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TAMURA

ELECTRONICS COMPONENTS

Gate Driver 



Your One and Only Company

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Introduction

What is Gate Driver ?

This is a dedicated module for SiC MOSFET / IGBT gate drive.
 This is an integrated module with a built-in DC-DC converter and a dedicated drive circuit, and is suitable for power conditioner, inverters and gate drive for the IGBT of motor drive and the SiC MOSFET of next generation.

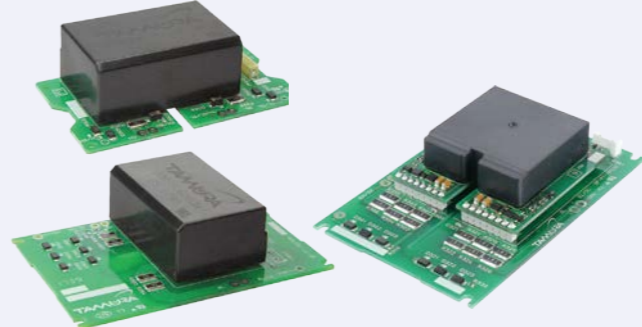
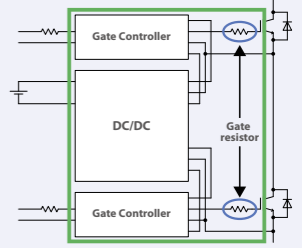

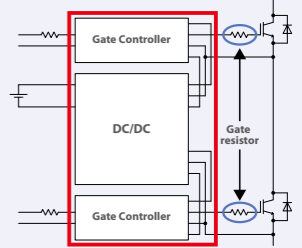
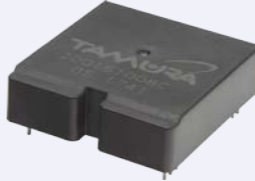
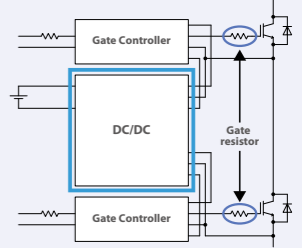
Features

Wide Input Voltage

Low Stray Capacity

High-Speed Response & Accuracy

Gate Drivers Family Selection guide

Products	Outline	
Use non adjust gate driver	<p>Gate Driver Unit</p>  <p>2DU Series 2DUB Series</p>	
Use the gate driver	<p>Gate Driver Module</p>  <p>2DM series*1 2DMB series*1</p>	
Design by oneself	<p>DC-DC Power Supply</p>  <p>2DD Series</p>	

*1 Customers need to prepare connection boards, gate resistors.

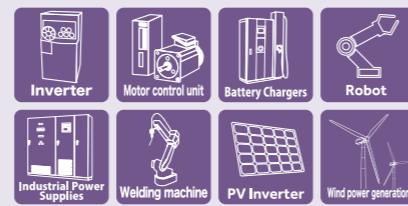
Product Lineup

DC-DC Converter for gate drive

2DD series



Applications



Features

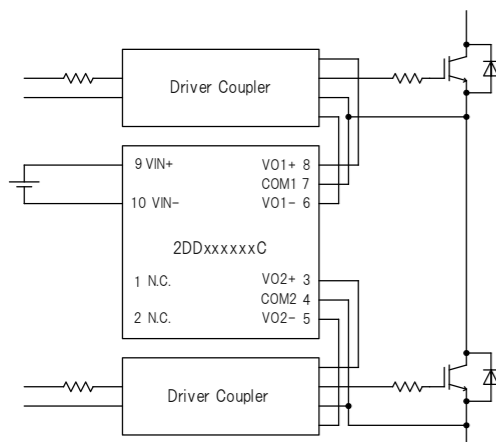
1. High insulation voltage (AC5kV)
2. Low stray capacity (9pF TYP)
3. Low profile (12.5mm)
4. Dual output corresponding to 2 in 1
5. Wide input voltage range (DC13V-28V)

Standards

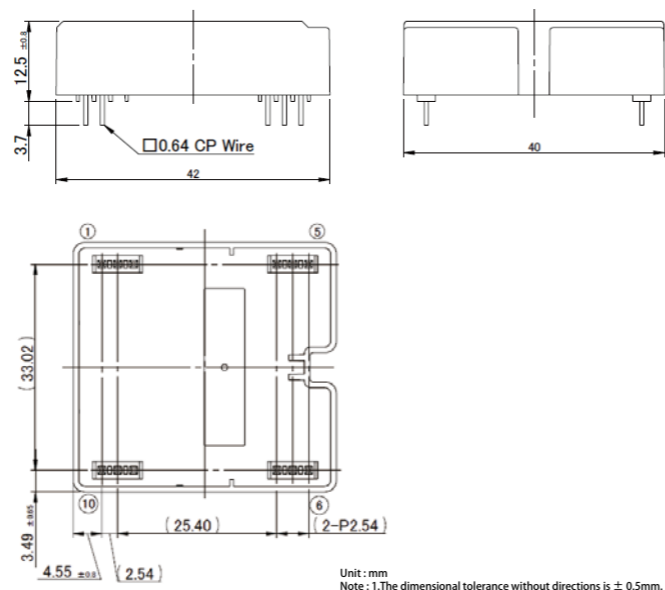
UL508 (file no.E243511)

The 2DD series is a dedicated DC-DC Converter for driving various SiC and IGBT power modules. The low parasitic capacitance (9pF) and Insulation voltage (5kV) make this product ideal for driving IGBT and SiC.

Application Image



Outline Dimensional Drawing



General characteristics

Model	2DD151507C	2DD151008C	2DD180407C	2DD180206C
Input Voltage Range	DC13V ~ 28V			
Number of Output	2			
Output Voltage (High) Vo1+,Vo2+	+14V ~ +16V	+14V ~ +16V	+17V ~ +19V	+17V ~ +19V
Output Voltage (Low) Vo1-,Vo2-	-14V ~ -16V	-9V ~ -11V	-3V ~ -5V	-1V ~ -3V
Rated Load (per 1ch)	0.11A	0.16A	0.16A	0.16A
Efficiency (DC24V, Rated load, Ta=25°C)	78.0% (typ)	78.0% (typ)	78.0% (typ)	77.0% (typ)
Line Regulation (Rated load, Ta=25°C)	50mV (typ)	50mV (typ)	50mV (typ)	50mV (typ)
Load Regulation (DC24V, 10mA ~ Rated load, Ta=25°C)	150mV (typ)	200mV (typ)	150mV (typ)	150mV (typ)
Ripple	250mVpp	150mVpp	150mVpp	150mVpp
Ripple & Noise	300mVpp	200mVpp	200mVpp	200mVpp
Protection	Over Current Protection	Auto recovery		
	Over Temperature Protection	Auto recovery		
Insulation	Withstand voltage	Primary to secondary : AC5000V		
		Secondary to secondary : AC4000V		
	Insulation Resistance	DC500V 100MΩmin		
Isolation Capacitance	9pF (typ)			
Environment	Ambient Temperature (Operating)	-40 ~ +85°C (Input Voltage : DC13V ~ 18V)		
		-40 ~ +75°C (Input Voltage : DC13V ~ 28V)		
	Ambient Humidity (Storage)	20 ~ 95%RH (No condensation)		
	Ambient Temperature (Storage)	-40 ~ +90°C		
	Ambient Humidity (Storage)	5 ~ 95%RH (No condensation)		
	Vibration	10 ~ 55HZ 1.5mmp-p 120min X,Y,Z direction each once		
Shock	490m/s ² 11ms X,Y,Z direction each once			

