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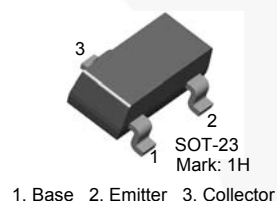
September 2015

# 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             |
|----------------|----------------------------------|-------------|------------------|
| $V_{CEO}$      | 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 | $^\circ\text{C}$ |

## Thermal Characteristics

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

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

### Note:

1. Device mounted on FR-4 PCB  $1.6'' \times 0.06''$

## Electrical Characteristics

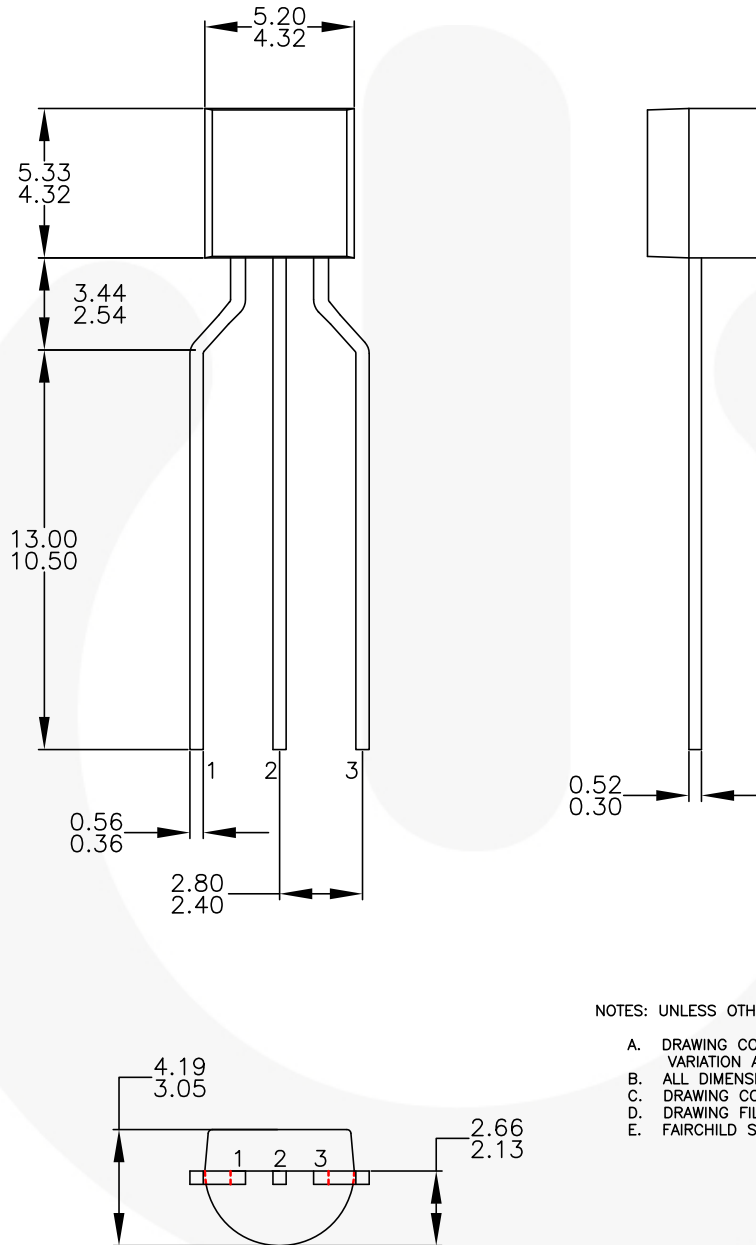
Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol        | Parameter  | Conditions  | Min. | Max. | Unit          |
|---------------|--|---|------|------|---------------|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage <sup>(2)</sup> | $I_C = 1\text{ mA}, I_B = 0$                                  | 60   |      | V             |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage                     | $I_E = 100\text{ }\mu\text{A}, I_C = 0$                       | 4    |      | V             |
| $I_{CEO}$     | Collector Cut-Off Current                          | $V_{CE} = 60\text{ V}, I_B = 0$                               |      | 0.1  | $\mu\text{A}$ |
| $I_{CBO}$     | Collector Cut-Off Current                          | $V_{CB} = 60\text{ V}, I_E = 0$                               |      | 0.1  | $\mu\text{A}$ |
| $h_{FE}$      | 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  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2.0\%$ .

