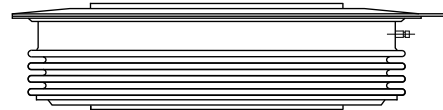


Phase Control Thyristors (Hockey PUK Version), 3370A

FEATURES

- Center amplifying gate
- Metal case with ceramic insulator
- International standard case Nell's DX-type Capsule
- Compliant to RoHS
- Low on-state and switching losses
- Designed and qualified for industrial level



Nell's DX-type Capsule

TYPICAL APPLICATIONS

- DC and AC motor controls
- Controlled DC power supplies
- AC controllers

PRODUCT SUMMARY

$I_{T(AV)}$	3370A
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MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNIT
$I_{T(AV)}$	Double side cooled, single phase, 50Hz, 180° half-sine wave $T_{hs}=70^{\circ}\text{C}$	3370	A
	Double side cooled, single phase, 50Hz, 180° half-sine wave $T_{hs}=55^{\circ}\text{C}$	4070	
$I_{T(RMS)}$	$T_{hs}=70^{\circ}\text{C}$	5290	A
	$T_{hs}=25^{\circ}\text{C}$	8100	
I_{TSM}	50 HZ	49000	A
	60 HZ	51300	
I^2t	50 HZ	12005	Ka^2s
	60 HZ	10922	
V_{DRM}/V_{RRM}		1200 to 1600	V
T_q	Typical	200	μs
T_J		-40 to 125	$^{\circ}\text{C}$

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS

TYPE NUMBER	VOLTAGE CODE	V_{DRM}/V_{RRM} , MAXIMUM REPETITIVE PEAK AND OFF-STATE VOLTAGE V	V_{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I_{DRM}/I_{RRM} , MAXIMUM AT $T_J = T_J$ MAXIMUM mA
3370PTxxDX0	12	1200	1300	200
	14	1400	1500	
	16	1600	1700	

FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNIT
Maximum average current at heatsink temperature	I _{T(AV)}	180° conduction, half sine wave double side (single side) cooled			3370(2300)	A
					70(55)	°C
Maximum RMS on-state current	I _{T(RMS)}	DC at 25°C heatsink temperature double side cooled			8100	A
Maximum peak, one cycle non-reptitive surge current	I _{TSM}	t = 10ms	No voltage reapplied	Sinusoidal half wave, initial T _J = T _J maximum	49000	A
		t = 8.3ms			51300	
		t = 10ms	100%V _{RRM} reapplied		41160	
		t = 8.3ms			43090	
Maximum I ² t for fusing	I ² t	t = 10ms	No voltage reapplied		12005	kA ² s
		t = 8.3ms			10922	
		t = 10ms	100%V _{RRM} reapplied		8471	
		t = 8.3ms			7706	
Maximum I ² √t for fusing	I ² √t	t = 0.1 to 10 ms, no voltage reapplied			120050	kA ² √s
Maximum threshold voltage	V _{T(TO)}	I _T = 4200A~12500A, T _J = T _J maximum			0.94	V
Maximum on-state slope resistance	r _t				0.066	mΩ
Maximum on-state voltage	V _{TM}	I _{pk} =4000A, T _J =T _J maximum, t _p = 10 ms sine pulse			1.20	V
Maximum holding current	I _H	T _J = 25°C, anode supply 12V resistive load			300	mA
Typical latching current	I _L				1000	

SWITCHING				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNIT
Maximum non-repetitive rate of rise of turned-on current	di/dt	$I_{TM} = I_{T(AV)}$, $V_D \leq 66.7\% V_{DRM}$, $I_{FG} = 2A$, $t_r = 0.3\mu s$, $T_J = T_J$ maximum, $f = 50Hz$	200	A/μs
Maximum delay time (Gate turn-on delay time)	t _d	$V_D = 0.4 V_{DRM}$, $I_{FG} = 2A$, $t_r = 0.3\mu s$, $T_J = 25^{\circ}C$	2.0	μs
Typical turn-off time	t _q	$I_{TM} = 2000A$, $T_J = T_J$ maximum, di/dt = -12.5 A/μs. $V_R = 100V$, dV/dt = 50 V/μs, $V_D \leq 0.67 V_{DRM}$	200	
Reverse recovery charge (Typical)	Q _{rr}	$I_{TM} = 2000A$, $T_J = T_J$ maximum, $V_R = 100V$, di/dt = -12.5 A/μs	2800	μC

