

Amplifier Transistors

MAXIMUM RATINGS

Rating	Symbol	MPS8098 MPS8598	MPS8099 MPS8599	Unit
Collector–Emitter Voltage	V_{CE0}	60	80	Vdc
Collector–Base Voltage	V_{CB0}	60	80	Vdc
Emitter–Base Voltage	V_{EB0}	6.0	5.0	Vdc
Collector Current – Continuous	I_C	500		mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	625	5.0	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.5	12	Watts mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–55 to +150		$^\circ\text{C}$

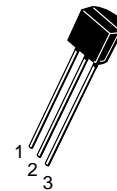
THERMAL CHARACTERISTICS

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

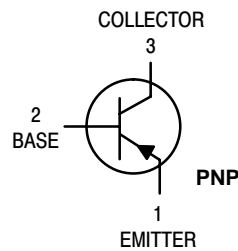
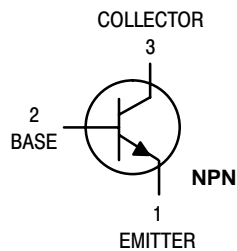
NPN
MPS8098
MPS8099*
PNP
MPS8598
MPS8599*

Voltage and current are negative
for PNP transistors

*ON Semiconductor Preferred Device



CASE 29–11, STYLE 1
TO–92 (TO–226AA)



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

NPN MPS8098 MPS8099 PNP MPS8598 MPS8599

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage ⁽¹⁾ (I _C = 10 mA _{dc} , I _B = 0)	MPS8098, MPS8598 MPS8099, MPS8599	V _{(BR)CEO}	60 80	— —	V _{dc}
Collector–Base Breakdown Voltage (I _C = 100 μA _{dc} , I _E = 0)	MPS8098, MPS8598 MPS8099, MPS8599	V _{(BR)CBO}	60 80	— —	V _{dc}
Emitter–Base Breakdown Voltage (I _E = 10 μA _{dc} , I _C = 0)	MPS8098, MPS8099 MPS8598, MPS8599	V _{(BR)EBO}	6.0 5.0	— —	V _{dc}
Collector Cutoff Current (V _{CE} = 60 V _{dc} , I _B = 0)		I _{CES}	—	0.1	μA _{dc}
Collector Cutoff Current (V _{CB} = 60 V _{dc} , I _E = 0) (V _{CB} = 80 V _{dc} , I _E = 0)	MPS8098, MPS8598 MPS8099, MPS8599	I _{CBO}	— —	0.1 0.1	μA _{dc}
Emitter Cutoff Current (V _{EB} = 6.0 V _{dc} , I _C = 0) (V _{EB} = 4.0 V _{dc} , I _C = 0)	MPS8098, MPS8099 MPS8598, MPS8599	I _{EBO}	— —	0.1 0.1	μA _{dc}

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle = 2.0%.

ON CHARACTERISTICS⁽¹⁾

DC Current Gain (I _C = 1.0 mA _{dc} , V _{CE} = 5.0 V _{dc}) (I _C = 10 mA _{dc} , V _{CE} = 5.0 V _{dc}) (I _C = 100 mA _{dc} , V _{CE} = 5.0 V _{dc})		h _{FE}	100 100 75	300 — —	—
Collector–Emitter Saturation Voltage (I _C = 100 mA _{dc} , I _B = 5.0 mA _{dc}) (I _C = 100 mA _{dc} , I _B = 10 mA _{dc})		V _{CE(sat)}	— —	0.4 0.3	V _{dc}
Base–Emitter On Voltage (I _C = 1.0 mA _{dc} , V _{CE} = 5.0 V _{dc}) (I _C = 10 mA _{dc} , V _{CE} = 5.0 V _{dc})	MPS8098, MPS8598 MPS8099, MPS8599	V _{BE(on)}	0.5 0.6	0.7 0.8	V _{dc}

SMALL–SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product (I _C = 10 mA _{dc} , V _{CE} = 5.0 V _{dc} , f = 100 MHz)		f _T	150	—	MHz
Output Capacitance (V _{CB} = 5.0 V _{dc} , I _E = 0, f = 1.0 MHz)	MPS8098, MPS8099 MPS8598, MPS8599	C _{obo}	— —	6.0 8.0	pF
Input Capacitance (V _{EB} = 0.5 V _{dc} , I _C = 0, f = 1.0 MHz)	MPS8098, MPS8099 MPS8598, MPS8599	C _{ibo}	— —	25 30	pF

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle = 2.0%.

