

# Diode Module AMDD170N16S



## Key Parameters

$I_{F(AV)M}$	=	170	A
$V_{RRM}$	=	1600	V
$I_{FSM}$	=	6600	A
$V_{T0}$	=	0.75	V
$r_T$	=	1.05	mΩ

## Properties

- International standard package
- High operation reliability
- Electrically insulated base plate

## MAXIMUM ALLOWABLE RATINGS

Symbols and parameters			Maximum Limits	Unit
$V_{RRM}$	Repetitive peak reverse voltage	$T_{vj} = -40^{\circ}\text{C} \dots T_{vj \text{ max}}$	1600	V
$V_{RSM}$	Non-repetitive peak reverse voltage	$T_{vj} = +25^{\circ}\text{C} \dots T_{vj \text{ max}}$	1700	V
$I_{FAVM}$	Average on-state current	$T_C = 100^{\circ}\text{C}$	165	A
$I_{FRMSM}$	Maximum RMS on-state current		260	A
$I_{FSM}$	Surge current	$T_{vj} = 25^{\circ}\text{C}, t_p = 10 \text{ ms}$	6600	A
		$T_{vj} = T_{vj \text{ max}}, t_p = 10 \text{ ms}$	5500	A
$I^2t$	Safety factor	$T_{vj} = 25^{\circ}\text{C}, t_p = 10 \text{ ms}$	217800	A <sup>2</sup> s
		$T_{vj} = T_{vj \text{ max}}, t_p = 10 \text{ ms}$	151250	A <sup>2</sup> s

## CHARACTERISTICS

Symbols and parameters			Value			Unit
			min	typ	max	
$V_F$	On-state voltage	$T_{vj} = 25^\circ\text{C}, I_F = 500\text{ A}$			1.4	V
$V_{(TO)}$	Threshold voltage	$T_{vj} = T_{vj\text{ max}}$			0.75	V
$r_T$	Slope resistance	$T_{vj} = T_{vj\text{ max}}$			1.05	m $\Omega$
$I_R$	Reverse current	$T_{vj} = T_{vj\text{ max}}, V_R = V_{RRM}$			9	mA
$V_{ISOL}$	Insulation test voltage	RMS, f = 50Hz, t = 1 sec RMS, f = 50Hz, t = 1 min			3.6 3.0	kV

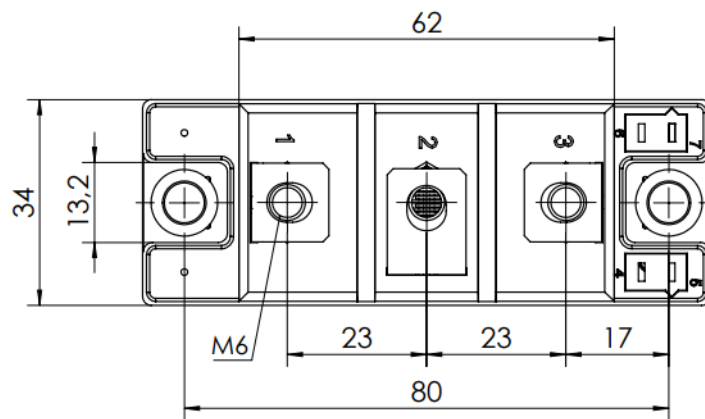
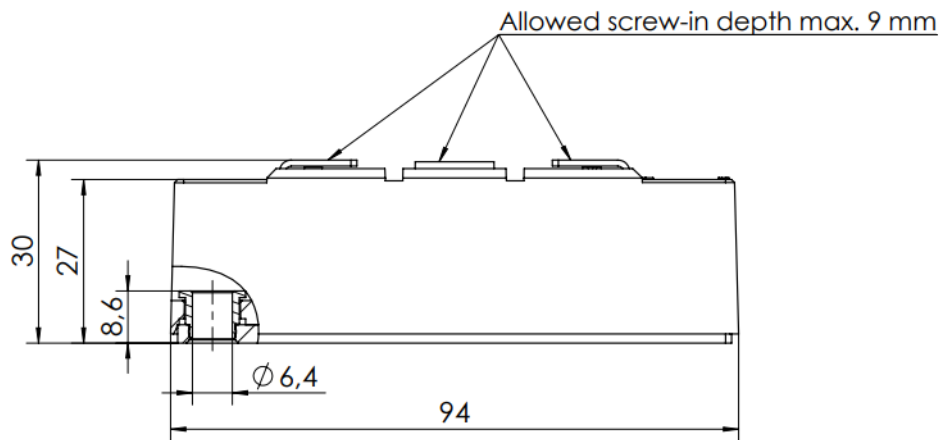
## THERMAL PARAMETERS

