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.

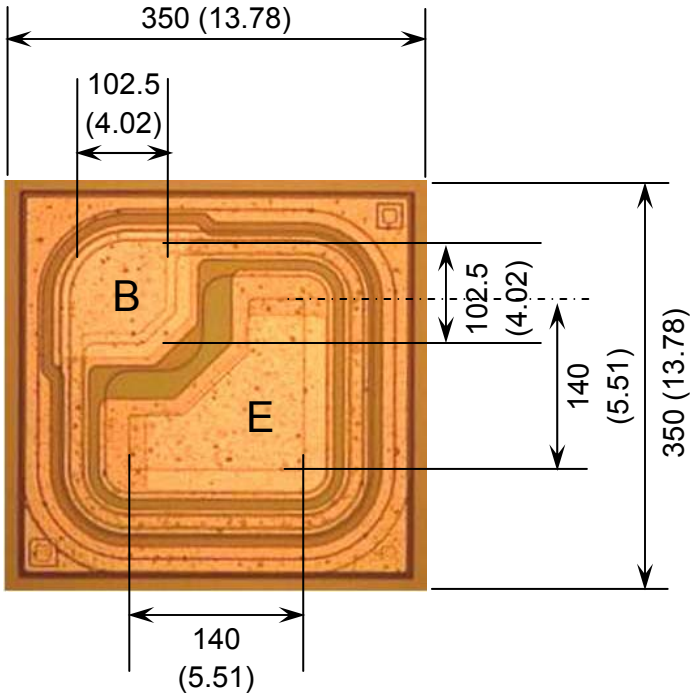
For further information on LAT process flows see below.

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	
Die Thickness	230 (±15) 9.06 (±0.59)	µm mils
Top Metal Composition	Al - 1.3µm	
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}	-65	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current	I_C	-50	mA
Junction Temperature	T_J	200	°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 = -10µA, I_E = 0	-60	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = -10mA, I_B = 0	-60	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = -10µA, I_C = 0	-5	-	-	V
Collector Cut-off Current	I_{CBO}	V_{CB} = -50V, I_E = 0	-	-	-0.01	µA
		V_{CB} = -50V, I_E = 0, T_A = 150°C	-	-	-10	µA
Emitter Cut-off Current	I_{EBO}	V_{EB} = -4V, I_C = 0	-	-	-20	nA
ON CHARACTERISTICS						
Forward-Current Transfer Ratio[1]	h_{FE}	V_{CE} = -5V, I_C = -1µA	75	-	-	-
		V_{CE} = -5V, I_C = -10µA	225	-	-	-
		V_{CE} = -5V, I_C = -100µA	300	-	-	-
		V_{CE} = -5V, I_C = -100µA, T_A = -55°C	150	-	-	-
		V_{CE} = -5V, I_C = -500µA	300	-	900	-
		V_{CE} = -5V, I_C = -1mA	300	-	-	-
		V_{CE} = -5V, I_C = -10mA	250	-	-	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = -100µA, I_B = -10µA	-	-	-0.2	V
		I_C = -1mA, I_B = -100µA	-	-	-0.25	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = -100µA, I_B = -10µA	-	-	-0.7	V
		I_C = -1mA, I_B = -100µA	-	-	-0.8	V
Base-Emitter On Voltage	$V_{BE(on)}$	I_C = -100µA, V_{CE} = 5V	-	-	-0.7	V
SMALL SIGNAL CHARACTERISTICS[2]						
Transition Frequency[3]	f_T	V_{CE} = -5V, I_C = -500µA, f = 30 MHz	30	-	-	MHz
		V_{CE} = -5V, I_C = -1mA, f = 100 MHz	-	80	-	MHz
Output Capacitance	C_{obo}	V_{CB} = -5V, I_E = 0, f = 100 kHz	-	-	5	pF
Input Capacitance	C_{ibo}	V_{BE} = -0.5V, I_C = 0, f = 100 kHz	-	-	15	pF
Input Impedance	h_{ie}	V_{CE}= -10V, I_C = -1mA, f = 1 kHz	10	-	40	kΩ
Voltage Feedback Ratio	h_{re}	V_{CE}= -10V, I_C = -1mA, f = 1 kHz	-	-	25	x 10^{-4}
Small-Signal Current Gain	h_{fe}	V_{CE}= -10V, I_C = -1mA, f = 1 kHz	300	-	900	
Output Admittance	h_{oe}	V_{CE}= -10V, I_C = -1mA, f = 1 kHz	5	-	60	µmhos

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SMALL SIGNAL CHARACTERISTICS[1] - CONTINUED						
Noise Figure	NF	V_{CE} = -10V, I_C = -100µA, R_G = 3kΩ, f = 100 Hz, BW = 20 Hz	-	2.5	4	dB
Spot Noise		V_{CE} = -10V, I_C = -100µA, R_G = 3kΩ, f = 1 kHz, BW = 200 Hz	-	0.8	1.5	dB
		V_{CE} = -10V, I_C = -100µA, R_G = 3kΩ, f = 10 kHz, BW = 2 kHz	-	0.8	1.5	dB
Broadband Noise-Bandwidth		V_{CE} = -10V, I_C = -100µA, R_G = 3kΩ 10 Hz to 15.7 kHz	-	1.5	2.5	dB

Note 1: Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤ 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.