

SPECIFICATION



ESD-00005481

FSP600-1PCH01F-C

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SPECIFICATION

FSP600-1PCH01F-C

R&D	CHECK	APPROVED	REV
George	Hanson	HB	04



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History

Rev.	Description	Date	Author
01	SPEC. issued.	2024/05/22	George
02	1.) 2.3 Pre-Charge Current Mode Pre-Charge Voltage $\pm 3\%$. 2.) 2.5 Constant Voltage Mode 58.8V $\pm 3\%$ @ Charge Current 0~10A 3.) 3.3 Maximum Charge Time Protection Default 6 hours 4.) 6.2 Weight $\leq 1.8\text{Kg}$	2024/9/26	George
03	1.) 1.1 Rated Input Voltage 100Vac ~ 240Vac 2.) 2.3 Pre-Charge Current Mode Pre-Charge Current 2A $\pm 0.5\text{A}$ 3.) 5.2 EMC Emissions Note added on page 7 regarding EMI solution requirements for output cable.	2024/12/13	George
04	7. CAN Communication: update CAN 2.0B	2025/2/13	George



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Electrical Requirements

General description:

This power supply is designed for charging the batteries and is available on on-board configurations. Optional CAN bus communication ensure seamless device integration, and AC/DC cabling is completely customizable.

1. Input :

ITEM	CONDITION	SPECIFICATION
1.1 Rated Input Voltage	Continuously	100Vac ~ 240Vac
1.2 Input Voltage Range	Continuously	90Vac ~ 264Vac
1.3 Input Frequency Range	Continuously	47Hz ~ 63Hz
1.4 Efficiency	230Vac/50Hz	≥ 93%
1.5 Inrush Current	230Vac	Should be less than rating of critical components < 80A
1.6 Power Factor	230Vac	≥ 0.90

2. Output:

※Measured at the output connector.

ITEM	CONDITION	SPECIFICATION
2.1 Max. Charging Voltage	58.8V±1%	
2.2 Output Voltage Ripple And Noise	The measuring is done by 20MHz bandwidth limited oscilloscope and terminated output with a 47uF/100V electrolytic capacitor in parallel with a 0.1uF /100V ceramic capacitor.	≤ 1Vp-p for reference *Test results base on actual battery pack
2.3 Pre-Charge Current Mode	Pre-charge voltage 28V ~ 42V	2A(average) ± 0.5A@ Pre-charge voltage ± 3% *Based on characteristics of the battery
2.4 Constant Current Mode	Charge voltage 42.1V ~ 58.4V	10A ± 0.5 @ Charge voltage ± 1% *Refer figure 2-1



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2.5 Constant Voltage Mode	Max. charge voltage	58.8V ± 1% @ Charge Current 0~10A
2.6 Full Charge Switch Off	Terminate Charge 800mA	0.8A(average) ± 0.1A
2.7 Reverse Current	Current from battery into charger when AC power off	< 0.5mA
2.8 Battery Voltage For Charger	Charger wake up	> 28V
2.9 Charge I/V Curve	Presetting as below I/V curve *Refer figure 2-1	Standard charger profile
2.10 LED Indicator	Power : Green Charging: Yellow Error : Red	Power : AC power on Charging : Charging Error : Error or protection *Refer figure 2-2
2.11 Charge Flow Chart	figure 2-3	*Refer figure 2-3
2.12 CAN_H	CAN bus (Option)	*Refer figure 2-4
2.13 CAN_L	CAN bus (Option)	*Refer figure 2-4

