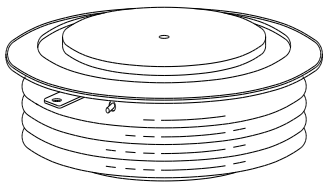
YN1712VC300

HIGH POWER THYRISTOR PHASE CONTROL APPLICATIONS

Features:

- **All Diffused Structure**
- **Spoke Amplifying Gate Configuration**
- **Guaranteed Maximum Turn-Off Time**
- **High dV/dt Capability**
- **Pressure Assembled Device**

CASE 6T



ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking - Off State

Device Type	V_{RRM} (1)	V_{DRM} (1)	V_{RSM} (1)
YN1712VC300	3000	3000	3100

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 90 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	$I_{T(AV)}$		1500		A	Sinewave,180° conduction,T_c=65°C
RMS value of on-state current	I_{TRMS}		2350		A	Nominal value
Peak one cpstcle surge (non repetitive) current	I_{TSM}		22500 20300		A A	8.3 msec (60Hz), sinusoidal wave-shape, 180° conduction, T_j = 125 °C 10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, T_j = 125 °C
I square t	I^2t		$2.3x10^6$		A^2s	8.3 msec
Latching current	I_L		500		mA	V_D = 24 V; R_L= 12 ohms
Holding current	I_H		500		mA	V_D = 24 V; I = 2.5 A
Peak on-state voltage	V_{TM}		2.62		V	I_{TM} = 3200 A; Tj = 125 °C
Critical rate of rise of on-state current (5, 6)	di/dt		250		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

ELECTRICAL CHARACTERISTICS AND RATINGS (cont'd) YN1712VC300 - Power Thyristor

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}		20		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}		20		V	

Dynamic

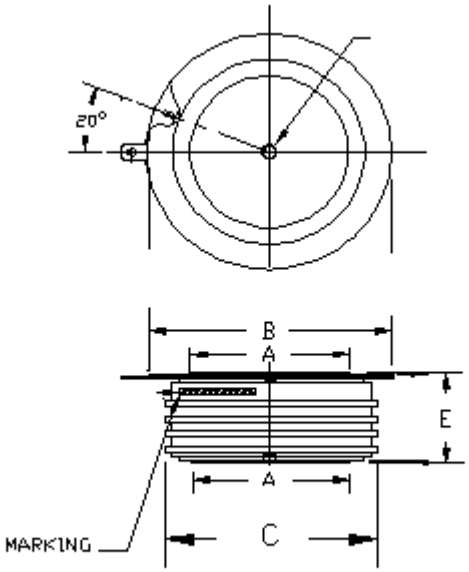
Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d		2.0		µs	I_{TM} = 50 A; V_D = 67% V_{DRM} Gate pulse: V_G = 30 V; R_G = 10 ohms; t_r = 0.1 µs; t_p = 20 µs
Turn-off time (with V_R = -50 V)	t_q		250		µs	I_{TM} > 2000 A; di/dt = 10 A/µs; V_R ≥ -50 V; Re-applied dV/dt = 20 V/µs linear to 67% V_{DRM} ; T_j = 125 °C; Duty cpstcle ≥ 0.01%
Reverse recovery current	I_{rr}		150		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	$R_{e\,(j\text{-}c)}$		0.017		°C/W	Double sided cooled
Thermal resistamce - case to sink	$R_{e\,(c\text{-}s)}$		0.003		°C/W	Double sided cooled *
Mounting force	P	 35.5	 44.4		 kN	
Weight	W				Lb. g.	

* Mounting surfaces smooth, flat and greased

Note : for case outline and dimensions, see case outline drawing in page 3 of this Technical Data



A:	**63**	**mm**
B:	**98**	**mm**
C:	**88**	**mm**
E:	**32**	**mm**