

# MPS-U55 (SILICON) MPS-U56

## PNP SILICON ANNULAR AMPLIFIER TRANSISTORS

... designed for general-purpose, high-voltage amplifier and driver applications.

- High Collector-Emitter Breakdown Voltage –  
 $V_{CE0} = 60 \text{ Vdc (Min) @ } I_C = 1.0 \text{ mAdc - MPS-U55}$   
 $80 \text{ Vdc (Min) @ } I_C = 1.0 \text{ mAdc - MPS-U56}$
- High Power Dissipation –  $P_D = 10 \text{ W @ } T_C = 25^\circ\text{C}$
- Complements to NPN MPS-U05 and MPS-U06

## PNP SILICON AMPLIFIER TRANSISTORS

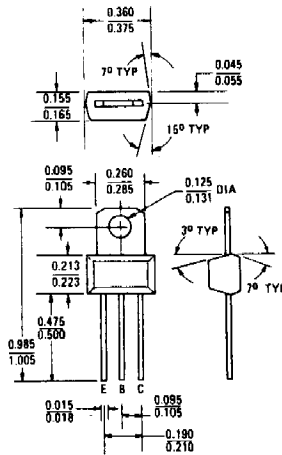


### MAXIMUM RATINGS

Rating	Symbol	MPS-U55	MPS-U56	Unit
Collector-Emitter Voltage	$V_{CE0}$	60	80	Vdc
Collector-Base Voltage	$V_{CB}$	60	80	Vdc
Emitter-Base Voltage	$V_{EB}$	4.0		Vdc
Collector Current – Continuous	$I_C$	2.0		Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.0	8.0	Watt mW/ $^\circ\text{C}$
Total Device 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	$\theta_{JC}$	12.5	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$\theta_{JA}$	125	$^\circ\text{C/W}$



Collector Connected

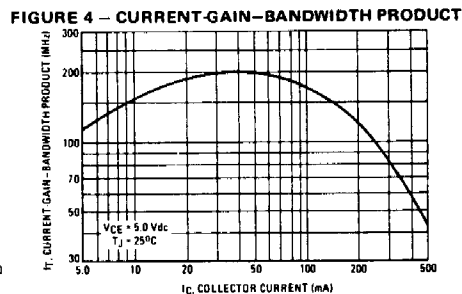
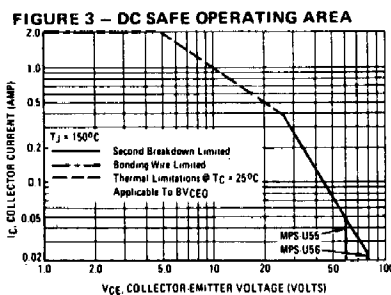
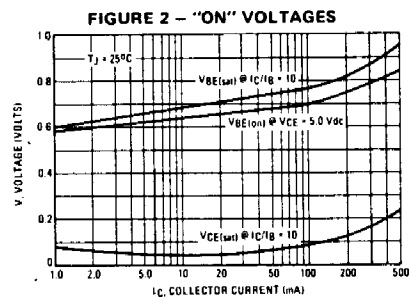
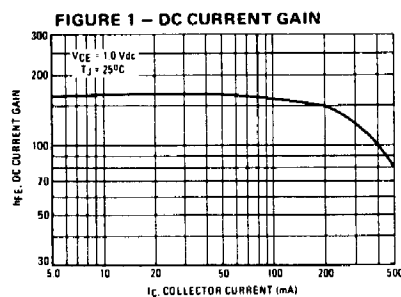


MPS-U55, MPS-U56 (continued)

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Breakdown Voltage ( $I_C = 1.0 \text{ mAdc}, I_B = 0$ )	$BV_{CEO}$	60 80	— —	— —	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 100 \mu\text{Adc}, I_C = 0$ )	$BV_{EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ( $V_{CB} = 40 \text{ Vdc}, I_E = 0$ ) ( $V_{CB} = 60 \text{ Vdc}, I_E = 0$ )	$I_{CBO}$	— —	— —	100 100	nAdc
<b>ON CHARACTERISTICS</b>					
DC Current Gain (1) ( $I_C = 50 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc}$ ) ( $I_C = 250 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc}$ ) ( $I_C = 500 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc}$ )	$h_{FE}$	80 50 —	160 130 80	— — —	—
Collector-Emitter Saturation Voltage(1) ( $I_C = 250 \text{ mAdc}, I_B = 10 \text{ mAdc}$ ) ( $I_C = 250 \text{ mAdc}, I_B = 25 \text{ mAdc}$ )	$V_{CE(sat)}$	— —	0.22 0.15	0.5 —	Vdc
Base-Emitter On Voltage (1) ( $I_C = 250 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}$ )	$V_{BE(on)}$	—	0.78	1.2	Vdc
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
Current-Gain-Bandwidth Product ( $I_C = 200 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}, f = 100 \text{ MHz}$ )	$f_T$	50	100	—	MHz
Output Capacitance ( $V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 100 \text{ kHz}$ )	$C_{ob}$	—	10	15	pF

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



There are two limitations on the power handling ability of a transistor: junction temperature and secondary breakdown. Safe operating area curves indicate  $I_C - V_{CE}$  limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 3 is based on  $T_{J(pk)} = 150^\circ\text{C}$ ;  $T_C$  is variable depending on conditions. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by secondary breakdown.