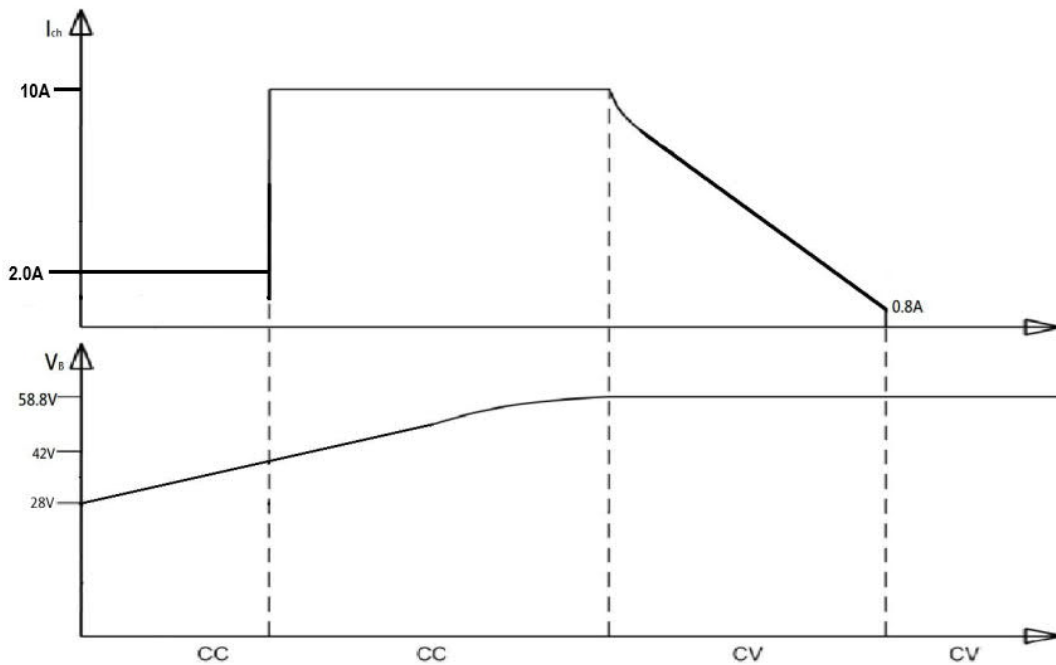


Figure 2-1



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Name	Description
AC Power On	The Green (POWER) LED turn on.
Charging mode	The Yellow (CHARGING) LED flashes every 1s.
Full Charge	The Yellow (CHARGING) LED turn on.
Charger Errors	The Red (ERROR) LED turn on.

