



Remote

ON/OFF

ŤŤ

Parallel

Operation



# **DBS-series**



# Feature

Ideal for distributed power systems Thin and small size Built-in overcurrent, overvoltage and thermal protection circuits Built-in remote ON/OFF (on both side of input and output) Inverter operating monitoring (IOG) Mounting hole (M3 tapped) The beet noise is decreased by installing of the crystal oscillator (DBS700)

# CE marking

Low Voltage Directive RoHS Directive

# UKCA marking

Electrical Equipment Safety Regulations RoHS Regulations

### Safety agency approvals

UL, C-UL recognized, TÜV approved

# 5-year warranty



MODEL	DBS100A05	DBS100A13R8	DBS150A12	DBS150A15	DBS150A24
MAX OUTPUT WATTAGE[W]	100	100.7	150	150	151
DC OUTPUT	5V 20A	13.8V 7.3A	12V 12.5A	15V 10A	24V 6.3A

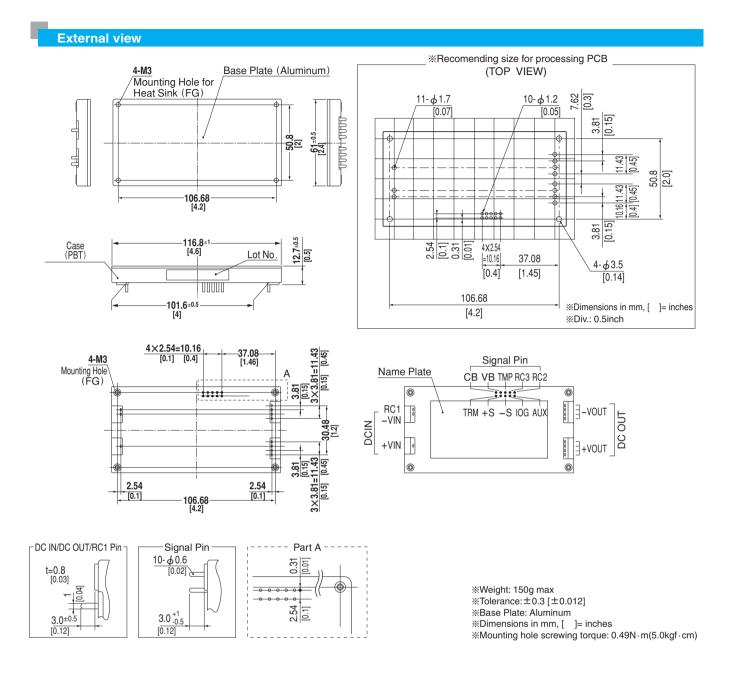
	MODEL		DBS100A05	DBS100A13R8	DBS150A12	DBS150A15	DBS150A24			
	VOLTAGE[V]		DC45 - 160	·	DC66 - 160	·				
INPUT	CURRENT[A]	*1	1.11typ	1.10typ	1.57typ	1.59typ	1.58typ			
	EFFICIENCY[%] *1		82typ	83typ	87typ	86typ	87typ			
	VOLTAGE[V]		5	13.8	12	15	24			
	CURRENT[A]		20	7.3	12.5	10	6.3			
	LINE REGULATION	l[mV]	20max	60max	40max	60max	95max			
	LOAD REGULATIO	N[mV]	40max	150max	100max	150max	190max			
	RIPPLE[mVp-p]	0 to +85℃ *2	80max	120max	120max	120max	120max			
	nirree[iiivp-p]	<b>-20 - 0</b> ℃ *2	140max	160max	160max	160max	160max			
Ουτρυτ	RIPPLE NOISE[mVp-p]	0 to +85℃ *2	100max	150max	150max	150max	150max			
001901		<b>-20 - 0</b> ℃ *2	150max	180max	180max	180max	180max			
	TEMPERATURE REGULATION[mV]	0 to +65℃	50max	180max	120max	180max	280max			
		-20 to +85℃	85max	310max	200max	310max	480max			
H	DRIFT[mV] *3		20max	60max	40max	60max	90max			
	START-UP TIME[ms]		200max (DCIN 110V, Io=100%)							
	OUTPUT VOLTAGE ADJUSTMENT RANGE		Fixed (TRM pin open), 60 - 110% adjustable by external VR or external voltage							
	OUTPUT VOLTAGE SETTING[V]		4.90 - 5.20	13.25 - 14.35	11.60 - 12.60	14.40 - 15.60	23.04 - 24.96			
	OVERCURRENT PROT	ECTION	Works over 105% of rating and recovers automatically							
PROTECTION CIRCUIT AND	OVERVOLTAGE PROTE	CTION	5.75 - 7.00V	15.87 - 19.32V	13.80 - 16.80V	17.25 - 21.00V	27.60 - 33.60V			
OTHERS	REMOTE SENSING	à	Provided							
	REMOTE ON/OFF		Provided (On both side of input and output)							
	INPUT-OUTPUT		AC3,000V 1minute,	Cutoff current = 10m	A, DC500V 50M $\Omega$ m	in (20±15℃)				
ISOLATION	INPUT-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (20±15°C)							
ISOLAHON	OUTPUT-FG		AC500V 1minute, Cutoff current = 100mA, DC500V 50M $\Omega$ min (20±15°C)							
	OUTPUT-RC2,RC3		AC100V 1minute, Cutoff current = 100mA, DC100V 10M $\Omega$ min (20±15°C)							
	OPERATING TEMP.,HUMID.AND A	ltitude *4	4 -20 to +85°C (On aluminum base plate), 20 - 95%RH (Non condensing) (Refer to "Derating"), 3,000m (10,000feet) max							
ENVIRONMENT	STORAGE TEMP.,HUMID.AND	ALTITUDE	-40 to +85°C, 20 - 95%RH (Non condensing), 9,000m (30,000feet) max							
	VIBRATION				od, 60minutes each a	ong X, Y and Z axis				
	IMPACT		196.1m/s <sup>2</sup> (20G), 11	ms once each along	X, Y and Z axis					
SAFETY	AGENCY APPROV	ALS	UL60950-1, C-UL, E	N62368-1						
OTHERS	CASE SIZE/WEIGH	IT	61 × 12.7 × 116.8mm	n [2.4×0.5×4.6 inche	es] (W×H×D) / 150g	max				
UTHENS	COOLING METHO	D	Conduction cooling	(e.g. heat radiation fr	om the aluminum bas	e plate to the attach	ed heat sink)			

