760W AC/DC Switching Power Supply
Model: TG23-0760-0X



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.
- 760W 1U Slim 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
TG23-0760-01	760W	12.0V / 62.3A	3.3V / 3.6A	Platinum	11,000μF / 4,700μF
TG23-0760-02	760W	12.0V / 62.3A	3.3V / 3.6A	Platinum	11,000μF / 4,700μF

Model No.
TG23-0760-01 is airflow out type; TG23-0760-02 is airflow in type.

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		-	-	9.0	Arms
	200VAC		-	-	4.5	
Inrush Current	100-240VAC	At 25°C, Cold start	-	-	55	A peak
Power Factor	115/230VAC	At 100% load	0.98	-	-	-
Touch Current	264VAC		-	-	1.75	mA

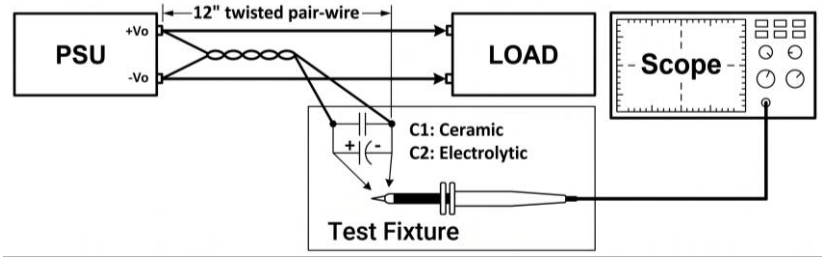
Input voltage: AC input
Power turn on : 85V±5V
Power turn off : 75V±5V
DC input
Power turn on : 175V±5V
Power turn off : 165V±5V (slow turn off over 10s)

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	12.05	-	12.1	VDC
Output Current	Output range	1.0	-	62.3	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.	12	-	-	mS
Short Circuit Protection	Output shut down and latch off	-	-	-	-
Over Current Protection	Output shut down and latch off	110	-	130	%
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.



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 :

A temperature sensing device, or devices, internal to the power supply shall monitor critical component(s) temperature(s).

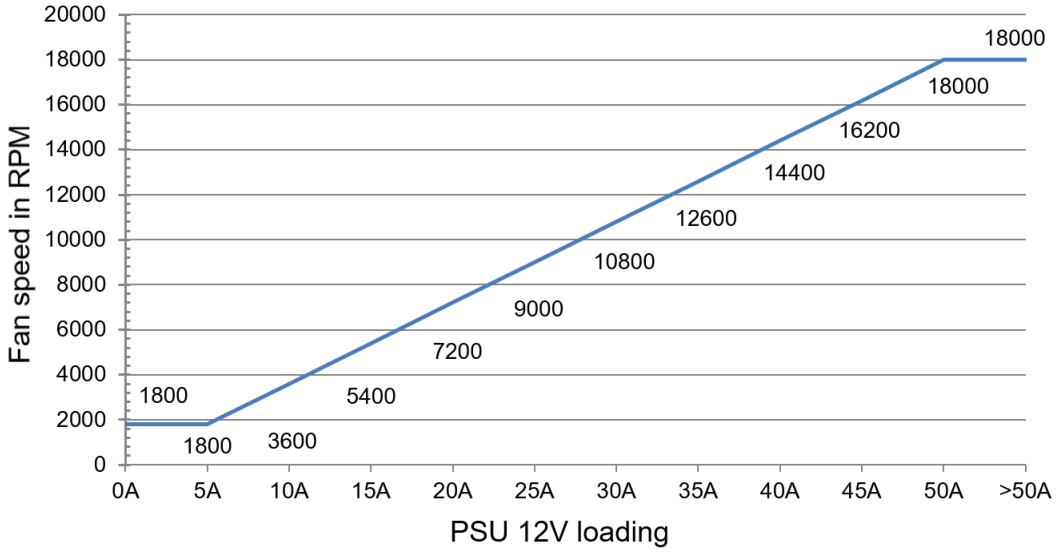
If monitored components critical temperatures are reached, the power supply shall stay in regulation for 10 seconds after declaring the over temperature condition by setting the OT Warning bit of STATUS_TEMPERATURE command in PMBus, if the over temperature persists then set OT Fault bit of STATUS_TEMPERATURE 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 100°C (PMBus 8Eh command value) or primary side Hot spot over 100°C (PMBus 8Fh command value) or Ambient temperature over 60°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 110°C (PMBus 8Eh command value) or primary side Hot spot over 110°C (PMBus 8Fh command value) or Ambient temperature over 70°C (PMBus 8Dh command value) STATUS_TEMPERATURE fault bit should be set and PMBus SMBAlert pin pull to logic low and PSU shunt down.

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 bit 0, 1 or 2 of 0x5F register in PSMI, if the over temperature persists then set bit 2 of 0x5E register, 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 100°C (PSMI 0x01 register value) or primary side Hot spot over 100°C (PSMI 0x02 register value) or Outlet temperature over TBD (PSMI 0x00 register value) thermal warning bit (PSMI 0x5F register) should be set and SMBAlert pin pull to logic low. If secondary side Hot spot over 110°C (PSMI 0x02 register value) or primary side Hot spot over 110°C (PSMI 0x02 register value) or Ambient temperature over TBD (PSMI 0x00 register value) Over temperature bit (PSMI 0x5E register) should be set and SMBAlert pin pull to logic low and PSU shunt down.

