SIMPLIFY YOUR DRIVER
- High capacity IGBT compatible Gate Driver–

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CONFIDENTIAL

TAM-GDM-00006
SIMPLIFY YOUR DRIVER
- High capacity IGBT compatible Gate Driver–

1. Tamura Products History for Power Electronics
   1-1. Tamura General History
   1-2. Tamura Gate Driver History
   1-3. Future of Tamura Gate Driver

2. Tamura Gate Driver Family Feature
   2-1. Pro and cons
   2-2. Diffusion of Power Modules
   2-3. Market trend of IGBT

3. Introduction of high capacity IGBT compatible Gate Driver
   3-1. Product features
   3-2. Gate Driver differences (SiC and IGBT)
   3-3. Performance comparison of other companies

4. New IGBT power module switching test data

5. Products Line-up

6. Conclusion and future development
   6-1. TAMURA Gate Driver Family Directional Development
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1. Products History for Power Electronics

1-1. General History

Since 1924

1924
RADIO

1930
Power Transformer

1939
Audio Transformer

1956
Power Supply

2007
Power Module
ZERO watt standby

2011
Power Module

2016~
SiC/IGBT
Gate Driver

1994
Current Sensor

CLOSED TYPE

OPEN TYPE

F Series

L Series

S Series

Further Expansion!!

2020
Large Current

More Products

CONFIDENTIAL
Confidential and Proprietary Information of TAMURA CORPORATION
1. Products History for Power Electronics

1-2. Gate Driver History

2018~

- 2DMB for SiC/IGBT
- 2DUC-E
- 4DUD
- 2DUD-P

2017

- 2DMB for SiC/IGBT
- 2DD of DC-DC converter

2016

- 2DM/2DU for SiC
- ROHM (SiC)

For NPC

For ANPC

For Parallel

High Power solution

2019

- FUJI (2in1)
- Infineon (2in1)

2018

- Mitsubishi (2in1)
- FUJI (4in1)
- Infineon (2in1)

2017

- Mitsubishi (2in1)
- FUJI (2in1)
- Infineon (2in1)

2016

- Mitsubishi (2in1)
- FUJI (2in1)
- Infineon (2in1)

ROHM (SiC)
1. **Products History for Power Electronics**

1-3. **Future of Gate Driver**

**2019~**

3~6 Parallel (Master and Slave)

- **2DUD-P**
- **4DUD**

- **ANPC/3 combination**

**2020**

- **DC method I-TYPE 3-Level**
- **NPC method T-TYPE 3-Level**

**2021**

- **ANPC method I-TYPE 3-Level**

**2022**

- **Parallel method \( \times 2, \times 3, \times 4 \cdots \)**

Renewable Energy Products

Wind power generation

Solar power generation

Power conditioner
■ SIMPLIFY YOUR DRIVER
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## 2. Gate Driver Family Feature

### 2-1. Pro and cons

<table>
<thead>
<tr>
<th>Item</th>
<th>Applied technology</th>
<th>Features</th>
<th>Compared with Competitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low stray capacity</td>
<td></td>
<td>Low noise at high frequencies</td>
<td></td>
</tr>
<tr>
<td>Wider input voltage</td>
<td></td>
<td>Supports 24V system</td>
<td></td>
</tr>
<tr>
<td>High Power DC-DC converter</td>
<td></td>
<td>High Frequency &amp; Large capacity</td>
<td></td>
</tr>
<tr>
<td>High-speed response &amp; accuracy</td>
<td></td>
<td>Parallel drive available</td>
<td></td>
</tr>
<tr>
<td>Various protections</td>
<td></td>
<td>Improved reliability</td>
<td></td>
</tr>
</tbody>
</table>
2-2. Diffusion of Power Modules

- Market growth · PV, and Wind power
- Motor control inverter (general-purpose inverter)
- Automotive (HV, PHV, EV)

**Topology Trend**

**Next-generation IGBT**
- Mitsubishi Electric: RFC diodes
- Fuji Electric: RC-IGBT
- Infineon: TRENCHSTOP

**Next-generation SiC**
- Trench structures
- Vth (2V→15V)

**2018 Inverter market**

**2021 Inverter market**

- IGBT
- SiC

- **SiC-MOSFET**
2-3. Market trend of IGBT

- **IGBT (Small capacity)**
- **IGBT (Large capacity)**
- **SiC**
- **EV charger**
- **Induction heating**
- **PV / WIND**

