NPN Transistor Bare Die, 2N1893

Rev 1.0
21/10/24

General purpose medium power amplifier or switch in bare die form

Features:

- Collector current up to 500mA
- Low Leakage Current & Saturation Voltage
- Characterized at temperature extremes
- High Reliability Gold Back Metal
- High Reliability tested grades for Military + Space

Ordering Information:

The following part suffixes apply:

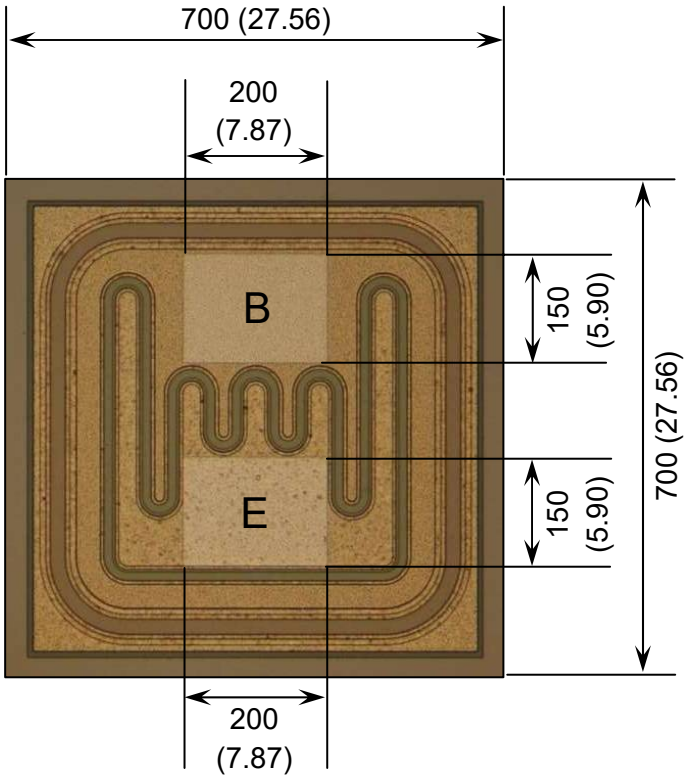
- No suffix - MIL-STD-750 /2072 Visual Inspection
- "**H**" - MIL-STD-750 /2072 Visual Inspection
  + MIL-STD-38534 Class H LAT
- "**K**" - MIL-STD-750 /2072 Visual Inspection
  + MIL-STD-38534 Class K LAT

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)	700 x 700 27.56 x 27.56	µm mils
Base & Emitter Pad Size	200 x 150 7.87 x 5.90	µm mils
Die Thickness	180 (±20) 7.09 (±0.79)	µm mils
Top Metal Composition	Al - 3µm	
Back Metal Composition	Au - 0.9µm	

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Absolute Maximum Ratings[1] T_A = 25°C unless otherwise stated

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CBO}	120	V
Collector-Emitter Voltage	V_{CER}	80	V
Collector-Emitter Voltage	V_{CEO}	80	V
Emitter-Base Voltage	V_{EBO}	7	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[2]	$V_{(BR)CBO}$	I_C = 100µA, I_E = 0	120	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CER}$	I_C = 10mA, R_{BE} = 10Ω	100	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 10mA, I_B = 0	80	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 100µA, I_C = 0	7	-	-	V
Collector Cut-off Current	I_{CBO}	V_{CB} = 90V, I_E = 0	-	-	0.01	µA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 5V, I_C = 0	-	-	0.01	µA
ON CHARACTERISTICS						
Forward-Current Transfer Ratio	h_{FE}	V_{CE} = 10V, I_C = 0.1mA	20	-	-	-
		V_{CE} = 10V, I_C = 10mA	35	-	-	-
		V_{CE} = 10V, I_C = 150mA	40	-	200	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 50mA, I_B = 5 mA	-	-	1.2	V
		I_C = 150mA, I_B = 15 mA	-	-	5	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 50mA, I_B = 5mA	-	-	0.9	V
		I_C = 150mA, I_B = 15mA	-	-	1.3	V
SMALL SIGNAL CHARACTERISTICS[3]						
Current Gain – Bandwidth Product	f_T	V_{CE} = 10V, I_C = 50mA, f = 20MHz	50	-	-	MHz
Output Capacitance	C_{obo}	V_{CB} = 10V, I_E = 0, f = 100kHz	-	-	15	pF
Input Capacitance	C_{ibo}	V_{EB} = 0.5V, I_C = 0, f = 100kHz	-	-	85	
Small-Signal Current Gain	h_{fe}	V_{CE} = 5V, I_C = 1mA, f = 1kHz	30	-	100	

1. These ratings are limiting values above which the serviceability of any semiconductor device may be impaired. **2.** Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤ 1% **3.** Not production testing in die form, characterized by chip design and package verification

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