



Low Profile



Safety Approvals



OCP



Remote ON/OFF

BRNS-series



■ Feature

- Small size and high efficiency non-isolated DC-DC converter.
- Wide input voltage 3.0V to 14.4V.
- Adjustment of the gain control depending on external capacitor is unnecessary.
- Built-in remote ON/OFF, Power good, Frequency synchronization.
- Built-in overcurrent and thermal protection (auto recovery type) functions.

■ CE marking

RoHS Directive

■ Safety agency approvals

UL60950-1, C-UL, EN60950-1

■ 5-year warranty

BRNS

BRN S 20 -□

① ② ③ ④



RoHS



- ① Series name
- ② Single output
- ③ Output current
6: 6A
12: 12A
20: 20A
- ④ Optional
R: Positive logic remote on/off
I: No clock output for frequency synchronization
Y1: Suitable control for external capacitor over 470 μF

| MODEL | BRNS6 | BRNS12 | BRNS20 |
|-----------------------|-----------|--------|--------|
| MAX OUTPUT CURRENT[A] | 6.0 | 12.0 | 20.0 |
| DC OUTPUT | 0.6 - 5.5 | | |

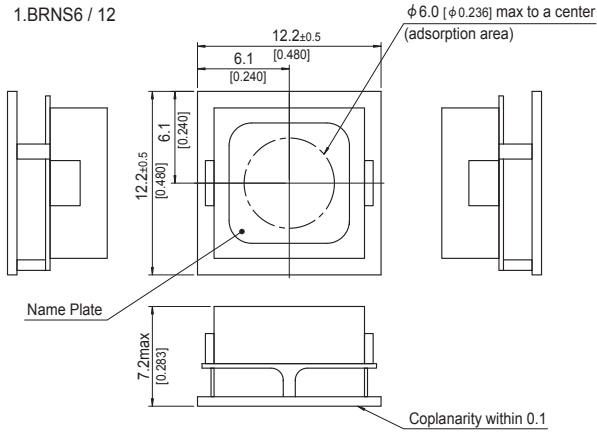
SPECIFICATIONS

| | MODEL | BRNS6 | BRNS12 | BRNS20 |
|-----------------------------------|--------------------------------------|---|--|-----------|
| INPUT | VOLTAGE[V] | DC3.0 - 14.4 | | |
| | CURRENT[A] | *1 0.70 typ | 1.40 typ | 2.30 typ |
| | EFFICIENCY[%] | *1 86 typ | 86 typ | 87 typ |
| OUTPUT | VOLTAGE[V] | *2 0.6 - 5.5 | 0.6 - 5.5 | 0.6 - 5.5 |
| | CURRENT[A] | 6 | 12 | 20 |
| | LINE REGULATION1[mV] Vo ≤ 1.8V | 10 | | |
| | LINE REGULATION2[%Vo] Vo > 1.8V | 0.5 | | |
| | LOAD REGULATION1[mV] Vo ≤ 1.8V | 10 | | |
| | LOAD REGULATION2[%Vo] Vo > 1.8V | 0.5 | | |
| | OUTPUT VOLTAGE SETTING [%Vo] | ±1.0 | | |
| | RIPPLE[mVp-p] | *3 25 | | |
| | RIPPLE NOISE[mVp-p] | *3 50 | | |
| | DRIFT[%Vo] | *4 ±0.5 | | |
| | START-UP TIME[ms] | 4.5 typ | | |
| | OUTPUT VOLTAGE ADJUSTMENT RANGE [V] | Adjustable by external resistor 0.6 - 5.5 | | |
| OUTPUT VOLTAGE REGULATION [%Vo]*5 | ±3.0 | | | |
| PROTECTION CIRCUIT AND OTHERS | OVERCURRENT PROTECTION | Works over 105% of rating (auto recovery type) | | |
| | REMOTE SENSING | Available (+S only) | | Available |
| | REMOTE ON/OFF | Available Negative logic L:ON, H:OFF | | |
| ISOLATION | INPUT-OUTPUT | non-isolated | | |
| ENVIRONMENT | OPERATING TEMP., HUMID. AND ALTITUDE | -40 to +85°C, 20-95%RH (Non condensing) (Refer to "Derating") 3,000m (10,000feet) max | | |
| | STORAGE TEMP., HUMID. AND ALTITUDE | -40 to +100°C, 20-95%RH (Non condensing), 9,000m (30,000feet) max | | |
| | VIBRATION | 10-55Hz, 49.0m/s ² (5G), 3minutes period, 60minutes each along X, Y and Z axis | | |
| | IMPACT | 196.1m/s ² (20G), 11ms, once each along X, Y and Z axis | | |
| SAFETY | AGENCY APPROVALS | UL60950-1, C-UL(CSA60950-1), EN60950 | | |
| OTHERS | CASE SIZE/WEIGHT | 12.2×7.2×12.2mm [0.48×0.28×0.48 inches] (W×H×D) / 4g max | 20.3×8.5×11.4mm [0.80×0.35×0.45 inches] (W×H×D) / 6g max | |
| | COOLING METHOD | Convection / Forced air | | |

