

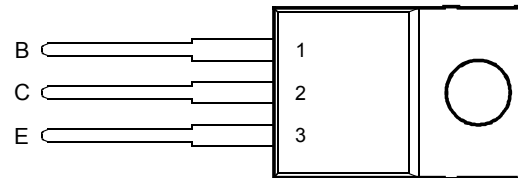
BUPD1520 NPN SILICON TRANSISTOR WITH INTEGRATED DIODE

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MAY 1999 - REVISED SEPTEMBER 1999

- **Designed for Self Oscillating Inverter Applications**
- **Rugged 1500 V Planar Construction**
- **Integral Free-Wheeling Anti-Parallel Diode**

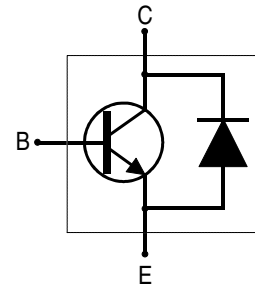
TO-220 PACKAGE
(TOP VIEW)



Pin 2 is in electrical contact with the mounting base.

MDTRACA

device symbol



absolute maximum ratings at 25°C case temperature (unless otherwise noted)

RATING	SYMBOL	VALUE	UNIT
Collector-emitter voltage ($I_B = 0$)	V_{CEO}	700	V
Collector-emitter voltage ($V_{BE} = 0$)	V_{CES}	1500	V
Emitter-base voltage ($I_C = 0$)	V_{EBO}	11	V
Continuous collector current	I_C	2	A
Peak collector current (see Note 1)	I_{CM}	2.5	A
Continuous base current	I_B	2	A
Peak base current (see Note 1)	I_{BM}	2.5	A
Continuous device dissipation at (or below) 25°C case temperature	P_{tot}	50	W
Operating junction temperature range	T_j	-55 to +125	°C
Storage temperature range	T_{stg}	-55 to +150	°C
Lead temperature 3.2 mm from case for 10 seconds	T_L	300	°C

NOTE 1: This value applies for $t_p = 10$ ms, duty cycle $\leq 2\%$.

PRODUCT INFORMATION

Information is current as of publication date. Products conform to specifications in accordance with the terms of Power Innovations standard warranty. Production processing does not necessarily include testing of all parameters.



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electrical characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
V_{CEO} Collector-emitter voltage	$I_C = 1 \text{ mA}$	700			V
V_{CBO} Collector-base voltage	$I_C = 100 \text{ } \mu\text{A}$	1500			V
V_{EBO} Emitter-base voltage	$I_{EB} = 1 \text{ mA}$	11			V
I_{CEO} Collector cut-off current	$V_{CE} = 700 \text{ V}$ $I_B = 0$			100	μA
I_{CES} Collector-emitter cut-off current	$V_{CE} = 1500 \text{ V}$ $V_{BE} = 0$			100	μA
I_{EBO} Emitter cut-off current	$V_{EB} = 11 \text{ V}$ $I_C = 0$			1	mA
$V_{BE(sat)}$ Base-emitter saturation voltage	$I_B = 100 \text{ mA}$ $I_C = 500 \text{ mA}$			1.0	V
	$I_B = 100 \text{ mA}$ $I_C = 1 \text{ A}$			1.1	
	$I_B = 400 \text{ mA}$ $I_C = 2 \text{ A}$			1.2	
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = 50 \text{ mA}$ $I_C = 250 \text{ mA}$		0.3	1.2	V
	$I_B = 100 \text{ mA}$ $I_C = 500 \text{ mA}$		0.7	3.0	
h_{FE} Forward current transfer ratio	$V_{CE} = 5 \text{ V}$ $I_C = 10 \text{ mA}$	10	21		
	$V_{CE} = 5 \text{ V}$ $I_C = 100 \text{ mA}$	10	25		
	$V_{CE} = 5 \text{ V}$ $I_C = 250 \text{ mA}$	10	25		
	$V_{CE} = 5 \text{ V}$ $I_C = 500 \text{ mA}$	7	18		

NOTES: 2. These parameters must be measured using pulse techniques, $t_p = 300 \text{ } \mu\text{s}$, duty cycle $\leq 2\%$.

