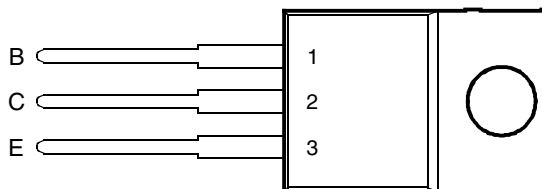


- Designed for Complementary Use with BDW74, BDW74A, BDW74B, BDW74C and BDW74D
- 80 W at 25°C Case Temperature
- 8 A Continuous Collector Current
- Minimum h_{FE} of 750 at 3V, 3 A

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This series is obsolete and not recommended for new designs.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 ($I_E = 0$) | BDW73 | V_{CBO} | 45 | V |
| | BDW73A | | 60 | |
| | BDW73B | | 80 | |
| | BDW73C | | 100 | |
| | BDW73D | | 120 | |
| Collector-emitter voltage ($I_B = 0$) (see Note 1) | BDW73 | V_{CEO} | 45 | V |
| | BDW73A | | 60 | |
| | BDW73B | | 80 | |
| | BDW73C | | 100 | |
| | BDW73D | | 120 | |
| Emitter-base voltage | | V_{EBO} | 5 | V |
| Continuous collector current | | I_C | 8 | A |
| Continuous base current | | I_B | 0.3 | A |
| Continuous device dissipation at (or below) 25°C case temperature (see Note 2) | | P_{tot} | 80 | W |
| Continuous device dissipation at (or below) 25°C free air temperature (see Note 3) | | P_{tot} | 2 | W |
| Unclamped inductive load energy (see Note 4) | | $\frac{1}{2}LI_C^2$ | 75 | mJ |
| Operating junction temperature range | | T_j | -65 to +150 | °C |
| Operating temperature range | | T_{stg} | -65 to +150 | °C |
| Operating free-air temperature range | | T_A | -65 to +150 | °C |

- NOTES: 1. These values apply when the base-emitter diode is open circuited.
 2. Derate linearly to 150°C case temperature at the rate of 0.64 W/°C.
 3. Derate linearly to 150°C free air temperature at the rate of 16 mW/°C.
 4. This rating is based on the capability of the transistor to operate safely in a circuit of: L = 20 mH, $I_{B(on)} = 5$ mA, $R_{BE} = 100 \Omega$, $V_{BE(off)} = 0$, $R_S = 0.1 \Omega$, $V_{CC} = 20$ V.

PRODUCT INFORMATION

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

| PARAMETER | TEST CONDITIONS | | | MIN | TYP | MAX | UNIT |
|--|--|--|---|--|-----|--|------|
| $V_{(BR)CEO}$ Collector-emitter breakdown voltage | $I_C = 30 \text{ mA}$ | $I_B = 0$ | (see Note 5) | BDW73 45 BDW73A 60 BDW73B 80 BDW73C 100 BDW73D 120 | | | V |
| I_{CEO} Collector-emitter cut-off current | $V_{CE} = 30 \text{ V}$ $V_{CE} = 30 \text{ V}$ $V_{CE} = 40 \text{ V}$ $V_{CE} = 50 \text{ V}$ $V_{CE} = 60 \text{ V}$ | $I_B = 0$ $I_B = 0$ $I_B = 0$ $I_B = 0$ $I_B = 0$ | | BDW73 BDW73A BDW73B BDW73C BDW73D | | 0.5 0.5 0.5 0.5 0.5 | mA |
| I_{CBO} Collector cut-off current | $V_{CB} = 45 \text{ V}$ $V_{CB} = 60 \text{ V}$ $V_{CB} = 80 \text{ V}$ $V_{CB} = 100 \text{ V}$ $V_{CB} = 120 \text{ V}$ $V_{CB} = 45 \text{ V}$ $V_{CB} = 60 \text{ V}$ $V_{CB} = 80 \text{ V}$ $V_{CB} = 100 \text{ V}$ $V_{CB} = 120 \text{ V}$ | $I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$ | $T_C = 150^\circ\text{C}$ $T_C = 150^\circ\text{C}$ $T_C = 150^\circ\text{C}$ $T_C = 150^\circ\text{C}$ $T_C = 150^\circ\text{C}$ | BDW73 BDW73A BDW73B BDW73C BDW73D BDW73 BDW73A BDW73B BDW73C BDW73D | | 0.2 0.2 0.2 0.2 0.2 5 5 5 5 5 | mA |
| I_{EBO} Emitter cut-off current | $V_{EB} = 5 \text{ V}$ | $I_C = 0$ | | | | 2 | mA |
| h_{FE} Forward current transfer ratio | $V_{CE} = 3 \text{ V}$ $V_{CE} = 3 \text{ V}$ | $I_C = 3 \text{ A}$ $I_C = 8 \text{ A}$ | (see Notes 5 and 6) | 750 100 | | 20000 | |
| $V_{BE(on)}$ Base-emitter voltage | $V_{CE} = 3 \text{ V}$ | $I_C = 3 \text{ A}$ | (see Notes 5 and 6) | | | 2.5 | V |
| $V_{CE(sat)}$ Collector-emitter saturation voltage | $I_B = 12 \text{ mA}$ $I_B = 80 \text{ mA}$ | $I_C = 3 \text{ A}$ $I_C = 8 \text{ A}$ | (see Notes 5 and 6) | | | 2.5 4 | V |
| V_{EC} Parallel diode forward voltage | $I_E = 8 \text{ A}$ | $I_B = 0$ | | | | 3.5 | V |

