MPSA64 is a Preferred Device

# **Darlington Transistors**

# **PNP Silicon**

## **Features**

• Pb-Free Packages are Available\*

### **MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector - Emitter Voltage  MPSA62  MPSA63/64	V <sub>CES</sub>	-20 -30	Vdc
Collector – Base Voltage  MPSA62  MPSA63/64	V <sub>CBO</sub>	-20 -30	Vdc
Emitter – Base Voltage	V <sub>EBO</sub>	-10	Vdc
Collector Current – Continuous	Ic	-500	mAdc
Total Device Dissipation  @ T <sub>A</sub> = 25°C  Derate above 25°C	P <sub>D</sub>	625 5.0	mW mW/°C
Total Device Dissipation @ T <sub>C</sub> = 25°C Derate above 25°C	P <sub>D</sub>	1.5 12	W mW/°C
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	°C

## THERMAL CHARACTERISTICS

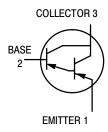
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	°C/W

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.



## ON Semiconductor®

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#### **MARKING DIAGRAM**





x = 2, 3, or 4

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 2 of this data sheet.

**Preferred** devices are recommended choices for future use and best overall value.

<sup>\*</sup>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<sub>A</sub> = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector – Emitter Breakdown Voltage ( $I_C = -100 \mu Adc$ , $V_{BE} = 0$ )	MPSA62 MPSA63, MPSA64	V <sub>(BR)CES</sub>	-20 -30	_ _	Vdc
Collector Cutoff Current $(V_{CB} = -15 \text{ Vdc}, I_E = 0)$ $(V_{CB} = -30 \text{ Vdc}, I_E = 0)$	MPSA62 MPSA63, MPSA64	I <sub>CBO</sub>	_ _	-100 -100	nAdc
Emitter Cutoff Current $(V_{EB} = -10 \text{ Vdc}, I_C = 0)$		I <sub>EBO</sub>	_	-100	nAdc
ON CHARACTERISTICS (Note 1)					
DC Current Gain $(I_C = -10 \text{ mAdc}, V_{CE} = -5.0 \text{ Vdc})$ $(I_C = -100 \text{ mAdc}, V_{CE} = -5.0 \text{ Vdc})$	MPSA63 MPSA64 MPSA62 MPSA63 MPSA64	h <sub>FE</sub>	5,000 10,000 20,000 10,000 20,000	- - - -	_
Collector – Emitter Saturation Voltage ( $I_C = -10$ mAdc, $I_B = -0.01$ mAdc) ( $I_C = -100$ mAdc, $I_B = -0.1$ mAdc)	MPSA62 MPSA63, MPSA64	V <sub>CE(sat)</sub>		-1.0 -1.5	Vdc
Base – Emitter On Voltage ( $I_C$ = -10 mAdc, $V_{CE}$ = -5.0 Vdc) ( $I_C$ = -100 mAdc, $V_{CE}$ = -5.0 Vdc)	MPSA62 MPSA63, MPSA64	V <sub>BE(on)</sub>	_ _	-1.4 -2.0	Vdc
SMALL-SIGNAL CHARACTERISTICS					
Current – Gain — Bandwidth Product (Note 2) (I <sub>C</sub> = –100 mAdc, V <sub>CE</sub> = –5.0 Vdc, f = 100 MHz)	MPSA63, MPSA64	f⊤	125	-	MHz

<sup>1.</sup> Pulse Test: Pulse Width  $\leq$  300  $\mu$ s; Duty Cycle  $\leq$  2.0%.

