

25C D ■ 8235605 0004072 4 ■ SIEG

PNP Germanium RF Transistor

AF 239 S

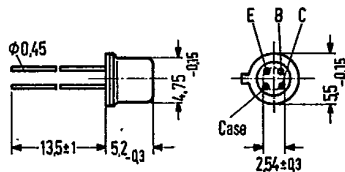
SIEMENS AKTIENGESELLSCHAFT

for output, mixer, and oscillator stages up to 900 MHz

T-31-07

AF 239 S is a germanium PNP mesa transistor in TO 72 case (18 A 4 DIN 41876). The leads are electrically insulated from the case.

Type	Ordering code
AF 239 S	Q62701-F51



Approx. weight 0.4 g

Dimensions in mm

#### Maximum ratings

Collector-emitter voltage

$-V_{CEO}$

15

V

Collector-emitter voltage

$-V_{CES}$

20

V

Emitter-base voltage

$-V_{EBO}$

0.3

V

Collector current

$-I_C$

10

mA

Emitter current

$I_E$

11

mA

Base current

$-I_B$

1

mA

Junction temperature

$T_j$

90

°C

Storage temperature range

$T_{stg}$

-30 to +75

°C

Total power dissipation ( $T_{amb} \leq 45^\circ\text{C}$ )

$P_{tot}$

60

mW

#### Thermal resistance

Junction to ambient air

$R_{thJA}$

$\leq 750$

K/W

Junction to case

$R_{thJC}$

$\leq 400$

K/W

**Static characteristics** ( $T_{amb} = 25^\circ\text{C}$ )

$-V_{CE}$ V	$I_C$ mA	$-I_B$ $\mu\text{A}$	$h_{FE}$ $I_C/I_B$	$-V_{BE}$ mV
10	2	40	50 (>10)	350
5	5	110	45	400

Collector cutoff current ( $-V_{CES} = 20\text{ V}$ ) $-I_{CES}$ 

0.5 (&lt;8)

 $\mu\text{A}$ Collector cutoff current ( $-V_{CEO} = 15\text{ V}$ ) $-I_{CEO}$ 

&lt;500

 $\mu\text{A}$ Emitter cutoff current ( $-V_{EBO} = 0.3\text{ V}$ ) $-I_{EBO}$ 

&lt;100

 $\mu\text{A}$ **Dynamic characteristics** ( $T_{amb} = 25^\circ\text{C}$ )Transition frequency ( $-I_C = 2\text{ mA}$ ;  $-V_{CE} = 10\text{ V}$ ;  $f = 100\text{ MHz}$ )  $f_T$  780 MHz

Reverse transfer capacitance

( $-I_C = 2\text{ mA}$ ;  $-V_{CE} = 10\text{ V}$ ;  $f = 450\text{ kHz}$ ) $-C_{12e}$ 

0.2

pF

**Power gain**Operating point:  $-I_C = 2\text{ mA}$ ;  $-V_{CE} = 10\text{ V}$ ( $f = 800\text{ MHz}$ ;  $R_L = 500\ \Omega$ ) $G_{pb}$ 

12.5

dB

( $f = 800\text{ MHz}$ ;  $R_L = 2\text{ k}\Omega$ ) $G_{pb}$ 

15 (&gt;12.5)

dB

( $f = 900\text{ MHz}$ ;  $R_L = 500\ \Omega$ ) $G_{pb}$ 

12

dB

**Noise figure**( $f = 800\text{ MHz}$ ;  $R_g = 60\ \Omega$ )

NF

&lt;5

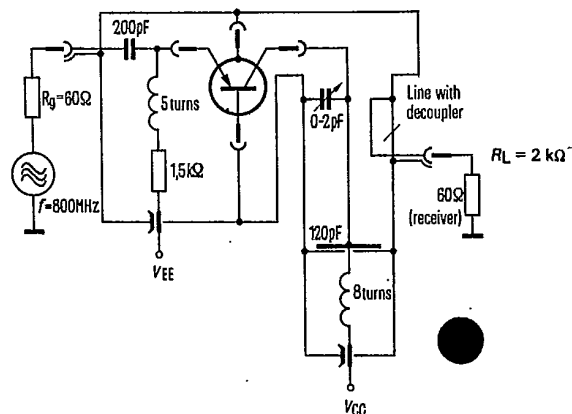
dB

( $f = 900\text{ MHz}$ ;  $R_g = 60\ \Omega$ )

