

## Two Separated Thyristor Module, 100A ( Low Profile Package)

### FEATURES

- High voltage
- 3000V<sub>RMS</sub> isolating voltage
- High surge capability
- **Planar SCR chips**
- Heat transfer and isolation through direct copper bonded aluminum oxide ceramic (Al<sub>2</sub>O<sub>3</sub> DBC)
- Simple mounting (One screw mounting)
- Compliant to RoHS
- Designed and qualified for multiple level

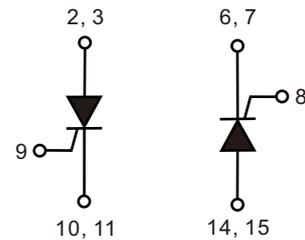


Low profile package

### APPLICATIONS

- Soft starters
- Brake chopper
- Light control
- Power converters
- Heat and temperature control

"TA" Circuit Configuration :



### PRODUCT SUMMARY

$I_{T(AV)}$	100A
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### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNIT
$I_{T(AV)}$	80°C	100	A
$I_{TSM}/I_{FSM}$	50 Hz	2000	
	60 Hz	2100	
$I^2t$	50 Hz	20	kA <sup>2</sup> s
	60 Hz	18.3	
$I^2\sqrt{f}$		200	kA <sup>2</sup> √s
$V_{DRM}/V_{RRM}$	Range	800 to 1600	V
$T_J$	Range	-40 to 150	°C

### ELECTRICAL SPECIFICATIONS

#### VOLTAGE RATINGS

TYPE NUMBER	VOLTAGE CODE	$V_{RRM}/V_{DRM}$ , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	$V_{RSM}/V_{DSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	$I_{RRM}/I_{DRM}$ AT 125°C mA
NK100TA	08	800	900	15
	12	1200	1300	
	16	1600	1700	

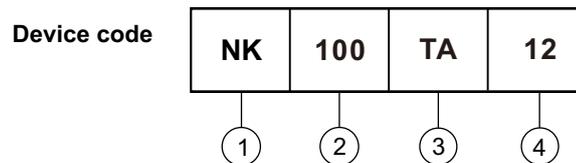
FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNIT	
Maximum RMS on-state current	$I_{T(AV)}$	180° conduction, half sine wave, 50Hz, $T_C = 80^\circ\text{C}$		100		
Maximum peak, one-cycle, on-state non-repetitive surge current	$I_{TSM}$	t = 10ms	No voltage reappplied	2000	A	
		t = 8.3ms		2100		
Maximum $I^2t$ for fusing	$I^2t$	t = 10ms		Sine half wave, initial $T_J = T_J$ maximum	20	kA <sup>2</sup> s
		t = 8.3ms			18.3	
		t = 10ms	100% $V_{RRM}$ reappplied	13.9		
		t = 8.3ms		12.8		
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reappplied		200	kA <sup>2</sup> √s	
Maximum on-state voltage drop	$V_{TM}$	$I_{TM} = 300\text{A}$ , $T_J = 25^\circ\text{C}$ , 180° conduction		1.85	V	
Maximum holding current	$I_H$	Anode supply = 6V, resistive load, $T_J = 25^\circ\text{C}$		150	mA	
Maximum latching current	$I_L$			400		

BLOCKING					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNIT
Maximum peak reverse and off-state leakage current	$I_{RRM}$ $I_{DRM}$	$T_J = 125^\circ\text{C}$		15	mA
RMS isolation Voltage	$V_{ISO}$	50 Hz, circuit to base, all terminals shorted		2500 (1 min) 3000 (1 s)	V
Critical rate of rise of off-state voltage	dV/dt	$T_J = T_J$ maximum, exponential to 67% rated $V_{DRM}$		1000	V/μs

TRIGGERING					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNIT
Maximum peak gate power	$P_{GM}$	$t_p \leq 5$ ms, $T_J = T_J$ maximum		10	W
Maximum average gate power	$P_{G(AV)}$	f = 50 Hz, $T_J = T_J$ maximum		3	
Maximum peak gate current	$I_{GM}$	$t_p \leq 5$ ms, $T_J = T_J$ maximum		3	A
Maximum peak negative gate voltage	$-V_{GT}$			10	V
Maximum required DC gate voltage to trigger	$V_{GT}$	$T_J = 25^\circ\text{C}$	Anode supply = 6V, resistive load; $R_a = 1\Omega$	0.7 to 1.5	
Maximum required DC gate current to trigger	$I_{GT}$			20 to 100	mA
Maximum gate voltage that will not trigger	$V_{GD}$	$T_J = T_J$ maximum, 66.7% $V_{DRM}$ = applied		0.25	V
Maximum gate current that will not trigger	$I_{GD}$			10	mA
Maximum rate of rise of turned-on current	dI/dt	$T_J = 25^\circ\text{C}$ , $I_{GM} = 1.5\text{A}$ , $t_r \leq 0.5$ μs		150	A/μs

