Gate Driver Slave Unit 2LG01xDZC11S

■Overview

2LG01xDZC11S is a parallel drive slave unit used by connecting to 2LG01xxxC11M.

IGBT power modules are compatible with CM1200DW-34T/ CM800DW-34T/ CM800DW-34TA .

This document is the data sheet of the slave unit.

Please refer to the data sheet: 2LG01xDZC11M for the master unit.

■Features

・Ideal for drive of IGBT Power module CM1200DW-34T/ CM800DW-34T/ CM800DW-34TA(Mitsubishi Electric)

・Ideal for parallel drive by using with 2LG01xDZC11S

・Gate voltage : +15V/-10V

・Gate resistor : +0.47Ω/-0.47Ω(TYP)

・Soft turn-off function (Gate drive circuit)

・Under-voltage lockout(UVLO) (Gate drive circuit)

・Thermistor isolated amplifier output function (Option)

・Active clamp protection function (Gate drive circuit)

・Insulating moistureproof coating

■Application

Industrial inverter, power conditioner, etc. …

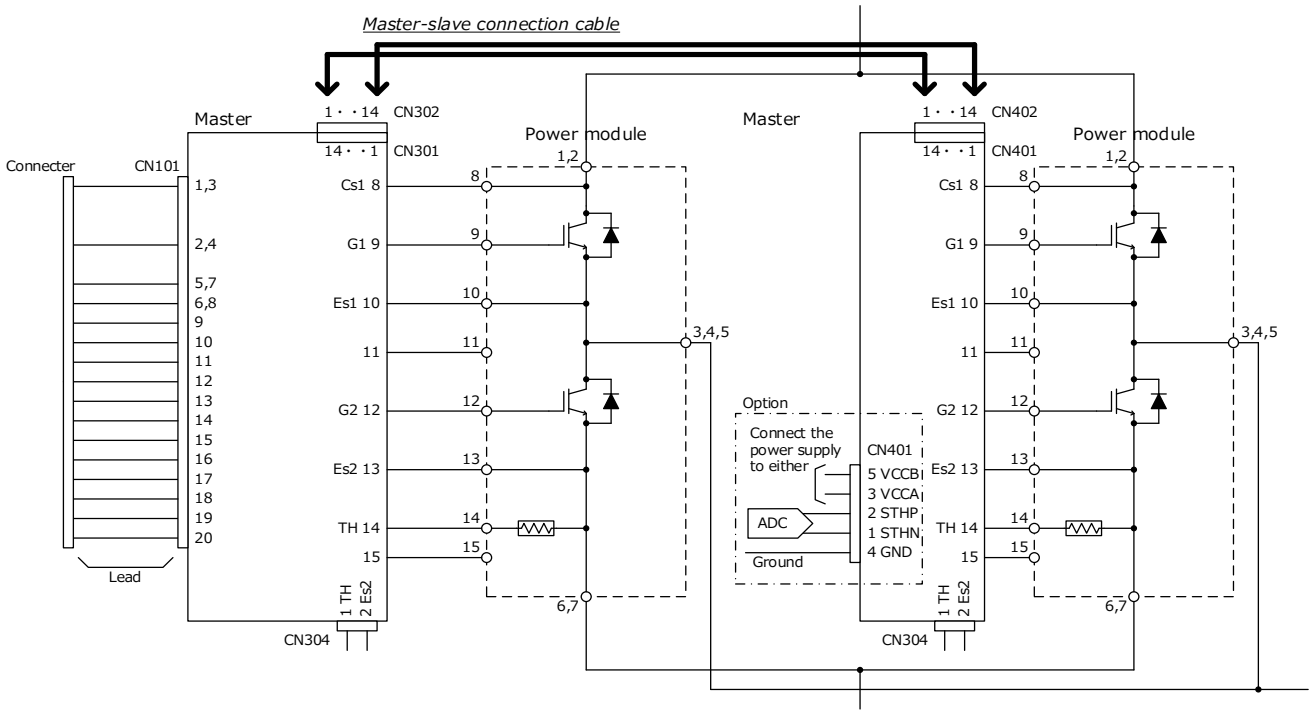
■Module information

Part number	Part number (Uncoated)	Signal input voltage	Active clamp	TH Isolated amplifier	Status
2LG010DZC11S	2LG010DZN11S	-	Yes	None	Planning
2LG01ADZC11S	2LG01ADZN11S	-	Yes	Yes	Active

*Uncoated type is sample only

*Refer to the [2LG01xDxC11M] data sheet for master units.