NF

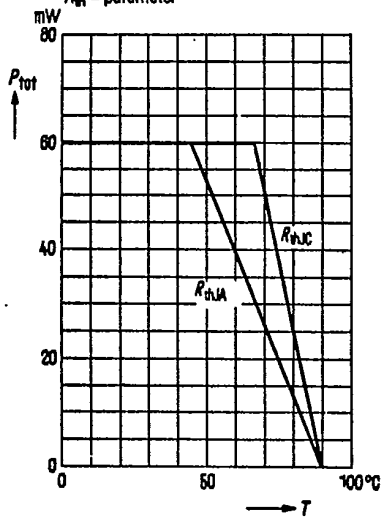
&lt;6

dB

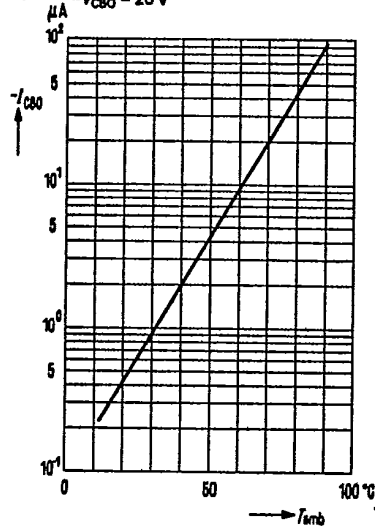
**Test circuit for power gain and noise figure at  $f = 800\text{ MHz}$** 

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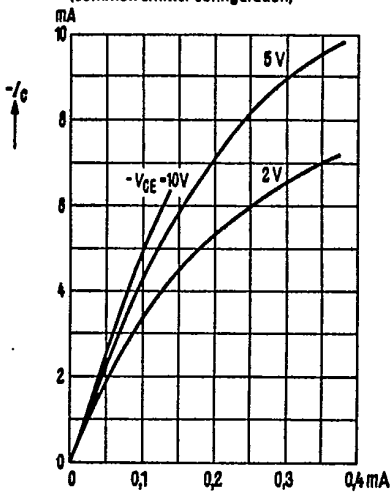
Total perm. power dissipation  
versus temperature  $P_{tot} = f(T)$ ;  
 $R_{thJA}$  = parameter



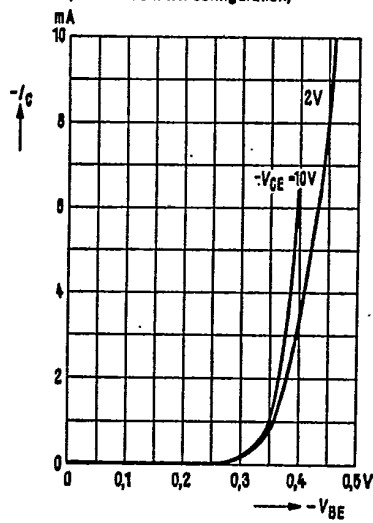
Collector cutoff current  
versus temperature  $I_{CBO} = f(T_{amb})$ ;  
 $-V_{CBO} = 20 V$



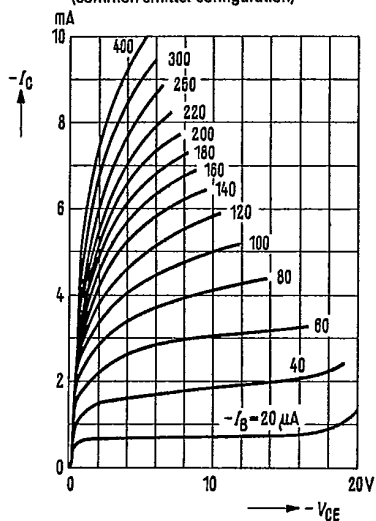
Collector current  $I_C = f(V_{BE})$   
 $V_{CE}$  = parameter  
(common emitter configuration)



Collector current  $I_C = f(V_{BE})$   
 $V_{CE}$  = parameter  
(common emitter configuration)



Output characteristics  $I_C = f(V_{CE})$   
 $I_B$  = parameter  
(common emitter configuration)



Output characteristics  $I_C = f(V_{CB})$   
 $I_E$  = parameter  
(common base configuration)

