PNP Transistor Bare Die, MPSA55

Rev 1.1
27/03/21

General purpose high voltage amplifier in bare die form
Complement to NPN MPSA05

Features:

- 60 Volt V_{CEO}
- 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:

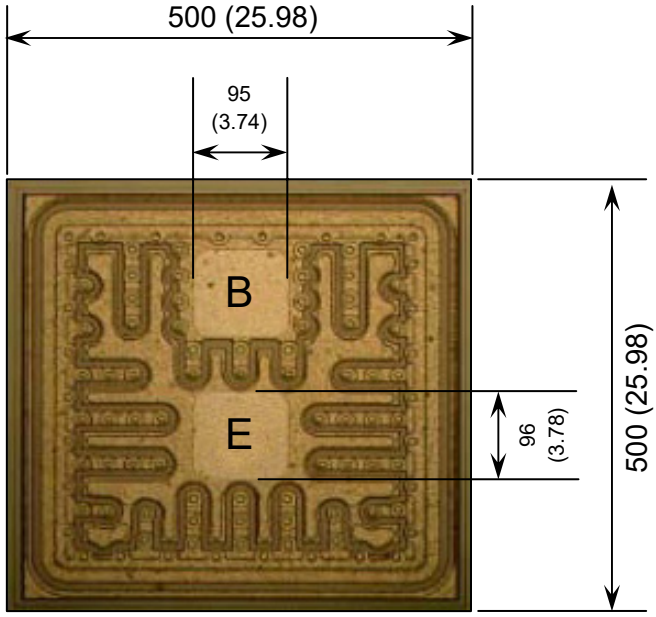
- No suffix - MIL-STD-750 /2072 Visual Inspection
- "**H**" - MIL-STD-750 /2072 Visual Inspection
  + MIL-STD-38534 Class H LAT
- "**K**" - MIL-STD-750 /2072 Visual Inspection
  + MIL-STD-38534 Class K LAT

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)	500 x 500 19.69 x 19.69	µm mils
Base & Emitter Pad Size	95 x 96 3.74 x 3.78	µm mils
Die Thickness	180 (±20) 7.09 (±0.79)	µm mils
Top Metal Composition	Al - 2.6µm	
Back Metal Composition	AuAs - 0.9µm	

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Absolute Maximum Ratings T_A = 25°C unless otherwise stated

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CBO}	-60	V
Collector-Emitter Voltage	V_{CEO}	-60	V
Emitter-Base Voltage	V_{EBO}	-4	V
Collector Current	I_C	-500	mA
Junction Temperature	T_J	150	°C
Storage Temperature	T_{stg}	-55 to 150	°C

Electrical Characteristics T_A = 25°C unless otherwise stated

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

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

Typical Electrical Characteristics

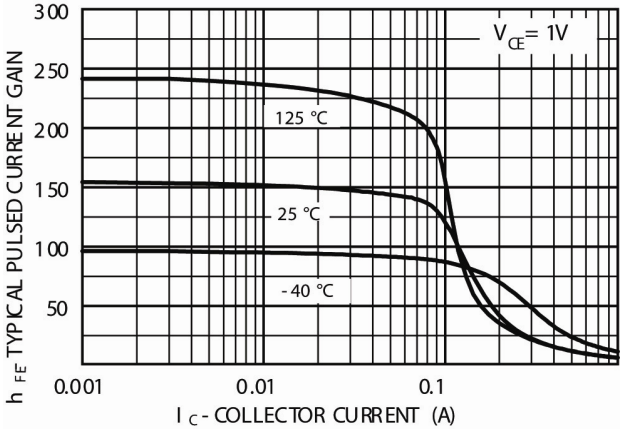

Fig 1 - Typical Pulsed Current Gain versus Collector Current

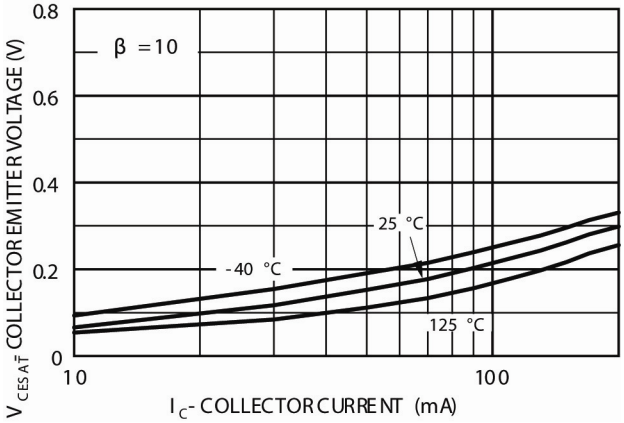

Fig 2 - Collector-Emitter Saturation Voltage versus Collector Current

Typical Electrical Characteristics (Continued)