■Circuit Image



■Pin Connection

CN401 : B10(14-6.7.8.9)B-PASK(LF)(SN) (JST)

Pin No.	Name	CH	Function
1	CC1A1	1	Connect the communication line for parallel drive 2LG series
2	CC1A2	1	
3	CC1A3	1	
4	CC1A4	1	
5	CC1A5	1	
6	None	-	Pin removal for insulation distance between CH1 and CH2
7	None	-	
8	None	-	
9	None	-	
10	CC2A5	2	Connect the communication line for parallel drive 2LG series
11	CC2A4	2	
12	CC2A3	2	
13	CC2A2	2	
14	CC2A1	2	

※Reference receptacle : PAP-14V-S (JST)

CN402 : B10(14-6.7.8.9)B-PASK(LF)(SN) (JST)

Pin No.	Name	CH	Function
1	CC2B1	2	Connect the communication line for parallel drive 2LG series
2	CC2B2	2	
3	CC2B3	2	
4	CC2B4	2	
5	CC2B5	2	
6	None	-	Pin removal for insulation distance between CH1 and CH2
7	None	-	
8	None	-	
9	None	-	
10	CC1B5	1	Connect the communication line for parallel drive 2LG series
11	CC1B4	1	
12	CC1B3	1	
13	CC1B2	1	
14	CC1B1	1	

※Reference receptacle : PAP-14V-S (JST)

Connection on the power module

No.	Name	CH	Function	No.	Name	CH	Function
8	Cs1	1(H)	Collector connection, High side	12	G2	2(L)	Gate connection, Low side
9	G1	1(H)	Gate connection, High side	13	Es2	2(L)	Emitter connection, Low side
10	Es1	1(H)	Emitter connection, High side	14	TH	2(L)	Thermistor connection, Low side
11	None	-	Electrical connection is not allowed	15	None	-	Electrical connection is not allowed

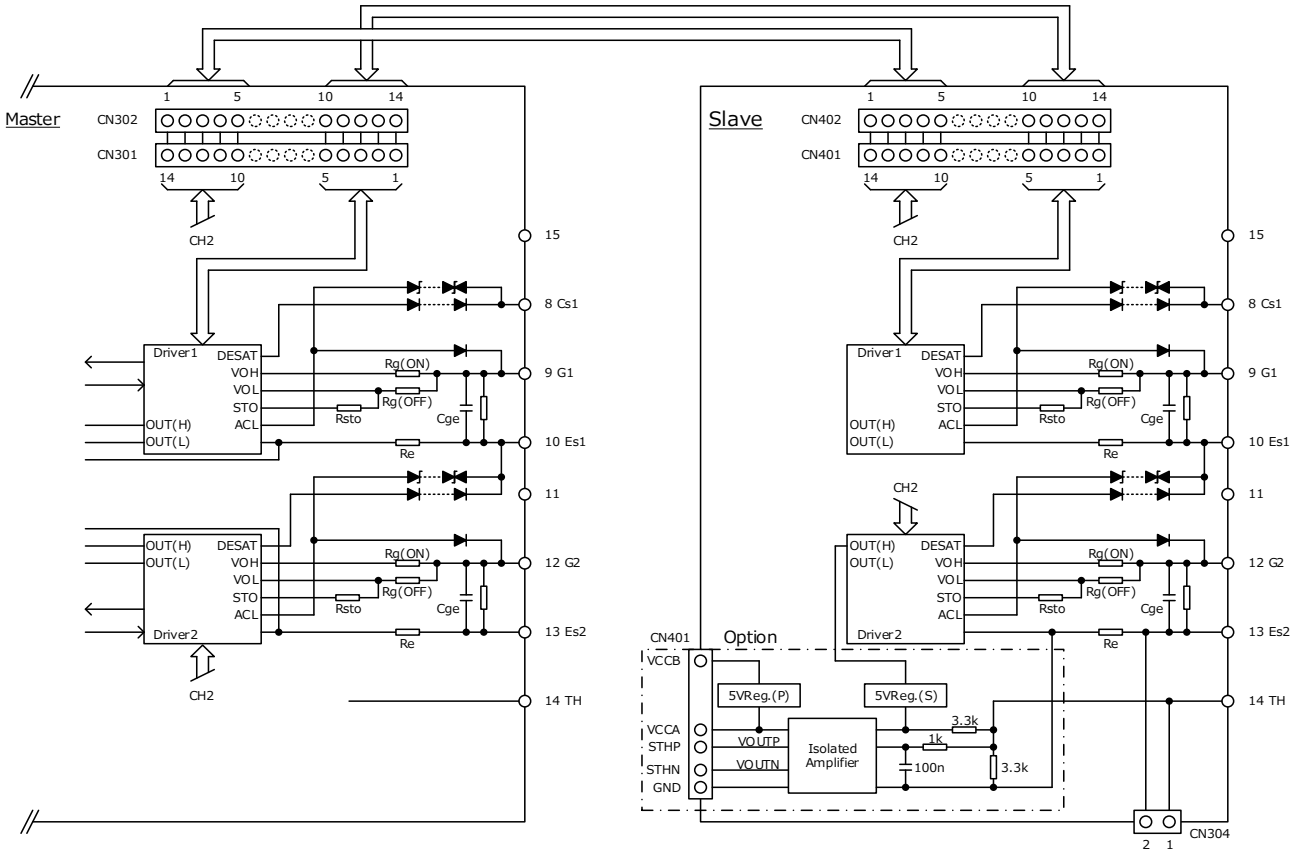
■Pin Connection (With thermistor isolated amplifier output function)

