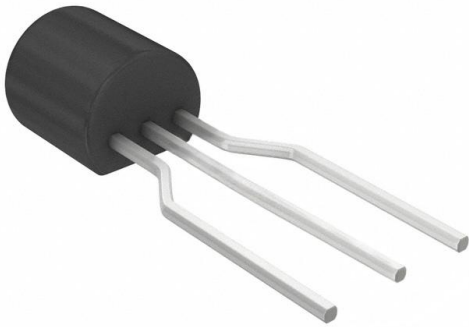


# MPS8099RLRA Datasheet

[www.digi-electronics.com](http://www.digi-electronics.com)



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	MPS8099RLRA-DG
Manufacturer	<a href="#">onsemi</a>
Manufacturer Product Number	MPS8099RLRA
Description	TRANS NPN SS GP 80V T092
Detailed Description	Bipolar (BJT) Transistor



Tel: +00 852-30501935

RFQ Email: [Info@DiGi-Electronics.com](mailto:Info@DiGi-Electronics.com)

DiGi is a global authorized distributor of electronic components.



## Purchase and inquiry

Manufacturer Product Number:

MPS8099RLRA

Series:

\*

Base Product Number:

MPS809

Manufacturer:

onsemi

Product Status:

Obsolete

## Environmental & Export classification

RoHS Status:

RoHS non-compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0095

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

# ON Semiconductor

## Is Now

The logo for onsemi, featuring the word "onsemi" in a dark teal, lowercase, sans-serif font. The letter "i" is stylized with a white dot and a teal vertical bar. A small orange triangle is positioned above the top right of the "i". A trademark symbol (TM) is located to the right of the logo.

To learn more about onsemi™, please visit our website at  
[www.onsemi.com](http://www.onsemi.com)

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# NPN - MPS8099; PNP - MPS8599

Preferred Device

## Amplifier Transistors

Voltage and Current are Negative for PNP Transistors

### Features

- Pb-Free Packages are Available\*

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	80	Vdc
Collector-Base Voltage	$V_{CBO}$	80	Vdc
Emitter-Base Voltage	$V_{EBO}$	4.0	Vdc
Collector Current - Continuous	$I_C$	500	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	625 5.0	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.5 12	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

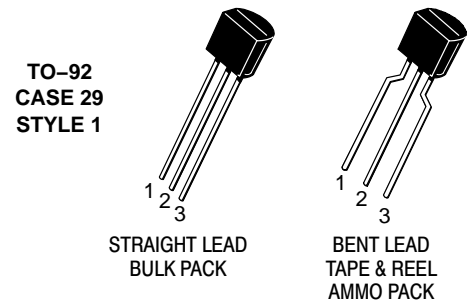
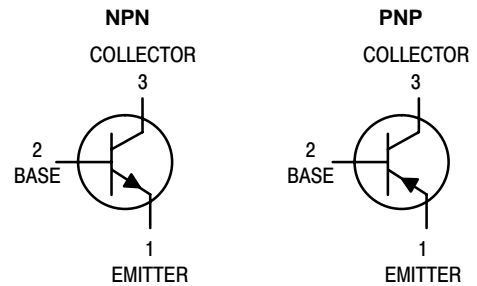
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient (Note 1)	$R_{\theta JA}$	200	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	$^\circ\text{C/W}$

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.

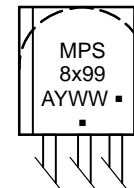
- $R_{\theta JA}$  is measured with the device soldered into a typical printed circuit board.



ON Semiconductor®

<http://onsemi.com>


### MARKING DIAGRAM



- x = 0 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 3 of this data sheet.