*Graph showing operating frequency (kHz) vs. immunity (kV/μs) with Tamura Technology and SiC areas.*
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2018~

2DUC-E
2DMB for SiC/IGBT

2017

2DD of DC-DC convertor

2016

2DM/2DU for SiC

ROHM / SiC

Mitsubishi (2in1)
FUJI (2in1)
Infineon (2in1)

FUJI (2in1)
Infineon (2in1)

Mitsubishi (2in1)
FUJI (2in1)
Infineon (2in1)

For NPC
For ANPC
For Parallel

High Power solution

2018

2017

2019

2020

More Products
3. Introduction of high capacity IGBT compatible Gate Driver

3-1. Product features

Infineon Technologies /EconoDUAL™

4W per channel

Fuji Electric /DUAL-XT

Frequency 200kHz (Max)

Mitsubishi Electric /NX-DX

Park Current 43A

PV Inverter

Wind power generation

Inverter

UPS

Motor control unit

Robot

EconoDUAL™ is registered trademark of Infineon Technologies AG, Germany.
### 3-2. Gate Driver differences (SiC and IGBT)

<table>
<thead>
<tr>
<th>Item</th>
<th>Condition (SiC-MOSFET)</th>
<th>Condition (IGBT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gate drive circuit</td>
<td>2 (Half bridge)</td>
<td>2 (Half bridge)</td>
</tr>
<tr>
<td>Gate voltage (H)/(L)</td>
<td>18V/-5V</td>
<td>15V/-10V</td>
</tr>
<tr>
<td>Protection function</td>
<td>DESAT, Miller clamp</td>
<td>DESAT, STO,ACL</td>
</tr>
<tr>
<td>Operating frequency</td>
<td>200kHz (MAX)</td>
<td>20kHz (MAX)</td>
</tr>
<tr>
<td>Stray capacity</td>
<td>12pF</td>
<td>30-40pF</td>
</tr>
<tr>
<td>Response</td>
<td>85nsec (TYP)</td>
<td>350nsec (TYP)</td>
</tr>
</tbody>
</table>

If the SiC-MOSFET can be driven, the IGBT can be driven easily!
### 3. Introduction of high capacity IGBT compatible Gate Driver

#### 3-2. Performance comparison of other companies

<table>
<thead>
<tr>
<th>Item</th>
<th>TAMURA</th>
<th>Company A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power module</td>
<td>SiC-MOSFET/IGBT</td>
<td>IGBT</td>
</tr>
<tr>
<td>Input Voltage</td>
<td>13-28V</td>
<td>15V</td>
</tr>
<tr>
<td>Output Voltage</td>
<td>15V/-10V</td>
<td>15V/-10V</td>
</tr>
<tr>
<td>Output power</td>
<td>○ 4W</td>
<td>1W</td>
</tr>
<tr>
<td>Frequency</td>
<td>○ 200kHz (Max)</td>
<td>20kHz (Max)</td>
</tr>
<tr>
<td>Output Peak current</td>
<td>○ 43A</td>
<td>15A</td>
</tr>
</tbody>
</table>

Large drive capacity makes it ideal for large capacity IGBTs!
3. Introduction of high capacity IGBT compatible Gate Driver

3-2. Performance comparison of other companies

Switching frequency range

- Drive range of Competitors
- Drive range of TAMURA

Increase of IGBT current
Supports high frequency!

- SiC area
- EV charger
- Induction heating
- AC motor drive
- PV / WIND

Operating frequency (KHz) →

The rated current of the power module (A) →

Competitors (1W/Ch)
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4. New IGBT power module switching test data

5. Products Line-up

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3. New IGBT power module switching test data

IGBT: FF900R12ME7_B11 (Infineon Technologies)

2DUC-E series Switching Test Data 1
2 Pulse Test

**DC Link**: 600V, Ron=Roff : 0.51Ω, Upper arm, Tj=150℃

**IGBT**: FF900R12ME7_B11 (Infineon)

C101,102,105,106 : 2700uF (Ls : 20nH)
C103,104 : 4.7uF (Ls : 20nH)
L101 : 22uH

---

**IGBT**: FF900R12ME7_B11 (Infineon)

<table>
<thead>
<tr>
<th>Item</th>
<th>Measurement value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Link</td>
<td>600 V</td>
</tr>
<tr>
<td>Ic</td>
<td>900 A</td>
</tr>
<tr>
<td>dV/dt</td>
<td>2.7 kV/us</td>
</tr>
<tr>
<td>di/dt</td>
<td>7.5 kA/us</td>
</tr>
<tr>
<td>td(on)</td>
<td>0.40 us</td>
</tr>
<tr>
<td>tr</td>
<td>0.12 us</td>
</tr>
<tr>
<td>Eon</td>
<td>172 mJ</td>
</tr>
</tbody>
</table>

