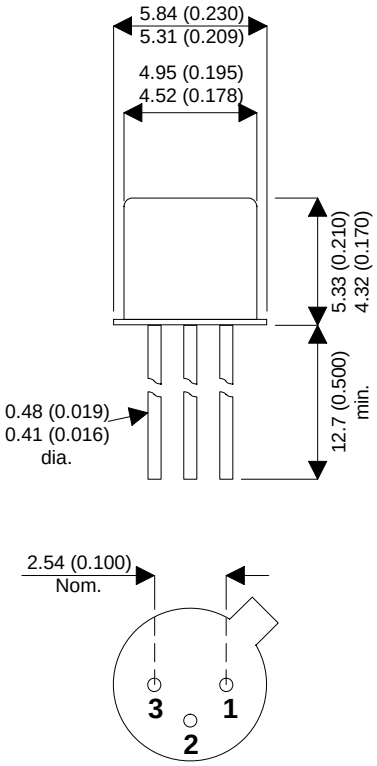
2N2222A

MECHANICAL DATA

Dimensions in mm (inches)



TO–18 METAL PACKAGE

Underside View

PIN 1 – Emitter PIN 2 – Base PIN 3 – Collector

HIGH SPEED MEDIUM POWER, NPN SWITCHING TRANSISTOR

FEATURES

- **SILICON PLANAR EPITAXIAL NPN TRANSISTOR**
- **HIGH SPEED SATURATED SWITCHING**
- **ALSO AVAILABLE IN CERAMIC SURFACE MOUNT PACKAGE**

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise stated)

V_{CBO}	Collector – Base Voltage		75V
V_{CEO}	Collector – Emitter Voltage		40V
V_{EBO}	Emitter – Base Voltage		6V
I_C	Collector Current		800mA
P_D	Total Device Dissipation	@ T_A = 25°C	0.5mW
	Derate above 25°C		2.28mW / °C
P_D	Total Device Dissipation	@ T_C = 25°C	1.2W
	Derate above 25°C		6.85mW / °C
T_J , T_{STG}	Operating and Storage Junction Temperature Range		–65 to +200°C

SEME LAB

2N2222A

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise stated)

	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
	OFF CHARACTERISTICS						
$V_{(BR)CEO}$	Collector – Emitter Sustaining Voltage	I_C = 10mA	I_B = 0	40			V
$V_{(BR)CBO}$	Collector – Base Breakdown Voltage	I_C = 10µA	I_E = 0	75			V
$V_{(BR)EBO}$	Emitter – Base Breakdown Voltage	I_E = 10µA	I_C = 0	6			V
I_{CEX}	Collector Cut-off Current	V_{CE} = 60V	$V_{EB(off)}$ = 3V			10	nA
I_{CBO}	Collector – Base Cut-off Current	I_E = 0	V_{CB} = 60V			0.01	µA
			T_A = 150°C			10	
I_{EBO}	Emitter Cut-off Current (I_C = 0)	I_C = 0	V_{EB} = 3V			10	nA
I_{BL}	Base Current	V_{CE} = 60V	$V_{EB(off)}$ = 3V			20	nA
	ON CHARACTERISTICS						
$V_{CE(sat)}$[1]	Collector – Emitter Saturation Voltage	I_C = 150mA	I_B = 15mA			0.3	V
		I_C = 500mA	I_B = 50mA			1	
$V_{BE(sat)}$[1]	Base – Emitter Saturation Voltage	I_C = 150mA	I_B = 15mA	0.6		1.2	V
		I_C = 500mA	I_C = 50mA			2	
h_{FE}	DC Current Gain	I_C = 0.1mA	V_{CE} = 10V	35			—
		I_C = 1mA	V_{CE} = 10V	50			
		I_C = 10mA	V_{CE} = 10V	75			
			T_A = –55°C	35			
		I_C = 150mA	V_{CE} = 10V [1]	100		300	
		I_C = 150mA	V_{CE} = 1V [1]	50			
		I_C = 500mA	V_{CE} = 10V [1]	40			
	SMALL SIGNAL CHARACTERISTICS						
f_T	Transition Frequency [2]	I_C = 20mA	V_{CE} = 20V f = 100MHz	300			MHz
C_{ob}	Output Capacitance	V_{CB} = 10V	I_E = 0 f = 100kHz			8	pF
C_{ib}	Input Capacitance	V_{EB} = 0.5V	I_C = 0 f = 100kHz			25	
h_{fe}	Small Signal Current Gain	I_C = 1mA	V_{CE} = 10V f = 1kHz	50		300	—
		I_C = 10mA	V_{CE} = 10V f = 1kHz	75		375	
	SWITCHING CHARACTERISTICS						
t_d	Delay Time	V_{CC} = 30V	$V_{BE(off)}$ = 0.5V			10	ns
t_r	Rise Time	I_C = 150mA	I_{B1} = 15mA			25	
t_s	Storage Time	V_{CC} = 30V	I_C = 150mA			225	ns
t_f	Fall Time	$I_{B1} = I_{B2}$ = 15mA				60	

NOTES:

1) Pulse test: $t_p \leq 300\mu s$, $\delta \leq 2\%$

2) f_T is defined as the frequency at which h_{FE} extrapolates to unity.