

**NEW**

# Ultra High Speed Response Four-Quadrant Bipolar Power Supplies

## DOA series

DOA75-1 :  $\pm 75\text{V}$ / 75W/DC to 1MHz  
DOA75-2 :  $\pm 75\text{V}$ /150W/DC to 1MHz  
DOA75-4 :  $\pm 75\text{V}$ /300W/DC to 1MHz  
DOA150-1:  $\pm 150\text{V}$ /150W/DC to 500kHz  
DOA150-2:  $\pm 150\text{V}$ /300W/DC to 500kHz

Wonder Broadband/High Speed Response of DC to MAX. 1MHz  
The max. current can be outputted also at the time of DC output  
The option which can switch output range is available



# DOA series

Stable operation is possible regardless to loads with massive broadband and high speed response of DC to 1MHz Maximum and four-quadrant output.



DOA series are four-quadrant bipolar power supplies realized broadband and ultra high speed response of DC to 1 MHz maximum.

They are best fitted to transient response tests using effectively this feature of massive high speed response. And, with the four-quadrant behavior usable as DC power supplies or DC electronic loads, they are applicable to various loads such as inductive loads as transformer, capacitive loads as capacitor or motors, piezo elements. They are products with excellent general-purpose property able to output maximum current at DC output.

## Features

- High speed response of DC to 1 MHz or 500 kHz is realized. (Refer to “Lineup” in Page.3)
- Four-quadrant behavior possible to source and sink current.
- DC bias function is equipped as standard.
- It is possible to output maximum current at DC output.
- Reassurance and safety design equipped overvoltage protection, overcurrent protection and output short-circuit protection.

## Applications

- Evaluation tests for inductive loads such as coils and transformers.    ▪ Voltage fluctuation tests for electric elements of cars.
- Evaluation tests for capacitive loads such as capacitors or display panels.    ▪ Ripple test for capacitors.
- Evaluation tests of various motors.    ▪ Evaluation tests of relative equipment to solar batteries.
- Drive of piezo elements. etc.

This product is not designed for charge and discharge of battery. Please contact nearby sales if unit is used for charge and discharge application.

## Lineup

Each model will be brought to the market sequentially. Please confirm our sales staff the detail period of sale for models you want prior to order.

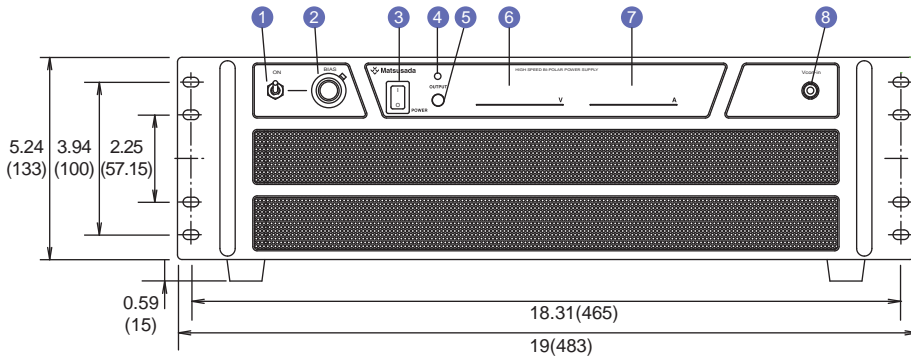
Model	Maximum output voltage	Maximum output current	Maximum output power	Frequency Bandwidth (-3 dB)	Weight (approx.)	Input Voltage	Input Current	
				At maximum oscillation			@115 V	@230 V
DOA75-1	±75 V	±1 A	75 W	DC to 1 MHz	10 kg	100 Vac to 240 Vac 50 Hz/60 Hz	3 A	1.5 A
DOA75-2	±75 V	±2 A	150 W	DC to 1 MHz	12 kg		4 A	2 A
DOA75-4	±75 V	±4 A	300 W	DC to 1 MHz	16 kg		6 A	3 A
DOA150-1	±150 V	±1 A	150 W	DC to 500 kHz	12 kg		4 A	2 A
DOA150-2	±150 V	±2 A	300 W	DC to 500 kHz	16 kg		6 A	3 A

