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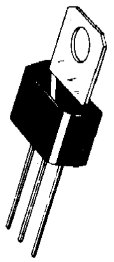
MPS-U55 (SILICON)
MPS-U56

PNP SILICON ANNULAR AMPLIFIER TRANSISTORS

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

- High Collector-Emitter Breakdown Voltage –
  BV_{CEO} = 60 Vdc (Min) @ I_C = 1.0 mAdc – MPS-U55
  80 Vdc (Min) @ I_C = 1.0 mAdc – MPS-U56
- High Power Dissipation – P_D = 10 W @ T_C = 25°C
- Complements to NPN MPS-U05 and MPS-U06

PNP SILICON AMPLIFIER TRANSISTORS

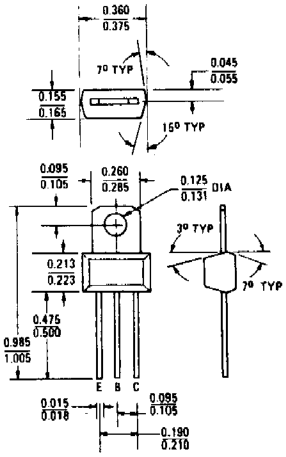


MAXIMUM RATINGS

Rating	Symbol	MPS-U55	MPS-U56	Unit
Collector-Emitter Voltage	V_{CEO}	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°C Derate above 25°C	P_D	1.0 8.0		Watt mW/°C
Total Device Dissipation @ T_C = 25°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	θ_{JC}	12.5	°C/W
Thermal Resistance, Junction to Ambient	θ_{JA}	125	°C/W



Collector Connected

Quality Semi-Conductors

MPS-U55, MPS-U56 (continued)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0)	MPS-U55 MPS-U56	BV_{CEO}	60 80	– –	– –	Vdc
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)		BV_{EBO}	4.0	–	–	Vdc
Collector Cutoff Current (V_{CB} = 40 Vdc, I_E = 0) (V_{CB} = 60 Vdc, I_E = 0)	MPS-U55 MPS-U56	I_{CBO}	– –	– –	100 100	nAdc
ON CHARACTERISTICS						
DC Current Gain (1) (I_C = 50 mAdc, V_{CE} = 1.0 Vdc) (I_C = 250 mAdc, V_{CE} = 1.0 Vdc) (I_C = 500 mAdc, V_{CE} = 1.0 Vdc)		h_{FE}	80 50 –	160 130 80	– – –	–
Collector-Emitter Saturation Voltage(1) (I_C = 250 mAdc, I_B = 10 mAdc) (I_C = 250 mAdc, I_B = 25 mAdc)		$V_{CE(sat)}$	– –	0.22 0.15	0.5 –	Vdc
Base-Emitter On Voltage (1) (I_C = 250 mAdc, V_{CE} = 5.0 Vdc)		$V_{BE(on)}$	–	0.78	1.2	Vdc
SMALL-SIGNAL CHARACTERISTICS						
Current-Gain—Bandwidth Product (I_C = 200 mAdc, V_{CE} = 5.0 Vdc, f = 100 MHz)		f_T	50	100	–	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)		C_{ob}	–	10	15	pF

(1)Pulse Test: Pulse Width ≤300 μs, Duty Cycle ≤2.0%.

FIGURE 1 – DC CURRENT GAIN

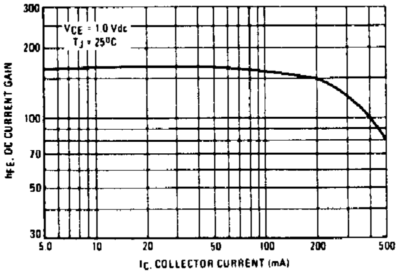


FIGURE 2 – "ON" VOLTAGES

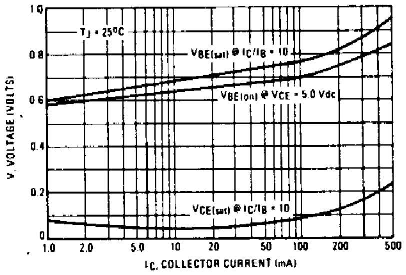


FIGURE 3 – DC SAFE OPERATING AREA

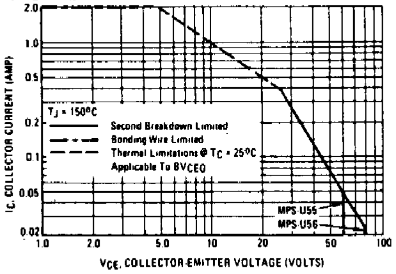
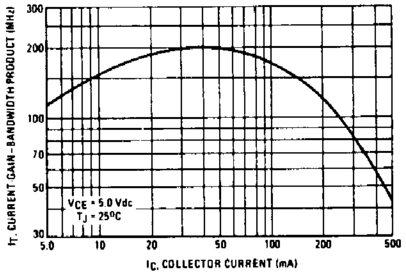


FIGURE 4 – CURRENT-GAIN–BANDWIDTH PRODUCT



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°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