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September 2014

MPSA06 / MMBTA06 / PZTA06 NPN General-Purpose Amplifier

Features

- This device is designed for general-purpose amplifier applications at collector currents to 300 mA.
- · Sourced from process 12.



Ordering Information

Part Number	Top Mark	Package	Packing Method		
MPSA06	MPSA06	TO-92 3L	Bulk		
MMBTA06	1G	SOT-23 3L	Tape and Reel		
PZTA06	A06	SOT-223 4L	Tape and Reel		

Absolute Maximum Ratings(1), (2)

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A = 25^{\circ}\text{C}$ unless otherwise noted.

Symbol	Parameter	Value	Unit
V _{CEO}	Collector-Emitter Voltage	80	V
V _{CBO}	Collector-Base Voltage	80	V
V _{EBO}	Emitter-Base Voltage	4.0	V
I _C	Collector Current - Continuous	500	mA
T _{J,} T _{STG}	Operating and Storage Junction Temperature Range	-55 to +150	°C

Notes:

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

Thermal Characteristics

Values are at $T_A = 25$ °C unless otherwise noted.

Symbol	Parameter		Unit			
Syllibol	Farameter	MPSA06	MMBTA06 ⁽³⁾	PZTA06 ⁽⁴⁾	Oilit	
В	Total Device Dissipation	625	350	1000	mW	
P _D	Derate Above 25°C	5.0	2.8	8.0	mW/°C	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	83.3			°C/W	
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	200	357	125	°C/W	

Notes:

- 3. Device is mounted on FR-4 PCB 1.6 inch x 1.6 inch x 0.06 inch.
- 4. Device is mounted on FR-4 PCB 36 mm x 18 mm x 1.5 mm, mounting pad for the collector lead minimum 6 cm².

Electrical Characteristics

Values are at $T_A = 25$ °C unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Max.	Unit
Off Charact	teristics			•	
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage ⁽⁵⁾	$I_C = 1.0 \text{ mA}, I_B = 0$	80		V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	$I_E = 100 \mu A, I_C = 0$	4.0		V
I _{CEO}	Collector Cut-Off Current	$V_{CE} = 60 \text{ V}, I_{B} = 0$		0.1	μΑ
I _{CBO}	Collector Cut-Off Current	$V_{CB} = 80 \text{ V}, I_{E} = 0$		0.1	μΑ
On Charact	eristics		•		•
h	DC Current Gain	$I_C = 10 \text{ mA}, V_{CE} = 1.0 \text{ V}$	100		
h _{FE}	De current Gain	I _C = 100 mA, V _{CE} = 1.0 V	100		
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C = 100 mA, I _B = 10 mA		0.25	V
V _{BE(on)}	Base-Emitter On Voltage	$I_C = 100 \text{ mA}, V_{CE} = 1.0 \text{ V}$		1.2	V
Small Signa	al Characteristics	•		•	
f _T	Current Gain - Bandwidth Product	$I_C = 10 \text{ mA}, V_{CE} = 2.0 \text{ V},$ f = 100 MHz	100		MHz

Notes:

5. Pulse test: pulse width \leq 300 μ s, duty cycle \leq 2%.

Typical Performance Characteristics

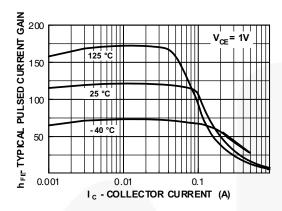


Figure 1. Typical Pulsed Current Gain vs. Collector Current

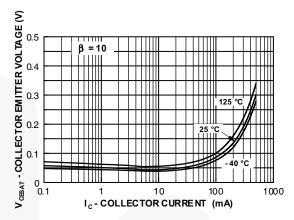


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

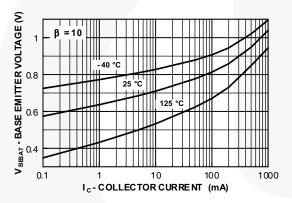


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

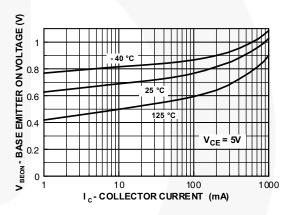


Figure 4. Base-Emitter On Voltage vs. Collector Current

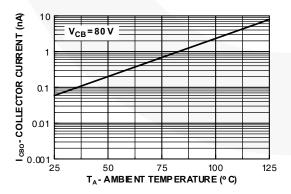


Figure 5. Collector Cut-Off Current vs. Ambient Temperature

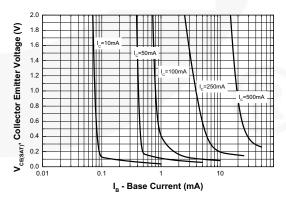


Figure 6. Collector Saturation Region

Typical Performance Characteristics (Continued)

