

PNP Germanium RF Transistor

AF 240

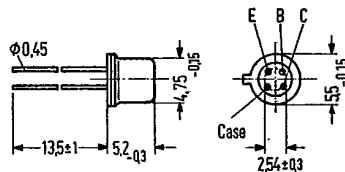
SIEMENS AKTIENGESELLSCHAFT

T-31-07

for mixer and oscillator stages up to 900 MHz

AF 240 is a germanium PNP mesa transistor in TO 72 case (18 A 4 DIN 41 876). The leads are electrically insulated from the case.

Type	Ordering code
AF 240	Q60106-X240



Approx. weight 0.4 g

Dimensions in mm

Maximum ratings

Collector-emitter voltage
 Collector-emitter voltage
 Emitter-base voltage
 Collector current
 Emitter current
 Base current
 Junction temperature
 Storage temperature range
 Total power dissipation ($T_{amb} \leq 45^\circ\text{C}$)

$-V_{CEO}$	15	V
$-V_{CES}$	20	V
$-V_{EBO}$	0.3	V
$-I_C$	10	mA
I_E	11	mA
$-I_B$	1	mA
T_j	90	$^\circ\text{C}$
T_{stg}	-30 to +75	$^\circ\text{C}$
P_{tot}	60	mW

Thermal resistance

Junction to ambient air
 Junction to case

R_{thJA}	≤ 750	K/W
R_{thJC}	≤ 400	K/W

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

$-V_{CE}$ V	$-I_C$ mA	$-I_B$ μA	h_{FE} I_C/I_B	$-V_{BE}$ mV
10	2	80	25 (> 10)	370

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

0.5 (< 8)

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

< 500

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

< 100

 μA **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

500

MHz

Reverse transfer capacitance

($-I_C = 1\text{ mA}$; $-V_{CE} = 10\text{ V}$; $f = 1\text{ MHz}$, $-C_{12e}$

0.26

pF

Power gain

($-I_C = 2\text{ mA}$; $-V_{CE} = 10\text{ V}$; $f = 800\text{ MHz}$; $R_L = 2\text{ k}\Omega$) G_{pb}

13

dB

Power gain

($-I_C = 2\text{ mA}$; $-V_{CE} = 10\text{ V}$; $f = 800\text{ MHz}$; $R_L = 50\Omega$) G_{pb}

11

dB

Noise figure

($-I_C = 2\text{ mA}$; $-V_{CE} = 10\text{ V}$; $f = 800\text{ MHz}$; $R_g = 60\Omega$)

NF

6.5

dB

($-I_C = 2\text{ mA}$; $-V_{CE} = 10\text{ V}$; $f = 200\text{ MHz}$; $R_g = 60\Omega$)

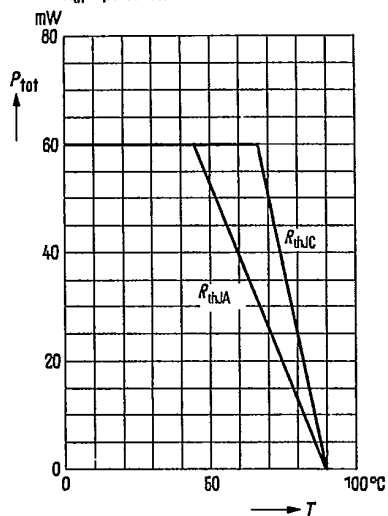
NF

3

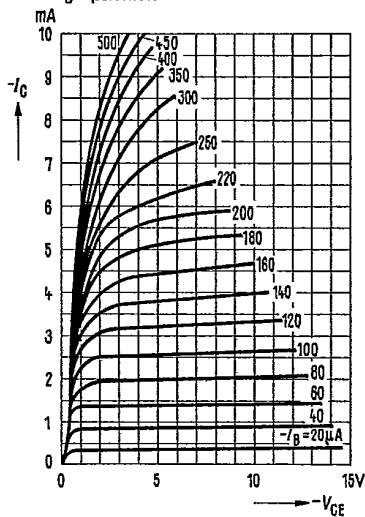
dB

Four-pole characteristics (measured at a spacing of 1 mm)Operating point: $-I_C = 3\text{ mA}$; $-V_{CE} = 10\text{ V}$; $f = 800\text{ MHz}$: $g_{11b} = 4,8\text{ mS}$
 $b_{11b} = -25\text{ mS}$ $|y_{12b}| = 0,31\text{ mS}$
 $\varphi_{12b} = -108^\circ$ $|y_{21b}| = 22\text{ mS}$
 $\varphi_{21b} = 25^\circ$ $g_{22b} = 0,5\text{ mS}$
 $b_{22b} = 5,2\text{ mS}$ $f = 400\text{ MHz}$: $g_{11b} = 30\text{ mS}$
 $b_{11b} = -46\text{ mS}$ $|y_{12b}| = 0,25\text{ mS}$
 $\varphi_{12b} = -90^\circ$ $|y_{21b}| = 51\text{ mS}$
 $\varphi_{21b} = 85^\circ$ $g_{22b} = 0,2\text{ mS}$
 $b_{22b} = 2,5\text{ mS}$

