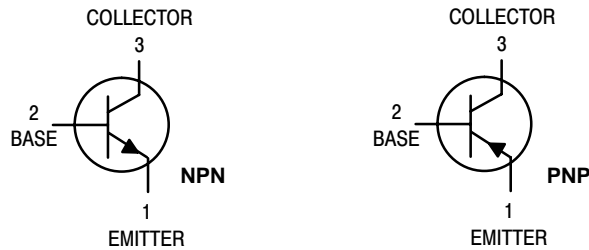


Amplifier Transistors



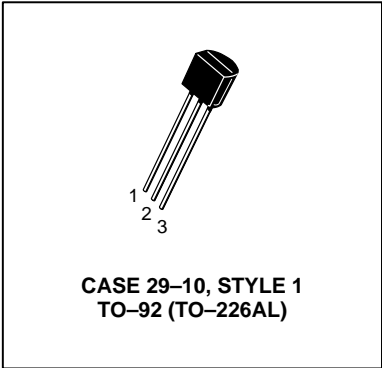
NPN
MPS650
MPS651 *
PNP
MPS750
MPS751 *

Voltage and current are negative for PNP transistors

*ON Semiconductor Preferred Devices

MAXIMUM RATINGS

Rating	Symbol	MPS650 MPS750	MPS651 MPS751	Unit
Collector–Emitter Voltage	V_{CE}	40	60	Vdc
Collector–Base Voltage	V_{CB}	60	80	Vdc
Emitter–Base Voltage	V_{EB}	5.0		Vdc
Collector Current — Continuous	I_C	2.0		Adc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	625	5.0	mW mW/ $^\circ\text{C}$
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.5	12	Watt 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	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage ⁽¹⁾ ($I_C = 10 \text{ mAdc}, I_B = 0$)	MPS650, MPS750 MPS651, MPS751	$V_{(BR)CEO}$	40 60	— —	Vdc
Collector–Base Breakdown Voltage ($I_C = 100 \mu\text{Adc}, I_E = 0$)	MPS650, MPS750 MPS651, MPS751	$V_{(BR)CBO}$	60 80	— —	Vdc
Emitter–Base Breakdown Voltage ($I_C = 0, I_E = 10 \mu\text{Adc}$)		$V_{(BR)EBO}$	5.0	—	Vdc
Collector Cutoff Current ($V_{CB} = 60 \text{ Vdc}, I_E = 0$) ($V_{CB} = 80 \text{ Vdc}, I_E = 0$)	MPS650, MPS750 MPS651, MPS751	I_{CBO}	— —	0.1 0.1	μAdc
Emitter Cutoff Current ($V_{EB} = 4.0 \text{ V}, I_C = 0$)		I_{EBO}	—	0.1	μAdc

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

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

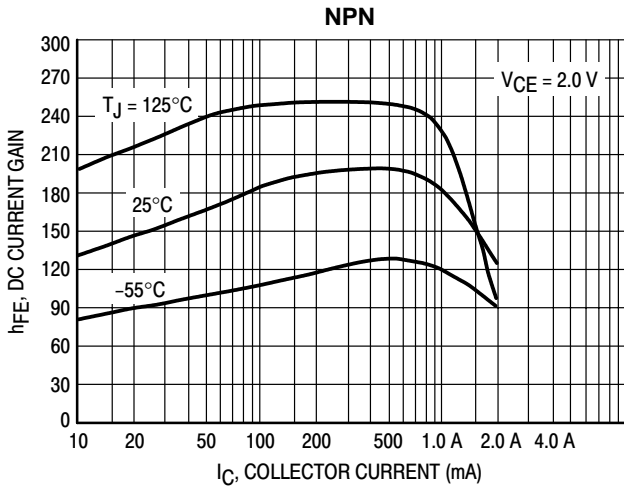
NPN MPS650 MPS651 PNP MPS750 MPS751

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted) (Continued)