BLOCKING				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNIT
Minimum critical rate of rise of off-state voltage	dV/dt	T _J =T _J maximum, linear to 67% rated V _{DRM}	1000	V/μs
Maximum peak reverse and off-state leakage current	I _{RRM} , I _{DRM} ,	T _J =T _J maximum, rated V _{DRM} /V _{RRM} applied	200	mA

TRIGGERING					
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES		UNIT
			TYP.	MAX.	
Maximum peak gate power	P_{GM}	$T_J = T_J$ maximum, $t_p \leq 5$ ms	25		W
Maximum average gate power	$P_{G(AV)}$	$T_J = T_J$ maximum, $f = 50$ Hz, $d\% = 50$	5		
Maximum peak positive gate current	I_{GM}	$T_J = T_J$ maximum, $t_p \leq 5$ ms	10		A
Maximum peak positive gate voltage	$+V_{GM}$	$T_J = T_J$ maximum, $t_p \leq 5$ ms	12		V
Maximum peak negative gate voltage	$-V_{GM}$		10		
DC gate current required to trigger	I_{GT}	$T_J = -40^\circ\text{C}$	200	500	mA
		$T_J = 25^\circ\text{C}$	100	250	
		$T_J = 125^\circ\text{C}$	50	150	
DC gate voltage required to trigger	V_{GT}	$T_J = -40^\circ\text{C}$	2.5	4	V
		$T_J = 25^\circ\text{C}$	1.8	3	
		$T_J = 125^\circ\text{C}$	1.1	2	
DC gate current not to trigger	I_{GD}	$T_J = T_J$ maximum	10		mA
DC gate voltage not to trigger	V_{GD}		0.25		V

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNIT
Maximum operating junction temperature range	T _J		-40 to 125	°C
Maximum storage temperature range	T _{stg}		-40 to 150	
Maximum thermal resistance, junction to heatsink	R _{th(J-hs)}	DC operation single side cooled	0.020	K/W
		DC operation double side cooled	0.010	
Maximum thermal resistance, case to heatsink	R _{th(C-hs)}	DC operation single side cooled	0.006	
		DC operation double side cooled	0.003	
Mounting force, ±10%			50000 (5100)	N (kg)
Approximate weight			930	g
Case style		Nell's DX-type Capsule		

ΔR_{thJC} CONDUCTION					
CONDUCTION ANGEL	SINUSOIDAL CONDUCTION		RECTANGULAR CONDUCTION		TEST CONDUCTIONS
	SINGLE SIDE	DOUBLE SIDE	SINGLE SIDE	DOUBLE SIDE	
180°	0.003	0.003	0.002	0.002	$T_J = T_J$ maximum
120°	0.004	0.004	0.004	0.004	
90°	0.005	0.005	0.005	0.005	
60°	0.007	0.007	0.007	0.007	
30°	0.012	0.012	0.012	0.012	

Note

- The table above shows the increment of thermal resistance R_{thJ-hs} when devices operate at different conduction angles than DC

