

TO-92 Plastic-Encapsulate Transistors

TRANSISTOR (NPN)

Features:

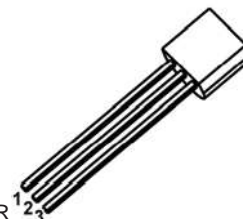
- General Purpose Amplifier

TO - 92

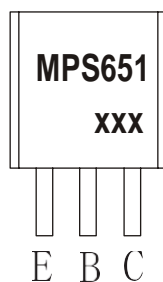
1.EMITTER

2.BASE

3.COLLECTOR

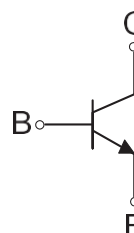


MARKING



MPS651=Device code
 XXX=Code

Equivalent Circuit



ORDERING INFORMATION

| Part Number | Package | Packing Method | Pack Quantity |
|-------------|---------|----------------|---------------|
| MPS651 | TO-92 | Bulk | 1000pcs/Bag |
| MPS651-TA | TO-92 | Tape | 2000pcs/Box |

MAXIMUM RATINGS (T_a=25°C unless otherwise noted)

| Symbol | Parameter | Value | Unit |
|----------------------------------|--|----------|-------|
| V _{CB0} | Collector-Base Voltage | 80 | V |
| V _{CEO} | Collector-Emitter Voltage | 60 | V |
| V _{EBO} | Emitter-Base Voltage | 5 | V |
| I _C | Collector Current -Continuous | 2 | A |
| P _D | Collector Power Dissipation | 625 | mW |
| R _{θJA} | Thermal Resistance rom Junction to Ambient | 200 | °C /W |
| T _J ,T _{stg} | Operation Junction and Storage Temperature Range | -55~+150 | °C |