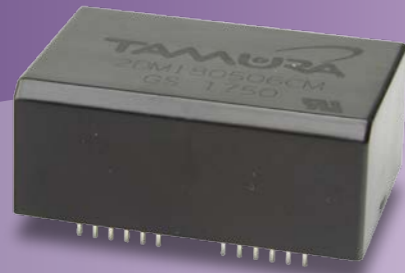
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Pin assignment

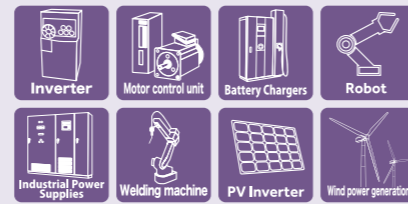
Pin No.	Name
1	N.C.
2	N.C.
3	VO2+
4	COM2
5	VO2-
6	VO1-
7	COM1
8	VO1+
9	VIN+
10	VIN-

Product Lineup

2DM Series



Applications



Features

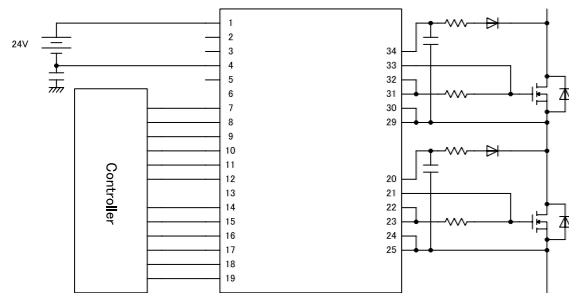
1. Low common mode noise (parasitic capacitance: 15pF TYP)
2. Fast response (100ns TYP)
3. All-in-one (built-in DC-DC converter/ Gate driver)
4. It corresponds to a module of 2in1 type. 2 drive circuits are separate respectively.
5. Dielectric withstand voltage: AC2500Vrms
5. Electrolytic capacitor-less

Standards

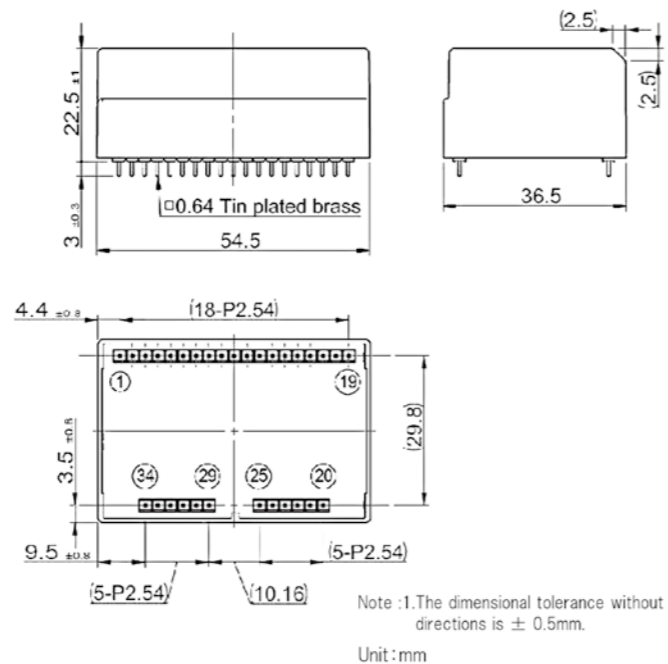
UL508 (file no. E243511)

The 2DM series is a product that integrates a gate drive dedicated DC-DC converter and a gate drive circuit.
It corresponds to various power modules by adding external gate resistor of your choice.

Application Image



Outline Dimensional Drawing



General characteristics

Model		2DM180506CM	2DM180206CM	2DM150806CM	2DM150606CM
Input	Supply voltage range	DC13V to DC28V / DC24V			
	Input signal voltage	5V			
Output	Number of drive circuits	2			
	Maximum output power	3W (per circuit)			
	Output terminal voltage (H)	+17V ~ +19V	+17V ~ +19V	+14V ~ +16V	+14V ~ +16V
	Output terminal voltage (L)	-4V ~ -6V	-1V ~ -3V	-7V ~ -9V	-5V ~ -7V
	Switching frequency	200kHz max			
	Gate drive capability	2400nC / 50kHz	2800nC / 50kHz	2400nC / 50kHz	2600nC / 50kHz
		600nC / 200kHz	700nC / 200kHz	600nC / 200kHz	650nC / 200kHz
(When the output power per circuit is equivalent to 3W)					
Maximum output current	18A peak (guaranteed by design)				
Delay time	100nsec. (typ.)				
Mirror clamp detection	Operation with Output terminal voltage +2Vtyp. ; - 3A peak (guaranteed by design)				
Desaturation protection function	Fault signal output function; Recovery by turning on the reset input again.				
Signal transmission method (isolation circuit)	Magnetic Isolator				
Dielectric withstand voltage	AC2500V/ 1min. Note: Between primary and secondary; Between drive circuits				
Operating temperature range	-40°C to +85°C; Maximum output power at 85°C : Approximately 1W (per circuit) Note: Temperature derating may occur depending on the drive conditions.				
Operating humidity range	20% to 95% RH (No condensation)				

Pin assignment

Input side

Pin No.	Name	CH	Explanation of pins
1	Vin(+)	Common	Power supply pin for DC/DC converter(+)
2	N.C.	-	Unused pin *Don't connect with other circuits.
3	N.C.	-	Unused pin *Don't connect with other circuits.
4	Vin(-)	Common	Power supply pin for DC/DC converter(-)
5	N.C.	-	Unused pin *Don't connect with other circuits.
6	N.C.	-	Unused pin *Don't connect with other circuits.
7	XRST1	1	Reset input pin
8	FLT1	1	Fault output pin
9	RDY1	1	Ready output pin
10	INB1	1	Opposite driver's control input pin
11	INA1	1	Control input pin
12	GND1	1	Ground pin for control circuit
13	N.C.	-	Unused pin *Don't connect with other circuits.
14	XRST2	2	Reset input pin
15	FLT2	2	Fault output pin
16	RDY2	2	Ready output pin
17	INB2	2	Opposite driver's control input pin
18	INA2	2	Control input pin
19	GND2	2	Ground pin for control circuit

