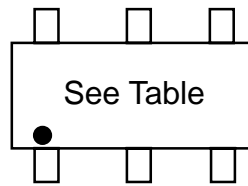
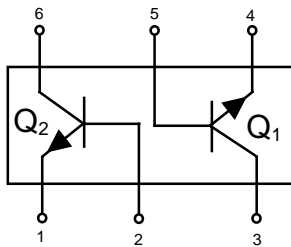


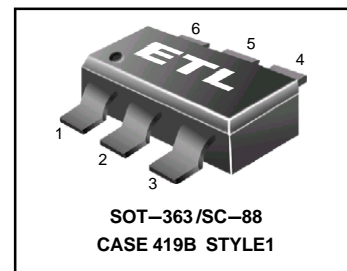
# Dual General Purpose Transistors

## NPN Duals

These transistors are designed for general purpose amplifier applications. They are housed in the SOT-363/SC-88 which is designed for low power surface mount applications.



**BC846BDW1T1**  
**BC847BDW1T1**  
**BC847CDW1T1**  
**BC848BDW1T1**  
**BC848CDW1T1**



## MAXIMUM RATINGS

Rating	Symbol	BC846	BC847	BC848	Unit
Collector-Emitter Voltage	$V_{CE0}$	65	45	30	V
Collector-Base Voltage	$V_{CBO}$	80	50	30	V
Emitter-Base Voltage	$V_{EBO}$	6.0	6.0	5.0	V
Collector Current -Continuous	$I_C$	100	100	100	mAdc

## THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation	$P_D$	380	mW
Per Device		250	mW
FR-5 Board, (1) $T_A = 25^\circ\text{C}$			
Derate above $25^\circ\text{C}$		3.0	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	328	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

1. FR-5 = 1.0 x 0.75 x 0.062 in.

## ORDERING INFORMATION

Device	Package	Shipping
BC846BDW1T1	SOT-363	3000 Units/Reel
BC847BDW1T1	SOT-363	3000 Units/Reel
BC847CDW1T1	SOT-363	3000 Units/Reel
BC848BDW1T1	SOT-363	3000 Units/Reel
BC848CDW1T1	SOT-363	3000 Units/Reel

**BC846BDW1T1, BC847BDW1T1, BC847CDW1T1, BC848BDW1T1, BC848CDW1T1**

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector–Emitter Breakdown Voltage ( $I_C = 10\text{ mA}$ )	$V_{(BR)CEO}$				V
BC846 Series		65	—	—	
BC847 Series		45	—	—	
BC848 Series		30	—	—	
Collector–Emitter Breakdown Voltage ( $I_C = 10\ \mu\text{A}$ , $V_{EB} = 0$ )	$V_{(BR)CES}$				V
BC846 Series		80	—	—	
BC847 Series		50	—	—	
BC848 Series		30	—	—	
Collector–Base Breakdown Voltage ( $I_C = 10\ \mu\text{A}$ )	$V_{(BR)CBO}$				V
BC846 Series		80	—	—	
BC847 Series		50	—	—	
BC848 Series		30	—	—	
Emitter–Base Breakdown Voltage ( $I_E = 1.0\ \mu\text{A}$ )	$V_{(BR)EBO}$				V
BC846 Series		6.0	—	—	
BC847 Series		6.0	—	—	
BC848 Series		5.0	—	—	
Collector Cutoff Current ( $V_{CB} = 30\text{ V}$ )	$I_{CBO}$	—	—	15	nA
( $V_{CB} = 30\text{ V}$ , $T_A = 150^\circ\text{C}$ )		—	—	5.0	$\mu\text{A}$