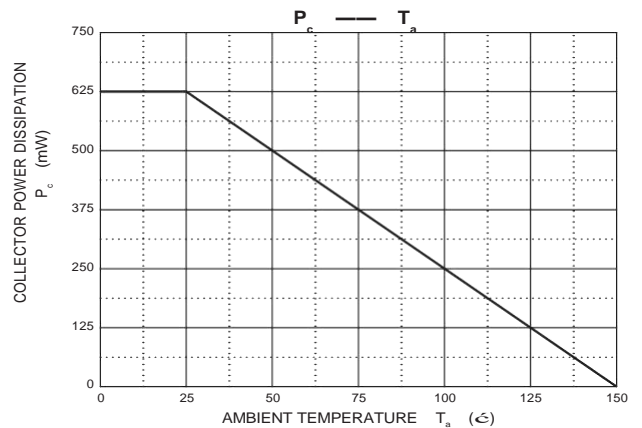
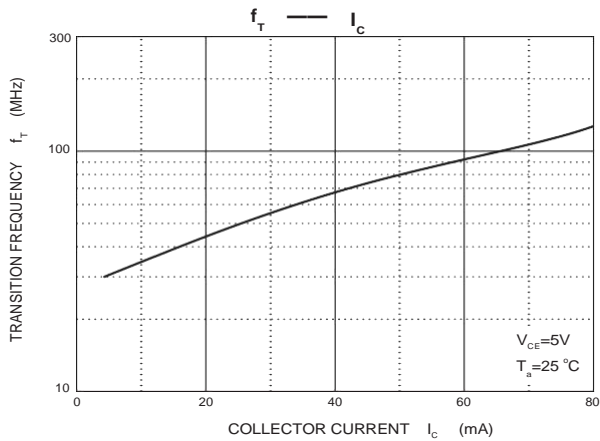
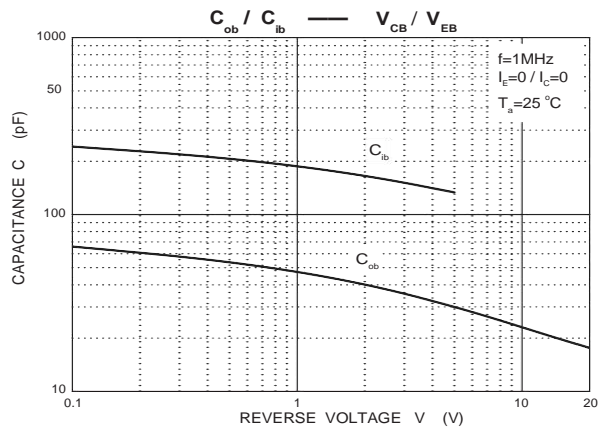
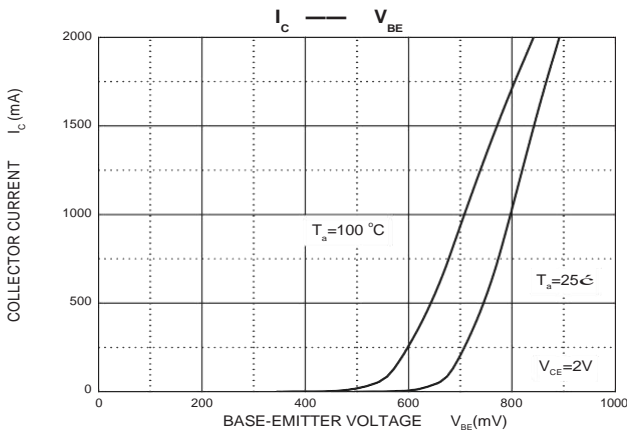
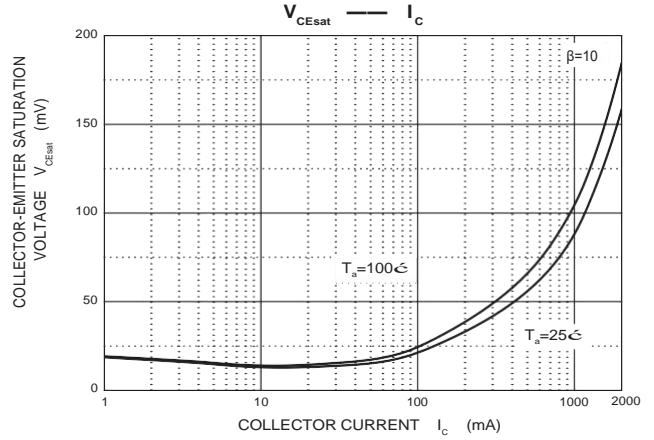
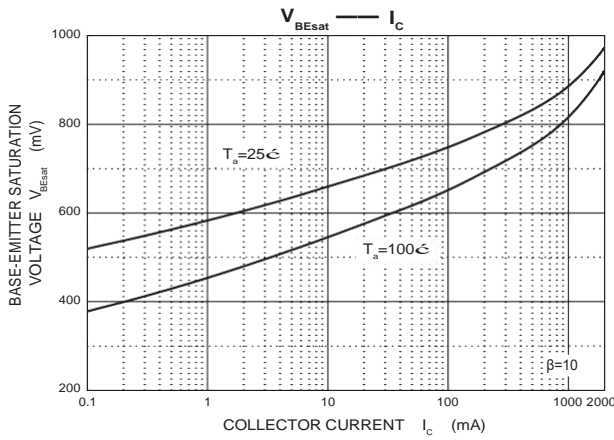
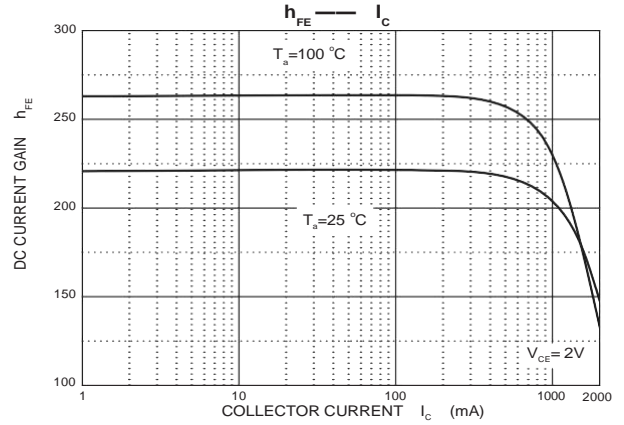
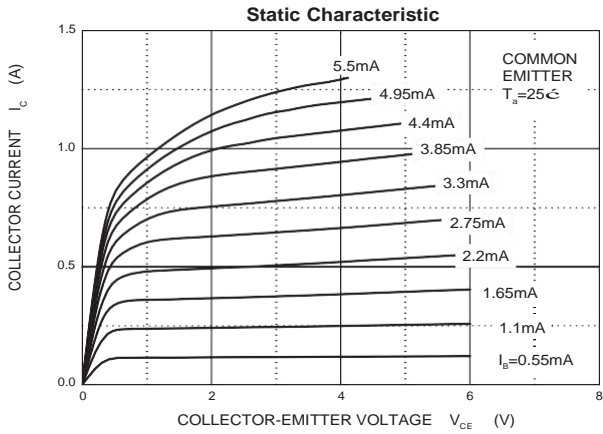
ELECTRICAL CHARACTERISTICS

