

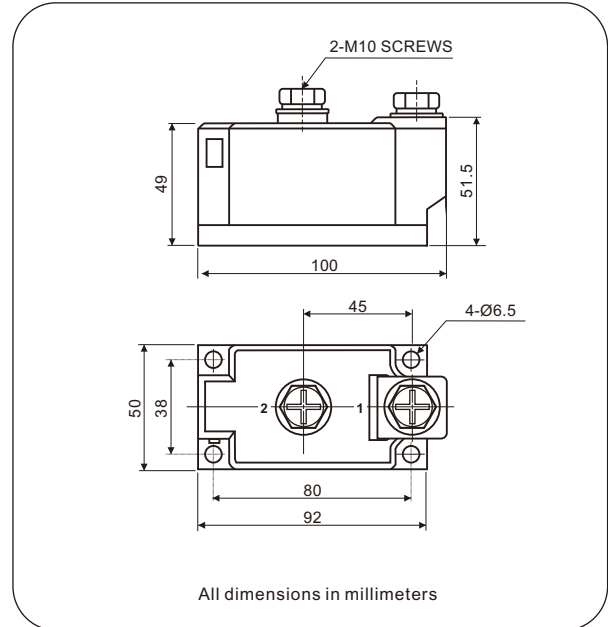
Standard Recovery Diodes, 500 A (MAGN-A-PAK Power Modules)



MAP Module

FEATURES

- High voltage
- Electrically isolated by DBC ceramic (Al_2O_3)
- 3000 V_{RMS} isolating voltage
- Industrial standard package
- High surge capability
- Modules uses high voltage power diodes in basic configuration
- 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



PRODUCT SUMMARY

$I_{F(AV)}$	500A
Type	Single Diode, High Voltage

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNIT
$I_{F(AV)}$		500	A
	T_C	100	$^{\circ}C$
$I_{F(RMS)}$		785	A
I_{FSM}	50 HZ	21000	
	60 HZ	21987	
I^2t	50 HZ	2205	kA^2s
	60 HZ	2006	
$I^2\sqrt{t}$		22050	$kA^2\sqrt{s}$
V_{RRM}		400 to 3000	V
t_J	Range	-40 to 150	$^{\circ}C$

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} AT $T_J = 150^\circ\text{C}$ mA
NKE500	04	400	500	30
	08	800	900	
	12	1200	1300	
	16	1600	1700	
	20	2000	2100	
	25	2500	2600	
	30	3000	3100	

FORWARD CONDUCTION					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNIT
Maximum average on-state current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave		500	A
				100	°C
Maximum RMS on-state current	$I_{F(RMS)}$	180° conduction, half sine wave, 50HZ, $T_C = 100^\circ\text{C}$		785	A
Maximum peak, one-cycle, on-state non-reptitive surge current	I_{FSM}	t = 10ms	No voltage reapplied	21000	
		t = 8.3ms		21987	
Maximum I^2t for fusing	I^2t	t = 10ms		Sine half wave, initial $T_J = T_J$ maximum	2205
		t = 8.3ms			2006
		t = 10ms	100% V_{RRM} reapplied	1544	
		t = 8.3ms		1404	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied		22050	$\text{kA}^2\sqrt{\text{s}}$
Maximum forward voltage drop	V_{FM}	$I_{FM} = 1500\text{A}$, $T_J = 25^\circ\text{C}$, 180° conduction		1.45	V

BLOCKING					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum peak reverse leakage current	I_{RRM}	$T_J = 150^\circ\text{C}$		30	mA
RMS insulation Voltage	V_{ISO}	50 Hz, circuit to base, all terminals shorted, t = 1s		3000	V
		t = 60s		2500	

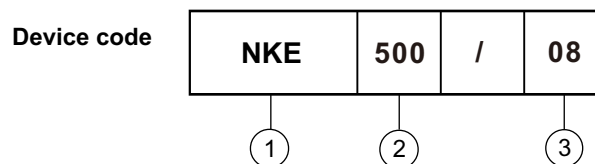
THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNIT
Maximum junction operating temperature range	T_J, T_{stg}		-40 to 150	°C
Maximum thermal resistance, junction to case per junction	R_{thJC}	DC operation	0.065	°C/W
Maximum thermal resistance, case to heatsink per module	R_{thCS}	Mounting surface, smooth, flat and greased	0.02	
Mounting torque, $\pm 10\%$ <small>MAP to heatsink, M6 busbar to MAP, M10</small>		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.	4 to 6	N-m
			9 to 12	
Approximate weight			900	g
			31.7	oz.
Case style			MAGN-A-PAK (MAP)	

