Vincotech

FZ06NIA045FH01

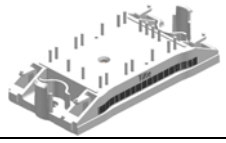
target datasheet

flowNPC 0 — **600V/75A & 45mΩ**

Features

- Neutral-point-Clamped inverter
- Ultra fast switching
- Clip-In PCB mounting
- Low Inductance Layout

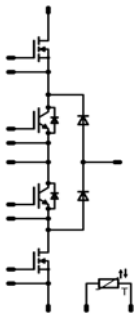
flow0 housing



Target Applications

- Solar inverters

Schematic



Types

- FZ06NIA045FH01

Maximum Ratings

Tj=25°C, unless otherwise specified

Parameter	Symbol	Condition		Value	Unit
Polarity Switch IGBT					
Collector-emitter break down voltage	V_{CE}			600	V
DC collector current	I_C	T_j=$T_j$max	T_h=80°C T_c=80°C	65	A
Repetitive peak collector current	I_{Cpulse}	t_p limited by $T_j$max	T_h=80°C T_c=80°C	225	A
Power dissipation per IGBT	P_{tot}	T_j=$T_j$max	T_h=80°C T_c=80°C	105	W
Gate-emitter peak voltage	V_{GE}			±20	V
Short circuit ratings	t_{SC} V_{CC}	T_j≤150°C V_{GE}=15V		6 360	µs V
Maximum Junction Temperature	$T_j$max			175	°C
Polarity Switch Inverse Diode					
Peak Repetitive Reverse Voltage	V_{RRM}	T_j=25°C		600	V
DC forward current	I_F	T_j=$T_j$max	T_h=80°C T_c=80°C	30	A
Repetitive peak forward current	I_{FRM}	t_p limited by $T_j$max	T_h=80°C T_c=80°C	60	A
Power dissipation per Diode	P_{tot}	T_j=$T_j$max	T_h=80°C T_c=80°C	46	W
Maximum Junction Temperature	$T_j$max			175	°C

Maximum Ratings

Tj=25°C, unless otherwise specified

Parameter	Symbol	Condition		Value	Unit
Buck MOSFET					
Drain to source breakdown voltage	V_{DS}			600	V
DC drain current	I_D	$T_j=T_j max$	T_h=80°C T_c=80°C	30	A
Pulsed drain current	I_{Dpulse}	t_p limited by $T_j max$	T_h=80°C T_c=80°C	230	A
Power dissipation	P_{tot}	$T_j=T_j max$	T_h=80°C T_c=80°C	92	W
Gate-source peak voltage	Vgs			±20	V
Maximum Junction Temperature	$T_j max$			150	°C
Buck Diode					
Peak Repetitive Reverse Voltage	V_{RRM}	T_j=25°C		600	V
DC forward current	I_F	$T_j=T_j max$	T_h=80°C T_c=80°C	20	A
Repetitive peak forward current	I_{FRM}	t_p limited by $T_j max$	T_h=80°C T_c=80°C	64	A
Power dissipation per Diode	P_{tot}	$T_j=T_j max$	T_h=80°C T_c=80°C	41	W
Maximum Junction Temperature	$T_j max$			175	°C
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		4000	V_{DC}
Creepage distance				min 12,7	mm
Clearance				min 12,7	mm

