imall

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!



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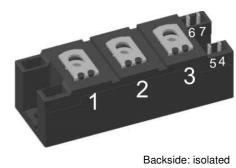
Thyristor Module

MCC132-18io1

V_{RRM}	= 2 2	x 1800 V
I _{tav}	=	130 A
VT	=	1.08 V

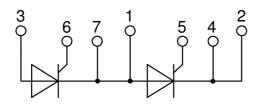
Phase leg

Part number MCC132-18io1



E72873

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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 60747and per semiconductor unless otherwise specified

MCC132-18io1

Thyristo					Ratings	>	1
Symbol	Definition	Conditions		min.	typ.	max.	Uni
V _{RSM/DSM}	max. non-repetitive reverse/forwa	ard blocking voltage	$T_{VJ} = 25^{\circ}C$			1900	١
V _{RRM/DRM}	max. repetitive reverse/forward b	• •	$T_{VJ} = 25^{\circ}C$			1800	١
R/D	reverse current, drain current	V _{R/D} = 1800 V	$T_{VJ} = 25^{\circ}C$			200	μA
		V _{R/D} = 1800 V	$T_{vJ} = 125^{\circ}C$			10	mA
VT	forward voltage drop	$I_{T} = 150 \text{ A}$	$T_{VJ} = 25^{\circ}C$			1.14	٧
		$I_{T} = 300 \text{ A}$				1.36	٧
		$I_{T} = 150 \text{ A}$	$T_{VJ} = 125 \degree C$			1.08	٧
		$I_{T} = 300 \text{ A}$				1.36	V
I TAV	average forward current	$T_c = 85^{\circ}C$	$T_{VJ} = 125^{\circ}C$			130	A
I _{T(RMS)}	RMS forward current	180° sine				300	A
V _{T0}	threshold voltage		$T_{VJ} = 125^{\circ}C$			0.80	V
r _T	slope resistance } for power in	oss calculation only				1.5	mΩ
R _{thJC}	thermal resistance junction to cas	Se				0.23	K/W
R _{thCH}	thermal resistance case to heatsi	ink			0.100		K/W
P _{tot}	total power dissipation		$T_c = 25^{\circ}C$			435	W
I _{TSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}C$			4.75	kA
		t = 8,3 ms; (60 Hz), sine	$V_{R} = 0 V$			5.13	kA
		t = 10 ms; (50 Hz), sine	T _{vJ} = 125°C			4.04	kA
		t = 8,3 ms; (60 Hz), sine	$V_{R} = 0 V$			4.36	kА
l²t	value for fusing	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}C$			112.8	kA ² s
		t = 8,3 ms; (60 Hz), sine	$V_{B} = 0 V$			109.5	kA²s
		t = 10 ms; (50 Hz), sine	T _{vJ} = 125°C			81.6	kA²s
		t = 8,3 ms; (60 Hz), sine	$V_{\rm B} = 0 V$			79.1	kA²s
C	junction capacitance	$V_{B} = 400 V f = 1 MHz$	$T_{VJ} = 25^{\circ}C$		211		pF
P _{GM}	max. gate power dissipation	t _P = 30 μs	T _c = 125°C			120	W
		t _P = 500 μs				60	W
PGAV	average gate power dissipation					8	W
(di/dt) _{cr}	critical rate of rise of current	T _{v.i} = 125 °C; f = 50 Hz re	petitive, $I_{T} = 500 \text{ A}$			150	A/μs
, ,,,		$t_{\rm P}$ = 200 µs; di _G /dt = 0.5 A/µs; —	•				
			on-repet., $I_{\tau} = 160 \text{ A}$			500	A/μs
(dv/dt) _{cr}	critical rate of rise of voltage	$V = \frac{2}{3} V_{\text{DRM}}$	T _{vJ} = 125°C			1000	i
(/0	0	$R_{GK} = \infty$; method 1 (linear voltage					
V _{GT}	gate trigger voltage	$V_{\rm p} = 6 \text{ V}$	$T_{v,l} = 25^{\circ}C$			2.5	v
- 01			$T_{VJ} = -40 ^{\circ}\text{C}$			2.6	v
I _{GT}	gate trigger current	$V_{D} = 6 V$	$T_{VJ} = 25^{\circ}C$			150	mA
G	3		$T_{VJ} = -40^{\circ}C$			200	mA
V _{gd}	gate non-trigger voltage	$V_{D} = \frac{2}{3} V_{DBM}$	$T_{VJ} = 125^{\circ}C$			0.2	V
I _{GD}	gate non-trigger current		. V3			10	mA
	latching current	t _p = 30 μs	T _{VJ} = 25°C			300	mA
•∟		$I_{g} = 0.5 \text{ A}; \text{ di}_{g}/\text{dt} = 0.5 \text{ A}/\mu\text{s}$				000	
I _H	holding current	$\frac{V_{\rm G}}{V_{\rm D}} = 6 \text{ V } $	T _{vJ} = 25°C			200	mA
t _{gd}	gate controlled delay time	$V_{\rm D} = \frac{1}{2} V_{\rm DRM}$	$T_{VJ} = 25 °C$			200	με
• gd	gate controlled doldy allo	$I_{G} = 0.5 \text{ A}; \text{ di}_{G}/\text{dt} = 0.5 \text{ A}/\mu\text{s}$				2	μο
•	turn-off time	$V_{\rm R} = 100 \text{ V}; \ I_{\rm T} = 160 \text{ A}; \ V = \frac{2}{3}$			150		
t _q					150		με
		$di/dt = 10 \text{ A}/\mu \text{s} dv/dt = 20 \text{ V}/\mu \text{s}$	μs ι _p = 200 μs		1		

