

DC-DC Converter DATA Sheet

MYBQC01138AZTF

Feature:

1/4th Brick type
 Vin 36Vdc-75Vdc
 Vout 10.6Vdc
 Iout 38Adc
 402.8W

Application:

This specification applies to DC-DC Converter MYBQC01138AZTF for telecommunication equipment.
 Please contact us to use this DC-DC Converter except this application.

1. Appearance

MYBQC01138AZTF



2. Part Number

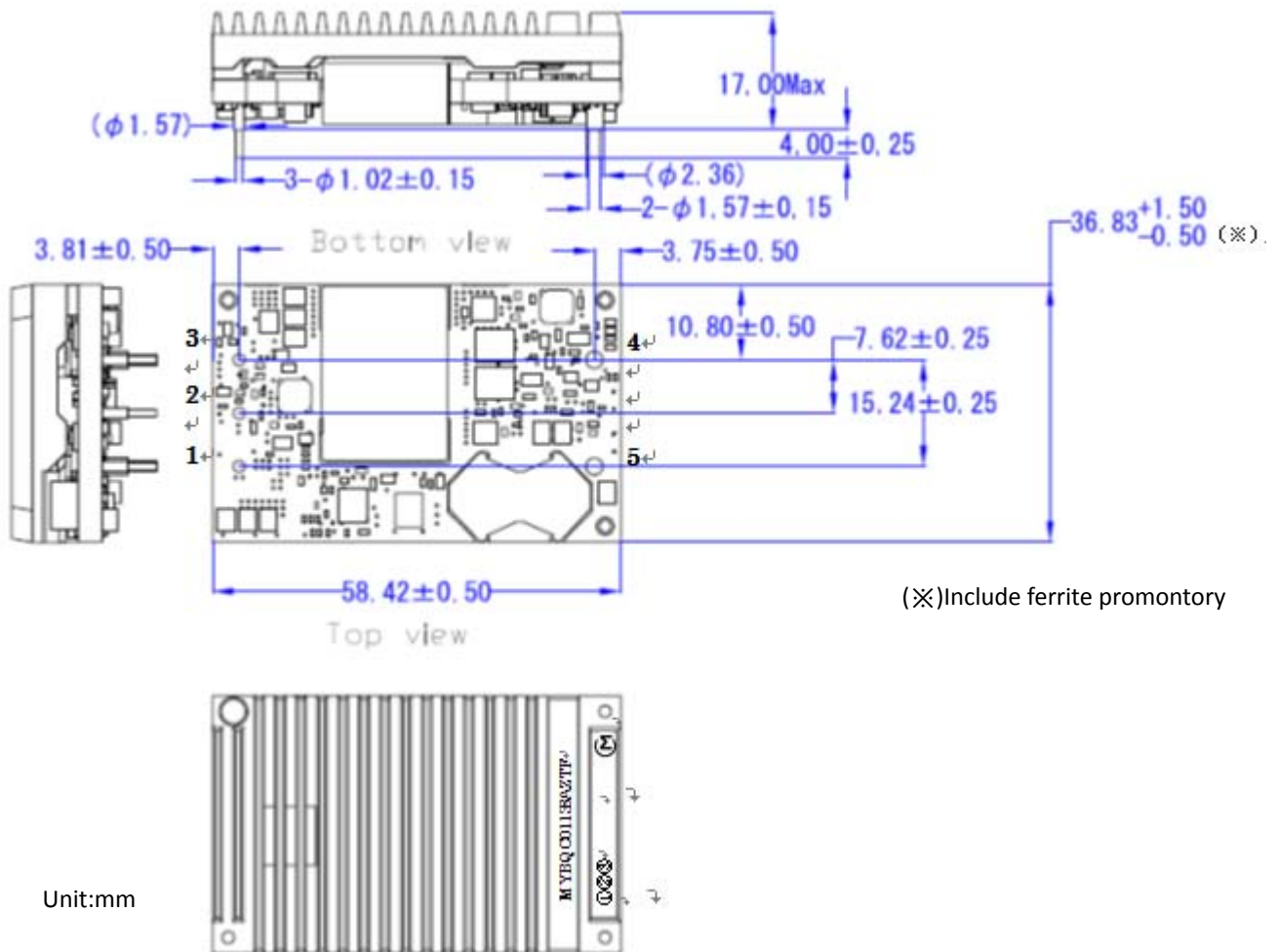
Part Number	Base Plate Option
MYBQC01138AZTF	Fin Base Plate

⚠ Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

3. Appearance, Dimensions

3.1 MYBQC01138AZTF



Marking

(1) Product No. MYBQC01138AZTF

(2) MFG, ID

(3) Lot No.
①②③

① Production Factory

② Production Year

③ Production Month (1,2,3,...9,0,N,D)

[Caution]

- ① Gate traces convexes 0.5max/1 place are left on four sides of product(heat sink).
- ② Slight shortage of basis materials at edge or small voids may exist in a heat sink.