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

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

**NPN – MPS8099; PNP – MPS8599****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 2) ( $I_C = 10\text{ mAdc}$ , $I_B = 0$ )	$V_{(BR)CEO}$	80	–	Vdc
Collector–Base Breakdown Voltage ( $I_C = 100\ \mu\text{Adc}$ , $I_E = 0$ )	$V_{(BR)CBO}$	80	–	Vdc
Emitter–Base Breakdown Voltage ( $I_E = 10\ \mu\text{Adc}$ , $I_C = 0$ )	$V_{(BR)EBO}$	5.0	–	Vdc
Collector Cutoff Current ( $V_{CE} = 60\text{ Vdc}$ , $I_B = 0$ )	$I_{CES}$	–	0.1	$\mu\text{Adc}$
Collector Cutoff Current ( $V_{CB} = 80\text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	–	0.1	$\mu\text{Adc}$
Emitter Cutoff Current ( $V_{EB} = 4.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	–	0.1	$\mu\text{Adc}$
<b>ON CHARACTERISTICS</b> (Note 2)				
DC Current Gain ( $I_C = 1.0\text{ mAdc}$ , $V_{CE} = 5.0\text{ Vdc}$ ) ( $I_C = 10\text{ mAdc}$ , $V_{CE} = 5.0\text{ Vdc}$ ) ( $I_C = 100\text{ mAdc}$ , $V_{CE} = 5.0\text{ Vdc}$ )	$h_{FE}$	100 100 75	300 – –	–
Collector–Emitter Saturation Voltage ( $I_C = 100\text{ mAdc}$ , $I_B = 5.0\text{ mAdc}$ ) ( $I_C = 100\text{ mAdc}$ , $I_B = 10\text{ mAdc}$ )	$V_{CE(sat)}$	– –	0.4 0.3	Vdc
Base–Emitter On Voltage ( $I_C = 10\text{ mAdc}$ , $V_{CE} = 5.0\text{ Vdc}$ )	$V_{BE(on)}$	0.6	0.8	Vdc
<b>SMALL–SIGNAL CHARACTERISTICS</b>				
Current–Gain – Bandwidth Product ( $I_C = 10\text{ mAdc}$ , $V_{CE} = 5.0\text{ Vdc}$ , $f = 100\text{ MHz}$ )	$f_T$	150	–	MHz
Output Capacitance ( $V_{CB} = 5.0\text{ Vdc}$ , $I_E = 0$ , $f = 1.0\text{ MHz}$ )	$C_{obo}$	–	8.0	pF
Input Capacitance ( $V_{EB} = 0.5\text{ Vdc}$ , $I_C = 0$ , $f = 1.0\text{ MHz}$ )	$C_{ibo}$	–	30	pF

2. Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle = 2.0%.

## NPN – MPS8099; PNP – MPS8599

### ORDERING INFORMATION

Device	Package	Shipping†
MPS8099	TO-92	5000 Units / Bulk
MPS8099G	TO-92 (Pb-Free)	5000 Units / Bulk
MPS8099RLRA	TO-92	2000 / Tape & Reel
MPS8099RLRAG	TO-92 (Pb-Free)	2000 / Tape & Reel
MPS8099RLRP	TO-92	2000 / Ammo Pack
MPS8099RLRPG	TO-92 (Pb-Free)	2000 / Ammo Pack
MPS8599RLRA	TO-92	2000 / Tape & Reel
MPS8599RLRAG	TO-92 (Pb-Free)	2000 / Tape & Reel
MPS8599RLRMG	TO-92 (Pb-Free)	2000 / Ammo Pack

