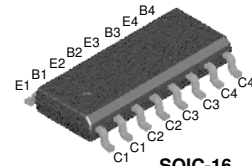


# MMPQ2222

## NPN Multi-Chip General Purpose Amplifier

- This device is for use as a medium power amplifier and switch requiring collector currents up to 500mA.
- Sourced from process 19.



SOIC-16  
Mark: MMPQ2222

### Absolute Maximum Ratings \* $T_a=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
$V_{CEO}$	Collector-Emitter Voltage	30	V
$V_{CBO}$	Collector-Base Voltage	60	V
$V_{EBO}$	Emitter-Base Voltage	5.0	V
$I_C$	Collector Current - Continuous	500	mA
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	- 55 ~ +155	$^\circ\text{C}$

\* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired

#### NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations

### Electrical Characteristics $T_a=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
<b>Off Characteristics</b>					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage *	$I_C = 10\text{mA}, I_B = 0$	30		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10\mu\text{A}, I_E = 0$	60		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_C = 10\mu\text{A}, I_C = 0$	5.0		V
$I_{CBO}$	Collector Cutoff Current	$V_{CB} = 50\text{V}, I_E = 0$		50	nA
$I_{EBO}$	Emitter Cutoff Current	$V_{EB} = 3.0\text{V}, I_C = 0$		50	nA
<b>On Characteristics *</b>					
$h_{FE}$	DC Current Gain	$I_C = 10\text{mA}, V_{CE} = 10\text{V}$ $I_C = 150\text{mA}, V_{CE} = 1.0\text{V}^*$ $I_C = 150\text{mA}, V_{CE} = 1.0\text{V}^*$	75 100 50		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage *	$I_C = 150\text{mA}, I_B = 15\text{mA}$ $I_C = 500\text{mA}, I_B = 50\text{mA}$		0.4 1.6	V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage *	$I_C = 150\text{mA}, I_B = 15\text{mA}$ $I_C = 500\text{mA}, I_B = 50\text{mA}$		1.3 2.6	V V
<b>Small Signal Characteristics</b>					
$f_T$	Current Gain Bandwidth Product	$I_C = 20\text{mA}, V_{CE} = 20\text{V},$ $f = 100\text{MHz}$		300	MHz
$C_{obo}$	Output Capacitance	$V_{CB} = 10\text{V}, I_E = 0, f = 100\text{kHz}$		4.0	pF
$C_{ibo}$	Input Capacitance	$V_{EB} = 0.5\text{V}, I_E = 0, f = 100\text{kHz}$		20	pF
NF	Noise Figure	$I_C = 100\mu\text{A}, V_{CE} = 10\text{V},$ $R_S = 1.0\text{k}\Omega, f = 1.0\text{kHz}$		2.0	dB

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

**Thermal Characteristics**  $T_a=25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Max.	Units
$P_D$	Total Device Dissipation	1000	mW
	Derate above $25^\circ\text{C}$	8.0	$\text{mW}/^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		
	Effective 4 Die	125	$^\circ\text{C}/\text{W}$
	Each Die	240	$^\circ\text{C}/\text{W}$

