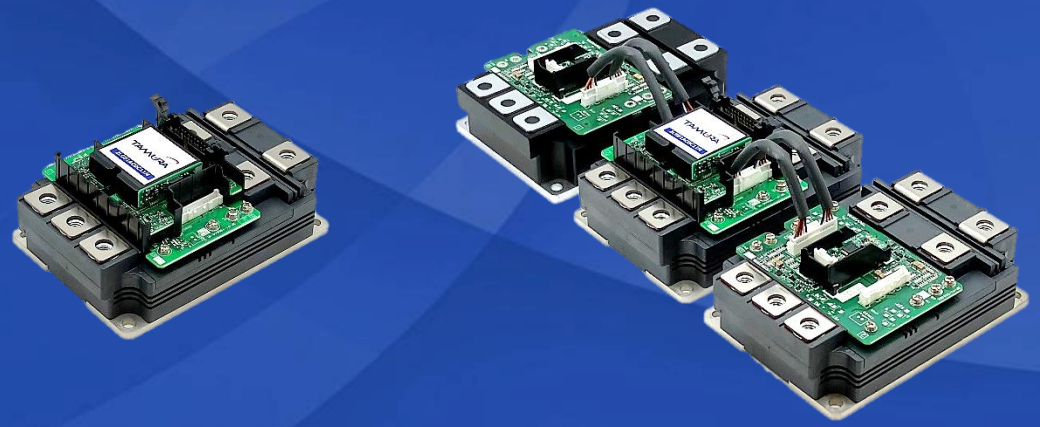
Gate Drivers optimized for FUJI Electric

High-Power Module HPnC X Series



Supported by FUJI Electric Corporation

SUSTAINABLE DEVELOPMENT GOALS

TAMURA
Your One and Only Company

TAM-GDM-00045

Issued on 1st Dec '24 Unit division HQ Japan

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Rev F

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Gate Drivers optimized for FUJI Electric High-Power Module HPnC X Series

01 Tamura provide of total solution

Gate driver

Provide of main components for various inverter !

Current sensor

Reactor / Trans

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Gate Drivers optimized for FUJI Electric High-Power Module HPnC X Series