NPN MPS8098 MPS8099 PNP MPS8598 MPS8599

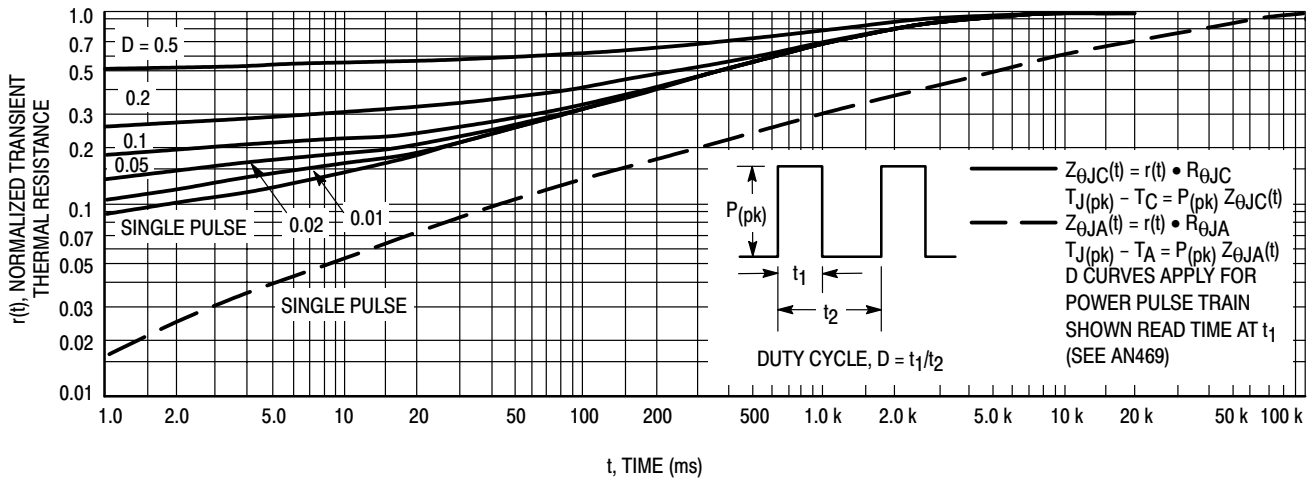


Figure 1. MPS8098, MPS8099, MPS8598 and MPS8599 Thermal Response

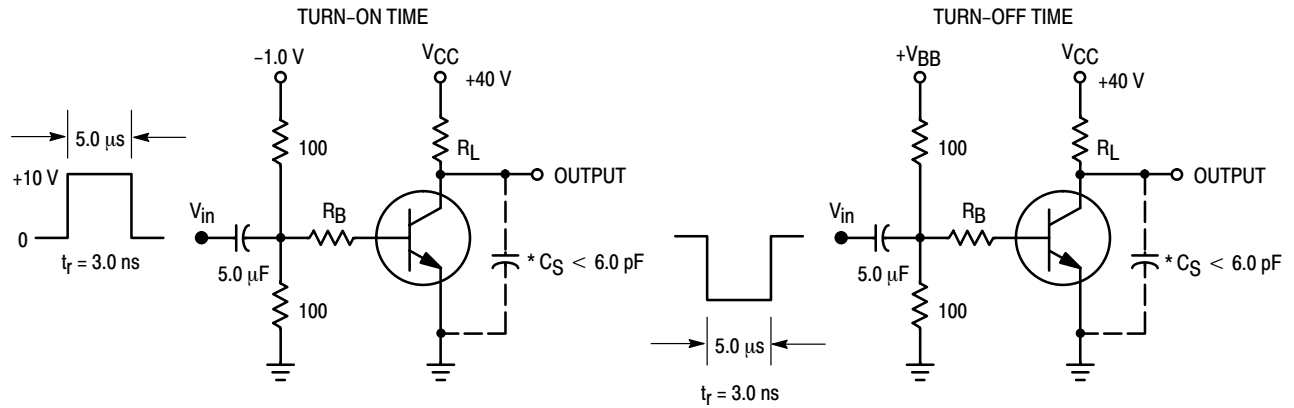


Figure 2. Switching Time Test Circuits

NPN MPS8098 MPS8099 PNP MPS8598 MPS8599

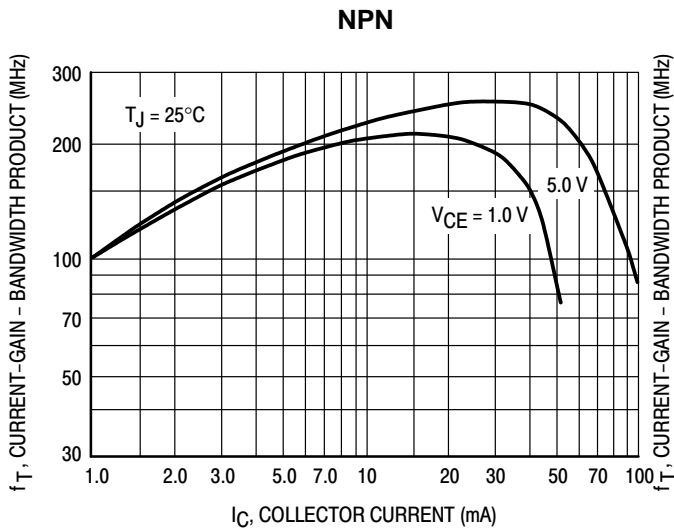


Figure 3. MPS8098/99 Current-Gain — Bandwidth Product

