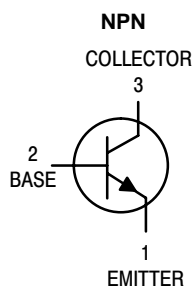


# MPSA05, MPSA06, MPSA55, MPSA56

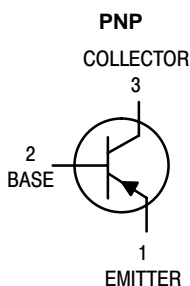
MPSA06 and MPSA56 are Preferred Devices

## Amplifier Transistors

Voltage and Current are Negative for PNP Transistors



STYLE 1  
MPSA05, MPSA06



STYLE 1  
MPSA55, MPSA56

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage MPSA05, MPSA55 MPSA06, MPSA56	$V_{CEO}$	60 80	Vdc
Collector–Base Voltage MPSA05, MPSA55 MPSA06, MPSA56	$V_{CBO}$	60 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	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	$R_{\theta JA}$ (Note 1.)	200	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83.3	$^\circ\text{C}/\text{W}$

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



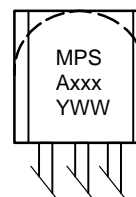
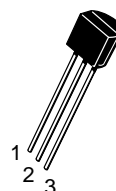
ON Semiconductor™

<http://onsemi.com>

NPN  
MPSA05, MPSA06  
PNP  
MPSA55, MPSA56

### MARKING DIAGRAM

TO-92  
CASE 29  
STYLE 1



MPSA = Specific Device Code  
xxx = 05, 06, 55 or 56  
Y = Year  
WW = Work Week

### ORDERING INFORMATION

Device	Package	Shipping
MPSA05	TO-92	5000 Units/Box
MPSA05RLRA	TO-92	2000/Tape & Reel
MPSA05RLRM	TO-92	2000/Ammo Pack
MPSA06	TO-92	5000 Units/Box
MPSA06RLRA	TO-92	2000/Tape & Reel
MPSA06RLRM	TO-92	2000/Ammo Pack
MPSA06RLRP	TO-92	2000/Ammo Pack
MPSA55	TO-92	5000 Units/Box
MPSA55RLRA	TO-92	2000/Tape & Reel
MPSA56	TO-92	5000 Units/Box
MPSA56RLRA	TO-92	2000/Tape & Reel
MPSA56RLRM	TO-92	2000/Ammo Pack
MPSA56RLRP	TO-92	2000/Ammo Pack

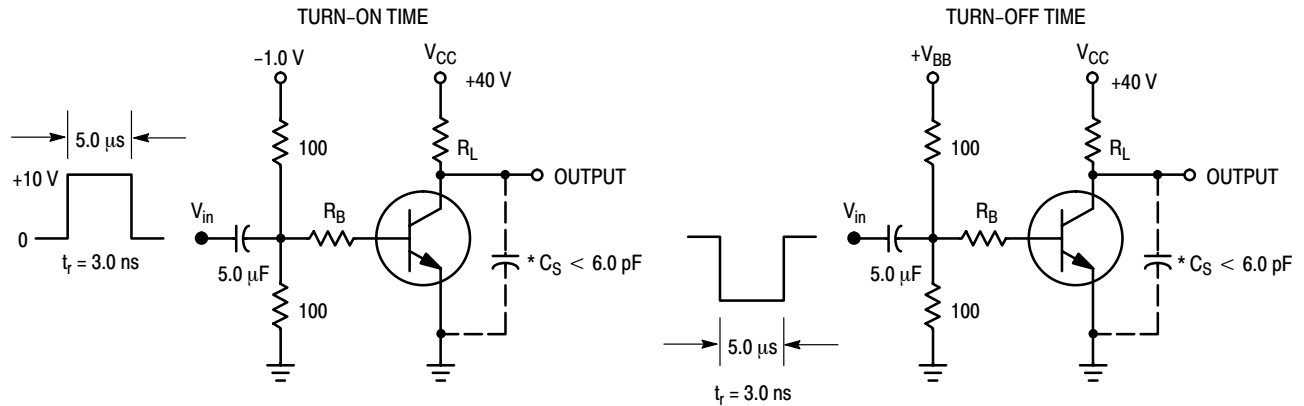
Preferred devices are recommended choices for future use and best overall value.