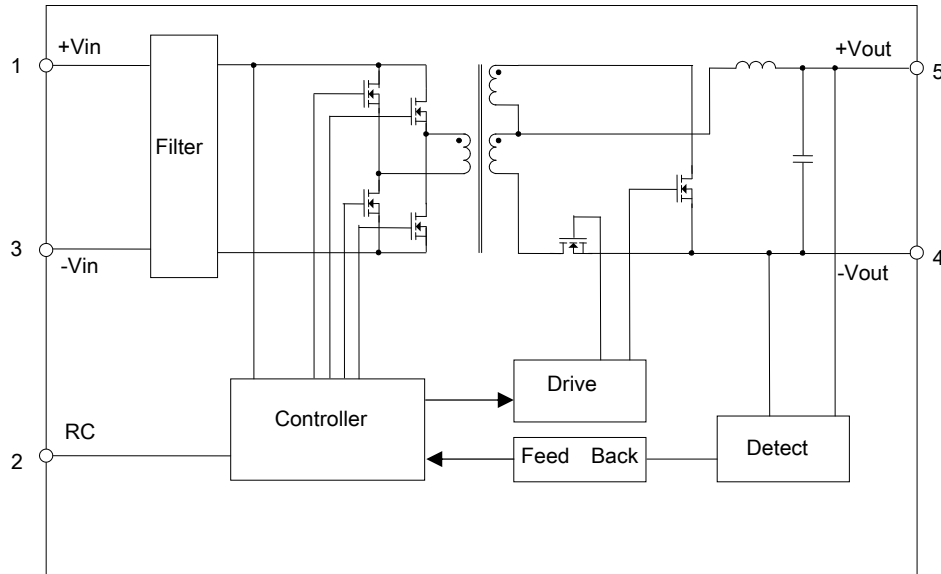
Pin Number, Function

Pin No.	Signal	Function
1	Vin(+)	Positive Input Voltage
2	ON/OFF	Remote ON/OFF
3	Vin(-)	Negative Input Voltage
4	Vout(-)	Negative output Voltage
5	Vout(+)	Positive output Voltage

⚠ Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., Ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

※Block Diagram



4. Absolute Maximum Ratings

Item		Unit	Absolute Rating	Remarks
Minimum Input Voltage		V	0	
Maximum Input Voltage	Time	Continuous	V	75
		100ms	V	100
ON/OFF pin Control Voltage		Maximum	V	40
		Minimum	V	0

※No voltage, no matter how instantaneous, shall be applied beyond the absolute maximum voltage rating to this product. If you apply any voltage over this limit the product characteristics will deteriorate or the product itself will be destroyed. Even though it may continue operating for a while after the over-voltage event, its life will likely be shortened significantly. Reliability and life of the module may degrade similarly if the maximum operating voltage rating is continuously exceeded. This product is designed to operate within the maximum operating voltage rating specification.

5. Rating

5.1 Operating Temperature Range	-40°C ~ +85°C (Temperature gradient $\leq 10^\circ\text{C}/\text{H}$)
5.2 Storage Temperature Range	-45°C ~ +90°C (Temperature gradient $\leq 25^\circ\text{C}/\text{H}$)
5.3 Operating Humidity Range	Relative Humidity 5% ~ 90% & Absolute Humidity 0.044kg/kgD.A.max(at 40°C) (No water condenses in any cases.)
5.4 Storage Humidity Range	5% ~ 95% (No water condenses in any cases.)

⚠ Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

6. Electrical Characteristics

6.1 Specific Characteristics (Ta= -40 to +85°C with temperature derated.)

Test circuit is mentioned in section 7.

Item	Symbol	Condition	Value			Unit
			Min.	Typ.	Max.	
Input Voltage	Vin		36	48	75	V
Turn-on Input Voltage	Von	Vin=increasing	32	-	36	V
Input Voltage difference of Turn-on and Turn-off	Von_hys		2.0	-	-	V
Output Voltage	Vout	Vin =Min ~ Max Iout=Min ~ Max	10.0	10.6	11.2	V
Output Current	Iout	with Temperature derated	0	-	38	A
Ripple Noise Voltage	Vripl	Vin =48V Iout=Max f BW=20MHz	-	100	200	mV(p_p)
Ripple Noise Voltage	Vnoise	Vin =48V Iout=Max f BW=20MHz	-	120	200	mV(p_p)
Efficiency	η	Vin =48.0V Iout=20.0A Ta=25°C	-	95.0	-	%
ON/OFF pin Control Voltage	Vrm-on		0	-	0.7	V
	Vrm-off		3	-	10	V
Setting point of Over Current Protection	OCP	Vin =Min ~ Max	39	-	-	A
Setting point of Over Voltage Protection	OVP	Vin =Min ~ Max	12.6	-	-	V
Setting point of Temperature Protection	OTP	Vin =Min ~ Max Temp. detect point: near main SW.	-	130	-	°C
Start up Delay Time	td	Vin =Min ~ Max Iout=Min ~ Max Vin connection to Vout x90%	-	500	-	μ sec
External Output Capacitance	Cout	Ceramic capacitor	100	-	15000	μ F

⚠ Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

Item	Symbol	Condition	Value			Unit
			Min.	Typ.	Max.	
Input to Output Isolation Voltage	Vdc_io	DC for one minute Leak \leq 1mA	2000	-	-	V
Input to Heat Sink Isolation Voltage	Vdc_ih		800	-	-	V
Output to Heat Sink Isolation Voltage	Vdc_oh		800	-	-	V

6.2 Protection Circuit

Item	Value
Protection	① If output is overload, or output voltage is over the value specified in OVP, DC-DC converter will enter a latch mode after a mask time. Input turn on/off or Remote on/off control in order to reset. ② If DC-DC converter is heated abnormally, it will shut down. After it is cooled down, DC-DC converter will automatically restart.
Noise (Radiation, Conduction)	In accordance with VCCI Class A (Connected to the external input filter specified at section 7.)



