MCC312 MCD312

Features

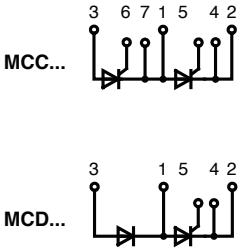
►International standard package,
►Direct copper bonded Al_2O_3 -ceramic with copper base plate
►Isolation voltage 3600 V~

Typical Applications

►Motor control,softstarter
►Power converter
►Light, heat and temperature control

Advantages

►Simple mounting
► Improved temperature and power cycling
► Reduced protection circuits



Symbol	MCC312-08io1 MCD312-08io1	MCC312-12io1 MCD312-12io1	MCC312-14io1 MCD312-14io1	MCC312-16io1 MCD312-16io1	MCC312-18io1 MCD312-18io1	Units
V_{RRM},V_{DRM}	800	1200	1400	1600	1800	V
V_{RSM},V_{DSM}	900	1300	1500	1700	1900	V

Symbol	Conditions		Values	Units
I_{TRMS},I_{FRMS}	T_{VJ}=T_{VJM}		520	A
I_{TAVM}, I_{FAVM}	sin.180; Tc=85ºC;		320	A
I_{TSM},I_{FSM}	Tvj=45ºC; t=10ms(50Hz)		9200	A
	V_R=0; t=8.3ms(60Hz)		10100	A
	Tvj=Tvjm; t=10ms(50Hz)		8000	A
	V_R=0; t=8.3ms(60Hz)		8800	A
I^2t	Tvj=45ºC; t=10ms(50Hz)		423000	A^2s
	V_R=0; t=8.3ms(60Hz)		423000	A^2s
	Tvj=Tvjm; t=10ms(50Hz)		320000	A^2s
	V_R=0; t=8.3ms(60Hz)		321000	A^2s
(di/dt)cr	Tvj = Tvjm f = 50 Hz; tp = 200 µs; V_D = 2/3 V_{DRM} I_G = 1 A di_G /dt = 1 A/µs	repetitive, I_T =960A	100	A/µs
		non repetitive, I_T =I_{TAVM}	500	A/µs
(dv/dt)cr	Tvj = Tvjm; V_D = 2/3 V_{DRM} R_{GK} = ∞; method 1 (linear voltage rise)		1000	V/µs
P_{GM}	Tvj = Tvjm; tp = 30 µs		120	W
	I_T = $I_{T(AV)M}$; tp = 500 µs		60	W
P_{GAV}			20	W
V_{RGM}			10	V
Tvj			-40...+140	ºC
T_{VJM}			140	ºC
T_{stg}			-40...+125	ºC
V_{isol}	a.c.50Hz/60Hz; I_{ISOL} < 1 mA t=1s/1min.		3600/3000	V~
M_d	Mounting torque (M5)		4.5-7	Nm
	Terminal connection torque (M8)		11-13	Nm
Weight	Typical including screws		750	g

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Symbol	Conditions		Values typ.	Values max.	Units
I_{RRM}, I_{DRM}	$V_R/V_D=V_{RRM}/V_{DRM}$	$T_{Vj}=T_{VjM}$		40	mA
V_T, V_F	I_T, I_F=600A	T_{Vj}=25ºC		1.32	V
V_{T0}	For power-loss calculations only			0.80	V
rt		$T_{Vj}=T_{VjM}$		0.68	mΩ
V_{GT}	V_D=6V	T_{Vj}= 25ºC		2.0	V
		T_{Vj}= -40ºC		3.0	V
I_{GT}	V_D=6V	T_{Vj}= 25ºC		150	mA
		T_{Vj}= -40ºC		200	mA
V_{GD}	V_D=2/3, V_{DRM}	$T_{Vj}=T_{VjM}$		0.25	V
I_{GD}				10	mA
I_L	tp = 30 µs; V_D = 6 V I_G = 0.45 A; di$_G$ /dt = 0.45 A/µs	T_{Vj}= 25ºC		200	mA
I_H	V_D = 6 V; R_{GK} = ∞;	T_{Vj}= 25ºC		150	mA
t_{gd}	V_D = ½V_{DRM} I_G = 1 A; di$_G$ /dt = 1 A/µs	T_{Vj}= 25ºC		2	µs
t_q	V_D = 2/3 V_{DRM} dv/dt = 50 V/µs; -di/dt = 10 A/µs I_T = 300 A; V_R = 100 V; tp = 200 µs	$T_{Vj}=T_{VjM}$	200		µs
Qs	I_T / I_F = 400 A; -di/dt = 50 A/µs	T_{Vj}=125ºC		760	µC
I_{RM}				275	A
R_{thJC}	per thyristor; DC current	other values see Fig. 8/9		0.12	K/W
	per module			0.06	K/W
R_{thJK}	per thyristor; DC current			0.16	K/W
	per module			0.08	K/W
ds	Creeping distance on surface			12.7	mm
dA	Creepage distance in air			9.6	mm
a	Maximum allowable acceleration			50	m/s²