# MPSA05, MPSA06, MPSA55, MPSA56

## 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.) ( $I_C = 1.0\text{ mAdc}$ , $I_B = 0$ )	$V_{(BR)CEO}$	60 80	–	Vdc
Emitter–Base Breakdown Voltage ( $I_E = 100\ \mu\text{Adc}$ , $I_C = 0$ )	$V_{(BR)EBO}$	4.0	–	Vdc
Collector Cutoff Current ( $V_{CE} = 60\text{ Vdc}$ , $I_B = 0$ )	$I_{CES}$	–	0.1	$\mu\text{Adc}$
Collector Cutoff Current ( $V_{CB} = 60\text{ Vdc}$ , $I_E = 0$ ) ( $V_{CB} = 80\text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	–	0.1	$\mu\text{Adc}$
<b>ON CHARACTERISTICS</b>				
DC Current Gain ( $I_C = 10\text{ mAdc}$ , $V_{CE} = 1.0\text{ Vdc}$ ) ( $I_C = 100\text{ mAdc}$ , $V_{CE} = 1.0\text{ Vdc}$ )	$h_{FE}$	100 100	–	–
Collector–Emitter Saturation Voltage ( $I_C = 100\text{ mAdc}$ , $I_B = 10\text{ mAdc}$ )	$V_{CE(sat)}$	–	0.25	Vdc
Base–Emitter On Voltage ( $I_C = 100\text{ mAdc}$ , $V_{CE} = 1.0\text{ Vdc}$ )	$V_{BE(on)}$	–	1.2	Vdc
<b>SMALL–SIGNAL CHARACTERISTICS</b>				
Current–Gain – Bandwidth Product (Note 3.) ( $I_C = 10\text{ mA}$ , $V_{CE} = 2.0\text{ V}$ , $f = 100\text{ MHz}$ )  ( $I_C = 100\text{ mAdc}$ , $V_{CE} = 1.0\text{ Vdc}$ , $f = 100\text{ MHz}$ )	$f_T$	100 50	–	MHz

- Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
- $f_T$  is defined as the frequency at which  $|h_{fe}|$  extrapolates to unity.