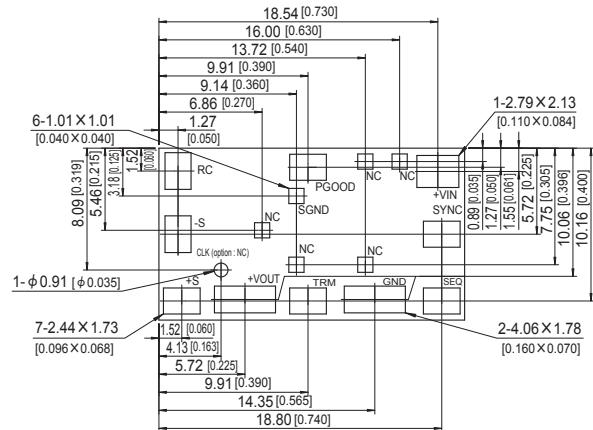
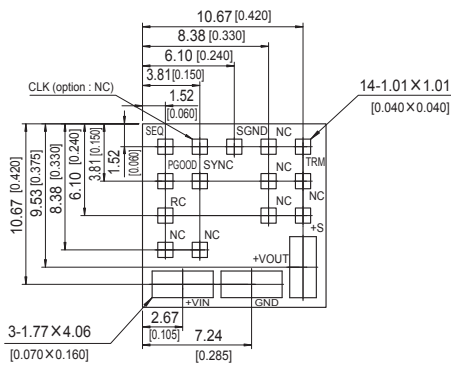
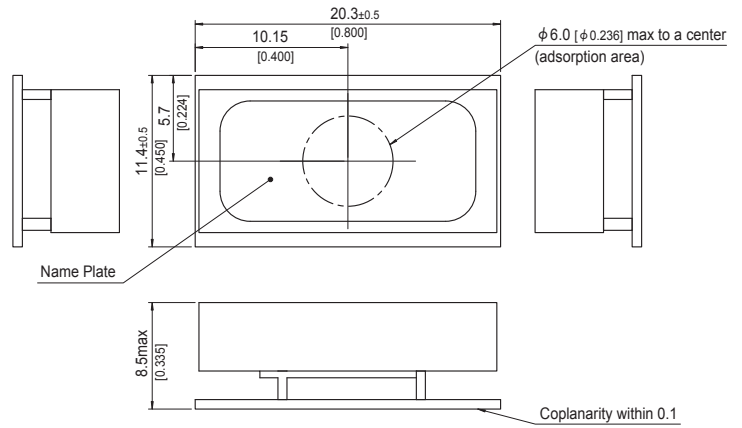
*1 At rated input (DC12V) and rated output (1.2V) Ta=25°C.
 *2 Output voltage is adjusted to the minimum when TRM is opened.
 *3 Ripple and ripple noise is measured by using measuring board with ceramic capacitor at 25mm from output pin.
 At rated input (DC12V) and rated output (1.2V).
 *4 Drift is the change in DC output for an eight hour period after a half - hour warm - up at 25°C, with the input voltage held.
 *5 Output voltage setting is added line regulation and load regulation and temperature regulation used resistance of the 0.5% tolerance.

