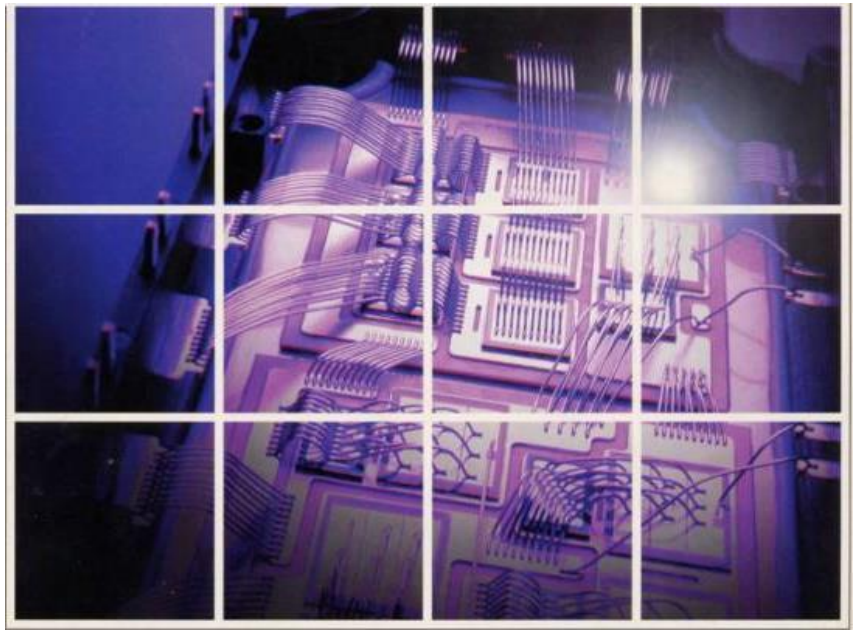
Fuji IGBT Modules for Welding machine



Device Application Technology Dept.
Sales Div.
Electronic Devices Business Gr.

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- Fuji's solutions for Welding machine
- Introduction of Gate Driver Unit (GDU)

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Topology in Welding machine

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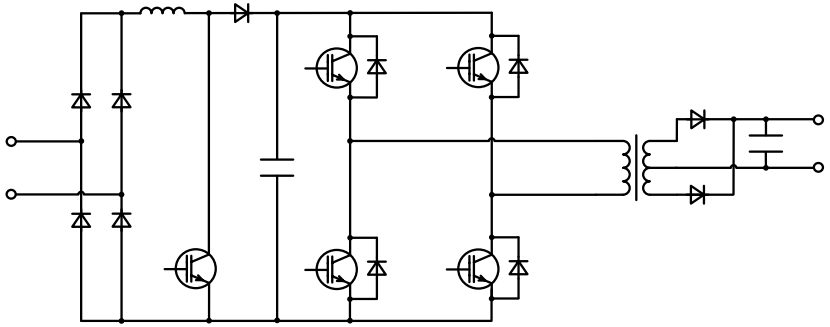
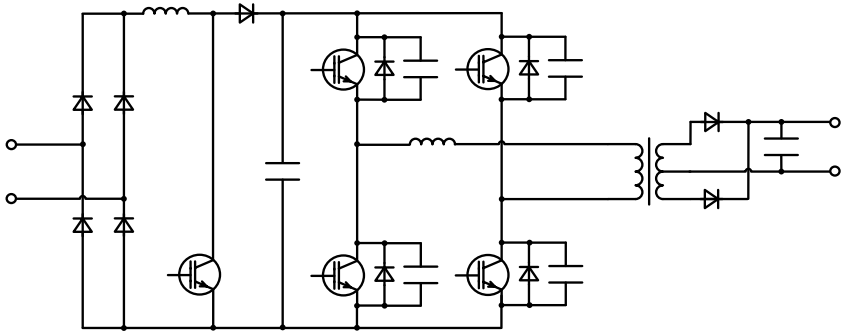
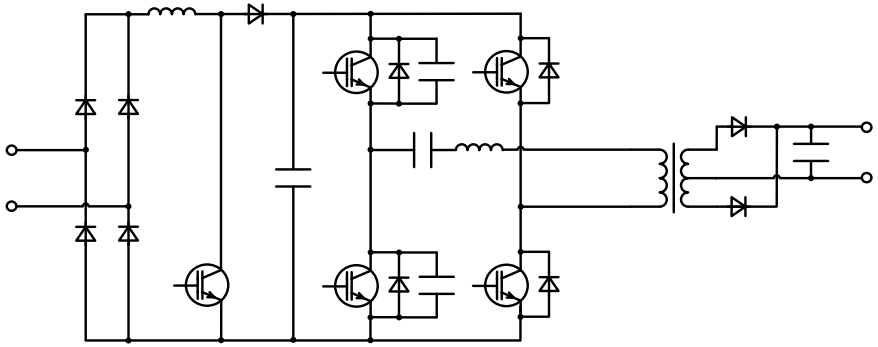
Innovating Energy Technology

