

Multiple Booster TB series

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"Tajubu" multiple booster system DC to DC step-up converter



TB4S-2000-280

Other

Continuous max.

1kW
~4kW

Peak

1.5kW
~8.5kW

Model	Description	Stock	Standard price (before TAX)
TB4S-2000-280	48V input and 284V output type	Standard stock	¥100, 000
TB4D-4000-280	Two "TB4S-2000-280"s in parallel connection	Contact us	¥210, 000
TB2S-1500-280	24V input and 284V output type	Contact us	¥108, 000
TB2S-1500-140	24V input and 140V output type	Contact us	¥108, 000

Model name coding

TB * * - **00 - **0

① ② ③ ④ ⑤

① Series name

② Input voltage

③ S: Single type

D: Two units in parallel connection

④ Output power

⑤ Output voltage

Features

- Ten times high of input voltage with ultra high efficiency (90%*)
 - Regulated output voltage
 - To endure overcurrent more than double of rated load for 10 seconds. (max 4.5kW output for 10 seconds)
 - Up to three units in parallel to correspond to large power
 - Compact design due to 500kHz switching frequency
- * TB4 series only.

See "Product page guideline" on page C-B1 for icons explanation.

Safety Standard	UL	CSA	EN	CE	CCC
Reliability Grade	HFA	FA	HOA	OA	

Input

DC Input	TB4 series	18V~32V
	TB2 series	37V~63V

Output

Model	TB4S-2000-280	TB4D-4000-280	TB2S-1500-280	TB2S-1500-140
Output voltage	284V	284V	284V	140V
Rated current/ Rated power (continuous)	7A	14A	3.52A	7.4A
	1988W	3976W	1000W	1000W
Peak current/ Peak power	16A	30A	5.28A	11A
	4544W	8520W	1500W	1540W
Min. Load	0A	0A	0A	0A

Dimension

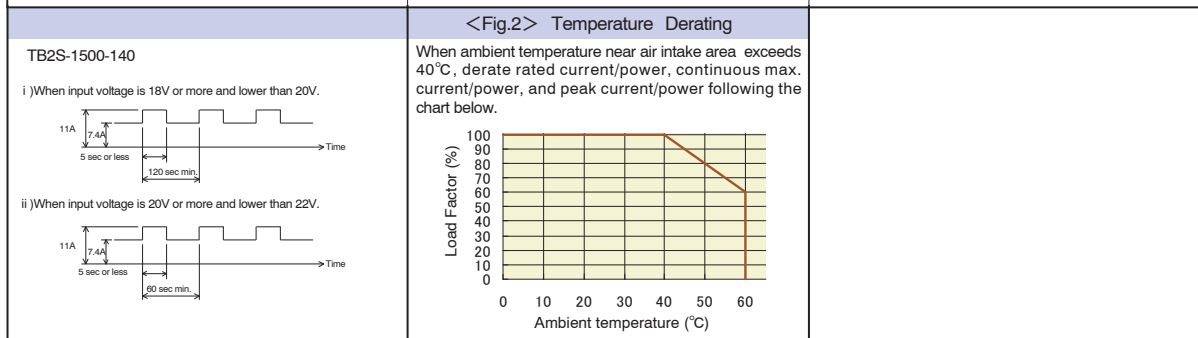
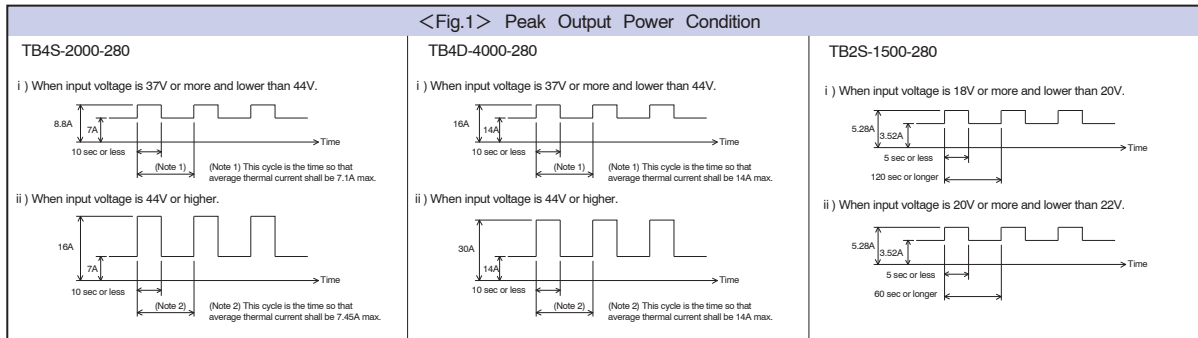
W × H × D (mm)	TB4S-2000-280	290 × 80 × 200
	TB2S-1500-140	
	TB2S-1500-280	
	TB4D-4000-280	330 × 175 × 200

