

### MAXIMUM RATINGS

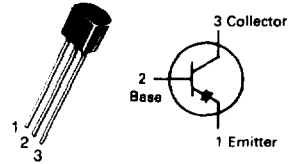
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	-12	Vdc
Collector-Base Voltage	$V_{CBO}$	-12	Vdc
Emitter-Base Voltage	$V_{EBO}$	-4.5	Vdc
Collector Current — Continuous	$I_C$	-80	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	625 5.0	mW mW/ $^\circ\text{C}$
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	$R_{\theta JA}$	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 MPS3640 for graphs.

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

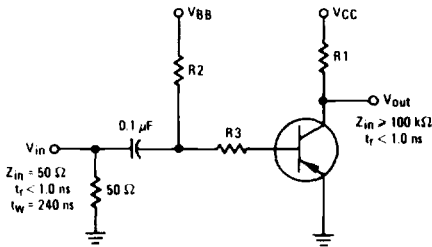
Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Breakdown Voltage(1) ( $I_C = -100 \mu\text{Adc}, V_{BE} = 0$ )	$V_{(BR)CES}$	-12	—	Vdc
Collector-Emitter Sustaining Voltage(1) ( $I_C = -3.0 \text{ mAdc}, I_B = 0$ )	$V_{CEO(sus)}$	-12	—	Vdc
Collector-Base Breakdown Voltage ( $I_C = -100 \mu\text{Adc}, I_E = 0$ )	$V_{(BR)CBO}$	-12	—	Vdc
Emitter-Base Breakdown Voltage ( $I_E = -100 \mu\text{Adc}, I_C = 0$ )	$V_{(BR)EBO}$	-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	$\mu\text{Adc}$
<b>ON CHARACTERISTICS</b>				
DC Current Gain ( $I_C = -1.0 \text{ mAdc}, V_{CE} = -0.5 \text{ Vdc}$ ) ( $I_C = -10 \text{ mAdc}, V_{CE} = -3.0 \text{ Vdc}$ ) ( $I_C = -50 \text{ mAdc}, V_{CE} = -1.0 \text{ Vdc}$ )	$h_{FE}$	15 30 30	— 120 —	—
Collector-Emitter Saturation Voltage ( $I_C = -10 \text{ mAdc}, I_B = -1.0 \text{ mAdc}$ ) ( $I_C = -50 \text{ mAdc}, I_B = -5.0 \text{ mAdc}$ )	$V_{CE(sat)}$	—	-0.15 -0.5	Vdc
Base-Emitter On Voltage ( $I_C = -10 \text{ mAdc}, I_B = -1.0 \text{ mAdc}$ ) ( $I_C = -50 \text{ mAdc}, I_B = -5.0 \text{ mAdc}$ )	$V_{BE(sat)}$	-0.75 —	-0.95 -1.5	Vdc
<b>SMALL-SIGNAL CHARACTERISTICS</b>				
Current Gain — Bandwidth Product(2) ( $I_C = -10 \text{ mAdc}, V_{CE} = -10 \text{ Vdc}, f = 100 \text{ MHz}$ )	$f_T$	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) ( $T_A = 25^\circ\text{C}$  unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
<b>SWITCHING CHARACTERISTICS</b>					
Turn-On Time	$(V_{CC} = -1.5\text{ Vdc},$ $V_{EB(\text{off})} = 0,$ $I_C = -10\text{ mA dc}, I_{B1} = -1.0\text{ mA dc})$	$t_{on}$	—	15	ns
Delay Time		$t_d$	—	10	ns
Rise Time		$t_r$	—	15	ns
Turn-Off Time	$(V_{CC} = -1.5\text{ Vdc},$ $I_C = -10\text{ mA dc},$ $I_{B1} = I_{B2} = -1.0\text{ mA dc})$	$t_{off}$	—	20	ns
Storage Time		$t_s$	—	10	ns
Fall Time		$t_f$	—	20	ns
Storage Time ( $I_C \approx -10\text{ mA dc}, I_{B1} \approx -10\text{ mA dc}, I_{B2} \approx 10\text{ mA dc}$ )		$t_s$	—	20	ns

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