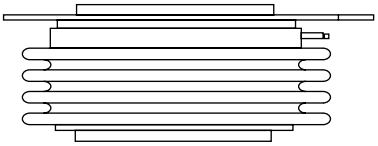
Standard Fast Switching Thyristors (Hockey PUK Version), 2620A

FEATURES

- Center amplifying gate
- Metal case with ceramic insulator
- International standard case R-PUK
  Nell's E-type Capsule
- Compliant to RoHS
- Designed and qualified for industrial level
- High operational capability
- Optimized turn-off parameters
- Low on-state voltage drop
- Low switching losses
- High di/dt performance



R-PUK
(Nell's E-type Capsule)

TYPICAL APPLICATIONS

- Power switching applications
- Inverters
- DC chopper drives
- UPS

PRODUCT SUMMARY	
$I_{T(AV)}$	2620A

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	**TEST CONDITIONS**	**VALUES**	**UNIT**
$I_{T(AV)}$	Double side cooled, single phase, 50Hz 180° half-sine wave	2620	A
	T_C	55	°C
$I_{T(RMS)}$	T_C =25°C	5000	A
	T_C =55°C	4110	°C
I_{TSM}	50 HZ	35000	A
	60 HZ	36650	
I^2t	50 HZ	6125	kA^2s
	60 HZ	5575	
V_{DRM}/V_{RRM}		2000 to 2500	V
t_q	Maximum	60	μs
T_J		-40 to 125	°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**
2620PTHxxExx	20	2000	2100	200
	22	2200	2300	
	24	2400	2500	
	25	2500	2600	

FORWARD CONDUCTION

PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNIT
Maximum average current at heatsink temperature	$I_{T(AV)}$	180° conduction, half sine wave double side cooled at T_C			2620	A
					55	°C
Maximum RMS on-state current	$I_{T(RMS)}$	DC at 25°C heatsink temperature double side cooled			5000	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	35000	A
		t = 8.3ms			36650	
		t = 10ms	100%V_{RRM} reapplied		29400	
		t = 8.3ms			30785	
Maximum I^2t for fusing	I^2t	t = 10ms	No voltage reapplied		6125	kA^2s
		t = 8.3ms			5575	
		t = 10ms	100%V_{RRM} reapplied		4320	
		t = 8.3ms			3935	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied			61250	$kA^2\sqrt{s}$
Maximum value of threshold voltage	$V_{T(TO)}$	I_T = 4000A, I_{T2} = 6645A, T_J=T_J maximum			1.48	V
Maximum value on-state of slope resistance	r_t	I_T = 4000A, I_{T2} = 6645A, T_J=T_J maximum			0.15	mΩ
Maximum on-state voltage	V_{TM}	I_{TM} = 4000A,T_J=T_J maximum, t_p=10 ms sine pulse			2.10	V
Maximum holding current	I_H	V_D =12V		T_J = 25°C	300	mA
				T_J = 125°C	180	
Maximum latching current	I_L			T_J = 25°C	1000	
				T_J = 125°C	700	

SWITCHING

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNIT
Maximum critical rate of rise of on-state current	di/dt	$I_T = I_{T(AV)}$, half sine waveform, f = 50Hz, V_D = 2/3 V_{DRM}, t_r = 0.3µs, I_{GT} = 2A, $T_J = T_J$ max.	1000	A/µs
Maximum delay time	t_d	$I_T = I_{T(AV)}$, V_D = 0.4 V_{DRM}, t_r = 0.3µs, I_{GT} = 2A, T_J = 25°C	2.0	µs
Maximum turn-off time	t_q	I_T = 1000A, di/dt = -50A/µs, V_R = 100V V_D = 2/3 V_{DRM}, dv/dt = 50V/µs	60	
Maximum recovery charge	Q_{rr}		1800	µC
Maximum reverse recovery current	I_{RRM}		210	A

