Solution Guide for FUJI Electric DualXT

Supported by FUJI Electric

SUSTAINABLE DEVELOPMENT GOALS

TAMURA
Your One and Only Company

TAM-GDM-00025

Issued on 1st Apr '22 Unit division HQ Japan

Rev A

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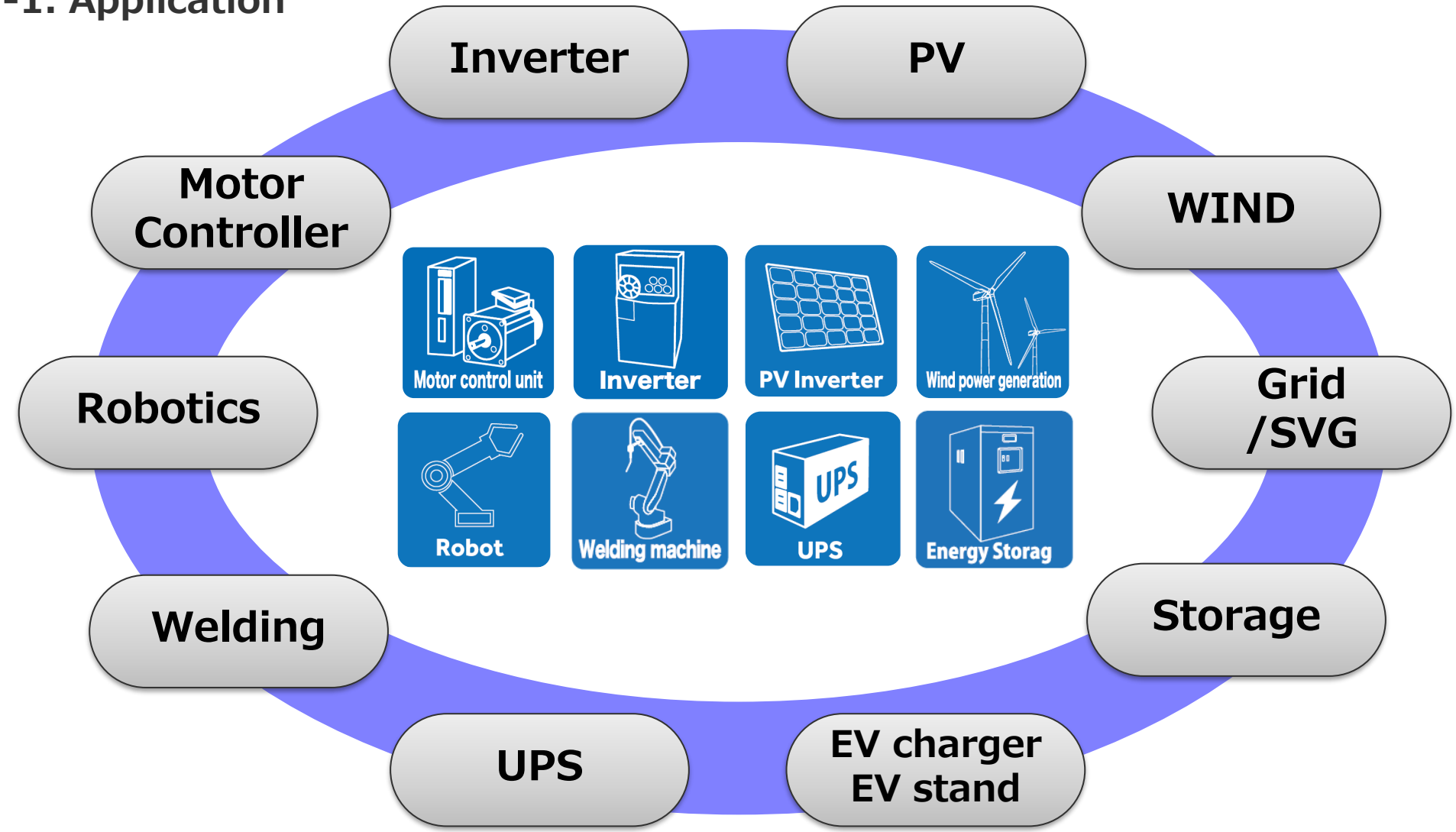
1. Solution Guide for FUJI Electric DualXT

1-1. Application



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1. Solution Guide for FUJI Electric DualXT

1-2. Tamura Gate Driver 7 key points

Rev A

- Low stray capacity
- Soft turn off + Active Clamp
- High-speed response
- High-accuracy
- High Power DC-DC converter
- Multi parallel solution
- Wider input voltage

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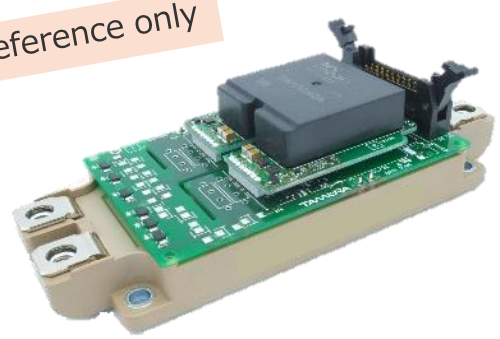
1. Solution Guide for FUJI Electric DualXT

1-3 Product features

Reference only

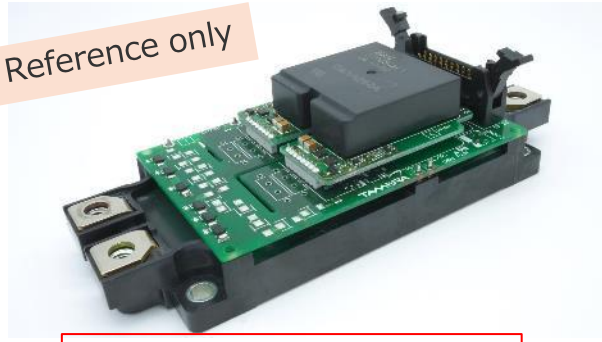
Infineon Technologies
/ EconoDUAL™

Reference only



Fuji Electric
/ DualXT

Reference only



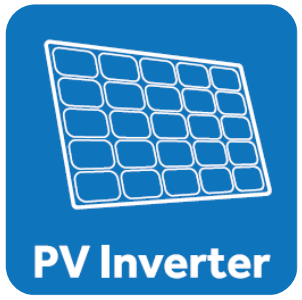
Mitsubishi Electric
/ NX type

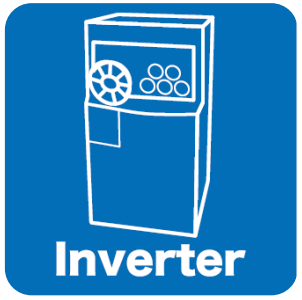
4W per channel

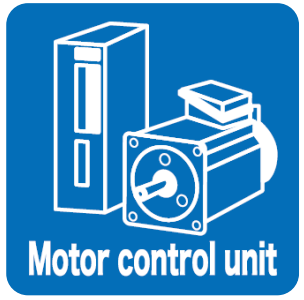
Frequency 100kHz (Max)

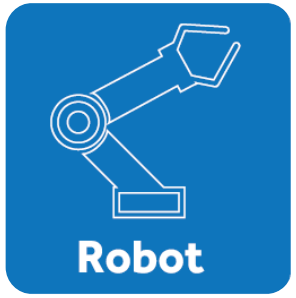
Peak Current 43A

Suitable for various applications !