3. These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts, and located within 3.2 mm from the device body.

thermal characteristics

PARAMETER	MIN	TYP	MAX	UNIT
$R_{\theta JA}$ Junction to free air thermal resistance			62.5	$^{\circ}\text{C/W}$
$R_{\theta JC}$ Junction to case thermal resistance			2	$^{\circ}\text{C/W}$

resistive switching characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
t_d Delay time	$I_C = 500 \text{ mA}$ $I_{B(on)} = 50 \text{ mA}$ $t_p = 300 \text{ } \mu\text{s}$ $V_{CC} = 125 \text{ V}$ $I_{B(off)} = 250 \text{ mA}$ Duty cycle = 2%		0.1		μs	
t_r Rise time			0.6		μs	
t_s Storage time				1.0		μs
t_f Fall time				0.2		μs

PRODUCT INFORMATION

TYPICAL CHARACTERISTICS

FORWARD CURRENT TRANSFER RATIO
VS
COLLECTOR CURRENT

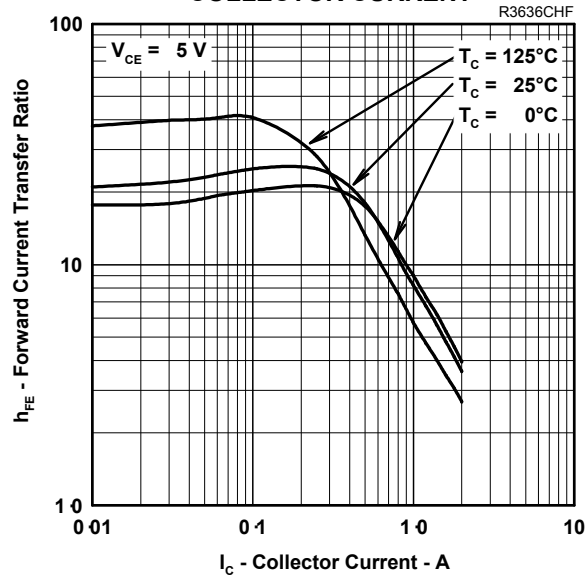


Figure 1.

MAXIMUM SAFE OPERATING REGIONS

MAXIMUM FORWARD-BIAS
SAFE OPERATING AREA

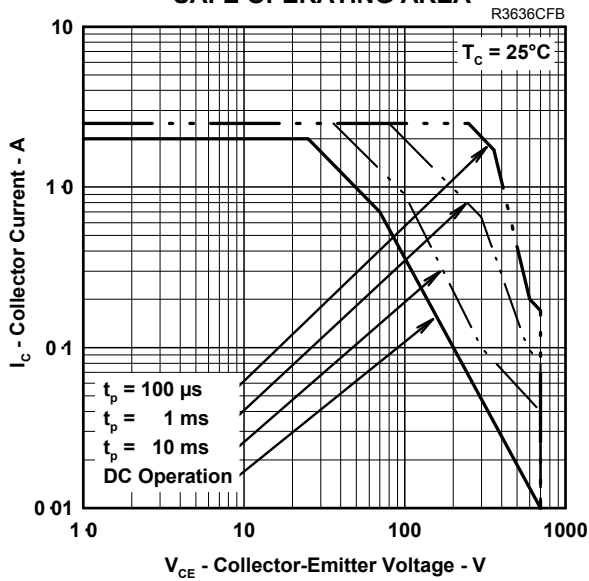


Figure 2.

MAXIMUM REVERSE-BIAS
SAFE OPERATING AREA

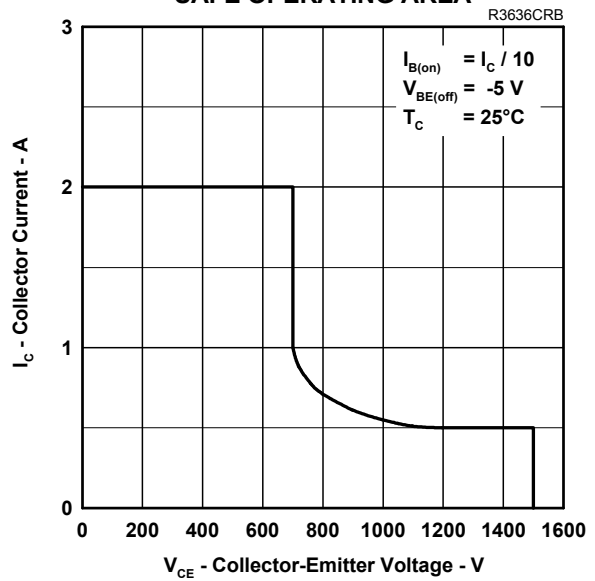


Figure 3.

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