800W AC/DC Switching Power Supply
Model: TG17-0800-01



FEATURES

- Universal 90 - 264VAC input voltage.
- Operating ambient temperature range: 0°C to +50°C.
- Built-in active PFC function.
- Output short circuit, over-current, over-voltage protection, over-temperature protection.
- 800W 1U CRPS type power supply.
- High efficiency up to 80Plus Platinum.
- N+1 redundancy design with active current sharing.
- Digital power management (PMBus).
- Operating altitude up to 5000m.
- Complies with IEC/EN/UL 62368-1 standard.

Models & Ratings

Model No.	Output Power	Main Output Voltage/ Current	Standby Output Voltage/ Current	Efficiency (80 plus)	External Capacitive Load
TG17-0800-01	800W	12.0V / 65.0A	12.0V / 2.1A	Platinum	25,000μF / 3,100μF

Efficiency

The power supply efficiency must exceed 80Plus Platinum at all specified load points. The efficiency should be measured at 230VAC and with external fan power according to Climate Saver /80Plus efficiency measurement specifications (CSCI-09-10)

Load	20%	50%	100%
230VAC/50Hz	90%	94%	91%

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input		90	100 - 240	264	VAC
	DC input		180	240	310	VDC
Input Frequency	-		47	50 - 60	63	Hz
Input Current	100VAC		-	-	10.0	Arms
	200VAC		-	-	5.0	
Inrush Current	100-240VAC	At 25°C, Cold start	-	-	35	A peak
Power Factor	115/230VAC	At 100% load	0.98	-	-	-
Touch Current	264VAC		-	-	1.75	mA

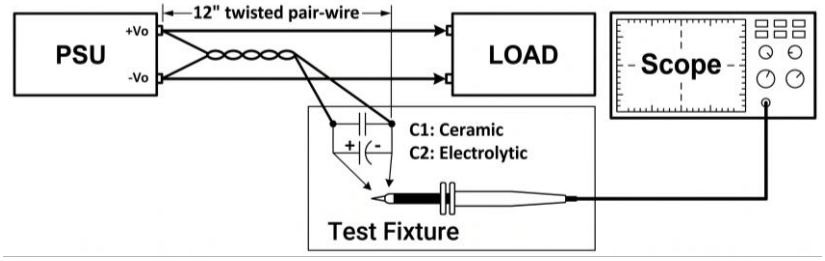
Input voltage: AC input
Power turn on : 85V±5V
Power turn off : 75V±5V
DC input
Power turn on : 175V±5V
Power turn off : 165V±5V (slow turn off over 10s)

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage	Output from 0 - 100% load	11.4	12.0	12.6	VDC
Initial setting output voltage	50% load	12.1	-	12.15	VDC
Output Current	Output range	0	-	65.0	A
CLST Peak	The CLST peak must withstand an peak current for a minimum of 20Sec			71.0	A
Pmax.app peak	The Pmax.app peak must withstand a peak current for a minimum of 15mSec. Pmax.app peak duty cycle shall be 5%			85.0	A
Pmax peak	The Pmax peak must withstand a peak current for a minimum of 100uSec. Pmax peak can be support based on peak load protection requirements that included added system 12V capacitors.			110.0	A
Line Regulation	100% load	-	±1	-	%
Load Regulation	Output from 0 - 100% load	11.4	-	12.6	V
Ripple & Noise	20MHz bandwidth	-	-	1	%
Turn On Time	100VAC/60Hz rated load from input AC turn on	-	-	2.5	S
Hold Up Time	With 70% of maximum load and over 100-240VAC input.	10	-	-	mS
Short Circuit Protection	Output shut down and latch off	-	-	-	-
Over Current Protection	Output shut down and latch off	71.5	-	84.5	A
Over Voltage Protection	Output shut down and latch off	13.3	-	14.5	V
Under Voltage Protection	Output shut down and latch off	9.0	-	11.0	V
Parallel Operation	Active current sharing	1		4	Pcs
Standby Output	The maximum output current is 3A	11.4V	12.0	12.6V	V

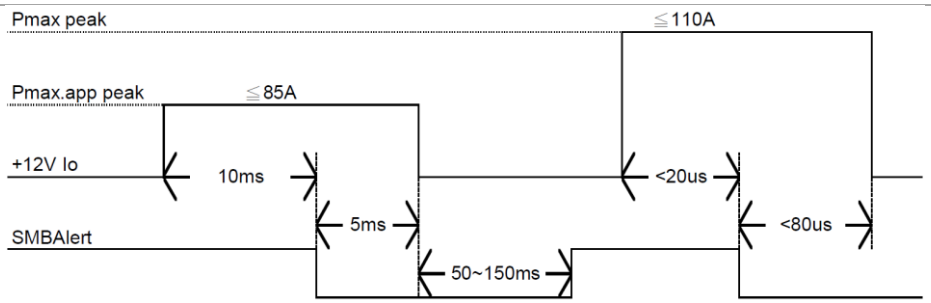
Ripple & Noise :

The output is decoupled with 100μF low ESR aluminum electrolytic (C2) and 0.1μF ceramic capacitor (C1). Measurement is made with a high impedance probe connected across the decoupling capacitance. Measurements shall be made with an oscilloscope with 20MHz bandwidth.



Peak Load Protection :

For peak loads above the Pmax.app peak load level the PSU will assert the SMBAlert signal to shorten the duration of the peak load to < 100μsec. For peak loads up to Pmax.app peak load level the PSU can't assert SMBAert if the peak load duration is < 10msec. If the peak load last longer than 10msec the PSU may assert SMBAlert to throttle the load within 15msec. The below are PSU requirements for Pmax peak load conditions.



Hot Swap Transient Load :
When an additional power supply is ORed together, or, removed from a group of one to three ORed power supplies, the outputs shall maintain regulation.

Turn On/Off Overshoot :
Overshoot at turn on shall be less than 10% of the nominal output voltage.

Dynamic Load :
The output voltages shall remain within limits specified for the step loading and capacitive loading specified in the test table below. The load transient repetition rate shall be tested between 50Hz and 5KHz frequency.