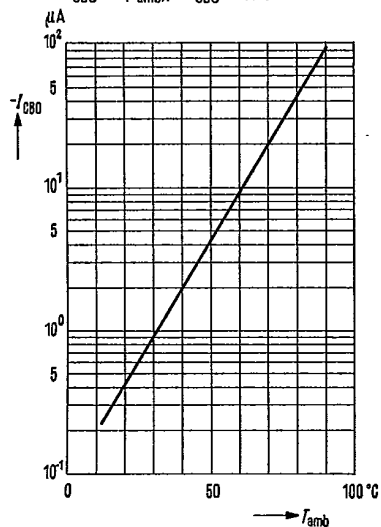
Total perm. power dissipation
versus temperature $P_{tot} = f(T)$;
 R_{th} = parameter



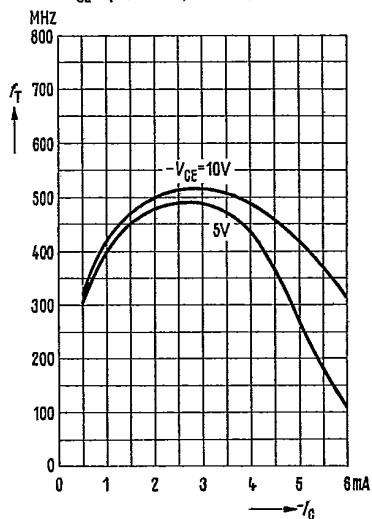
Output characteristics $I_C = f(V_{CE})$;
 I_B = parameter



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



Transition frequency $f_T = f(I_C)$;
 $-V_{CE}$ = parameter; $f = 100 \text{ MHz}$



PNP Germanium UHF Transistor

AF 279 S

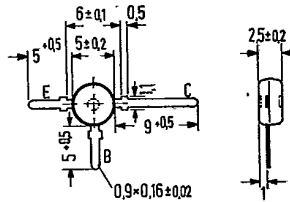
SIEMENS AKTIENGESELLSCHAFT 25C 04079 D

T-31-07

for input stages up to 900 MHz

AF 279 S is a germanium PNP UHF planar transistor with passivated surface in low-capacitance 50 B 3 DIN 41867 plastic package similar to TO 119. This transistor is particularly intended for use in low-noise regulated input stages up to 900 MHz in diode-tuned tuners.

Type	Ordering code
AF 279 S	Q62701-F87



Approx. weight 0.25 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	P_{tot}	60	mW

Thermal resistance

Junction to ambient air	R_{thJA}	≤ 600	K/W
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Static characteristics ($T_{amb} = 25^\circ\text{C}$)

$-V_{CE}$ 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 ($-V_{CES} = 20\text{ V}$)	$-I_{CES}$	1 (<15)	μA
Collector cutoff current ($-V_{CEO} = 15\text{ V}$)	$-I_{CEO}$	<500	μA
Emitter cutoff current ($-V_{EBO} = 0.3\text{ V}$)	$-I_{EBO}$	<100	μA

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	820	MHZ
Collector base capacitance ($-V_{CB} = 10\text{ V}$; $f = 1\text{ MHz}$)	$-C_{CBO}$	0.4	pF
Power gain ($-I_C = 2\text{ mA}$; $-V_{CE} = 10\text{ V}$; $f = 800\text{ MHz}$; $R_L = 2\text{ k}\Omega$)	G_{pb}	20	dB
($-I_C = 2\text{ mA}$; $-V_{CE} = 10\text{ V}$; $f = 900\text{ MHz}$; $R_L = 500\Omega$)	G_{pb}	12	dB
Noise figure ($-I_C = 2\text{ mA}$; $-V_{CE} = 10\text{ V}$; $f = 800\text{ MHz}$; $R_g = 60\Omega$)	NF	<4.5	dB

Four-pole characteristics:

$-I_C = 2\text{ mA}$; $-V_{CE} = 10\text{ V}$; $f = 800\text{ MHz}$ (measured at a spacing of 1.5 mm)

$g_{11b} = 23\text{ mS}$	$ y_{12b} = 0,6\text{ mS}$	$ y_{21b} = 38\text{ mS}$	$g_{22b} = 0,3\text{ mS}$
$-b_{11b} = 33\text{ mS}$	$\varphi_{12b} = -90^\circ$	$\varphi_{21b} = 75^\circ$	$b_{22b} = 2,5\text{ mS}$

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

