

**TO-92 Plastic-Encapsulate Transistors****MPSA05** TRANSISTOR (NPN)**FEATURES**

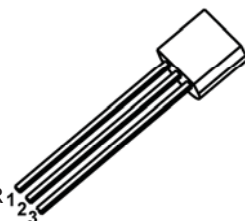
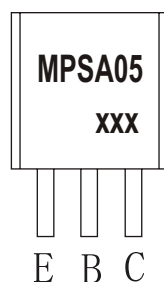
- General Purpose Amplifier

**TO – 92**

1.EMITTER

2.BASE

3.COLLECTOR

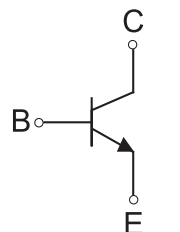
**MARKING**

MPSA05=Device code

XXX=Code

GXX=Green molding compound device

CXX=Normal molding compound device

**Equivalent Circuit****ORDERING INFORMATION**

| Part Number | Package | Packing Method | Pack Quantity |
|-------------|---------|----------------|---------------|
| MPSA05      | TO-92   | Bulk           | 1000pcs/Bag   |
| MPSA05-TA   | TO-92   | Tape           | 2000pcs/Box   |

**MAXIMUM RATINGS (T<sub>a</sub>=25°C unless otherwise noted)**

| Symbol                            | Parameter                                        | Value    | Unit  |
|-----------------------------------|--------------------------------------------------|----------|-------|
| V <sub>CBO</sub>                  | Collector-Base Voltage                           | 60       | V     |
| V <sub>CEO</sub>                  | Collector-Emitter Voltage                        | 60       | V     |
| V <sub>EBO</sub>                  | Emitter-Base Voltage                             | 4        | V     |
| I <sub>C</sub>                    | Collector Current -Continuous                    | 0.5      | A     |
| P <sub>D</sub>                    | Collector Power Dissipation                      | 625      | mW    |
| R <sub>θJA</sub>                  | Thermal Resistance from Junction to Ambient      | 200      | °C /W |
| T <sub>J</sub> , T <sub>stg</sub> | Operation Junction and Storage Temperature Range | -55~+150 | °C    |

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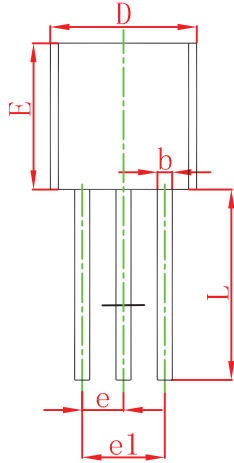
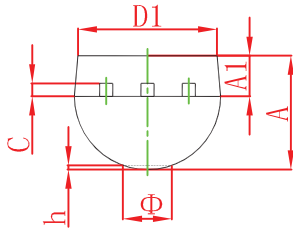
## ELECTRICAL CHARACTERISTICS

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$T_a=25^{\circ}\text{C}$  unless otherwise specified

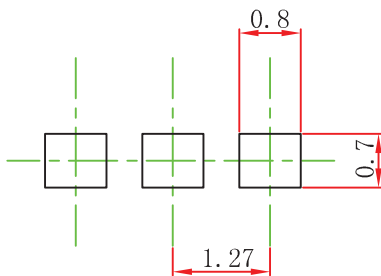
| Parameter                            | Symbol        | Test conditions                                        | Min | Typ | Max  | Unit          |
|--------------------------------------|---------------|--------------------------------------------------------|-----|-----|------|---------------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | $I_C=0.1\text{mA}, I_E=0$                              | 60  |     |      | V             |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | $I_C=1\text{mA}, I_B=0$                                | 60  |     |      | V             |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | $I_E=0.1\text{mA}, I_C=0$                              | 4   |     |      | V             |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB}=60\text{V}, I_E=0$                             |     |     | 0.1  | $\mu\text{A}$ |
| Collector cut-off current            | $I_{CEO}$     | $V_{CE}=60\text{V}, I_B=0$                             |     |     | 0.1  | $\mu\text{A}$ |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB}=3\text{V}, I_C=0$                              |     |     | 1    | $\mu\text{A}$ |
| DC current gain                      | $h_{FE(1)}$   | $V_{CE}=1.0\text{V}, I_C=100\text{mA}$                 | 100 |     |      |               |
|                                      | $h_{FE(2)}$   | $V_{CE}=1.0\text{V}, I_C=10\text{mA}$                  | 100 |     |      |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=100\text{mA}, I_B=10\text{mA}$                    |     |     | 0.25 | V             |
| Base-emitter voltage                 | $V_{BE}$      | $I_C=100\text{mA}, V_{CE}=1.0\text{V}$                 |     |     | 1.2  | V             |
| Transition frequency                 | $f_T$         | $V_{CE}=2.0\text{V}, I_C=10\text{mA}, f=100\text{MHz}$ | 100 |     |      | MHz           |

## TO-92 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min                       | Max    | Min                  | Max   |
| A      | 3.300                     | 3.700  | 0.130                | 0.146 |
| A1     | 1.100                     | 1.400  | 0.043                | 0.055 |
| b      | 0.380                     | 0.550  | 0.015                | 0.022 |
| c      | 0.360                     | 0.510  | 0.014                | 0.020 |
| D      | 4.300                     | 4.700  | 0.169                | 0.185 |
| D1     | 3.430                     |        | 0.135                |       |
| E      | 4.300                     | 4.700  | 0.169                | 0.185 |
| e      | 1.270 TYP                 |        | 0.050 TYP            |       |
| e1     | 2.440                     | 2.640  | 0.096                | 0.104 |
| L      | 14.100                    | 14.500 | 0.555                | 0.571 |
| Φ      |                           | 1.600  |                      | 0.063 |
| h      | 0.000                     | 0.380  | 0.000                | 0.015 |