## Typical Characteristics

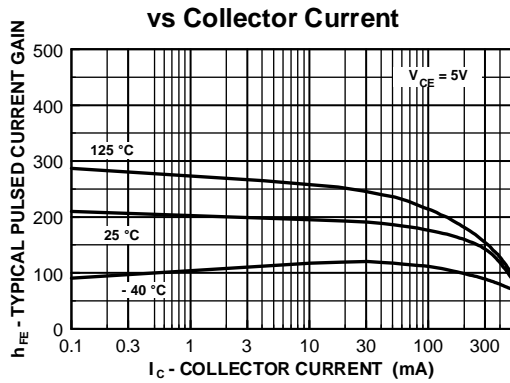


Figure 1. Typical Pulsed Current Gain vs Collector Current

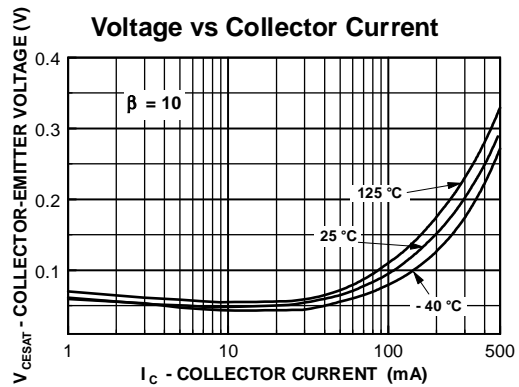


Figure 2. Collector-Emitter Saturation Voltage vs Collector Current

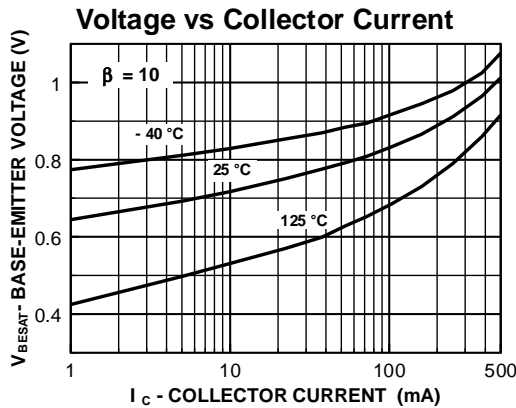


Figure 3. Base-Emitter Saturation Voltage vs Collector Current

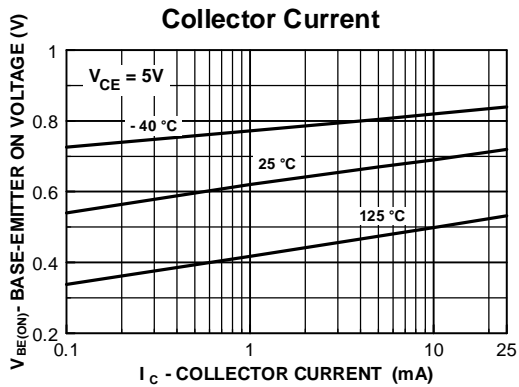


Figure 4. Base-Emitter On Voltage vs Collector Current

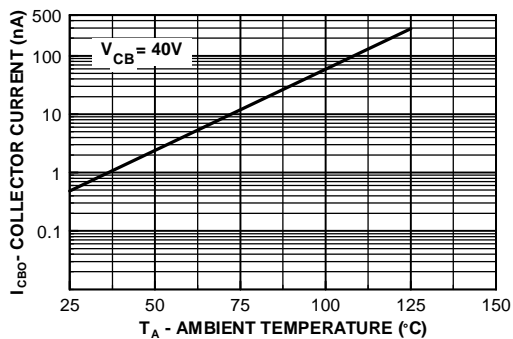


Figure 5. Collector Cutoff Current vs Ambient Temperature

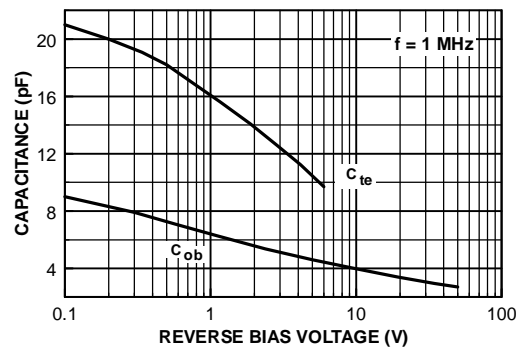
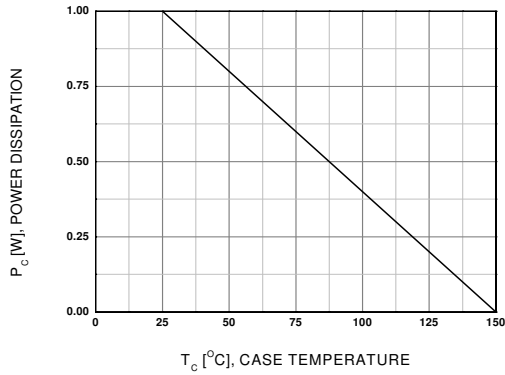
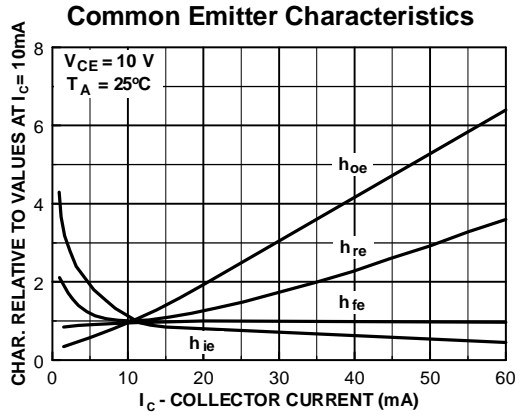


Figure 6. Emitter Transition and Output Capacitance vs Reverse Bias Voltage

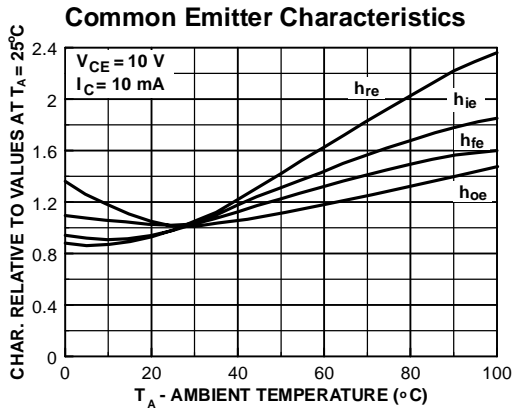
**Typical Characteristics** (Continued)