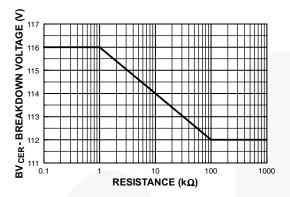


Figure 7. Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base

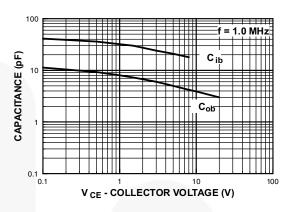


Figure 8. Input and Output Capacitance vs. Reverse Current

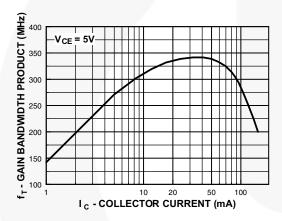


Figure 9. Gain Bandwidth Product vs. Collector Current

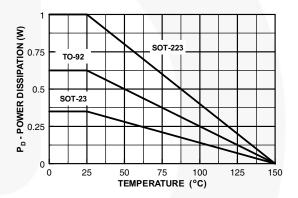
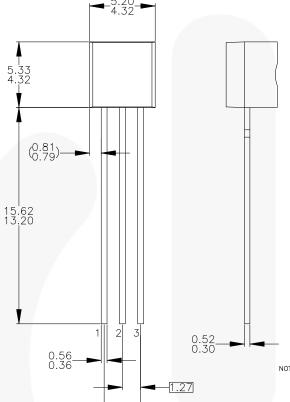


Figure 10. Power Dissipation vs.
Ambient Temperature

Physical Dimensions



2.54

2 3

4.19 3.05

NOTES: UNLESS OTHERWISE SPECIFIED

- DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
 ALL DIMENSIONS ARE IN MILLIMETERS.
 DRAWING CONFORMS TO ASME Y14.5M-1994.
 TO-92 (92,94,96,97,98) PIN CONFIGURATION:

z		92		94		96			97			98			
۵	Р	F	М	Р	F	М	В	F	М	Р	F	М	Р	F	М
1	Ε	S	S	Ε	S	S	В	D	G	С	G	D	С	G	D
2	В	D	G	С	G	D	Ε	S	S	В	D	G	Ε	S	S
3	С	G	D	В	D	G	С	G	D	Ε	S	S	В	D	G

LEGEND:

- P BIPOLAR F JFET M DMOS – EMITTER– BASE– COLLECTOR D - DRAIN S - SOURCE G - GATE
 - E) FOR PACKAGE 92, 94, 96, 97 AND 98:
 PIN CONFIGURATION DRAIN "D" AND SOURCE "S"
 ARE INTERCHANGEAGLE AT JETE "F" OPTION.
 F) DRAWING FILENAME: MKT-ZAO3DREV3.

Figure 11. 3-LEAD, TO-92, MOLDED, STD STRAIGHT LEAD (NO EOL CODE)

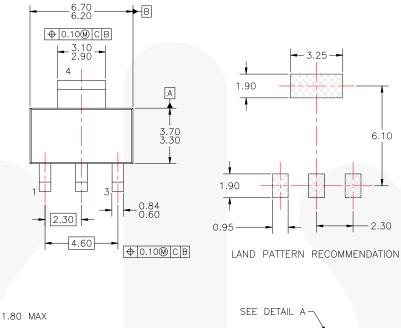
2.66 2.13

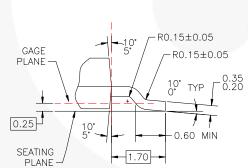
Physical Dimensions (Continued) 0.95 2.92±0.20 3 1.40 1.30+0.20 2.20 2 0.60 0.37 (0.29) -0.95 ⊕ | 0.20 M | A | B 1.00 1.90 1.90 LAND PATTERN RECOMMENDATION SEE DETAIL A 1.20 MAX (0.93)0.10 0.00 ○ 0.10 M C С 2.40±0.30 NOTES: UNLESS OTHERWISE SPECIFIED **GAGE PLANE** A) REFERENCE JEDEC REGISTRATION TO-236, VARIATION AB, ISSUE H. B) ALL DIMENSIONS ARE IN MILLIMETERS. 0.23 0.08 C) DIMENSIONS ARE INCLUSIVE OF BURRS, 0.25 MOLD FLASH AND TIE BAR EXTRUSIONS. D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M - 1994. 0.20 MIN SEATING E) DRAWING FILE NAME: MA03DREV10 **PLANE** (0.55)**DETAIL A** SCALE: 2X

Figure 12. 3-LEAD, SOT23, JEDEC TO-236, LOW PROFILE

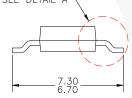
Physical Dimensions (Continued)

C 0.10 -





DETAIL A



NOTES: UNLESS OTHERWISE SPECIFIED

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 REGISTRATION TO-261, VARIATION AA.
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 MOLD FLASH AND TIE BAR EXTRUSIONS.
 ALL DIMENSIONS ARE IN MILLIMETERS.
 DRAWING CONFORMS TO ASME
 Y14.5M-1994.
 LANDPATTERN NAME:
 S0T230P700X180-4BN
 DRAWING FILENAME: MKT-MA04AREV2
- E)

Figure 13. MOLDED PACKAGING, SOT-223, 4-LEAD

△ 0.08M C





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Definition of Terms		
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