Vincotech

V23990-P629-L83-PM
target datasheet

flow BOOST 0 SiC — 1200 V / 80 mΩ

Features

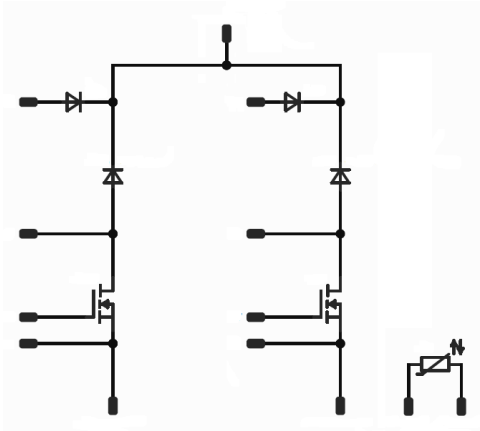
- High efficiency dual boost
- Ultra fast switching frequency
- Low Inductive Layout
- 1200V SiC MOSFET (Cree) and 1200V SiC diode (Cree)

flow 0 12mm housing

Target applications

- Solar inverter

Schematic



Types

- V23990-P629-L83-PM

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	$T_j = T_{jmax}$ Ts = 80 °C	16	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}	60	A
Avalanche energy, single pulse	E_{AS}	I_D = 20 A V_{DD} = 50 V	1000	mJ
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ Ts = 80 °C	39	W
Gate-source voltage	V_{GSS}		-10/+25	V
Maximum Junction Temperature	T_{jmax}		150	°C

Parameter	Symbol	Conditions		Value	Unit
Boost Diode					
Peak Repetitive Reverse Voltage	V_{RRM}			1200	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$	$T_h = 80°C$	15	A
Repetitive peak forward current	I_{FRM}			52	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	$T_h = 80°C$	44	W
Maximum Junction Temperature	T_{jmax}			175	°C

Parameter	Symbol	Conditions		Value	Unit
Bypass Diode					
Peak Repetitive Reverse Voltage	V_{RRM}			1600	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$	$T_h = 80°C$	33	A
Surge (non-repetitive) forward current	I_{FSM}	50 Hz Single Half Sine Wave $t_p = 10$ ms	$T_j = 150°C$	200	A
Surge current capability	I^2t			200	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$	$T_h = 80°C$	43	W
Maximum Junction Temperature	T_{jmax}			150	°C

Parameter	Symbol	Conditions		Value	Unit
Module Properties					
Thermal Properties					
Storage temperature	T_{stg}			-40...+125	°C
Operation Junction Temperature	T_{jop}			-40...+(T_{jmax} - 25)	°C
Isolation Properties					
Isolation voltage	V_{isol}	DC voltage	t_p=2s	4000	V
Creepage distance				min 12,7	mm
Clearance				9,55	mm
Comparative Tracking Index	CTI			>200	

Characteristic Values

Boost Switch

Parameter	Symbol	Conditions					Value			Unit
			V_{GS} [V]	V_{DS} [V]	I_D [A]	T_j[°C]	Min	Typ	Max	
Static										
Drain-source on-state resistance	$r_{DS(on)}$		10		20	25 125 150		84 136 -	98 208	mΩ
Gate-source threshold voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}$			0,001	25 125	1,7	2,2	-	V
Gate to Source Leakage Current	I_{GSS}		-10/+25	0		25 125			250	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	1200		25 125			100	µA
Internal gate resistance	r_g							4,6		Ω
Gate charge	Q_g		0/10	800	20	25		49,2		nC
Gate to source charge	Q_{GS}							10,8		
Gate to drain charge	Q_{GD}							18		
Short-circuit input capacitance	C_{iss}	f=1MHz	0	1000		25		950		pF
Short-circuit output capacitance	C_{oss}							80		
Reverse transfer capacitance	C_{rss}							6,5		
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	Phase-Change Material λ=3,4 W/mK						1,79		K/W

