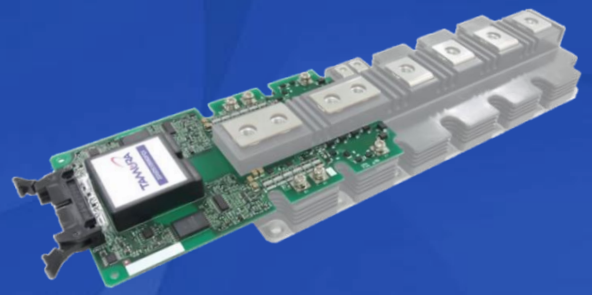
Solution Guide for FUJI Electric PrimePACK™ series

PrimePACK™ 2in1



PrimePACK™3+

PrimePACK™ 4in1

SUSTAINABLE DEVELOPMENT GOALS

Supported by FUJI Electric

TAMURA
Your One and Only Company

TAM-GDM-00024

Issued on 1st Apr '22 Unit division HQ Japan

Rev B

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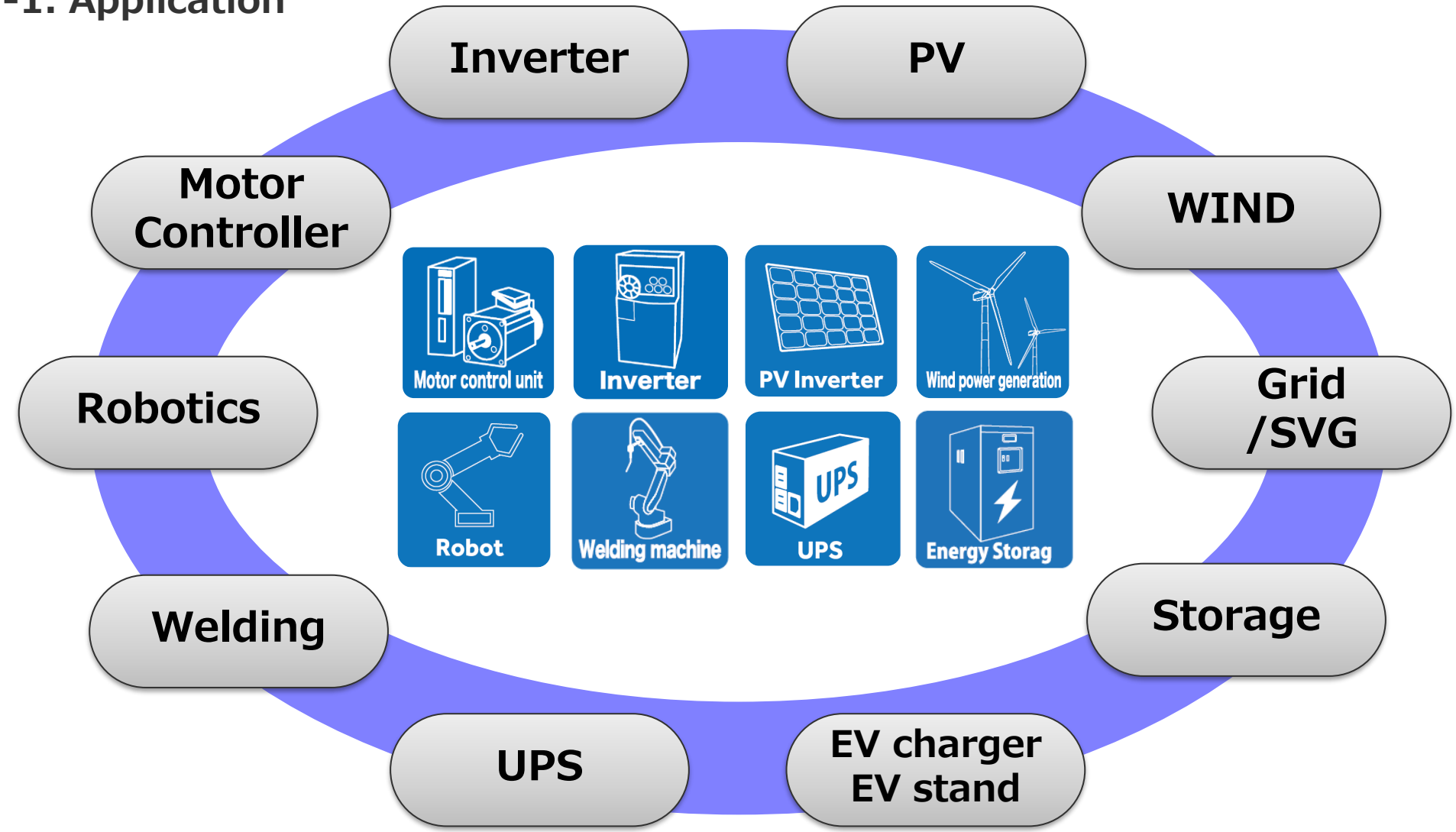
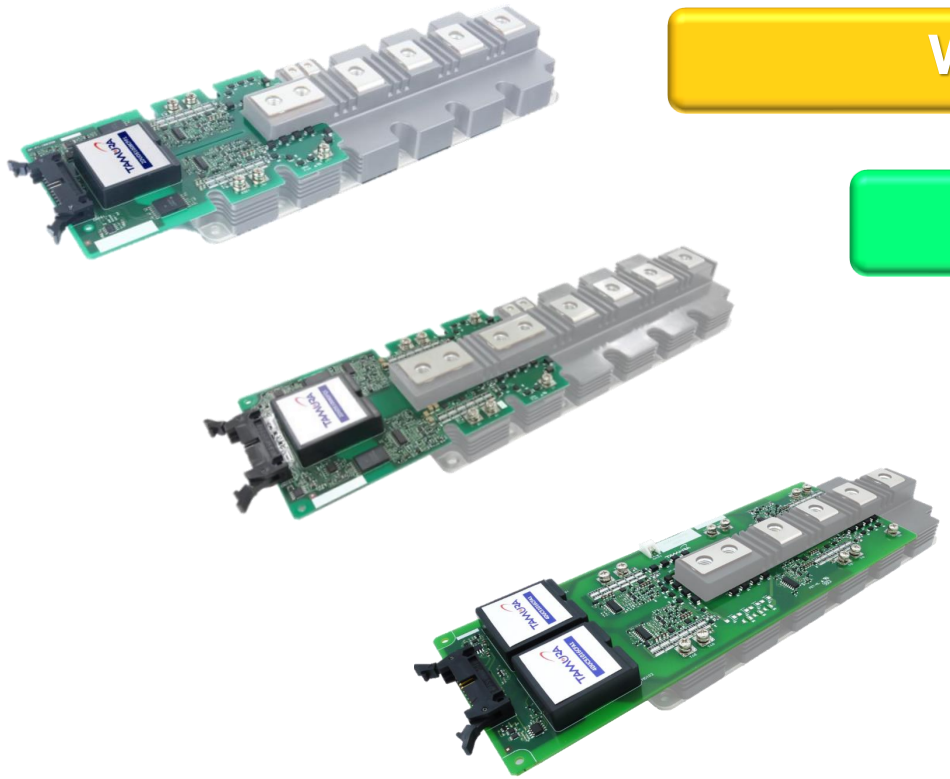
1. Solution Guide for FUJI Electric PrimePACK™