<Caution>

The above electrical characteristics are guaranteed, in the condition as shown in section 10, and with the input power supply whose the impedance is sufficiently low.

Connecting an input inductance or using an input power supply having output inductance may cause an unstable operation of this product.

Please check the proper operation of this product with the peripheral circuits on your product.

⚠ Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

6.3 Operation in information

6.3.1 Over Voltage Protection

Output halts in latch mode after 1 msec(typ) mask time while Output Voltage is over the value of OVP specified in section 6.1 with failure of controller circuit. DC-DC converter will enter a latch mode after a mask time. Input turn on/off or Remote on/off control in order to reset.

Output voltage might exceed the point at over voltage protection under the specific condition of transient change of input voltage or output load. In this condition OVP waits its start until the mask time. It is recommended to evaluate your appliance installed with DC-DC converter.

6.3.2 Over Current Protection

Over Current Protection operates with a controller circuit failure or over-load condition, and DC-DC converter will enter a latch mode after a mask time:25msec(typ). Input turn on/off or Remote on/off control in order to reset.

6.3.3 Over Temperature Protection

If DC-DC converter is heated abnormally, it will shut down. The detected point of over temperature is the main switch in the primary circuit.

After it is cooled down, DC-DC converter will automatically restart.

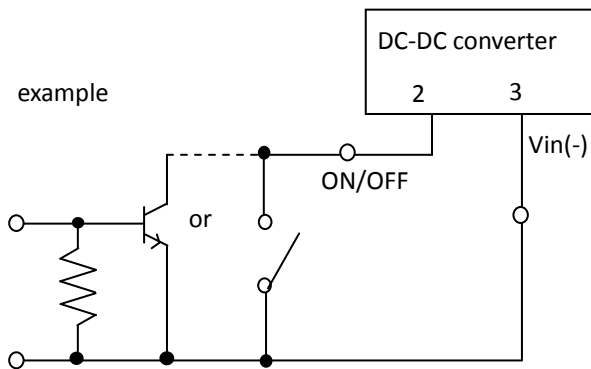
6.3.4 ON/OFF control

1) On control

ON/OFF Pin (2Pin) should be connected to Vin(-) Pin (3Pin) or keep less than 0.7V.

2) Off control

ON/OFF Pin (2Pin) should be opened.



6.4 External input capacitor

When an inductance or a switch device is connected to Input line, or when the transient response of input power supply is bad, input voltage is greatly changed at the time of load sudden change of DC-DC converter.

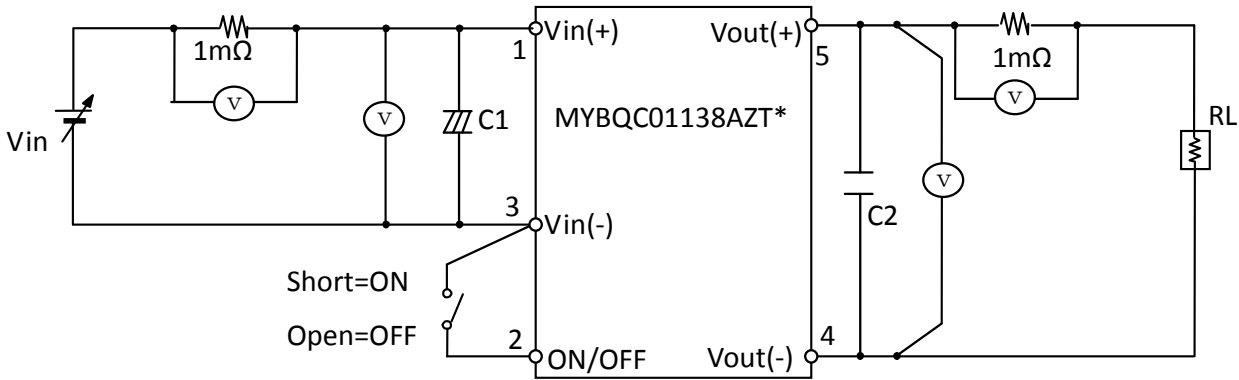
Since the load response of DC-DC converter may not be normally demonstrated by this influence, and DC-DC converter may cause unusual oscillation, in such a case, please connect an external input capacitor.

