Vincotech

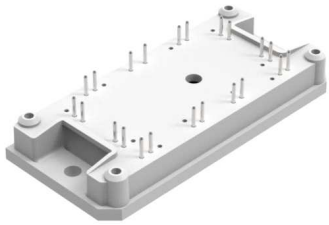
10-FY12B2A040MR02-L387L63
target datasheet

flow BOOST 1 dual SiC — **1200 V / 40 mΩ**

Features

- High frequency SiC MOSFET
- Compact and low inductive design

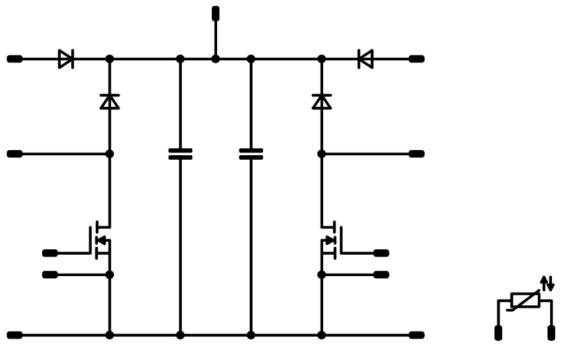
flow 1 12mm housing



Target applications

- Solar

Schematic



Types

- 10-FY12B2A040MR02-L387L63

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
Boost Switch				
Drain-source voltage	V_{DSS}		1200	V
Drain current	I_D	$T_j = T_{jmax}$ T_s = 80 °C	32	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}	137	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	73	W
Gate-source voltage	V_{GSS}		-4/22	V
Maximum Junction Temperature	T_{jmax}		175	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
Boost Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		1200	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ T_s = 80 °C	48	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	125	W
Maximum Junction Temperature	T_{jmax}		175	°C
Rectifier Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		1600	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ T_s = 80 °C	53	A
Surge (non-repetitive) forward current	I_{FSM}	50 Hz Single Half Sine Wave t_p = 10 ms T_j = 150 °C	490	A
Surge current capability	I^2t		1200	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	86	W
Maximum Junction Temperature	T_{jmax}		150	°C
DC Link Capacitance				
Maximum DC voltage	V_{MAX}		1500	V
Operation Temperature	T_{op}		-55…+125	°C
Module Properties				
Thermal Properties				
Storage temperature	T_{stg}		-40…+125	°C
Operation temperature under switching condition	T_{jop}		-40…(T_{jmax} - 25)	°C
Isolation Properties				
Isolation voltage	V_{isol}	DC Test Voltage t_p = 2 s	4000	V
Creepage distance			min. 12,7	mm
Clearance			9,43	mm
Comparative Tracking Index	CTI		> 200	

Characteristic Values

Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V]	I_C [A] I_D [A]	T_j [°C]	Min	Typ	Max	
Boost Switch										
Static										
Drain-source on-state resistance	$r_{DS(on)}$		18		20	25 125 150		39 52 60	50	mΩ
Gate-source threshold voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}$			0,01	25	2,7		5,6	V
Gate to Source Leakage Current	I_{GSS}		22 -4	0		25			100 -100	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	1200		25			10	µA
Internal gate resistance	r_g							7		Ω
Gate charge	Q_g		18	600	20	25		107		nC
Gate to source charge	Q_{GS}							22		
Gate to drain charge	Q_{GD}							41		
Short-circuit input capacitance	C_{iss}	f= 1 MHz	0	800		25		1337		pF
Short-circuit output capacitance	C_{oss}							76		
Reverse transfer capacitance	C_{rss}							27		
Reverse Diode Static										
Forward voltage	V_{sd}		0		20	25		3,20		V
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material λ = 3,4 W/mK						1,31		K/W
Boost Diode										
Static										
Forward voltage	V_F				30	25 125 150		1,4 1,8 1,9	1,6	V
Reverse leakage current	I_r			1200		25			600	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material λ = 3,4 W/mK						0,76		K/W