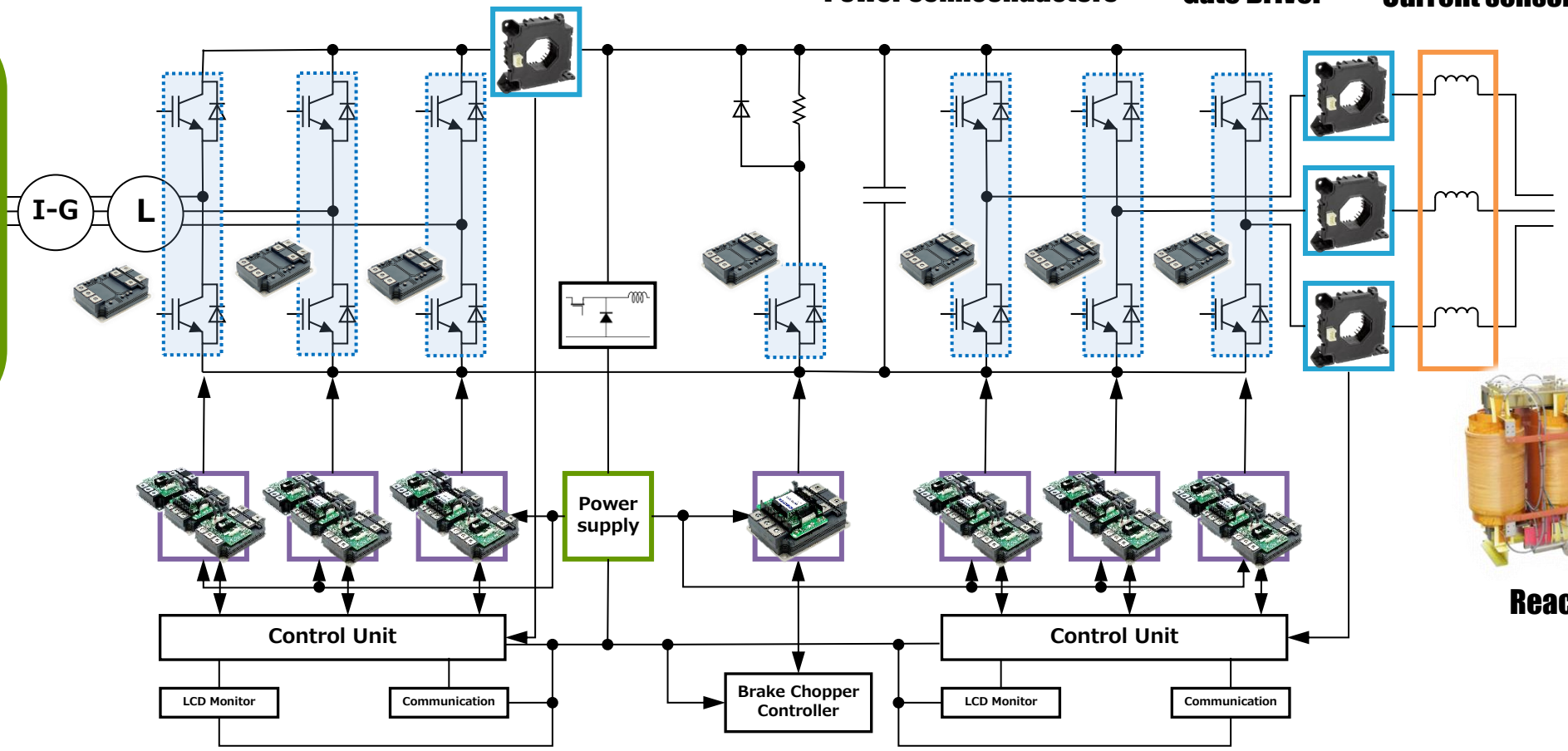
01 Tamura provide of total solution

Wind power converter

Power semiconductors

Gate Driver

Current sensor



Reactor

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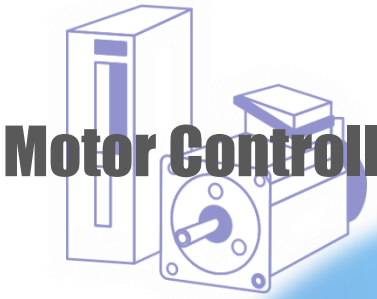
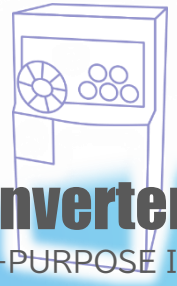
Gate Drivers optimized for FUJI Electric High-Power Module HPnC X Series

02 Application



Motor Controller



Inverter

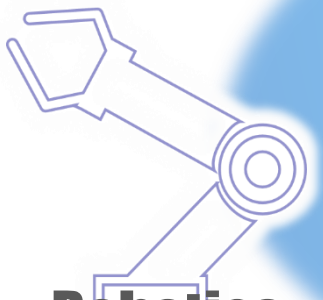
GENERAL-PURPOSE INVERTER

PV

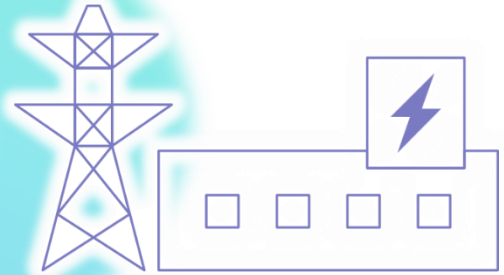
Photovoltaic Power Generation

Wind

Wind Power Generation

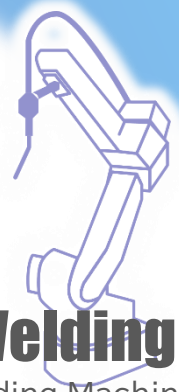


Robotics



Grid/SVG

Electric grid



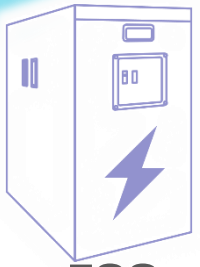
Welding

Welding Machine

UPS

Uninterruptible Power Supply

EV Charger
EV Stand



ESS

Energy Storage System

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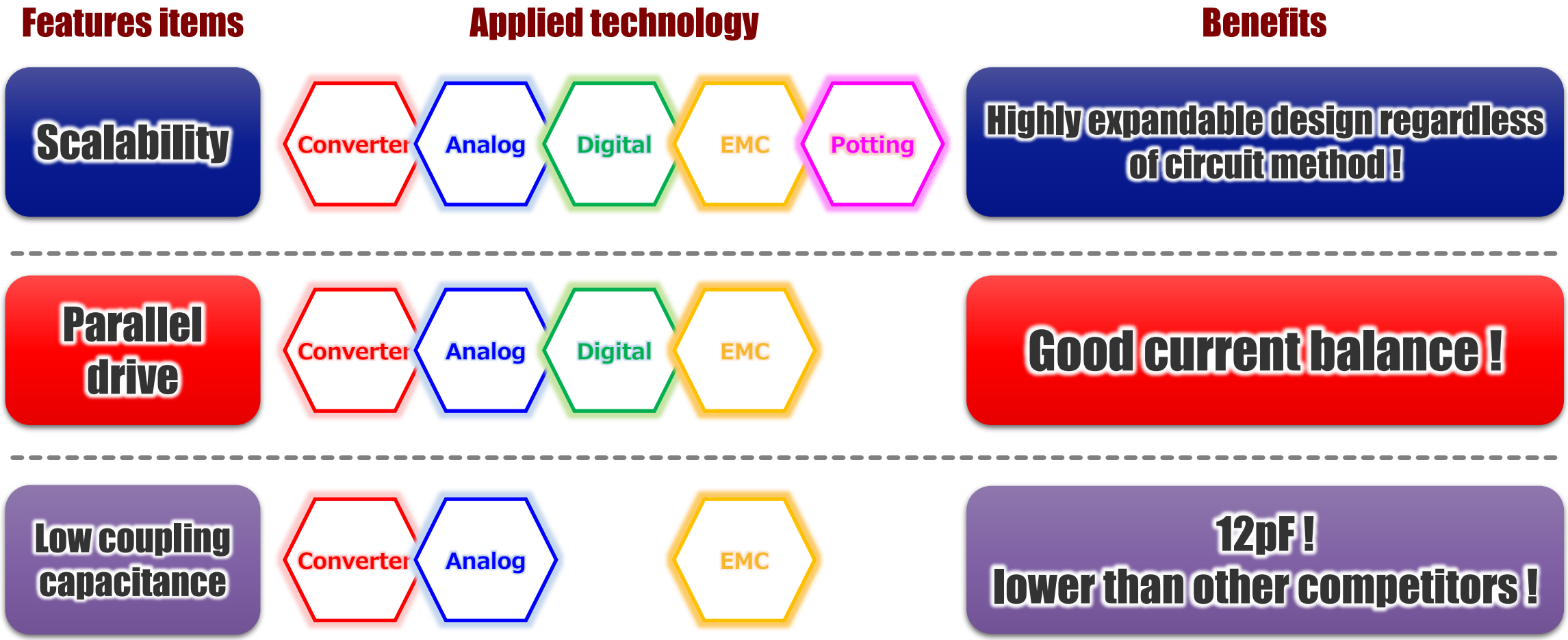
Gate Drivers optimized for FUJI Electric High-Power Module HPnC X Series

