Gate driver module and Evaluation board that bring out the performance of Wolfspeed, INC. SiC Power Module

SUSTAINABLE DEVELOPMENT GOALS

TAMURA
Your One and Only Company

TAM-GDM-00061

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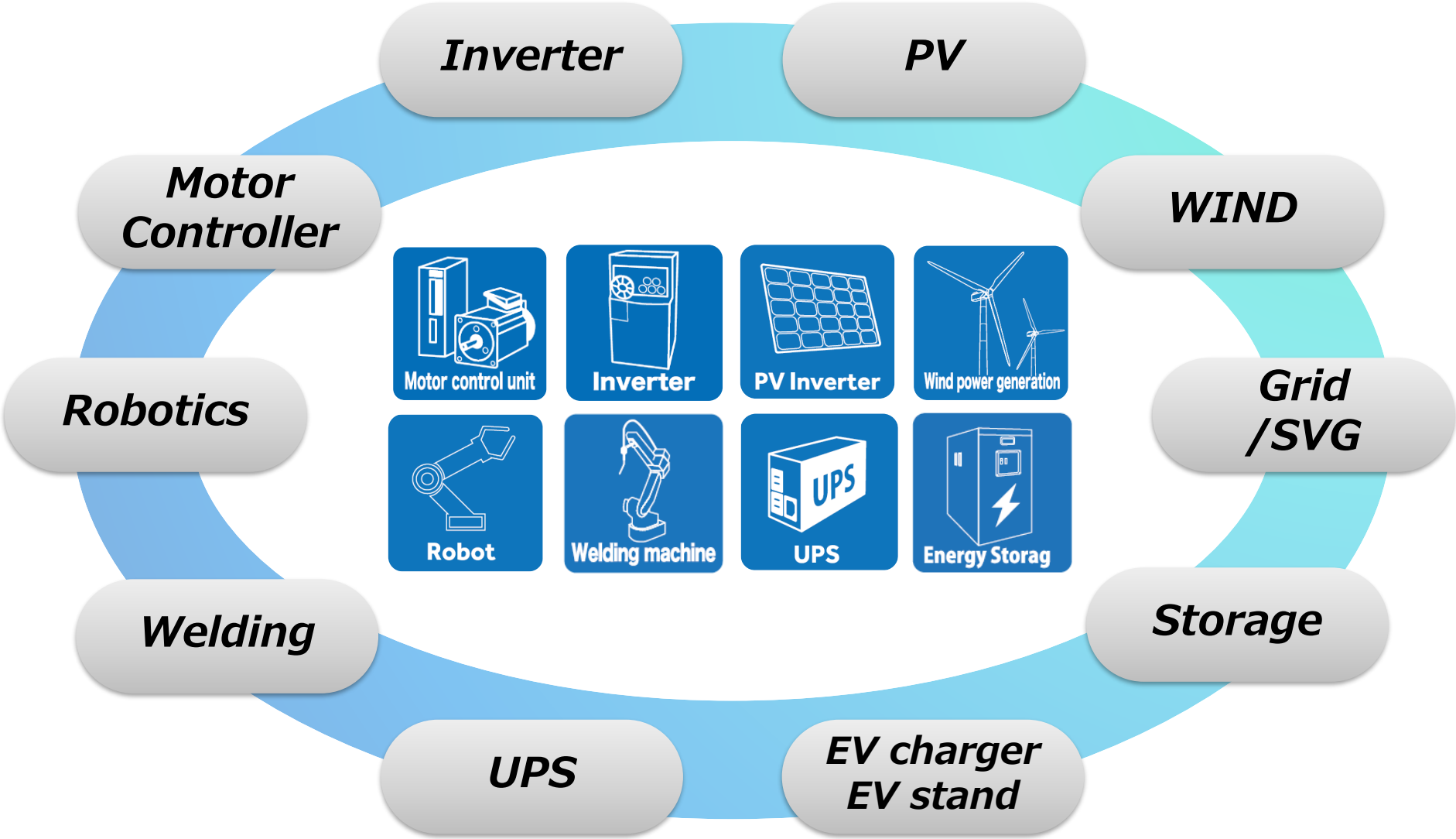
1-1 Application
1-2 Features of Gate driver module.
1-3 Product line-up
1-4 Reference board

2) Introduction of One Tamura

Appendix) Contact person

1. Solution Guide for SiC Power Module

1-1. Application



1. Solution Guide for SiC Power Module

1-2. Features of Gate driver module.