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.



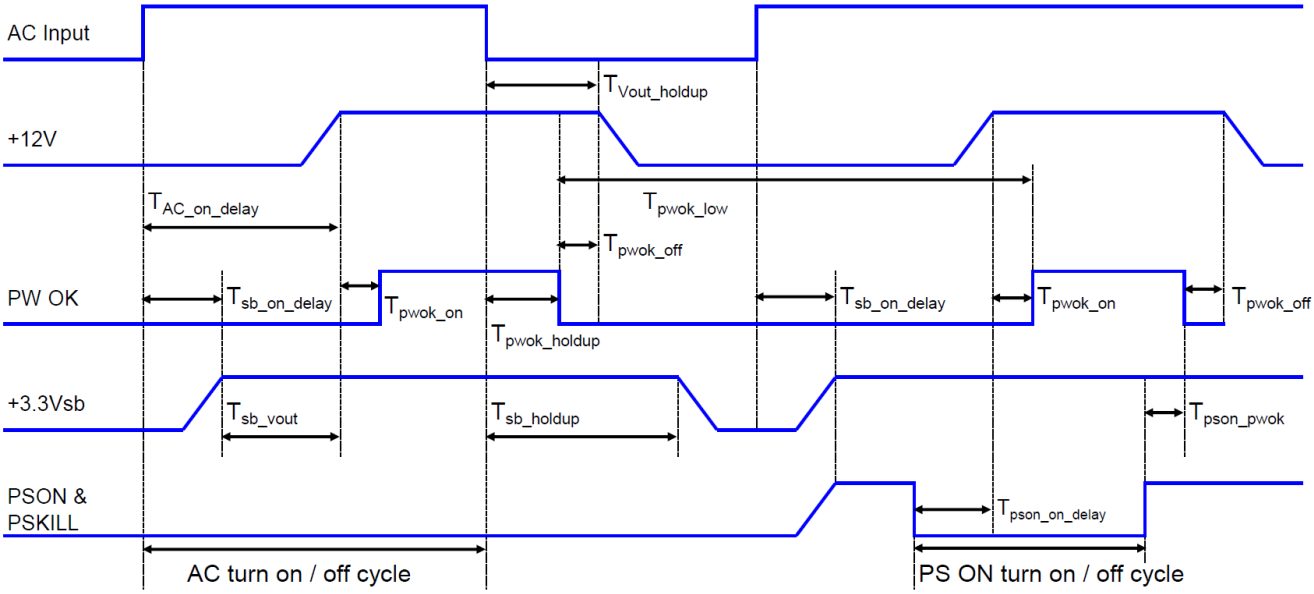
Fan speed control tolerance to whichever is the ≦10000rpm +1500/-1000rpm and >10000rpm ±1800rpm of fan controlled speed.
In operating mode the fan will operate at maximum RPM when the ambient temperature exceeds 60°C or the Primary hot spot exceeds 90°C or the Secondary hot spot exceeds 90°C.

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 +3.3Vsb output isn't required to actively share current between the power sources (passive sharing).

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 +3.3Vsb 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 +3.3Vsb)	Solid amber

Sequencing :



ITEM	DESCRIPTION	Min	Max	UNIT
TVsb_rise	+3.3Vsb output voltage rise time	1ms	70ms	TVsb_rise
TVout_rise	+12V output voltage rise time	10ms	70ms	TVout_rise
Tac_on_delay	Delay from AC being applied to all output voltages being within regulation	-	3000ms	Tac_on_delay
Tvout_holdup	Time all output voltages stay within regulation after loss of AC	12ms	-	Tvout_holdup
Tpwok_holdup	Delay from loss of AC to de-assertion of PW OK	8ms	-	Tpwok_holdup
Tpson_on_delay	Delay from PSON & PSKILL active to output voltages within regulation limits.	5ms	400ms	Tpson_on_delay
Tpson_pwok	Delay from PSON & PSKILL de-active to PW OK being de-asserted	-	5ms	Tpson_pwok
Tpwok_on	Delay from output voltages within regulation limits to PW OK asserted at turn on.	100ms	500ms	Tpwok_on
Tpwok_off	Delay from PW OK de-asserted to +12V output voltage dropping out of regulation limits	1ms	-	Tpwok_off
Tpwok_low	Duration of PW OK being in the de-asserted state during an off / on cycle using AC or the PSON & PSKILL signal.	100ms	-	Tpwok_low
Tsb_vout	Delay from +3.3Vsb being in regulation to O/Ps being in regulation at AC turn on	50ms	1000ms	Tsb_vout

Tsb_holdup	Time the +3.3Vsb output voltage stays within regulation after loss of AC.	70ms	-	Tsb_holdup
TVsb_rise	+3.3Vsb output voltage rise time	1ms	70ms	TVsb_rise

Note: DC_GOOD and +12V hold-up test condition also follows the hold-up time with 70% of maximum load and over 100-240VAC input.