03 Three features obtained by combining HPnC and 2LG series



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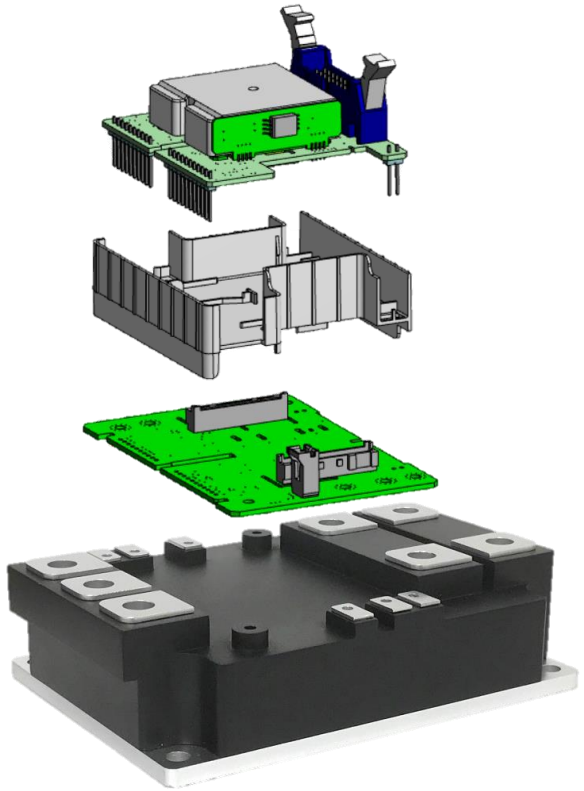
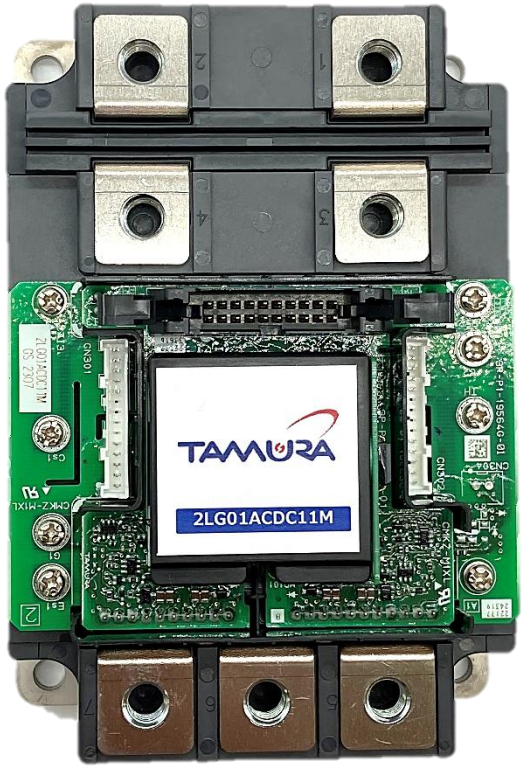
Gate Drivers optimized for FUJI Electric High-Power Module HPnC X Series

03 Three features obtained by combining HPnC and 2LG series

Scalability



Can be mounted on HPnC !



Same width as power module

Contribute to compact design of system thanks to “no protrusion”

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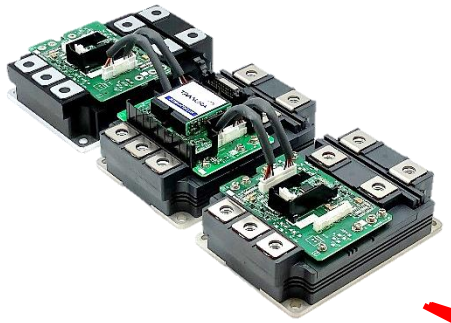
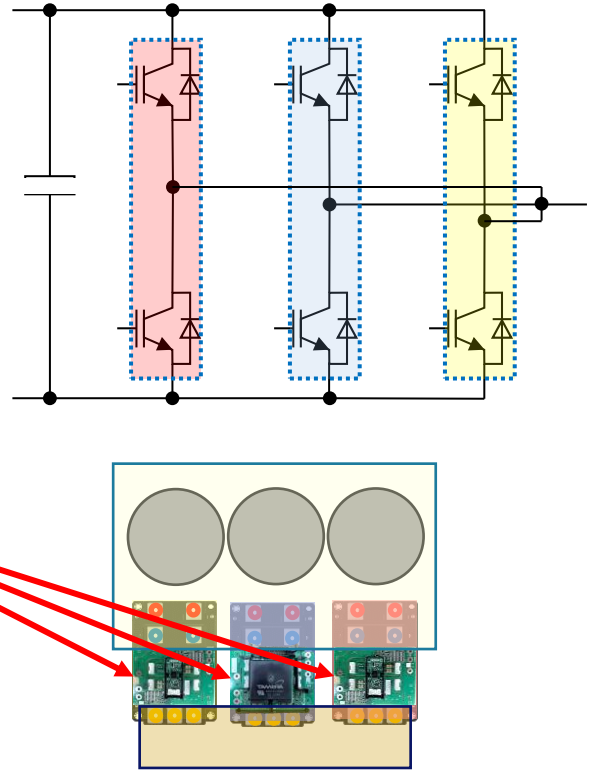
Gate Drivers optimized for FUJI Electric High-Power Module HPnC X Series