CN401 : B05B-PASK (JST)

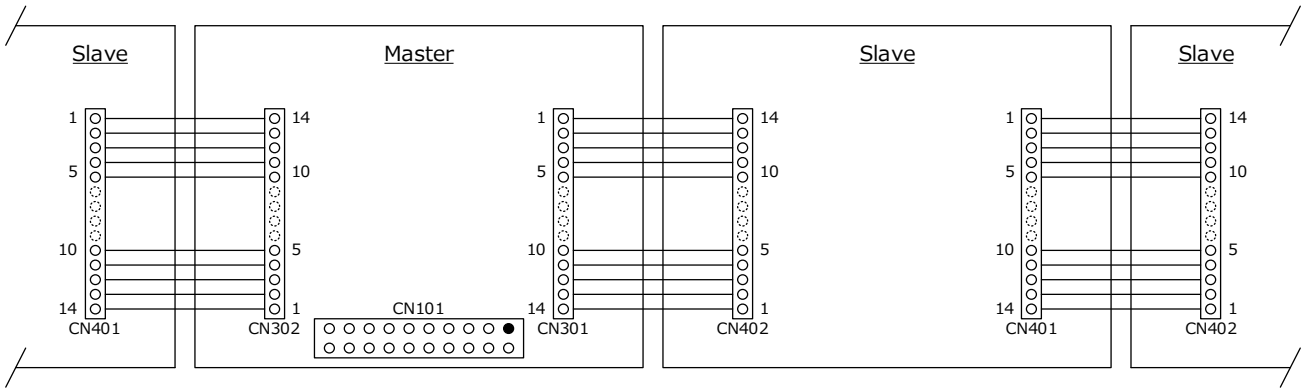
No.	Name	Function	
1	STHN	Inverting analog output of the isolated amplifier	
2	STHP	Noninverting analog output of the isolated amplifier	
3	VCCA	Power supply for isolated amplifier (5VDC)	*Connect this power supply to either VCCA (5VDC) or VCCB (15VDC).
4	GND	Ground for isolated amplifier	
5	VCCB	Power supply for isolated amplifier (15VDC)	*Connect this power supply to either VCCA (5VDC) or VCCB (15VDC).

※Reference receptacle : PAP-05V-S (JST)

■Internal Block Diagram



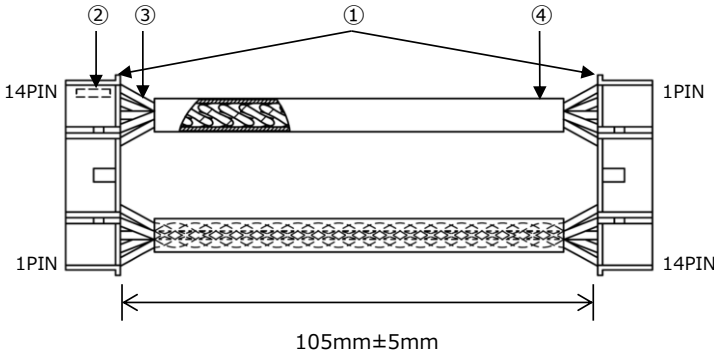
■Master-slave connection diagram



■Master-slave connection cable example

*This sample is provided with cable.

