P S T N 1 6 0 0 C H - Power Thyristor

400 - 1200 V_{DRM}; 8165Arms

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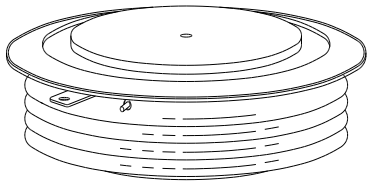
HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS

Features:

- **All Diffused Structure**
- **Linear Amplifying Gate Configuration**
- **Blocking capabilty up to 1200 volts**
- **Guaranteed Maximum Turn-Off Time**
- **High dV/dt Capability**
- **Pressure Assembled Device**

CASE 5T



ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking - Off State

Device Type	V_{RRM} (1)	V_{DRM} (1)	V_{RSM} (1)
N1600CH04	400	400	500
N1600CH06	600	600	700
N1600CH08	800	800	900
N1600CH10	1000	1000	1100
N1600CH12	1200	1200	1300

V_{RRM} = Repetitive peak reverse voltage
V_{DRM} = Repetitive peak off state voltage
V_{RSM} = Non repetitive peak reverse voltage (2)

Repetitive peak reverse leakage and off state leakage	I_{RRM} / I_{DRM}	10 mA 150 mA (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 +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.
(6) The value of di/dt is established in accordance with EIA/NIMA Standard RS-397, Section 5-2-2-6. The value defined would be in addition to that obtained from a snubber circuit, comprising a 0.2 μF capacitor and 20 ohms resistance in parallel with the thristor under test.

Conducting - on state

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	$I_{T(AV)}$		4000		A	Sinewave,180° conduction,T_c=55°C
RMS value of on-state current	I_{TRMS}		8165		A	Nominal value
Peak one cycle surge (non repetitive) current	I_{TSM}		64000		A	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, T_j = 125 °C
I square t	I^2t		$24.5x10^6$		A^2s	10.0 msec
Latching current	I_L		400		mA	V_D = 24 V; R_L= 12 ohms
Holding current	I_H		100		mA	V_D = 24 V; I = 2.5 A
Peak on-state voltage	V_{TM}		1.25		V	I_{TM} =3000 A; Duty cycle ≤ 0.01%
Critical rate of rise of on-state current (5, 6)	di/dt		300		A/μs	Switching from V_{DRM} ≤ 1000 V, non-repetitive
Critical rate of rise of on-state current (6)	di/dt		150		A/μs	Switching from V_{DRM} ≤ 1000 V

Gating

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	P_{GM}		200		W	t_p = 40 us
Average gate power dissipation	$P_{G(AV)}$		5		W	
Peak gate current	I_{GM}		15		A	
Gate current required to trigger all units	I_{GT}		300 200 125		mA mA mA	V_D = 6 V;R_L = 3 ohms;T_j = -40 °C V_D = 6 V;R_L = 3 ohms;T_j = +25 °C V_D = 6 V;R_L = 3 ohms;T_j = +125°C
Gate voltage required to trigger all units	V_{GT}	 0.30	5 4 		V V V	V_D = 6 V;R_L = 3 ohms;T_j = -40 °C V_D = 6 V;R_L = 3 ohms;T_j = 0-125°C V_D = Rated V_{DRM}; R_L = 1000 ohms; T_j = + 125 °C
Peak negative voltage	V_{GRM}		15		V	

Dynamic

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d		3.0	2.5	μs	I_{TM} = 50 A; V_D = 1500 V Gate pulse: V_G = 20 V; R_G = 20 ohms; t_r = 0.1 μs; t_p = 20 μs
Turn-off time (with V_R = -50 V)	t_q		400	250	μs	I_{TM} > 2000 A; di/dt = 10 A/μs; V_R ≥ -50 V; Re-applied dV/dt = 20 V/μs linear to 80% V_{DRM}; V_G = 0; T_j = 125 °C; Duty cycle ≥ 0.01%
Reverse recovery current	I_{rr}		200		A	I_{TM} > 2000 A; di/dt = 10 A/μs; V_R ≥ -50 V

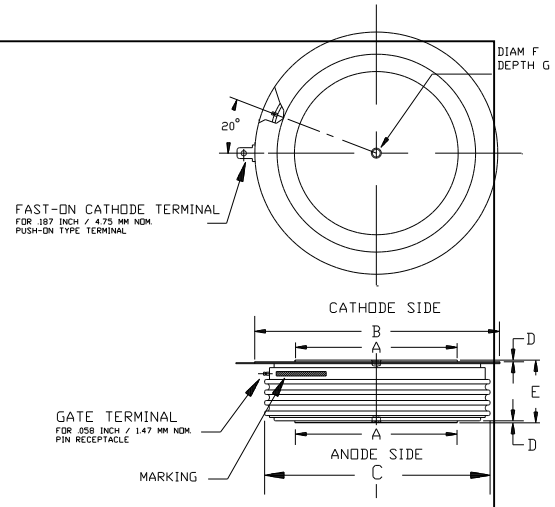
THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T_j	-40	+125		°C	
Storage temperature	T_{stg}	-40	+150		°C	
Thermal resistance - junction to case	$R_{e\,(j\text{-}c)}$		0.012		°C/W	Double sided cooled Single sided cooled
Thermal resistamce - case to sink	$R_{e\,(c\text{-}s)}$		0.002		°C/W	Double sided cooled * Single sided cooled *
Mounting force	P	8000 35.5	10000 44.4		lb. kN	
Weight	W			3.5 1.60	Lb. Kg.	

* 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. N1600CH- Power Thyristor



CASE 5T
NOMINAL OUTLINE DIMENSIONS

DIMENSIONS	INCH	MM
DIAM. A	2.88	73.2
DIAM. B	4.36	110.7
DIAM. C	3.95	100.3
D	.030	.76
E	1.400 / 1.440	35.56 / 36.58
F	.140	3.56
G	.080	2.03

STRIKE DISTANCE = 1.04 inch / 26.4 mm MIN.
CREEPAGE DISTANCE = 1.64 inch / 41.6 mm MIN.