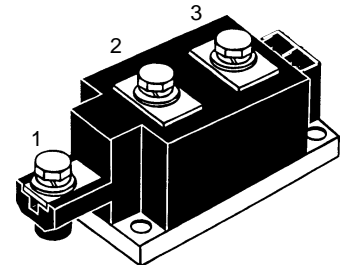


# High Power Diode Modules

$I_{FRMS} = 2 \times 450 \text{ A}$   
 $I_{FAVM} = 2 \times 270 \text{ A}$   
 $V_{RRM} = 1200\text{-}2200 \text{ V}$

$V_{RSM}$ $V_{DSM}$ V	$V_{RRM}$ $V_{DRM}$ V	Type
1300	1200	MDD 255-12N1
1500	1400	MDD 255-14N1
1700	1600	MDD 255-16N1
1900	1800	MDD 255-18N1
2100	2000	MDD 255-20N1
2300	2200	MDD 255-22N1



Symbol	Test Conditions	Maximum Ratings	
$I_{FRMS}$	$T_{VJ} = T_{VJM}$	450	A
	$T_C = 100^\circ\text{C}; 180^\circ \text{ sine}$	270	A
$I_{FSM}$	$T_{VJ} = 45^\circ\text{C}; V_R = 0$	t = 10 ms (50 Hz) t = 8.3 ms (60 Hz)	9500 A 10200 A
	$T_{VJ} = T_{VJM}; V_R = 0$	t = 10 ms (50 Hz) t = 8.3 ms (60 Hz)	8400 A 9000 A
$\int i^2 dt$	$T_{VJ} = 45^\circ\text{C}; V_R = 0$	t = 10 ms (50 Hz) t = 8.3 ms (60 Hz)	451 000 A <sup>2</sup> s 437 000 A <sup>2</sup> s
	$T_{VJ} = T_{VJM}; V_R = 0$	t = 10 ms (50 Hz) t = 8.3 ms (60 Hz)	353 000 A <sup>2</sup> s 340 000 A <sup>2</sup> s
$T_{VJ}$		-40...+150	°C
$T_{VJM}$		150	°C
$T_{stg}$		-40...+125	°C
$V_{ISOL}$	50/60 Hz, RMS	t = 1 min	3000 V~
	$I_{ISOL} \leq 1 \text{ mA}$	t = 1 s	3600 V~
$M_d$	Mounting torque (M6)	4.5-7/40-62 Nm/lb.in.	
	Terminal connection torque (M8)	11-13/97-115 Nm/lb.in.	
Weight	Typical including screws	750 g	

### Features

- International standard package
- Direct copper bonded  $\text{Al}_2\text{O}_3$ -ceramic with copper base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered E 72873

### Applications

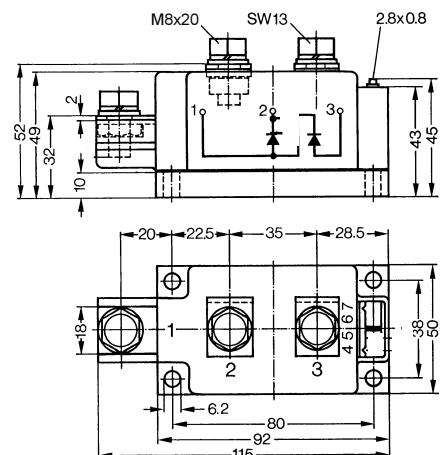
- Supplies for DC power equipment
- DC supply for PWM inverter
- Field supply for DC motors
- Battery DC power supplies

### Advantages

- Simple mounting
- Improved temperature and power cycling
- Reduced protection circuits

