

**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	@ $T_{amb} = 25^\circ$	0.5	Watts
		2N2222A		
$P_D$	Total Power Dissipation	@ $T_{case} = 25^\circ$	1.2	Watts
		2N2222A		
$T_J$	Junction Temperature	2N2222A	200	$^\circ C$
		2N2222		
$T_{Stg}$	Storage Temperature range	2N2222A	-65 to +200	$^\circ C$
		2N2222		

(1) Applicable up to  $I_C = 500mA$

### 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		

**NPN 2N2222 – 2N2222A  
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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	$V_{CB}=60\text{ V}, I_E=0\text{ V}$	2N2222A	-	-	10	nA
		$V_{CB}=50\text{ V}, I_E=0\text{ V}$	2N2222	-	-	-	-
$I_{CBO}$	Collector Cutoff Current	$V_{CB}=60\text{ V}, I_E=0\text{ V}, T_J=150^\circ\text{C}$	2N2222A	-	-	10	$\mu\text{A}$
		$V_{CB}=50\text{ V}, I_E=0\text{ V}, T_J=150^\circ\text{C}$	2N2222	-	-	-	-
$I_{EBO}$	Emitter Cutoff Current	$V_{BE}=3.0\text{ V}, I_C=0$	2N2222A	-	-	10	nA
			2N2222	-	-	-	-
$I_{CEX}$	Collector Cutoff Current	$V_{CE}=60\text{ V}, -V_{BE}=3\text{ V}$	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	$I_C=10\text{ }\mu\text{A}, I_E=0$	2N2222A	75	-	-	V
			2N2222	60	-	-	-
$V_{EBO}$	Emitter Base Breakdown Voltage	$I_E=10\text{ }\mu\text{A}, I_C=0$	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	-	-	-	-
$V_{CE(SAT)}$	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	
		$I_C=150\text{ mA}, I_B=15\text{ mA}$	2N2222A	-	-	1.2	
			2N2222	-	-	1.3	
$V_{BE(SAT)}$	Base-Emitter saturation Voltage (1)	$I_C=150\text{ mA}, I_B=15\text{ mA}$	2N2222A	-	-	2	V
			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	$I_C=20\text{ mA}, V_{CE}=20\text{ V}$	2N2222A	250	-	-	MHz
		$f=100\text{ MHz}$	2N2222	300	-	-	
$h_{fe}$	Small signal current gain	$I_C=1\text{ A}, V_{CE}=2.0\text{ V}$	2N2222A	3	-	-	-
			2N2222	2.5	-	-	

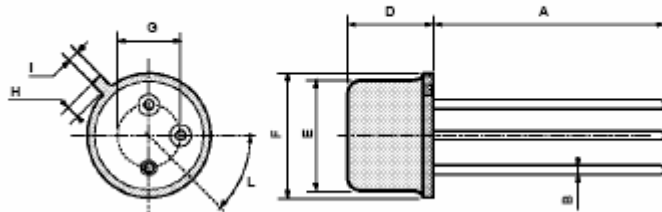
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Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit
$t_d$	Delay time	$I_C=150\text{ mA}$ , $I_B=15\text{ mA}$	-	-	10	ns
$t_r$	Rise time	$-V_{BE}=0.5\text{ V}$	-	-	25	
$C_C$	Collector capacitance	$I_E=I_c=0$ , $V_{CB}=10\text{ V}$ $f=100\text{ kHz}$	-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

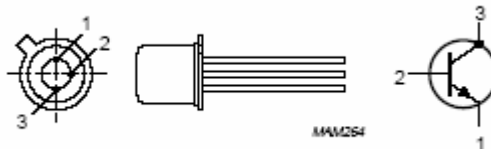
(1) Pulse conditions :  $t_p < 300\ \mu\text{s}$ ,  $\delta = 2\%$

**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.