

NPN 2N2222 – 2N2222A PNP 2N2907 – 2N2907A

SILICON PLANAR EPITAXIAL TRANSISTORS

The 2N2222 and 2N2222A are NPN transistors mounted in TO-18 metal package with the collector connected to the case .
They are primarily intended for high speed switching. The 2N2222 is also suitable for d.c. and v.h.f./u.h.f. amplifiers .
PNP complements are 2N2907 and 2N2907A .
Compliance to RoHS

ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings		Value	Unit
V_{CEO}	Collector-Emitter Voltage	2N2222A	40(1)	V
		2N2222	30	
V_{CBO}	Collector-Base Voltage	2N2222A	75	V
		2N2222	60	
V_{EBO}	Emitter-Base Voltage	2N2222A	6	V
		2N2222	5	
I_C	Collector Current	2N2222A	800	mA
		2N2222		
P_D	Total Power Dissipation	@ $T_{amb} = 25^\circ$ 2N2222A 2N2222	0.5	Watts
	Total Power Dissipation	@ $T_{case} = 25^\circ$ 2N2222A 2N2222	1.2	Watts
T_J	Junction Temperature	2N2222A	200	$^\circ\text{C}$
		2N2222		
T_{Stg}	Storage Temperature range	2N2222A	-65 to +200	$^\circ\text{C}$
		2N2222		

(1) Applicable up to $I_C = 500\text{mA}$

THERMAL CHARACTERISTICS

Symbol	Ratings		Value	Unit
R_{thJ-a}	Thermal Resistance, Junction to ambient in free air	2N2222A	350	K/W
		2N2222		
R_{thJ-c}	Thermal Resistance, Junction to case	2N2222A	146	K/W
		2N2222		

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ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

Symbol	Ratings	Test Condition(s)		Min	Typ	Mx	Unit
I_{CBO}	Collector Cutoff Current	$V_{CB}=60\text{ V}, I_E=0V$	2N2222A	-	-	10	nA
		$V_{CB}=50\text{ V}, I_E=0V$	2N2222				
I_{CBO}	Collector Cutoff Current	$V_{CB}=60\text{ V}, I_E=0V, T_j=150^{\circ}C$	2N2222A	-	-	10	μA
		$V_{CB}=50\text{ V}, I_E=0V, T_j=150^{\circ}C$	2N2222				
I_{EBO}	Emitter Cutoff Current	$V_{BE}=3.0\text{ V}, I_C=0$	2N2222A	-	-	10	nA
			2N2222				
I_{CEX}	Collector Cutoff Current	$V_{CE}=60\text{ V}, -V_{BE}=3V$	2N2222A	-	-	10	nA
			2N2222				
V_{CEO}	Collector Emitter Breakdown Voltage	$I_C=10\text{ mA}, I_B=0$	2N2222A	40	-	-	V
			2N2222	30	-	-	
V_{CBO}	Collector Base Breakdown Voltage	$I_C=10\text{ }\mu A, I_E=0$	2N2222A	75	-	-	V
			2N2222	60	-	-	
V_{EBO}	Emitter Base Breakdown Voltage	$I_E=10\text{ }\mu A, I_C=0$	2N2222A	6	-	-	V
			2N2222	5	-	-	
h_{FE}	DC Current Gain	$I_C=0.1\text{ mA}, V_{CE}=10\text{ V}$	2N2222A	35	-	-	-
		2N2222					
		$I_C=1\text{ mA}, V_{CE}=10\text{ V}$	2N2222A	50	-	-	
		2N2222					
		$I_C=10\text{ mA}, V_{CE}=10\text{ V}$	2N2222A	75	-	-	
		2N2222					
		$I_C=10\text{ mA}, V_{CE}=10\text{ V}$ $T_{amb} = -55^{\circ}$	2N2222A	35	-	-	
		2N2222					
		$I_C=150\text{ mA}, V_{CE}=1\text{ V (1)}$	2N2222A	50	-	-	
		2N2222					
$I_C=150\text{ mA}, V_{CE}=10\text{ V (1)}$	2N2222A	100	-	-			
2N2222							
$I_C=500\text{ mA}, V_{CE}=10\text{ V (1)}$	2N2222A	40	-	-			
2N2222	30				-	-	
$V_{CE(SAT)}$	Collector-Emitter saturation Voltage (1)	$I_C=150\text{ mA}, I_B=15\text{ mA}$	2N2222A	-	-	0.3	V
			2N2222	-	-	0.4	
		$I_C=500\text{ mA}, I_B=50\text{ mA}$	2N2222A	-	-	1	
			2N2222	-	-	1.6	
$V_{BE(SAT)}$	Base-Emitter saturation Voltage (1)	$I_C=150\text{ mA}, I_B=15\text{ mA}$	2N2222A	-	-	1.2	
			2N2222	-	-	1.3	
		$I_C=500\text{ mA}, I_B=50\text{ mA}$	2N2222A	-	-	2	
			2N2222	-	-	2.6	

Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit
f_T	Transition frequency	$I_C=20\text{ mA}, V_{CE}=20\text{ V}$ $f=100\text{ MHz}$	250	-	-	MHz
			300	-	-	
h_{fe}	Small signal current gain	$I_C=1\text{ A}, V_{CE}=2.0\text{ V}$	3	-	-	-
			2.5	-	-	

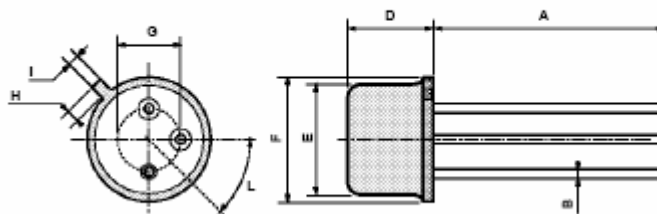
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Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit
t_d	Delay time	$I_C=150\text{ mA}$, $I_B=15\text{ mA}$	-	-	10	ns
t_r	Rise time	$-V_{BE}=0.5\text{ V}$	-	-	25	ns
C_C	Collector capacitance	$I_E=I_C=0$, $V_{CB}=10\text{ V}$ $f=100\text{ kHz}$	-	-	8	pF
C_E	Emitter capacitance	$I_C=I_E=0$, $V_{EB}=0.5\text{ V}$ $f=100\text{ kHz}$	-	-	25	pF
r_b, C_C	Feedback time constant	$I_C=20\text{ mA}$, $V_{CE}=20\text{ V}$ $f=31.8\text{ MHz}$	-	-	150	ps

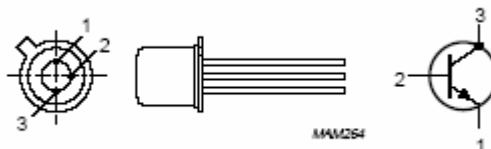
(1) Pulse conditions : $t_p < 300\text{ }\mu\text{s}$, $\delta=2\%$

MECHANICAL DATA CASE TO-18

DIMENSIONS		
	mm	inches
A	12,7	0,5
B	0,49	0,019
D	5,3	0,208
E	4,9	0,193
F	5,8	0,228
G	2,54	0,1
H	1,2	0,047
I	1,16	0,045
L	45°	45°



Pin 1 :	Emitter
Pin 2 :	Base
Pin 3 :	Collector



Information furnished is believed to be accurate and reliable. However, CS assumes no responsibility for the consequences of use of such information nor for errors that could appear.

Data are subject to change without notice.