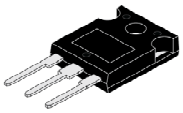
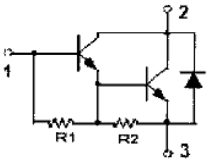
Silicon NPN Darlington Power Transistor

BDW83 / A/ B/ C



TO-3P



PIN 1. BASE
2.COLLECTOR
3. EMITTER

TO-3P
Leaded Plastic Package
RoHS compliant

FEATURES

1. Collector Current -Ic= 15A
2. High DC Current Gain-h_{FE}= 750(Min)@ Ic= 6A
3. Complement to Type BDW84/A/B/C

APPLICATION: Designed for general purpose amplifier and low speed switching applications.

ABSOLUTE MAXIMUM RATINGS (Ta = 25 ℃ Unless otherwise specified)

PARAMETER		SYMBOL	VALUE	UNIT
Collector-Emitter Voltage	BDW83	V_{CER}	45	V
	BDW83A		60	
	BDW83B		80	
	BDW83C		100	
Collector-Emitter Voltage	BDW83	V_{CEO}	45	V
	BDW83A		60	
	BDW83B		80	
	BDW83C		100	
Emitter-Base Voltage		V_{EBO}	5	V
Collector Current-Continuous		I_C	15	A
Base Current-Continuous		I_B	0.5	A
Collector Power Dissipation @ T_a=25'C		P_C	3.5	W
Collector Power Dissipation @ T_C=25°C			150	
Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{stg}	-65 to +150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction to Case	$R_{th\ j\text{-}c}$	0.83	°C/W
Thermal Resistance, Junction to Ambient	$R_{th\ j\text{-}a}$	35.7	°C/W

ELECTRICAL CHARACTERISTICS at (Ta = 25 ℃ Unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector-Emitter Breakdown Voltage	BDW83	$V_{(BR)CEO}$	I_C=30mA, I_B=0	45	--	--	V
	BDW83A			60	--	--	
	BDW83B			80	--	--	
	BDW83C			100	--	--	
Collector-Emitter Saturation Voltage		$V_{CE(sat)-1}$	I_C=6A,I_B= 12mA	--	--	2.5	V
Collector-Emitter Saturation Voltage		$V_{CE(sat)-2}$	I_C=15A,I_B= 150mA	--	--	4.0	V
Base-Emitter On Voltage		$V_{BE(on)}$	Ic= 6A , V_{CE}= 3V	--	--	2.5	V
C-E Diode Forward Voltage		V_{FEC}	I_F= 15A	--	--	3.5	V
Collector Cutoff Current	BDW83	I_{CEO}	V_{CE}= 30V, I_B= 0	--	--	1.0	A
	BDW83A		V_{CE}= 30V, I_B= 0	--	--		
	BDW83B		V_{CE}= 40V, I_B= 0	--	--		
	BDW83C		V_{CE}= 50V, I_B= 0	--	--		
Collector Cutoff Current	BDW83	I_{CBO}	V_{CB}= 45V,I_E= 0 V_{CB}=45V,I_E=0,T_C=150°C	--	--	0.5 5.0	mA
	BDW83A		V_{CB}= 60V,I_E= 0 V_{CB}=60V,I_E=0,T_C=150°C	--	--	0.5 5.0	
	BDW83B		V_{CB}= 80V, I_E= 0 V_{CB}=80V,I_E=0,Tc=150°C	--	--	0.5 5.0	
	BDW83C		V_{CB}=100V,I_E=0 V_{CB}=100V,I_E=0,Tc=150°C	--	--	0.5 5.0	
Emitter Cutoff Current		I_{EBO}	V_{EB}= 5V, Ic=0			2	mA
DC Current Gain		h_{FE-1}	Ic=6A,V_{CE}=3V	750		20000	
DC Current Gain		h_{FE-2}	Ic=15A, V_{CE}=3V	100			

Switching Time

Turn-on Time	ton	Ic=10A,I_{B1}= -I_{B2}=40mA, R_L= 3Ω, $V_{BE(OFF)}$= -4.2V		0.9		µs
Turn-off Time	toff			7.0		µs