# **ORDERING INFORMATION**

Device	Package	Shipping <sup>†</sup>	
MPSA62	TO-92	5000 Units / Bulk	
MPSA63	TO-92	5000 Units / Bulk	
MPSA63G	TO-92 (Pb-Free)	5000 Units / Bulk	
MPSA63RLRA	TO-92	2000 / Tape & Reel	
MPSA63RLRAG	TO-92 (Pb-Free)	2000 / Tape & Reel	
MPSA63RLRM	TO-92	2000 / Ammo Pack	
MPSA63RLRMG	TO-92 (Pb-Free)	2000 / Ammo Pack	
MPSA63RLRP	TO-92	2000 / Ammo Pack	
MPSA63RLRPG	TO-92 (Pb-Free)	2000 / Ammo Pack	
MPSA63ZL1	TO-92	2000 / Ammo Pack	
MPSA63ZL1G	TO-92 (Pb-Free)	2000 / Ammo Pack	
MPSA64	TO-92	5000 Units / Bulk	
MPSA64G	TO-92 (Pb-Free)	5000 Units / Bulk	
MPSA64RLRA	TO-92	2000 / Tape & Reel	
MPSA64RLRAG	TO-92 (Pb-Free)	2000 / Tape & Reel	
MPSA64RLRM	TO-92	2000 / Ammo Pack	
MPSA64RLRMG	TO-92 (Pb-Free)	2000 / Ammo Pack	

<sup>†</sup>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.

<sup>2.</sup>  $f_T = |h_{fe}| \cdot f_{test}$ .

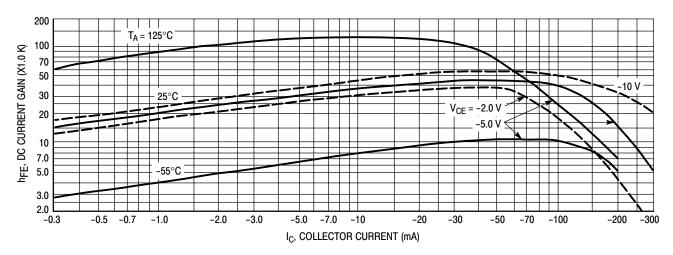


Figure 1. DC Current Gain

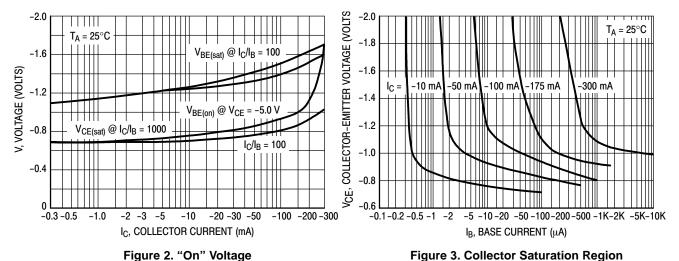


Figure 2. "On" Voltage

IhFEI, HIGH FREQUENCY CURRENT GAIN

4.0

3.0 2.0

1.0

0.4

0.2

-1.0 -2.0

 $V_{CE} = -5.0 \text{ V}$ 

f = 100 MHz

\_ T<sub>A</sub> = 25°C

-1000 1.0 ms COLLECTOR CURRENT (mA) -300 -200  $T_A = 25^{\circ}C$ T<sub>C</sub> = 25°C -100 **CURRENT LIMIT** -50 THERMAL LIMIT SECOND BREAKDOWN LIMIT <u>ث</u> -20 (DUTY CYCLE ≤ 10%) MPSA62 MPSA63 -2.0 -4.0 -6.0 -10 -40 -1K -1.0 V<sub>CE</sub>, COLLECTOR VOLTAGE (VOLTS)

IC, COLLECTOR CURRENT (mA) Figure 4. High Frequency Current Gain

-50

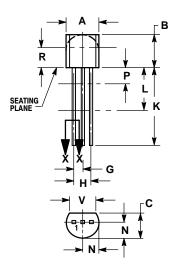
-100 -200

-500

Figure 5. Active Region, Safe Operating Area

## PACKAGE DIMENSIONS

TO-92 (TO-226) **CASE 29-11** ISSUF AL





- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  - CONTROLLING DIMENSION: INCH.
- CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED. LEAD DIMENSION IS UNCONTROLLED IN P AND
- BEYOND DIMENSION K MINIMUM.

	INCHES		MILLIN	IETERS
DIM	MIN	MAX	MIN	MAX
Α	0.175	0.205	4.45	5.20
В	0.170	0.210	4.32	5.33
С	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
Н	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
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	0.115		2.93	
٧	0.135		3.43	

STYLE 1: PIN 1. EMITTER

COLLECTOR

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