Page	Items	Specification	Measurement conditions, etc.
DC Input	D-6 (1) Rated voltage	TB2 DC 24V TB4 DC 48V	
	Voltage range	TB2 DC18~32V TB4 DC37~63V	
		D-6 (3) Efficiency	TB2 85% or more TB4 90% or more Characteristic data (C-G16 Fig.3)
	Input voltage at Startup	TB2 DC 20V or more TB4 DC 40V or more	Startup voltage when input is applied.
	Protection	No protection such fuse in input side is equipped. Employ external protections such as fuse or circuit breaker.	
Output	Model	TB4S-2000-280 TB4D-4000-280 TB2S-1500-280 TB2S-1500-140	
	Rated voltage	284V 284V 284V 140V	
	Rated Current/Power	7A 14A 3.52A 7.4A	
		1988W 3976W 1000W 1000W	
	D-6 (9) Peak Current/Power	8.8A/16A* 16A/30A* 5.28A* 11A* 2499.2W/4544W* 4544W/8520W* 1500W* 1540W*	* Refer to <Fig.1> "Peak output power condition" below.
Setup voltage	Voltage 284V ± 3V 284V ± 3V 284V ± 3V 140V ± 3V Current 7A 14A 3.52A 7.4A	Setup voltage at Factory and the load current at voltage setup with rated input.	
D-7 (12) Max. ripple voltage (Vp-p)	3 max.		
Protection	D-7 (13) Overcurrent Protection	OCp point (A) 17~20A 31~40A 5.8~8.0A 15.7±2A	
	Method	Hold-down current limiting. When load current exceeding OCP point continues for 2 seconds or longer, boosting operation stops. (Output is not shut down).	
		Automatic recovery (Reclosing of Input after boosting operation stops)	
	D-7 (14) Overvoltage Protection	OVP point (V) 390 ± 10V 390 ± 10V 170 ± 20V	
	Method	Halt of boosting operation	
Recovery	Reclosing of Input		
Environment	D-7 (16) Operating Temperature/Humidity	0-60°C*/30-95%	Refer to <Fig.2> "Temperature derating" below. No condensation
	D-7 (17) Storage Temp. /Humidity	-25-85°C/30-95%	No condensation
	D-7 (18) Vibration	To endure for one hour in each of X-, Y-, and -Z with acceleration of 29.4m/s ² , frequency of 5 to 100Hz, and sweep cycle of three minute.	at No operation
	D-7 (19) Mechanical strength	Apply acceleration of 196m/s ² , shock operation time for 10msec in each direction of X-, Y-, and X, one time, and no malfunction shall be observed.	at No operation
Insulation	D-7 (20) Dielectric strength	AC 1500V for one minute between DC input/DC output/Signal and Chassis AC 1000V for one minute between DC input/DC output and Signal.	Increased test voltage by 20% for one second is acceptable at final test.
	D-7 (21) Insulation resistance	30M Ω min. between DC input/DC output and Chassis	DC500V Megger
EMC	D-8 (31) Conducted emission	N/A	
	D-7 (24) Electrostatic discharge	EN61000-4-2 compliant	
	D-7 (29) Power frequency magnetic field immunity	EN61000-4-8 compliant	
Others	D-8 (34) Cooling system	Forced air cooling	
	D-8 (35) Output GND grounding	Floating	
	D-8 (38) Output hold-up time	Refer to characteristics data on page C-616 Fig. 10	
	F-3 Reliability Grade	FA (Industrial equipment grade and Double sided PWB with through holes)	
	D-8 (41) MTBF	70,000 hours min. (For TB4D-4000-280, 35,000 hours min.)	
	Weight	4.5kg typical 9.0kg typical 4.5kg typical	
F-3 Warranty	3 years after delivery. However, If any faults belong to us, the defective unit shall be repaired or replaced at our cost.		

