

BTB20D-800CW



THREE-QUADRANTS TRIAC

VOLTAGE: 800 Volts

CURRENT: 20 Amperes

Package: TO-263

FEATURES

- Highly di/dt For High Reliability
- Low Thermal Resistance Increases Carrying Capacity
- Very High Commutation Capability
- Packages Are RoHS (2011/65/EU) Compliant

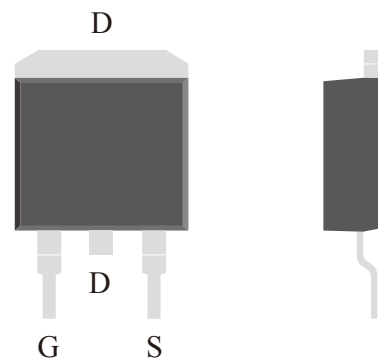
TYPICAL APPLICATIONS

- Phase Control Operation Of Light Dimmers And Motor Speed Controllers
- ON/OFF Control Operation Of Heating Regulation And Induction Motor

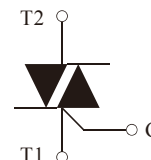
PRODUCT SUMMARY

Gear	CW	Unit
$I_{GT(I-II-III)} \text{ Max.}$	35	mA
$V_{DRM}/V_{RRM} \text{ Min.}$	800	V
$I_{T(RMS)}$	20	A

Diagram:



Polarity:



Absolute Maximum Ratings (Ta=25°C Unless otherwise specified)

Parameter	Test Conditions	Symbol	Ratings	Unit
Repetitive Peak Off-State Voltage		V_{DRM}	800	V
Repetitive Peak Reverse Voltage		V_{RRM}	800	V
RMS On-State Current	$T_c \leq 96^\circ\text{C}$	$I_{T(RMS)}$	20.0	A
Non Repetitive Surge Peak On-State Current	F= 50 Hz, T_p = 20 ms	I_{TSM}	200	A
	F= 60 Hz, T_p = 16.6 ms		220	
I^2T Value For Fusing	T_p = 10 ms	I^2t	200	A
Critical Rate Of Rise Of On-State Current	$I_G=2 \cdot I_{GT}$, $t_r \leq 100\text{ns}$	di/dt	100	A/ μs
	F= 100 Hz, T_j = 125 °C			
Peak Gate Current	T_p = 20 μs , T_j = 125 °C	I_{GM}	4.0	A
Average Gate Power Dissipation	T_j = 125 °C	$P_{G(AV)}$	0.5	W
Peak Gate Power Dissipation		P_{GM}	10.0	W

Thermal Characteristics (Ta=25°C Unless otherwise specified)

Parameter	Test Conditions	Symbol	Typ.	Unit
Operating Junction Temperature Range		T_j	-40 to 125	°C
Storage Temperature Range		T_{STD}	-40 to 150	
Thermal Resistance Junction To Ambient With Steady-State	Still Air Environment With $T_a=25^\circ\text{C}$	$R_{\theta JA}$	45.0	°C/W
Thermal Resistance Junction-Case With Steady-State	Device Mounted On 1 in2 FR-4 Board With 2oz. Copper	$R_{\theta JC}$	1.1	

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Electrical Characteristics (Ta=25°C Unless otherwise specified)

Parameter	Test Conditions	Symbol	Quadrant	Value	Unit
				CW	
Gate Trigger Current	$V_D=12V, R_L=33\Omega$	$I_{GT} M_{AX}$	I - II - III	35	mA
Max. Gate Trigger Voltage	$V_D=12V, R_L=33\Omega$	$V_{GT} M_{AX}$	I - II - III	1.0	V
Min. Gate Trigger Voltage	$V_D = V_{DRM}, T_j = 125^\circ C, R_L = 3.3K\Omega$	$V_{GD} M_{IN}$	I - II - III	0.2	V
Holding Current	$I_T = 500 \text{ mA}$	$I_H M_{AX}$		40	mA
Latching Current	$I_G = 1.2 * I_{GT}$	$I_L M_{AX}$	I - III	50	mA
			II	60	
Rise Of Off- State Voltage	$V_D = V_{DRM}, T_j = 125^\circ C, \text{Gate Open}$	$dv/dt M_{IN}$		1600	V/us

Static Characteristics (Ta=25°C Unless otherwise specified)

Parameter	Test Conditions	Symbol	T_j	Value	Unit
Peak On-State Voltage	$I_T = 28 \text{ A}$	$V_{TM} M_{AX}$	25°C	1.4	V
Threshold Voltage		$V_{TO} M_{AX}$	125°C	0.77	V
Dynamic resistance		$R_D M_{AX}$	125°C	20	mΩ
Peak Repetitive Forward Blocking Current	$V_D = V_{DRM}$	$I_{DRM} M_{AX}$	25°C	5	uA
	$V_D = V_{DRM}$		125°C	1.0	mA
Peak Repetitive Reverse Blocking Current	$V_R = V_{RRM}$	$I_{RRM} M_{AX}$	25°C	5	uA
	$V_R = V_{RRM}$		125°C	1.0	mA