Standby Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage	Output from 0 - 100% load	3.135	3.3	3.465	VDC
Output Current	Output range	0.1	-	3.6	A
Line Regulation	100% load	-	±1	-	%
Load Regulation	Output from 0 - 100% load	3.135	3.3	3.465	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	120	-	250	%

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)

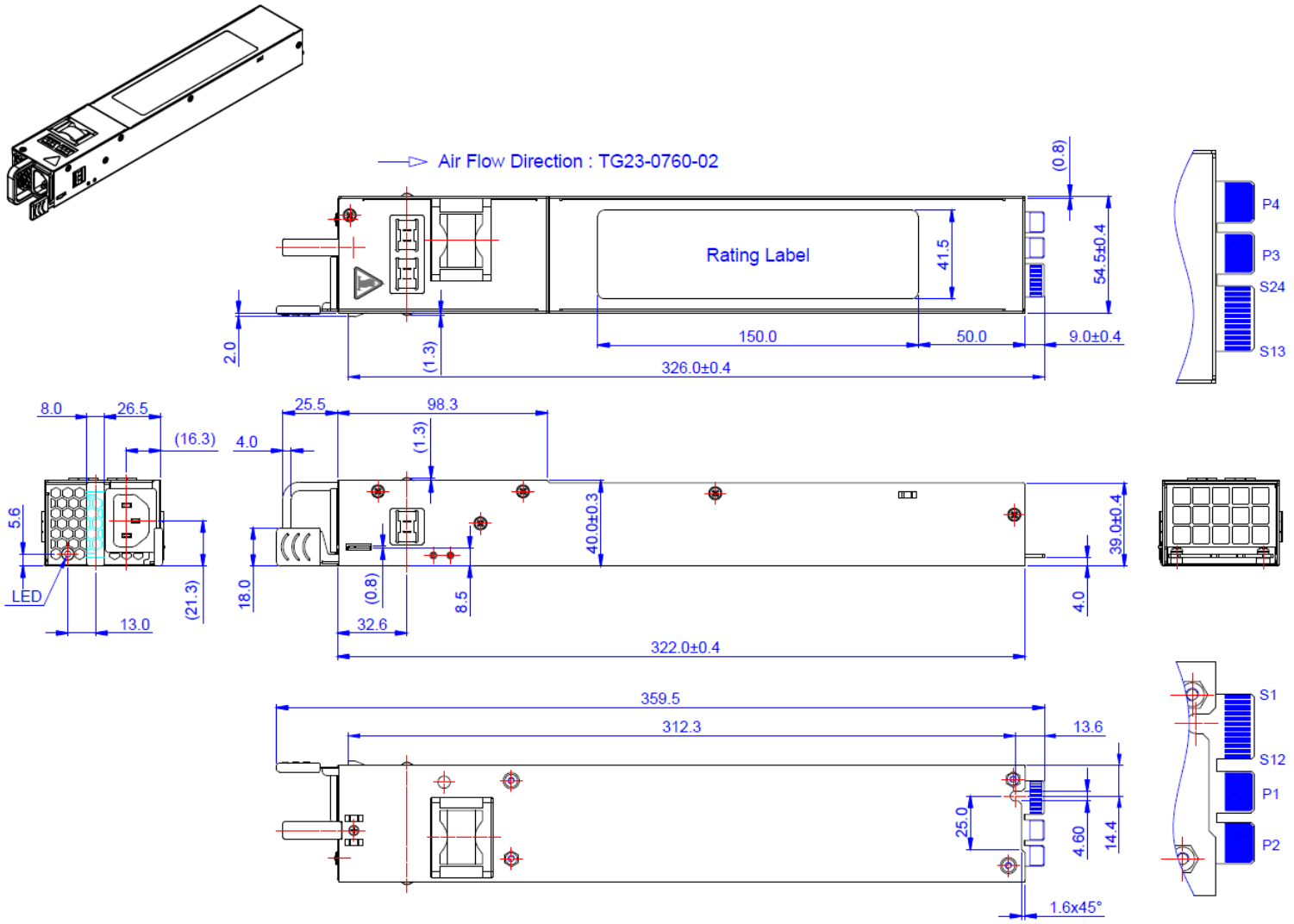
Emissions	CE	EN55032 (CISPR32) Class A
	RE	EN55032 (CISPR32) Class A
	Harmonic Current	IEC/EN/EN61000-3-2 Class A

	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

Dimensions and Recommended Layout

Item	Value	Unit
Weight (Typ.)	842	g
Size (L x W x H)	322 x 54 x 39	mm

Outline Drawing



DC Output:

Pin assignment (Top Side)	
P4	GND
P3	GND
S24	+3.3Vsb
S23	+3.3Vsb
S22	N/A
S21	BP FAIL (Reserved)
S20	GND (Reserved)
S19	AC OK
S18	EEPROM_WP
S17	PS (Protocol)
S16	BP SIG (Reserved)
S15	A0
S14	PRESENT
S13	CR Bus (Reserved)

Pin assignment (Bottom Side)	
S1	+12Vsen+
S2	+12Vsen-
S3	+12V LS Bus
S4	SMBAlert
S5	SDA
S6	SCL
S7	PSKILL
S8	PSON
S9	PW OK
S10	A1
S11	+3.3Vsb
S12	+3.3Vsb
P1	+12V
P2	+12V

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

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.