NOTES: 5. These parameters must be measured using pulse techniques, $t_p = 300 \mu\text{s}$, duty cycle $\leq 2\%$.

6. 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 |

resistive-load-switching characteristics at 25°C case temperature

| PARAMETER | TEST CONDITIONS † | | | MIN | TYP | MAX | UNIT |
|-------------------------|--------------------------------|-----------------------------|--|-----|-----|-----|---------------|
| t_{on} Turn-on time | $I_C = 3 \text{ A}$ | $I_{B(on)} = 12 \text{ mA}$ | $I_{B(off)} = -12 \text{ mA}$ | | 1 | | μs |
| t_{off} Turn-off time | $V_{BE(off)} = -3.5 \text{ V}$ | $R_L = 10 \Omega$ | $t_p = 20 \mu\text{s}$, dc $\leq 2\%$ | | 5 | | μs |

† Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

TYPICAL CHARACTERISTICS

TYPICAL DC CURRENT GAIN
vs
COLLECTOR CURRENT

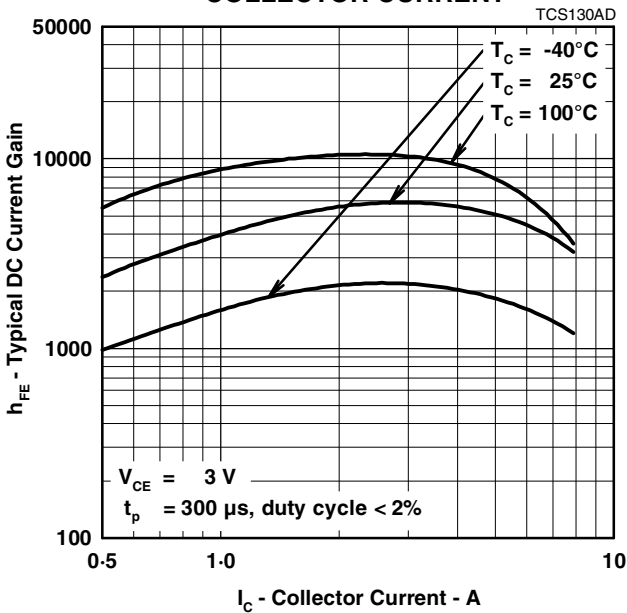


Figure 1.

COLLECTOR-EMITTER SATURATION VOLTAGE
vs
COLLECTOR CURRENT

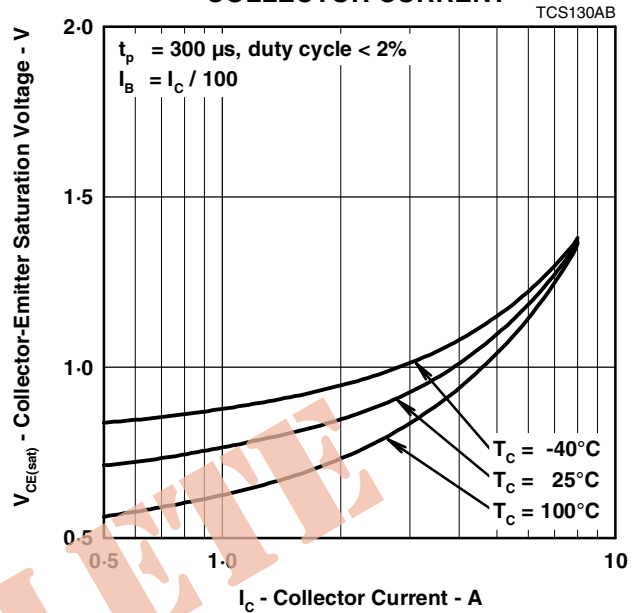


Figure 2.

