PNP Transistor Bare Die - BTP981

Rev 1.0
02/09/17

General purpose high voltage switch in bare die form
Complement to NPN BTN991

Features:

- High Voltage: V_{CEO} = -600V
- High Speed: $t_f \leq 1\mu s$
- Characterized at temperature extremes
- Silver backside metalization for solder attach

Ordering Information:

The following part suffixes apply:

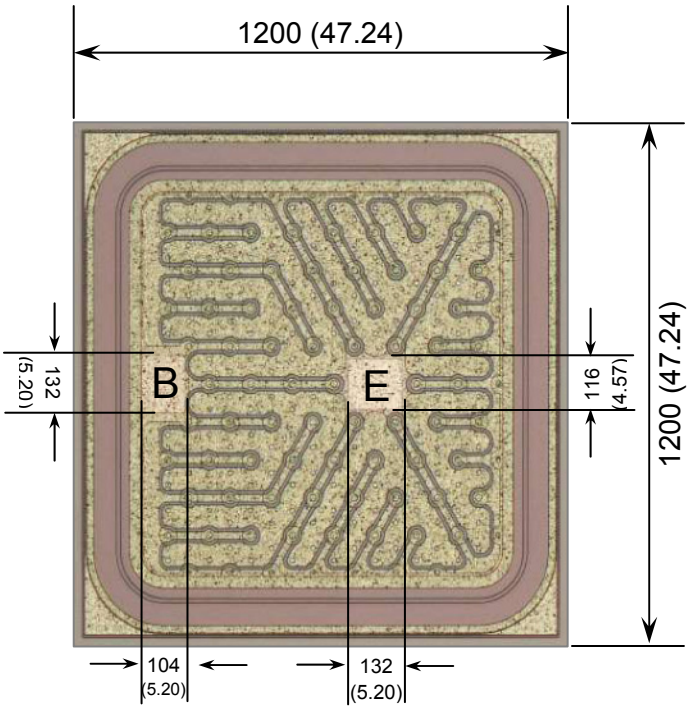
- No suffix - MIL-STD-750 /2072 Visual Inspection
- "**H**" - MIL-STD-750 /2072 Visual Inspection
  + MIL-STD-38534 Class H LAT
- "**K**" - MIL-STD-750 /2072 Visual Inspection
  + MIL-STD-38534 Class K LAT

LAT = Lot Acceptance Test.

For further information on LAT process flows see below.

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

Die Dimensions in µm (mils)



E = EMITTER **B** = BASE

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)	1200 x 1200 47.24 x 47.24	µm mils
Base Pad Size	104 x 132 3.94 x 3.94	µm mils
Emitter Pad Size	132 x 116 3.94 x 3.94	
Die Thickness	230 (±20) 9.06 (±0.79)	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}	-600	V
Collector-Emitter Voltage	V_{CEO}	-600	V
Emitter-Base Voltage	V_{EBO}	-7	V
Collector Current	I_C	-280	mA
Collector Current (Pulse)	I_{CM}	-560	mA
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_C = -1mA	-600	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = -1mA	-600	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = -100µA	-7	-	-	V
Collector Cut-off Current	I_{CBO}	V_{CB} = -600V	-	-	-1	µA
Collector Cut-off Current	I_{CEO}	V_{CB} = -600V	-	-	-3	µA
Emitter Cut-off Current	I_{EBO}	V_{EB} = -7V	-	-	-1	µA
ON CHARACTERISTICS						
Forward-Current Transfer Ratio	h_{FE}	V_{CE} = -5V, I_C = -10mA	54	-	310	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = -10mA, I_B = -1mA	-	-	-0.5	V
Base Saturation Voltage	$V_{BE(sat)}$	I_C = -10mA, I_B = -1mA	-	-	-1	V
SMALL SIGNAL CHARACTERISTICS[1]						
Transition Frequency	f_T	V_{CE} = -10V, I_E = 10mA	-	25	-	MHz
Output Capacitance	C_{obo}	V_{CB} = -10V, I_E = 0, f = 1MHz	-	20	-	pF
Turn-on time	t_{on}	V_{CC} = -250V, I_C = -10mA, $-I_{B1} = -I_{B2}$ = -1mA	-	-	0.5	µs
Storage time	t_{stg}		-	-	5	µs
Fall time	t_f		-	-	0.5	µs