*You must meet the required wire standard according to the usage conditions.



No.	Name	Part No,	Quantity	Manufacturer
②	Contact	SPHD-001T-P0.5	20	JST
①	Housing	PAP-14V-S	2	JST
③	Wire	AWG#24(UL3443) *Twist processing	10	-
④	Tube	SUMITUBE F2(Z)	2	SUMITOMO

■Absolute Maximum Ratings

Item	Symbol	Min	Max	Unit	Conditions・Note
Maximum gate current	I_{GPEAK}	-	43	A	Excluding gate resistor
Short circuit detection pin voltage	V_{SD}	0	1700	V	
Operating temperature range	T_{OP}	-40	85	℃	See the derating curve
Operating humidity	RH_{OP}	20	95	%RH	No condensation
Storage temperature range	T_{STG}	-40	90	℃	
Storage humidity	RH_{STG}	5	95	%RH	No condensation
With thermistor isolated amplifier output function					
Input voltage of isolated amplifier (VCCA)	V_{STHI}	-0.3	5.5	V	Between VCCA to GND *1
Input voltage of isolated amplifier (VCCB)	V_{STHI}	-0.3	18	V	Between VCCB to GND *1
Output voltage of isolated amplifier	V_{STHO}	-0.3	5.3	V	STHP, STHN

*1 Connect this power supply to either VCCA (5VDC) or VCCB (15VDC).

■Recommended Operating Conditions

Item	Symbol	Min	Max	Unit	Conditions・Note
Driver circuit number	N	-	2	-	
Maximum gate charge	Q_G	-	14000	nC	*2
Switching frequency	F_{SW}	-	3.8	kHz	Test load : 0.68Ω/560nF See the Operating frequency in parallel graph
With thermistor isolated amplifier output function					
Input voltage of isolated amplifier (VCCA)	V_{STHI}	4.8	5.2	V	Between VCCA to GND *3
Input voltage of isolated amplifier (VCCB)	V_{STHI}	13.5	18	V	Between VCCB to GND *3

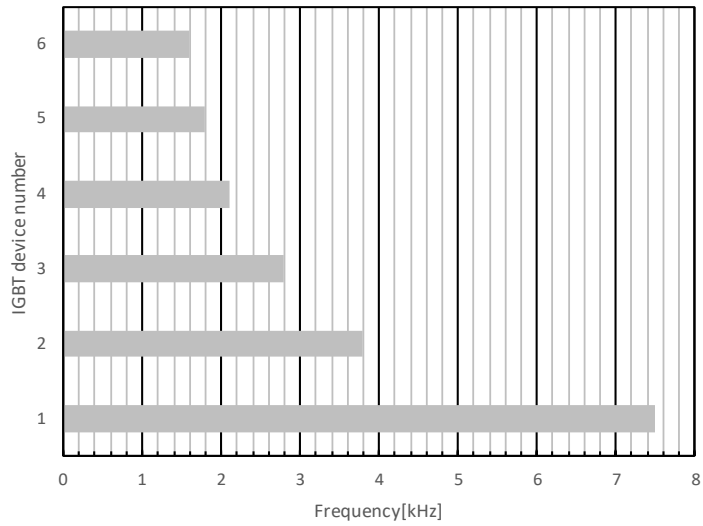
*2 If the gate charge exceeds the allowable value, the gate voltage at turn-on and turn-off will drop, which may affect the switching performance of the IGBT.

If you are considering using it under conditions other than the recommended conditions, please contact us.

*3 Connect this power supply to either VCCA (5VDC) or VCCB (15VDC).