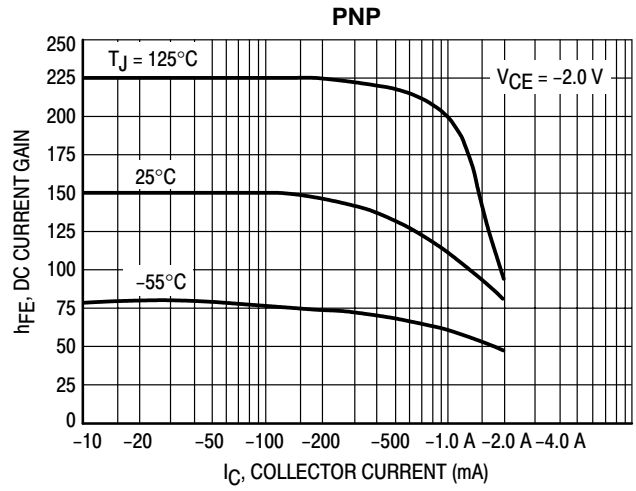
Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS(1)				
DC Current Gain (I _C = 50 mA, V _{CE} = 2.0 V) (I _C = 500 mA, V _{CE} = 2.0 V) (I _C = 1.0 A, V _{CE} = 2.0 V) (I _C = 2.0 A, V _{CE} = 2.0 V)	h _{FE}	75 75 75 40	— — — —	—
Collector–Emitter Saturation Voltage (I _C = 2.0 A, I _B = 200 mA) (I _C = 1.0 A, I _B = 100 mA)	V _{CE(sat)}	— —	0.5 0.3	Vdc
Base–Emitter On Voltage (I _C = 1.0 A, V _{CE} = 2.0 V)	V _{BE(on)}	—	1.0	Vdc
Base–Emitter Saturation Voltage (I _C = 1.0 A, I _B = 100 mA)	V _{BE(sat)}	—	1.2	Vdc
SMALL–SIGNAL CHARACTERISTICS				
Current–Gain — Bandwidth Product(2) (I _C = 50 mA, V _{CE} = 5.0 Vdc, f = 100 MHz)	f _T	75	—	MHz

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle = 2.0%.
2. f_T is defined as the frequency at which |h_{fe}| extrapolates to unity.

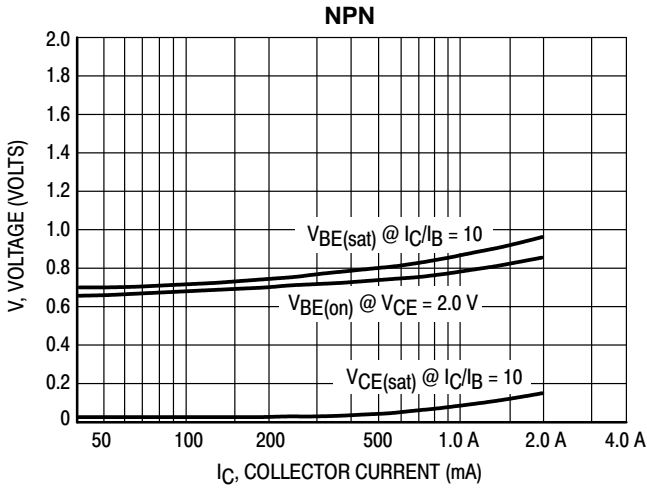
NPN MPS650 MPS651 PNP MPS750 MPS751



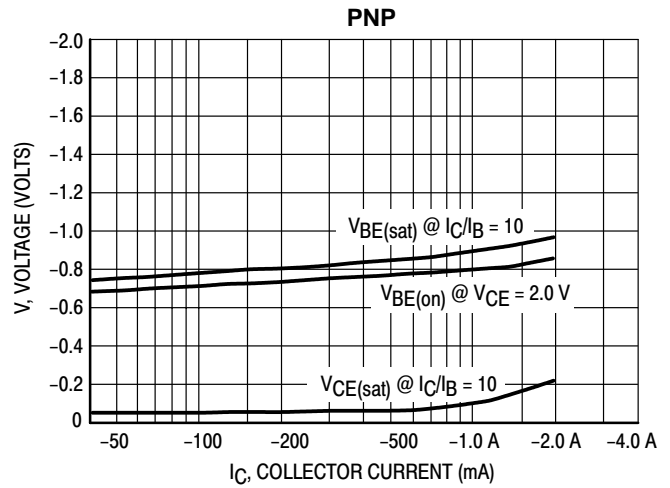
**Figure 1. MPS650, MPS651
Typical DC Current Gain**



