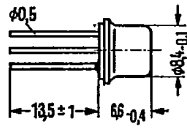


NPN Silicon Planar Transistor

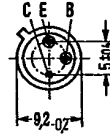
SIEMENS AKTIENGESELLSCHAFT

2 N 3019 is an epitaxial NPN silicon planar transistor in TO 39 case (5 C 3 DIN 41 873). The collector is electrically connected to the case. The transistor is particularly suitable for use in Af amplifiers and for AF switching applications.

Type	Ordering code
2 N 3019	Q68000-A627



Approx. weight 1.5 g



Dimensions in mm

Maximum ratings

Collector-base voltage	V_{CBO}	140	V
Collector-emitter voltage	V_{CEO}	80	V
Emitter-base voltage	V_{EBO}	7	V
Collector current	I_C	1	A
Junction temperature	T_j	200	°C
Storage temperature range	T_{stg}	-65 to +200	°C
Total power dissipation ($T_{amb} \leq 25\text{ °C}$)	P_{tot}	0.8	W
Total power dissipation ($T_{case} \leq 25\text{ °C}$)	P_{tot}	5	W

Thermal resistance

Junction to ambient air	R_{thJA}	≤ 218	K/W
Junction to case	R_{thJC}	≤ 35	K/W

SIEMENS AKTIENGESELLSCHAFT

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

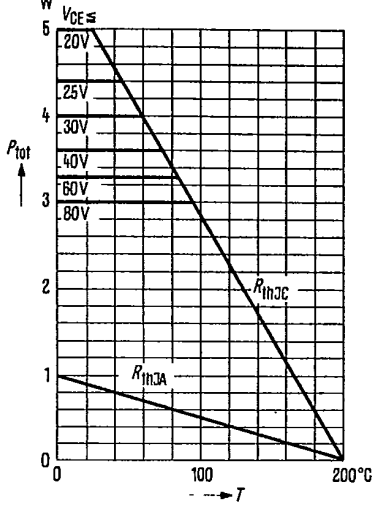
Collector-base breakdown voltage ($I_C = 100\ \mu\text{A}$)	$V_{(BR)CBO}$	> 140	V
Collector-emitter breakdown voltage ($I_C = 30\ \text{mA}$)	$V_{(BR)CEO}$	> 80	V
Emitter-base breakdown voltage ($I_E = 100\ \mu\text{A}$)	$V_{(BR)EBO}$	> 7	V
Collector-emitter saturation voltage ($I_C = 150\ \text{mA}$, $I_B = 15\ \text{mA}$)	V_{CEsat}	< 0.2	V
($I_C = 500\ \text{mA}$, $I_B = 50\ \text{mA}$)	V_{CEsat}	< 0.5	V
Base-emitter saturation voltage ($I_C = 150\ \text{mA}$, $I_B = 15\ \text{mA}$)	V_{BEsat}	< 1.1	V
Collector cutoff current ($V_{CBO} = 90\ \text{V}$)	I_{CBO}	< 10	nA
($V_{CBO} = 90\ \text{V}$, $T_{amb} = 150\text{ °C}$)	I_{CBO}	< 10	μA
Emitter cutoff current ($V_{EBO} = 5\ \text{V}$)	I_{EBO}	< 10	nA
DC current gain ($V_{CE} = 10\ \text{V}$, $I_C = 0.1\ \text{mA}$)	h_{FE}	> 50	-
($V_{CE} = 10\ \text{V}$, $I_C = 10\ \text{mA}$)	h_{FE}	> 90	-
($V_{CE} = 10\ \text{V}$, $I_C = 150\ \text{mA}$)	h_{FE}	100 to 300	-
($V_{CE} = 10\ \text{V}$, $I_C = 500\ \text{mA}$)	h_{FE}	> 50	-
($V_{CE} = 10\ \text{V}$, $I_C = 1\ \text{A}$)	h_{FE}	> 15	-
($V_{CE} = 10\ \text{V}$; $I_C = 150\ \text{mA}$; $T_{amb} = -55\text{ °C}$)	h_{FE}	> 40	-

