



# PNP Transistor Bare Die, MPSA56

Rev 1.1  
27/03/21

**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:

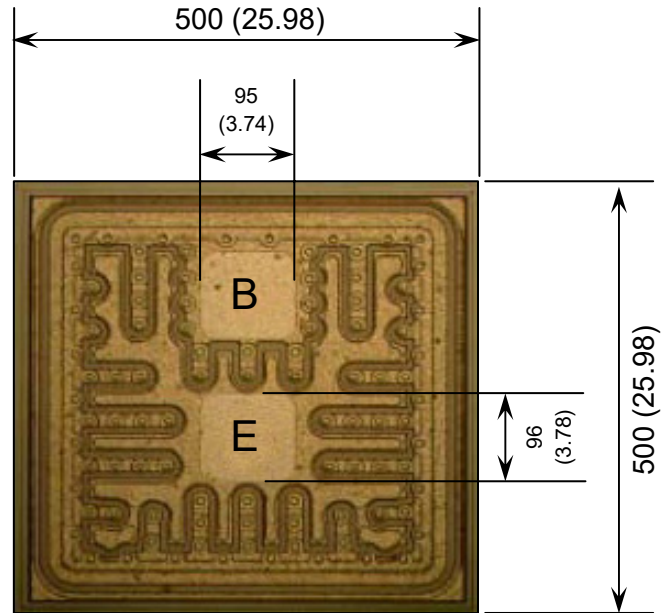
- No suffix - MIL-STD-750 /2072 Visual Inspection
- "H" - MIL-STD-750 /2072 Visual Inspection  
+ MIL-STD-38534 Class H LAT
- "K" - MIL-STD-750 /2072 Visual Inspection  
+ MIL-STD-38534 Class K LAT

LAT = Lot Acceptance Test.

For further information on LAT process flows see below.

[www.siliconsupplies.com/quality/bare-die-lot-qualification](http://www.siliconsupplies.com/quality/bare-die-lot-qualification)

## Die Dimensions in $\mu\text{m}$ (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)	500 x 500 19.69 x 19.69	$\mu\text{m}$ mils
Base & Emitter Pad Size	95 x 96 3.74 x 3.78	$\mu\text{m}$ mils
Die Thickness	180 ( $\pm 20$ ) 7.09 ( $\pm 0.79$ )	$\mu\text{m}$ mils
Top Metal Composition	Al - 2.6 $\mu\text{m}$	
Back Metal Composition	AuAs - 0.9 $\mu\text{m}$	





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

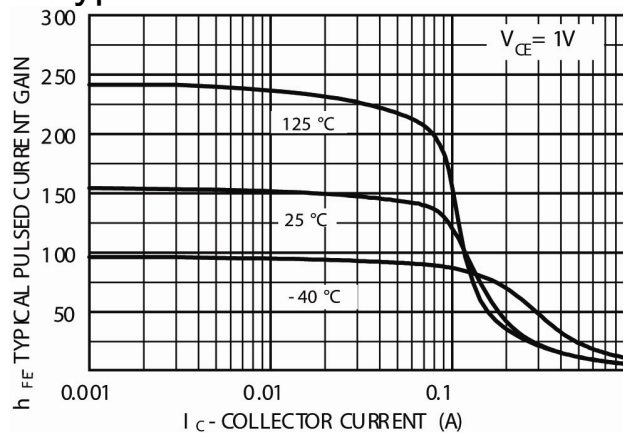
PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	$V_{CBO}$	-80	V
Collector-Emitter Voltage	$V_{CEO}$	-80	V
Emitter-Base Voltage	$V_{EBO}$	-4	V
Collector Current	$I_C$	-500	mA
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to 150	$^\circ\text{C}$

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

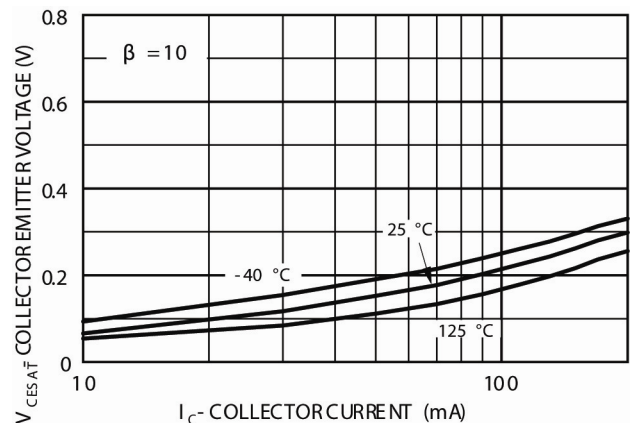
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = -100\mu\text{A}$	-80	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -1\text{mA}$	-80	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = -100\mu\text{A}$	-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
<b>ON CHARACTERISTICS</b>						
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
<b>SMALL SIGNAL CHARACTERISTICS<sup>1</sup></b>						
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

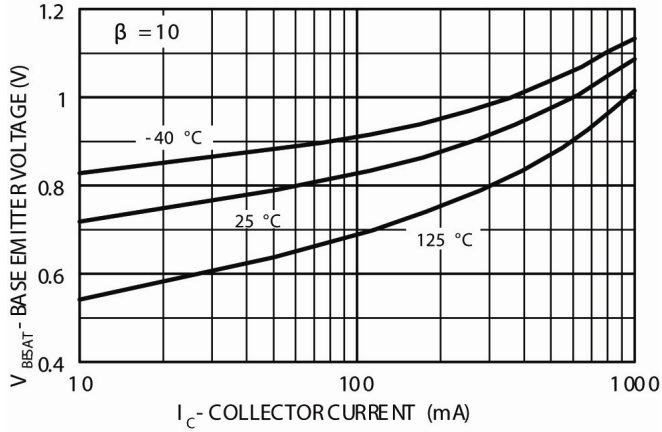




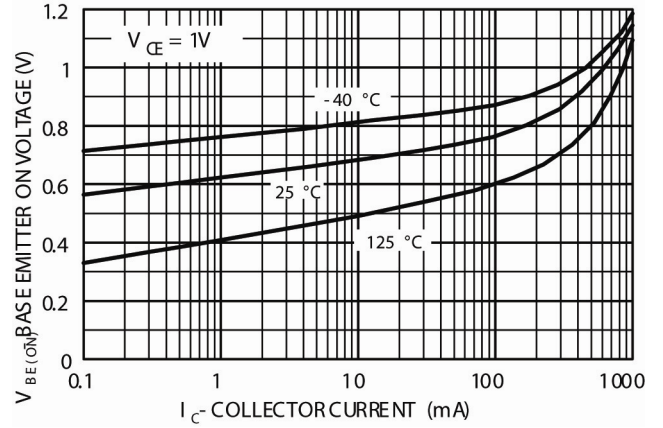
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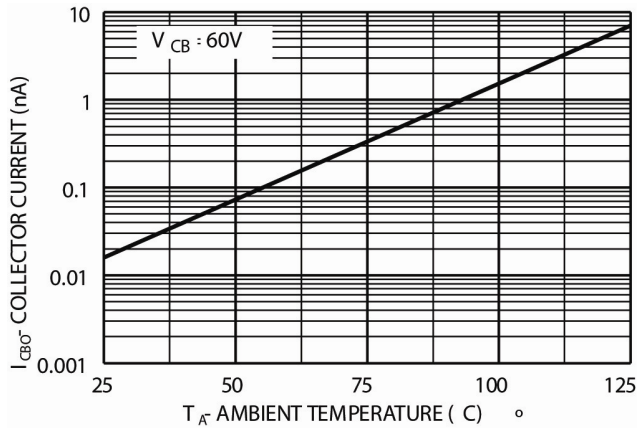
## Typical Electrical Characteristics (Continued)



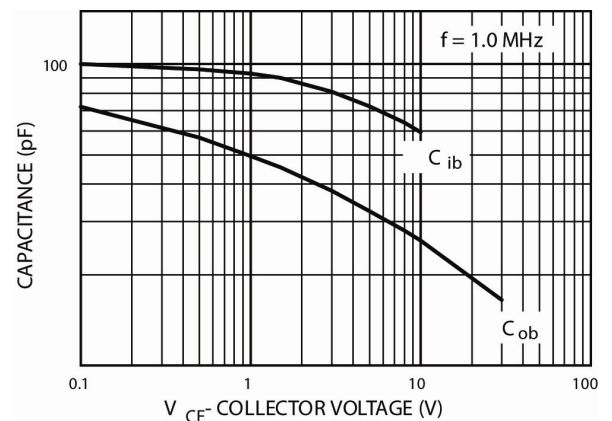
**Fig 3 - Base-Emitter Saturation Voltage versus Collector Current**



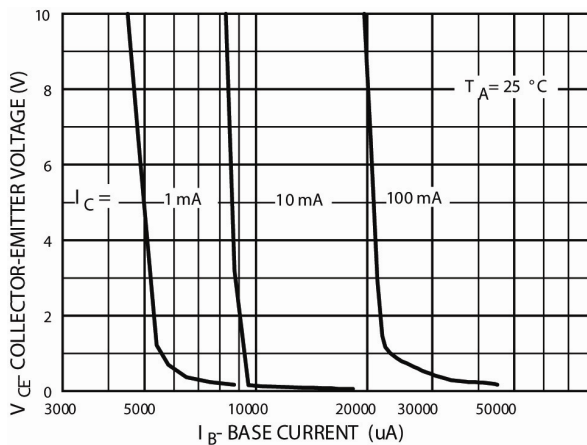
**Fig 4 - Base-Emitter ON Voltage versus Collector Current**



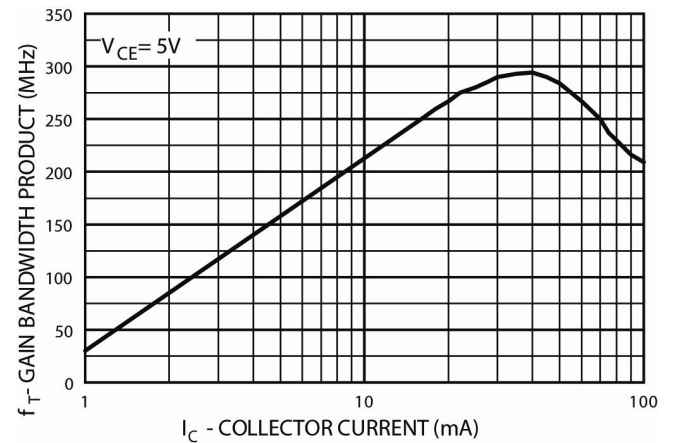
**Fig 5 - Collector-Cut-off Current versus Ambient Temperature**



**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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