Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

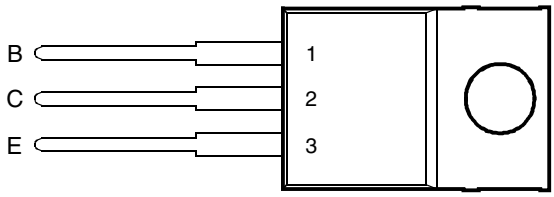

## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

BOURNS®

- **Designed for Complementary Use with BDW93, BDW93A, BDW93B and BDW93C**
- **80 W at 25°C Case Temperature**
- **12 A Continuous Collector Current**
- **Minimum $h_{FE}$ of 750 at 3V, 5 A**

**TO-220 PACKAGE**
**(TOP VIEW)**




Pin 2 is in electrical contact with the mounting base.

MDTRACA

This series is obsolete and not recommended for new designs.

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

| RATING | | SYMBOL | VALUE | UNIT |
|---|---|---|---|---|
| Collector-base voltage ($I_E$ = 0) | BDW94 | $V_{CBO}$ | -45 | V |
| | BDW94A | | -60 | |
| | BDW94B | | -80 | |
| | BDW94C | | -100 | |
| Collector-emitter voltage ($I_B$ = 0) | BDW94 | $V_{CEO}$ | -45 | V |
| | BDW94A | | -60 | |
| | BDW94B | | -80 | |
| | BDW94C | | -100 | |
| Emitter-base voltage | | $V_{EBO}$ | -5 | V |
| Continuous collector current | | $I_C$ | -12 | A |
| Continuous base current | | $I_B$ | -0.3 | A |
| Continuous device dissipation at (or below) 25°C case temperature (see Note 1) | | $P_{tot}$ | 80 | W |
| Continuous device dissipation at (or below) 25°C free air temperature (see Note 2) | | $P_{tot}$ | 2 | W |
| Operating junction temperature range | | $T_j$ | -65 to +150 | °C |
| Storage temperature range | | $T_{stg}$ | -65 to +150 | °C |
| Operating free-air temperature range | | $T_A$ | -65 to +150 | °C |



NOTES: 1. Derate linearly to 150°C case temperature at the rate of 0.64 W/°C.
2. Derate linearly to 150°C free air temperature at the rate of 16 mW/°C.

## electrical characteristics at 25°C case temperature (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS | | | | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| $V_{(BR)CEO}$ | Collector-emitter breakdown voltage | $I_C$ = -100 mA | $I_B$ = 0 | (see Note 3) | BDW94 | -45 | | | V |
| | | | | | BDW94A | -60 | | | |
| | | | | | BDW94B | -80 | | | |
| | | | | | BDW94C | -100 | | | |
| $I_{CEO}$ | Collector-emitter cut-off current | $V_{CB}$ = -40 V | $I_B$ = 0 | | BDW94 | | | -1 | mA |
| | | $V_{CB}$ = -60 V | $I_B$ = 0 | | BDW94A | | | -1 | |
| | | $V_{CB}$ = -80 V | $I_B$ = 0 | | BDW94B | | | -1 | |
| | | $V_{CB}$ = -80 V | $I_B$ = 0 | | BDW94C | | | -1 | |
| $I_{CBO}$ | Collector cut-off current | $V_{CB}$ = -45 V | $I_E$ = 0 | | BDW94 | | | -0.1 | mA |
| | | $V_{CB}$ = -60 V | $I_E$ = 0 | | BDW94A | | | -0.1 | |
| | | $V_{CB}$ = -80 V | $I_E$ = 0 | | BDW94B | | | -0.1 | |
| | | $V_{CB}$ = -100 V | $I_E$ = 0 | | BDW94C | | | -0.1 | |
| | | $V_{CB}$ = -45 V | $I_E$ = 0 | $T_C$ = 150°C | BDW94 | | | -5 | |
| | | $V_{CB}$ = -60 V | $I_E$ = 0 | $T_C$ = 150°C | BDW94A | | | -5 | |
| | | $V_{CB}$ = -80 V | $I_E$ = 0 | $T_C$ = 150°C | BDW94B | | | -5 | |
| | | $V_{CB}$ = -100 V | $I_E$ = 0 | $T_C$ = 150°C | BDW94C | | | -5 | |
| $I_{EBO}$ | Emitter cut-off current | $V_{EB}$ = -5 V | $I_C$ = 0 | | | | | -2 | mA |
| $h_{FE}$ | Forward current transfer ratio | $V_{CE}$ = -3 V | $I_C$ = -3 A | (see Notes 3 and 4) | | 1000 | | | |
| | | $V_{CE}$ = -3 V | $I_C$ = -10 A | | | 100 | | | |
| | | $V_{CE}$ = -3 V | $I_C$ = -5 A | | | 750 | | 20000 | |
| $V_{CE(sat)}$ | Collector-emitter saturation voltage | $I_B$ = -20 mA | $I_C$ = -5 A | (see Notes 3 and 4) | | | | -2 | V |
| | | $I_B$ = -100 mA | $I_C$ = -10 A | | | | | -3 | |
| $V_{BE(sat)}$ | Base-emitter saturation voltage | $I_B$ = -20 mA | $I_C$ = -5 A | (see Notes 3 and 4) | | | | -2.5 | V |
| | | $I_B$ = -100 mA | $I_C$ = -10 A | | | | | -4 | |
| $V_{EC}$ | Parallel diode forward voltage | $I_E$ = -5 A | $I_B$ = 0 | | | | | -2 | V |
| | | $I_E$ = -10 A | $I_B$ = 0 | | | | | -4 | |

