

MPS6724, MPS6725

One Watt Darlington Transistors

NPN Silicon

Features

- Pb-Free Packages are Available*

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|----------------|-------------|---------------------------|
| Collector-Emitter Voltage MPS6724 MPS6725 | V_{CEO} | 40 50 | Vdc |
| Collector-Base Voltage MPS6724 MPS6725 | V_{CBO} | 50 60 | Vdc |
| Emitter-Base Voltage | V_{EBO} | 12 | Vdc |
| Collector Current - Continuous | I_C | 1000 | mAdc |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 1.0 8.0 | W mW/ $^\circ\text{C}$ |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 2.5 20 | W mW/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|-----------------|-----|---------------------------|
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 125 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 50 | $^\circ\text{C}/\text{W}$ |

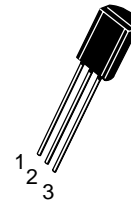
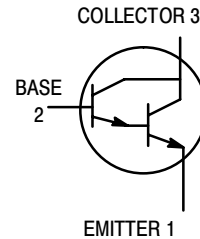
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

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



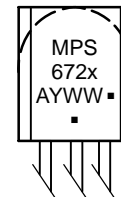
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<http://onsemi.com>



TO-92 (TO-226)
CASE 29-10
STYLE 1

MARKING DIAGRAM



MPS672x = Device Code
x = 4 or 5
A = Assembly Location
Y = Year
WW = Work Week
■ = Pb-Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

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ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit | |
|--|--------------------|---------------|----------|------------|------|
| OFF CHARACTERISTICS | | | | | |
| Collector – Emitter Breakdown Voltage (Note 1) ($I_C = 1.0 \text{ mAdc}$, $I_B = 0$) | MPS6724 MPS6725 | $V_{(BR)CES}$ | 40 50 | – – | Vdc |
| Collector – Base Breakdown Voltage ($I_C = 1.0 \mu\text{Adc}$, $I_E = 0$) | MPS6724 MPS6725 | $V_{(BR)CBO}$ | 50 60 | – – | Vdc |
| Emitter – Base Breakdown Voltage ($I_E = 10 \mu\text{Adc}$, $I_C = 0$) | | $V_{(BR)EBO}$ | 12 | – | Vdc |
| Collector Cutoff Current ($V_{CB} = 30 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = 40 \text{ Vdc}$, $I_E = 0$) | MPS6724 MPS6725 | I_{CBO} | – – | 100 100 | nAdc |
| Emitter Cutoff Current ($V_{EB} = 10 \text{ Vdc}$, $I_C = 0$) | | I_{EBO} | – | 100 | nAdc |

ON CHARACTERISTICS (Note 1)

| | | | | |
|--|---------------|-----------------|-------------|-----|
| DC Current Gain ($I_C = 200 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$) ($I_C = 1000 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$) | h_{FE} | 25,000 4,000 | – 40,000 | – |
| Collector – Emitter Saturation Voltage ($I_C = 1000 \text{ mAdc}$, $I_B = 2.0 \text{ mAdc}$) | $V_{CE(sat)}$ | – | 1.5 | Vdc |
| Base – Emitter On Voltage ($I_C = 1000 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$) | $V_{BE(on)}$ | – | 2.0 | Vdc |

SMALL-SIGNAL CHARACTERISTICS

| | | | | |
|---|----------|-----|------|-----|
| Current – Gain – Bandwidth Product ($I_C = 200 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$, $f = 100 \text{ MHz}$) | f_T | 100 | 1000 | MHz |
| Collector – Base Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$) | C_{cb} | – | 10 | pF |

1. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$; Duty Cycle $\leq 2.0\%$.