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

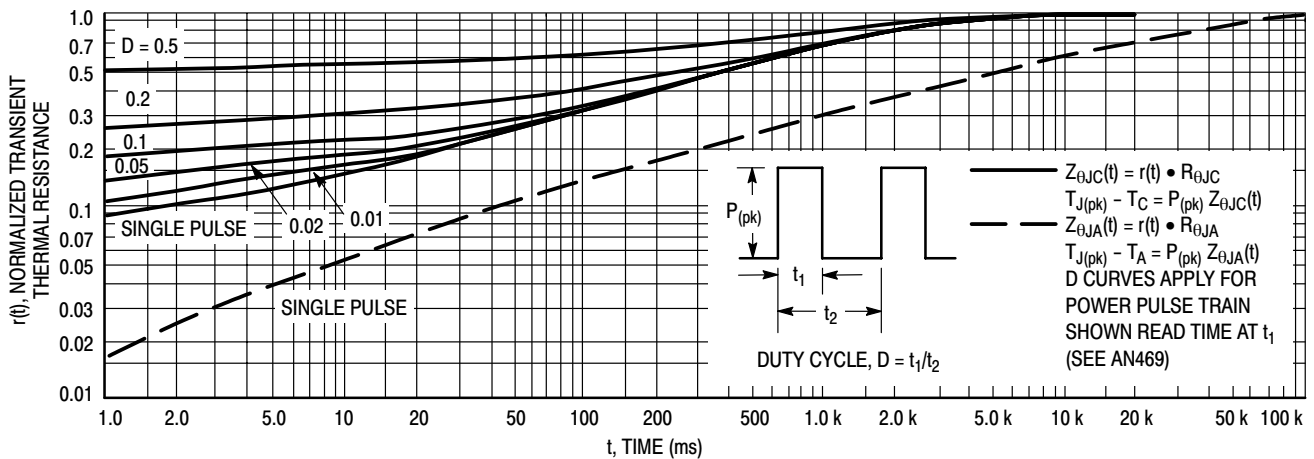
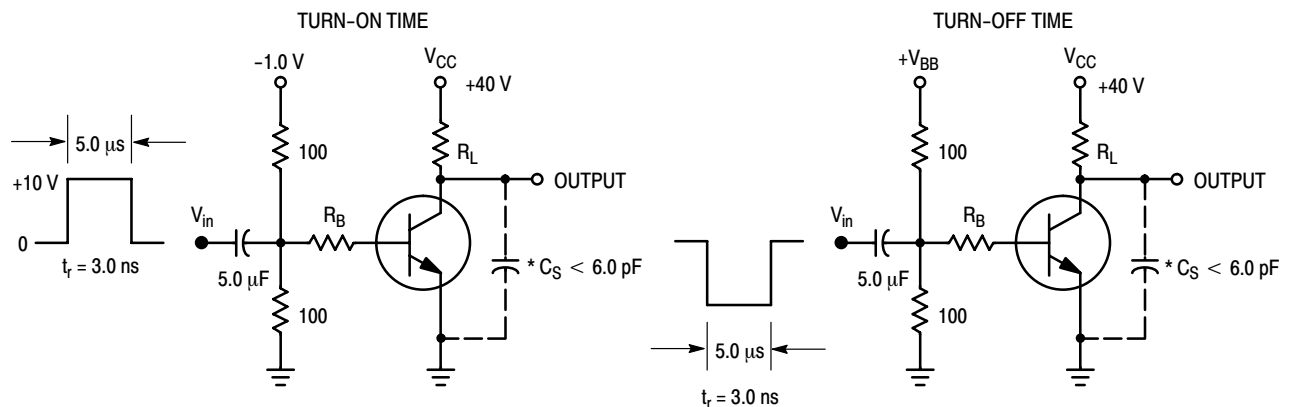