T =25 °C unless otherwise specified

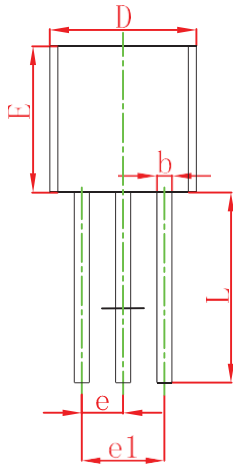
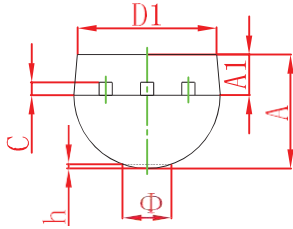
| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|--------------------------------------|--------------------|---------------------------------|-----|-----|-----|---------|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | $I_C=0.1mA, I_E=0$ | 80 | | | V |
| Collector-emitter breakdown | $V_{(BR)CEO}^*$ | $I_C=10mA, I_B=0$ | 60 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E=0.01mA, I_C=0$ | 5 | | | V |
| Collector cut-off current | I_{CBO} | $V_{CB}=80V, I_E=0$ | | | 0.1 | μA |
| Emitter cut-off current | I_{EBO} | $V_{EB}=4V, I_C=0$ | | | 0.1 | μA |
| DC current gain | $h_{FE(1)}^*$ | $V_{CE}=2V, I_C=50mA$ | 75 | | | |
| | $h_{FE(2)}^*$ | $V_{CE}=2V, I_C=500mA$ | 75 | | | |
| | $h_{FE(3)}^*$ | $V_{CE}=2V, I_C=1A$ | 75 | | | |
| | $h_{FE(4)}^*$ | $V_{CE}=2V, I_C=2A$ | 40 | | | |
| Collector-emitter saturation voltage | $V_{CE(sat)(1)}^*$ | $I_C=2A, I_B=200mA$ | | | 0.5 | V |
| | $V_{CE(sat)(2)}^*$ | $I_C=1A, I_B=100mA$ | | | 0.3 | V |
| Base-emitter saturation voltage | $V_{BE(sat)}^*$ | $I_C=1A, I_B=100mA$ | | | 1.2 | V |
| Base-emitter voltage | V_{BE} | $I_C=1A, V_{CE}=2V$ | | | 1 | V |
| Transition frequency | f_T | $V_{CE}=5V, I_C=50mA, f=100MHz$ | 75 | | | MHz |

*Pulse test: pulse width $\leq 300\mu s$, duty cycles $\leq 2.0\%$.