Fig.1 Current ratings characteristics

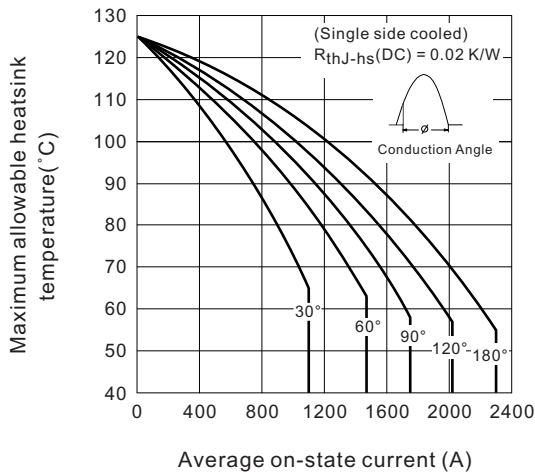


Fig.2 Current ratings characteristics

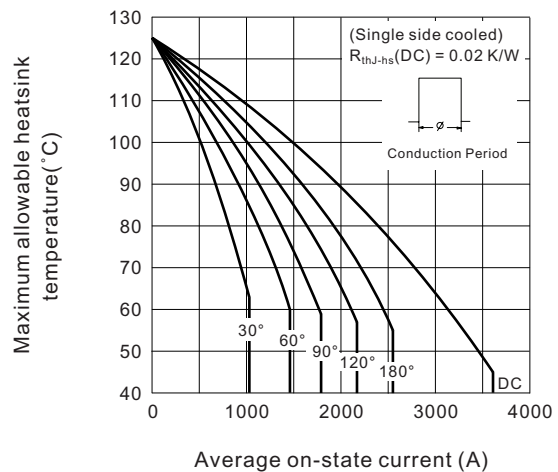


Fig.3 Current ratings characteristics

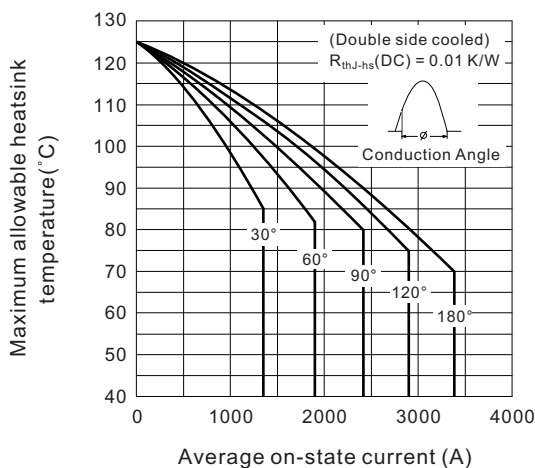


Fig.4 Current ratings characteristics

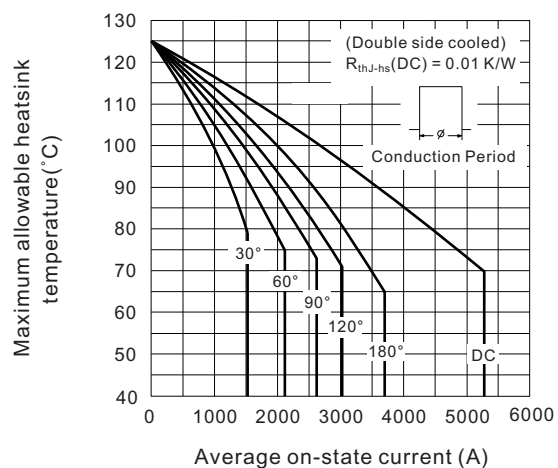


Fig.5 On-state power loss characteristics

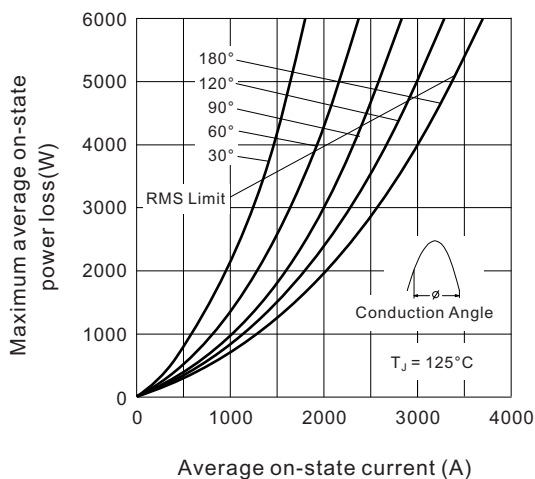


Fig.6 On-state power loss characteristics

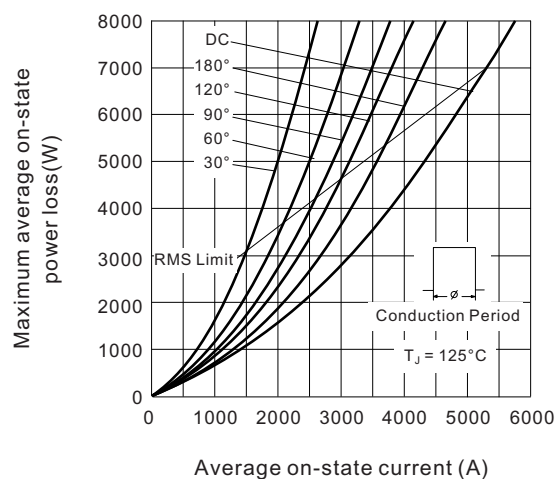


