Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

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Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

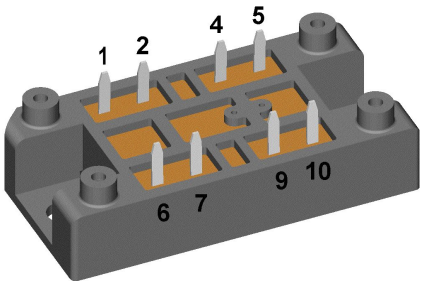
Thyristor Module

V_{RRM}	=	1600 V
I_{TAV}	=	27 A
V_T	=	1,28 V

AC Controlling
2~ full-controlled

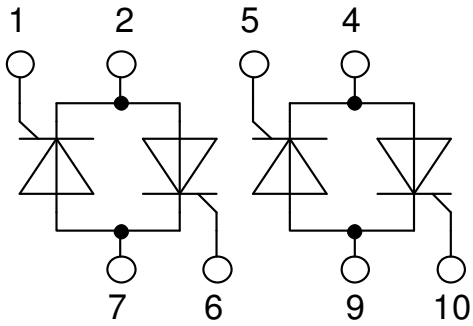
Part number

VW2x60-16io1



Backside: isolated

E72873



Features / Advantages:

- Thyristor for line frequency
- Planar passivated chip
- Long-term stability
- Direct Copper Bonded Al2O3-ceramic

Applications:

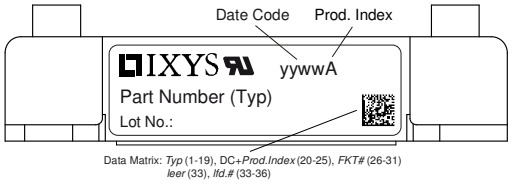
- Line rectifying 50/60 Hz
- Softstart AC motor control
- DC Motor control
- Power converter
- AC power control
- Lighting and temperature control

Package: V1-A-Pack

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 17 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

Rectifier				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
$V_{RSM/DSM}$	*max. non-repetitive reverse/forward blocking voltage*		T_{VJ} = 25°C			1700	V
$V_{RRM/DRM}$	*max. repetitive reverse/forward blocking voltage*		T_{VJ} = 25°C			1600	V
$I_{R/D}$	*reverse current, drain current*	$V_{R/D}$ = 1600 V	T_{VJ} = 25°C			100	µA
		$V_{R/D}$ = 1600 V	T_{VJ} = 125°C			5	mA
V_T	*forward voltage drop*	I_T = 40 A	T_{VJ} = 25°C			1,25	V
		I_T = 80 A				1,65	V
		I_T = 40 A	T_{VJ} = 125°C			1,28	V
		I_T = 80 A				1,75	V
I_{TAV}	*average forward current*	T_C = 85°C	T_{VJ} = -40°C			27	A
I_{RMS}	*RMS forward current per phase*	180° sine				60	A
V_{T0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = -40°C			0,85	V
r_T	*slope resistance* }					11	mΩ
R_{thJC}	*thermal resistance junction to case*					0,92	K/W
R_{thCH}	*thermal resistance case to heatsink*				0,30		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			110	W
I_{TSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			520	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			560	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = -40°C			440	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			475	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			1,35	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1,31	kA²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = -40°C			970	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			940	A²s
C_J	*junction capacitance*	V_R = 400 V f = 1 MHz	T_{VJ} = 25°C		64		pF
P_{GM}	*max. gate power dissipation*	t_P = 30 µs	T_C = -40°C			10	W
		t_P = 300 µs				5	W
P_{GAV}	*average gate power dissipation*					0,5	W
$(di/dt)_{cr}$	*critical rate of rise of current*	T_{VJ} = 125°C; f = 50 Hz repetitive,	I_T = 45 A			100	A/µs
		t_P = 200 µs; di_G/dt = 0,45 A/µs;					
		I_G = 0,45 A; V = ⅔ V_{DRM} non-repet.,	I_T = 27 A			500	A/µs
$(dv/dt)_{cr}$	*critical rate of rise of voltage*	V = ⅔ V_{DRM}	T_{VJ} = 125°C			1000	V/µs
		R_{GK} = ∞; method 1 (linear voltage rise)					
V_{GT}	*gate trigger voltage*	V_D = 6 V	T_{VJ} = 25°C			1,5	V
			T_{VJ} = -40°C			1,6	V
I_{GT}	*gate trigger current*	V_D = 6 V	T_{VJ} = 25°C			100	mA
			T_{VJ} = -40°C			200	mA
V_{GD}	*gate non-trigger voltage*	V_D = ⅔ V_{DRM}	T_{VJ} = 125°C			0,2	V
I_{GD}	*gate non-trigger current*					5	mA
I_L	*latching current*	t_p = 10 µs	T_{VJ} = 25°C			450	mA
		I_G = 0,45 A; di_G/dt = 0,45 A/µs					
I_H	*holding current*	V_D = 6 V R_{GK} = ∞	T_{VJ} = 25°C			200	mA
t_{gd}	*gate controlled delay time*	V_D = ½ V_{DRM}	T_{VJ} = 25°C			2	µs
		I_G = 0,45 A; di_G/dt = 0,45 A/µs					
t_q	*turn-off time*	V_R = 100 V; I_T = 20 A; V = ⅔ V_{DRM}	T_{VJ} = -65 °C		150		µs
		di/dt = 10 A/µs dv/dt = 15 V/µs t_p = 200 µs					