**900A turn on**

**1800A turn off**

---

**Item** | **Measurement value** |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Link</td>
<td>600 V</td>
</tr>
<tr>
<td>Ic</td>
<td>1800 A</td>
</tr>
<tr>
<td>Vcep</td>
<td>973 V</td>
</tr>
<tr>
<td>dV/dt</td>
<td>5.2 kV/us</td>
</tr>
<tr>
<td>di/dt</td>
<td>12.4 kA/us</td>
</tr>
<tr>
<td>td(off)</td>
<td>0.56 us</td>
</tr>
<tr>
<td>tf</td>
<td>0.28 us</td>
</tr>
<tr>
<td>Eoff</td>
<td>240 mJ</td>
</tr>
</tbody>
</table>
2 Pulse Test

DC Link: 600V, Ron=Roff: 0.51Ω, Upper arm, Tj=-40°C

IGBT : FF900R12ME7_B11 (Infineon)

2DUC51008DXE1

Low temp test

900A turn on

Vce : 200V/div

Ic : 500A/div

Vge : 10V/div

1200A turn off

Vce : 200V/div

Ic : 500A/div

Vge : 10V/div

Item | Measurement value
--- | ---
DC Link | 600 V
Ic | 900 A
dV/dt | 4.2 kV/us
di/dt | 9.2 kA/us
td(on) | 0.36 us
tr | 0.10 us
Eon | 108 mJ

Item | Measurement value
--- | ---
DC Link | 600 V
Ic | 1200 A
Vce | 1197 V
dV/dt | 8.0 kV/us
di/dt | 16.3 kA/us
td(off) | 0.47 us
tf | 0.07 us
Eoff | 82 mJ
Desaturation Protection

DC Link: 600V, Ron=Roff: 0.51Ω, Upper arm, Tj=150°C

Load inductance: 170nH

SOA

<table>
<thead>
<tr>
<th>Item</th>
<th>Measurement value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vcep</td>
<td>750 V</td>
</tr>
<tr>
<td>Icp</td>
<td>3318 A</td>
</tr>
<tr>
<td>tsc</td>
<td>4.7 us</td>
</tr>
</tbody>
</table>

Load inductance: 7uH

<table>
<thead>
<tr>
<th>Item</th>
<th>Measurement value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vcep</td>
<td>674 V</td>
</tr>
<tr>
<td>Icp</td>
<td>3487 A</td>
</tr>
</tbody>
</table>

IGBT: FF900R12ME7_B11 (Infineon)
Desaturation Protection

DC Link: 600V, Ron=Roff: 0.51Ω, Upper arm, Tj=-40°C

Load inductance: 170nH

<table>
<thead>
<tr>
<th>Item</th>
<th>Measurement value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vcep</td>
<td>752 V</td>
</tr>
<tr>
<td>Icp</td>
<td>3841 A</td>
</tr>
<tr>
<td>tsc</td>
<td>4.9 us</td>
</tr>
</tbody>
</table>

Vge: 10V/div
Vce: 200V/div
Ic: 1kA/div

t: 2us/div

Load inductance: 7μH

<table>
<thead>
<tr>
<th>Item</th>
<th>Measurement value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vcep</td>
<td>759 V</td>
</tr>
<tr>
<td>Icp</td>
<td>3805 A</td>
</tr>
</tbody>
</table>

Vge: 10V/div
Vce: 200V/div
Ic: 1kA/div

t: 10us/div

IGBT: FF900R12ME7_B11 (Infineon)

1.2kV

SOA
3. New IGBT power module switching test data

IGBT:CM800DX-24T1 (Mitsubishi Electric)

2DUC-E series Switching Test Data 1
DC Link: 600V, Ron: 1Ω, Roff: 10Ω, Upper arm, Tj=150°C

<table>
<thead>
<tr>
<th>Item</th>
<th>DC Link</th>
<th>Ic</th>
<th>dV/dt</th>
<th>di/dt</th>
<th>td(on)</th>
<th>tr</th>
<th>Eon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement value</td>
<td>600 V</td>
<td>800 A</td>
<td>2.2 kV/us</td>
<td>7.2 kA/us</td>
<td>0.37 us</td>
<td>0.14 us</td>
<td>99 mJ</td>
</tr>
</tbody>
</table>