⚠ Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., Ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

7. Test Circuit

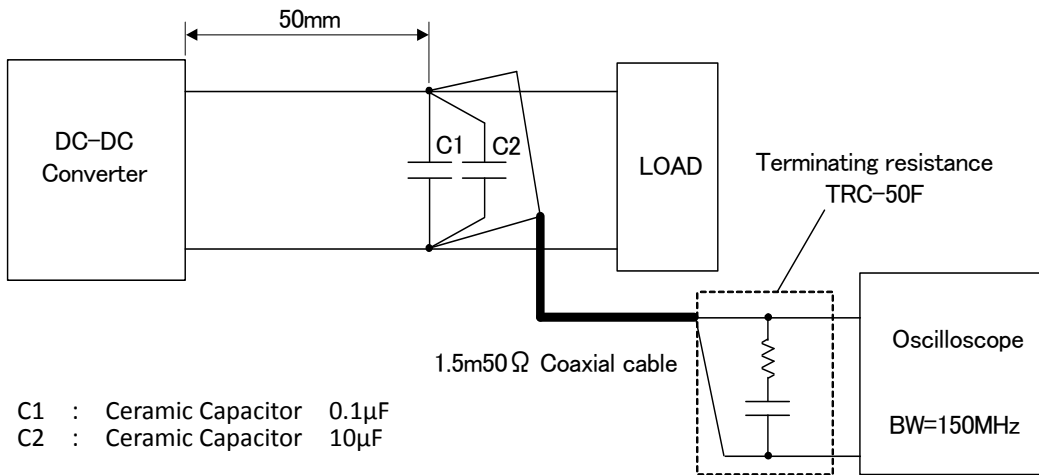
In the following test circuit, the initial values in section 6 should be met.



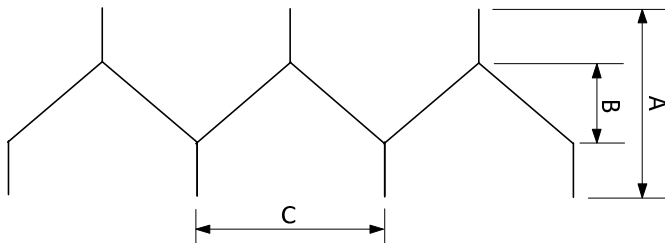
- C1 : Low Impedance Electrolytic Capacitor 100μF
- C2 : Ceramic Capacitor 100μF
- RL : Electronic Load Device :Model ELL-1005 KEISOKU GIKEN equivalent
- Vin : DC Power Supply :Model HP6675A HP equivalent
- (V) : Digital Multi meter :Model HP34401A HP equivalent

※When deviating from the above application, DC-DC converter may operate abnormally. It should be fully evaluated on your board.

※Ripple Noise Test



- C1 : Ceramic Capacitor 0.1μF
- C2 : Ceramic Capacitor 10μF

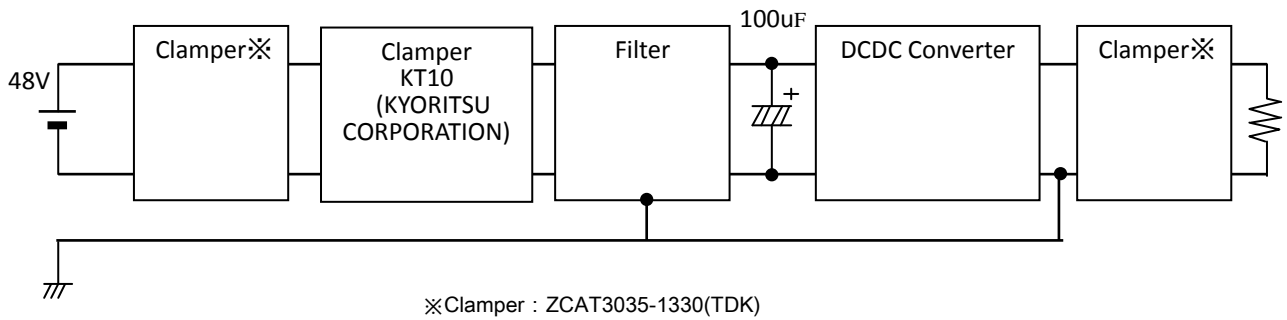


- A: Output Ripple Voltage&Noise
- B: Output Ripple Voltage
- C: Switching Period

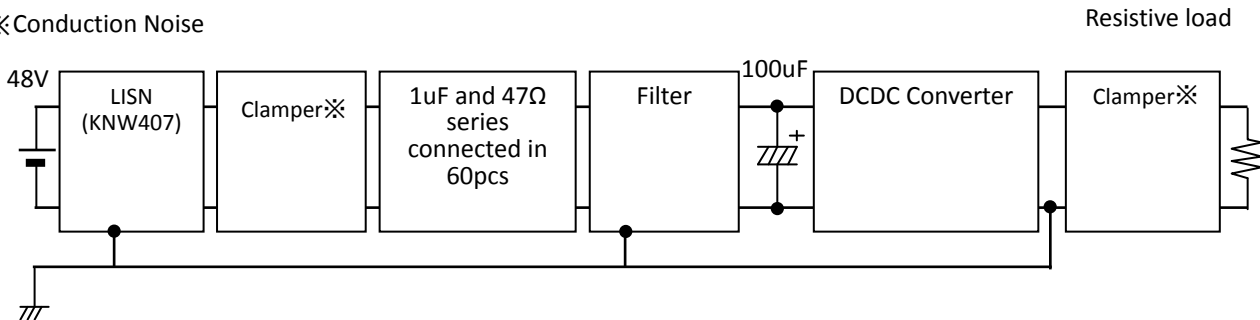
⚠ Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

※ Radiation Noise



※ Conduction Noise



Measurement at Radiation Noise, Conductive Noise, Output ripple & Noise.

Please measure Radiation Noise, Conductive Noise and Output ripple & Noise with conforming to the Test Circuit in section 7

Otherwise the noise might not meet the specified values.