Output side

Pin No.	Name	CH	Explanation of pins
20	DESAT2	2	Desaturation protection pin
21	CLAMP2	2	Miller clamp pin
22	OUT2	2	Gate drive pin
23	OUT2	2	Gate drive pin
24	COM2	2	Common pin
25	COM2	2	Common pin
26	NONE	-	None
27	NONE	-	None
28	NONE	-	None
29	COM1	1	Common pin
30	COM1	1	Common pin
31	OUT1	1	Gate drive pin
32	OUT1	1	Gate drive pin
33	CLAMP1	1	Miller clamp pin
34	DESAT1	1	Desaturation protection pin

Product Lineup

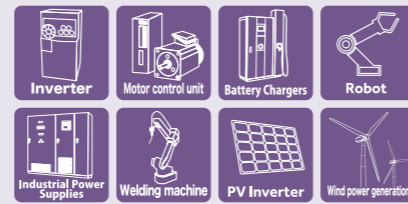
Next-generation gate driver shared to SiC and IGBT

2DMB Series

UL508 Under development



Applications



Features

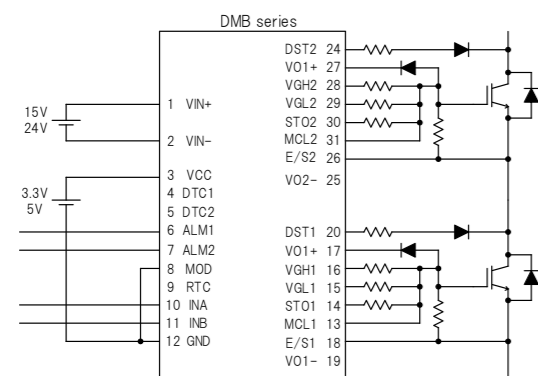
1. All-in-one (built-in DC-DC converter/ Gate driver)
2. High insulation voltage (AC5kV)
3. Low stray capacity (12pF TYP)
4. Dual output corresponding to 2 in 1
5. Wide input voltage range (DC13V-28V)

Standards

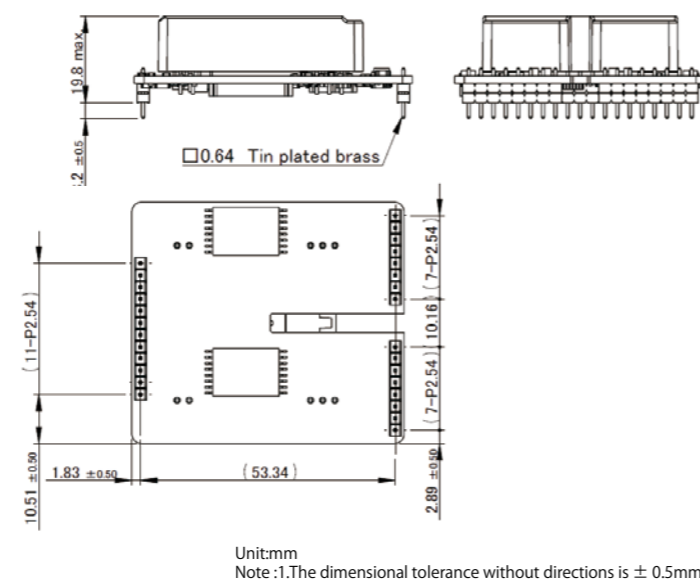
UL508

The next generation gate driver emerges with high insulation voltage (support to 1700V module) and low profile, in addition to the conventional low stray capacity.

Application Image



Outline Dimensional Drawing



General characteristics

Model		2DMB51507CC	2DMB51008CC	2DMB80407CC	2DMB80206CC
Application		IGBT		SiC-MOSFET	
Input	Input Voltage Range	DC13V ~ 28V			
	Logic Input Voltage	DC3.3V ~ 5V			
Output	Number of Output	2			
	Output Power (per 1ch)n	3.3W (T.B.D)	4.0W (T.B.D)	3.5W (T.B.D)	3.2W (T.B.D)
	Gate Voltage (ON)	+14V ~ +16V	+14V ~ +16V	+17V ~ +19V	+17V ~ +19V
	Gate Voltage (OFF)	-14V ~ -16V	-9V ~ -11V	-3V ~ -5V	-1V ~ -3V
	Peak Output Current (Gate Current)	±35A (T.B.D)			
Insulation	Withstand Voltage	Primary to secondary : AC5000V			
		Secondary to secondary : AC4000V			
	Delay Time	100ns (T.B.D)			
	Minimum Clearance Distance	Primary to secondary : 14mm			
Secondary to secondary : 7mm					
Minimum Creepage Distance	Primary to secondary : 14mm				
	Secondary to secondary : 12mm				
Function	Switching Mode Select	Direct mode and half bridge mode can be selected			
	Dead Time (Half Bridge Mode)	Adjustable by external circuit			
	Desaturation Protection	Yes			
	Soft Turn Off	Yes			
	Miller Clamp	Yes			
	Protection Release Condition	Auto recovery			
Environment	Ambient Temperature (Operating)	-40 ~ +85°C (Input Voltage ~ DC13V ~ 18V) (TBD)			
		-40 ~ +75°C (Input Voltage ~ DC18V ~ 28V) (TBD)			
	Ambient Humidity (Operating)	20 ~ 95% RH (No condensation)			
	Ambient Temperature (Storage)	-40 ~ +90°C			
	Ambient Humidity (Storage)	5 ~ 95% RH (No condensation)			

*The content of this document is subject to change without prior notice for the purpose of improvements, etc.

Pin assignment

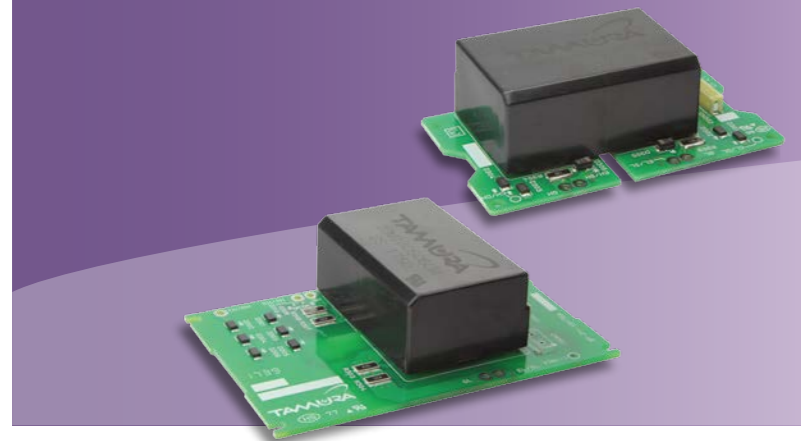
Input side

Pin No.	Name	Explanation of pins
1	VIN+	Power supply terminal for DC/DC converter (+)
2	VIN-	Power supply terminal for DC/DC converter (-)
3	VCC	Power supply input pin of driver circuit
4	DTC1	Dead time adjustment pin (CH1)
5	DTC2	Dead time adjustment pin (CH2)
6	ALM1	Abnormal signal output pin (CH1)
7	ALM2	Abnormal signal output pin (CH2)
8	MODE	Mode selection pin
9	RTC	Pin for adjusting the recovery time of the protection circuit
10	INA	Control input terminal A
11	INB	Control input terminal B
12	GND	Ground pin for drive circuit