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

Figure 1. Switching Time Test Circuits

# MPSA05, MPSA06, MPSA55, MPSA56

NPN

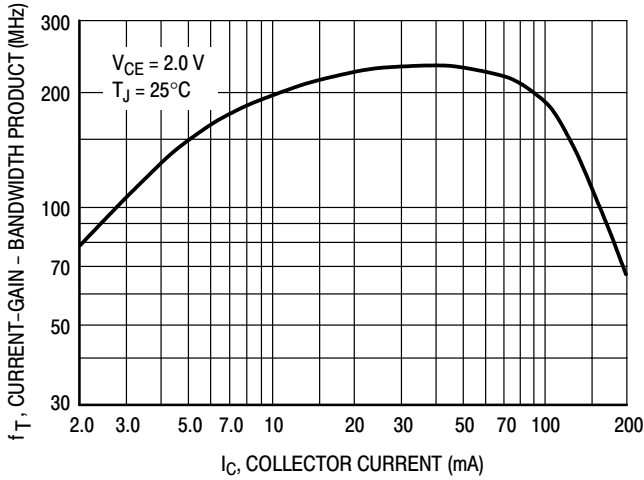


Figure 2. MPSA05/06 Current-Gain — Bandwidth Product

PNP

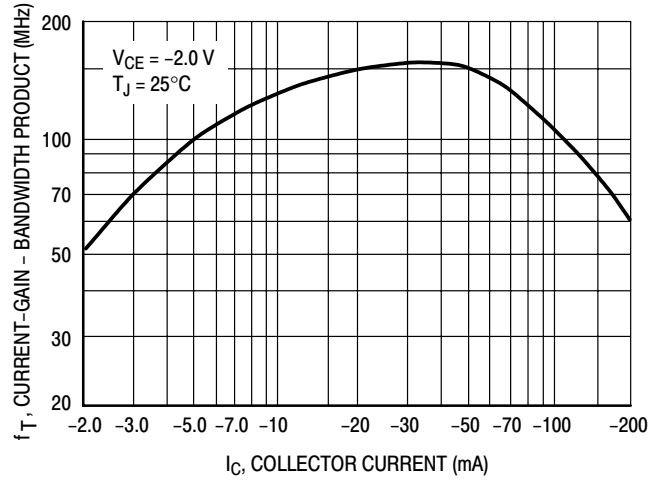


Figure 3. MPSA55/56 Current-Gain — Bandwidth Product

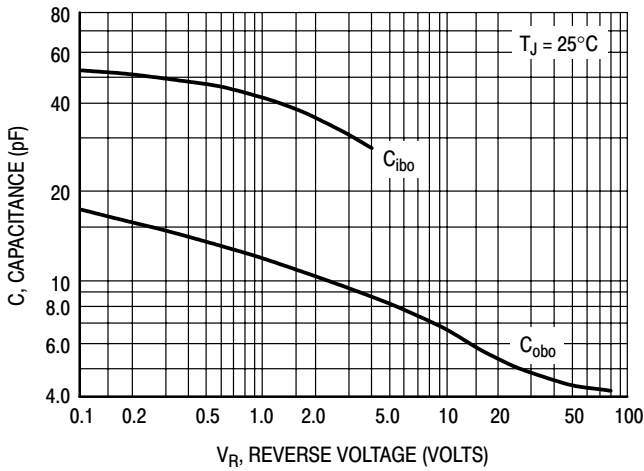


Figure 4. MPSA05/06 Capacitance

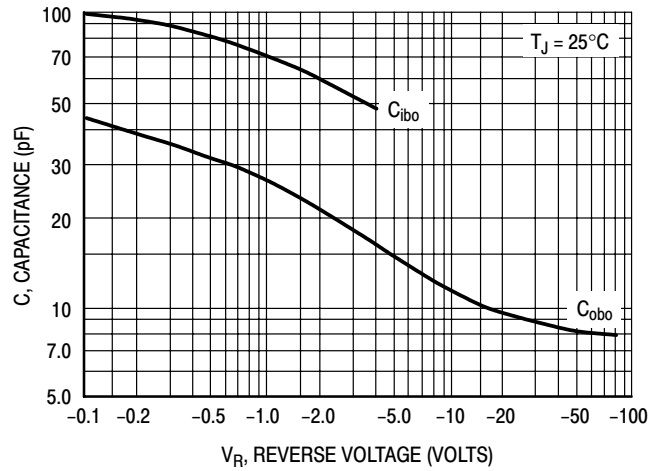


