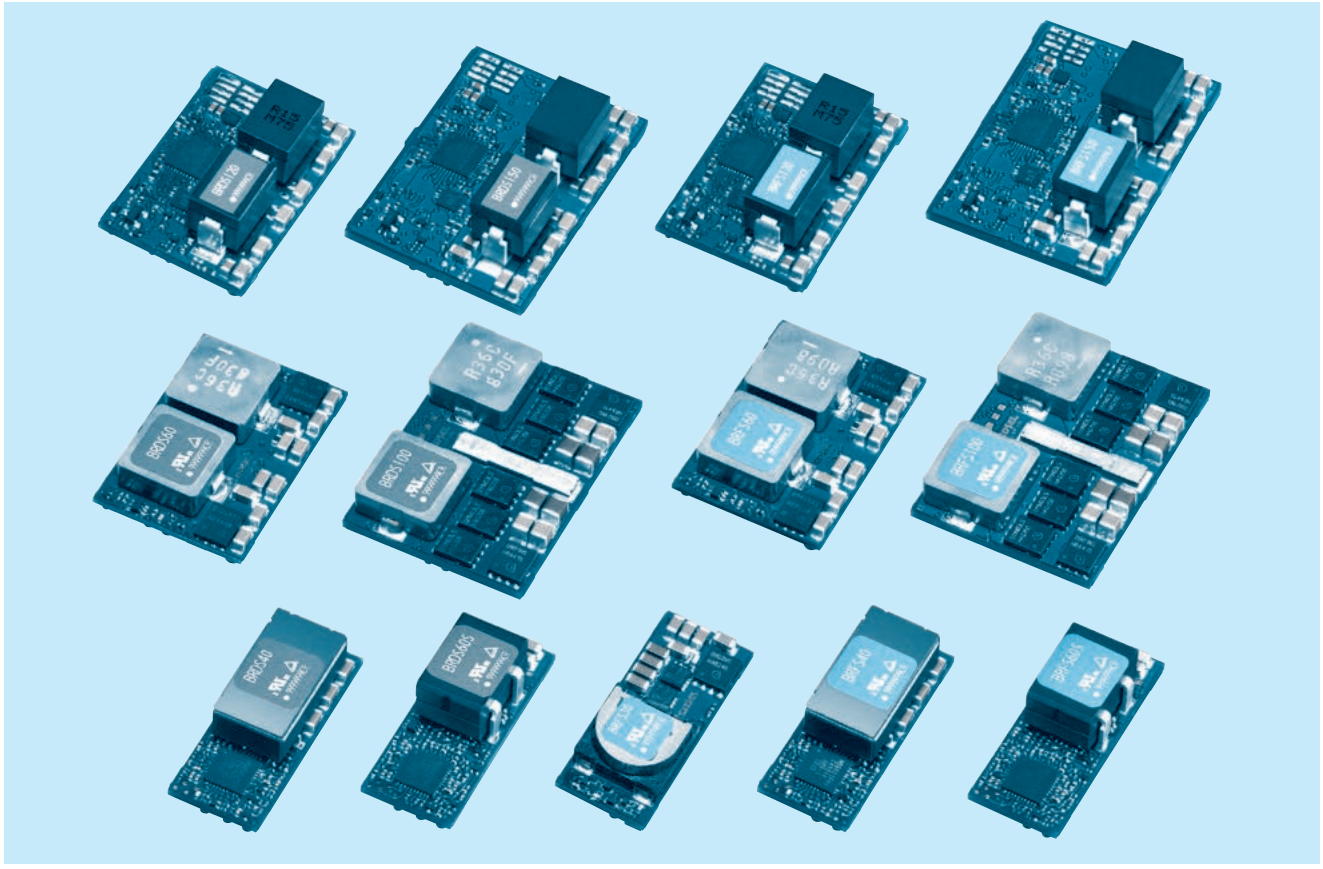
Low Profile | Safety Approvals | OCP | Remote ON/OFF

BRFS/BRDS-series



Feature

Small size and high efficiency non-isolated DC-DC converter.
Wide input voltage 4.5V to 14.0V.
Fast transient respoce by Robust control.
Built-in remote ON/OFF,Power good,Start-up sequence.
Built-in overcurrent and thermal protection (auto recovery type) functions.
PMBus interface for programming, margining, and telemetry (BRDS-series).

CE marking

Low Voltage Directive
RoHS Directive

UKCA marking

Electrical Equipment Safety Regulations
RoHS Regulations

Safety agency approvals

UL60950-1, C-UL, EN62368-1

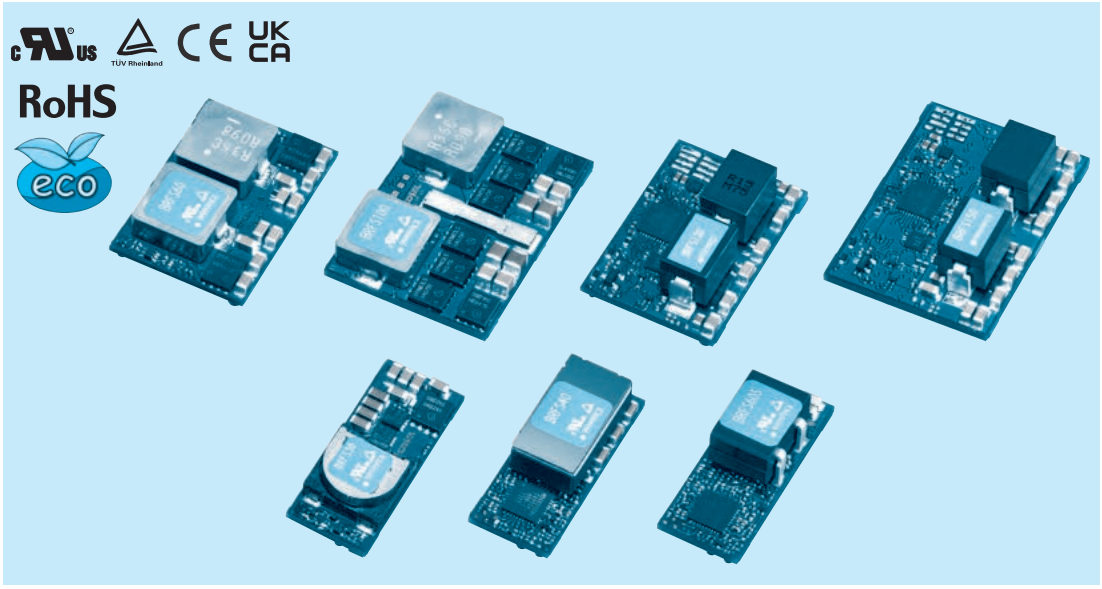
5-year warranty

COSEL DC-DC Converters POL Type

BRFS

Ordering information

BRF ① S ② 60 ③ S ④ -□ ⑤



①Series name
②Single output
③Output current
30:30A
40:40A
60:60A
100:100A
120:120A
150:150A
④Type
Blank : Standard type
S : Small type (only 60A)
⑤Optional
R : Positive logic remote on/off
I : POWERGOOD (only BRFS30/40/60S)
※Other models has POWERGOOD function normally.
P : Parallel operation (only BRFS40/60S)
Y1 : Fast transient response (only BRFS100)

MODEL	BRFS30	BRFS40	BRFS60	BRFS60S	BRFS100	BRFS120	BRFS150
MAX OUTPUT CURRENT[A]	30.0	40.0	60.0	60.0	100.0	120.0	150.0
DC OUTPUT	0.8 - 3.63V	0.6 - 2.0V	0.7 - 2.0V	0.6 - 2.0V	0.7 - 2.0V	0.6 - 1.8V	0.6 - 1.8V *7