1-1. Application



1. Solution Guide for FUJI Electric PrimePACK™

1-2. Tamura Gate Driver 7 key points



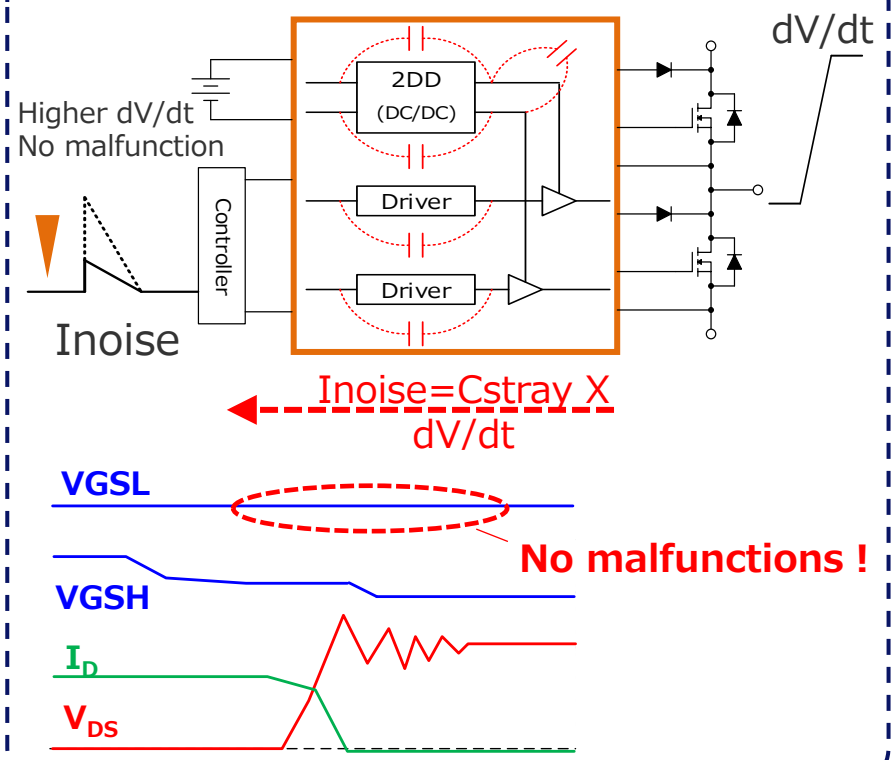
- Low stray capacity
- Soft turn off + Active Clamp
- Wider input voltage
- High-speed response
- High-accuracy
- High Power DC-DC converter
- Multi parallel solution