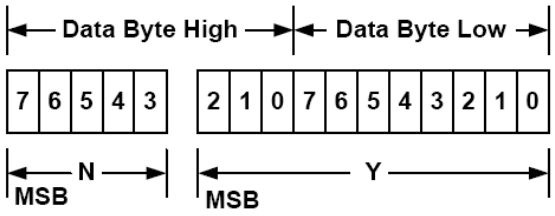


Figure 4. Linear Data Format Data Bytes

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

$X = Y \cdot 2^N$

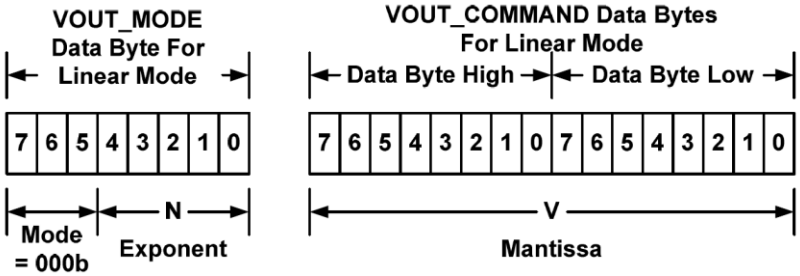
Where, as described above:

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 :

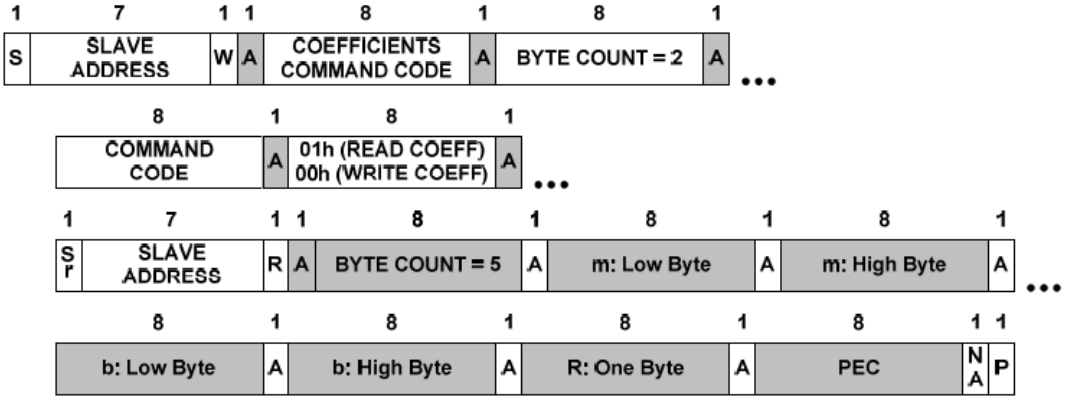
The follow commands shall be supported for discovery of the power supplies capabilities.

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	TG23-076-0X
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%.	Word

	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.	

Output Voltage Related Commands :

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

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 (reserved – always 00H)	
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	32	2	
19H	33	3	
1AH	2D	-	
1BH	30	0	
1CH	37	7	
1DH	36	6	
1EH	30	0	
1FH	2D	-	
20H	30	0	
21H	31 / 32	1 or 2	
22H	D4	Customer information (max 20 bytes)	Customer Name
23H	20	X： ASCII code	
24H	20	X： ASCII code	
25H	20	X： ASCII code	

26H	20	X： ASCII code	
27H	20	X： ASCII code	
28H	20	X： ASCII code	
29H	20	X： ASCII code	
2AH	20	X： ASCII code	
2BH	20	X： ASCII code	
2CH	20	X： ASCII code	
2DH	20	X： ASCII code	
2EH	20	X： ASCII code	
2FH	20	X： ASCII code	
30H	20	X： ASCII code	
31H	20	X： ASCII code	
32H	20	X： ASCII code	
33H	20	X： ASCII code	
34H	20	X： ASCII code	
35H	20	X： ASCII code	
36H	20	X： ASCII code	
37H	C3	Product version / length	
38H	20	X：From A to Z ("X" try out version)	To be updated
39H	20	X：From 0 to 9	To be updated
3AH	20	X：From 0 to 9 (Reserved)	To be updated
3BH	D0	Product serial number / length	
3CH	20	① ：Manufactory code (1 or 2 bytes) T = LEAD YEAR, M = SMART, C1 = AMAX ② ：LEAD YEAR model code (2 bytes) ③ ：Date code of year (2 bytes) From 00 to 99 ④ ：Date code of week (2 bytes) From 01 to 52 ⑤ ：Product version (2 bytes) ⑥ ：Serial number (6 bytes) From 000001 to 999999 ⑦ ：Reserved (4 or 5 bytes)	To be updated
3DH	20		
3EH	20		
3FH	20		
40H	20		
41H	20		
42H	20		
43H	20		
44H	20		
45H	20		
46H	20		
47H	20		
48H	20		
49H	20		
4AH	20		
4BH	20		
4CH	C0	Asset tag / length	
4DH	C0	FRU File ID type/length byte	
4EH	C1	No more info fields	
4FH	D0	Product area checksum	
50H	00	Power supply information	Multi record
51H	02	Record format version	Header
52H	18	Record length	
53H	38	Record checksum	To be updated
54H	AE	Header checksum	To be updated
55H	F8	Output power (2 bytes)	760W