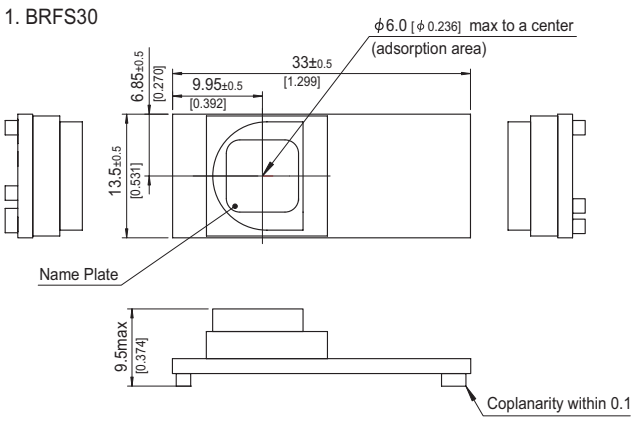
SPECIFICATIONS

	MODEL	BRFS30	BRFS40	BRFS60	BRFS60S	BRFS100	BRFS120	BRFS150
INPUT	VOLTAGE[V]	DC4.5 - 14.0						
	CURRENT[A] *1	3.41 typ	4.52 typ	6.82 typ	6.71 typ	11.24 typ	13.50 typ	16.90 typ
	EFFICIENCY[%] *1	88.0 typ	88.5 typ	88.0 typ	89.5 typ	89.0 typ	89.0 typ	89.0 typ
OUTPUT	VOLTAGE[V] *2	0.8 - 3.63	0.6 - 2.0	0.7 - 2.0	0.6 - 2.0	0.7 - 2.0	0.6 - 1.8	0.6 - 1.8 *7
	CURRENT[A]	30	40	60	60	100	120	150
	LINE REGULATION[mV]	5						
	LOAD REGULATION[mV]	5						
	RIPPLE[mVp-p] *3	25						
	RIPPLE NOISE[mVp-p] *3	50						
	OUTPUT VOLTAGE SETTING [%Vo]	±1						
	DRIFT[mV] *4	5						
	START-UP TIME[ms]	8.0 typ			12.0 typ *6	8.0 typ	12.0 typ *6	
	OUTPUT VOLTAGE ADJUSTMENT RANGE [V]	Adjustable by external resistor						
		0.8 - 3.63	0.6 - 2.0	0.7 - 2.0	0.6 - 2.0	0.7 - 2.0	0.6 - 1.8	0.6 - 1.8 *7
	OUTPUT VOLTAGE TOTAL REGULATION [%Vo] *5	±3						
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 105% of rating (auto recovery type)						
	REMOTE SENSING	Available (+S only)		Available	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℃, 20-95%RH (Non condensing) (Refer to "Derating") 3,000m (10,000feet) max						
	STORAGE TEMP.,HUMID.AND ALTITUDE	-40 to +100℃, 20-95%RH (Non condensing), 9,000m (30,000feet) max						
	VIBRATION	10-55Hz, 49.0m/s² (5G), 3minutes period, 60minutes each along X, Y and Z axis						
	IMPACT	196.1m/s² (20G), 11ms, once each along X, Y and Z axis						
SAFETY	AGENCY APPROVALS	UL60950-1, C-UL (CSA60950-1), EN62368-1						
OTHERS	CASE SIZE/WEIGHT	33.0X9.5X13.5mm [1.3X0.37X0.53 inches] (WXHXD) / 10g max	33.0X10.9X13.5mm [1.3X0.43X0.53 inches] (WXHXD) / 12g max	33.0X8.0X22.9mm [1.3X0.31X0.9 inches] (WXHXD) / 15g max	33.0X12.7X13.5mm [1.3X0.5X0.53 inches] (WXHXD) / 12g max	38.0X8.5X27.7mm [1.5X0.33X1.09 inches] (WXHXD) / 22g max	33.0X12.7X22.9mm [1.3X0.5X0.9 inches] (WXHXD) / 14g max	38.0X13.8X27.7mm [1.5X0.54X1.09 inches] (WXHXD) / 21g max
	COOLING METHOD	Convection / Forced air						

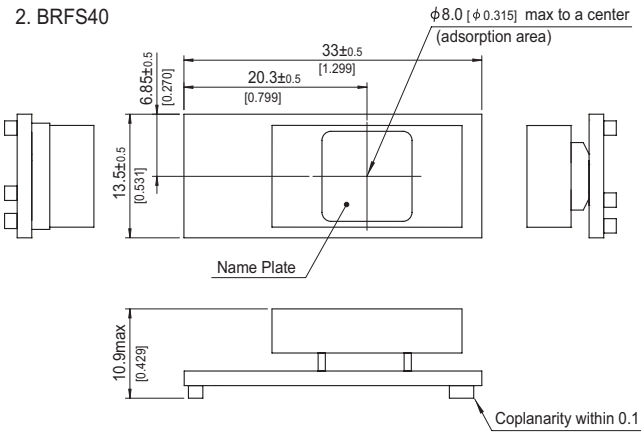
*1 At rated input (DC12V) and rated output (1.2V) Ta=25℃.
*2 Output voltage is adjusted to the minimum when TRM is opened.
*3 Ripple and ripple noise is measured by using measuring board with ceramic capacitor at 50mm from output pin.
*4 Drift is the change in DC output for an eight hour period after a half - hour warm - up at 25℃, 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.
*6 The start-up time when using the RC terminal is same as other BRFS.
*7 The output voltage adjustment area determines by the input voltage.

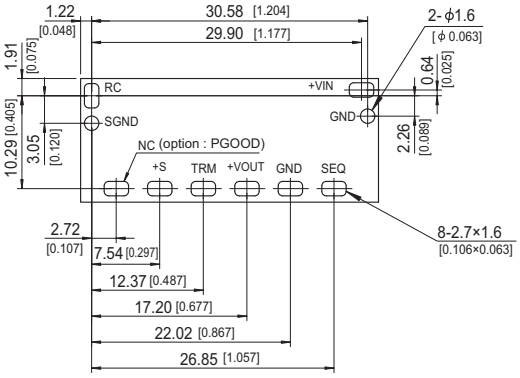
External view

1. BRFS30

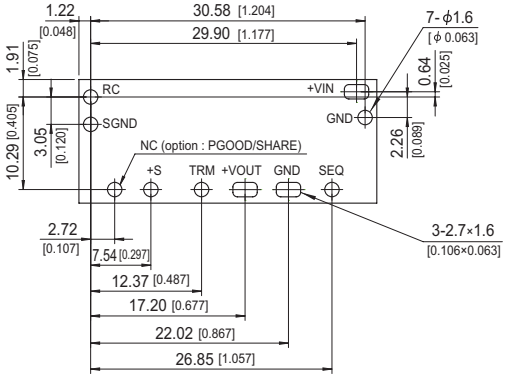


2. BRFS40



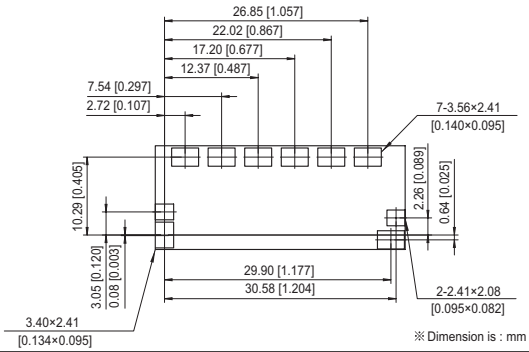


※ Tolerance : ±0.3 [±0.012]
※ Dimensions in mm, [ ]=inches
※ Weight : 10g max
※ Terminal material : copper
※ Plating treatment of terminal
: Lead free plating



