PNP Transistor Bare Die - 2N4209A

Rev 1.1
08/03/19

Ultra-high speed Saturated Switch in bare die form
Complement NPN 2N2369A

Features:

- Higher 20V breakdown voltage versus 2N4209
- Very fast t_{on} + t_{off} switching time + low capacitance
- Collector current up to 200mA
- High Reliability Gold Back Metal
- High Reliability tested grades for Military + Space

Ordering Information:

The following part suffixes apply:

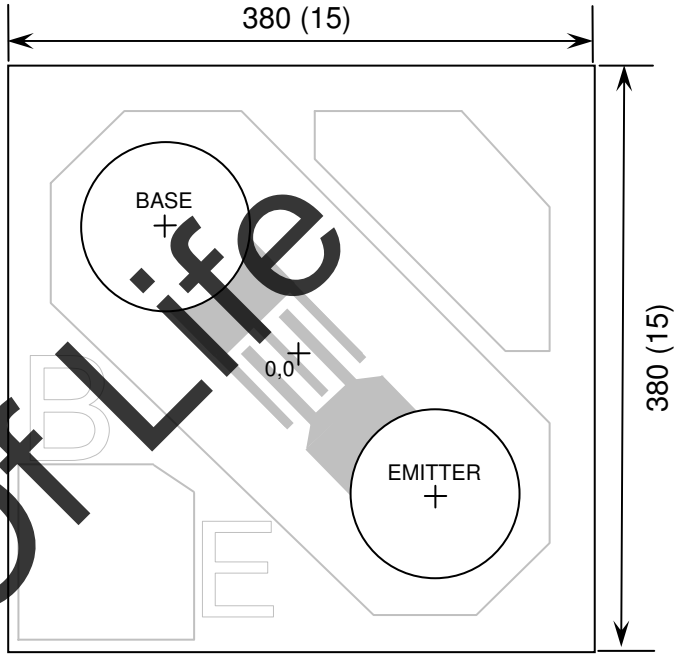
- No suffix - MIL-STD-750 /2072 Visual Inspection
- "**H**" - MIL-STD-750 /2072 Visual Inspection
  + MIL-PRF-38534 Class H LAT
- "**K**" - MIL-STD-750 /2072 Visual Inspection
  + MIL-PRF-38534 Class K LAT

LAT = Lot Acceptance Test.

For further information on LAT process flows see below.

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

Die Dimensions in µm (mils)



PAD	COORDINATES (µm)	
	X	Y
BASE	-70	70
EMITTER	70	-70
CHIP BACKSIDE IS 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 (Unsawn)	380 x 380 15 x 15	µm mils
Base Pad Size Emitter Pad Size	110 Ø 4.33 Ø	µm mils
Die Thickness	200 (±20) 7.87 (±0.79)	µm mils
Top Metal Composition	Al 1.3µm	
Back Metal Composition	Au 1.7µm	

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Absolute Maximum Ratings T_A = 25°C unless otherwise stated

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CBO}	-20	V
Collector-Emitter Voltage	V_{CEO}	-20	V
Emitter-Base Voltage	V_{EBO}	-4.5	V
Collector Current	I_C	200	mA
Junction & Storage Temperature	T_J, T_{stg}	-55 to 200	°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, I_E = 0	-20	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 3mA, I_B = 0	-20	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CES}$	I_C = 100µA, V_{BE} = 0	-20	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 100µA, I_C = 0	4.5	-	-	V
Collector Cut-off Current[1]	I_{CES}	V_{CE} = -8V, V_{BE} = 0	-	-	10	nA
		V_{CE} = -8V, V_{BE} = 0, T_A = 125°C	-	-	5	µA
ON CHARACTERISTICS						
Forward-Current Transfer Ratio[1]	h_{FE}	V_{CE} = -0.5V, I_C = 1mA	35	-	-	-
		V_{CE} = -0.3V, I_C = 10mA	50	-	120	-
		V_{CE} = -0.3V, I_C = 10mA, T_A = -55°C	20	-	-	-
		V_{CE} = -1V, I_C = 50mA	40			
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 1mA, I_B = 0.1mA		-	-0.15	V
Pulsed Collector-Emitter Saturation Voltage[1]		I_C = 10mA, I_B = 1mA	-	-	-0.18	V
		I_C = 50mA, I_B = 5mA	-	-	-0.6	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 1mA, I_B = 0.1mA	-	-	-0.8	V
Pulsed Base-Emitter Saturation Voltage[1]		I_C = 10mA, I_B = 1mA	-0.8	-	-0.95	V
		I_C = 50mA, I_B = 5mA	-	-	-1.5	V
SMALL SIGNAL CHARACTERISTICS[2]						
High Frequency Current Gain	h_{fe}	I_C = 10mA, V_{CE} = -10V, f = 100MHz	-	-	8.5	-
Output Capacitance	C_{ob}	V_{CB} = -5V, I_E = 0	-	-	3	pF
Input Capacitance	C_{ib}	V_{BE} = -0.5V, I_C = 0	-	-	3.5	
SWITCHING CHARACTERISTICS[2]						
Transition Frequency	f_T	V_{CE} = -10V, I_C = 10mA, f = 100MHz	850	-	-	MHz
Turn-On Time	t_{on}	I_C = 10mA, I_{B1} = 1mA, V_{CC} = -1.5V	-	-	15	ns
Turn-Off Time	t_{off}	I_C = 10mA, I_{B1} = I_{B2} = 1mA, V_{CC} = -1.5V	-	-	20	
Storage Time	t_s	I_C = 10mA, I_{B1} = I_{B2} = 10mA, V_{CC} = -3V	-	-	20	

Note 1: Pulse conditions : length = 300µs; duty cycle = 1%
Note 2: Not production testing in die form, proven by chip design and qualification test

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End Of Life