Features of All-SiC Power Module

Feature① Short circuit tolerance is lower than Si

Feature② Low threshold voltage VGS (th) (1V~3V)

Feature③ VGS(+) :On resistance does not decrease at 15V
VGS(−) :Low tolerance (Less than −5~4V)

Feature④ dV/dt can be set high

Feature⑤ High frequency operation is possible

Gate Driver Module solves all problems!

1. Solution Guide for SiC Power Module

1-2. Features of Gate driver module.

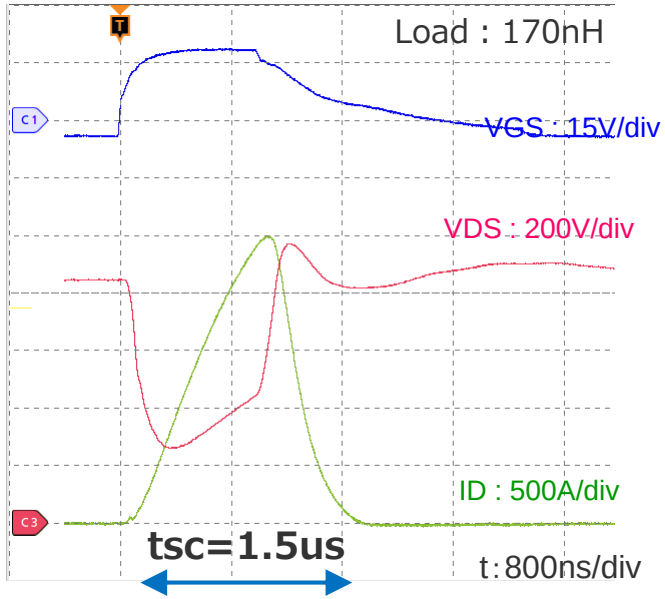
Feature ① Short circuit tolerance is lower than Si

Small chip area

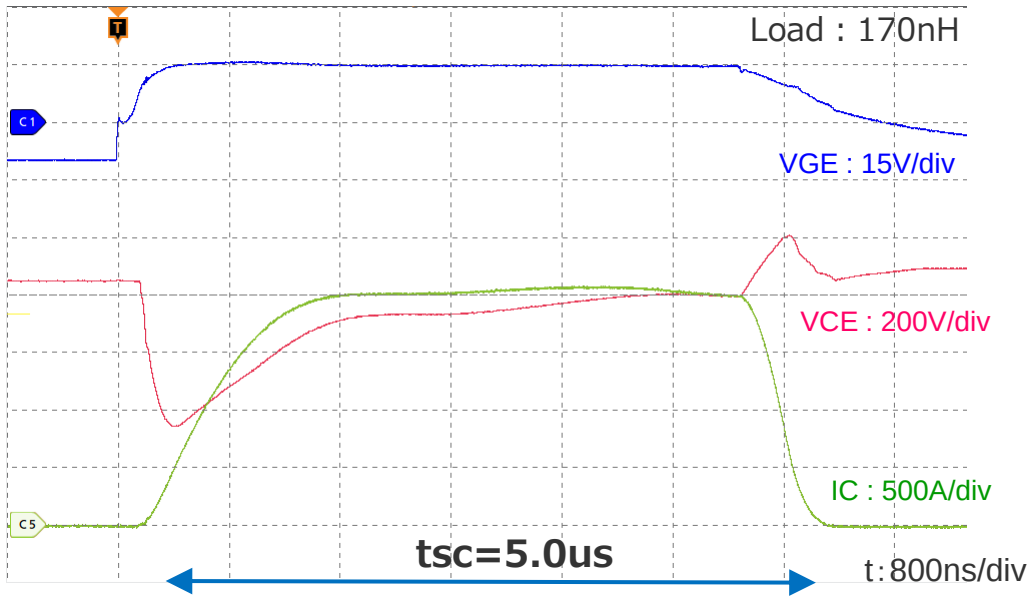
- Wide band gap
- High breakdown voltage
- High temperature operation

