

MPS-U10

**NOT RECOMMENDED
FOR NEW DESIGNS**

NPN SILICON ANNULAR TRANSISTOR

... designed for high-voltage video and luminance output stages in TV receivers.

- High Collector-Emitter Breakdown Voltage –
 $V_{(BR)CEO} = 300 \text{ Vdc (Min) @ } I_C = 1.0 \text{ mAdc}$
- Low Collector-Emitter Saturation Voltage –
 $V_{CE(sat)} = 0.75 \text{ Vdc (Max) @ } I_C = 30 \text{ mAdc}$
- Low Collector-Base Capacitance –
 $C_{cb} = 3.0 \text{ pF (Max) @ } V_{CB} = 20 \text{ Vdc}$

**NPN SILICON
HIGH VOLTAGE
AMPLIFIER
TRANSISTOR**



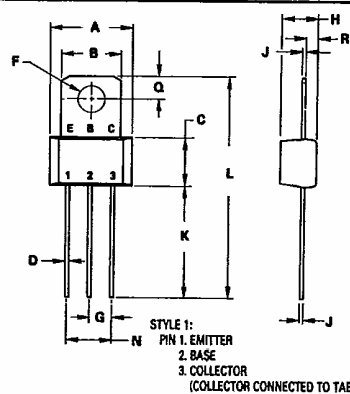
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	300	Vdc
Collector-Base Voltage	V_{CB}	300	Vdc
Emitter-Base Voltage	V_{EB}	6.0	Vdc
Collector Current – Continuous	I_C	0.5	Ade
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	1.0 8.0	Watt mW/°C
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	10 80	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	12.5	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA(1)}$	125	°C/W

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



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	0.35	0.41	0.014	0.016
K	11.63	12.70	0.458	0.500
L	24.59	25.53	0.969	1.005
M	5.08 BSC		0.200 BSC	
Q	2.39	2.69	0.094	0.106
R	1.14	1.40	0.045	0.055

CASE 152-02

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

Characteristics	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (1) ($I_C = 1.0\text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	300	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 100\text{ }\mu\text{Adc}$, $I_E = 0$)	$V_{(BR)CBO}$	300	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 100\text{ }\mu\text{Adc}$, $I_C = 0$)	$V_{(BR)EBO}$	6.0	—	Vdc
Collector Cutoff Current ($V_{CB} = 200\text{ Vdc}$, $I_E = 0$)	I_{CBO}	—	0.2	μAdc
Emitter Cutoff Current ($V_{BE} = 6.0\text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	0.1	μAdc

ON CHARACTERISTICS

DC Current Gain ($I_C = 1.0\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 10\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$) ($I_C = 30\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$)	h_{FE}	25 40 40	— — —	—
Collector-Emitter Saturation Voltage ($I_C = 30\text{ mAdc}$, $I_B = 3.0\text{ mAdc}$)	$V_{CE(sat)}$	—	0.75	Vdc
Base-Emitter On Voltage ($I_C = 30\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$)	$V_{BE(on)}$	—	0.85	Vdc

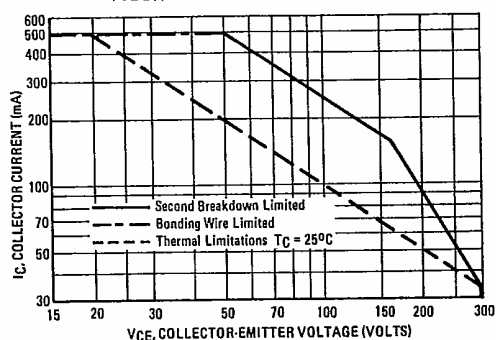
DYNAMIC CHARACTERISTICS

Current-Gain-Bandwidth Product (1) ($I_C = 10\text{ mAdc}$, $V_{CE} = 20\text{ Vdc}$, $f = 100\text{ MHz}$)	f_T	45	—	MHz
Collector-Base Capacitance ($V_{CB} = 20\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{cb}	—	3.0	pF

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

3

FIGURE 1 – DC SAFE OPERATING AREA



The Safe Operating Area Curves indicate I_C – V_{CE} limits below which the device will not enter second breakdown. Collector load lines for specific circuits must fall within the applicable Safe Area to avoid causing a catastrophic failure. To insure operation below the maximum T_J , power-temperature derating must be observed for both steady state and pulse power conditions.

FIGURE 2 – DC CURRENT GAIN

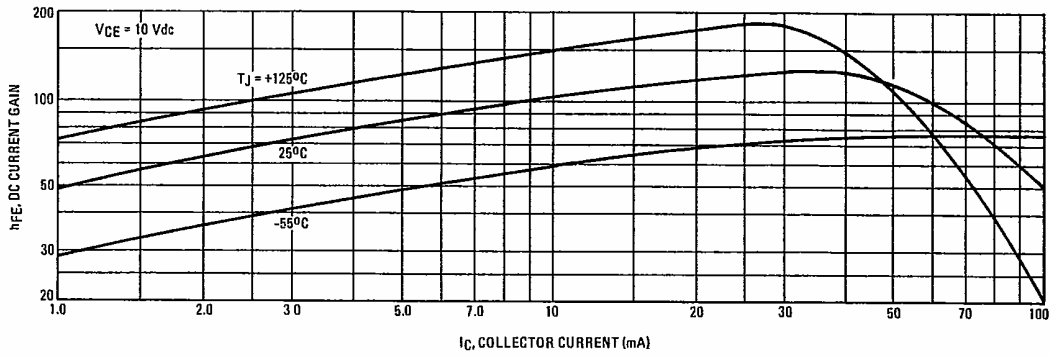


FIGURE 3 – CAPACITANCES

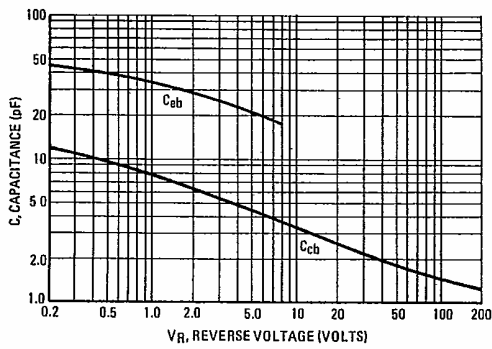


FIGURE 4 – CURRENT-GAIN-BANDWIDTH PRODUCT

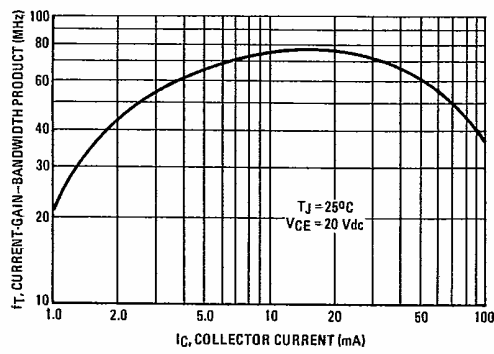


FIGURE 5 – "ON" VOLTAGES

