

**MOTOROLA**  
**SEMICONDUCTOR**  
**TECHNICAL DATA**

T-33-17

**MPS-U60**

**NOT RECOMMENDED  
FOR NEW DESIGNS**

**PNP SILICON ANNULAR TRANSISTOR**

Designed for general-purpose applications requiring high breakdown voltages, low saturation voltages and low capacitance.

Complement to NPN Type MPS-U10

**PNP SILICON  
HIGH VOLTAGE  
TRANSISTOR****MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	300	Vdc
Collector-Base Voltage	$V_{CB}$	300	Vdc
Emitter-Base Voltage	$V_{EB}$	50	Vdc
Collector Current - Continuous	$I_C$	500	mA dc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.0 80	Watt mW/ $^\circ\text{C}$
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	10 80	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 Case	$R_{\theta JC}$	12.5	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}(1)$	125	$^\circ\text{C/W}$

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Breakdown Voltage (2) ( $I_C = 10\text{ mA dc}, I_E = 0$ )	$V_{(BR)CEO}$	300	—	Vdc
Collector-Base Breakdown Voltage ( $I_C = 100\text{ }\mu\text{A dc}, I_E = 0$ )	$V_{(BR)CBO}$	300	—	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 10\text{ }\mu\text{A dc}, I_C = 0$ )	$V_{(BR)EBO}$	50	—	Vdc
Collector Cutoff Current ( $V_{CB} = 200\text{ Vdc}, I_E = 0$ )	$I_{CBO}$	—	0.2	$\mu\text{A dc}$
Emitter Cutoff Current ( $V_{BE} = 3.0\text{ Vdc}, I_C = 0$ )	$I_{EBO}$	—	0.1	$\mu\text{A dc}$

**ON CHARACTERISTICS**

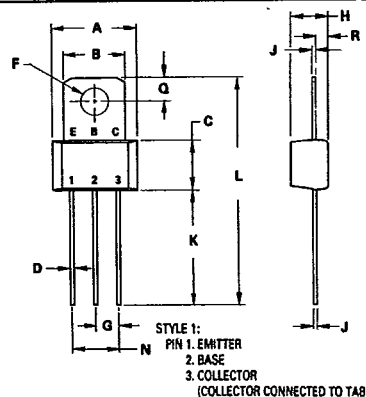
DC Current Gain (2) ( $I_C = 10\text{ mA dc}, V_{CE} = 10\text{ Vdc}$ ) ( $I_C = 10\text{ mA dc}, V_{CE} = 10\text{ Vdc}$ ) ( $I_C = 30\text{ mA dc}, V_{CE} = 10\text{ Vdc}$ )	$\beta_{FE}$	25 30 30	— — —	—
Collector-Emitter Saturation Voltage ( $I_C = 20\text{ mA dc}, I_E = 2.0\text{ mA dc}$ )	$V_{CE(sat)}$	—	0.75	Vdc
Base-Emitter Saturation Voltage ( $I_C = 20\text{ mA dc}, I_E = 2.0\text{ mA dc}$ )	$V_{BE(sat)}$	—	0.9	Vdc

**DYNAMIC CHARACTERISTICS**

Current Gain-Bandwidth Product (2) ( $I_C = 10\text{ mA dc}, V_{CE} = 20\text{ Vdc}, f = 100\text{ MHz}$ )	$f_T$	60	—	MHz
Collector Base Capacitance ( $V_{CB} = 20\text{ Vdc}, I_E = 0, f = 10\text{ MHz}$ )	$C_{cb}$	—	8.0	pF

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

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



NOTE:  
1. LEADS WITHIN 0.15 mm (0.006) TOTAL OF TRUE POSITION AT CASE, AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.14	9.53	0.360	0.375
B	6.60	7.24	0.260	0.285
C	5.41	5.66	0.213	0.223
D	0.38	0.53	0.015	0.021
F	3.18	3.33	0.125	0.131
G	2.54 BSC		0.100 BSC	
H	3.94	4.19	0.155	0.165
J	0.36	0.41	0.014	0.016
K	11.63	12.73	0.458	0.500
L	24.59	25.53	0.968	1.005
M	5.08 BSC		0.200 BSC	
Q	2.33	2.69	0.094	0.106
R	1.14	1.40	0.045	0.055

