# MPS4250

# Transistor

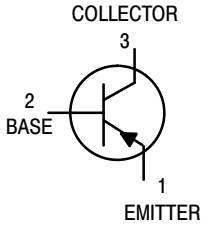
## PNP Silicon

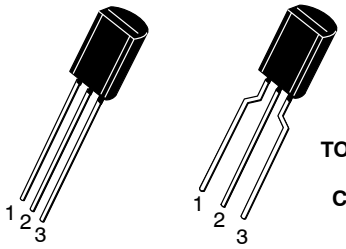
**Features**

- This is a Pb−Free Device*

**ON Semiconductor®**

**http://onsemi.com**




STRAIGHT LEAD
BULK PACK

BENT LEAD
TAPE & REEL
AMMO PACK

**TO−92 1 WATT**
**(TO−226)**
**CASE 29−10**
**STYLE 1**

**MAXIMUM RATINGS**

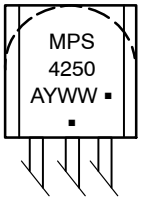
| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Collector − Emitter Voltage | $V_{CEO}$ | −40 | Vdc |
| Collector − Emitter Voltage | $V_{CES}$ | −40 | Vdc |
| Collector − Base Voltage | $V_{CBO}$ | −40 | Vdc |
| Emitter − Base Voltage | $V_{EBO}$ | −5.0 | Vdc |
| Collector Current − Continuous | $I_C$ | −50 | mAdc |
| Total Device Dissipation @ $T_A$ = 25°C<br>Derate above 25°C | $P_D$ | 625<br>5.0 | W<br>mW/°C |
| Total Device Dissipation @ $T_C$ = 25°C<br>Derate above 25°C | $P_D$ | 1.5<br>12 | W<br>mW/°C |
| Operating and Storage Junction Temperature Range | $T_J$, $T_{stg}$ | −55 to +150 | °C |

**THERMAL CHARACTERISTICS**

| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Thermal Resistance, Junction−to−Ambient | $R_{\theta JA}$ | 200 | °C/W |
| Thermal Resistance, Junction−to−Case | $R_{\theta JC}$ | 83.3 | °C/W |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

**MARKING DIAGRAM**




A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb−Free Package

(Note: Microdot may be in either location)

**ORDERING INFORMATION**

| Device | Package | Shipping† |
|---|---|---|
| MPS4250G | TO−92<br>(Pb−Free) | 5000 / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

**ELECTRICAL CHARACTERISTICS** ($T_A$ = 25°C unless otherwise noted)

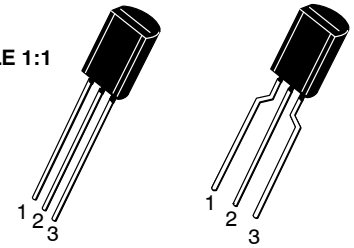
| Characteristic | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | |
| Collector – Emitter Breakdown Voltage ($I_C$ = –5.0 mA) | $V_{(BR)CES}$ | –40 | – | Vdc |
| Collector – Emitter Sustaining Voltage (Note 1) ($I_C$ = –5.0) | $V_{(BR)CEO(sus)}$ | –40 | – | Vdc |
| Collector – Base Breakdown Voltage ($I_C$ = –10 μA) | $V_{(BR)CBO}$ | –40 | – | Vdc |
| Emitter – Base Breakdown Voltage ($I_E$ = –10 μA) | $V_{(BR)EBO}$ | –5.0 | – | Vdc |
| Collector Cutoff Current<br>($V_{CB}$ = –50 V)<br>($V_{CB}$ = –40 V, $T_A$ = 65°C) | $I_{CBO}$ | <br>–<br>– | <br>–10<br>–3.0 | <br>nA<br>μA |
| Emitter Cutoff Current ($V_{EB}$ = –3.0 V) | $I_{EBO}$ | – | –20 | nA |
| **ON CHARACTERISTICS** | | | | |
| DC Current Gain<br>($I_C$ = –1.0 mA, $V_{CE}$ = –5.0 V)<br>($I_C$ = –10 mA, $V_{CE}$ = –5.0 V) | $h_{FE}$ | <br>250<br>250 | <br>–<br>– | – |
| Collector – Emitter Saturation Voltage (Note 1) ($I_C$ = –10 mA, $I_B$ = –0.5 mA) | $V_{CE(sat)}$ | – | –0.25 | Vdc |
| Base – Emitter Saturation Voltage (Note 1) ($I_C$ = –10 mA, $I_B$ = –0.5 mA) | $V_{BE(sat)}$ | – | –0.9 | Vdc |
| **SMALL–SIGNAL CHARACTERISTICS** | | | | |
| Output Capacitance ($V_{CB}$ = –5.0 V, f = 1.0 MHz) | $C_{obo}$ | – | 6.0 | pF |
| Input Capacitance ($V_{EB}$ = –0.5 V, f = 1.0 MHz) | $C_{ibo}$ | – | 16 | pF |
| Small–Signal Current Gain<br>($I_C$ = –1.0 mA, $V_{CE}$ = –5.0 V, f = 1.0 kHz)<br>($I_C$ = –0.5 mA, $V_{CE}$ = –5.0 V, f = 20 MHz) | $h_{fe}$ | <br>250<br>2.0 | <br>800<br>– | – |
| Noise Figure<br>($I_C$ = –20 μA, $V_{CE}$ = –5.0 V, $R_S$ = 10 kΩ, f = 1.0 kHz, $P_{BW}$ = 150 Hz)<br>($I_C$ = –250 μA, $V_{CE}$ = –5.0 V, $R_S$ = 1.0 kΩ, f = 1.0 kHz, $P_{BW}$ = 150 Hz) | NF | <br>–<br>– | <br>2.0<br>2.0 | dB |