	Topology (example)	Feature
Hard switching type		・Duty control method ・IGBT: small turn on and large turn off loss ・FWD: small reverse recovery loss
Soft switching type (ZVS)		・IGBT: zero voltage switching at turn on, and hard switching at turn off. ・FWD: small reverse recovery loss
Soft switching Type (ZVZCS)		・IGBT: zero voltage zero current switching at turn on, and hard switching at turn off. ・FWD: small reverse recovery loss

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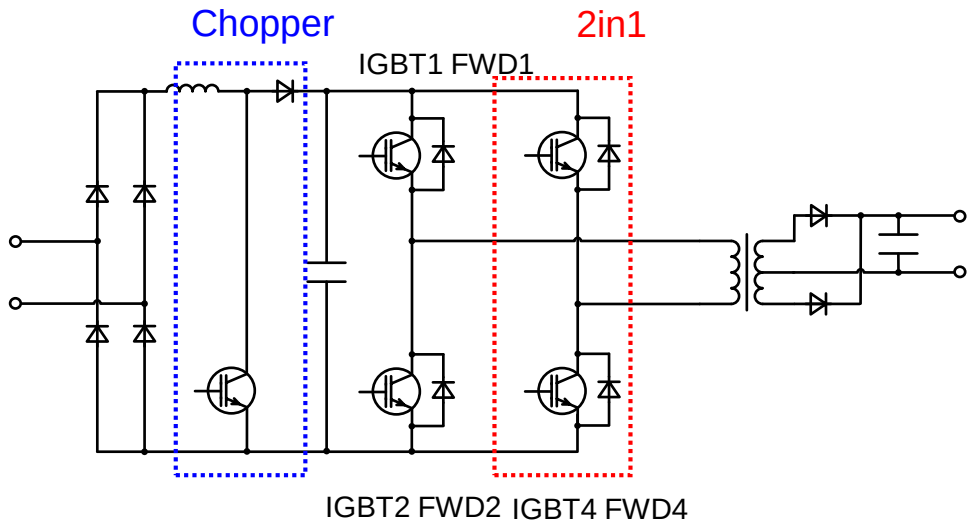
Topology in Welding machine

■Topology (Hard switching type)



・Chopper Module:

1MBI200HH-120L-50
1MBI300HH-120L-50
1MBI400HH-120L-50

・H bridge (2in1)

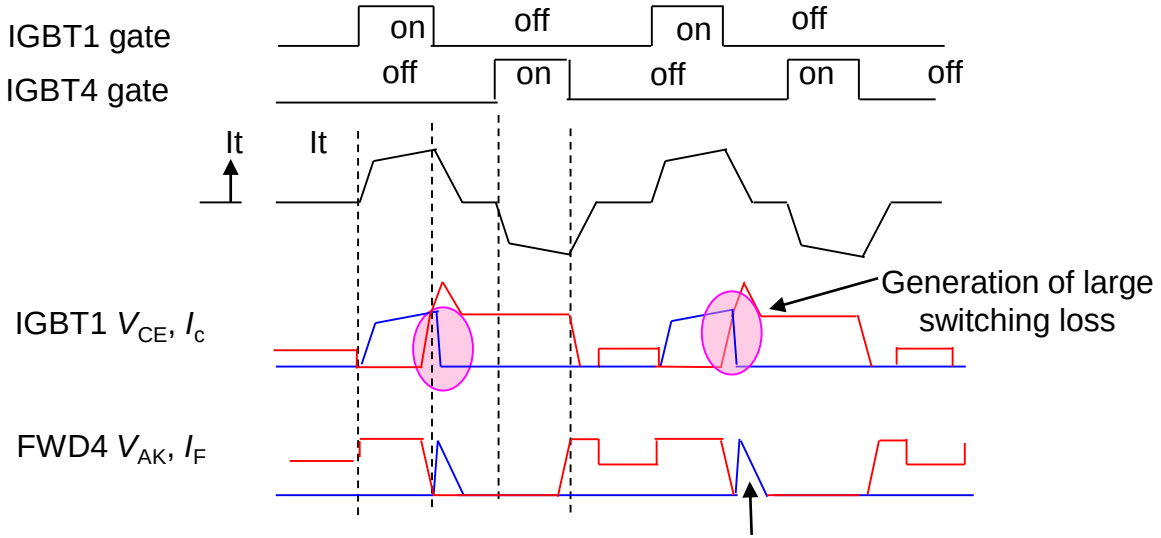
2MBI100HB-120-50
2MBI200HH-120-50
2MBI300HH-120-50

■Feature:

・Duty control method

・IGBT: small turn on and large turn off loss (high speed IGBT is necessary.)

