

BR301

General Descriptions

The BR301 is non-insulation step down type DC/DC converter module which include control IC, inductor, ceramic capacitor, pins. This product, with few external components, DC / DC converter can be configured easily, reducing design time, contributes to space saving.

Package



Features

- Output 3.3V 1A 3.3W
- Outline 14mm x 14mm x 10mm (W x D x H)
- Weight 1.6g
- All in one
- Design free
- High efficiency 87% typ. (at $V_{IN}=8V, I_o=0.6A$)
- This product can achieve miniaturization by high-frequency switching technology.
- Protection functions
 - Over current Protection function (OCP):Auto restart
 - Thermal Shutdown Protection function (TSD): Auto restart

Electrical Characteristics

Input voltage range DC 8 to 30V
 Circuit topology Step down chopper
 Switching frequency 350kHz

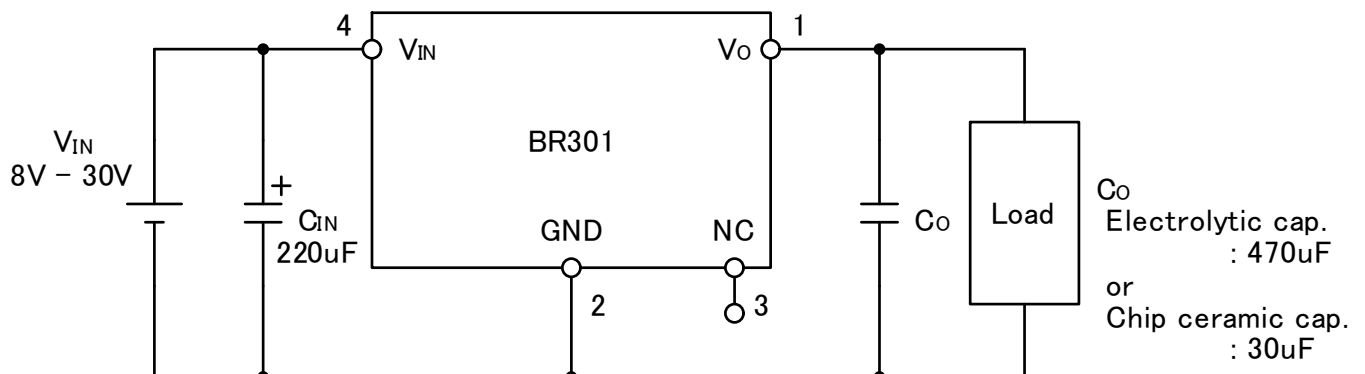
RoHS Directive Compliance

Lead, cadmium, mercury, hexavalent chromium and PBB, PBDE meet the specified criteria on the basis of EU Directive 2002/95/EC, except for nonrestricted materials.

Applications

- Factory Automation
- Communication Devices
- Consumer
- Others

Typical Application circuit



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Absolute maximum ratings Valid at Ta = 25°C, unless otherwise specified

Characteristic	Pins	Symbol	Rating	Units	Notes
Input voltage	4-2	V _{IN}	-0.3 to +35	V	

Recommended Operating Conditions Valid at Ta = 25°C, unless otherwise specified

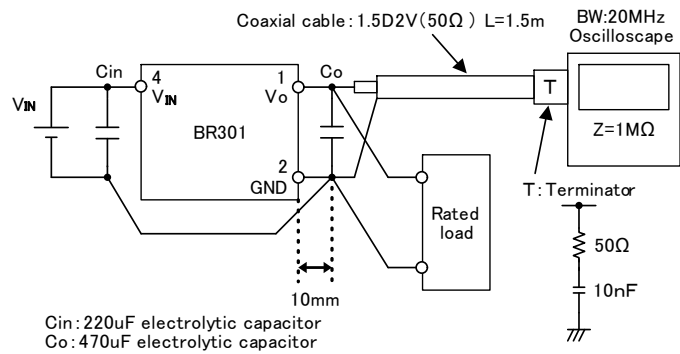
Characteristic	Pins	Symbol	Rating		Units	Notes
			MIN	MAX		
Input voltage range	4-2	V _{IN}	8	30	V	
Output current range	1-2	I _O	0	1	A	