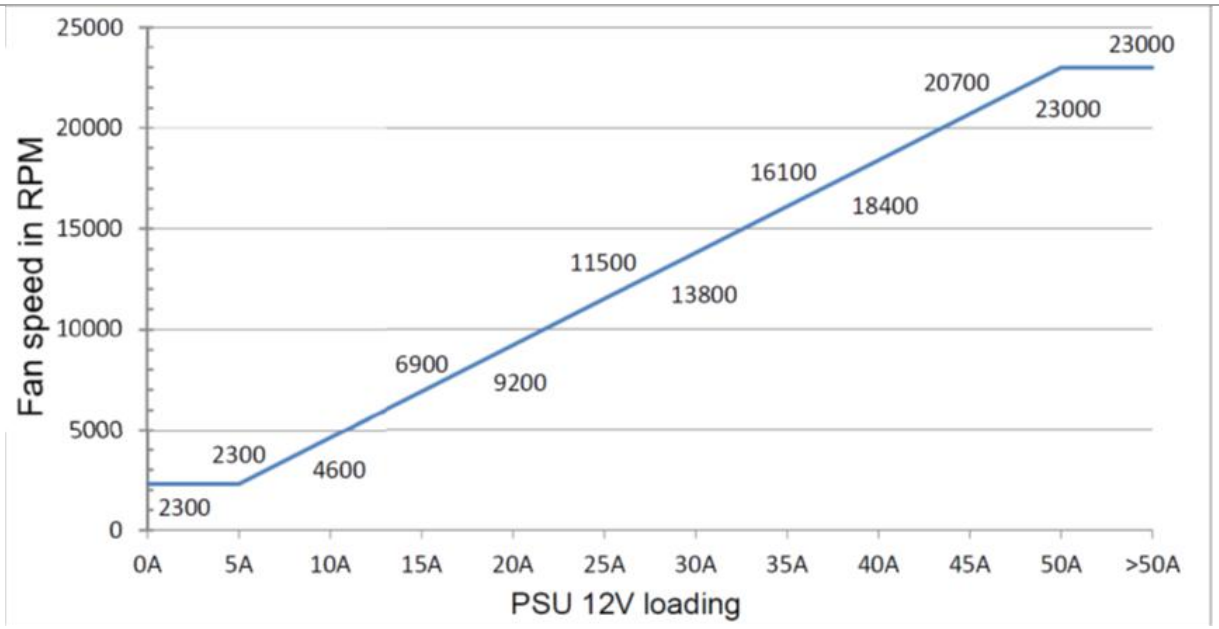
Output	△Step Load Size	Load Slew Rate	Test capacitive Load
12V	60% of max load	0.5A/uS	11000uF

Note: Step load for 40% load change (above 25% load), at 50Hz-5KHz. The recovery time is less than 500us.

Thermal Fault Protection :
If monitored components critical temperatures are reached, the power supply shall stay in regulation for 10 seconds after declaring the over temperature condition by setting the OT Warning bit of STATUS_TEMPERATURE command in PMBus, if the over temperature persists then set OT Fault bit of STATUS_TEMPERATURE command , then shuts down. Over temperature protect will be 2 level band. One is OTP warning and the other is OTP fault. If secondary side Hot spot over 110°C (PMBus 8Eh command value) or primary side Hot spot over 110°C(PMBus 8Fh command value) or Ambient temperature over 62°C (PMBus 8Dh command value) STATUS_TEMPERATURE warning bit should be set and PMBus SMBAlert pin pull to logic low. If secondary side Hot spot over 115°C (PMBus 8Eh command value) or primary side Hot spot over 115°C(PMBus 8Fh command value) or Ambient temperature over 66°C (PMBus 8Dh command value) STATUS_TEMPERATURE fault bit should be set and PMBus SMBAlert pin pull to logic low and PSU shunt down. When the temperature of the power is cool down, power will automatically be turned on.

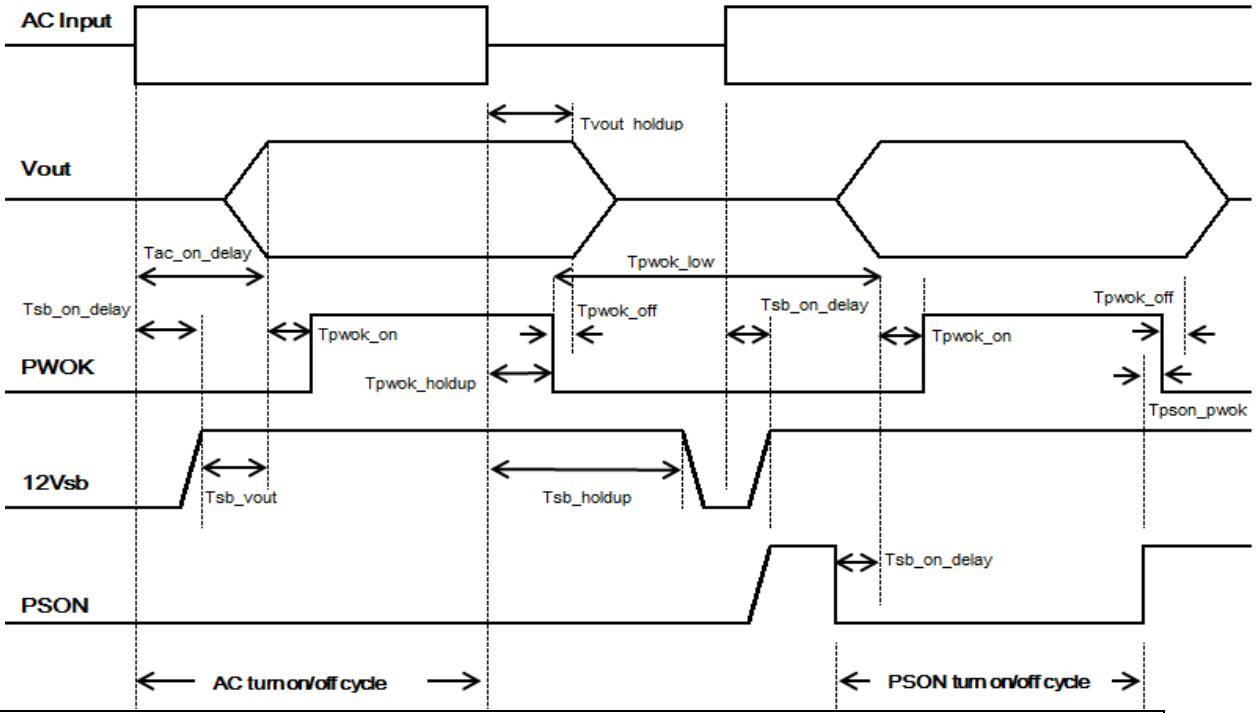
Fan Fault Protection :
After 10 sec the power supply should be latch off when fan fault occur. When fan speed malfunction, fan warning signal should be sent it out first then latch off the power supply.