CASE 152-02

T-33-17

FIGURE 1 - DC CURRENT GAIN

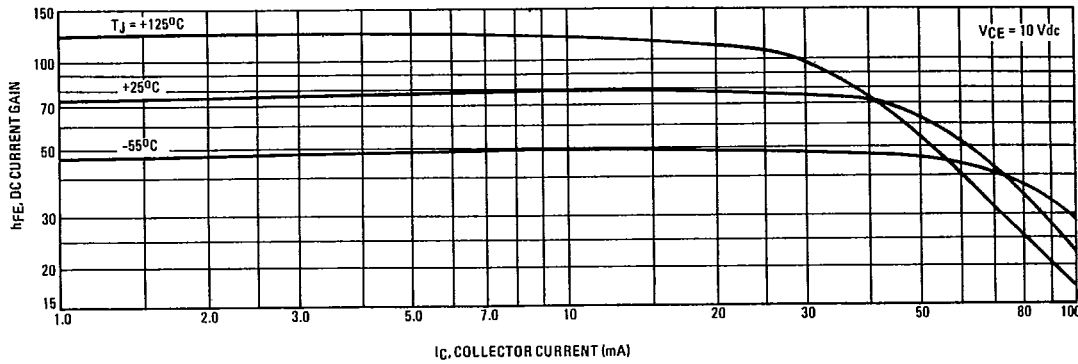


FIGURE 2 - CAPACITANCES

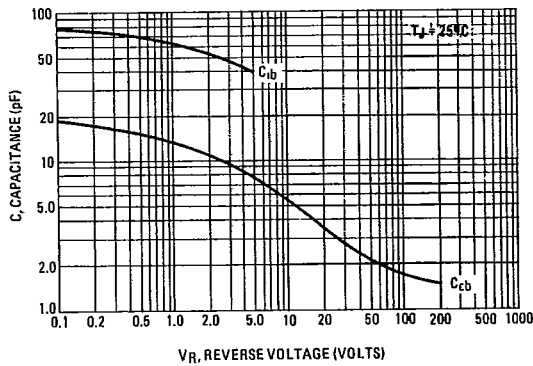


FIGURE 3 - CURRENT-GAIN-BANDWIDTH PRODUCT

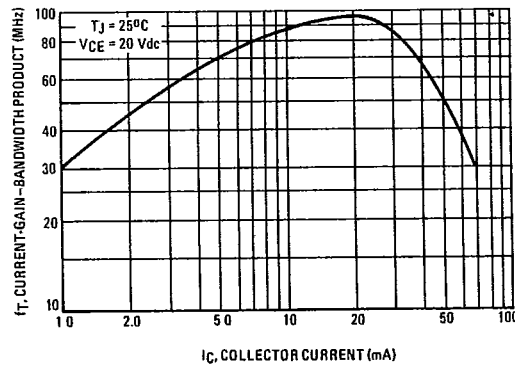


FIGURE 4 - "ON" VOLTAGES

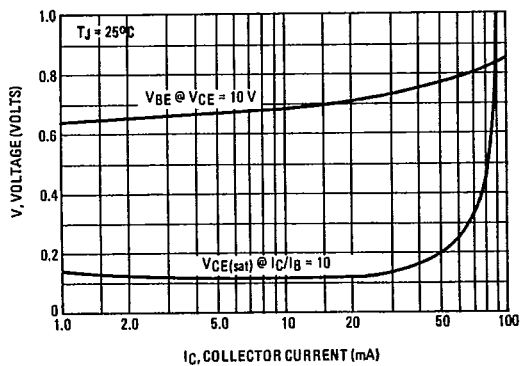


FIGURE 5 - DC SAFE OPERATING AREA