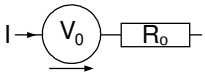
Package V1-A-Pack				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal				100	A
T_{VJ}	*virtual junction temperature*			-40		-40	°C
T_{op}	*operation temperature*			-40		-65	°C
T_{stg}	*storage temperature*			-40		125	°C
Weight					37		g
M_D	*mounting torque*			2		2,5	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	6,0			mm
$d_{Spb/Apb}$			*terminal to backside*	12,0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA	3600			V
		t = 1 minute		3000			V



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VW2x60-16io1	VW2x60-16io1	Blister	24	471410

Equivalent Circuits for Simulation

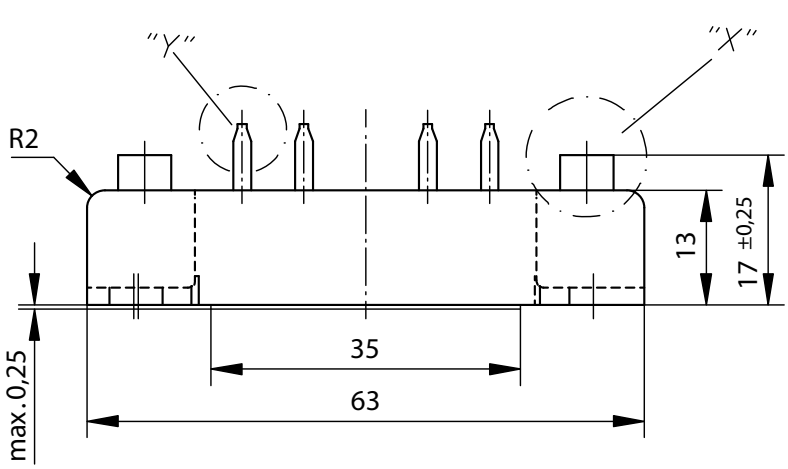