Fan Control :
System control fan speed of PSU by duty from 10~100%, n=0.
If the system written value is over than PSU FAN control, system can control FAN speed of PSU by 10~100%.
If the system written value is less than PSU FAN control or out of range or some data-error, FAN obeyed the PSU FAN control.



Fan speed control tolerance to whichever is the ≦10000rpm +2000/-1000rpm and >10000rpm ±2300rpm of fan controlled speed.
In operating mode the fan will operate at maximum RPM when the ambient temperature exceeds 60°C or the Primary hot spot exceeds 110°C or the Secondary hot spot exceeds 100°C.

Sequencing :



ITEM	DESCRIPTION	Min	Max	UNIT
TVsb_on_delay	Delay from AC being applied to 12VSB being within regulation	-	1500	ms
TVsb_rise	12Vsb Output voltage rise time	10	70	ms
TVout_rise	+12V Output voltage rise time	10	70	ms
Tac_on_delay	Delay from AC being applied to all output voltages being within regulation	-	3000	ms

Tvout_holdup[1]	Time all output voltages stay within regulation after loss of AC at 70% load condition	11	-	ms
Tpwok_holdup	Delay from loss of AC to de-assertion of PWOK at 70% load condition	10	-	ms
Tpson_on_delay	Delay from PSON# active to output voltages within regulation limits.	5	400	ms
Tpson_pwok	Delay from PSON# de-active to PWOK being de-asserted	-	5	ms
Tpwok_on	Delay from output voltages within regulation limits to PWOK asserted at turn on.	100	500	ms
Tpwok_off	Delay from PWOK de-asserted to +12V output voltage dropping out of regulation limits.	1	-	ms
Tpwok_low	Duration of PWOK being in the de-asserted state during an off/on cycle using AC or the PSON signal.	100	-	ms
Tsb_vout	Delay from 12Vsb being in regulation to O/Ps being in regulation at AC turn on	50	1000	ms
T12Vsb_holdup	Time the 12Vsb output voltage stays within regulation after loss of AC.	70	-	ms

Current Sharing Operation :

The +12V output has active load sharing. The output will share within 10% at full load. The failure of a power supply should not affect the load sharing or output voltages of the other supplies still operating.

The +12Vsb output isn't required to actively share current between the power sources (passive sharing).

Cold Redundancy Support :

Power supplies that support cold redundancy can be enabled to go into a low-power state (that is, cold redundant state) in order to provide increased power usage efficiency when system loads are such that both power supplies are not needed. When the power subsystem is in Cold Redundant mode, only the needed power supply to support the best power delivery efficiency is ON. Any additional power supplies; including the redundant power supply, is in Cold Standby state.

The following table shows the state of the power supplies programmed for Cold Standby mode based on the condition of the "C_R" signal and Load Share bus voltage(+12VLS).

Cold Redundancy Config		Load Share Bus (+12VLS)	
		Turn ON	Turn OFF
Disable	00h	Always ON	
Cold Redundant Active	01h	Always ON	
Cold Standby mode 1	02h	>3.2V	<1.44V

LED Indicator :

All LEDs shall protrude beyond the supply chassis surface for good visibility.

There is a dual-color LED

Power Supply Condition	LEDs State
Only 12Vsb and AC good or PSU in cold redundant state	1Hz Blink green
PWOK (Power normal)	Solid green
Power supply warning events where the power supply continues to operate; high temp, high power, high current, slow fan.	1Hz Blink amber
No AC power	Not lit
Fault： Ambient or Hot spot occur OTP, Fan fault, Input AC UV, +12V output occur OVP, UVP or OCP (without 12Vsb)	Solid amber

Standby Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage	Output from 0 - 100% load	11.4	12.0	12.6	VDC
Output Current	Output range	0.1	-	2.1	A
Line Regulation	100% load	-	±1	-	%
Load Regulation	Output from 0 - 100% load	11.4	-	12.6	V
Ripple & Noise	20MHz bandwidth	-	-	1	%
Turn On Time	100VAC/60Hz rated load from input AC turn on	-	-	1.5	S
Short Circuit Protection	Output shut down and auto-recovery	-	-	-	-
Over Current Protection	Output shut down and auto-recovery	3.0	-	5.0	A

Analog and Digital Signal

Item	Function
PS ON and PSKILL	PSON and PSKILL are active low input signals to the power supply. When both signals are low, the power supply is activated with the main 12V output.
PWOK	PWOK is an active high output signal from the power supply used to indicate that: ◆ The PSON signal is active low ◆ The main 12V output is above its under-voltage threshold and below its over-voltage threshold ◆ The load is below the over current threshold ◆ The power supply is operating normally and within thermal limits. If PWOK transitions from high to low (de-asserted) shows the power supply shut down and latch off.
PRESENT	PRESENT is an active low output signal from the power supply used to indicate that the power supply is physically present. The power supply generates this signal by wiring the signal pin to ground internally.
VSENSE (+ & -)	+VSENSE and -VSENSE are input signals to the power supply used to provide for remote sensing of the main 12V output voltage. The power supply must be able to compensate for up to 500mV of IR drop measured between the power supply connector output and the location where the remote sense points are applied.
12VLS	12VLS is an analog output signal used to help equalize the load sharing of the main 12V output between multiple power supplies. It also represents the amount of the loading on the power supply (or supplies).
A0 and A1	ADDR is 2 pin digital I/O signal the power supply uses to set its serial bus eight bit address. A0/A1 include internal 10K pull up resistor to 5Vdc. Host system not need add pull up resistor if A0/A1 pin config to logic 1.
SCL and SDA	SCL and SDA comprise a bi-directional serial data bus used to communicate between the SMBus / PMBus devices with-in the power supply and the host system.
SMBus_ALERT#	SMBAlert is an open collector active low output signal from the power supply. When driven low, it indicates one or more PMBus status power port bits have changed state. SMBAlert will be setting by following cases: ◆ AC input voltage drops below warning threshold. ◆ +12V output current ramps over warning threshold. ◆ Hot spot or ambient temperature ramps over warning threshold.

