



PNP Transistor Bare Die, MPSA56

Rev 1.0
02/09/17

General purpose high voltage amplifier in bare die form
Complement to NPN MPSA06

Features:

- 80 Volt V_{CE0}
- Low $V_{CE(sat)}$
- Characterized at temperature extremes
- High Reliability Gold Back Metal
- High Reliability tested grades for Military + Space

Ordering Information:

The following part suffixes apply:

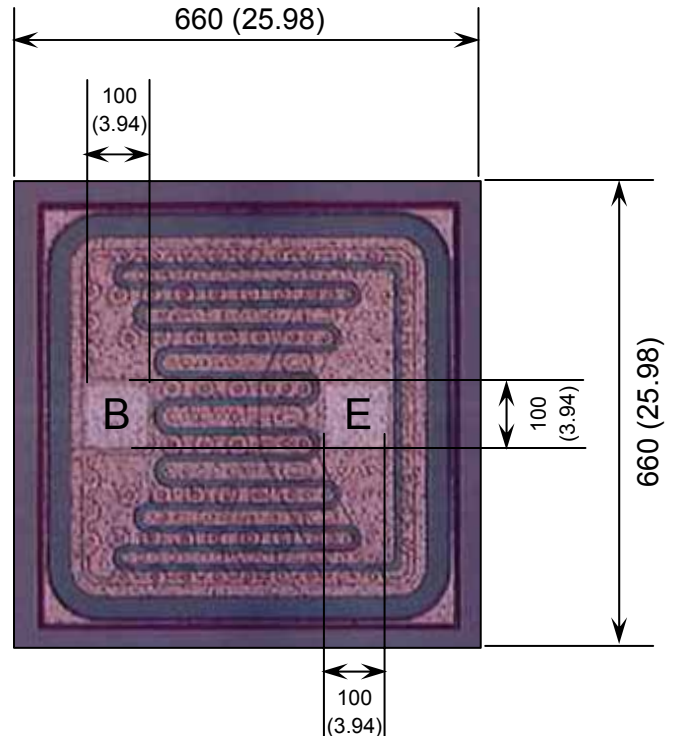
- No suffix - MIL-STD-750 /2072 Visual Inspection
- "H" - MIL-STD-750 /2072 Visual Inspection
+ MIL-STD-38534 Class H LAT
- "K" - MIL-STD-750 /2072 Visual Inspection
+ MIL-STD-38534 Class K LAT

LAT = Lot Acceptance Test.

For further information on LAT process flows see below.

www.siliconsupplies.com/quality/bare-die-lot-qualification

Die Dimensions in μm (mils)



E = EMITTER B = BASE

DIE BACK = COLLECTOR

Supply Formats:

- Default – Die in Waffle Pack (400 per tray capacity)
- Sawn Wafer on Tape – Specific request
- Unsawn Wafer – Specific request
- With additional electrical selection – Specific request
- Sawn as pairs or adjacent pair pick – Specific request

Mechanical Specification

| | | |
|------------------------------------|---|-----------------------|
| Die Size (Excluding Saw Street) | 660 x 660 25.98 x 25.98 | μm mils |
| Base & Emitter Pad Size | 100 x 100 3.94 x 3.94 | μm mils |
| Die Thickness | 230 (± 20) 9.06 (± 0.79) | μm mils |
| Top Metal Composition | Al - 2.6 μm | |
| Back Metal Composition | AuAs - 0.9 μm | |





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Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise stated

| PARAMETER | SYMBOL | VALUE | UNIT |
|---------------------------|-----------|------------|------------------|
| Collector-Base Voltage | V_{CBO} | -80 | V |
| Collector-Emitter Voltage | V_{CEO} | -80 | V |
| Emitter-Base Voltage | V_{EBO} | -4 | V |
| Collector Current | I_C | -500 | mA |
| Junction Temperature | T_J | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -55 to 150 | $^\circ\text{C}$ |