・FWD: small reverse recovery loss (high speed diode in 2in1 module is not necessary.)



FWD current is small and it is only leakage inductance energy.

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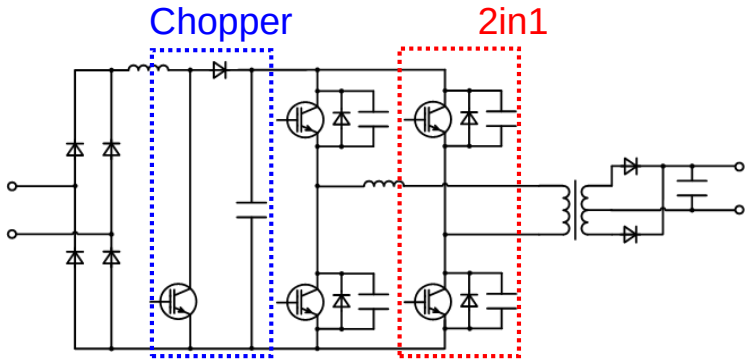
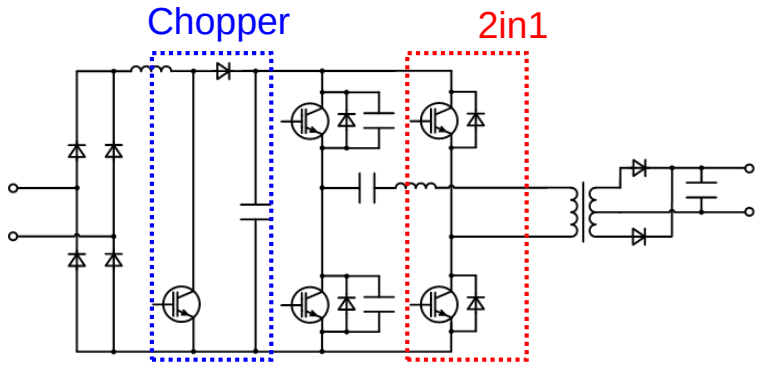
Topology in Welding machine

■Topology (Soft switching type)



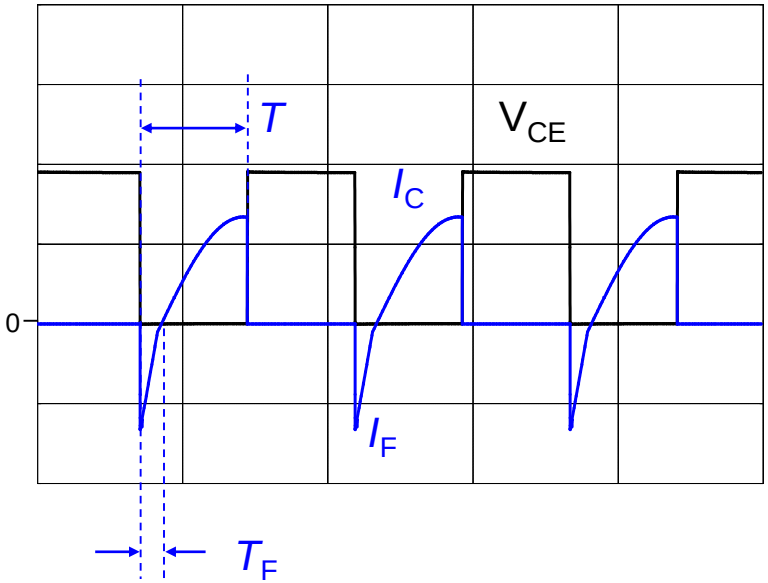


・Chopper Module:

1MBI200HH-120L-50
1MBI300HH-120L-50
1MBI400HH-120L-50

・H bridge (2in1)

2MBI100HB-120-50
2MBI200HH-120-50
2MBI300HH-120-50



■Feature:

・IGBT: zero voltage switching at turn on, and hard switching at turn off. (high speed IGBT is necessary.)

・FWD: small reverse recovery loss (high speed diode in 2in1 module is not necessary.)

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Fuji Discrete IGBTs for Welding machine – XS series

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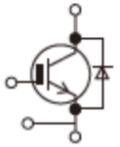
	Device type※1	Current	Voltage	Package	Equivalent circuit
XS series	FGW**XS65C	30A 40A 50A 75A	650V	TO-247-P2	
	FGW**XS65D	50A 75A	650V		
	FGW**XS120C	40A 75A※2	1200V		
	FGZ75XS65C	75A	650V	TO-247-4-P2	

※1 "**" is rated current.　　※2 Under development

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Fuji IGBT modules for Welding machine – 2in1, Chopper

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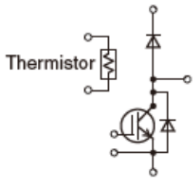
Innovating Energy Technology

	Device type※1	Current	Voltage	Package	Equivalent circuit
2in1	2MBI100HB-120-50	100A	1200V	M233:92 x 45 x 30	
	2MBI**HH-120-50	150A 200A	1200V	M249:108 x 62 x 30	
	2MBI**HJ-120-50	100A 150A 200A 300A	1200V	M276:108 x 62 x 30.5	

※1 “**” is rated current.