1. Solution Guide for FUJI Electric PrimePACK™

1-3. Each protection function to ensure reliability

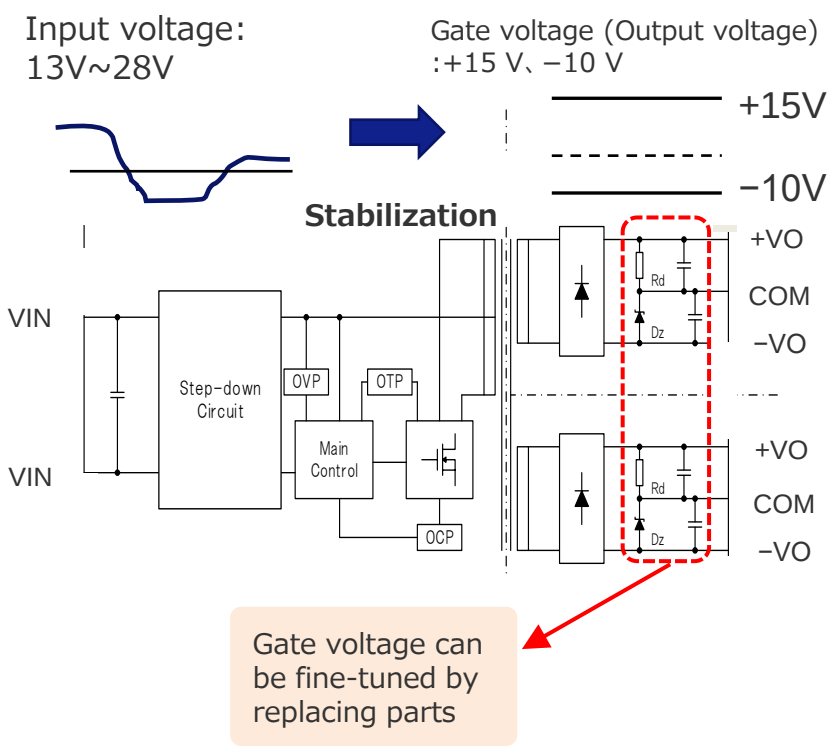
Low stray capacity

Reduction of stray capacitance



Wider input voltage

Gate voltage stabilization

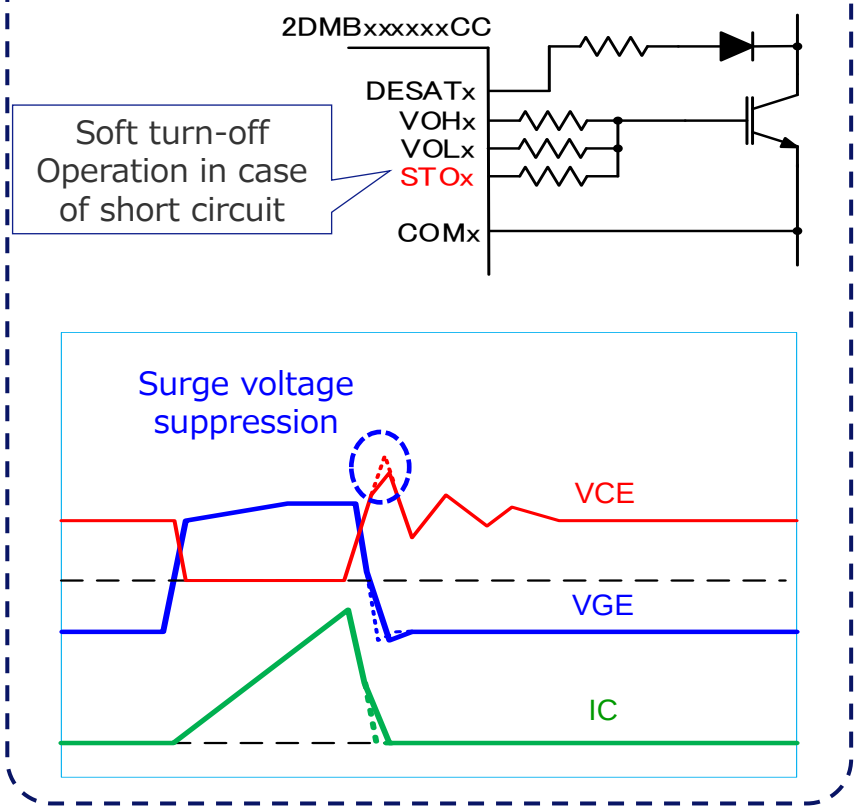


1. Solution Guide for FUJI Electric PrimePACK™

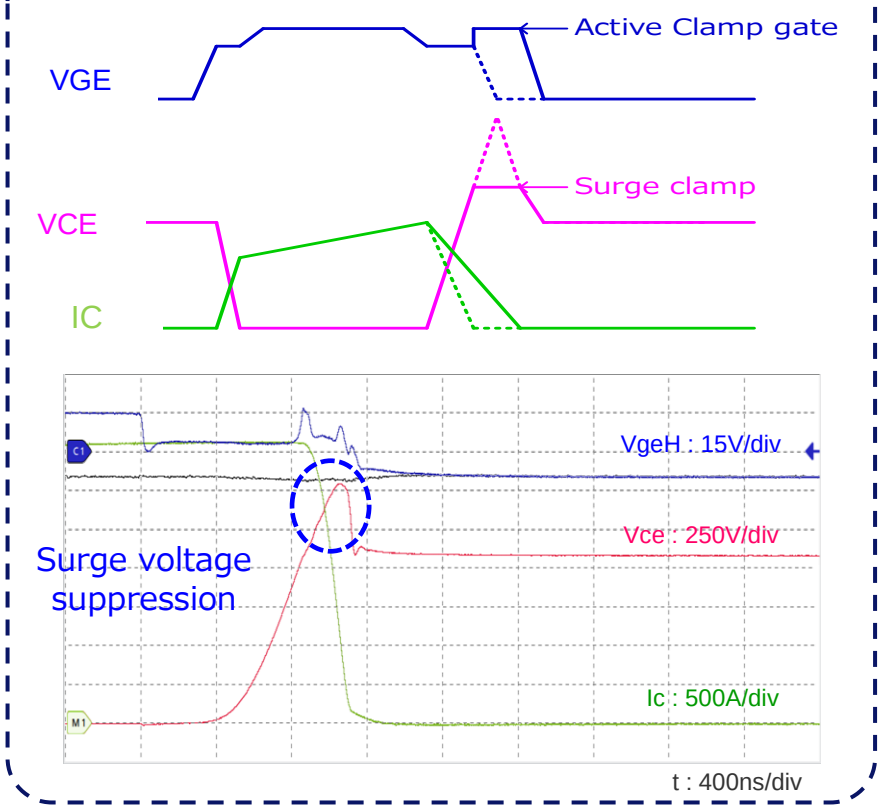
1-3. Each protection function to ensure reliability

Soft turn off + Active Clamp

Soft turn-off



Active clamp



1. Solution Guide for FUJI Electric PrimePACK™

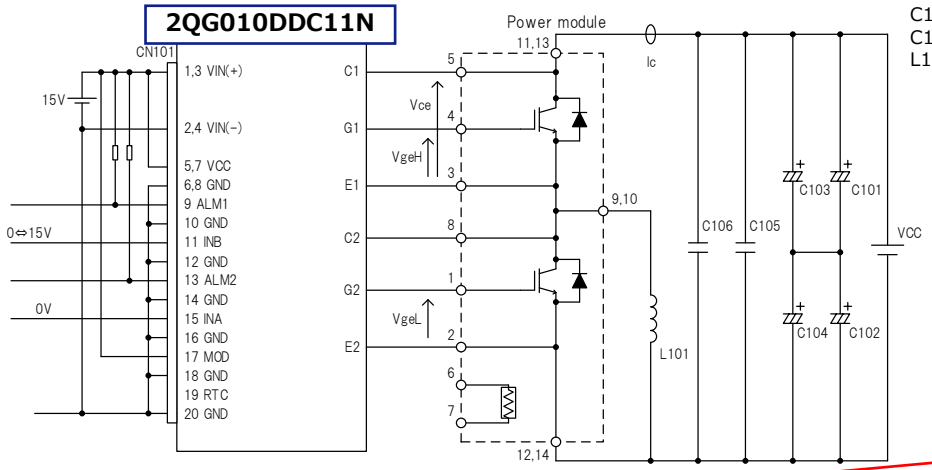
1-4. Waveform of Tamura gate driver (2 Pulse test)

IGBT : 2MBI1800XXG170-50

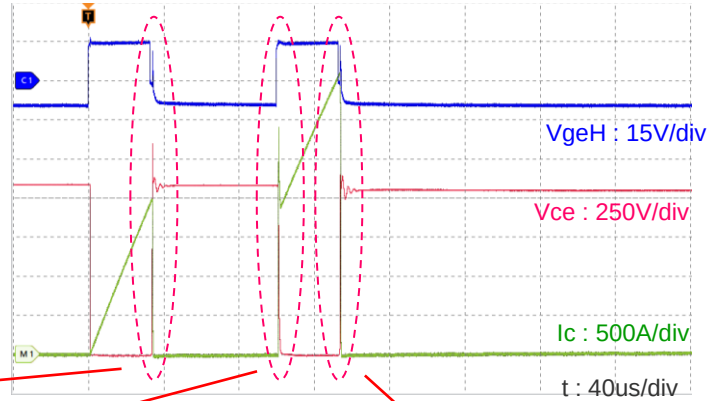
Rev B

DC Link : 1100V, Ron : 0.22Ω, Roff : 1.5Ω, Upper arm, Tj=25℃

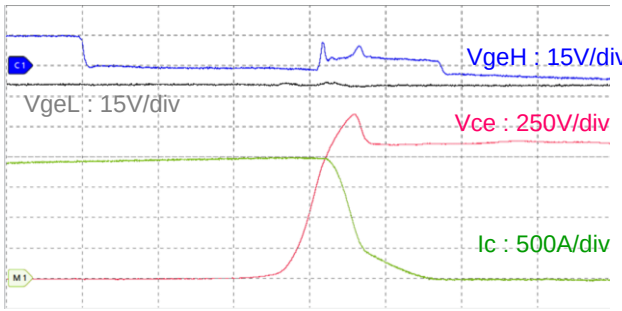
Highly stable gate drive with proprietary drive circuit and active clamp circuit (patent pending)



C101-104 : 3300uF(Ls : 20nH)
C105,106 : 3.0uF(Ls : 25nH)
L101: 16uH

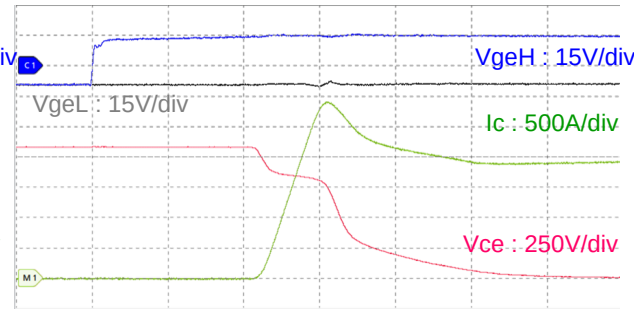


Turn OFF / Ic =1800A



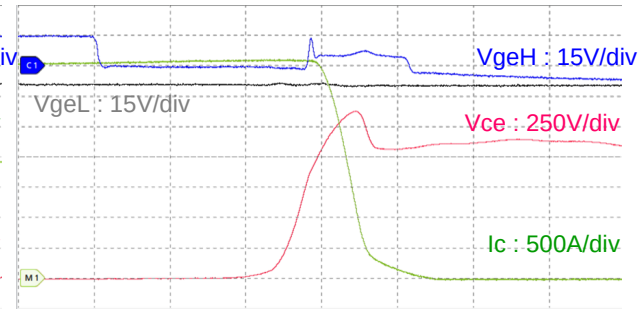
Item	Measurement value	
Vcep	1349	V
dV/dt	6.1	kV/us
di/dt	11.6	kA/us
Eoff	601	mJ

Turn ON / Ic =1800A



Item	Measurement value	
dV/dt	4.0	kV/us
di/dt	10.2	kA/us
Eon	895	mJ

Turn OFF / Ic =3600A



Item	Measurement value	
Vcep	1374	V
dV/dt	5.8	kV/us
di/dt	16.7	kA/us
Eoff	1155	mJ