Characteristic Values

Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V]	I_C [A] I_D [A]	T_j [°C]	Min	Typ	Max	
Rectifier Diode										
Static										
Forward voltage	V_F				50	25 125		1,22 1,48	1,8	V
Reverse leakage current	I_r			1600		25 150			50 1100	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material λ = 3,4 W/mK						0,82		K/W
DC Link Capacitance										
Capacitance	C							78		nF
Tolerance							-10		+10	%
Climatic category							55/125/56			
Thermistor										
Rated resistance	R					25		22		kΩ
Deviation of R100	$\Delta_{R/R}$	R_{100} = 1484 Ω				100	-5		5	%
Power dissipation	P					25		5		mW
Power dissipation constant						25		1,5		mW/K
B-value	$B_{(25/50)}$	Tol. ±1 %				25		3962		K
B-value	$B_{(25/100)}$	Tol. ±1 %				25		4000		K
Vincotech NTC Reference									I	

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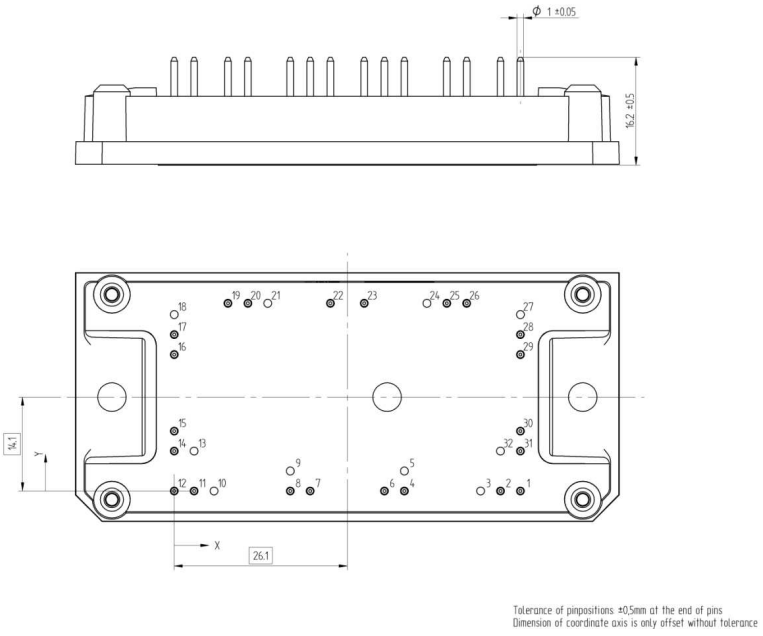
Ordering Code & Marking

Version	Ordering Code
without thermal paste with solder pins 12mm housing	10-FY12B2A040MR02-L387L63