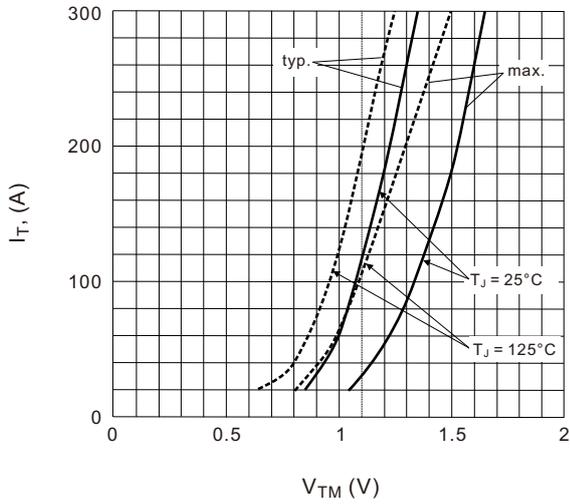
THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNIT
Maximum junction operating temperature range	$T_J$		-40 to 125	°C
Maximum storage temperature range	$T_{stg}$		-40 to 150	
Maximum thermal resistance, junction to case per junction	$R_{thJC}$	DC operation	0.45	°C/W
Maximum thermal resistance, case to heatsink per module	$R_{thCS}$	Mounting surface, smooth, flat and greased	0.18	
Mounting torque, ±10% module to heatsink, M4		A mounting compound is recommended and the torque should be rechecked after a period of 3 hours to allow for the spread of the compound. Lubricated threads.	2	N·m
Approximate weight			22	g
			0.78	oz.
Case style			Low Profile package (Nell-Top 2)	

### Ordering Information Table

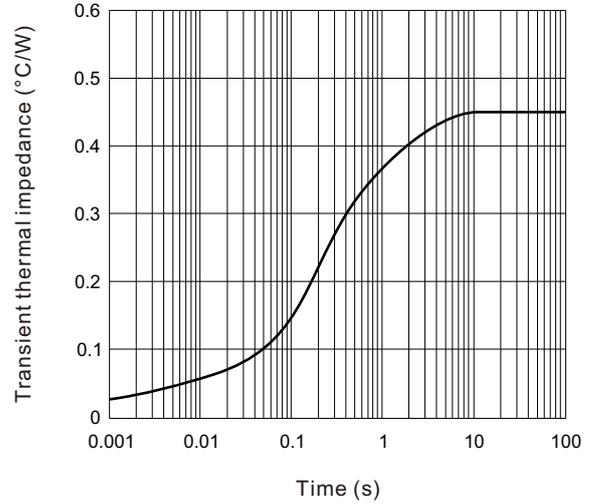


- 1 - Nell's Low profile module (Nell-Top 2)
- 2 - Current rating :  $I_{T(AV)}$
- 3 - Circuit configuration type
- 4 - Voltage code x 100 =  $V_{DRM}/V_{RRM}$

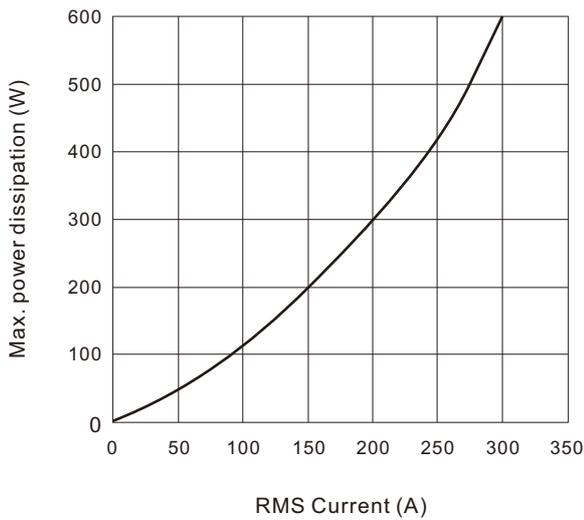
**Fig.1 Forward characteristic of single thyristor**



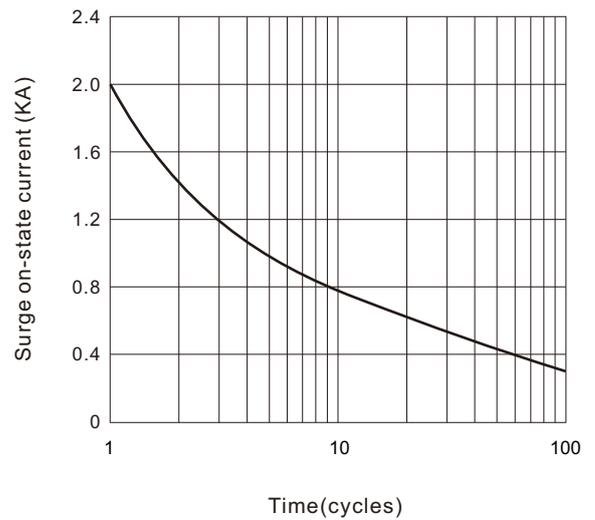
**Fig.2 Transient thermal Impedance vs. time (per thyristor)**