Support with a gate driver ・・・ Short-circuit mask time (tsc) adjustment function

SiC power module （1200V 300A）
Waveform with shorted load



IGBT power module (1200V 300A)
Waveform with shorted load



Adjustable with external capacitor capacity

Optimal value of SiC : 1.0~3.0us

Optimal value of IGBT : 3.0~7.0us

1. Solution Guide for SiC Power Module

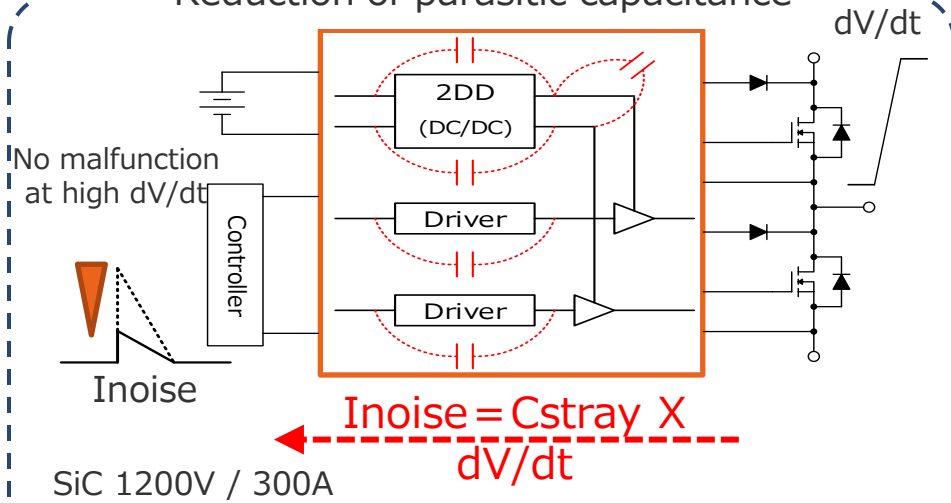
1-2. Features of Gate driver module.

Feature② Low threshold voltage VGS (th) (1V~3V)

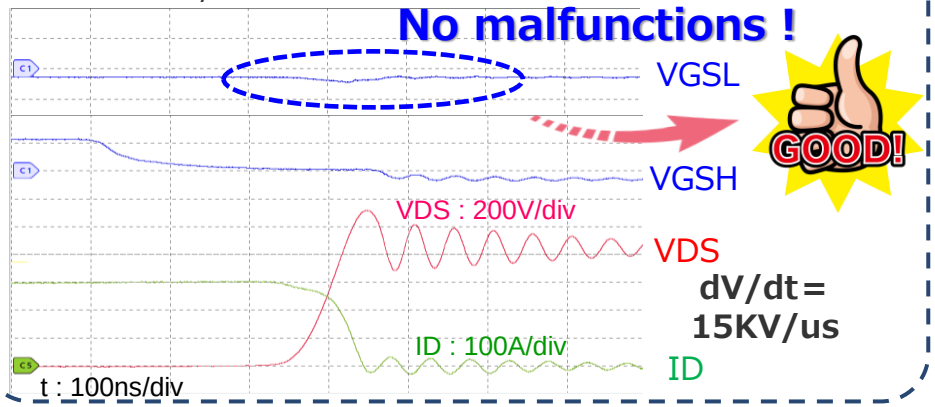
--- IGBT is 6V~7V --- Beware of malfunctions from IGBT

Support with a gate driver ･･･Reduction of parasitic capacitance and Miller clamp circuit