**Figure 2. MPS750, MPS751
Typical DC Current Gain**



**Figure 3. MPS650, MPS651
On Voltages**



**Figure 4. MPS750, MPS751
On Voltages**

NPN MPS650 MPS651 PNP MPS750 MPS751

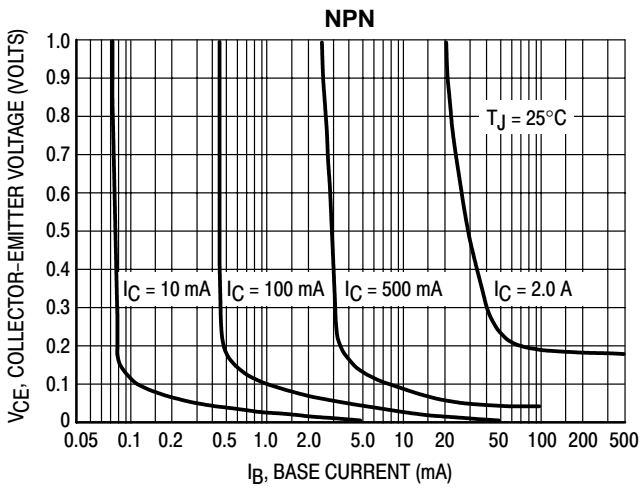


Figure 5. MPS650, MPS651
Collector Saturation Region

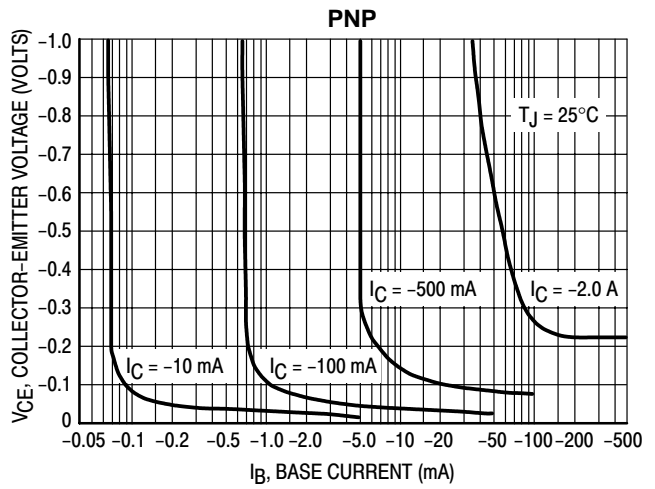


Figure 6. MPS750, MPS751
Collector Saturation Region

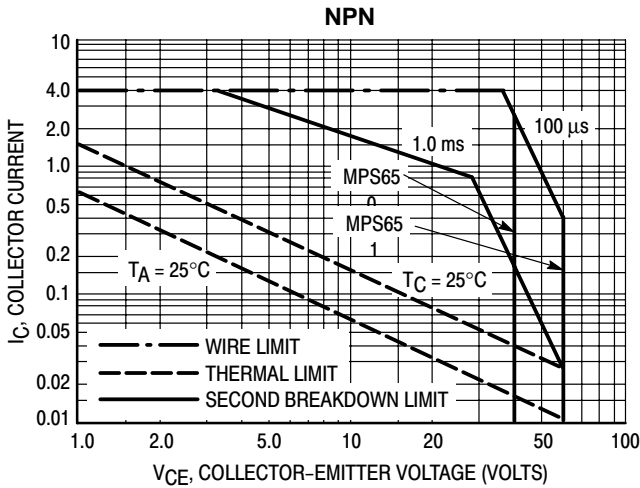


Figure 7. MPS650, MPS651 SOA,
Safe Operating Area

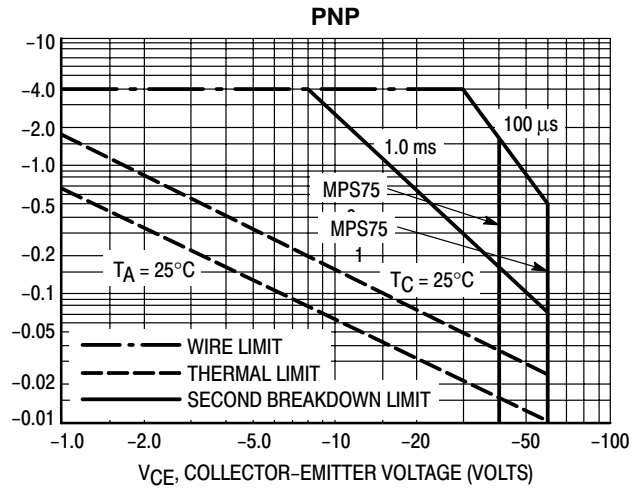
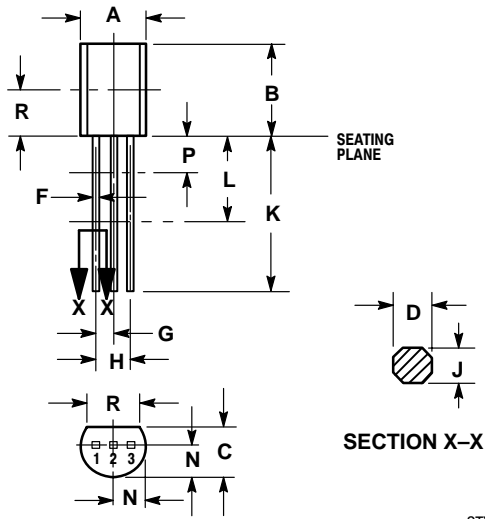


Figure 8. MPS750, MPS751 SOA,
Safe Operating Area

NPN MPS650 MPS651 PNP MPS750 MPS751

PACKAGE DIMENSIONS

TO-92 (TO-226)
CASE 29-10
ISSUE AL



SECTION X-X

STYLE 1:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

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	---

Notes

Notes

NPN MPS650 MPS651 PNP MPS750 MPS751

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