Signal Specification

Item	Operating Conditions		Min.	Typ.	Max.	Unit
PS ON and PSKILL	Output condition off	Remote off = High / floated	2.0	-	3.46	VDC
	Output condition on	Remote on = Low	0	-	0.8	
PWOK	Power good	TTL High level	2.0	-	3.46	VDC
	Delay time	Main output reaches 90% of its set value	100	-	500	mS
	Output current		-	-	1.0	mA
	Power off/Power fail	TTL Low level	0	-	0.8	VDC
	Warning time	Main output falls to 90% of set value at Power off	1.0	-	-	mS
	Sink current		-	-	1.0	mA
12VLS	25% of power supply max. current capacity		1.8	2.0	2.2	V
	50% of power supply max. current capacity		3.6	4.0	4.4	V
	100% of power supply max. current capacity		7.2	8.0	8.8	V

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Operating Temperature	Refer to power de-rating curve	0	-	+50	°C
Storage Temperature	Non-operation	-40	-	+85	
Operating Humidity	Non-condensing	10	-	90	%
Storage Humidity		5	-	95	
Altitude	Operating altitude	-	-	5000	meter
Dielectric Strength Test	Input - FG	1800	-	-	VAC
Insulation Resistance	Input– FG, 500VDC, 3 seconds at 25°C and 70% RH	20	-	-	MΩ
Mean Time Between Failure	At 230VAC/50Hz, 100% load, 25°C, Telcordia SR332, issue 4.	100,000	-	-	Hrs.
Vibration	Operating：2.94 , 5-150Hz, 10 minutes per cycle, 30 minutes for each X, Y and Z axis.				
Shock	Non-operating：1.2G, duration time at 11mS, sine wave, each axis 1 times (X, Y, Z)				

Altitude :
For every 305 meters of altitude increase, the operating ambient temperature needs to be decreased by 1°C.

Safety Approvals

Safety Standard	-	UL/cUL UL 62368-1, 3rd Edition CB IEC 62368-1, 3rd Edition
Safety Class	-	Class I

Electromagnetic Compatibility (EMC)

Emissions	CE	EN55032 (CISPR32) Class A	
	RE	EN55032 (CISPR32) Class A	
	Harmonic Current	IEC/EN/EN61000-3-2 Class A	
	Flicker	IEC/EN/EM61000-3-3	
Immunity	ESD	IEC/EN61000-4-2, level 4, Contact +/- 8KV; Air discharge +/-15KV	Criteria A
	RS	IEC/EN61000-4-3, level 3, 10V/m	Criteria A
	EFT	IEC/EN61000-4-4, level 3, +/- 2KV	Criteria A

	Surge	IEC/EN61000-4-5, level 3, Line to Line +/-1KV; Line to Earth +/-2KV	Criteria A
	CS	IEC/EN61000-4-6	Criteria A
	PFMF	IEC.EN61000-4-8	Criteria A
	DIP	IEC/EN61000-4-11	Criteria B

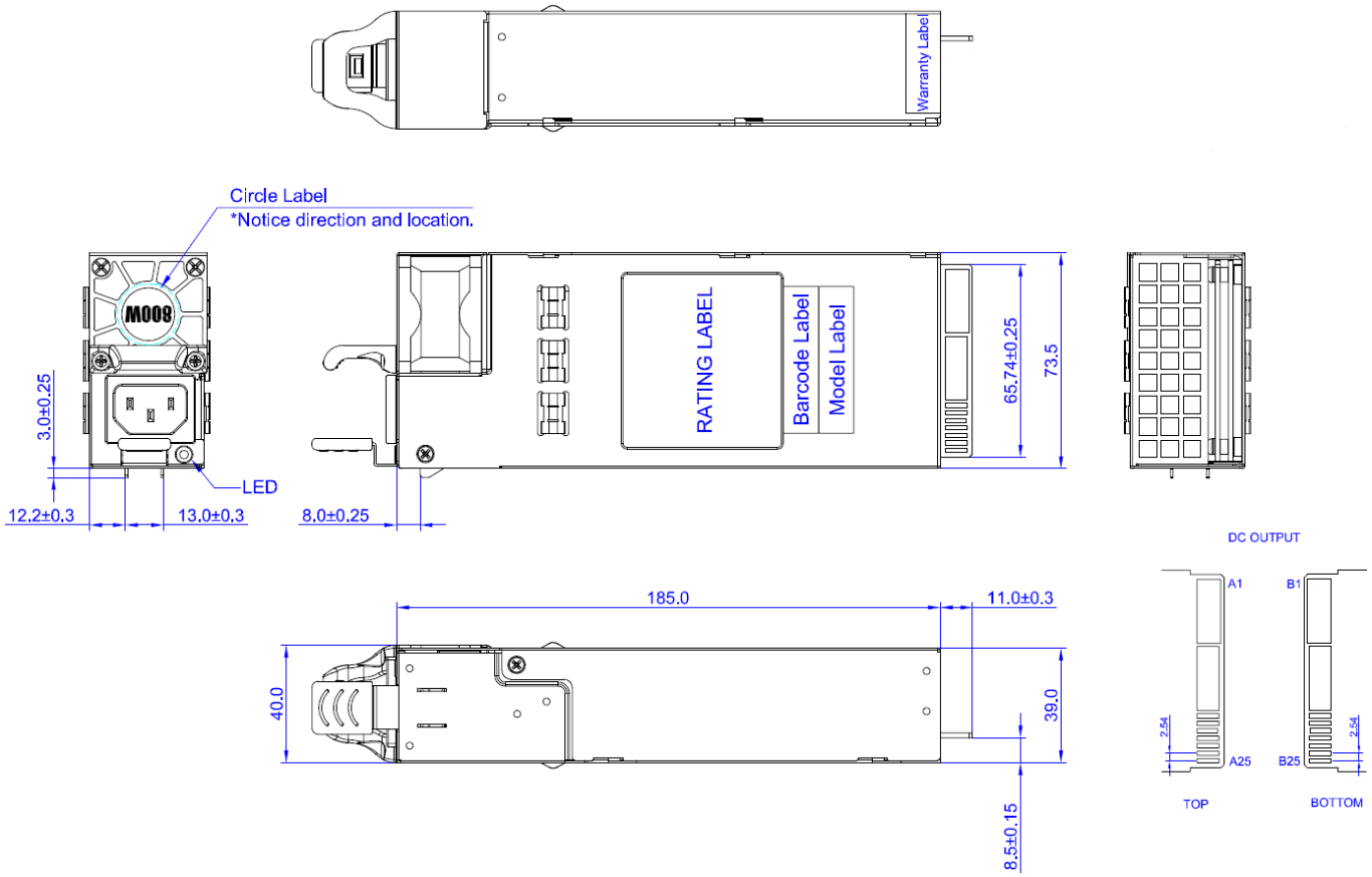
Emissions :

The power supply should be considered a part of the system component. All EMC tests conducted with the unit installed in a metal enclosure dummy system. The power supply needs to be confirmed for electromagnetic compatibility in conjunction with the terminal equipment.

