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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!



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Thyristor Module

= 2x 1400 V

130 A

 V_{τ} 1.08 V

Phase leg

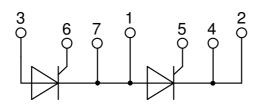
Part number

MCC132-14io1



Backside: isolated





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: Y4

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

Terms _Conditions of usage:

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact your local sales office.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office.

Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend

to perform joint risk and quality assessments;
the conclusion of quality agreements;

- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

IXYS reserves the right to change limits, conditions and dimensions.

Data according to IEC 60747 and per semiconductor unless otherwise specified

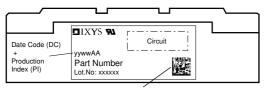
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Thyristo				 	Ratings	1	1
Symbol	Definition	Conditions		min.	typ.	max.	Un
V _{RSM/DSM}	max. non-repetitive reverse/forwa	ard blocking voltage	$T_{VJ} = 25^{\circ}C$			1500	
V _{RRM/DRM}	max. repetitive reverse/forward bl	<u> </u>	$T_{VJ} = 25^{\circ}C$			1400	<u>i </u>
I _{R/D}	reverse current, drain current	$V_{R/D} = 1400 \text{ V}$	$T_{VJ} = 25^{\circ}C$			200	μ
		$V_{R/D} = 1400 \text{ V}$	$T_{VJ} = 125^{\circ}C$			10	m
V _T	forward voltage drop	$I_T = 150 A$	$T_{VJ} = 25^{\circ}C$			1.14	
		$I_{T} = 300 \text{ A}$				1.36	,
		$I_T = 150 \text{ A}$	T _{VJ} = 125°C			1.08	
		$I_{T} = 300 \text{ A}$				1.36	
I _{TAV}	average forward current	T _C = 85°C	T _{vJ} = 125°C			130	
I _{T(RMS)}	RMS forward current	180° sine				300	
V _{T0}	threshold voltage		T _{vJ} = 125°C			0.80	
r _T	slope resistance	oss calculation only				1.5	m!
R _{thJC}	thermal resistance junction to cas	se				0.23	K/V
R _{thCH}	thermal resistance case to heatsi				0.100		K/V
P _{tot}	total power dissipation		$T_{\rm C} = 25^{\circ}{\rm C}$			435	٧
I _{TSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	T _{v.i} = 45°C			4.75	<u> </u>
-15M		t = 8,3 ms; (60 Hz), sine	$V_{R} = 0 V$			5.13	k
		t = 0, sine $t = 10$ ms; (50 Hz), sine	T _{VJ} = 125°C			4.04	1
		t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			4.36	k
l²t	value for fusing	t = 0.5 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}C$			112.8	!
I-L	value for fushing	t = 8.3 ms; (60 Hz), sine	$V_{R} = 0 V$			109.5	i .
		t = 0.3 ms; (50 Hz), sine t = 10 ms; (50 Hz), sine	$V_{R} = 0 V$ $T_{VJ} = 125 ^{\circ}C$				kA ²
							į
^	iunation canacitanas	t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$		011	79.1	
C,	junction capacitance	V _R = 400 V f = 1 MHz	$T_{VJ} = 25^{\circ}C$		211	100	р
P_{GM}	max. gate power dissipation	$t_P = 30 \mu s$	$T_{C} = 125^{\circ}C$			120	۷
_		$t_{P} = 500 \mu s$				60	۷
P _{GAV}	average gate power dissipation					8	۷
(di/dt) _{cr}	critical rate of rise of current		epetitive, $I_T = 500 A$			150	A/μ
		$t_P = 200 \mu s; di_G/dt = 0.5 A/\mu s; -$					
			on-repet., $I_T = 160 A$			500	<u> </u>
$(dv/dt)_{cr}$	critical rate of rise of voltage	$V = \frac{2}{3} V_{DRM}$	$T_{VJ} = 125^{\circ}C$			1000	V/μ
		$R_{GK} = \infty$; method 1 (linear volta					
V_{GT}	gate trigger voltage	$V_D = 6 V$	$T_{VJ} = 25^{\circ}C$			2.5	١
			$T_{VJ} = -40$ °C			2.6	١
I _{GT}	gate trigger current	$V_D = 6 V$	$T_{VJ} = 25^{\circ}C$			150	m
			$T_{VJ} = -40$ °C			200	m
V _{GD}	gate non-trigger voltage	$V_D = \frac{2}{3} V_{DRM}$	$T_{VJ} = 125^{\circ}C$			0.2	,
I _{GD}	gate non-trigger current					10	m
l _L	latching current	t _p = 30 μs	$T_{VJ} = 25$ °C			300	m
		$I_{G} = 0.5 \text{ A}; di_{G}/dt = 0.5 \text{ A}/\mu \text{s}$	3				
I _H	holding current	$V_D = 6 \text{ V} R_{GK} = \infty$	$T_{VJ} = 25$ °C			200	m
t _{gd}	gate controlled delay time	$V_D = \frac{1}{2} V_{DRM}$	$T_{VJ} = 25$ °C			2	μ
gu	- ,	$I_{\rm G} = 0.5 \text{A}; \text{di}_{\rm G}/\text{dt} = 0.5 \text{A}/\mu \text{s}$				_	٣
t _q	turn-off time	$V_{\rm R} = 100 \text{ V}; \ I_{\rm T} = 160 \text{ A}; \ V = \frac{2}{3}$			150		- 11
q	011 11110	$V_R = 100 \text{ V}, I_T = 100 \text{ A}, V = 7$ $di/dt = 10 \text{ A}/\mu \text{s} dv/dt = 20 \text{ V}.$			150		μ



