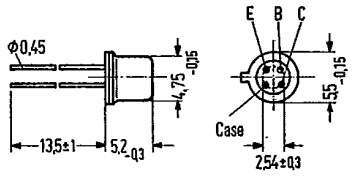
PNP Germanium RF Transistor — AF 240

SIEMENS AKTIENGESELLSCHAF 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 41876). 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	$-V_{CEO}$	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

T-31-07

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	80	25 (> 10)	370

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 ($-I_C$ = 2 mA; $-V_{CE}$ = 10 V; f = 100 MHz)	f_T	500	MHz
Reverse transfer capacitance ($-I_C$ = 1 mA; $-V_{CE}$ = 10 V; f = 1 MHz,	$-C_{12e}$	0.26	pF
Power gain ($-I_C$ = 2 mA; $-V_{CE}$ = 10 V; f = 800 MHz; R_L = 2 kΩ)	G_{pb}	13	dB
Power gain ($-I_C$ = 2 mA; $-V_{CE}$ = 10 V; f = 800 MHz; R_L = 500 Ω)	G_{pb}	11	dB
Noise figure ($-I_C$ = 2 mA; $-V_{CE}$ = 10 V; f = 800 MHz; R_g = 60 Ω)	NF	6.5	dB
($-I_C$ = 2 mA; $-V_{CE}$ = 10 V; f = 200 MHz; R_g = 60 Ω)	NF	3	dB

Four-pole characteristics (measured at a spacing of 1 mm)

Operating point: $-I_C$ = 3 mA; $-V_{CE}$ = 10 V;

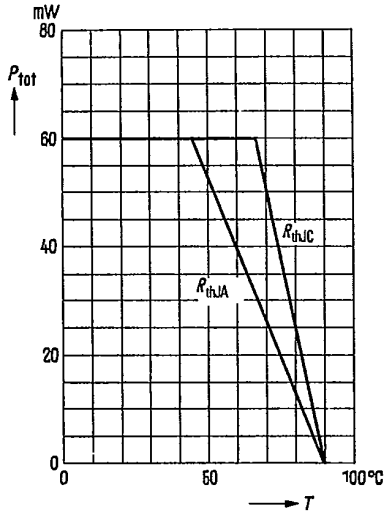
f = 800 MHz:

g_{11b} = 4,8 mS	$\lvert y_{12b}\rvert$ = 0,31 mS	$\lvert y_{21b}\rvert$ = 22 mS	g_{22b} = 0,5 mS
b_{11b} = −25 mS	φ_{12b} = −108°	φ_{21b} = 25°	b_{22b} = 5,2 mS

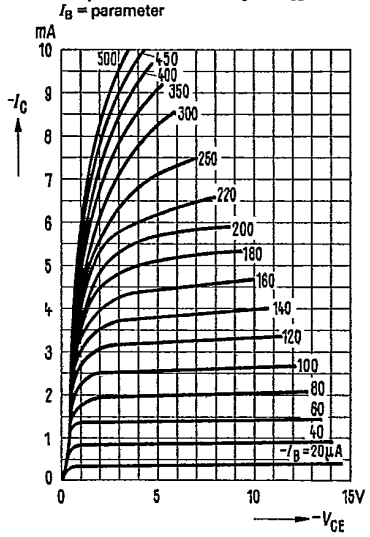
f = 400 MHz:

g_{11b} = 30 mS	$\lvert y_{12b}\rvert$ = 0,25 mS	$\lvert y_{21b}\rvert$ = 51 mS	g_{22b} = 0,2 mS
b_{11b} = −46 mS	φ_{12b} = −90°	φ_{21b} = 85°	b_{22b} = 2,5 mS

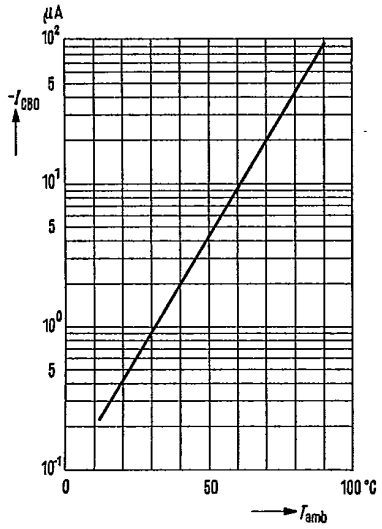
Total perm. power dissipation versus temperature $P_{tot} = f(T)$; R_{th} = parameter



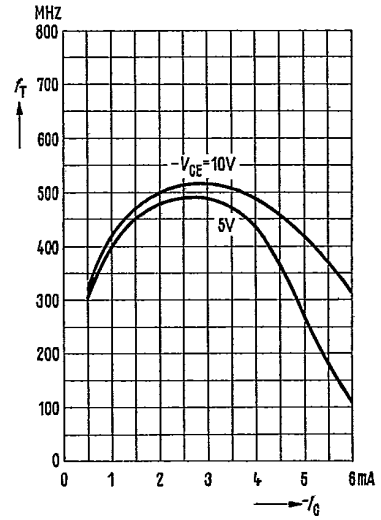
Output characteristics $I_C = f(V_{CE})$; I_B = parameter



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



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



PNP Germanium UHF Transistor

AF 279 S

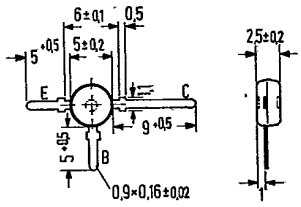
SIEMENS AKTIENGESELLSCHAF 25C 04079 D

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

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)	$-I_{CES}$	1 (<15)	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 ($-I_C$ = 2 mA; $-V_{CE}$ = 10 V; f = 100 MHz)	f_T	820	MHZ
Collector base capacitance ($-V_{CB}$ = 10 V; f = 1 MHz)	$-C_{CBO}$	0.4	pF
Power gain ($-I_C$ = 2 mA; $-V_{CE}$ = 10 V; f = 800 MHz; R_L = 2 kΩ)	G_{pb}	20	dB
($-I_C$ = 2 mA; $-V_{CE}$ = 10 V; f = 900 MHz; R_L = 500 Ω)	G_{pb}	12	dB
Noise figure ($-I_C$ = 2 mA; $-V_{CE}$ = 10 V; f = 800 MHz; R_g = 60 Ω)	NF	<4.5	dB

Four-pole characteristics:

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

g_{11b} = 23 mS	$\|y_{12b}\|$ = 0,6 mS	$\|y_{21b}\|$ = 38 mS	g_{22b} = 0,3 mS
$-b_{11b}$ = 33 mS	φ_{12b} = −90°	φ_{21b} = 75°	b_{22b} = 2,5 mS

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