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MCC132-18io1

Package	Y4				F	Ratings	6	
Symbol	Definition	Conditions			min.	typ.	max.	Unit
	RMS current	per terminal					300	Α
T _{vj}	virtual junction temperature				-40		125	°C
T _{op}	operation temperature				-40		100	°C
T _{stg}	storage temperature				-40		125	°C
Weight						150		g
M _D	mounting torque				2.25		2.75	Nm
M _T	terminal torque				4.5		5.5	Nm
d _{Spp/App}	creenade distance on surfa	ce striking distance through air	terminal to terminal	14.0	10.0			mm
d _{Spb/Apb}	creepage distance on suna		terminal to backside	16.0	16.0			mm
V	isolation voltage	t = 1 second			3600			V
		t = 1 minute	50/60 Hz, RMS; liso∟ ≤ 1 mA		3000			V

<u> </u>			
Date Code (DC) + Production Index (PI)	UIXYS N yywwAA Part Number Lot.No: xxxxxx	Circuit	1

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

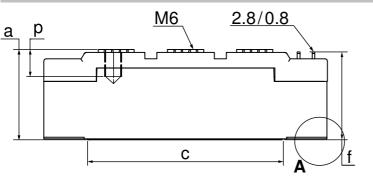
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MCC132-18io1	MCC132-18io1	Box	6	454605

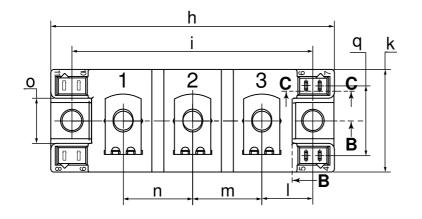
Equiv	alent Circuits for	Simulation	* on die level	T _{vj} = 125 °C
) R	Thyristor		
V _{0 max}	threshold voltage	0.8		V
$\mathbf{R}_{0 \max}$	slope resistance *	0.8		mΩ

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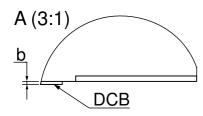
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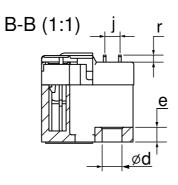
Outlines Y4