**ON CHARACTERISTICS**

DC Current Gain ( $I_C = 10\ \mu\text{A}$ , $V_{CE} = 5.0\text{ V}$ )	$h_{FE}$				—
BC846B, BC847B, BC848B		—	150	—	
BC847C, BC848C		—	270	—	
( $I_C = 2.0\text{ mA}$ , $V_{CE} = 5.0\text{ V}$ )					
BC846B, BC847B, BC848B		200	290	450	
BC847C, BC848C		420	520	800	
Collector–Emitter Saturation Voltage ( $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$ )	$V_{CE(sat)}$	—	—	0.25	V
( $I_C = 100\text{ mA}$ , $I_B = 5.0\text{ mA}$ )		—	—	0.6	
Base–Emitter Saturation Voltage ( $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$ )	$V_{BE(sat)}$	—	0.7	—	V
( $I_C = 100\text{ mA}$ , $I_B = 5.0\text{ mA}$ )		—	0.9	—	
Base–Emitter Voltage ( $I_C = 2.0\text{ mA}$ , $V_{CE} = 5.0\text{ V}$ )	$V_{BE(on)}$	580	660	700	mV
( $I_C = 10\text{ mA}$ , $V_{CE} = 5.0\text{ V}$ )		—	—	770	

**SMALL–SIGNAL CHARACTERISTICS**

Current–Gain — Bandwidth Product ( $I_C = 10\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ , $f = 100\text{ MHz}$ )	$f_T$	100	—	—	MHz
Output Capacitance ( $V_{CB} = 10\text{ V}$ , $f = 1.0\text{ MHz}$ )	$C_{obo}$	—	—	4.5	pF
Noise Figure ( $I_C = 0.2\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ , $R_S = 2.0\text{ k}\Omega$ , $f = 1.0\text{ kHz}$ , $BW = 200\text{ Hz}$ )	NF				dB
BC846B, BC847B, BC848B		—	—	10	
BC847C, BC848C		—	—	4.0	