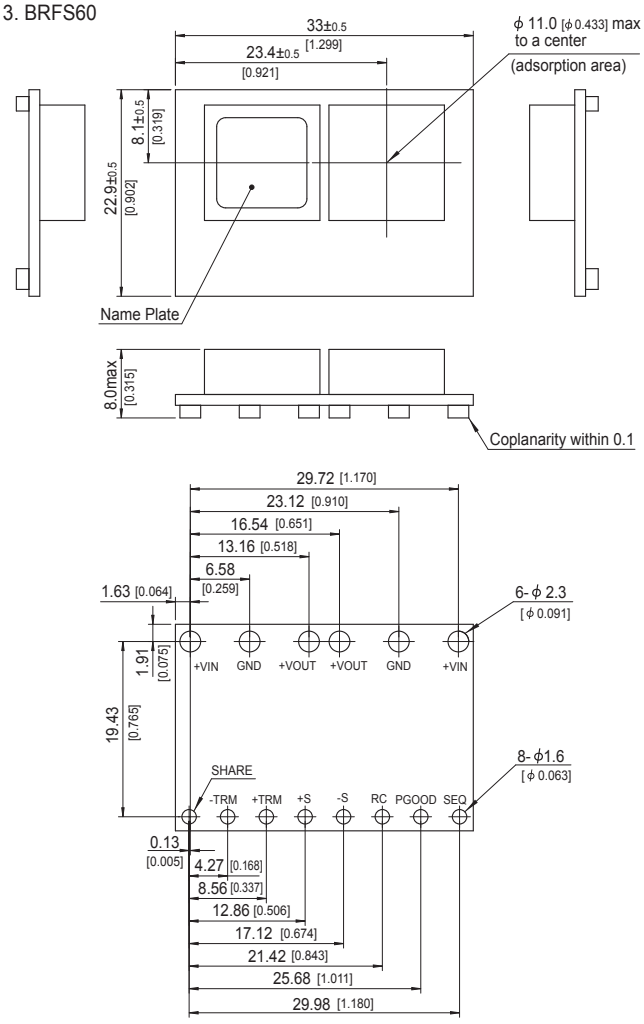
※ Tolerance : ±0.3 [±0.012]
※ Dimensions in mm, [ ]=inches
※ Weight : 12g max
※ Terminal material : copper
※ Plating treatment of terminal
: Lead free plating

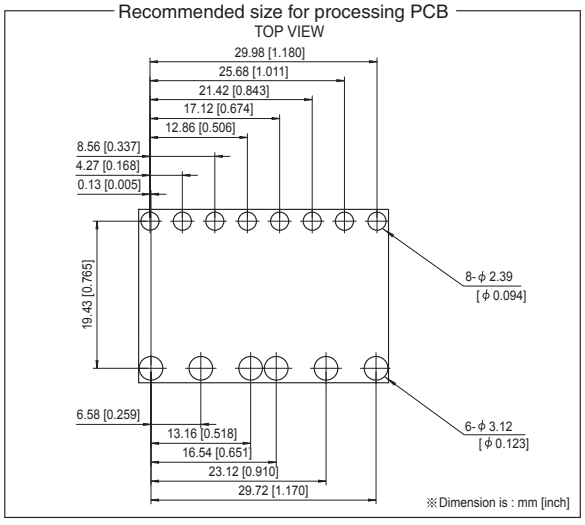
Recommended size for processing PCB
TOP VIEW



External view

3. BRFS60

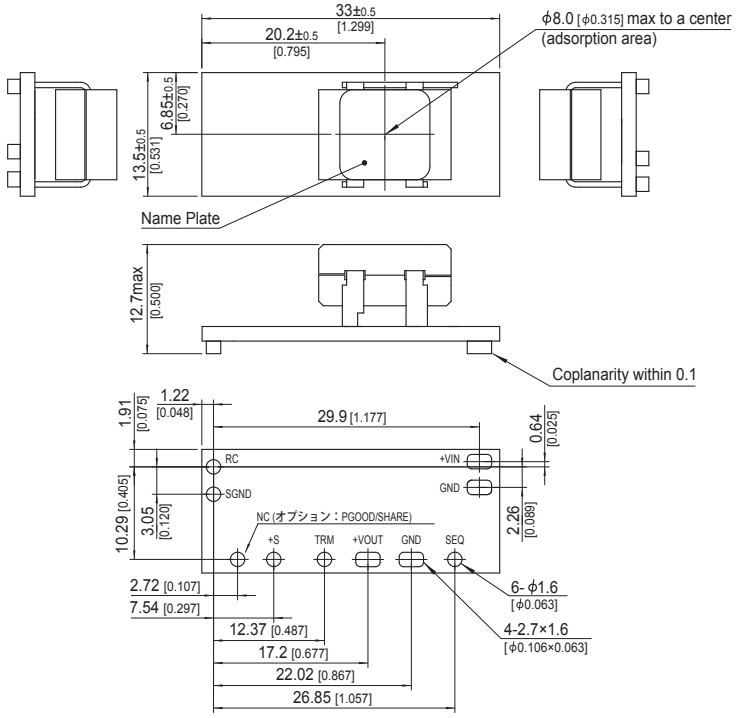


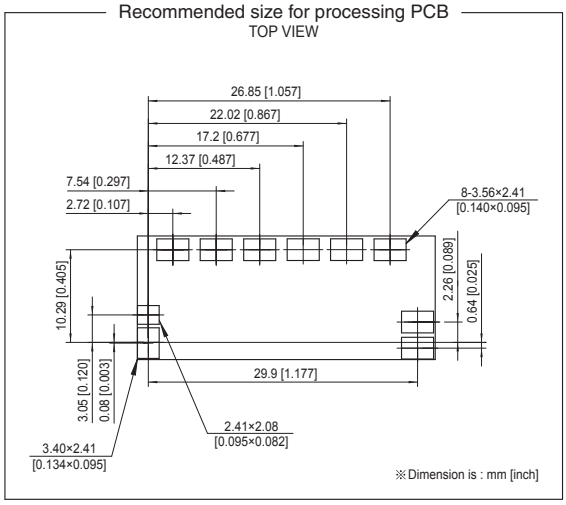


※ Tolerance : ±0.3 [±0.012]
※ Dimensions in mm, [ ]=inches
※ Weight : 15g max
※ Terminal material : copper
※ Plating treatment of terminal
: Lead free plating

External view

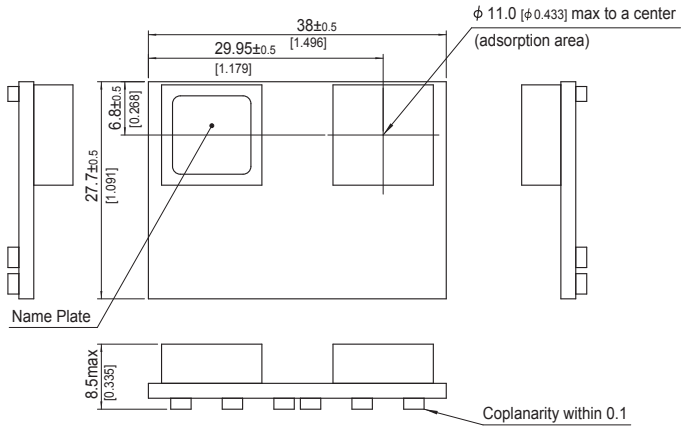
4. BRFS60S

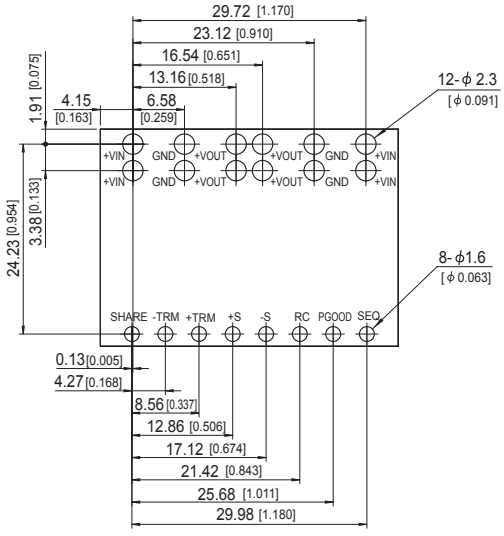


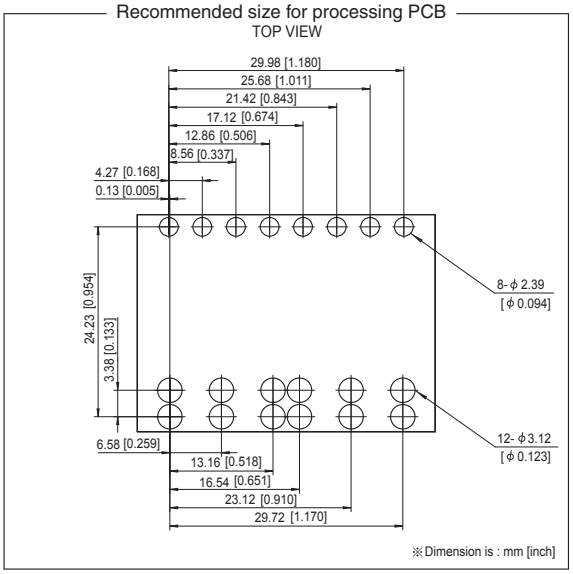


※ Tolerance : ±0.3 [±0.012]
※ Dimensions in mm, [ ]=inches
※ Weight : 12g max
※ Terminal material : copper
※ Plating treatment of terminal
: Lead free plating