Symbols and parameters			Value	Unit
$R_{th(j-c)}$	Thermal resistance, junction to case	per Module, $\theta = 180^\circ$ sin	0.09	K/W
		per arm, $\theta = 180^\circ$ sin	0.18	
		per Module, DC	0.09	
		per arm, DC	0.18	
$R_{th(c-h)}$	Thermal resistance, case to heatsink	per Module	0.05	K/W
		per arm	0.10	
$T_{vj\text{ max}}$	Maximum junction temperature		+135	$^\circ\text{C}$
$T_{C\text{ op}}$	Operating temperature range		-40...+125	$^\circ\text{C}$
$T_{stg}$	Storage temperature range		-40...+125	$^\circ\text{C}$

## MECHANICAL PARAMETERS

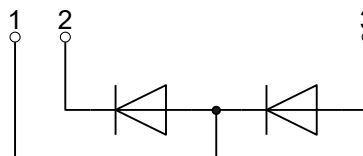
Symbols and parameters			Value	Unit
<b>M1</b>	Mounting torque	Tolerance $\pm 15\%$	5	Nm
<b>M2</b>	Terminal connection torque	Tolerance $\pm 15\%$	5	Nm
<b>W</b>	Weight		165	g
<b>a</b>	Vibration resistance	f = 50 Hz	50	m/s <sup>2</sup>

