



PNP Transistor Bare Die, 2N3799

Rev 1.0
08/01/19

General purpose medium power amplifier or switch in bare die form
Complement to NPN 2N2484

Features:

- High Collector Current
- Very low saturation voltage
- Well suited for low noise amplifier applications
- 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.

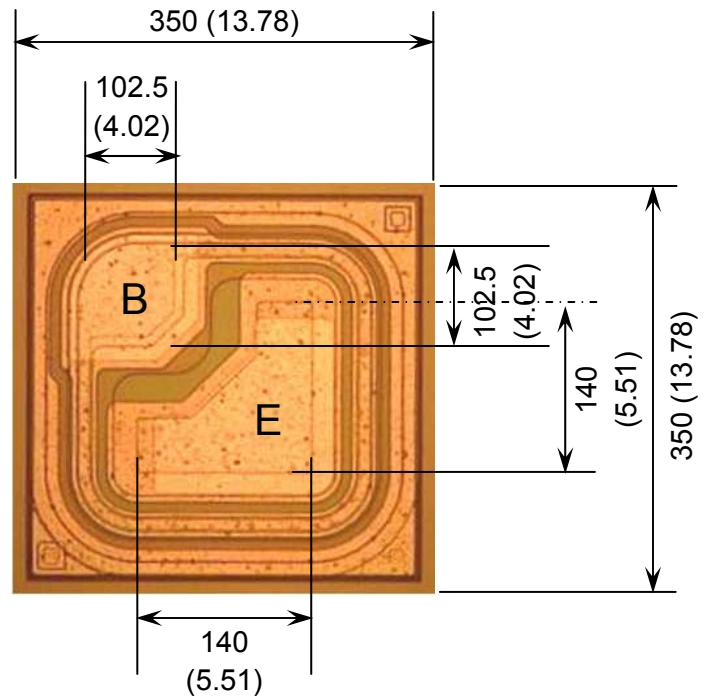
For further information on LAT process flows see below.

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

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

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	102.5 x 102.5 4.02 x 4.02	μm mils
Emitter Pad Size	96 x 96 5.51 x 5.51	μm mils
Die Thickness	230 (± 15) 9.06 (± 0.59)	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_{CB0}	-60	V
Collector-Emitter Voltage	V_{CEO}	-65	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current	I_C	-50	mA
Junction Temperature	T_J	200	$^\circ\text{C}$
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	$V_{(BR)CBO}$	$I_C = -10\mu\text{A}, I_E = 0$	-60	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -10\text{mA}, I_B = 0$	-60	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = -10\mu\text{A}, I_C = 0$	-5	-	-	V
Collector Cut-off Current	I_{CBO}	$V_{CB} = -50\text{V}, I_E = 0$	-	-	-0.01	μA
		$V_{CB} = -50\text{V}, I_E = 0, T_A = 150^\circ\text{C}$	-	-	-10	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = -4\text{V}, I_C = 0$	-	-	-20	nA
ON CHARACTERISTICS						
Forward-Current Transfer Ratio ¹	h_{FE}	$V_{CE} = -5\text{V}, I_C = -1\mu\text{A}$	75	-	-	-
		$V_{CE} = -5\text{V}, I_C = -10\mu\text{A}$	225	-	-	-
		$V_{CE} = -5\text{V}, I_C = -100\mu\text{A}$	300	-	-	-
		$V_{CE} = -5\text{V}, I_C = -100\mu\text{A}, T_A = -55^\circ\text{C}$	150	-	-	-
		$V_{CE} = -5\text{V}, I_C = -500\mu\text{A}$	300	-	900	-
		$V_{CE} = -5\text{V}, I_C = -1\text{mA}$	300	-	-	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -100\mu\text{A}, I_B = -10\mu\text{A}$	-	-	-0.2	V
		$I_C = -1\text{mA}, I_B = -100\mu\text{A}$	-	-	-0.25	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = -100\mu\text{A}, I_B = -10\mu\text{A}$	-	-	-0.7	V
		$I_C = -1\text{mA}, I_B = -100\mu\text{A}$	-	-	-0.8	V
Base-Emitter On Voltage	$V_{BE(on)}$	$I_C = -100\mu\text{A}, V_{CE} = 5\text{V}$	-	-	-0.7	V
SMALL SIGNAL CHARACTERISTICS²						
Transition Frequency ³	f_T	$V_{CE} = -5\text{V}, I_C = -500\mu\text{A}, f = 30\text{ MHz}$	30	-	-	MHz
		$V_{CE} = -5\text{V}, I_C = -1\text{mA}, f = 100\text{ MHz}$	-	80	-	MHz
Output Capacitance	C_{obo}	$V_{CB} = -5\text{V}, I_E = 0, f = 100\text{ kHz}$	-	-	5	pF
Input Capacitance	C_{ibo}	$V_{BE} = -0.5\text{V}, I_C = 0, f = 100\text{ kHz}$	-	-	15	pF
Input Impedance	h_{ie}	$V_{CE} = -10\text{V}, I_C = -1\text{mA}, f = 1\text{ kHz}$	10	-	40	k Ω
Voltage Feedback Ratio	h_{re}	$V_{CE} = -10\text{V}, I_C = -1\text{mA}, f = 1\text{ kHz}$	-	-	25	$\times 10^{-4}$
Small-Signal Current Gain	h_{fe}	$V_{CE} = -10\text{V}, I_C = -1\text{mA}, f = 1\text{ kHz}$	300	-	900	
Output Admittance	h_{oe}	$V_{CE} = -10\text{V}, I_C = -1\text{mA}, f = 1\text{ kHz}$	5	-	60	μmhos





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SMALL SIGNAL CHARACTERISTICS ¹ - CONTINUED						
Noise Figure	NF	$V_{CE} = -10\text{V}, I_C = -100\mu\text{A}, R_G = 3\text{k}\Omega,$ $f = 100\text{ Hz}, \text{BW} = 20\text{ Hz}$	-	2.5	4	dB
Spot Noise		$V_{CE} = -10\text{V}, I_C = -100\mu\text{A}, R_G = 3\text{k}\Omega,$ $f = 1\text{ kHz}, \text{BW} = 200\text{ Hz}$	-	0.8	1.5	dB
		$V_{CE} = -10\text{V}, I_C = -100\mu\text{A}, R_G = 3\text{k}\Omega,$ $f = 10\text{ kHz}, \text{BW} = 2\text{ kHz}$	-	0.8	1.5	dB
Broadband Noise-Bandwidth		$V_{CE} = -10\text{V}, I_C = -100\mu\text{A}, R_G = 3\text{k}\Omega$ 10 Hz to 15.7 kHz	-	1.5	2.5	dB

Note 1: Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2\%$

Note 2: Not production testing in die form. Characterized by chip design and tested in package LAT

Note 3: f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

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