5. BRFS100



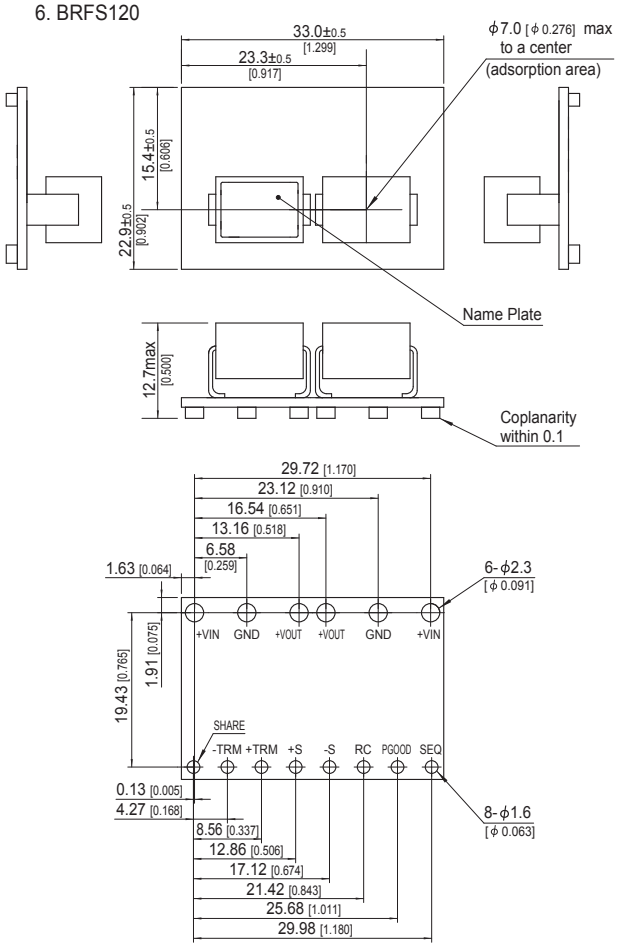




※ Tolerance : ±0.3 [±0.012]
※ Dimensions in mm, [ ]=inches
※ Weight : 22g max
※ Terminal material : copper
※ Plating treatment of terminal
: Lead free plating

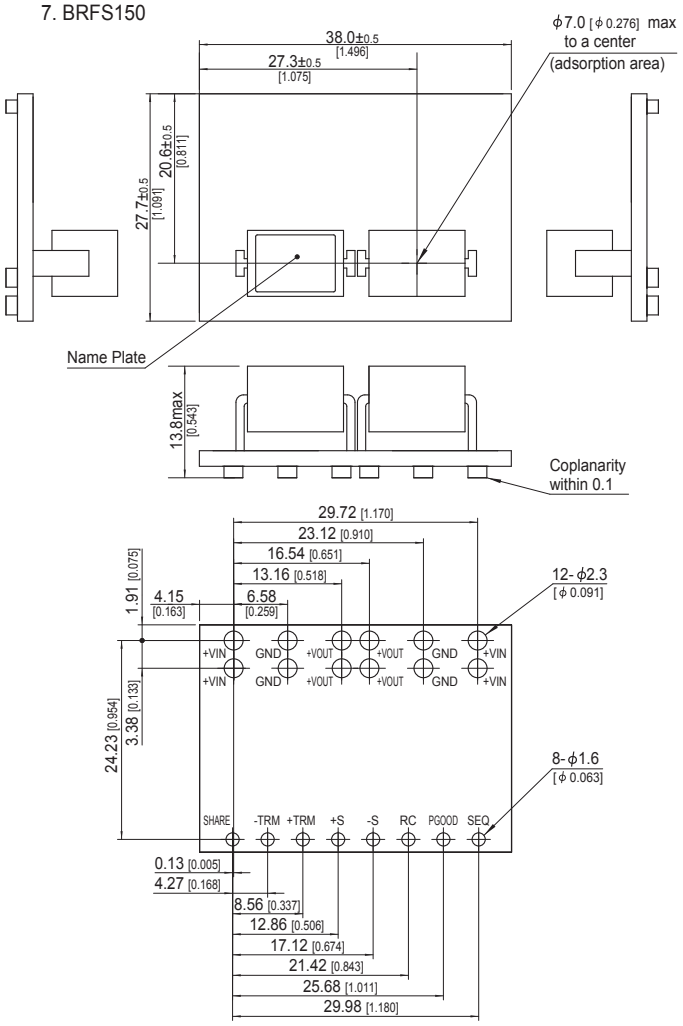
External view

6. BRFS120



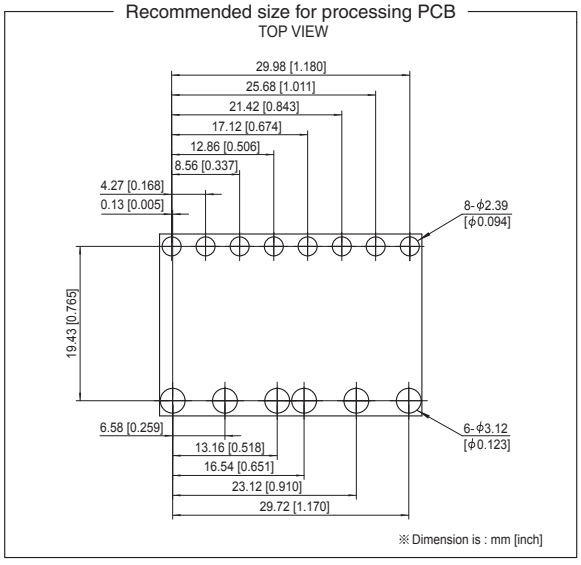
※ Tolerance : ±0.3 [±0.012]
※ Dimensions in mm, [ ]=inches
※ Weight : 14g max
※ Terminal material : copper
※ Plating treatment of terminal
: Lead free plating

7. BRFS150

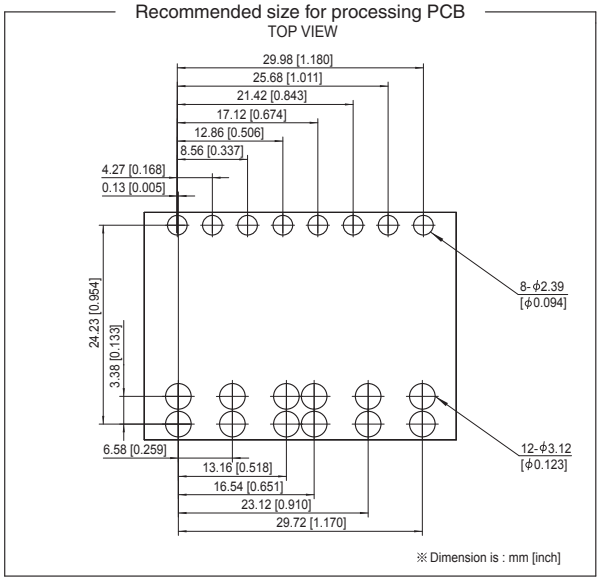


※ Tolerance : ±0.3 [±0.012]
※ Dimensions in mm, [ ]=inches
※ Weight : 21g max
※ Terminal material : copper
※ Plating treatment of terminal
: Lead free plating