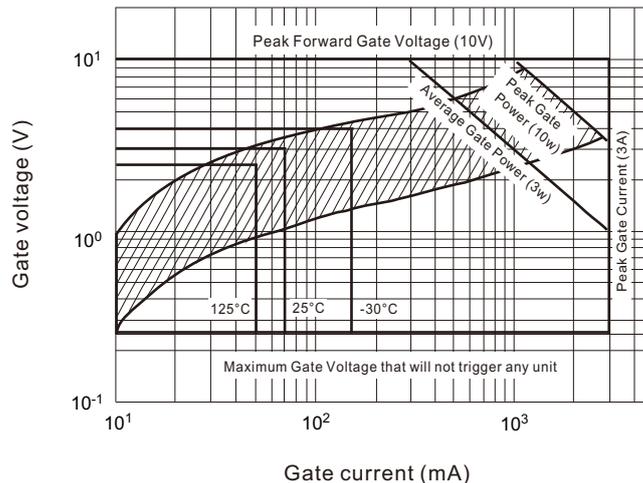
**Fig.3 Power dissipation Vs. RMS current**

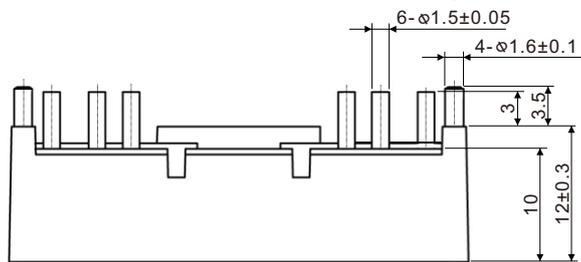
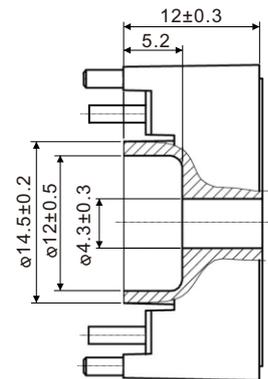
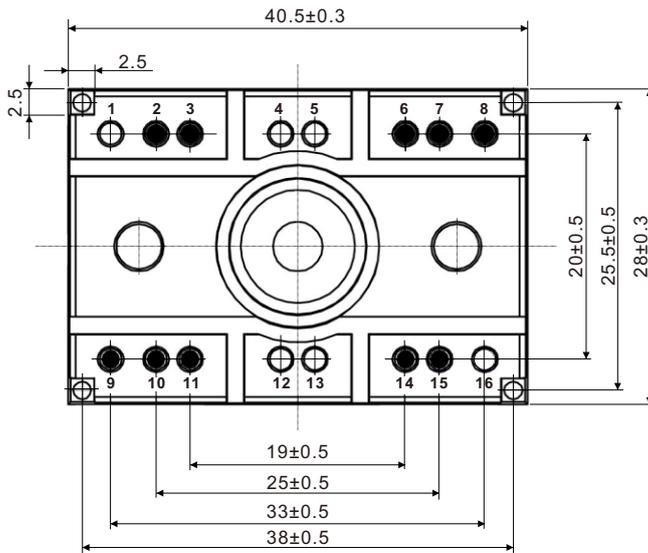
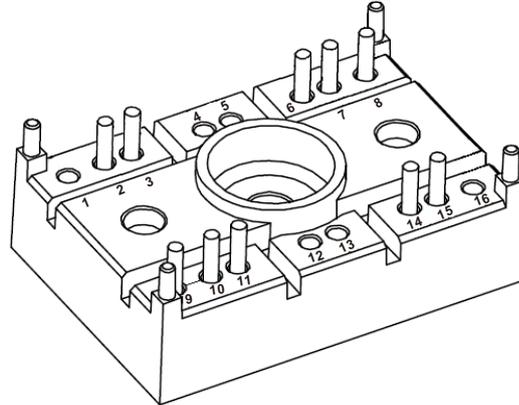


**Fig.4 Surge on-state current Vs. Cycles**

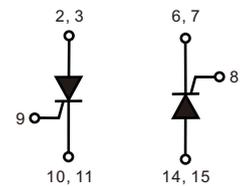


**Fig.5 Gate characteristics**





"TQ" Circuit Configuration :



All dimensions in millimeters( inches)