	Device type※1	Current	Voltage	Package	Equivalent circuit
Chopper	1MBI**HH-120L-50	200A 300A 400A	1200V	M249:108 x 62 x 30	

※1 “**” is rated current.

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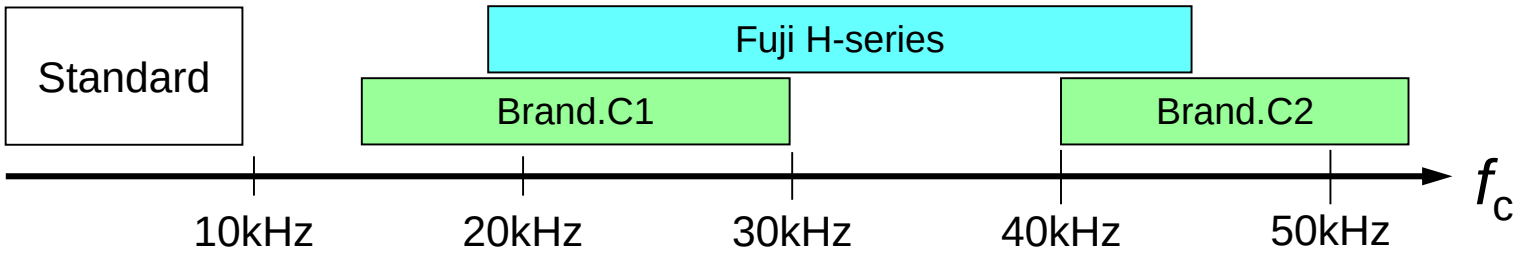
● High performance for high carrier frequency application

◆Optimized design for fc = 20 ~ 50kHz

Lower switching loss, lower surge voltage

◆Low thermal impedance package

New Si_3N_4-DCB substrate, RoHS package



Carrier frequency: f_c

● 2in1 module and Chopper module lineup

◆ 2in1 module: 1200V / 100A ~ 200A

◆ Chopper module: 1200V / 200A ~ 400A with NTC

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Fuji IGBT modules for Welding machine

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Innovating Energy Technology

RoHS, SiN-DBC

1/2 half-bridge - 2in1 module

※only for soft turn on

High-speed IGBT + Standard, small FWD

2MBI100HB-120-50 (1200V/100A Pkg: M233)

2MBI150HH-120-50 (1200V/150A Pkg: M249)

2MBI200HH-120-50 (1200V/200A Pkg: M249)

M233
Size:92 x 45 x 30 mm

PFC – Chopper module + NTC

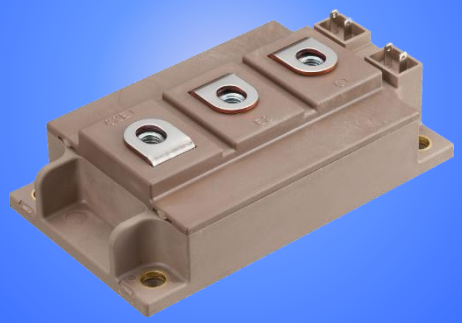
High-speed IGBT + High speed diode + NTC

1MBI200HH-120L-50 (1200V/200A Pkg: M249)

1MBI300HH-120L-50 (1200V/300A Pkg: M249)

1MBI400HH-120L-50 (1200V/400A Pkg: M249)

M249
Size:108 x 62 x 30 mm



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Introduction of GDU for Welding machine

CONCEPT
A Power Integrations Company

http://igbt-driver.com/

I_C rating	IGBT part No.	Driver part No.
100A	2MBI100HB-120-50	2SP0115T2Ax
150A	2MBI150HH-120-50	
200A	2MBI200HH-120-50	
200A	1MBI200HH-120-50	
300A	1MBI300HH-120-50	
400A	1MBI400HH-120-50	

IDC イサルヤ電子株式会社

http://www.idc-com.co.jp/

I_C rating	IGBT part No.	Driver part No.
100A	2MBI100HB-120-50	VLA546**
150A	2MBI150HH-120-50	
200A	2MBI200HH-120-50	
200A	1MBI200HH-120-50	
300A	1MBI300HH-120-50	
400A	1MBI400HH-120-50	VLA500K

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