At rated input(DC110V) and rated load. \*1

\*2 Riple and ripple noise is measured by using measuring board with the recommended capacitor Co & the film capacitor 0.1 μ F. Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN:RM101). Refer to the manual.

\*3 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 constant at the rated input/output. \*4 Please consult us in regard to use from -40°C.

DBS100A/DBS150A COSEL





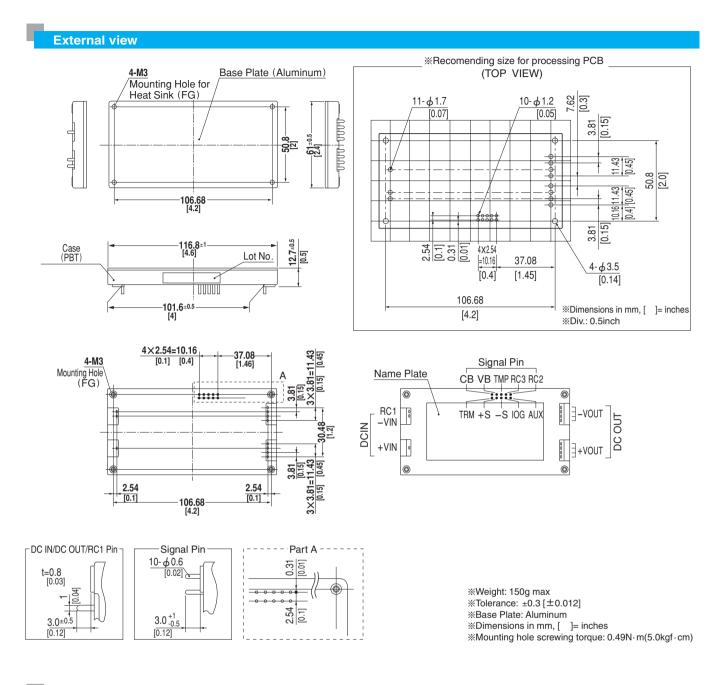
MODEL	DBS200B03	DBS200B05	DBS200B07	DBS200B12
MAX OUTPUT WATTAGE[W]	165	200	210	240
DC OUTPUT	3.3V 50A	5V 40A	7.5V 28A	12V 20A

