



Vincotech

10-FY07BIA050SM-M523E38
10-PY07BIA050SM-M523E38Y
target datasheet

flowSOL 1 BI

650 V / 50 A

Features

Booster:

- Dual boost topology
- Ultra High-Speed IGBT and Diode
- High efficiency bypass rectifier

Inverter:

- Split Output H-Bridge topology
- High-Speed IGBT and Diode

- Integrated DC capacitors
- Temperature sensor

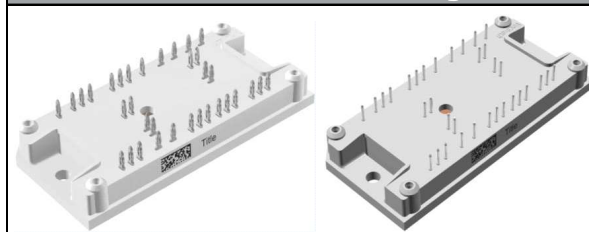
Target applications

- Power Supply
- Solar
- Welding

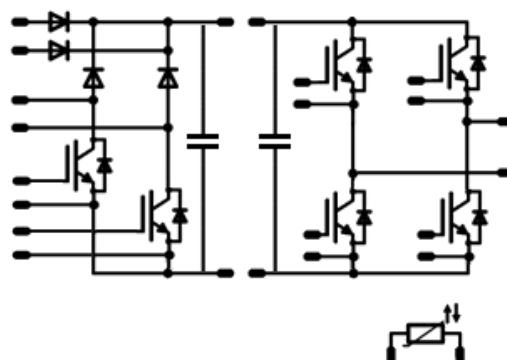
Types

- 10-FY07BIA050SM-M523E38
- 10-PY07BIA050SM-M523E38Y

flow 1 12mm housing



Schematic



Maximum Ratings

$T_j = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
In. Boost Switch\H-Bridge Switch				
Collector-emitter voltage	V_{CES}		650	V
Collector current	I_C	$T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$	43	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	150	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$	84	W
Gate-emitter voltage	V_{GES}		± 20	V
Maximum Junction Temperature	T_{jmax}		175	$^\circ\text{C}$



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Parameter	Symbol	Conditions	Value	Unit
In. Boost Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		650	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$	33	A
Repetitive peak forward current	I_{FRM}		90	A
Power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$	62	W
Maximum Junction Temperature	T_{jmax}		175	$^\circ\text{C}$

Parameter	Symbol	Conditions	Value	Unit
In. Boost Inverse Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		650	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$	17	A
Repetitive peak forward current	I_{FRM}		20	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$	33	W
Maximum Junction Temperature	T_{jmax}		175	$^\circ\text{C}$

Parameter	Symbol	Conditions	Value	Unit
Bypass Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		1600	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	48	A
Surge (non-repetitive) forward current	I_{FSM}	50 Hz Single Half Sine Wave $T_j = 150^\circ\text{C}$ $t_p = 10 \text{ ms}$	270	A
Surge current capability	I^2t		370	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	60	W
Maximum Junction Temperature	T_{jmax}		150	$^\circ\text{C}$



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Parameter	Symbol	Conditions	Value	Unit
H-Bridge Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		650	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$	38	A
Repetitive peak forward current	I_{FRM}		60	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80^\circ\text{C}$	52	W
Maximum Junction Temperature	T_{jmax}		175	$^\circ\text{C}$

DC Link Capacitance

Parameter	Symbol	Conditions	Value	Unit
Maximum DC voltage	V_{MAX}		630	V
Operation Temperature	T_{op}		-55...+125	$^\circ\text{C}$

Module Properties

Parameter	Symbol	Conditions	Value	Unit
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Thermal Properties

Storage temperature	T_{stg}		-40...+125	$^\circ\text{C}$
Operation Junction Temperature	T_{jop}		-40...+($T_{jmax} - 25$)	$^\circ\text{C}$

Isolation Properties

Isolation voltage	V_{isol}	DC voltage	$t_p=2s$	4000	V
Creepage distance				min 12,7	mm
Clearance				min 12,7	mm
Comparative Tracking Index	CTI			>200	



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Characteristic Values

In. Boost Switch\H-Bridge Switch

Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V]	V_{CE} [V]	I_C [A]	T_j [°C]	Min	Typ	Max	
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}$			0,0005	25 125	3,3	4	4,7	V
Collector-emitter saturation voltage	V_{CEsat}		15		50	25 125 150	1	1,82 2,00	2,22	V
Collector-emitter cut-off current	I_{CES}		0	650		25 125			40	μA
Gate-emitter leakage current	I_{GES}		20	0		25 125			120	nA
Internal gate resistance	r_g							none		Ω
Input capacitance	C_{ies}	f=1 MHz	0	25		25		3000		pF
Output capacitance	C_{oes}							50		
Reverse transfer capacitance	C_{res}							11		
Gate charge	Q_g		15	520	50	25		120		nC

