

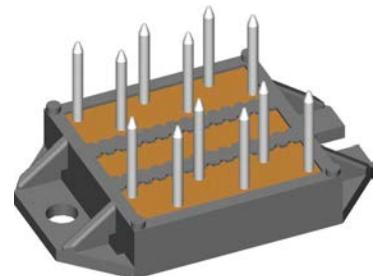
Thyristor Module

V_{RRM} = 1200 V
 I_{TAV} = 16 A
 V_T = 1,19 V

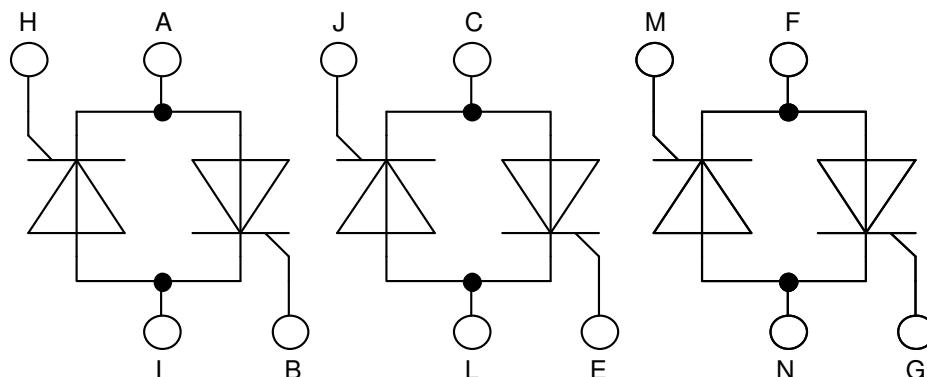
AC Controlling
3~ full-controlled

Part number

VWO35-12HO7



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: ECO-PAC1

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 9 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

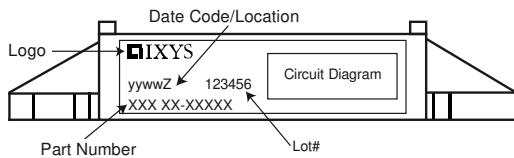
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Rectifier

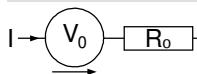
Symbol	Definition	Conditions	Ratings			
			min.	typ.	max.	
$V_{RSM/DSM}$	max. non-repetitive reverse/forward blocking voltage	$T_{VJ} = 25^\circ C$			1300	V
$V_{RRM/DRM}$	max. repetitive reverse/forward blocking voltage	$T_{VJ} = 25^\circ C$			1200	V
$I_{R/D}$	reverse current, drain current	$V_{R/D} = 1200 V$ $V_{R/D} = 1200 V$	$T_{VJ} = 25^\circ C$ $T_{VJ} = 125^\circ C$		50 2	μA mA
V_T	forward voltage drop	$I_T = 15 A$ $I_T = 30 A$ $I_T = 15 A$ $I_T = 30 A$	$T_{VJ} = 25^\circ C$ $T_{VJ} = 125^\circ C$		1,23 1,48 1,19 1,51	V V V V
I_{TAV}	average forward current	$T_C = 85^\circ C$	$T_{VJ} = 125^\circ C$		16	A
I_{RMS}	RMS forward current per phase	180° sine			35	A
V_{TO}	threshold voltage	r_T slope resistance } for power loss calculation only	$T_{VJ} = 125^\circ C$		0,88	V
	slope resistance				21	$m\Omega$
R_{thJC}	thermal resistance junction to case				1,3	K/W
R_{thCH}	thermal resistance case to heatsink			0,5		K/W
P_{tot}	total power dissipation		$T_C = 25^\circ C$		77	W
I_{TSM}	max. forward surge current	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$ $t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$T_{VJ} = 45^\circ C$ $V_R = 0 V$ $T_{VJ} = 125^\circ C$ $V_R = 0 V$		200 215 170 185	A A
I^2t	value for fusing	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$ $t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$T_{VJ} = 45^\circ C$ $V_R = 0 V$ $T_{VJ} = 125^\circ C$ $V_R = 0 V$		200 190 145 140	A^2s A^2s A^2s A^2s
C_J	junction capacitance	$V_R = 400 V$ $f = 1 \text{ MHz}$	$T_{VJ} = 25^\circ C$		7	pF
P_{GM}	max. gate power dissipation	$t_p = 30 \mu s$ $t_p = 300 \mu s$	$T_C = 125^\circ C$		5 2,5 0,5	W W W
P_{GAV}	average gate power dissipation					
$(di/dt)_{cr}$	critical rate of rise of current	$T_{VJ} = 125^\circ C; f = 50 \text{ Hz}$ repetitive, $I_T = 45 A$ $t_p = 200 \mu s; di_G/dt = 0,15 A/\mu s;$ $I_G = 0,15 A; V_D = \frac{2}{3} V_{DRM}$ non-repet., $I_T = 15 A$			100	$A/\mu s$
$(dv/dt)_{cr}$	critical rate of rise of voltage	$V_D = \frac{2}{3} V_{DRM}$ $R_{GK} = \infty$; method 1 (linear voltage rise)	$T_{VJ} = 125^\circ C$		500	$V/\mu s$
V_{GT}	gate trigger voltage	$V_D = 6 V$	$T_{VJ} = 25^\circ C$ $T_{VJ} = -40^\circ C$		1,5 2,5	V V
I_{GT}	gate trigger current	$V_D = 6 V$	$T_{VJ} = 25^\circ C$ $T_{VJ} = -40^\circ C$		25 50	mA mA
V_{GD}	gate non-trigger voltage	$V_D = \frac{2}{3} V_{DRM}$	$T_{VJ} = 125^\circ C$		0,2	V
I_{GD}	gate non-trigger current				3	mA
I_L	latching current	$t_p = 10 \mu s$ $I_G = 0,1 A; di_G/dt = 0,1 A/\mu s$	$T_{VJ} = 25^\circ C$		75	mA
I_H	holding current	$V_D = 6 V$ $R_{GK} = \infty$	$T_{VJ} = 25^\circ C$		50	mA
t_{gd}	gate controlled delay time	$V_D = \frac{1}{2} V_{DRM}$ $I_G = 0,1 A; di_G/dt = 0,1 A/\mu s$	$T_{VJ} = 25^\circ C$		2	μs
t_q	turn-off time	$V_R = 100 V; I_T = 15 A; V_D = \frac{2}{3} V_{DRM}$ $T_{VJ} = 100^\circ C$ $di/dt = 10 A/\mu s; dv/dt = 20 V/\mu s; t_p = 200 \mu s$		150		μs