IGBT: CM800DX-24T1 (Mitsubishi)
C101, 102, 105, 106: 2700uF (Ls: 20nH)
C103, 104: 4.7uF (Ls: 20nH)
L101: 22uH

High temp test

800A turn on
1600A turn off
2 Pulse Test

DC Link: 600V, Ron: 1Ω, Roff: 10Ω, Upper arm, Tj=-40°C

IGBT: CM800DX-24T1 (Mitsubishi)

Vce: 200V/div
Vge: 10V/div
Ic: 500A/div

Item | Measurement value |
--- | --- |
DC Link | 600 V |
Ic | 800 A |
dV/dt | 3.2 kV/us |
di/dt | 8.9 kA/us |
\(t\text{d(on)}\) | 0.33 us |
\(tr\) | 0.08 us |
\(E_{\text{on}}\) | 46 mJ |

800A turn on

1600A turn off

Ic: 500A/div

Item | Measurement value |
--- | --- |
DC Link | 600 V |
Ic | 1600 A |
Vcep | 840 V |
dV/dt | 4.3 kV/us |
di/dt | 8.0 kA/us |
\(t\text{d(off)}\) | 1.45 us |
\(tf\) | 0.18 us |
\(E_{\text{off}}\) | 236 mJ |
Desaturation Protection

**DC Link**: 600V,  Ron: 1Ω,  Roff: 10Ω,  Upper arm,  Tj=150°C

**Load inductance**: 170nH

**High temp test**

**Stable tw**

**Load inductance**: 7μH

**IGBT**: CM800DX-24T1 (Mitsubishi)

**SOA**

**Item** | **Measurement value**
--- | ---
Vce | 738 V
Icp | 3312 A
tw | 5.1 us

**Item** | **Measurement value**
--- | ---
Vce | 711 V
Icp | 2657 A
tw | 5.1 us

**GND level**

**Vcep**

**Icp**

**tw**

**Load inductance**

**t**: 2us/div

**Vce**: 200V/div

**Vge**: 10V/div

**Ic**: 1kA/div

**t**: 10us/div
Desaturation Protection

DC Link: 600V, \( R_{on} = 1\, \Omega \), \( R_{off} = 10\, \Omega \), Upper arm, \( T_j = -40^\circ C \)

Load inductance: 170nH

Low temp test

<table>
<thead>
<tr>
<th>Item</th>
<th>Measurement value</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_{cep} )</td>
<td>811 V</td>
</tr>
<tr>
<td>( I_{cp} )</td>
<td>4182 A</td>
</tr>
<tr>
<td>( t_{w} )</td>
<td>5.0 us</td>
</tr>
</tbody>
</table>

Stable tw

Load inductance: 7uH

<table>
<thead>
<tr>
<th>Item</th>
<th>Measurement value</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_{cep} )</td>
<td>795 V</td>
</tr>
<tr>
<td>( I_{cp} )</td>
<td>3165 A</td>
</tr>
<tr>
<td>( t_{w} )</td>
<td>5.1 us</td>
</tr>
</tbody>
</table>

IGBT: CM800DX-24T1 (Mitsubishi)