03 Three features obtained by combining HPnC and 2LG series

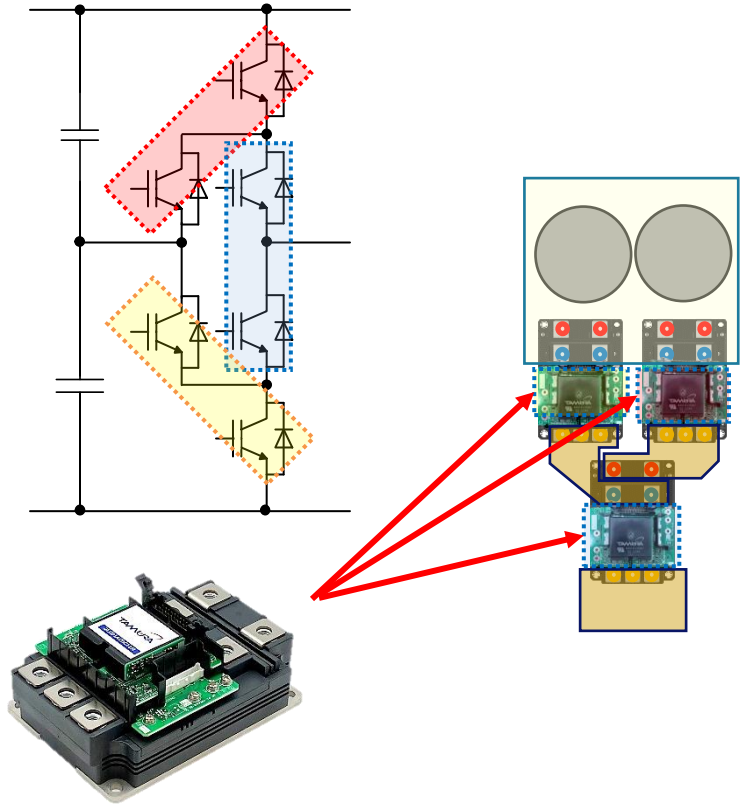
Scalability

HPnC
With 2-level / 3pcs paralleling





HPnC
With 3-level ANPC (I-Type)



Highly expandable design regardless of circuit method

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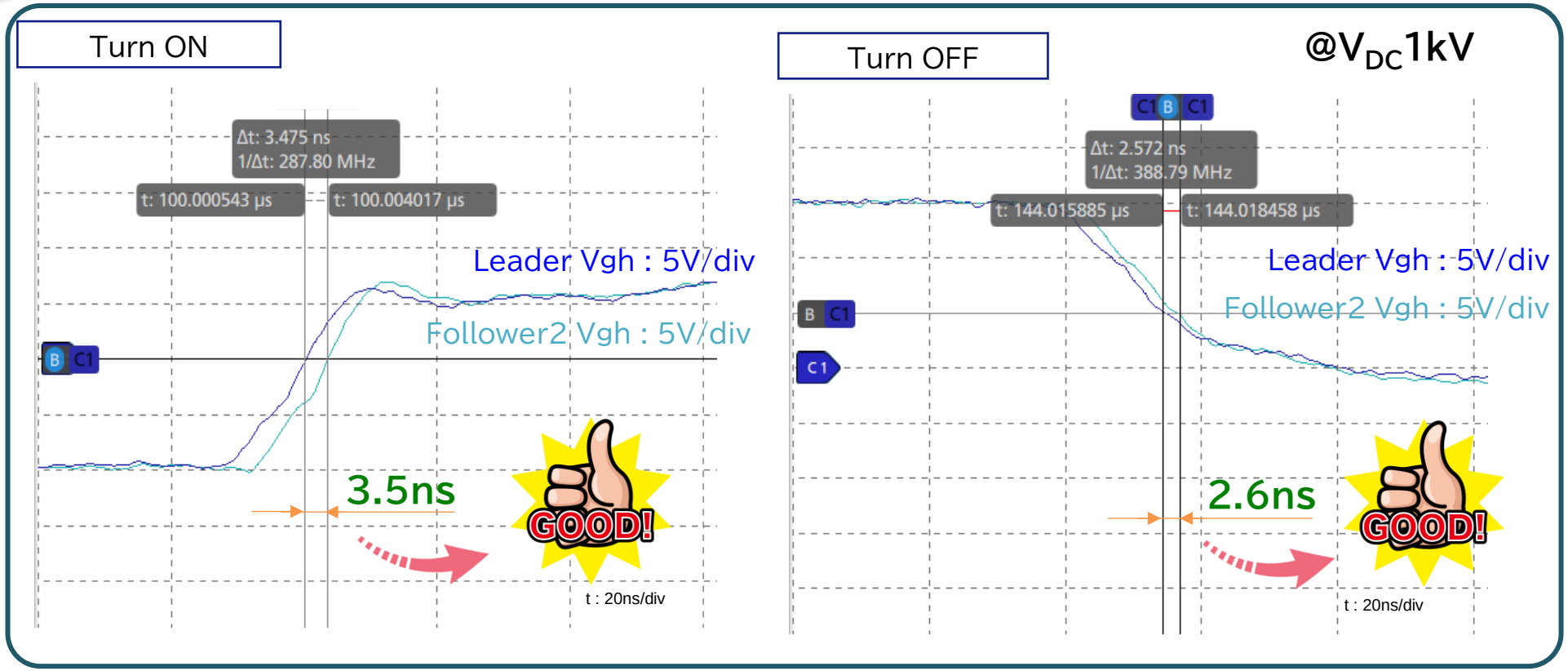
Gate Drivers optimized for FUJI Electric High-Power Module HPnC X Series