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	
Polarity Switch IGBT										
Gate emitter threshold voltage	$V_{GE(th)}$	VCE=VGE			0,0012	Tj=25°C Tj=150°C	4	5,8	7	V
Collector-emitter saturation voltage	$V_{CE(sat)}$		15		75	Tj=25°C Tj=150°C		1,5 1,67	2,55	V
Collector-emitter cut-off current incl. Diode	I_{CES}		0	600		Tj=25°C Tj=150°C			0,5	mA
Gate-emitter leakage current	I_{GES}		20	0		Tj=25°C Tj=150°C			650	nA
Integrated Gate resistor	R_{gint}							none		Ω
Turn-on delay time	$t_{d(on)}$	LF switching only	±15	300	0	Tj=25°C Tj=125°C		tbd		ns
Rise time	t_r					Tj=25°C Tj=125°C		tbd		
Turn-off delay time	$t_{d(off)}$					Tj=25°C Tj=125°C		tbd		
Fall time	t_f					Tj=25°C Tj=125°C		tbd		
Turn-on energy loss per pulse	E_{on}					Tj=25°C Tj=125°C		n.A.		mWs
Turn-off energy loss per pulse	E_{off}					Tj=25°C Tj=125°C		n.A.		
Input capacitance	C_{ies}	f=1MHz	0	25		Tj=25°C		2360		pF
Output capacitance	C_{oss}							230		
Reverse transfer capacitance	C_{rss}							125		
Gate charge	Q_{Gate}	Vcc=960 V	15		40	Tj=25°C		192		nC
Thermal resistance chip to heatsink per chip	R_{thJH}	Thermal grease thickness≤50um λ = 1 W/mK						0,90		K/W
Polarity Switch Inverse Diode										
Diode forward voltage	V_F				30	Tj=25°C Tj=150°C		1,6	2,2	V
Peak reverse recovery current	I_{RRM}	LF switching only	±15	300	0	Tj=25°C Tj=150°C		tbd		A
Reverse recovery time	t_{rr}					Tj=25°C Tj=150°C		tbd		ns
Reverse recovered charge	Q_{rr}					Tj=25°C Tj=150°C		tbd		nC
Peak rate of fall of recovery current	di(rec)max /dt					Tj=25°C Tj=150°C		tbd		A/µs
Reverse recovered energy	Erec					Tj=25°C Tj=150°C		tbd		mWs
Thermal resistance chip to heatsink per chip	R_{thJH}	Thermal grease thickness≤50um λ = 1 W/mK						2,1		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	
Buck MOSFET										
Static drain to source ON resistance	$R_{ds(on)}$		10		20	Tj=25°C Tj=125°C		0,04	0,045	Ω
Gate threshold voltage	$V_{(GS)th}$	VGS=VDS			0,003	Tj=25°C Tj=125°C	2,1	3	3,9	V
Gate to Source Leakage Current	I_{gss}		20	0		Tj=25°C Tj=125°C			100	nA
Turn On Delay Time	$t_{d(ON)}$	RG=4 Ω	10	400	15	Tj=25°C Tj=125°C		31 30		ns
Rise Time	t_r					Tj=25°C Tj=125°C		6 6		
Turn off delay time	$t_{d(OFF)}$					Tj=25°C Tj=125°C		158 170		
Fall time	t_f					Tj=25°C Tj=125°C		45 12		
Turn-on energy loss per pulse	E_{on}					Tj=25°C Tj=125°C		0,132 0,229		mWs
Turn-off energy loss per pulse	E_{off}					Tj=25°C Tj=125°C		0,026 0,026		
Total gate charge	Q_g		10	400	44	Tj=25°C		150		nC
Gate to source charge	Q_{gs}							34		
Gate to drain charge	Q_{gd}							51		
Input capacitance	C_{iss}	f=1MHz	0	100		Tj=25°C		6800		pF
Output capacitance	C_{oss}							320		
Reverse transfer capacitance	C_{rss}							tbd		
Thermal resistance chip to heatsink per chip	R_{thJH}	Thermal grease thickness≤50um λ = 1 W/mK						0,75		K/W
Buck Diode										
Diode forward voltage	V_F				30	25°C 150°C		2,2 1,7	2,6	V
Peak reverse recovery current	I_{RRM}	Rgon=4 Ω	10	400	30	25°C 150°C		60		A
Reverse recovery time	t_{rr}					25°C 150°C		20		ns
Reverse recovered charge	Q_{rr}					25°C 150°C		650		nC
Peak rate of fall of recovery current	di(rec)max /dt					25°C 150°C		13000		A/µs
Reverse recovery energy	E_{rec}					25°C 150°C		0,2		mWs
Thermal resistance chip to heatsink per chip	R_{thJH}	Thermal grease thickness≤50um λ = 1 W/mK						2		K/W
Thermistor										
Rated resistance	R_{25}	Tol. ±13%				Tj=25°C	19,1	22	24,9	kΩ
	R_{100}	Tol. ±5%				Tj=100°C	1411	1486	1560	Ω
Power dissipation given Epcos-Typ	P					Tj=25°C		210		mW
B-value	$B_{(25/100)}$	Tol. ±3%				Tj=25°C		4000		K