1. Solution Guide for FUJI Electric PrimePACK™

IGBT : 2MBI1800XXG170-50

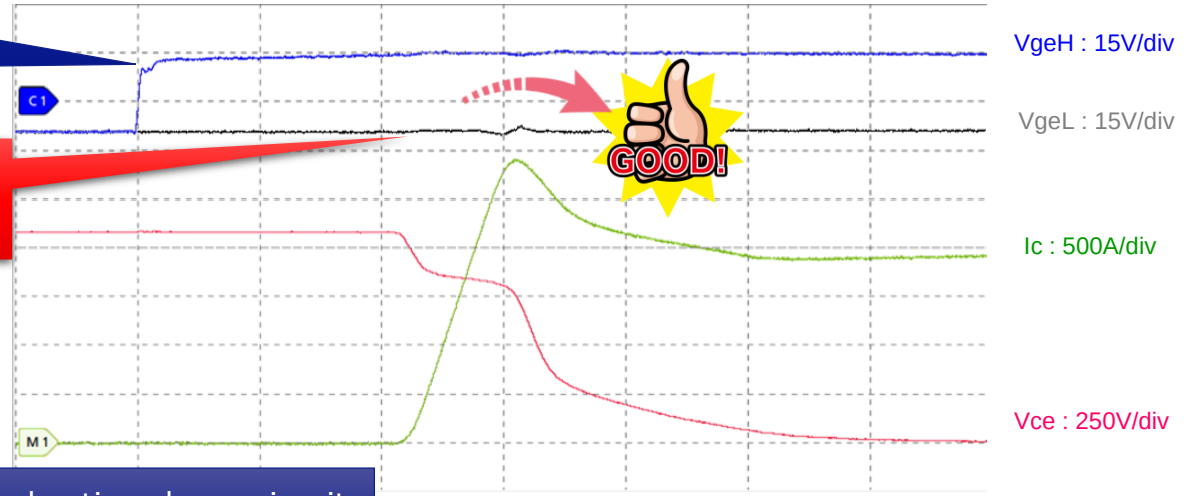
TAMURA
Rev B

1-4. 2 Pulse test (Enlarged waveform)

SW side gate (turn ON)
No ringing and no overshoot

OFF side gate
Stable L state without malfunction

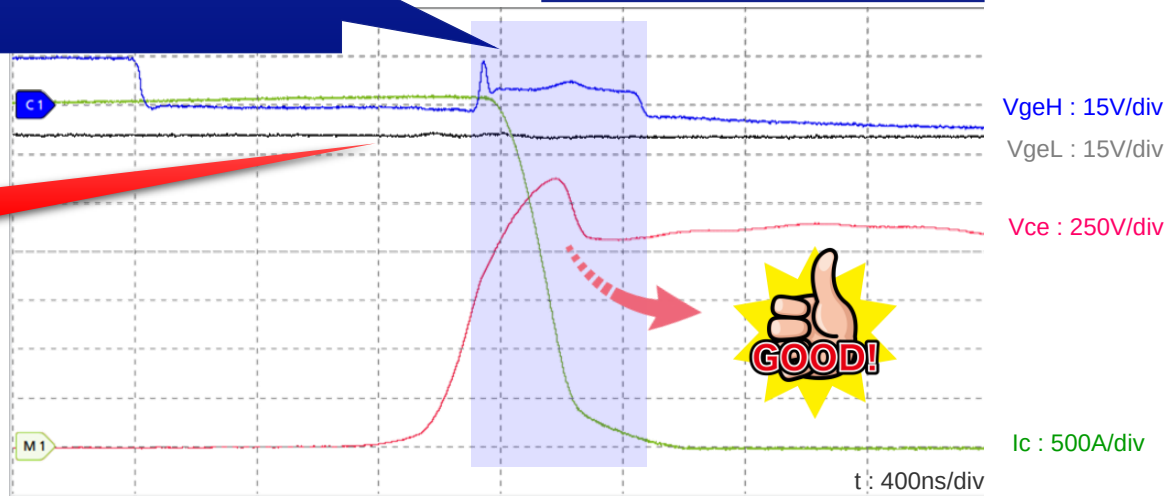
Turn ON / Ic =1800A



Gate resistance change area by our original active clamp circuit
(Normal turn-off ⇒ shift to soft turn-off)
⇒ Assist Vce Peak voltage reduction before clamping by TVS
⇒ TVS conduction loss can be reduced

OFF side gate
Stable L state without malfunction

Turn OFF / Ic =3600A



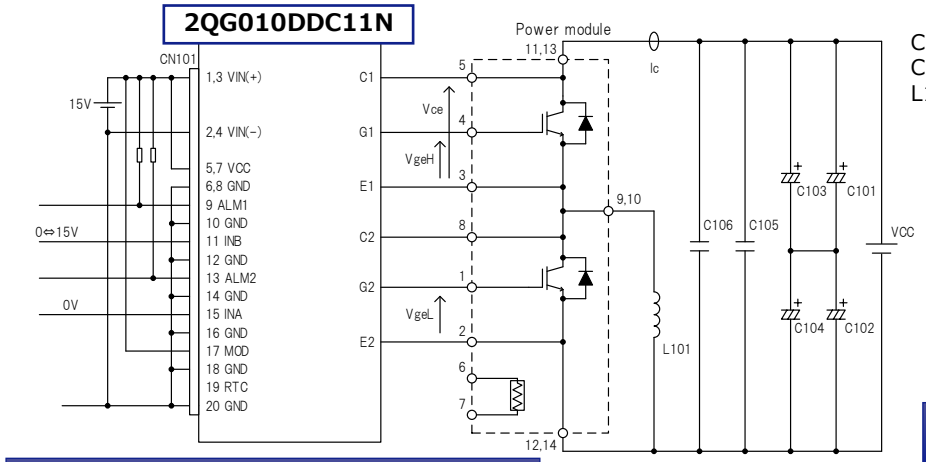
1. Solution Guide for FUJI Electric PrimePACK™

1-4 Waveform of Tamura gate driver (Short circuit test)

IGBT : 2MBI1800XXG170-50

Rev B

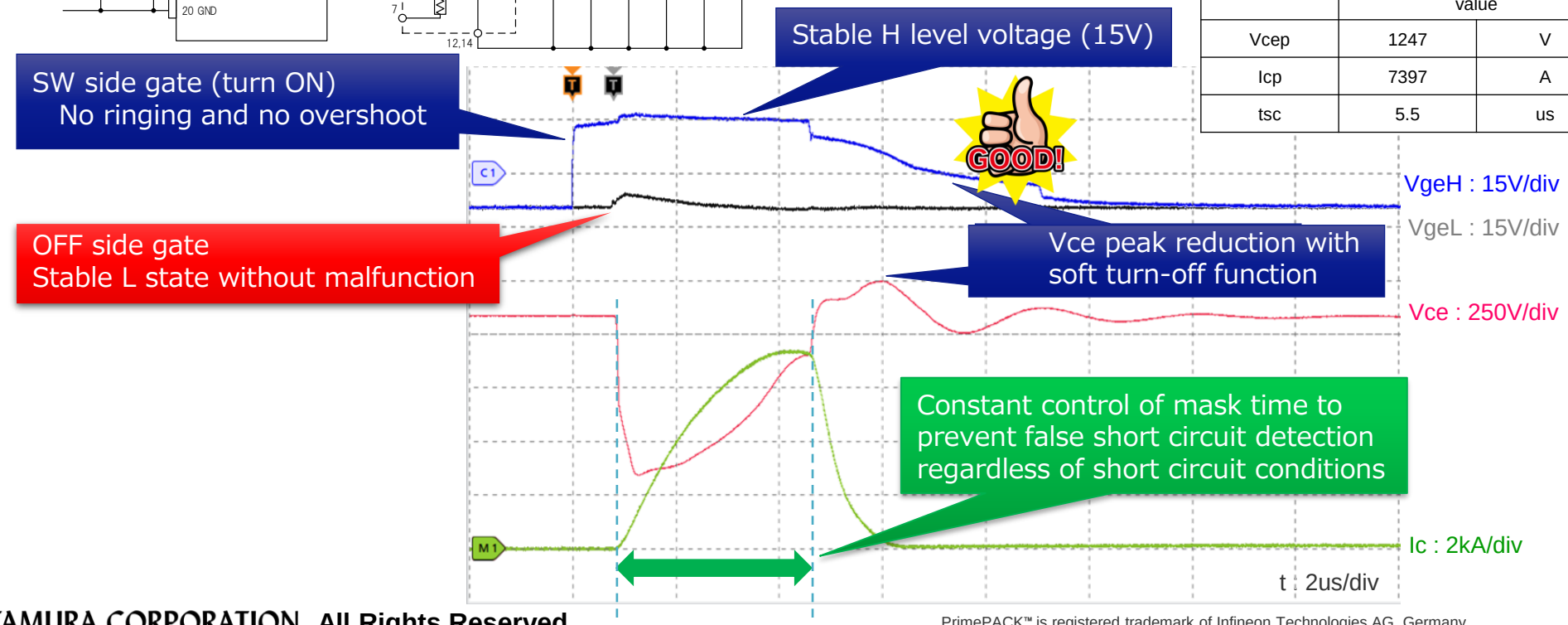
DC Link : 1100V,　Ron : 0.22Ω, Roff : 1.5Ω,　Upper arm,　Tj=25℃