	MODEL		DBS200B03	DBS200B05	DBS200B07	DBS200B12				
	VOLTAGE[V]		DC200 - 400	0002000000	DB0200B07	000200012				
INPUT	CURRENT[A]	*1	0.75typ	0.86typ	0.87typ	0.99typ				
	EFFICIENCY[%] *1		79typ	83typ	86typ	87typ				
	VOLTAGE[V]		3.3	5	7.5	12				
	CURRENT[A]		50	40	28	20				
	LINE REGULATION	l[mV]	16max	20max	30max	40max				
	LOAD REGULATIO		30max	40max	60max	100max				
		0 to +85°C *2	80max	80max	100max	120max				
	RIPPLE[mVp-p]	-20 - 0℃ *2		140max	150max	160max				
		0 to +85℃ *2		100max	140max	150max				
OUTPUT	RIPPLE NOISE[mVp-p]	-20 - 0°C *2	150max	150max	160max	180max				
		0 to +65℃	35max	50max	75max	120max				
-	TEMPERATURE REGULATION[mV]	-20 to +85℃	60max	85max	130max	200max				
	DRIFT[mV] *3		16max	20max	30max	40max				
	START-UP TIME[ms]		200max (DCIN 280V, Io=100%)							
	OUTPUT VOLTAGE ADJUSTMENT RANGE		Fixed (TRM pin open), 60 - 110% adjustable by external VR or external voltage							
	OUTPUT VOLTAGE SETTING[V]		3.25 - 3.45	4.90 - 5.20	7.25 - 7.85	11.60 - 12.60				
	OVERCURRENT PROT	ECTION	Works over 105% of rating and recovers automatically							
PROTECTION	OVERVOLTAGE PROTE	ECTION	4.00 - 5.50V	5.75 - 7.00V	8.60 - 10.50V	13.80 - 16.80V				
CIRCUIT AND OTHERS	REMOTE SENSING	à	Provided							
	REMOTE ON/OFF		Provided (On both side of input and output)							
	INPUT-OUTPUT		AC3,000V 1minute, Cutof	f current = 10mA, DC500V	/ 50MΩ min (20±15℃)					
ISOLATION	INPUT-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (20±15°C)							
ISOLATION	OUTPUT-FG		AC500V 1minute, Cutoff current = 100mA, DC500V 50M $\Omega$ min (20±15°C)							
	OUTPUT-RC2,RC3		AC100V 1minute, Cutoff current = 100mA, DC100V 10M $\Omega$ min (20±15°C)							
	OPERATING TEMP.,HUMID.AND A	ltitude *4	-20 to +85℃ (On aluminum b	pase plate), 20 - 95%RH (Non	condensing) (Refer to "Deratir	ng"), 3,000m (10,000feet) max				
ENVIRONMENT	STORAGE TEMP.,HUMID.AND	ALTITUDE	-40 to +85°C, 20 - 95%RH (Non condensing), 9,000m (30,000feet) max							
	VIBRATION		10 - 55Hz, 49.0m/s <sup>2</sup> (5G), 3minutes period, 60minutes each along X, Y and Z axis							
	IMPACT		196.1m/s <sup>2</sup> (20G), 11ms once each along X, Y and Z axis							
SAFETY		-		68-1 Complies with DEN-A						
OTHERS	TEMPERATURE REGULATION[mV] -20 to + DRIFT[mV] START-UP TIME[ms] DUTPUT VOLTAGE ADJUSTMENT RAN DUTPUT VOLTAGE ADJUSTMENT RAN DUTPUT VOLTAGE SETTING[ OVERCURRENT PROTECTIO OVERVOLTAGE PROTECTIO REMOTE SENSING REMOTE ON/OFF INPUT-OUTPUT INPUT-FG OUTPUT-FG OUTPUT-FG OUTPUT-FG OUTPUT-RC2,RC3 DPERATING TEMP.HUMID.AND ALTITUDE STORAGE TEMP.HUMID.AND ALTITUDE STORAGE TEMP.HUMID.AND ALTITUDE STORAGE TEMP.HUMID.AND ALTITUDE	IT	-	$\times 0.5 \times 4.6$ inches] (W $\times$ H $\times$						
	COOLING METHO	D	Conduction cooling (e.g. l	neat radiation from the alu	minum base plate to the at	tached heat sink)				