## Specifications

<b>External Control Voltage</b> (Vcon-in)	-3 V to +3 V (Input Impedance 50 Ω) at option -LVs, L range: -5 V to +1 V/H range: -1 V to +5 V
<b>Output Display</b> (Indicate DC values)	Output Voltage: 3 digits Digital Meter ±999 Output Current: 3 digits Digital Meter ±999
<b>DC Bias</b>	-100% to +100% settable with 10-turn potentiometer
<b>Ripple</b>	≤ 0.02% rms
<b>Stability</b>	0.016%/Hr typical
<b>Setting Accuracy</b>	±0.5% Full Scale
<b>Distortion Ratio</b>	0.05%
<b>Regulation</b>	Input: 0.05% (For at ±10% input change) Load: 0.05% (For at 10% to 100% load change)
<b>Temperature Coefficient</b>	0.02%/°C
<b>Output Monitor</b>	Output voltage: -3 V to +3 V ±1% Full Scale at option -LVs, L range: -5 V to +1 V ±1% Full Scale/H range: -1 V to +5 V ±1% Full Scale Output Impedance 1 kΩ
<b>Protection</b>	Overvoltage, Overcurrent, Output short-circuit, Power Failure (can be canceled with -LN option)
<b>Operation Temperature</b>	0°C to +40°C
<b>Storage Temperature</b>	-20°C to +70°C
<b>Relative Humidity</b>	10 % to 90%, non condensing
<b>Accessories</b>	Input cable 2.5 m length (1), Instruction Manual (1)

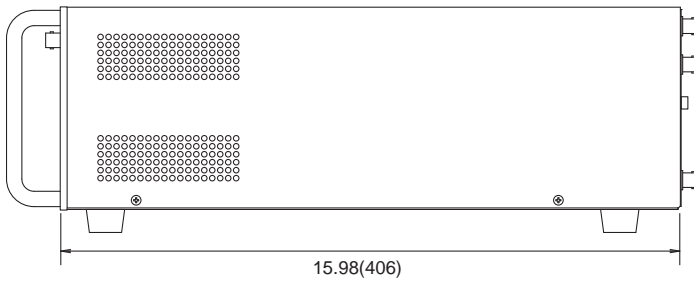
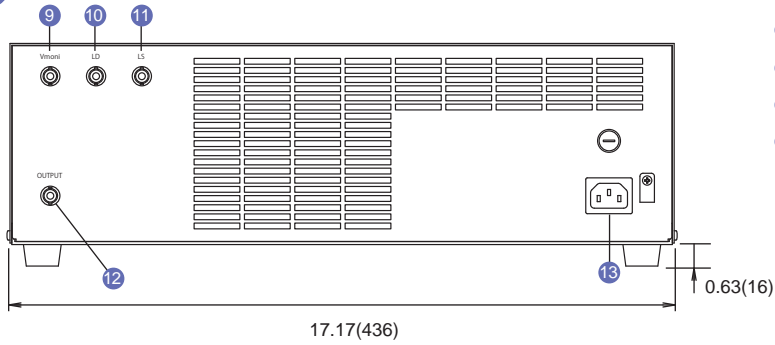
Dimensions inch (mm)/Explanation of Function

Front Panel



- 1 ON/OFF switch of Bias
- 2 Setting dial of Bias
- 3 Power ON/OFF switch
- 4 Output sign LED
- 5 Output ON/OFF switch
- 6 Voltage meter
- 7 Current meter
- 8 Terminal for Vcon-in
- 9 Output voltage monitor terminal
- 10 Interlock
- 11 Remote switch ON/OFF
- 12 Output terminal
- 13 AC input terminal

Rear Panel



How to use of Bias

If "ON/OFF Switch of Bias" to ON,  
Bias adjustable with "Setting Dial of Bias" is enabled.

