flowMNPC 0-SIC	**1200V/ 30mΩ**

Features

- **Rohm™** Silicon Carbide Power MOSFET
- **Rohm™** Silicon Carbide Power Schottky Diode
- MNPC Topology with Splitted Output
- Ultra Low Inductance with Integrated DC-capacitors
- Extremely Fast Switching with No "Tail" Current
- Unsensitivity for Cross Through Conduction
- Solderless Press-fit Mounting Technology
- Temperature sensor

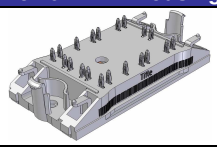
Target Applications

- High Efficient Solar Inverter
- UPS

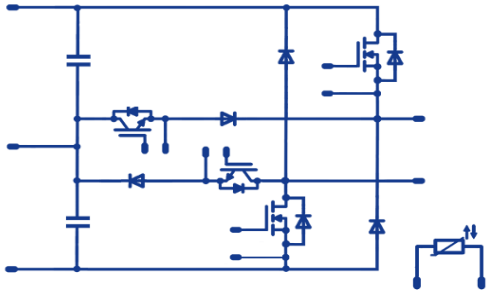
Types

- 10-PZ12NMA027MR-M340F68Y

flow0 12mm housing



Schematic



Maximum Ratings

Tj=25°C, unless otherwise specified

Parameter	Symbol	Condition		Value	Unit
T1, T4 H-bridge MOSFET					
Drain-source break down voltage	V_{DSS}			1200	V
DC drain current	I_D	T_j=$T_j$max	T_h=80°C	40	A
Pulsed drain current	I_{Dpulse}	t_p limited by $T_j$max		240	A
Power dissipation	P_{tot}	T_j=$T_j$max	T_h=80°C	85	W
Gate-source peak voltage	V_{GS}			-6 / 22	V
Maximum Junction Temperature	$T_j$max			150	°C
D7, D8 Neutral Point FWD					
Peak Repetitive Reverse Voltage	V_{RRM}			650	V
DC forward current	I_F	T_j=$T_j$max	T_h=80°C	28	A
Repetitive peak forward current	I_{FRM}	t_p limited by $T_j$max		120	A
Power dissipation per Diode	P_{tot}	T_j=$T_j$max	T_h=80°C	63	W
Maximum Junction Temperature	$T_j$max			175	°C

Maximum Ratings

Tj=25°C, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
T2, T3 Neutral Point IGBT				
Collector-emitter break down voltage	V_{CE}		650	V
DC collector current	I_C	T_j=$T_j$max T_h=80°C	50	A
Repetitive peak collector current	I_{Cpuls}	t_p limited by $T_j$max	240	A
Power dissipation per IGBT	P_{tot}	T_j=$T_j$max T_h=80°C	76	W
Gate-emitter peak voltage	V_{GE}		±20	V
Short circuit ratings	t_{SC} V_{CC}	T_j≤150°C V_{GE}=15V	none	µs V
Reverse Bias Safe Operation Area	Icmax	T_j≤150°C V_{CEmax}=650V	160	A
Maximum Junction Temperature	$T_j$max		175	°C
D2,D3 Neutral Point IGBT Inverse Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		650	V
DC forward current	I_F	T_j=$T_j$max T_h=80°C	11	A
Repetitive peak forward current	I_{FRM}	t_p limited by $T_j$max	12	A
Power dissipation per Diode	P_{tot}	T_j=$T_j$max T_h=80°C	21	W
Maximum Junction Temperature	$T_j$max		175	°C
D5, D6 H-bridge FWD				
Peak Repetitive Reverse Voltage	V_{RRM}		1200	V
DC forward current	I_F	T_j=$T_j$max T_h=80°C	14	A
Repetitive peak forward current	I_{FRM}	t_p limited by $T_j$max	46	A
Power dissipation per Diode	P_{tot}	T_j=$T_j$max T_h=80°C	38	W
Maximum Junction Temperature	$T_j$max		175	°C
DC link Capacitor				
Max.DC voltage	V_{MAX}	Tc=25°C	500	V
Thermal Properties				
Storage temperature	T_{stg}		-40…+125	°C
Operation temperature under switching condition	T_{op}		-40…+(Tjmax - 25)	°C
Insulation Properties				
Insulation voltage	V_{is}	t=2s DC voltage	4000	V
Comparative tracking index	CTI		>200	

