KN400/1300V Fast Switching Reverse-conducting Thyristor

1300 V_{DRM}; 630 A rms

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RCT FOR INVERTER AND CHOPPER APPLICATIONS

Features:

- **. All Diffused Structure**
- **. Interdigitated Amplifying Gate Configuration**
- **. Blocking capabilty up to1300 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)
KN400/1300	1300	1300

V_{DRM} = Repetitive peak off state voltage

Repetitive peak off state leakage	I_{DRM}	10 mA 35mA (3)
Critical rate of voltage rise	dV/dt (4)	500 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 +115 °C.
(2) 10 msec. max. pulse width
(3) Maximum value for Tj = 115 °C.
(4) Minimum value for linear and exponential waveshape to 80% rated V_{DRM}. Gate open. Tj = 115 °C.
(5) Non-repetitive value.

Conducting - on state

Parameter	Symbol		Max.	Typ.	Units	Conditions
RMS value of on-state current	I_{TRMS}		630		A	Nominal value
Average on-state current	$I_{T(AV)}$		400		**A**	Continuous single-phase,half sine wave,180°conduction
Peak one cycle surge (non repetitive) current	I_{TSM}		7000		A	8.3 msec (60Hz), sinusoidal wave-shape, 180° conduction, T_j = 115 °C
I square t	I^2t		$2.0x10^5$		A^2s	8.3 msec and 10.0 msec
RNS reverse currrnt	$I_{R(RMS)}$		235		A	
Average reverse current	$I_{R(AV)}$		150		A	Continuous single-phase,half sine wave,180°conduction
Peak on-state voltage	V_{TM}		3.0		V	I_{TM} =1200A; T_j = 25 °C
Peak reverse voltage	V_{RM}		2.5		V	I_{RM}=500A, T_j = 25 °C
Critical rate of rise of on-state current	di/dt		100		A/μs	V_D=1/2V_{DRM},I_{TM}=800A f=60H_Z I_{GM}=1.5A,di_G/dt=1.0A/us,Tj=115℃
Critical rate of decrease of reverse conmmutating current	$(di/dt)_C$		200		A/μs	I_{TM}=2000A,tw=60us,I_{RM}=1000A, V_{DM}=1/2V_{DRN},Tj=115℃

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		40		μs	I_{TM} = 400 A;; ,I_{RM}=500A; dV/dt(C) =200 V/μs V_D=650V T_j = 115 ^oC;tw=60us

* For guaranteed max. value, contact factory.

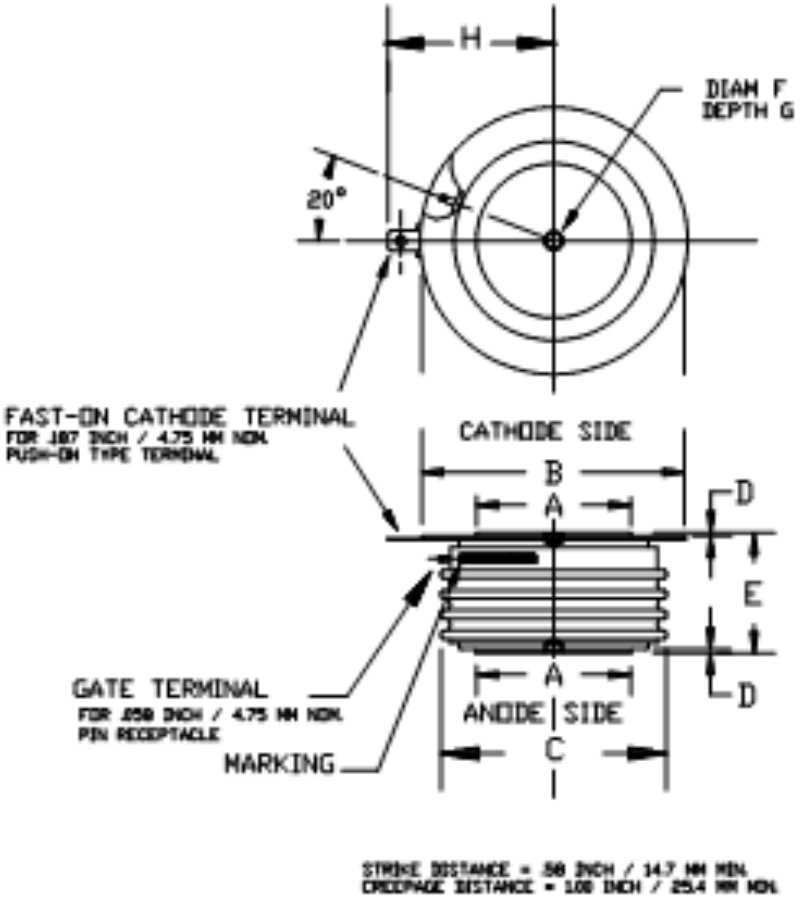
THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T_j	-40	+115		^oC	
Storage temperature	T_{stg}	-40	+150		^oC	
Thyristor part thermal resistance - junction to fin	$R_{\theta I\ (j-f)}$		0.04		$^oC/W$	Double sided cooled
Diode part thermal resistamce – junction to fin	$R_{\theta III\ (j-f)}$		0.10		$^oC/W$	Double sided cooled
Mounting force	P	14.5	16.7		kN	
Weight	W			360	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 OUTLINE AND DIMENSIONS. Reverse-conducting Thyristor



DIMENSIONS	Min mm	Max mm	Min in	Max in
DIAN A	35.02	40.29	1.38	1.58
DIAN B	62.88	65.50	2.47	2.57
DIAN C	-----	56.61	-----	2.23
D	0.76	------	0.03	----
E	25.40 (13.72)	27.08 (15.24)	1.00 (0.54)	1.07 (0.60)
F	3.3	3.81	0.13	0.15
G	1.78	2,03	0.07	0.08