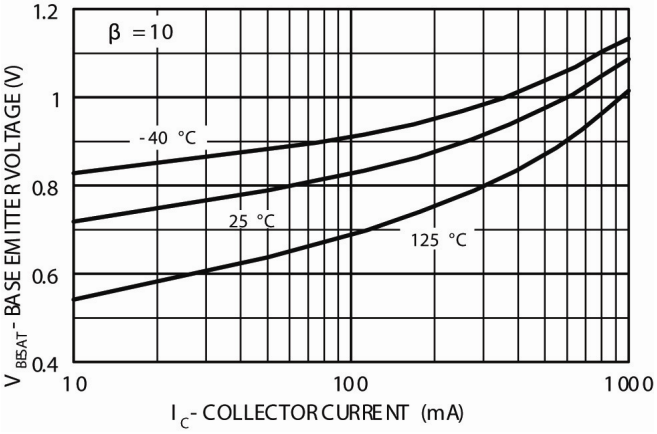

Fig 3 - Base-Emitter Saturation Voltage versus Collector Current

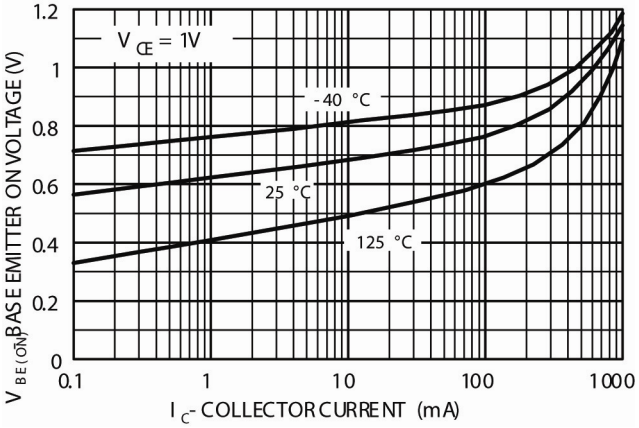

Fig 4 - Base-Emitter ON Voltage versus Collector Current

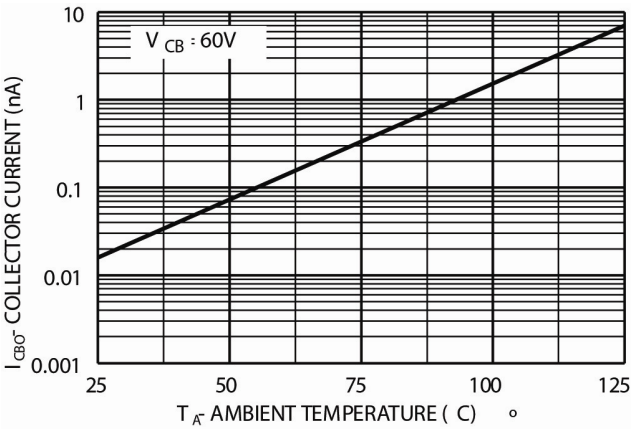

Fig 5 - Collector-Cut-off Current versus Ambient Temperature

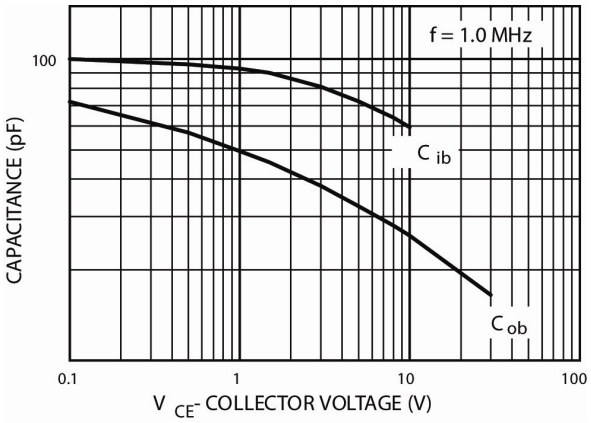

Fig 6 – Input and Output Capacitance versus Reverse Voltage

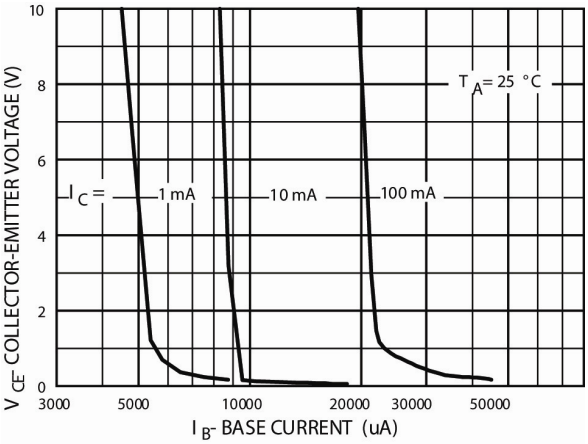

Fig 7 – Collector Saturation region

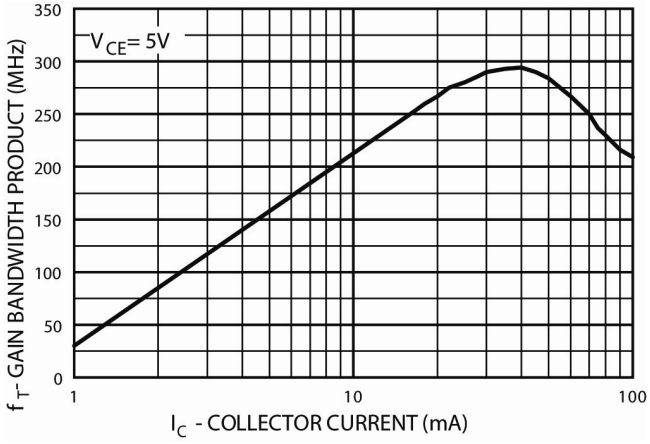

Fig 8 – Gain Bandwidth Product versus Collector Current