NOTES: 3. These parameters must be measured using pulse techniques, $t_p$ = 300 µs, duty cycle ≤ 2%.
4. These parameters must be measured using voltage-sensing contacts, separate from the current carrying contacts.



## thermal characteristics

| PARAMETER | | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| $R_{\theta JC}$ | Junction to case thermal resistance | | | 1.56 | °C/W |
| $R_{\theta JA}$ | Junction to free air thermal resistance | | | 62.5 | °C/W |

BOURNS®

## TYPICAL CHARACTERISTICS

### TYPICAL DC CURRENT GAIN vs COLLECTOR CURRENT

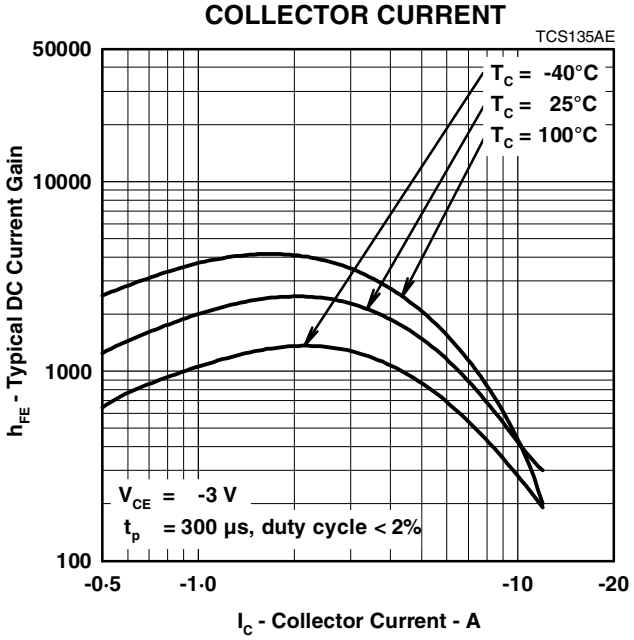



Figure 1.