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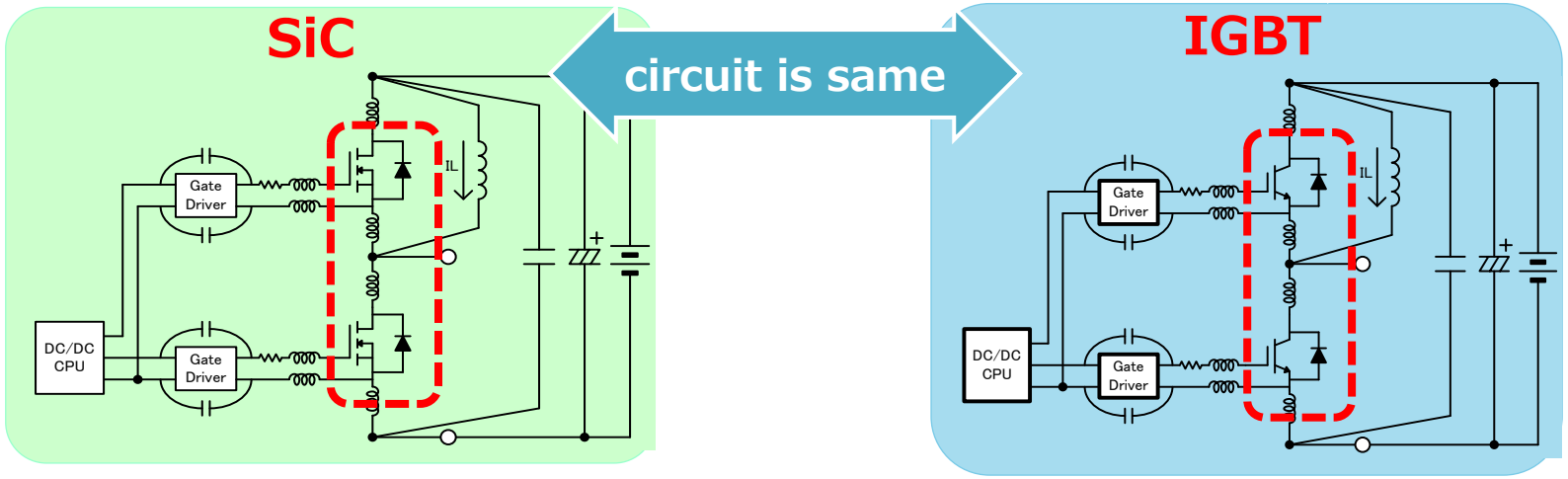
1. Solution Guide for FUJI Electric DualXT

1-4. Gate Driver differences (SiC and IGBT)

Item	Condition (SiC-MOSFET)	Condition (IGBT)
Gate drive circuit	2 (Half bridge)	2 (Half bridge)
Gate voltage (H)/(L)	18V/-5V	15V/-10V
Protection function	DESAT, Miller clamp	DESAT, STO,ACL
Operating frequency	100kHz (MAX)	20kHz (MAX)
Stray capacity	12pF	30-40pF
Response	85nsec (TYP)	350nsec (TYP)

Cover with all items!



If the SiC-MOSFET can be driven, the IGBT can be driven easily!

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1. Solution Guide for FUJI Electric DualXT

1-5. Performance comparison of other companies

Rev A

Item	TAMURA	Company A
Power module	SiC-MOSFET/IGBT	IGBT
Input Voltage	13-28V	15V
Output Voltage	15V/-10V	15V/-10V
Output power ○	4W	1W
Frequency ○	100kHz (Max)	20kHz (Max)
Output Perk current ○	43A	15A

Large drive capacity makes it ideal for large capacity IGBTs!

