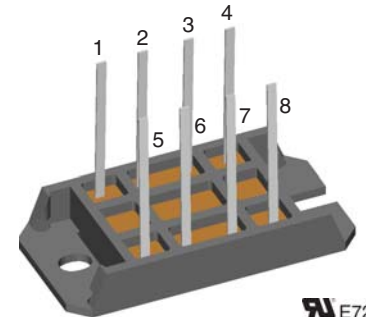
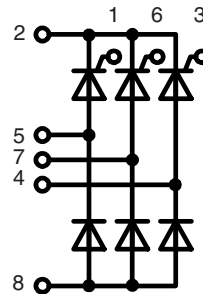


# Three Phase Half Controlled Rectifier Bridge

$I_{dAVM} = 27 \text{ A}$   
 $V_{RRM} = 1200/1600 \text{ V}$

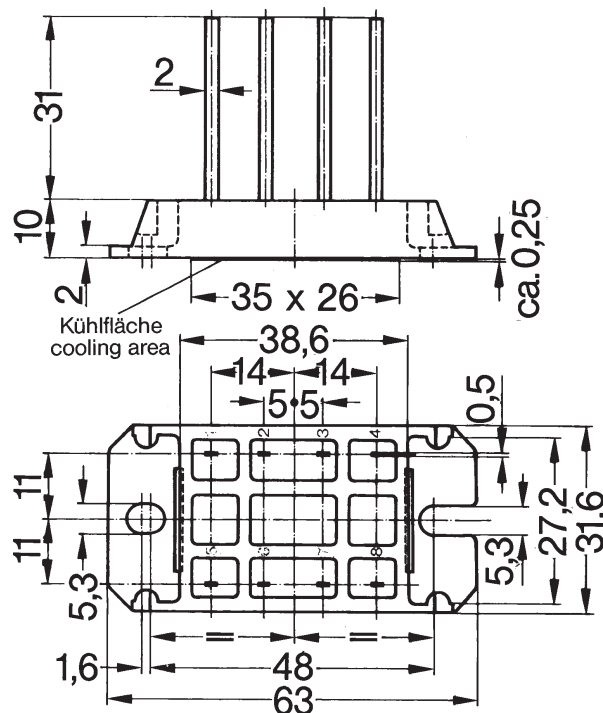
$V_{RSM}$ $V_{DSM}$ V	$V_{RRM}$ $V_{DRM}$ V	Type
1300	1200	VVZ 24-12io1
1700	1600	VVZ 24-16io1



Symbol	Conditions	Maximum Ratings	Features
$I_{dAV}$	$T_K = 100^\circ\text{C}$ ; module	21 A	<ul style="list-style-type: none"> <li>• Package with DCB ceramic base plate</li> <li>• Isolation voltage 3600 V~</li> <li>• Planar passivated chips</li> <li>• Soldering terminals</li> <li>• UL registered E 72873</li> </ul>
$I_{dAVM}$	module	27 A	
$I_{FRMS}, I_{TRMS}$	per leg	16 A	
$I_{FSM}, I_{TSM}$	$T_{VJ} = 45^\circ\text{C}$ ; $V_R = 0$	$t = 10 \text{ ms}$ (50 Hz), sine $t = 8.3 \text{ ms}$ (60 Hz), sine	300 A 320 A
	$T_{VJ} = T_{VJM}$ $V_R = 0$	$t = 10 \text{ ms}$ (50 Hz), sine $t = 8.3 \text{ ms}$ (60 Hz), sine	270 A 290 A
$I^2t$	$T_{VJ} = 45^\circ\text{C}$ $V_R = 0$	$t = 10 \text{ ms}$ (50 Hz), sine $t = 8.3 \text{ ms}$ (60 Hz), sine	450 A <sup>2</sup> s 430 A <sup>2</sup> s
	$T_{VJ} = T_{VJM}$ $V_R = 0$	$t = 10 \text{ ms}$ (50 Hz), sine $t = 8.3 \text{ ms}$ (60 Hz), sine	365 A <sup>2</sup> s 350 A <sup>2</sup> s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$ $f = 400 \text{ Hz}$ , $t_p = 200 \mu\text{s}$ $V_D = 2/3 V_{DRM}$ $I_G = 0.3 \text{ A}$ , $di_G/dt = 0.3 \text{ A}/\mu\text{s}$	repetitive, $I_T = 50 \text{ A}$  non repetitive, $I_T = 1/3 \cdot I_{dAV}$	150 A/ $\mu\text{s}$  500 A/ $\mu\text{s}$
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$ ; $V_{DR} = 2/3 V_{DRM}$ $R_{GK} = \infty$ ; method 1 (linear voltage rise)		1000 V/ $\mu\text{s}$
$V_{RGM}$			10 V
$P_{GM}$	$T_{VJ} = T_{VJM}$ $I_T = I_{TAVM}$	$t_p = 30 \mu\text{s}$	$\leq 10 \text{ W}$
		$t_p = 500 \mu\text{s}$	$\leq 5 \text{ W}$
		$t_p = 10 \text{ ms}$	$\leq 1 \text{ W}$
$P_{GAVM}$			0.5 W
$T_{VJ}$			-40...+125 °C
$T_{VJM}$			125 °C
$T_{stg}$			-40...+125 °C
$V_{ISOL}$	50/60 Hz, RMS	$t = 1 \text{ min}$	3000 V~
	$I_{ISOL} \leq 1 \text{ mA}$	$t = 1 \text{ s}$	3600 V~
$M_d$	Mounting torque	(M5)	2-2.5 Nm
		(10-32 UNF)	18-22 lb.in.
Weight	typ.		28 g

