

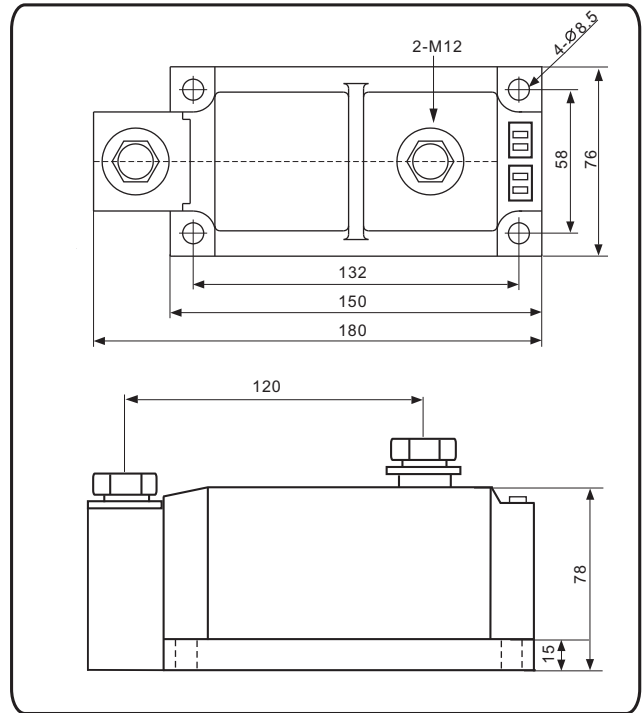
### Phase Control Thyristor, 800A (Super MAGN-A-PAK Power Modules)



Super MAGN-A-PAK

#### FEATURES

- High voltage
- Electrically isolated by DBC ceramic ( $Al_2O_3$ )
- 3500 V<sub>RMS</sub> isolating voltage
- Industrial standard package
- High surge capability
- Glass passivated chips
- Modules uses high voltage power thyristor in basic configurations
- Simple mounting
- UL approved file E320098
- Compliant to RoHS
- Designed and qualified for multiple level



#### APPLICATIONS

- DC motor control and drives
- Battery charges
- Welders
- Power converters
- Lighting control
- Heat and temperature control



PRODUCT SUMMARY	
$I_{T(AV)}$	800 A

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{T(AV)}$	85 C	800	A
$I_{T(RMS)}$	85 C	1256	A
$I_{TSM}$	50 Hz	16000	
	60 Hz	16800	
$I^2t$	50 Hz	1280	kA <sup>2</sup> s
	60 Hz	1166	
$I^2\sqrt{t}$		12800	kA <sup>2</sup> $\sqrt{s}$
$V_{DRM} / V_{RRM}$	Range	400 to 1600	V
$T_J$	Range	-40 to 125	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
NKET800	04	400	500	40
	08	800	900	
	12	1200	1300	
	14	1400	1500	
	16	1600	1700	

FORWARD CONDUCTION								
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS			
Maximum average on-state current at case temperature	$I_{T(AV)}$	180 conduction, half sine wave ,50Hz		800	A			
				85	°C			
Maximum RMS on-state current	$I_{T(RMS)}$	180 conduction, half sine wave ,50Hz , $T_J = 85^\circ\text{C}$		1256				
Maximum peak, one-cycle, on-state non-repetitive surge current	$I_{TSM}$	t = 10 ms	No voltage reappplied	Sine half wave, initial $T_J = T_J$ maximum	16000	A		
		t = 8.3 ms			16800			
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms			100% $V_{RRM}$ reappplied		1280	kA <sup>2</sup> s
		t = 8.3 ms					1166	
		t = 10 ms	896					
		t = 8.3 ms	815					
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reappplied		12800	kA <sup>2</sup> $\sqrt{s}$			
Maximum on-state voltage drop	$V_{TM}$	$I_{TM} = 1500\text{A}$ , $T_J = 25^\circ\text{C}$ , 180 conduction		2.0	V			
Maximum holding current	$I_H$	Anode supply = 12 V initial $I_T = 30\text{A}$ , $T_J = 25^\circ\text{C}$		40~200	mA			
Maximum latching current	$I_L$	Anode supply = 12 V resistive load = 1 $\Omega$ Gate pulse: 10 V, 100 $\mu\text{s}$ , $T_J = 25^\circ\text{C}$		400				