03 Three features obtained by combining HPnC and 2LG series

Parallel drive

Gate signal balance



Follower drive signal delay is very small

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Gate Drivers optimized for FUJI Electric High-Power Module HPnC X Series

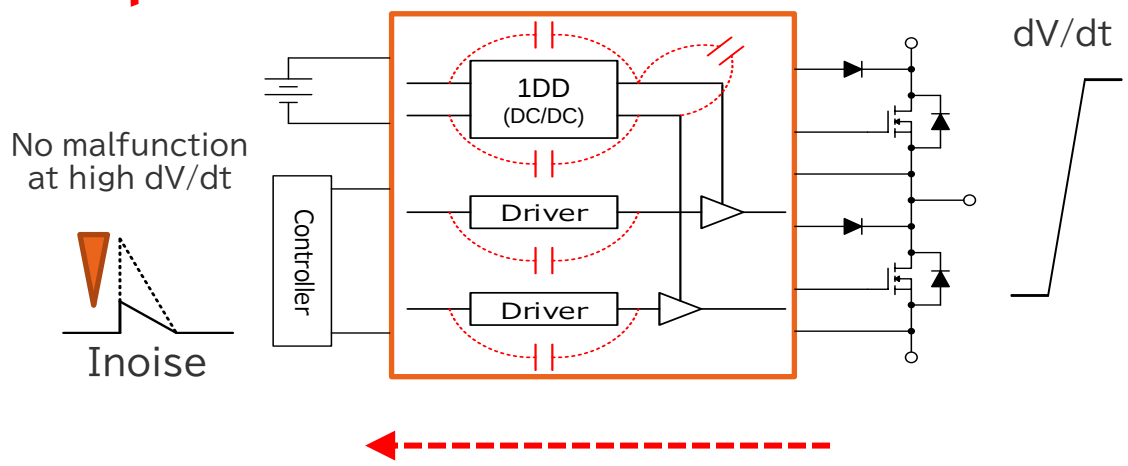
03 Three features obtained by combining HPnC and 2LG series

Low coupling capacitance

No malfunctions during switching of Si or SiC.
⇒ Reduction of parasitic capacitance !

Total=12pF !

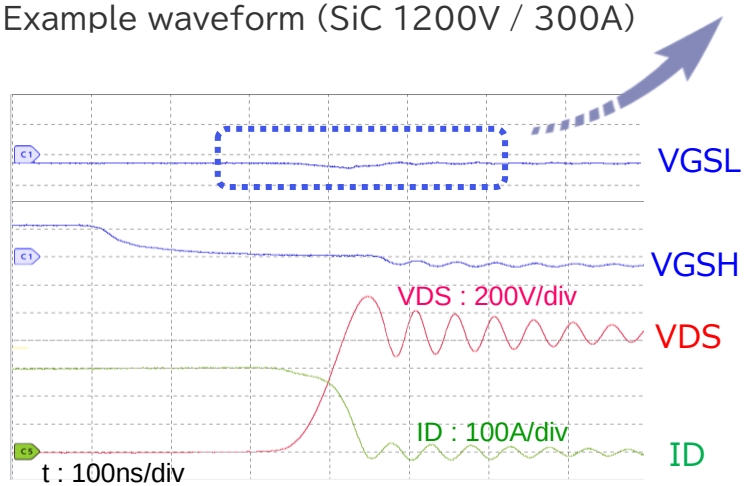
Conceptual diagram



Inoise = Cstray X dV/dt

No malfunctions !

Example waveform (SiC 1200V / 300A)



dV/dt = 15kV/us

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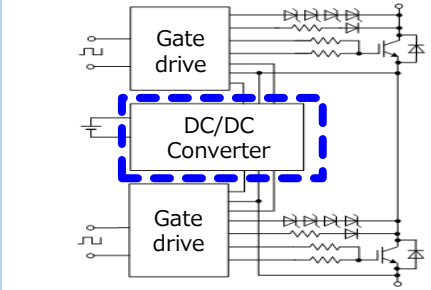
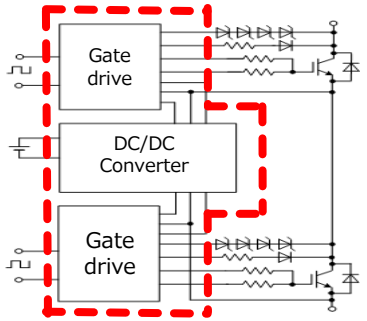
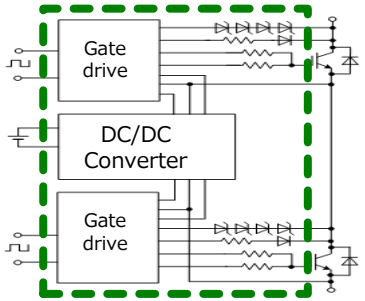
Gate Drivers optimized for FUJI Electric High-Power Module HPnC X Series