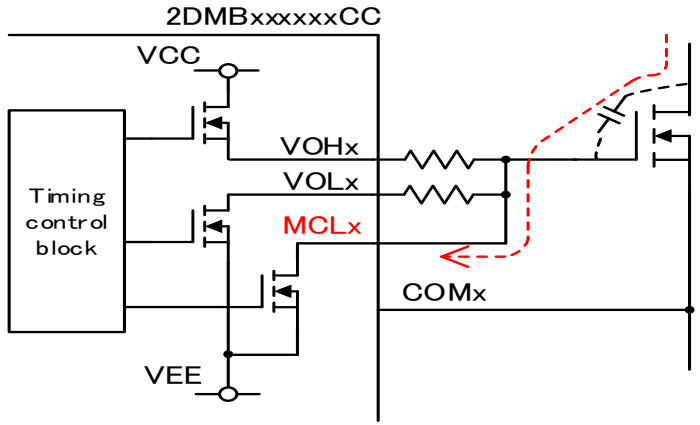
Reduction of parasitic capacitance

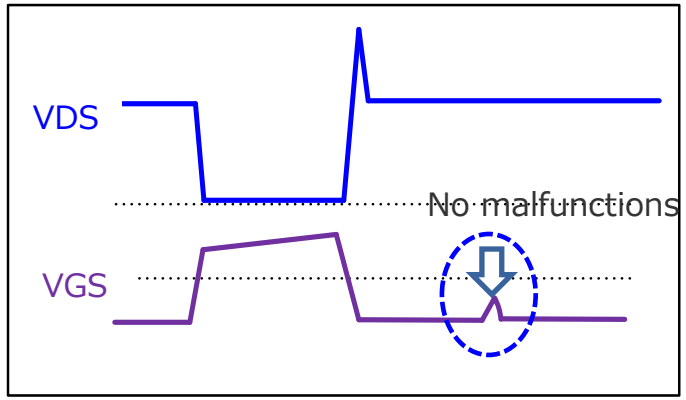


SiC 1200V / 300A



Miller clamp circuit





1. Solution Guide for SiC Power Module

1-2. Features of Gate driver module.

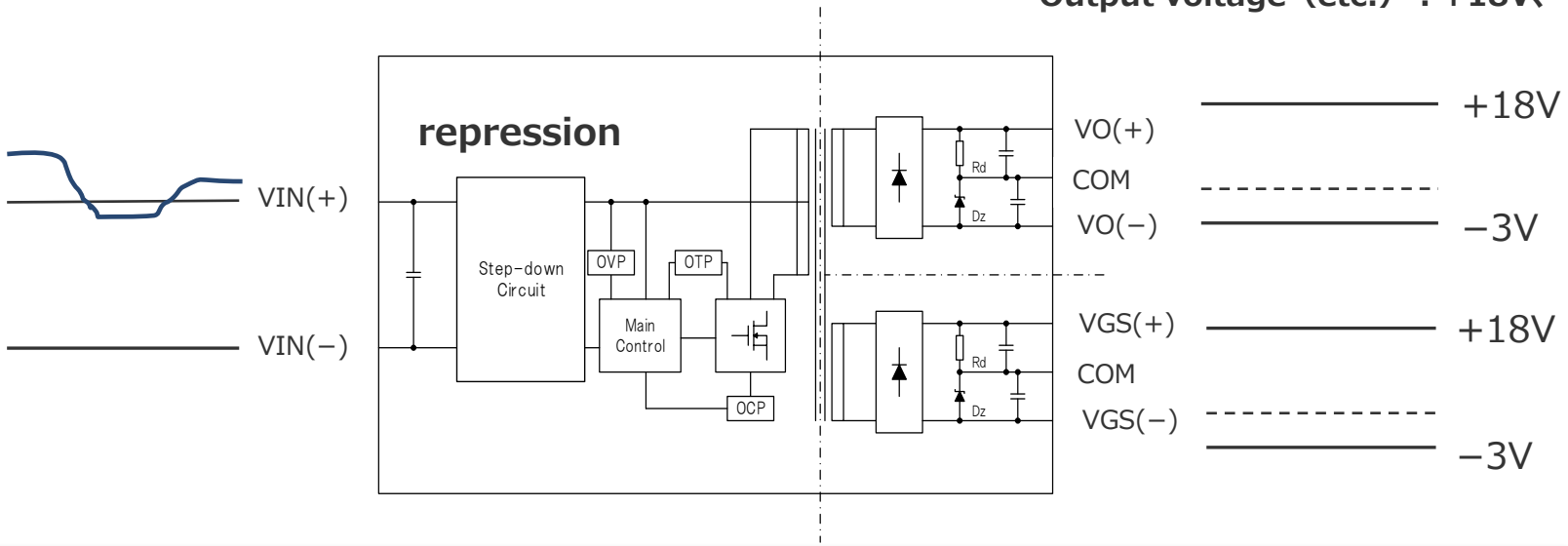
Feature③ VGS(+) :On resistance does not decrease at 15V
VGS(−) :Low tolerance（Less than −5~4V）

