load mismatch conditions with a supply over-voltage to 16,5 V. Gold metallization ensures extremely high reliability.

It has a capstan envelope with a moulded cap. All leads are isolated from the stud.

QUICK REFERENCE DATA

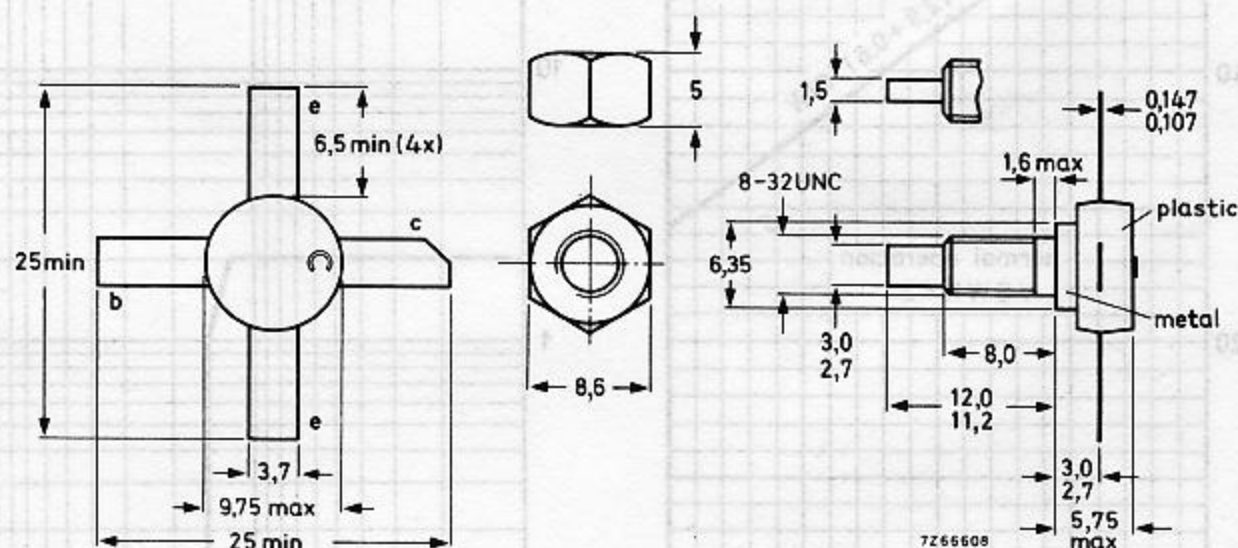
R.F. performance up to $T_{mb} = 25^{\circ}\text{C}$ in an unneutralized common-emitter class-B circuit

mode of operation	V_{CE} V	f MHz	P_S W	P_L W	I_C A	G_p dB	η %	$\bar{Z}_i$ Ω	$\bar{Y}_L$ mA/V
c.w.	13,5	470	< 8,0	20	< 2,28	> 4	> 65	$1,2 + j4,5$	$163 - j35$
c.w.	12,5	470	< 6,8	17	< 2,09	> 4	> 65	—	—

MECHANICAL DATA

Fig. 1 SOT-48.