Symbol	Test Conditions	Characteristic Values		
$I_{RRM}$	$T_{VJ} = T_{VJM}; V_R = V_{RRM}$	30	mA	
$V_F$	$I_F = 600 \text{ A}; T_{VJ} = 25^\circ\text{C}$	1.4	V	
$V_{T0}$	For power-loss calculations only	0.8	V	
$r_T$	$T_{VJ} = T_{VJM}$	0.6	mΩ	
$R_{thJC}$	per diode; DC current per module	} other values see MCC 255	0.140	K/W
			0.07	K/W
$R_{thJK}$	per diode; DC current per module	}	0.18	K/W
			0.09	K/W
$Q_s$	$T_{VJ} = 125^\circ\text{C}; I_F = 400 \text{ A}; -di/dt = 50 \text{ A}/\mu\text{s}$	700	μC	
$I_{RM}$		260	A	
$d_s$	Creeping distance on surface	12.7	mm	
$d_A$	Creepage distance in air	9.6	mm	
$a$	Maximum allowable acceleration	50	m/s <sup>2</sup>	

### Dimensions in mm (1 mm = 0.0394")



Data according to IEC 60747 and refer to a single diode unless otherwise stated. IXYS reserves the right to change limits, test conditions and dimensions

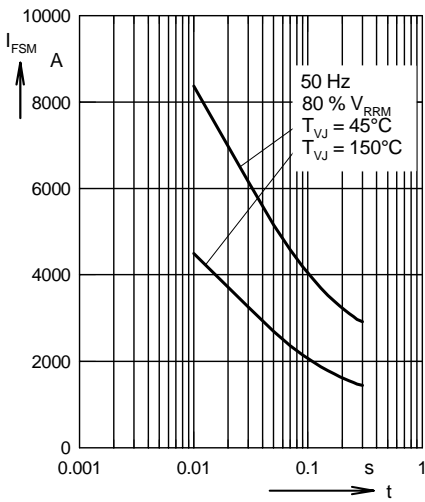


Fig. 1 Surge overload current  
 $I_{FSM}$ : Crest value,  $t$ : duration

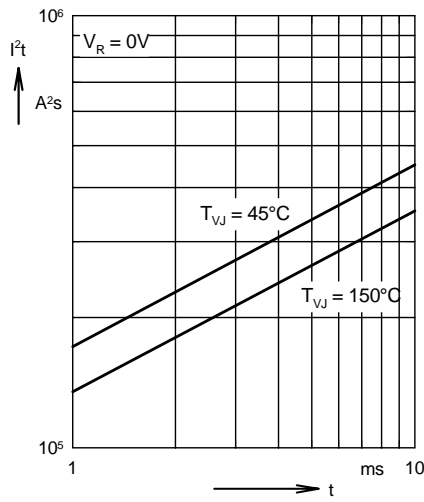


Fig. 2  $I^2t$  versus time (1-10 ms)

