



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 2N2222A	30 40	V
V <sub>CBO</sub>	Collector-Base Voltage 2N2222 2N2222A	60 75	V
V <sub>EBO</sub>	Emitter-Base Voltage 2N2222 2N2222A	5.0 6.0	V
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
$P_{tot}$	Total power Dissipation $T_A \leq 25^\circ\text{C}$ $T_C \leq 25^\circ\text{C}$	500 1.2	mW 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

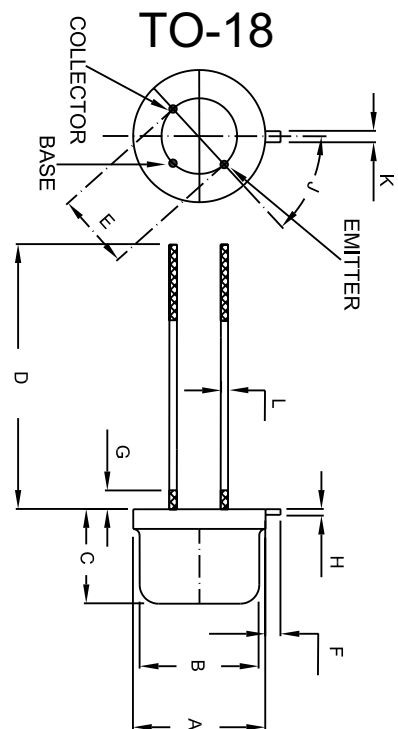
Symbol	Parameter	Min	Max	Units
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### OFF CHARACTERISTICS

$I_{CBO}$	Collector cut-off current ( $V_{CB}=50\text{Vdc}$ , $I_E=0$ ) ( $V_{CB}=50\text{Vdc}$ , $I_E=0$ , $T_A=150^\circ\text{C}$ ) ( $V_{CB}=60\text{Vdc}$ , $I_E=0$ ) ( $V_{CB}=60\text{Vdc}$ , $I_E=0$ , $T_A=150^\circ\text{C}$ )	2N2222 2N2222A	--- --- --- ---	10 10 10 10	nAdc uAdc nAdc uAdc
$I_{EBO}$	Emitter Cut-off current ( $I_C=0$ , $V_{EB}=3\text{Vdc}$ )		---	10	nAdc
$h_{FE}$	DC Current Gain ( $I_C=0.1\text{mA}$ , $V_{CE}=10\text{Vdc}$ ) ( $I_C=1.0\text{mA}$ , $V_{CE}=10\text{Vdc}$ ) ( $I_C=10\text{mA}$ , $V_{CE}=10\text{Vdc}$ ) ( $I_C=150\text{mA}$ , $V_{CE}=1.0\text{Vdc}$ )* ( $I_C=150\text{mA}$ , $V_{CE}=10\text{Vdc}$ )*		35 50 75 50 100		
$h_{FE}$	DC Current Gain ( $I_C=500\text{mA}$ , $V_{CE}=10\text{Vdc}$ ) *	2N2222 2N2222A	30 40	---	

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

## NPN Switching Transistors



DIMENSIONS					
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
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## ON CHARACTERISTICS\*

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

## SMALL-SIGNAL CHARACTERISTICS

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

## SWITCHING CHARACTERISTICS

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

\* Pulse Test:  $t_p \leq 300us$ , Duty Cycle  $\leq 2.0\%$

Ordering Information :

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

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