BLOCKING

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNIT
Maximum critical rate of rise of off-state voltage	dv/dt	$T_J = T_J$ maximum, V_D = 2/3 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 TYP.	VALUES MAX.	UNIT
Maximum peak gate power	P_{GM}	$T_J = T_J$ maximum, $t_p \le 5$ ms		15		W
Maximum average gate power	$P_{G(AV)}$	$T_J = T_J$ maximum, f = 50 Hz, d% = 50		3		W
Maximum peak positive gate current	I_{GM}	$T_J = T_J$ maximum, $t_p \le 5$ ms		10		A
Maximum peak positive gate voltage	$+V_{GM}$	$T_J = T_J$ maximum, $t_p \le 5$ ms		12		V
Maximum peak negative gate voltage	$-V_{GM}$			5		V
DC gate current required to trigger	I_{GT}	T_J = -40°C	Maximum required gate current/voltage are the lowest value which will trigger all units 12V anode to cathode applied	200	400	mA
		T_J = 25°C		100	200	mA
		T_J = 125°C		50	120	mA
DC gate voltage required to trigger	V_{GT}	T_J = -40°C		2.0	4	V
		T_J = 25°C		1.5	3	V
		T_J = 125°C		1.0	2	V
DC gate current not to trigger	I_{GD}	$T_J = T_J$ maximum	Maximum gate current/ voltage not to trigger is the maximum value which will not trigger any unit with rated V_{DRM} anode to cathode applied	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	°C
Maximum thermal resistance, junction to heatsink	$R_{thJ\text{-}hs}$	DC operation single side cooled	0.022	K/W
		DC operation double side cooled	0.011	K/W
Maximum thermal resistance, case to heatsink	$R_{thC\text{-}hs}$	DC operation single side cooled	0.004	K/W
		DC operation double side cooled	0.002	K/W
Mounting force, ±10%			40000 (4045)	N (kg)
Approximate weight			1500	g
Case style		R-PUK, Nell's E-type Capsule		

△ R_{thJC} CONDUCTION

CONDUCTION ANGEL	SINUSOIDAL CONDUCTION		RECTANGULAR CONDUCTION		TEST CONDUCTIONS	UNITS
	SINGLE SIDE	DOUBLE SIDE	SINGLE SIDE	DOUBLE SIDE		
180°	0.0005	0.0006	0.0004	0.0004	$T_J = T_J$ maximum	K/W
120°	0.0006	0.0007	0.0006	0.0006		
90°	0.0007	0.0008	0.0008	0.0008		
60°	0.0010	0.0010	0.0011	0.0011		
30°	0.0018	0.0018	0.0019	0.0019		