\*1 At rated input(DC280V) and rated load.
 \*2 Ripple and ripple noise is measured by using measuring board with the recommended capacitor Co & the film capacitor 0.1 µF. Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN:RM101). Refer to the manual.

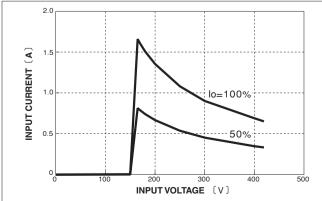
\*3 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output. \*4 Please consult us in regard to use from -40°C.

DBS200B | CO\$EL

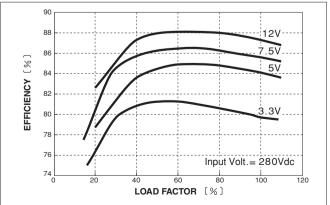


#### **Performance data**

■INPUT CURRENT CHARACTERISTICS (DBS200B12)



**EFFICIENCY CHARACTERISTICS** 





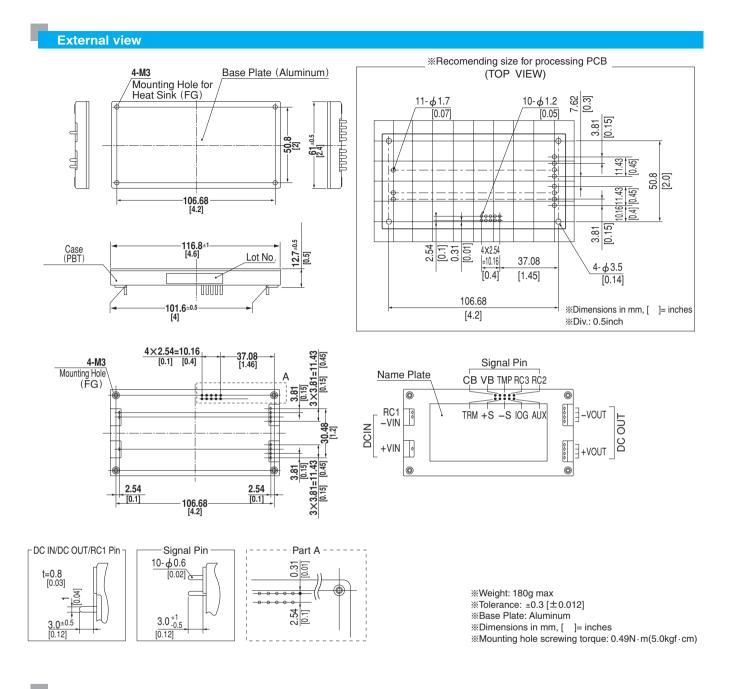
MODEL	DBS400B03	DBS400B05	DBS400B07	DBS400B12	DBS400B15	DBS400B18	DBS400B24	DBS400B28
MAX OUTPUT WATTAGE[W]	264	400	405	408	405	396	408	406
DC OUTPUT	3.3V 80A	5V 80A	7.5V 54A	12V 34A	15V 27A	18V 22A	24V 17A	28V 14.5A