Dimensions in mm



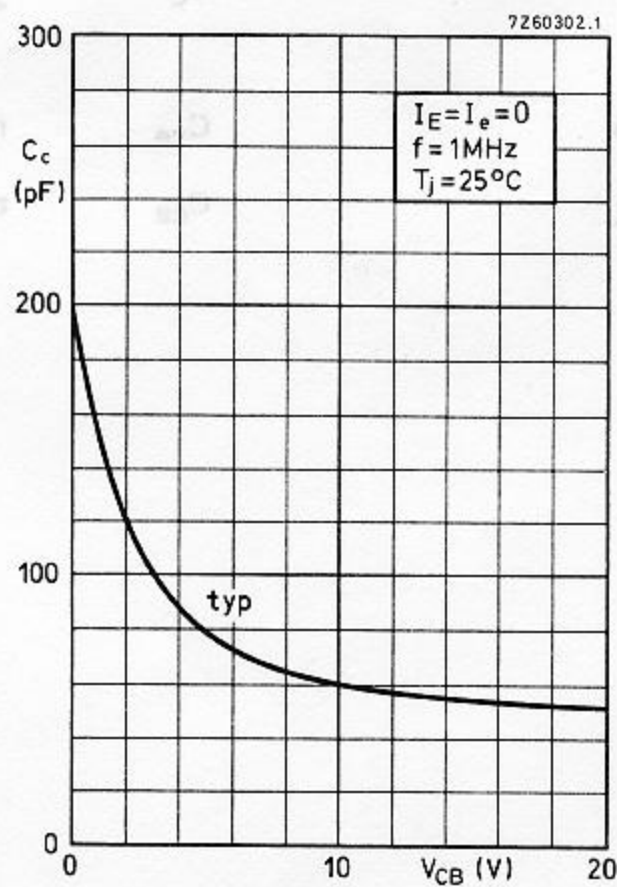
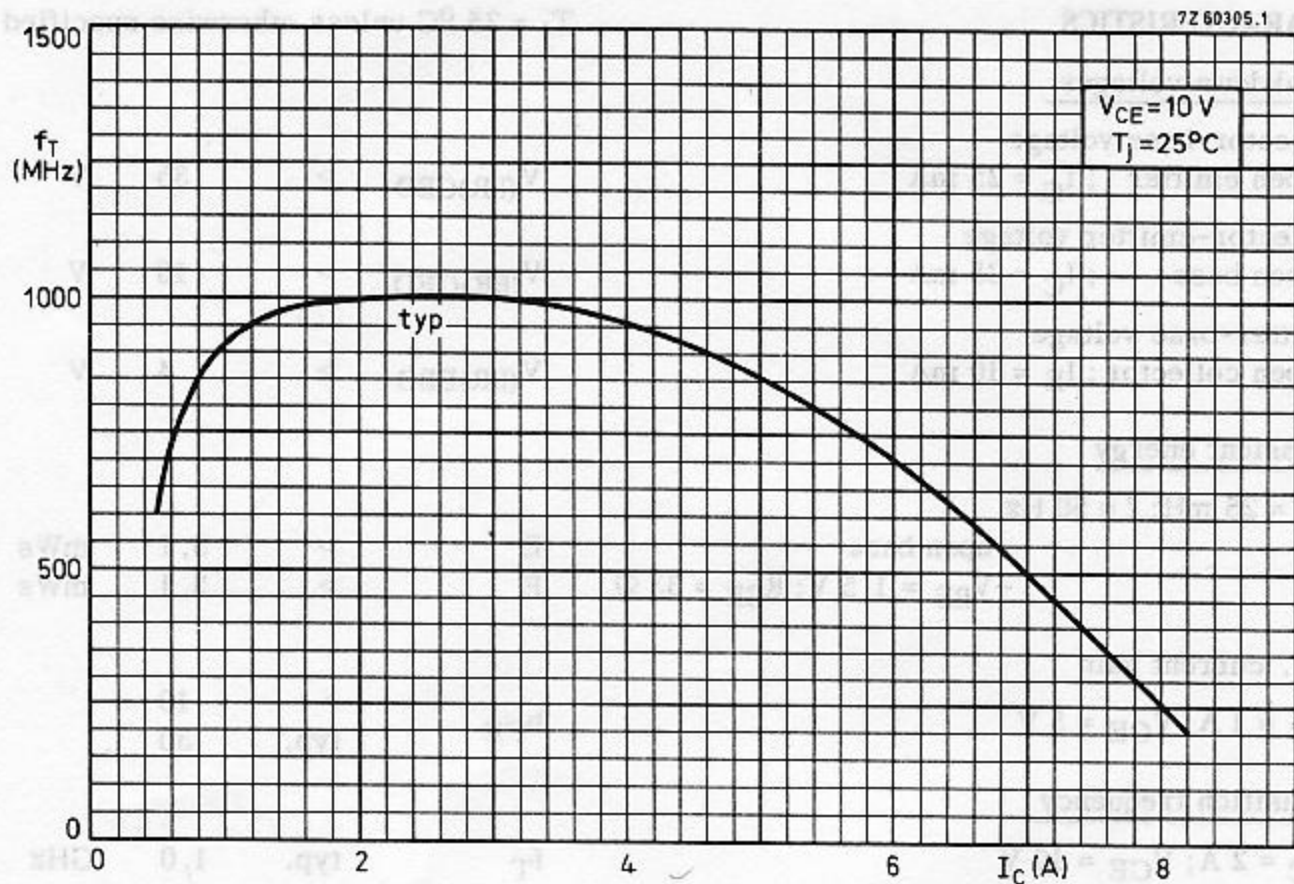
Torque on nut: min. 0,75 Nm
(7,5 kg cm)
max. 0,85 Nm
(8,5 kg cm)

Diameter of clearance hole in heatsink: max. 4,2 mm.
Mounting hole to have no burrs at either end.
De-burring must leave surface flat; do not chamfer or countersink either end of hole.

When locking is required an adhesive is preferred instead of a lock washer.

CAUTION This device incorporates beryllium oxide, the dust of which is toxic. The device is entirely safe provided that the BeO disc is not damaged.

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

Voltages

Collector-base voltage (open emitter)
peak value

V_{CBOM} max. 36 V

Collector-emitter voltage (open base)

V_{CEO} max. 18 V

Emitter-base voltage (open collector)

V_{EBO} max. 4 V

Currents

Collector current (average)