Scales	Output Voltage
000(ccw)	-Rating
500	0V
1000(cw)	+Rating

## About protection functions

### Overvoltage Protection (O.V.P)

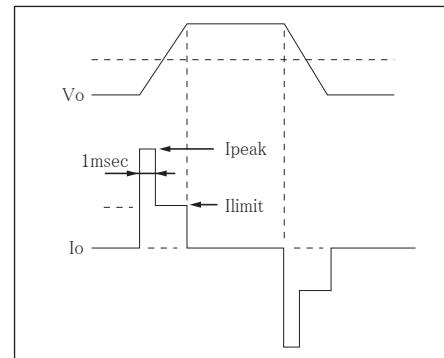
This unit is equipped overvoltage protection and output voltage is limited about 110% of rating and the load is protected at abnormal.

### Overcurrent Protection (O.C.P)

This unit is equipped overcurrent protection and output current is limited about 110% of rating and the power supply and the load are protected at overload.

### High Speed Eddy Current Protection

This unit is equipped two kinds of eddy current protections, high speed eddy current protection circuit to limit pulse current and overcurrent protection circuit to limit stationary current. The above mentioned overcurrent protection is to limit stationary current and its response speed is about 1msec. Another circuit to limit current of high speed response type is added separately and it restricts pulse current to about 2 times of rating at rectangular wave or capacitive load.





## About the range of output

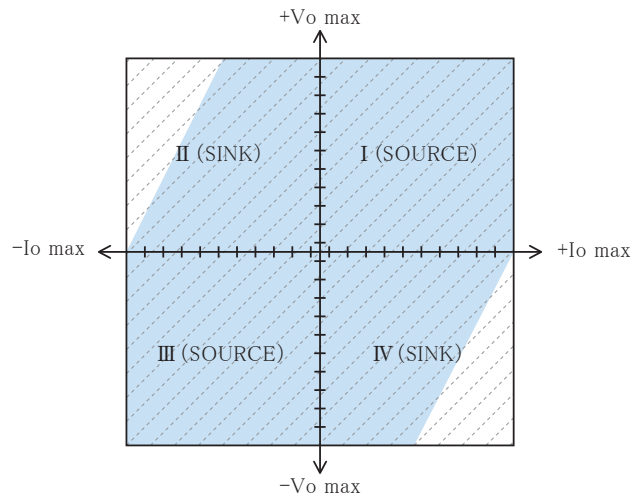
This unit is a bipolar power supply possible to operate in four-quadrant behavior. It is able to source or sink current in the ranges as shown on the following figure.

$V_o$  max: rated output voltage

$I_o$  max : rated output current

 AC operation range (with 50 Hz or more frequency, 50% of duty cycle and without any DC bias)

 DC operation range



## Options

**-LN** ...Power Failure Protection is not equipped

**-LVs** ...The output range is shifted.

● Shifting following 3 ranges is possible for  $\pm 75\text{V}$  output models.

(L)  $-125\text{ V to }+25\text{ V}$  (M)  $-75\text{ V to }+75\text{ V}$  (H)  $-25\text{ V to }+125\text{ V}$

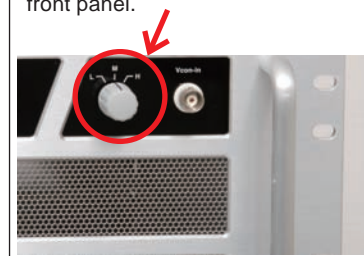
● Shifting following 3 ranges is possible for  $\pm 150\text{V}$  output models.

(L)  $-250\text{ V to }+50\text{ V}$  (M)  $-150\text{ V to }+150\text{ V}$  (H)  $-50\text{ V to }+250\text{ V}$

At ordering, please suffix option codes to the tail of the model number.

<Example> DOA150-2-LNVs (alphabetical order)

This knob is attached on the front panel.