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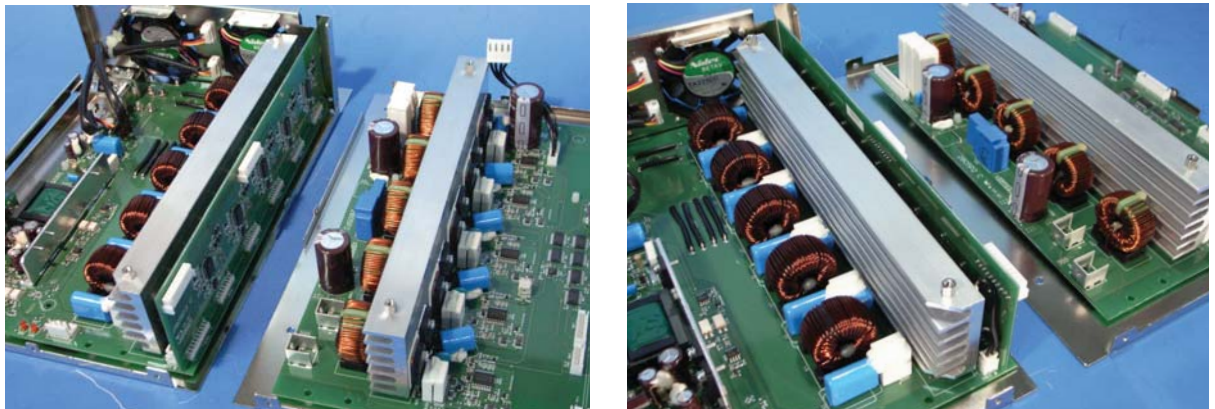


Signal Input/Output specification (All items are provided at normal temperature and humidity unless otherwise specified).