Typical Characteristics

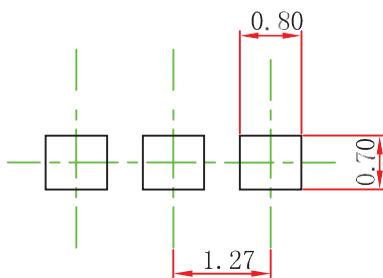


TO-92 Package Outline Dimensions



| 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 |

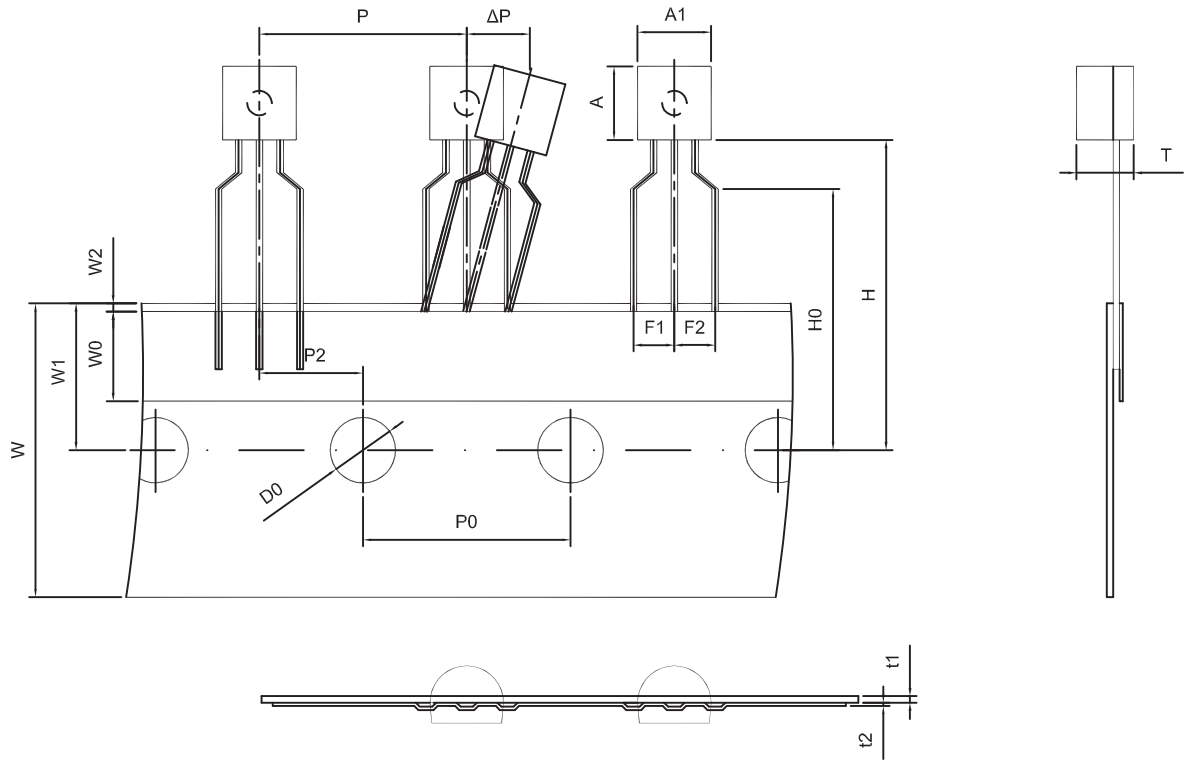
TO-92 Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: ± 0.05 mm.
 3. The pad layout is for reference purposes only.

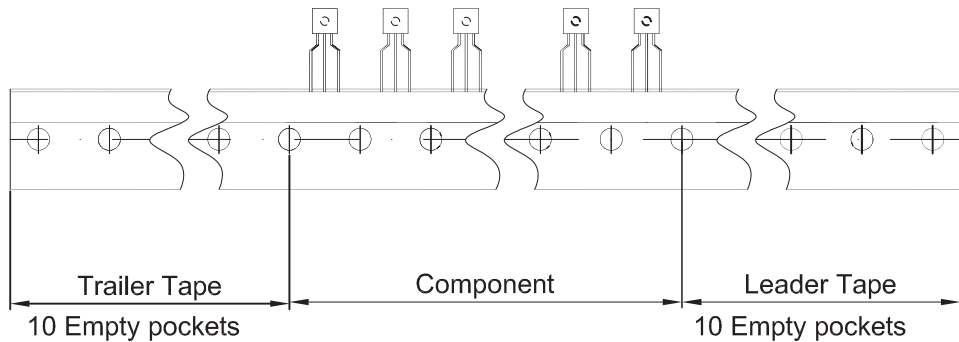
TO-92 Tape and Reel

TO-92 PACKAGE TAPEING DIMENSION



Dimensions 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 | ΔP |
| 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 |