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

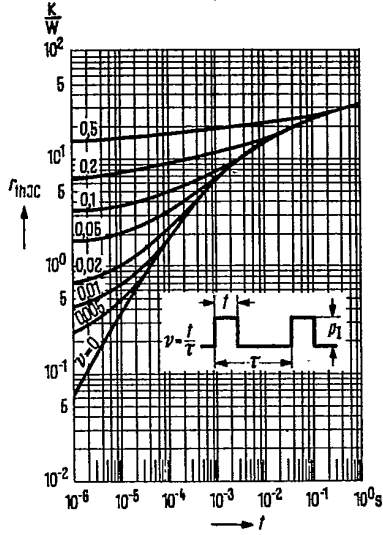
Transition frequency ($V_{CE} = 10\ \text{V}$, $I_C = 50\ \text{mA}$, $f = 20\ \text{MHz}$)	f_T	> 100	MHz
Collector base capacitance ($V_{CBO} = 10\ \text{V}$, $f = 1\ \text{MHz}$)	C_{CBO}	< 12	pF
Emitter base capacitance ($V_{EBO} = 0.5\ \text{V}$, $f = 1\ \text{MHz}$)	C_{EBO}	< 60	pF
Small signal current gain ($I_C = 1\ \text{mA}$, $V_{CE} = 5\ \text{V}$, $f = 1\ \text{kHz}$)	h_{fe}	80 to 400	-
Feedback time constant ($V_{CE} = 10\ \text{V}$, $I_C = 10\ \text{mA}$, $f = 4\ \text{MHz}$)	$r_{bb'} C_{bc}$	< 400	ps
Noise figure ($I_C = 100\ \mu\text{A}$, $V_{CE} = 10\ \text{V}$, $f = 1\ \text{kHz}$, $R_g = 1\ \text{k}\Omega$)	NF	< 4	dB
Switching times ($I_C = 500\ \text{mA}$; $I_{B1} = I_{B2} = 50\ \text{mA}$)			
Turn-on time	t_{on}	< 100	ns
Turn-off time	t_{off}	< 500	ns

SIEMENS AKTIENGESELLSCHAFT

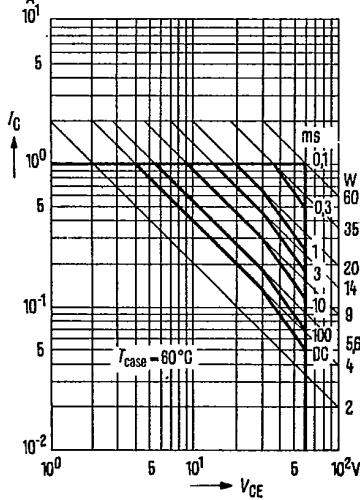
Total perm. power dissipation versus temperature
 $P_{tot} = f(T); V_{CE} = \text{parameter}$



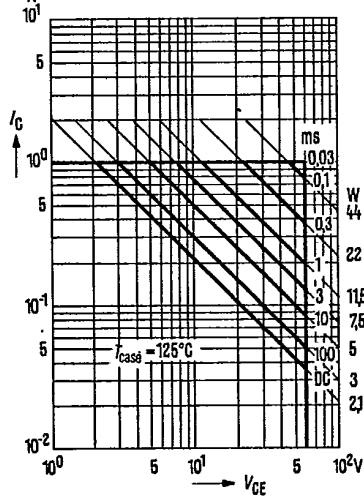
Permissible pulse load
 $r_{thJC} = f(t); v = \text{parameter}$