--- IGBT's Gate driver cannot be used

Support with a gate driver ･･･Constant voltage control of VGS

Input voltage : 13V~28V

Output voltage（etc.）: +18V、−3V



Controls the gate voltage to be constant even for input fluctuations
The gate voltage is constant even for output fluctuations
(SW frequency, QG of power module)

Improved SiC reliability
Low loss operation

1. Solution Guide for SiC Power Module

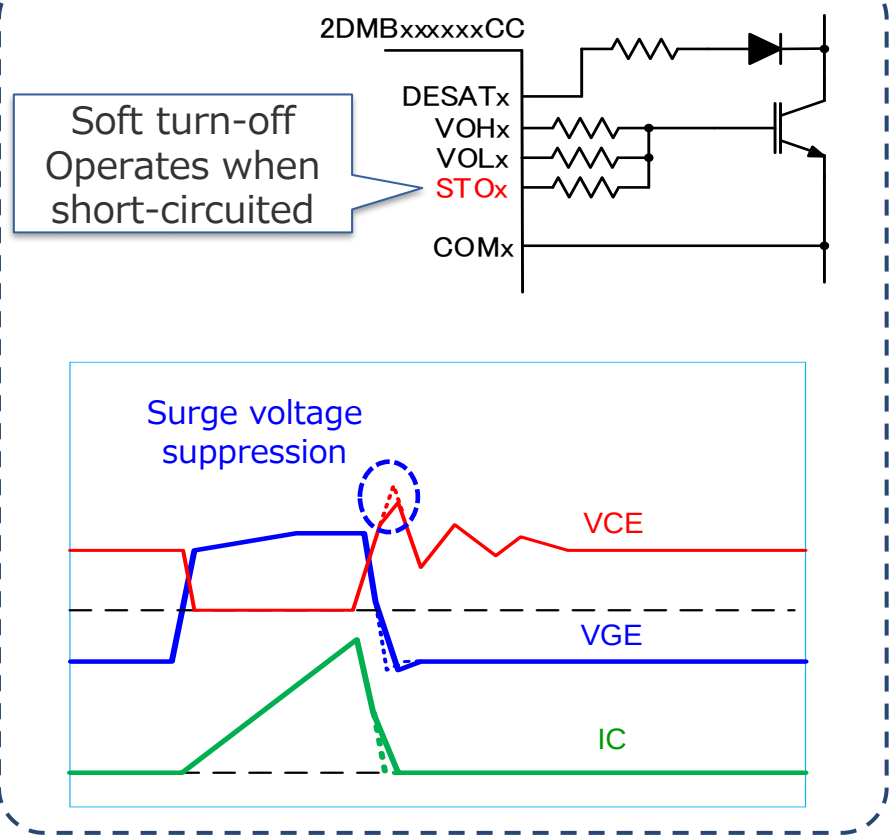
1-2. Features of Gate driver module.