Optional accessories for modules

Coded gate/cathode twin plugs with wire length = 350 mm, gate = yellow, cathode = red
Type **ZY 180L** (L = Left for pin pair 4/5)
Type **ZY 180R** (R = Right for pin pair 6/7)
CSA class 5851, guide 460-1-1

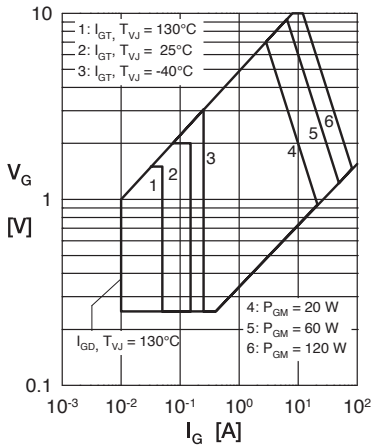

Fig. 1 Surge overload current
$I_{TSM/FSM}$: Crest value, t: duration

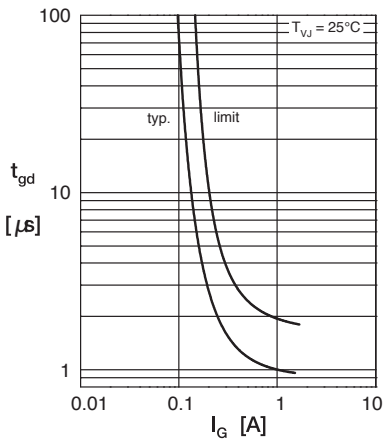

Fig. 2 Gate trigger delay time

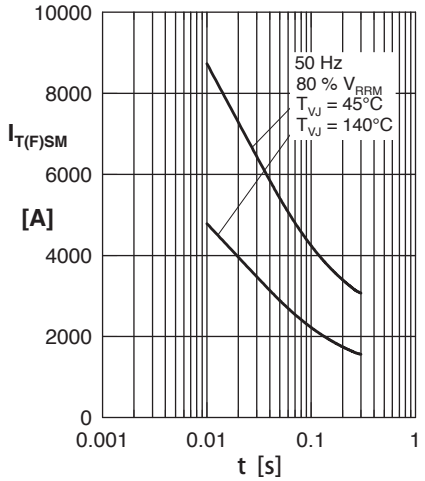

Fig. 3 Surge overload current
$I_{T(F)SM}$:Crest value, t: duration