Note

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

Fig.1 Current ratings characteristics

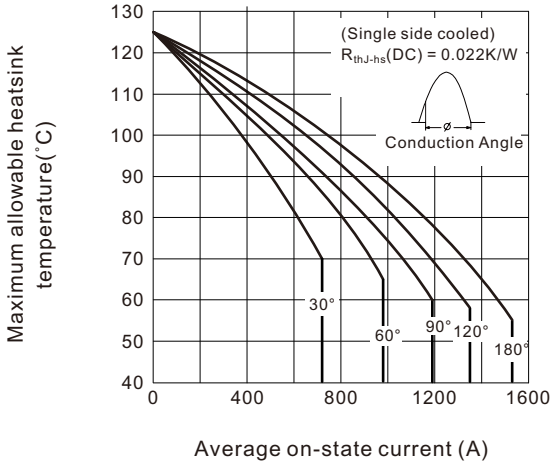


Fig.2 Current ratings characteristics

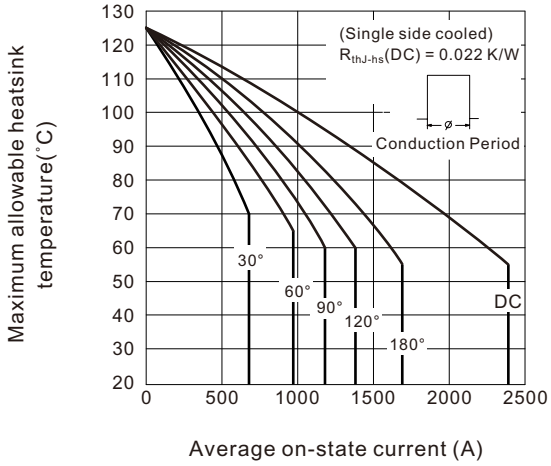


Fig.3 Current ratings characteristics

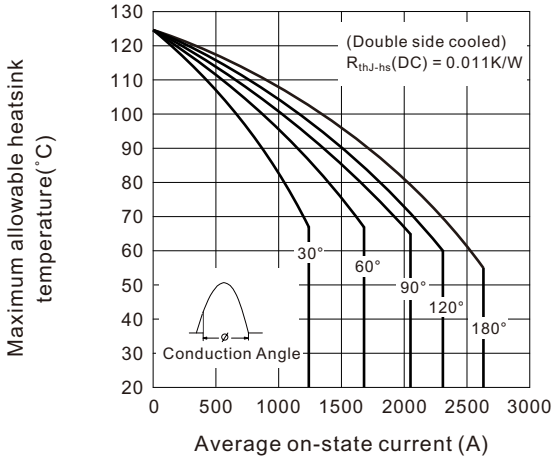


Fig.4 Current ratings characteristics

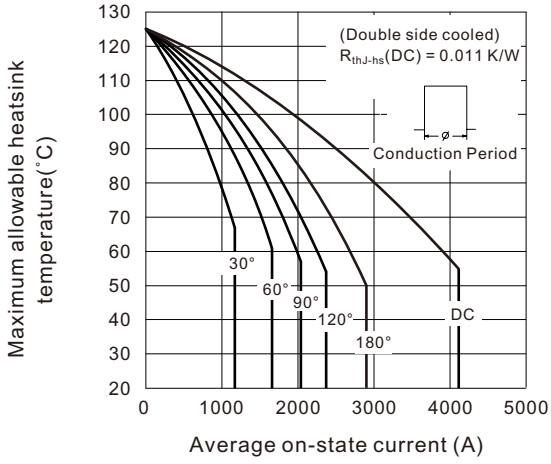


Fig.5 On-state power loss characteristics

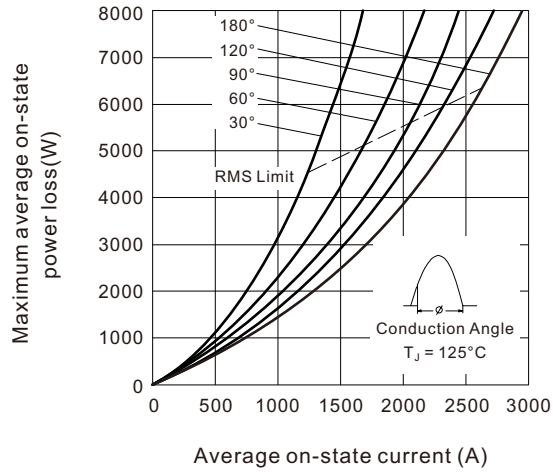


Fig.6 On-state power loss characteristics

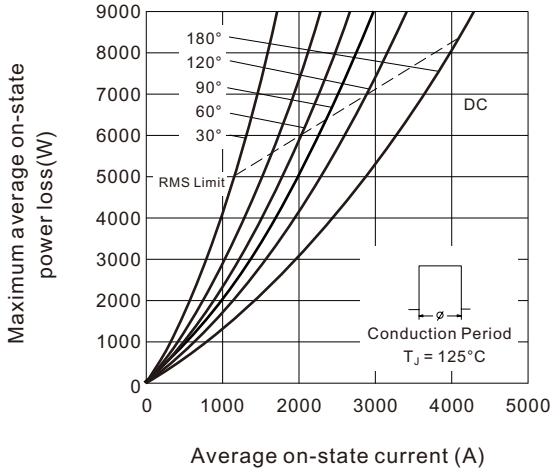


Fig.7 Maximum non-repetitive surge current single and double side cooled

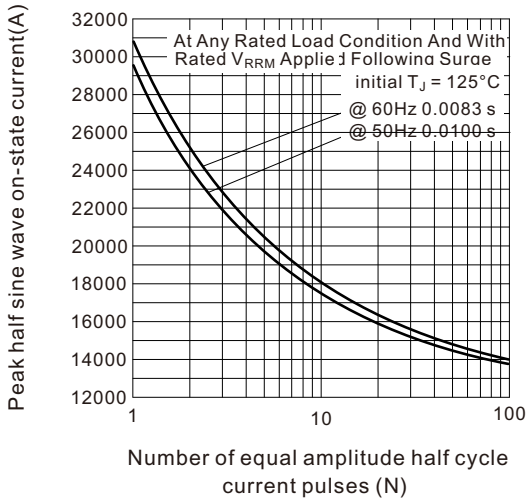


Fig.8 Maximum non-repetitive surge current single and double side cooled