BC846BDW1T1, BC847BDW1T1, BC847CDW1T1, BC848BDW1T1, BC848CDW1T1

TYPICAL CHARACTERISTICS

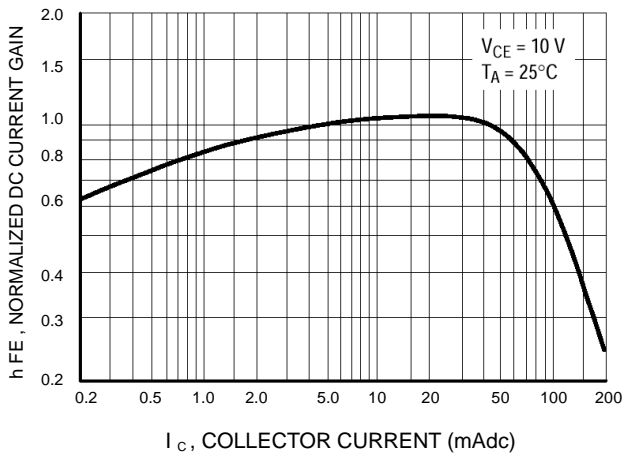


Figure 1. Normalized DC Current Gain

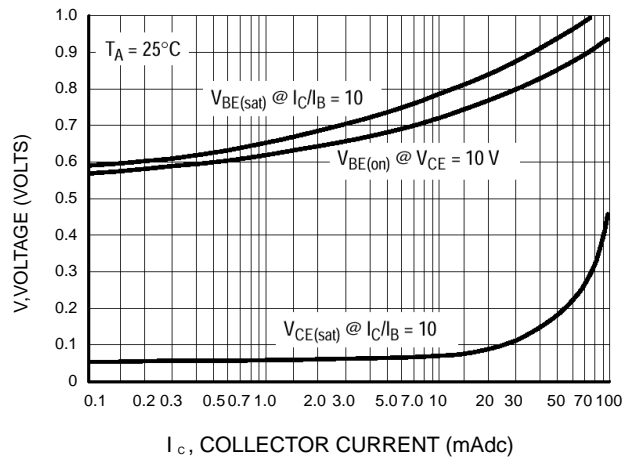


Figure 2. "Saturation" and "On" Voltages

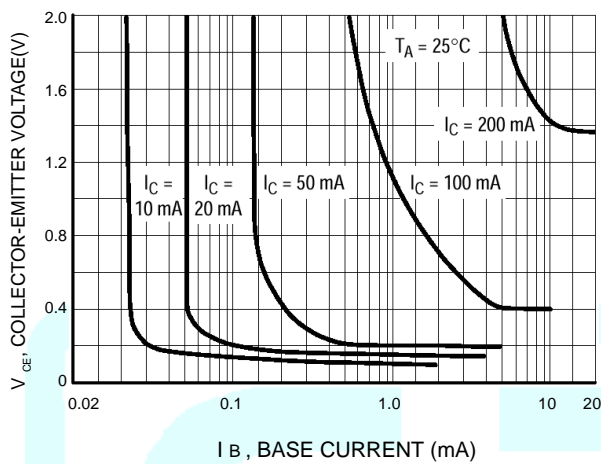


Figure 3. Collector Saturation Region

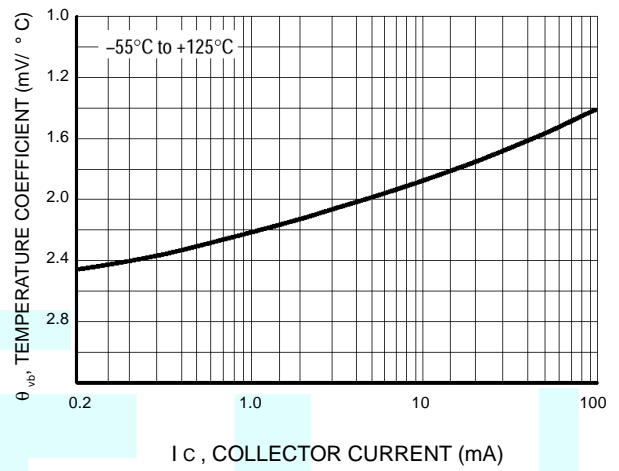


Figure 4. Base-Emitter Temperature Coefficient

BC846BDW1T1, BC847BDW1T1, BC847CDW1T1, BC848BDW1T1, BC848CDW1T1

TYPICAL CHARACTERISTICS

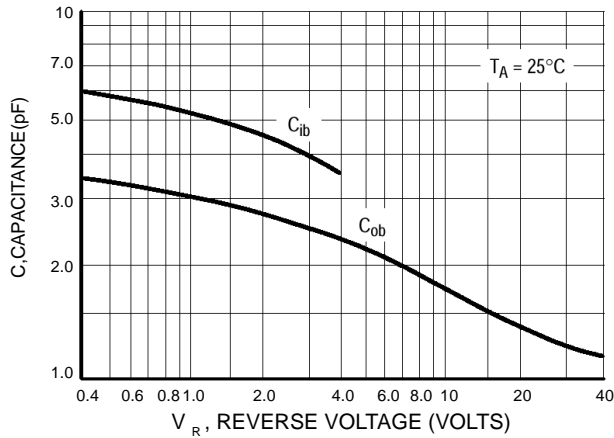


Figure 5. Capacitances