1. Not production testing in die form. Characterized by chip design and tested in package.

Typical Electrical Characteristics

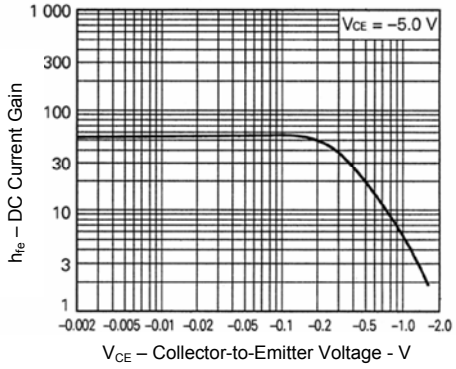

Figure 1 – DC Current Gain Vs. Collector Current

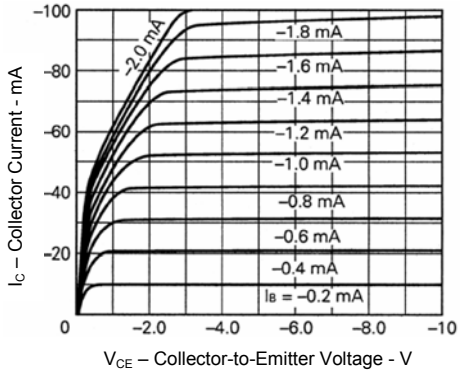

Figure 2 – Collector Current Vs. Collector-to-Emitter Voltage

Typical Electrical Characteristics (Continued)

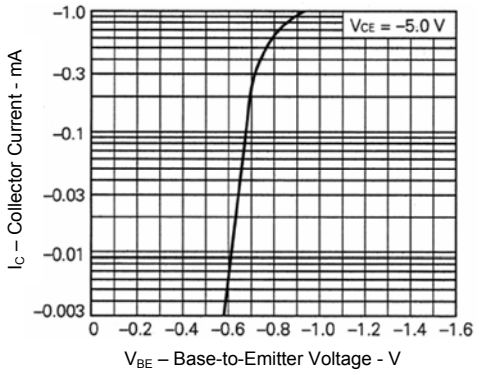

Figure 3 – Collector Current Vs. Base-to-Emitter Voltage

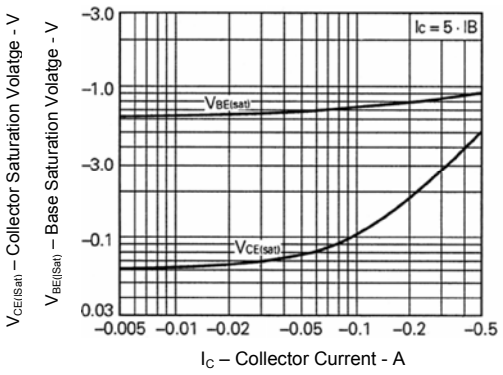

Figure 4 – Collector and Base Saturation Voltage Vs. Collector Current

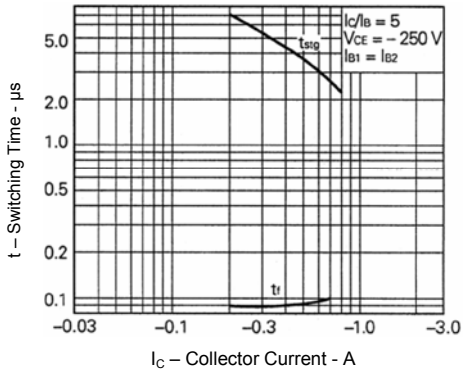

Figure 5 – Turn-Off Time Vs. Current

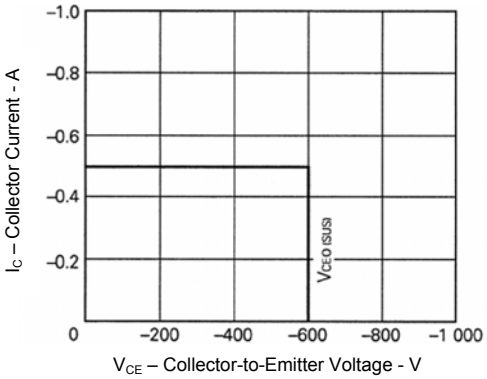

Figure 6 – Reverse Bias Safe Operating Area

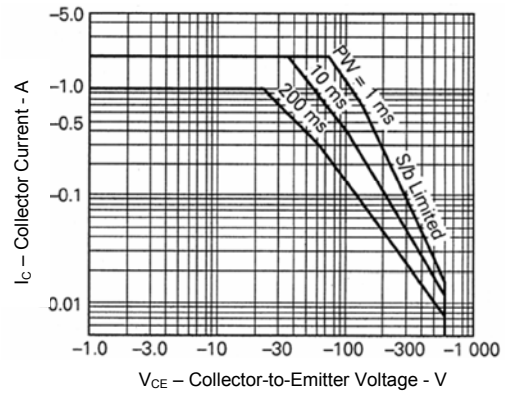

Figure 7 – Forward Safe Operating Area

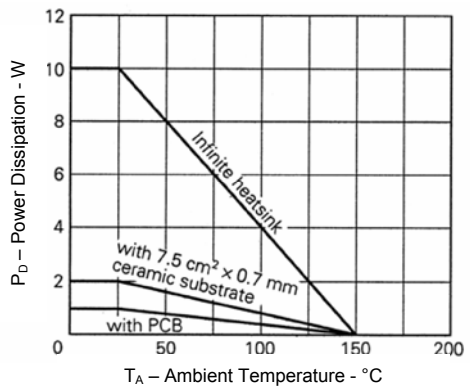

Figure 8 – Total Power Dissipation Vs. Ambient Temperature

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