Figure 5. MPSA55/56 Capacitance

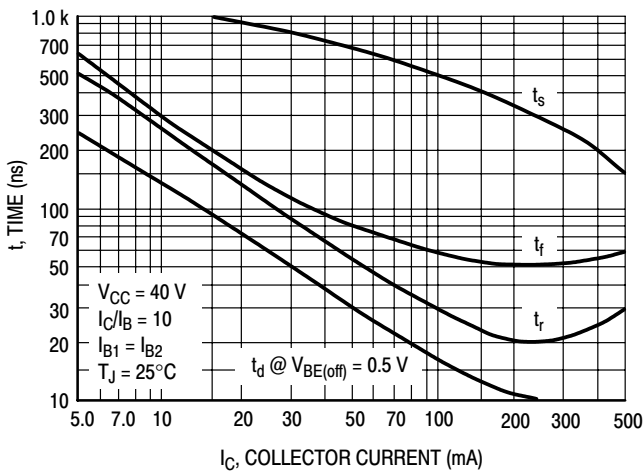


Figure 6. MPSA05/06 Switching Time

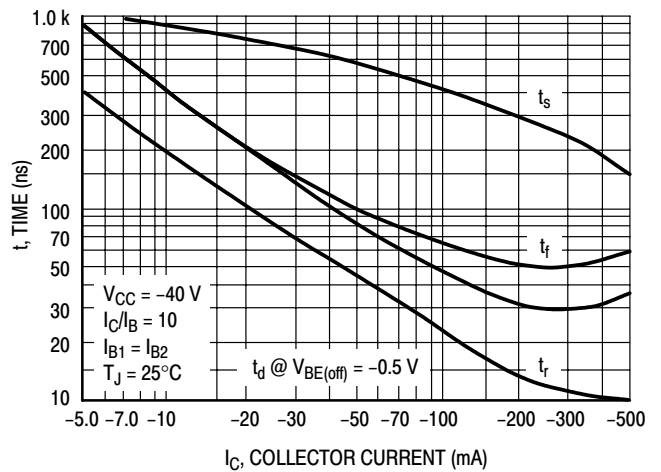


Figure 7. MPSA55/56 Switching Time

# MPSA05, MPSA06, MPSA55, MPSA56

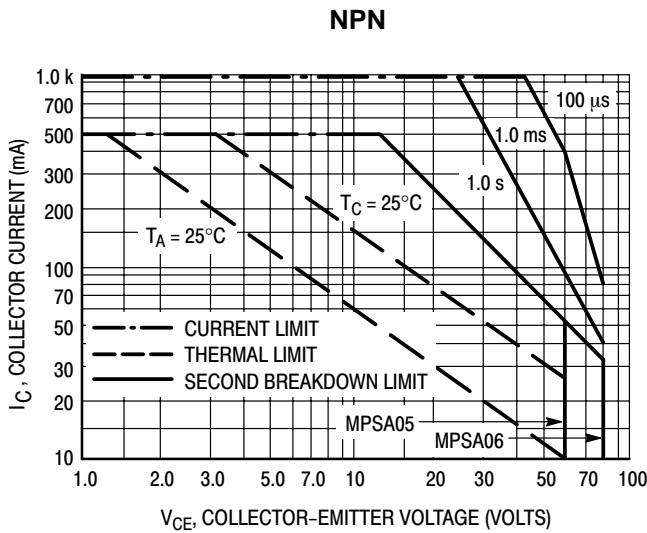


Figure 8. MPSA05/06 Active-Region Safe Operating Area

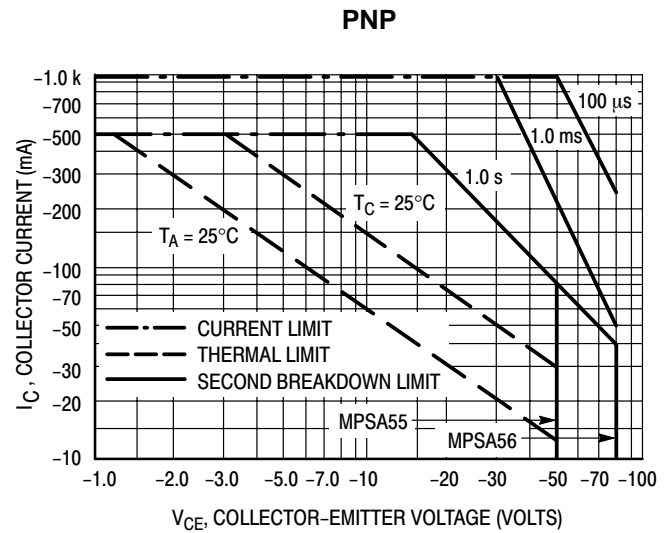


Figure 9. MPSA55/56 Active-Region Safe Operating Area