Electrical characteristics Valid at Ta = 25°C, unless otherwise specified

Characteristic		Pins	Symbol	Rating			Units	Notes
				MIN	TYP	MAX		
Input current		4-2	I _{IN}	-	0.17	-	A	V _{IN} =24V I _O =1A
Standby power		4-2	P _{STB}	-	0.13	-	W	V _{IN} =24V I _O =0A
Output voltage		1-2	V _O	-	3.30	-	V	
Constant Voltage Accuracy		1-2	V _{ACC}	-3.0	-	3.0	%	
Output current		1-2	I _O	0	-	1.0	A	
Maximum output power		1-2	P _{O(MAX)}	-	-	3.3	W	
Output voltage ripple	(1)	1-2	V _{RIP}	-	50	-	mV _{P-P}	V _{IN} =24V I _O =1A
Output voltage noise	(1)	1-2	V _{NOISE}	-	50	-	mV _{P-P}	V _{IN} =24V I _O =1A
Output over current protection		1-2	I _{OC}	1.1	-	-	A	
Operating Temperature Range		-	T _{OP}	-20	-	85	°C	See the derating curve
Operating Humidity Range		-	HOP	10	-	90	%	No condensation
Storage Temperature Range		-	TSTG	-25	-	85	°C	
Storage Humidity Range		-	HSTG	5	-	95	%	No condensation
Vibration (Non Operation)	Frequency	-	-	10	-	55	Hz	
	Acceleration	-	-	-	19.6	-	m/s ²	
	Sweep Time	-	-	-	1	-	min	
	Vibration	-	-	-	1.5	-	mm	
	Vibration Direction	-	-	-	X,Y,Z	-	—	
	Vibration Time	-	-	-	2	-	hour	
Shock Capability		Dropped from heights of 50mm to a concrete surface. Each surface is dropped five times						no failure
Product Weight		-	-	-	1.6	-	g	
Product Outline	W × D × H	-	-	-	14x14 x10	-	mm	See the Package Outline

(1) The ripple measurement is made at both ends of electrolytic capacitors Co=470μF. For the Cin, YXF made by Rubycon or equivalent for switching power supplies is recommended. For the Co, low impedance ZL made by Rubycon or equivalent for switching power supplies is recommended. In this case, a 470μF electrolytic capacitor is connected to the position of 10mm wire length from the output terminal.

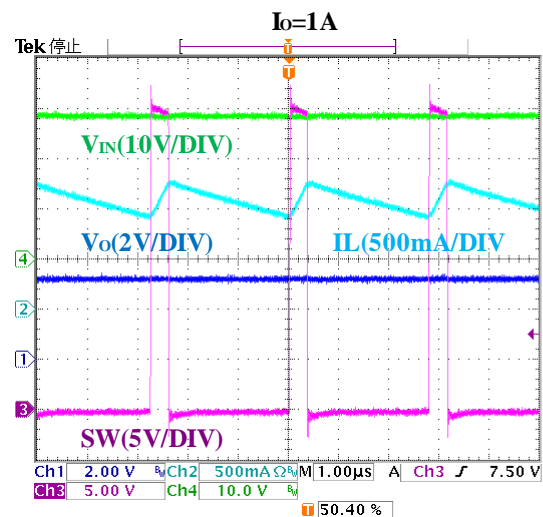
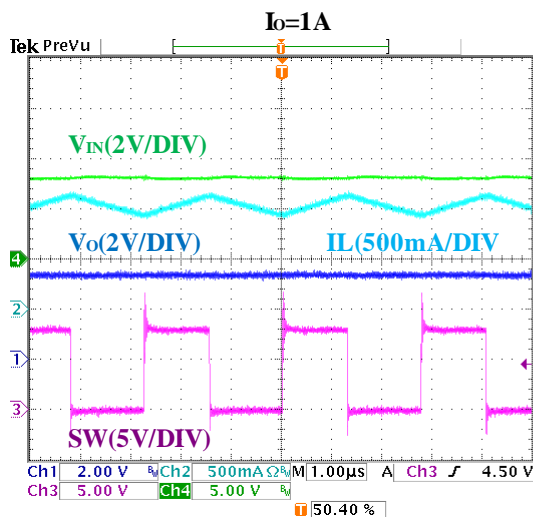
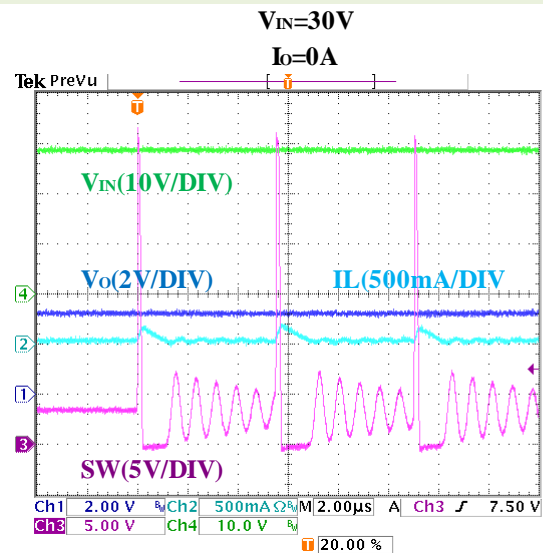
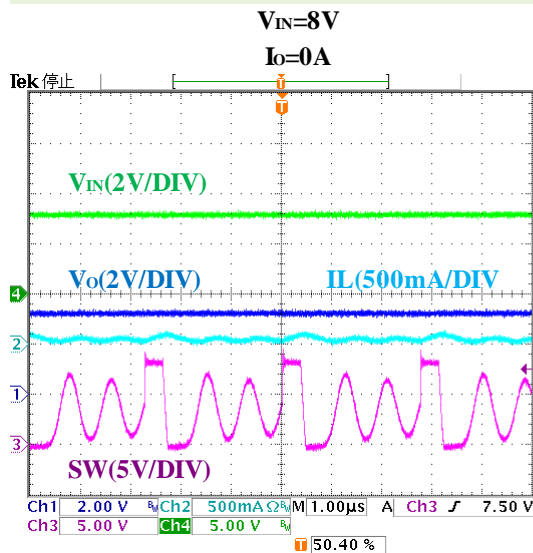
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Ripple Measurement Circuit