Recommended size for processing PCB
TOP VIEW



Recommended size for processing PCB
TOP VIEW

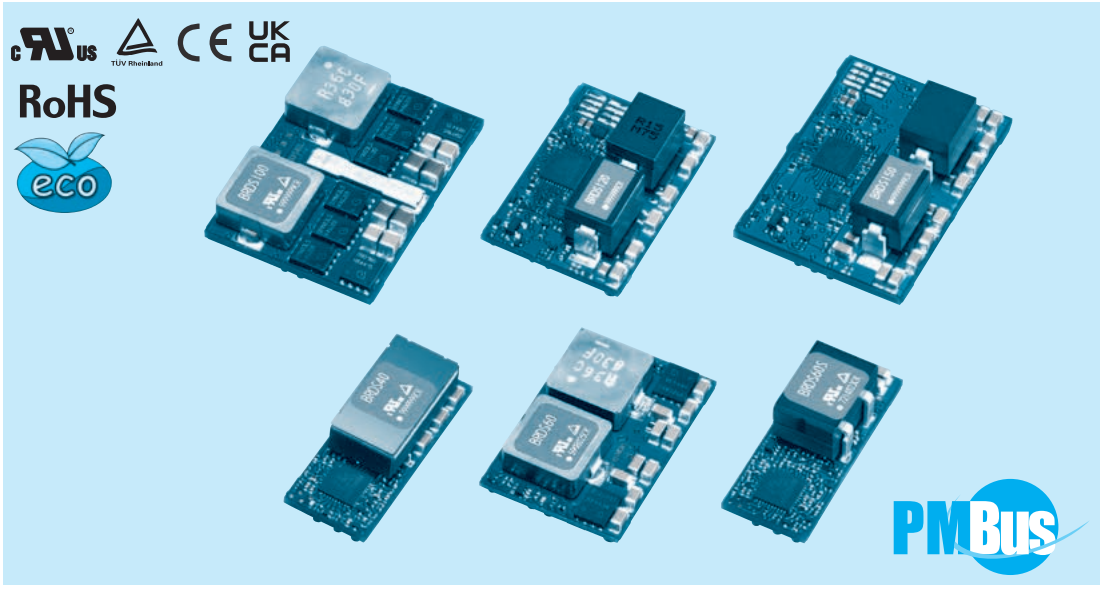


COSEL DC-DC Converters POL Type

BRDS

Ordering information

BRD ① S ② 100 ③ □ ④ -□ ⑤



①Series name
②Single output
③Output current
40:40A
60:60A
100:100A
120:120A
150:150A
④Type
Blank : Standard type
S : Small type (Only 60A)
⑤Optional
R : Positive logic remote on/off

MODEL	BRDS40	BRDS60	BRDS60S	BRDS100	BRDS120	BRDS150
MAX OUTPUT CURRENT[A]	40.0	60.0	60.0	100.0	120.0	150.0
DC OUTPUT	0.6 - 2.0V	0.7 - 2.0V	0.6 - 2.0V	0.7 - 2.0V	0.6 - 1.8V	0.6 - 1.8V ∗6

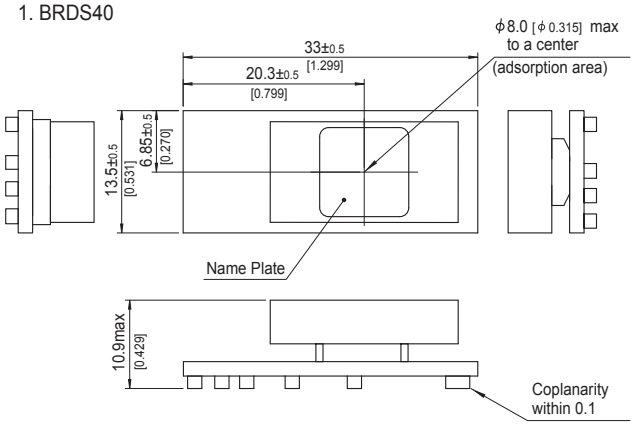
SPECIFICATIONS

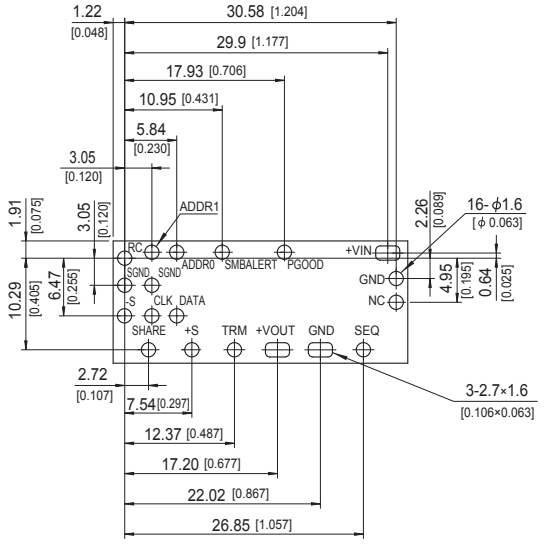
	MODEL	BRDS40	BRDS60	BRDS60S	BRDS100	BRDS120	BRDS150
INPUT	VOLTAGE[V]	DC4.5 - 14.0					
	CURRENT[A] ∗1	4.52 typ	6.82 typ	6.71 typ	11.24 typ	13.50 typ	16.90 typ
	EFFICIENCY[%] ∗1	88.5 typ	88.0 typ	89.5 typ	89.0 typ	89.0 typ	89.0 typ
OUTPUT	VOLTAGE[V] ∗2	0.6 - 2.0	0.7 - 2.0	0.6 - 2.0	0.7 - 2.0	0.6 - 1.8	0.6 - 1.8 ∗6
	CURRENT[A]	40	60	60	100	120	150
	LINE REGULATION[mV]	5					
	LOAD REGULATION[mV]	5					
	RIPPLE[mVp-p] ∗3	25					
	RIPPLE NOISE[mVp-p] ∗3	50					
	OUTPUT VOLTAGE SETTING [%Vo]	±1					
	DRIFT[mV] ∗4	5					
	START-UP TIME[ms]	12.0 typ					
	OUTPUT VOLTAGE ADJUSTMENT RANGE [V]	Adjustable by external resistor					
		0.6 - 2.0	0.7 - 2.0	0.6 - 2.0	0.7 - 2.0	0.6 - 1.8	0.6 - 1.8 ∗6
	OUTPUT VOLTAGE TOTAL REGULATION [%Vo] ∗5	±3					
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 105% of rating (auto recovery type)					
	REMOTE SENSING	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℃, 20-95%RH (Non condensing) (Refer to “Derating”) 3,000m (10,000feet) max					
	STORAGE TEMP.,HUMID.AND ALTITUDE	-40 to +100℃, 20-95%RH (Non condensing), 9,000m (30,000feet) max					
	VIBRATION	10-55Hz, 49.0m/s² (5G), 3minutes period, 60minutes each along X, Y and Z axis					
	IMPACT	196.1m/s² (20G), 11ms, once each along X, Y and Z axis					
SAFETY	AGENCY APPROVALS	UL60950-1, C-UL (CSA60950-1), EN62368-1					
OTHERS	CASE SIZE/WEIGHT	33.0×10.9×13.5mm [1.3×0.43×0.53 inches] (W×H×D) / 12g max	33.0×8.0×22.9mm [1.3×0.31×0.9 inches] (W×H×D) / 15g max	33.0×12.7×13.5mm [1.3×0.5×0.53 inches] (W×H×D) / 12g max	38.0×8.5×27.7mm [1.5×0.33×1.09 inches] (W×H×D) / 22g max	33.0×12.7×22.9mm [1.3×0.5×0.9 inches] (W×H×D) / 14g max	38.0×13.8×27.7mm [1.5×0.54×1.09 inches] (W×H×D) / 21g max
	COOLING METHOD	Convection / Forced air					

∗1 At rated input (DC12V) and rated output (1.2V) Ta=25℃.
∗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 50mm from output pin.
∗4 Drift is the change in DC output for an eight hour period after a half - hour warm - up at 25℃, 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.
∗6 The output voltage adjustment area determines by the input voltage.
∗ This product is subject to a license from PAI Capital LLC related to digital power technology patents owned by PAI Capital LLC.