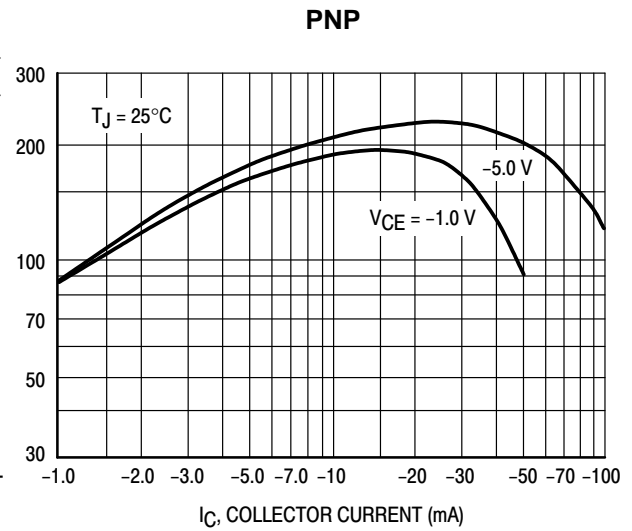


Figure 4. MPS8598/99 Current-Gain — Bandwidth Product

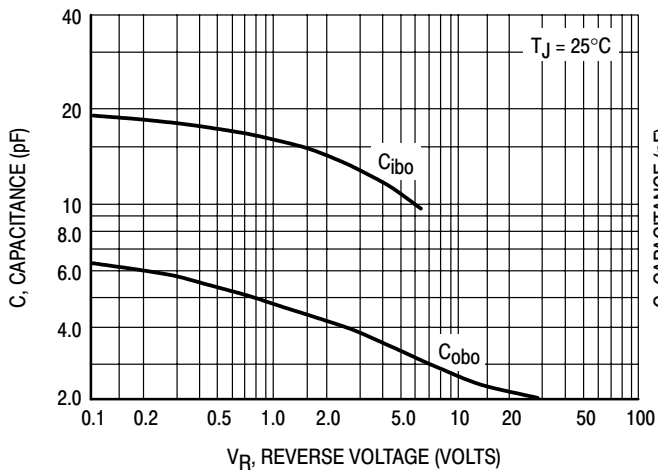


Figure 5. MPS8098/99 Capacitance

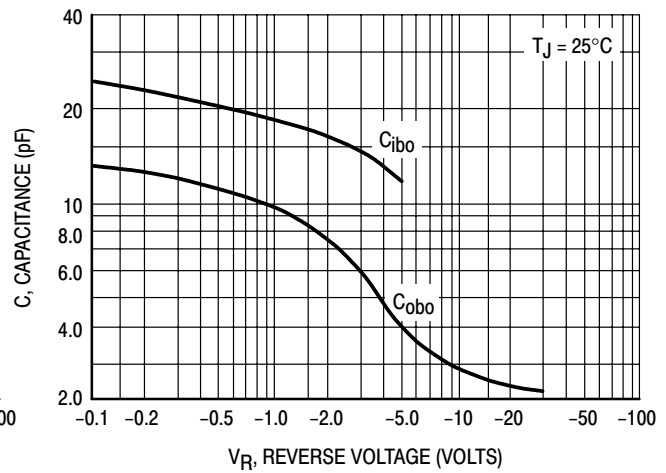


Figure 6. MPS8598/99 Capacitance

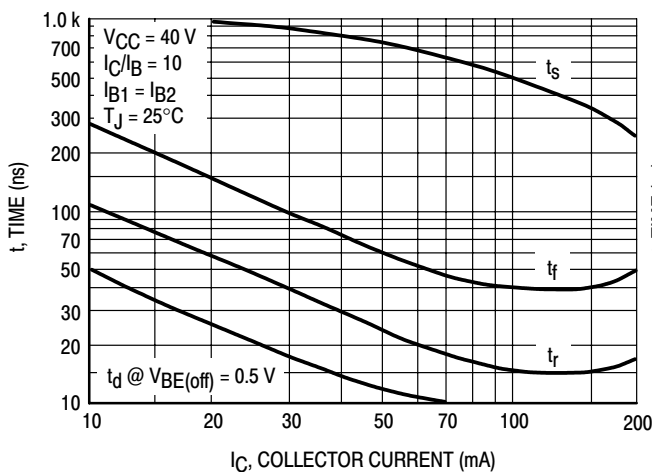


Figure 7. MPS8098/99 Switching Times