Feature④ dV/dt can be set high

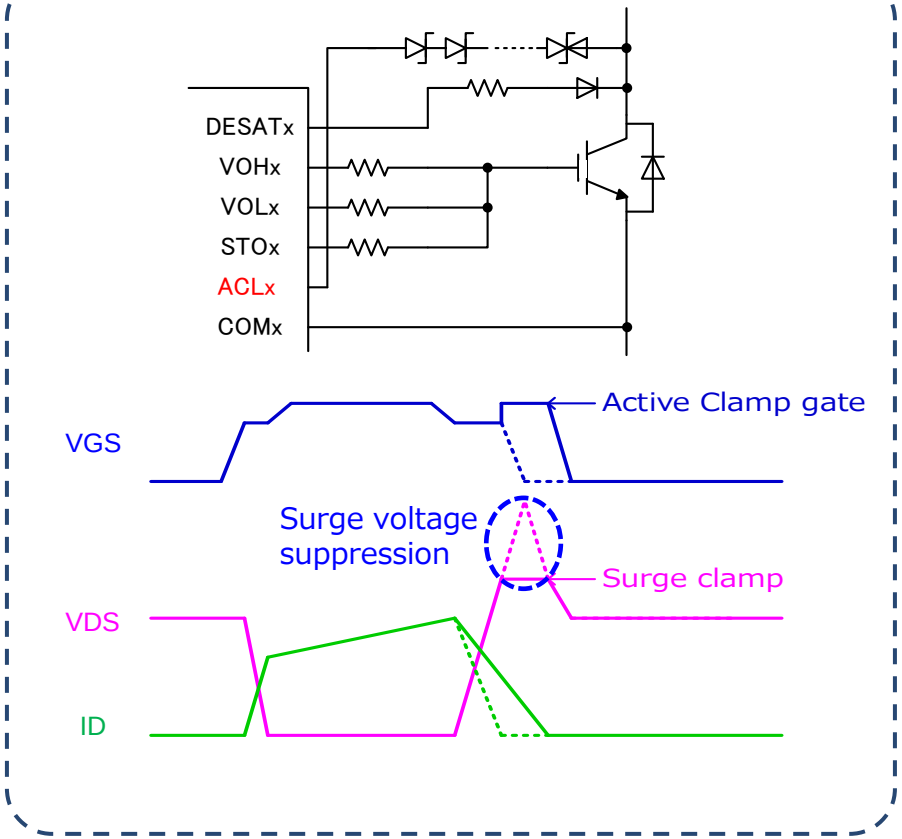
Turn-on: Recovery current is small
Turn-off: No tail current

Support with a gate driver ・・・Ability to suppress surge voltage with high dV/dt (Soft turn-off, Active clamp)

Soft turn-off



Active clamp (Option)