TYPICAL CHARACTERISTICS

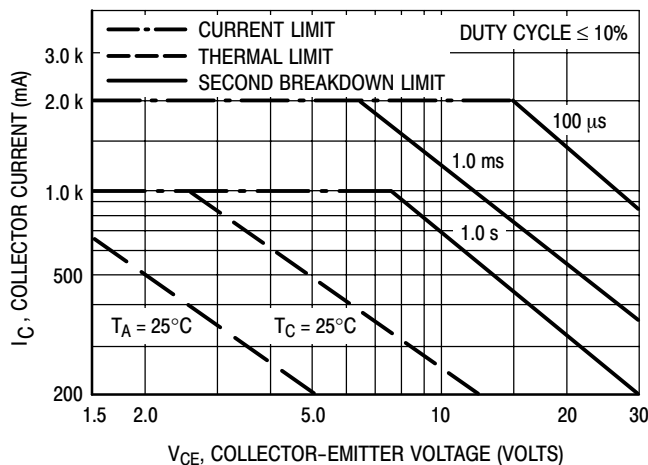


Figure 1. Active Region — Safe Operating Area

MPS6724, MPS6725

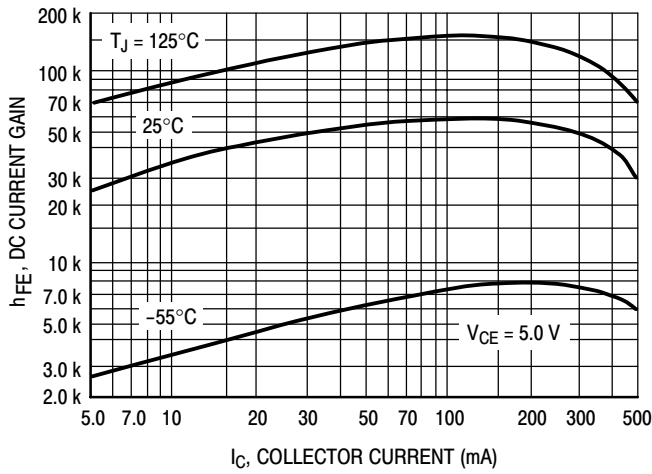


Figure 2. DC Current Gain

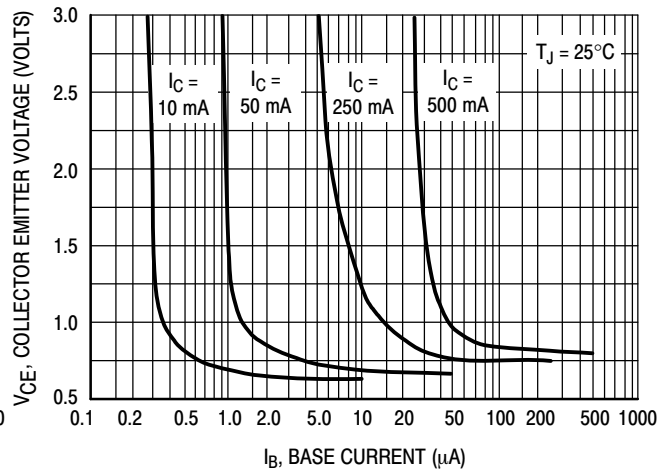


Figure 3. Collector Saturation Region

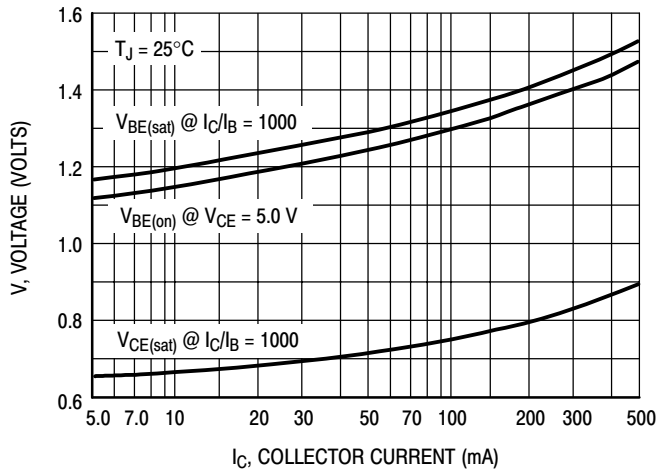


Figure 4. "ON" Voltages

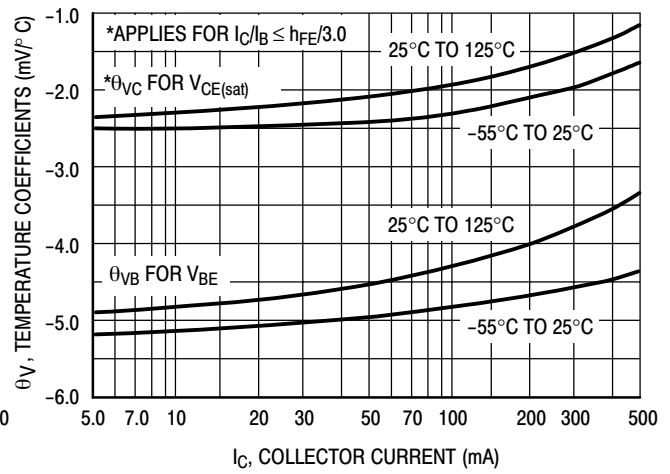


Figure 5. Temperature Coefficients

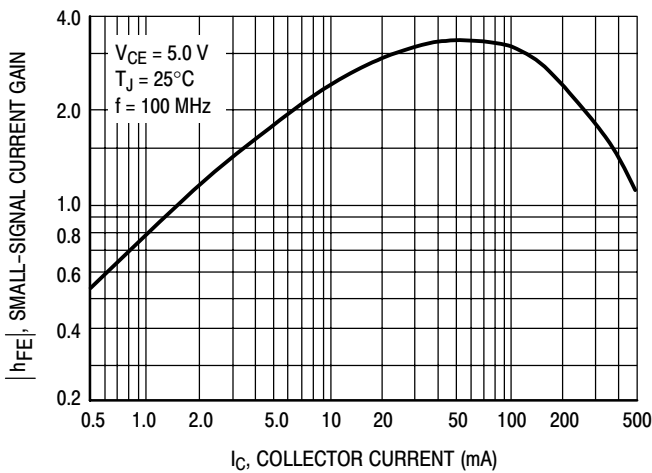


Figure 6. High Frequency Current Gain

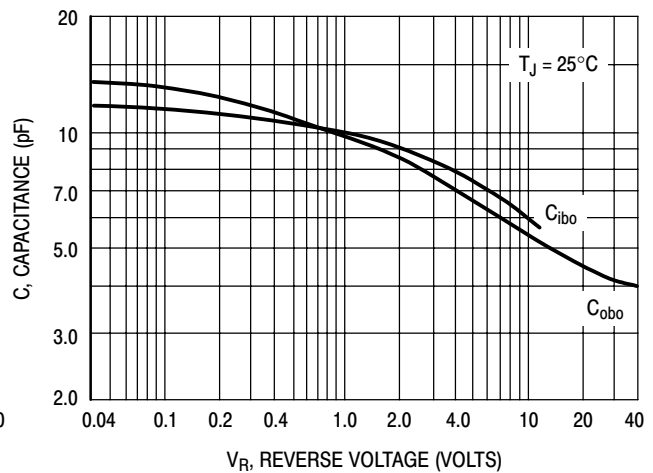


Figure 7. Capacitance

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ORDERING INFORMATION

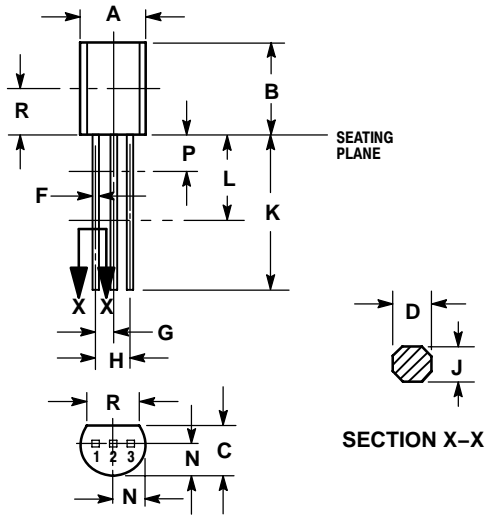
| Device | Package | Shipping† |
|--------------|--------------------|------------------------------|
| MPS6724 | TO-92 | 5000 Units / Bulk |
| MPS6724G | TO-92 (Pb-Free) | |
| MPS6725 | TO-92 | 5000 Units / Bulk |
| MPS6725G | TO-92 (Pb-Free) | |
| MPS6724RLRA | TO-92 | 2000 Units / Tape & Reel |