■Operating frequency in parallel

Reference value



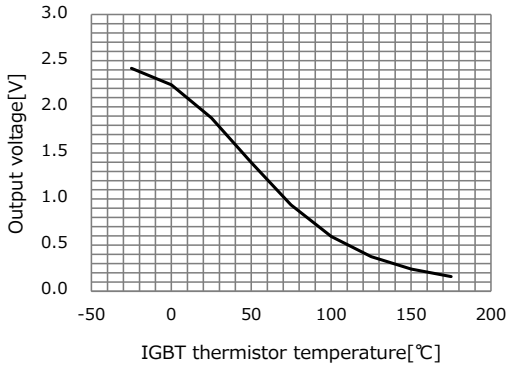
Test load : 0.68Ω/560nF

Rg: +0.47ohm/-0.47ohm

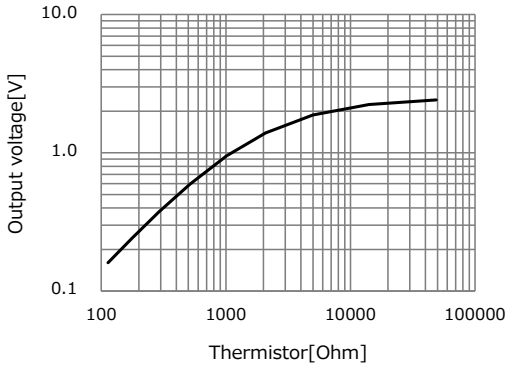
■Electrical Specification (Ta=25℃, Unless otherwise specified)

Item		Symbol	Min	Typ	Max	Unit	Conditions・Note
Gate driver output							
Output pin voltage(High)		V_{OUTH}	14	15	16	V	No load
Output pin voltage(Low)		V_{OUTL}	-11	-10	-9	V	No load
Gate resistor		Rg(ON)	-	0.47	-	Ω	
		Rg(OFF)	-	0.47	-		
Auxiliary gate capacitor		Cge	-	OPEN	-	nF	
Emitter resistor		Re	-	0.1	-	Ω	
2LG01AxZx11S (With thermistor isolated amplifier output function)							
Thermistor signal output voltage	TH = 5000Ω	V_{STHP-N}	-	1.88	-	V	STHP-STHN
	TH = 300Ω		-	0.39	-	V	

■Thermistor Signal Output Voltage Curve (With thermistor isolated amplifier output function)



Thermistor signal output voltage
vs IGBT thermistor temperature



Thermistor signal output voltage
vs thermistor resistance value

■Protection

Item	Symbol	Min	Typ	Max	Unit	Conditions・Note
Gate driver						
Soft turn-off resistance	R_{STO}	-	10	-	Ω	
Soft turn-off duration	t_{STO}	-	6	-	us	

■Insulation

Item	Specification	Conditions・Note
Between CH1-CH2		
Minimum clearance distances	8mm	Excluding electrical connections point
Minimum creepage distances	8mm	
Between Input-Thermistor (With thermistor isolated amplifier output function)		
Dielectric withstand voltage	AC5000V	1min, Cutoff 2mA
Insulation resistance	100MΩ or more	DC500V
Partial discharge extinction voltage	1875Vpeak or more	According to EN50178/IEC 60270
Minimum clearance distances	8.5mm	
Minimum creepage distances	8.5mm	

