



Micro Commercial Components

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**2N2222**  
**2N2222A**

## Features

- High current (max.800mA)
- Low voltage (max.40V)

## Maximum Ratings

Symbol	Rating	Rating	Unit
$V_{CEO}$	Collector-Emitter Voltage	2N2222	30
		2N2222A	40
$V_{CBO}$	Collector-Base Voltage	2N2222	60
		2N2222A	75
$V_{EBO}$	Emitter-Base Voltage	2N2222	5.0
		2N2222A	6.0
$I_C$	Collector Current (DC)	800	mA
$I_{CM}$	Peak Collector Current	800	mA
$I_{BM}$	Peak Base Current	200	mA
$T_J$	Operating Junction Temperature	-55 to +150	$^{\circ}C$
$T_{STG}$	Storage Temperature	-55 to +150	$^{\circ}C$

## Thermal Characteristics

Symbol	Rating	Max	Unit
$P_{Tot}$	Total power Dissipation		
	$T_A \leq 25^{\circ}C$	500	mW
	$T_C \leq 25^{\circ}C$	1.2	W
$R_{JC}$	Thermal Resistance, Junction to Case	146	K/W
$R_{JA}$	Thermal Resistance, Junction to Ambient	350	K/W

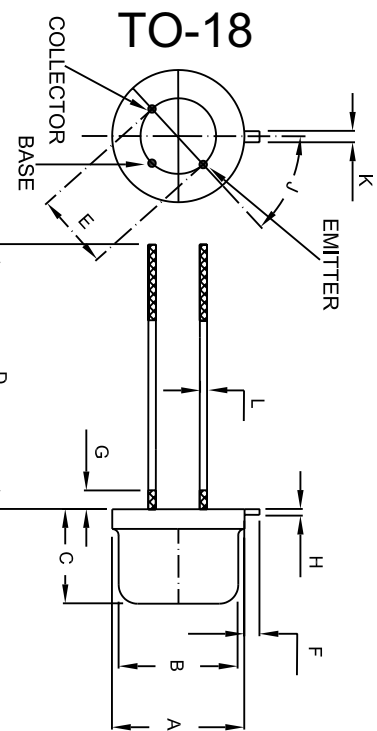
## Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
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### OFF CHARACTERISTICS

$I_{CBO}$	Collector cut-off current			
	( $V_{CB}=50Vdc, I_E=0$ )	2N2222	---	10
	( $V_{CB}=50Vdc, I_E=0, T_A=150^{\circ}C$ )		---	10
	( $V_{CB}=60Vdc, I_E=0$ )	2N2222A	---	10
$I_{EBO}$	Emitter Cut-off current			
	( $I_C=0, V_{EB}=3Vdc$ )			10
				10
				10
$h_{FE}$	DC Current Gain			
	( $I_C=0.1mA, V_{CE}=10Vdc$ )		35	
	( $I_C=1.0mA, V_{CE}=10Vdc$ )		50	
	( $I_C=10mA, V_{CE}=10Vdc$ )		75	
	( $I_C=150mA, V_{CE}=1.0Vdc$ )*		50	
$h_{FE}$	DC Current Gain			
	( $I_C=500mA, V_{CE}=10Vdc$ ) *	2N2222	30	---
		2N2222A	40	---

## NPN Switching Transistors



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.209	.230	5.309	5.842	$\Phi$
B	.178	.195	4.521	4.953	$\Phi$
C	.170	.210	4.318	5.334	
D	.50	----	12.7	----	
E		.100		2.54	$\Phi$ TYP
F	.028	.048	.7112	1.219	
G	----	.050	----	1.27	
H	.009	.031	0.229	0.787	
J	44°	46°	44°	46°	
K	.036	.046	0.914	1.168	
L	.016	.021	0.406	0.533	

# 2N2222, 2N2222A

Symbol	Parameter	Min	Max	Units	
<b>ON CHARACTERISTICS*</b>					
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage <sup>8</sup> ( $I_C=150\text{mA}$ , $I_B=15\text{mA}$ ) ( $I_C=500\text{mA}$ , $I_B=50\text{mA}$ )	2N2222	---	400	mVdc
			---	1.6	Vdc
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage* ( $I_C=150\text{mA}$ , $I_B=15\text{mA}$ ) ( $I_C=500\text{mA}$ , $I_B=50\text{mA}$ )	2N2222A	---	300	mVdc
			---	1.0	Vdc
$V_{BE(sat)}$	Base-Emitter Saturation Voltage * ( $I_C=150\text{mA}$ , $I_B=15\text{mA}$ ) ( $I_C=500\text{mA}$ , $I_B=50\text{mA}$ )	2N2222	---	1.3	Vdc
			---	2.6	Vdc
$V_{BE(sat)}$	Base-Emitter Saturation Voltage* ( $I_C=150\text{mA}$ , $I_B=15\text{mA}$ ) ( $I_C=500\text{mA}$ , $I_B=50\text{mA}$ )	2N2222A	0.6	1.2	Vdc
			---	2.0	Vdc

### SMALL-SIGNAL CHARACTERISTICS

$C_{OB}$	Output Capacitance ( $V_{CB}=10\text{Vdc}$ , $I_E=I_E=0$ , $f=1.0\text{MHz}$ )		---	8.0	pF
$f_T$	Transition Frequency ( $V_{CE}=20\text{Vdc}$ , $I_C=20\text{mA}$ , $f=100\text{MHz}$ )	2N2222	250	---	MHz
		2N2222A	300	---	MHz
NF	Noise Figure ( $V_{CE}=5.0\text{Vdc}$ , $I_C=200\mu\text{A}$ , $R_s=2.0\text{KOHM}$ , $f=1.0\text{kHz}$ , $B=200\text{Hz}$ )	2N2222A	---	4.0	dB

### SWITCHING CHARACTERISTICS

$T_d$	Delay Time	$I_{CON}=150\text{mA}$ , $I_{BON}=15\text{mA}$ , $I_{B(off)}=15\text{mA}$	---	10	ns
$t_r$	Rise Time		---	25	ns
$t_s$	Storage Time		---	200	ns
$t_f$	Fall Time		---	60	ns

\* Pulse Test:  $t_p \leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$



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