



NPN Transistor Bare Die, 2N956

Rev 1.0
04/09/17

General purpose medium power amplifier or switch in bare die form

Features:

- Collector current up to 500mA
- Low Leakage Current
- Low Saturation Voltage
- 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.

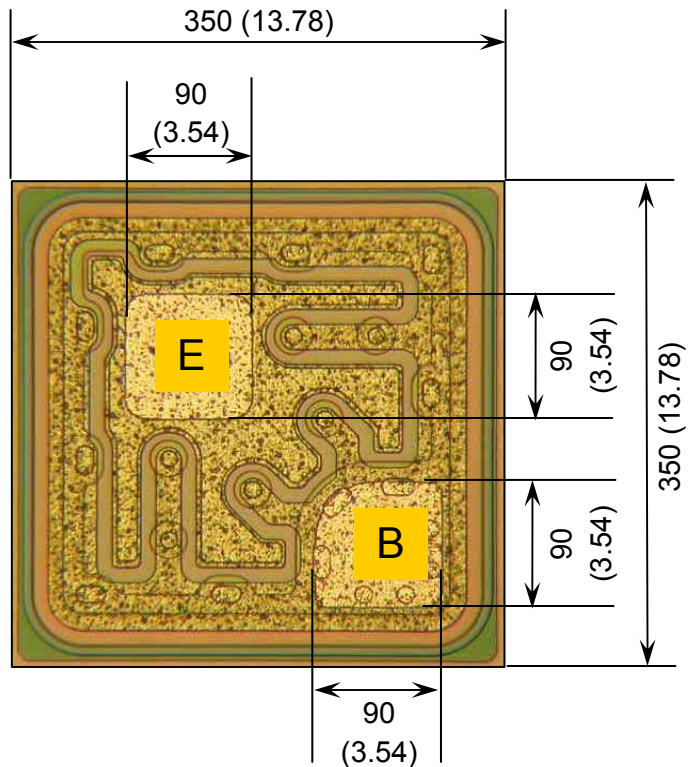
For further information on LAT process flows see below.

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

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

Die Dimensions in μm (mils)



E = EMITTER B = BASE

DIE BACK = COLLECTOR

Mechanical Specification

Die Size (Excluding Saw Street)	350 x 350 13.78 x 13.78	μm mils
Base Pad Size Emitter Pad Size	90 x 90 3.54 x 3.54	μm mils
Die Thickness	180 (± 20) 7.09 (± 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}	75	V
Collector-Emitter Voltage	V_{CER}	50	V
Emitter-Base Voltage	V_{EBO}	7	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	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}, I_E = 0$	75	-	-	V
Collector-Emitter Breakdown Voltage	$V_{CER(sus)}$	$I_C = 100\text{mA}, \text{pulsed}; R_{BE} \leq 10\Omega$	50	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 100\mu\text{A}, I_C = 0$	7	-	-	V
Collector Cut-off Current	I_{CBO}	$V_{CB} = 60\text{V}, I_E = 0$	-	-	10	nA
		$V_{CB} = 60\text{V}, I_E = 0, T_A = 150^\circ\text{C}$	-	-	10	μA
Emitter Cut-off Current	I_{EBO}	$V_{BE} = 5\text{V}, I_C = 0$	-	-	5	nA
ON CHARACTERISTICS						
Forward-Current Transfer Ratio	h_{FE}	$V_{CE} = 10\text{V}, I_C = 0.01\text{mA}$	20	-	-	-
		$V_{CE} = 10\text{V}, I_C = 0.1\text{mA}$	35	-	-	-
		$V_{CE} = 10\text{V}, I_C = 10\text{mA}$	75	-	-	-
		$V_{CE} = 10\text{V}, I_C = 10\text{mA}, T_A = -55^\circ\text{C}$	35	-	-	-
		$V_{CE} = 10\text{V}, I_C = 150\text{mA}$	100	-	300	-
		$V_{CE} = 10\text{V}, I_C = 500\text{mA}$	40	-	-	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$	-	-	1.5	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$	-	-	1.3	V
SMALL SIGNAL CHARACTERISTICS¹						
Transition Frequency	f_T	$V_{CE} = 10\text{V}, I_C = 50\text{mA}$	70	-	-	MHz
Output Capacitance	C_{obo}	$V_{CB} = 10\text{V}, I_E = 0, f = 100\text{KHz}$	-	-	25	pF
Input Capacitance	C_{ibo}	$V_{EB} = 0.5\text{V}, I_C = 0, f = 100\text{KHz}$	-	-	80	
Noise Figure	NF	$I_C = 300\mu\text{A}, V_{CE} = 10\text{V}, f = 1\text{kHz}$	-	-	8	dB
SWITCHING CHARACTERISTICS¹						
Turn-On Time + Turn-Off Time (See figure 1 of MIL-PRF19500/225)	$t_{on} + t_{off}$	-	-	-	30	ns

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





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