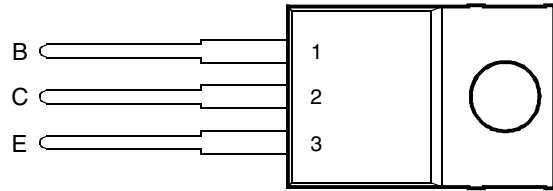


- Designed for Complementary Use with BDW23, BDW23A, BDW23B and BDW23C
- 50 W at 25°C Case Temperature
- 6 A Continuous Collector Current
- Minimum  $h_{FE}$  of 750 at 2 A, 3 V

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This series is obsolete and not recommended for new designs.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 ( $I_E = 0$ )	BDW24	$V_{CBO}$	-45	V
	BDW24A		-60	
	BDW24B		-80	
	BDW24C		-100	
Collector-emitter voltage ( $I_B = 0$ )	BDW24	$V_{CEO}$	-45	V
	BDW24A		-60	
	BDW24B		-80	
	BDW24C		-100	
Emitter-base voltage		$V_{EBO}$	-5	V
Continuous collector current		$I_C$	-6	A
Continuous base current		$I_B$	-0.2	A
Continuous device dissipation at (or below) 25°C case temperature (see Note 1)		$P_{tot}$	50	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 0.4 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)	BDW24 BDW24A BDW24B BDW24C	-45 -60 -80 -100		V
$I_{CEO}$ Collector-emitter cut-off current	$V_{CE} = -30 \text{ V}$ $V_{CE} = -30 \text{ V}$ $V_{CE} = -40 \text{ V}$ $V_{CE} = -50 \text{ V}$	$I_B = 0$ $I_B = 0$ $I_B = 0$ $I_B = 0$		BDW24 BDW24A BDW24B BDW24C		-0.5 -0.5 -0.5 -0.5	mA
$I_{CBO}$ Collector cut-off current	$V_{CB} = -45 \text{ V}$ $V_{CB} = -60 \text{ V}$ $V_{CB} = -80 \text{ V}$ $V_{CB} = -100 \text{ V}$	$I_E = 0$ $I_E = 0$ $I_E = 0$ $I_E = 0$		BDW24 BDW24A BDW24B BDW24C		-0.2 -0.2 -0.2 -0.2	mA
$I_{EBO}$ Emitter cut-off current	$V_{EB} = -5 \text{ V}$	$I_C = 0$				-2	mA
$h_{FE}$ Forward current transfer ratio	$V_{CE} = -3 \text{ V}$ $V_{CE} = -3 \text{ V}$ $V_{CE} = -3 \text{ V}$	$I_C = -1 \text{ A}$ $I_C = -2 \text{ A}$ $I_C = -6 \text{ A}$	(see Notes 3 and 4)		1000 750 100	20000	
$V_{CE(sat)}$ Collector-emitter saturation voltage	$I_B = -8 \text{ mA}$ $I_B = -60 \text{ mA}$	$I_C = -2 \text{ A}$ $I_C = -6 \text{ A}$	(see Notes 3 and 4)			-2 -3	V
$V_{BE(sat)}$ Base-emitter saturation voltage	$I_B = -8 \text{ mA}$	$I_C = -2 \text{ A}$	(see Notes 3 and 4)			-2.5	V
$V_{BE(on)}$ Base-emitter voltage	$V_{CE} = -3 \text{ V}$ $V_{CE} = -3 \text{ V}$	$I_C = -1 \text{ A}$ $I_C = -6 \text{ A}$	(see Notes 3 and 4)			-2.5 -3	V
$V_{EC}$ Parallel diode forward voltage	$I_E = -2 \text{ A}$	$I_B = 0$				-1.8	V

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			2.5	°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		$\mu\text{s}$
$t_{off}$ Turn-off time	$V_{BE(off)} = 4.5 \text{ V}$	$R_L = 10 \Omega$	$t_p = 20 \mu\text{s}$ , dc $\leq 2\%$		5		$\mu\text{s}$

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

TYPICAL CHARACTERISTICS

TYPICAL DC CURRENT GAIN  
VS  
COLLECTOR CURRENT

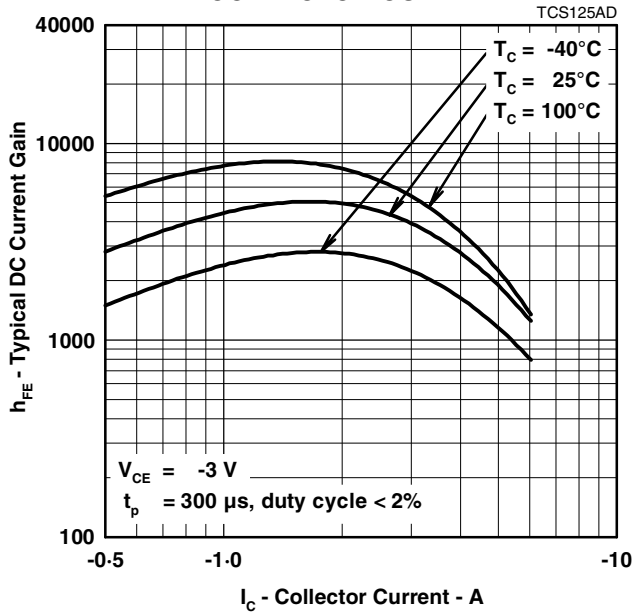


Figure 1.