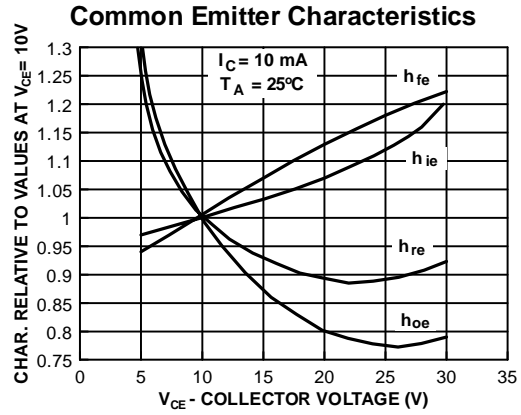
**Figure 7. Power Dissipation vs Ambient Temperature**



**Figure 8. Common Emitter Characteristics**



**Figure 9. Common Emitter Characteristics**



**Figure 10. Common Emitter Characteristics**

Test Circuit

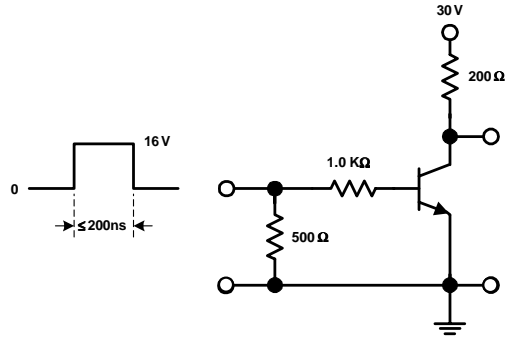


Figure 1. Saturated Turn-On Switching Time

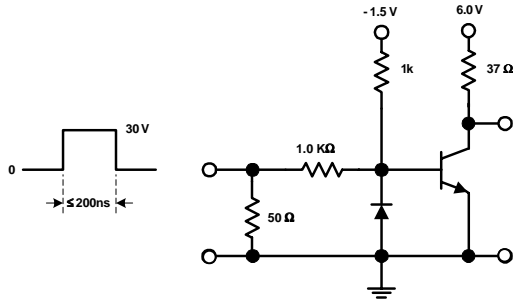
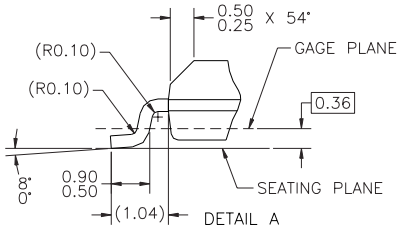
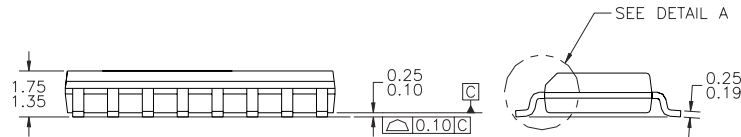
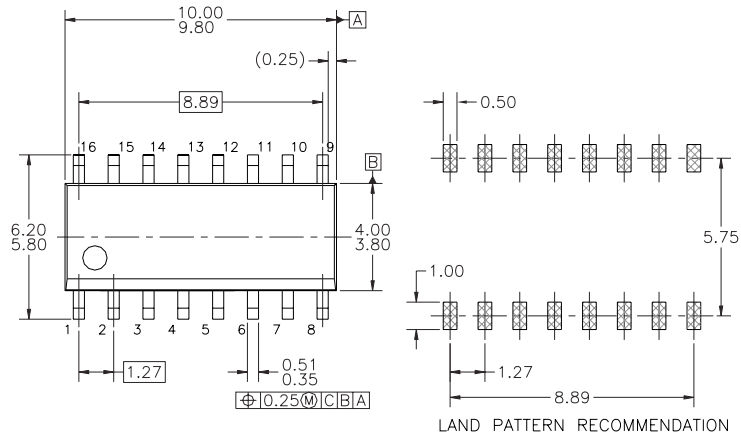


Figure 2. Saturated Turn-Off Switching Time

Package Dimensions

SOIC-16



- NOTES: UNLESS OTHERWISE SPECIFIED
- A) THIS PACKAGE CONFORMS TO JEDEC MS-012, VARIATION AC, ISSUE C, DATED MAY 1990.
  - B) ALL DIMENSIONS ARE IN MILLIMETERS.
  - C) STANDARD LEAD FINISH:  
200 MICRONS / 5.08 MICRONS MIN. LEAD/TIN (SOLDER) ON COPPER.

Dimensions in Millimeters

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