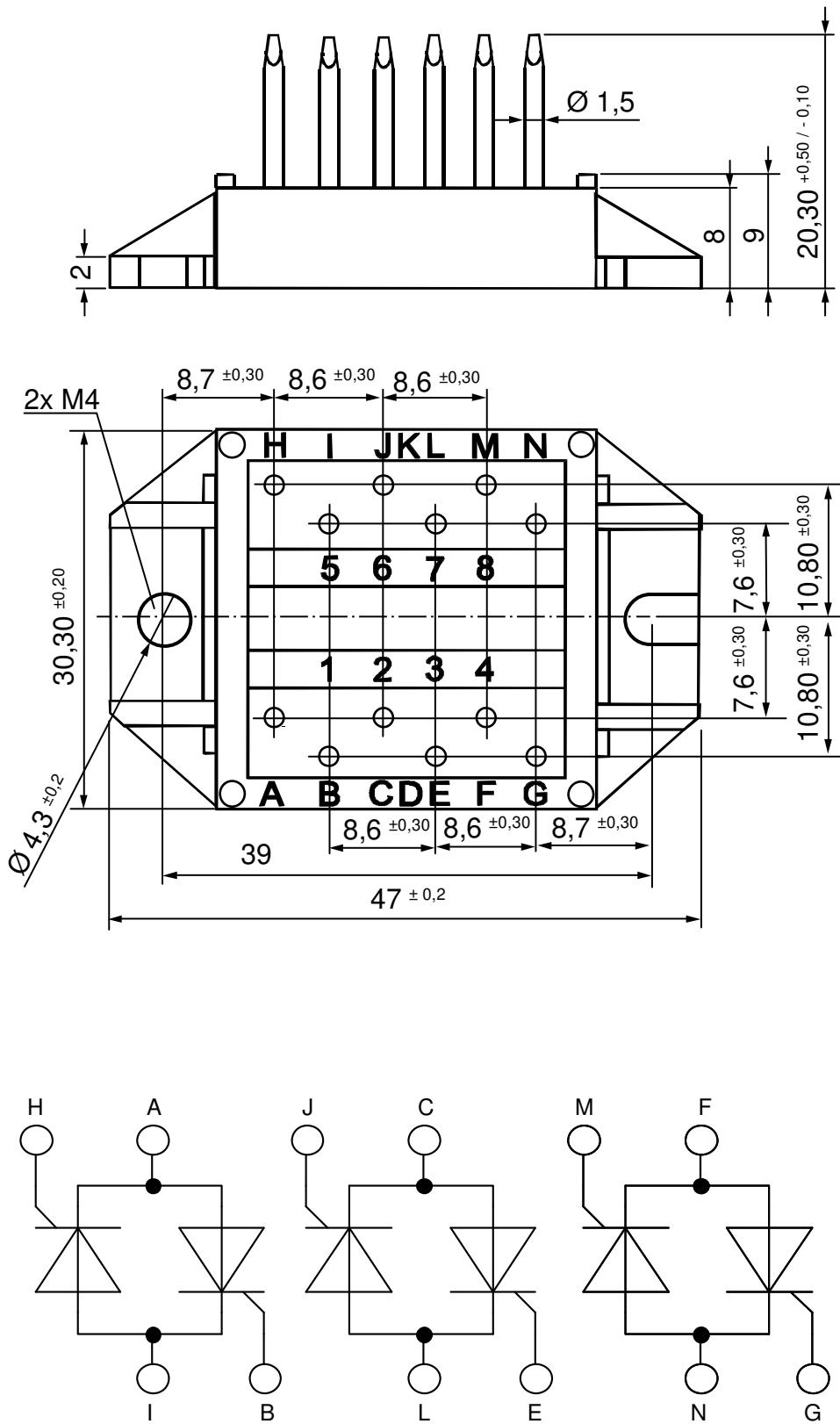
Package ECO-PAC1			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			40	A
T_{VJ}	virtual junction temperature		-40		125	°C
T_{op}	operation temperature		-40		100	°C
T_{stg}	storage temperature		-40		125	°C
Weight				19		g
M_D	mounting torque		1,4		2	Nm
$d_{Spp/App}$	creepage distance on surface striking distance through air		terminal to terminal		6,0	mm
$d_{Spb/Apb}$			terminal to backside		10,0	mm
V_{ISOL}	isolation voltage	t = 1 second t = 1 minute	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA		3600 3000	V V