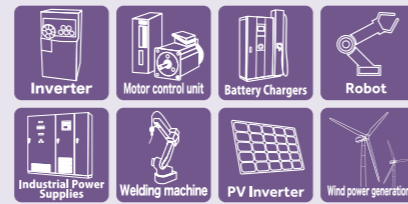
Output side

Pin No.	Name	CH	Explanation of terminal
13	MCL1	1	Miller clamp pin
14	STO1	1	Soft turn off pin
15	VGL1	1	OFF side of gate output
16	VGH1	1	ON side of gate output
17	VO1+	1	DC/DC converter output pin
18	E/S1	1	Emitter or source connection pin
19	VO1-	1	DC/DC converter output pin
20	DST1	1	Desaturation protection pin
21	None		None
22	None		None
23	None		None
24	DST2	2	Desaturation protection pin
25	VO2-	2	DC/DC converter output pin
26	E/S2	2	Emitter or source connection pin
27	VO2+	2	DC/DC converter output pin
28	VGH2	2	ON side of gate output
29	VGL2	2	OFF side of gate output
30	STO2	2	Soft turn off pin
31	MCL2	2	Miller clamp pin

Product Lineup 2DU Series



Applications



Features

1. Easy product directly attachable to ROHM SiC power module
2. Low common mode noise (parasitic capacitance: 15pF TYP)
3. Fast response (100ns TYP)
4. Dielectric withstand voltage: AC2500Vrms
5. Electrolytic capacitor-less

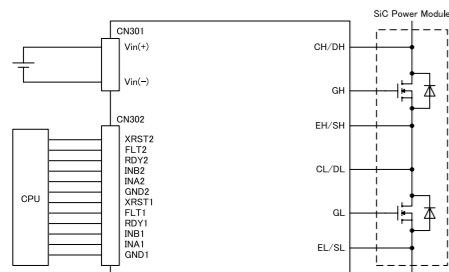
Standards

Confirm to UL508

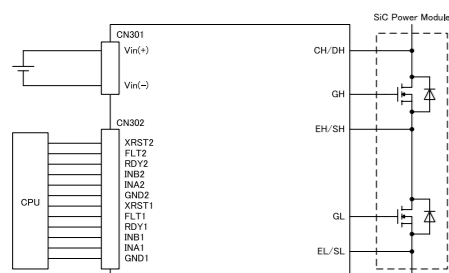
The 2DU series is a product added 2DM with dedicated connection board (with gate resistance).
It is possible to drive immediately to the target power module without designing it.

Application Image

- 2DU180506MR03, 2DU180506MR01, 2DU180206MR01

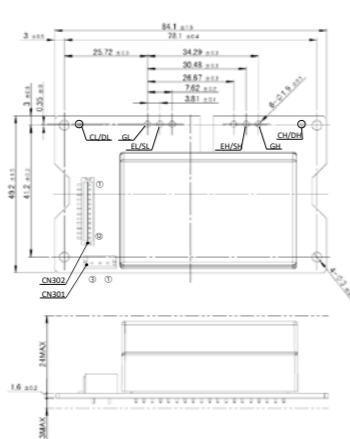


- 2DU180506MR02

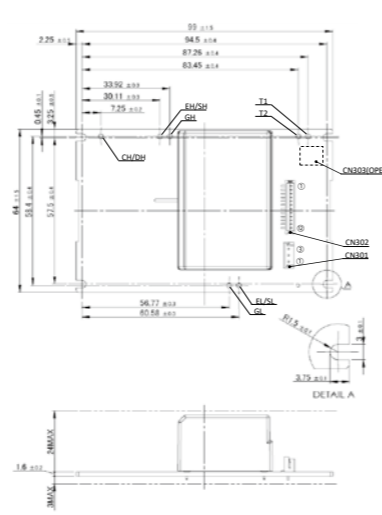


Outline Dimensional Drawing

- 2DU180506MR03, 2DU180506MR01, 2DU180206MR01



- 2DU180506MR02



General characteristics

Model	2DU180506MR03	2DU180506MR01	2DU180206MR01	2DU180506MR02
Application	BSM080D12P2C008*(ROHM)*	BSM120D12P2C005*(ROHM)*	BSM180D12P3C007*(ROHM)*	BSM300D12P2E001*(ROHM)*
Input	DC13V ~ DC28V / DC24V			
Supply voltage range (Internal DC / DC)	DC13V ~ DC28V / DC24V			
Input signal voltage	5V			
Number of drive circuits	2			
Output	2			
Output terminal voltage (H)	+17V ~ +19V	+17V ~ +19V	+17V ~ +19V	+17V ~ +19V
Output terminal voltage (L)	-4V ~ -6V	-4V ~ -6V	-1V ~ -3V	-4V ~ -6V
Switching frequency (Ta=55°C)	200kHz	90kHz	100kHz	60kHz
Switching frequency (Ta=85°C)	80kHz	30kHz	35kHz	15kHz
Gate drive capability	390nC	690nC	600nC	1910nC
Test load (gate equivalent circuit)	3.0Ω / 16.7nF	1.8Ω / 30nF	1.4Ω / 30nF	1.5Ω / 83nF
Gate resistance	0.82Ω	4.1Ω	ON : 8.2Ω OFF : 4.5Ω	0.2Ω
Maximum output current	6A	4A	ON : 2.5A OFF : 3.5A	14A
Turn on/off delay	100nsec. (typ.)			
Mirror clamp detection circuit	Output voltage +2V typ; - 3Apeak (guaranteed by design)			
Short circuit protection (DESAT)	Fault output pin; Restore by inputting again (Reset input pin)			
DESAT protection detection voltage (design value)	7.0V (TYP)	5.1V (TYP)	4.5V (TYP)	4.8V (TYP)
Signal transmission method (isolation circuit)	Magnetic Isolator			
Dielectric withstand voltage	AC2500V/ 1min. Note: Between input and output; Between drive circuits			
Operating temperature range	-40°C to +85°C ; At 85°C, it is about 25% of the maximum output power. (per circuit/Reference value) Note: Temperature derating may occur depending on the drive conditions.			
Operating humidity range	20% to 95% RH (No condensation)			

Pin assignment

- 2DU180506MR03, 2DU180506MR01, 2DU180206MR01
CN301 : B2(3)B-EH For Power supply

Pin No.	Name	Explanation of terminal
1	Vin(+)	Power supply terminal for DC/DC converter (+)
2		None
3	Vin(-)	Power supply terminal for DC/DC converter (-)

- 2DU180506MR02
CN302 : B12B-ZR-SM4-TF For signal

Pin No.	Name	CH	Explanation of terminal
1	GND2	2(H)	Ground terminal for control circuit
2	INA2	2(H)	Control input terminal A
3	INB2	2(H)	Control input terminal B
4	RDY2	2(H)	Ready output terminal
5	FLT2	2(H)	Fault output terminal
6	XRST2	2(H)	Reset input terminal
7	GND1	1(L)	Ground terminal for control circuit
8	INA1	1(L)	Control input terminal A
9	INB1	1(L)	Control input terminal B
10	RDY1	1(L)	Ready output terminal
11	FLT1	1(L)	Fault output terminal
12	XRST1	1(L)	Reset input terminal