Data according to IEC 60747 and refer to a single thyristor/diode unless otherwise stated.

Symbol	Conditions	Characteristic Values
$I_R, I_D$	$V_R = V_{RRM}; V_D = V_{DRM}$ $T_{VJ} = T_{VJM}$ $T_{VJ} = 25^\circ\text{C}$	$\leq 5$ mA $\leq 0.3$ mA
$V_F, V_T$	$I_F, I_T = 30$ A, $T_{VJ} = 25^\circ\text{C}$	$\leq 1.45$ V
$V_{T0}$	For power-loss calculations only	1 V
$r_T$	( $T_{VJ} = 125^\circ\text{C}$ )	16 m $\Omega$
$V_{GT}$	$V_D = 6$ V; $T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = -40^\circ\text{C}$	$\leq 1.0$ V $\leq 1.2$ V
$I_{GT}$	$V_D = 6$ V; $T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = -40^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$	$\leq 65$ mA $\leq 80$ mA $\leq 50$ mA
$V_{GD}$	$T_{VJ} = T_{VJM};$ $T_{VJ} = T_{VJM};$	$\leq 0.2$ V $\leq 5$ mA
$I_{GD}$	$V_D = 2/3 V_{DRM}$ $V_D = 2/3 V_{DRM}$	
$I_L$	$I_G = 0.3$ A; $t_G = 30$ $\mu\text{s}$ $di_G/dt = 0.3$ A/ $\mu\text{s}$ $T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = -40^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$	$\leq 150$ mA $\leq 200$ mA $\leq 100$ mA
$I_H$	$T_{VJ} = 25^\circ\text{C}; V_D = 6$ V; $R_{GK} = \infty$	$\leq 100$ mA
$t_{gd}$	$T_{VJ} = 25^\circ\text{C}; V_D = 1/2 V_{DRM}$ $I_G = 0.3$ A; $di_G/dt = 0.3$ A/ $\mu\text{s}$	$\leq 2$ $\mu\text{s}$
$t_q$	$T_{VJ} = 125^\circ\text{C}; I_T = 15$ A, $t_p = 300$ $\mu\text{s}$ , $-di/dt = 10$ A/ $\mu\text{s}$	typ. 150 $\mu\text{s}$
$Q_f$	$V_R = 100$ V, $dv/dt = 20$ V/ $\mu\text{s}$ , $V_D = 2/3 V_{DRM}$	75 $\mu\text{C}$
$R_{thJC}$	per thyristor (diode); DC current per module	2.1 K/W 0.35 K/W
$R_{thJH}$	per thyristor (diode); DC current per module	2.7 K/W 0.45 K/W
$d_s$	Creeping distance on surface	7 mm
$d_A$	Creepage distance in air	7 mm
$a$	Max. allowable acceleration	50 m/s <sup>2</sup>