Boost Diode

Parameter	Symbol	Conditions					Value			Unit
				V_r [V]	I_F [A]	T_j [°C]	Min	Typ	Max	
Static										
Forward voltage	V_F				10	25 125 150		1,49 1,92 -	1,8	V
Reverse leakage current	I_r			1200		25 150			300	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	Phase-Change Material λ=3,4W/mK						2,15		K/W

Bypass Diode

Parameter	Symbol	Conditions					Value			Unit
				V_r [V]	I_F [A]	T_j [°C]	Min	Typ	Max	
Static										
Forward voltage	V_F				25	25 125		1,22 1,21	1,9	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=3,4W/mK						1,61		K/W

Thermistor

Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V]	V_{CE} [V]	I_C [A]	T_j [°C]	Min	Typ	Max	
Rated resistance	R					25		21,5		kΩ
Deviation of R100	$\Delta_{R/R}$	R100=1486 Ω				100	-4,5		+4,5	%
Power dissipation	P					25		210		mW
Power dissipation constant						25		3,5		mW/K
B-value	$B_{(25/50)}$					25		3884		K
B-value	$B_{(25/100)}$					25		3964		K
Vincotech NTC Reference									F	

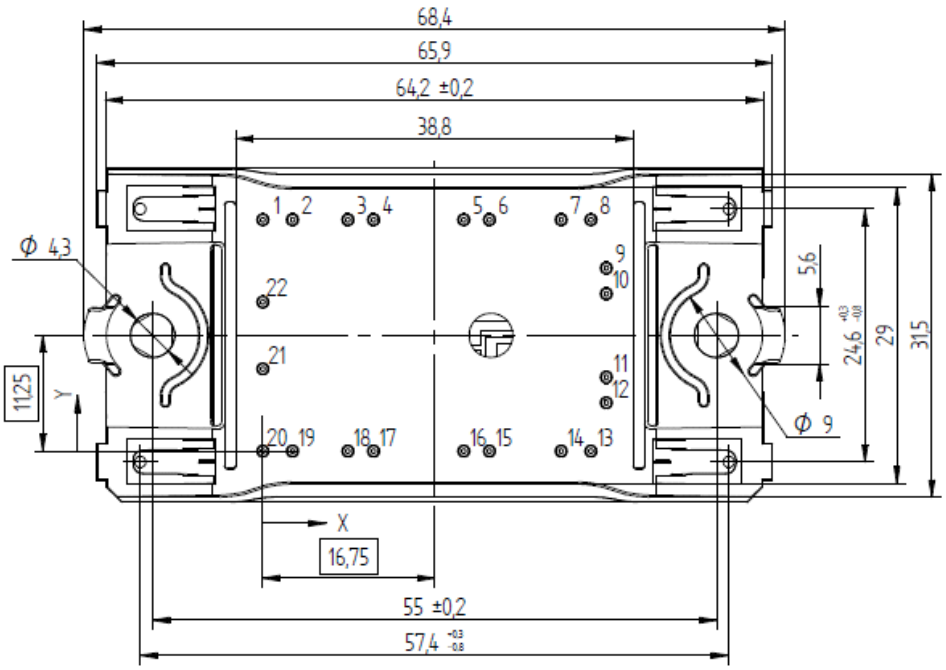
Ordering Code & Marking

Version	Ordering Code	in DataMatrix as	in packaging barcode as
without thermal paste 12mm housing	V23990-P629-L83-PM	P629L83	P629L83