Dimensions and Recommended Layout

Item	Value	Unit
Weight (Typ.)	842	g
Size (L x W x H)	185 x 73.5 x 40	mm

Outline Drawing : (Unit: mm, Tolerance: ±0.5 mm)



Output Connector

The output gold finger connector connects the power as well as the signal to the system or power backplane board.

DC output pin assignment

Pin	Name	Pin	Name
A1	GND	B1	GND
A2	GND	B2	GND
A3	GND	B3	GND
A4	GND	B4	GND
A5	GND	B5	GND
A6	GND	B6	GND
A7	GND	B7	GND
A8	GND	B8	GND
A9	GND	B9	GND
A10	+12V	B10	+12V
A11	+12V	B11	+12V
A12	+12V	B12	+12V
A13	+12V	B13	+12V
A14	+12V	B14	+12V

A15	+12V	B15	+12V
A16	+12V	B16	+12V
A17	+12V	B17	+12V
A18	+12V	B18	+12V
A19	SDA	B19	A0
A20	SCL	B20	A1
A21	PS ON	B21	12Vsb
A22	SMBAlert	B22	C_R
A23	+12VRS-	B23	+12VLS
A24	+12VRS+	B24	Presence(GND)
A25	PWOK	B25	CRPS Check Pin(TBD)

PMBus Specification

Address Signal Description :

Defines the PSU PMBus address as follows:

Host must wire A0 / A1 to ground via a 100ohm resistor if A0/A1 pin config to logic 0.

A1	A0	PMBUS Address		FRU Address	
		Binary	Hex	Binary	Hex
0V (0)	0V (0)	1011 0000	B0	1010 0000	A0
0V (0)	Open (1)	1011 0010	B2	1010 0010	A2
Open (1)	0V (0)	1011 0100	B4	1010 0100	A4
Open (1)	Open (1)	1011 0110	B6	1010 0110	A6

Hardware :

The PMBus device in the power supply shall be compatible with both SMBus specification 2.0 for I2C Vdd based power and drive. The bus will be both 3.3V and 5V compatible.

The pull-ups will be provided external to the power supply via 4.7K~10Kohm in the host system.

Data Speed :

The PMBus device in the power supply shall operate at the 100Kbps SMBus speed.

PMBUS Command Summary :

PMBus commands are one byte command codes. As below listing is power supply can support of PMBus commands.

Code	Command	Bytes	Read / Write
01h	Operation	1	Read / Write
03h	Clear_Faults	0	Write
05h	Page_Plus_Write	Variable	Block Write
06h	Page_Plus_Read	Variable	Block Write – Block Read Process Call
19h	Capability	1	Read
1Ah	Query	1	Block Write – Block Read Process Call
1Bh	SMBALERT_Mask	2	Block Write – Block Read Process Call
20h	Vout_Mode	1	Read
30h	Coefficients	5	Block Write – Block Read Process Call
3Ah	Fan_Config	1	Read
3Bh	Fan_Command	2	Read / Write
78h	Status_Byte	1	Read
79h	Status_Word	2	Read
7Ah	Status_Vout	1	Read
7Bh	Status_Iout	1	Read
7Ch	Status_Input	1	Read
7Dh	Status_Temperature	1	Read
7Eh	Status_CML	1	Read
81h	Status_Fans	1	Read
86h	Read_Ein	6	Block Read
87h	Read_Eout	6	Block Read
88h	Read_Vin	2	Read
89h	Read_Iin	2	Read
8Bh	Read_Vout	2	Read
8Ch	Read_Iout	2	Read
8Dh	Read_Temperature1	2	Read
8Eh	Read_Temperature2	2	Read
8Fh	Read_Temperature3	2	Read

90h	Read_Fan speed	2	Read
96h	Read_Pout	2	Read
97h	Read_Pin	2	Read
98h	PMBus_Revision	1	Read
99h	MFR_ID	9	Block Read
9Ah	MFR_MODEL	12	Block Read
9Bh	MFR_Revision	2	Block Read
9Eh	MFR_Serial	14	Block Read
D0h	Redundancy_Config	1	Read / Write
D4h	HW_Compatibility	2	Read
D5h	FWUPLOAD_Capability	1	Read
D6h	FWUPLOAD_Mode	1	Read / Write
D7h	FWUPLOAD	32	Block Write
D8h	FWUPLOAD_Status	2	Read
D9h	FW_Revision	3	Block Read
DCh	Read Block with PEC	238	Block Read
DDh	Real_Time_Black_Box	4	Block Read / Write
DEh	System_Black_Box	40	Block Read / Write
DFh	BlackBox_Config	1	Read
E0h	Clear_BlackBox	0	Write

Data Formats :

The linear data format is typically used for commanding and reporting the parameters such as (but not only) the following:

- Input power and output power,
- Operating temperatures,
- Input current and output current,
- Input voltage,
- Fan speed RPM

The linear data format is a two bytes value with:

- An 11 bit, two's complement mantissa and
- A 5 bit, two's complement exponent (scaling factor).

The format of the two data bytes is illustrated in Figure 4.

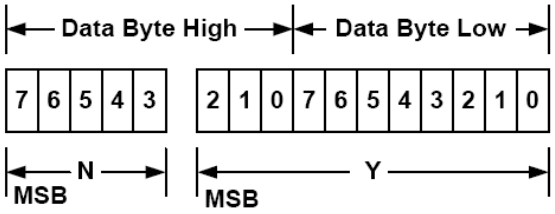


Figure 4. Linear Data Format Data Bytes

The relation between Y, N and the "real world" value is:

$X = Y \cdot 2^N$

Where, as described above:

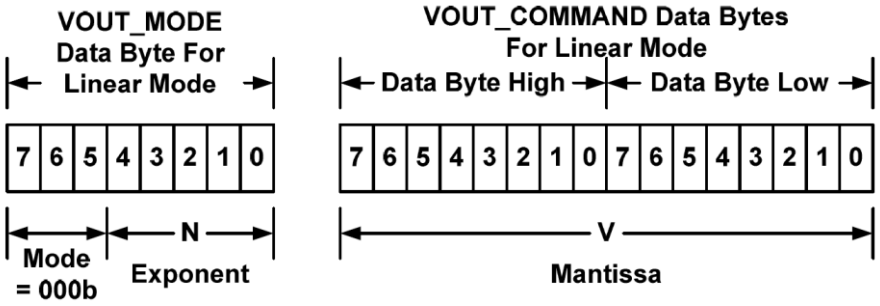
X is the "real world" value; Y is an 11 bit, two's complement integer; and N is a 5 bit, two's complement integer.