	MODEL		DBS400B03	DBS400B05	DBS400B07	DBS400B12	DBS400B15	DBS400B18	DBS400B24	DBS400B28	
	VOLTAGE[V]		DC200 - 400	)	1	I	1		I		
INPUT	CURRENT[A]	*1	1.19typ	1.72typ	1.68typ	1.67typ	1.66typ	1.61typ	1.67typ	1.63typ	
INPUT C E V C L L L L R OUTPUT R F E OUTPUT R F C C C C C C C C C C C C C C C C C C	EFFICIENCY[%]	*1	79typ	83typ	86typ	87typ	87typ	89typ	87typ	88typ	
	VOLTAGE[V]		3.3	5	7.5	12	15	18	24	28	
	CURRENT[A]		80	80	54	34	27	22	17	14.5	
	LINE REGULATION	V[mV]	16max	20max	30max	40max	60max	60max	95max	95max	
	LOAD REGULATION[mV]		30max	40max	60max	100max	150max	150max	190max	190max	
		0 to +85℃ *2	80max	80max	100max	120max	120max	120max	120max	120max	
OUTPUT	nirrceliiivb-b]	-20 - 0℃ *2	140max	140max	150max	160max	160max	160max	160max	160max	
	RIPPLE[mVp-p]         20.00 × 2         140max         150max         160max         <	150max	150max								
VOLTAGE[V]         DC200 - 400           INPUT         CURRENT[A]         ⇒         1.19typ         1.72typ         1.68typ         1.67typ         1.66typ         1.61t           EFFICIENCY[%]         ⇒         79typ         83typ         88typ         87typ         87typ         89typ           VOLTAGE[V]         3.3         5         7.5         12         15         18           CURRENT[A]         80         80         54         34         27         22           LINE REGULATION[mV]         16max         20max         30max         40max         60max         160max         160max           LOAD REGULATION[mV]         30max         40max         140max         150max         160max         160max         160max         160max         160max         160max         160max         160max         160max         180max         1	180max	180max	180max								
	TEMPERATURE REGULATION(mV)	0 to +65℃	35max	50max	75max	120max	180max	180max	280max	280max	
		-20 to +85℃	60max	85max	130max	200max	310max	310max	480max	480max	
	DRIFT[mV] *3		16max	20max	30max	40max	60max	60max	90max	90max	
	START-UP TIME[ms]										
	OUTPUT VOLTAGE ADJUSTMENT RANGE										
	OUTPUT VOLTAGE SET	TING[V]	3.25 - 3.45	4.90 - 5.20	7.25 - 7.85	11.60 - 12.60	14.40 - 15.60	17.28 - 18.72	23.04 - 24.96	26.88 - 29.12	
	OVERCURRENT PROT	ECTION									
INPUT C C C C C C C C C C C C C C C C C C C	OVERVOLTAGE PROT	ECTION	4.00 - 5.50V	5.75 - 7.00V	8.60 - 10.50V	13.80 - 16.80V	17.25 - 21.00V	20.70 - 25.20V	27.60 - 33.60V	32.20 - 39.20V	
OTHERS	REMOTE SENSING	à									
	REMOTE ON/OFF		Provided (O	n both side of	input and ou	tput)					
INPUT OUTPUT OUTPUT PROTECTION CIRCUIT AND OTHERS ISOLATION ENVIRONMENT SAFETY OTHERS			AC3,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (20±15°C)								
			AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (20±15°C)								
			AC500V 1minute, Cutoff current = 100mA, DC500V 50M $\Omega$ min (20±15°C)								
		-			1 /		0, 1		ıg"), 3,000m (10	),000feet) max	
ENVIRONMENT	, .	ALTITUDE	-			<u></u> ,					
								X, Y and Z a	axis		
	-		,	,		0					
SAFETY		-									
OTHERS				•			· •		24       28         17       14.5         95max       95max         190max       190max         120max       120max         120max       120max         160max       160max         150max       150max         180max       180max         280max       280max         280max       90max         90max       90max         90max       90max         e       23.04 - 24.96       26.88 - 29         27.60 - 33.60V       32.20 - 39         mg"), 3.000m (10.000feet) n       axis		
PROTECTION CIRCUIT AND OTHERS ISOLATION ENVIRONMENT SAFETY OTHERS	COOLING METHO	D	Conduction	cooling (e.g. ł	neat radiation	from the alun	ninum base p	late to the att	ached heat si	nk)	

\*1 At rated input(DC280V) and rated load.
 \*2 Ripple and ripple noise is measured by using measuring board with the recommended capacitor Co & the film capacitor 0.1 µF. Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN:RM101). Refer to the manual.

