PNP Germanium RF Transistor — AF 239 S

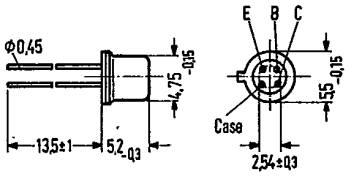
SIEMENS AKTIENGESELLSCHAF

T-31-07

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

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 ($T_{amb} \leq 45$ °C)	P_{tot}	60	mW

Thermal resistance

Junction to ambient air	R_{thJA}	≤750	K/W
Junction to case	R_{thJC}	≤400	K/W

Static characteristics (T_{amb} = 25 °C)

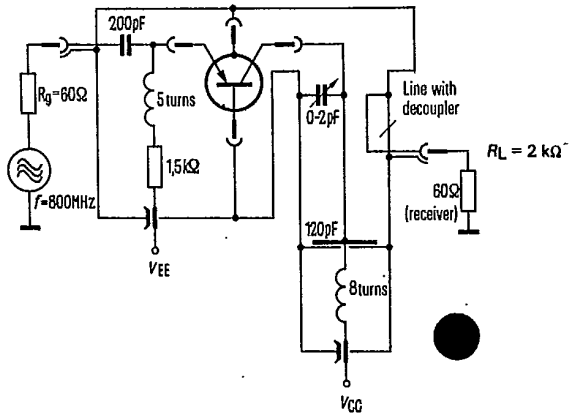
$-V_{CE}$ V	I_C mA	$-I_B$ µA	h_{FE} I_C/I_B	$-V_{BE}$ mV
10	2	40	50 (>10)	350
5	5	110	45	400

Collector cutoff current ($-V_{CES}$ = 20 V)	$-I_{CES}$	0.5 (<8)	µA
Collector cutoff current ($-V_{CEO}$ = 15 V)	$-I_{CEO}$	<500	µA
Emitter cutoff current ($-V_{EBO}$ = 0.3 V)	$-I_{EBO}$	<100	µA

Dynamic characteristics (T_{amb} = 25 °C)

Transition frequency($-I_C$=2mA; $-V_{CE}$=10V; f=100MHz)	f_T	780	MHz
Reverse transfer capacitance ($-I_C$ = 2 mA; $-V_{CE}$ = 10 V; f = 450 kHz)	$-C_{12e}$	0.2	pF
Power gain			
Operating point: $-I_C$ = 2 mA; $-V_{CE}$ = 10 V			
(f = 800 MHz; R_L = 500 Ω)	G_{pb}	12.5	dB
(f = 800 MHz; R_L = 2 kΩ)	G_{pb}	15 (>12.5)	dB
(f = 900 MHz; R_L = 500 Ω)	G_{pb}	12	dB
Noise figure			
(f = 800 MHz; R_g = 60 Ω)	NF	<5	dB
(f = 900 MHz; R_g = 60 Ω)	NF	<6	dB

Test circuit for power gain and noise figure at f = 800 MHz



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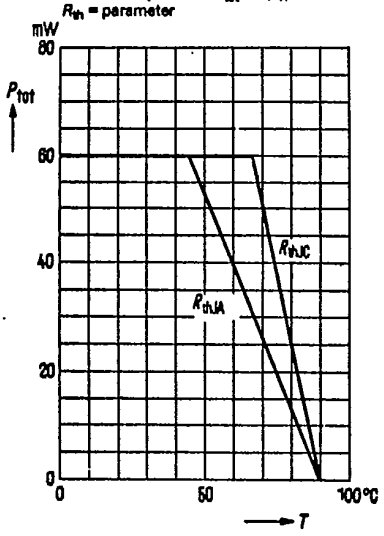
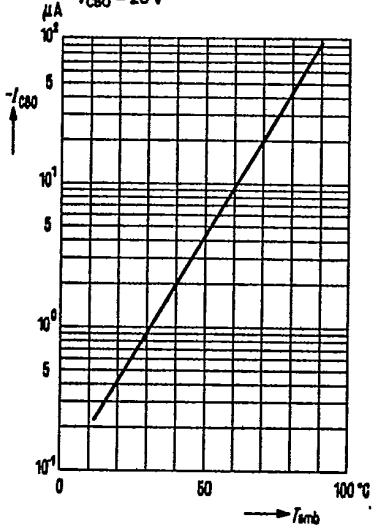
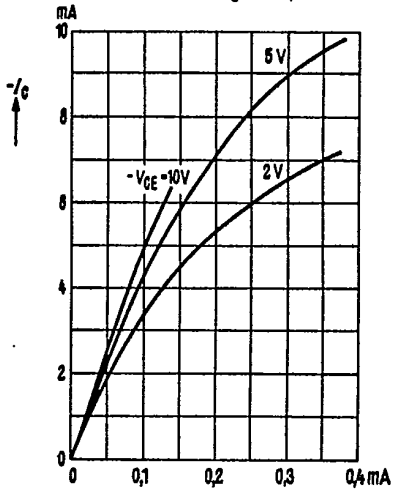
Total perm. power dissipation
versus temperature $P_{tot} = f(T)$;
R_{th} = parameter



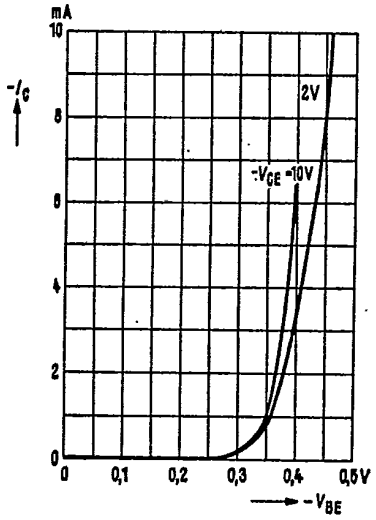
Collector cutoff current
versus temperature $I_{CBO} = f(T_{amb})$;
$-V_{CBO}$ = 20 V



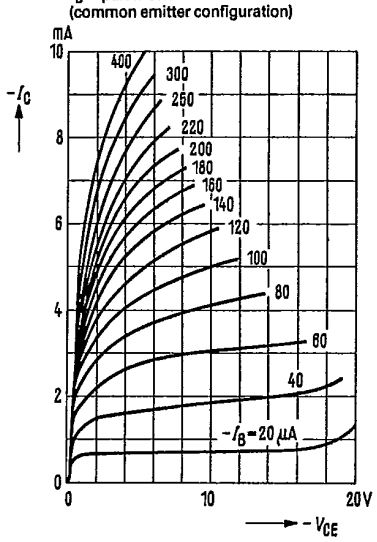
Collector current $I_C = f(V_B)$
V_{CE} = parameter
(common emitter configuration)



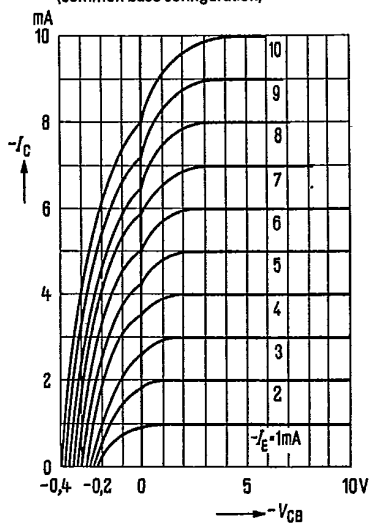
Collector current $I_C = f(V_{BE})$
V_{CE} = parameter
(common emitter configuration)



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)



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