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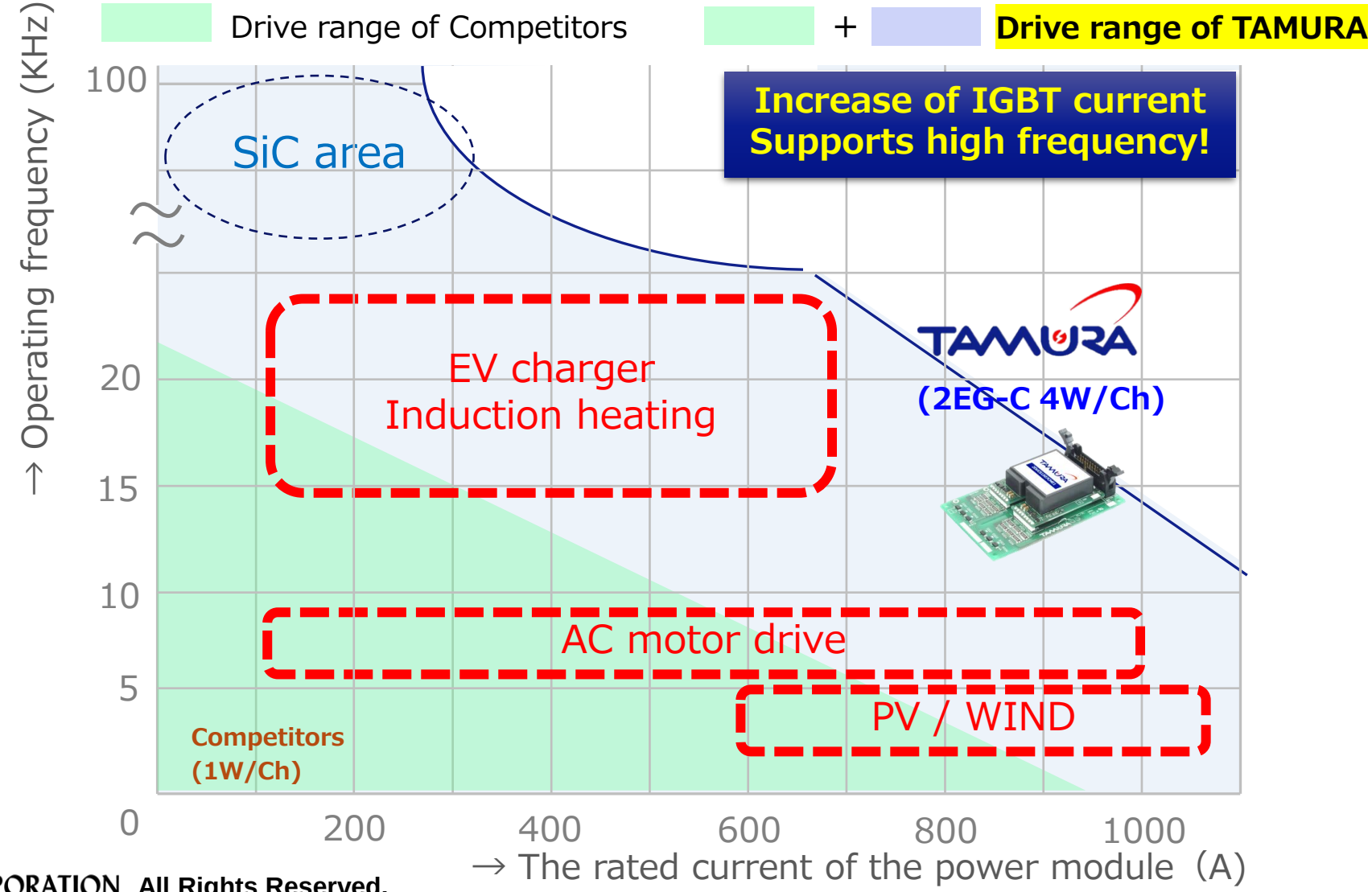
1. Solution Guide for FUJI Electric DualXT

1-6 High power of DC-DC converter (Performance comparison)

Switching frequency range (image)



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1. Solution Guide for FUJI Electric DualXT

1-7 Feature of Tamura gate driver

IGBT: 2MBI1000XRNE120-50 (FUJI Electric)

2EG01XCDN11N Switching Test Data

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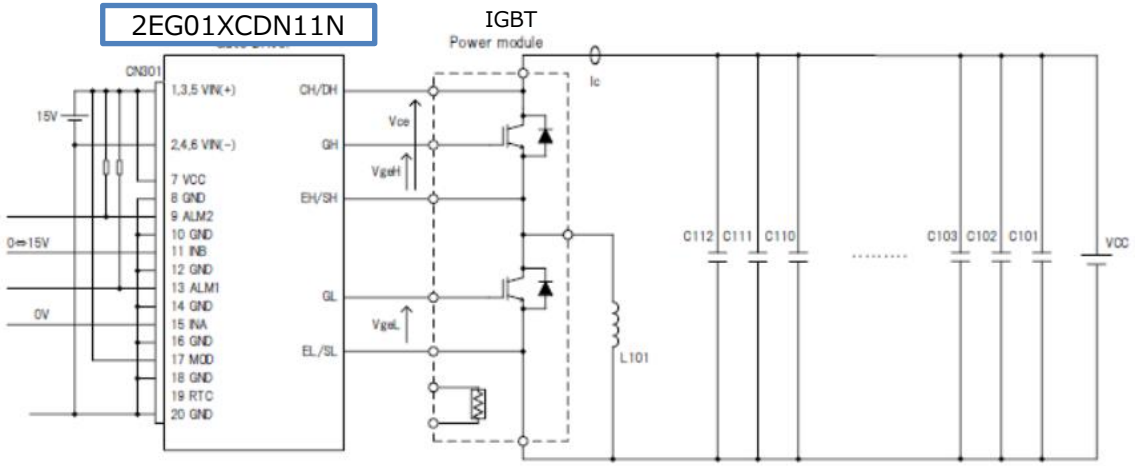
1. Solution Guide for FUJI Electric DualXT

