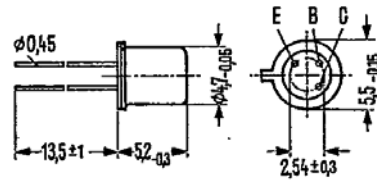


2N2220, 2N2221, and 2N2222 are epitaxial NPN silicon planar transistors in TO 18 case (18 A 3 DIN 41876). The collector is electrically connected to the case. The transistors are particularly suitable for use as high-speed switches.

Type	Ordering code
2N2220	Q68000-A4573
2N2221	Q62702-F134
2N2222	Q62702-F135



Approx. weight 0.33 g Dimensions in mm

Maximum ratings		2N2220 2N2221 2N2222	
Collector-emitter Voltage	V_{CEO}	30	V
Collector-base voltage	V_{CBO}	60	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_c	0.8	A
Junction temperature	T_j	175	
Storage temperature range	T_{stg}	-65 to +200	
Total power dissipation ($T_{amb} = 25^\circ\text{C}$)	P_{tot}	0.5	W
Total Power dissipation ($T_{case} = 25^\circ\text{C}$)	P_{tot}	1.8	W
Thermal resistance			
Junction to ambient air	R_{thJA}	≤ 300	K/W
Junction to case	R_{thJC}	≤ 83	K/W

Static characteristics (Tamb=25 °C)		2N2220	2N2221	2N2222	
Collector-base breakdown voltage (Ic=10µA)	V _{(BR)CBO}	>60	>60	>60	V
Collector-emitter Breakdown voltage (Ic=10mA)	V _{(BR)CEO}	>30	>30	>30	V
Emitter-base breakdown voltage (I _E =10µA)	V _{(BR)EBO}	>5	>5	>5	V
Collector-emitter saturation voltage (I _B =15mA; I _C =150mA)	V _{CEsat}	<0.4	<0.4	<0.4	V
(I _B =50mA; I _C =500mA)	V _{CEsat}	-	<1.6	<1.6	V
Base-emitter saturation voltage (Ic=150mA; I _B =15mA)	V _{BEsat}	<1.3	<1.3	<1.3	V
(Ic=500mA; I _B =50mA)	V _{BEsat}	-	<2.6	<2.6	V
Emitter Cutoff Current (V _{EB} =3V)	I _{EBO}	<10	<10	<10	nA
Collector cutoff current (V _{CB} =50V)	I _{CBO}	<10	<10	<10	nA
(V _{CB} =50V; Tamb=150 °C)	I _{CBO}	<10	<10	<10	µA
DC current gain (V _{CE} =10V; I _C =0.1mA)	h _{FE}	-	>20	>35	-
(V _{CE} =10V; I _C =1mA)	h _{FE}	>12	>25	>50	-
(V _{CE} =10V; I _C =10mA)	h _{FE}	>17	>35	>75	-
(V _{CE} =10V; I _C =150mA)	h _{FE}	20 to 60	40 to 120	100 to 300	-
(V _{CE} =10V; I _C =500mA)	h _{FE}	-	>20	>30	-
(V _{CE} =10V; I _C =150mA)	h _{FE}	>10	>20	>50	-
Dynamic characteristics (Tamb=25 °C)					
Collector base capacitance (V _{CB} =10V; f=1MHz)	C _{CBO}	<8	<8	<8	pF
Transition frequency (V _{CE} =20V; I _C =20mA; f=100MHz)	f _T	>250	>250	>250	MHz
Switching times: (V _{CC} =20V; I _C =150mA; I _{B1} approx. I _{B2} approx. 150mA)					
Delay time	t _d	5	5	5	ns
Rise time	t _r	15	15	15	ns
Storage time	t _s	190	190	190	ns
Fall time	t _f	23	23	23	ns