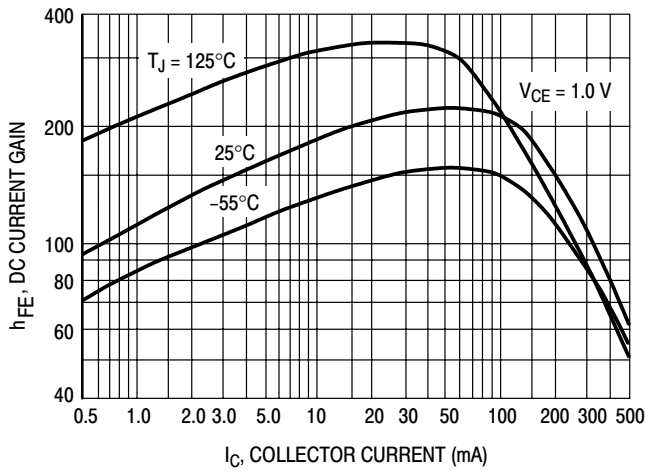


Figure 10. MPSA05/06 DC Current Gain

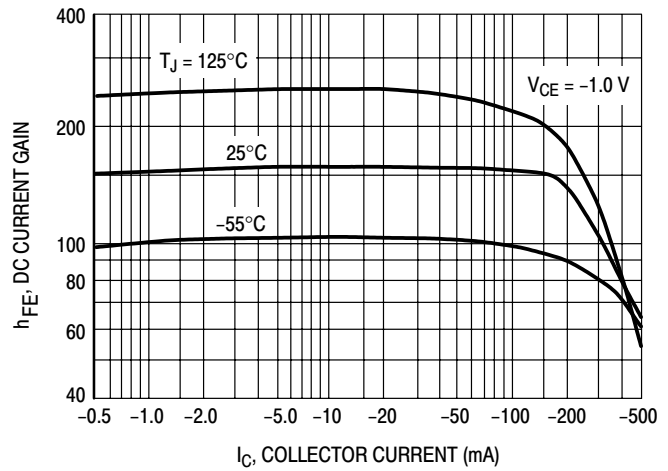


Figure 11. MPSA55/56 DC Current Gain

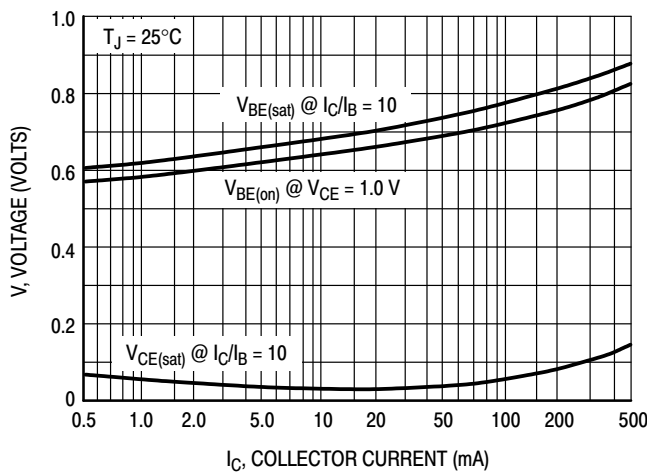


Figure 12. MPSA05/06 "ON" Voltages

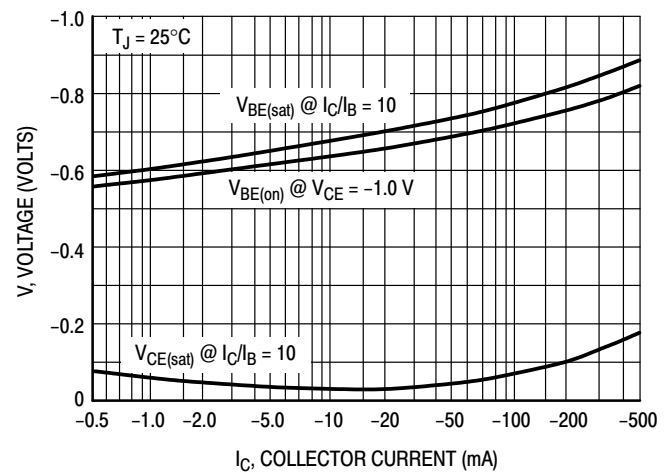


Figure 13. MPSA55/56 "ON" Voltages

# MPSA05, MPSA06, MPSA55, MPSA56

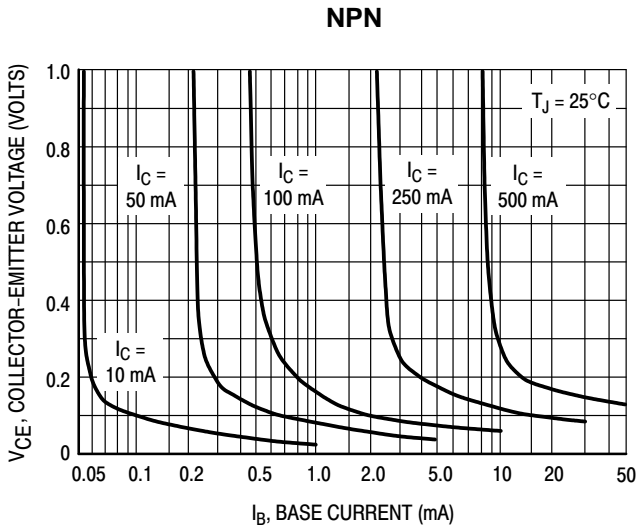


Figure 14. MPSA05/06 Collector Saturation Region

