# UBV45

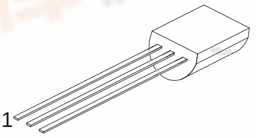
*NPN SILICON TRANSISTOR*

# HIGH VOLTAGE FAST SWITCHING NPN POWER APPLICATIONS

## DESCRIPTION

The device is manufactured using High Voltage Multi Epitaxial Planar technology for high switching speeds and high voltage capability.

The UTC **UBV45** is designed for use in Compact Fluorescent Lamps.



TO-92

*Pb-free plating product number: UBV45L

## FEATURES

* High Voltage Capability
* Low Spread of Dynamic Parameters
* Very High Switching Speed

## ORDERING INFORMATION

| Order Number | | Package | Pin Assignment | | | Packing |
|---|---|---|---|---|---|---|
| Normal | Lead Free Plating | | 1 | 2 | 3 | |
| UBV45-T92-B | UBV45L-T92-B | TO-92 | E | C | B | Tape Box |
| UBV45-T92-K | UBV45L-T92-K | TO-92 | E | C | B | Bulk |

UBV45L-T92-B

(1)Packing Type

(2)Package Type

(3)Lead Plating

(1) B: Tape Box, K: Bulk

(2) T92: TO-92

(3) L: Lead Free Plating, Blank: Pb/Sn

## ■ ABSOLUTE MAXIMUM RATINGS (Ta = 25℃)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Collector Emitter Voltage ($V_{BE}$ = 0) | $V_{CES}$ | 700 | V |
| Collector Emitter Voltage ($I_B$ = 0) | $V_{CEO}$ | 400 | V |
| Emitter Base Voltage ($I_C$ = 0) | $V_{EBO}$ | 9 | V |
| Collector Current | $I_C$ | 0.75 | A |
| Collector Peak Current ($t_p$ < 5 ms) | $I_{CM}$ | 1.5 | A |
| Base Current | $I_B$ | 0.4 | A |
| Base Peak Current ($t_p$ < 5 ms) | $I_{BM}$ | 0.75 | A |
| Total Dissipation at Ta = 25℃ | $P_D$ | 0.95 | W |
| Junction Temperature | $T_J$ | +150 | ℃ |
| Storage Temperature | $T_{STG}$ | -40 ~ +150 | ℃ |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

## ■ THERAMAL DATA

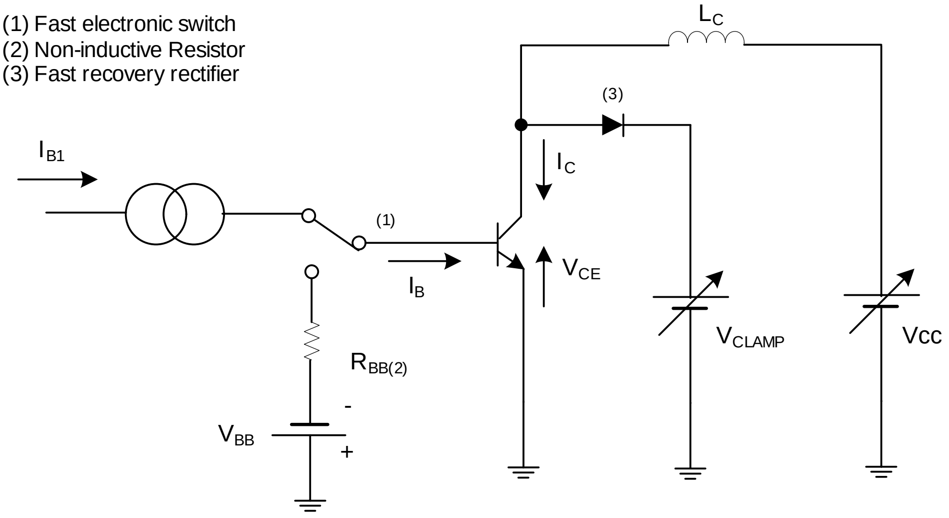
| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Thermal Resistance Junction-ambient | $\theta_{JA}$ | 130 | ℃/W |

## ■ ELECTRICAL CHARACTERISTICS (Ta= 25℃, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Collector Emitter Sustaining Voltage ($I_B$ = 0) | $V_{CEO(SUS)}$* | $I_C$ = 1 mA | 400 | | | V |
| Collector Emitter Saturation Voltage | $V_{CE(SAT)}$* | $I_C$ = 0.2 A , $I_B$ = 40 mA | | 0.2 | 0.5 | V |
| | | $I_C$ = 0.3 A , $I_B$ = 75 mA | | 0.3 | 1 | |
| | | $I_C$ = 0.4 A , $I_B$ = 135 mA | | 0.4 | 1.5 | |
| Base Emitter Saturation Voltage | $V_{BE(SAT)}$* | $I_C$ = 0.2 A , $I_B$ = 40 mA | | | 1 | V |
| | | $I_C$ = 0.3 A , $I_B$ = 75 mA | | | 1.2 | |
| Emitter Cut off Current ($I_C$ = 0) | $I_{EBO}$ | $V_{EB}$ = 9 V | | | 1 | mA |
| Collector Cut off Current ($V_{BE}$ = -1.5V) | $I_{CEV}$ | $V_{CE}$ = 700 V | | | 250 | μ A |
| DC Current Gain | $h_{FE}$* | $I_C$ = 0.2 A, $V_{CE}$ = 5 V | 12 | | 27 | |
| | | $I_C$ = 0.4 A, $V_{CE}$ = 5 V | 7 | | 20 | |
| Inductive Load Fall Time | $t_F$ | $I_C$ = 0.2 A , $V_{CLAMP}$ = 300 V<br>$I_{B1}$ = -$I_{B2}$ = 40 mA , L = 3 mH | | 0.3 | | μ s |