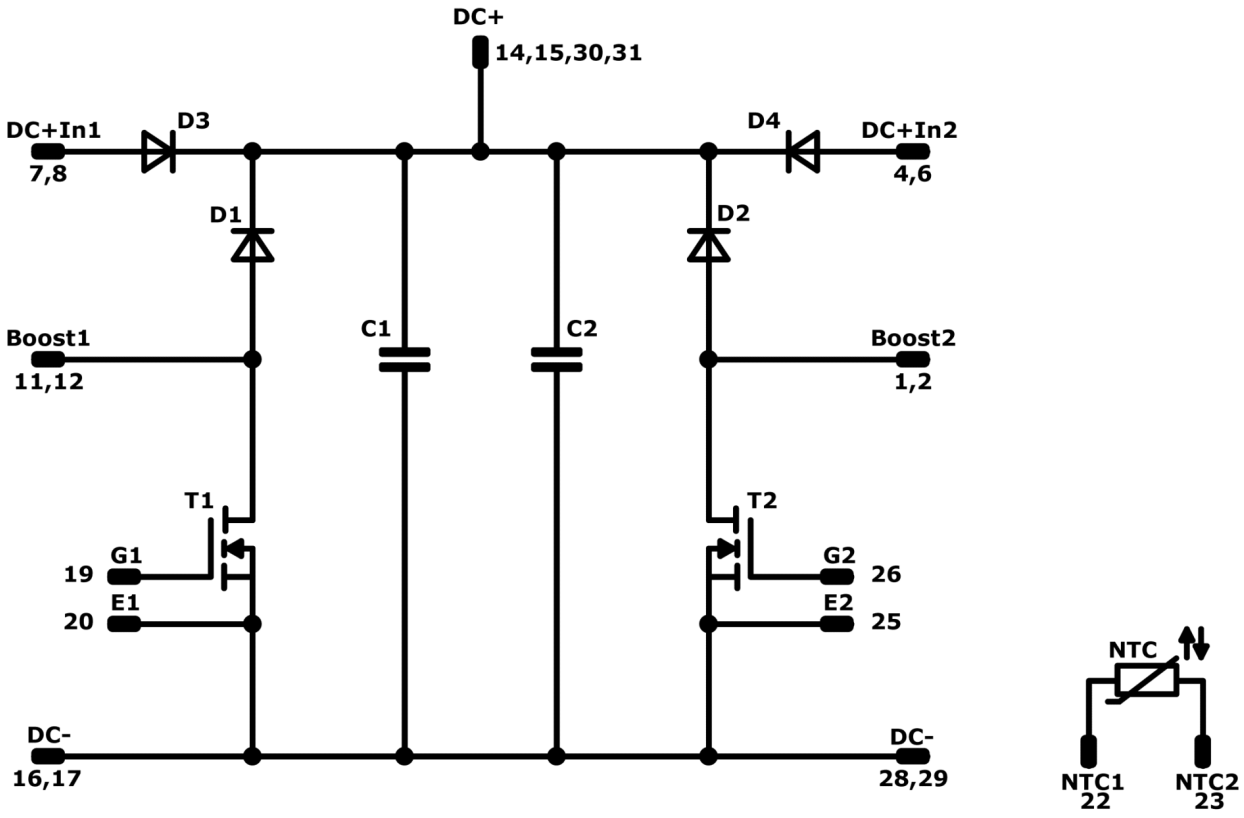
		Name		Date code	UL & VIN	Lot	Serial
Text		NN-NNNNNNNNNNNNN-TTTTTTVV		WWYY	UL VIN	LLLLL	SSSS
Datamatrix		Type&Ver	Lot number	Serial	Date code		
		TTTTTTTVV	LLLLL	SSSS	WWYY		

Outline

Pin table [mm]				Pin table [mm]			
Pin	X	Y	Function	Pin	X	Y	Function
1	52,2	0	Boost2	28	52,2	23,5	DC-
2	49,2	0	Boost2	29	52,2	20,5	DC-
3	not assembled			30	52,2	9	DC+
4	34,7	0	DC+In2	31	52,2	6	DC+
5	not assembled			32	not assembled		
6	31,7	0	DC+In2				
7	20,5	0	DC+In1				
8	17,5	0	DC+In1				
9	not assembled						
10	not assembled						
11	3	0	Boost1				
12	0	0	Boost1				
13	not assembled						
14	0	6	DC+				
15	0	9	DC+				
16	0	20,5	DC-				
17	0	23,5	DC-				
18	not assembled						
19	8,1	28,2	G1				
20	11,1	28,2	E1				
21	not assembled						
22	23,55	28,2	NTC1				
23	28,65	28,2	NTC2				
24	not assembled						
25	41,1	28,2	E2				
26	44,1	28,2	G2				
27	not assembled						



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T1, T2	MOSFET	1200 V	40 mΩ	Boost Switch	
D1, D2	FWD	1200 V	30 A	Boost Diode	
D3, D4	FWD	1600 V	50 A	Rectifier Diode	
C1, C2	Capacitor	1500 V		DC Link Capacitance	
NTC	Thermistor			Thermistor	

Packaging instruction				
Standard packaging quantity (SPQ) 100	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for *flow* 1 packages see vincotech.com website.

Package data
Package data for *flow* 1 packages see vincotech.com website.

UL recognition and file number
This device is certified according to UL 1557 standard, UL file number E192116. For more information see vincotech.com website.

Document No.:	Date:	Modification:	Pages
10-FY12B2A040MR02-L387L63-T1-14	25 Apr. 2016		

Product status definition		
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.