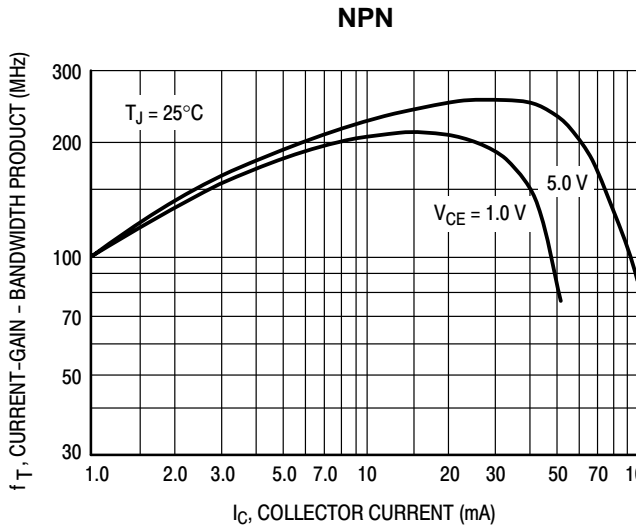
Figure 1. Thermal Response



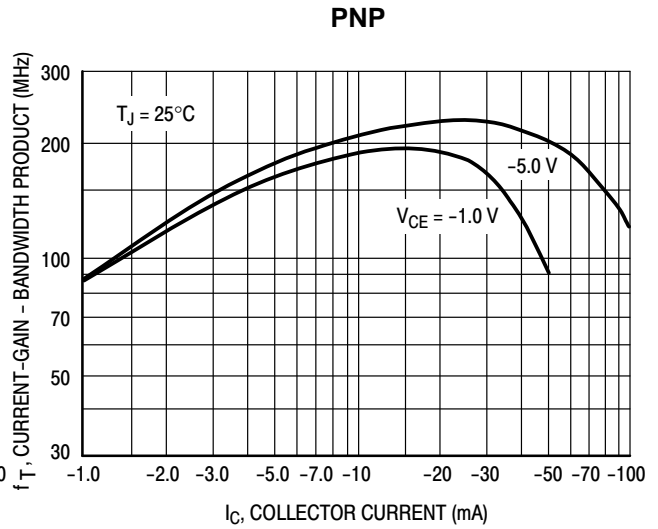
\*Total Shunt Capacitance of Test Jig and Connectors For PNP Test Circuits, Reverse All Voltage Polarities

Figure 2. Switching Time Test Circuits

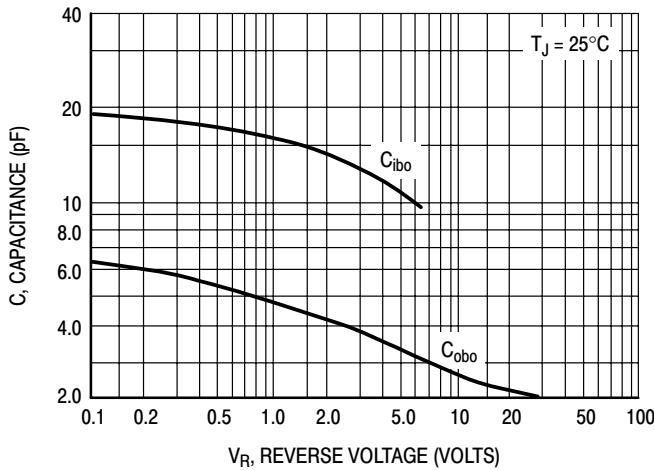
**NPN – MPS8099; PNP – MPS8599**



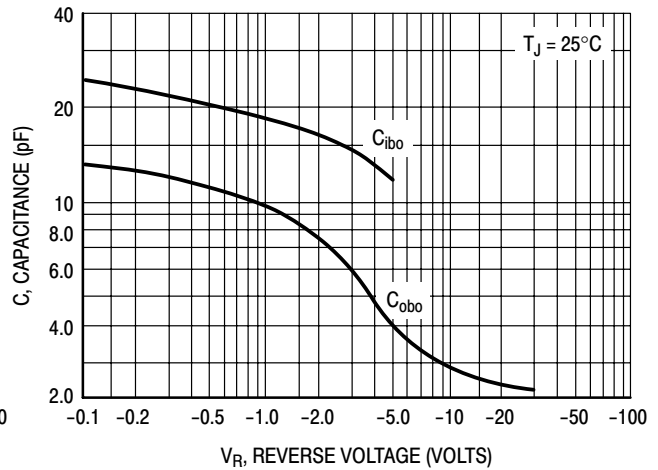
**Figure 3. Current-Gain – Bandwidth Product**



