PNP Silicon Planar Transistor

2 N 4033

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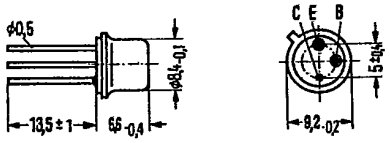
2 N 4033 is an epitaxial PNP silicon planar transistor in TO 39 case (5 C 3 DIN 41873). The collector is electrically connected to the case. The transistor is particularly intended for use in AF amplifiers and for AF switching applications up to 1 A.

Type	Ordering code
2 N 4033	Q62702-S154



Approx. weight 1.5 g

Dimensions in mm

Maximum ratings

Collector-base voltage	$-V_{CBO}$	80	V
Collector-emitter voltage	$-V_{CEO}$	80	V
Emitter-base voltage	$-V_{EBO}$	5	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 ($T_{amb} \leqq 25$ °C)	P_{tot}	0.8	W
Total power dissipation ($T_{case} \leqq 25$ °C)	P_{tot}	4	W

Thermal resistance

Junction to ambient air	R_{thJA}	≦ 220	K/W
Junction to case	R_{thJC}	≦ 44	K/W

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

Collector-base breakdown voltage ($-I_C$ = 10 µA)	$-V_{(BR)CBO}$	> 80	V
Collector-emitter breakdown voltage ($-I_C$ = 10 mA)	$-V_{(BR)CEO}$	> 80	V
Emitter-base breakdown voltage ($-I_E$ = 10 µA)	$-V_{(BR)EBO}$	> 5	V
Collector-emitter saturation voltage			
($-I_C$ = 150 mA, $-I_B$ = 15 mA)	$-V_{CEsat}$	< 0.15	V
($-I_C$ = 500 mA, $-I_B$ = 50 mA)	$-V_{CEsat}$	< 0.5	V
Base-emitter saturation voltage			
($-I_C$ = 150 mA, $-I_B$ = 15 mA)	$-V_{BEsat}$	< 0.9	V
($-I_C$ = 500 mA, $-I_B$ = 50 mA)	$-V_{BEsat}$	< 1.1	V
Collector cutoff current			
($-V_{CBO}$ = 60 V)	$-I_{CBO}$	< 50	nA
($-V_{CBO}$ = 60 V, T_{amb} = 150 °C)	$-I_{CBO}$	< 50	µA
Emitter cutoff current			
($-V_{EBO}$ = 5 V)	$-I_{EBO}$	< 10	mA
DC current gain			
($-V_{CE}$ = 5 V, $-I_C$ = 100 µA)	h_{FE}	> 75	–
($-V_{CE}$ = 5 V, $-I_C$ = 1 mA)	h_{FE}	> 25	–
($-V_{CE}$ = 5 V, $-I_C$ = 100 mA)	h_{FE}	100 to 300	–
($-V_{CE}$ = 5 V, $-I_C$ = 100 mA, T_{amb} = 55 °C)	h_{FE}	> 40	–
($-V_{CE}$ = 5 V, $-I_C$ = 500 mA)	h_{FE}	> 70	–

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

Transition frequency ($-V_{CE}$ = 10 V, $-I_C$ = 50 mA, f = 100 MHz)	f_T	> 150	MHz
Collector-base capacitance ($-V_{CBO}$ = 10 V, f = 1 MHz)	C_{CBO}	< 20	pF
Emitter-base capacitance ($-V_{EBO}$ = 0.5 V, f = 1 MHz)	C_{EBO}	< 110	pF
Switching times: ($-V_{CC}$ = 30 V, $-I_C$ = 500 mA, $-I_{B1} = I_{B2}$ = 50 mA)			
Turn-on time	t_{on}	< 100	ns
Storage time	t_s	< 350	ns
Fall time	t_f	< 50	ns

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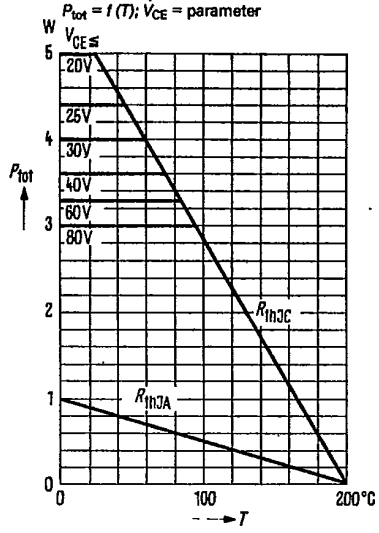
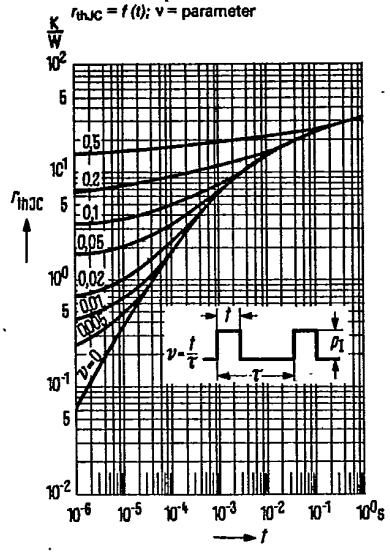
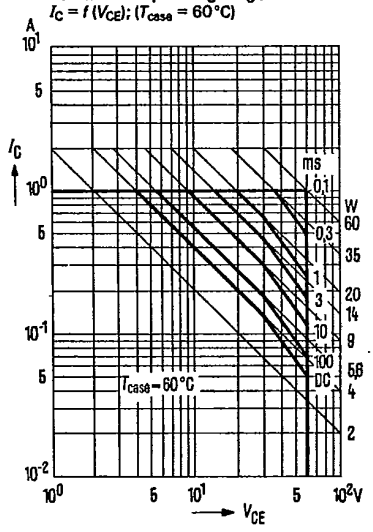
Total perm. power dissipation versus temperature
$P_{tot} = f(T)$; V_{CE} = parameter