## TO-92 Suggested Pad Layout



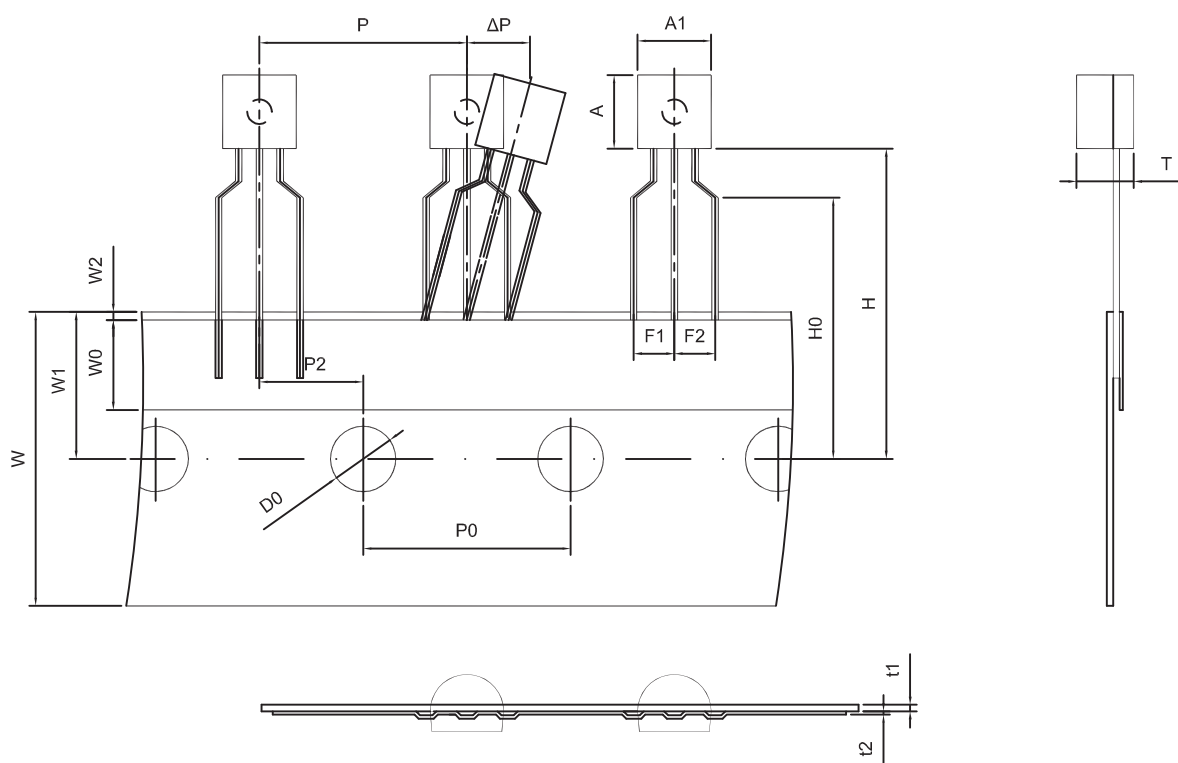
Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

### NOTICE

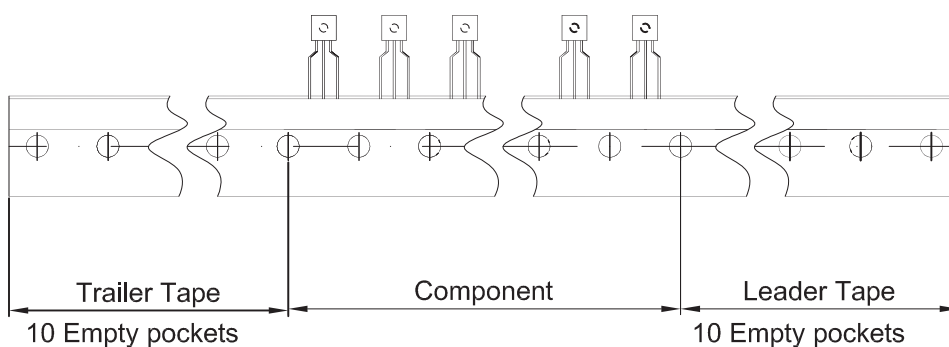
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## TO-92 Tape and Reel



Dimiensions are in millimeter

| A1  | A   | T        | P    | P0   | P2   | F1  | F2  | W          |
|-----|-----|----------|------|------|------|-----|-----|------------|
| 4.5 | 4.5 | 3.5      | 12.7 | 12.7 | 6.35 | 2.5 | 2.5 | 18.0       |
| W0  | W1  | W2       | H    | H0   | D0   | t1  | t2  | $\Delta P$ |
| 6.0 | 9.0 | 1.0 MAX. | 19.0 | 16.0 | 4.0  | 0.4 | 0.2 | 0          |



| Package | Box      | Box Size(mm) | Carton     | Carton Size(mm) |
|---------|----------|--------------|------------|-----------------|
| TO-92   | 2000 pcs | 333×162×43   | 20,000 pcs | 350×340×250     |