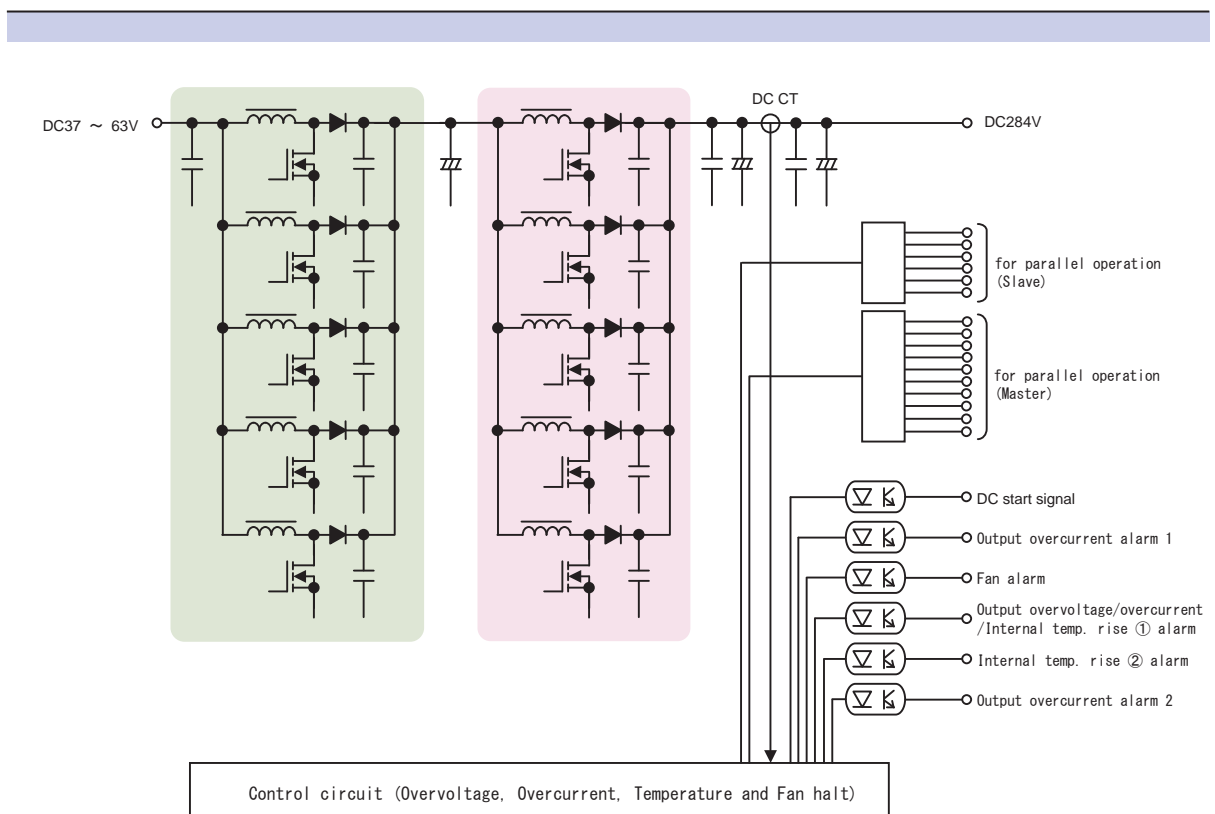
Items	Specification	Note
DC-DC start signal	'L' is delivered at DC-DC startup	CN2 pin 1
N.C.	—	CN2 pin 2
Output overcurrent alarm 1	'L' is delivered when output current is 7.5A or more.	CN2 pin 3
Fan alarm	'L' is delivered when the fan is in normal operation, and 'OPEN' when the fan stops.	CN2 pin 4
Overvoltage, Overcurrent Internal temp. rise ① alarm	'L' is delivered when overvoltage, overcurrent, or internal temp. is detected.	CN2 pin 5
Internal temp. rise ② alarm	'L' is delivered when internal fan's temperature rises.	CN2 pin 6
Output overcurrent alarm 2	'L' is delivered at OCP detection, and booster operation halt 2 seconds or more after 'L' is delivered.	CN2 pin 7
COM	GND is in common use for signal output.	CN2 pin 8

Signal circuit	
	<p>Vcc for photo transistor shall be 35V max. Vce(sat) shall be 0.7V max. Sink current (Ic) shall be 10mA max.</p>