- Connection on the power module

Name	CH	Explanation of terminal
CL/DL	1(L)	Drain (Low side)
GL	1(L)	Gate (Low side)
EL/SL	1(L)	Source (Low side)
CH/DH	2(H)	Drain (High side)
GH	2(H)	Gate (High side)
EH/SH	2(H)	Source (High side)

- 2DU180506MR02

- CN301 : B2(3)B-EH For Power supply

Pin No.	Name	Explanation of terminal
1	Vin(+)	Power supply terminal for DC/DC converter (+)
2		None
3	Vin(-)	Power supply terminal for DC/DC converter (-)

- CN302 : B12B-ZR-SM4-TF For signal

Pin No.	Name	CH	Explanation of terminal
1	GND2	2(H)	Ground terminal for control circuit
2	INA2	2(H)	Control input terminal A
3	INB2	2(H)	Control input terminal B
4	RDY2	2(H)	Ready output terminal
5	FLT2	2(H)	Fault output terminal
6	XRST2	2(H)	Reset input terminal
7	GND1	1(L)	Ground terminal for control circuit
8	INA1	1(L)	Control input terminal A
9	INB1	1(L)	Control input terminal B
10	RDY1	1(L)	Ready output terminal
11	FLT1	1(L)	Fault output terminal
12	XRST1	1(L)	Reset input terminal

- CN303 : OPEN(B2B-ZR-SM4-TF) For Thermistor

Pin No.	Name	Explanation of terminal
1	TH1	Terminal for thermistor
2	TH2	Terminal for thermistor

- Connection on the power module

Name	CH	Explanation of terminal
GL	1(L)	Gate (Low side)
CH/DH	1(L)	Source (Low side)
EL/SL	2(H)	Drain (High side)
GH	2(H)	Gate (High side)
EH/SH	2(H)	Source (High side)
T1		NTC
T2		NTC

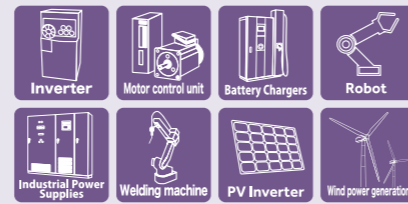
Product Lineup

2DUB Series

Under development



Applications



Features

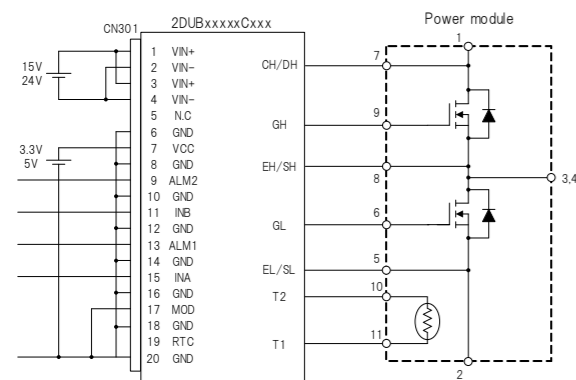
1. High insulation voltage (AC5kV)
2. Low profile (20mmMax, From the board mounting position)
3. Low stray capacity (12pF TYP)
4. Wide input voltage range (DC13V-28V)

Standards

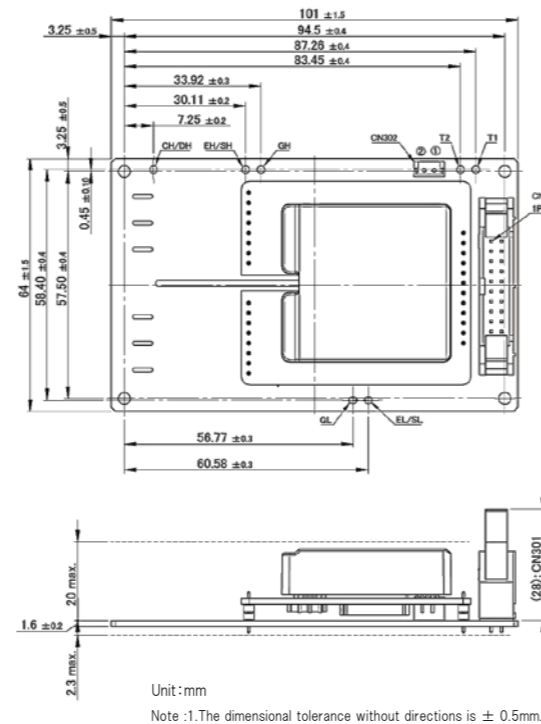
Confirm to UL508

Built-in isolated DC / DC converter and gate drive circuit, in addition, gate resistor and short circuit detection voltage have already been set.

Application Image



Outline Dimensional Drawing



General characteristics

Model		2DUB51507CME1	2DUB80407CRE6
Application		CM600DX-24T/T1, CM800DX-24T1 (Mitsubishi)	BSM250D17P2E004 (ROHM)
Input	Input Voltage Range	DC13V ~ 28V	
	Logic Input Voltage	DC3.3V ~ 5V	
Output	Number of Output	2	
	Gate Voltage (ON)	+14V ~ +16V	+17V ~ +19V
	Gate Voltage (OFF)	-16V ~ -14V	-5V ~ -3V
	Maximum Switching Frequency	10kHz (T.B.D)	63kHz (T.B.D)
	Maximum Gate Charge	8000nC	2000nC
Insulation	Withstand Voltage	Primary to secondary : AC5000V	
	Delay Time	100ns (T.B.D)	
	Minimum Clearance Distance	Primary to secondary : 14mm	
		Secondary to secondary : 7mm	
Minimum Creepage Distance	Primary to secondary : 14mm		
	Secondary to secondary : 12mm		
Function	Switching Mode Select	Direct mode and half bridge mode can be selected	
	Dead Time (Half Bridge Mode)	3us (T.B.D)	
	Desaturation Protection	Yes	
	Soft Turn Off	Yes	
	Miller Clamp	Yes	
	Protection Release Condition	Auto recovery	
Environment	Ambient Temperature (Operating)	-40 ~ +85°C (Input Voltage : DC13V ~ 18V) (TBD)	
		-40 ~ +75°C (Input Voltage : DC18V ~ 28V) (TBD)	
	Ambient Humidity (Operating)	20~95%RH (No condensation)	
	Ambient Temperature (Storage)	-40 ~ +90°C	
Ambient Humidity (Storage)	5 ~ 95%RH (No condensation)		

*The content of this document is subject to change without prior notice for the purpose of improvements, etc.