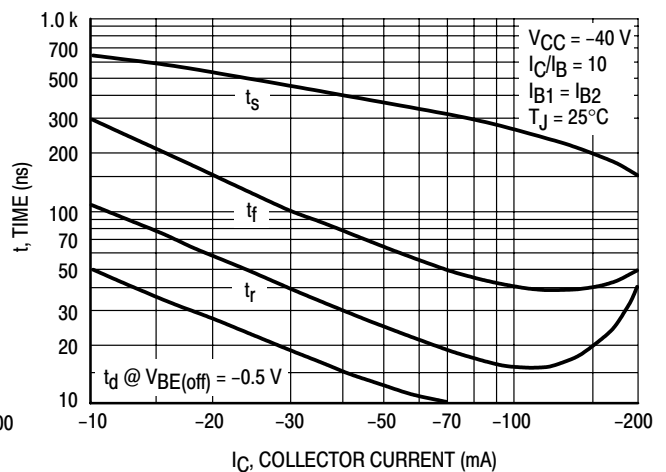


Figure 8. MPS8598/99 Switching Times

NPN MPS8098 MPS8099 PNP MPS8598 MPS8599

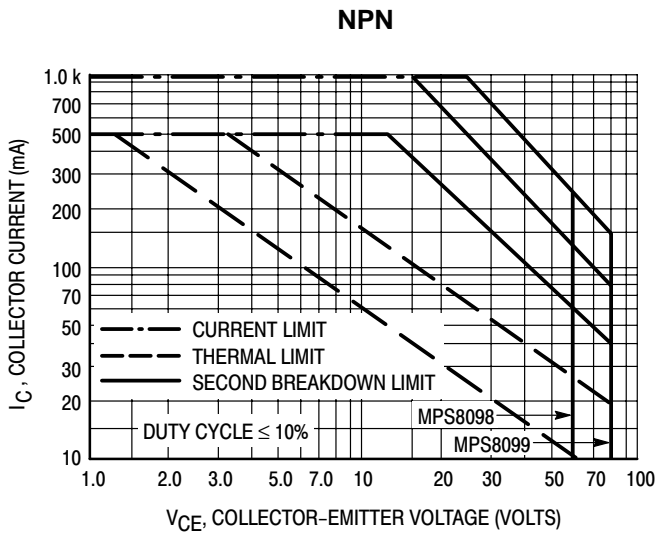


Figure 9. MPS8098/99 Active-Region Safe Operating Area

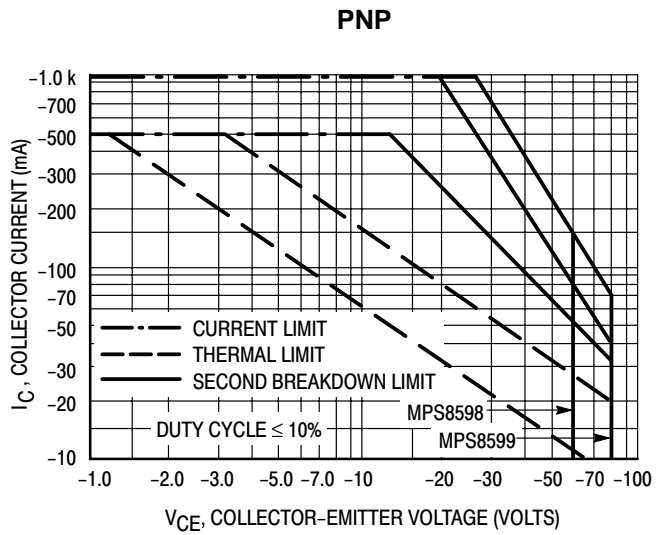


Figure 10. MPS8598/99 Active-Region Safe Operating Area

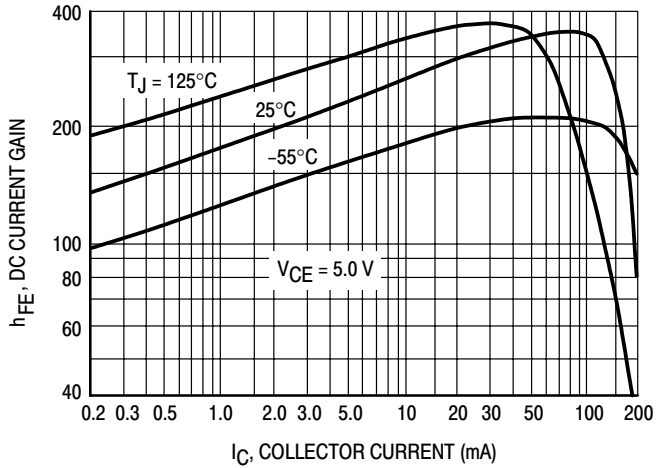