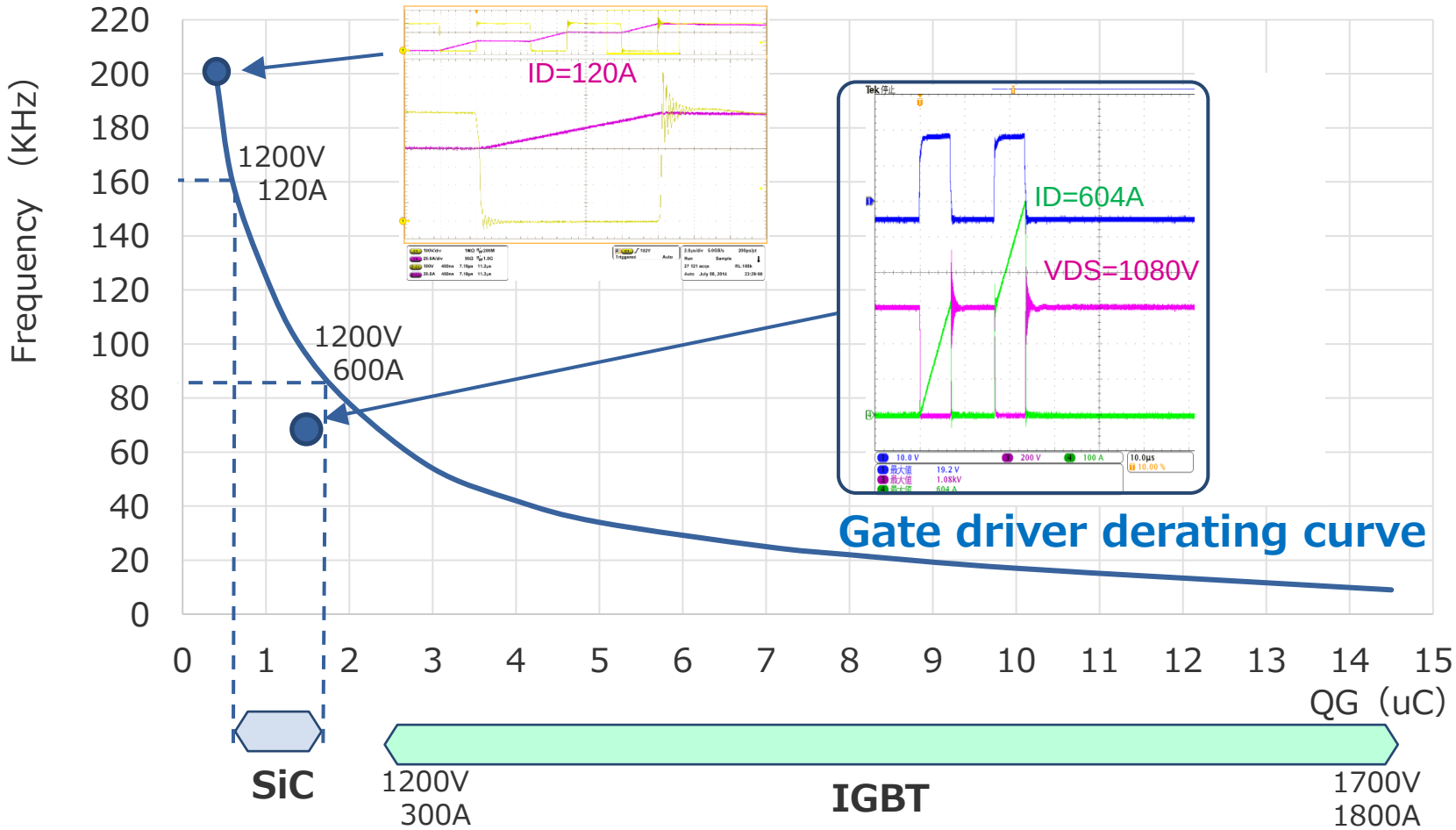
1. Solution Guide for SiC Power Module

1-2. Features of Gate driver module.

Feature⑤ High frequency operation is possible

Drive power needs to be increased

Support with a gate driver ・・・Output capacity considering SiC power module



1. Solution Guide for SiC Power Module

1-3. Product Line-up

Gate Driver Module 2CG-B series

		MODEL				
		2CG010BBC11N	2CG010BBC12N	2CG010BBC13N	2CG010BBC14N	2CG010BBC15N
Output	Output voltage(+)	+15V	+15V	+18V	+18V	+15V
	Output voltage(-)	-10V	-15V	-4V	-2V	-4V
	Output power/1ch	3.8W	3.3W	3.5W	3.2W	T.B.D
	Number of output	2				
	Peak output current	±43A				
Input	Input voltage	DC13~28V				
	Logic input voltage	DC3.3~5V				
Insulation	Withstand voltage	Primary to secondary AC5KV / Secondary to secondary AC4KV				
	Partial discharge extinction voltage	1768V peak				
Function	Mode select	Direct mode / Half bridge mode				
	DESAT protection	Yes				
	Soft turn off	Yes				
	Active clamp	No				
	Miller clamp	Yes				

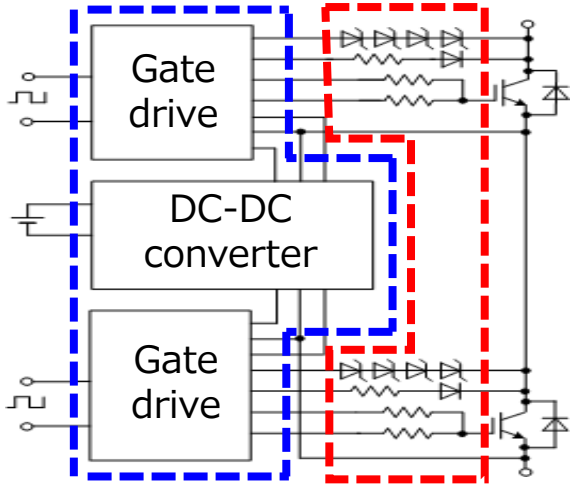
1. Solution Guide for SiC Power Module

1-4. Evaluation board (2RB020BB)

Rev A

Help your evaluation !

Gate Driver Module



Evaluation board

Can be connected directly !