Devices that use the linear format must accept and be able to process any value of N.

The linear data format is typically used for commanding and reporting the parameters such as (but not only) the following:

- Output voltage

The linear data format is a two bytes value with:



The relation between Y, N and the "real world" value is:

$X = Y \cdot 2^N$

Where, as described above:

X is the "real world" value; Y is an 11 bit, two's complement integer; and N is a 5 bit, two's complement integer and value default is -9.

DIRECT format data is a two byte, two's complement binary integer. DIRECT format data may be used with any command that sends or reads a parametric value.

$$X = \frac{1}{m}(Y \times 10^{-R} - b)$$

Where:

X, is the calculated, "real world" value in the appropriate units (A, V, °C, etc.);

m, the slope coefficient, is a two byte, two's complement integer and value default is 1.

Y, is a two byte two's complement integer received from the PMBus device;

b, the offset, is a two byte, two's complement integer and value default is 0.

R, the exponent, is a one byte, two's complement integer and value default is 0.

Read commands :

The READ commands allow the host to read temperature, current, voltage, power and energy parameters of the power supply.

PMBus command	Description	Data format
Read_Vin	Returns the input voltage in voltage.	Linear
Read_Iin	Returns the input current in amperes.	Linear
Read_Pin	Returns the input power, in watts, of the power supply.	Linear
Read_Ein	Commands are used to return information the host can use to calculate the input power consumption of power supply.	Direct
Read_Eout	Commands are used to return information the host can use to calculate the output power consumption of power supply.	Direct
Read_Vout	Returns the output voltage in voltage.	Linear
Read_Iout	Returns the output current in amperes.	Linear
Read_Pout	Returns the output power, in watts, of the power supply.	Linear
Read_Temperature_1	Returns the temperature in ℃ of the airflow inside temperature.	Linear
Read_Temperature_2	Returns the temperature in ℃ of the hot spot temperature.	Linear
Read_Temperature_3	Returns the temperature in ℃ of the primary side hot spot temperature.	Linear
Read_Fan speed	Returns the fan speed in revolutions per minute	Linear

PMBus direct format set m = 01h, R = 00h, b = 00h.

Accuracy

	Accuracy	
	Pin < 100W	Pin > 100W
Read_Vin	±5%	
Read_Iin	±0.1A	±5%
Read_Pin	±10W	±5%
Read_Vout	±5%	
Read_Iout	±0.5A	±5%
Read_Pout	±10W	±5%
Read_Temperature_1	±5℃	
Read_Temperature_2	±5℃	
Read_Temperature_3	±5℃	
Read_Fan speed	<9000rpm±1000rpm; >9000rpm±2000rpm	

Capability and inventory reporting :

The follow commands shall be supported for discovery of the power supplies capabilities.

Command	Meaning	Value
Capability	Packet Error Checking is supported Maximum supported bus speed is 100KHz Support the SMBus Alert Response protocol	90h
Query	Used to determine if the PSU supports a specific command	Byte
PMBus_Revision	Used to verify the PMBus revision the power supply is base on	22h

PAGE_PLUS_WRITE :

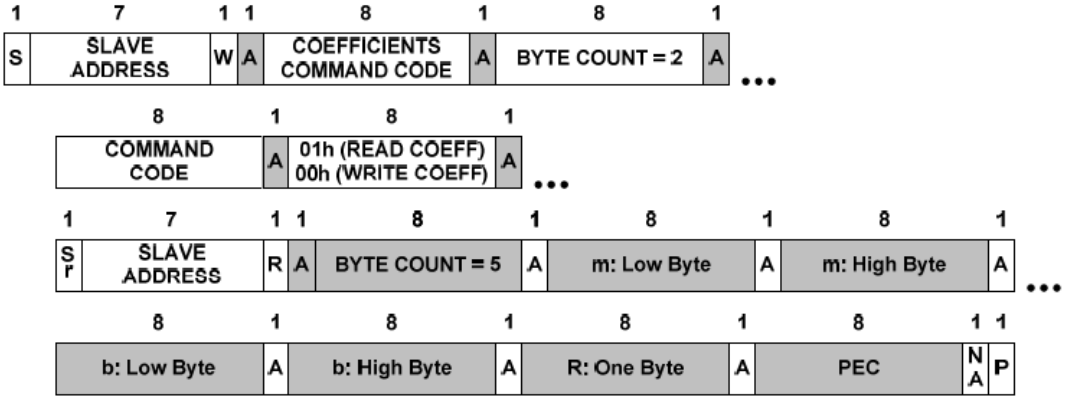
The PAGE_PLUS_WRITE command is used to set the page within a device, send a command, and send the data for the command in one packet.

PAGE_PLUS_READ :

The PAGE_PLUS_READ command is used to set the page within a device, send a command, and read the data returned by the command in one packet.

Coefficients :

This command is used to retrieve the m, b and R coefficients needed by data in the DIRECT format.



Status commands :

Status information is binary. A value of 1 indicates a fault or warning event has occurred and a value of 0 indicates that a fault or warning event has not occurred.

When the power an exception occurs, will set the warning bit. Warning bit will be automatically cleared when the anomalies remove.

The Status_Byte (78h) and Status_Word (79h) message content is described as shown below.