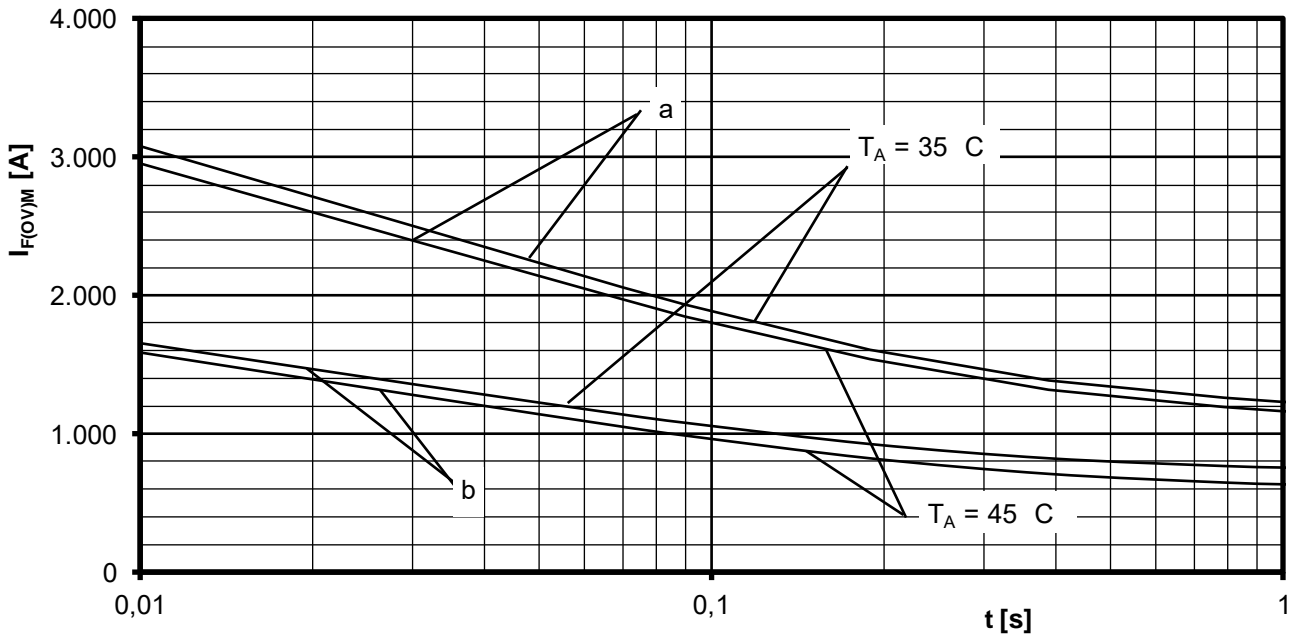
## DIMENSIONS



General tolerance  $\pm 0,5$  mm

## TOPOLOGY OF INTERNAL CONNECTION





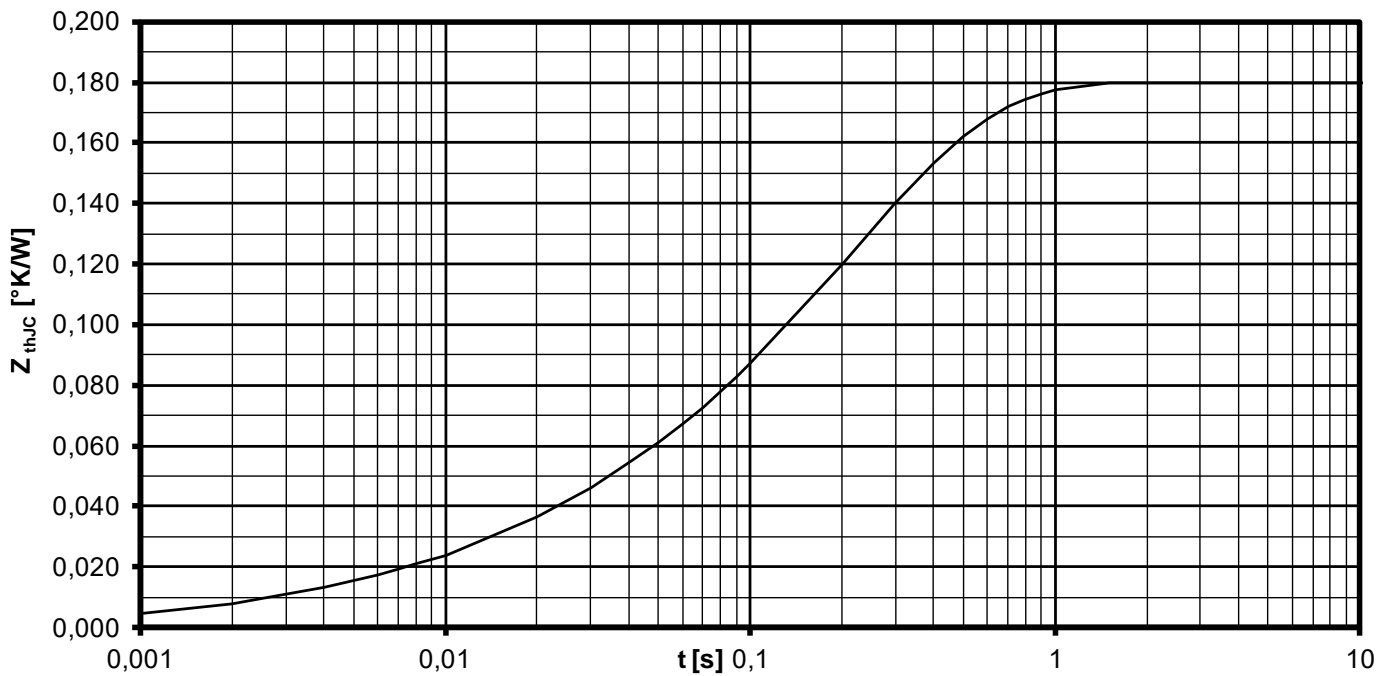
Maximum overload on-state current per arm  $I_{F(ov)m} = f(t)$ ,  $V_{RM} = 0,8 V_{RRM}$