Characteristic Values

Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V] or V_{GS} [V]	V_r [V] or V_{CE} [V] or V_{DS} [V]	I_C [A] or I_F [A] or I_D [A]	T_j	Min	Typ	Max	
T1, T4 H-bridge MOSFET										
Drain-source on-state resistance	$R_{ds(on)}$	$V_{CE}=V_{GE}$	18		30	Tj=25°C Tj=125°C		27,00 42,00		mΩ
Gate threshold voltage	$V_{(GS)th}$	$V_{DS}=V_{GS}$			0,0132	Tj=25°C Tj=125°C	1,6		4	V
Gate to Source Leackage Current	I_{GSS+} I_{GSS-}		-6/22	0		Tj=25°C Tj=25°C			300	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	1200		Tj=25°C Tj=150°C			30	µA
Turn-on delay time	$t_{d(on)}$	Rgoff=tbd Ω Rgon=tbd Ω				Tj=25°C Tj=125°C		tbd tbd		ns
Rise time	t_r					Tj=25°C Tj=125°C		tbd tbd		
Turn-off delay time	$t_{d(off)}$					Tj=25°C Tj=125°C		tbd tbd		
Fall time	t_f					Tj=25°C Tj=125°C		tbd tbd		
Turn-on energy loss per pulse	E_{on}					Tj=25°C Tj=125°C		tbd tbd		mWs
Turn-off energy loss per pulse	E_{off}					Tj=25°C Tj=125°C		tbd tbd		
Total gate charge *	Q_g		18	400	30	Tj=25°C		318		nC
Gate to source charge	Q_{gs}							81		nC
Gate to drain charge	Q_{gd}							93		nC
Input capacitance *	C_{ies}	f=1MHz	0	800		Tj=25°C		6240		pF
Output capacitance	C_{oss}							231		
Reverse transfer capacitance	C_{rss}							48		
Internal Gate Resistance	R_G	f=1MHz UAC=25mV				Tj=25°C		2,1		Ω
Thermal resistance chip to heatsink per chip	R_{thJH}	Preaplied Phase change material						0,8		K/W
D7, D8 Neutral Point FWD										
Diode forward voltage	V_F				30	Tj=25°C Tj=150°C		1,40 1,60		V
Peak reverse recovery current	I_{RRM}	Rgon=tbdΩ				Tj=25°C Tj=125°C		tbd tbd		A
Reverse recovery time	t_{rr}					Tj=25°C Tj=125°C		tbd tbd		ns
Reverse recovered charge	Q_{rr}					Tj=25°C Tj=125°C		tbd tbd		µC
Peak rate of fall of recovery current	di(rec)max /dt					Tj=25°C Tj=125°C		tbd tbd		A/µs
Reverse recovered energy	Erec					Tj=25°C Tj=125°C		tbd tbd		mWs
Thermal resistance chip to heatsink per chip	R_{thJH}	Preaplied Phase change material						1,50		K/W