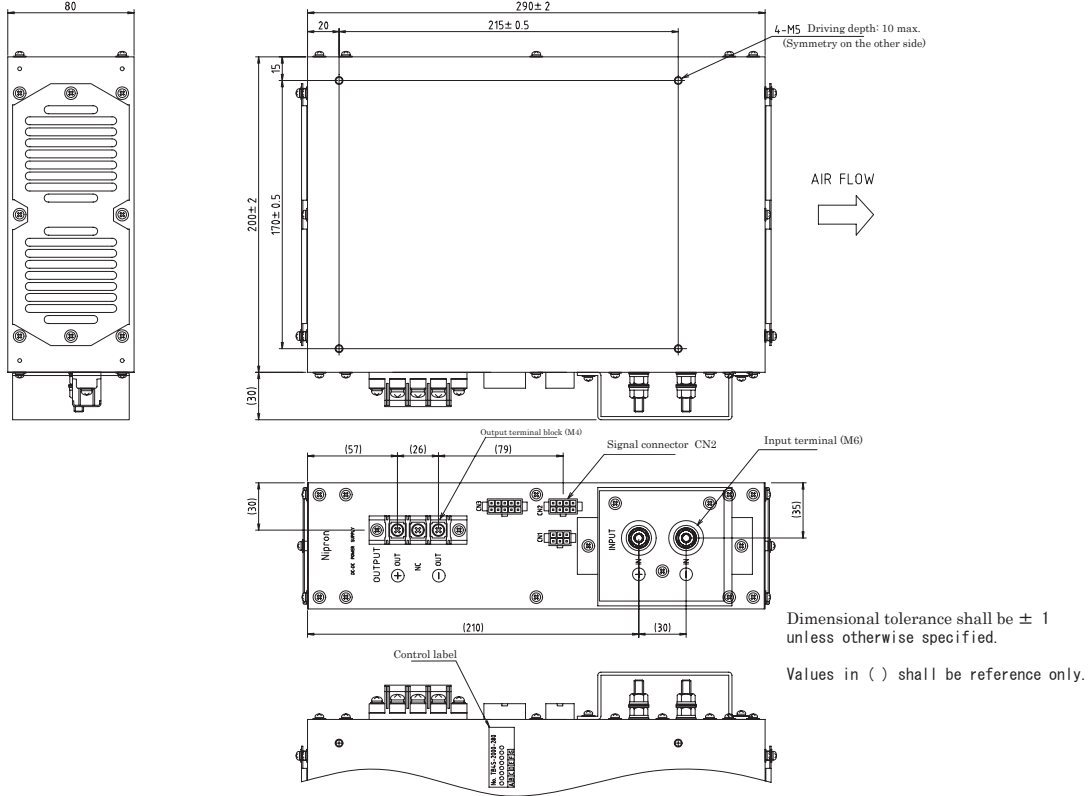
Interior View



Block Diagram



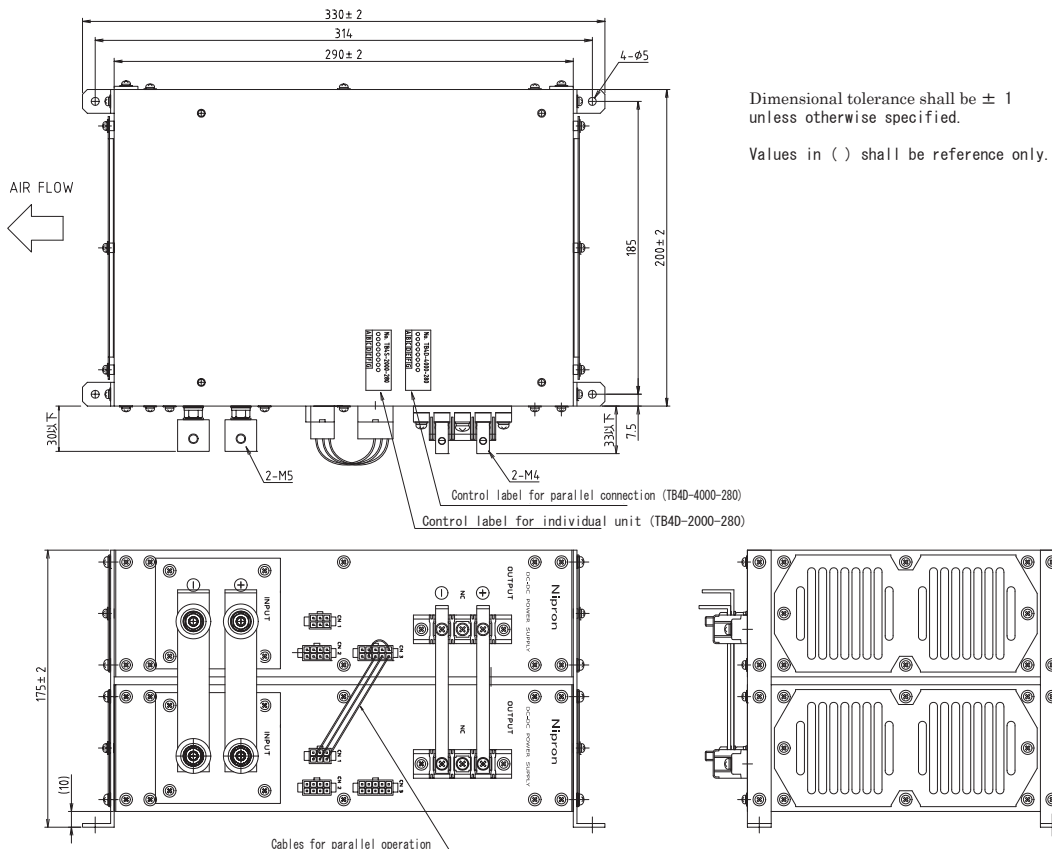
TB4S-2000-280, TB2S-1500-280, and TB2S-1500-140



