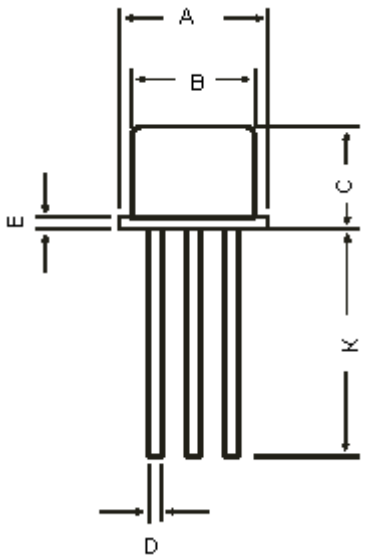
2N2222A

High Speed Switching Transistor

Features:

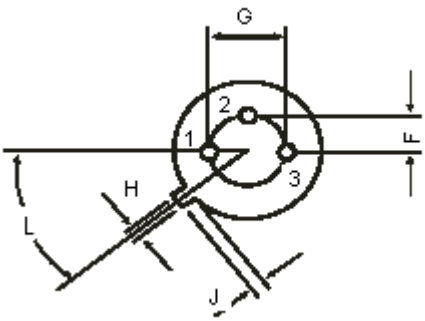
- NPN Silicon Planar Switching Transistor.
- Fast switching devices exhibiting short turn-off and low saturation voltage characteristics.
- Switching and Linear application DC and VHF Amplifier applications.

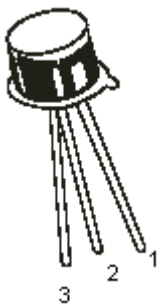
TO-18 Metal Can Package



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°C Derate above 25°C	P_D	500 2.28	mW mW/°C
Power Dissipation at T_C= 25°C Derate above 25°C	P_D	1.2 6.85	W mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	°C

Electrical Characteristics (T_a = 25°C unless otherwise specified)

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

Electrical Characteristics (T_a = 25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Rating	Unit
DC Current Gain	h_{FE}	I_C = 0.1mA, V_{CE} = 10V I_C = 1mA, V_{CE} = 10V I_C = 10mA, V_{CE} = 10V T_a = 55°C I_C = 10mA, V_{CE} = 10V I_C = 150mA, V_{CE} = 10V I_C = 150mA, V_{CE} = 1V I_C = 500mA, V_{CE} = 10V	>35 >50 >75 >35 100-300 >50 >40	-
Dynamic Characteristics				
		ALL F = 1kHz		
Small Signal Current Gain	h_{fe}	I_C = 1mA, V_{CE} = 10V I_C = 10mA, V_{CE} = 10V	50 - 300 75 - 375	-
Input Impedance	h_{ie}	I_C = 1mA, V_{CE} = 10V I_C = 10mA, V_{CE} = 10V	2.0-8.0 0.25-1.25	kΩ
Voltage Feedback Ratio	h_{re}	I_C = 1mA, V_{CE} = 10V I_C = 10mA, V_{CE} = 10V	<8.0 <4.0	x10-4
Output Admittance	h_{oe}	I_C = 1mA, V_{CE} = 10V I_C = 10mA, V_{CE} = 10V	5.0-35 25-200	umhos
Collector Base Time Constant	rb'Cc	I_E = 20mA, V_{CB} = 20V f = 31.8MHz	<150	ps
Real Part Common-Emitter High Frequency	$Re_{(hie)}$	I_C = 20mA, V_{CE} = 20V	<60	Ω
Input Impedance	-	f = 300MHz	-	-
Noise Figure	N_F	I_C = 100µA, V_{CE} = 10V Rs = 1kohms, f = 1kHz	<4.0	dB
Dynamic Characteristics				
Transistors Frequency	f_t	I_C = 20mA, V_{CE} = 20V f = 100MHz	>300	MHz
Output Capacitance	C_{ob}	V_{CB} = 10V, I_E = 0 f = 100kHz	<8.0	pF
Input Capacitance	C_{ib}	V_{EB} = 0.5V, I_C = 0 f = 100kHz	<25	
Switching Time				
Delay Time Rise Time	t_d t_r	I_C = 150mA,I_{B1} = 15mA V_{CC} = 30V, V_{BE} = 0.5V	<10 <25	ns
Storage Time Fall Time	t_s t_f	I_C = 150mA, I_{B1} = I_{B2} = 15mA, V_{CC} = 30V	<225 <60	

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

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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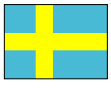

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