TYPICAL CHARCTERISTIC CURVES

Fig 1. Typical DC Current Gain Vs.Collector Current

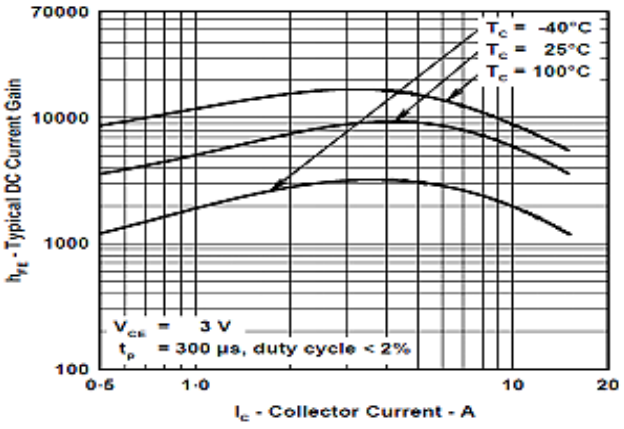


Fig 2. Collector-Emitter Saturation Voltage vs.Collector Current

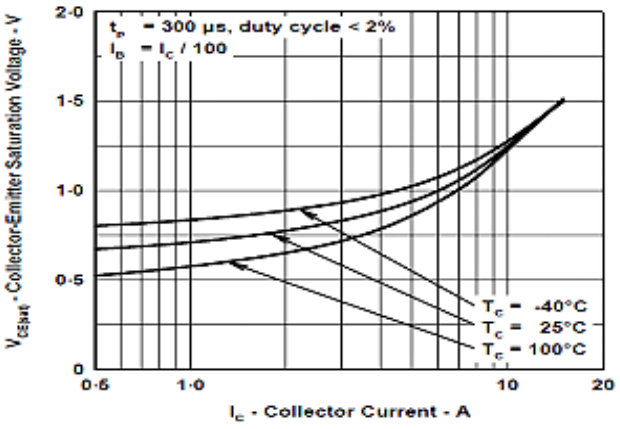


Fig 3. Base Emitter Saturation Voltage vs. Collector Current

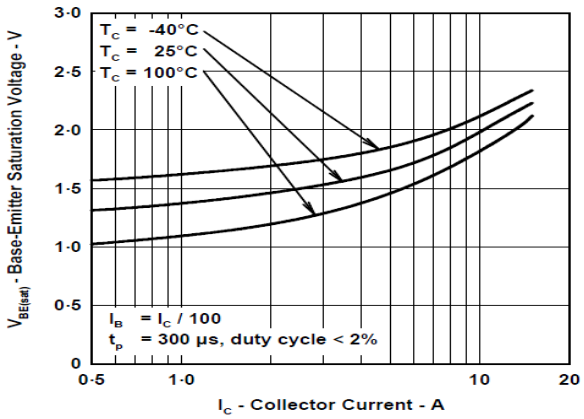


Fig 4. Maximum Forward-Bias Safe operating Area

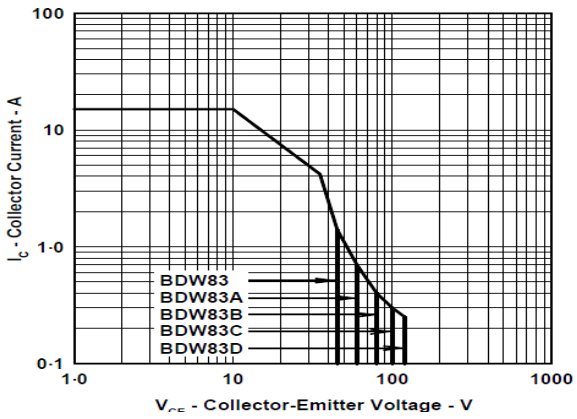
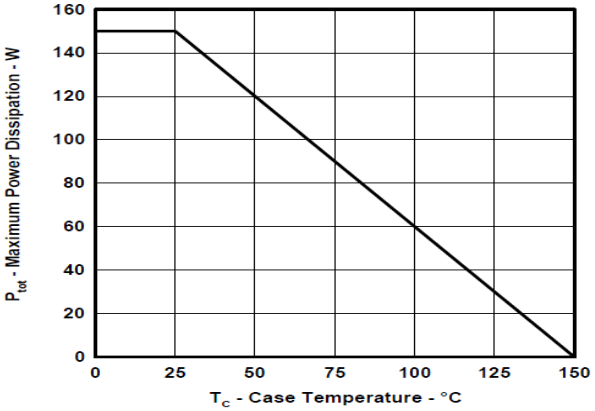
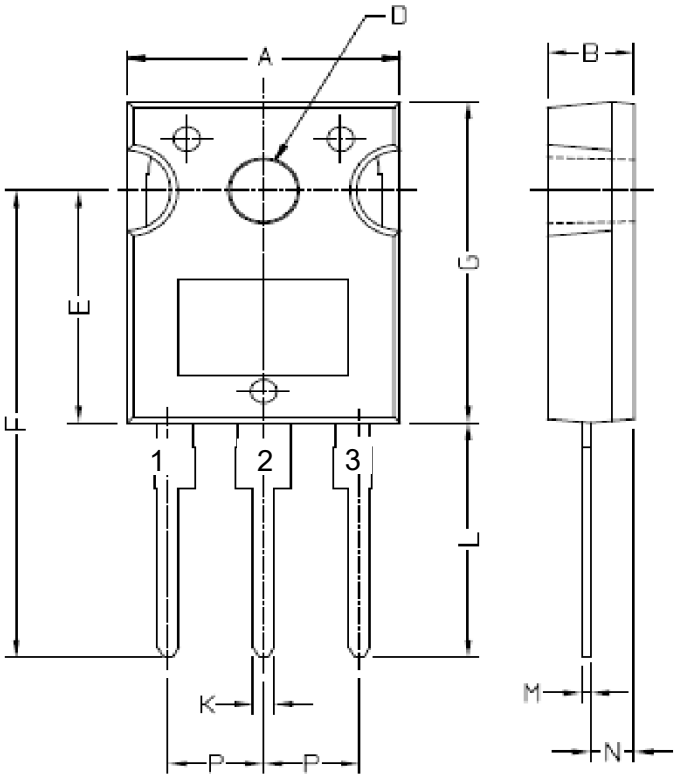