	N A IN I		N A IN I	
Dim.	MIN	MAX	MIN	MAX
	[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
Ι	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





C-C (1:1)



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3 6 7 1 5 4 0

Thyristor

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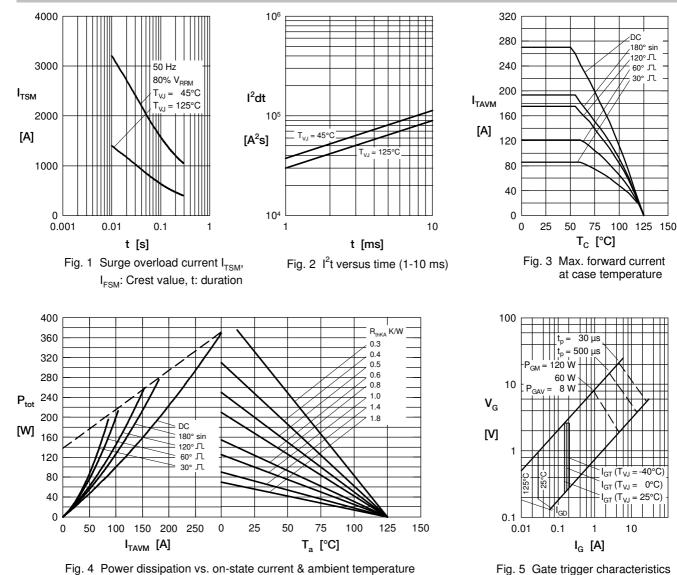


Fig. 4 Power dissipation vs. on-state current & ambient temperature (per thyristor or diode)

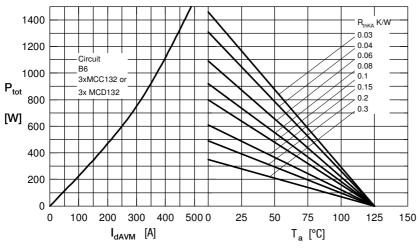


Fig. 6 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

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100

10

0.1

0.01

0.1

I_G [A] ¹

Fig. 7 Gate trigger delay time

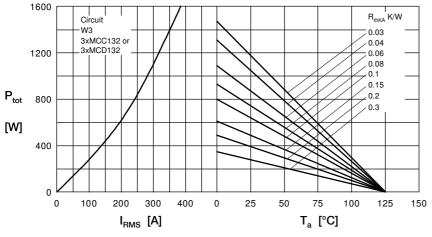
 t_{gd}

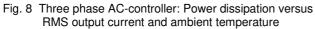
[µs]

10

MCC132-18io1

Thyristor





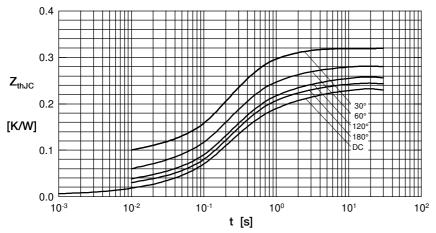
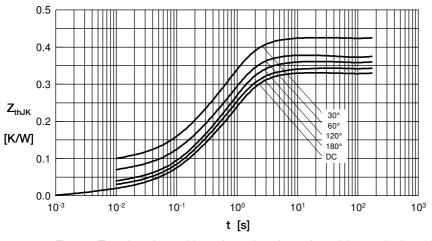


Fig. 9 Transient thermal impedance junction to case (per thyristor/diode)



 R_{thJK} for various conduction angles d: d R_{thJK} [K/W]

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

d

DC

180°

120°

60°

30°

i R_{thi} [K/W]

1 2

3

0.0095

0.0175

0.2030

R_{thJC} [K/W]

0.230

0.244

0.255

0.283

0.321

t_i [s]

0.001

0.065

0.400

Constants for Z_{thJC} calculation:

	unor -
DC	0.330
180°	0.344
120°	0.355
60°	0.383
30°	0.421

Constants for \mathbf{Z}_{thJK} calculation:

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

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