

# 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 $25^\circ\text{C}$	$P_D$	1.0 8.0	W mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	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	$^\circ\text{C}/\text{W}$

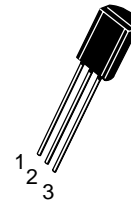
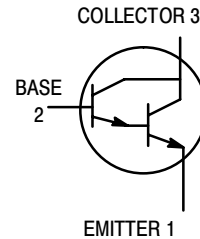
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur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



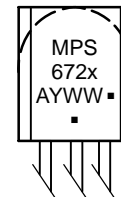
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TO-92 (TO-226)  
CASE 29-10  
STYLE 1

#### 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.

# MPS6724, MPS6725

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

Characteristic	Symbol	Min	Max	Unit	
<b>OFF CHARACTERISTICS</b>					
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

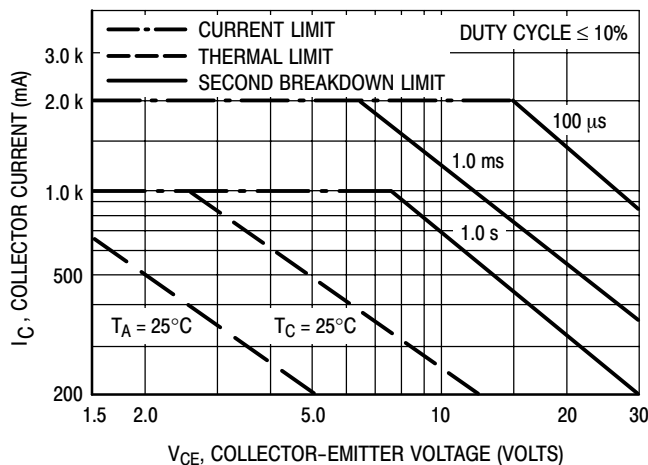


Figure 1. Active Region — Safe Operating Area

# MPS6724, MPS6725

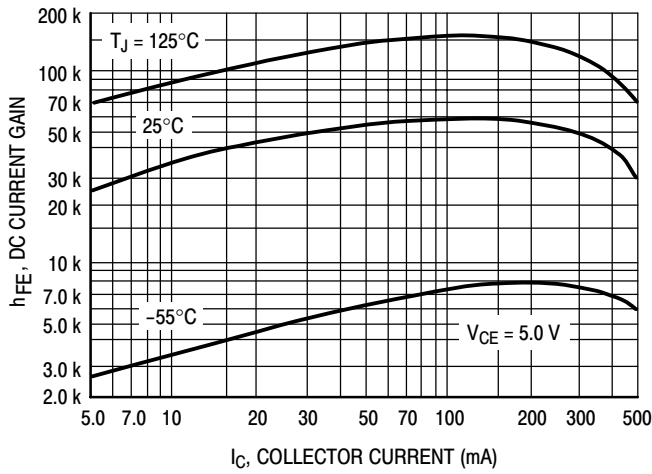