Typical Characteristics

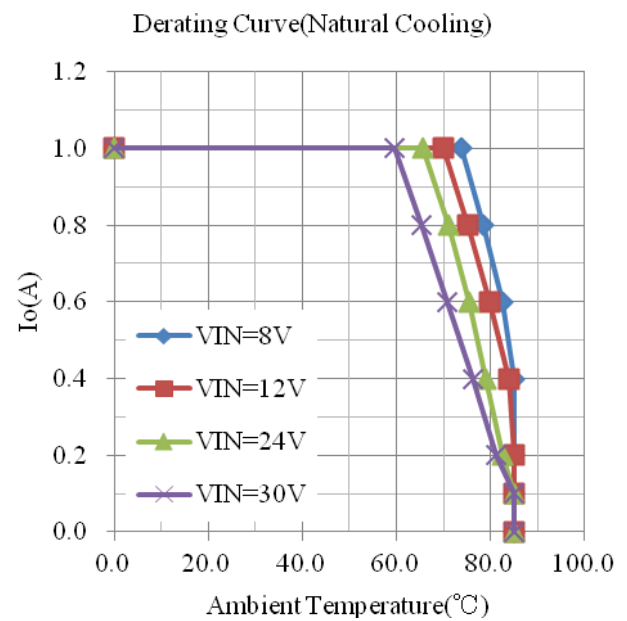
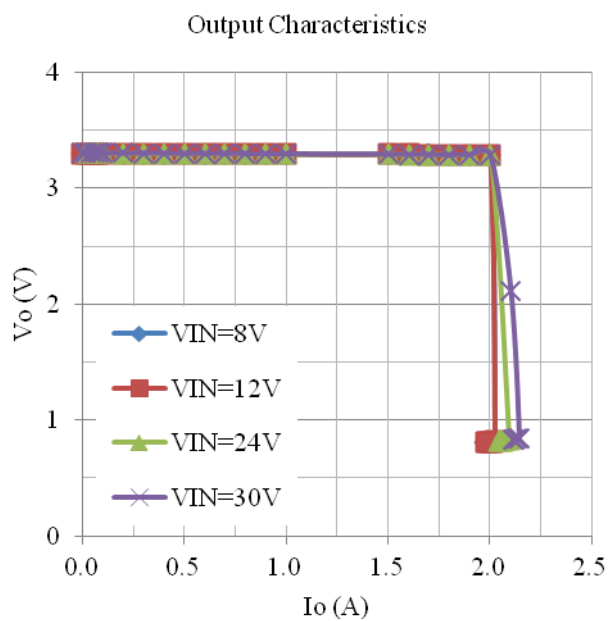
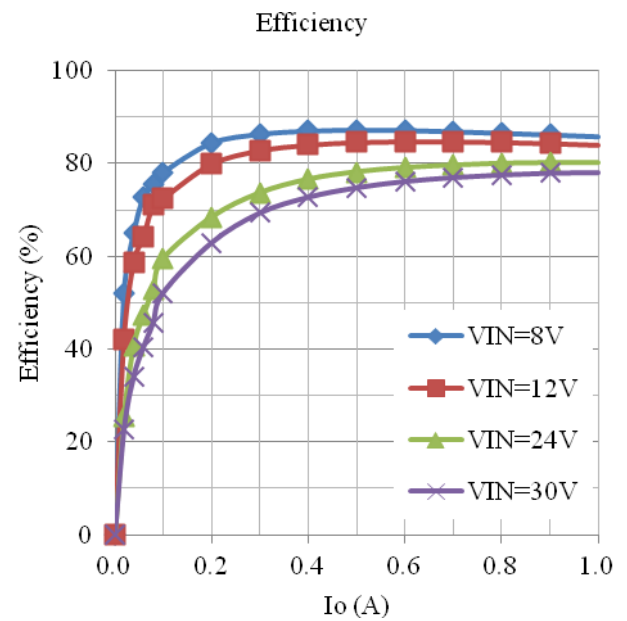
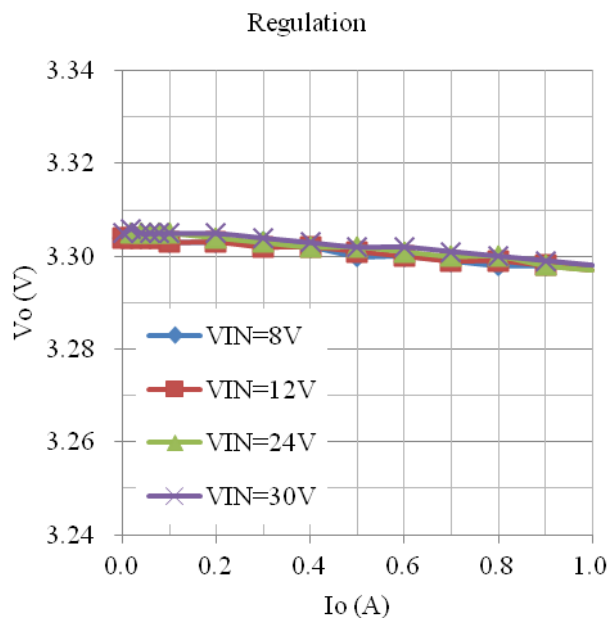
