FR1000BX（BW）Fast Switching Reverse-conducting Thyristor

2500 V_{DRM}; 1550 A rms

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RCT FOR INVERTER AND CHOPPER APPLICATIONS

Features:

- **All Diffused Structure**
- **Interdigitated Amplifying Gate Configuration**
- **Blocking capabilty up to 2500 volts**
- **Guaranteed Maximum Turn-Off Time**
- **High dV/dt Capability**
- **Pressure Assembled Device**

ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking - Off State

Device Type	V_{DRM} (1)	V_{DSM} (1)
FR1000BX50	2500	2500
FR1000BW50	2500	2500

V_{DRM} = Repetitive peak off state voltage

Repetitive peak off state leakage	I_{DRM}	20 mA 80mA (3)
Critical rate of voltage rise	dV/dt (4)	700 V/μsec

Notes:
All ratings are specified for Tj=25 °C unless otherwise stated.
(1) All voltage ratings are specified for an applied 50Hz/60zHz sinusoidal waveform over the temperature range -40 to +125 °C.
(2) 10 msec. max. pulse width
(3) Maximum value for Tj = 125 °C.
(4) Minimum value for linear and exponential waveshape to 80% rated V_{DRM}. Gate open. Tj = 125 °C.
(5) Non-repetitive value.

Conducting - on state

Parameter	Symbol		Max.	Typ.	Units	Conditions
RMS value of on-state current	I_{TRMS}		1550		A	Nominal value
Average on-state current	$I_{T(AV)}$	FR1000BX FR1000BW	 1000		**A**	Continuous single-phase,half sine wave,180°conduction
Peak one cycle surge (non repetitive) current	I_{TSM}		14000		A	8.3 msec (60Hz), sinusoidal wave-shape, 180° conduction, T_j = 125 °C
I square t	I^2t		8.2.x 10^5		A^2s	8.3 msec and 10.0 msec
RNS reverse currrnt	$I_{R(RMS)}$		630		A	
Average reverse current	$I_{R(AV)}$		400		A	Continuous single-phase,half sine wave,180°conduction
Peak on-state voltage	V_{TM}	FR1000BX FR1000BW	2.2 3.0		V	I_{TM}=1000A T_j = 125 °C I_{TM} =2400A; T_j = 125 °C
Peak reverse voltage	V_{RM}		4		V	I_{RM}=1200A, T_j = 125 °C
Critical rate of rise of on-state current	di/dt		300		A/μs	V_D=1/2V_{DRM},I_{TM}=800A f=60Hz I_{GM}=1.5A,di_G/dt=1.0A/us,Tj=125℃
Critical rate of decrease of reverse conmmutating current	$(di/dt)_C$	FR1000BX FR1000BW	200		A/μs	I_{TM}=4000A,tw=60us,I_{RM}=4000A,dv/dt=700V/us,V_{DM}=1/2V_{DRN},Tj=125℃,Saturable reactor7500v.us

ELECTRICAL CHARACTERISTICS AND RATINGS (cont.)

Gating

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	P_{GM}		16		W	t_p = 40 us
Average gate power dissipation	$P_{G(AV)}$		8		W	
Peak gate current	I_{GM}		10		A	
Gate current required to trigger all units	I_{GT}		350		mA	V_D = 6 V;R_L = 2 ohms;T_j = +25 ^oC
Gate voltage required to trigger all units	V_{GT}		4		V	V_D = 6 V;R_L = 2 ohms;T_j = 25^oC
Peak non- trigger voltage	V_{GD}		0.2		V	T_j = 125 ^oC;V_D=1/2V_{DRM}

Dynamic

Parameter	Symbol	.	Max.	Typ.	Units	Conditions
Turn-off time	t_q	FR1000BX FR1000BW	35 50		µs	I_{TM} =4000 A; di_1/dt = -200A/µs; di_2/dt=50A/us,I_{RM}=500A; dV/dt =700 V/µs V_{DR}=1250V T_j = 125 ^oC;tw=60us

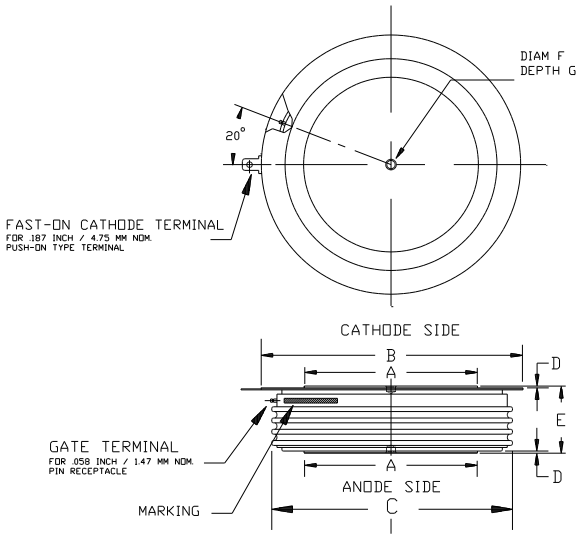
* For guaranteed max. value, contact factory.

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T_j	-40	+125		^oC	
Storage temperature	T_{stg}	-40	+150		^oC	
Thyristor part thermal resistance - junction to fin	$R_{\theta I\ (j-f)}$		0.022		$^oC/W$	Double sided cooled
Diode part thermal resistamce – junction to fin	$R_{\theta III\ (j-f)}$		0.070		$^oC/W$	Double sided cooled
Mounting force	P				lb. kN	
Weight	W				g	

* Mounting surfaces smooth, flat and greased

Note : for case outline and dimensions, see case outline drawing in page 4 of this Technical Data



CASE 6T
NOMINAL OUTLINE DIMENSIONS

DIMENSIONS	INCH	MM
DIAM. A	2.47	62.7
DIAM. B	3.91	99.3
DIAM. C	3.50	88.9
D	.030	.76
E	1.300 / 1.340	32.02 / 34.04
F	.140	3.56
G	.080	2.03