### COLLECTOR-EMITTER SATURATION VOLTAGE vs COLLECTOR CURRENT

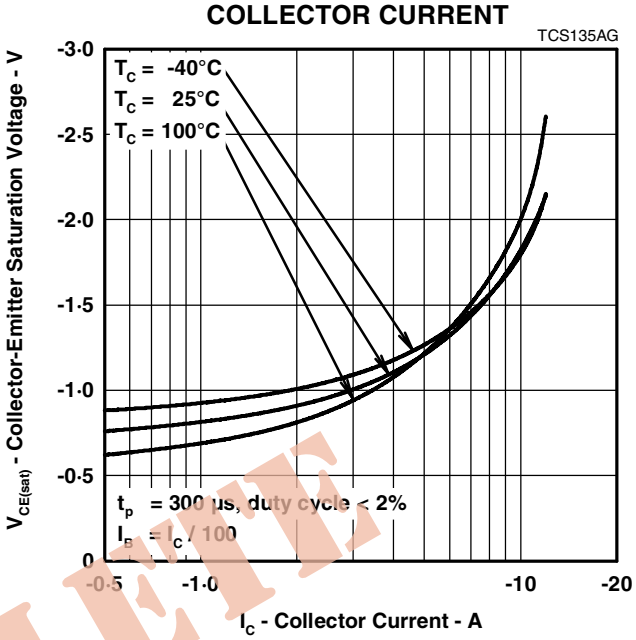



Figure 2.



### BASE-EMITTER SATURATION VOLTAGE vs COLLECTOR CURRENT

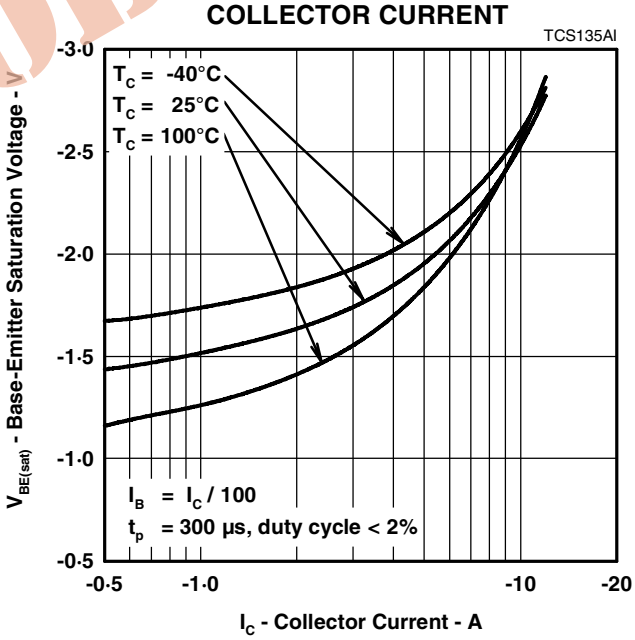



Figure 3.

## THERMAL INFORMATION

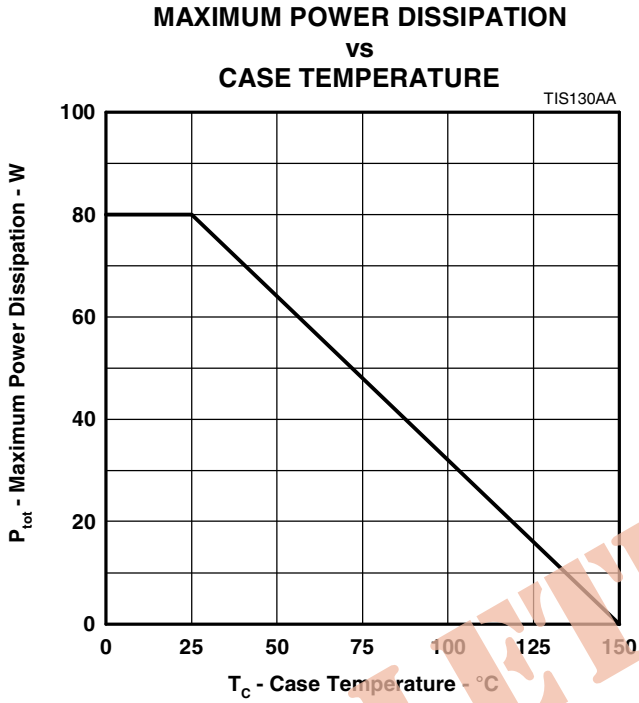



Figure 4.