a: No-load conditions

b: Pre-load current per arm  $I_{FAV(vor)} = I_{FAVM}$

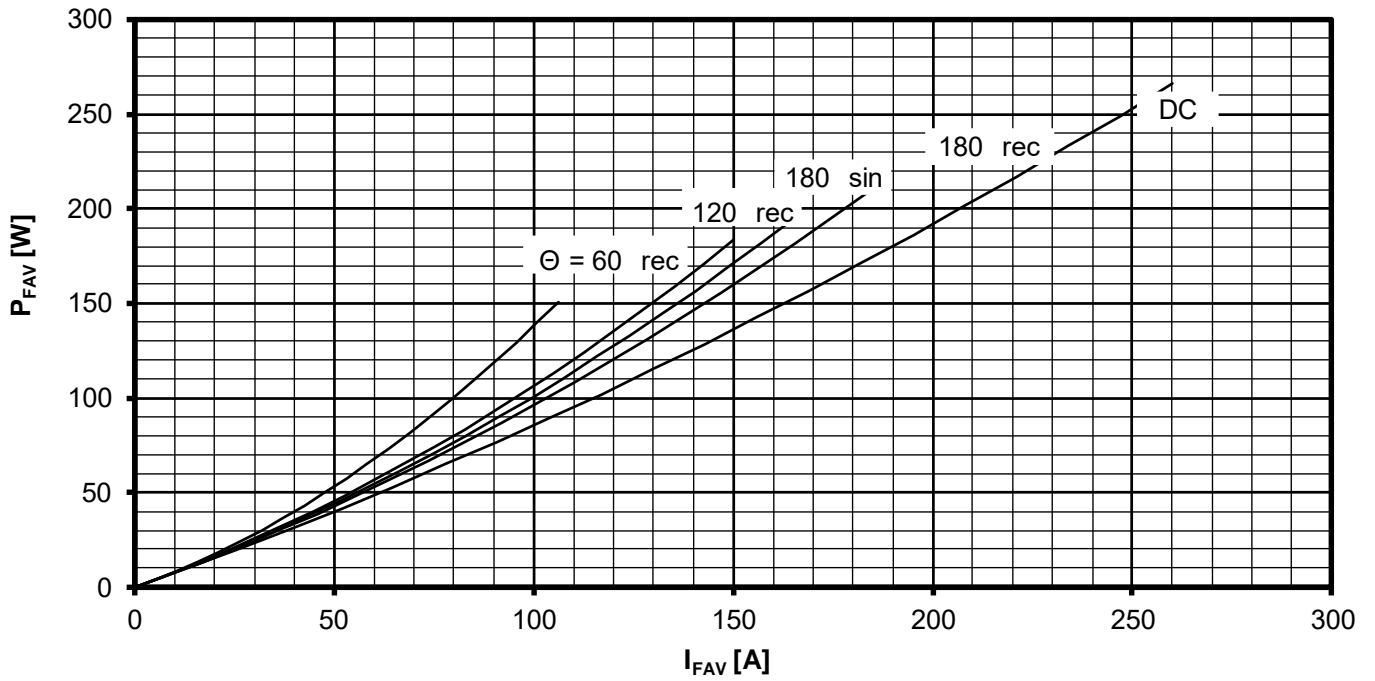
$T_a = 35^\circ\text{C}$ , Forced air cooling Heatsink type: KM17 (Papst 4650)

$T_a = 45^\circ\text{C}$ , Natural air cooling Heatsink type: KM17 (160W)