$I_{C(AV)}$ max. 3,5 A

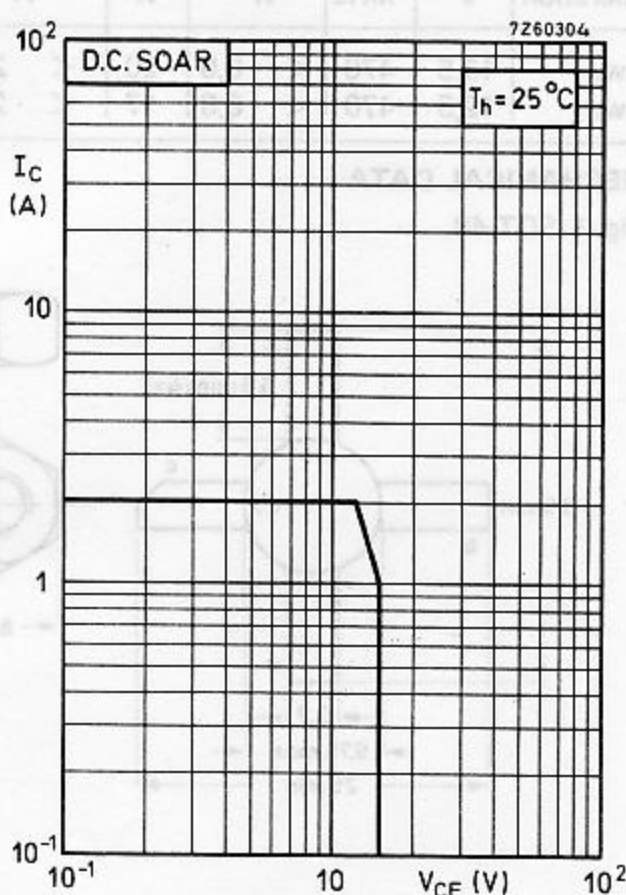
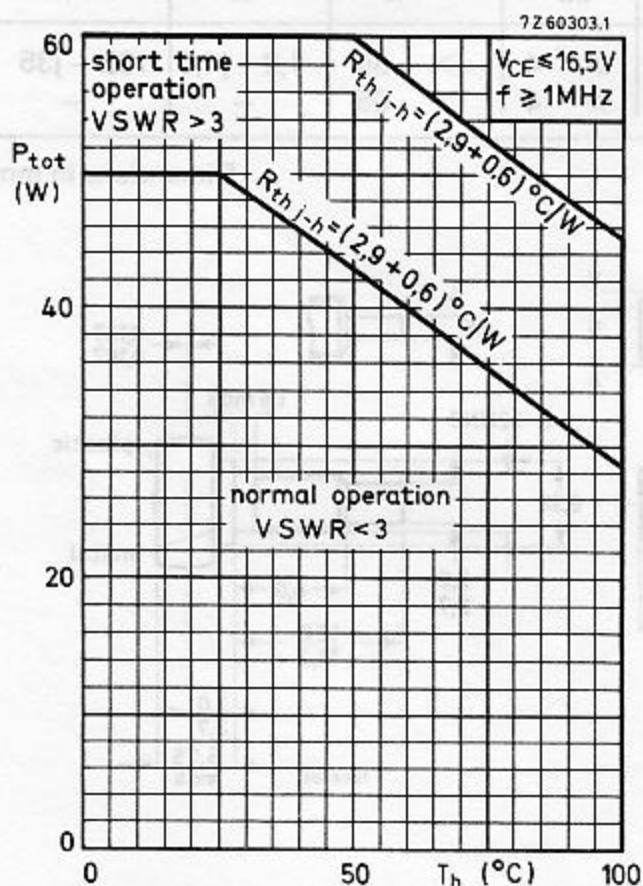
Collector current (peak value) $f > 1$ MHz

I_{CM} max. 10 A

Power dissipation

Total power dissipation up to $T_h = 25^\circ\text{C}$
 $f \geq 1$ MHz

P_{tot} max. 50 W



Temperatures

Storage temperature

T_{stg} -65 to +200 $^\circ\text{C}$

Junction temperature

T_j max. 200 $^\circ\text{C}$

THERMAL RESISTANCE

From junction to mounting base

$R_{th j-mb}$ = 2,9 $^\circ\text{C/W}$

From mounting base to heatsink

$R_{th mb-h}$ = 0,6 $^\circ\text{C/W}$

CHARACTERISTICS $T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise specifiedBreakdown voltages

Collector-base voltage

open emitter ; $I_C = 25\text{ mA}$ $V_{(BR)CBO} > 36\text{ V}$

Collector-emitter voltage

open base ; $I_C = 25\text{ mA}$ $V_{(BR)CEO} > 18\text{ V}$

Emitter-base voltage

open collector ; $I_E = 10\text{ mA}$ $V_{(BR)EBO} > 4\text{ V}$ Transient energy $L = 25\text{ mH}$; $f = 50\text{ Hz}$

open base

 $-V_{BE} = 1,5\text{ V}$; $R_{BE} = 33\text{ }\Omega$ $E > 3,1\text{ mWs}$ $E > 3,1\text{ mWs}$ D.C. current gain $I_C = 1\text{ A}$; $V_{CE} = 5\text{ V}$ $h_{FE} > 10$
typ. 30Transition frequency $I_C = 2\text{ A}$; $V_{CE} = 10\text{ V}$ f_T typ. 1,0 GHzCollector capacitance at $f = 1\text{ MHz}$ $I_E = I_e = 0$; $V_{CB} = 15\text{ V}$ C_c typ. 55 pF
< 70 pFFeedback capacitance $I_C = 100\text{ mA}$; $V_{CE} = 15\text{ V}$ C_{re} typ. 32 pFCollector-stud capacitance C_{cs} typ. 2 pF