External view

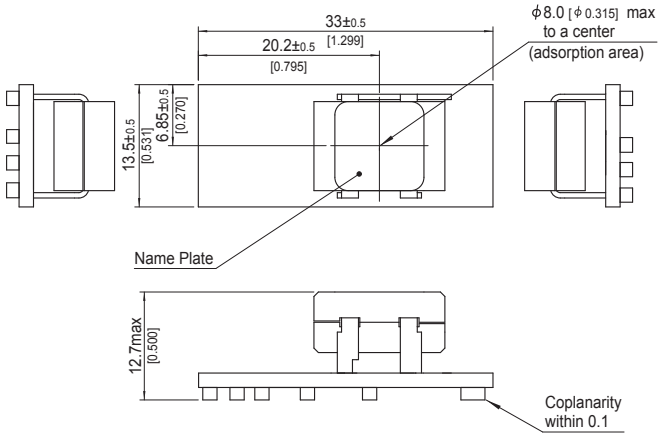
1. BRDS40

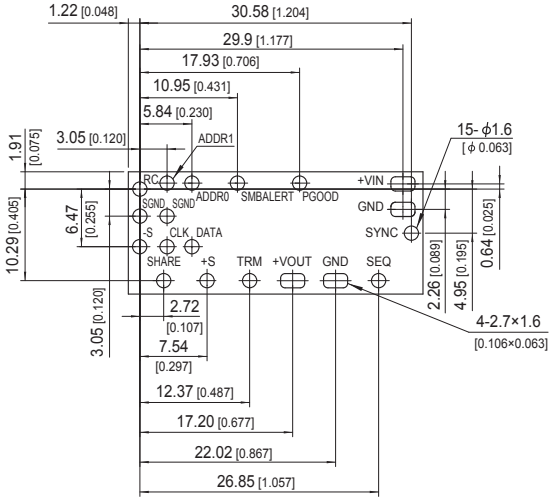




※ Tolerance : ±0.3 [±0.012]
※ Dimensions in mm, [ ]=inches
※ Weight : 12g max
※ Terminal material : copper
※ Plating treatment of terminal
: Lead free plating

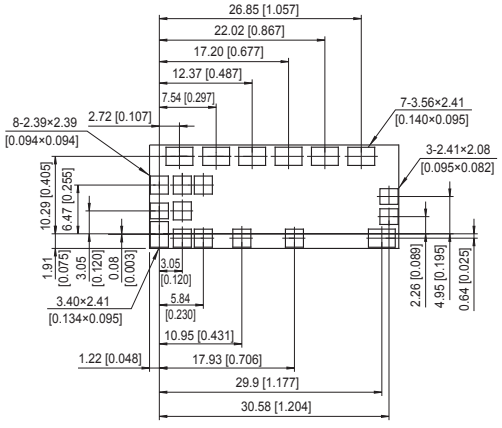
2. BRDS60S





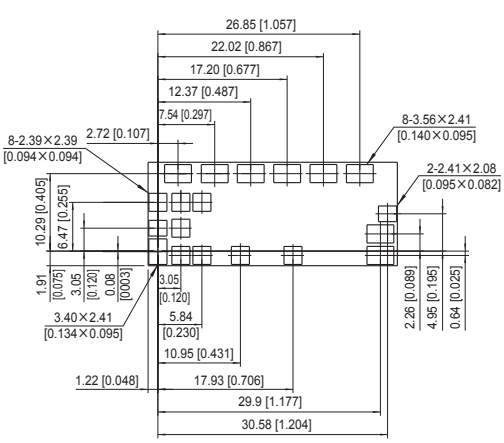
※ Tolerance : ±0.3 [±0.012]
※ Dimensions in mm, [ ]=inches
※ Weight : 12g max
※ Terminal material : copper
※ Plating treatment of terminal
: Lead free plating

Recommended size for processing PCB
TOP VIEW



※ Dimension is : mm [inch]

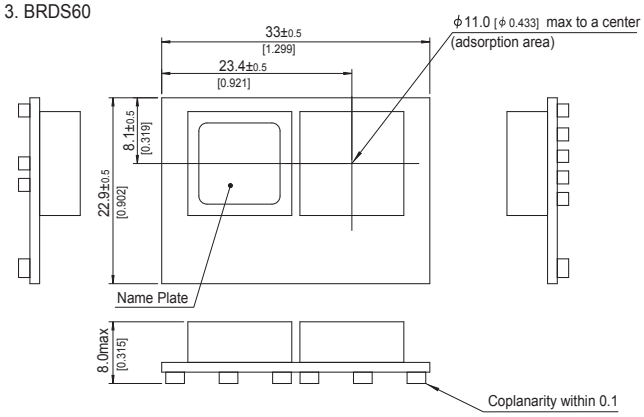
Recommended size for processing PCB
TOP VIEW

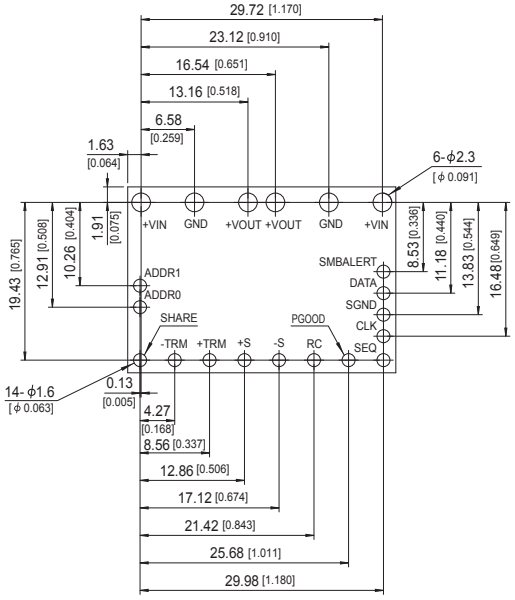


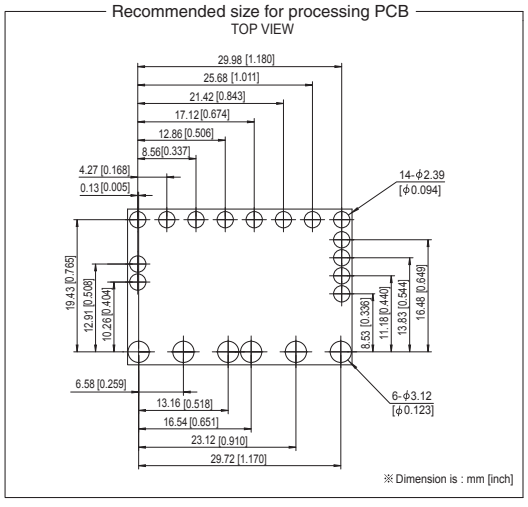
※ Dimension is : mm [inch]

External view

3. BRDS60

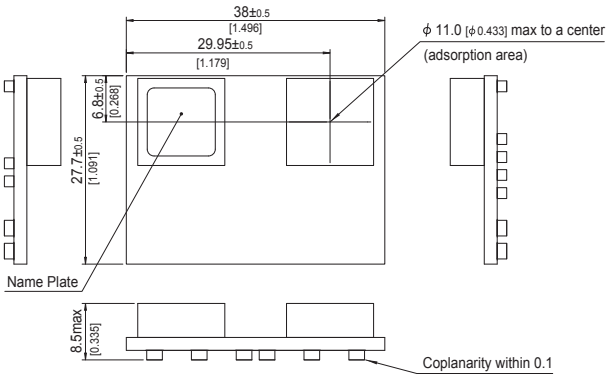


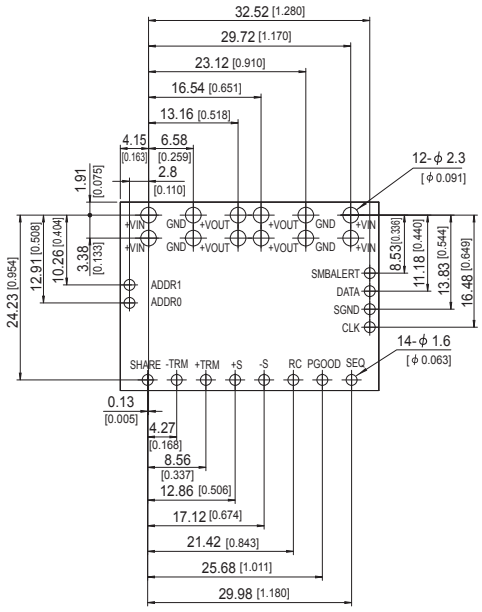


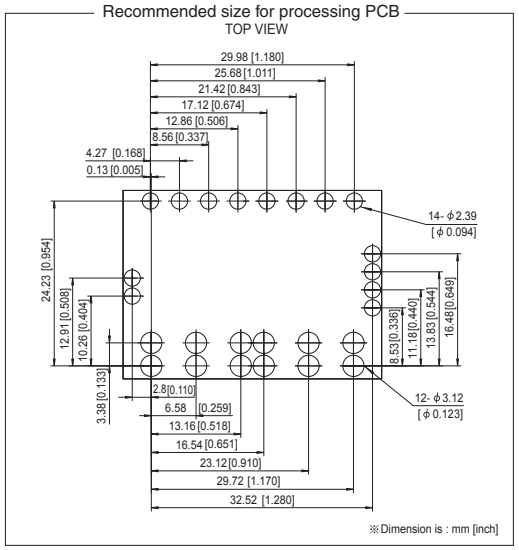


※Tolerance : ±0.3 [±0.012]
※Dimensions in mm, [ ]=inches
※Weight : 15g max
※Terminal material : copper
※Plating treatment of terminal
: Lead free plating