Rev A

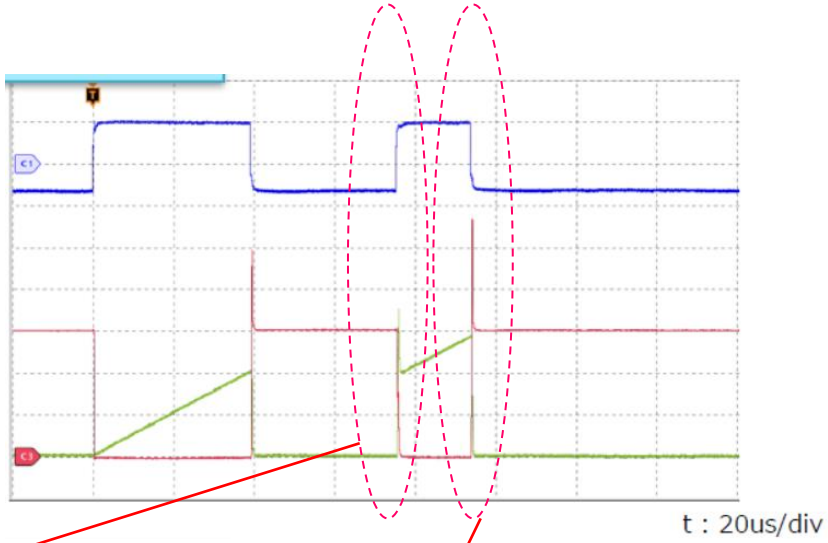
1-7 Single drive solution /2 Pulse test

DC Link : 600V,　Ron=Roff : 0.47Ω,　Upper arm,　Tj=150℃

2EG01XCDN11N

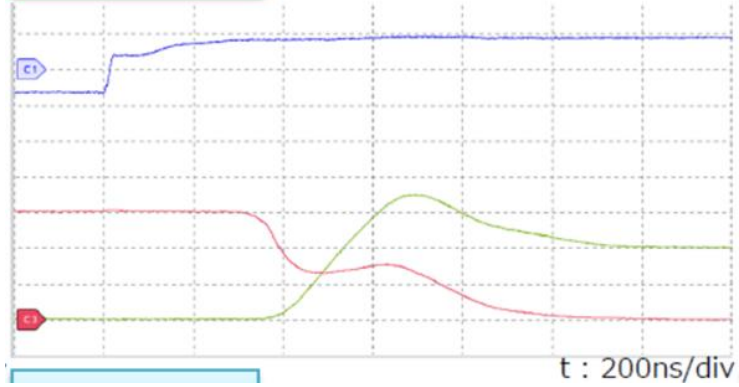


IGBT : 2MBI1000XRNE120-50(Fuji Elec)
C101-112 :　560uF(Ls : 60nH)
L101:　22uH



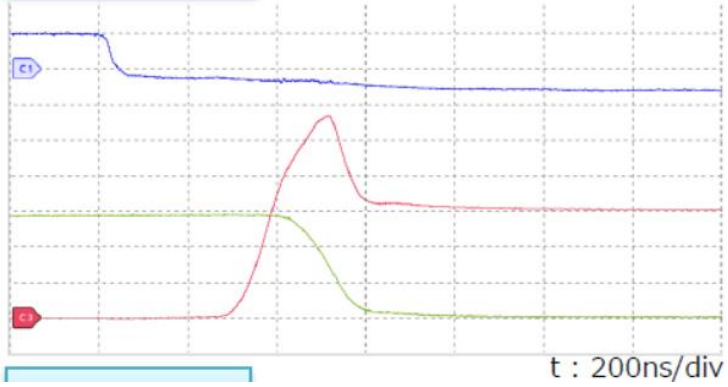
Turn ON / Ic =1000A

Vce,Ic,VgeH



Turn OFF / Ic =1400A

Vce,Ic,VgeH



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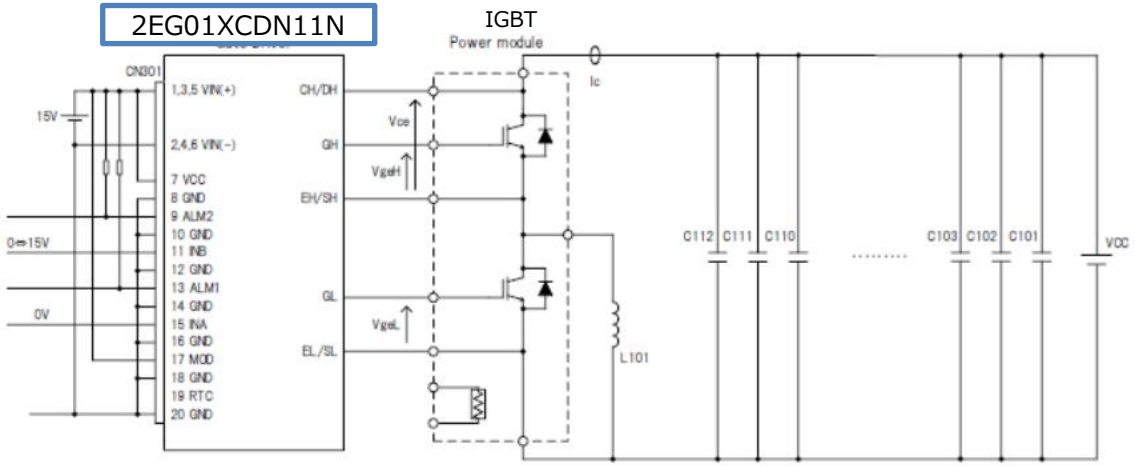
1. Solution Guide for FUJI Electric DualXT

