



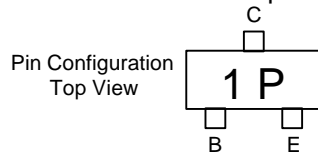
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# MMBT2222A

## NPN General Purpose Amplifier

### Features

- Surface Mount SOT-23 Package
- Capable of 350mWatts of Power Dissipation



### Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
<b>OFF CHARACTERISTICS</b>				
$V_{(BR)CEO}$	Collector-Emmitter Breakdown Voltage* ( $I_C=10\text{mAdc}$ , $I_B=0$ )	40		Vdc
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ( $I_C=10\mu\text{Adc}$ , $I_E=0$ )	75		Vdc
$V_{(BR)EBO}$	Emmitter-Base Breakdown Voltage ( $I_E=10\mu\text{Adc}$ , $I_C=0$ )	6.0		Vdc
$I_{BL}$	Base Cutoff Current ( $V_{CE}=60\text{Vdc}$ , $V_{BE}=3.0\text{Vdc}$ )		20	nAdc
$I_{CEX}$	Collector Cutoff Current ( $V_{CE}=60\text{Vdc}$ , $V_{BE}=3.0\text{Vdc}$ )		10	nAdc

### ON CHARACTERISTICS

$h_{FE}$	DC Current Gain* ( $I_C=0.1\text{mAdc}$ , $V_{CE}=10\text{Vdc}$ ) ( $I_C=1.0\text{mAdc}$ , $V_{CE}=10\text{Vdc}$ ) ( $I_C=10\text{mAdc}$ , $V_{CE}=10\text{Vdc}$ ) ( $I_C=150\text{mAdc}$ , $V_{CE}=10\text{Vdc}$ ) ( $I_C=150\text{mAdc}$ , $V_{CE}=1.0\text{Vdc}$ ) ( $I_C=500\text{mAdc}$ , $V_{CE}=10\text{Vdc}$ )	35 50 75 100	300	
$V_{CE(sat)}$	Collector-Emmitter Saturation Voltage ( $I_C=150\text{mAdc}$ , $I_B=15\text{mAdc}$ ) ( $I_C=500\text{mAdc}$ , $I_B=50\text{mAdc}$ )		0.3 1.0	Vdc
$V_{BE(sat)}$	Base-Emmitter Saturation Voltage ( $I_C=150\text{mAdc}$ , $I_B=15\text{mAdc}$ ) ( $I_C=500\text{mAdc}$ , $I_B=50\text{mAdc}$ )	0.6	1.2 2.0	Vdc

### SMALL-SIGNAL CHARACTERISTICS

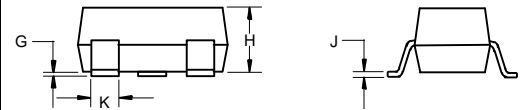
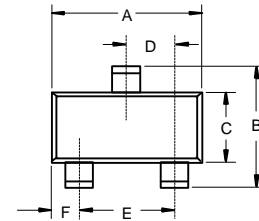
$f_T$	Current Gain-Bandwidth Product ( $I_C=20\text{mAdc}$ , $V_{CE}=20\text{Vdc}$ , $f=100\text{MHz}$ )	300		MHz
$C_{obo}$	Output Capacitance ( $V_{CB}=10\text{Vdec}$ , $I_E=0$ , $f=1.0\text{MHz}$ )		8.0	pF
$C_{ibo}$	Input Capacitance ( $V_{BE}=0.5\text{Vdc}$ , $I_C=0$ , $f=1.0\text{MHz}$ )		25	pF
NF	Noise Figure ( $I_C=100\mu\text{Adc}$ , $V_{CE}=10\text{Vdc}$ , $R_S=1.0\text{k}\Omega$ , $f=1.0\text{kHz}$ )		4.0	dB

### SWITCHING CHARACTERISTICS

$t_d$	Delay Time	( $V_{CC}=30\text{Vdc}$ , $V_{BE}=0.5\text{Vdc}$ )	10	ns
$t_r$	Rise Time	( $I_C=150\text{mAdc}$ , $I_{B1}=15\text{mAdc}$ )	25	ns
$t_s$	Storage Time	( $V_{CC}=30\text{Vdc}$ , $I_C=150\text{mAdc}$ )	225	ns
$t_f$	Fall Time	( $I_{B1}=I_{B2}=15\text{mAdc}$ )	60	ns

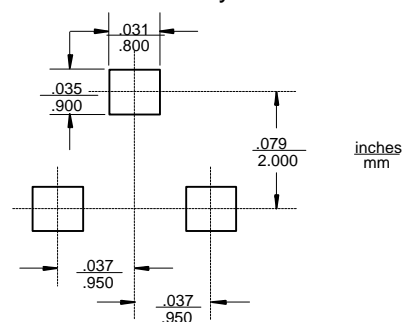
\*Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