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material $\lambda=3,4W/mK$						1,13		K/W
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In. Boost Diode

Parameter	Symbol	Conditions					Value			Unit
				V_r [V]	I_F [A]	T_j [°C]	Min	Typ	Max	
Static										
Forward voltage	V_F				30	25 125 150		2,46 2,03	2,6	V
Reverse leakage current	I_r			665		25 150			10	μA

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material $\lambda=3,4W/mK$						1,54		K/W
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In. Boost Inverse 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		1,67 1,56	1,87	V
Reverse leakage current	I_r			650		25 150			0,14	μA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material $\lambda=3,4\text{W/mK}$						2,87		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				35	25 125 150		1,17 1,1	1,21	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 $\lambda=3,4\text{W/mK}$						1,16		K/W

H-Bridge Diode

Parameter	Symbol	Conditions					Value			Unit
				V_r [V]	I_F [A]	T_j [°C]	Min	Typ	Max	
Static										
Forward voltage	V_F				30	25 125 150		1,35	1,7	V
Reverse leakage current	I_r			650		25 150			1,6	μA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material $\lambda=3,4\text{W/mK}$						1,82		K/W



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DC Link Capacitance

Parameter	Symbol	Conditions					Value			Unit
						$T_j [^{\circ}\text{C}]$	Min	Typ	Max	
Capacitance	C							47		nF
Tolerance							-10		+10	%

Thermistor

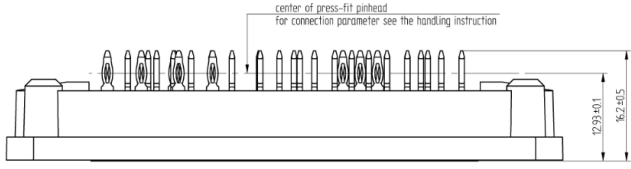
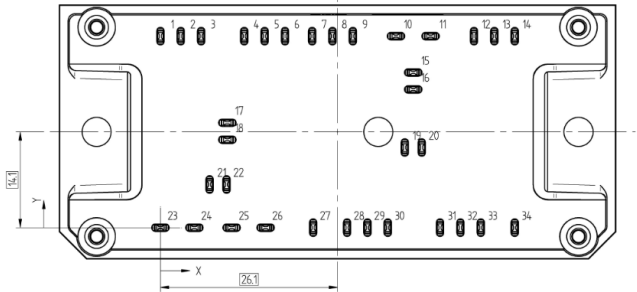
Parameter	Symbol	Conditions					Value			Unit
			$V_{GE} [V]$	$V_{CE} [V]$	$I_C [A]$	$T_{jl} [^{\circ}\text{C}]$	Min	Typ	Max	
Rated resistance	R					25		22		k Ω
Deviation of R100	$\Delta_{R/R}$	R100=1486 Ω				100	-12		+14	%
Power dissipation	P					25		200		mW
Power dissipation constant						25		2		mW/K
B-value	$B_{(25/50)}$	Tol. $\pm 3\%$				25		3950		K
B-value	$B_{(25/100)}$	Tol. $\pm 3\%$				25		3998		K
Vincotech NTC Reference									B	



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Ordering Code & Marking								
Version	Ordering Code		in DataMatrix as		in packaging barcode as			
without thermal paste solder pins	10-FY07BIA050SM-M523E38		M523E38		M523E38			
with thermal paste solder pins	10-FY07BIA050SM-M523E38-/3/		M523E38		M523E38-/3/			
without thermal paste Press-fit pins	10-PY07BIA050SM-M523E38Y		M523E38Y		M523E38Y			
with thermal paste Press-fit pins	10-PY07BIA050SM-M523E38Y-/3/		M523E38Y		M523E38Y-/3/			
NN-NNNNNNNNNNNNNN NNNNNNNN WWYY UL Vinc LLLLL SSSS 		Text	Name		Date code	UL & Vinco	Lot	Serial
			NN-NNNNNNNNNNNNNN-NNNNNNNN		WWYY	UL Vinco	LLLLL	SSSS
		Datamatrix	Type&Ver	Lot number	Serial	Date code		
	TTTTTTTV	LLLLL	SSSS	WWYY				