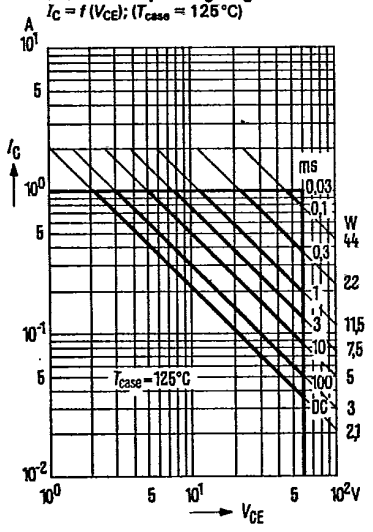
Permissible pulse load
$r_{thJC} = f(t)$; v = parameter



Permissible operating range
$I_C = f(V_{CE})$; (T_{case} = 60 °C)



Permissible operating range
$I_C = f(V_{CE})$; (T_{case} = 125 °C)



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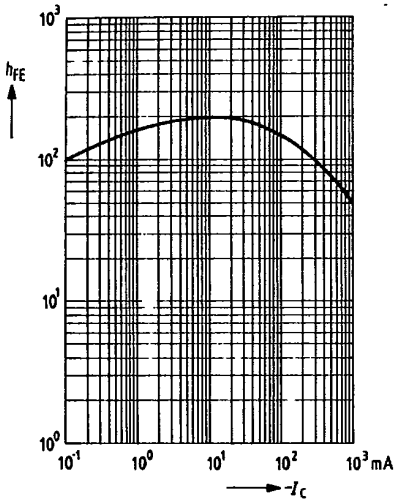
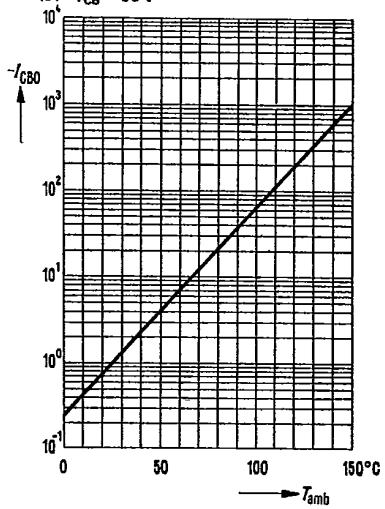
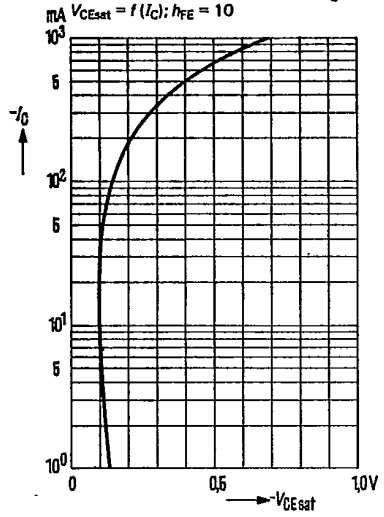
DC current gain $h_{FE} = f(I_C)$
V_{CE} = 5 V; T_{amb} = parameter



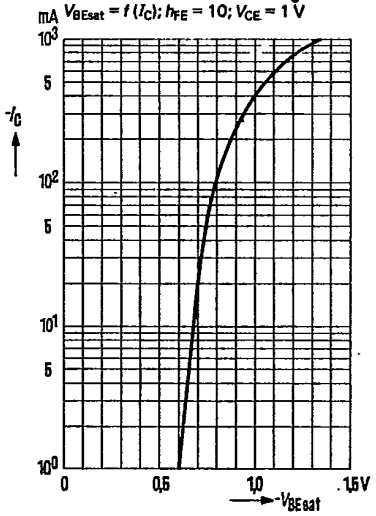
Collector cutoff current versus temperature $I_{CBO} = f(T_{amb})$
$-V_{CB}$ = 60 V



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 V



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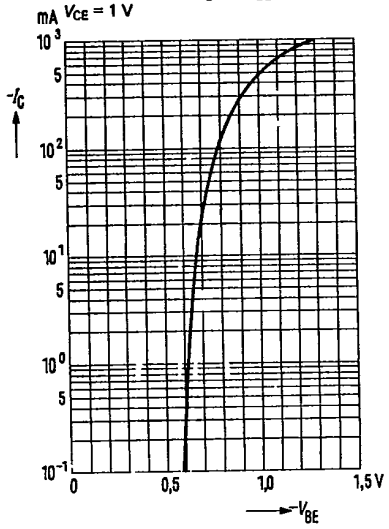
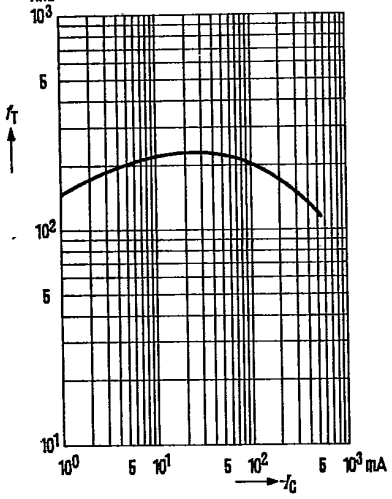
Collector current $I_C = f(V_{BE})$
$V_{CE} = 1$ V



Transition frequency $f_T = f(I_C)$
$V_{CE} = 10$ V



Test circuit for switching times