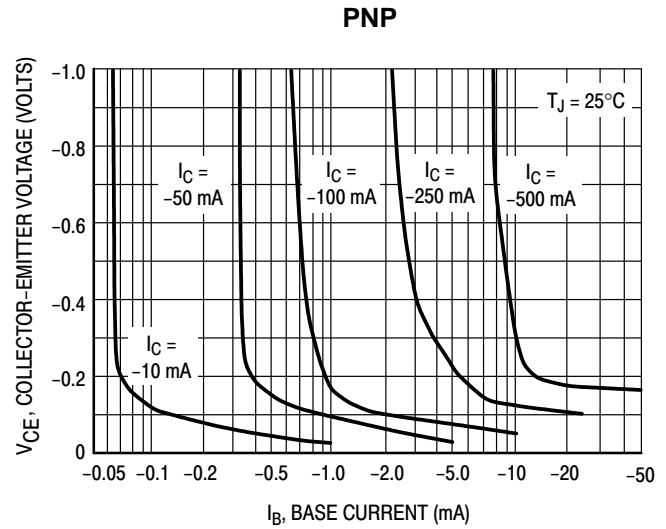


Figure 15. MPSA55/56 Collector Saturation Region

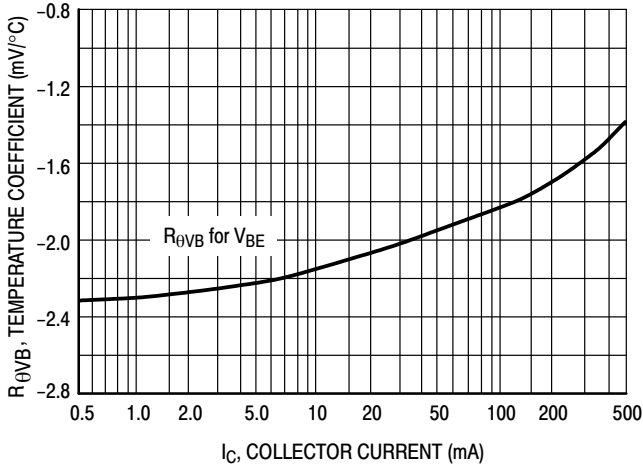


Figure 16. MPSA05/06 Base-Emitter Temperature Coefficient

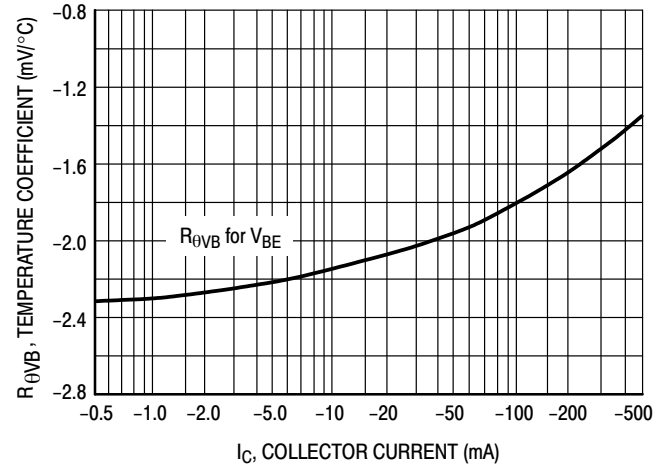


Figure 17. MPSA55/56 Base-Emitter Temperature Coefficient

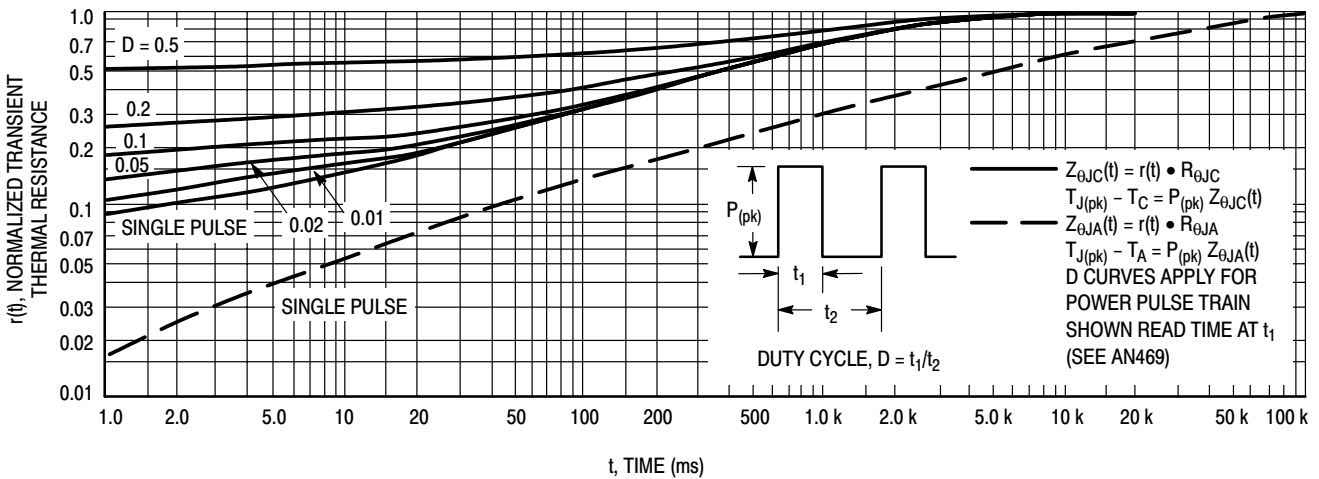
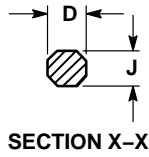
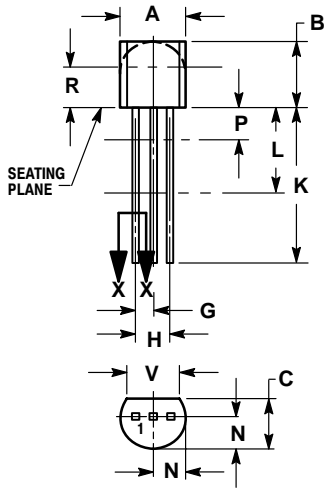


Figure 18. MPSA05, MPSA06, MPSA55 and MPSA56 Thermal Response

# MPSA05, MPSA06, MPSA55, MPSA56

## PACKAGE DIMENSIONS

TO-92  
TO-226AA  
CASE 29-11  
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. 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	---

STYLE 1:

- PIN 1. EMITTER
2. BASE
3. COLLECTOR

STYLE 14:

- PIN 1. EMITTER
2. COLLECTOR
3. BASE

## Notes

# MPSA05, MPSA06, MPSA55, MPSA56

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