

2N2222A

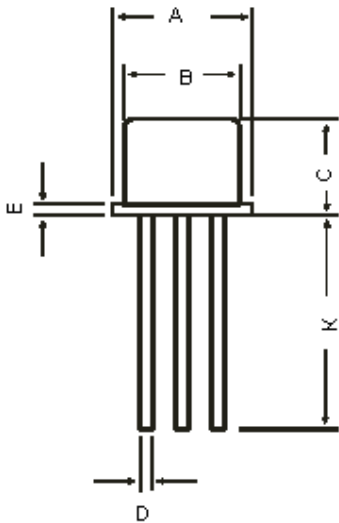
High Speed Switching Transistor



Features:

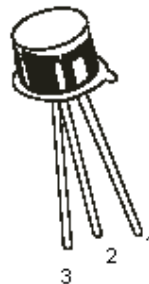
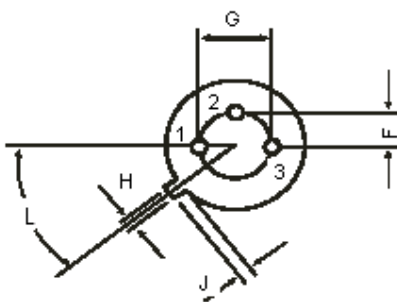
- NPN Silicon Planar Switching Transistor.
- Fast switching devices exhibiting short turn-off and low saturation voltage characteristics.
- Switching and Linear application DC and VHF Amplifier applications.

TO-18 Metal Can Package



Dimensions	Minimum	Maximum
A	5.24	5.84
B	4.52	4.97
C	4.31	5.33
D	0.4	0.53
E	—	0.76
F	—	1.27
G	—	2.97
H	0.91	1.17
J	0.71	1.21
K	12.7	—
L	45°	

Dimensions : Millimetres



Pin Configuration:

1. Emitter
2. Base
3. Collector



Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Collector-Emitter Voltage	V_{CEO}	40	V
Collector-Base Voltage	V_{CBO}	75	
Emitter-Base Voltage	V_{EBO}	6.0	
Collector Current Continuous	I_C	800	mA
Power Dissipation at $T_a = 25^\circ\text{C}$ Derate above 25°C	P_D	500 2.28	mW mW/ $^\circ\text{C}$
Power Dissipation at $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.2 6.85	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$

Electrical Characteristics ($T_a = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Value		
			Minimum	Maximum	Unit
Collector-Emitter Voltage	V_{CEO}	$I_C = 10\text{mA}, I_B = 0$	40	-	V
Collector-Base Voltage	V_{CBO}	$I_C = 10\mu\text{A}, I_E = 0$	75	-	
Emitter-Base Voltage	V_{EBO}	$I_E = 10\mu\text{A}, I_C = 0$	6.0	-	
Collector-Cut off Current	I_{CBO}	$V_{CB} = 60\text{V}, I_E = 0$	-	10	nA
	I_{CEX}	$T_a = 150^\circ\text{C}$ $V_{CB} = 60\text{V}, I_E = 0$ $V_{CE} = 60\text{V}, V_{EB} = 3\text{V}$	-	10 10	μA nA
Emitter-Cut off Current	I_{EBO}	$V_{EB} = 3\text{V}, I_C = 0$	-	10	nA
Base-Cut off Current	I_{BL}	$V_{CE} = 60\text{V}, V_{EB} = 3\text{V}$	-	20	
Collector Emitter Saturation Voltage	$*V_{CE(Sat)}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$	-	0.3	V
		$I_C = 500\text{mA}, I_B = 50\text{mA}$	-	1.0	
Base Emitter Saturation Voltage	$*V_{BE(Sat)}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$	-	0.6-1.2	
		$I_C = 500\text{mA}, I_B = 50\text{mA}$	-	2.0	

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Electrical Characteristics ($T_a = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Rating	Unit
DC Current Gain	h_{FE}	$I_C = 0.1\text{mA}, V_{CE} = 10\text{V}$	>35	-
		$I_C = 1\text{mA}, V_{CE} = 10\text{V}$	>50	
		$I_C = 10\text{mA}, V_{CE} = 10\text{V}$	>75	
		$T_a = 55^\circ\text{C}$		
		$I_C = 10\text{mA}, V_{CE} = 10\text{V}$	>35	
		$I_C = 150\text{mA}, V_{CE} = 10\text{V}$	100-300	
		$I_C = 150\text{mA}, V_{CE} = 1\text{V}$	>50	
		$I_C = 500\text{mA}, V_{CE} = 10\text{V}$	>40	
Dynamic Characteristics				
		ALL F = 1kHz		
Small Signal Current Gain	h_{fe}	$I_C = 1\text{mA}, V_{CE} = 10\text{V}$ $I_C = 10\text{mA}, V_{CE} = 10\text{V}$	50 - 300 75 - 375	-
Input Impedance	h_{ie}	$I_C = 1\text{mA}, V_{CE} = 10\text{V}$ $I_C = 10\text{mA}, V_{CE} = 10\text{V}$	2.0-8.0 0.25-1.25	k Ω
Voltage Feedback Ratio	h_{re}	$I_C = 1\text{mA}, V_{CE} = 10\text{V}$ $I_C = 10\text{mA}, V_{CE} = 10\text{V}$	<8.0 <4.0	$\times 10^{-4}$
Output Admittance	h_{oe}	$I_C = 1\text{mA}, V_{CE} = 10\text{V}$ $I_C = 10\text{mA}, V_{CE} = 10\text{V}$	5.0-35 25-200	umhos
Collector Base Time Constant	$rb'Cc$	$I_E = 20\text{mA}, V_{CB} = 20\text{V}$ $f = 31.8\text{MHz}$	<150	ps
Real Part Common-Emitter High Frequency	$Re_{(hie)}$	$I_C = 20\text{mA}, V_{CE} = 20\text{V}$	<60	Ω
Input Impedance	-	$f = 300\text{MHz}$	-	-
Noise Figure	N_F	$I_C = 100\mu\text{A}, V_{CE} = 10\text{V}$ $R_s = 1\text{kohms}, f = 1\text{kHz}$	<4.0	dB
Dynamic Characteristics				
Transistors Frequency	f_t	$I_C = 20\text{mA}, V_{CE} = 20\text{V}$ $f = 100\text{MHz}$	>300	MHz
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}, I_E = 0$ $f = 100\text{kHz}$	<8.0	pF
Input Capacitance	C_{ib}	$V_{EB} = 0.5\text{V}, I_C = 0$ $f = 100\text{kHz}$	<25	
Switching Time				
Delay Time	t_d	$I_C = 150\text{mA}, I_{B1} = 15\text{mA}$	<10	ns
Rise Time	t_r	$V_{CC} = 30\text{V}, V_{BE} = 0.5\text{V}$	<25	
Storage Time	t_s	$I_C = 150\text{mA}, I_{B1} =$	<225	
Fall Time	t_f	$I_{B2} = 15\text{mA}, V_{CC} = 30\text{V}$	<60	

*Pulse Condition: Pulse Width = 300 μs , Duty Cycle = 2%



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Specifications

V_{CEO} maximum (V)	I_C maximum (A)	$V_{CE(sat)}$ maximum (V) at $I_C = 150mA$	t_{off} maximum (ns) at $I_C = 150mA$	h_{FE} minimum at $I_C = 150mA$	P_{tot} at 25°C (mW)	Package and Pin Out	Part Number
40	0.8	0.3	60	100	500	TO-18	2N2222A



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Notes:

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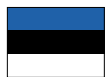
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