External view

1. BRNS6 / 12



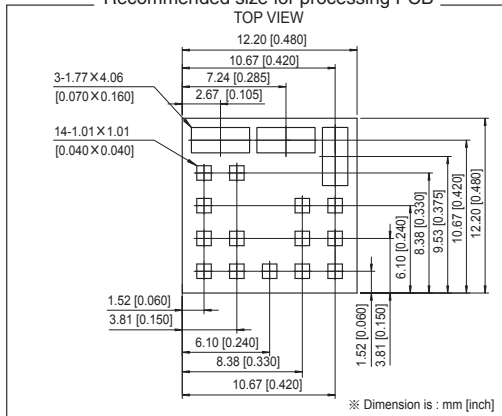
2. BRNS20



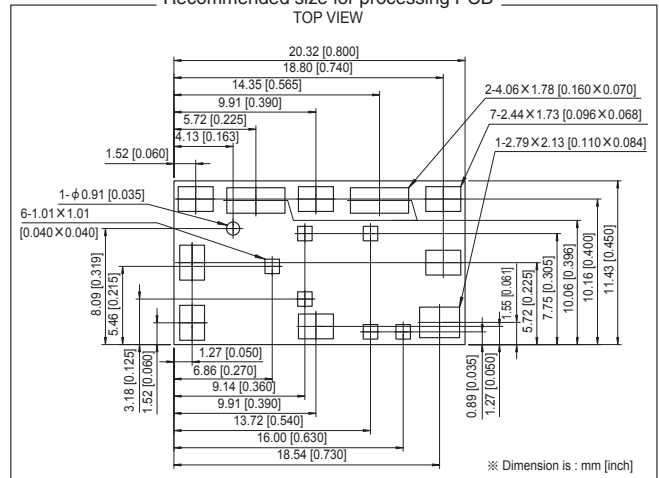
- ※ Tolerance : ± 0.3
- ※ Dimensions in mm, [] =inches
- ※ Weight : 4.0g max
- ※ Terminal material : PCB pattern
- ※ Plating treatment of terminal : Gold flashing

- ※ Tolerance : ± 0.3
- ※ Dimensions in mm, [] =inches
- ※ Weight : 6.0g max
- ※ Terminal material : PCB pattern
- ※ Plating treatment of terminal : Gold flashing

Recommended size for processing PCB

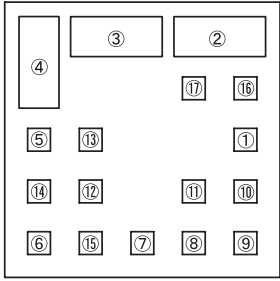


Recommended size for processing PCB



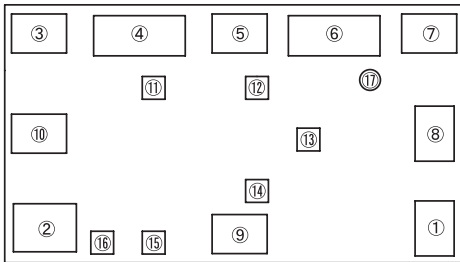
Pin Configuration

BRNS6/12



*BOTTOM VIEW

BRNS20



*BOTTOM VIEW

| Pin No. | | Pin Connection | Function |
|-----------|---------|----------------|---|
| BRNS 6/12 | BRNS 20 | | |
| ① | | RC | Remote ON/OFF |
| ② | | +VIN | +DC input |
| ③ | ④ | GND | GND(-DC input, -DC output) |
| ④ | ⑥ | +VOUT | +DC output |
| ⑤ | ⑦ | +S | +Remote sensing |
| ⑥ | ⑤ | TRM | Adjustment of output voltage |
| ⑦ | ⑭ | SGND | Signal GND |
| ⑧ | ⑰ | CLK(NC) | Clock output |
| ⑨ | ③ | SEQ | Control of Start up time and turn |
| ⑩ | ⑨ | PGOOD | Power good |
| ⑪ | ⑩ | SYNC | Input for frequency synchronization |
| ⑫ | ⑧ | -S | NC : BRNS6/12 -Remote sensing : BRNS20 |
| ⑬ | ⑪ | NC | NC |
| ⑭ | ⑬ | NC | NC |
| ⑮ | ⑫ | NC | NC |
| ⑯ | ⑯ | NC | NC |
| ⑰ | ⑮ | NC | NC |

Implementation · Mounting Method

Mounting method

■The unit can be mounted in any direction. When two or more power supplies are used side by side, position them with proper intervals to allow enough air ventilation. The temperature around each power supply should not exceed the temperature range shown in "Derating".