Model and identification instructions

	BT	B	20	D	-	800	CW
Product Type							
BT=Trica							
Insulation Spec.:							
A=Ins.=Insulation							
B=No Ins.=No Insulation							
$I_{T(RMS)}$ Spec.:							
20=20A							
Package Spec.:							
D=TO-263							
"-"=Connection Symbol							
Constant And Unchanging							
V_{DRM}/V_{RRM} Spec.							
800 ≧ 800V							
I_{GT} Spec.							
CW:IGT MAX I - II - III ≧ 35mA							

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Typical Characteristics Curves

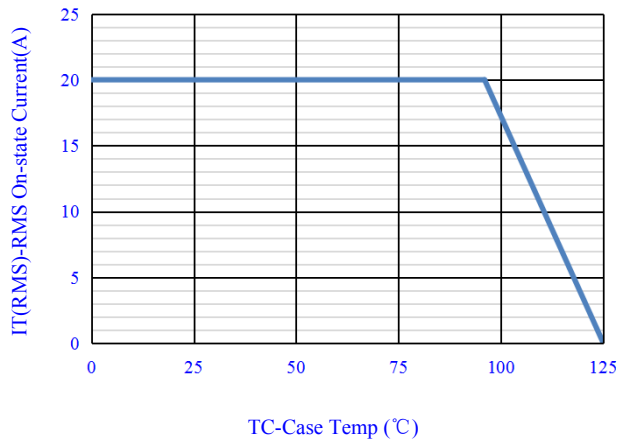


Fig.1-RMS on-state current vs. case temperature

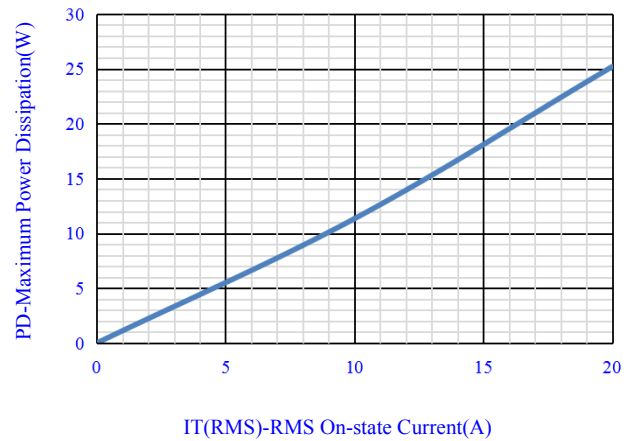


