

PNP Germanium UHF Transistor

AF 280 S

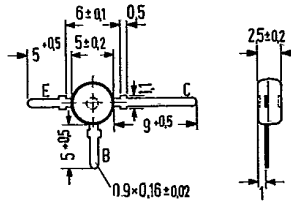
SIEMENS AKTIENGESELLSCHAFT

T-31-07

for mixer and oscillator circuits up to 900 MHz

AF 280 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 mixer and oscillator circuits up to 900 MHz in diode tuned tuners.

Type	Ordering code
AF 280 S	Q62701-F88



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	80	25 (>8)	370

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 ( $-I_C = 2\text{ mA}; -V_{CE} = 10\text{ V}; f = 100\text{ MHz}$ )

$f_T$  550 MHz

Collector-base capacitance ( $-V_{CB} = 10\text{ V}; f = 1\text{ MHz}$ )

$-C_{CBO}$  0.42 pF

Power gain

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

$G_{pb}$  16.5 dB

Power gain

( $-I_C = 2\text{ mA}; -V_{CE} = 10\text{ V}; f = 800\text{ MHz}; R_L = 500\ \Omega$ )

$G_{pb}$  14.5 dB

Noise figure

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

$NF$  6 dB

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

$NF$  2.6 dB

**Four-pole characteristics:**

$-I_C = 3\text{ mA}; -V_{CE} = 10\text{ V}$  (measured at a spacing of 1.5 mm)

$f = 200\text{ MHz}$ :

$g_{11b} = 94\text{ mS}$      $|Y_{12b}| = 0,15\text{ mS}$      $|Y_{21b}| = 88\text{ mS}$      $g_{22b} = 0,02\text{ mS}$   
 $-b_{11b} = 32\text{ mS}$      $\varphi_{12b} = -90^\circ$      $\varphi_{21b} = 144^\circ$      $b_{22b} = 0,6\text{ mS}$

$f = 800\text{ MHz}$ :

$g_{11b} = 22\text{ mS}$      $|Y_{12b}| = 0,6\text{ mS}$      $|Y_{21b}| = 37\text{ mS}$      $g_{22b} = 0,5\text{ mS}$   
 $-b_{11b} = 46\text{ mS}$      $\varphi_{12b} = -100^\circ$      $\varphi_{21b} = 48^\circ$      $b_{22b} = 3\text{ mS}$

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