COLLECTOR-EMITTER SATURATION VOLTAGE  
VS  
COLLECTOR CURRENT

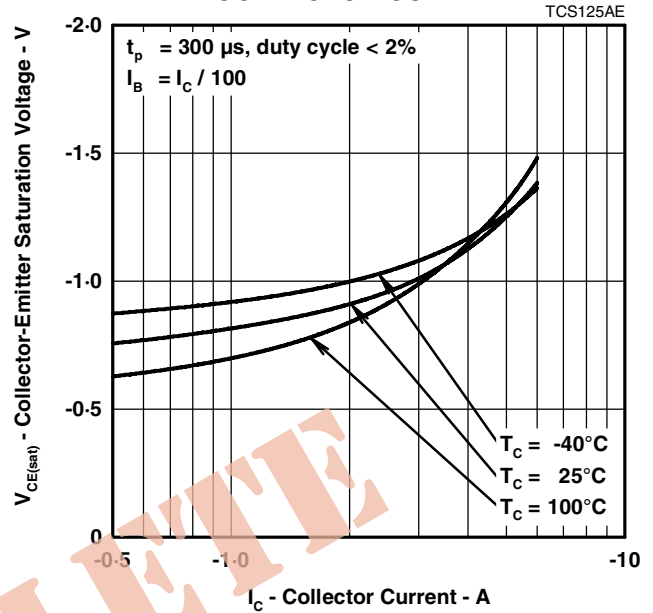


Figure 2.

BASE-EMITTER SATURATION VOLTAGE  
VS  
COLLECTOR CURRENT

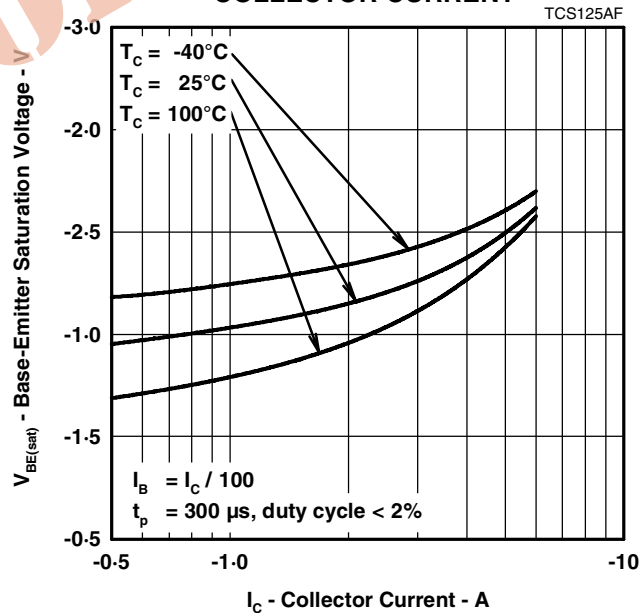


Figure 3.

**PRODUCT INFORMATION**

**MAXIMUM SAFE OPERATING REGIONS**

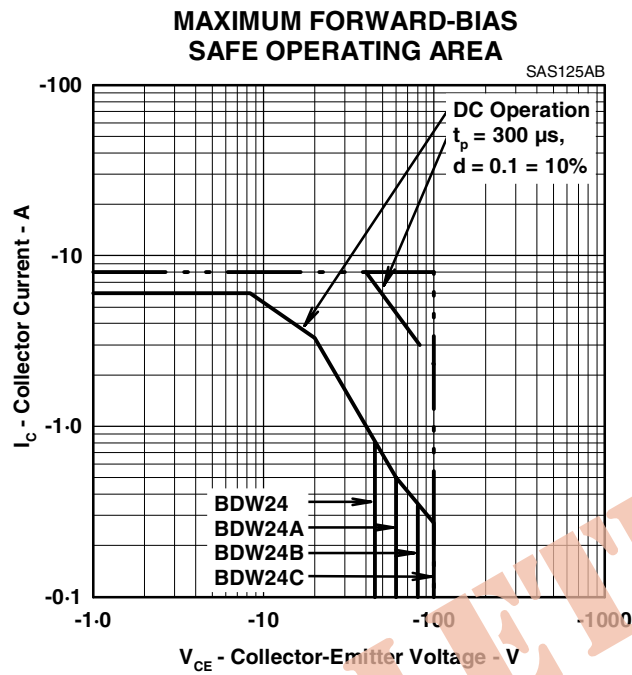


Figure 4.

**THERMAL INFORMATION**

**MAXIMUM POWER DISSIPATION  
vs  
CASE TEMPERATURE**

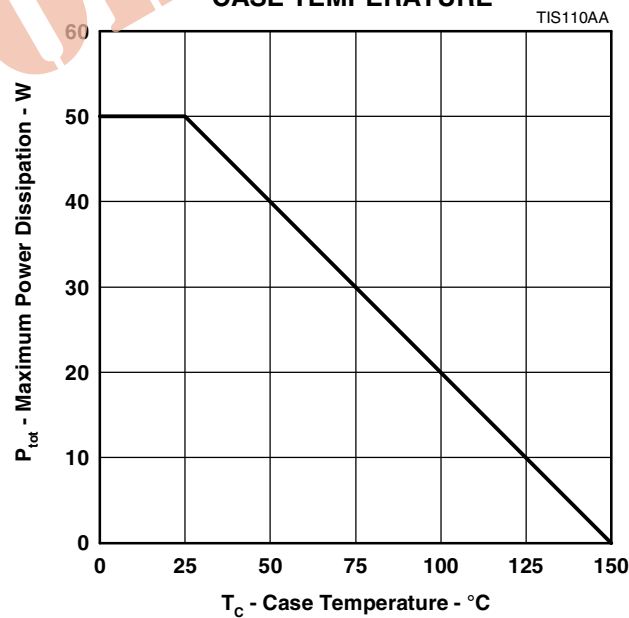


Figure 5.

**PRODUCT INFORMATION**