Reference Data ($V_{IN}=8V/30V$, $V_O=3.3V$)



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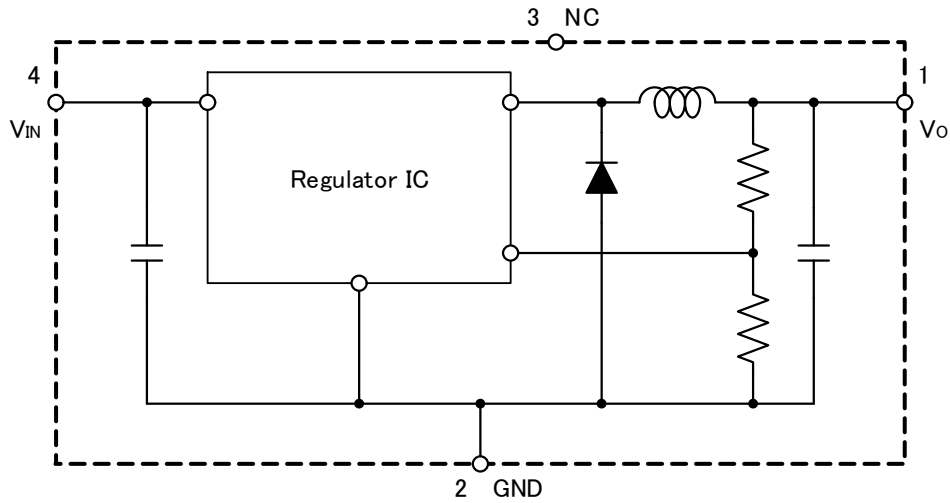
Temperature rise

