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

preliminary

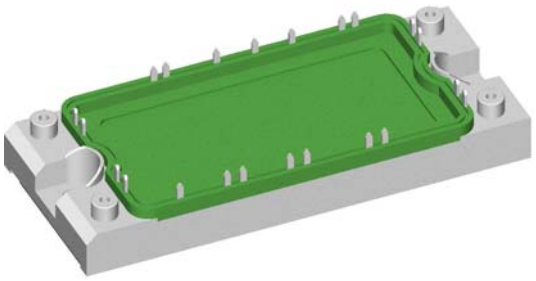
Thyristor Module

3~ Rectifier		
V_{RRM}	=	1800 V
I_{DAV}	=	117 A
I_{FSM}	=	500 A

3~ Rectifier Bridge, half-controlled (high-side) + free wheeling Diode

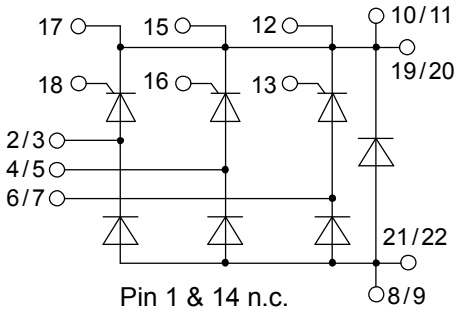
Part number

MCMA120UJ1800ED



Backside: isolated

E72873



Features / Advantages:

- Thyristor/Standard Rectifier for line frequency
- Planar passivated chips
- Long-term stability
- Low forward voltage drop
- Leads suitable for PC board soldering
- Copper base plate with Direct Copper Bonded Al2O3-ceramic
- Improved temperature and power cycling

Applications:

- Supplies for DC power equipment
- Input rectifiers for PWM inverter
- Battery DC power supplies
- Field supply for DC motors

Package:

- Housing: E2-Pack
- International standard package
- RoHS compliant
- Isolation voltage: 3600 V~
- Advanced power cycling

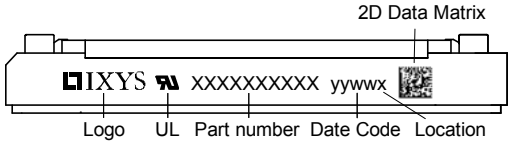
preliminary

Thyristor

Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
$V_{RSM/DSM}$	*max. non-repetitive reverse/forward blocking voltage*		T_{VJ} = 25°C			1900	V
$V_{RRM/DRM}$	*max. repetitive reverse/forward blocking voltage*		T_{VJ} = 25°C			1800	V
$I_{R/D}$	*reverse current, drain current*	$V_{R/D}$ = 1800 V	T_{VJ} = 25°C			50	µA
		$V_{R/D}$ = 1800 V	T_{VJ} = 125°C			10	mA
V_T	*forward voltage drop*	I_T = 40 A	T_{VJ} = 25°C			1.33	V
		I_T = 80 A				1.70	V
		I_T = 40 A	T_{VJ} = 125°C			1.36	V
		I_T = 80 A				1.88	V
I_{DAV}	*bridge output current*	T_C = 80°C	T_{VJ} = 150°C			117	A
		rectangular d = ⅓					
V_{T0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			0.89	V
r_T	*slope resistance* }					13.6	mΩ
R_{thJC}	*thermal resistance junction to case*					0.65	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.10		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			190	W
I_{TSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			500	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			540	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			425	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			460	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			1.25	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1.22	kA²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			905	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			880	A²s
C_J	*junction capacitance*	V_R = 400 V f = 1 MHz	T_{VJ} = 25°C		18		pF
P_{GM}	*max. gate power dissipation*	t_P = 30 µs	T_C = 150°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} = 150°C; f = 50 Hz	repetitive, I_T = 120 A			100	A/µs
		t_P = 200 µs; di_G/dt = 0.45 A/µs					
		I_G = 0.45A; V_D = ⅔ V_{DRM}	non-repet., I_T = 40 A			500	A/µs
$(dv/dt)_{cr}$	*critical rate of rise of voltage*	V_D = ⅔ V_{DRM}	T_{VJ} = 150 °C			1000	V/µs
		R_{GK} = ∞; method 1 (linear voltage rise)					
V_{GT}	*gate trigger voltage*	V_D = 6 V	T_{VJ} = 25 °C			1.4	V
			T_{VJ} = -40 °C			1.6	V
I_{GT}	*gate trigger current*	V_D = 6 V	T_{VJ} = 25 °C			70	mA
			T_{VJ} = -40 °C			150	mA
V_{GD}	*gate non-trigger voltage*	V_D = ⅔ V_{DRM}	T_{VJ} = 150 °C			0.2	V
I_{GD}	*gate non-trigger current*					5	mA
I_L	*latching current*	t_p = 10 µs	T_{VJ} = 25 °C			150	mA
		I_G = 0.45A; di_G/dt = 0.45 A/µs					
I_H	*holding current*	V_D = 6 V R_{GK} = ∞	T_{VJ} = 25 °C			100	mA
t_{gd}	*gate controlled delay time*	V_D = ½ V_{DRM}	T_{VJ} = 25 °C			2	µs
		I_G = 0.45A; di_G/dt = 0.45 A/µs					
t_q	*turn-off time*	V_R = 100 V; I_T = 40 A; V_D = ⅔ V_{DRM}	T_{VJ} = 150 °C		500		µs
		di/dt = 10 A/µs; dv/dt = 20 V/µs; t_p = 200 µs					

preliminary

Package E2-Pack			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal			200	A
T_{stg}	*storage temperature*		-40		125	°C
T_{VJ}	*virtual junction temperature*		-40		150	°C
Weight				176		g
M_D	*mounting torque*		3		6	Nm
V_{ISOL}	*isolation voltage*	t = 1 second	3600			V
		t = 1 minute	3000			V
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*	*terminal to terminal*	6.0			mm
$d_{Spb/Apb}$		*terminal to backside*	12.0			mm