### SOT-23

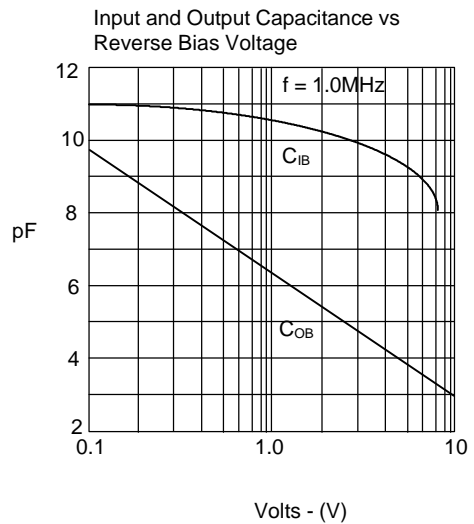
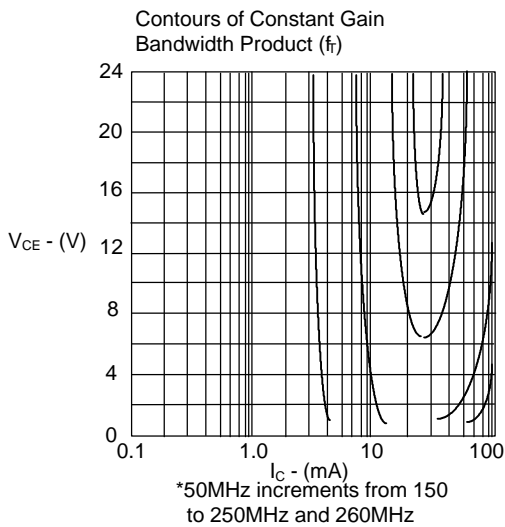
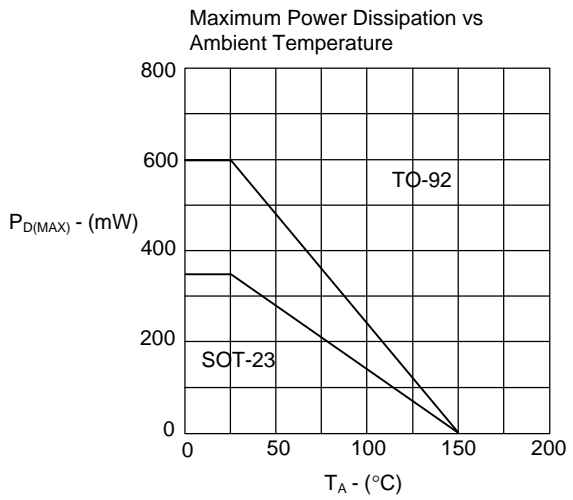
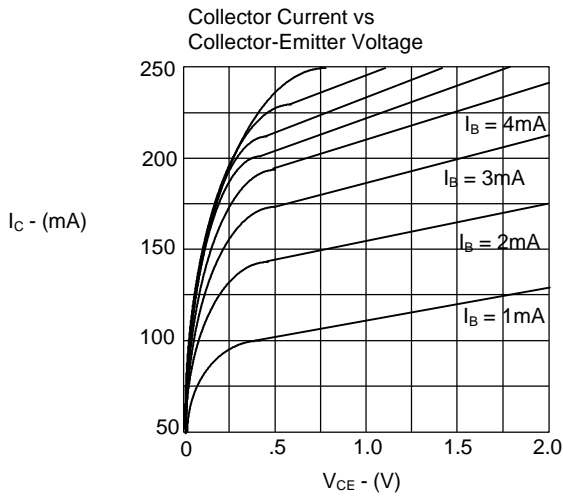
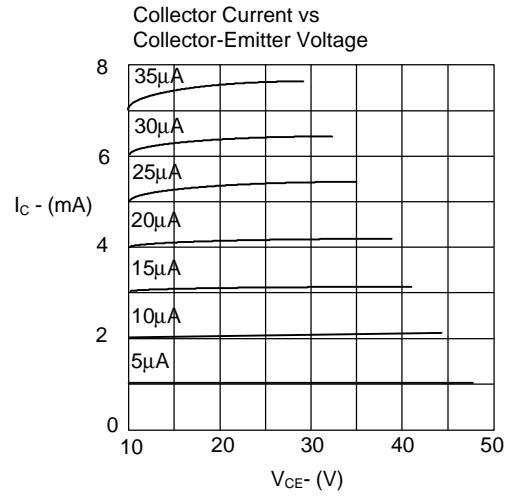
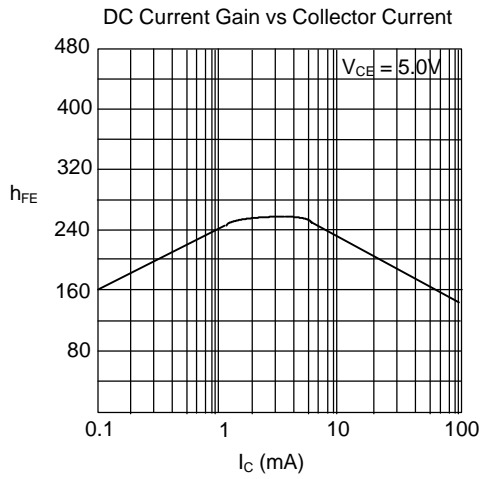


DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.110	.120	2.80	3.04	
B	.083	.098	2.10	2.64	
C	.047	.055	1.20	1.40	
D	.035	.041	.89	1.03	
E	.070	.081	1.78	2.05	
F	.018	.024	.45	.60	
G	.0005	.0039	.013	.100	
H	.035	.044	.89	1.12	
J	.003	.007	.085	.180	
K	.015	.020	.37	.51	

### Suggested Solder Pad Layout



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