Measurement points		At $V_{IN}=30V$, $V_O=5V$, $I_O=1A$	
		Temperature (°C)	Temperature Rise (°C)
Inductor	Top	68.5	41.2
Diode	Top	71.5	44.2
Ceramic capacitor	Top	58.7	31.4
IC	Bottom	74.8	47.5
Input ceramic capacitor	Bottom	64.2	36.9
Output ceramic capacitor	Bottom	62.2	34.9
Ambient temperature	—	27.3	—



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Block Diagram



Pin List Table

Pin No.	Symbol	Function
1	V_O	Output terminal
2	GND	Ground terminal
3	NC	Non connection
4	V_{IN}	Input terminal

Pin function

1. V_O

This pin is the output terminal of the positive electrode of the DC / DC converter.
The output load can be taken from this pin and GND pin .

2. GND

This pin is the ground terminal of the DC / DC converter. The output load can be taken from this pin and V_O pin .

3. NC

This pin is unconnected. Do not use this pin.

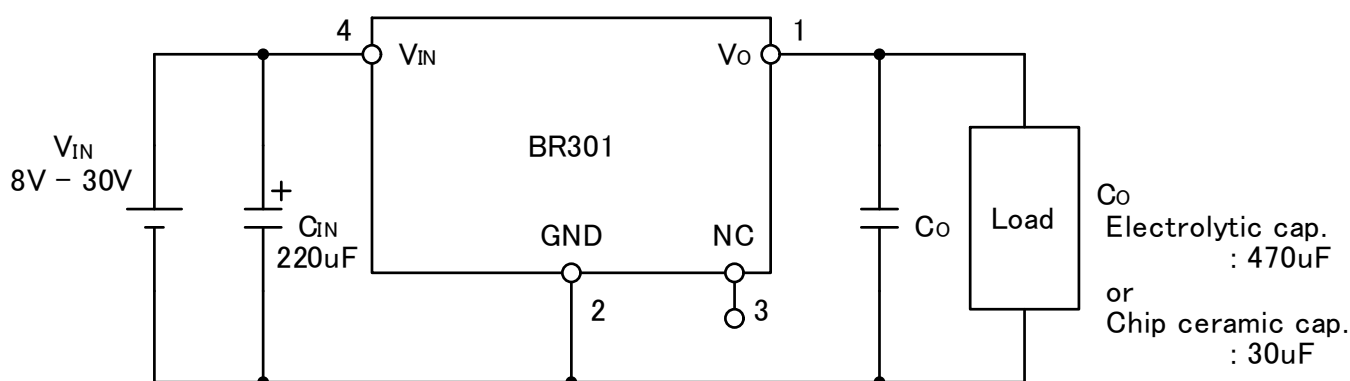
4. V_{IN}

This pin is the input terminal of the positive electrode of the DC / DC converter.
The input voltage of DC 8 to 30V can be supplied between this pin and GND pin.