C101-104 : 3300uF(Ls : 20nH)
C105,106 : 3.0uF(Ls : 25nH)
L101:　170nH

This driver suppresses the Vce peak voltage in the short circuit by our original circuit technology, and can control the mask time to prevent false short circuit detection.
(Patent pending)

Item	Measurement value	
Vcep	1247	V
Icp	7397	A
tsc	5.5	us



1. Solution Guide for FUJI Electric PrimePACK™

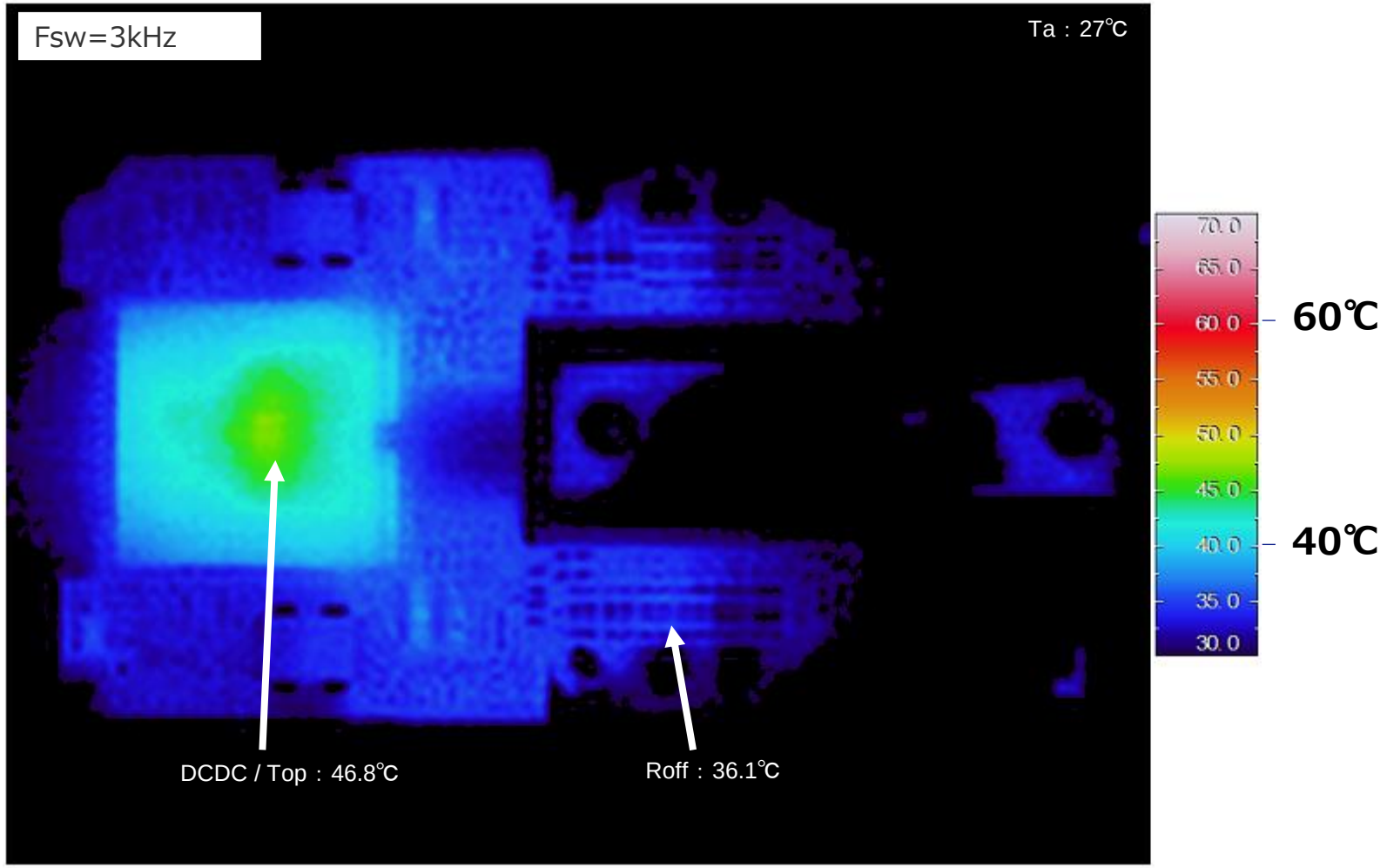
1-4. Temperature rise (Reference data)

IGBT : 2MBI1800XXG170-50

Rev B

Operating temperature range: -40~85℃

Low temperature rise ⇒ **Δt < 20 ℃**
IGBT: 2MBI1800XXG170-50 (Qg = 12.5uC), at 3kHz operation