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


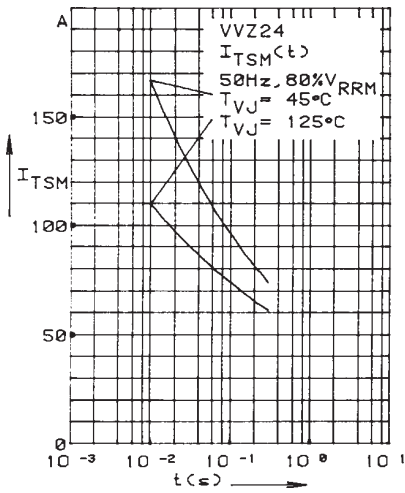


Fig. 1 Surge overload current per chip  
 $I_{FSM}$ : Crest value, t: duration

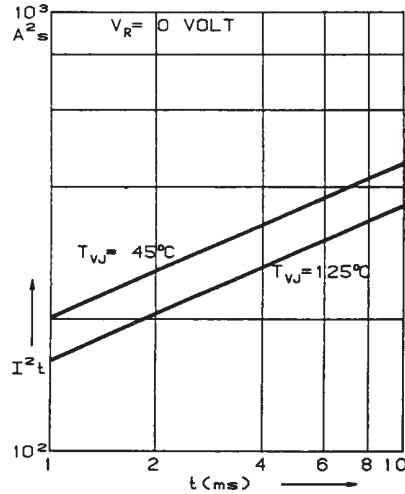


Fig. 2  $I^2t$  versus time (1-10 ms) per chip

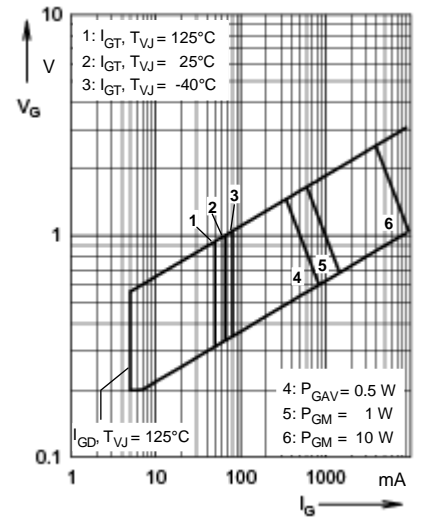


Fig. 3 Gate trigger characteristics  
 Triggering

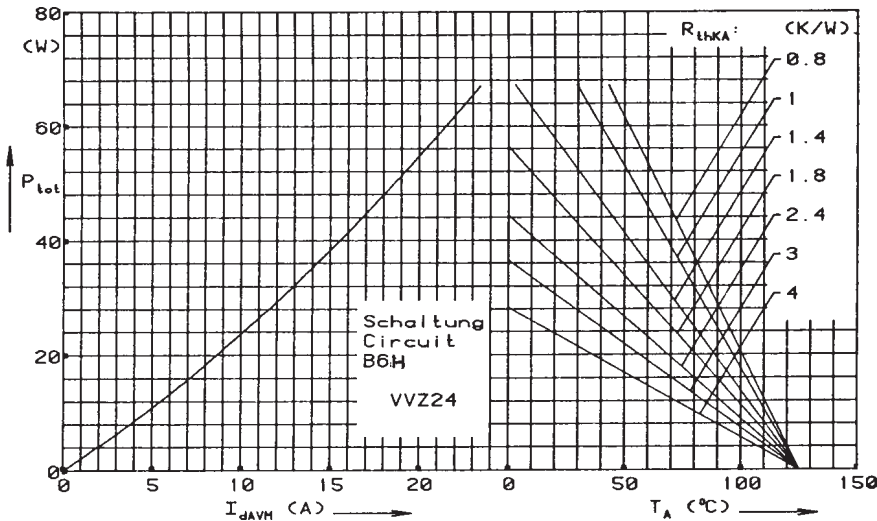


Fig. 4 Power dissipation versus direct output current and ambient temperature

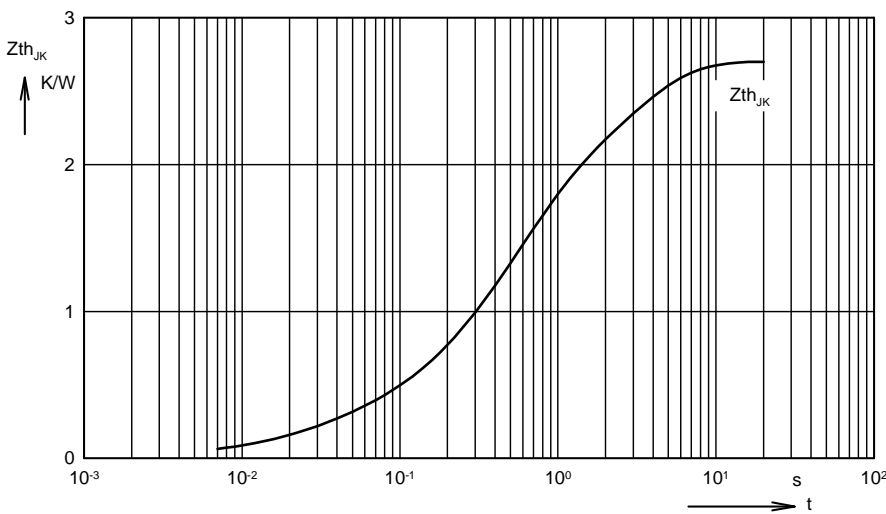


Fig. 5 Transient thermal impedance junction to heatsink

Constants for  $Z_{thJK}$  calculation

i	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.17	0.028
2	1.4	0.44
3	1.1	2.6