Fig.2- Maximum Power Dissipation Vs. on-state current

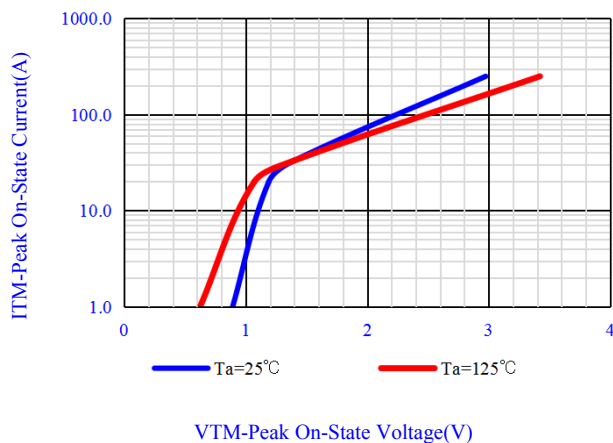


Fig.3-On-State Characteristics

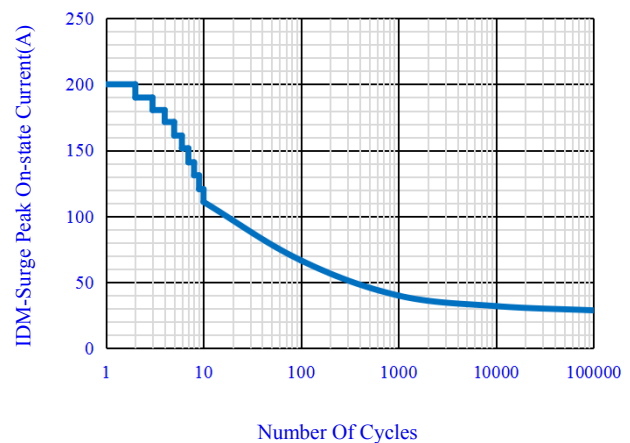


Fig.4- Surge Peak On-state Current Vs. Number Cycles

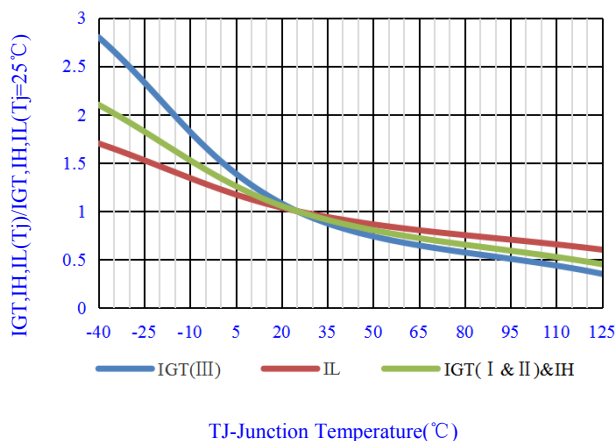


Fig.5- Relative Variation Of Gate Trigger Current, Holding Current And Latching Current Versus Junction Temperature (Typical Value)

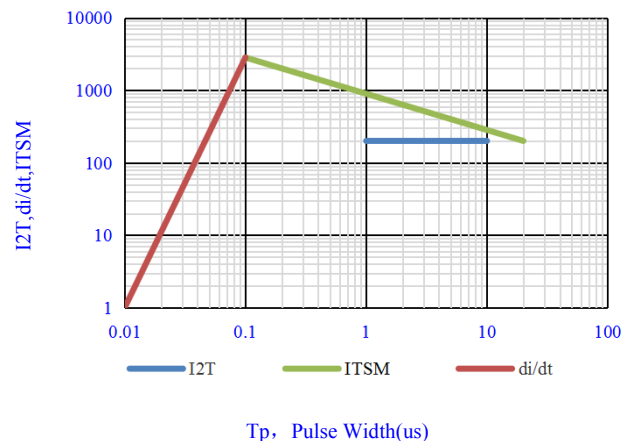


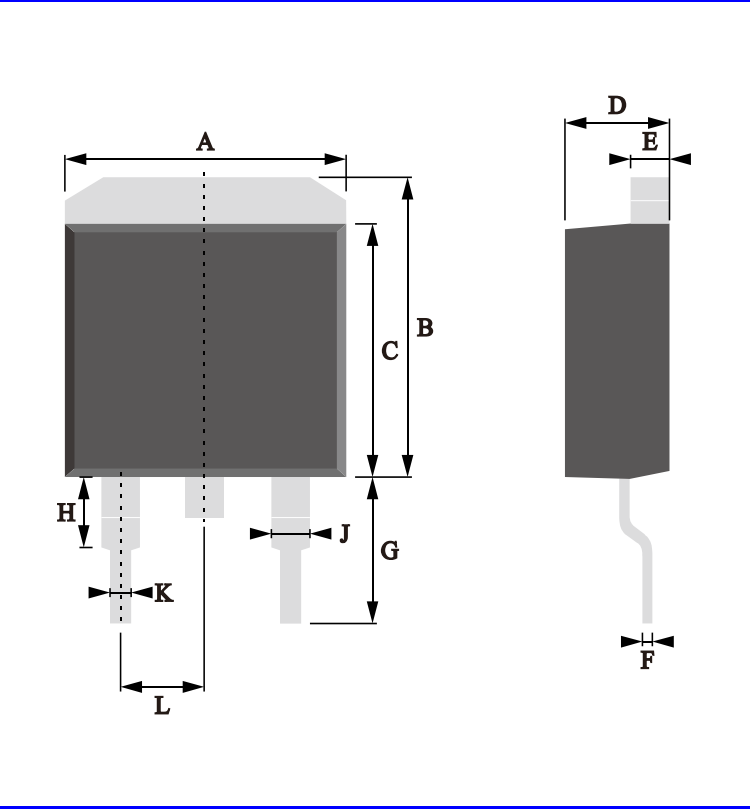
Fig.6- Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20\text{ms}$, and corresponding value of I_2t ($di/dt < 50\text{A}/\mu\text{s}$)