04 Product tree and line-up

Product	**DC/DC Converter**	**Gate Driver Module**	**Gate Driver Unit**
Function	**2in1 PM designated DC/DC Converter**	**DC/DC Converter + Gate drive**	**Gate Driver Module + Gate resistors Protective function**
Block diagram			
Appearance	 2DD series	 2CG-B/D series	

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Gate Drivers optimized for FUJI Electric High-Power Module HPnC X Series

04 Product tree and line-up

GDM Leading sector

DC-DC converter
2DD

Gate driver module
2CG-B / 2CG-D

Gate driver Unit
2LG-C
High-Power Module HPnC X series

Gate driver Unit
2LG-C (Multi-parallel)
High-Power Module HPnC X series

Gate Driver Family Selection Guide

Click here !

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Gate Drivers optimized for FUJI Electric High-Power Module HPnC X Series

04 Product tree and line-up

＊Model name for product under development is subject to be changed.

Package	Vce	Ic	Part No	Master /Slave	Model *	Frequency (kHz) For Reference	Maximum parallel number
	1700	1200	2MBI1200XZF170-50	Leader 	2LG0xAyxC11M	T.B.D	Contact us
				 Follower	2LG0xAyZC11S		
		1500	2MBI1500XZF170-50	Leader 	2LG0xAyxC11M	T.B.D	Contact us
				 Follower	2LG0xAyZC11S		
		1800	2MBI1800XZF170-50	Leader 	2LG0xAyxC11M	T.B.D	Contact us
				 Follower	2LG0xAyZC11S		
	2300	1200	2MBI1200XZF230-50	Leader 	2LG0xAyxC11M	T.B.D	Contact us
				 Follower	2LG0xAyZC11S		

x: Signal input voltage selectable: “**C**” => 3.3~15V “**D**” => 15V

y: Protection circuits: “**C**”=>Soft turn off / “**D**”=>Soft turn off + Active clamp

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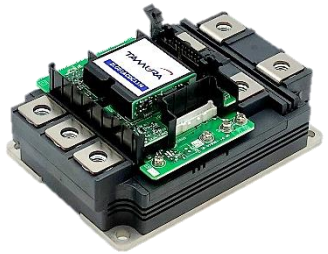
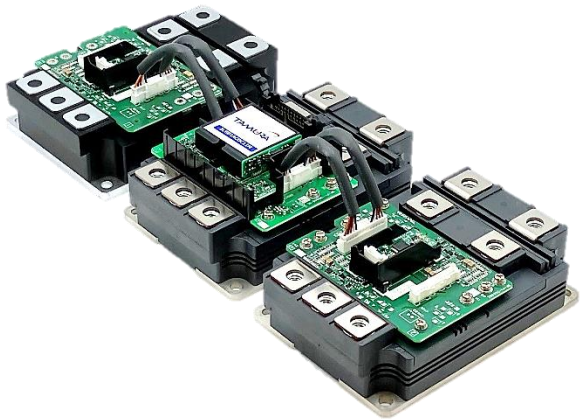
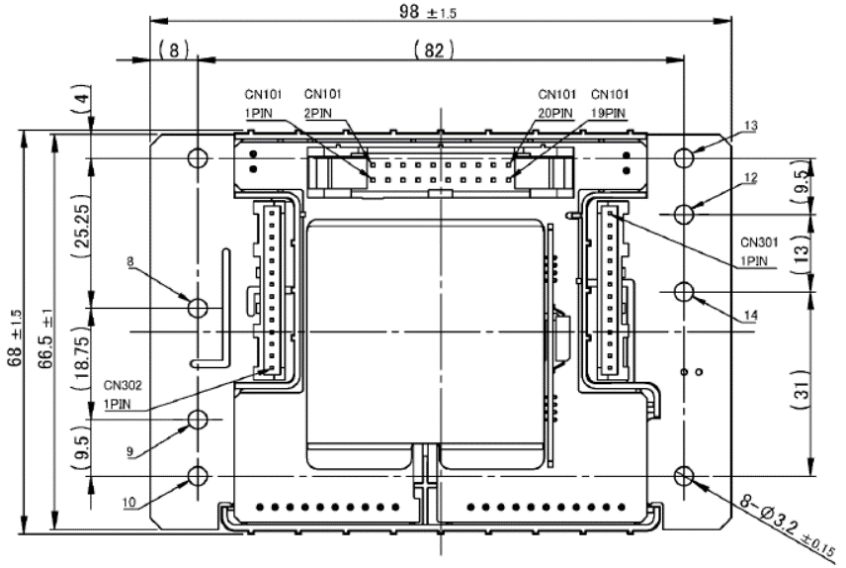
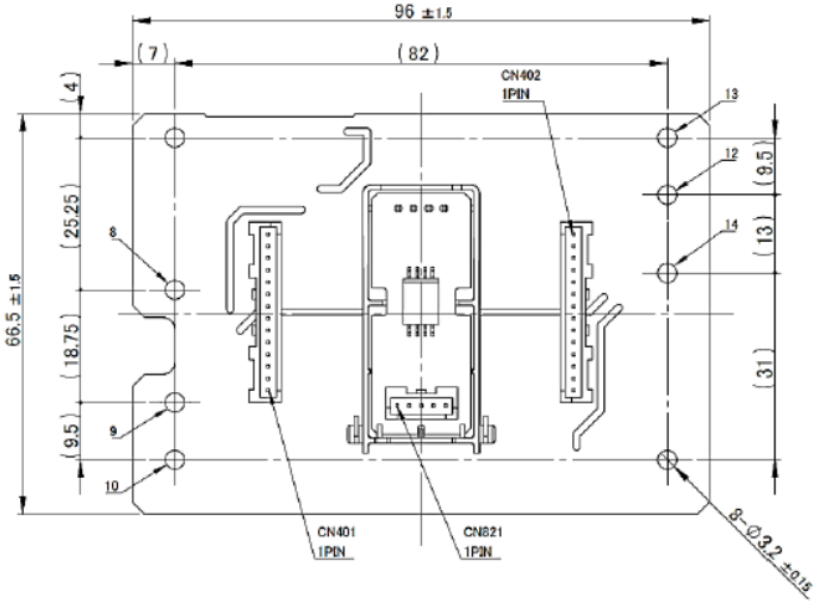
Gate Drivers optimized for FUJI Electric High-Power Module HPnC X Series