Figure 11. MPS8098/99 DC Current Gain

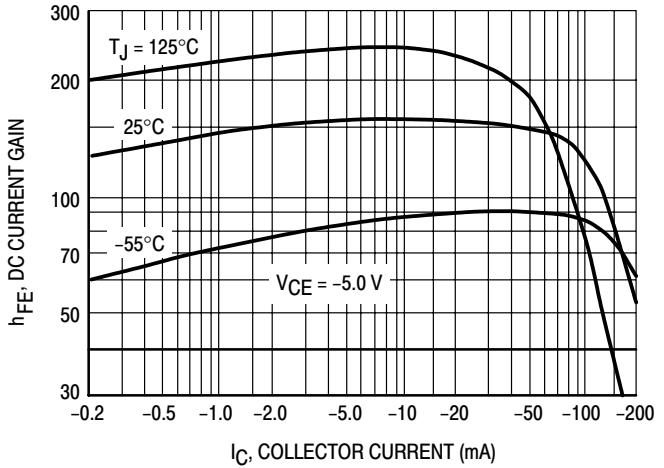


Figure 12. MPS8598/99 DC Current Gain

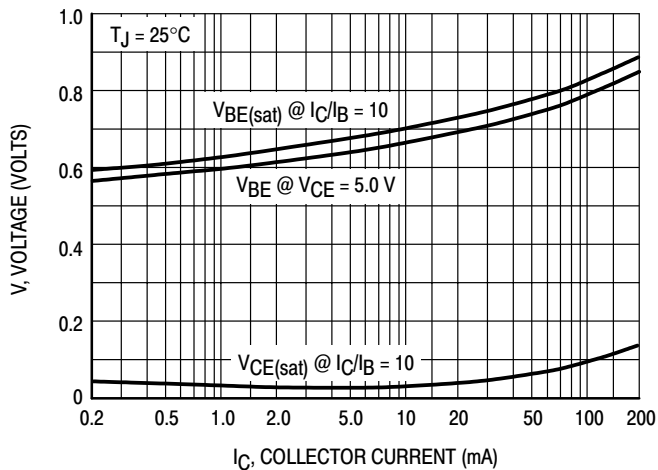


Figure 13. MPS8098/99 "ON" Voltages

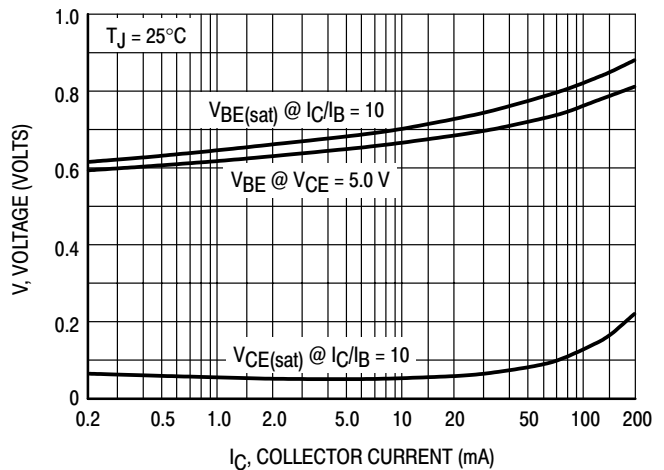


Figure 14. MPS8598/99 "ON" Voltages

NPN MPS8098 MPS8099 PNP MPS8598 MPS8599