56H	02		
57H	FF	Peak VA (FFFFh if not specified)	
58H	FF		
59H	37	Inrush current	55A
5AH	0A	Inrush interval in ms	10ms
5BH	10	Low end input voltage range 1 (The units are 10mV)	100V
5CH	27		
5DH	C0	High end input voltage range 1 (The units are 10mV)	240V
5EH	5D		
5FH	28	Low end input voltage range 2 (The units are 10mV)	90V
60H	23		
61H	20	High end input voltage range 2 (The units are 10mV)	264V
62H	67		
63H	00	Low end input frequency range, support DC input	0Hz
64H	3F	High end Input frequency range	63Hz
65H	0A	Input dropout tolerance in ms	10ms
66H	1A	Hot swap, Power factor correction support	
67H	F8	Peak wattages	760W
68H	02	Hold up time in second	0S
69H	12	+12V and +12Vsb combined wattages (800W at 90Vac, 1000W at 100~132Vac, 1100W at 180~264Vac)	760W
6AH	F8		
6BH	02		
6CH	00	Predictive fail tachometer lower threshold (RPS)	
6DH	01	DC output	Multi record
6EH	02	Record format version	Header
6FH	0D	Record length	
70H	91	Record checksum	
71H	5F	Header checksum	
72H	09	Output number 1	+12V
73H	B0	Nominal voltage (The units are 10mV)	12.00V
74H	04		
75H	A4	Maximum negative voltage deviation (The units are 10mV)	11.88V
76H	04		
77H	BC	Maximum positive voltage deviation (The units are 10mV)	12.12V
78H	04		
79H	78	Ripple and noise pk-pk 10Hz to 20MHz (The units are mV)	120mV
7AH	00		
7BH	64	Minimum current draw	1.00A
7CH	00	(The units are 10mA)	
7DH	56	Maximum current draw	62.30A
7EH	18	(The units are 10mA)	
7FH	01	DC output	Multi record
80H	82	Record format version	Header

81H	0D	Record length	
82H	B7	Record checksum	
83H	B9	Header checksum	
84H	82	Output number 2	+3.3Vsb
85H	4A	Nominal voltage	3.30V
86H	01	(The units are 10mV)	
87H	3A	Maximum negative voltage deviation (The units are 10mV)	3.14V
88H	01		
89H	5B	Maximum positive voltage deviation (The units are 10mV)	3.47V
8AH	01		
8BH	64	Ripple and noise pk-pk 10Hz to 20MHz (The units are mV)	100mV
8CH	00		
8DH	64	Minimum current draw	0.100A
8EH	00	(The units are mA)	
8FH	10	Maximum current draw	3.600A
90H	0E	(The units are mA)	
91H | FFH	FF	Don't used	

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	32	33	2D	30	37	36	30	2D
20	30	32	D4	20	20	20	20	20	20	20	20	20	20	20	20	20
30	20	20	20	20	20	20	20	C3	20	20	20	D0	20	20	20	20
40	20	20	20	20	20	20	20	20	20	20	20	20	C0	C0	C1	D0
50	00	02	18	38	AE	F8	02	FF	FF	37	0A	10	27	C0	5D	28
60	23	20	67	00	3F	0A	1A	F8	02	12	F8	02	00	01	02	0D
70	91	5F	09	B0	04	A4	04	BC	04	78	00	64	00	56	18	01
80	82	0D	B7	B9	82	4A	01	3A	01	5B	01	64	00	64	00	10
90	0E	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

Power Supply Management Interface (PSMI)

The Power Supply Management Interface (PSMI) compliant with Design guide V2.12. For format details and contents refer the PSMI design guide. Any registers not specified will return 0x00.

Register Data

The registers described in this specification are all 16-bits wide. Signed 2-byte data is returned in 2's compliment format. The data is returned in little endian format.

All registers not specified are reserved and defined as read only. If read will return zero.

Register data access type:

- Read Only (RO)
- Read and Write (R/W)
- Read and Write Reset (RWR)

Read protocol

S	Slave Address	W	A	Register Number	A	S	Slave Address	R	A	Low order data byte	A	High order	A	P

Write protocol

S	Slave Address	W	A	Register Number	A	Low order data byte	A	High order	A	P

- S = Start condition
- P = Stop condition
- W = Write
- R = Read
- A = Acknowledge

Register Summary

Register Address	Register Groups
0x00 - 0x05	Sensor (Temperature)
0x06 - 0x1F	PSMI Capability
0x20 - 0x23	Sensor (Fan Speed)
0x24 - 0x27	Control (Fan Speed)
0x28 - 0x32	Sensor (Voltage)
0x33 - 0x3D	Sensor (Current)
0x3E - 0x52	PSMI Header
0x53 - 0x5D	Sensor (Peak Current)
0x5E	Shutdown
0x5F - 0x61	Warning
0x62	Status
0x63	Control
0x64 - 0xBF	PS Capability records

0xC0 - 0xDF	Custom Registers
0xE0 - 0xFF	PS Capability records

Note:
The prefix "0x" is used for hexadecimal. (hex also mean hexadecimal) In hexadecimal notation, each digit can represent a value from 0 to 15. The first 10 digits are represented by the numbers 0 to 9, and the remaining six digits are represented by the letters A to F (where a represents 10, B represents 11, and so on up to F, which represents 15).