Fig.7 Maximum non-repetitive surge current single and double side cooled

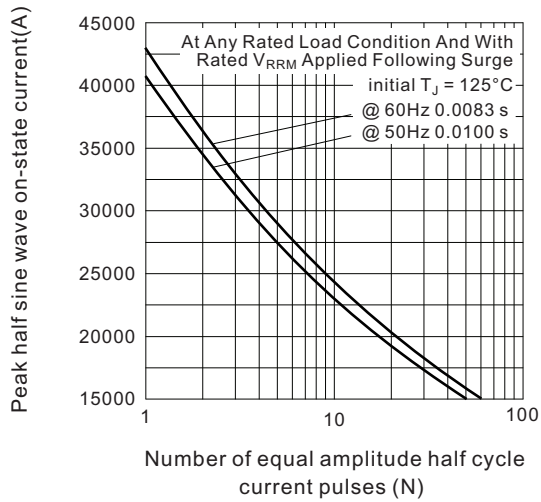


Fig.8 Maximum non-repetitive surge current single and double side cooled

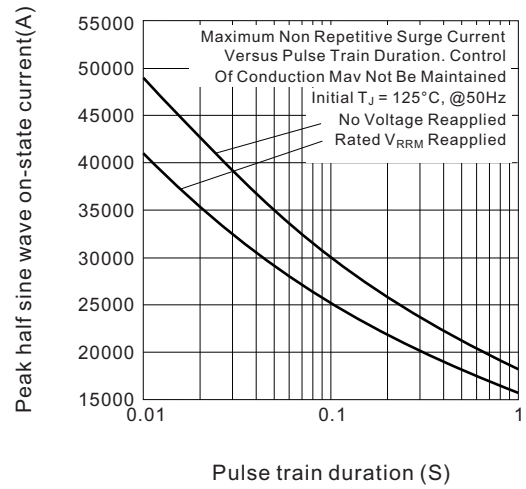


Fig.9 Maximum on-state voltage drop characteristics

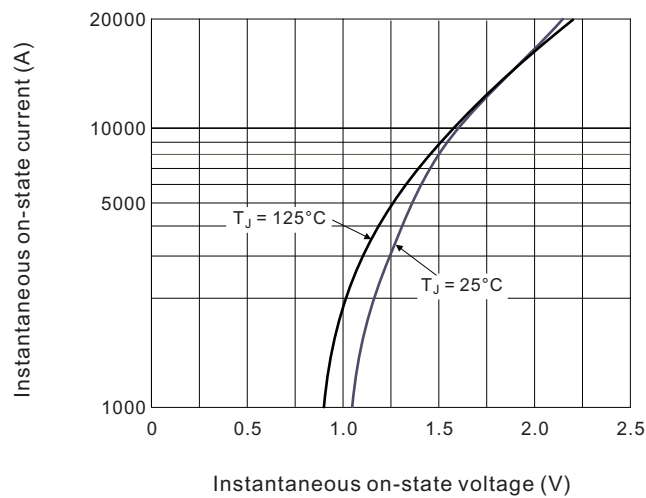


Fig.10 Thermal Impedance $Z_{th(J-hs)}$ characteristics

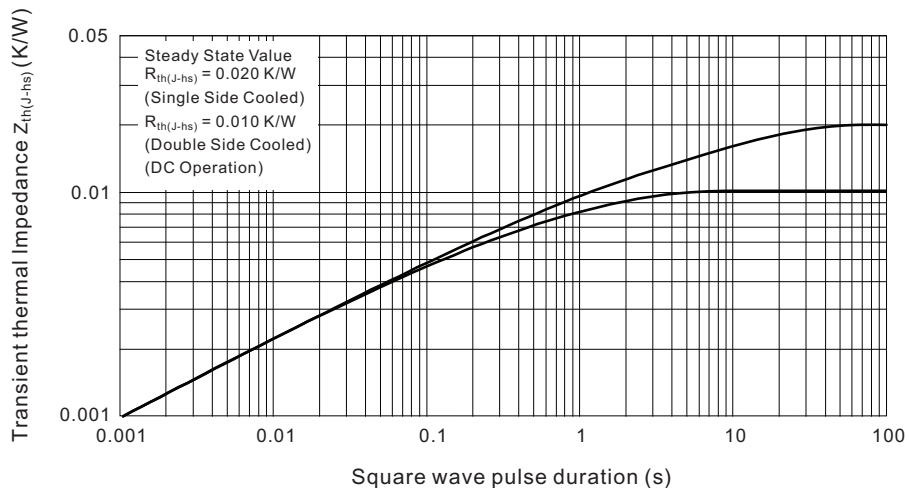


Fig.11 Gate trigger characteristics

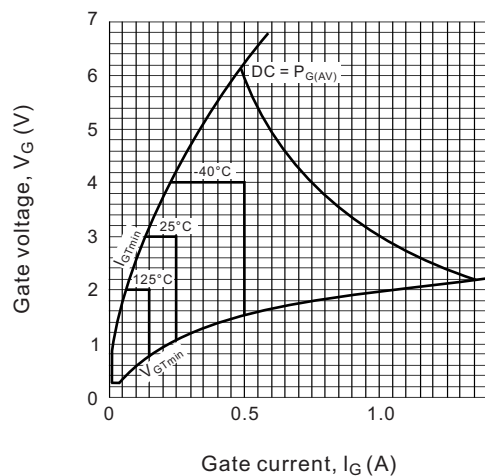