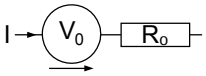
Part number

M = Module
C = Thyristor (SCR)
M = Thyristor
A = (up to 1800V)
120 = Current Rating [A]
UJ = 3~ Rectifier Bridge, half-controlled (high-side) + free wheeling Diode
1800 = Reverse Voltage [V]
ED = E2-Pack

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MCMA120UJ1800ED	MCMA120UJ1800ED	Box	6	510125

Equivalent Circuits for Simulation

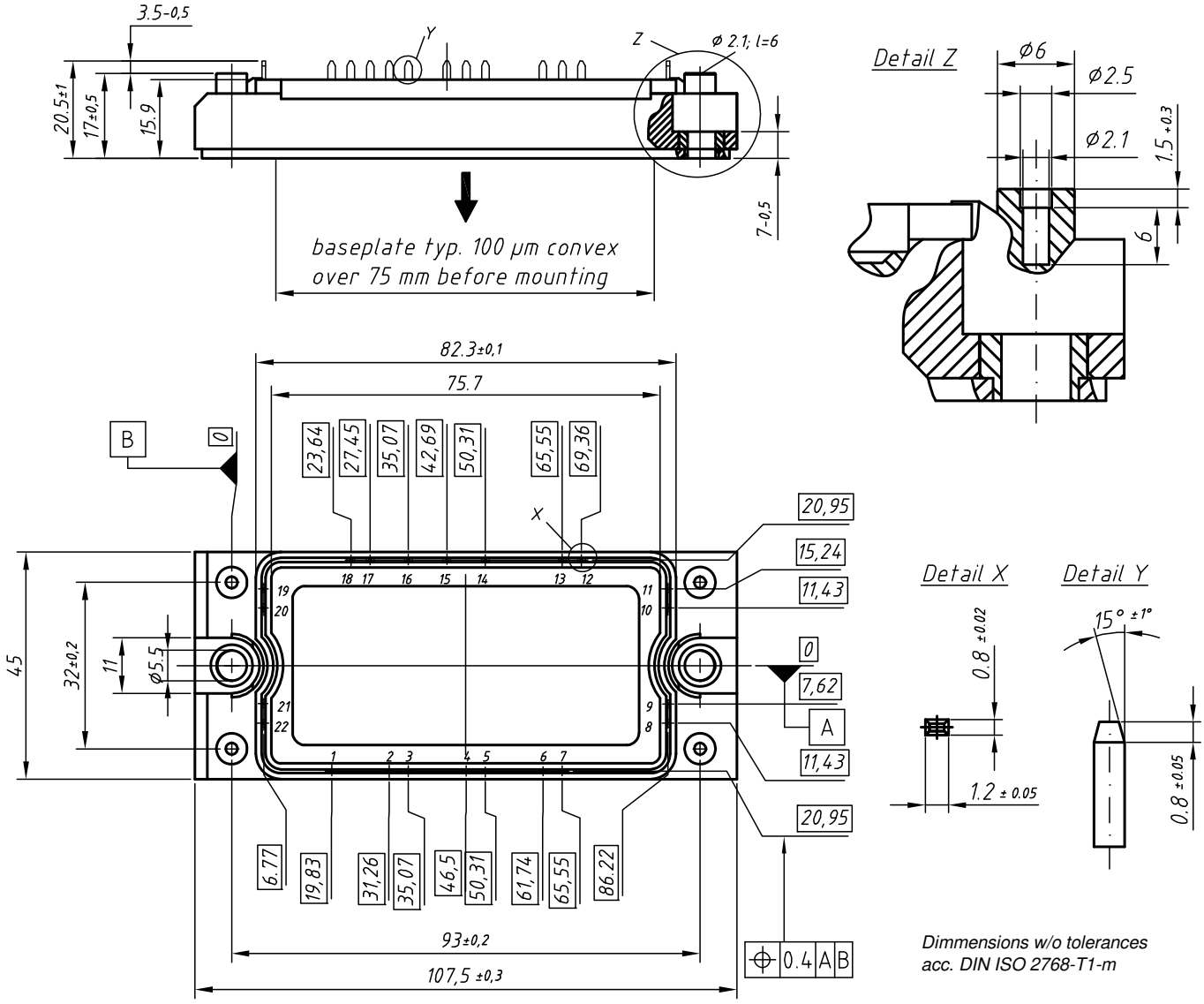
** on die level* T_{VJ} = 150°C



Thyristor

$V_{0\,max}$	*threshold voltage*	0.89	V
$R_{0\,max}$	*slope resistance **	10.5	mΩ

Outlines E2-Pack



Dimmensions w/o tolerances
acc. DIN ISO 2768-T1-m