

preliminary

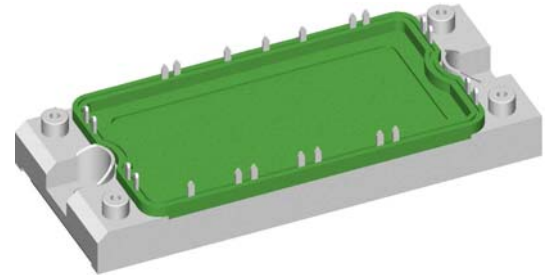
Thyristor Module

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

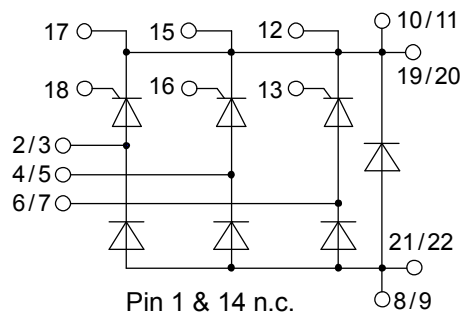
3~ Rectifier Bridge, half-controlled (high-side) + free wheeling Diode

Part number

MCMA120UJ1800ED



Backside: isolated



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

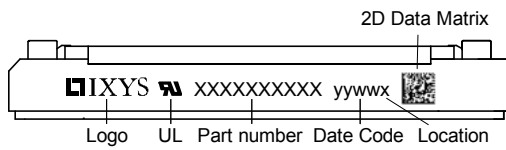
Package:

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

Thyristor				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
$V_{RSM/DSM}$	max. non-repetitive reverse/forward blocking voltage	$T_{VJ} = 25^{\circ}C$			1900	V	
$V_{RRM/DRM}$	max. repetitive reverse/forward blocking voltage	$T_{VJ} = 25^{\circ}C$			1800	V	
I_{RD}	reverse current, drain current	$V_{R/D} = 1800 V$	$T_{VJ} = 25^{\circ}C$		50	μA	
		$V_{R/D} = 1800 V$	$T_{VJ} = 125^{\circ}C$		10	mA	
V_T	forward voltage drop	$I_T = 40 A$	$T_{VJ} = 25^{\circ}C$		1.33	V	
		$I_T = 80 A$			1.70	V	
		$I_T = 40 A$	$T_{VJ} = 125^{\circ}C$		1.36	V	
		$I_T = 80 A$			1.88	V	
I_{DAV}	bridge output current	$T_C = 80^{\circ}C$ rectangular $d = 1/3$	$T_{VJ} = 150^{\circ}C$		117	A	
V_{T0}	threshold voltage	} for power loss calculation only	$T_{VJ} = 150^{\circ}C$		0.89	V	
r_T	slope resistance				13.6	m Ω	
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		$T_C = 25^{\circ}C$		190	W	
I_{TSM}	max. forward surge current	$t = 10 ms; (50 Hz), sine$	$T_{VJ} = 45^{\circ}C$		500	A	
		$t = 8,3 ms; (60 Hz), sine$	$V_R = 0 V$		540	A	
		$t = 10 ms; (50 Hz), sine$	$T_{VJ} = 150^{\circ}C$		425	A	
		$t = 8,3 ms; (60 Hz), sine$	$V_R = 0 V$		460	A	
I^2t	value for fusing	$t = 10 ms; (50 Hz), sine$	$T_{VJ} = 45^{\circ}C$		1.25	kA ² s	
		$t = 8,3 ms; (60 Hz), sine$	$V_R = 0 V$		1.22	kA ² s	
		$t = 10 ms; (50 Hz), sine$	$T_{VJ} = 150^{\circ}C$		905	A ² s	
		$t = 8,3 ms; (60 Hz), sine$	$V_R = 0 V$		880	A ² s	
C_J	junction capacitance	$V_R = 400 V$ $f = 1 MHz$	$T_{VJ} = 25^{\circ}C$		18	pF	
P_{GM}	max. gate power dissipation	$t_p = 30 \mu s$	$T_C = 150^{\circ}C$		10	W	
		$t_p = 300 \mu s$			5	W	
P_{GAV}	average gate power dissipation				0.5	W	
$(di/dt)_{cr}$	critical rate of rise of current	$T_{VJ} = 150^{\circ}C; f = 50 Hz$ repetitive, $I_T = 120 A$			100	A/ μs	
		$t_p = 200 \mu s; di_G/dt = 0.45 A/\mu s$ $I_G = 0.45 A; V_D = 2/3 V_{DRM}$ non-repet., $I_T = 40 A$			500	A/ μs	
$(dv/dt)_{cr}$	critical rate of rise of voltage	$V_D = 2/3 V_{DRM}$ $R_{GK} = \infty$; method 1 (linear voltage rise)	$T_{VJ} = 150^{\circ}C$		1000	V/ μs	
V_{GT}	gate trigger voltage	$V_D = 6 V$	$T_{VJ} = 25^{\circ}C$		1.4	V	
			$T_{VJ} = -40^{\circ}C$		1.6	V	
I_{GT}	gate trigger current	$V_D = 6 V$	$T_{VJ} = 25^{\circ}C$		70	mA	
			$T_{VJ} = -40^{\circ}C$		150	mA	
V_{GD}	gate non-trigger voltage	$V_D = 2/3 V_{DRM}$	$T_{VJ} = 150^{\circ}C$		0.2	V	
I_{GD}	gate non-trigger current				5	mA	
I_L	latching current	$t_p = 10 \mu s$	$T_{VJ} = 25^{\circ}C$		150	mA	
		$I_G = 0.45 A; di_G/dt = 0.45 A/\mu s$					
I_H	holding current	$V_D = 6 V$ $R_{GK} = \infty$	$T_{VJ} = 25^{\circ}C$		100	mA	
t_{gd}	gate controlled delay time	$V_D = 1/2 V_{DRM}$	$T_{VJ} = 25^{\circ}C$		2	μs	
		$I_G = 0.45 A; di_G/dt = 0.45 A/\mu s$					
t_q	turn-off time	$V_R = 100 V; I_T = 40 A; V_D = 2/3 V_{DRM}$ $di/dt = 10 A/\mu s; dv/dt = 20 V/\mu s; t_p = 200 \mu s$	$T_{VJ} = 150^{\circ}C$		500	μs	