** on die level* T_{VJ} = -40 °C

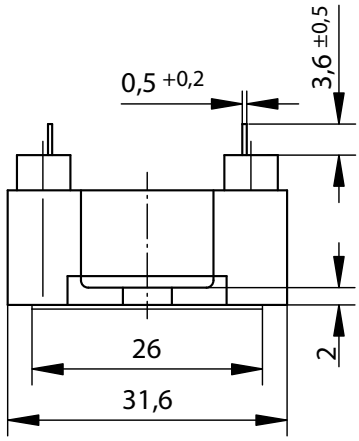


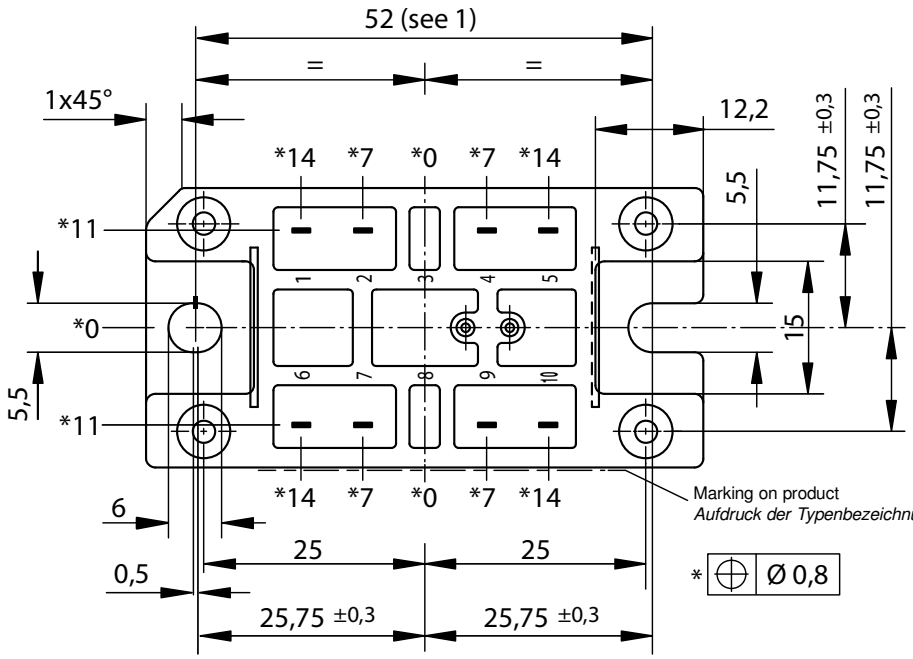
Thyristor

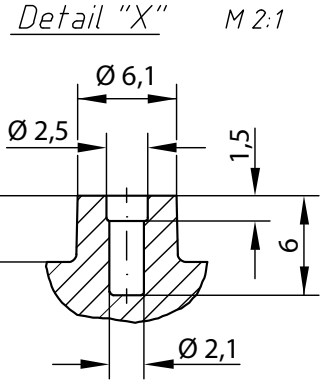
$V_{0\,max}$	*threshold voltage*	0,85	V
$R_{0\,max}$	*slope resistance **	8,5	mΩ

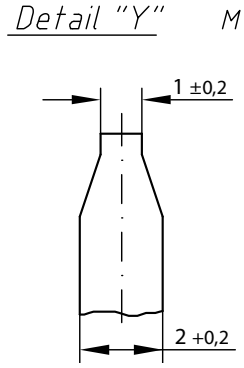
Outlines V1-A-Pack



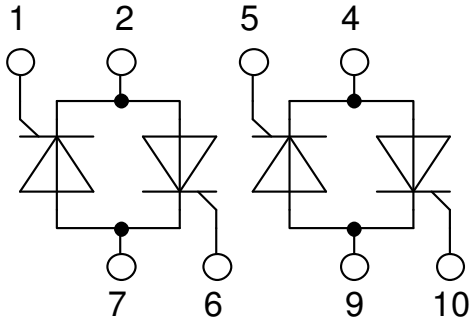








Remarks / ***Bemerkungen:***
1. Nominal distance mounting screws on heat sink: 52 mm / *Nennabstand Befestigungsschrauben auf Kühlkörper: 52 mm*
2. General tolerance / *Allgemeintoleranz*: DIN ISO 2768 -T1-c
3. Surface treatment of pins: tin plated (Sn) in hot dip / *Oberflächenbehandlung der Pins: verzinnt (Sn) im Tauchbad*