## As for characteristics of amplifiers

### Rising time:

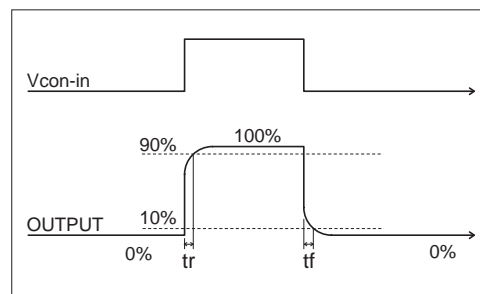
(step time): responsiveness may be expressed with rise time.  
(see right figure)

Rise time for amplifiers in  $f_c$  (Hz) of response time ( $-$ frequency band) is calculated with following equation generally.

$$tr \div 0.35/f_c$$

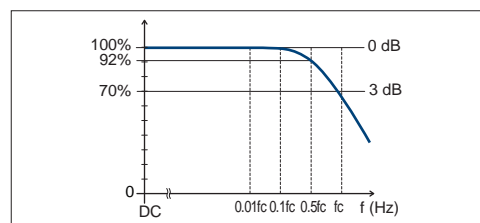
Decay time  $tf$  is equal to  $tr$ .

Frequency band: to 1 MHz,  $tr = tf \div 0.35\text{ }\mu\text{s}$   
: to 500 kHz,  $tr = tf \div 0.7\text{ }\mu\text{s}$



### Response speed:

When accurate output wave is required, please select an amplifier in sufficiently higher frequency band than applied one.  
Generally, speedy frequency band as 3 to 5 times of applied frequency for sine wave and 10 times for rectangular wave are required.  
If frequency band is in lacking, as not only output amplitude is reduced but also phase difference between input and output become larger, consideration to utilize it monitoring output wave is required.



### For Capacitive Loads:

In case of capacitive load, oscillation may be caused.  
If so, please insert a power resistance to the output in series.  
And, in capacitive load, please attend to that frequency band is limited by the resistance and capacity inserted in series

### For Induced Loads:

At CC mode, oscillation may be caused by inductance of induced loads.  
If so, please connect C-R straight circuit between output terminals so as not to cause oscillation.



# Introduction of Related Product

Please inquire to our sales branch nearest for you about the detail of products.

## Integrated Function Generator Type Four-quadrant Bipolar Power Supplies

### DOPF<sub>series</sub>

Output Voltage :  $\pm 20\text{ V}$  to  $\pm 300\text{ V}$   
Output Current : 150 W to 2 kW  
Frequency Band: DC to 30 kHz



- It is possible to generate distortion less waves. "Sine, Rectangular and Triangle waves in DC to 30 kHz"
- Possible to set individually DC and AC. Excellent usability is realized in combined with the simplified operability.
- External control is enabled by using option for communication. "USB, Ethernet, RS-232C, RS-485"

Individual detailed catalogues are prepared. Please inquire them our sale staff.

DOPF series are **four-quadrant bipolar power supplies improved spectacularly in their usability by being installed the function generator**. It is able to output required waves with only simplified operation from the front panel and they have become more usable and convenient. Not only wave generation, but also it is able to set memory and protection functions. Moreover, as they are equipped control signal output function for parallel operation as standard, **complete synchronized operation is enabled at high speed operation**. And as measurement function is fulfilled and it is enabled to measure not only DC values or AC values (ms) but also the maximum value and minimum value, measuring instruments ever required before are made redundant. Therefore various experiments and evaluation tests have been enabled with 1 unit of DOPF only.



## High Speed Four-quadrant Bipolar Power Supplies

### DOP<sub>series</sub>

Output Voltage :  $\pm 20\text{ V}$  to  $\pm 300\text{ V}$   
Output Current : 150W to 2kW  
Frequency Band: DC to 30kHz



- They can be utilized as a high speed response power supply or electronic loads with their four-quadrant behavior.
- Their high power and broadband are realized and they are best fitted to transient response tests and so on.
- DC bias is equipped as standard. (settable to -100% to +100%)

Individual detailed catalogues are prepared. Please inquire them our sale staff.