Package Y4				Ratings				
Symbol	Definition	Conditions			min.	typ.	max.	Unit
I _{RMS}	RMS current	per terminal					300	Α
T _{vJ}	virtual junction temperature				-40		125	°C
Top	operation temperature			-40		100	°C	
T _{stg}	storage temperature				-40		125	°C
Weight						150		g
M _D	mounting torque				2.25		2.75	Nm
$\mathbf{M}_{_{T}}$	terminal torque				4.5		5.5	Nm
d _{Spp/App}	creepage distance on surface striking distance throug		terminal to terminal	14.0	10.0			mm
d _{Spb/Apb}	creepage distance on surfac	e striking distance through an	terminal to backside	16.0	16.0			mm
V _{ISOL}	isolation voltage	t = 1 second			3600			٧
	t = 1 minute		50/60 Hz, RMS; IISOL ≤ 1 mA		3000			٧



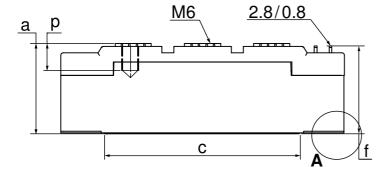
Data Matrix: part no. (1-19), DC + Pl (20-25), lot.no.# (26-31), blank (32), serial no.# (33-36)

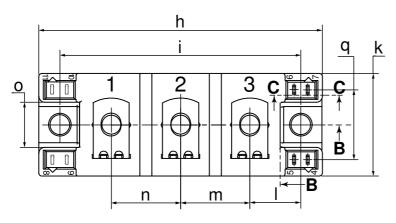
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MCC132-14io1	MCC132-14io1	Box	6	430560

Equiva	alent Circuits for	Simulation	* on die level	$T_{VJ} = 125 ^{\circ}\text{C}$
$I \rightarrow V_0$	R_0	Thyristor		
V _{0 max}	threshold voltage	0.8		V
$R_{0 \text{ max}}$	slope resistance *	0.8		$m\Omega$

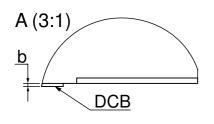


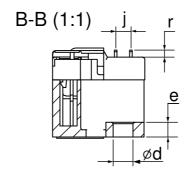
Outlines Y4



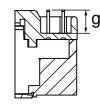


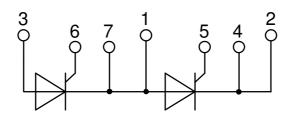
Dim.	MIN	MAX	MIN	MAX
DIIII.	[mm]	[mm]	[inch]	[inch]
а	30.0	30.6	1.181	1.205
b	typ.	0.25	typ. (0.010
С	64.0	65.0	2.520	2.559
d	6.5	7.0	0.256	0.275
е	4.9	5.1	0.193	0.201
f	28.6	29.2	1.126	1.150
g	7.3	7.7	0.287	0.303
h	93.5	94.5	3.681	3.720
i	79.5	80.5	3.130	3.169
j	4.8	5.2	0.189	0.205
k	33.4	34.0	1.315	1.339
ı	16.7	17.3	0.657	0.681
m	22.7	23.3	0.894	0.917
n	22.7	23.3	0.894	0.917
0	14.0	15.0	0.551	0.591
р	typ. 10.5		typ. (0.413
q	22.8	23.3	0.898	0.917
r	1.8	2.4	0.071	0.041