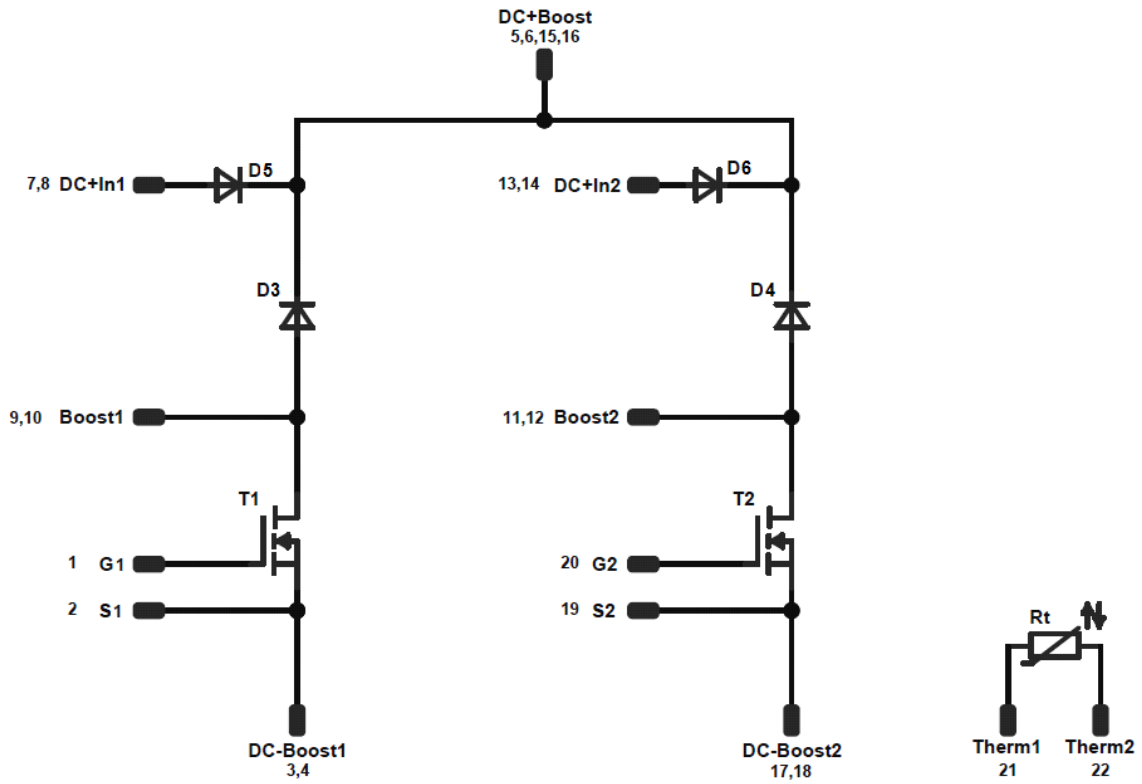
Text	**Vinco**	**Date code**	**Name&Ver**	**UL**	**Lot**	**Serial**
	Vinco	WWYY	NNNNNNNVV	UL	LLLLL	SSSS
Datamatrix	**Type&Ver**	**Lot number**	**Serial**	**Date code**		
	TTTTTTTVV	LLLLL	SSSS	WWYY		

Outline

Pin table [mm]			
Pin	X	Y	Function
1	0	22,5	G1
2	2,9	22,5	S1
3	8,3	22,5	DC-Boost1
4	10,8	22,5	DC-Boost1
5	19,6	22,5	DC+Boost
6	22,1	22,5	DC+Boost
7	29,1	22,5	DC+In1
8	32	22,5	DC+In1
9	33,5	17,8	Boost1
10	33,5	15,3	Boost1
11	33,5	7,2	Boost2
12	33,5	4,7	Boost2
13	32	0	DC+In2
14	29,1	0	DC+In2
15	22,1	0	DC+Boost
16	19,6	0	DC+Boost
17	10,8	0	DC-Boost2
18	8,3	0	DC-Boost2
19	2,9	0	S2
20	0	0	G2
21	0	8	Therm1
22	0	14,5	Therm2



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T1,T2	MOSFET	1200 V	80mΩ	Boost Switch	
D3,D4	FWD	1200 V	10A	Boost Diode	
D5,D6	Rectifier	1600 V	25A	Bypass Diode	
Rt	NTC	-	-	Thermistor	

Packaging instruction					
Standard packaging quantity (SPQ)	135	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for *flow* 0 packages see vincotech.com website.

Document No.:	Date:	Modification:	Pages
V23990-P629-L83-T1-14	21 Jul. 2015		

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.