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OUTLINE DRAWINGS

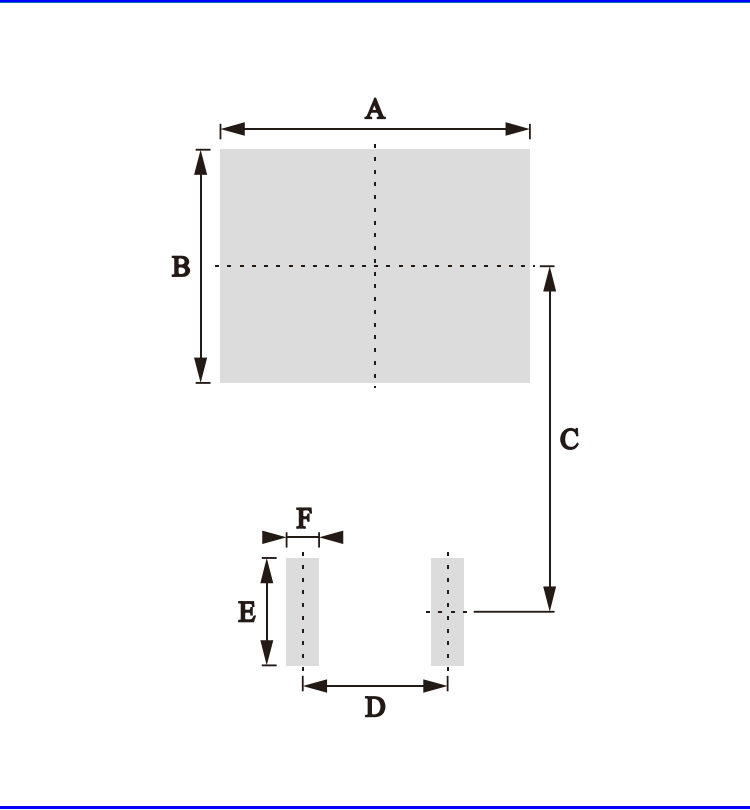
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OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.30	-	10.50	0.3661	-	0.4134
B	9.60	-	11.60	0.3780	-	0.4567
C	8.20	-	9.50	0.3228	-	0.3740
D	4.00	-	5.00	0.1575	-	0.1969
E	1.00	-	1.70	0.0394	-	0.0669
F	0.20	-	0.70	0.0079	-	0.0276
G	4.45	-	5.25	0.1752	-	0.2067
H	1.25	-	1.85	0.0492	-	0.0728
J	1.00	-	1.60	0.0394	-	0.0630
K	0.60	-	1.00	0.0236	-	0.0394
L	2.25	-	2.80	0.0886	-	0.1102

RECOMMEDND LAYOUT DRAWINGS

TO-263



OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	10.86	-	-	0.4276	-
B	-	7.86	-	-	0.3094	-
C	-	11.64	-	-	0.4583	-
D	-	5.08	-	-	0.2000	-
E	-	3.62	-	-	0.1090	-
F	-	1.14	-	-	0.0560	-

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MARKING INFORMATION



MARKING INSTRUCTIONS

NH=Niuhang Trademark
FF=Product Line Code,According To Actual Changes
YWW=Date Code,According To Actual Changes
LLWWF=Inernal Code,According To Actual Changes
BTB20D-800CW=Model

PACKING INFORMATION

Package Type	Package Code	Product Weight Approx(g/Pcs)	Package Method	Quantity (Pcs/Min. Pack.)	Quantity (Pcs/Inner Box)	Quantity (Pcs/Carton)
TO-263	P1	1.4331	13" Reel	800	800	4000
TO-263	P2	1.4331	13" Reel	800	800	4800

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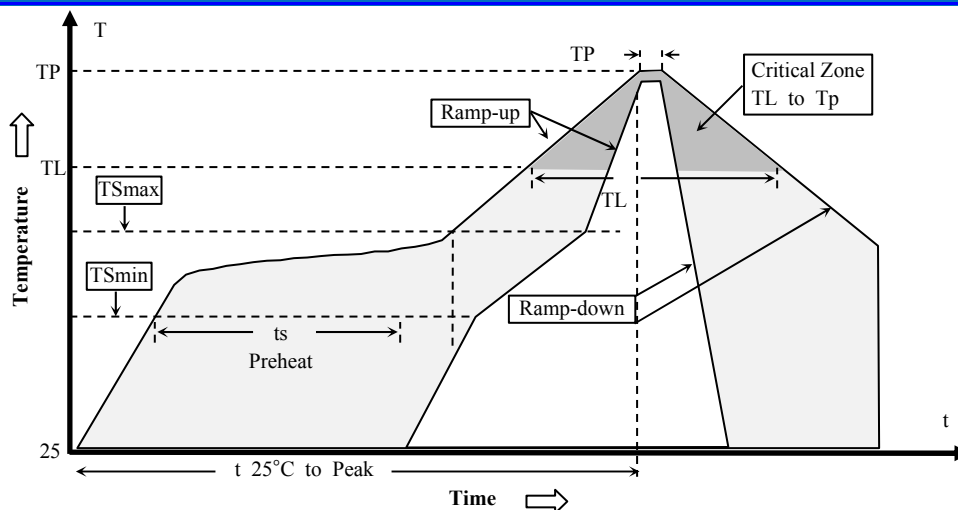
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Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T _{smax} to T _p)	3°C/second max.	3°C/second max.
Preheat -Temperature Min(TS min) -Temperature Max(TS max) -Time(ts min to ts max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (TL) - Time (tL)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

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