Characteristic Values

Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V] or V_{GS} [V]	V_r [V] or V_{CE} [V] or V_{DS} [V]	I_C [A] or I_F [A] or I_D [A]	T_j	Min	Typ	Max	
T2, T3 Neutral Point IGBT										
Gate emitter threshold voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}$			0,0008	Tj=25°C Tj=125°C	3,3	4,0	4,7	V
Collector-emitter saturation voltage	$V_{CE(sat)}$		15		80	Tj=25°C Tj=150°C		1,65	2,22	V
Collector-emitter cut-off incl diode	I_{CES}		0	650		Tj=25°C Tj=175°C			0,08	mA
Gate-emitter leakage current	I_{GES}		20	0		Tj=25°C Tj=125°C			240	nA
Integrated Gate resistor	R_{gint}							none		Ω
Turn-on delay time	$t_{d(on)}$	Rgoff=tbdΩ Rgon=tbdΩ				Tj=25°C Tj=125°C		tbd tbd		ns
Rise time	t_r					Tj=25°C Tj=125°C		tbd tbd		
Turn-off delay time	$t_{d(off)}$					Tj=25°C Tj=125°C		tbd tbd		
Fall time	t_f					Tj=25°C Tj=125°C		tbd tbd		
Turn-on energy loss per pulse	E_{on}					Tj=25°C Tj=125°C		tbd tbd		mWs
Turn-off energy loss per pulse	E_{off}					Tj=25°C Tj=125°C		tbd tbd		
Input capacitance	C_{ies}	f=1MHz	0	25		Tj=25°C		5000		pF
Output capacitance	C_{oss}							80		
Reverse transfer capacitance	C_{rss}							18		
Gate charge	Q_{Gate}		15	520	80	Tj=25°C		190		nC
Thermal resistance chip to heatsink per chip	R_{thJH}	Preaplied Phase change material						1,25		K/W
D2,D3 Neutral Point IGBT Inverse Diode										
Diode forward voltage	V_F				6	Tj=25°C Tj=125°C	1,23	1,55 1,50	2,1	V
Thermal resistance chip to heatsink per chip	R_{thJH}	Preaplied Phase change material						3,70		K/W
D5, D6 H-bridge FWD										
Diode forward voltage	V_F				10	Tj=25°C Tj=150°C	1	1,49 1,77	1,9	V
Reverse leakage current	I_r			1200		Tj=25°C Tj=175°C			250	µA
Peak reverse recovery current	I_{RRM}	Rgon=tbd Ω				Tj=25°C Tj=150°C		tbd tbd		A
Reverse recovery time	t_{rr}					Tj=25°C Tj=150°C		tbd tbd		ns
Reverse recovered charge	Q_{rr}					Tj=25°C Tj=150°C		tbd tbd		µC
Peak rate of fall of recovery current	di(rec)max /dt					Tj=25°C Tj=150°C		tbd tbd		A/µs
Reverse recovery energy	E_{rec}					Tj=25°C Tj=150°C		tbd tbd		mWs
Thermal resistance chip to heatsink per chip	R_{thJH}	Preaplied Phase change material						2,50		K/W
DC link Capacitor										
C value	C							270		nF
Thermistor										
Rated resistance	R					T=25°C		22000		Ω
Deviation of R100	ΔR/R	R100=1486 Ω				T=25°C	-5		+5	%
Power dissipation	P					T=25°C		200		mW
Power dissipation constant						Tj=25°C		2		mW/K
B-value	$B_{(25/50)}$	Tol. ±3%				Tj=25°C		3950		K
B-value	$B_{(25/100)}$	Tol. ±3%				Tj=25°C		3996		K
Vincotech NTC Reference									B	

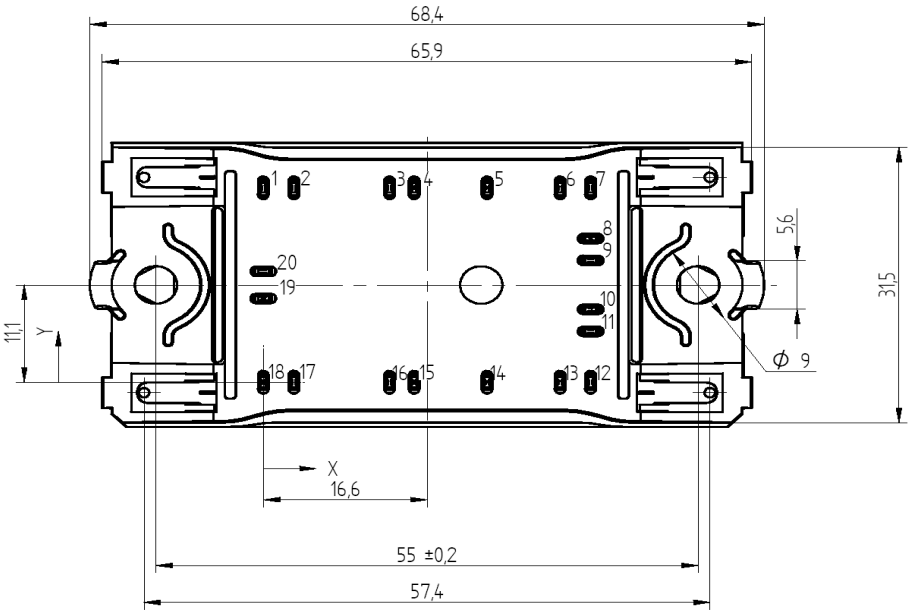
Ordering Code and Marking - Outline - Pinout