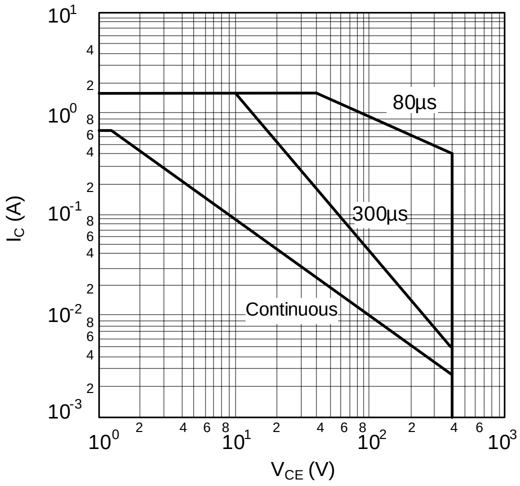
* Pulsed: Pulse duration = 300μs, duty cycle = 1.5 %

## ■ INDUCTIVE LOAD SWITCHING TEST CIRCUIT

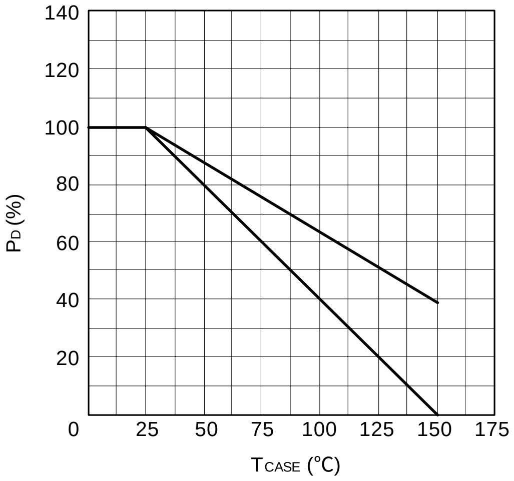


## ■ TYPICAL CHARACTERICS

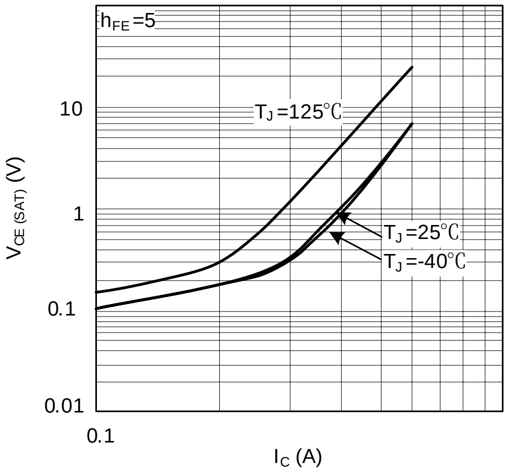
Safe Operating Area



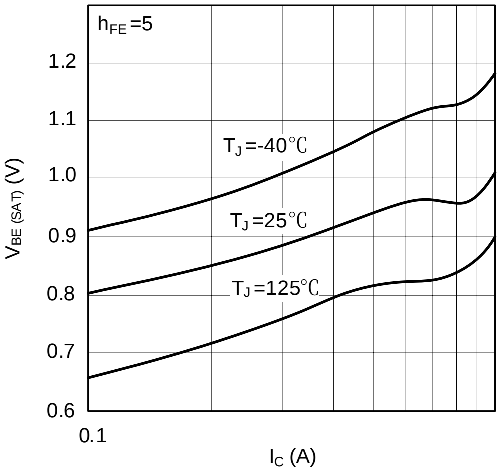
Derating Curve



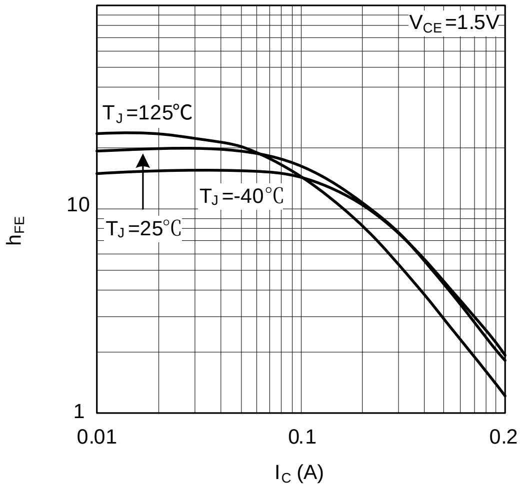
Collector Emitter Saturation Voltage



Base Emitter Saturation Voltage



DC Current Gain



DC Current Gain