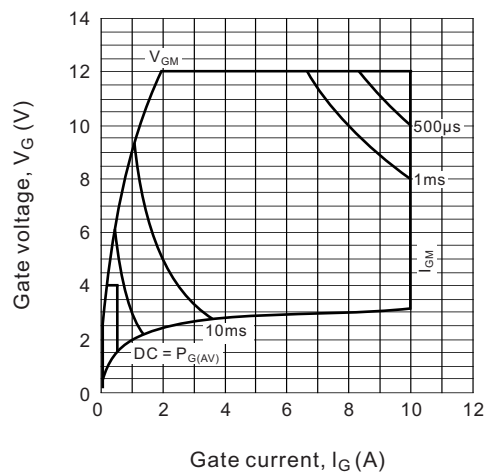


Fig.12 Gate trigger characteristics

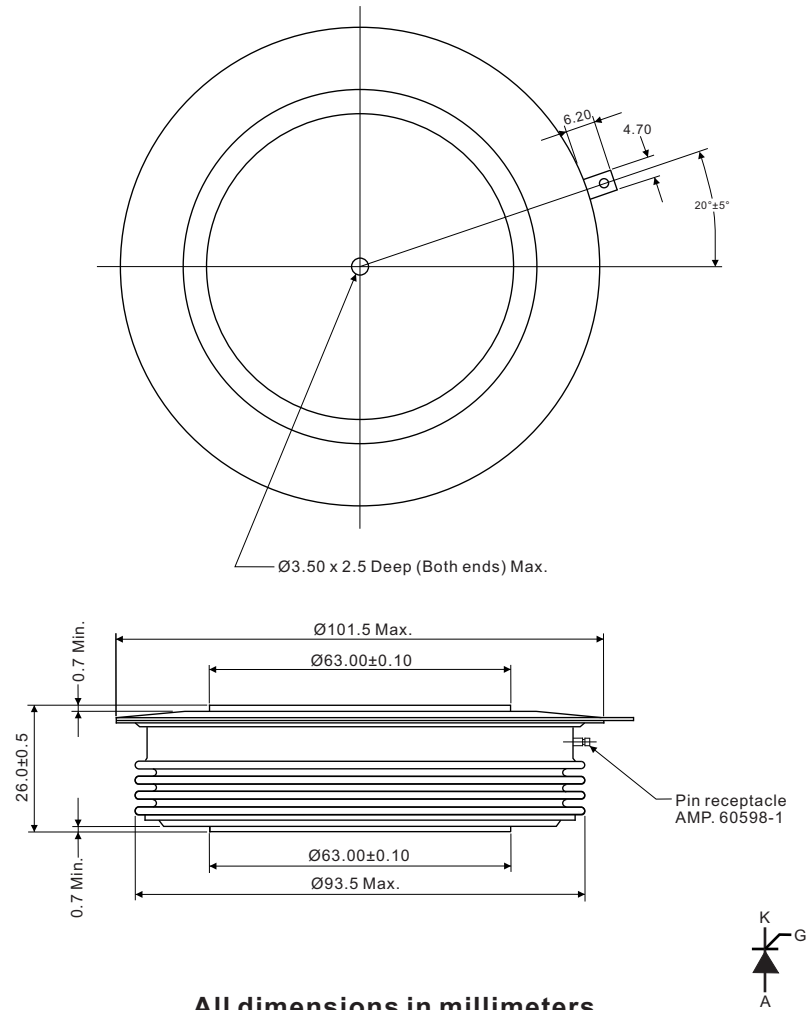


ORDERING INFORMATION TABLE

Device code	3370	PT	16	DX	0
	①	②	③	④	⑤

- ① - Maximum average on-state current $I_{T(AV)}$, 3370 for 3370A
- ② - PT = Phase control thyristor
- ③ - Voltage code, cold $\times 100 = V_{RRM}/V_{RRM}$
- ④ - DX = Nell's DX-type Capsule
- ⑤ - Terminal type, "0" for eyelet

NELL'S DX-type Capsule



All dimensions in millimeters