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VWO35-12ho7	VWO35-12ho7	Box	25	479667

Equivalent Circuits for Simulation
* on die level
 $T_{VJ} = 125^\circ\text{C}$

	Thyristor
$V_{0\ max}$	threshold voltage 0,88 V
$R_{0\ max}$	slope resistance * 18 mΩ

Outlines ECO-PAC1


Thyristor

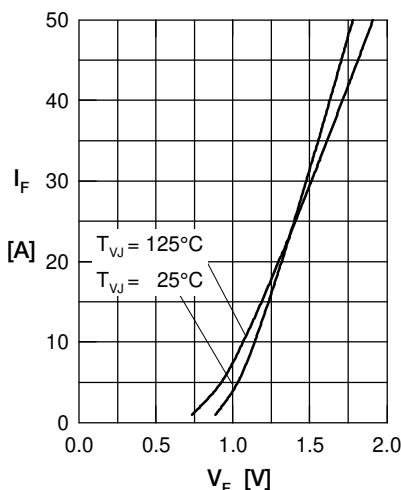


Fig. 1 Forward current vs.
voltage drop per thyristor

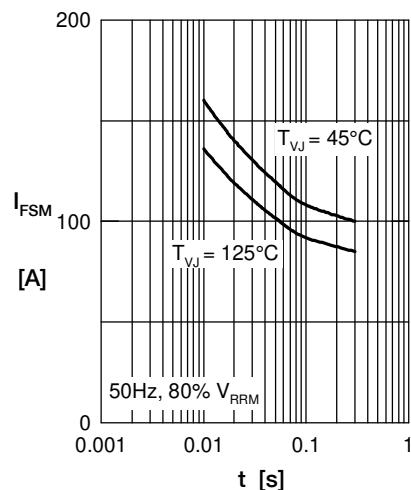


Fig. 2 Surge overload current
vs. time per thyristor

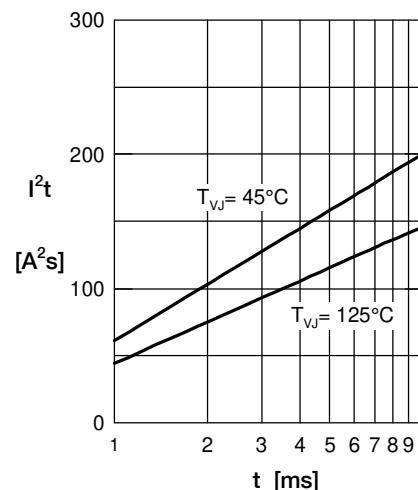


