

MOTOROLA
SEMICONDUCTOR
 TECHNICAL DATA

T-33-17

MPS-U52**PNP SILICON ANNULAR TRANSISTOR**

... designed for general-purpose amplifier and driver applications.

- Complement to NPN MPS-U02

**PNP SILICON
AMPLIFIER TRANSISTOR****MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	40	Vdc
Collector-Base Voltage	V_{CB}	60	Vdc
Emitter-Base Voltage	V_{EB}	5.0	Vdc
Collector Current — Continuous	I_C	1.5	Adc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$	P_D	1.0	Watt
Derate above 25°C		8.0	mW/ $^\circ\text{C}$
Total Power Dissipation @ $T_C = 25^\circ\text{C}$	P_D	10	Watts
Derate above 25°C		80	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	$R_{\theta JA}$	125	$^\circ\text{C/W}$

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

Characteristic	Symbol	Min	Max	Unit
----------------	--------	-----	-----	------

OFF CHARACTERISTICS

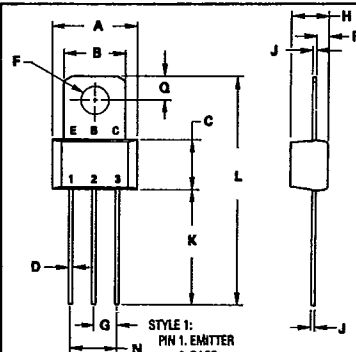
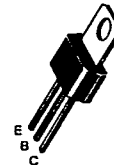
Collector-Emitter Breakdown Voltage ($I_C = 1.0 \text{ mAdc}$, $I_E = 0$)	$V_{(BR)CEO}$	40	-	Vdc
Collector-Base Breakdown Voltage ($I_C = 100 \mu\text{Adc}$, $I_E = 0$)	$V_{(BR)CBO}$	60	-	Vdc
Collector Cutoff Current ($V_{CB} = 40 \text{ Vdc}$, $I_E = 0$)	I_{CBO}	-	100	nAdc

ON CHARACTERISTICS (2)

DC Current Gain ($I_C = 10 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 150 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 500 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$)	h_{FE}	50 50 30	- 300 -	-
Collector-Emitter Saturation Voltage ($I_C = 150 \text{ mAdc}$, $I_E = 15 \text{ mAdc}$)	$V_{CE(sat)}$	-	0.4	Vdc
Base-Emitter Saturation Voltage ($I_C = 150 \text{ mAdc}$, $I_E = 15 \text{ mAdc}$)	$V_{BE(sat)}$	-	1.3	Vdc

DYNAMIC CHARACTERISTICS

Current-Gain-Bandwidth Product (2) ($I_C = 20 \text{ mAdc}$, $V_{CE} = 20 \text{ Vdc}$, $f = 100 \text{ MHz}$)	f_T	100	-	MHz
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 100 \text{ kHz}$)	C_{ob}	-	24	pF

(1) $R_{\theta JA}$ is measured with device soldered into a typical printed circuit board(2) Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$ **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	0.286
C	5.41	5.66	0.213	0.223
D	0.38	0.63	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	12.70	0.458	0.500
L	24.58	25.53	0.968	1.005
M	5.08 BSC		0.200 BSC	
O	2.39	2.69	0.094	0.106
R	1.14	1.40	0.045	0.055

CASE 152-02

3-1060

MPS-U52

T-33-17

FIGURE 1 - DC CURRENT GAIN

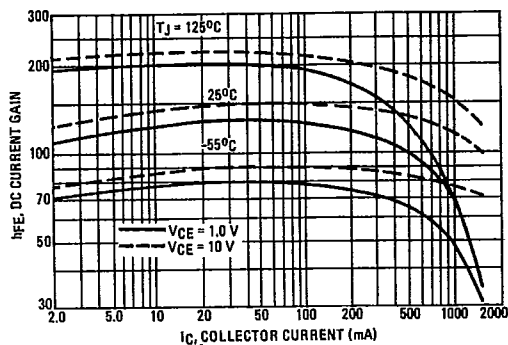


FIGURE 2 - "ON" VOLTAGES

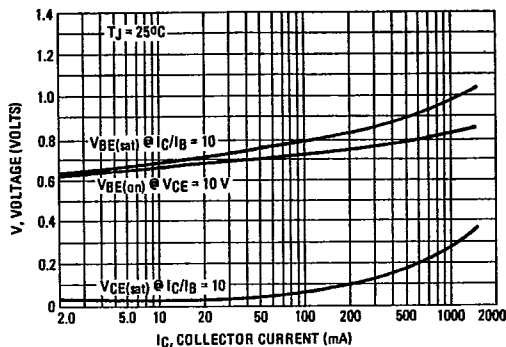


FIGURE 3 - COLLECTOR SATURATION REGION

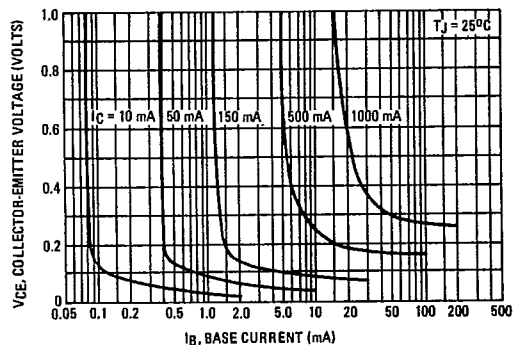
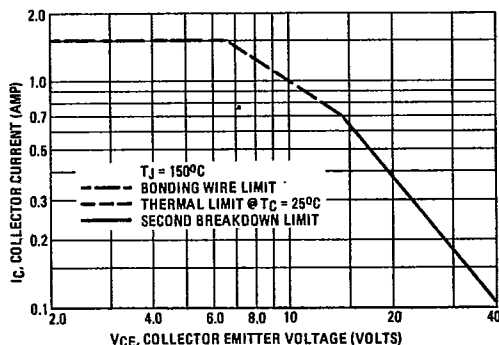


FIGURE 4 - DC SAFE OPERATING AREA



3

FIGURE 5 - CURRENT-GAIN BANDWIDTH PRODUCT

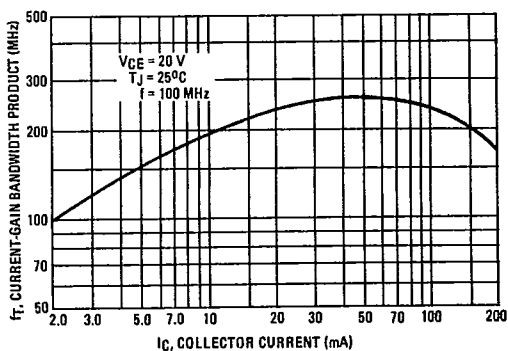


FIGURE 6 - CAPACITANCE

