

MAXIMUM RATINGS

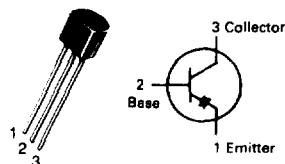
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	-12	Vdc
Collector-Base Voltage	V_{CBO}	-12	Vdc
Emitter-Base Voltage	V_{EBO}	-4.5	Vdc
Collector Current — Continuous	I_C	-80	mA dc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	625 5.0	mW mW/ $^\circ\text{C}$
Total 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	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83.3	$^\circ\text{C/W}$

MPS4258

**CASE 29-04, STYLE 1
TO-92 (TO-226AA)**

**SWITCHING TRANSISTOR**

PNP SILICON

Refer to MP33640 for graphs.

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

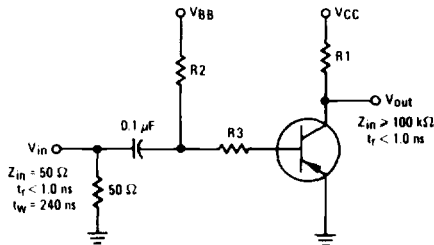
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage(1) ($I_C = -100 \mu\text{A dc}$, $V_{BE} = 0$)	$V_{(BR)CES}$	-12	—	Vdc
Collector-Emitter Sustaining Voltage(1) ($I_C = -3.0 \text{ mA dc}$, $I_B = 0$)	$V_{CEO(sus)}$	-12	—	Vdc
Collector-Base Breakdown Voltage ($I_C = -100 \mu\text{A dc}$, $I_E = 0$)	$V_{(BR)CBO}$	-12	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = -100 \mu\text{A dc}$, $I_C = 0$)	$V_{(BR)EBO}$	-4.5	—	Vdc
Collector Cutoff Current ($V_{CE} = -6.0 \text{ Vdc}$, $V_{BE} = 0$) ($V_{CE} = -6.0 \text{ Vdc}$, $V_{BE} = 0$, $T_A = +65^\circ\text{C}$)	I_{CES}	— —	-0.01 -5.0	$\mu\text{A dc}$
ON CHARACTERISTICS				
DC Current Gain ($I_C = -1.0 \text{ mA dc}$, $V_{CE} = -0.5 \text{ Vdc}$) ($I_C = -10 \text{ mA dc}$, $V_{CE} = -3.0 \text{ Vdc}$) ($I_C = -50 \text{ mA dc}$, $V_{CE} = -1.0 \text{ Vdc}$)	h_{FE}	15 30 30	— 120 —	—
Collector-Emitter Saturation Voltage ($I_C = -10 \text{ mA dc}$, $I_B = -1.0 \text{ mA dc}$) ($I_C = -50 \text{ mA dc}$, $I_B = -5.0 \text{ mA dc}$)	$V_{CE(sat)}$	— —	-0.15 -0.5	Vdc
Base-Emitter On Voltage ($I_C = -10 \text{ mA dc}$, $I_B = -1.0 \text{ mA dc}$) ($I_C = -50 \text{ mA dc}$, $I_B = -5.0 \text{ mA dc}$)	$V_{BE(sat)}$	-0.75 —	-0.95 -1.5	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Current Gain — Bandwidth Product(2) ($I_C = -10 \text{ mA dc}$, $V_{CE} = -10 \text{ Vdc}$, $f = 100 \text{ MHz}$)	f_T	700	—	MHz
Input Capacitance ($V_{EB} = -0.5 \text{ Vdc}$, $I_C = 0$, $f = 1.0 \text{ MHz}$)	C_{ibo}	—	3.5	pF
Collector-Base Capacitance ($V_{CB} = -5.0 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$)	C_{cb}	—	3.0	pF

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

Characteristic		Symbol	Min	Max	Unit
SWITCHING CHARACTERISTICS					
Turn-On Time	(V _{CC} = -1.5 Vdc, V _{EB(off)} = 0, I _C = -10 mAdc, I _{B1} = -1.0 mAdc)	t _{on}	—	15	ns
Delay Time		t _d	—	10	ns
Rise Time		t _r	—	15	ns
Turn-Off Time	(V _{CC} = -1.5 Vdc, I _C = -10 mAdc, I _{B1} = I _{B2} = -1.0 mAdc)	t _{off}	—	20	ns
Storage Time		t _s	—	10	ns
Fall Time		t _f	—	20	ns
Storage Time (I _C ≈ -10 mAdc, I _{B1} ≈ -10 mAdc, I _{B2} ≈ 10 mAdc)		t _s	—	20	ns

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

FIGURE 1 — SWITCHING TIME TEST CIRCUIT



	V _{in} Volts	V _{BB} Volts	V _{CC} Volts	R1 Ohms	R2 Ohms	R3 Ohms	I _C mA	I _{B1} mA	I _{B2} mA
t _{on}	-5.8	GND	-1.5	130	2.2 k	5 k	10	1.0	—
t _{off}	+9.8	-8.0	-1.5	130	2.2 k	5 k	10	1.0	1.0
t _s	+9.0	-10	-3.0	270	510	390	10	10	10