Header

All header registers are read only.

Register Number	Name	Bits	Description
0x3E	Discovery 1	0-7	"P" 0x50
	Discovery 2	8-F	"S" 0x53
0x3F	Discovery 3	0-7	"M" 0x4D
	Discovery 4	8-F	"I" 0x49
0x40	PSMI version	0-7	0x02
		8-F	0x12
0x41	Power supply code version	0-7	0x01 (TBD)
		8-F	0x00 (TBD)
0x42	Supplier ID		0x0000
0x43			
0x44 – 0x52	Reserved		Not support, return 0x0000

PSMI Capabilities

All registers in this section are defined as **read only**.

Register Number	Name	Bits	Description
0x06	**Thermal sensor configuration**		0x004B
	Thermal sensor quantity	0 - 2	Air flow in, secondary side hot spot and primary side hot spot thermal Value: 3 (011b)
	FAN sensor quantity	3 - 5	Value: 1 (001b)
	FAN control quantity	6 - 8	Value: 1 (001b)
	FAN Temperature associations	9	Value: 0 (0b)
	FAN control associations	A	Value: 0 (0b)
	Reserved	B - F	Set to zero (00000b)
0x07	**Temperature sensor types**		0x0001
	T1	0 – 3	Value: 1 (001b) for TG23-0760-01 Value: 2 (010b) for TG23-0760-02
	T2	4 – 7	Value: 0 (000b) secondary hot spot
	T3	8 – B	Value: 0 (000b) primary hot spot
	T4	C - F	Set to zero (0000b)
0x08	T1 temperature sensor offset		No offset, 0x0000
0x09	T2 temperature sensor offset		No offset, 0x0000
0x0A	T3 temperature sensor offset		No offset, 0x0000
0x0B	T4 temperature sensor offset		Not support, return 0x0000
0x0C	Fan 1, 2 resolution register		Not present, 0x0000

0x0D	Fan 3, 4 resolution register		Not support, return 0x0000
0x0E	**F1 configuration**		0x59D8
	fan speed type	0	Value: 0 (0b) using RPM
	fan maximum speed in RPM	1 - F	Maximum speed 23000 RPM
0x0F	F2 configuration		Not support, return 0x0000
0x10	F3 configuration		Not support, return 0x0000
0x11	F4 configuration		Not support, return 0x0000
0x12	**Voltage / Current sensor configuration**		0x0E52
	PS Output quantity	0 – 3	Value: 2 (+12V and +3.3Vsb)
	Voltage sensors	4	Value: 1 (1b) support 2 channel
	Output current sensors	5 – 8	Value: 2 (0 010b) support 2 channel
	Input current sensor	9	Value: 1 (1b) support
	Peak current sensor	A	Value: 1 (1b) support
	Input voltage sensor	B	Value: 1 (1b) support
	Reserved	C - F	Set to zero (0000b)
0x13	Fan associations		0x0000
0x14	F1, F2 cont		Not support, return 0x0000
0x15	F3, F4 cont		Not support, return 0x0000
0x16	**Shutdown events register capability**		0x001F
	Failure	0	Support
	Over current	1	Support
	Over temperature	2	Support
	AC loss	3	Support
	Fan1 failure	4	Support
	Fan2 failure	5	Not support
	Fan3 failure	6	Not support
	Fan4 failure	7	Not support
	Reserved	8 - F	Set to zero (00000000b)
0x17	**Status capability**		0x01F1
	F1cont override indicator	0	Support
	F2cont override indicator	1	Not support
	F3cont override indicator	2	Not support
	F4cont override indicator	3	Not support
	PWOK	4	Support
	PSON	5	Support
	Interrupt	6	Support
	Redundancy	7	Support
	Input range	8	Support
	Reserved	9 - F	Set to zero (0000000b)
0x18	**Control**		0x0111
	F1cont	0	Support
	F2cont	1	Not support
	F3cont	2	Not support
	F4cont	3	Not support
	LED control	4	Support
	Reserved	5 – 7	Set to zero (000b)
	Records		
	PS capability records	8	Support
	Vendor PSMI device field	9	Not support
	Custom features	A	Not support

	Reserved	B - F	Set to zero (0000b)
0x19	**Warning events**		0x1895
	Control temperature	0 – 1	Support
	Ambient temperature	2 – 3	Support
	Fan failure	4 – 6	Support
	Output current	7 – A	Support
	Input voltage	B	Support
	Input current	C	Support
	Reserved	D – F	Set to zero (000b)
0x1A | 0x1F	Reserved		Not support, return 0x0000

Sensors

All sensor registers not specified are defined as read only.

