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September 2015



MPSA05 / MMBTA05 NPN General-Purpose Amplifier

Description

This device is designed for general-purpose amplifier applications at collector currents to 300 mA. Sourced from process 10.



Ordering Information

Part Number	Marking	Package	Packing Method
MPSA05RA	MPSA05	TO-92 3L	Tape and Reel
MMBTA05	1H	SOT-23 3L	Tape and Reel

Absolute Maximum Ratings

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_{CE0}	Collector-Emitter Voltage	60	V
V_{CBO}	Collector-Base Voltage	60	V
V_{EBO}	Emitter-Base Voltage	4.0	V
I_C	Collector Current - Continuous	500	mA
T_J, T_{STG}	Junction and Storage Temperature	-55 to +150	$^\circ\text{C}$

Thermal Characteristics

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

Symbol	Parameter	Max.		Unit
		MPSA05	MMBTA05 ⁽¹⁾	
P_D	Total Device Dissipation	625	350	mW
	Derate Above 25°C	5.0	2.8	mW/ $^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	83.3		$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	200	357	$^\circ\text{C}/\text{W}$

Note:

1. Device mounted on FR-4 PCB 1.6" × 0.06"

Electrical Characteristics

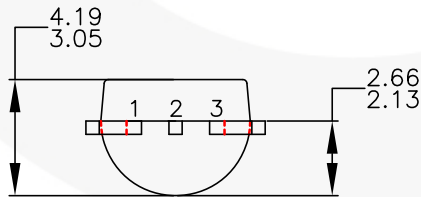
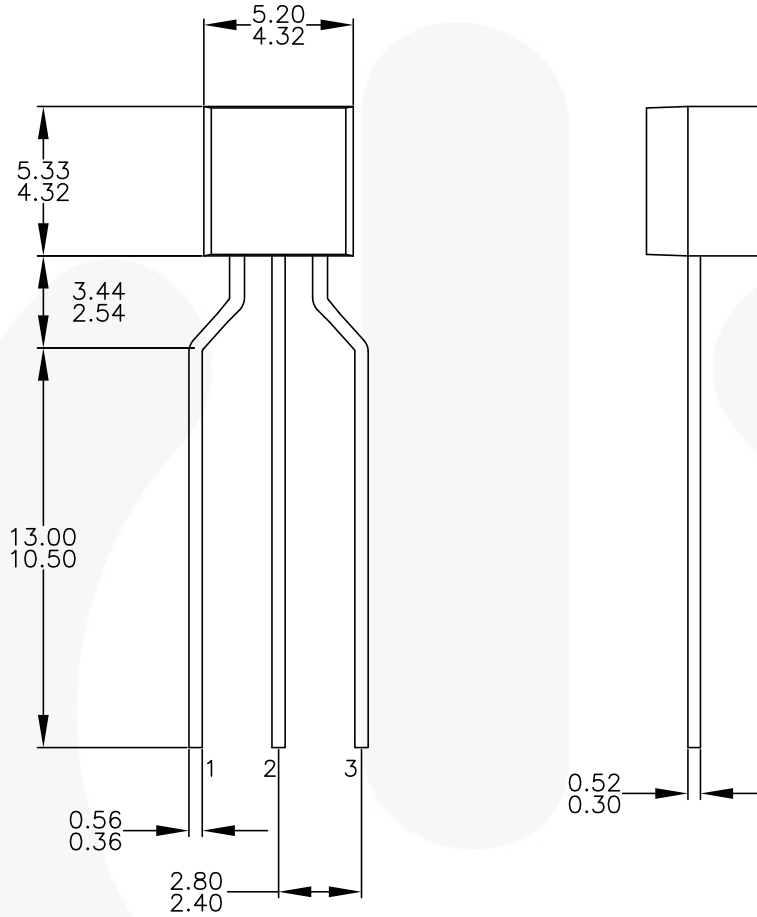
Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Max.	Unit
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage ⁽²⁾	$I_C = 1\text{ mA}, I_B = 0$	60		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 100\ \mu\text{A}, I_C = 0$	4		V
I_{CEO}	Collector Cut-Off Current	$V_{CE} = 60\text{ V}, I_B = 0$		0.1	μA
I_{CBO}	Collector Cut-Off Current	$V_{CB} = 60\text{ V}, I_E = 0$		0.1	μA
h_{FE}	DC Current Gain	$I_C = 10\text{ mA}, V_{CE} = 1.0\text{ V}$	100		
		$I_C = 100\text{ mA}, V_{CE} = 1.0\text{ V}$	100		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 100\text{ mA}, I_B = 10\text{ mA}$		0.25	V
$V_{BE(on)}$	Base-Emitter On Voltage	$I_C = 100\text{ mA}, V_{CE} = 1.0\text{ V}$		1.2	V
f_T	Current Gain - Bandwidth Product	$I_C = 10\text{ mA}, V_{CE} = 2\text{ V}, f = 100\text{ MHz}$	100		MHz