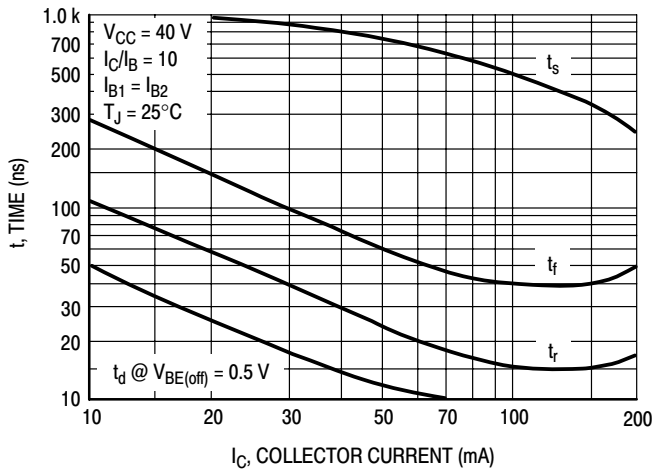
**Figure 4. Current-Gain – Bandwidth Product**



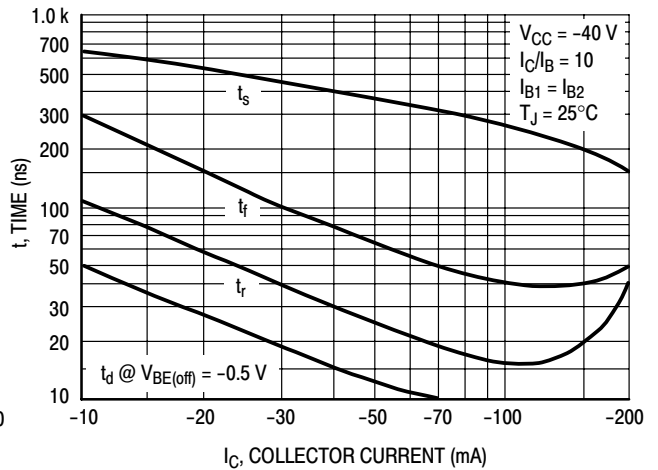
**Figure 5. Capacitance**



**Figure 6. Capacitance**



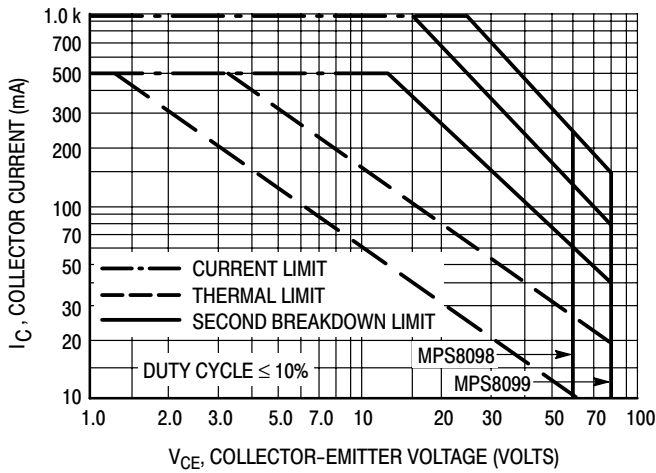
**Figure 7. Switching Times**



**Figure 8. Switching Times**

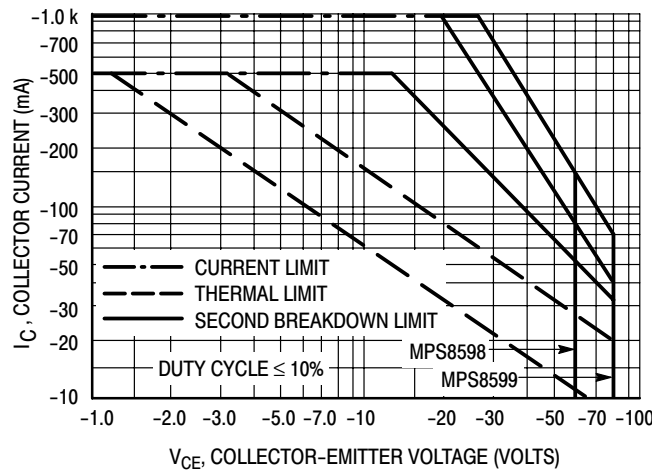