Electrical Characteristics $T_A = 25^\circ\text{C}$ unless otherwise stated

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---------------|---|-----|-----|-------|------|
| OFF CHARACTERISTICS | | | | | | |
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C = -100\mu\text{A}$ | -80 | - | - | V |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = -1\text{mA}$ | -80 | - | - | V |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E = -100\mu\text{A}$ | -5 | - | - | V |
| Collector Cut-off Current | I_{CBO} | $V_{CB} = -80\text{V}$ | - | - | -100 | nA |
| Emitter Cut-off Current | I_{CEO} | $V_{EB} = -60\text{V}$ | - | - | -100 | nA |
| ON CHARACTERISTICS | | | | | | |
| Forward-Current Transfer Ratio | h_{FE} | $V_{CE} = -1\text{V}, I_C = -10\text{mA}$ | 100 | - | - | - |
| | | $V_{CE} = -1\text{V}, I_C = -100\text{mA}$ | 100 | - | - | - |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = -100\text{mA}, I_B = -10\text{mA}$ | - | - | -0.25 | V |
| Base Saturation Voltage | $V_{BE(sat)}$ | $I_C = -100\text{mA}, V_{CE} = -1\text{V}$ | - | - | -1.2 | V |
| SMALL SIGNAL CHARACTERISTICS¹ | | | | | | |
| Transition Frequency | f_T | $V_{CE} = -1\text{V}, I_C = -100\text{mA}, f = 100\text{MHz}$ | 50 | 70 | - | MHz |
| Output Capacitance | C_{obo} | $V_{CB} = -20\text{V}, I_E = 0, f = 1\text{MHz}$ | - | 3.5 | - | pF |

Note 1: Not production testing in die form. Characterized by chip design and tested in package LAT.

Typical Electrical Characteristics

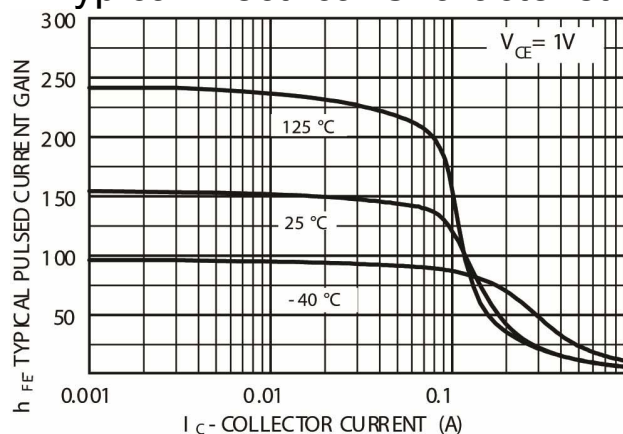


Fig 1 - Typical Pulsed Current Gain versus Collector Current

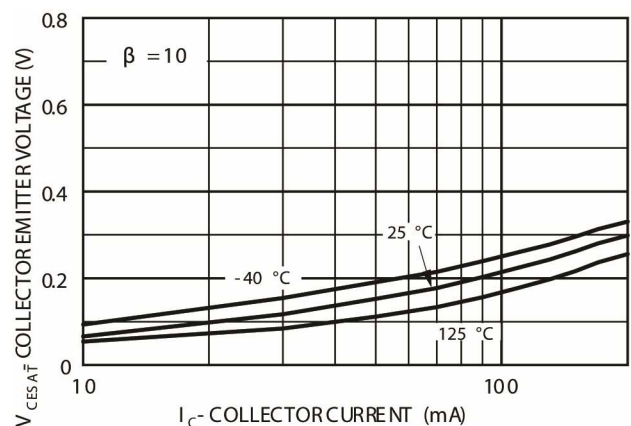


Fig 2 - Collector-Emitter Saturation Voltage versus Collector Current





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Typical Electrical Characteristics (Continued)