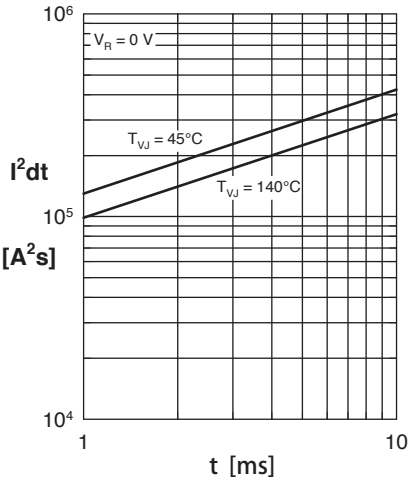

Fig. 4 I^2dt versus time

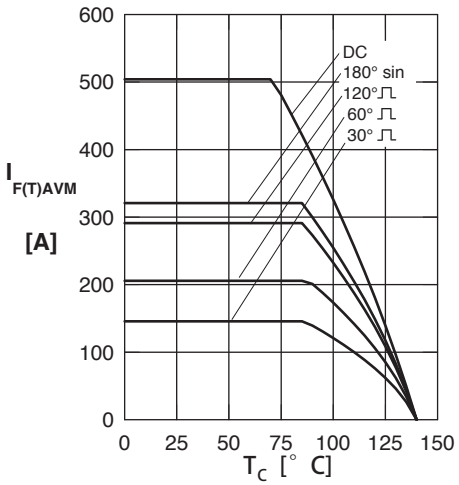

Fig. 4a Max. forward current at case temperature

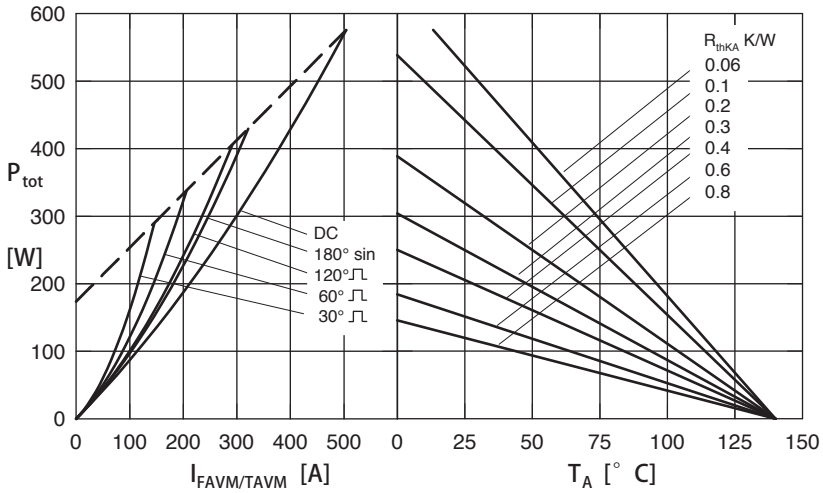

Fig. 5 Power dissipation versus on-state current and ambient temperature (per thyristor or diode)

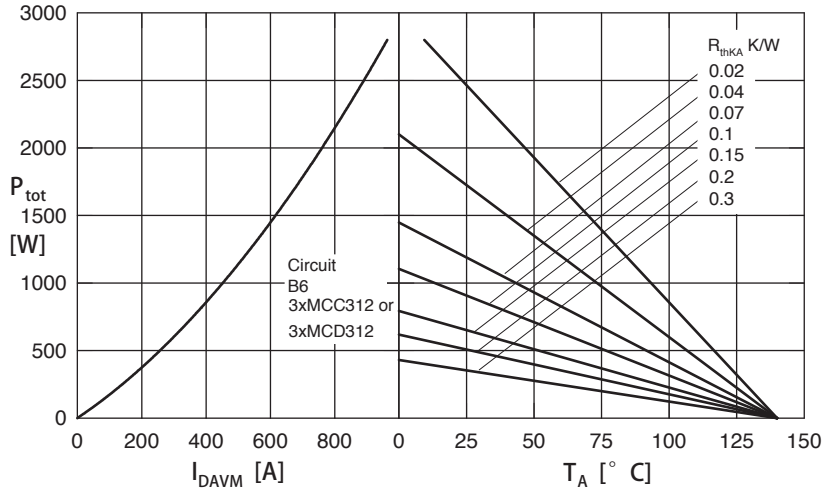

Fig. 6 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

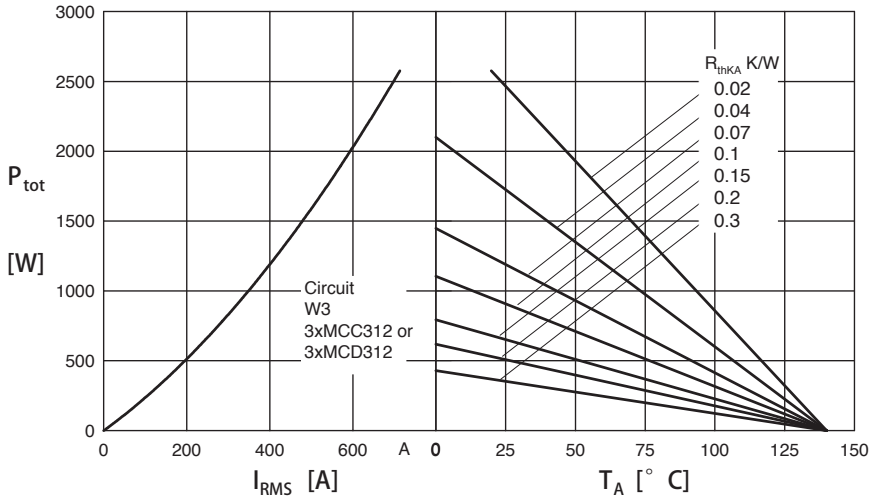

Fig. 7 Three phase AC-controller: Power dissipation versus R_{MS} output current and ambient temperature