# Physical Dimensions



NOTES: UNLESS OTHERWISE SPECIFIED

- 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)

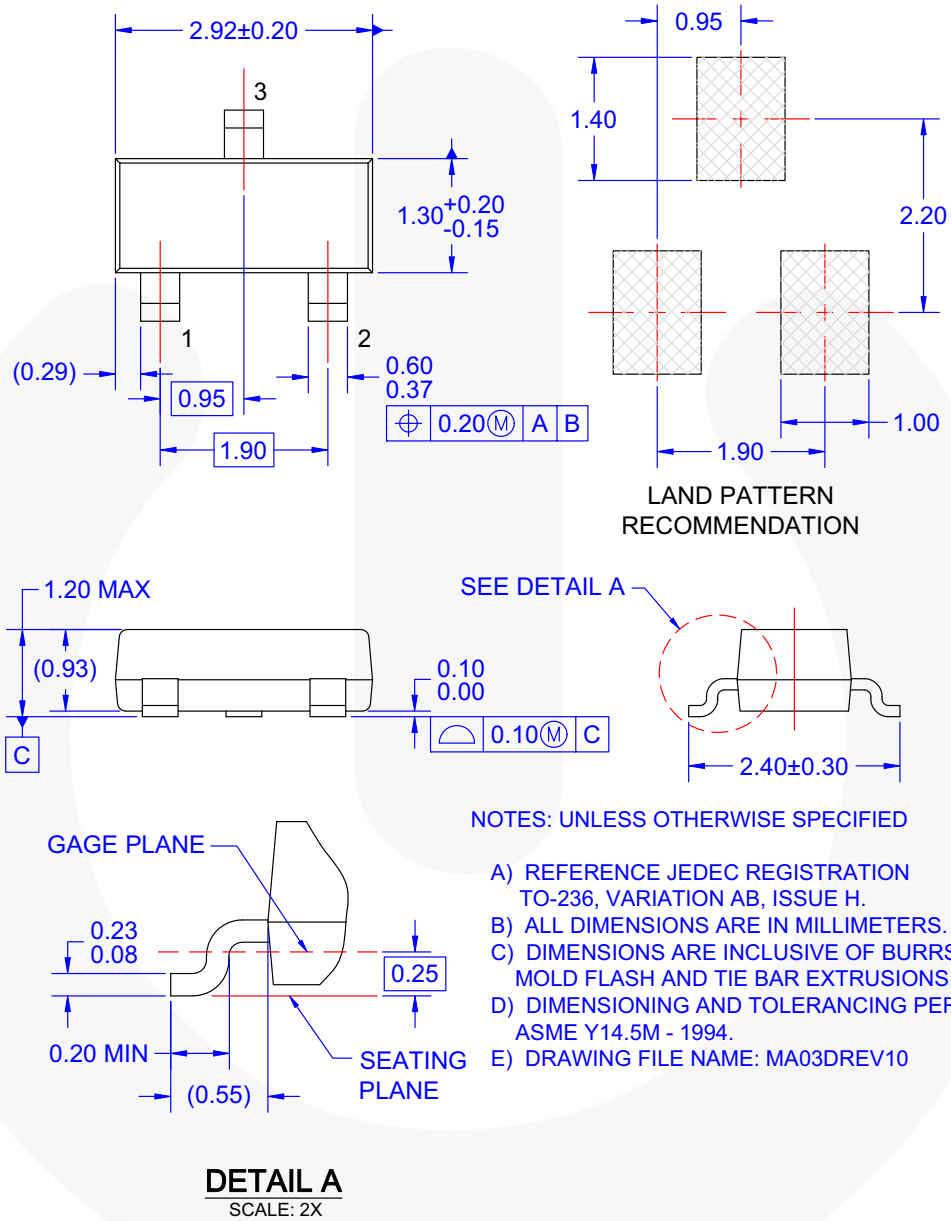


Figure 2. 3-LEAD, SOT23, JEDEC TO-236, LOW PROFILE



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