1. Pulse Test: Pulse Width = 300 μs; Duty Cycle = 2.0%.

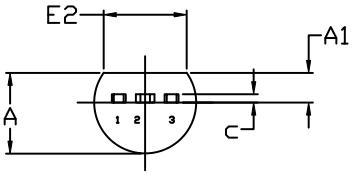
**TO−92 (TO−226) 1 WATT**
CASE 29−10
ISSUE D

DATE 05 MAR 2021

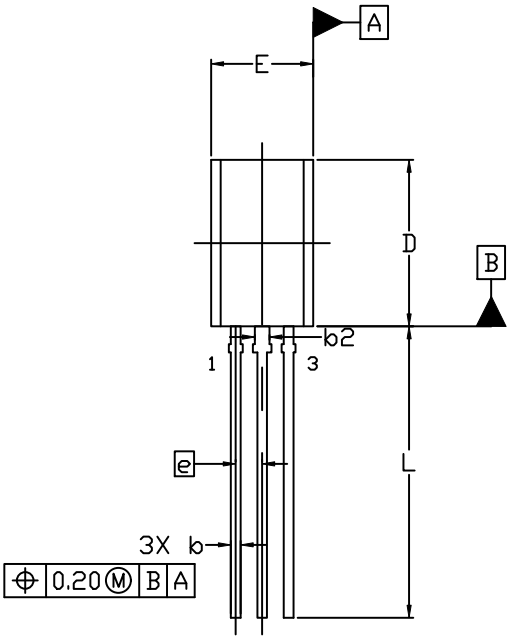
SCALE 1:1




## STRAIGHT LEAD




END VIEW




TOP VIEW

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH OR GATE PROTRUSIONS.
4. DIMENSION b AND b2 DOES NOT INCLUDE DAMBAR PROTRUSION. LEAD WIDTH INCLUDING PROTRUSION SHALL NOT EXCEED 0.20. DIMENSION b2 LOCATED ABOVE THE DAMBAR PORTION OF MIDDLE LEAD.

| | MILLIMETERS | | |
|---|---|---|---|
| DIM | MIN. | NOM. | MAX. |
| A | 3.75 | 3.90 | 4.05 |
| A1 | 1.28 | 1.43 | 1.58 |
| b | 0.38 | 0.465 | 0.55 |
| b2 | 0.62 | 0.70 | 0.78 |
| c | 0.35 | 0.40 | 0.45 |
| D | 7.85 | 8.00 | 8.15 |
| E | 4.75 | 4.90 | 5.05 |
| E2 | 3.90 | --- | --- |
| e | 1.27 BSC | | |
| L | 13.80 | 14.00 | 14.20 |

**STYLES AND MARKING ON PAGE 3**

**TO−92 (TO−226) 1 WATT**
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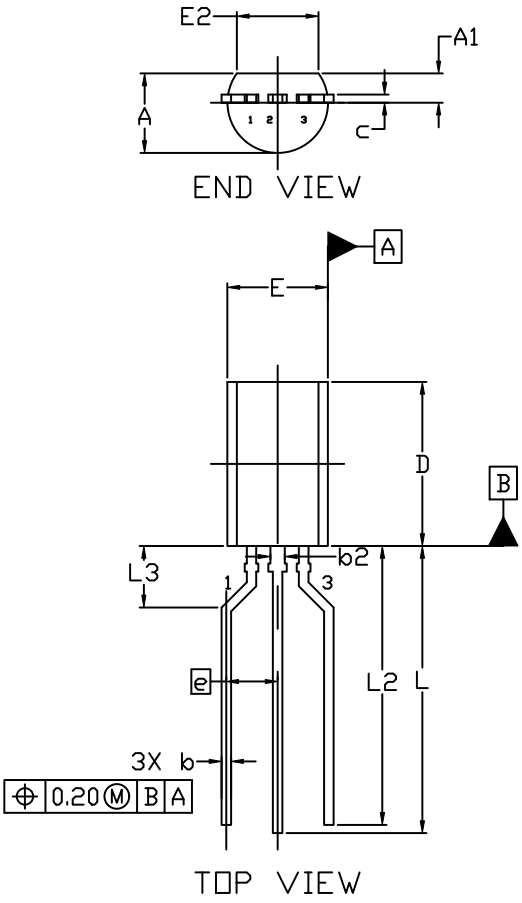
ISSUE D