■Storage Conditions

Item	Min	Max	Unit	Conditions・Note
Storage temperature	-25	60	℃	A packing state

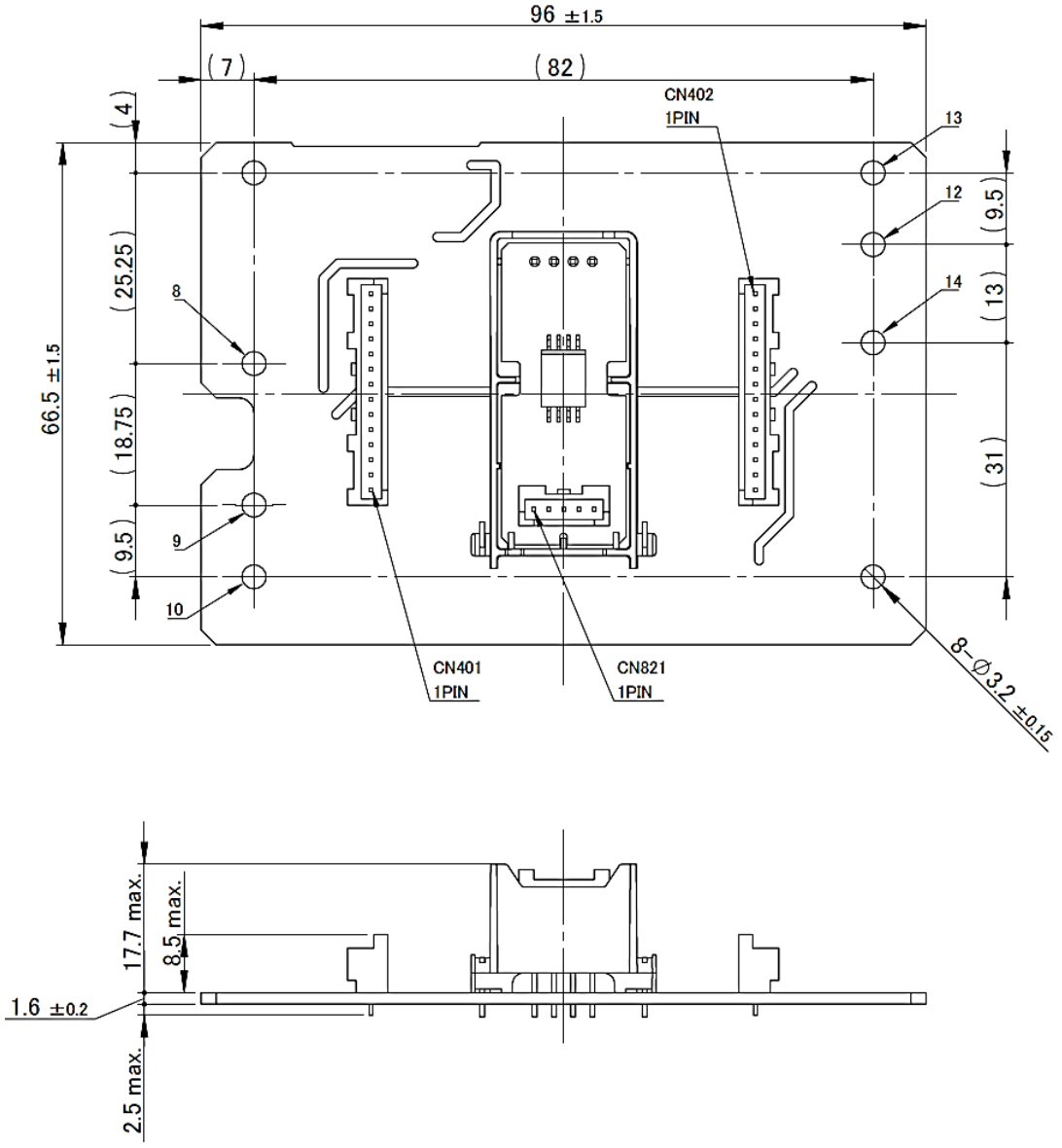
■Usage Cautions

- Please do not apply excessive stress to this product when attaching to IGBT power module.
  Please follow the device manufacturer's instructions on how to install the IGBT power module
  (type of screw used, material, tightening torque conditions, etc.).
  Also, The screw header / washer diameter uses the following.
  M3: 6mm or less *To maintain the reliability of parts near the metal terminal pad, the screw header including the washer must not exceed the available metal terminal pad of the gate driver.

- The coating material is applied to the product, so it may appear to be partially whitened.
  This does not affect the characteristics of the product.