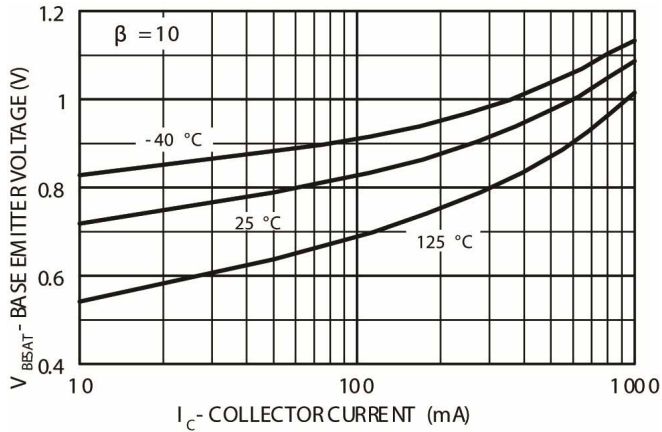


Fig 3 - Base-Emitter Saturation Voltage versus Collector Current

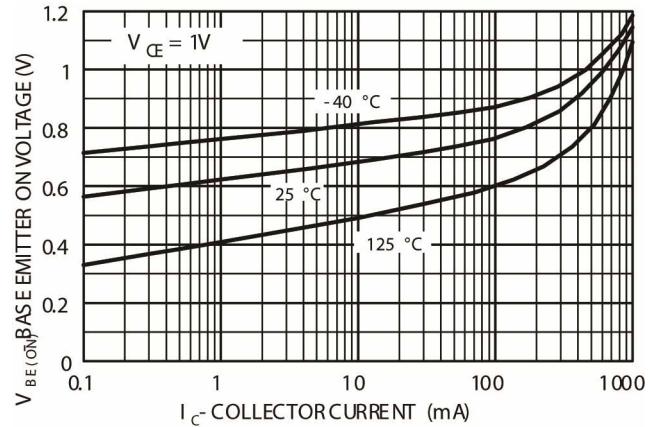


Fig 4 - Base-Emitter ON Voltage versus Collector Current

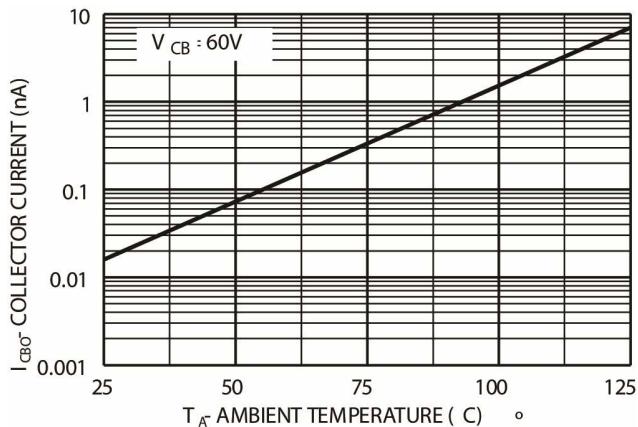


Fig 5 - Collector-Cut-off Current versus Ambient Temperature

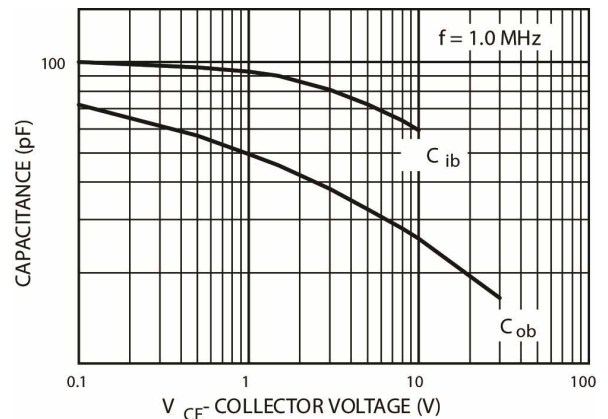


Fig 6 - Input and Output Capacitance versus Reverse Voltage

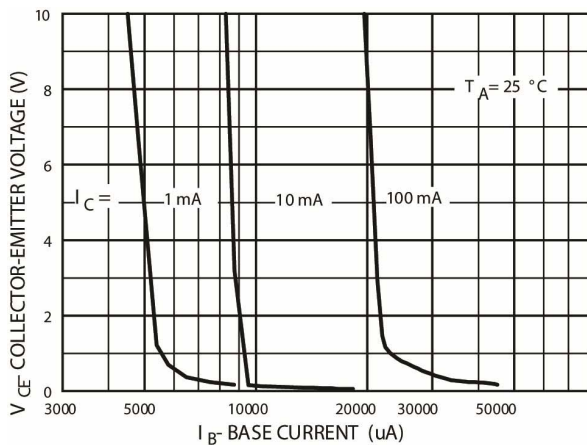


Fig 7 - Collector Saturation region

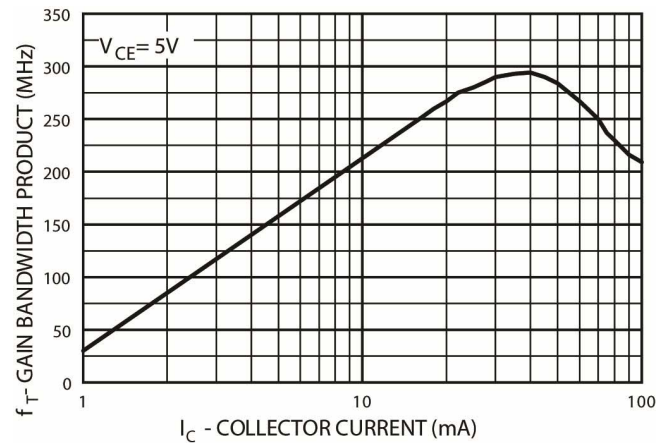


Fig 8 - Gain Bandwidth Product versus Collector Current





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