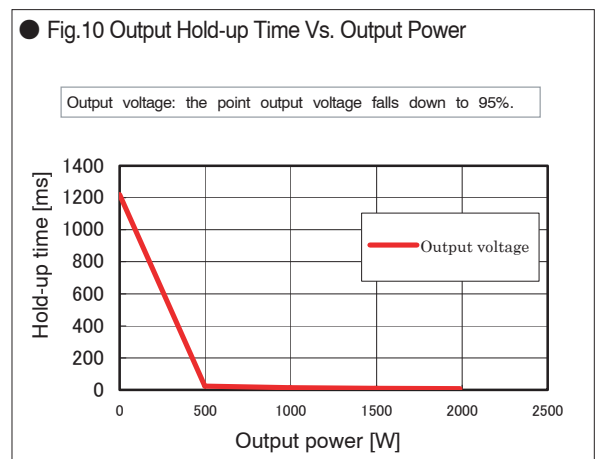
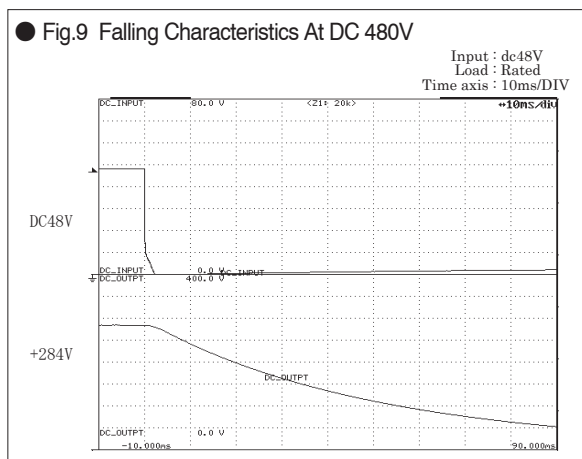
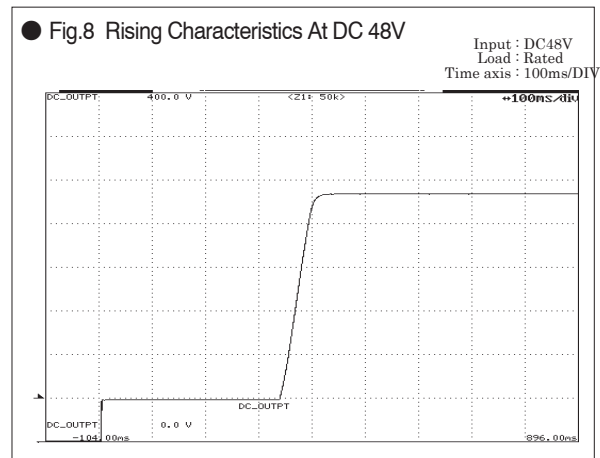
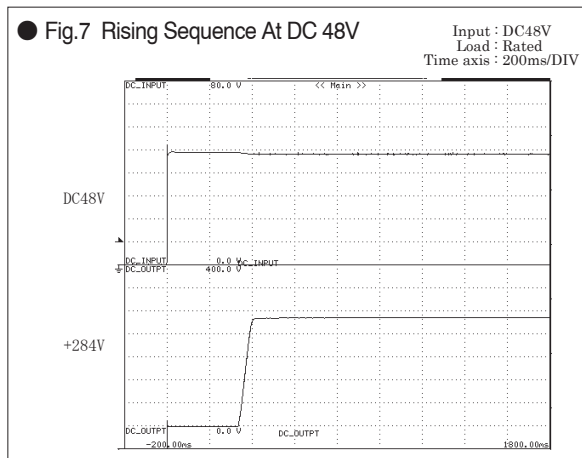
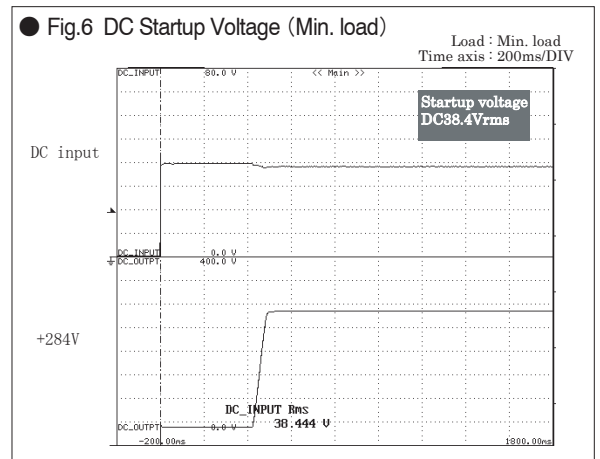