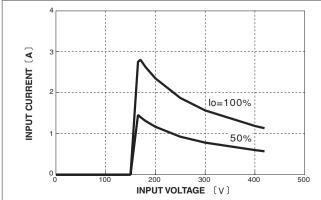
\*3 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output. \*4 Please consult us in regard to use from -40°C.

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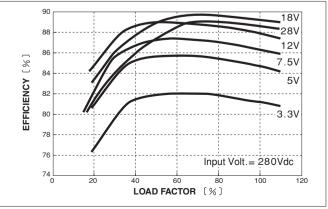


#### **Performance data**

#### ■INPUT CURRENT CHARACTERISTICS (DBS400B12)



**EFFICIENCY CHARACTERISTICS** 





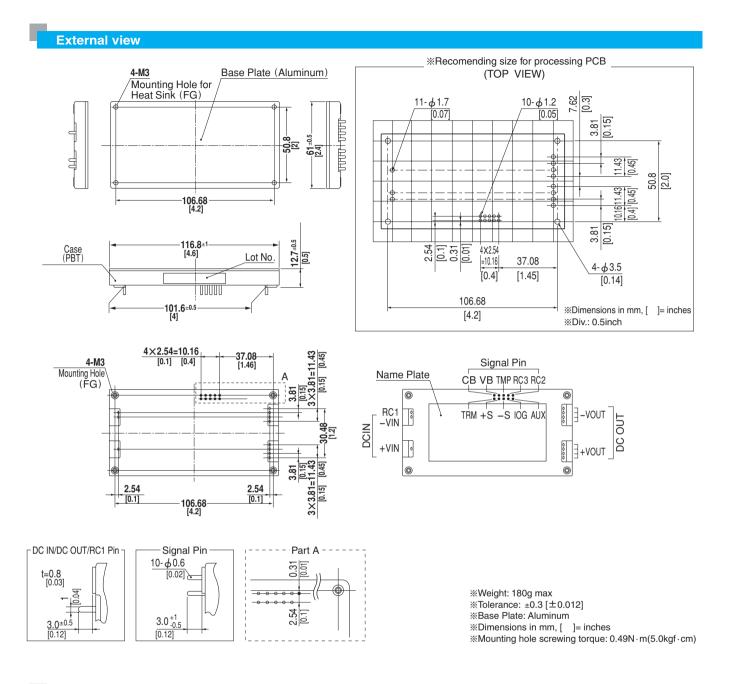
MODEL	DBS700B12	DBS700B24	DBS700B28	DBS700B36	DBS700B48
MAX OUTPUT WATTAGE[W]	696	696	700	702	696
DC OUTPUT	12V 58A	24V 29A	28V 25A	36V 19.5A	48V 14.5A