| MPS6724RLRAG | TO-92 (Pb-Free) | |
| MPS6725RLRP | TO-92 | 2000 Units / Tape & Ammo Box |
| MPS6725RLRPG | TO-92 (Pb-Free) | |

†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.

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PACKAGE DIMENSIONS

TO-92 (TO-226)
CASE 29-10
ISSUE AL



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSIONS D AND J APPLY BETWEEN L AND K MINIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.175 | 0.205 | 4.44 | 5.21 |
| B | 0.290 | 0.310 | 7.37 | 7.87 |
| C | 0.125 | 0.165 | 3.18 | 4.19 |
| D | 0.018 | 0.021 | 0.457 | 0.533 |
| F | 0.016 | 0.019 | 0.407 | 0.482 |
| G | 0.045 | 0.055 | 1.15 | 1.39 |
| H | 0.095 | 0.105 | 2.42 | 2.66 |
| J | 0.018 | 0.024 | 0.46 | 0.61 |
| K | 0.500 | --- | 12.70 | --- |
| L | 0.250 | --- | 6.35 | --- |
| N | 0.080 | 0.105 | 2.04 | 2.66 |
| P | --- | 0.100 | --- | 2.54 |
| R | 0.135 | --- | 3.43 | --- |

STYLE 1:

- PIN 1. EMITTER
- BASE
- COLLECTOR

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