# **ON Semiconductor**

# Is Now



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# MPSA63, MPSA64

MPSA64 is a Preferred Device

# **Darlington Transistors**

# **PNP Silicon**

#### **Features**

• These are Pb-Free Devices\*

#### **MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CES</sub>	-30	Vdc
Collector-Base Voltage	V <sub>CBO</sub>	-30	Vdc
Emitter-Base Voltage	V <sub>EBO</sub>	-10	Vdc
Collector Current - Continuous	I <sub>C</sub>	-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

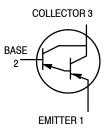
Rating	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	°C/W

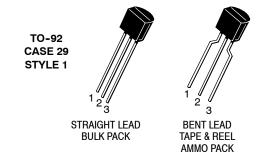
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



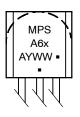
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http://onsemi.com





#### **MARKING DIAGRAM**



xx = 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.

# MPSA63, MPSA64

# **ELECTRICAL CHARACTERISTICS** (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I <sub>C</sub> = -100 µAdc, V <sub>BE</sub> = 0)		V <sub>(BR)CES</sub>	-30	-	Vdc
Collector Cutoff Current (V <sub>CB</sub> = -30 Vdc, I <sub>E</sub> = 0)		I <sub>CBO</sub>	-	-100	nAdc
Emitter Cutoff Current (V <sub>EB</sub> = -10 Vdc, I <sub>C</sub> = 0)		I <sub>EBO</sub>	-	-100	nAdc
ON CHARACTERISTICS (Note 1)			•	•	-
DC Current Gain (I <sub>C</sub> = -10 mAdc, V <sub>CE</sub> = -5.0 Vdc)	MPSA63 MPSA64	h <sub>FE</sub>	5,000 10,000	-	-
$(I_C = -100 \text{ mAdc}, V_{CE} = -5.0 \text{ Vdc})$	MPSA63 MPSA64		10,000 20,000	-	
Collector-Emitter Saturation Voltage (I <sub>C</sub> = -100 mAdc, I <sub>B</sub> = -0.1 mAdc)		V <sub>CE(sat)</sub>	-	-1.5	Vdc
Base-Emitter On Voltage (I <sub>C</sub> = -100 mAdc, V <sub>CE</sub> = -5.0 Vdc)		V <sub>BE(on)</sub>	-	-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)		f <sub>T</sub>	125	-	MHz

<sup>1.</sup> Pulse Test: Pulse Width  $\leq$  300  $\mu$ s; Duty Cycle  $\leq$  2.0%. 2.  $f_T = |h_{fe}| \bullet f_{test}$ .

## **ORDERING INFORMATION**

Device	Package	Shipping <sup>†</sup>
MPSA63G	TO-92 (Pb-Free)	5000 Units / Bulk
MPSA63RLRAG	TO-92 (Pb-Free)	2000 / Tape & Reel
MPSA64G	TO-92 (Pb-Free)	5000 Units / Bulk
MPSA64RLRAG	TO-92 (Pb-Free)	2000 / Tape & Reel
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.

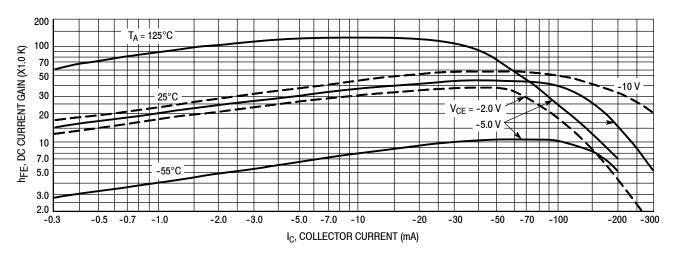


Figure 1. DC Current Gain

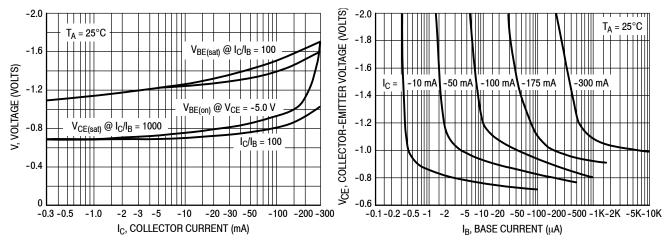


Figure 2. "On" Voltage

Ihfel, HIGH FREQUENCY CURRENT GAIN

4.0

3.0 2.0

1.0

0.4

0.2

-1.0

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

f = 100 MHz

\_ T<sub>A</sub> = 25°C

-2.0

-1000 100 սs 1.0 ms IC, COLLECTOR CURRENT (mA) -300 -200  $T_C = 25^{\circ}C$ -100 **CURRENT LIMIT** -50 THERMAL LIMIT SECOND BREAKDOWN LIMIT -20 (DUTY CYCLE ≤ 10%) MPSA62 MPSA63 -500 -1.0 -2.0 -4.0 -6.0 -10 -40 -1K -60 V<sub>CE</sub>, COLLECTOR VOLTAGE (VOLTS)

I<sub>C</sub>, COLLECTOR CURRENT (mA)

Figure 4. High Frequency Current Gain

-50

-100 -200

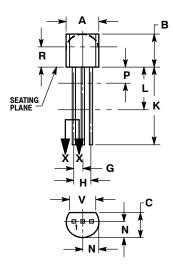
Figure 5. Active Region, Safe Operating Area

Figure 3. Collector Saturation Region

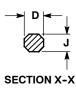
## MPSA63, MPSA64

### PACKAGE DIMENSIONS

TO-92 (TO-226) CASE 29-11 ISSUE AM



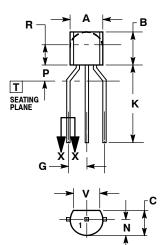
STRAIGHT LEAD **BULK PACK** 



#### NOTES:

- 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	



**BENT LEAD TAPE & REEL** AMMO PACK



#### NOTES:

- DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
- CONTROLLING DIMENSION: MILLIMETERS.
  CONTOUR OF PACKAGE BEYOND
  DIMENSION R IS UNCONTROLLED.
  LEAD DIMENSION IS UNCONTROLLED IN P
- AND BEYOND DIMENSION K MINIMUM

	MILLIMETERS		
DIM	MIN	MAX	
Α	4.45	5.20	
В	4.32	5.33	
С	3.18	4.19	
D	0.40	0.54	
G	2.40	2.80	
7	0.39	0.50	
K	12.70		
N	2.04	2.66	
P	1.50	4.00	
R	2.93		
٧	3.43		

STYLE 1: PIN 1. EMITTER

BASE

COLLECTOR

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