Thyristor

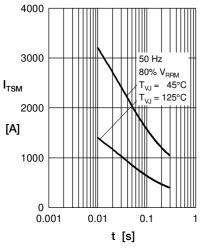


Fig. 1 Surge overload current I_{TSM} , I_{ESM} : Crest value, t: duration

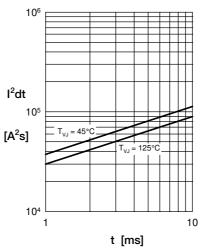


Fig. 2 I²t versus time (1-10 ms)

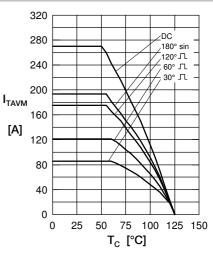


Fig. 3 Max. forward current at case temperature

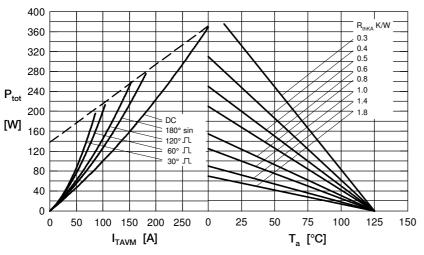


Fig. 4 Power dissipation vs. on-state current & ambient temperature (per thyristor or diode)

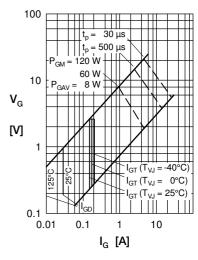


Fig. 5 Gate trigger characteristics

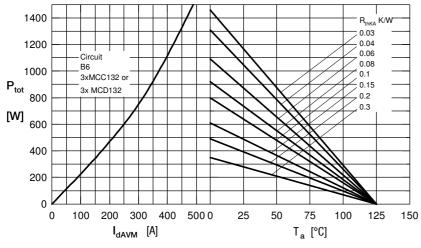


Fig. 6 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

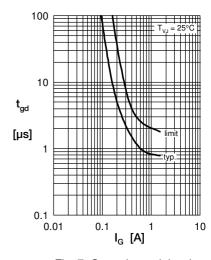


Fig. 7 Gate trigger delay time



Thyristor

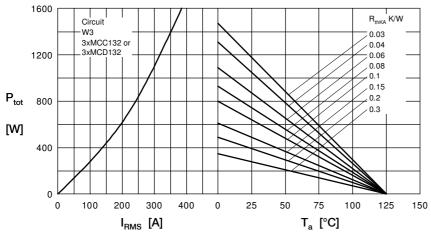


Fig. 8 Three phase AC-controller: Power dissipation versus RMS output current and ambient temperature

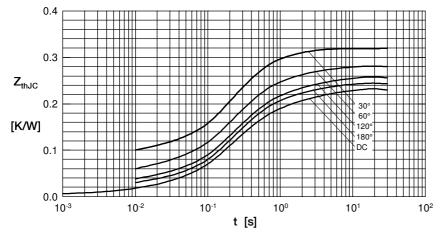


Fig. 9 Transient thermal impedance junction to case (per thyristor/diode)

 $\boldsymbol{R}_{\text{thJC}}$ for various conduction angles d:

d	R _{thJC} [K/V
DC	0.230
180°	0.244
120°	0.255
60°	0.283
30°	0.321

Constants for Z_{thJC} calculation:

i	R_{thi} [K/W]	t _i [s]
1	0.0095	0.001
2	0.0175	0.065
3	0.2030	0.400

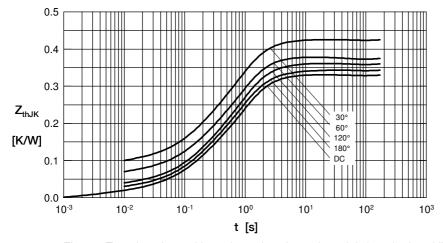


Fig. 10 Transient thermal impedance junction to heatsink (per thyristor/diode)

 $\boldsymbol{R}_{\text{thJK}}$ for various conduction angles d:

d	R_{thJK} [K/W]
DC	0.330
180°	0.344
120°	0.355
60°	0.383
200	0.421

Constants for Z_{thJK} calculation:

i	R _{thi} [K/W]	t _i [s]
1	0.0095	0.001
2	0.0175	0.065
3	0.2030	0.400
4	0.1000	1.290