SOA
## 5. Products Line-up

### 5-1. Product line-up for Infineon Technologies EconoDUAL™ 2in1 Type

<table>
<thead>
<tr>
<th>Package</th>
<th>Output power (Ref.)</th>
<th>Ic</th>
<th>Part No</th>
<th>Number of parallel</th>
<th>TAMURA Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>2DUC-E</strong> *</td>
</tr>
<tr>
<td>20kW</td>
<td>150</td>
<td>FF150R12MS4G</td>
<td></td>
<td>1</td>
<td>2DUC51008CXE1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FF225R12ME4</td>
<td></td>
<td></td>
<td>2DUC51008CXE1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FF225R12MS4</td>
<td></td>
<td></td>
<td>2DUC51008CXE1</td>
</tr>
<tr>
<td>30kW</td>
<td>225</td>
<td>FF300R12ME4</td>
<td></td>
<td>1</td>
<td>2DUC51008CXE1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FF300R12MS4</td>
<td></td>
<td></td>
<td>2DUC51008CXE1</td>
</tr>
<tr>
<td>50kW</td>
<td>300</td>
<td>FF450R12ME4</td>
<td></td>
<td>1</td>
<td>2DUC51008CNE3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FF450R12MS4</td>
<td></td>
<td></td>
<td>2DUC51008CNE3</td>
</tr>
<tr>
<td>100kW</td>
<td>450</td>
<td>FF600R12ME4</td>
<td></td>
<td>1</td>
<td>2DUC51008CNE2</td>
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<tr>
<td>125kW</td>
<td>600</td>
<td>FF900R12ME7</td>
<td></td>
<td>1</td>
<td>2DUC51008CNE1</td>
</tr>
<tr>
<td>150kW</td>
<td>900</td>
<td>FF125R12ME4</td>
<td></td>
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<td>2DUC51008CXE1</td>
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<td></td>
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<td>FF125R12MS4</td>
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<td>FF150R12ME4</td>
<td></td>
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<td>2DUC51008CXE1</td>
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<td></td>
<td></td>
<td>FF150R12MS4</td>
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<td>2DUC51008CXE1</td>
</tr>
<tr>
<td>TBC</td>
<td>225</td>
<td>FF225R17ME4</td>
<td></td>
<td>1</td>
<td>2DUC51008CXE1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FF300R17ME4</td>
<td></td>
<td></td>
<td>2DUC51008CNE7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FF450R17ME4</td>
<td></td>
<td></td>
<td>2DUC51008CNE6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FF600R17ME4</td>
<td></td>
<td></td>
<td>2DUC51008CNE5</td>
</tr>
</tbody>
</table>

Vce = 1200V

Vce = 1700V

*TConsider evaluation on customer's request.*

EconoDUAL™ is registered trademark of Infineon Technologies AG, Germany.
5. Products Line-up

Product line-up for **Mitsubishi Electric NX-DX 2in1 Type**

<table>
<thead>
<tr>
<th>Package</th>
<th>Output power (Ref.)</th>
<th>Ic</th>
<th>Part No</th>
<th>TAMURA Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Number of parallel: 1</td>
</tr>
<tr>
<td>30kW</td>
<td>225</td>
<td>CM225DX-24T</td>
<td>2DUC51008CXE1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM225DX-24T</td>
<td>2DUC51008CME3</td>
<td></td>
</tr>
<tr>
<td>50kW</td>
<td>300</td>
<td>CM300DX-24T</td>
<td>2DUC51008CME2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM300DX-24T</td>
<td>2DUC51008CME1</td>
<td></td>
</tr>
<tr>
<td>100kW</td>
<td>450</td>
<td>CM450DX-24T</td>
<td>2DUC51008CME6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM450DX-24T</td>
<td>2DUC51008CME5</td>
<td></td>
</tr>
<tr>
<td>125kW</td>
<td>600</td>
<td>CM600DX-24T</td>
<td>2DUC51008CME4</td>
<td></td>
</tr>
<tr>
<td>150kW</td>
<td>900</td>
<td>CM800DX-24T</td>
<td>2DUC51008CME3</td>
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</tr>
<tr>
<td>TBC</td>
<td>225</td>
<td>CM225DX-34T</td>
<td>2DUC51008CXE1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>300</td>
<td>CM300DX-34T</td>
<td>2DUC51008CME6</td>
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</tr>
<tr>
<td></td>
<td>450</td>
<td>CM450DX-34T</td>
<td>2DUC51008CME5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>600</td>
<td>CM600DX-34T</td>
<td>2DUC51008CME4</td>
<td></td>
</tr>
</tbody>
</table>

