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September 2015

MPSA05 / MMBTA05
NPN General-Purpose Amplifier

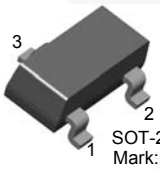
Description

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

Straight Lead
Bulk Packing

Bent Lead
Tape & Reel
Ammo Packing

TO-92
1. Emitter
2. Base
3. Collector



SOT-23
Mark: 1H

1. Base 2. Emitter 3. Collector

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°C unless otherwise noted.

Symbol	Parameter	Value	Unit
V_{CEO}	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	°C

Thermal Characteristics

Values are at T_A = 25°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/°C
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	83.3		°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	200	357	°C/W

Note:

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

Electrical Characteristics

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

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

Note:

2. Pulse test: pulse width ≤ 300 μs, duty cycle ≤ 2.0%.

Physical Dimensions

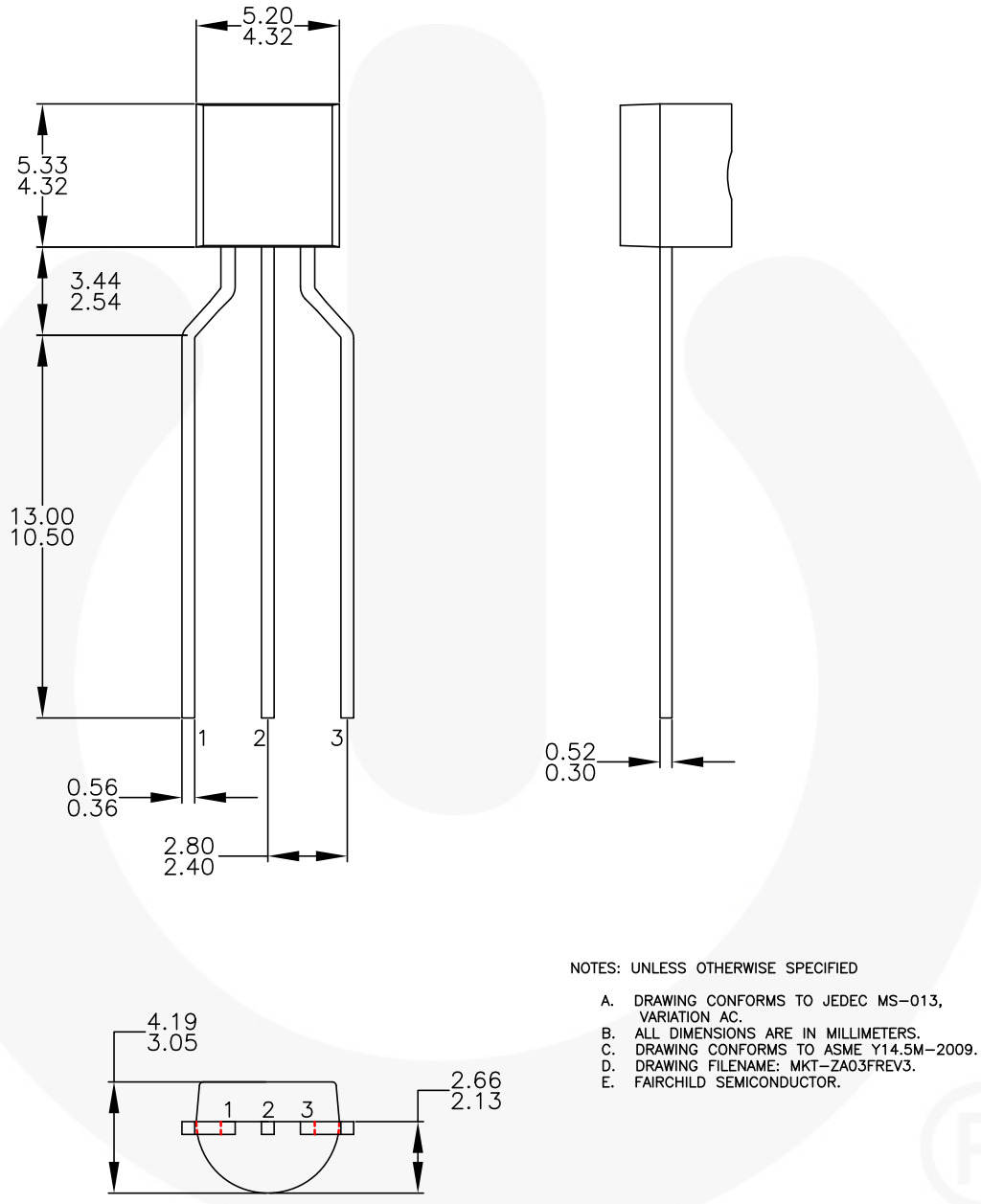


Figure 1. 3-Lead, TO-92, Molded, 0.2 In Line Spacing Lead Form

Physical Dimensions (Continued)