1. Solution Guide for FUJI Electric PrimePACK™

IGBT : 2MBI1800XXG170-50

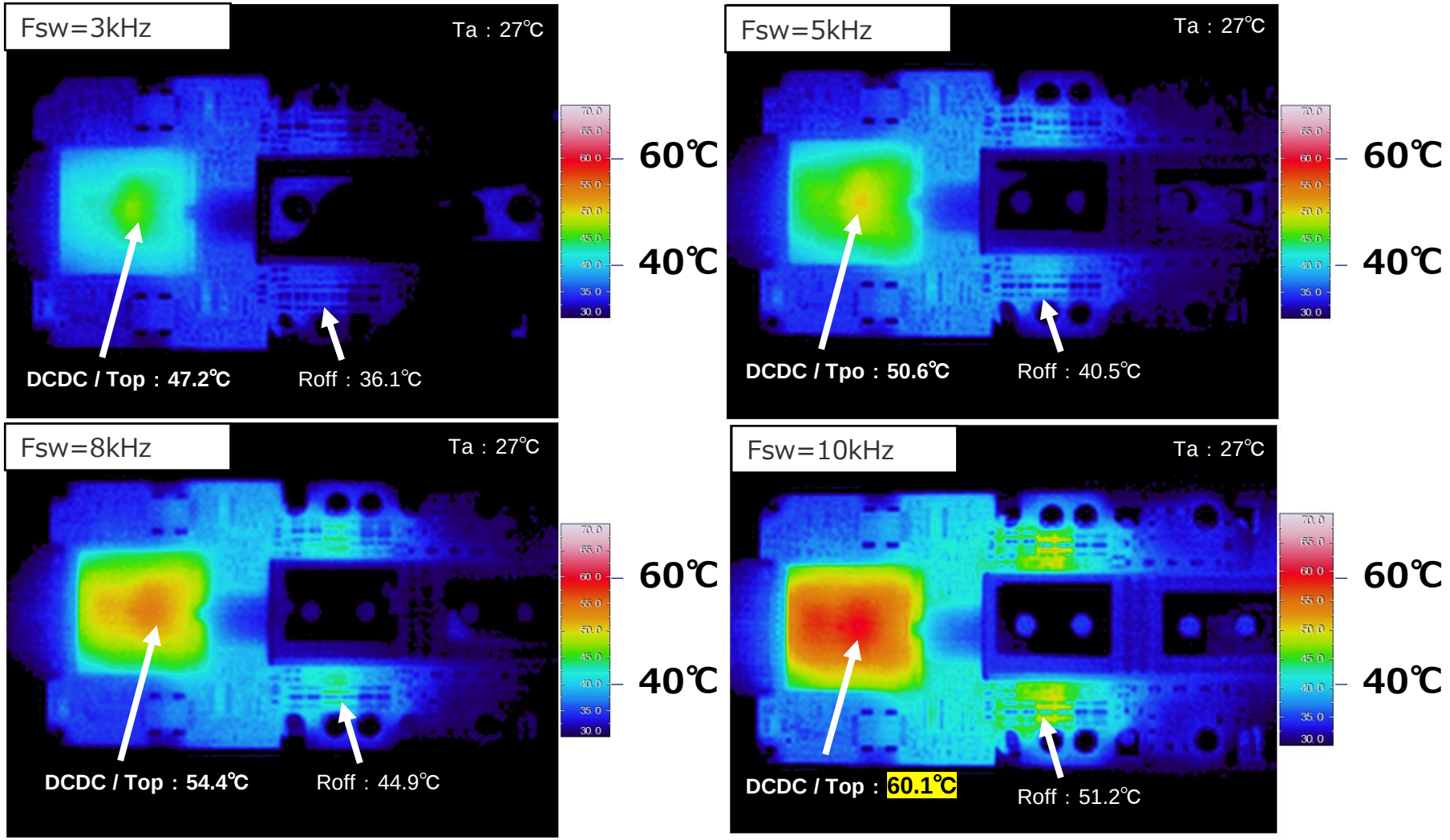
Rev B

1-4. Temperature rise (Reference data)

Low temperature rise ⇒ **Δt < 33 ℃**

IGBT: 2MBI1800XXG170-50 (Qg = 12.5uC), at 10kHz operation

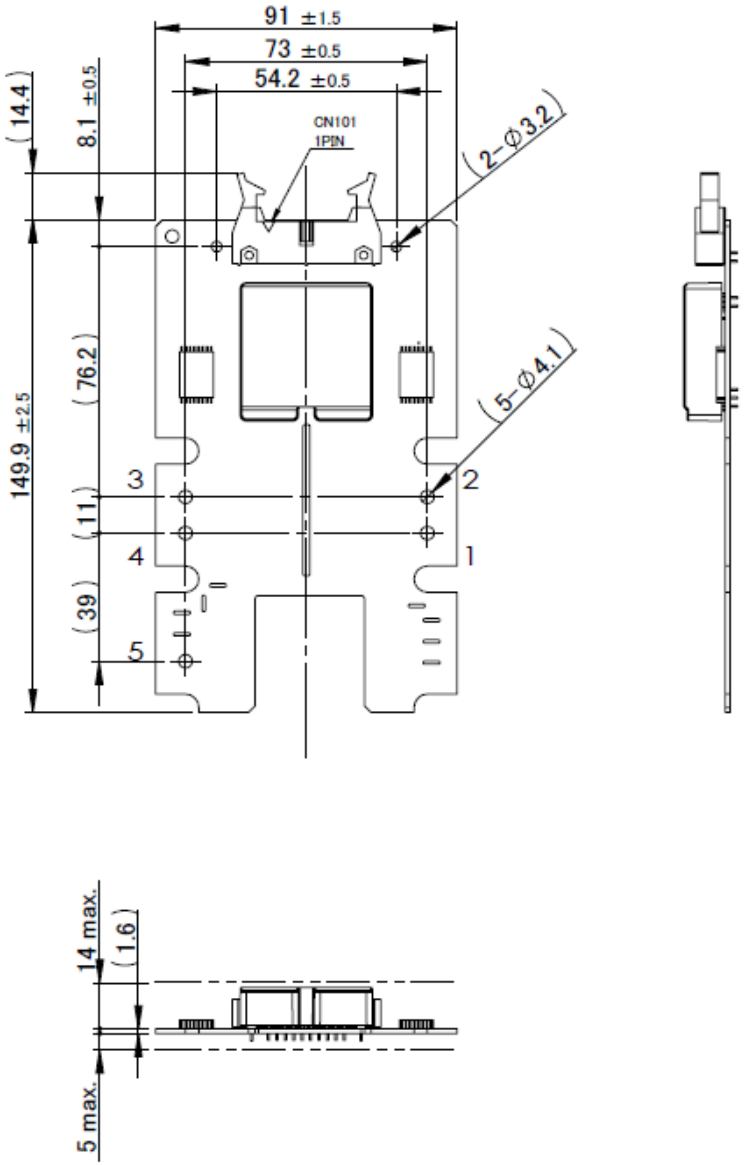
Operating temperature range: -40~85℃



1. Solution Guide for FUJI Electric PrimePACK™

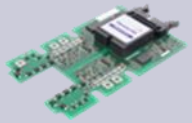
1-5 Products appearance and line-up

FUJI Electric
PrimePACK™ 2in1 Type



1. Solution Guide for FUJI Electric PrimePACK™

1-5. Product line-up for FUJI Electric PrimePACK™ 2in1 Type

Package	Output power (Ref.)	Ic	Part No	TAMURA Driver 2PG-C/2PG-D	TAMURA Driver 2PG-C/2PG-D	TAMURA Driver 2CG-B/2CG-D	TAMURA Driver 2DD
			Vce = 1200V				
	150kW	900	2MBI900XXA120P-50		2PG??0yxC11N-?? *2	2CG010BBC11N (+15/-10V) Soft turn off ---------- 2CG010DBC11N (+15/-10V) Soft turn off +Active clamp 	2DD151008C (+15V/-10V) 
			2MBI900XXA120E-50				
	250kW	1200	2MBI1200XXE120P-50				
			2MBI1200XXE120E-50				
		1400	2MBI1400XXB120P-50				
	350kW	1800	2MBI1800XXF120P-50				
			Vce = 1700V				
	150kW	650	2MBI650XXA170-50		2PG??0yxC11N-?? *2	2CG010BBC11N (+15/-10V) Soft turn off ---------- 2CG010DBC11N (+15/-10V) Soft turn off +Active clamp 	2DD151008C (+15V/-10V) 
	350kW	1200	2MBI1200XXE170-50				
	250kW	1000	2MBI1000XXB170-50				
	350kW	1400	2MBI1400XXB170-50				
	550kW	1800	2MBI1800XXF170-50		2PG010DxC11N *1		

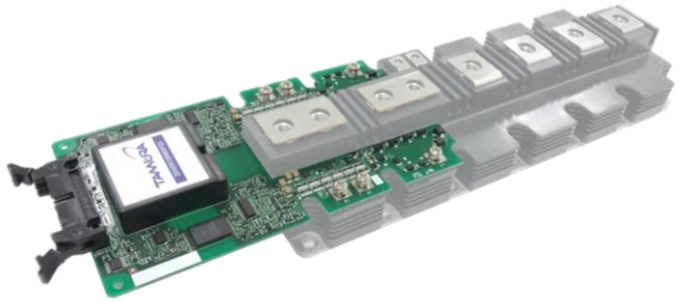
*1 Catalog products. Please confirm stock.
*2 Not in stock due to optimization required. Please contact us.