DOP series are **four-quadrant bipolar power supplies** possible to source and sink electric power. They are applicable to two modes of constant voltage and current. Light weight as a half of conventional one is realized. It is able to output proportional waves to input such as sine, triangle, saw-tooth and rectangular wave in high speed response despite of compact size. We maintain high reliability with all solid state for all models and prepare plenty of line-up with total 36 models to cover wide output band. They are applicable to loads for evaluation of solar battery panels or the power supply for evaluation of power conditioners.



We have **developed, manufactured and sold by own high performance power supplies for various fields such as DC power supplies, high voltage power supplies, AC power supplies and piezo driver**, other than these high voltage amplifiers or four-quadrant bipolar power supplies. We prepare individual detailed catalogues. Please ask them our sale staff without any hesitations.





**USA/Canada : +1-888-652-8651**

other countries : ☎81-6-6150-5089

# Customer Inquiry Sheet (DOA series)

Please copy this page and above fax number after filling out form below.

☐ I would like

- ☐ A quotation    ☐ An explanation of product    ☐ A demonstration    ☐ To purchase
- ☐ Other ( )

■ Give us your requirement / comment

■ Please fill in below.

Address:	
Company:	
Dept.:	Title:
Name:	
Tel:	Fax:
E-mail:	

### Manufacturer warranty

We warrant the specification, unless otherwise specified, at max. rated output after warm up, and scope of application is between 10% and 100% of max. rated output. We warrant that products contained in this catalog (hereinafter, the "Products") are free from defects in material and workmanship under normal use for a period of one (1) year from the date of shipment thereof. However, the warranty period for X-ray detectors and X-ray source shall be either one (1) year from the date of shipment or 1,000 hours, whichever shorter. The above warranty shall not apply to any Product which, at our sole judgment, has been: i) Repaired or altered by persons unauthorized by us; or ii) Connected, installed, adjusted or used otherwise than in accordance with the instructions furnished by us (including being used in an inappropriate installation environment, such as in corrosive gas, high temperature and humidity). We are not liable for any loss, damage or failure of the Products after the shipment thereof caused by external factors such as disasters. We will not inspect, adjust or repair any of our power supply products in the field or at any customer site. If you suspect that there has been a power supply failure in the field, please inspect your whole unit by yourself in an effort to determine that the problem is, in fact, arising out of our power supply products. If it is found that the problem is arising out of such power supply product after inspection, please contact your local sales office for additional troubleshooting. A "Return Merchandise Authorization" is required in case the power supply must be sent back to the factory in Japan for inspection and repair. We, at our sole discretion repair or replace such defective products at no cost to the purchaser. We assume no liability to the purchaser or any third party for special, incidental, consequential, or other damages resulting from a breach of the foregoing warranty. This warranty excludes any and all other warranties not set forth herein, express or implied, including without limitation the implied warranties of merchantability or fitness for a particular purpose. The Products are not designed and produced for such applications as requiring extremely high reliability and safety, or involving human lives (such as nuclear power, aerospace, social infrastructure facility, medical equipment, etc.). The use under such environment is not covered by this warranty and may require additional design and manufacturing processes. No modification or supplement of this warranty shall be binding unless in writing and signed by a duly authorized officer of Matsusada. Matsusada reserves the right to make any changes in the contents of catalogs or specifications at any time without advance notice. Due to compelling reason such as unavailability of components used, products might be unavailable or unable to repair. The products specified in catalogs or specifications are designed for use by the person who has enough expertise or under the control of such person, and not for general consumers. Schematics of products shall not be submitted to users. Test result or test data for the products shall be available upon request with charge.

Make sure you read the specification in the latest catalog before you order. Contact nearby sales office for the latest catalog.

PLEASE SEE THE LINK BELOW FOR THE COMPLETE WARRANTY TERMS

<https://www.matsusada.com/site/warranty.html>

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