Figure 2. DC Current Gain

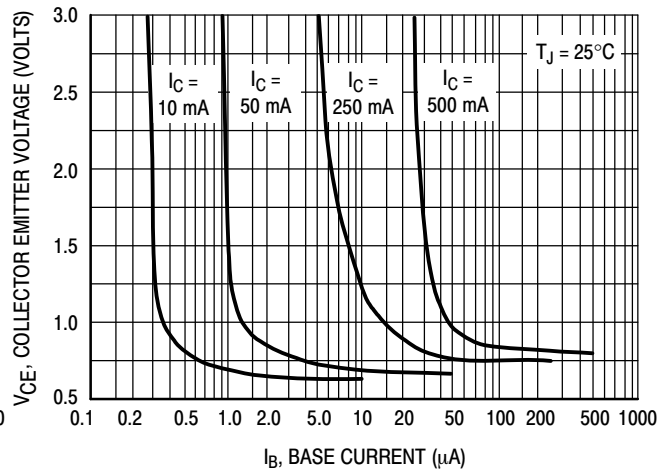


Figure 3. Collector Saturation Region

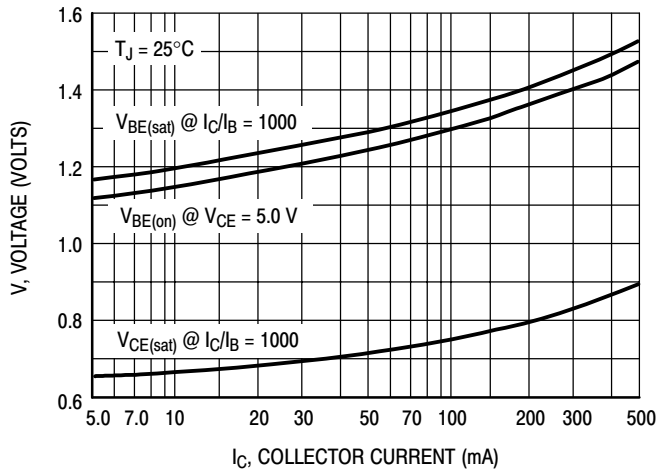


Figure 4. "ON" Voltages

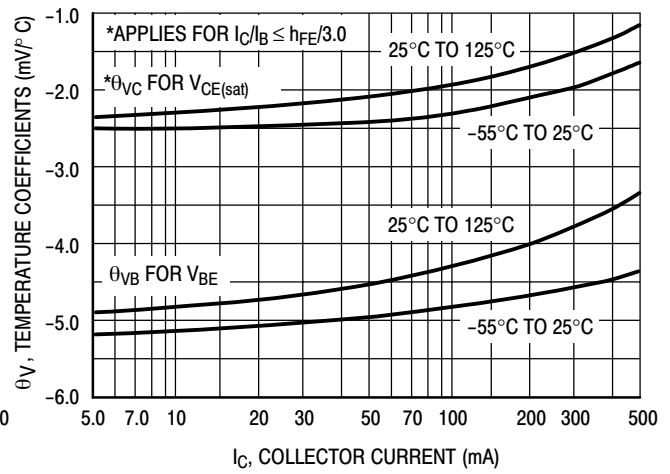


Figure 5. Temperature Coefficients

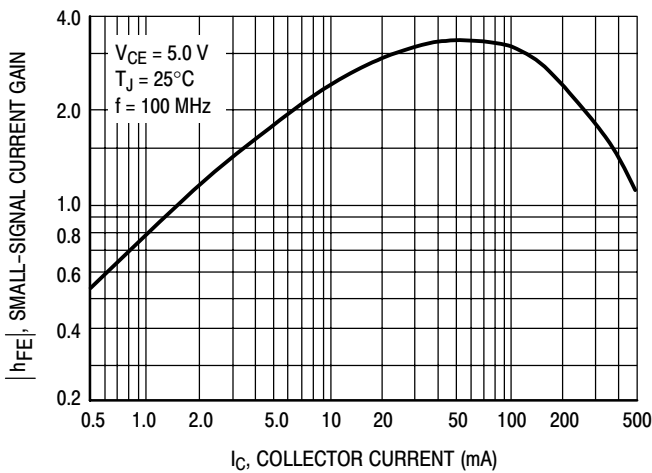


Figure 6. High Frequency Current Gain

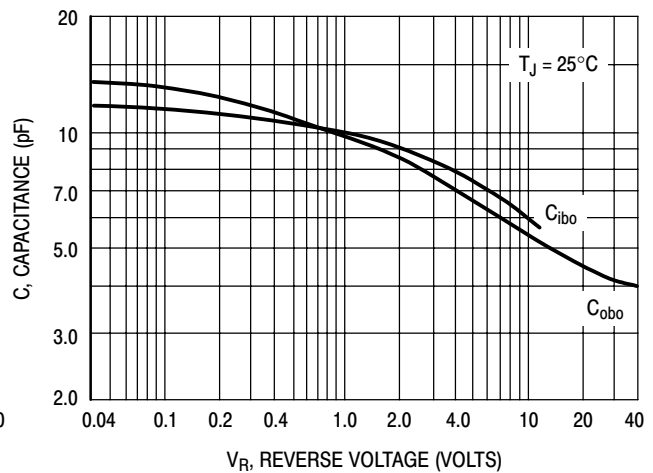


Figure 7. Capacitance

## MPS6724, MPS6725

### ORDERING INFORMATION

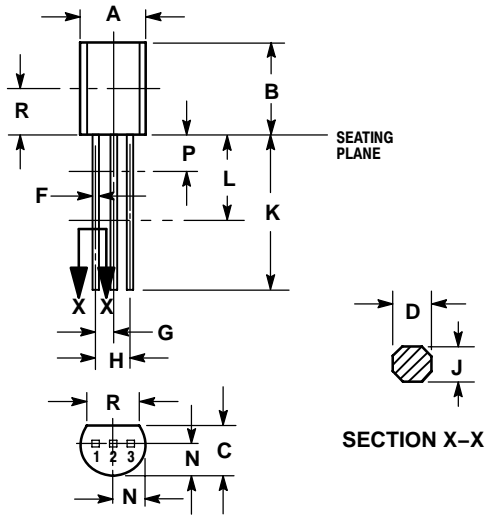
Device	Package	Shipping†
MPS6724	TO-92	5000 Units / Bulk
MPS6724G	TO-92 (Pb-Free)	
MPS6725	TO-92	5000 Units / Bulk
MPS6725G	TO-92 (Pb-Free)	
MPS6724RLRA	TO-92	2000 Units / Tape & Reel
MPS6724RLRAG	TO-92 (Pb-Free)	
MPS6725RLRP	TO-92	2000 Units / Tape & Ammo Box
MPS6725RLRPG	TO-92 (Pb-Free)	

†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.

# MPS6724, MPS6725

## 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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