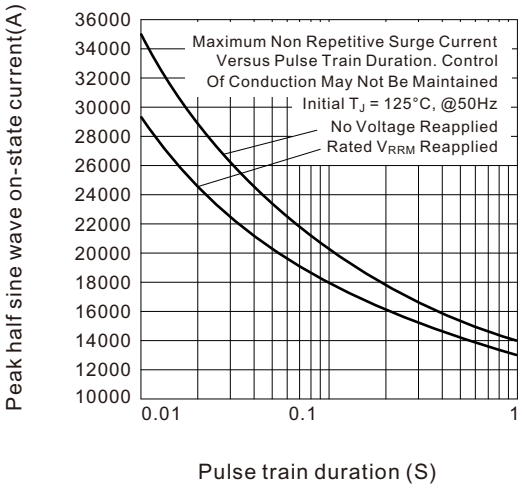


Fig.9 On-state voltage drop characteristcs

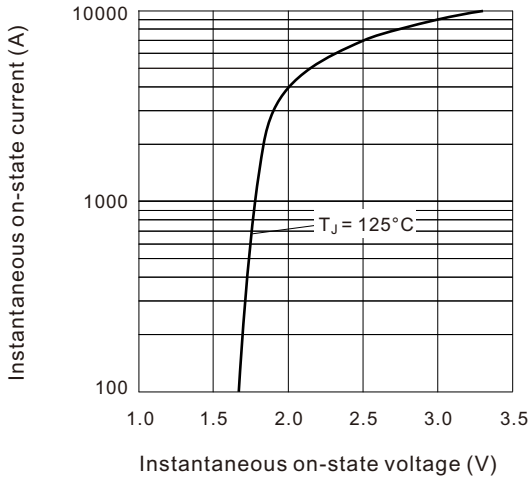


Fig.10 Thermal Impedance Z_{thJ-hs} characteristics

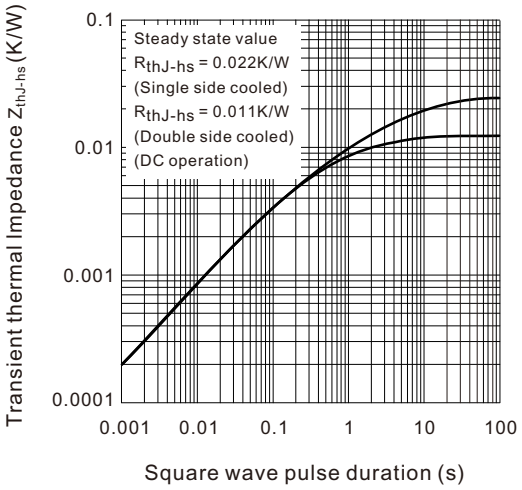
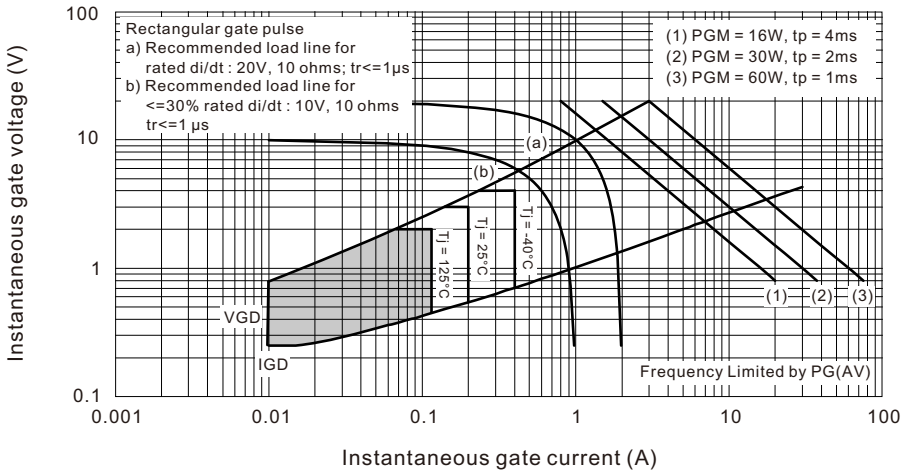


Fig.11 Gate characteristics



ORDERING INFORMATION TABLE

Device code	2620	PTH	20	E	60
	①	②	③	④	⑤

1 - Maximum average on-state current $I_{T(AV)}$, 2620 for 2620A

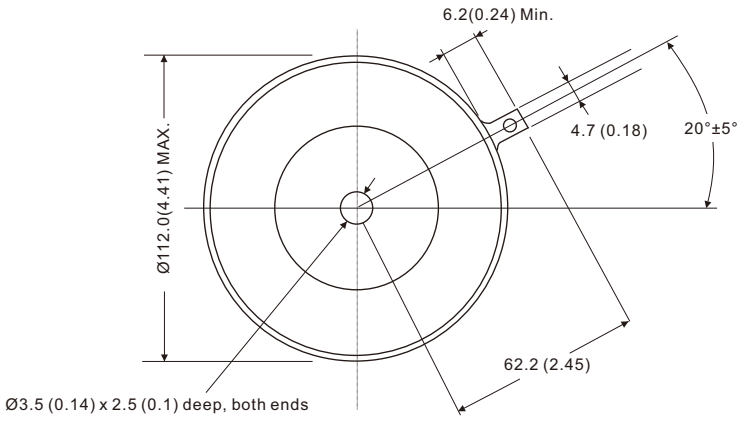
2 - PTH = Fast Switching Thyristors

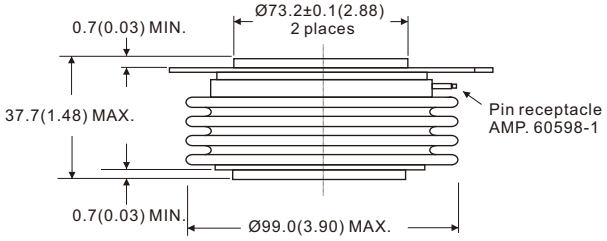
3 - Voltage code, code × 100 = V_{RRM}/V_{RRM}

4 - Package type : E = PUK case R-PUK, Nell's E-type Capsule

5 - tq value, 60 for 60 μs

R-PUK (Nell's E-type Capsule)





All dimensions in millimeters (inches)