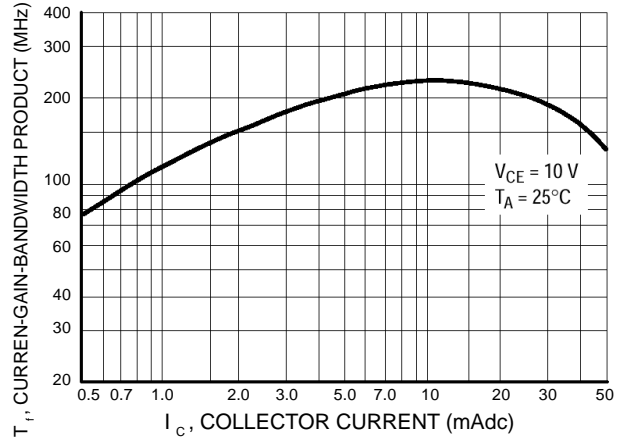


Figure 6. Current-Gain – Bandwidth Product

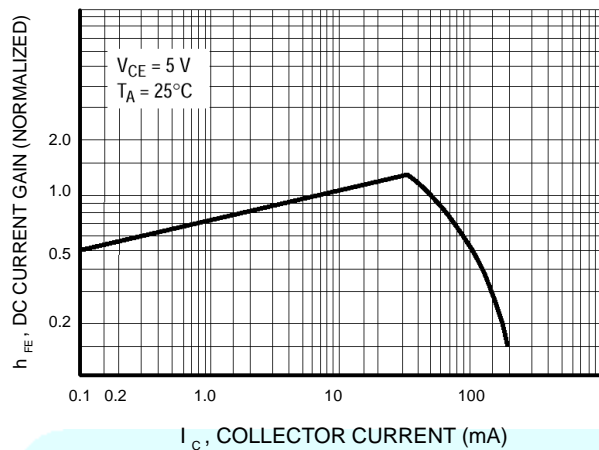


Figure 7. DC Current Gain

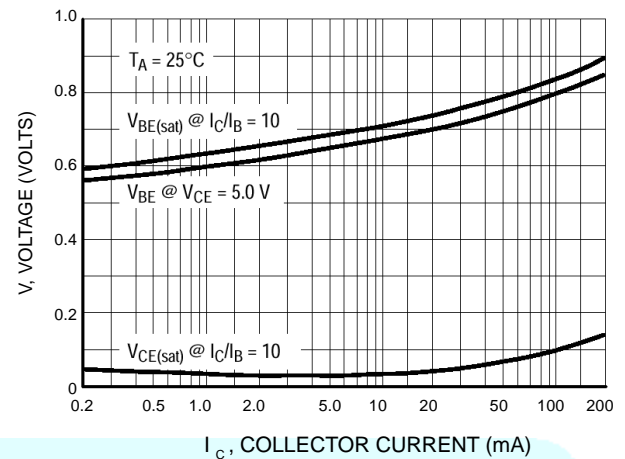


Figure 8. "On" Voltage

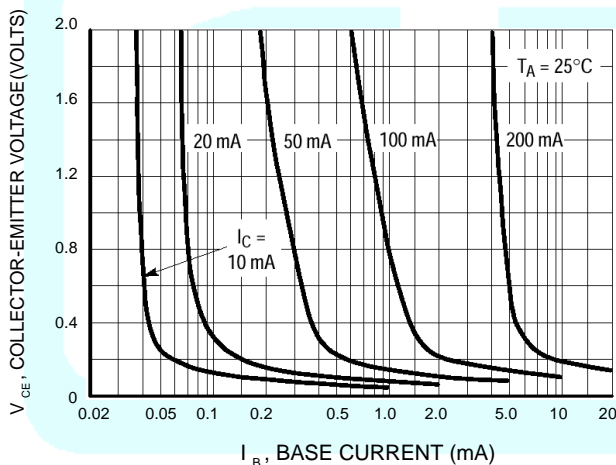


Figure 9. Collector Saturation Region

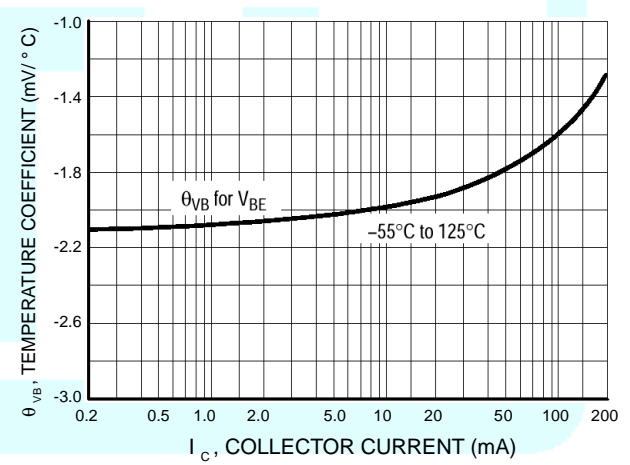
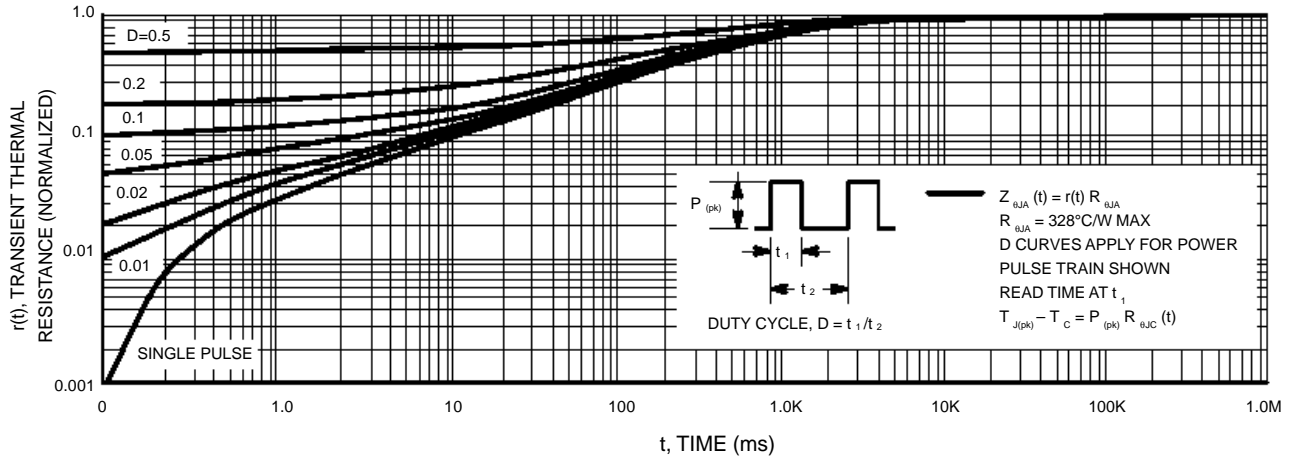
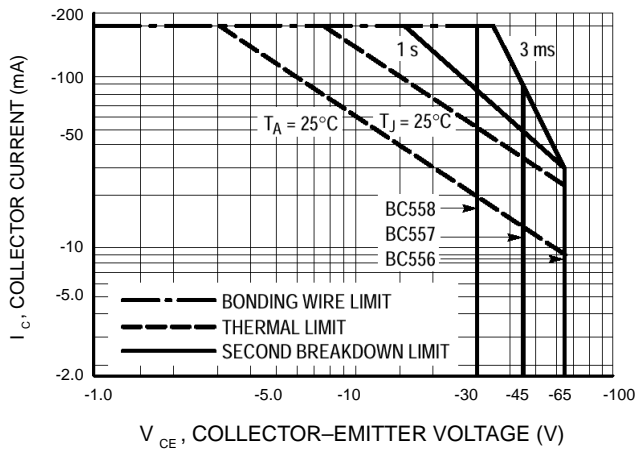


Figure 10. Base-Emitter Temperature Coefficient

**BC846BDW1T1, BC847BDW1T1, BC847CDW1T1, BC848BDW1T1, BC848CDW1T1**



**Figure 11. Thermal Response**



**Figure 12. Active Region Safe Operating Area**

The safe operating area curves indicate  $I_C - V_{CE}$  limits of the transistor that must be observed for reliable operation. Collector load lines for specific circuits must fall below the limits indicated by the applicable curve.

The data of Figure 12 is based upon  $T_{J(pk)} = 150^\circ\text{C}$ ;  $T_C$  or  $T_A$  is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided  $T_{J(pk)} \leq 150^\circ\text{C}$ .  $T_{J(pk)}$  may be calculated from the data in Figure 12. At high case or ambient temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by the secondary breakdown.