Fig 5. Maximum Power Dissipation vs.Cse temperature



PACKAGE DETAILS

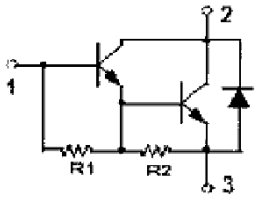
TO-3P Leaded Plastic Package



DIMENSIONS		
REF DIM	MIN	MAX
A	15.20	15.80
B	4.90	5.10
øD	3.90	4.10
E	14.20	14.80
F	28.20	30.50
G	19.80	20.20
K	1.00	1.30
L	13.90	14.50
M	0.40	0.60
N	2.00	2.75
P	5.20	5.70

ALL DIMENSION ARE MM

PINS CONFUGRATION



PIN 1. BASE
2. COLLECTOR
3. EMITTER

Recommended Reflow Solder Profiles

The recommended reflow solder profiles for Pb and Pb-free devices are shown below.

Figure 1 shows the recommended solder profile for devices that have Pb-free terminal plating, and where a Pb-free solder is used.

Figure 2 shows the recommended solder profile for devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with a leaded solder.

Figure 1

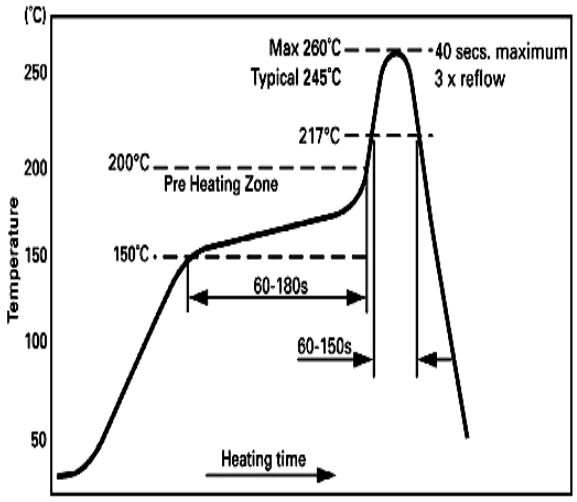
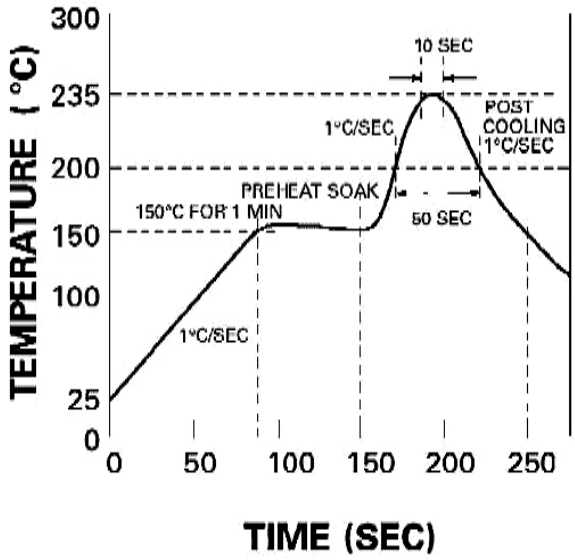