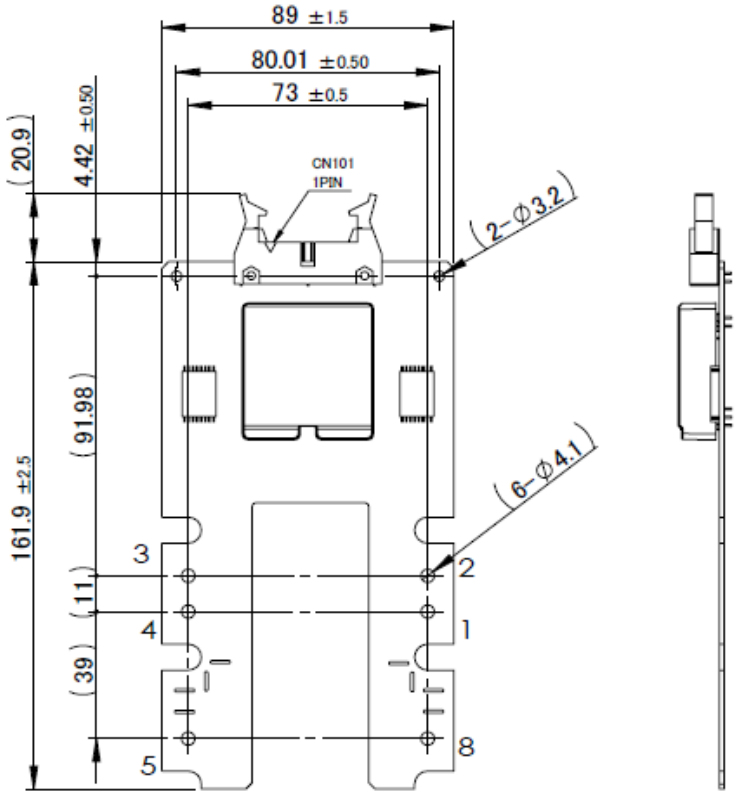
x: Signal input voltage selectable: "C" => 3.3~15V / "D" => 15V
y: Protection circuits: "C"=>Soft turn off / "D"=>Soft turn off + Active clamp
??: Semi-optimized code

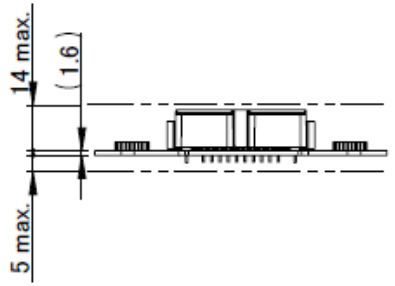
1. Solution Guide for FUJI Electric PrimePACK™

1-5 Products appearance and line-up

FUJI Electric
PrimePACK™3+ 2in1 Type

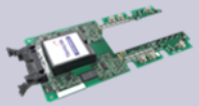
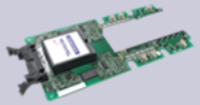






1. Solution Guide for FUJI Electric PrimePACK™

1-5. Product line-up for FUJI Electric PrimePACK™3+ 2in1 Type

Package	Output power (Ref.)	Ic	Part No	TAMURA Driver			
				2QG-C/2QG-D		2CG-B/2CG-D	2DD
		Vce = 1200V					
	750kW	2400	2MBI2400XRXF120-50		2QG??0yDC11N-?? *2	2CG010BBC11N (+15/-10V) Soft turn off ---------- 2CG010DBC11N (+15/-10V) Soft turn off +Active clamp 	2DD151008C (+15V/-10V) 
		Vce = 1700V					
	500kW	1800	2MBI1800XXG170-50		2QG010DDC11N *1	2CG010BBC11N (+15/-10V) Soft turn off ---------- 2CG010DBC11N (+15/-10V) Soft turn off +Active clamp 	2DD151008C (+15V/-10V) 

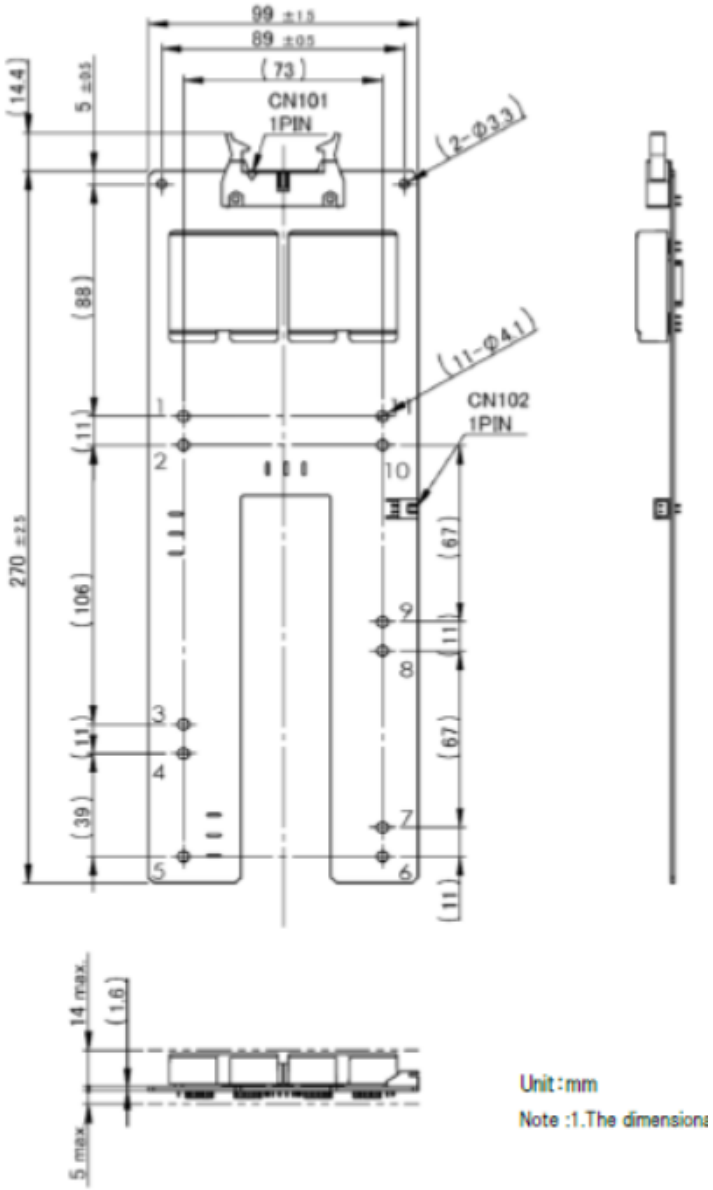
***1 Catalog products. Please confirm stock.**
***2 Not in stock due to optimization required. Please contact us.**

y: Protection circuits: "**C**"=>Soft turn off / "**D**"=>Soft turn off + Active clamp
??: Semi-optimized code

1. Solution Guide for FUJI Electric PrimePACK™

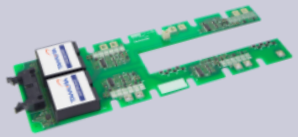
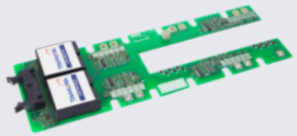
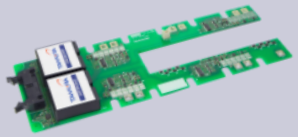
1-5 Products appearance and line-up