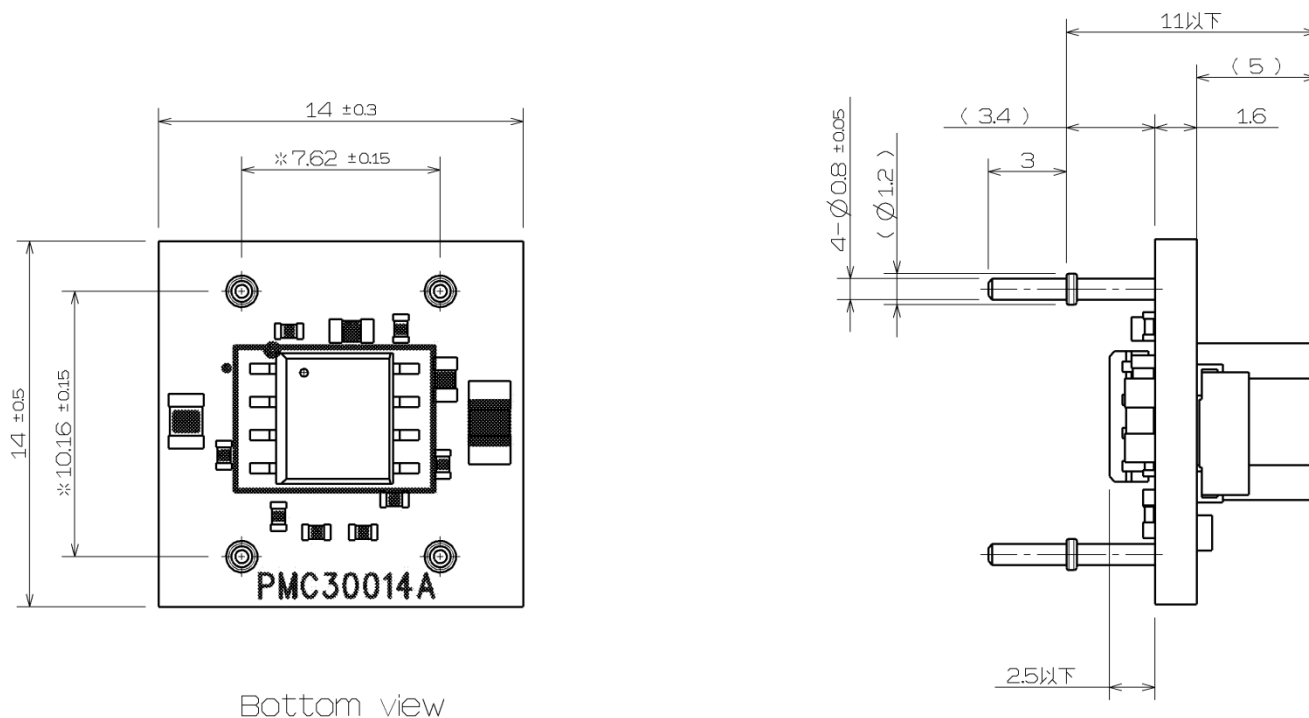
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Typical application circuit

- When handling the products, the operator must be grounded. To prevent shock hazard, grounded wrist straps should be used and at least 1M Ω of resistance from the operator to ground should be placed near the operator.
- Input electrolytic capacitor C_{IN} of around 220 μ F should be connected to the input side of BR301. If the input voltage is stable, it is not required.
- Output electrolytic capacitor C_O of around 470 μ F or chip ceramic capacitor of around 30 μ F should be connected to the output side of BR301.
- ※For the C_{in}, YXF made by Rubycon or equivalent for switching power supplies is recommended.
For the C_o, low impedance ZL made by Rubycon or three ceramic capacitors (GRM31CR71E106KA12 made by Murata) connected in parallel or equivalent for switching power supplies is recommended.
- Depending on PCB layout, output voltage ripple could be amplified. Please check the output voltage ripple on your set.



Typical application circuit example

BR301**Package Outline**

※寸法は、ピン根元での寸法規定とする

NOTES:

- 1) All dimensions are in millimeters
- 2) The tolerance is $\pm 0.3\text{mm}$ unless otherwise specified.
- 3) Dimensions shown in () are reference dimensions.
- 4) Pb-free. Device composition compliant with the RoHS directive

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OPERATING PRECAUTIONS

Because reliability can be affected adversely by improper storage environments and handling methods, please observe the following cautions.

Cautions for Storage

- Ensure that storage conditions comply with the standard temperature (5 to 35°C) and the standard relative humidity (around 40 to 75%); avoid storage locations that experience extreme changes in temperature or humidity.
- Avoid locations where dust or harmful gases are present and avoid direct sunlight.
- Reinspect for rust on leads and solderability of products that have been stored for a long time.

Cautions for Testing and Handling

- When tests are carried out during inspection testing and other standard test periods, protect the products from power surges from the testing products, shorts between the product pins, and wrong connections. In addition, avoid tests exceeded ratings

Soldering

- When soldering the products, please be sure to minimize the working time, within the following limits.
 - 260±5°C 10±1 s(Flow, 2times)
 - 350±5°C 3.0±0.5s (Soldering iron, 1time)
- At a distance of 3.4mm from the main body of the Products.

Electrostatic Discharge

- When handling the products, the operator must be grounded. To prevent shock hazard, grounded wrist straps should be used and at least 1MΩ of resistance from the operator to ground should be placed near the operator.
- Workbenches where the products are handled should be grounded and be provided with conductive table and floor mats.
- When using measuring equipment such as a curve tracer, the equipment should be grounded.
- When soldering the products, the head of a soldering irons or the solder bath must be grounded in order to prevent leak voltages generated by them from being applied to the products.
- The products should always be stored and transported in Sanken shipping containers or conductive containers, or be wrapped in aluminum foil.

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