With Thermistor insulation circuit

■Outline Dimensional Drawing



Unit: mm

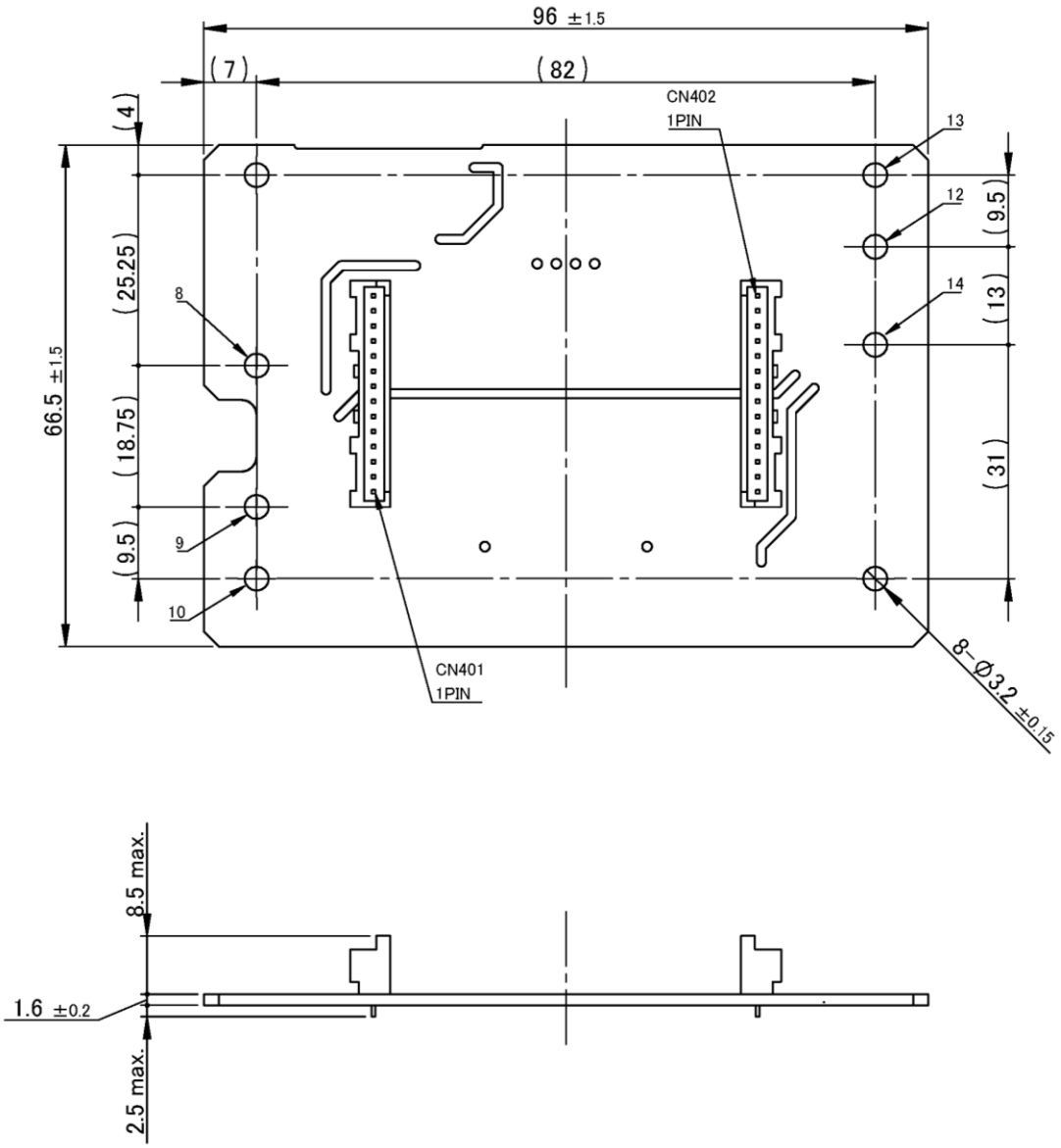
Note: 1. The dimensional tolerance without directions is ± 0.5mm.

■Product Weight

30.5g(typ)

Without Thermistor insulation circuit

■Outline Dimensional Drawing



Unit: mm

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

■Product Weight

25.0g(typ)

■Important Notice

- This information and product are 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 document 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 this document 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 has evaluated the efficiency and performance of this product in a usage environment determined by us.
  Depending on your usage environment or usage method, there is the possibility that this product will not perform sufficiently as shown in the specifications, or may malfunction.
  When applying this product to your devices or systems, please ensure that you conduct evaluations of their state when integrated with this product. You are responsible for judging its applicability.
  TAMURA bears no responsibility whatsoever for any problems with your devices,
  systems or this product which are caused by your usage environment or usage method.

- 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, at your own responsibility.

- 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.

- This product is intended for use in environments where consumer electronics are commonly used.
  It is not designed for use in special environments such as listed below, and if such use is considered, you are to perform thorough safety and reliability checks at your own responsibility.
  - 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.

- This product is not designed to be connected in series or parallel.
  Do not operate this product in a series, parallel, or N+1 redundant configuration.

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