DATE 05 MAR 2021

FORMED LEAD




NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH OR GATE PROTRUSIONS.
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| | MILLIMETERS | | |
|---|---|---|---|
| DIM | MIN. | NOM. | MAX. |
| A | 3.75 | 3.90 | 4.05 |
| A1 | 1.28 | 1.43 | 1.58 |
| b | 0.38 | 0.465 | 0.55 |
| b2 | 0.62 | 0.70 | 0.78 |
| c | 0.35 | 0.40 | 0.45 |
| D | 7.85 | 8.00 | 8.15 |
| E | 4.75 | 4.90 | 5.05 |
| E2 | 3.90 | --- | --- |
| e | 2.50 BSC | | |
| L | 13.80 | 14.00 | 14.20 |
| L2 | 13.20 | 13.60 | 14.00 |
| L3 | 3.00 REF | | |

**STYLES AND MARKING ON PAGE 3**

**TO−92 (TO−226) 1 WATT**
CASE 29−10
ISSUE D

DATE 05 MAR 2021

STYLE 1:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

STYLE 2:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

STYLE 3:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 4:
PIN 1. CATHODE
2. CATHODE
3. ANODE

STYLE 5:
PIN 1. DRAIN
2. SOURCE
3. GATE

STYLE 6:
PIN 1. GATE
2. SOURCE & SUBSTRATE
3. DRAIN

STYLE 7:
PIN 1. SOURCE
2. DRAIN
3. GATE

STYLE 8:
PIN 1. DRAIN
2. GATE
3. SOURCE & SUBSTRATE

STYLE 9:
PIN 1. BASE 1
2. EMITTER
3. BASE 2

STYLE 10:
PIN 1. CATHODE
2. GATE
3. ANODE

STYLE 11:
PIN 1. ANODE
2. CATHODE & ANODE
3. CATHODE

STYLE 12:
PIN 1. MAIN TERMINAL 1
2. GATE
3. MAIN TERMINAL 2

STYLE 13:
PIN 1. ANODE 1
2. GATE
3. CATHODE 2

STYLE 14:
PIN 1. EMITTER
2. COLLECTOR
3. BASE

STYLE 15:
PIN 1. ANODE 1
2. CATHODE
3. ANODE 2

STYLE 16:
PIN 1. ANODE
2. GATE
3. CATHODE

STYLE 17:
PIN 1. COLLECTOR
2. BASE
3. EMITTER

STYLE 18:
PIN 1. ANODE
2. CATHODE
3. NOT CONNECTED

STYLE 19:
PIN 1. GATE
2. ANODE
3. CATHODE

STYLE 20:
PIN 1. NOT CONNECTED
2. CATHODE
3. ANODE

STYLE 21:
PIN 1. COLLECTOR
2. EMITTER
3. BASE

STYLE 22:
PIN 1. SOURCE
2. GATE
3. DRAIN

STYLE 23:
PIN 1. GATE
2. SOURCE
3. DRAIN

STYLE 24:
PIN 1. EMITTER
2. COLLECTOR/ANODE
3. CATHODE

STYLE 25:
PIN 1. MT 1
2. GATE
3. MT 2

STYLE 26:
PIN 1. $V_{CC}$
2. GROUND 2
3. OUTPUT

STYLE 27:
PIN 1. MT
2. SUBSTRATE
3. MT

STYLE 28:
PIN 1. CATHODE
2. ANODE
3. GATE

STYLE 29:
PIN 1. NOT CONNECTED
2. ANODE
3. CATHODE

STYLE 30:
PIN 1. DRAIN
2. GATE
3. SOURCE

STYLE 31:
PIN 1. GATE
2. DRAIN
3. SOURCE

STYLE 32:
PIN 1. BASE
2. COLLECTOR
3. EMITTER

STYLE 33:
PIN 1. RETURN
2. INPUT
3. OUTPUT

STYLE 34:
PIN 1. INPUT
2. GROUND
3. LOGIC

STYLE 35:
PIN 1. GATE
2. COLLECTOR
3. EMITTER

## GENERIC MARKING DIAGRAM*


XXXX = Specific Device Code
A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week
▪ = Pb−Free Package

(Note: Microdot may be in either location)

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

| | | | |
|---|---|---|---|
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