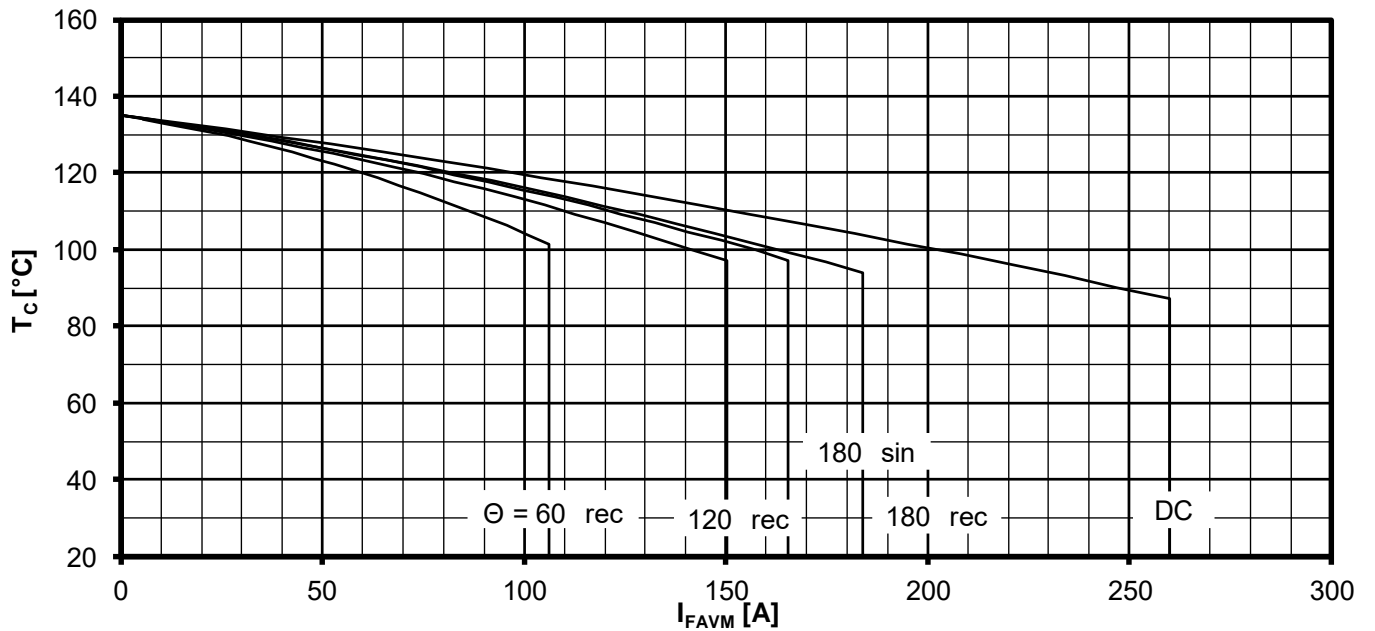
Transient thermal impedance per arm  $Z_{thjC} = f(t)$

Parameter: Current conduction angle  $\Theta$



**On-state power loss per arm  $P_{FAV} = f(I_{FAV})$**

Parameter: Current conduction angle  $\Theta$

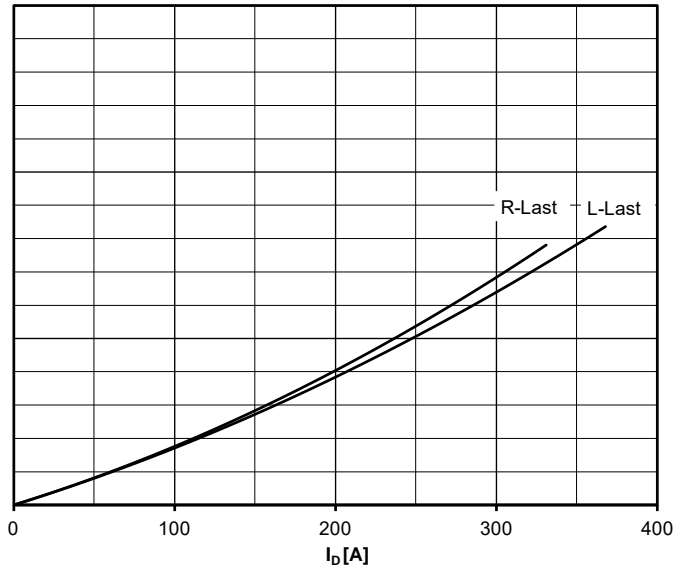
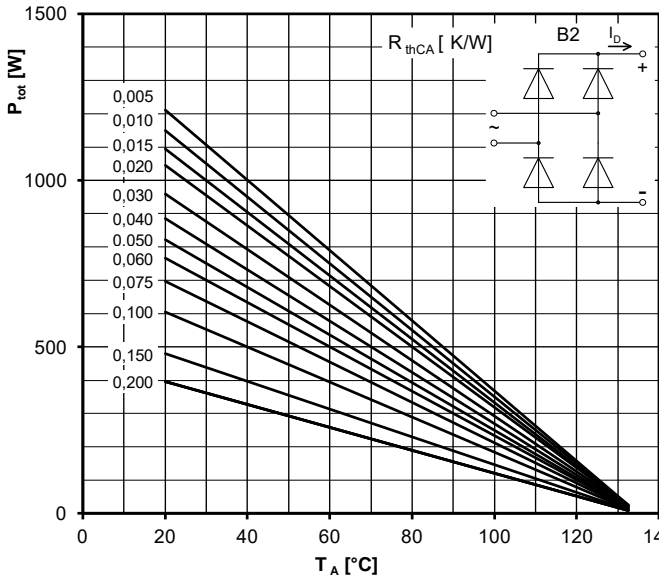