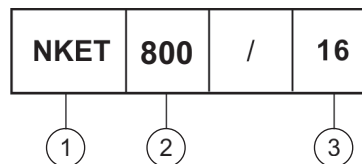
BLOCKING					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum peak reverse and off-state leakage current	$I_{RRM}, I_{DRM}$	$T_J = 125^\circ\text{C}$		40	mA
RMS isolation Voltage	$V_{ISO}$	50 Hz, circuit to base, all terminals shorted		2500 (1min) 3500 (1s)	V
Critical rate of rise of off-state voltage	dV/dt	$T_J = T_J$ maximum, exponential to 67 % rated $V_{DRM}$		500	V/ $\mu\text{s}$

TRIGGERING					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum peak gate power	$P_{GM}$	$t_p \leq 5 \text{ ms}, T_J = T_J \text{ maximum}$		10	W
Maximum average gate power	$P_{G(AV)}$	$f = 50 \text{ Hz}, T_J = T_J \text{ maximum}$		3	
Maximum peak gate current	$I_{GM}$	$t_p \leq 5 \text{ ms}, T_J = T_J \text{ maximum}$		3	A
Maximum peak negative gate voltage	$-V_{GT}$			10	V
Maximum required DC gate voltage to trigger	$V_{GT}$	$T_J = 25 \text{ }^\circ\text{C}$	Anode supply = 12 V, resistive load; $R_a = 1 \Omega$	0.7~2.0	
Maximum required DC gate current to trigger	$I_{GT}$			30~200	
Maximum gate voltage that will not trigger	$V_{GD}$	$T_J = T_J \text{ maximum}, 66.7\% V_{DRM} \text{ applied}$		0.25	V
Maximum gate current that will not trigger	$I_{GD}$			10	mA
Maximum rate of rise of turned-on current	$di/dt$	$T_J = 25^\circ\text{C}, I_{GM} = 1.5\text{A}, t_r \leq 0.5 \mu\text{s}$		150	A/ $\mu\text{s}$

THERMAL AND MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction operating temperature range	$T_J$			- 40 to 125	C
Maximum storage temperature range	$T_{Stg}$			- 40 to 125	
Maximum thermal resistance, junction to case per junction	$R_{thJC}$	DC operation		0.054	C/W
Maximum thermal resistance, case to heatsink per module	$R_{thCS}$	Mounting surface, smooth , flat and greased		0.009	
Mounting torque 10 % IAP to heatsink ,M8 busbar to IAP ,M8		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.		6 to 14	N.m
Approximate weight				3500	g
				123.4	oz.
Case style				Super MAGN-A-PARK	