ΔR_{thJC} CONDUCTION											
DEVICES	SINE HALF WAVE CONDUCTION AT T_J MAXIMUM					RECTANGULAR WAVE CONDUCTION AT T_J MAXIMUM					UNITS
	180°	120°	90°	60°	30°	180°	120°	90°	60°	30°	
NKE500	0.009	0.011	0.014	0.021	0.037	0.007	0.011	0.015	0.022	0.038	°C/W

Note

- Table shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC

Ordering Information Tabel



- ① - Module type, NKE for single diode module
- ② - Current rating : $I_{F(AV)}$
- ③ - Voltage code x 100 = V_{RRM}

Fig.1 Current ratings characteristics

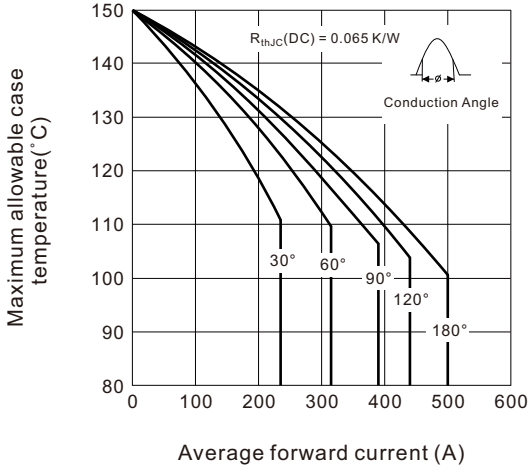


Fig.2 Current ratings characteristics

