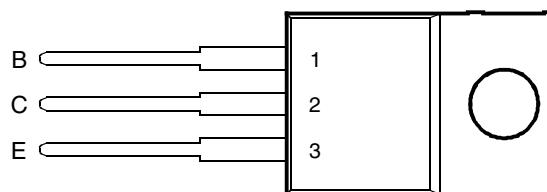


- Designed for Complementary Use with BDW73, BDW73A, BDW73B, BDW73C and BDW73D
- 80 W at 25°C Case Temperature
- 8 A Continuous Collector Current
- Minimum  $h_{FE}$  of 750 at 3V, 3 A

TO-220 PACKAGE  
(TOP VIEW)

Pin 2 is in electrical contact with the mounting base.

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

RATING	SYMBOL	VALUE	UNIT
Collector-base voltage ( $I_E = 0$ )	$V_{CBO}$	BDW74	-45
		BDW74A	-60
		BDW74B	-80
		BDW74C	-100
		BDW74D	-120
Collector-emitter voltage ( $I_B = 0$ ) (see Note 1)	$V_{CEO}$	BDW74	-45
		BDW74A	-60
		BDW74B	-80
		BDW74C	-100
		BDW74D	-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:  $L = 20 \text{ mH}$ ,  $I_{B(on)} = -5 \text{ mA}$ ,  $R_{BE} = 100 \Omega$ , $V_{BE(off)} = 0$ ,  $R_S = 0.1 \Omega$ ,  $V_{CC} = -20 \text{ V}$ .**PRODUCT INFORMATION**

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

PARAMETER		TEST CONDITIONS			MIN	TYP	MAX	UNIT
V <sub>(BR)CEO</sub>	Collector-emitter breakdown voltage	I <sub>C</sub> = -30 mA	I <sub>B</sub> = 0	(see Note 5)	BDW74 BDW74A BDW74B BDW74C BDW74D	-45 -60 -80 -100 -120		V
I <sub>CEO</sub>	Collector-emitter cut-off current	V <sub>CE</sub> = -30 V	I <sub>B</sub> = 0		BDW74		-0.5	
		V <sub>CE</sub> = -30 V	I <sub>B</sub> = 0		BDW74A		-0.5	
		V <sub>CE</sub> = -40 V	I <sub>B</sub> = 0		BDW74B		-0.5	
		V <sub>CE</sub> = -50 V	I <sub>B</sub> = 0		BDW74C		-0.5	
		V <sub>CE</sub> = -60 V	I <sub>B</sub> = 0		BDW74D		-0.5	
I <sub>CBO</sub>	Collector cut-off current	V <sub>CB</sub> = -45 V	I <sub>E</sub> = 0		BDW74		-0.2	
		V <sub>CB</sub> = -60 V	I <sub>E</sub> = 0		BDW74A		-0.2	
		V <sub>CB</sub> = -80 V	I <sub>E</sub> = 0		BDW74B		-0.2	
		V <sub>CB</sub> = -100 V	I <sub>E</sub> = 0		BDW74C		-0.2	
		V <sub>CB</sub> = -120 V	I <sub>E</sub> = 0		BDW74D		-0.2	
		V <sub>CB</sub> = -45 V	I <sub>E</sub> = 0	T <sub>C</sub> = 150°C	BDW74		-5	
		V <sub>CB</sub> = -60 V	I <sub>E</sub> = 0	T <sub>C</sub> = 150°C	BDW74A		-5	
		V <sub>CB</sub> = -80 V	I <sub>E</sub> = 0	T <sub>C</sub> = 150°C	BDW74B		-5	
		V <sub>CB</sub> = -100 V	I <sub>E</sub> = 0	T <sub>C</sub> = 150°C	BDW74C		-5	
		V <sub>CB</sub> = -120 V	I <sub>E</sub> = 0	T <sub>C</sub> = 150°C	BDW74D		-5	
I <sub>EBO</sub>	Emitter cut-off current	V <sub>EB</sub> = -5 V	I <sub>C</sub> = 0				-2	mA
h <sub>FE</sub>	Forward current transfer ratio	V <sub>CE</sub> = -3 V	I <sub>C</sub> = -3 A	(see Notes 5 and 6)	750		20000	
		V <sub>CE</sub> = -3 V	I <sub>C</sub> = -8 A		100			
V <sub>BE(on)</sub>	Base-emitter voltage	V <sub>CE</sub> = -3 V	I <sub>C</sub> = -3 A	(see Notes 5 and 6)			-2.5	V
V <sub>CE(sat)</sub>	Collector-emitter saturation voltage	I <sub>B</sub> = -12 mA	I <sub>C</sub> = -3 A	(see Notes 5 and 6)			-2.5	V
		I <sub>B</sub> = -80 mA	I <sub>C</sub> = -8 A				-4	
V <sub>EC</sub>	Parallel diode forward voltage	I <sub>E</sub> = -8 A	I <sub>B</sub> = 0				-3.5	V