**Maximum allowable case temperature  $T_C = f(I_{FAVM})$**

Current load per arm

Calculation base  $P_{TAV}$

Parameter: Current conduction angle  $\Theta$



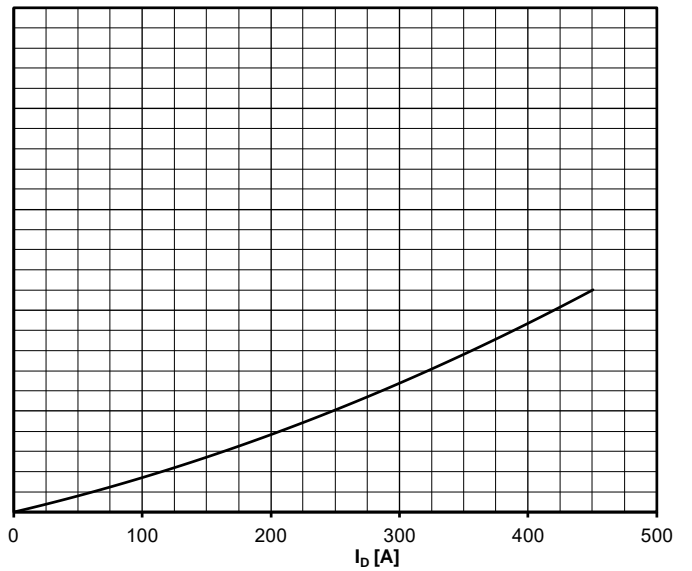
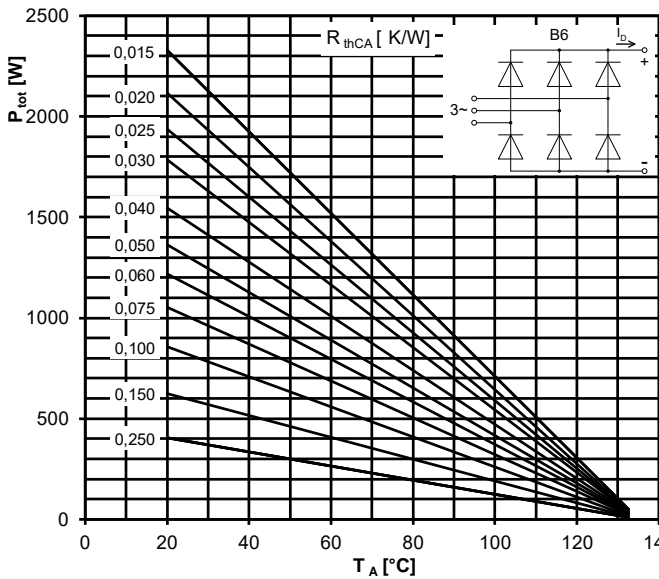
**Maximum rated output current  $I_b$**

B2- Two-pulse bridge circuit

Total power dissipation at circuit  $P_{tot}$

Parameter:

Thermal resistance cases to ambient  $R_{thCA}$



**Maximum rated output current  $I_b$**

B6- Six-pulse bridge circuit

Total power dissipation at circuit  $P_{tot}$

Parameter:

Thermal resistance cases to ambient  $R_{thCA}$