Byte	Bits	Bit name	Meaning
Low	7	Busy	Not support, set to 0
	6	OFF	+12V output off set to 1
	5	Vout_OV_Fault	+12V output overvoltage fault has occurred
	4	Iout_OC_Fault	+12V output overcurrent fault has occurred
	3	Vin_UV_Fault	Input undervoltage fault has occurred
	2	Temperature	A temperature fault or warning has occurred
	1	CML	A communications, memory or logic fault has occurred
	0	None of above	Not support, set to 0
High	7	Vout	+12V output voltage fault or warning has occurred
	6	Iout	+12V output current fault or warning has occurred
	5	Input	An input voltage fault or warning has occurred
	4	Not use	Not support, set to 0
	3	Power_Good#	The PWOK signal, if present, is negated
	2	Fans	A fan or airflow fault or warning has occurred
	1	Other	Not support, set to 0
	0	Not use	Not support, set to 0

The Status_Vout (7Ah) command returns one data byte with contents as below:

Bits	Meaning
7	+12V output voltage exceed 14V has occurred (Fault)
6	+12V output voltage exceed 13.2V has occurred (Warning)
5	+12V output voltage less than 10.8V has occurred (Warning)
4	+12V output voltage less than 10V has occurred (Fault)
3	Not support, set to 0
2	Not support, set to 0
1	Not support, set to 0
0	Not support, set to 0

The Status_Iout (7Bh) command returns one data byte with contents as below:

Bits	Meaning
7	+12V output current exceed 120% has occurred (Fault)
6	Not support, set to 0
5	+12V output current exceed 110% has occurred (Warning)
4	Not support, set to 0
3	Not support, set to 0
2	Not support, set to 0
1	Not support, set to 0
0	Not support, set to 0

The Status_Input (7Ch) command returns one data byte with contents as below:

Bits	Meaning
7	Not support, set to 0
6	Not support, set to 0
5	Input voltage less than 80±5Vrms has occurred (Warning)
4	Input voltage less than 75±5Vrms has occurred (Fault)
3	Unit Off For Insufficient Input Voltage
2	Not support, set to 0
1	Not support, set to 0
0	Not support, set to 0

Notes: Input voltage sense in front of PSU.

The Status_Temperature (7Dh) command returns one data byte with contents as below:

Bits	Meaning
7	Fault setting: Temperature (The power supply into the airflow inside) exceed 66 ±4℃ or Secondary hot spot exceed 115 ±5℃or Primary side hot spot exceed 105±5℃ Recover setting: Temperature less than 55 ±5℃ and Secondary hot spot less than 70 ±5℃ and Primary side hot spot less than 70±5℃
6	Temperature (The power supply into the airflow inside) exceed 62 ±4℃ (Warning) or Secondary side hot spot exceed 110±5℃ or Primary side hot spot exceed 100±5℃ (Warning)
5	Not support, set to 0
4	Not support, set to 0
3	Reserved, read 0
2	Reserved, read 0
1	Reserved, read 0
0	Reserved, read 0

The Status_CML (7Eh) command returns one data byte with contents as below:

Bits	Meaning
7	Invalid or Unsupported Command Received
6	Invalid or Unsupported Data Received
5	Packet Error Check Failed
4	Not support, set to 0
3	Not support, set to 0
2	Reserved, read 0
1	Not support, set to 0
0	Not support, set to 0

The Status_Fans (81h) command reports on the status of fans installed in position

Bits	Meaning
7	Fan speed less than 800 rpm during over 10 seconds If the fan control to stop condition will not set this bit
6	Not support, set to 0
5	Fan speed less than target 3800 rpm, during over 5 seconds If the fan control target less than 4600 rpm, The warning and fault bit may be together setting.
4	Not support, set to 0
3	Not support, set to 0
2	Not support, set to 0
1	Not support, set to 0
0	Not support, set to 0

Resetting of status bits and SMBAlert signal :

The STATUS_ commands and SMBAlert signal output shall be reset only by the below methods. If the event is still present that caused the assertion of the status bit, the bit shall stay assert after clearing.

- ◆ Sending a CLEAR_FAULTS command to the power supply shall reset all STATUS_ bits to '0'. The STATUS commands accessed via the PAGE_PLUS_READ command shall not be affected by CLEAR_FAULTS.
- ◆ Reset all STATUS_bits to '0' after the AC power reset for OFF/ON cycle with a minimum OFF time of 1 second.

◆ The AC shut down at least more than 10ms, then turn it back on.
◆ The PS ON signal high level to low level.

Manufacturer's Information and Ratings :

The following commands provide the ability for manufacturers to provide summary information about the unit's ratings. This information serves as an electronic nameplate for the user's convenience.

Command	Meaning	Value
MFR_ID	Defined the manufacturer's name	LEAD YEAR
MFR_MODEL	Defined the power model name	TG17-0800-01
MFR_Serial	Product serial number	Variable

FAN Speed Control :

The power supply should support the PMBus commands to allow the system to control and monitor the power supply's fan.

Command	Meaning	Value
FAN_CONFIG_1_2	Fan 1 commanded in duty cycle 2 pulses per revolution	90h
FAN_COMMAND_1	System control fan speed of PSU by duty from 0~100%, n=0 Default value is 0 and FAN obeyed the PSU FAN control. If the system written value is over than PSU FAN control, system can control FAN speed of PSU by 0~100%. If the system written value is less than PSU FAN control or out of range or some data-error, FAN obeyed the PSU FAN control.	Word

Output Voltage Related Commands :

Command	Meaning	Value
VOUT_MODE	Linear data format, N = -9	17h

Black Box :

There are two types of data saved in the black box;
◆ System Tracking Data
◆ Power supply event data.

System tracking data is saved to the Black Box whenever the system powers ON or when a power supply is added to the system.

The black box data include system tracking data and power supply event data as below：

Item	Number of bytes	Source of Information
System top assembly number	10	System
System serial number	10	System
Motherboard assembly number	10	System
Motherboard serial number	10	System
Present total PSU ON time	3	PSU
Present number of AC power cycles	2	PSU
Present number of PSON power cycles	2	PSU
Power supply event data (N)	38	PSU
Power supply event data (N-1)	38	PSU
Power supply event data (N-2)	38	PSU
Power supply event data (N-3)	38	PSU
Power supply event data (N-4)	38	PSU

Power supply event data format as below：

Item	Number of bytes

Power supply total power on time	3
Real Time Clock Data from System	4
Number of AC power cycles	2
Number of PSON power cycles	2
STATUS_WORD	2
STATUS_VOUT	1
STATUS_IOUT	1
STATUS_INPUT	1
STATUS_TEMPERTATURE	1
STATUS_FAN_1_2	1
READ_VIN	2
READ_IIN	2
READ_IOUT	2
READ_TEMPERATURE_1	2
READ_TEMPERATURE_2	2
READ_FAN_SPEED_1	2
READ_PIN	2
READ_VOUT	2
AC shutdown due to under voltage on input	Lower ½
Thermal shutdown	Upper ½
Over current or over power shutdown on output	Lower ½
General failure shutdown	Upper ½
Fan failure shutdown	Lower ½
Shutdown due to over voltage on output	Upper ½
Input voltage warning; no shutdown	Lower ½
Thermal warning; no shutdown	Upper ½
Output current power warning; no shutdown	Lower ½
Fan slow warning; no shutdown	Upper ½

FRU Data Format :

The information to be contained in the FRU device is shown in the following table.

