



NPN Transistor Bare Die – TIP122

Rev 1.0
22/08/23

Bipolar Darlington Power Transistor in bare die form
Complement to PNP TIP127

Features:

- Collector current up to 5A
- Low $V_{CE(sat)}$
- Very high h_{FE}
- Solderable back metal
- High Reliability tested grades for Military + Space

Ordering Information:

The following part suffixes apply:

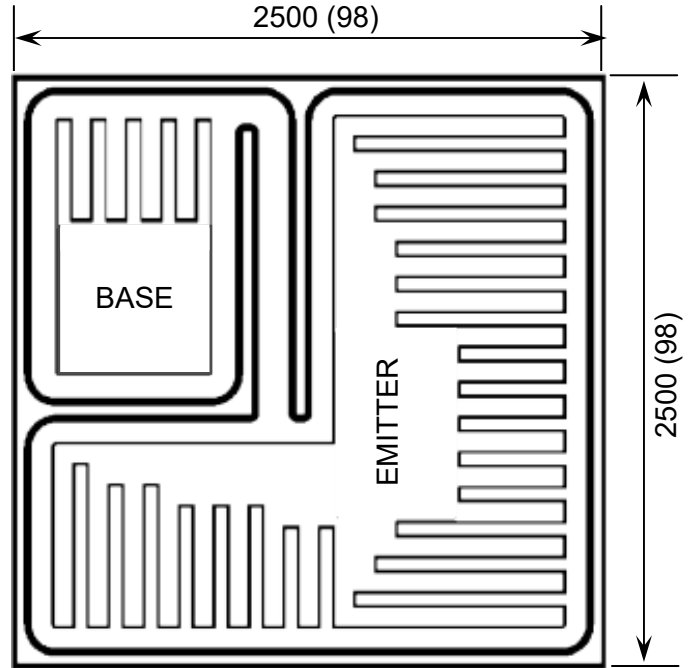
- No suffix - Commercial grade die
- “H” – Hi-rel grade die + MIL-STD-38534 Class H LAT
- “K” – Hi-rel grade die + MIL-STD-38534 Class K LAT.

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 (100 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)	2500 x 2500 98 x 98	μm mils
Emitter Pad Size	492 x 786 19.37 x 30.95	μm mils
Base Pad Size	606 x 606 23.86 x 23.86	μm mils
Die Thickness	260 (± 25) 10.2 (± 1)	μm mils
Top Metal Composition	Al	
Back Metal Composition	Ti/Ni/Ag	





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Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ 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	5	A
Collector Current – Peak ($t_P < 5\text{ms}$)	I_{CM}	8	
Base Current	I_B	0.12	A
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65 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	$V_{(BR)CBO}$	$I_E = 0$	100	-	-	V
Collector-Emitter Sustaining Voltage ¹	$V_{CEO(SUS)}$	$I_B = 0, I_C = 30\text{mA}$	100	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_C = 0$	5	-	-	V
Collector Cut-off Current	I_{CEO}	$V_{CE} = 50\text{V}, I_B = 0$	-	-	0.5	mA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 5\text{V}, I_C = 0$	-	-	2	mA
Collector Cut-off Current	I_{CBO}	$V_{CB} = 100\text{V}, I_E = 0$	-	-	0.2	mA
ON CHARACTERISTICS						
Forward-Current Transfer Ratio ¹	h_{FE}	$I_C = 0.5\text{A}, V_{CE} = 3\text{V}$	1000	-	-	-
		$I_C = 3.0\text{A}, V_{CE} = 3\text{V}$	1000	-	-	-
Collector-Emitter Saturation Voltage ¹	$V_{CE(sat)}$	$I_C = 3\text{A}, I_B = 12\text{mA}$	-	-	2	V
		$I_C = 5\text{A}, I_B = 20\text{mA}$	-	-	4	V
Base-Emitter Saturation Voltage ¹	$V_{BE(on)}$	$I_C = 3\text{A}, V_{CE} = 3\text{V}$	-	-	2.5	V
SMALL SIGNAL CHARACTERISTICS²						
Small-Signal Current Gain	h_{fe}	$V_{CE} = 4\text{V}, I_C = 3\text{A}, f = 1\text{MHz}$	4	-	-	-
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}, I_E = 0, f = 0.1\text{MHz}$	-	-	300	pF

1. Pulsed duration = 300 ms, duty cycle $\geq 1.5\%$

2. Not production testing in die form, characterized by chip design and package verification

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