Pin assignment

CN301 : RA-H201TD For power supply • signal

Pin No.	Name	Function
1	VIN(+)	Power supply for DC/DC converter(+)
2	VIN(-)	Power supply for DC/DC converter(-)
3	VIN(+)	Power supply for DC/DC converter(+)
4	VIN(-)	Power supply for DC/DC converter(-)
5	N.C.	Not connected
6	GND	Ground for drive circuit
7	VCC	Power supply for drive circuit
8	GND	Ground for drive circuit
9	ALM2	Alarm signal output 2 (High side)
10	GND	Ground for drive circuit
11	INB	Control input B (High side)
12	GND	Ground for drive circuit
13	ALM1	Alarm signal output 1 (Low side)
14	GND	Ground for drive circuit
15	INA	Control input A (Low side)
16	GND	Ground for drive circuit
17	MOD	Mode switching
18	GND	Ground for drive circuit
19	RTC	Recovery time of protection circuit control
20	GND	Ground for drive circuit

Connection on the power module

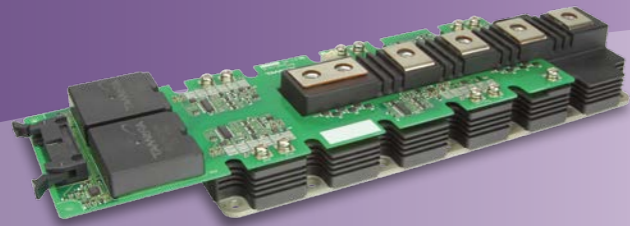
Pin No.	Name	CH	Function
1	GL	1(L)	Gate connection, Low side
2	EL/SL	1(L)	Emitter connection, Low side
3	CH/DH	2(H)	Emitter connection, High side
4	GH	2(H)	Gate connection, High side
5	EH/SH	2(H)	Collector connection, High side

Product Lineup

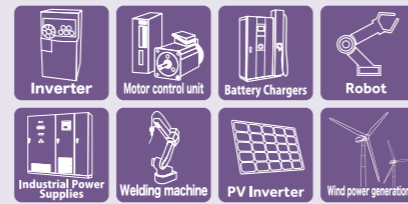
Gate driver for 3-Level/IGBT

4DUC Series

Under development



Applications



Features

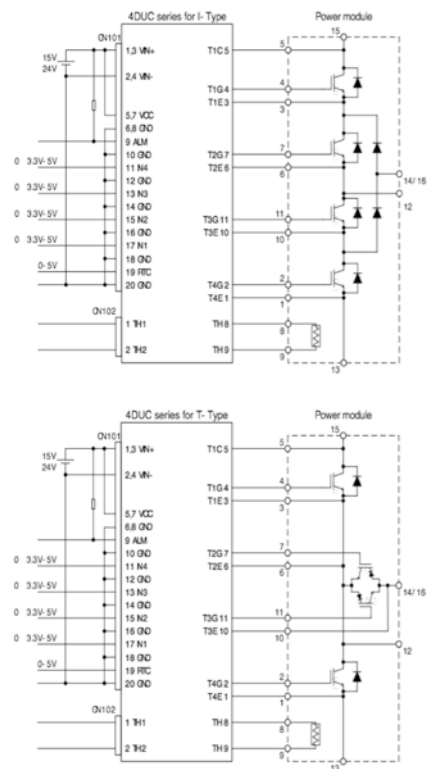
1. High insulation voltage (AC5kV)
2. Low profile (14mmMax, From the board mounting position)
3. Low stray capacity (12pF TYP)
4. Wide input voltage range (DC13V-28V)

Standards

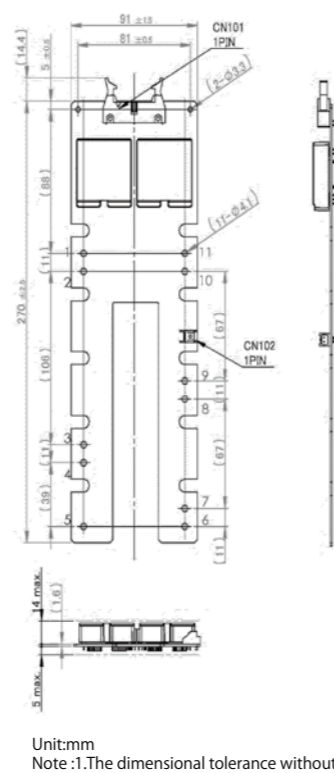
Confirm to UL508

It is an optimum gate driver for 3-Level circuit IGBT (4in1).
We prepared two models for T-TYPE and I-TYPE with a low profile of almost the same height as the T-Prime terminals.

Application Image



Outline Dimensional Drawing



General characteristics

Model		4DUC51016CFN1	4DUC51016CFA1
Application		4MBI600VC-120-50 (Fuji Electric)	4MBI900VB-120R1-50 (Fuji Electric)
Input	Input Voltage Range	DC13V ~ 28V	
	Logic Input Voltage	DC3.3 ~ 5V	
Output	Number of Output	4	
	Gate Voltage (ON)	+14V ~ +16V	
	Gate Voltage (OFF)	-9V ~ -11V	
	Maximum Gate Charge	5700nC	T1,T4 : 8500nC, T2,T3 : 4300nC
	Maximum Switching Frequency	7.5kHz (Ave), 15kHz (Peak) (T.B.D)	
Insulation	Withstand Voltage	Primary to secondary : AC5000V	
	Delay Time	+105ns / -110ns (TYP)	
	Minimum Clearance Distance	Primary to secondary : 14mm	
		Secondary to secondary : 8mm	
Minimum Creepage Distance	Primary to secondary : 14mm		
	Secondary to secondary : 8mm		
Function	Desaturation Protection	T1,T4 : Yes, T2,T3 : None	
	Soft Turn Off	T1,T4 : Yes, T2,T3 : None	
	Miller Clamp	Yes	
	Protection Release Condition	Auto Recovery, Interval : 110 ms (TYP)	
Environment	Ambient Temperature (Operating)	-40 ~ +85°C (Input Voltage : DC13V ~ 18V)	
		-40 ~ +75°C (Input Voltage : DC18V ~ 28V)	
	Ambient Humidity (Operating)	20 ~ 95%RH (No condensation)	
	Ambient Temperature (Storage)	-40 ~ +90°C	
Ambient Humidity (Storage)	5 ~ 95%RH (No condensation)		

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Pin assignment

CN101 : RA-H201SD / JST For power supply • signal

Pin No.	Name	Function
1	VIN(+)	Power supply for DC/DC converter (+)
2	VIN(-)	Power supply for DC/DC converter (-)
3	VIN(+)	Power supply for DC/DC converter (+)
4	VIN(-)	Power supply for DC/DC converter (-)
5	VCC	Power supply for drive circuit
6	GND	Ground for drive circuit
7	VCC	Power supply for drive circuit
8	GND	Ground for drive circuit
9	ALM	Alarm signal output
10	GND	Ground for drive circuit
11	IN4	Control input 4
12	GND	Ground for drive circuit
13	IN3	Control input 3
14	GND	Ground for drive circuit
15	IN2	Control input 2
16	GND	Ground for drive circuit
17	IN1	Control input 1
18	GND	Ground for drive circuit
19	RTC	Recovery time of protection circuit control
20	GND	Ground for drive circuit