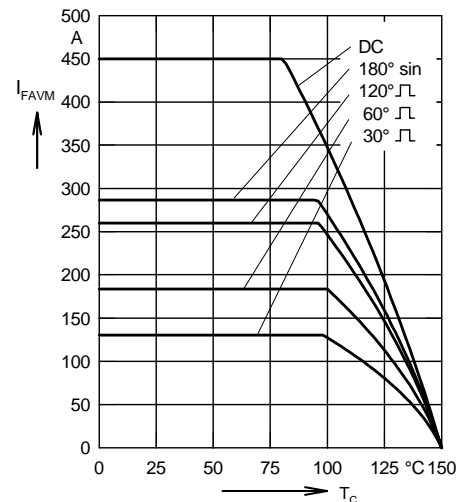


Fig. 3 Maximum forward current at case temperature

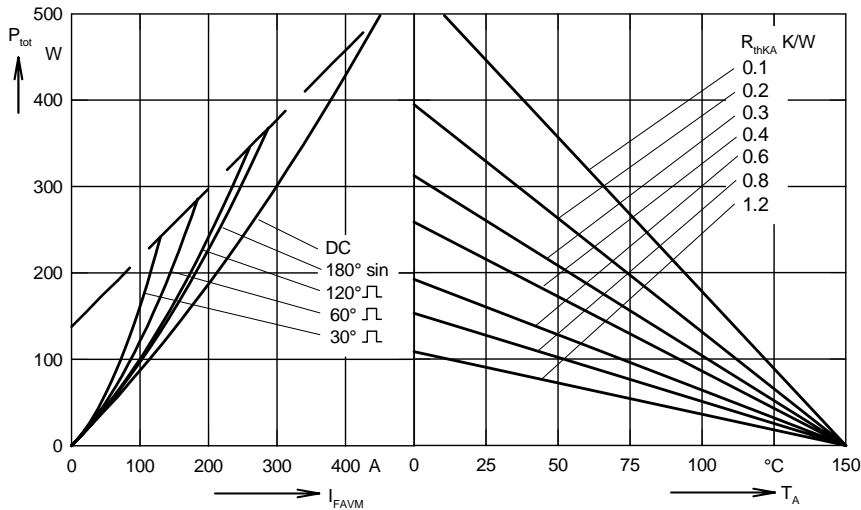


Fig. 4 Power dissipation versus forward current and ambient temperature (per diode)

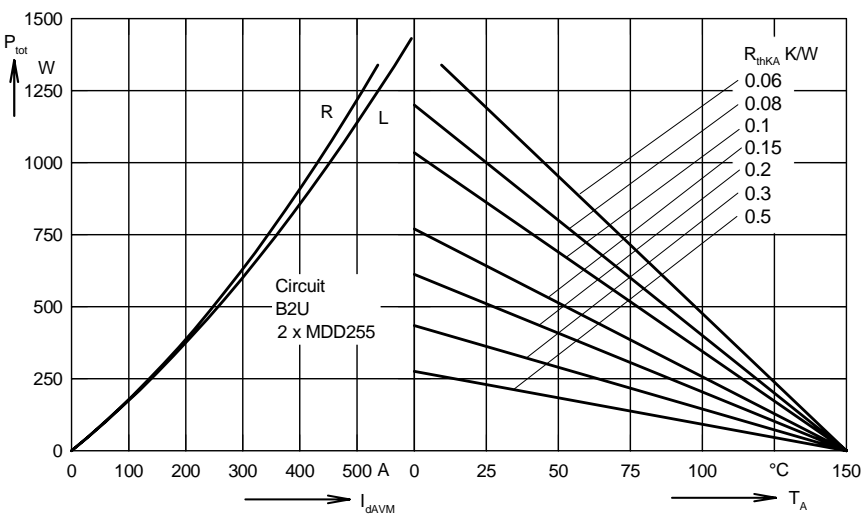


Fig. 5 Single phase rectifier bridge:  
Power dissipation versus direct output current and ambient temperature  
R = resistive load  
L = inductive load