Register Number	Name	Description
0x00	T1 temperature	Inlet air Temp for TG23-0760-01 Outlet air Temp for TG23-0760-02
0x01	T2 temperature	Secondary side hot spot Temp
0x02	T3 temperature	Primary side hot spot Temp
0x03	T4 temperature	Not support, return 0x0000
0x04 – 0x05	Reserved	Set to zero (0x0000)
0x20	F1 Sense	Fan speed in RPM
0x21 – 0x23	F2, F3, F4 Sense	Not support, return 0x0000
0x24	F1 control	Fan speed increase function shall be available with the control represented as an 8 bit number giving the % duty cycle for the PWM (0 = 0%, 255 = 100%)
0x25 – 0x27	F2, F3, F4 speed control	Not support, return 0x0000
0x28	V1 output voltage	+12V output voltage
0x29	V2 output voltage	+3.3Vsb output voltage
0x2A – 0x31	V3 – V10 output voltage	Not support, return 0x0000
0x32	Input voltage	Input voltage
0x33	V1 output current	+12V output current
0x34	V2 output current	+3.3Vsb output current
0x35 – 0x3C	V3 – V10 output current	Not support, return 0x0000
0x3D	Input current	Input current
0x53	V1 output current Peak	+12V peak output current
0x54 – 0x5C	V2 – V10 output current Peak	Not support, return 0x0000
0x5D	Input current Peak	Not support, return 0x0000

Sensor data shall be updated at least once every 250ms for temperatures, currents and voltages. Fan data shall be updated at least once a second.

Temperature Sensors

Temperature sensor data shall be relative to a target defined in the PSMI capability section.

Max number of sensors	3
Range	-20℃ to +125℃
Resolution	1℃
Error	+/-5℃

Temperature sensor data format reports temperatures in the range of ±256℃ from the desired maximum temperature. The temperature sensor data is returned as a 2's complement 16-bit binary value. It represents the number of 1/64℃ increments in the actual reading. See the following figure:

MSB Upper nibble					MSB Lower nibble					LSB Upper nibble					LSB Lower nibble			
s	x	x	x		x	x	x	x		x	x	x	x		x	x	x	x
Sign	Integer Value (-256 ~ 255℃)									Fractional Value (1/64C)								

Fan Speed Sensor

Fan rotation in RPM is available.

Max number of sensors	1
Duty cycle fan speed range	0 ~ 100%
RPM fan speed range	0 ~ 25000 RPM
Resolution	98 RPM (TBD)
Error	< 12000 RPM ± 1000 RPM > 12000 RPM ± 2000 RPM

Note: The power supply has a self-defined fan control curve, please refer to section 4.7.

Output Voltage Sensor

The data format used to report output voltage values in the range of +/-128V to be reported.
The voltage sensor data is returned as a 16-bit binary value.
It represents the number of 1/256 volts in the actual reading.

Max number of sensors	2
Output voltage range	0 ~16V
Minimum resolution	0.063V
Error	+/-5%

MSB Upper nibble					MSB Lower nibble					LSB Upper nibble					LSB Lower nibble			
x	x	x	x		x	x	x	x		x	x	x	x		x	x	x	x
Sign	Integer Value (±128V)									Fractional Value (1/256V)								

Input Voltage Sensor

The data format used to report output voltage values in the range of +/-512V to be reported.
The voltage sensor data is returned as a 16-bit binary value.
It represents the number of 1/32 volts in the actual reading.
AC RMS values will always be returned as a positive value.

Max number of sensors	1
Input voltage range	0 ~ 512V
Minimum resolution	1V
Error	+/-5%

MSB Upper nibble					MSB Lower nibble					LSB Upper nibble					LSB Lower nibble			
x	x	x	x		x	x	x	x		x	x	x	x		x	x	x	x
Sign	Integer Value ~512V RMS														Fractional Value (1/32V)			

Output Current Sensor

The data format used to report output current values in the range of 0 ~ 1024A to be reported.
The current sensor data is returned as a 16-bit binary value.

It represents the number of 1/64 amps in the actual reading.

Max number of sensors	2
Output current range	0 ~ 128A
Minimum resolution	0.25A
Error	+/-5%

MSB Upper nibble					MSB Lower nibble					LSB Upper nibble					LSB Lower nibble			
x	x	x	x		x	x	x	x		x	x	x	x		x	x	x	x
Integer value (0 – 1024A)										Fractional Value (1/64A)								

Input Current Sensor

The data format used to report input current values in the range of 0 ~ 1024A to be reported.
The voltage sensor data is returned as a 16-bit binary value.
It represents the number of 1/64 amps in the actual reading.
AC RMS values will always be returned as a positive value.

Max number of sensors	1
Input current range	0 ~ 32A
Minimum resolution	0.032A
Error	+/-5%

MSB Upper nibble					MSB Lower nibble					LSB Upper nibble					LSB Lower nibble			
x	x	x	x		x	x	x	x		x	x	x	x		x	x	x	x
Integer value (0 – 1024A)										Fractional Value (1/64A)								

Peak Current Sensor Reset

The peak current sensors shall be reset to 0 when PSON is asserted during a power cycle.
The peak current sensors shall hold their value during a loss of AC input power for as long as the standby output is present.
A write of any value to the peak current sensor shall reset the vale to 0.

Shutdown

The shutdown event register shall hold their value during a loss of AC input power for as long as the standby output is present.
The register will be cleared at initial power on, when PSON is cycled, and if 1 is written to the associated bit.