Note:

2. Pulse test: pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2.0\%$.

Physical Dimensions

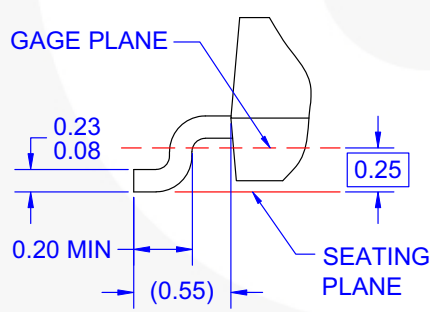
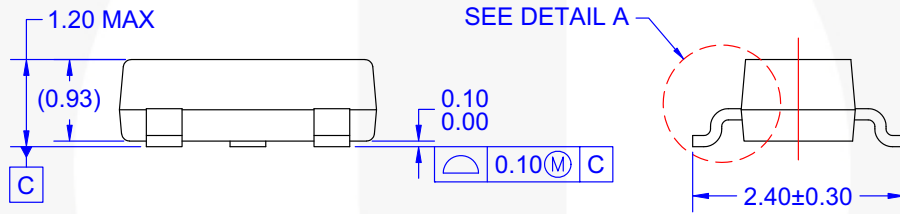
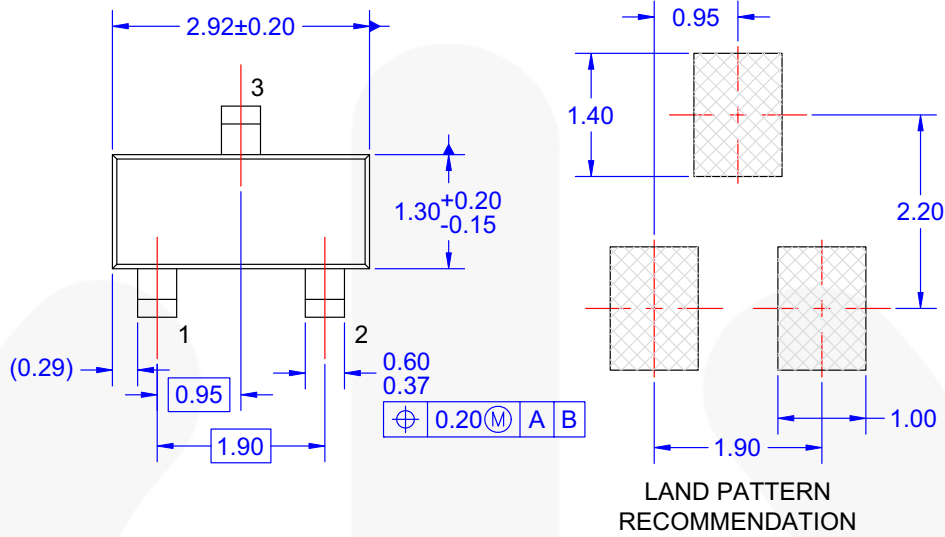


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- A. DRAWING CONFORMS TO JEDEC MS-013, VARIATION AC.
- B. ALL DIMENSIONS ARE IN MILLIMETERS.
- C. DRAWING CONFORMS TO ASME Y14.5M-2009.
- D. DRAWING FILENAME: MKT-ZA03FREV3.
- E. FAIRCHILD SEMICONDUCTOR.

Figure 1. 3-Lead, TO-92, Molded, 0.2 In Line Spacing Lead Form

Physical Dimensions (Continued)



DETAIL A
SCALE: 2X

NOTES: UNLESS OTHERWISE SPECIFIED


- A) REFERENCE JEDEC REGISTRATION TO-236, VARIATION AB, ISSUE H.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE INCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.
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Figure 2. 3-LEAD, SOT23, JEDEC TO-236, LOW PROFILE





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