Ordering Code & Marking

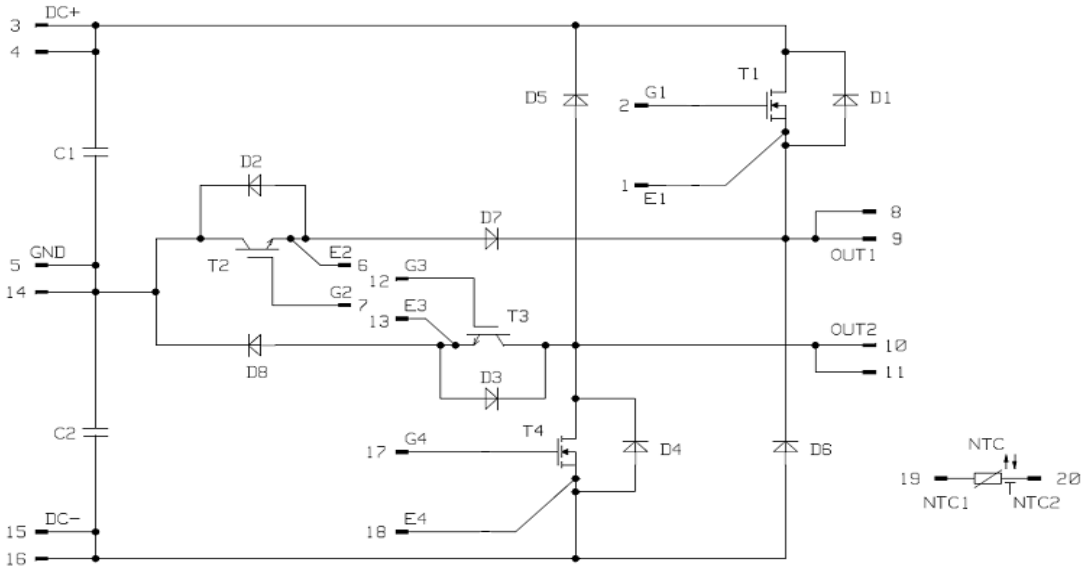
Version	Ordering Code	in DataMatrix as	in packaging barcode as
without thermal paste 12mm housing	10-PZ12NMA027MR-M340F68Y	M340F68Y	M340F68Y

Outline

Pin	X	Y	Function
1	0	22,2	E1
2	3,1	22,2	G1
3	12,8	22,2	DC+
4	15,3	22,2	DC+
5	22,7	22,2	GND
6	30,1	22,2	E2
7	33,2	22,2	G2
8	33,2	16,4	OUT1
9	33,2	13,9	OUT1
10	33,2	8,3	OUT2
11	33,2	5,8	OUT2
12	33,2	0	G3
13	30,1	0	E3
14	22,7	0	GND
15	15,3	0	DC-
16	12,8	0	DC-
17	3,1	0	G4
18	0	0	E4
19	0	9,55	NTC1
20	0	12,65	NTC2



Pinout



PRODUCT STATUS DEFINITIONS

Datasheet Status	Product Status	Definition
Target	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice. The data contained is exclusively intended for technically trained staff.

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