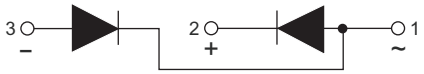
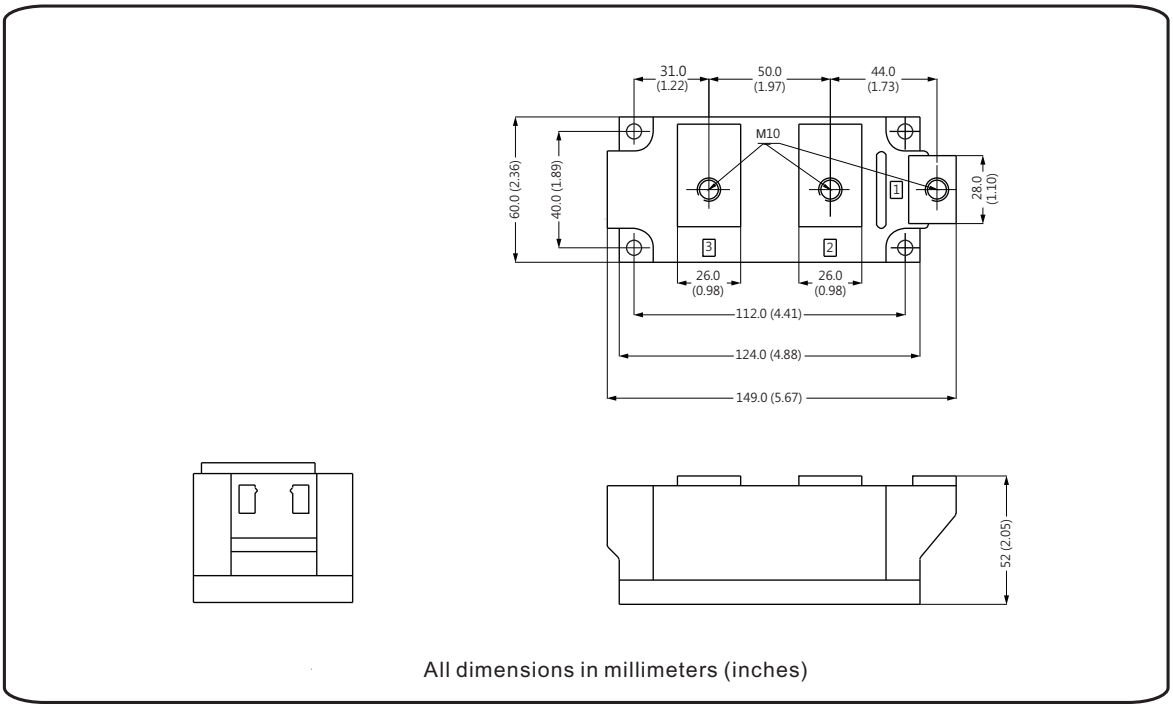
Standard Diodes, 600 A
(MAGN-A-PAK Power Modules)

SUPER MAGN A-PAK





All dimensions in millimeters (inches)

FEATURES

- UL approved file E320098
- High surge capability
- High voltage ratings up to 2000 V
- 3000 V_{RMS} isolating voltage with non-toxic substrate
- Industrial standard package
- Compliant to RoHS

RoHS

APPLICATIONS

- Rectifying bridge for large motor drives
- Rectifying bridge for large UPS

PRODUCT SUMMARY	
$I_{F(AV)}$	600 A
Type	Modules - Diode, High Voltage

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	**CHARACTERISTICS**	**VALUES**	**UNITS**
$I_{F(AV)}$		600	A
	T_C	100	°C
$I_{F(RMS)}$		942	A
	T_C	100	°C
I_{FSM}	50 Hz	19000	A
	60 Hz	20100	
I^2t	50 Hz	1805	kA^2s
	60 Hz	1683	
$I^2\sqrt{t}$		18050	$kA^2\sqrt{t}$
V_{RRM}	Range	800 to 2000	V
T_{Stg}, T_J	Range	- 40 to 150	°C

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**
NKD600	08	800	900	50
	12	1200	1300	
	16	1600	1700	
	20	2000	2100	

FORWARD CONDUCTION						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**			**VALUES**	**UNITS**
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave			600	A
					100	°C
Maximum RMS forward current	$I_{F(RMS)}$	180° conduction, half sine wave at T_C = 100°C			942	A
Maximum peak, one-cycle forward, non-repetitive surge current	I_{FSM}	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial T_J = T_J maximum	19.0	kA
		t = 8.3 ms			20.1	
Maximum $I^2\sqrt{t}$ for fusing	I^2t	t = 10 ms			1805	kA^2s
		t = 8.3 ms			1683	
		t = 10 ms	100 % V_{RRM} reapplied		1319	
		t = 8.3 ms			1230	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1ms to 10 ms, no voltage reapplied			18050	$kA^2\sqrt{t}$
Maximum forward voltage drop	V_{FM}	I_{pk} = 1000A, T_J = 25 °C, t_p = 10 ms sine pulse			1.45	V