**NPN – MPS8099; PNP – MPS8599**

**NPN**

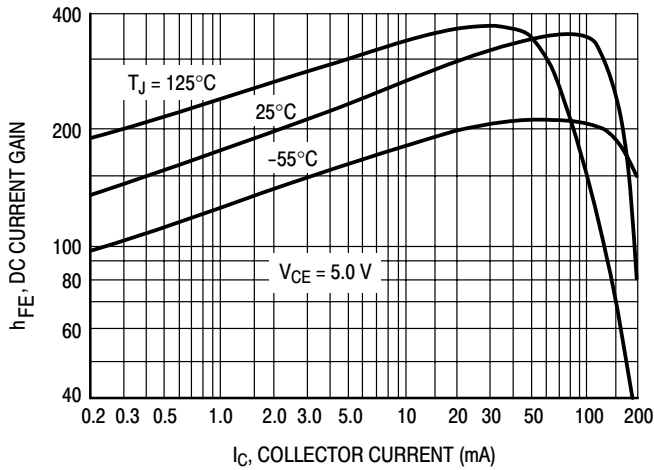


**Figure 9. Active-Region Safe Operating Area**

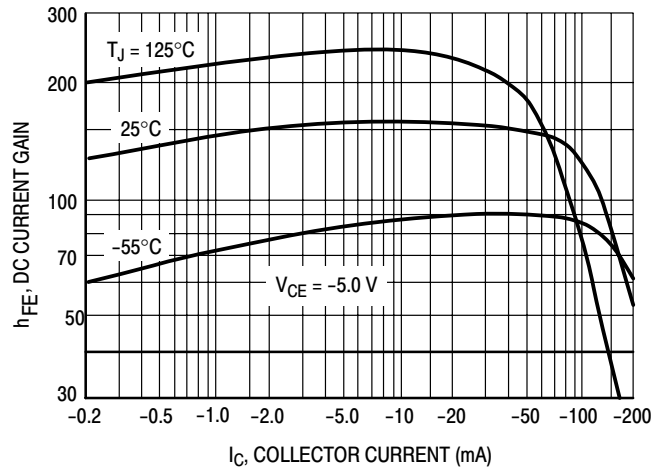
**PNP**



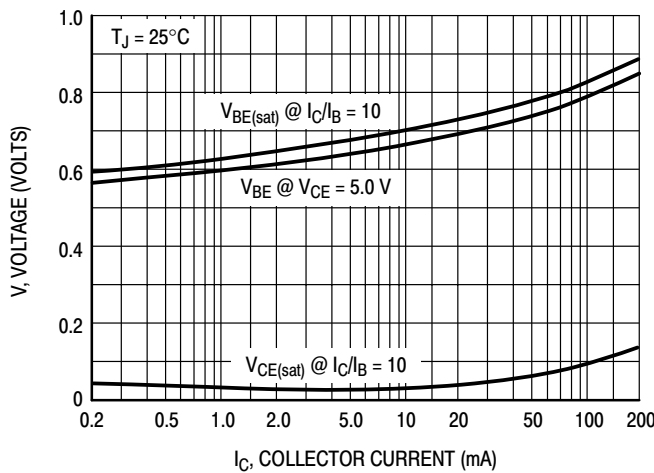
**Figure 10. Active-Region Safe Operating Area**