Permissible operating range
 $I_C = f(V_{CE}); (T_{case} = 60^{\circ}\text{C})$

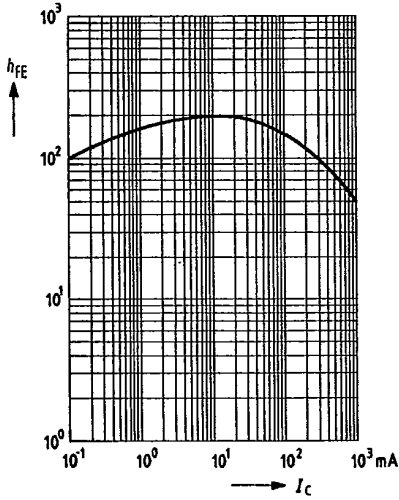


Permissible operating range
 $I_C = f(V_{CE}); (T_{case} = 125^{\circ}\text{C})$

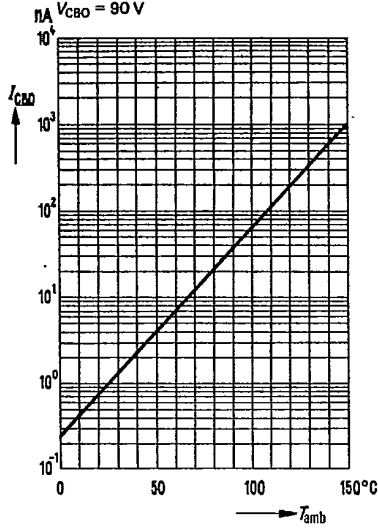


SIEMENS AKTIENGESELLSCHAFT

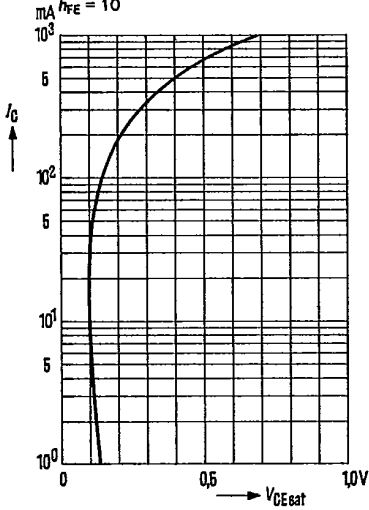
DC current gain $h_{FE} = f(I_C)$
 $V_{CE} = 10\text{ V}; T_{amb} = \text{parameter}$



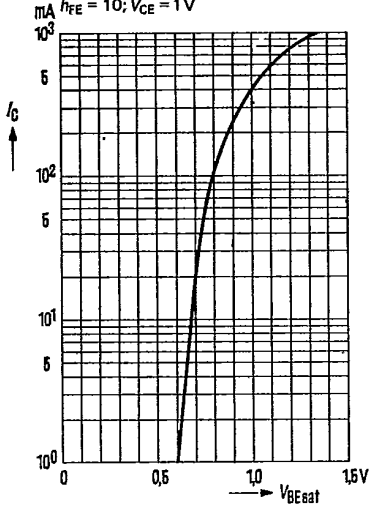
Collector cutoff current versus temperature $I_{CBO} = f(T_{amb})$
 $V_{CBO} = 90\text{ V}$



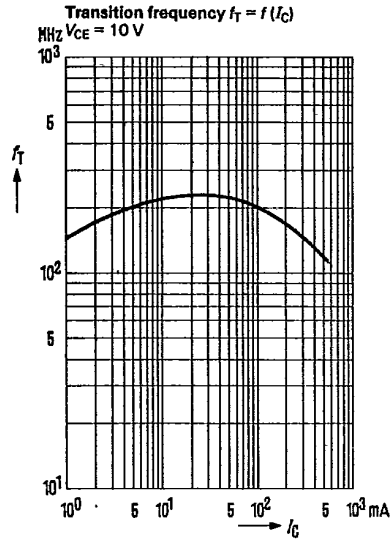
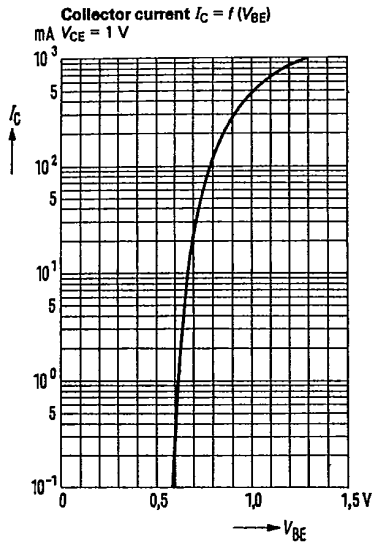
Collector-emitter saturation voltage $V_{CEsat} = f(I_C)$
 $h_{FE} = 10$



Base-emitter saturation voltage $V_{BEsat} = f(I_C)$
 $h_{FE} = 10; V_{CE} = 1\text{ V}$



— SIEMENS AKTIENGESELLSCHAFT



Test circuit for switching times

