



Micro Commercial Components



Micro Commercial Components  
20736 Marilla Street Chatsworth  
CA 91311  
Phone: (818) 701-4933  
Fax: (818) 701-4939

**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
$V_{CEO}$	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	500	mW
	$T_A \leq 25^{\circ}C$	1.2	W
	$T_C \leq 25^{\circ}C$		
$R_{JC}$	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

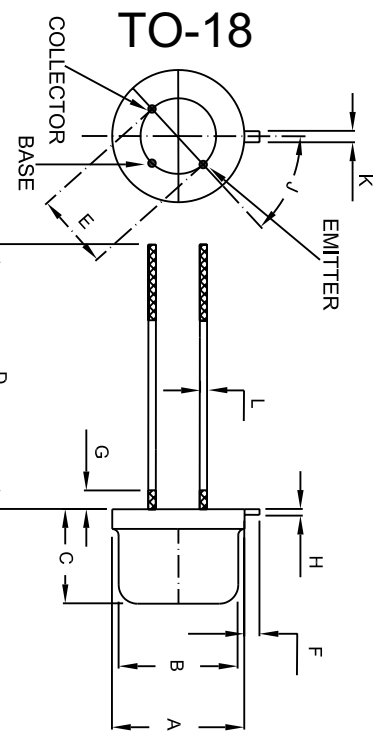
Symbol	Parameter	Min	Max	Units
--------	-----------	-----	-----	-------

### OFF CHARACTERISTICS

$I_{CBO}$	Collector cut-off current ( $V_{CB}=50Vdc, I_E=0$ )	2N2222	---	10	nAdc
	( $V_{CB}=50Vdc, I_E=0, T_A=150^{\circ}C$ )		---	10	uAdc
	( $V_{CB}=60Vdc, I_E=0$ )	2N2222A	---	10	nAdc
	( $V_{CB}=60Vdc, I_E=0, T_A=150^{\circ}C$ )		---	10	uAdc
$I_{EBO}$	Emitter Cut-off current ( $I_C=0, V_{EB}=3Vdc$ )		---	10	nAdc
$h_{FE}$	DC Current Gain ( $I_C=0.1mAdc, V_{CE}=10Vdc$ )		35		
	( $I_C=1.0mAdc, V_{CE}=10Vdc$ )		50		
	( $I_C=10mAdc, V_{CE}=10Vdc$ )		75		
	( $I_C=150mAdc, V_{CE}=1.0Vdc$ )*		50		
	( $I_C=150mAdc, V_{CE}=10Vdc$ )*		100	300	
$h_{FE}$	DC Current Gain ( $I_C=500mAdc, V_{CE}=10Vdc$ ) *	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	$\Phi$
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	

**WWW.MCCSEMI.COM**

# 2N2222, 2N2222A

Symbol	Parameter	Min	Max	Units	
<b>ON CHARACTERISTICS*</b>					
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage <sup>8</sup> ( $I_C=150\text{mAdc}$ , $I_B=15\text{mAdc}$ ) ( $I_C=500\text{mAdc}$ , $I_B=50\text{mAdc}$ )	2N2222	---	400	mVdc
			---	1.6	Vdc
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage* ( $I_C=150\text{mAdc}$ , $I_B=15\text{mAdc}$ ) ( $I_C=500\text{mAdc}$ , $I_B=50\text{mAdc}$ )	2N2222A	---	300	mVdc
			---	1.0	Vdc
$V_{BE(sat)}$	Base-Emitter Saturation Voltage * ( $I_C=150\text{mAdc}$ , $I_B=15\text{mAdc}$ ) ( $I_C=500\text{mAdc}$ , $I_B=50\text{mAdc}$ )	2N2222	---	1.3	Vdc
			---	2.6	Vdc
$V_{BE(sat)}$	Base-Emitter Saturation Voltage* ( $I_C=150\text{mAdc}$ , $I_B=15\text{mAdc}$ ) ( $I_C=500\text{mAdc}$ , $I_B=50\text{mAdc}$ )	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 ( $V_{CE}=20\text{Vdc}$ , $I_C=20\text{mAdc}$ , $f=100\text{MHz}$ )	2N2222	250	---	MHz
		2N2222A	300	---	MHz
NF	Noise Figure ( $V_{CE}=5.0\text{Vdc}$ , $I_C=200\mu\text{Adc}$ , $R_s=2.0\text{KOHM}$ , $f=1.0\text{kHz}$ , $B=200\text{Hz}$ )	2N2222A	---	4.0	dB

### SWITCHING CHARACTERISTICS

$T_d$	Delay Time	$I_{CON}=150\text{mAdc}$ , $I_{BON}=15\text{mAdc}$ , $I_{B(off)}=15\text{mAdc}$	---	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  $\leq 2.0\%$



Micro Commercial Components

### Ordering Information :

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

**\*\*\*IMPORTANT NOTICE\*\*\***

**Micro Commercial Components Corp.** reserves the right to make changes without further notice to any product herein to make corrections, modifications, enhancements, improvements, or other changes. **Micro Commercial Components Corp.** does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold **Micro Commercial Components Corp.** and all the companies whose products are represented on our website, harmless against all damages.

**\*\*\*LIFE SUPPORT\*\*\***

MCC's products are not authorized for use as critical components in life support devices or systems without the express written approval of Micro Commercial Components Corporation.

**\*\*\*CUSTOMER AWARENESS\*\*\***

Counterfeiting of semiconductor parts is a growing problem in the industry. Micro Commercial Components (MCC) is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. MCC strongly encourages customers to purchase MCC parts either directly from MCC or from Authorized MCC Distributors who are listed by country on our web page cited below. Products customers buy either from MCC directly or from Authorized MCC Distributors are genuine parts, have full traceability, meet MCC's quality standards for handling and storage. **MCC will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources.** MCC is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.

**www.mccsemi.com**

This datasheet has been downloaded from:

[www.DatasheetCatalog.com](http://www.DatasheetCatalog.com)

Datasheets for electronic components.