Rev A

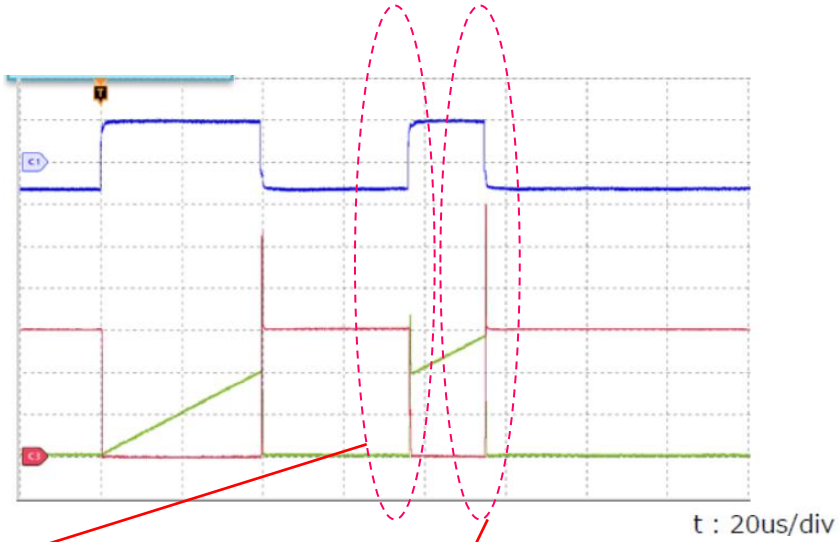
1-7 Single drive solution /2 Pulse test

DC Link : 600V, Ron=Roff : 0.47Ω, Upper arm, Tj=25℃

2EG01XCDN11N

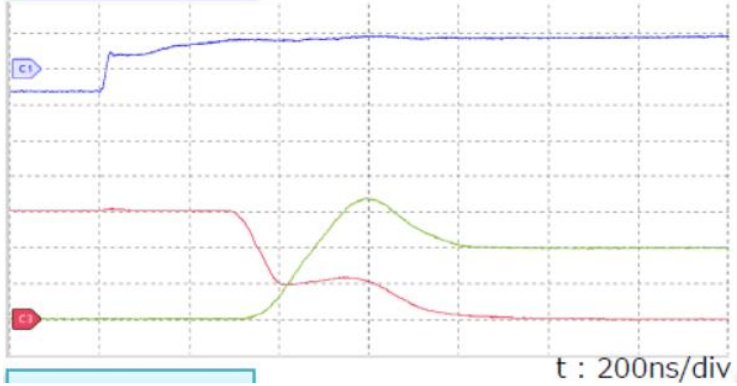


IGBT : 2MBI1000XRNE120-50(Fuji Elec)
C101-112 : 560uF(Ls : 60nH)
L101: 22uH



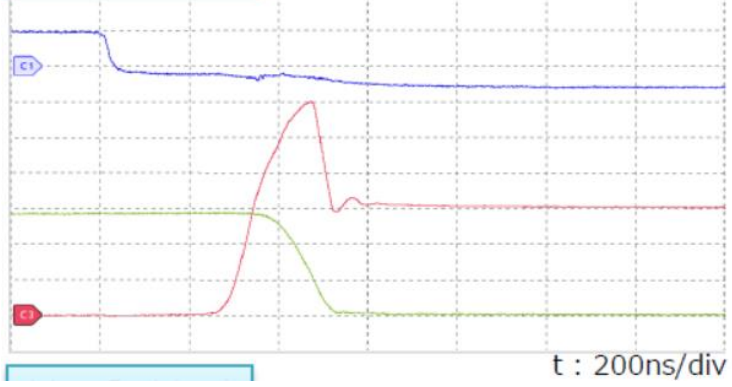
Turn ON / Ic =1000A

Vce,Ic,VgeH



Turn OFF / Ic =1400A

Vce,Ic,VgeH



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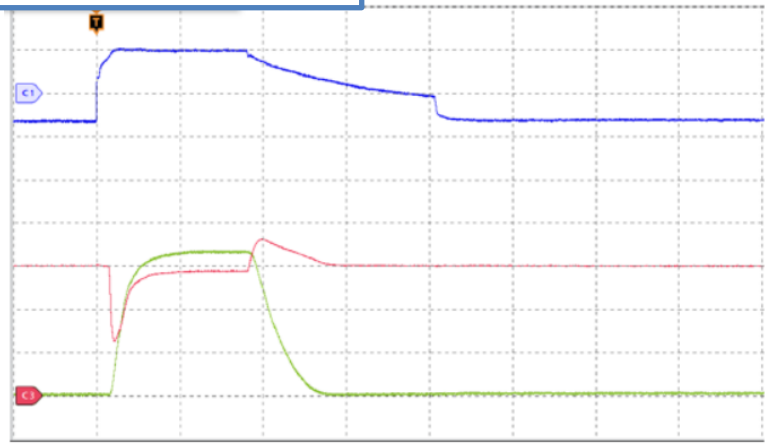
1. Solution Guide for FUJI Electric DualXT

1-7 Single drive solution/Arm short circuit

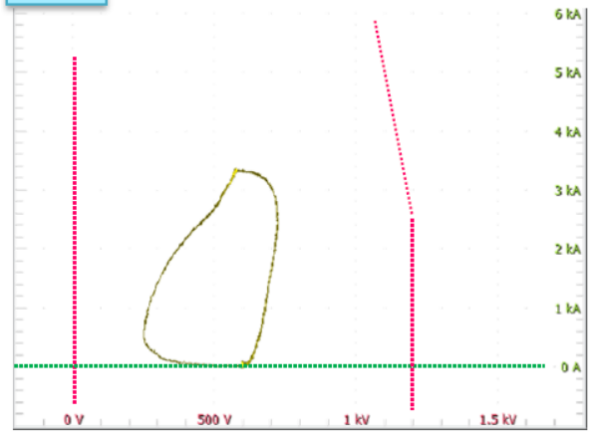
DC Link : 600V,　Ron=Roff : 0.47Ω,　Upper arm,　Tj=150℃

Load inductance : Arm short

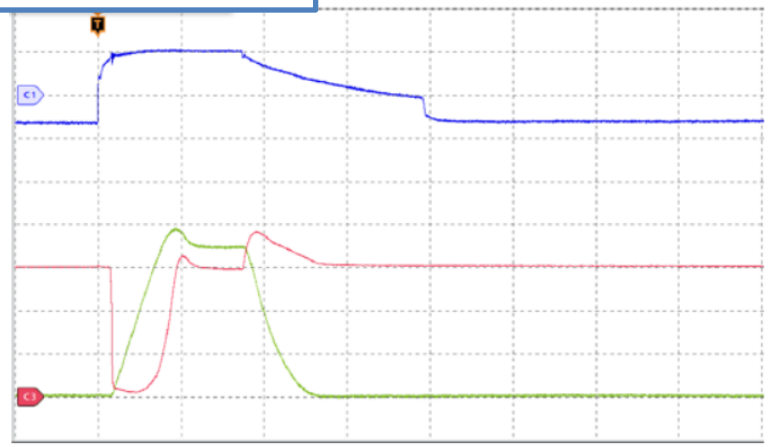


t : 2us/div

SOA

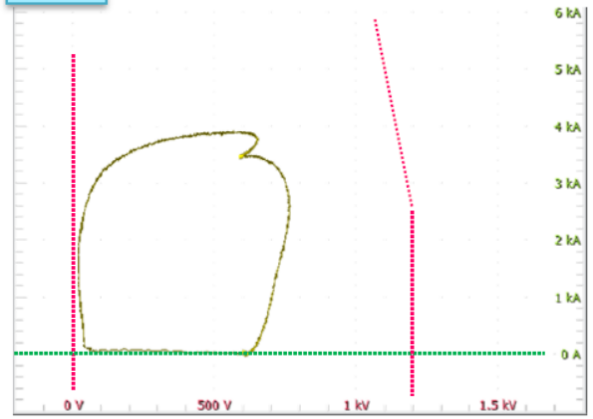


Load inductance : 170nH



t : 2us/div

SOA



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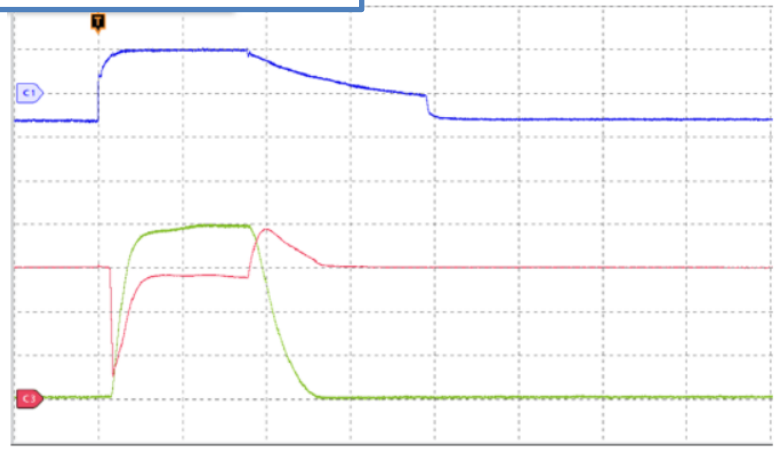
1. Solution Guide for FUJI Electric DualXT