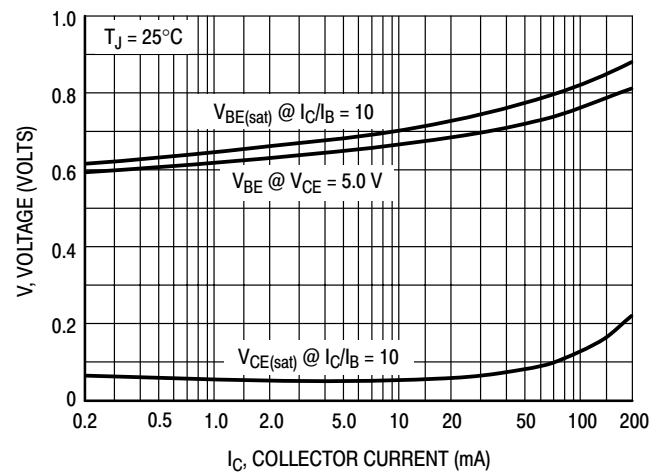
**Figure 11. DC Current Gain**



**Figure 12. DC Current Gain**



**Figure 13. "ON" Voltages**



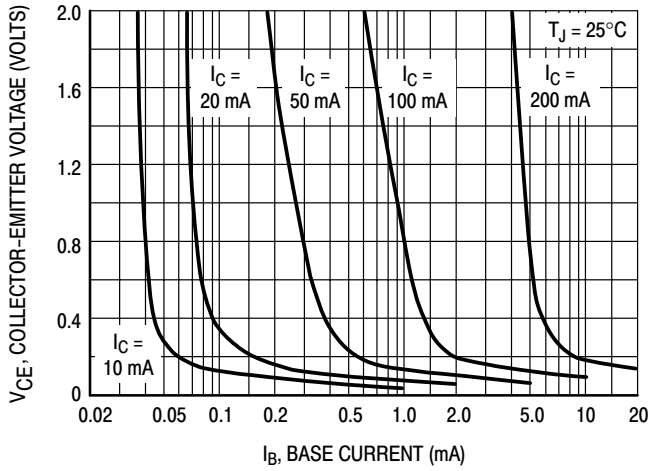
**Figure 14. "ON" Voltages**



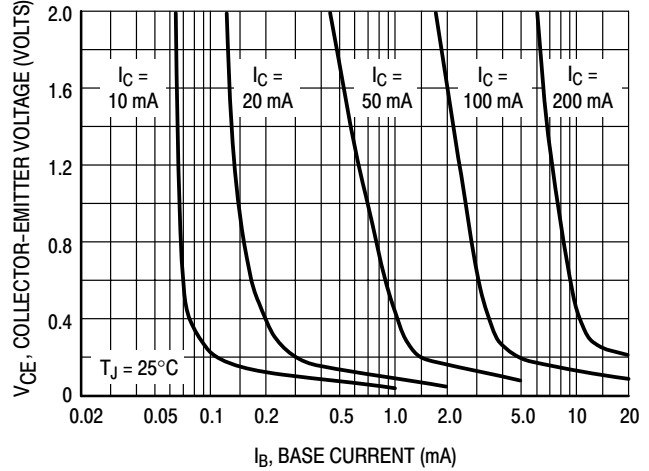
**NPN – MPS8099; PNP – MPS8599**

**NPN**

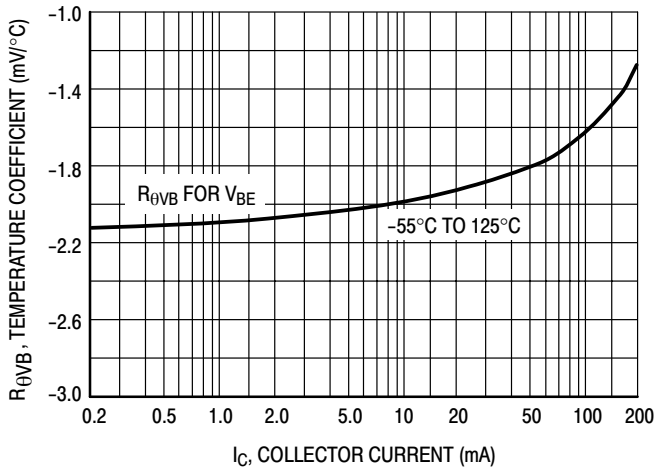
**PNP**



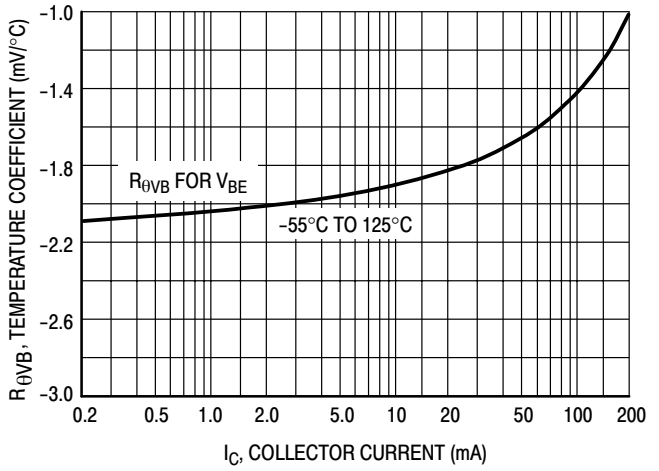
**Figure 15. Collector Saturation Region**



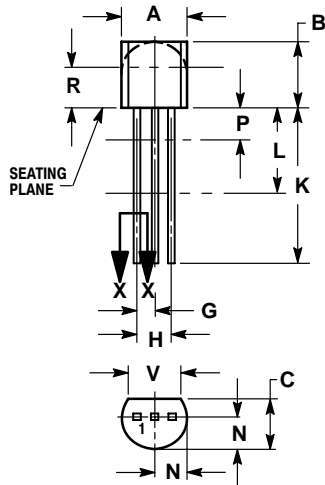
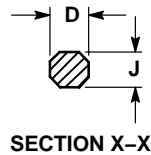
**Figure 16. Collector Saturation Region**



**Figure 17. Base-Emitter Temperature Coefficient**

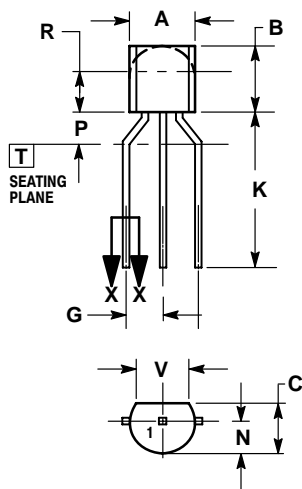
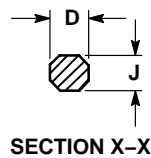


**Figure 18. Base-Emitter Temperature Coefficient**

**NPN – MPS8099; PNP – MPS8599****PACKAGE DIMENSIONS****TO-92 (TO-226)  
CASE 29-11  
ISSUE AM****STRAIGHT LEAD  
BULK PACK****SECTION X-X****NOTES:**

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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	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
H	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	---
V	0.135	---	3.43	---

**BENT LEAD  
TAPE & REEL  
AMMO PACK****SECTION X-X****NOTES:**

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

DIM	MILLIMETERS	
	MIN	MAX
A	4.45	5.20
B	4.32	5.33
C	3.18	4.19
D	0.40	0.54
G	2.40	2.80
J	0.39	0.50
K	12.70	---
N	2.04	2.66
P	1.50	4.00
R	2.93	---
V	3.43	---

**STYLE 1:**

1. EMITTER
2. BASE
3. COLLECTOR

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