NPN Transistor Bare Die - TIP31C

Rev 1.1
10/01/24

Bipolar Medium Power Transistor in bare die form
Complement to PNP TIP32C

Features:

- Collector current up to 3A
- High switching speed
- Improved h_{FE} linearity
- Solderable back metal
- High Reliability tested grades for Military + Space

Ordering Information:

The following part suffixes apply:

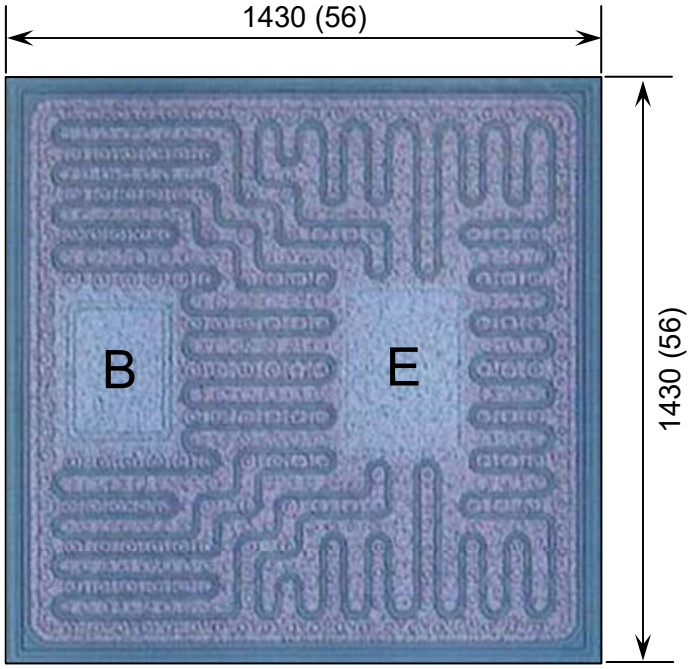
- No suffix - Commercial grade die
- "**H**" – Hi-rel grade die + MIL-STD-38534 Class H LAT
- "**K**" – Hi-rel grade die + MIL-STD-38534 Class K LAT.

LAT = Lot acceptance Test.

For information on Hi-Rel LAT flows please see below.

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

Die Dimensions in µm (mils)



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)	1430 x 1430 56.30 x 56.30	µm mils
Base Pad Size	310 x 430 12.20 x 16.93	µm mils
Emitter Pad Size	310 x 430 12.20 x 16.93	µm mils
Die Thickness	230 (±25) 9.06 (±1)	µm mils
Top Metal Composition	Al	
Back Metal Composition	Ti/Ni/Ag	

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Absolute Maximum Ratings T_A = 25°C unless otherwise stated

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	V_{CBO}	100	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current - Continuous	I_C	3	A
Collector Current – Peak (t_P < 5ms)	I_{CM}	5	
Base Current	I_B	1	A
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	$V_{(BR)CBO}$	I_E = 0	100	-	-	V
Collector-Emitter Sustaining Voltage[1]	$V_{CEO(SUS)}$	I_B = 0, I_C = 30mA	100	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_C = 0	5	-	-	V
Collector Cut-off Current	I_{CEO}	V_{CE} = 60V, I_B = 0	-	-	0.3	mA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 5V, I_C = 0	-	-	1	mA
Collector Cut-off Current	I_{CES}	V_{CE} = 100V, V_{EB} = 0	-	-	0.2	mA
ON CHARACTERISTICS						
Forward-Current Transfer Ratio[1]	h_{FE}	I_C = 1A, V_{CE} = 4V	25	-	-	-
		I_C = 3.0A, V_{CE} = 4V	10	-	50	-
Collector-Emitter Saturation Voltage[1]	$V_{CE(sat)}$	I_C = 3A, I_B = 375mA	-	-	1.2	V
Base-Emitter Saturation Voltage[1]	$V_{BE(on)}$	I_C = 3A, V_{CE} = 4V	-	-	1.8	V
SMALL SIGNAL CHARACTERISTICS[2]						
Transition Frequency[3]	f_T	V_{CE} = 10V, I_C = 500mA, f_{TEST} = 1MHz	3	-	-	MHz
Small Signal Current Gain	h_{fe}	V_{CE} = 10V, I_C = 500mA, f = 1kHz	20	-	-	-

1. Pulsed duration = 300 ms, duty cycle ≥1.5%
2. Not production testing in die form, characterized by chip design and package verification
3. $f_T = |h_{fe}| \circ f_{TEST}$