Power module side

Pin No.	Name	Function
1	T4E	T4 Emitter connection
2	T4G	T4 Gate connection
3	T1E	T1 Emitter connection
4	T1G	T1 Gate connection
5	T1C	T1 Collector connection
6	T2E	T2 Emitter connection
7	T2G	T2 Gate connection
8	TH	For thermistor
9	TH	For thermistor
10	T3E	T3 Emitter connection
11	T3G	T3 Gate connection

Product Cross reference

Product line-up for FUJI Electric

Ic	Part No	2DUB	2DMB	2DD
Vce = 1200V				
225	2MBI225VN-120-50	(Plan)	2DMB51507CC *1 (+15V/-15V) 2DMB51008CC *1 (+15/-10V)	2DD151507C (+15V/-15V) 2DD151008C (+15V/-10V)
300	2MBI300VN-120-50	(Plan)		
450	2MBI450VN-120-50	(Plan)		
600	2MBI600VN-120-50	(Plan)		
225	2MBI225XNA120-50	(Plan)		
300	2MBI300XNA120-50	2DUB51008CFE4 *1		
450	2MBI450XNA120-50	2DUB51008CFE3 *1		
600	2MBI600XNG120-50	2DUB51008CFE2 *1		
600	2MBI600XNE120-50	2DUB51008CFE2 *1		
800	2MBI800XNE120-50	2DUB51008CFE1 *1		
Vce = 1700V				
300	2MBI300VN-170-50	(Plan)	2DMB51507CC *1 (+15V/-15V) 2DMB51008CC *1 (+15/-10V)	2DD151507C (+15V/-15V) 2DD151008C (+15V/-10V)
450	2MBI450VN-170-50	(Plan)		
550	2MBI550VN-170-50	(Plan)		
225	2MBI225XNA170-50	(Plan)		
300	2MBI300XNA170-50	2DUB51008CFE7 *1		
450	2MBI450XNA170-50	2DUB51008CFE6 *1		
600	2MBI600XNE170-50	2DUB51008CFE5 *1		

*1: Under development

Product line-up for FUJI Electric

Ic	Part No	2DUB	2DMB	2DD			
Vce = 650V							
150	2MBI150XAA065-50	/	2DMB51507CC *1 (+15V/-15V) 2DMB51008CC *1 (+15/-10V)	2DD151507C (+15V/-15V) 2DD151008C (+15V/-10V)			
200	2MBI200XAA065-50						
300	2MBI300XBE065-50						
400	2MBI400XBE065-50						
	2MBI400XDE065-50						
600	2MBI600XDE065-50						
600	2MBI600XEE065-50						
Vce = 1200V							
100	2MBI100XAA120-50	/	2DMB51507CC *1 (+15V/-15V) 2DMB51008CC *1 (+15/-10V)	2DD151507C (+15V/-15V) 2DD151008C (+15V/-10V)			
150	2MBI150XAA120-50						
200	2MBI200XAA120-50						
	2MBI200XBE120-50						
300	2MBI300XBE120-50						
	2MBI300XHA120-50						
400	2MBI400XDE120-50						
450	2MBI450XHA120-50						
	2MBI450XEE120-50						
600	2MBI600XDE120-50						
	2MBI600XHA120-50						
	2MBI600XEE120-50						
Vce = 1700V							
75	2MBI75XAA170-50				/	2DMB51507CC *1 (+15V/-15V) 2DMB51008CC *1 (+15/-10V)	2DD151507C (+15V/-15V) 2DD151008C (+15V/-10V)
100	2MBI100XAA170-50						
150	2MBI150XAA170-50						
	2MBI150XHA170-50						
200	2MBI200XHA170-50						
300	2MBI300XHA170-50						
	2MBI300XEE170-50						
400	2MBI400XHA170-50						
	2MBI400XEE170-50						

*1: Under development

Product Cross reference

Product line-up for FUJI Electric

Ic	Part No	2DUD	2DMB	2DD
Vce = 1200V				
900	2MBI900XXA120P-50	(Plan)	2DMB51507CC *1 (+15V/-15V) 2DMB51008CC *1 (+15/-10V)	2DD151507C (+15V/-15V) 2DD151008C (+15V/-10V)
1200	2MBI1200XXE120P-50	(Plan)		
1400	2MBI1400XXB120P-50	(Plan)		
1800	2MBI1800XXF120P-50	(Plan)		
Vce = 1700V				
650	2MBI650XXA170-50	(Plan)	2DMB51507CC *1 (+15V/-15V) 2DMB51008CC *1 (+15/-10V)	2DD151507C (+15V/-15V) 2DD151008C (+15V/-10V)
1200	2MBI1200XXE170-50	(Plan)		
1000	2MBI1000XXB170-50	(Plan)		
1400	2MBI1400XXB170-50	(Plan)		
1800	2MBI1800XXF170-50	2DUD51008CFP1 *1		

*1: Under development

Product line-up for FUJI Electric

Ic (T1,T4)	Ic (T2,T3)	Part No	4DUC
Vce = 1200V (T1,T4)			
900	450	4MBI450VB-120R1-50	(Plan)
900	650	4MBI650VB-120R1-50	(Plan)
900	900	4MBI900VB-120R1-50	4DUC51016CFA1 *1
900	900	4MBI900VB-120RA-50	4DUC51016CFA2 *1
1200	600	4MBI600VC-120-50	4DUC51016CFN1 *1
Vce = 1700V (T1,T4)			
1200	450	4MBI450VB-170R2-50	(Plan)
1200	600	4MBI600VB-170R2-50	(Plan)

*1: Under development

Product line-up for Mitsubishi Electric

Ic	Part No	2DUB	2DMB	2DD
Vce = 650V				
300	CM300DX-13T	(Plan)	2DMB51507CC *1 (+15V/-15V) 2DMB51008CC *1 (+15/-10V)	2DD151507C (+15V/-15V) 2DD151008C (+15V/-10V)
450	CM450DX-13T	(Plan)		
600	CM600DX-13T	(Plan)		
Vce = 1200V				
225	CM225DX-24T1	2DUB51507CME4 *1 /2DUB51008CME4	2DMB51507CC *1 (+15V/-15V) 2DMB51008CC *1 (+15/-10V)	2DD151507C (+15V/-15V) 2DD151008C (+15V/-10V)
300	CM300DX-24T1	2DUB51507CME3 *1 /2DUB51008CME3		
450	CM450DX-24T1	2DUB51507CME2 *1 /2DUB51008CME2		
	CM450DX-24T			
600	CM600DX-24T1	2DUB51507CME1 *1 /2DUB51008CME1		
	CM600DX-24T			
800	CM800DX-24T1			
Vce = 1700V				
225	CM225DX-34T	(Plan)	2DMB51507CC *1 (+15V/-15V) 2DMB51008CC *1 (+15/-10V)	2DD151507C (+15V/-15V) 2DD151008C (+15V/-10V)
300	CM300DX-34T	(Plan)		
450	CM450DX-34T	2DUB51507CME6 *2 /2DUB51008CME6		
600	CM600DX-34T	2DUB51507CME5 *2 /2DUB51008CME5		