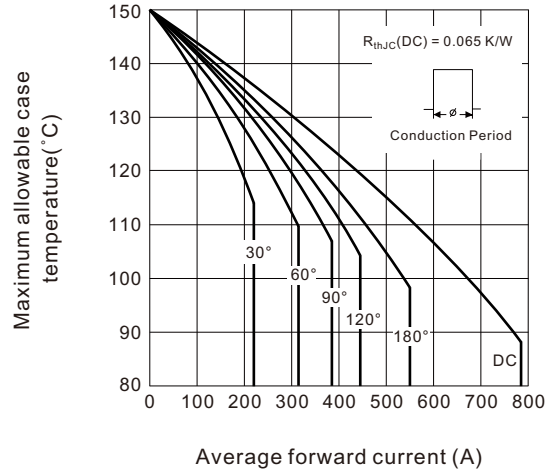


Fig.3 On-state power loss characteristics

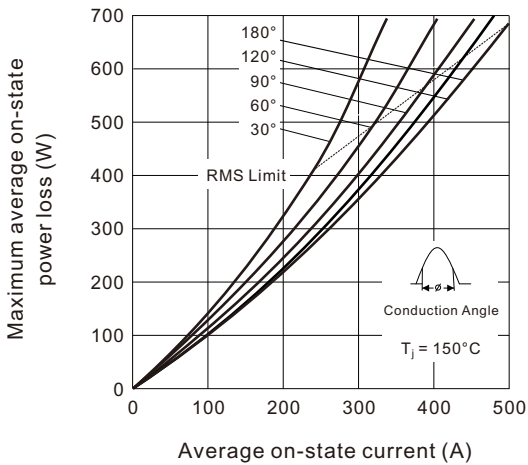


Fig.4 On-state power loss characteristics

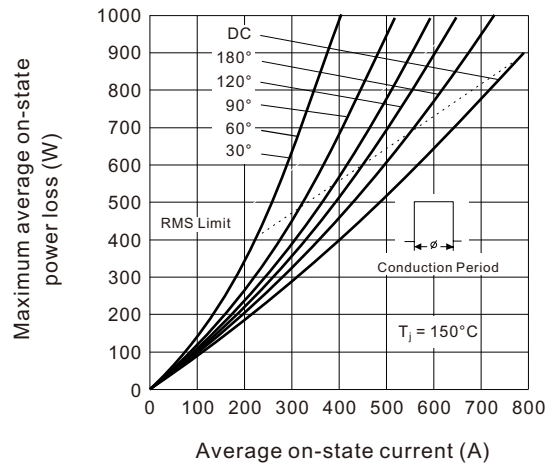


Fig.5 Forward power loss characteristics

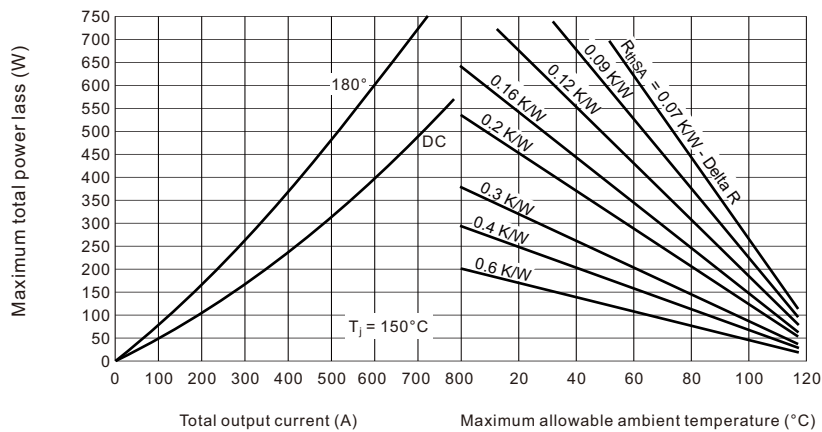


Fig.6 Maximum non-repetitive surge current

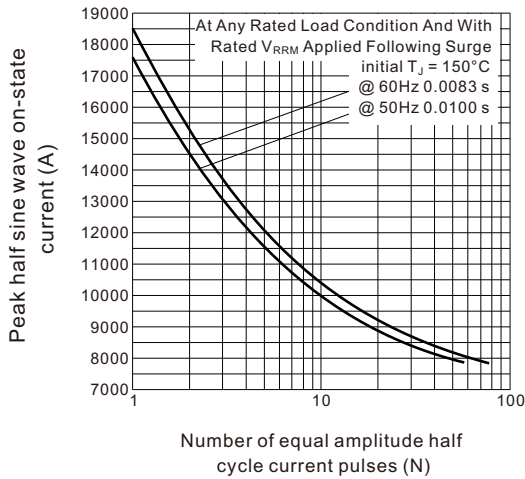


Fig.7 Maximum non-repetitive surge current

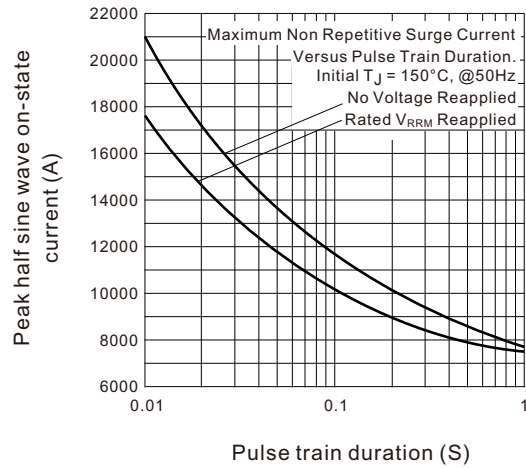


Fig.8 On-state voltage drop characteristics

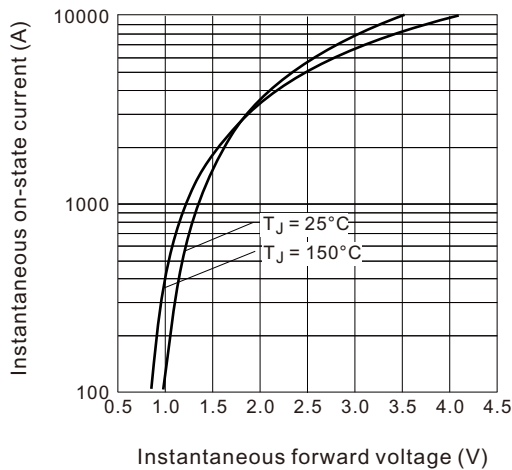


Fig.9 Thermal Impedance Z_{thJC} characteristics

