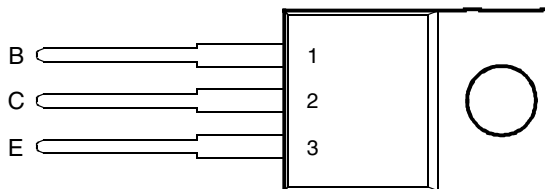




- Designed for Complementary Use with BDW94, BDW94A, BDW94B and BDW94C
- 80 W at 25°C Case Temperature
- 12 A Continuous Collector Current
- Minimum  $h_{FE}$  of 750 at 3V, 5 A

TO-220 PACKAGE  
(TOP VIEW)



This series is obsolete and not recommended for new designs.

Pin 2 is in electrical contact with the mounting base.

MDTRACA

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

RATING		SYMBOL	VALUE	UNIT
Collector-base voltage ( $I_E = 0$ )	BDW93	$V_{CBO}$	45	V
	BDW93A		60	
	BDW93B		80	
	BDW93C		100	
Collector-emitter voltage ( $I_B = 0$ )	BDW93	$V_{CEO}$	45	V
	BDW93A		60	
	BDW93B		80	
	BDW93C		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.

**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	$I_C = 100 \text{ mA}$	$I_B = 0$ (see Note 3)	BDW93	45		V
			BDW93A	60		
			BDW93B	80		
			BDW93C	100		
$I_{CEO}$ Collector-emitter cut-off current	$V_{CB} = 40 \text{ V}$	$I_B = 0$	BDW93		1	mA
	$V_{CB} = 60 \text{ V}$	$I_B = 0$	BDW93A		1	
	$V_{CB} = 80 \text{ V}$	$I_B = 0$	BDW93B		1	
	$V_{CB} = 80 \text{ V}$	$I_B = 0$	BDW93C		1	
$I_{CBO}$ Collector cut-off current	$V_{CB} = 45 \text{ V}$	$I_E = 0$	BDW93		0.1	mA
	$V_{CB} = 60 \text{ V}$	$I_E = 0$	BDW93A		0.1	
	$V_{CB} = 80 \text{ V}$	$I_E = 0$	BDW93B		0.1	
	$V_{CB} = 100 \text{ V}$	$I_E = 0$	BDW93C		0.1	
	$V_{CB} = 45 \text{ V}$	$I_E = 0$	BDW93	$T_C = 150^\circ\text{C}$	5	
	$V_{CB} = 60 \text{ V}$	$I_E = 0$	BDW93A	$T_C = 150^\circ\text{C}$	5	
	$V_{CB} = 80 \text{ V}$	$I_E = 0$	BDW93B	$T_C = 150^\circ\text{C}$	5	
	$V_{CB} = 100 \text{ V}$	$I_E = 0$	BDW93C	$T_C = 150^\circ\text{C}$	5	
$I_{EBO}$ Emitter cut-off current	$V_{EB} = 5 \text{ V}$	$I_C = 0$			2	mA
$h_{FE}$ Forward current transfer ratio	$V_{CE} = 3 \text{ V}$	$I_C = 3 \text{ A}$		1000		
	$V_{CE} = 3 \text{ V}$	$I_C = 10 \text{ A}$	(see Notes 3 and 4)	100		
	$V_{CE} = 3 \text{ V}$	$I_C = 5 \text{ A}$		750	20000	
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = 20 \text{ mA}$	$I_C = 5 \text{ A}$	(see Notes 3 and 4)		2	V
	$I_B = 100 \text{ mA}$	$I_C = 10 \text{ A}$			3	
$V_{BE(sat)}$ Base-emitter saturation voltage	$I_B = 20 \text{ mA}$	$I_C = 5 \text{ A}$	(see Notes 3 and 4)		2.5	V
	$I_B = 100 \text{ mA}$	$I_C = 10 \text{ A}$			4	
$V_{EC}$ Parallel diode forward voltage	$I_E = 5 \text{ A}$	$I_B = 0$			2	V
	$I_E = 10 \text{ A}$	$I_B = 0$			4	

NOTES: 3. These parameters must be measured using pulse techniques,  $t_p = 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ .

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	$^\circ\text{C/W}$
$R_{\theta JA}$ Junction to free air thermal resistance			62.5	$^\circ\text{C/W}$

TYPICAL CHARACTERISTICS

TYPICAL DC CURRENT GAIN  
VS  
COLLECTOR CURRENT

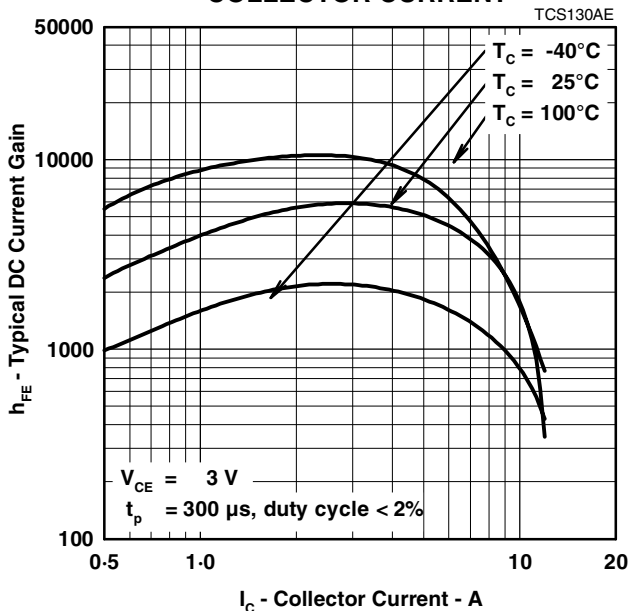


Figure 1.