BASE-EMITTER SATURATION VOLTAGE
vs
COLLECTOR CURRENT

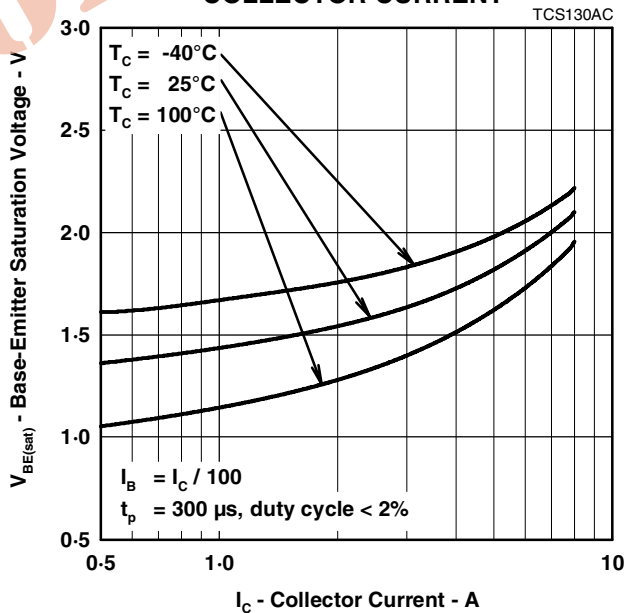


Figure 3.

PRODUCT INFORMATION

MAXIMUM SAFE OPERATING REGIONS

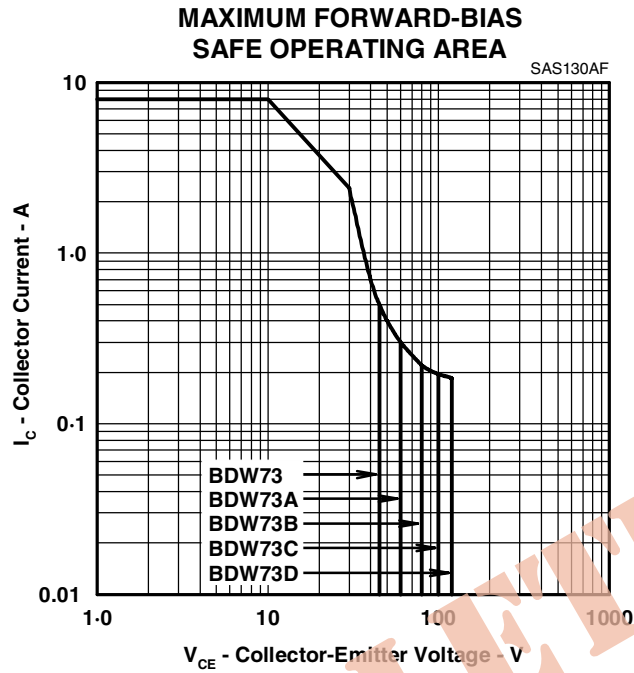


Figure 4.

THERMAL INFORMATION

**MAXIMUM POWER DISSIPATION
vs
CASE TEMPERATURE**

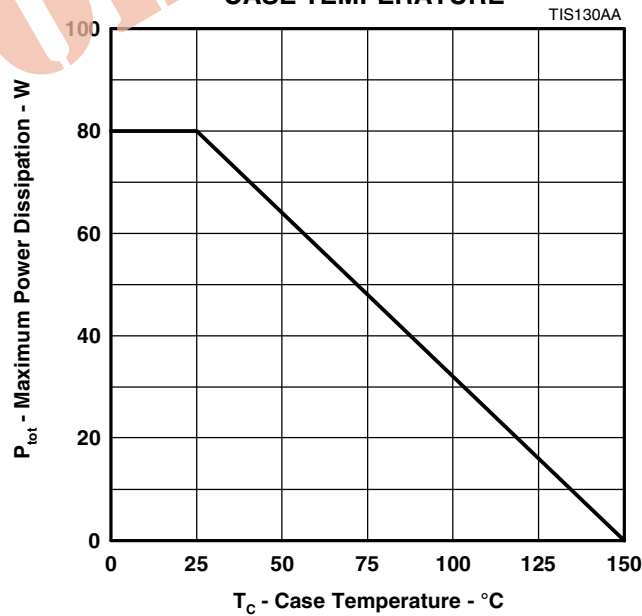


Figure 5.

PRODUCT INFORMATION