NOTES: 5. These parameters must be measured using pulse techniques, t<sub>p</sub> = 300 μs, duty cycle ≤ 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 <sub>θJC</sub>	Junction to case thermal resistance			1.56	°C/W
R <sub>θJA</sub>	Junction to free air thermal resistance			62.5	°C/W

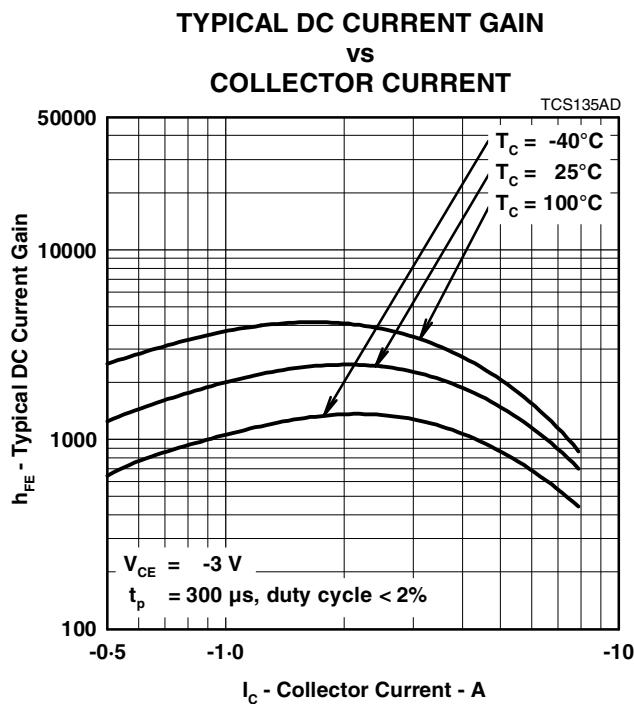
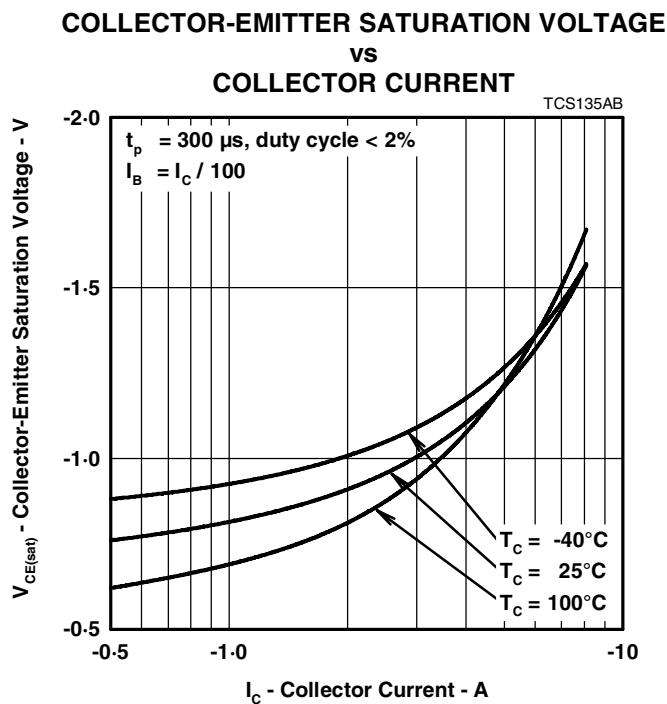
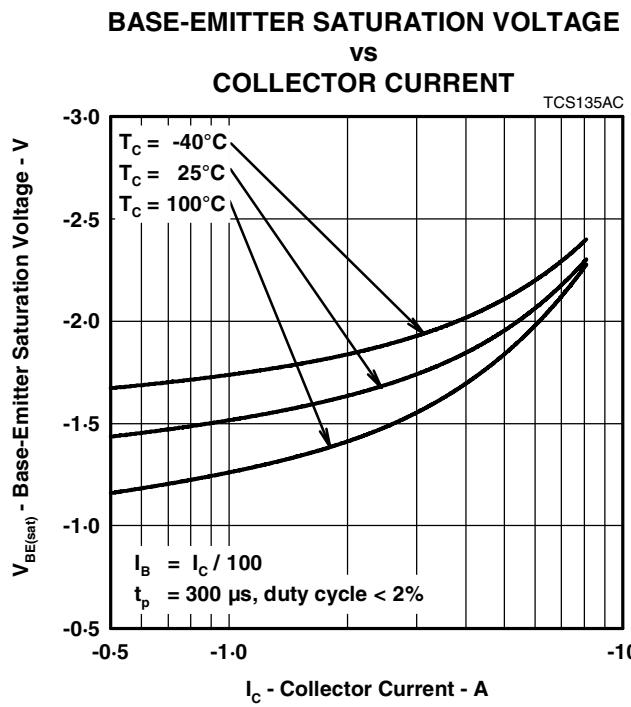
**resistive-load-switching characteristics at 25°C case temperature**

