

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA
MPS-U60

T-33-17

**NOT RECOMMENDED
FOR NEW DESIGNS**
PNP SILICON ANNULAR TRANSISTOR

Designed for general-purpose applications requiring high break-
down 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}	5.0	Vdc
Collector Current - Continuous	I_C	500	mA dc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	1.0 8.0	Watt mW/ $^\circ\text{C}$
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°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
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (2) ($I_C = 1.0 \text{ mA dc}, I_E = 0$)	$V_{(BR)CEO}$	300	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 100 \mu\text{A dc}, I_E = 0$)	$V_{(BR)CBO}$	300	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10 \mu\text{A dc}, I_C = 0$)	$V_{(BR)EBO}$	5.0	—	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

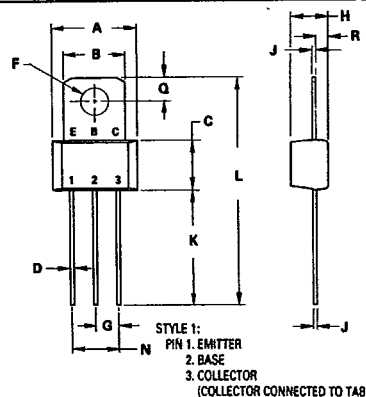
DC Current Gain (2) ($I_C = 1.0 \text{ mA dc}, V_{CE} = 10 \text{ Vdc}$) ($I_C = 10 \text{ mA dc}, V_{CE} = 10 \text{ Vdc}$) ($I_C = 30 \text{ mA dc}, V_{CE} = 10 \text{ Vdc}$)	β_{FE}	25 30 30	— — —	— — —
Collector-Emitter Saturation Voltage ($I_C = 20 \text{ mA dc}, I_E = 2.0 \text{ mA dc}$)	$V_{CE(sat)}$	—	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 ($V_{CB} = 20 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz}$)	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 $< 300 \mu\text{s}$, 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	0.38	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	2.38	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

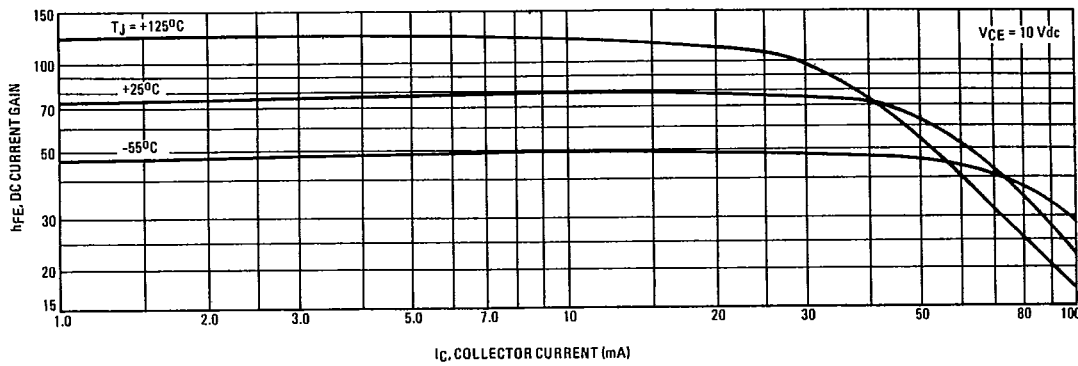


FIGURE 2 - CAPACITANCES

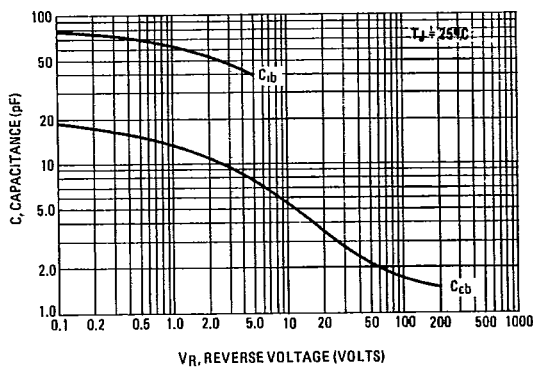


FIGURE 3 - CURRENT-GAIN-BANDWIDTH PRODUCT

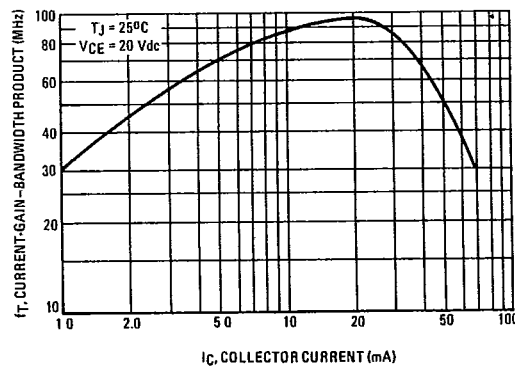


FIGURE 4 - "ON" VOLTAGES

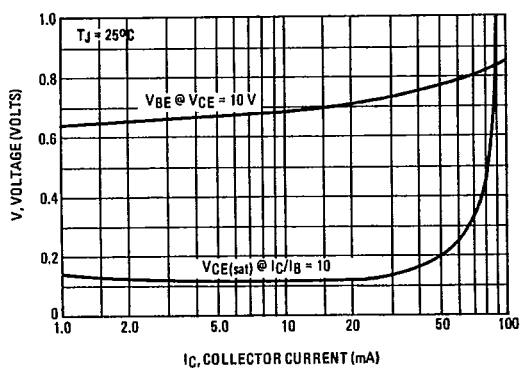


FIGURE 5 - DC SAFE OPERATING AREA

