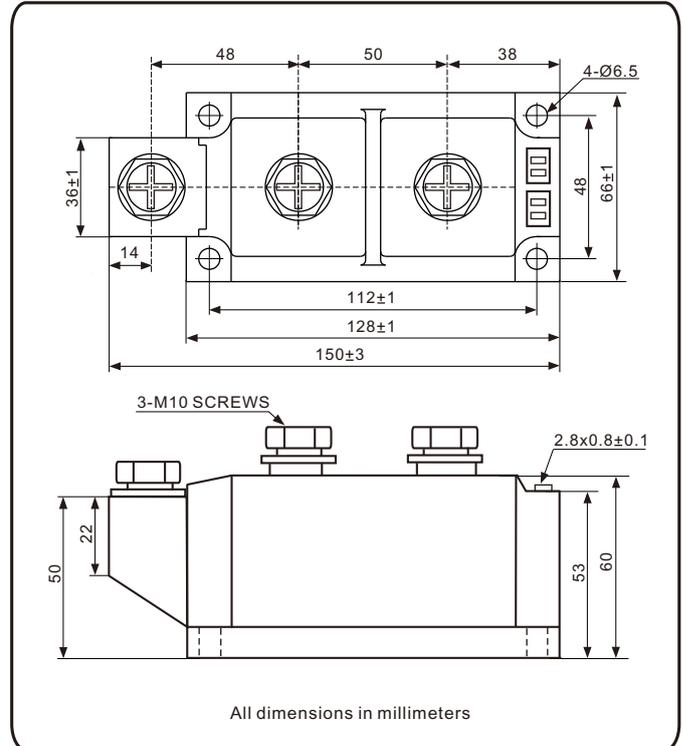


## Standard Diodes, 500 A ( SUPER MAGN-A-PAK Power Modules)

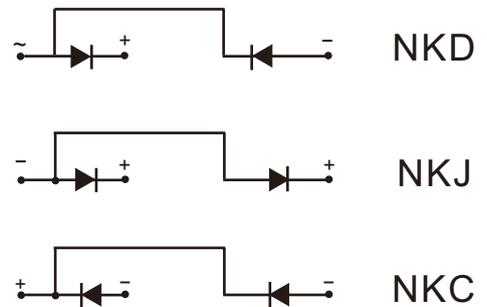


### FEATURES

- UL approved file E320098
- High current capability
- High surge capability
- High voltage ratings up to 2000 V
- 3000 V<sub>RMS</sub> isolating voltage with non-toxic substrate
- Industrial standard package
- Compliant to RoHS

### APPLICATIONS

- Rectifying bridge for large motor drives
- Rectifying bridge for large UPS
- Rectifying power supplier
- Frequency converters
- Snubber for large GTO and IGBT



PRODUCT SUMMARY	
I <sub>F(AV)</sub>	500A
Type	Modules-Diode, High Voltage

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNIT
I <sub>F(AV)</sub>		500	A
	T <sub>C</sub>	100	°C
I <sub>F(RMS)</sub>		785	A
		100	°C
I <sub>FSM</sub>	50 HZ	21000	A
	60 HZ	21990	
I <sup>2</sup> t	50 HZ	2205	kA <sup>2</sup> s
	60 HZ	1830	
I <sup>2</sup> √t		22050	kA <sup>2</sup> √s
V <sub>RRM</sub>	Range	800 to 2000	V
T <sub>Stg</sub> , T <sub>J</sub>		-40 to 150	°C

## ELECTRICAL SPECIFICATIONS

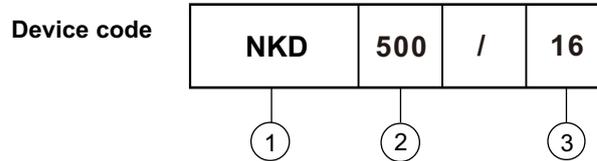
VOLTAGE RATINGS				
TYPE NUMBER	VOLTAGE CODE	$V_{RRM}$ , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	$V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	$I_{RRM}$ MAXIMUM AT $T_J$ MAXIMUM mA
NKD500 NKJ500 NKC500	08	800	900	40
	12	1200	1300	
	16	1600	1700	
	20	2000	2100	

FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNIT	
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave		500	A	
				100	°C	
Maximum RMS forward current	$I_{F(RMS)}$	180° conduction, half sine wave at $T_C = 100^\circ\text{C}$		785	A	
Maximum peak, one-cycle forward non-repetitive surge current	$I_{FSM}$	t = 10ms	No voltage reapplied	Sine half wave, initial $T_J = T_J$ maximum	21	kA
		t = 8.3ms			22	
Maximum $I^2t$ for fusing	$I^2t$	t = 10ms	No voltage reapplied	Sine half wave, initial $T_J = T_J$ maximum	2205	kA <sup>2</sup> s
		t = 8.3ms			1830	
		t = 10ms	100% $V_{RRM}$ reapplied		1548	
		t = 8.3ms			1293	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied		22050	kA <sup>2</sup> $\sqrt{s}$	
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 1500\text{A}$ , $T_J = 25^\circ\text{C}$		1.4	V	

BLOCKING				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNIT
RMS insulation Voltage	$V_{INS}$	t = 1s	3000	V
Maximum peak reverse and off-state leakage current	$I_{RRM}$	$T_J = T_J$ maximum, rated $V_{RRM}$ applied	40	mA
		$T_J = 25^\circ\text{C}$	50	$\mu\text{A}$