### ORDERING INFORMATION TABLE

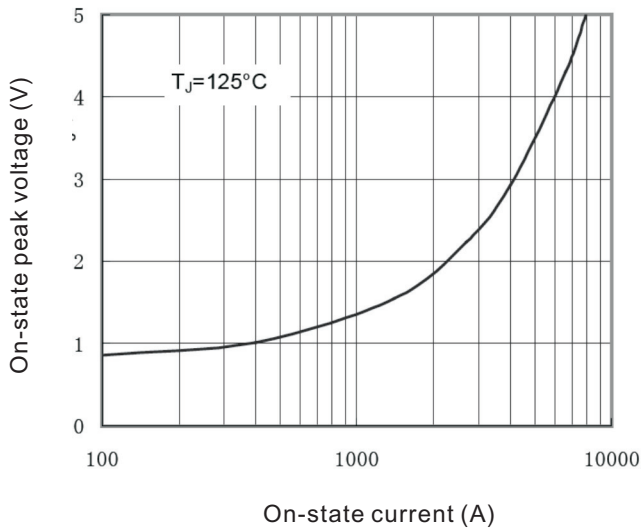
Device code



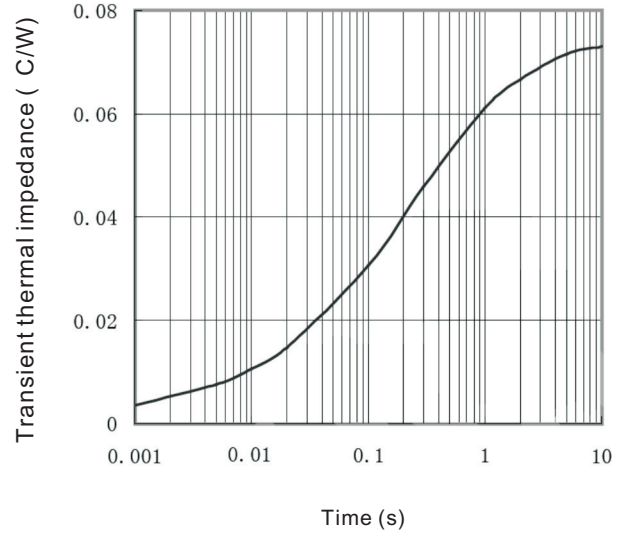
- 1 - Module type
- 2 - Current rating:  $I_{T(AV)}$
- 3 - Voltage code x 100 =  $V_{RRM}$

## Nell High Power Products

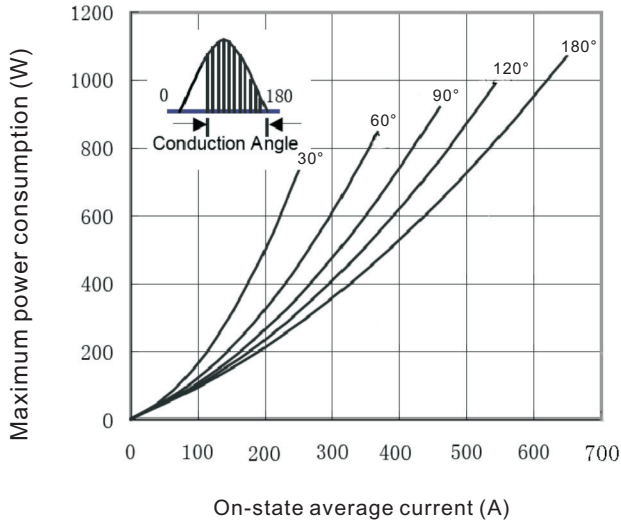
On-state current vs voltage characteristic



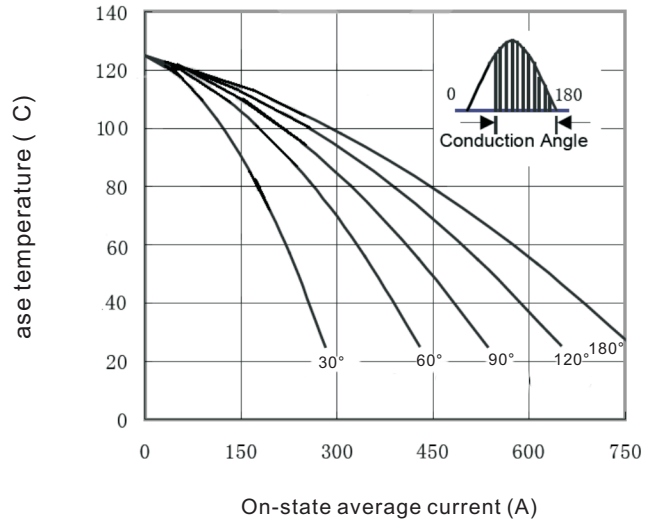
Transient thermal impedance(junction-case)



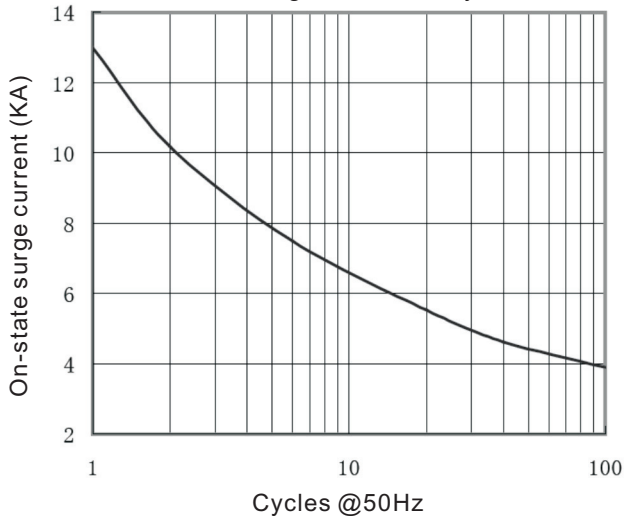
Power consumption vs. average current



Case temperature vs. on-state average current



On-state surge current vs cycles



I<sup>2</sup>t Characteristic