Package	I_D	Part No	TAMURA Driver			
			Evaluation board		2CG-B	2DD
	V_{D-S} = 1200V					
	120	CAS120M12BM2		2RB020BB	2CG010BBC15N (+15/-4V) 	2DD1504xxC (+15V/-4V) 
	175	CAS175M12BM3				
	300	CAS300M12BM2				
	350	CAS350M12BM3				
	530	CAS530M12BM3				
		CAB530M12BM3				
	V_{D-S} = 1700V					
	225	CAS300M17BM2		2RB020BB	2CG010BBC15N (+15/-4V)	2DD1504xxC (+15V/-4V)

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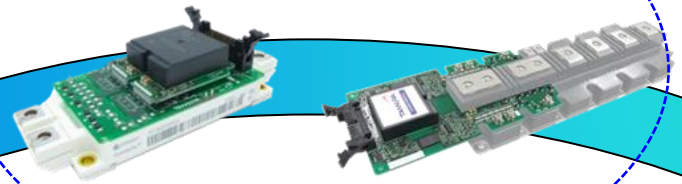
2) Introduction of One Tamura (General application)

Rev A

Power electronics technology and main products

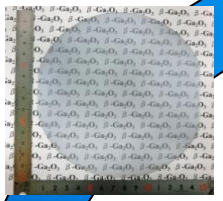
Gate driver
Circuit technology



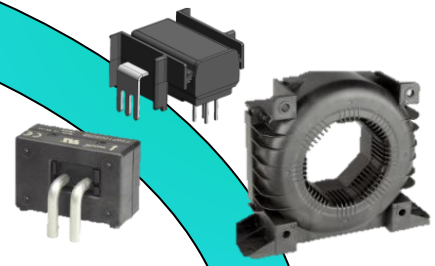
Gate Driver Unit

Device technology
Novel Crystal Technology, Inc.

Ga_2O_3

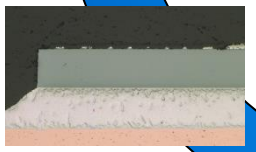


Module technology
Current sensor



Power electronics technology and main products

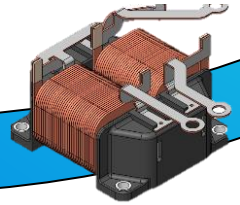
Soldering technology



Electric Chemicals
Soldering material
Die attach material
TIM material

Reflow soldering system

Automotive reactor



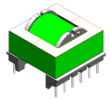
Reactor for PF
(2 in 1)

Passive components

Reactor
Trans
Coil

Large reactor/ transformer

Toroidal coil

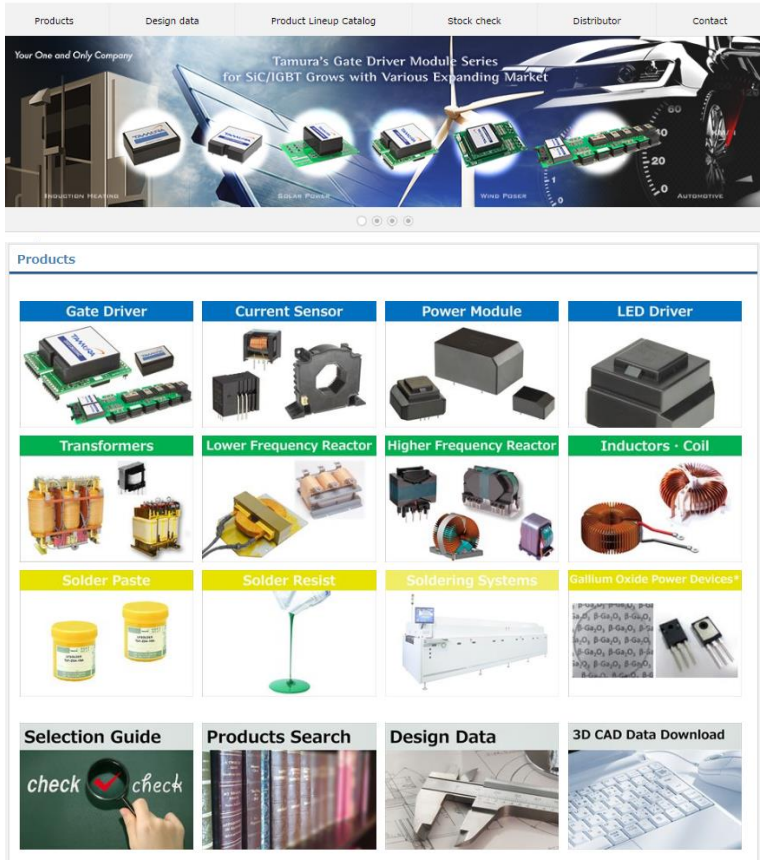


SW-Trans

Appendix) Information & Contact

Rev A

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!

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