Address	Value	Description	Remark
00H	01	Common header format version	Common header
01H	00	Internal use area starting offset	No used
02H	00	Chassis info area starting offset	No used
03H	00	Board area starting offset	No used
04H	01	Product info area starting offset	
05H	0A	Multi record area starting offset	
06H	00	PAD	
07H	F4	Common Header Checksum	
08H	01	Product area format version	Product header
09H	09	Product area length	
0AH	19	Language (English)	
0BH	C9	Manufacturer name / length	
0CH	4C	L	
0DH	45	E	
0EH	41	A	
0FH	44	D	
10H	20		
11H	59	Y	
12H	45	E	
13H	41	A	
14H	52	R	

15H	CC	Model number / length	
16H	54	T	
17H	47	G	
18H	31	1	
19H	37	7	
1AH	2D	-	
1BH	30	0	
1CH	38	8	
1DH	30	0	
1EH	30	0	
1FH	2D	-	
20H	30	0	
21H	31	1	
22H	CF	Customer information (max 15 bytes)	Customer Name
23H	58	X： ASCII code	
24H	58	X： ASCII code	
25H	58	X： ASCII code	
26H	58	X： ASCII code	
27H	58	X： ASCII code	
28H	58	X： ASCII code	
29H	58	X： ASCII code	
2AH	58	X： ASCII code	
2BH	58	X： ASCII code	
2CH	58	X： ASCII code	
2DH	58	X： ASCII code	
2EH	58	X： ASCII code	
2FH	58	X： ASCII code	
30H	58	X： ASCII code	
31H	58	X： ASCII code	
32H	C3	Product version / length	
33H	58	X：From A to Z	To be updated
34H	58	X：From 0 to 9	To be updated
35H	58	X：Reserve	To be updated
36H	CF	Product serial number / length	
37H	58	X：T = LEAD YEAR, M = SMART, C = AMAX	To be updated
38H	58	X：For LEAD YEAR model code (2 bytes)	
39H	58	X	
3AH	58	X：Year (00~99) date code	To be updated
3BH	58	X	To be updated
3CH	58	X：Week (01~52)	To be updated
3DH	58	X	To be updated
3EH	58	X：Product version (2 bytes)	To be updated
3FH	58	X	To be updated
40H	58	X：Serial number (000001~999999)	To be updated
41H	58	X	To be updated
42H	58	X	To be updated

43H	58	X	To be updated
44H	58	X	To be updated
45H	58	X	To be updated
46H	C0	Asset tag / length	
47H	C0	FRU File ID type/length byte	
48H	C1	No more info fields	
49H	00	PAD (Always zero)	
4AH	00	PAD (Always zero)	
4BH	00	PAD (Always zero)	
4CH	00	PAD (Always zero)	
4DH	00	PAD (Always zero)	
4EH	00	PAD (Always zero)	
4FH	61	Product area checksum	
50H	00	Power supply information	Multirecord
51H	02	Record format version	Header
52H	18	Record length	
53H	96	Record checksum	To be updated
54H	50	Header checksum	To be updated
55H	0C	Output power (2 bytes)	780W
56H	03		
57H	28	Peak VA (2 bytes)	1320W
58H	05		
59H	23	Inrush current	35A
5AH	0A	Inrush interval in ms	10ms
5BH	10	Low end Input voltage range 1	100V
5CH	27		
5DH	C0	High end Input voltage range 1	240V
5EH	5D		
5FH	28	Low end Input voltage range 2	90V
60H	23		
61H	20	High end Input voltage range 2	264V
62H	67		
63H	2F	Low end Input frequency range	47Hz
64H	3F	High end Input frequency range	63Hz
65H	0C	Input dropout tolerance in ms	12ms
66H	1A	Hot swap, Power factor correction support	
67H	54	Peak wattages	852W
68H	F3		15S
69H	00	Combined Wattage (3 bytes)	No used
6AH	00		No used
6BH	00		No used
6CH	00	Predictive fail tachometer lower threshold (RPS)	
6DH	01	DC output	Multirecord
6EH	02	Record format version	Header
6FH	0D	Record length	
70H	86	Record checksum	
71H	6A	Header checksum	
72H	01	Output number 1	+12V

73H	B0	Nominal voltage	12V
74H	04		
75H	74	Maximum negative voltage	11.4V
76H	04		
77H	EC	Maximum positive voltage	12.6V
78H	04		
79H	78	Ripple and noise pk-pk 10Hz to 20MHz	120mV
7AH	00		
7BH	00	Minimum output current	0A
7CH	00		
7DH	E8	Maximum output current	65A
7EH	FD		
7FH	01	DC output	Multirecord
80H	82	Record format version	Header
81H	0D	Record length	
82H	AE	Record checksum	
83H	C2	Header checksum	
84H	82	Output number 2	+12Vsb
85H	B0	Nominal voltage	12V
86H	04		
87H	74	Maximum negative voltage	11.4V
88H	04		
89H	EC	Maximum positive voltage	12.6V
8AH	04		
8BH	78	Ripple and noise pk-pk 10Hz to 20MHz	120mV
8CH	00		
8DH	00	Minimum output current	0A
8EH	00		
8FH	34	Maximum output current	2.1A
90H	08		
91H | FFH	FF	Don't used Common header format version	

Field replaceable unit data memory (Hex) show in below table:

Offset	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	01	00	00	00	01	0A	00	F4	01	09	19	C9	4C	45	41	44
10	20	59	45	41	52	CC	54	47	31	37	2D	30	38	30	30	2D
20	30	31	CF	58	58	58	58	58	58	58	58	58	58	58	58	58
30	58	58	C3	58	58	58	CF	58	58	58	58	58	58	58	58	58
40	58	58	58	58	58	58	C0	C0	C1	00	00	00	00	00	00	61
50	00	02	18	96	50	0C	03	28	05	23	0A	10	27	C0	5D	28
60	23	20	67	2F	3F	0C	1A	54	F3	00	00	00	00	01	02	0D
70	86	6A	01	B0	04	74	04	EC	04	78	00	00	00	E8	FD	01
80	82	0D	AE	C2	82	B0	04	74	04	EC	04	78	00	00	00	34
90	08	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

A0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
B0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
C0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
D0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
E0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
F0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF