



NPN Transistor Bare Die, MPSA06

Rev 1.0

02/09/17

General purpose medium power amplifier or saturated switch in bare die form

Complement to PNP MPSA56

Features:

- Minimum gain of 100 @ 100mA
- 80 Volt V_{CE0}
- Characterized at temperature extremes
- High Reliability Gold Back Metal
- High Reliability tested grades for Military + Space

Ordering Information:

The following part suffixes apply:

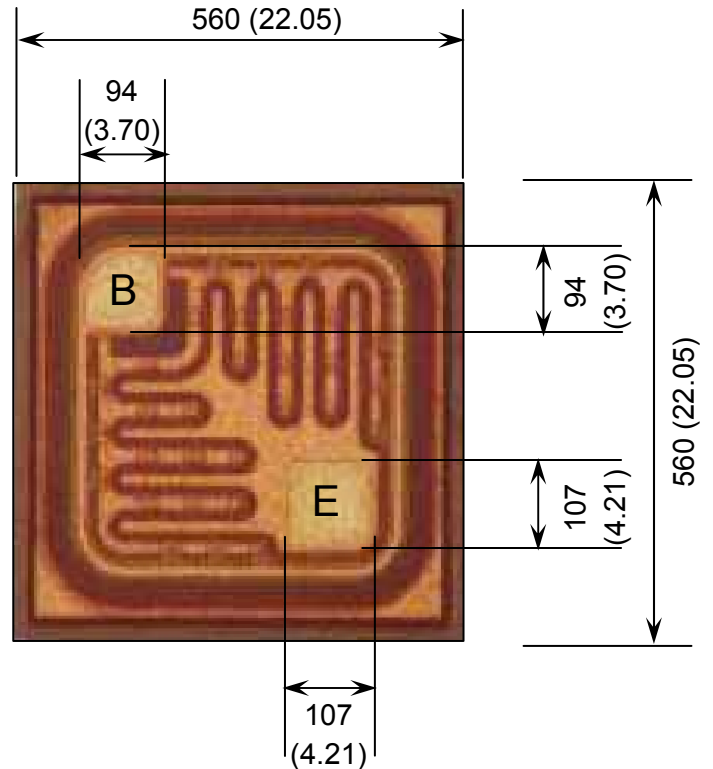
- No suffix - MIL-STD-750 /2072 Visual Inspection
- "H" - MIL-STD-750 /2072 Visual Inspection + MIL-PRF-38534 Class H LAT
- "K" - MIL-STD-750 /2072 Visual Inspection + MIL-PRF-38534 Class K LAT

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)	560 x 560 22.05 x 22.05	μm mils
Base Pad Size	94 x 94 3.70 x 3.70	μm mils
Emitter Pad Size	107 x 107 4.21 x 4.21	μm mils
Die Thickness	230 (± 20) 9.06 (± 0.79)	μm mils
Top Metal Composition	Al - 1.3 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	$V_{(BR)EBO}$	$I_E = 100\mu\text{A}$	4	-	-	V
Collector Cut-off Current	I_{CEO}	$V_{CE} = 60\text{V}$	-	-	100	nA
		$V_{CB} = 80\text{V}$	-	-	100	nA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 5\text{V}$	-	-	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	-	330	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 100\text{mA}, I_B = 10\text{mA}$	-	-	0.25	V
Base-Emitter On Voltage	$V_{BE(on)}$	$I_C = 100\text{mA}, V_{CE} = 1\text{V}$	-	-	1.2	V
SMALL SIGNAL CHARACTERISTICS¹						
Transition Frequency	f_T	$V_{CE} = 2\text{V}, I_E = -10\text{mA}$	100	-	-	MHz
Output Capacitance	C_{obo}	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$	-	4.5	-	pF

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





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Typical Electrical Characteristics

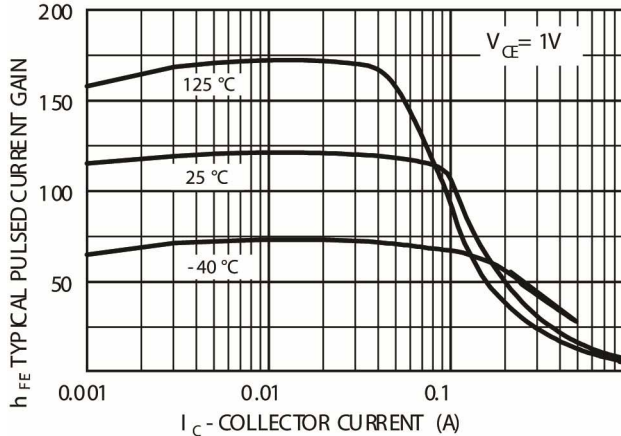


Fig 1 - Typical Pulsed Current Gain versus Collector Current

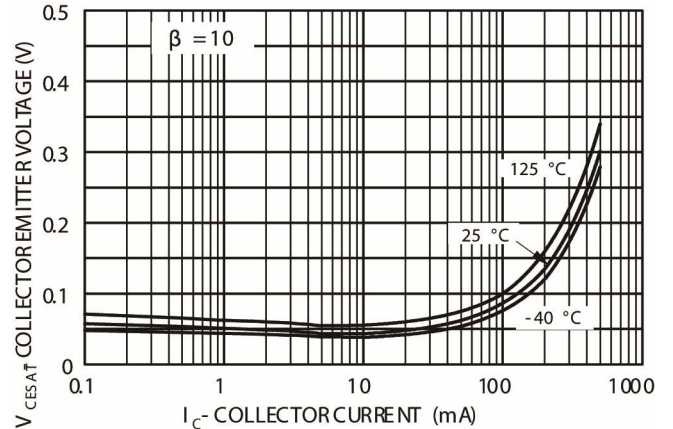


Fig 2 - Collector-Emitter Saturation Voltage versus Collector Current

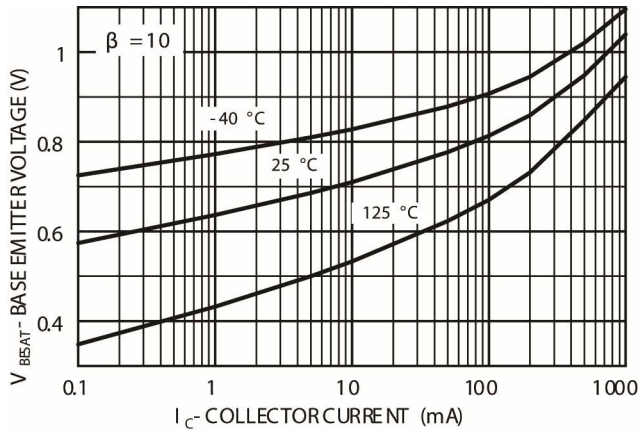


Fig 3 - Base-Emitter Saturation Voltage versus Collector Current

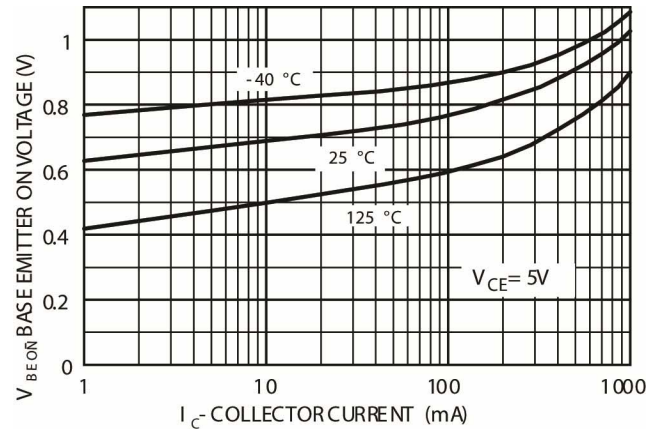


Fig 4 - Base-Emitter ON Voltage versus Collector Current

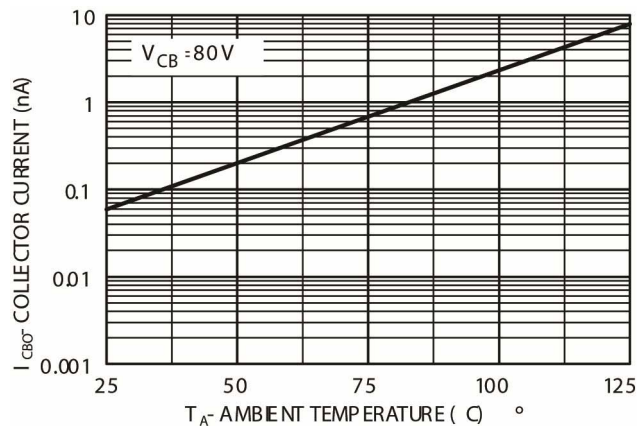


Fig 5 - Collector-Cut-off Current versus Ambient Temperature

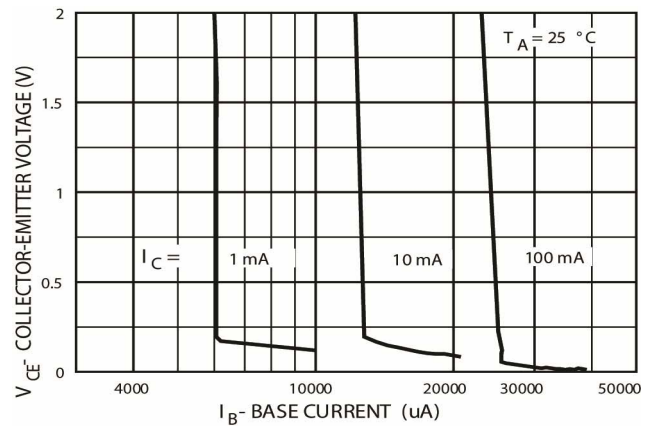


Fig 6 - Collector Saturation Region





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Typical Electrical Characteristics (Continued)

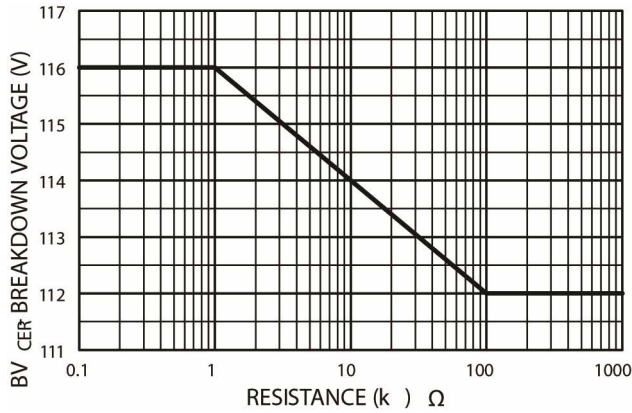


Fig 7 – Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base

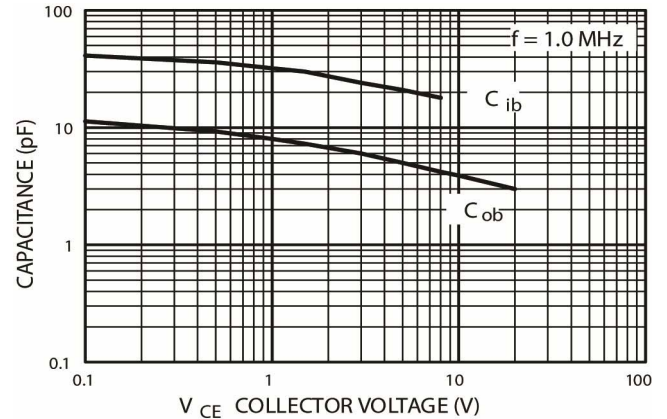


Fig 8 - Noise Figure versus Source Resistance

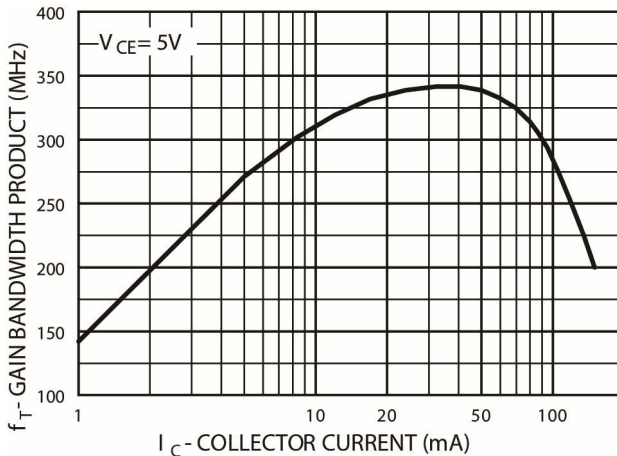


Fig 9 – Gain Bandwidth Product versus Collector Current

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