1-7 Single drive solution/Arm short circuit

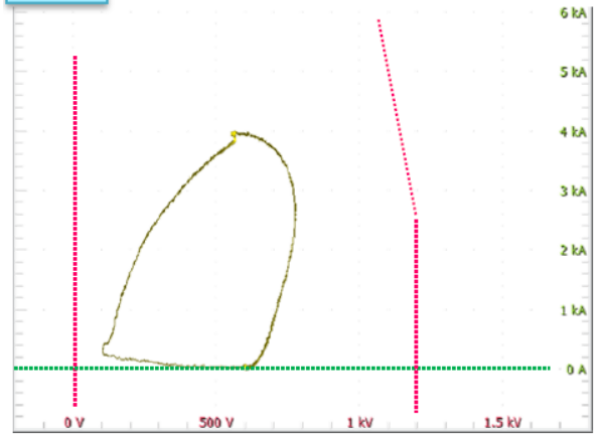
DC Link : 600V,　Ron=Roff : 0.47Ω,　Upper arm,　Tj=25℃

Load inductance : Arm short

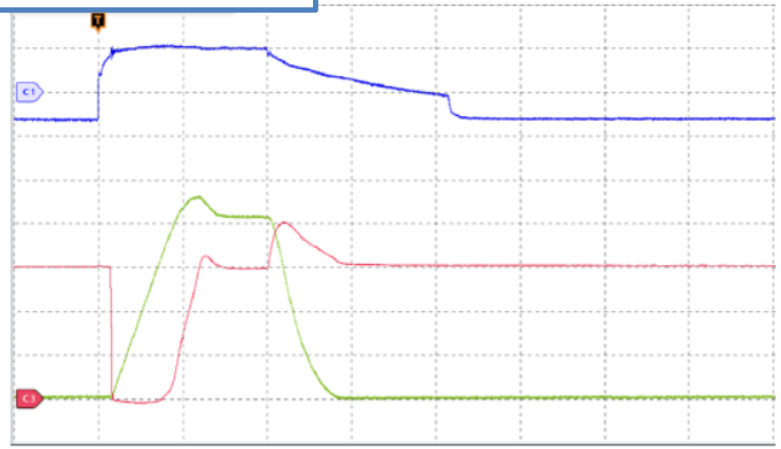


t : 2us/div

SOA

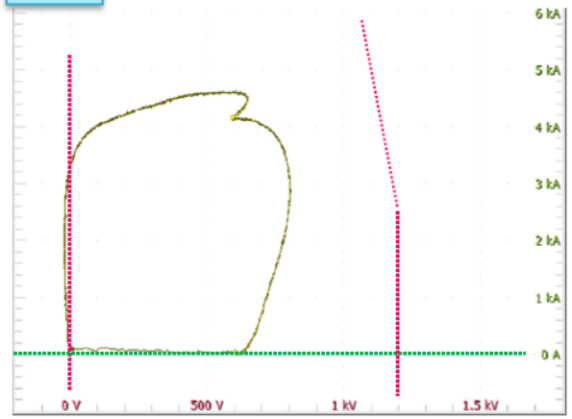


Load inductance : 170nH



t : 2us/div

SOA



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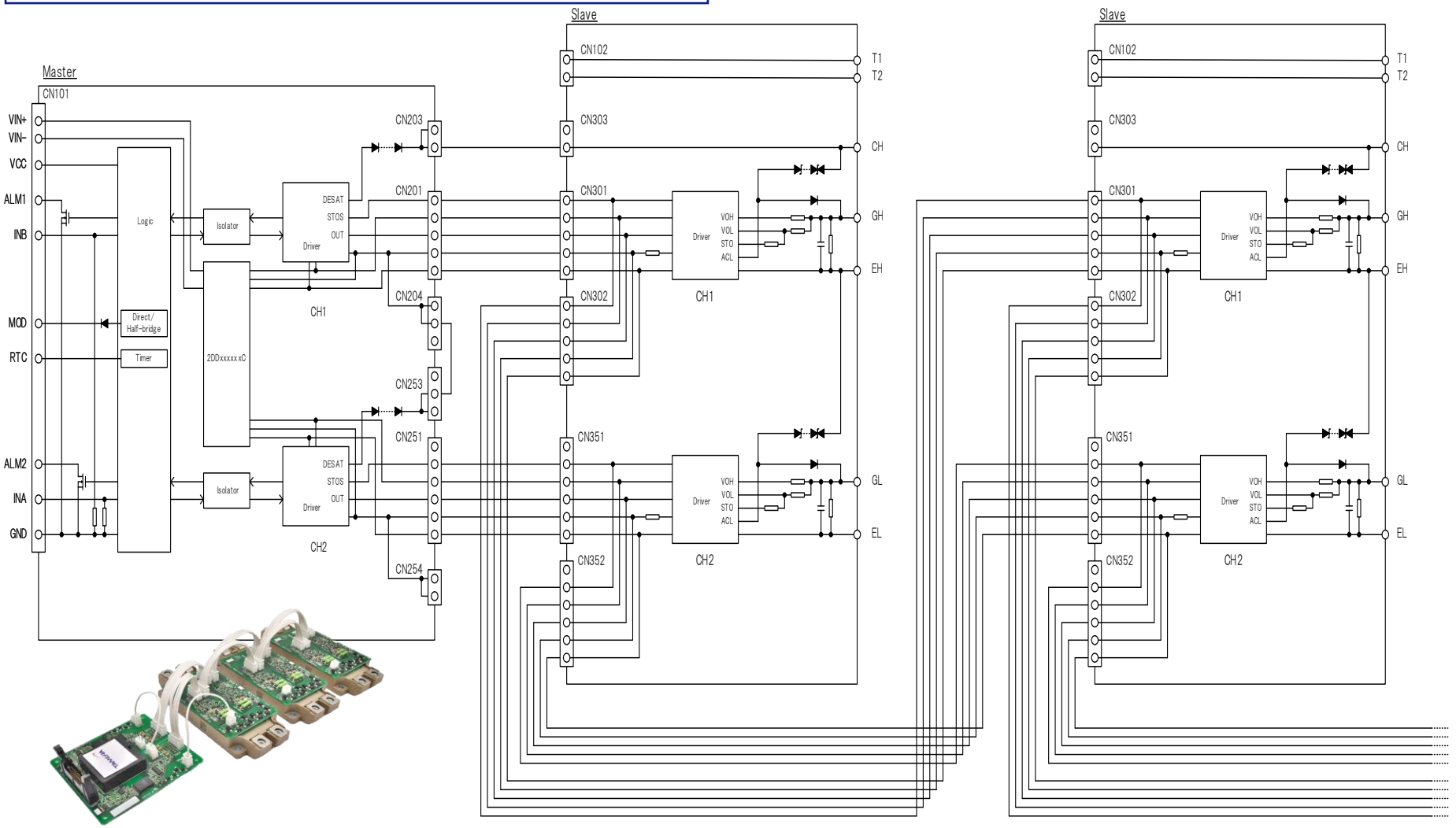
1. Solution Guide for FUJI Electric DualXT

1-8 Application example (parallel drive configuration)

Connection diagram in parallel drive

Please contact us if you are interested !