Register Number	Name	Bits	Description
0x5E	Failure	0	If the power supply not supplying output due to internal shutdown
	Over current	1	Shutdown due to overcurrent of +12V
	Over temperature	2	Shutdown due to over temperature
	AC loss	3	Shutdown due to AC loss
	Fan failure	4	Shutdown due to Fan failure
	Reserved	5 - F	Set to zero, return (00000000000b)

Note: Internal shutdown including over current, over temperature, over or under voltage, fan failure, device failure. Also AC failure.

Warning

The power supply provide Shutdown event register for thermal warnings, output over current warnings.

The input warnings which will maintain data while the Standby rail is present even if the AC supply to the power supply is lost.
The register will be cleared at initial power on, when PSON is cycled, and if 1 is written to the associated bit.

Register Number	Name	Bits	Description
0x5F	Thermal warning		
	T1 Cont warning	0	If the power supply temperature has exceeded the maximum value in the PSMI capabilities registers
	T2 Cont warning	1	
	T3 Cont warning	2	
	T4 Cont warning	3	Not support, return 0b
	F1 warning	4	Shutdown due to Fan failure
	Not used or reserved	5 - F	Set to zero
0x60	Current warning		
	V1 output current warning	0	If the power supply output on V1 has exceeded the maximum value in the PSMI capabilities registers
	Not used or reserved	1 - F	Set to zero
0x61	Input warning		
	Input over current warning	0	If the power supply input current has exceeded the maximum value in the PSMI capabilities register
	Not used	1 – 2	Set to zero
	Input under voltage warning	3	If the power supply input voltage was below the minimum value in the PSMI capabilities register
	Not used	4 – F	Set to zero

Status

If the AC supply to the power supply is lost, the power supply will maintain data while the Standby rail is present.
The register will be cleared at initial power on and when PSON is asserted.

Register Number	Name	Bits	Description
0x62	Status		
	RPMI over-ride	0	1 = Fan control override 0 = no override on Fan control
	Not used	1 – 3	Set to zero
	PW OK	4	Asserts when the PWOK signal is asserted. 1 = asserted, 0 = de-asserted
	PS ON	5	Asserts when the PSON signal is asserted. 1 = asserted, 0 = de-asserted
	SMBAlert	6	Asserts when an interrupt is sent to the system. This bit shall latch once an event has occurred. It shall reset to 0b with a power cycle or writing 1b to the bit. 1 = asserted, 0 = de-asserted
	Power supply operating range	7 - 8	Input operating range – It has only one range so always 00b
	Redundancy	9	Set to zero
	Not used	A - F	Set to zero

Control

This register is used to allow the system to set the fan speed control method and LED status.

Register Number	Name	Bits	Description
0x63	Control		
	RPMI over-ride	0	1 = system control, 0 = power supply control
	Not used	1 – 3	Set to zero
	Shutdown LED status	4	1 if shutdown LED is turned on by the system 0 if controlled by the power supply (Default)

			This will turn on the Amber Fail LED. Note either shutdown or warning LED control shall turn that LED on Amber
	Warning LED status	5	1 if warning LED is turned on by the system 0 if controlled by the power supply (Default)
	Shutdown event mask	6	0 = shutdown events do not cause an interrupt 1 = shutdown events will cause an interrupt Default = 1
	Warning event mask	7	0 = warning events do not cause an interrupt 1 = warning events will cause an interrupt Default = 1
	Reserved	8 - F	Set to zero

Power Supply Capability Records

Records are not used will return 0 if read. All registers in this section are defined as read only. Data formats are defined in the PSMI design guide.

Register Number	Name	Description
0x64	T1 target	Value: 70℃ (0x1180) (TBD)
0x65	T2 target	Value: 110℃ (0x1B80)
0x66	T3 target	Value: 110℃ (0x1B80)
0x67	T4 target	Not used, return 0x0000
0x68	F1 min	Value:2300 (0x08FC) TBD
0x69 | 0x6B	F2, 3, 4 min	Not used, return 0x0000
0x6C	Max / Min fan speed sound power	Not used, return 0x0000
0x6D	V1 output max voltage	12.6V (0x0C99)
0x6E	V1 output min voltage	11.4V (0x0B66)
0x6F	V2 output max voltage	3.5175V (0x0386)
0x70	V2 output min voltage	3.1825V (0x032E)
0x71 | 0x80	V3 - V10 limits	Not used, return 0x0000
0x81	Iout1 @ V-input R1	62.3A (0x0F93)
0x82	Iout2 @ V-input R1	3.6A (0x00E6)
0x83 | 0x8A	Iout3-10 @ V-input R1	Not used, return 0x0000
0x8B | 0x94	Iout1-10 @ V-input R2	Not used, return 0x0000
0x95 | 0x9E	Iout1-10 @ V-input R3	Not used, return 0x0000
0x9F	First input current limit	TBD
0xA0	Second input current limit	Not used, return 0x0000
0xA1	Third input current limit	Not used, return 0x0000
0xA2	First input voltage min	90Vac (0x0B40)
0xA3	Second input voltage min	Not used, return 0x0000
0xA4	Third input voltage min	Not used, return 0x0000
0xA5	First output power limit	760W (0x02F8)
0xA6	Second output power limit	Not used, return 0x0000
0xA7	Third output power limit	Not used, return 0x0000