⚠ Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

8. Mechanical Tests

8.1 Vibration

Vibration frequency : 10 ~ 55Hz
 Amplitude : 1.5mm max
 10 to 55Hz, 1.5mm amplitude, 1 hour for each of X, Y, Z directions.
 No damage in appearance and no deviation from electrical characteristics (section 6).

8.2 Mechanical Shock

20G, 1 time for each X,Y,Z directions.
 No damage in appearance and no deviation from electrical characteristics(section 6).

8.3 Soldering Heat Resistance

Immerse the tips of lead pins, which are to be mounted on a mother board, in a solder bath of 260+/-5deg.C for 10s.
 Then tested products are left for 2 hours.
 No damage in appearance and no deviation from electrical characteristics (section 6).

8.4 Pin Strength

Fasten the body of DC-DC Converter and pull the lead pin gradually in a radial direction with 5.0N load, keep the load for 5 seconds. The body should not be damaged thereafter.

8.5 Solderability of Pins

The lead pins will be immersed in the isopropyl alcohol (JIS-K-1522) with Rosin (JIS-K-5902) solution (the concentration of Rosin will be allowed 10wt%~35wt%, and normally approx. 25wt% will be used unless otherwise any specific required.). Then the lead pins up to 1 to 1.5mm from the product substrate will be immersed in the Sn-3Ag-0.5Cu solder melted in the temperature of 250±5°C and pulled up after 5±1 seconds. The solder will adhere to over 75% of the immersed area.

9. Environmental Tests

9.1 Humidity Test

Subjected to a temperature 40°C±2°C with 90~95% for 100 hours.
 Return to room temperature (25°C) for 2 hours and measure. The initial values in section 6 should be met. (JIS-C-0022)

9.2 Thermal Cycle Test

Subjected to 5 cycle of the following condition.
 Placed in room temperature (25°C) for 2 hours and are measured.
 The initial values in section 6 should be met.

Step	Condition	Time
1	-40°C±3°C	30 minutes
2	Room Temp.	5 ~ 10 minutes
3	+85°C±3°C	30 minutes
4	Room Temp.	5 ~ 10 minutes

9.3 Electrostatic Discharges(ESD)

After electrostatic discharge test is conducted according to IEC6100-4-2, there is no abnormality in appearance and meet the characteristics specified in section 6-1.

- 1) Discharge method : Conductive discharge
- 2) Discharge times : 10 times of positive and negative polarity 1kV with 1s periods.
- 3) Condition of DC-DC converter : No operation

⚠ Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

10. Packaging Information

10.1 The packaging form in the section 10.2 is applied to MYBQC01138AZTF.

10.2 Packaging form

- ① Like the below figure, put the products on a conductive mat. (1row×8column) (See Fig.1)
- ② Pile these conductive mats and pack maximum 4 units. (See Fig.2)