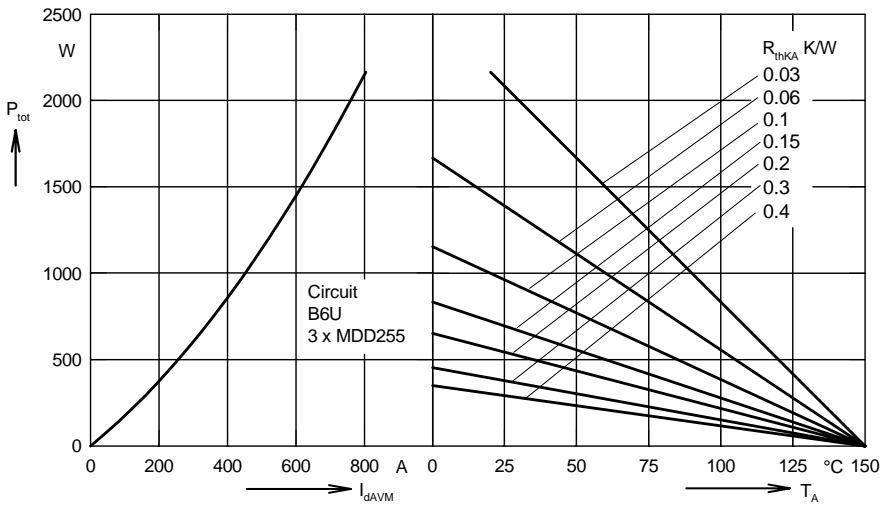


Fig. 6 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

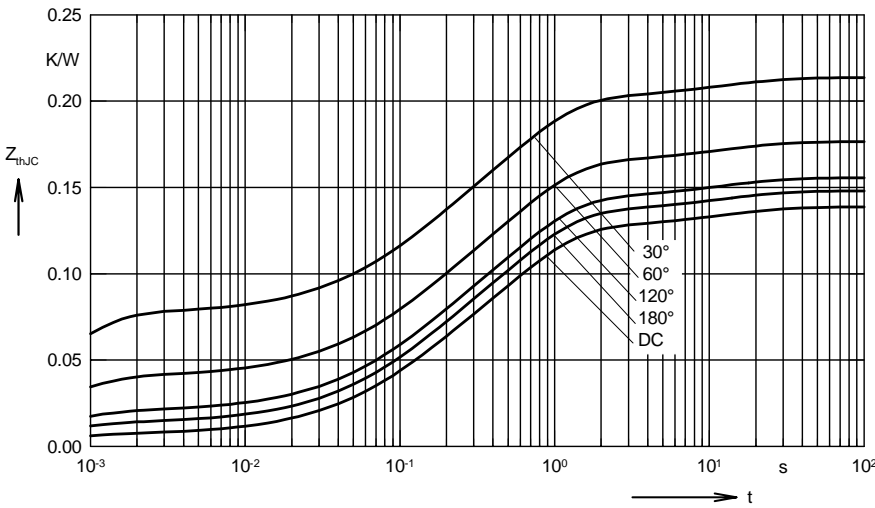


Fig. 7 Transient thermal impedance junction to case (per diode)

$R_{thJC}$  for various conduction angles d:

d	$R_{thJC}$ (K/W)
DC	0.139
180°	0.148
120°	0.156
60°	0.176
30°	0.214

Constants for  $Z_{thJC}$  calculation:

i	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.0066	0.00054
2	0.0358	0.098
3	0.0831	0.54
4	0.0129	12

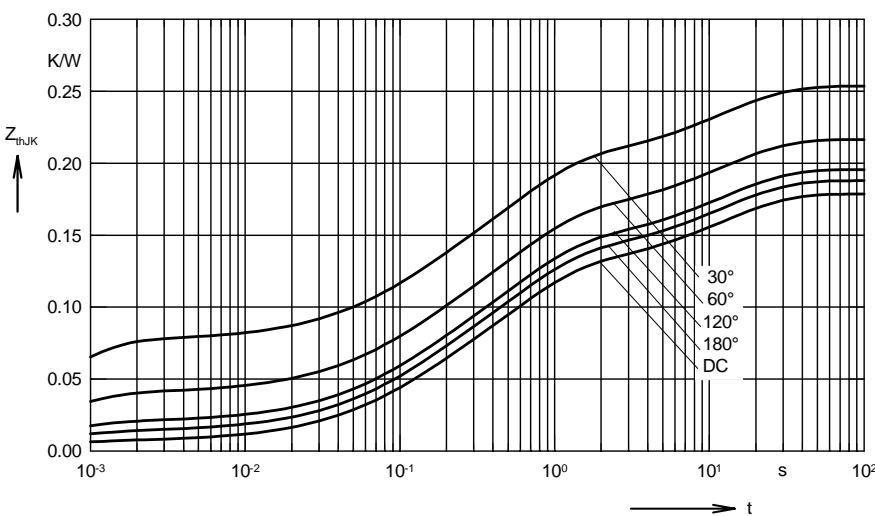


Fig. 8 Transient thermal impedance junction to heatsink (per diode)

$R_{thJK}$  for various conduction angles d:

d	$R_{thJK}$ (K/W)
DC	0.179
180°	0.188
120°	0.196
60°	0.216
30°	0.254

Constants for  $Z_{thJK}$  calculation:

i	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.0066	0.00054
2	0.0358	0.098
3	0.0831	0.54
4	0.0129	12
5	0.04	12