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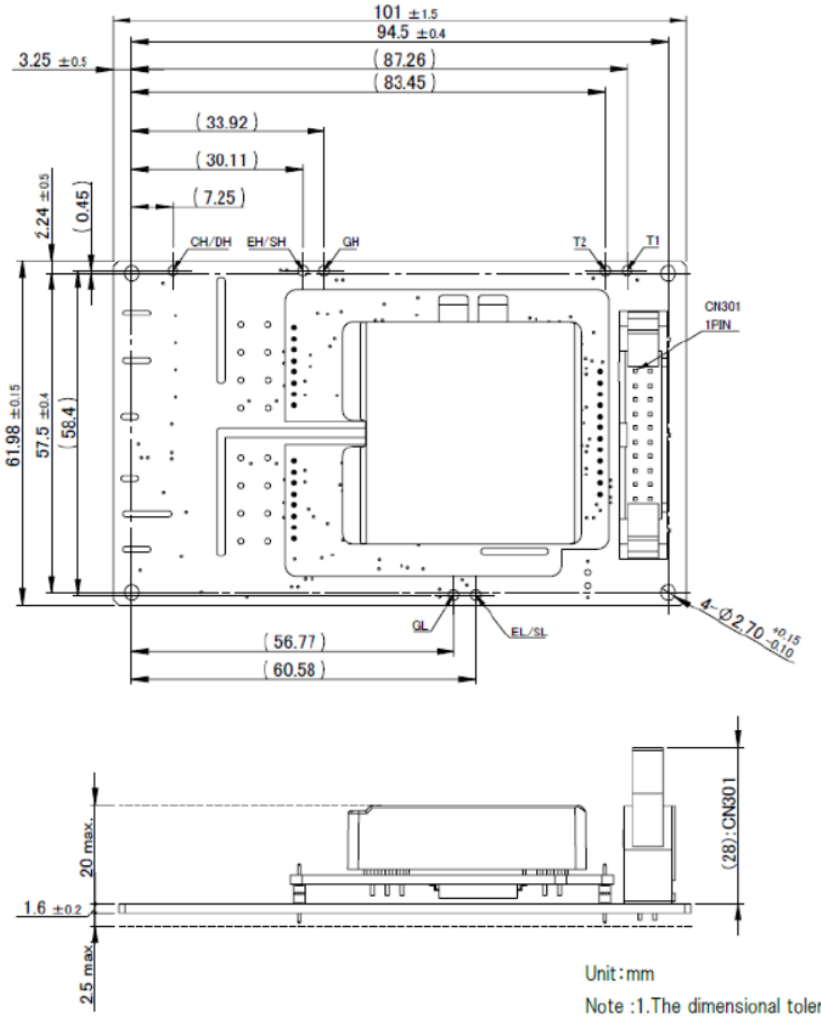
1. Solution Guide for FUJI Electric DualXT

1-9 Products appearance and line-up

Rev A



Unit:mm

Note :1.The dimensional tolerance without directions is ± 0.5mm.

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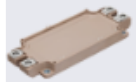
1. Solution Guide for FUJI Electric DualXT

1-9. Product line-up for FUJI Electric DualXT 2in1 Type

Package	Output power (Ref.)	Ic	Part No	TAMURA Driver 2EG-C / D		2CG-B/2CG-D	2DD
			Vce = 1200V				
	30kW	225	2MBI225XNA120-50		2EG01XCCN11N *1 2EG01XCDN11N *1 2EG??zyxN11N - ?? *2	2CG010BBC11N (+15/-10V) Soft turn off ---------- 2CG010DBC11N (+15/-10V) Soft turn off +Active clamp 	2DD151008C (+15V/-10V) 
	50kW	300	2MBI300XNA120-50				
			2MSI300VAN-120-53				
			2MSI300VWAN-120-53				
	100kW	450	2MBI450XNA120-50				
			2MSI450VAN-120-53				
	125kW	600	2MBI600XNG120-50				
			2MBI600XNE120-50				
			2MSI600VAN-120-53				
	150kW	800	2MBI800XNE120-50				
		1000	2MBI1000XRNE120-50				
			Vce = 1700V				
	TBC	225	2MBI225XNA170-50		2EG01XCCN11N *1 2EG01XCDN11N *1 2EG??zyxN11N - ?? *2	2CG010BBC11N (+15/-10V) Soft turn off ---------- 2CG010DBC11N (+15/-10V) Soft turn off +Active clamp 	2DD151008C (+15V/-10V) 
		300	2MBI300XNA170-50				
		450	2MBI450XNA170-50				
		550	2MSI550VAN-170-53				
		600	2MBI600XNG170-50				
			2MBI600XNE170-50				
		800	2MBI800XRNE170-50				

*1 Catalog products. Please confirm stock.
*2 Not in stock due to optimization required. Please contact us.

x: Signal input voltage selectable: "C" => 3.3~15V / "D" => 15V
y: Protection circuits: "C"=>Soft turn off / "D"=>Soft turn off + Active clamp
z: Gate resistors: "X" => Not mounted / "0" mounted
??: Semi-optimized code

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2) Introduction of One Tamura (Wind Power converters)