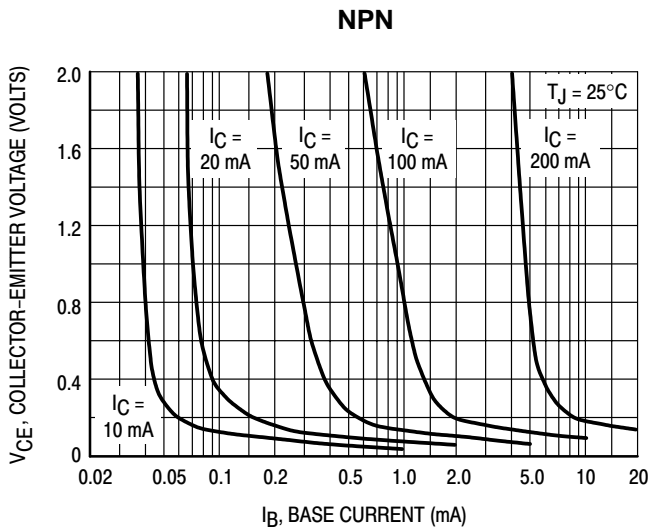


Figure 15. MPS8098/99 Collector Saturation Region

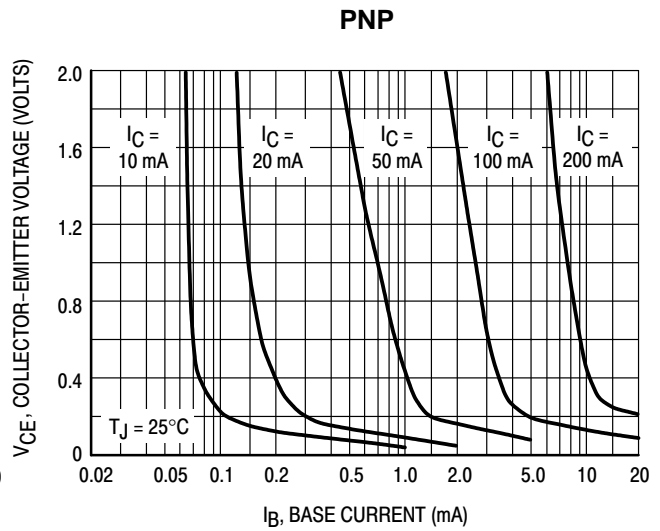


Figure 16. MPS8598/99 Collector Saturation Region

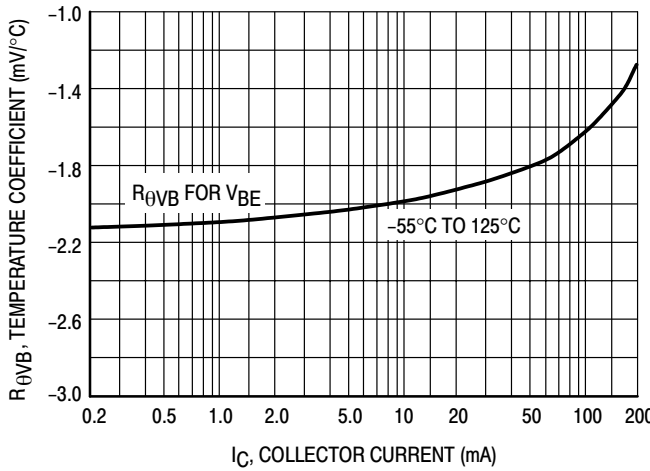


Figure 17. MPS8098/99 Base-Emitter Temperature Coefficient

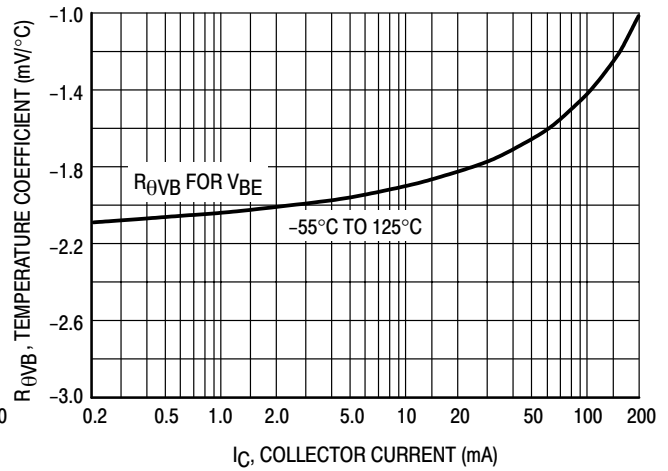
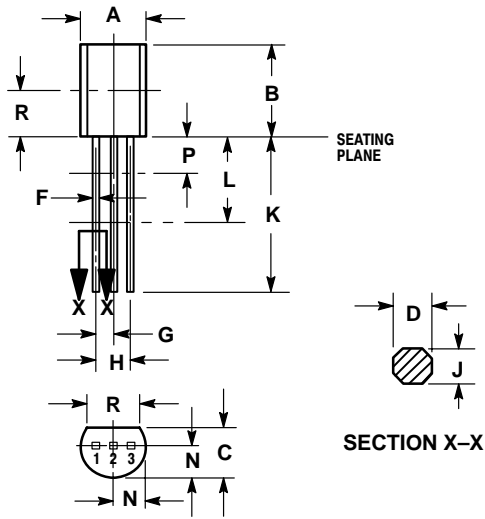


Figure 18. MPS8598/99 Base-Emitter Temperature Coefficient

NPN MPS8098 MPS8099 PNP MPS8598 MPS8599

PACKAGE DIMENSIONS

CASE 029-11
(TO-226AA)
ISSUE AD



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	---

- YLE 1:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

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