BLOCKING				
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**VALUES**	**UNITS**
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	50	mA
		T_J = 25°C	50	µA

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**VALUES**	**UNITS**
Maximum junction operating and storage temperature range	T_J, T_{Stg}		- 40 to 150	°C
Maximum thermal resistance, junction to ca se per junction	R_{thJC}	DC operation	0.065	K/W
Maximum thermal resistance, case to heatsink	$R_{thC\text{-}hs}$		0.02	
Mounting torque 10 % — SMAP to heatsink		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.	6 to 8	Nm
Mounting torque 10 % — busbar to SMAP			12 to 15	
Approximate weight			1500	g
Case style		See dimensions - link at the end of datashet	SUPER MAGN-A-PAK	

‘R_{thJC} CONDUCTION				
CONDUCTION ANGLE	**SINUSOIDAL CONDUCTION**	**RECTANGULAR CONDUCTION**	**TEST CONDITIONS**	**UNITS**
180°	0.009	0.006	$T_J = T_J$ maximum	K/W
120°	0.011	0.011		
90°	0.014	0.015		
60°	0.021	0.022		
30°	0.037	0.038		

Note

• The table above shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC

Fig. 1 Current Ratings Characteristics

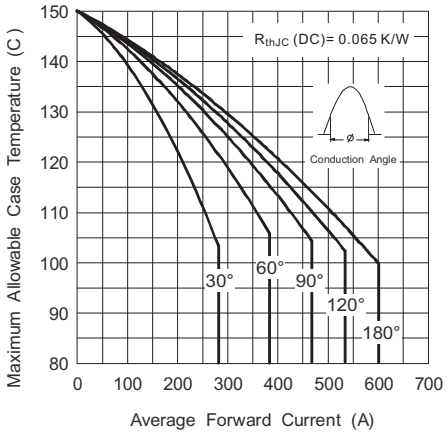


Fig. 2 Current Ratings Characteristics

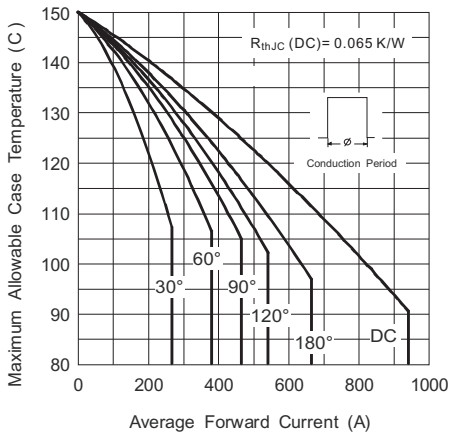


Fig. 3 Forward Power Loss Characteristics

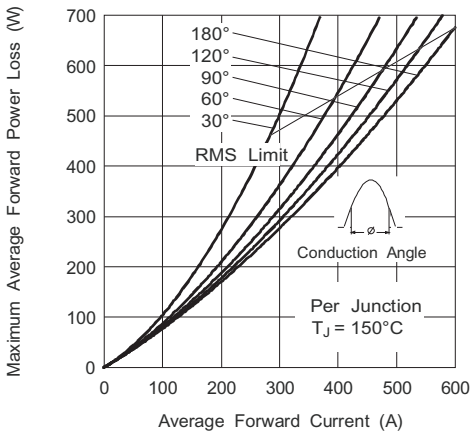


Fig. 4 Forward Power Loss Characteristics

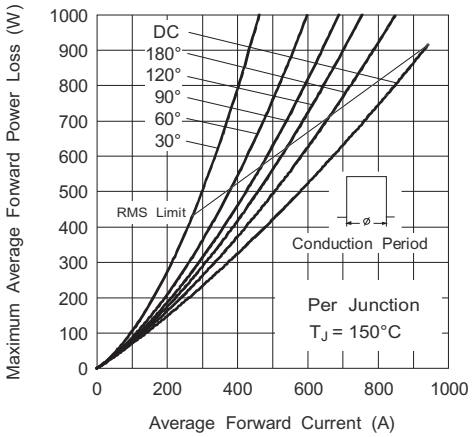


Fig.5 Maximum Non-Repetitive Surge Current

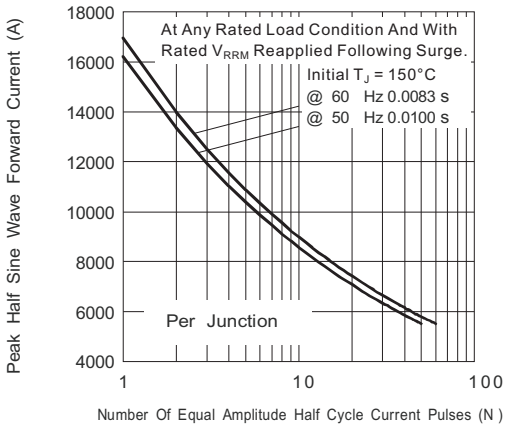


Fig.6 Maximum Non-Repetitive Surge Current

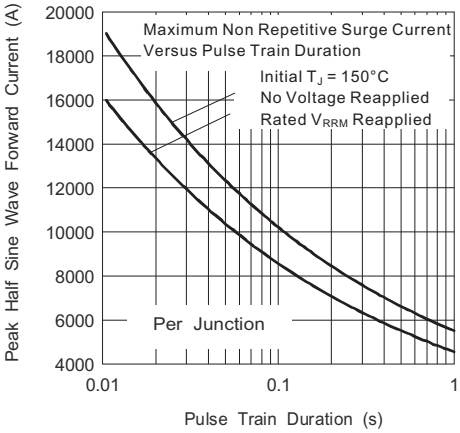


Fig. 7 Forward Power Loss Characteristics

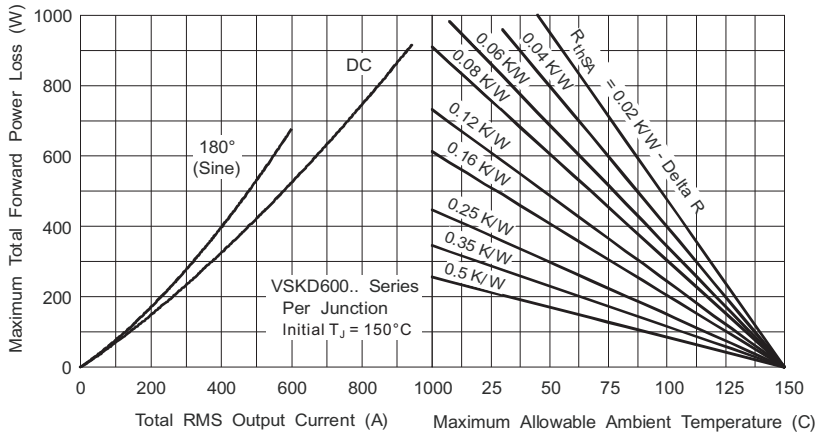


Fig.8 Forward Power Loss Characteristics

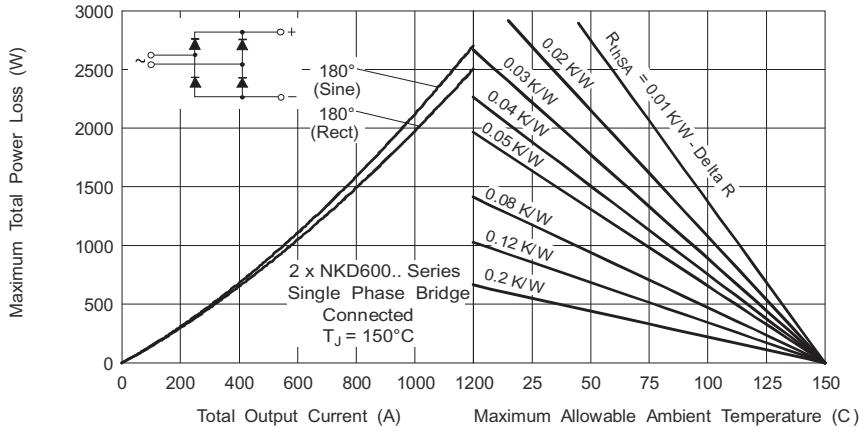


Fig. 9 Forward Power Loss Characteristics

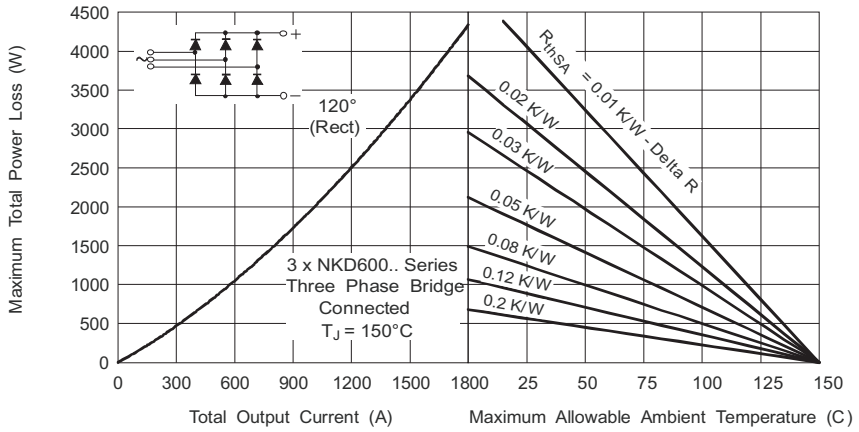


Fig.10 Thermal Impedance Z_{thJC} Characteristic