



Micro Commercial Components



Micro Commercial Components  
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**2N2222**  
**2N2222A**

## Features

- High current (max.800mA)
- Low voltage (max.40V)
- Lead Free Finish/RoHS Compliant(Note 1) ("P" Suffix designates RoHS Compliant. See ordering information)

## Maximum Ratings

Symbol	Rating	Rating	Unit
V <sub>CEO</sub>	Collector-Emitter Voltage	2N2222	30
		2N2222A	40
V <sub>CBO</sub>	Collector-Base Voltage	2N2222	60
		2N2222A	75
V <sub>EBO</sub>	Emitter-Base Voltage	2N2222	5.0
		2N2222A	6.0
I <sub>C</sub>	Collector Current (DC)	800	mA
I <sub>CM</sub>	Peak Collector Current	800	mA
I <sub>BM</sub>	Peak Base Current	200	mA
T <sub>J</sub>	Operating Junction Temperature	-55 to +150	°C
T <sub>STG</sub>	Storage Temperature	-55 to +150	°C

## Thermal Characteristics

Symbol	Rating	Max	Unit
P <sub>tot</sub>	Total power Dissipation		
	T <sub>A</sub> ≤ 25°C	500	mW
	T <sub>C</sub> ≤ 25°C	1.2	W
R <sub>JC</sub>	Thermal Resistance, Junction to Case	146	K/W
R <sub>JA</sub>	Thermal Resistance, Junction to Ambient	350	K/W

## Electrical Characteristics @ 25°C Unless Otherwise Specified

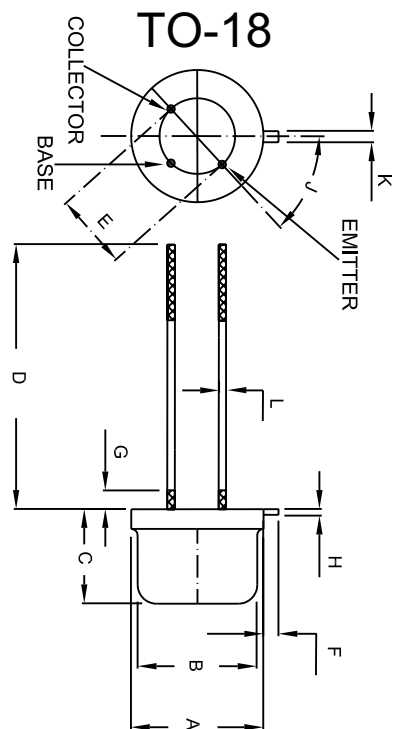
Symbol	Parameter	Min	Max	Units
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### OFF CHARACTERISTICS

I <sub>CBO</sub>	Collector cut-off current (V <sub>CB</sub> =50Vdc, I <sub>E</sub> =0)	2N2222	---	10	nAdc
	(V <sub>CB</sub> =50Vdc, I <sub>E</sub> =0, T <sub>A</sub> =150°C)		---	10	uAdc
	(V <sub>CB</sub> =60Vdc, I <sub>E</sub> =0)	2N2222A	---	10	nAdc
	(V <sub>CB</sub> =60Vdc, I <sub>E</sub> =0, T <sub>A</sub> =150°C)		---	10	uAdc
I <sub>EBO</sub>	Emitter Cut-off current (I <sub>C</sub> =0, V <sub>EB</sub> =3Vdc)		---	10	nAdc
h <sub>FE</sub>	DC Current Gain (I <sub>C</sub> =0.1mAdc, V <sub>CE</sub> =10Vdc)		35		
	(I <sub>C</sub> =1.0mAdc, V <sub>CE</sub> =10Vdc)		50		
	(I <sub>C</sub> =10mAdc, V <sub>CE</sub> =10Vdc)		75		
	(I <sub>C</sub> =150mAdc, V <sub>CE</sub> =1.0Vdc)*		50		
	(I <sub>C</sub> =150mAdc, V <sub>CE</sub> =10Vdc)*		100	300	
h <sub>FE</sub>	DC Current Gain (I <sub>C</sub> =500mAdc, V <sub>CE</sub> =10Vdc) *	2N2222	30	---	
		2N2222A	40	---	

Notes:1.High Temperature Solder Exemption Applied, see EU Directive Annex 7.

## NPN Switching Transistors



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.209	.230	5.309	5.842	Φ
B	.178	.195	4.521	4.953	Φ
C	.170	.210	4.318	5.334	
D	.50	----	12.7	----	
E	.100		2.54		ΦTYP
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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Ordering Information :

Device	Packing
Part Number-BP	Bulk; 100pcs/Box

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