4. BRDS100



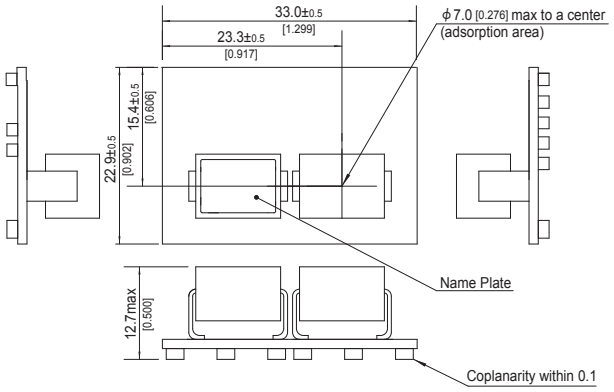


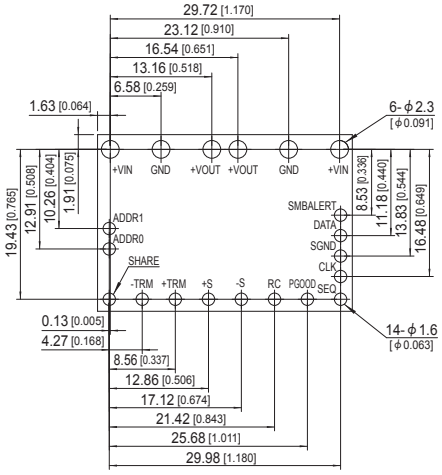


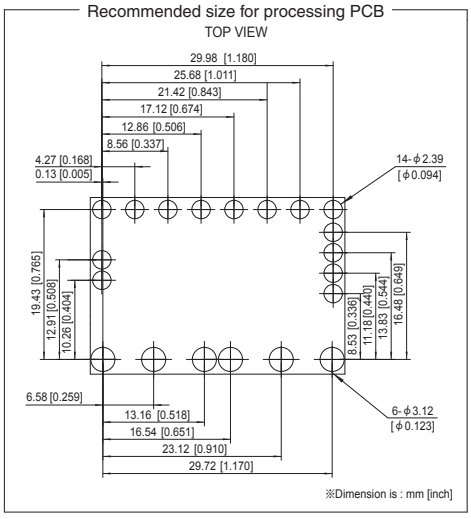
※Tolerance : ±0.3 [±0.012]
※Dimensions in mm, [ ]=inches
※Weight : 22g max
※Terminal material : copper
※Plating treatment of terminal
: Lead free plating

External view

5. BRDS120

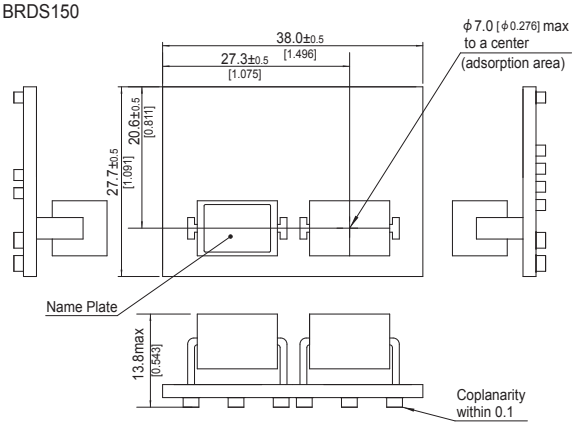


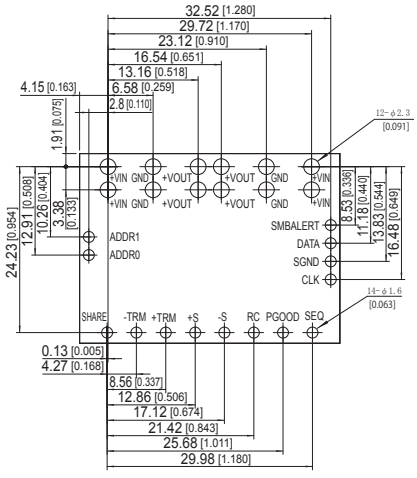


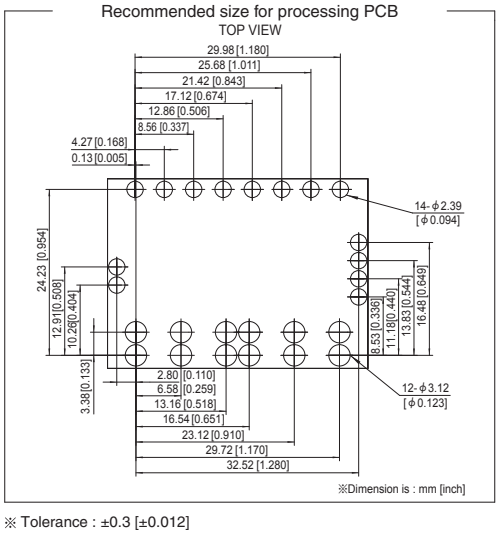


※ Tolerance : ±0.3 [±0.012]
※ Dimensions in mm, [ ]=inches
※ Weight : 14g max
※ Terminal material : copper
※ Plating treatment of terminal
: Lead free plating

6. BRDS150



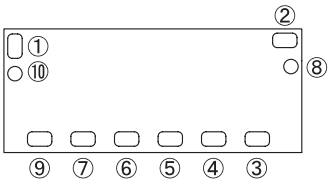




※ Tolerance : ±0.3 [±0.012]
※ Dimensions in mm, [ ]=inches
※ Weight : 21g max
※ Terminal material : copper
※ Plating treatment of terminal
: Lead free plating

Pin Connection

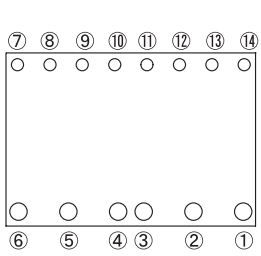
●BRFS30/40/60S



∗BOTTOM VIEW

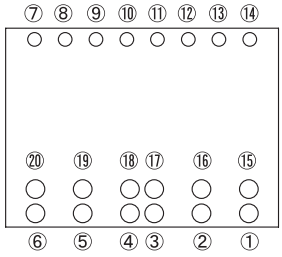
Pin No.	Pin Connection	Function
①	RC	Remote ON/OFF
②	+VIN	+DC input
③	SEQ	Control of Start up time and turn
④	GND	GND (-DC input, -DC output)
⑤	+VOUT	+DC output
⑥	TRM	Adjustment of output voltage
⑦	+S	+Remote sensing
⑧	GND	GND (-DC input, -DC output)
⑨	NC(PGOOD/ SHARE)	NC (optional : Power good, SHARE (BRFS40/60S))
⑩	SGND	Signal GND

●BRFS60/100/120/150



(a) BRFS60/120

∗BOTTOM VIEW

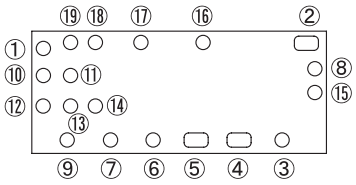


(b) BRFS100/150

∗BOTTOM VIEW

Pin No.	Pin Connection	Function
① ⑮	+VIN	+DC input
② ⑯	GND	GND (-DC input, -DC output)
③ ⑰	+VOUT	+DC output
④ ⑱	+VOUT	+DC output
⑤ ⑲	GND	GND (-DC input, -DC output)
⑥ ⑳	+VIN	+DC input
⑦	SEQ	Control of Start up time and turn
⑧	PGOOD	Power good
⑨	RC	Remote ON/OFF
⑩	-S	-Remote sensing
⑪	+S	+Remote sensing
⑫	+TRM	+Adjustment of output voltage
⑬	-TRM	-Adjustment of output voltage
⑭	SHARE	Parallel operation