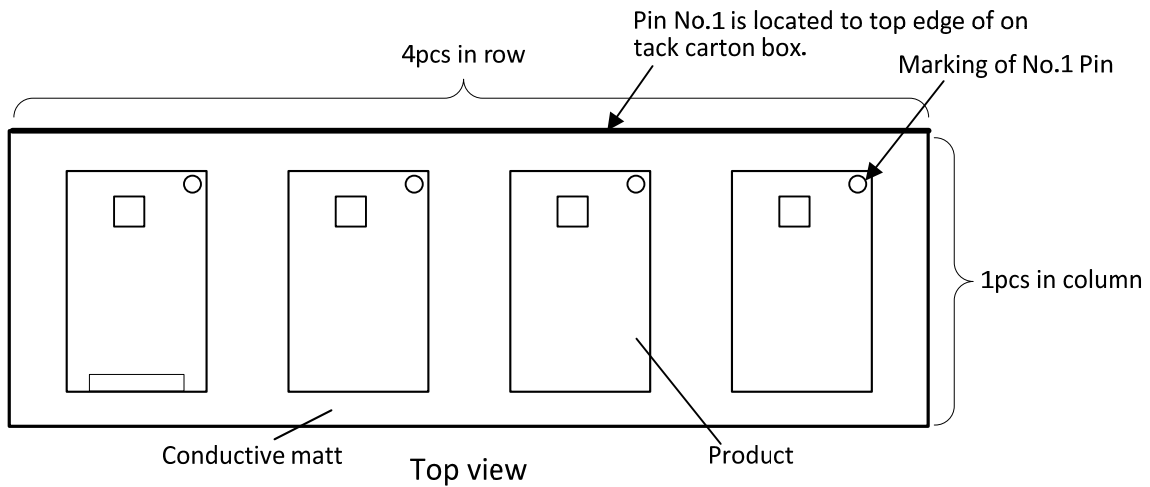


Fig.1

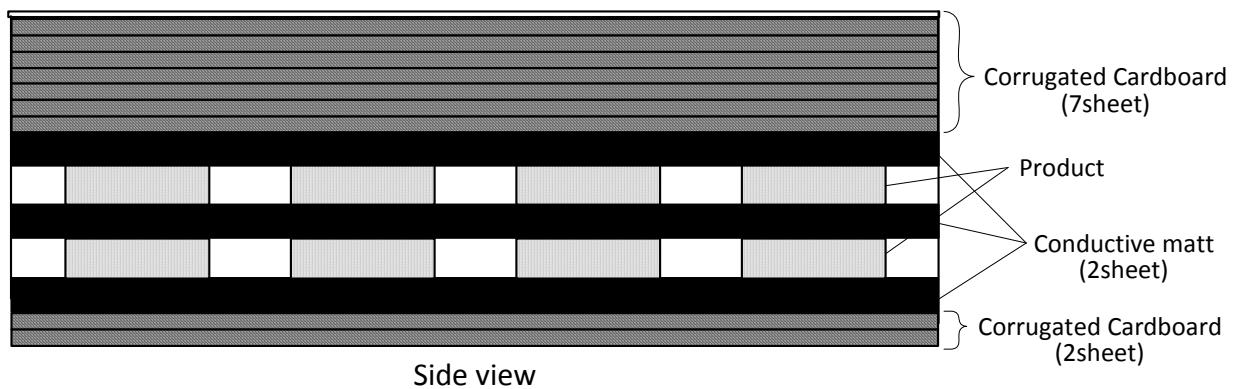
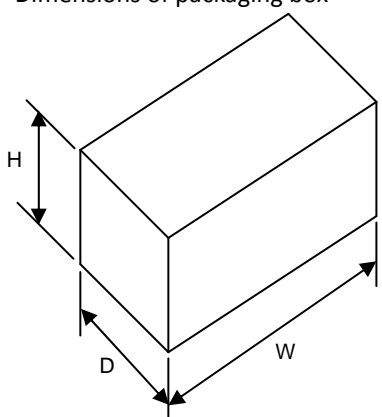


Fig.2

⚠ Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

Item	Specification
Packaging form typical classification	Box
Dimensions of packaging box 	$W = 245(\text{ mm })$ $D = 78(\text{ mm })$ $H = 104(\text{ mm })$
Maximum number in a box	8(p c s)
Remark <ul style="list-style-type: none"> ▪The number of contained products may not reach to the maximum number. ※ Marking on the box <ol style="list-style-type: none"> 1. MURATA Parts Number 2. Quantity 3. Inspection No. 4. CE Mark 5. ROHS—Y / ROHS—Y 	

▪Products must not scattered in the box or product pins must not be bended in transportation.

11. Production factory

Komatsu Murata Mfg.Co.,Ltd.
 Kanazu Murata Mfg.Co.,Ltd.
 Wakura Murata Mfg.Co.,Ltd.

⚠ Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

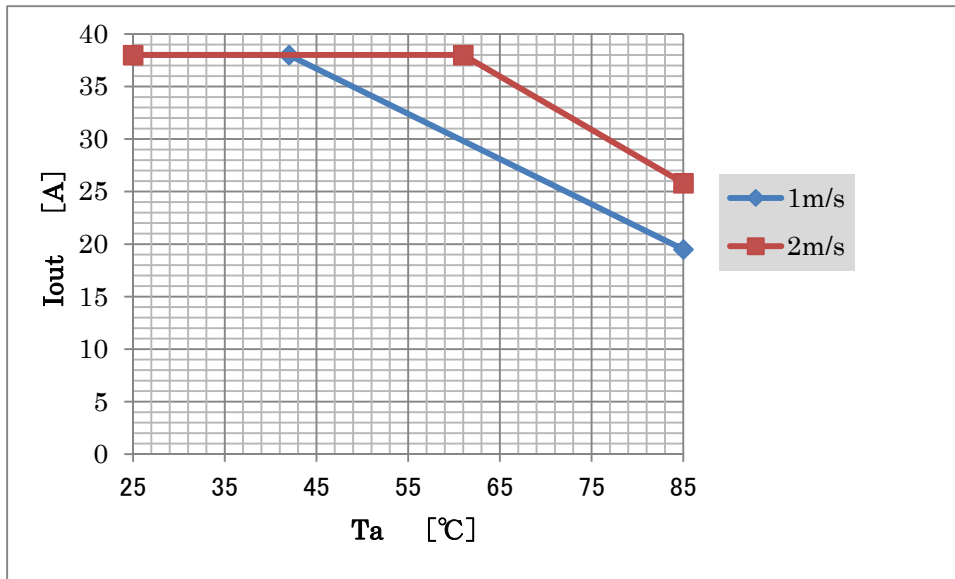
12. Reference data

12.1 Temperature Derating

· Forced Air flow

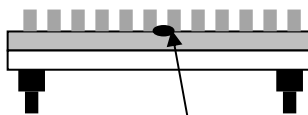
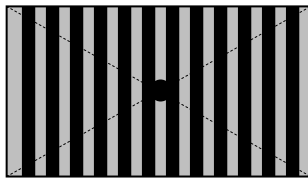
Temperature Derating in Murata's standard measurement condition<For Reference Only>

< MYBQC01138AZTF >



※DC-DCconverter is mounted on Murata standard board.(10inch□ / 12Layer / glass-epoxi board)

Please make sure that the temperature of the center on the heatsink is less than 112°C on your application.