	MODEL		DBS700B12	DBS700B24	DBS700B28	DBS700B36	DBS700B48			
	VOLTAGE[V]		DC200 - 400	I	1					
INPUT	CURRENT[A]	*1	2.76typ	2.76typ	2.76typ	2.76typ	2.73typ			
	EFFICIENCY[%]	*1	90.0typ	90.0typ	90.5typ	90.0typ	91.0typ			
	VOLTAGE[V]		12	24	28	36	48			
	CURRENT[A]		58	29	25	19.5	14.5			
	LINE REGULATION	l[mV]	40max	95max	95max	95max	120max			
	LOAD REGULATIO	N[mV]	100max	190max	190max	200max	240max			
		0 to +100℃*2	120max	120max	120max	150max	200max			
	RIPPLE[mVp-p]	-40 to 0℃*2	160max	160max	160max	200max	250max			
OUTPUT		0 to +100℃*2	150max	150max	150max	200max	250max			
OUTPUT	RIPPLE NOISE[mVp-p]	-40 to 0℃*2	180max	180max	180max	240max	400max			
		0 to +65℃	120max	280max	280max	360max	480max			
	TEMPERATURE REGULATION[mV]	-40 to +100°C	200max	480max	480max	680max	960max			
	DRIFT[mV] *3		40max	90max	90max	120max	180max			
	START-UP TIME[ms]		200max (DCIN 280V, Io=100%)							
	OUTPUT VOLTAGE ADJUSTMENT RANGE *4		Fixed (TRM pin open), 60 - 110% adjustable by external VR or external voltage							
	OUTPUT VOLTAGE SETTING[V]		11.64 - 12.36	23.28 - 24.72	27.16 - 28.84	34.92 - 37.08	46.56 - 49.44			
	OVERCURRENT PROT	ECTION	Works over 105% of rating and recovers automatically							
PROTECTION CIRCUIT AND		ECTION	14.40 - 16.80V	27.60 - 33.60V	32.20 - 39.20V	41.40 - 50.40V	55.20 - 63.00V			
OTHERS	REMOTE SENSING	à	Provided							
	REMOTE ON/OFF		Provided (On both side of input and output)							
	INPUT-OUTPUT		AC3,000V 1minute,	Cutoff current = 10m/	A, DC500V 50M $\Omega$ m	in (20±15℃)				
ISOLATION	INPUT-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50M $\Omega$ min (20±15°C)							
ISOLATION	OUTPUT-FG		AC500V 1minute, Cutoff current = 100mA, DC500V 50M $\Omega$ min (20±15°C)							
	OUTPUT-RC2,RC3		AC100V 1minute, Cutoff current = 100mA, DC100V 10M $\Omega$ min (20±15°C)							
	OPERATING TEMP.,HUMID.AND	ALTITUDE	-40 to +100°C (On aluminum base plate), 20 - 95%RH (Non condensing) (Refer to "Derating"), 3,000m (10,000feet) max							
ENVIRONMENT	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 <sup>2</sup> , 3minutes period, 60minutes each along X, Y and Z axis							
	IMPACT			nce each along X, Y a	and Z axis					
SAFETY	AGENCY APPROV	ALS	UL60950-1, C-UL, E							
OTHERS	CASE SIZE/WEIGH	IT		[2.4×0.5×4.6 inche						
OTTENS	COOLING METHO	D	Conduction cooling (	e.g. heat radiation fro	om the aluminum bas	e plate to the attach	ed heat sink)			

 \*1 At rated input(DC280V) and rated load.
 \*2 Ripple and ripple noise is measured by using measuring board with the recommended capacitor Co & the film capacitor 0.1 µF. Refer to the manual. \*3 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 constant at the rated input/output.

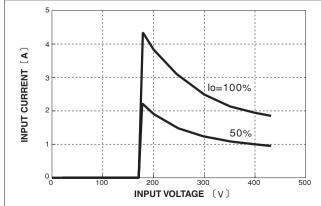
\*4 Refer to the manual for the input range.

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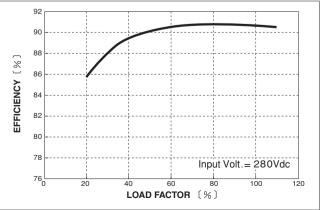


#### Performance data

#### ■INPUT CURRENT CHARACTERISTICS (DBS700B28)

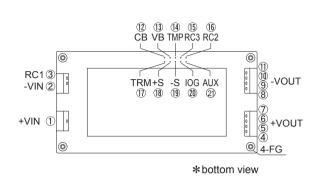


#### ■EFFICIENCY CHARACTERISTICS (DBS700B28)



# **COŞEL** | DBS-series

#### Pin Configuration



NO.	Pin Connection	Function
1	+VIN	+DC input
2	-VIN	-DC input
3	RC1	Remote ON/OFF(Input side)
4567	+VOUT	+DC output
89101	-VOUT	-DC output
12	СВ	Current balance
13	VB	Voltage balance
14)	TMP	Thermal detection signal
15	RC3	Remote ON/OFF(output side)
16	RC2	Keniole Olivor i (output side)
10	TRM	Adjustment of output voltage
18	+S	+Remote sensing
19	-S	-Remote sensing
20	IOG	Inverter operation monitor
21)	AUX	Auxiliary power supply
	FG	Mounting hole(FG)

#### 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. Aluminum base plate temperature around each power supply should not exceed the temperature range shown in "Derating".
- Avoid placing the DC input line pattern lay out underneath the unit, it will increase the line conducted noise. Make sure to leave an ample distance between the line pattern lay out and the unit. Also avoid placing the DC output line pattern underneath the unit because it may increase the output noise. Lay out the pattern away from the unit.
- High-frequency noise radiates directly from the unit to the atmosphere. Therefore, design the shield pattern on the printed circuit board and connect its one to FG.

