New Jersey Semi-Conductor Products, Inc.

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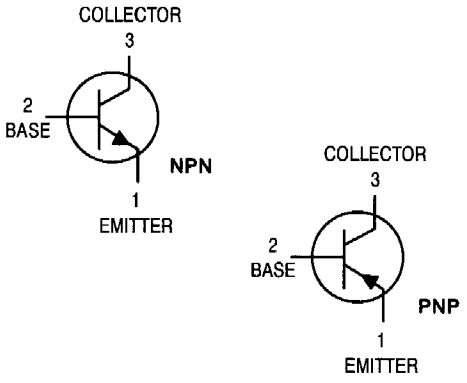
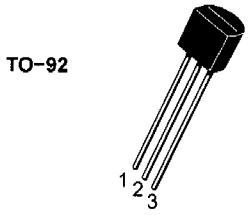
NPN - MPS650, MPS651;
PNP - MPS750, MPS751

MPS651 and MPS751 are Preferred Devices

Amplifier Transistors





MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage MPS650; MPS750 MPS651; MPS751	V_{CE}	 40 60	Vdc
Collector-Base Voltage MPS650; MPS750 MPS651; MPS751	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°C Derate above 25°C	P_D	625 5.0	mW mW/°C
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.5 12	W mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	V_{CE}	200	°C/W
Thermal Resistance, Junction-to-Case	V_{CB}	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.

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

Quality Semi-Conductors

NPN – MPS650, MPS651; PNP – MPS750, MPS751

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (Note 1) (I_C = 10 mAdc, I_B = 0)	MPS650, MPS750 MPS651, MPS751	$V_{(BR)CEO}$	40 60	– –	Vdc
Collector–Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	MPS650, MPS750 MPS651, MPS751	$V_{(BR)CBO}$	60 80	– –	Vdc
Emitter–Base Breakdown Voltage (I_C = 0, I_E = 10 μAdc)		$V_{(BR)EBO}$	5.0	–	Vdc
Collector Cutoff Current (V_{CB} = 60 Vdc, I_E = 0) (V_{CB} = 80 Vdc, I_E = 0)	MPS650, MPS750 MPS651, MPS751	I_{CBO}	– –	0.1 0.1	μAdc
Emitter Cutoff Current (V_{EB} = 4.0 V, I_C = 0)		I_{EBO}	–	0.1	μAdc
ON CHARACTERISTICS (Note 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 (Note 2) (I_C = 50 mAdc, 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.

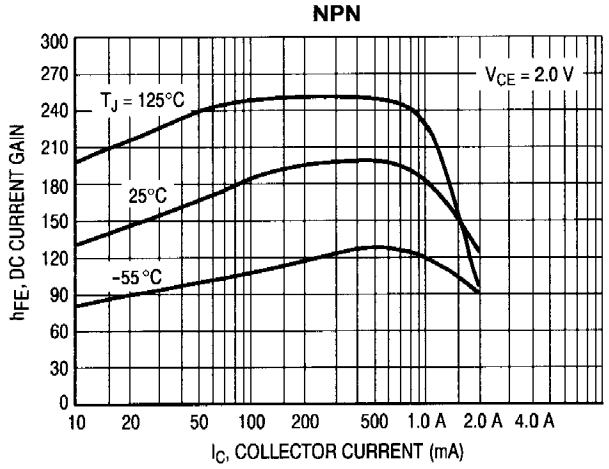


Figure 1. MPS650, MPS651 Typical DC Current Gain

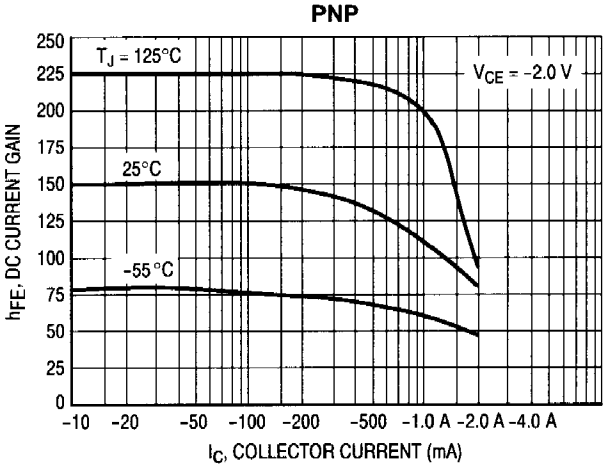


Figure 2. MPS750, MPS751 Typical DC Current Gain