Outline							
Pin table [mm]				Pin table [mm]			
Pin	X	Y	Function	Pin	X	Y	Function
1	0	28,2	G25	30	33,5	0	Ph1
2	3	28,2	S25	31	41,2	0	Ph2
3	6	28,2	N.C.	32	44,2	0	S14
4	12,35	28,2	N.C.	33	47,2	0	G14
5	15,35	28,2	S27	34	52,2	0	Ph2
6	18,35	28,2	G27				
7	22,35	28,2	N.C.				
8	25,35	28,2	S11				
9	28,35	28,2	G11				
10	34,7	28,2	Therm1				
11	39,8	28,2	Therm2				
12	46,2	28,2	G13				
13	49,2	28,2	S13				
14	52,2	28,2	N.C.				
15	37,25	22,85	DC-				
16	37,25	20,35	DC-				
17	9,85	15,45	DC-Boost				
18	9,85	12,95	DC-Boost				
19	36	11,8	DC+				
20	38,5	11,8	DC+				
21	7,25	6,35	DC+Boost				
22	9,75	6,35	DC+Boost				
23	0	0	ACIn1				
24	5	0	Sol1				
25	10,5	0	Sol2				
26	15,5	0	ACIn2				
27	22,5	0	Ph1				
28	27,5	0	G12				
29	30,5	0	S12				

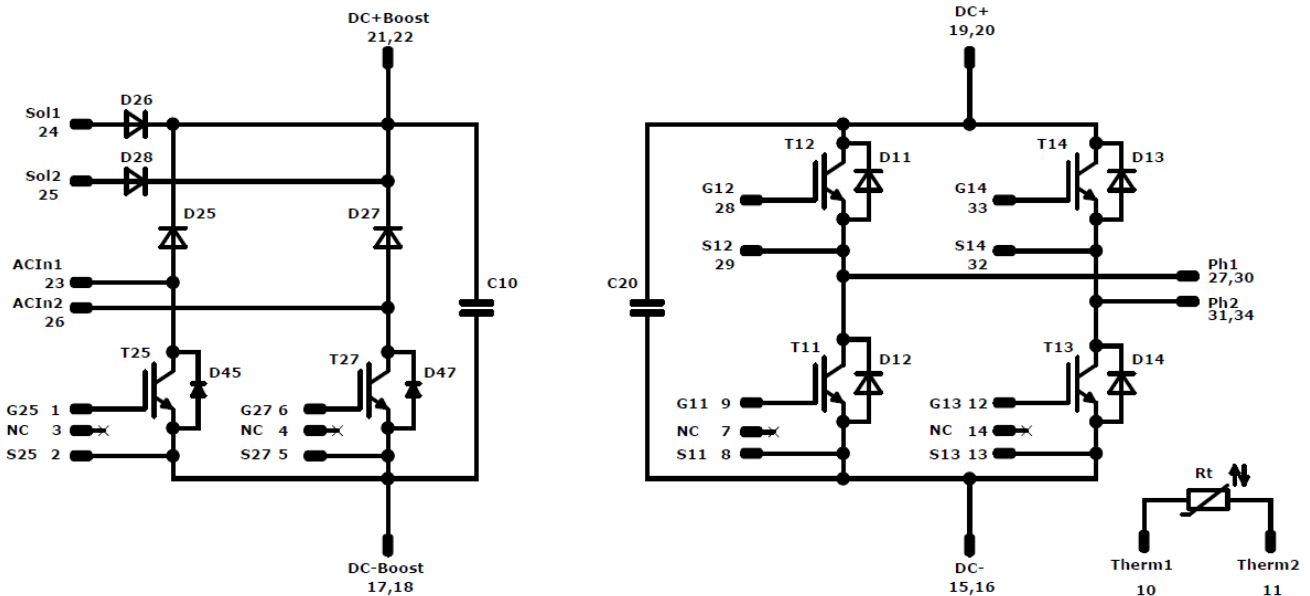
Tolerance of pinpositions: ±0,5mm at the end of pins
Dimension of coordinate axis is only offset without tolerance



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Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T25,T27	IGBT	650V	50A	In. Boost Switch	
D25,D27	FWD	650V	30A	In. Boost Diode	
D45,D47	FWD	650	10A	In. Boost Inverse Diode	
D26,D28	Rectifier	1600V	35A	Bypass Diode	
T11,T12,T13,T14	IGBT	650V	50A	H- Bridge IGBT	
D11,D12,D13,D14	FWD	650V	30A	H- Bridge Diode	
C10,C20	Capacitor	630V	-	DC Link Capacitance	
Rt	NTC	-	-	Thermistor	



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

Handling instruction
Handling instructions for <i>flow</i> 1 packages see vincotech.com website.

Package data
Package data for <i>flow</i> 1 packages see vincotech.com website.

Document No.:	Date:	Modification:	Pages
10-FY07BIA050SM-M523E38-T1-14	19 Oct. 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.

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