Figure 2

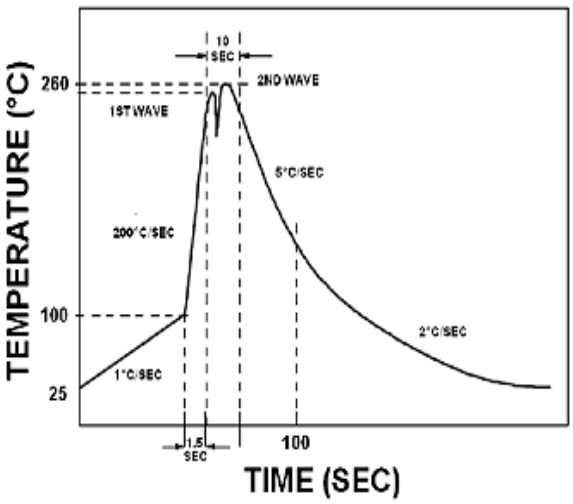


Reflow profiles in tabular form

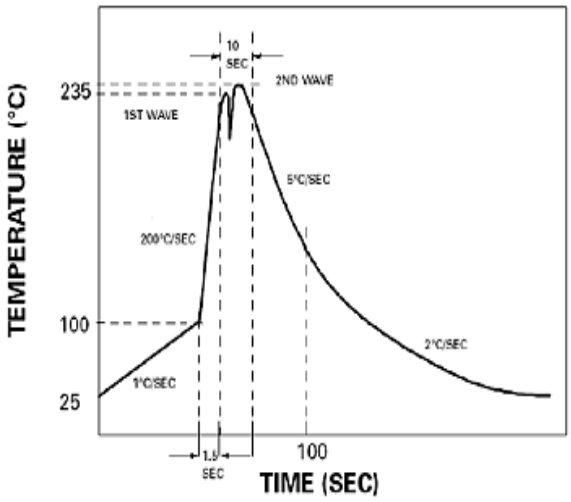
Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~3°C/second	~3°C/second
Preheat – Temperature Range – Time	 150-170°C 60-180 seconds	 150-200°C 60-180 seconds
Time maintained above: – Temperature – Time	 200°C 30-50 seconds	 217°C 60-150 seconds
Peak Temperature	235°C	260°C max.
Time within +0 -5°C of actual Peak	10 seconds	40 seconds
Ramp-Down Rate	3°C/second max.	6°C/second max.

Recommended Wave Solder Profiles

The Recommended solder Profile For Devices with Pb-free terminal plating where a Pb-free solder is used



The Recommended solder Profile For Devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with leaded solder



Wave Profiles in Tabular Form

Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~200°C/second	~200°C/second
Heating rate during preheat	Typical 1-2, Max 4°C/sec	ypical 1-2, Max 4°C/Se
Final preheat Temperature	Within 125°C of Solder Temp	hin 125°C of Solder Te
Peak Temperature	235°C	260°C max.
Time within +0 -5°C of actual Peak	10 seconds	10 seconds
Ramp-Down Rate	5°C/second max.	5°C/second max

Recommended Product Storage Environment for Discrete Semiconductor Devices

This storage environment assumes that the Diodes and transistors are packed properly inside the original packing supplied by CDIL.

- Temperature 5 °C to 30 °C
- Humidity between 40 to 70 %RH
- Air should be clean.
- Avoid harmful gas or dust.
- Avoid outdoor exposure or storage in areas subject to rain or water spraying .
- Avoid storage in areas subject to corrosive gas or dust. Product shall not be stored in areas exposed to direct sunlight.
- Avoid rapid change of temperature.
- Avoid condensation.
- Mechanical stress such as vibration and impact shall be avoided.
- The product shall not be placed directly on the floor.
- The product shall be stored on a plane area. They should not be turned upside down. They should not be placed against the wall.

Shelf Life of CDIL Products

The shelf life of products is the period from product manufacture to shipment to customers. The product can be unconditionally shipped within this period. The period is defined as 2 years.

If products are stored longer than the shelf life of 2 years the products shall be subjected to quality check as per CDIL quality procedure.

The products are further warranted for another one year after the date of shipment subject to the above conditions in CDIL original packing.

Floor Life of CDIL Products and MSL Level

When the products are opened from the original packing, the floor life will start.
For this, the following JEDEC table may be referred:

JEDEC MSL Level		
Level	**Time**	**Condition**
1	Unlimited	≤30 °C / 85% RH
2	1 Year	≤30 °C / 60% RH
2a	4 Weeks	≤30 °C / 60% RH
3	168 Hours	≤30 °C / 60% RH
4	72 Hours	≤30 °C / 60% RH
5	48 Hours	≤30 °C / 60% RH
5a	24 Hours	≤30 °C / 60% RH
6	Time on Label(TOL)	≤30 °C / 60% RH

Customer Notes

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

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