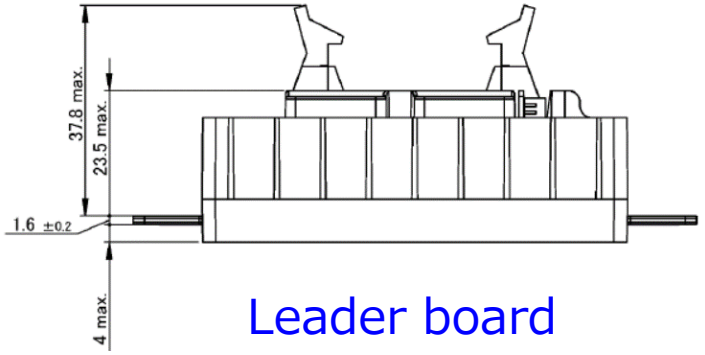
04 Product tree and line-up



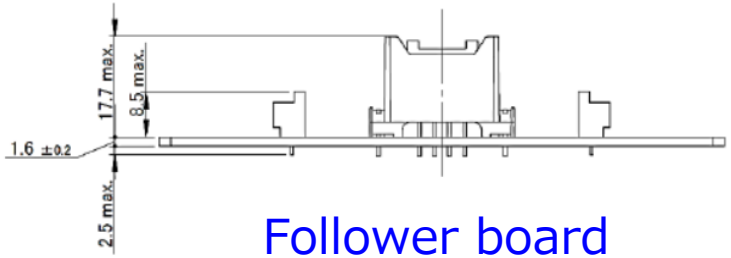








Leader board



Follower board

Unit : mm

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

* Specifications may be changed.

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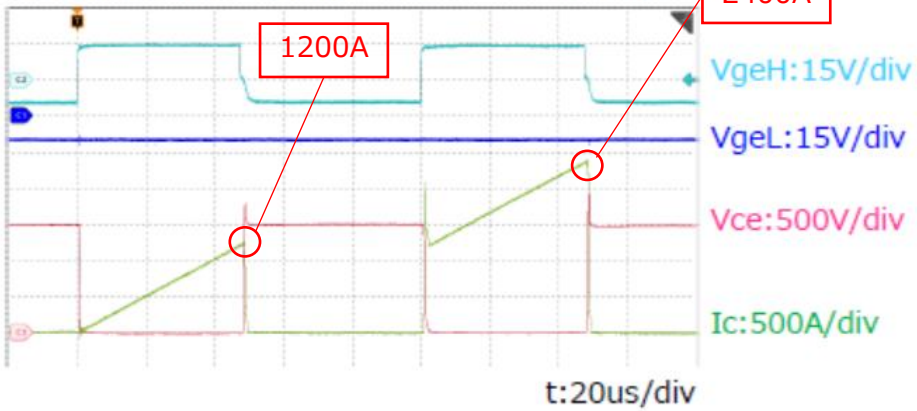
Gate Drivers optimized for FUJI Electric High-Power Module HPnC X Series