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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

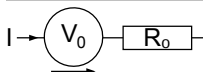

Part number

- 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

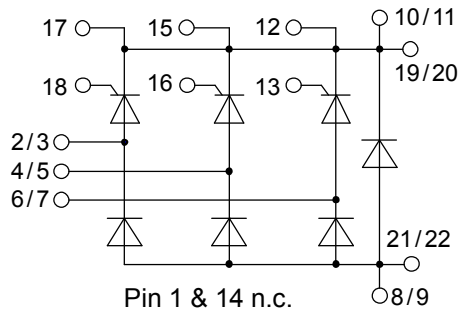
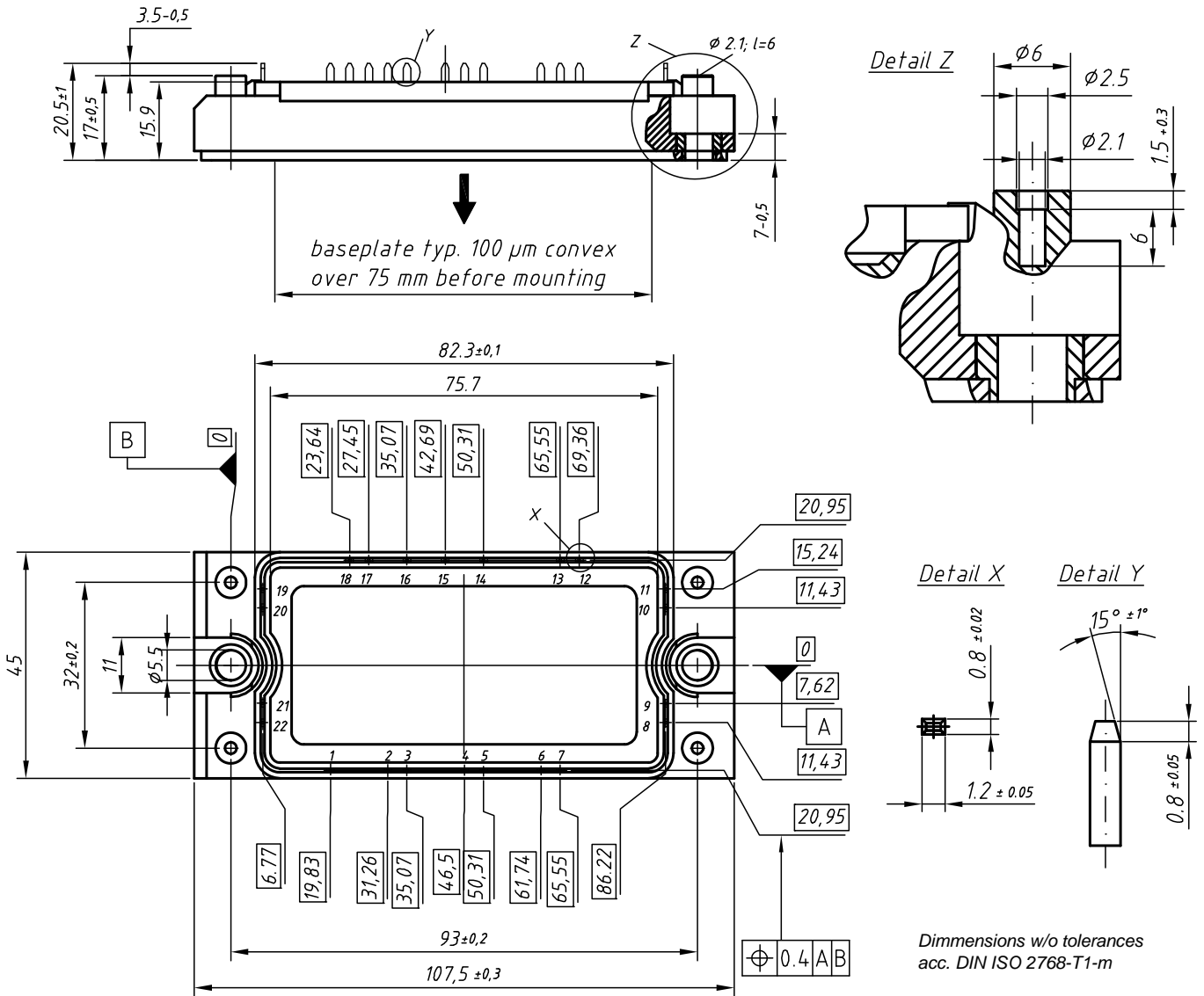
Equivalent Circuits for Simulation

* on die level

 $T_{VJ} = 150^{\circ}\text{C}$

Thyristor

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

Outlines E2-Pack



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

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[MCMA120UJ1800ED](#)