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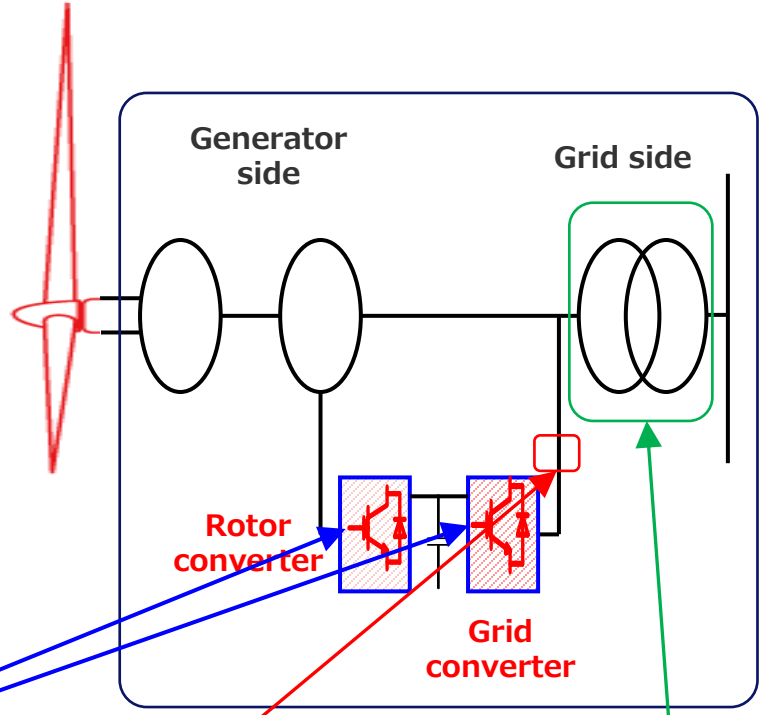
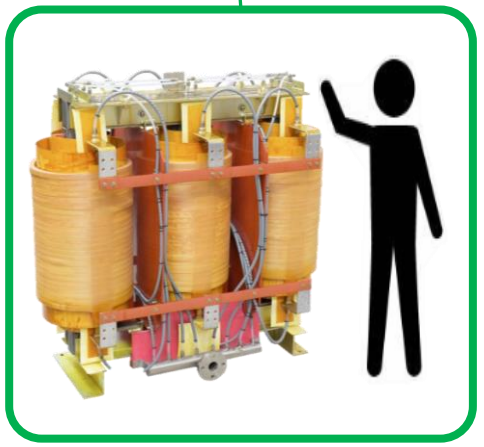


Gate Driver Unit

Current sensor



Reactor

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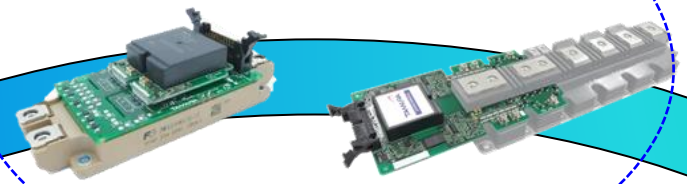
2) Introduction of One Tamura (General application)

TAMURA
Rev A

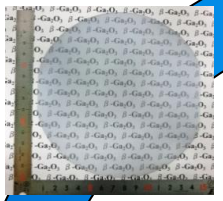
Power electronics technology and main products

Gate driver
Circuit technology

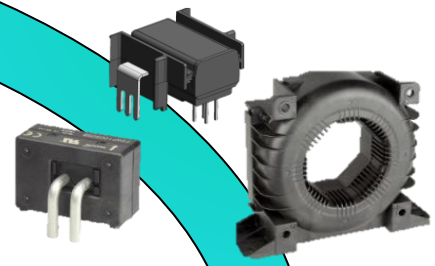


Gate Driver Unit

Device technology
Novel Crystal Technology, Inc.
Ga_2O_3

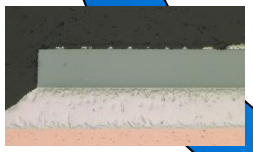


Module technology
Current sensor



Power electronics technology and main products

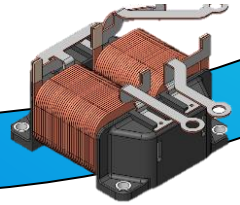
Soldering technology



Electric Chemicals
Soldering material
Die attach material
TIM material

Reflow soldering system

Automotive reactor



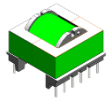
Reactor for PF
(2 in 1)

Passive components

Reactor
Trans
Coil

Large reactor/ transformer

Toroidal coil



SW-Trans

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Appendix) Information & Contact

Rev A

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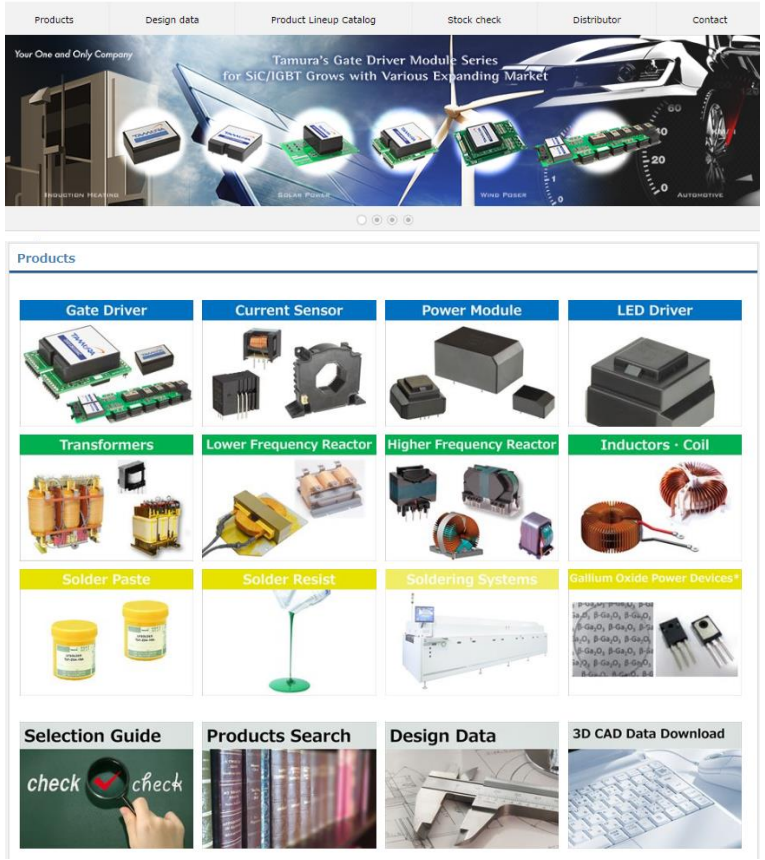

WEB

Tamura Gate Driver

- Let's know more TAMURA products
  - Special movie
  - Presentation of conference
- Easy Get the essential
  - Matching data with power module
  - 3D data to design!
- One-click to purchase
  - from the check stock!

Feel free to inquire! ↓

https://www.tamuracorp.com/electronics/en/contact/

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