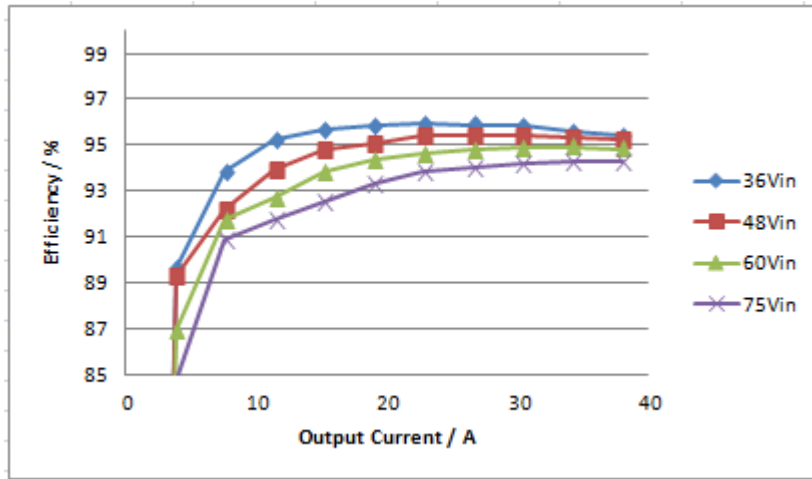
measure point

MYBQC01138AZTE

⚠ **Note:**

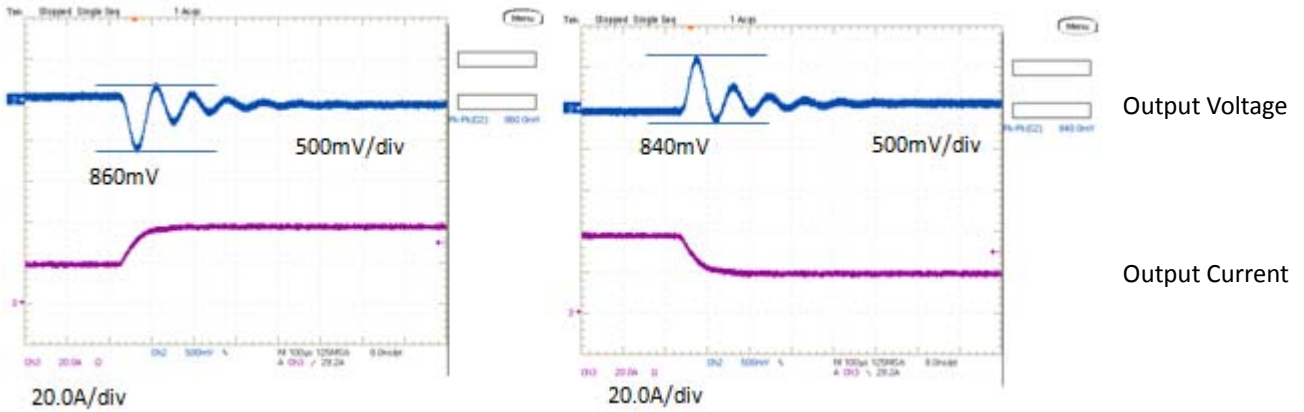
1. This datasheet is downloaded from the website of Murata Manufacturing co., ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

12.3 Efficiency



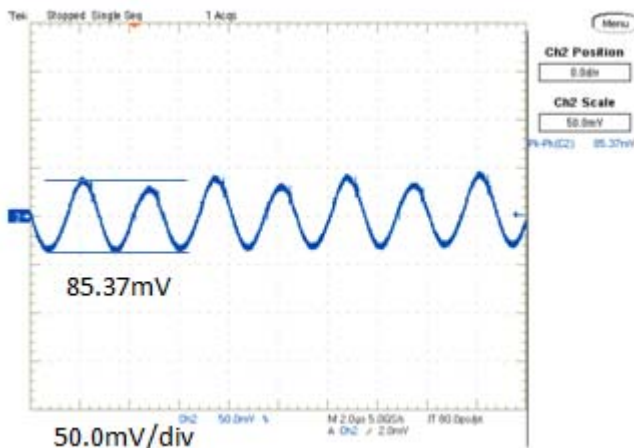
12.4 Transient Response

50%↔100% Load Fluctuation Ta=25°C



12.5 Ripple

48Vin38Aout Ta=25°C



⚠ Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

13. Notice

13.1 Soldering

13.1.1 Flux

Please solder the product with Rosin Flux, which contains chlorine 0.2wt% or less.
Please do NOT use acid flux or water-soluble flux, which could corrode metals and glass of the product.

13.1.2 Solder

Please use solder Sn-3Ag-0.5Cu.

13.1.3 Recommended soldering Condition

① Flow Solder

Preheating : 120±10°C 60~120 seconds
Solder temperature : 260°C +0°C/-5°C
Soldering time : 10 seconds max

② Condition of iron Soldering

Preheating : 120±10°C 30 minutes max
Iron temperature : 350°C max
Soldering time : 3 seconds max

(caution1) This is a condition that the board and the parts without pins on DC-DC converter must not exceed.
It isn't a condition of iron setting temperature and soldering time.

(caution2) Do not strongly push around the ferrite core of the DC-DC converters. It will cause bad influence to DCDC converter's characteristics.

13.1.4 Recommended solder Land Pattern

Pin No	Pin Size	Hole diameter	Land diameter
1.Vin(+) 2.ON/OFF 3.Vin(-)	φ1.02	φ1.5	φ3.0
4.Vout(-) 5.Vout(+)	φ1.57	φ2.0	φ4.0

As for a position of a hole, refer to an appearance figure.