Thyristor

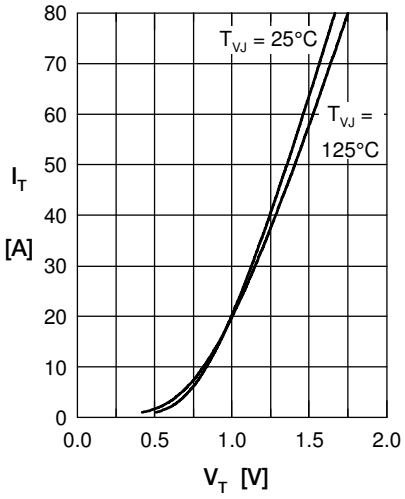


Fig. 1 Forward characteristics

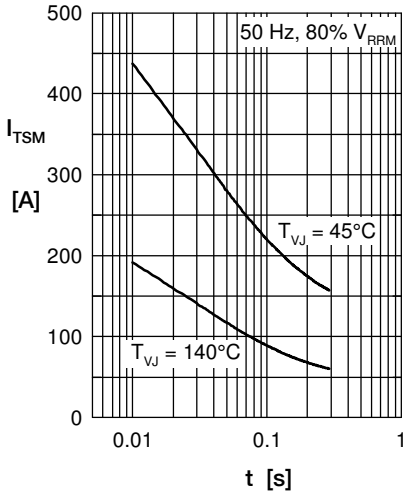


Fig. 2 Surge overload current
I_{TSM}: crest value, t: duration

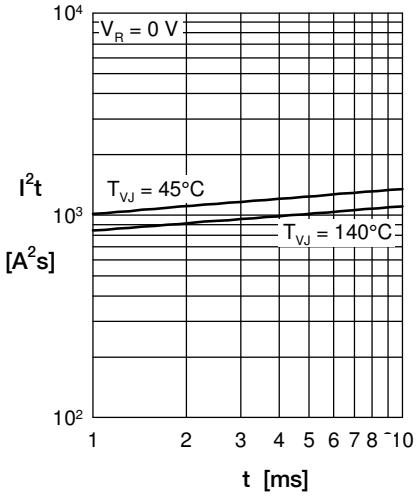


Fig. 3 I^2t versus time (1-10 s)

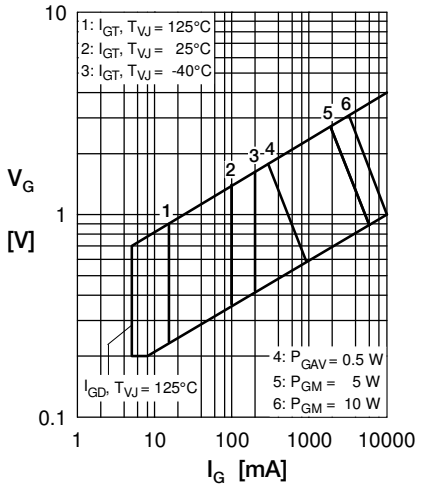


Fig. 4 Gate voltage & gate current

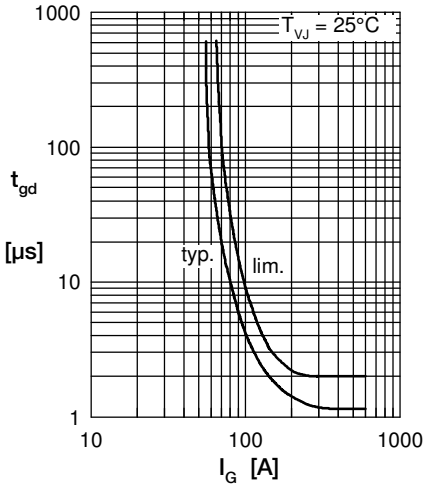


Fig. 5 Gate controlled delay time t_{gd}

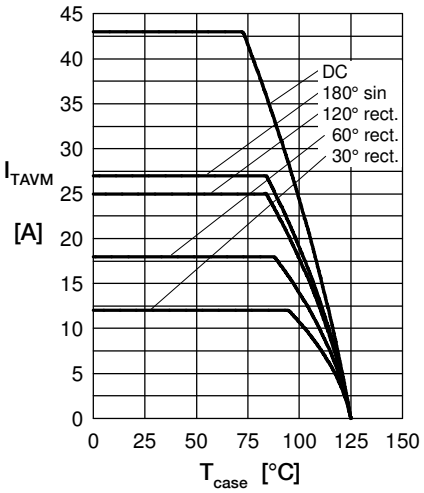


Fig. 6 Max. forward current at case temperature

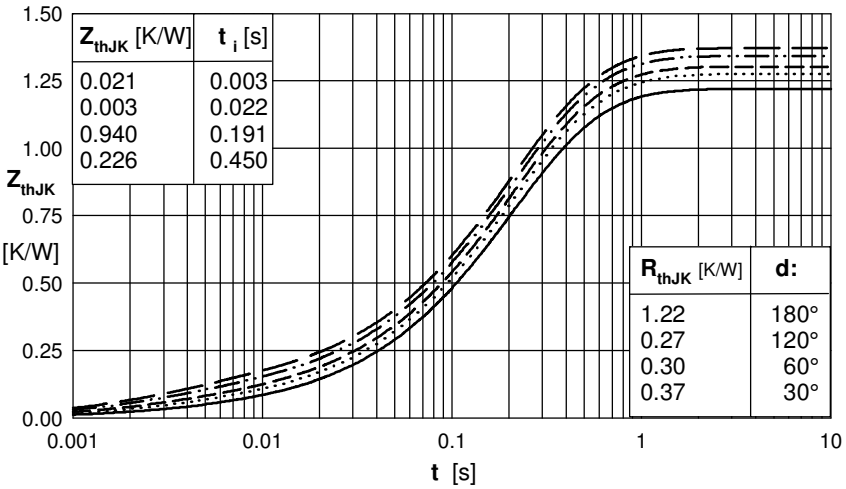


Fig. 7 Transient thermal impedance junction to heatsink (per thyristor)