Fig. 3 I^2t vs. time per thyristor

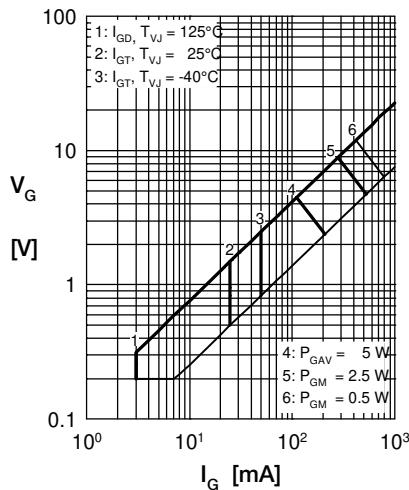


Fig. 4 Gate trigger characteristics

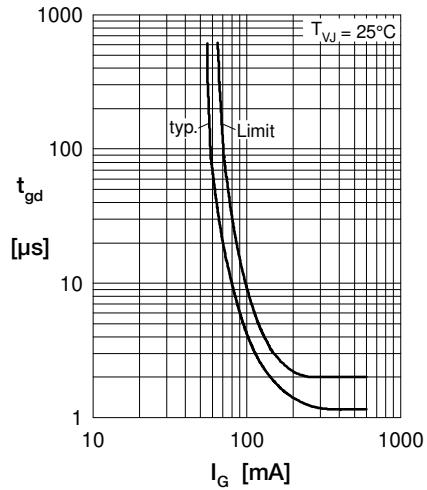


Fig. 5 Gate trigger delay time

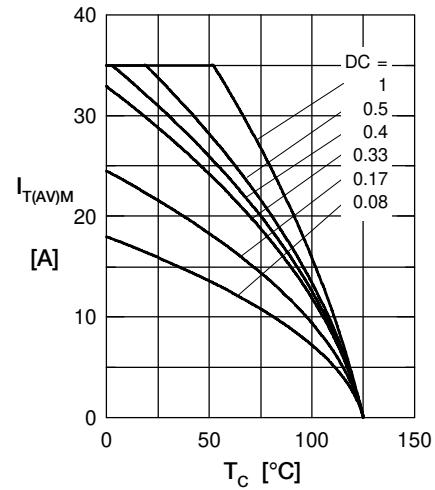


Fig. 5 Max. forward current vs.
case temperature per thyristor

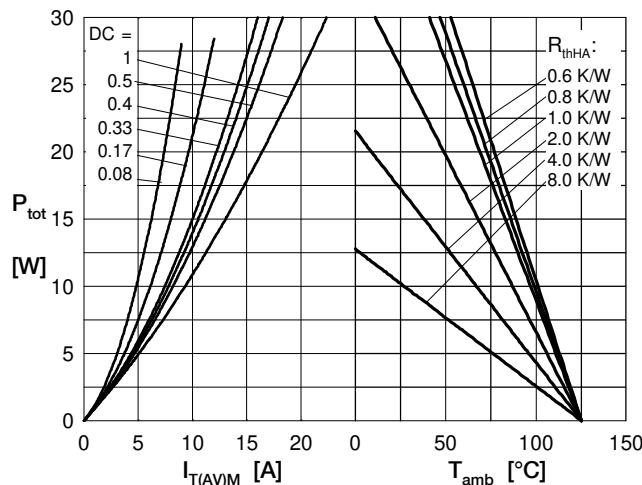


Fig. 4 Power dissipation vs. forward current
and ambient temperature per thyristor

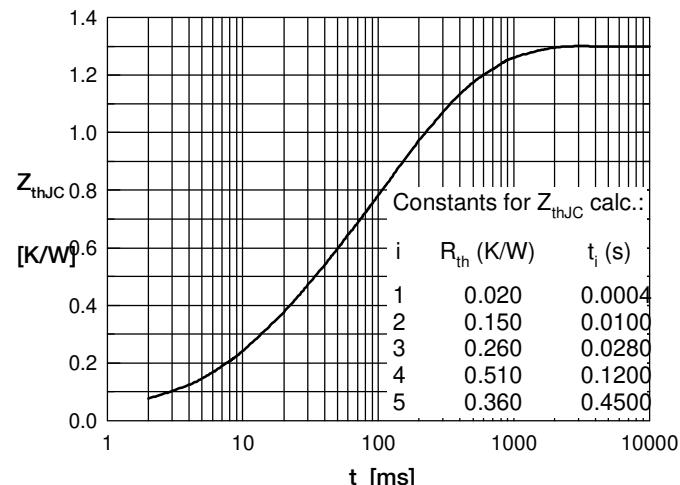


Fig. 6 Transient thermal impedance junction to case
vs. time per thyristor