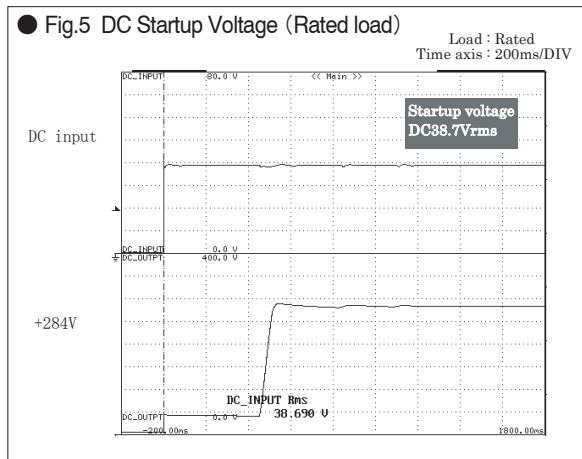
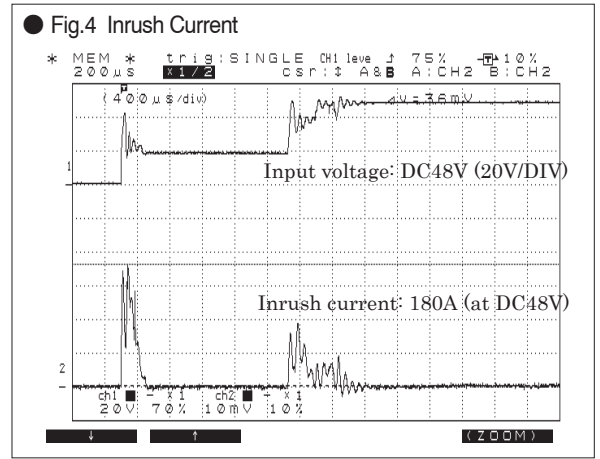
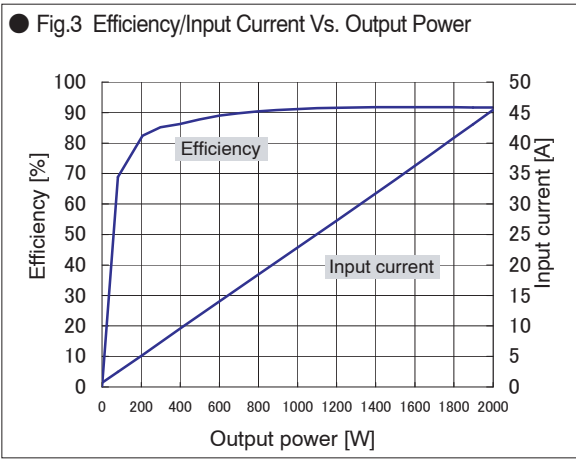
■ **Installation direction:**
Installation direction is not limited.