Automatic Mounting

■To mount BRNS series automatically, use the coil area near the center of the PCB as an adsorption point. Please see the External View for details of the adsorption point.

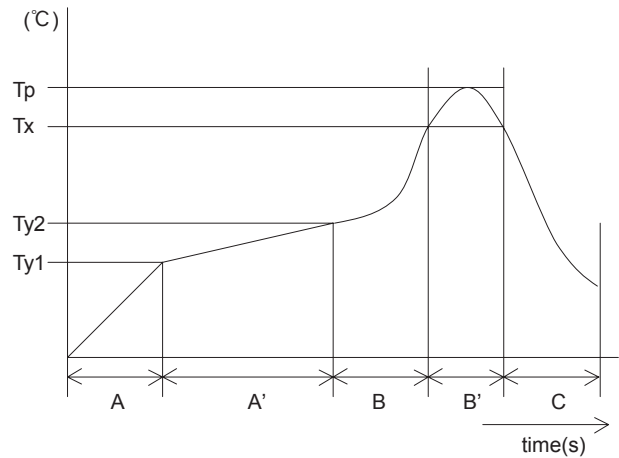
Soldering

■Right figure shows condition for reflow of BRNS series. Please make sure that the temperature of board's pattern near by +VOUT and GND terminal.

■While soldering, having vibration or impact on the unit should be avoided, because of solder melting.

■Please do not do the implementation except the reflow.

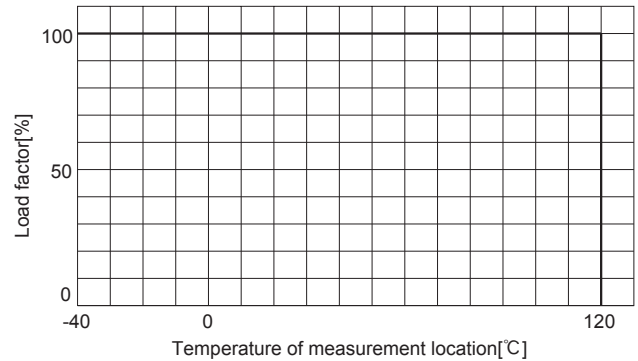
■Because some parts drops, please do not do reflow of the back side.



| | |
|----|--|
| A | 1.0 - 5.0°C/ s |
| A' | Ty1 : 160±10°C Ty2 : 180±10°C Ty1 - Ty2 : 120s max |
| B | 1.0 - 5.0°C/ s |
| B' | Tp : Max245°C 10s max Tx : 220°C or more : 70s max |
| C | 1.0 - 5.0°C/ s |

Derating

- Make sure the temperatures measurement locations shown from Instruction Manual 8 are on or under the derating curve in right figure. Ambient temperature must be kept at 85°C or under.



Instruction Manual

- It is necessary to read the “Instruction Manual” and “Before using our product” before you use our product.

Instruction Manual <https://en.cosel.co.jp/product/powersupply/BRNS/>
 Before using our product <https://en.cosel.co.jp/technical/caution/index.html>

BRNS



NOTICE



Basic Characteristics Data

| Model | Circuit method | Switching frequency [kHz] (reference) | Input current [A] | Inrush current protection | PCB/Pattern | | | Series/Parallel operation | |
|--------|----------------|---------------------------------------|-------------------|---------------------------|-------------------------------|--------------|--------------|---------------------------|--------------------|
| | | | | | Material | Single sided | Double sided | Series operation | Parallel operation |
| BRNS6 | Buck Converter | 600 | * 1 | - | glass fabric base,epoxy resin | - | Multilayer | - | - |
| BRNS12 | Buck Converter | 600 | * 1 | - | glass fabric base,epoxy resin | - | Multilayer | - | - |
| BRNS20 | Buck Converter | 600 | * 1 | - | glass fabric base,epoxy resin | - | Multilayer | - | - |

*1 Refer to Specification.