05　Matching data（2-pulse / 2MBI1200XZF230-50）

Waveform example（Vcc=1500V Tj=150℃） Upper arm

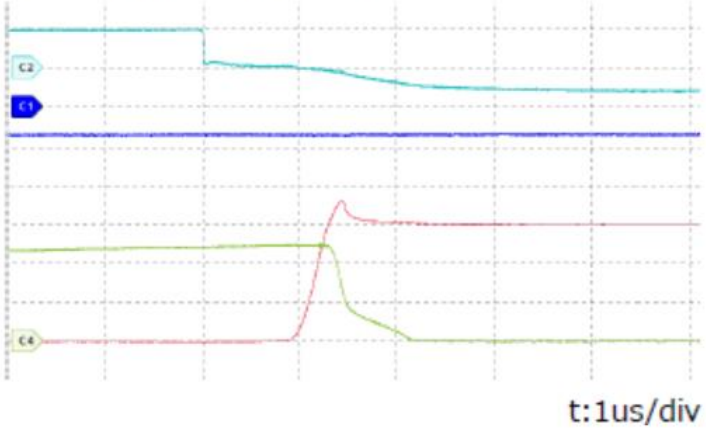
Overall Waveform



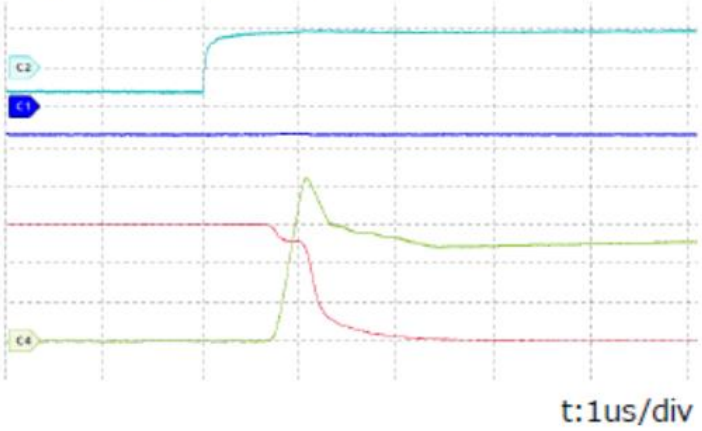
Measurement Value

Item	Turn on [1200A]	Turn off [1200A]	Turn off [2400A]	unit
Vcepk	–	1806	1939	V
dV/dt	3.7	5.0	4.6	kV/us
dI/dt	6.9	2.0	10.2	kA/us
Eon	898	–	–	mJ
Eoff	–	833	1685	mJ

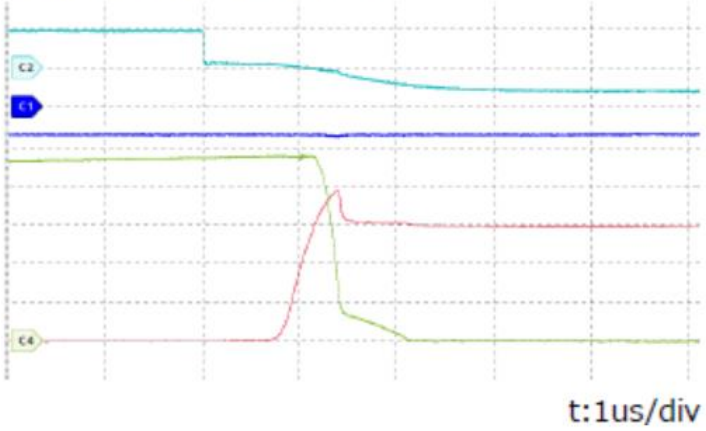
Turn off/Ic=1200A



Turn on/Ic=1200A



Turn off/Ic=2400A



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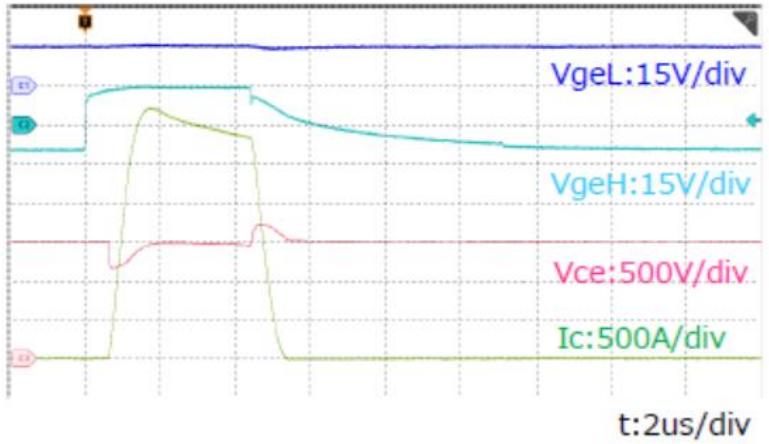
Gate Drivers optimized for FUJI Electric High-Power Module HPnC X Series

05　Matching data（Short circuit / 2MBI1200XZF230-50）

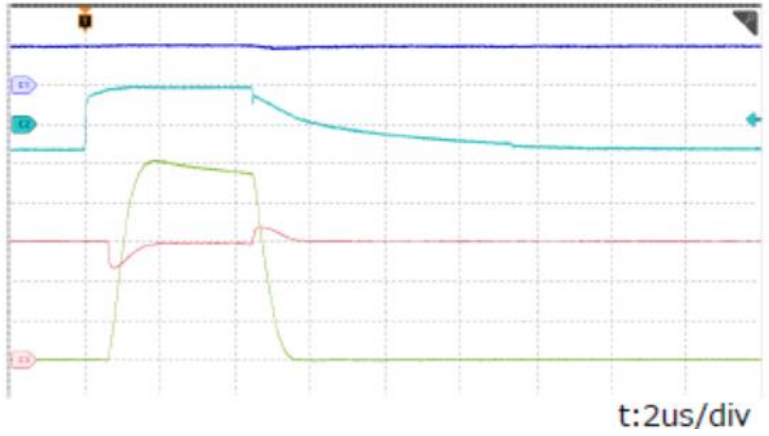
Waveform example（Vcc=1500V Tj=25 / 150℃）　Upper arm

Overall Waveform_VCC=1500V,Tj=25℃



SOA

Overall Waveform_VCC=1500V,Tj=150℃



SOA

Measurement Value

Item	Tj=25℃	Tj=150℃	Unit
Vcepk	1727	1685	V
Icpk	6439	5077	A
tsc	4.8	5.0	us
Esc	33.6	27.6	J

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Energize the Future 100th

CORPORATE GOVERNANCE REPORT

Tamura's mascot "Quenu"

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