The shield pattern prevents noise radiation.

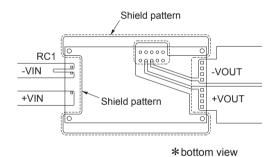
#### Stress onto the pins

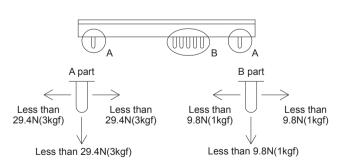
- When too much stress is applied to the pins of the power supply, the internal connection may be weakened. As shown in right figure avoid applying stress of more than 29.4N (3kgf) on the input pins/output pins (A part) and more than 9.8N (1kgf) to the signal pins (B part).
- The pins are soldered on PCB internally, therefore, do not pull or bend them with abnormal forces.
- Mounting hole diameter of PCB should be 3.5mm to reduce the stress onto the pins.
- Fix the unit on PCB(fixing fittings) by screws to reduce the stress onto the pins. Be sure to mount the unit first, then solder the unit.

#### Soldering temperature

Flow soldering : 260°C less than 15 seconds.
 Soldering iron

DC IN/DC OUT/RC1 : 450°C less than 5 seconds. Signal pins : 350°C less than 3 seconds (less than 20W)



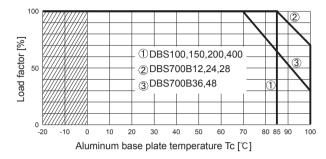


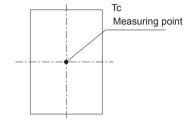
DBS-series | CO\$EL

#### Derating

Use with the conduction cooling(e.g. heat radiation by conduction from the aluminum base plate to the attached heat sink). Below shows the derating curve based on the aluminum base plate temperature. In the hatched area, the specification of ripple and ripple noise is different from other areas.

It is necessary to note thermal fatigue life by power cycle.Please reduce the temperature fluctuation range as much as possible when the up and down of temperature are frequently gener-ated.Contact for more information on cooling methods.





#### **Instruction Manual**

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

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



#### **Basic Characteristics Data**

Model Circuit method	Circuit mathed	Switching	Switching Input frequency current	Rated	Inrush	PCB/Pattern			Series/Parallel operation availability	
	[kHz]	[A]	input fuse	current protection	Material	Single sided	Double sided	Series operation	Parallel operation	
DBS100A	Forward converter	370	1.10 <b>*1</b>	-	-	Aluminum	Yes		Yes	Yes
DBS150A	Forward converter	370	1.59 <mark>*1</mark>	-	-	Aluminum	Yes		Yes	Yes
DBS200B	Forward converter	370	0.99 <mark>*1</mark>	-	-	Aluminum	Yes		Yes	Yes
DBS400B	Forward converter	370	1.72 <mark>*1</mark>	-	-	Aluminum	Yes		Yes	Yes
DBS700B	Forward converter	381	2.76 <mark>*1</mark>	-	-	Aluminum	Yes		Yes	Yes

\*1 The value of input current is at rated input and rated load.

# **Mouser Electronics**

Authorized Distributor

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Cosel:

 DBS150A12
 DBS700B28
 DBS400B12
 DBS400B24
 DBS200B03
 DBS100A13R8
 DBS700B12
 DBS200B07

 DBS700B48-T
 DBS400B05
 DBS100A05
 DBS400B03
 DBS700B36-T
 DBS200B12
 DBS400B18
 DBS700B36

 DBS700B24
 DBS150A15
 DBS400B28
 DBS700B12-T
 DBS400B07
 DBS700B24-T
 DBS150A24
 DBS700B28-T

 DBS400B15
 DBS200B05
 DBS700B48
 DBS700B48
 DBS700B48
 DBS700B48
 DBS700B48