13.2 Cleaning

Please do not clean or wash the products.

13.3 Storage

13.3.1 Please store the products in room where the temperature/humidity is stable and direct sunlight cannot come in and use the products within 6 months after delivery.
Avoid damp heated places or such places where there are large temperature changes, because water may condense on the products, the characteristics may be reduced in quality, and/or be degraded in the solderability.
If you store the products for a long time (more than 1 year), use caution because the products may be degraded in the solderability and/or rusty.
Please confirm solderability and characteristics for the products regularly.

13.3.2 Please do not store the products in the places such as: in a dusty place, in a place exposed directly to sea breeze, in an atmosphere containing corrosive gas (Cl₂, NH₃, SO₂, NO_x and so on).

13.4 Operational Environment and Operational Conditions

13.4.1 Operational Environment

The products are not waterproof, chemical-proof or rustproof.
In order to prevent leakage of electricity and abnormal temperature increase of the products, do not use the products under the following circumstances:

- (1) in an atmosphere containing corrosive gas (Cl₂, NH₃, SO₂, NO_x and so on)
- (2) in a dusty place
- (3) in a place exposed to direct sunlight
- (4) in such a place where water splashes or in such a humid place where water condenses
- (5) in a place exposed to sea breeze
- (6) in any other places similar to the above (1) through (5)

⚠ Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., Ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

13.4.2 Operational Conditions

Please use the products within specified values (power supply, temperature, input, output and load condition, and so on). Input voltage may drop for line impedance, so please make sure that input voltage is within the specified range. If you use the products over the specified range, it may break the products, reduce the quality, and even if the products can endure the condition for short time, it may cause degradation of the reliability.

13.4.3 Note prior to use

If you apply high static electricity, over rated voltage or reverse voltage to the products, it may cause defects in the products or degrade the reliability.

Please avoid the following items:

- (1) over rating power supply, reverse power supply or not-enough connection of 0 V(DC)line
- (2)electrostatic discharge by production line and/or operator
- (3)electrified product by electrostatic induction

·Do not give an excessive mechanical shock.

If you drop the products on the floor, etc., it may occur a crack to the core of inductors and monolithic ceramic capacitors.

Do not give a strong shock such as a drop in handling.

·Do not bend this product much more than 0.1mm.

13.5 Transportation

If you transport the products, please pack them so that the package will not be damaged by mechanical vibration or mechanical shock, and please educate and guide a carrier to prevent rough handling.

If you transport the products to overseas (in particular, by sea), it is expected that the transportation environment will be the worst, so please pack the products, in the package designed on the consideration of mechanical strength, vibration-resistant and humidity-resistant.

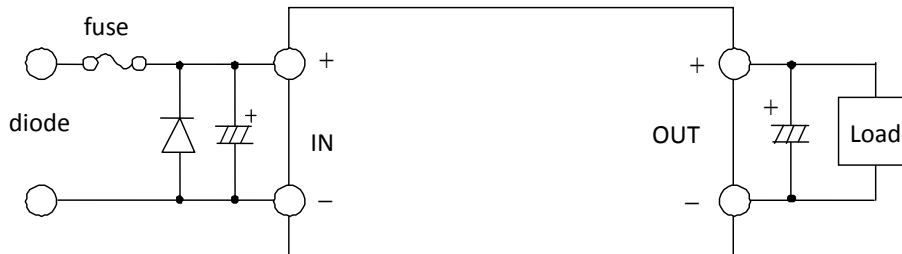
The package of the products, which Murata sells in Japan, may not resist over sea transport.

Please consult us if you are to use the Murata package of the products sold in Japan for transport to overseas.

⚠ Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

- Caution**
1. Be sure to provide an appropriate fail-safe function on your product to prevent a second damage that may be caused by the abnormal function or the failure of our product.
 2. Please connect the input terminal by right polarity. If you mistake the connection, it may break the DC-DC converter. In the case of destruction of the DC-DC converter inside, a large input current may flow. Please add a diode and fuse as follows.



Rated Fuse Current : 30A

※Please select a diode and fuse after confirming the operation.

3.Applications

- 1) This product is designed and manufactured for the general applications such as computers, office appliances, communication equipment, measurement instruments, machine tools, factory equipment, audiovisual equipment and home appliances, etc.
- 2) Please contact us before using this product for the applications, which require high reliability, such as transportation equipment (aircraft, trains, vehicles, etc.), traffic lights equipment, disaster prevention/crime prevention equipment, etc.
- 3) Please do NOT use this product for the applications which require especially high reliability, such as aerospace equipment, undersea equipment, nuclear power plant control equipment, medical equipment, etc.

Note

1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
2. All the items and parameters in this product specification have been prescribed on the premise that our product is used for the purpose, under the condition and in the environment agreed upon between you and us. You are requested not to use our product deviating from such agreement.
3. We consider it not appropriate to include other terms and conditions for transaction warranty in product specifications, drawings or other technical documents. Therefore, if your technical documents as above include such terms and conditions as warranty clause, product liability clause, or intellectual property infringement liability clause, we will not be able to accept such terms and conditions unless they are based on the governmental regulation or they are stated in a separate contract agreement.

Note:

1. This datasheet is downloaded from the website of Murata Manufacturing co., Ltd. Therefore, it's specifications are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering.
2. This datasheet has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.