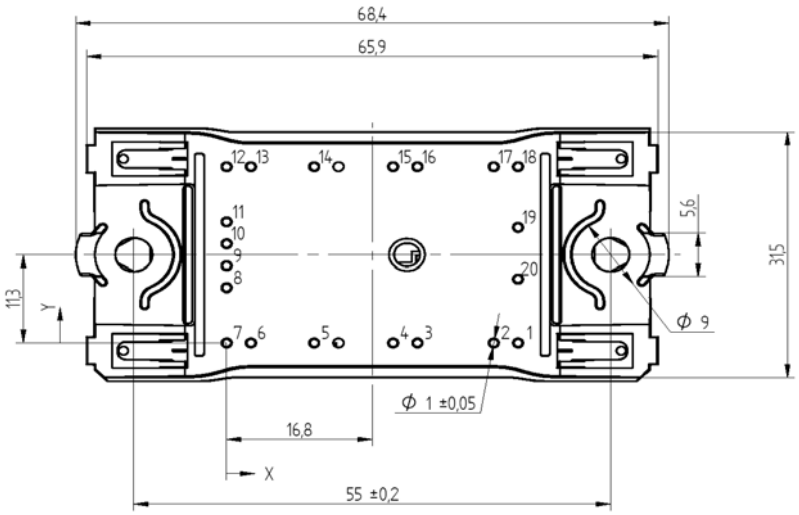
Ordering Code and Marking - Outline - Pinout

Ordering Code & Marking

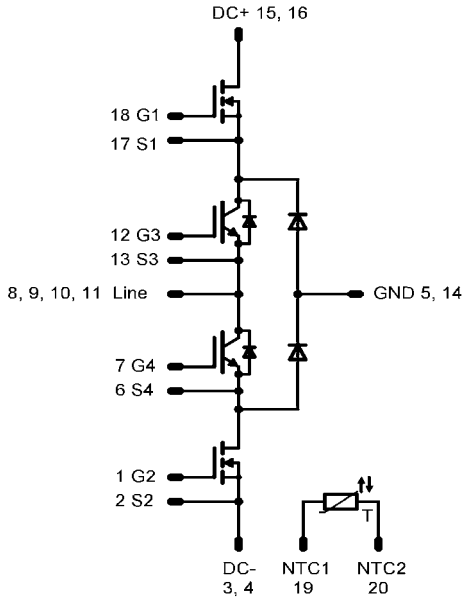
Version	Ordering Code	in DataMatrix as	in packaging barcode as
Standard in flow0 12mm housing	10-FZ06NIA045FH01-P925F10	P925F10	P925F10

Outline

Pin table		
Pin	X	Y
1	33,6	0
2	30,8	0
3	22	0
4	19,2	0
5	10,1	0
6	2,8	0
7	0	0
8	0	7,1
9	0	9,9
10	0	12,7
11	0	15,5
12	0	22,6
13	2,8	22,6
14	10,1	22,6
15	19,2	22,6
16	22	22,6
17	30,8	22,6
18	33,6	22,6
19	33,6	14,8
20	33,6	8,2



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.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data may be published at a later date. Vincotech reserves the right to make changes at any time without notice in order to improve design. The data contained is exclusively intended for technically trained staff.
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