*1: Under development

Product Cross reference

Product line-up for Mitsubishi Electric

Ic	Part No	2DUB	2DMB	2DD
Vce = 650V				
300	CM300DY-13T	/	2DMB51507CC *1 (+15V/-15V)	2DD151507C (+15V/-15V)
400	CM400DY-13T		2DMB51008CC *1 (+15V/-10V)	2DD151008C (+15V/-10V)
600	CM600DY-13T			
Vce = 1200V				
300	CM300DY-24T	/	2DMB51507CC *1 (+15V/-15V)	2DD151507C (+15V/-15V)
450	CM450DY-24T		2DMB51008CC *1 (+15V/-10V)	2DD151008C (+15V/-10V)
600	CM600DY-24T			
Vce = 1700V				
300	CM300DY-34T	/	2DMB51507CC *1 (+15V/-15V)	2DD151507C (+15V/-15V)
400	CM400DY-34T		2DMB51008CC *1 (+15V/-10V)	2DD151008C (+15V/-10V)

Product line-up for ROHM SiC Power module

Ic	Part No	2DUB	2DU	2DM
Vce = 1200V				
80	BSM080D12P2C008	-	2DU180506MR03	2DM180506CM
120	BSM120D12P2C005	-	2DU180506MR01	
180	BSM180D12P3C007	-	2DU180206MR01	2DM180206CM
180	BSM180D12P2E002	(Plan)	2DU180506MR04 *1	2DM180506CM
300	BSM300D12P2E001	(Plan)	2DU180506MR02	
300	BSM300D12P3E005	(Plan)	2DU180206MR02 *1	2DM180206CM
400	BSM400D12P2G003	(Plan)	2DU180506MR05 *1	2DM180506CM
400	BSM400D12P3G002	(Plan)	2DU180206MR03 *1	2DM180206CM
600	BSM600D12P3G001	(Plan)	2DU180206MR04 *1	
Vce = 1700V				
250	BSM250D17P2E004	2DUB80407CRE6 *1	-	-

*1: Under development

Part numbering system

1) DC-DC converter module

Model :

2 DD 15 10 08 C
2 DDA 5 10 08 C

Special specification	1 figure MAX
Input voltage	C : 15V, 24V input (13 ~ 28V)
Total output power	5W ⇒ 05, 12W ⇒ 12
Output voltage -	5V ⇒ 05, 12V ⇒ 12
Output voltage +	Model: 2 figures ... 15V ⇒ 15, 18V ⇒ 18 Model: 3 figures ... 15V ⇒ 5, 20V ⇒ 0
Model	2 ~ 3 figures 3 figures ... Rev.
Number of outputs	

2) Driver module

Model :

2 DM 18 05 06 C M
2 DMB 5 10 08 C C

Special specification	1 figure MAX
Insulation method	M: magnetic coupling insulation / P: PHC insulation / C: capacitive coupling insulation
Input voltage	C : 15V, 24V input (13 ~ 28V)
Total output power	5W ⇒ 05, 12W ⇒ 12
Output voltage -	5V ⇒ 05, 12V ⇒ 12
Output voltage +	Model: 2 figures ... 15V ⇒ 15, 18V ⇒ 18 Model: 3 figures ... 15V ⇒ 5, 20V ⇒ 0
Model	2 ~ 3 figures 3 figures ... Rev.
Number of outputs	

3) Driver unit

Model :

2 DU 18 05 06 M R 01
2 DUB 5 10 08 C RE 1
4 DUC 5 10 16 C FA 1

Device identification symbol	Model: DU ... 2 figures Other Model ... 1 figure
Package identification symbol	Model: 4DUC ... A: T-Type (A-NPC) / N: I-Type (NPC)
Insulation method	M: magnetic coupling insulation / P: PHC insulation / C: capacitive coupling insulation
Total output power	5W ⇒ 05, 12W ⇒ 12
Output voltage -	5V ⇒ 05, 12V ⇒ 12
Output voltage +	Model: 2 figures ... 15V ⇒ 15, 18V ⇒ 18 Model: 3 figures ... 15V ⇒ 5, 20V ⇒ 0
Model	2 ~ 3 figures 3 figures ... Rev.
Number of outputs	

Important notice

Usage Cautions

- Always mount fuse on the plus side of input for ensuring safety because the fuse is not built-in the product. Please select the fuse considering conditions such as steady current, inrush current, and ambient temperature. When using a fuse having large rated current or high capacity input electrolytic condenser, by combining another converter and input line and input electrolytic condenser, fuse may not blow off in the case of abnormality. Do not combine high voltage line and fuse.
- This product is designed to be best when it drives two devices to have the same gate capacitance simultaneously. Because it leads to the "output unstable" and "output accuracy deterioration". If you want to use to drive only one of the devices, because of the output voltage accuracy deterioration prevention, please configure the dummy gate circuit (resistor and capacitor) to consume the equivalent of the power and the drive side.
- This product is to transmit the signal of the insulating part by the magnetic coupling. Therefore, if you use this product in a strong magnetic field in, there is a possibility of malfunction. In that case, connect the capacitor between the GND terminal of this product and a metal enclosure.
- Make sure the rise/fall time of the input signal is 500ns or less.

Important Notice

- The content of this information is subject to change without prior notice for the purpose of improvements, etc. Ensure that you are in possession of the most up-to-date information when using this product.
- The operation examples and circuit examples shown in this information are for reference purposes only, and Tamura Corporation disclaims all responsibility for any violations of industrial property rights, intellectual property rights and any other rights owned by Tamura Corporation or third parties that these may entail.
- The circuit examples and part constants listed in these specifications are provided as reference for the verification of characteristics. You are to perform design, verification, and judgment at your own responsibility, taking into account the various conditions.
- Tamura Corporation constantly strives to improve quality and reliability, but malfunction or failures are bound to occur with some probability in power products. To ensure that failures do not cause accidents resulting in injury or death, fire accidents, social damage, and so on, you are to thoroughly verify the safety of their designs in devices and/or systems.
- This product is intended for use in consumer electronics (electric home appliances, business equipment, Information equipment, communication terminal equipment, measuring devices, and so on.) If considering use of this product in equipment or devices that require high reliability (medical devices, transportation equipment, traffic signal control equipment, fire and crime prevention equipment, aeronautics and space devices, nuclear power control, fuel control, in-vehicle equipment, safety devices, and so on), please consult a Tamura sales representative in advance. Do not use this product for such applications without written permission from Tamura Corporation.

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 - Use in liquids such as water, oil, chemical solutions, or organic solvents, and use in locations where the product will be exposed to such liquids.
 - Use that involves exposure to direct sunlight, outdoor exposure, or dusty conditions.
 - Use in locations where corrosive gases such as salt air, C12, H2S, NH3, SO2, or NO2, are present.
 - Use in environments with strong static electricity or electromagnetic radiation.
 - Use that involves placing inflammable material next to the product.
 - Use of this product either sealed with a resin filling or coated with resin.
 - Use of water or a water soluble detergent for flux cleaning.
 - Use in locations where condensation is liable to occur.
- This product is not designed to resist radiation.
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