COLLECTOR-EMITTER SATURATION VOLTAGE  
VS  
COLLECTOR CURRENT

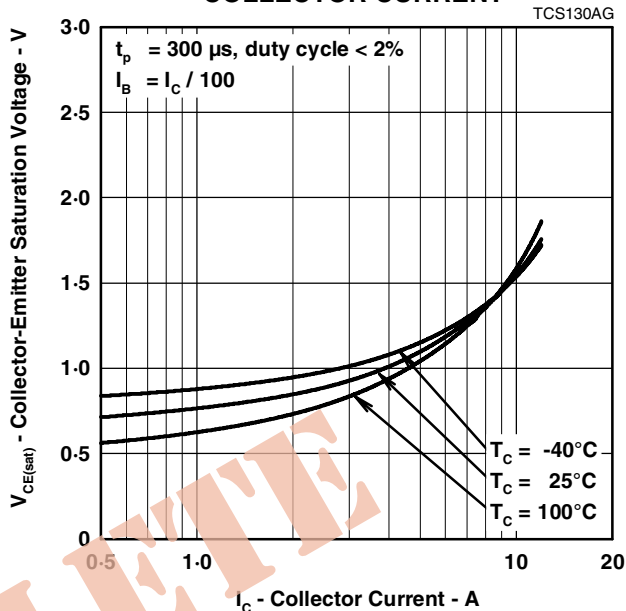


Figure 2.

BASE-EMITTER SATURATION VOLTAGE  
VS  
COLLECTOR CURRENT

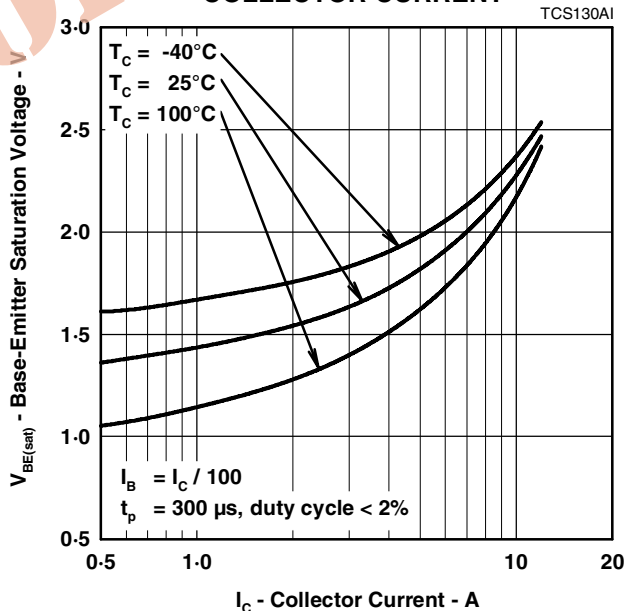


Figure 3.

**PRODUCT INFORMATION**

**THERMAL INFORMATION**

**MAXIMUM POWER DISSIPATION  
VS  
CASE TEMPERATURE**

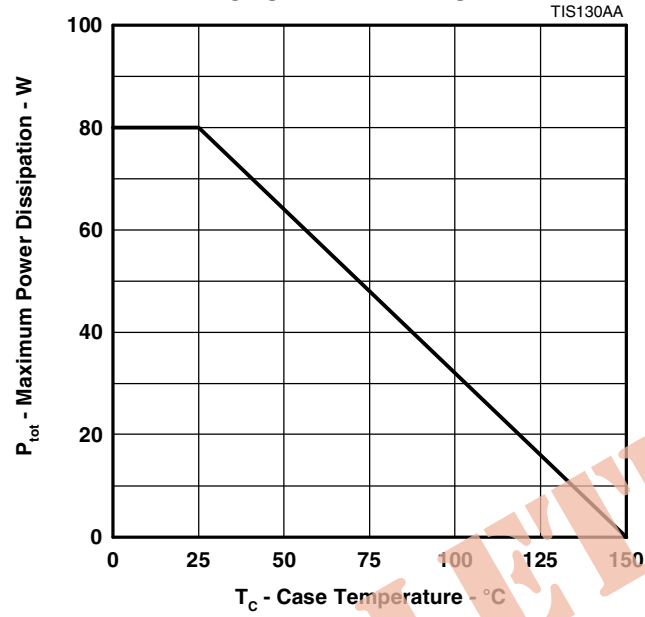


Figure 4.

OBSOLETE

**PRODUCT INFORMATION**

SEPTEMBER 1993 - REVISED SEPTEMBER 2002  
Specifications are subject to change without notice.