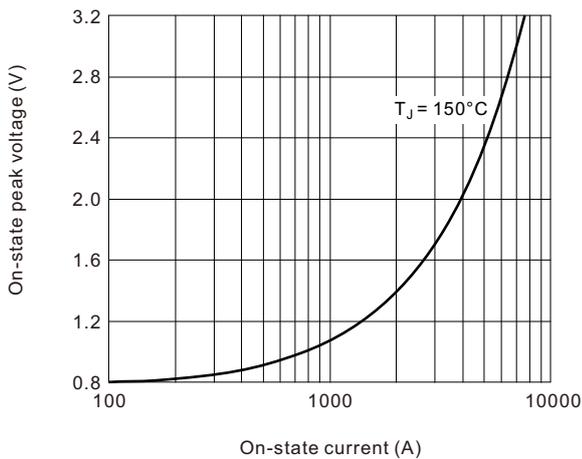
THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNIT
Maximum junction operating and storage temperature range	$T_J, T_{stg}$		-40 to 150	°C
Maximum thermal resistance, junction to case per junction	$R_{thJC}$	DC operation	0.09	°C/W
Maximum thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth, flat and greased	0.02	
Mounting torque, $\pm 10\%$	SMAP to heatsink, M6 busbar to SMAP, M10	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.	4	N·m
			12	
Approximate weight			1800	g
Case style		See dimensions - link at the end of datasheet	SUPER MAGN-A-PAK	

## Ordering Information Tabel

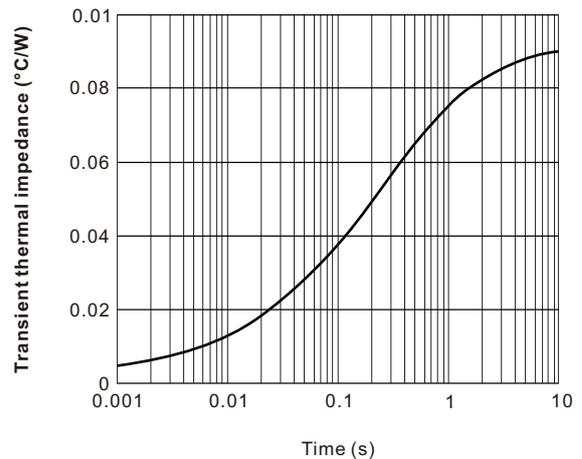


- 1 - Module type, NKD, NKJ and NKC for ( Diode + Diode ) module
- 2 - Current rating :  $I_{F(AV)}$
- 3 - Voltage code x 100 =  $V_{RRM}$

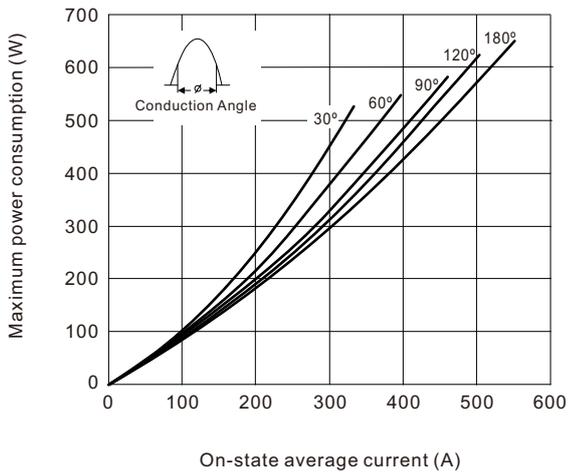
**Fig.1 On-state current vs. voltage characteristic**



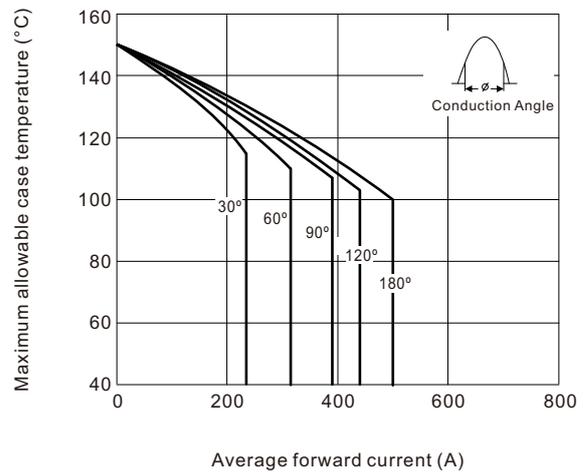
**Fig.2 Transient thermal impedance (junction-case)**



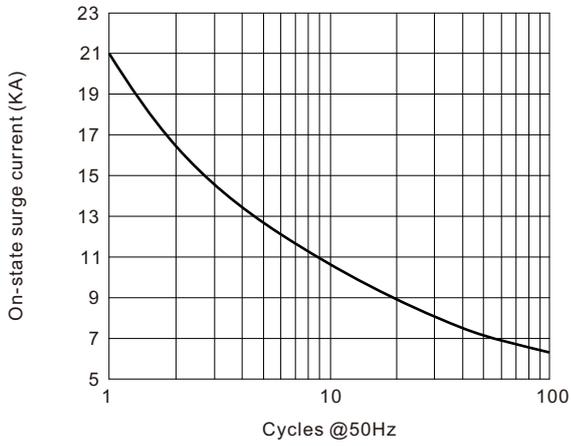
**Fig.3 Power consumption vs. average current**



**Fig.4 Case temperature vs. on-state average current**



**Fig.5 On-state surge current vs cycles**



**Fig.6 I<sup>2</sup>t Characteristic**