**Vce = 1200V**

*Consider evaluation on customer's request.*
### 5. Products Line-up

#### 5-3. Product line-up for Fuji Electric Dual-XT 2in1 Type

| Package | Output power (Ref.) | Ic  | Part No                | Number of parallel | TAMURA Driver                  |
|---------|---------------------|-----|------------------------|--------------------|---------------------------------
|         |                     |     |                        |                    | **2DUC-E** * | **2DMB** | **2DD** |
| 30kW    |                     | 225 | 2MBI225XNA120-50       | 1                  | 2DUC51008CXE1                     |
|         |                     |     | 2MBI300XNA120-50       |                    | 2DUC51008CFE5                     |
|         |                     |     | 2MSI300VAN-120-53      |                    | 2DUC51008CXE1                     |
|         |                     |     | 2MSI300VWAN-120-53     |                    | 2DUC51008CXE1                     |
| 50kW    |                     | 300 | 2MBI450XNA120-50       | 1                  | 2DUC51008CXE1                     |
|         |                     |     | 2MSI450VAN-120-53      |                    | 2DUC51008CXE1                     |
|         |                     |     | 2MSI450VWAN-120-53     |                    | 2DUC51008CXE1                     |
| 100kW   |                     | 450 | 2MBI600XNG120-50       | 1                  | 2DUC51008CXE1                     |
|         |                     |     | 2MBI600XNE120-50       |                    | 2DUC51008CXE1                     |
|         |                     |     | 2MSI600VAN-120-53      |                    | 2DUC51008CXE1                     |
| 125kW   |                     | 600 | 2MBI800XNE120-50       | 1                  | 2DUC51008CXE1                     |
|         |                     |     | 2MBI1000XRNE120-50     |                    | 2DUC51008CXE1                     |
| 150kW   |                     | 800 | 2MBI1000XRNE120-50     | 1                  | 2DUC51008CXE1                     |
|         |                     | 1000| 2MBI1000XRNE120-50     |                    | 2DUC51008CXE1                     |
|         |                     |     |                        |                    | Vce = 1700V                       |
| TBC     | 225                 | 2MBI225XNA170-50       | 1                  | 2DUC51008CXE1                     |
|         | 300                 | 2MBI300XNA170-50       | 1                  | 2DUC51008CXE1                     |
|         | 450                 | 2MBI450XNA170-50       | 1                  | 2DUC51008CXE1                     |
|         | 550                 | 2MSI550VAN-170-53      | 1                  | 2DUC51008CXE1                     |
|         | 600                 | 2MBI600XNG170-50       | 1                  | 2DUC51008CXE1                     |
|         |                     |     | 2MBI600XNE170-50       |                    | 2DUC51008CXE1                     |

Vce = 1200V

*Consider evaluation on customer's request.*
SIMPLIFY YOUR DRIVER
- High capacity IGBT compatible Gate Driver–

1. Tamura Products History for Power Electronics
   1-1. Tamura General History
   1-2. Tamura Gate Driver History
   1-3. Future of Tamura Gate Driver

2. Tamura Gate Driver Family Feature
   2-1. Pro and cons
   2-2. Diffusion of Power Modules
   2-3. Market trend of IGBT

3. Introduction of high capacity IGBT compatible Gate Driver
   3-1. Product features
   3-2. Gate Driver differences (SiC and IGBT)
   3-3. Performance comparison of other companies

4. New IGBT power module switching test data

5. Products Line-up

6. Conclusion and future development
   6-1. TAMURA Gate Driver Family Directional Development
6. Conclusion and future development

6-1. TAMURA Gate Driver Family Directional Development (SiC / DUAL)

- DC-DC converter 2DD (Complete)
- Gate driver module 2DMB (Complete)
- Gate driver Unit 2DU (Complete)
- Gate driver Unit 2DUB (Development)
- Gate driver Unit 2DUC-E (Complete)
- Gate driver Unit 2DUC-E ×3 (Complete)
- SiC 1200V
- SiC 1700V
- DUAL
- 3-combination

Topology

- SiC
- ANPC I-TYPE 3-Level
- Parallel ×2,3,4
6. Conclusion and future development

6-1. TAMURA Gate Driver Family Directional Development PrimePACK™

- DC-DC converter 2DD
  - Complete

- Gate driver module 2DMB
  - Complete

- Gate driver Unit 2DUD-P
  - Complete

- Gate driver Unit 2DUD-Q
  - Development

- Gate driver Unit 4DUD
  - Complete

- Gate driver Unit 4DWD
  - Development

- Gate driver Unit 2DUD-Q
  - Development

- PrimePACK™

- PrimePACK™ 3+

- 3-combination

- Parallel drive

- 3-Level

- Parallel ×2,3,4

- NPC T-TYPE 3-Level

- ANPC I-TYPE 3-Level

PrimePACK™ is registered trademark of Infineon Technologies AG, Germany.
PrimePACK™ 3+ is registered trademark of Infineon Technologies AG, Germany.
6. Conclusion and future development

6-1. TAMURA Gate Driver Family Directional Development

DC-DC converter 2DD
Gate driver module 2DMB

Gate driver Unit 2DUD-*
Development

Single

3-Parallel

Gate driver Unit 2DUD-*
Development

3-combination

Multi Parallel

Parallel ×2,3,4

ANPC I-TYPE 3-Level
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- One-click to purchase from the check stock!

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