Items	Specification	Note
DC-DC start signal	'L' is delivered at DC-DC startup.	CN2 pin 1
N.C.		CN2 pin 2
Output OCP alarm1	'L' is delivered when output current is 7.5A or more.	CN2 pin 3
Fan alarm	'L' is delivered when Fan is normal, and 'OPEN' for fan halt.	CN2 pin 4
OVP, OCP, Internal Temp. rise (1) alarm	'L' is delivered when OVP, OCP, or internal temp. rise is detected.	CN2 pin 5
Internal Temp. rise 2 alarm	'L' is delivered at internal fan's temp. rise.	CN2 pin 6
Output OCP alarm 2	'L' is delivered at OCP detection, and boosting stops 2 seconds or more after 'L' is delivered.	CN2 pin 7
COM	GND is in common use for signal output.	CN2 pin 8

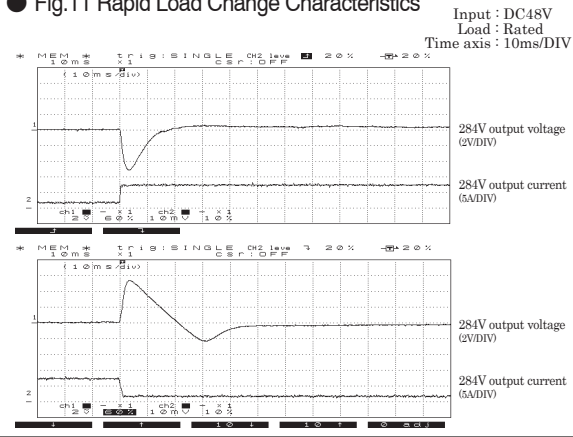
TB4D-4000-280



Characteristics Data TB4S-2000-280 (Examples of actual measurement)



● Fig.11 Rapid Load Change Characteristics

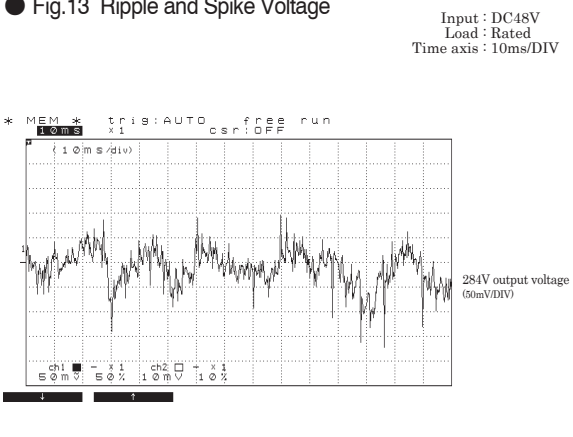


● Fig.12 Output Voltage Regulation

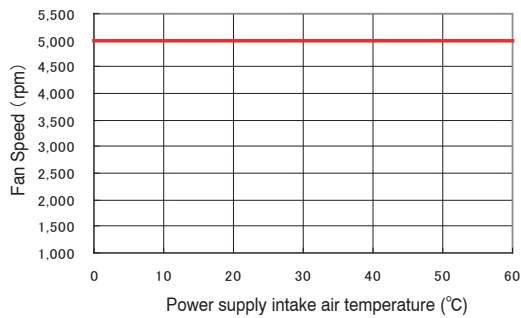
Output spec	Min. load	Rated load	Peak load
284V output	0A	7A	16A

DC Input	DC 37V	DC 48V	DC 63V
284V output (min.)	283.630 V	283.830 V	283.780 V
284V output (rated)	284.720 V	284.150 V	284.940 V
284V output (peak)	285.030 V	284.720 V	285.120 V

● Fig.13 Ripple and Spike Voltage



● Fig.14 Intake Air Temperature Ts. Fan Speed



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