●BRDS40/60S

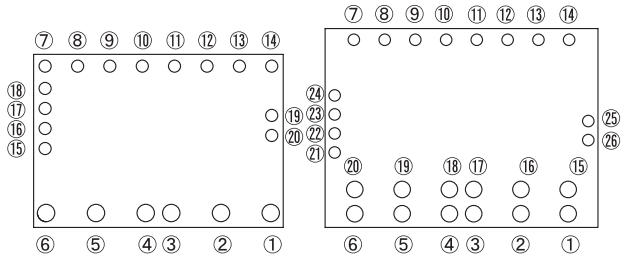


∗BOTTOM VIEW

Pin No.	Pin Connection	Function
①	RC	Remote ON/OFF
②	+VIN	+DC input
③	SEQ	Control of Start up time and turn
④	GND	GND (-DC input, -DC output)
⑤	+VOUT	+DC output
⑥	TRM	Adjustment of output voltage
⑦	+S	+Remote sensing
⑧	GND	GND (-DC input, -DC output)
⑨	SHARE	Parallel operation
⑩	SGND	Signal GND
⑪	SGND	Signal GND
⑫	-S	-Remote sensing
⑬	CLK	PMBus communication clock input
⑭	DATA	PMBus communication data input & output
⑮	NC/SYNC	NC/Switching frequency synchronization (BRDS40/60S)
⑯	PGOOD	Power good
⑰	SMBALERT	PMBus alarm output
⑱	ADDR0	Address setting
⑲	ADDR1	Address setting

Pin Configuration

●BRDS60/100/120/150



(a) BRDS60/120 (b) BRDS100/150

∗BOTTOM VIEW

Pin No.		Pin Connection	Function
BRDS60 /120	BRDS100 /150		
①	① ⑮	+VIN	+DC input
②	② ⑯	GND	GND (-DC input, -DC output)
③	③ ⑰	+VOUT	+DC output
④	④ ⑱	+VOUT	+DC output
⑤	⑤ ⑲	GND	GND (-DC input, -DC output)
⑥	⑥ ⑳	+VIN	+DC input
⑦	⑦	SEQ	Control of Start up time and turn
⑧	⑧	PGOOD	Power good
⑨	⑨	RC	Remote ON/OFF
⑩	⑩	-S	-Remote sensing
⑪	⑪	+S	+Remote sensing
⑫	⑫	+TRM	+Adjustment of output voltage
⑬	⑬	-TRM	-Adjustment of output voltage
⑭	⑭	SHARE	Parallel operation
⑮	㉑	SMBALERT	PMBus alarm output
⑯	㉒	DATA	PMBus communication data input & output
⑰	㉓	SGND	Signal GND
⑱	㉔	CLK	PMBus communication clock input
⑲	㉕	ADDR0	Address setting
⑳	㉖	ADDR1	Address setting

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 BRFS/BRDS 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.

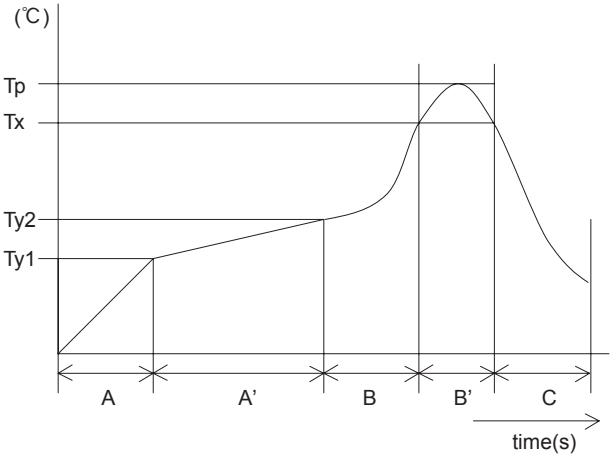
Soldering

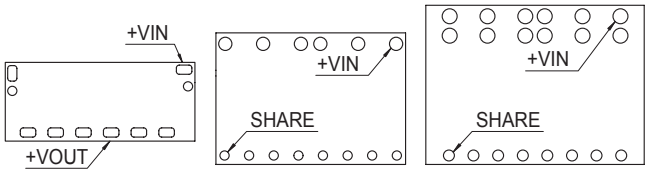
■Right figure shows condition for reflow of BRFS/BRDS series. Please make sure that the temperature of pin shown in (a),(b) and(c) do not exceed the temperatures shown in right figure .

■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.



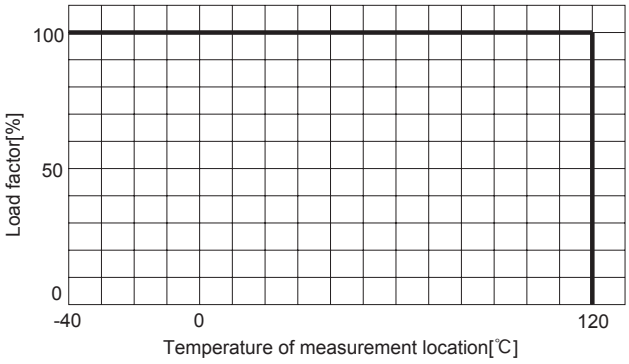


(a) BRFS30/40/60S BRDS40/60S (b) BRFS60/120 BRDS60/120 (c) BRFS100/150 BRDS100/150

A	1.0 - 5.0℃/ s
A’	Ty1 : 160±10℃ Ty2 : 180±10℃ Ty1 - Ty2 : 120s max
B	1.0 - 5.0℃/ s
B’	Tp : Max245℃ 10s max Tx : 220℃ or more : 70s max
C	1.0 - 5.0℃/ 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℃ or under.



Instruction Manual

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

Instruction Manual	https://www.cosel.co.jp/redirect/catalog/en/BRFS/
Instruction Manual	https://www.cosel.co.jp/redirect/catalog/en/BRDS/
Before using our product	https://en.cosel.co.jp/technical/caution/index.html

BRFS BRDS NOTICE

Basic Characteristics Data

Model	Circuit method	Switching frequency [kHz] (reference)	Input current [A]	Inrush current protection	PCB/Pattern			Series/Parailel operation	
					Material	Single sided	Double sided	Series operation	Parailel operation
BRFS30	Buck Converter	300	＊1	-	glass fabric base,epoxy resin	-	Multilayer	-	＊3
BRFS40	Buck Converter	300	＊1	-	glass fabric base,epoxy resin	-	Multilayer	-	＊3
BRFS60	Buck Converter	300 ＊2	＊1	-	glass fabric base,epoxy resin	-	Multilayer	-	＊3
BRFS60S	Buck Converter	300 ＊2	＊1	-	glass fabric base,epoxy resin	-	Multilayer	-	＊3
BRFS100	Buck Converter	300 ＊2	＊1	-	glass fabric base,epoxy resin	-	Multilayer	-	＊3
BRFS120	Buck Converter	400 ＊2	＊1	-	glass fabric base,epoxy resin	-	Multilayer	-	＊3
BRFS150	Buck Converter	400 ＊2	＊1	-	glass fabric base,epoxy resin	-	Multilayer	-	＊3
BRDS40	Buck Converter	300	＊1	-	glass fabric base,epoxy resin	-	Multilayer	-	＊3
BRDS60	Buck Converter	300 ＊2	＊1	-	glass fabric base,epoxy resin	-	Multilayer	-	＊3
BRDS60S	Buck Converter	300 ＊2	＊1	-	glass fabric base,epoxy resin	-	Multilayer	-	＊3
BRDS100	Buck Converter	300 ＊2	＊1	-	glass fabric base,epoxy resin	-	Multilayer	-	＊3
BRDS120	Buck Converter	400 ＊2	＊1	-	glass fabric base,epoxy resin	-	Multilayer	-	＊3
BRDS150	Buck Converter	400 ＊2	＊1	-	glass fabric base,epoxy resin	-	Multilayer	-	＊3

＊1 Refer to Specification.
＊2 These models have 2 phase interleave, and the ripple frequency is double the switching frequency.
＊3 Refer to the Instruction Manual.