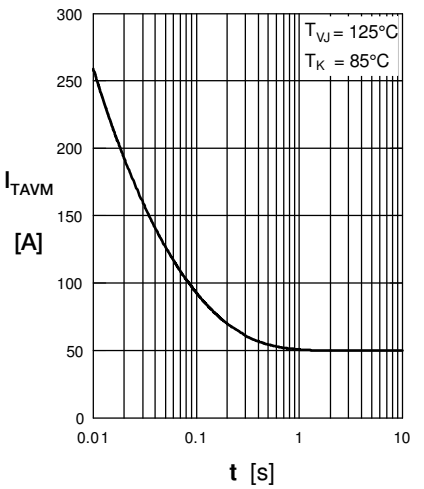


Fig. 8 Rated RMS current vs. time (360° conduction)

Rectifier

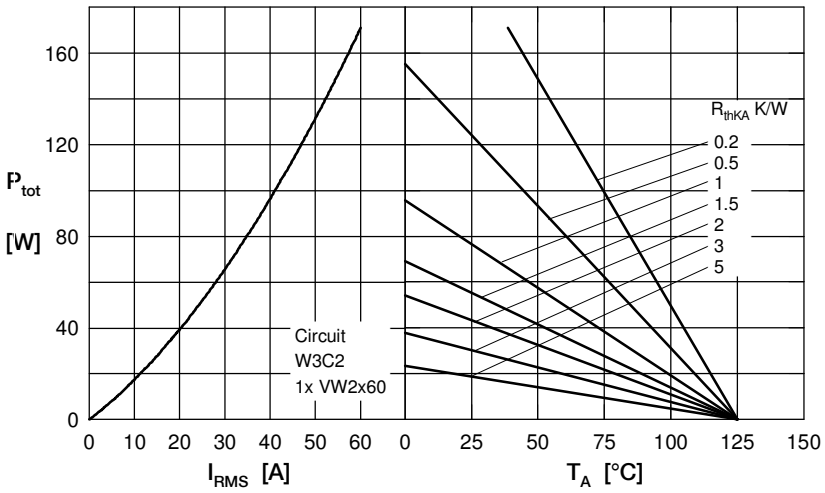


Fig. 9 Load current capability for two phase AC controller

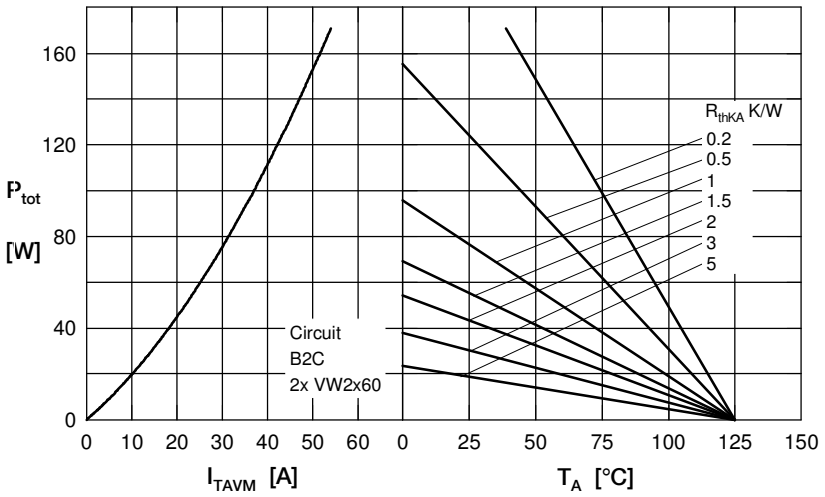


Fig. 10 Power dissipation vs. direct output current and ambient temperature
cyclo converter, four quadrant operation