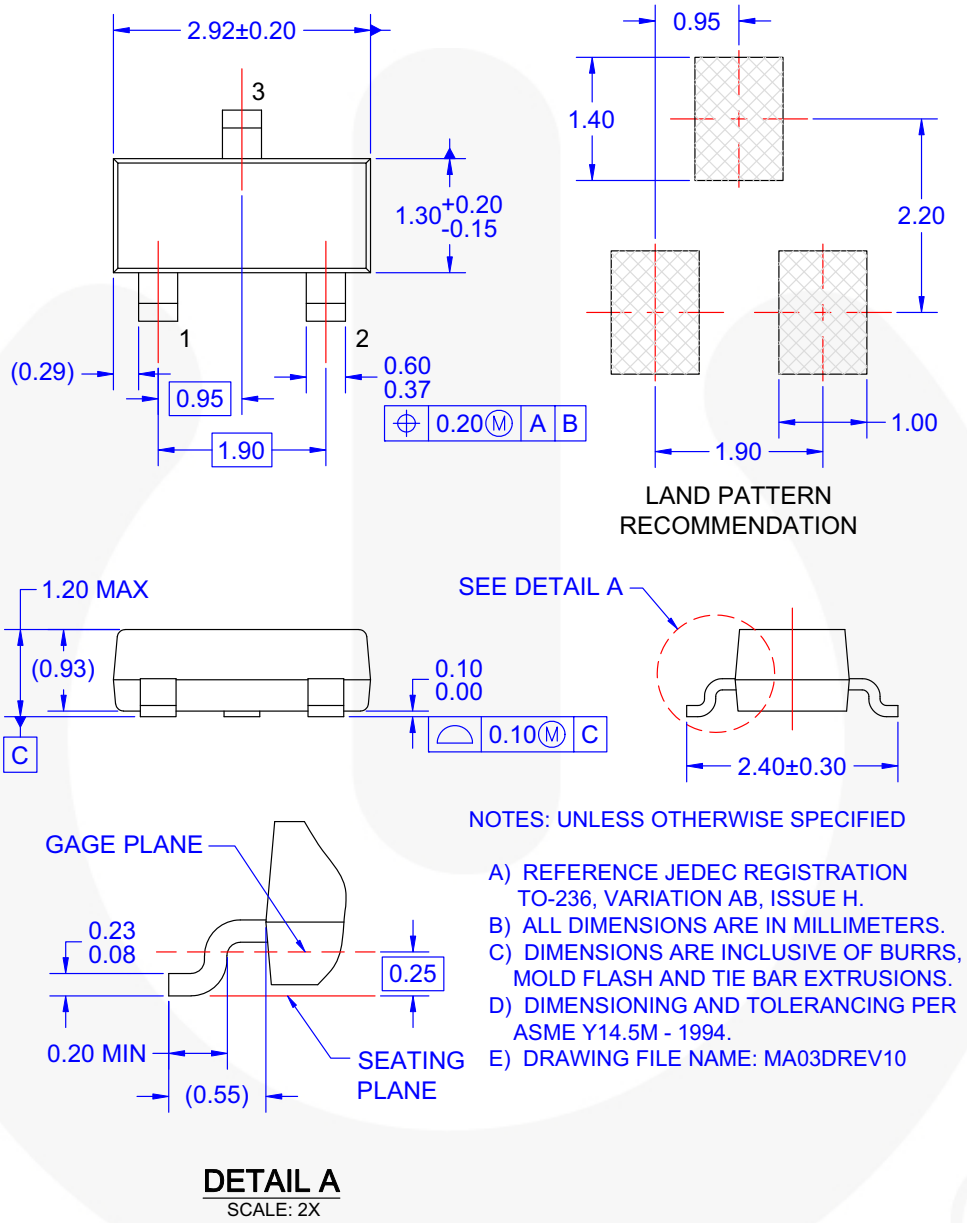


Figure 2. 3-LEAD, SOT23, JEDEC TO-236, LOW PROFILE

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Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
Obsolete	Not In Production	Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.

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