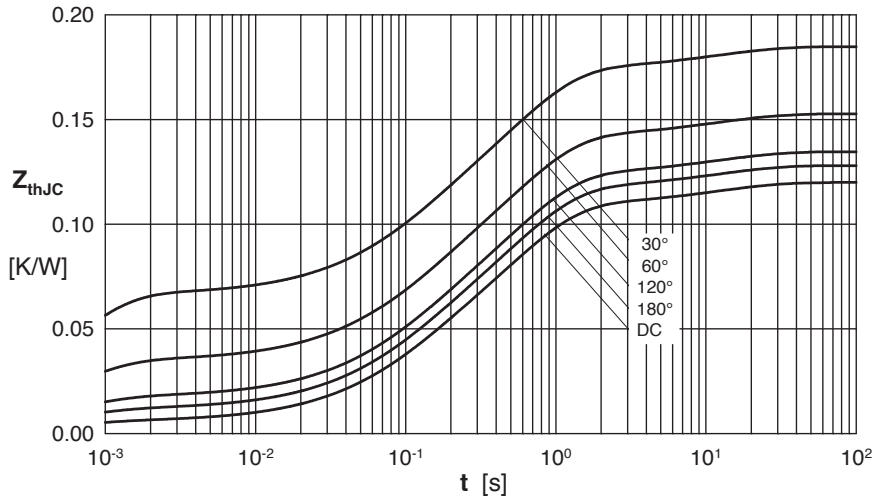

Fig. 8 Transient thermal impedance junction to case (per thyristor/diode)

R_{thJC} for various conduct. angles d:

d	R_{thJC} (K/W)
DC	0.120
180°	0.128
120°	0.135
60°	0.153
30°	0.185

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0058	0.00054
2	0.031	0.098
3	0.072	0.54
4	0.0112	12

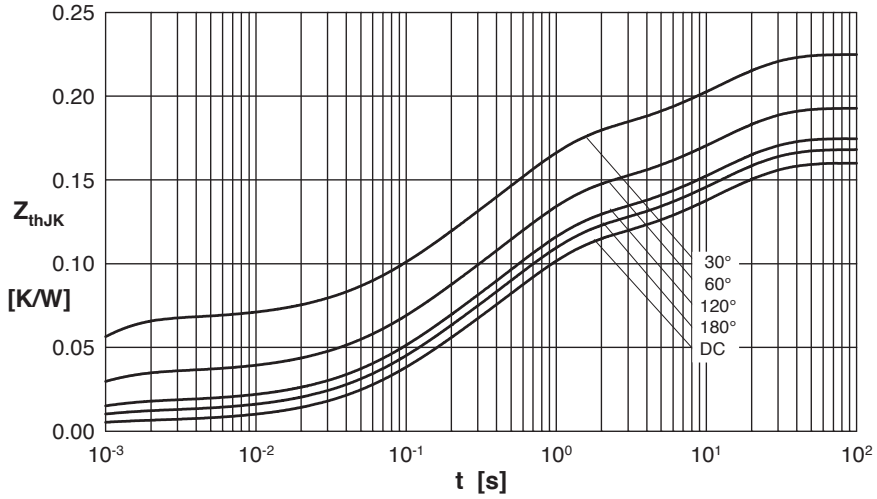

Fig. 9 Transient thermal impedance junction to heatsink (per thyristor/diode)

R_{thJK} for various conduct. angles d:

d	R_{thJK} (K/W)
DC	0.160
180°	0.168
120°	0.175
60°	0.193
30°	0.225

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0058	0.00054
2	0.031	0.098
3	0.072	0.54
4	0.0112	12
5	0.04	12

Dimensions in mm (1 mm = 0.0394“)