PARAMETER		TEST CONDITIONS †			MIN	TYP	MAX	UNIT
t <sub>on</sub>	Turn-on time	I <sub>C</sub> = -3 A	I <sub>B(on)</sub> = -12 mA	I <sub>B(off)</sub> = 12 mA		1		μs
t <sub>off</sub>	Turn-off time	V <sub>BE(off)</sub> = 3.5 V	R <sub>L</sub> = 10 Ω	t <sub>p</sub> = 20 μs, dc ≤ 2%		5		μs

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

**PRODUCT INFORMATION**

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 Specifications are subject to change without notice.

**TYPICAL CHARACTERISTICS**

**Figure 1.**

**Figure 2.**

**Figure 3.**
**PRODUCT INFORMATION**

### MAXIMUM SAFE OPERATING REGIONS

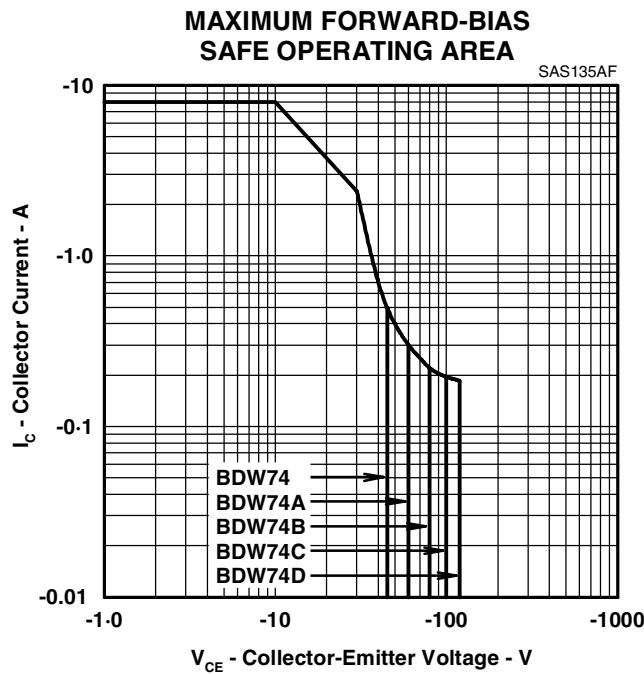


Figure 4.

### THERMAL INFORMATION

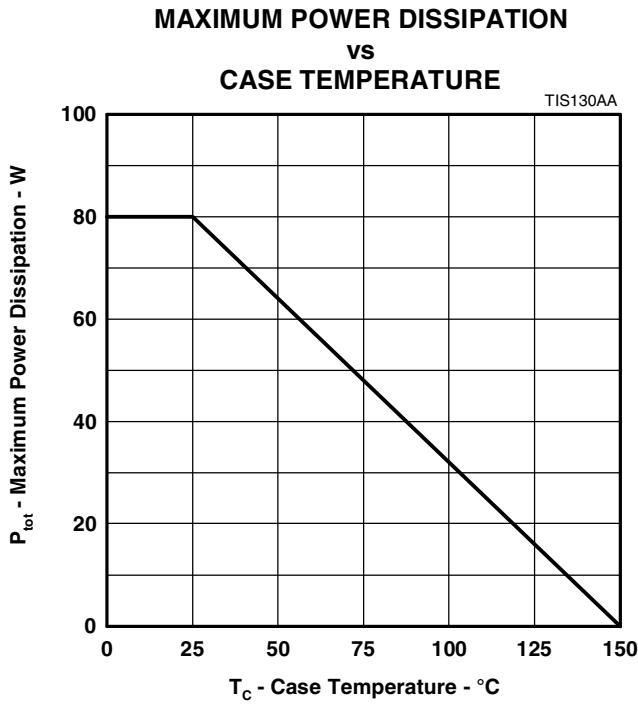


Figure 5.

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