FUJI Electric
PrimePACK™ 4in1 Type



1. Solution Guide for FUJI Electric PrimePACK™

1-5. Product line-up for FUJI Electric PrimePACK™ 4in1 Type

Package	Output power (Ref.)	Topology	Ic	Part No	TAMURA Driver		
					4DU - A or N		2DD
			Vce = 1200V (T1,T2)				
	100kW	3-Level T-TYPE	450	4MBI450VB-120R1-50		4DUC51016xFA *	2DD151008C (+15V/-10V) 
	125kW		650	4MBI650VB-120R1-50			
	200kW		900	4MBI900VB-120R1-50		4DUC51016xFA1 *	
				4MBI900VB-120RA-50		4DUC51016xFA2 *	
			Vce = 1700V (T1,T2)				
	150kW		450	4MBI450VB-170R2-50		4DUC51016xFA *	2DD151008C (+15V/-10V) 
	200kW		600	4MBI600VB-170R2-50			
		Vce = 1200V (T1 - T4)					
	150kW	3-Level I-TYPE	600	4MBI600VC-120-50		4DUD51016xFN1 *	2DD151008C (+15V/-10V) 

*** Not in stock due to optimization required. Please contact us.**

x: Signal input voltage selectable "E" => 3.3~15V "F" => 15V

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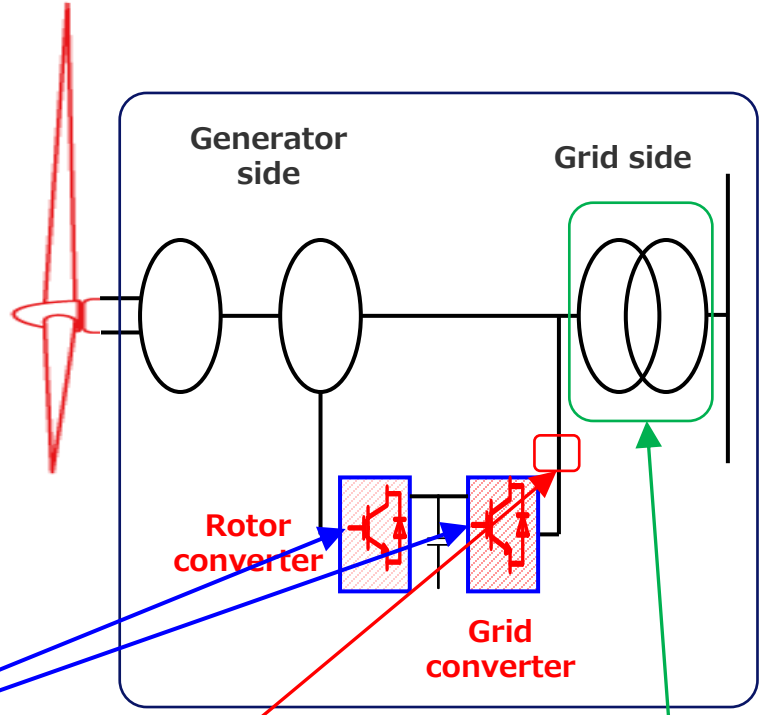
2) Introduction of One Tamura (Wind Power converters)

Rev B



Gate Driver Unit

Current sensor

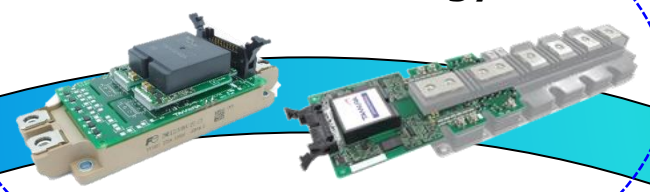
Reactor

2) Introduction of One Tamura (General application)

Rev B

Power electronics technology and main products

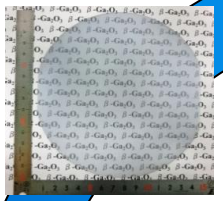
Gate driver
Circuit technology



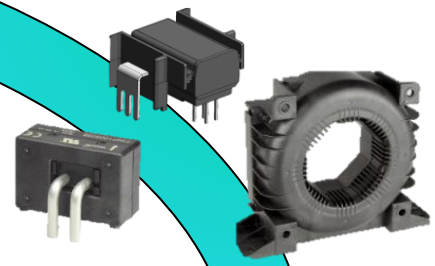
Gate Driver Unit

Device technology
Novel Crystal Technology, Inc.

Ga_2O_3

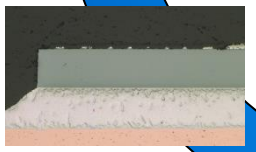


Module technology
Current sensor



Power electronics technology and main products

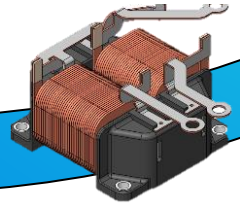
Soldering technology



Electric Chemicals
Soldering material
Die attach material
TIM material

Reflow soldering system

Automotive reactor



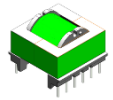
Reactor for PF
(2 in 1)

Passive components

Reactor
Trans
Coil

Large reactor/ transformer

Toroidal coil

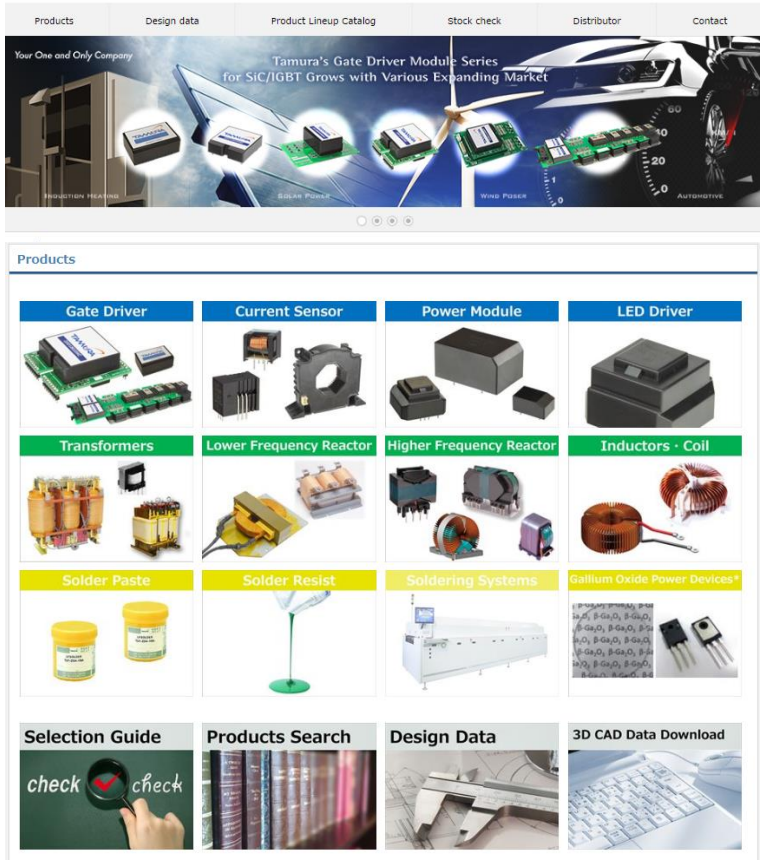


SW-Trans

Appendix) Information & Contact

Rev B

Please visit our website!



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/