Figure 2-2

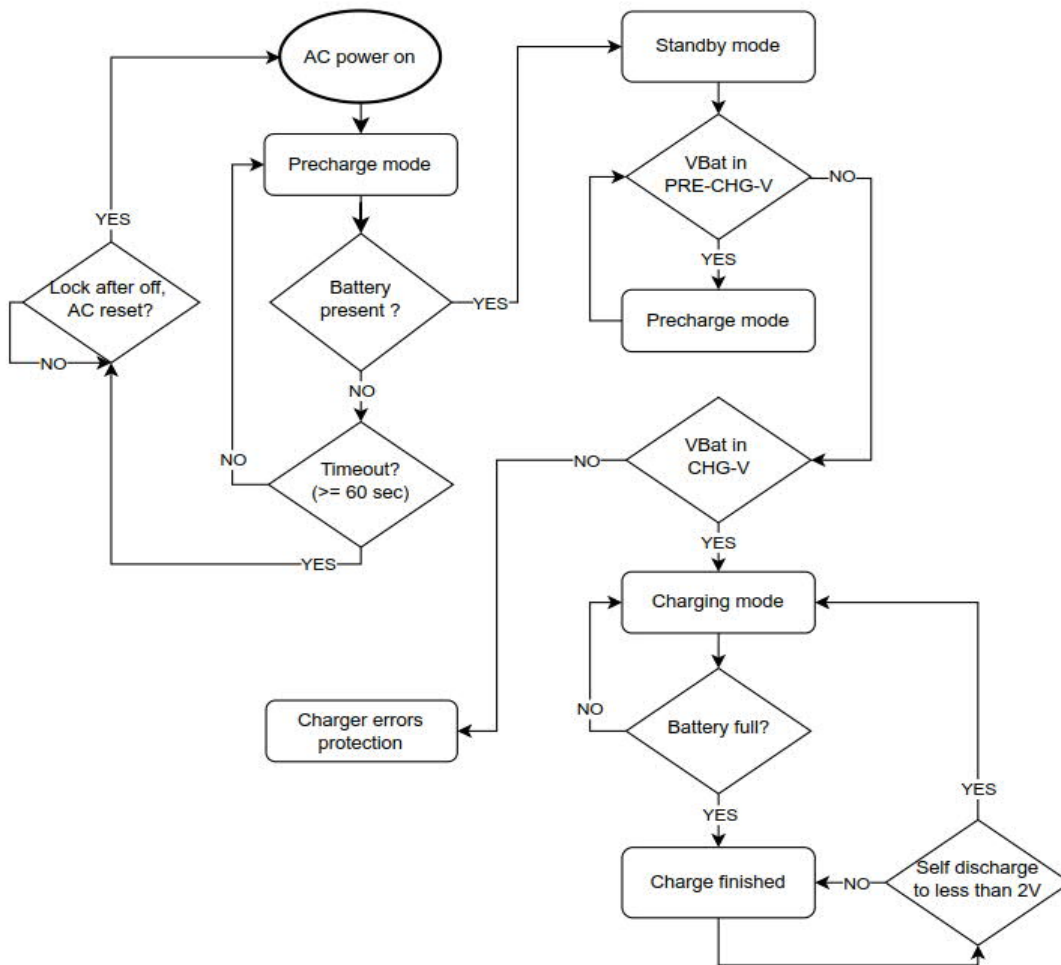


Figure 2-3



Electrical Specification

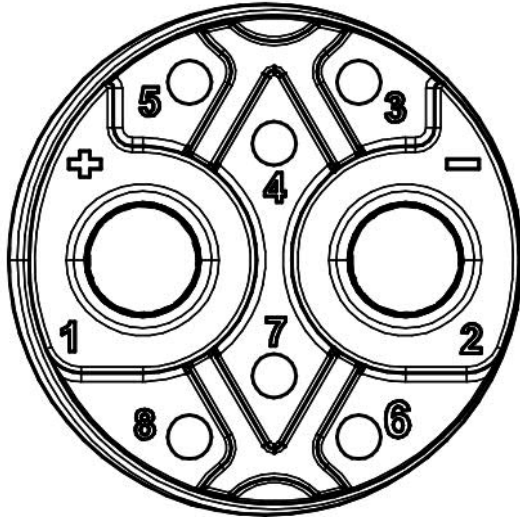


Figure 2-4

CONN NO.	FUNCTION
1	+ VBAT
2	- VBAT
3	INTERLOCK_IN
4	WAKE_UP_BAT
5	NC
6	CAN_H
7	CAN_L
8	ISO_GND

3. Protection:

ITEM	CONDITION	SPECIFICATION
3.1 Short Circuit Protection	When an internal fault occurs or an external fault (overload or short circuit) is applied to the power supply, the power supply shall shut down. It will be required to reset the system by removing the AC mains input.	Latch and no damage
3.2 Over Voltage Protection	OVP > 59.5V	Latch and no damage
3.3 Maximum Charge Time Protection	Error signal to system (only with CAN bus connection)	Default 6 hours
3.4 Thermal Protection	The power supply will shut down during over temperature condition and returns back to normal operation when the power supply is cooled down and require remove the AC mains input to reset the system	Latch and no damage



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4. Environment:

ITEM	CONDITION	SPECIFICATION
4.1 Cooling	FAN cooling	FAN size 40mm * 40mm 2 pcs
4.2 Temperature	Operating	-15°C to +40°C *Refer figure 4-1
	Storage	-40°C to +85°C
4.3 Relative Humidity	Operating	- 15°C / 0% RH +40°C / 75% RH
	Storage	-40°C / 0% RH +85°C / 95% RH
4.4 Vibration	IEC60068-2-64	Normal operation shall be continued
4.5 MTBF	At maximum load and +25°C ambient, SR-332	> 50000 hours

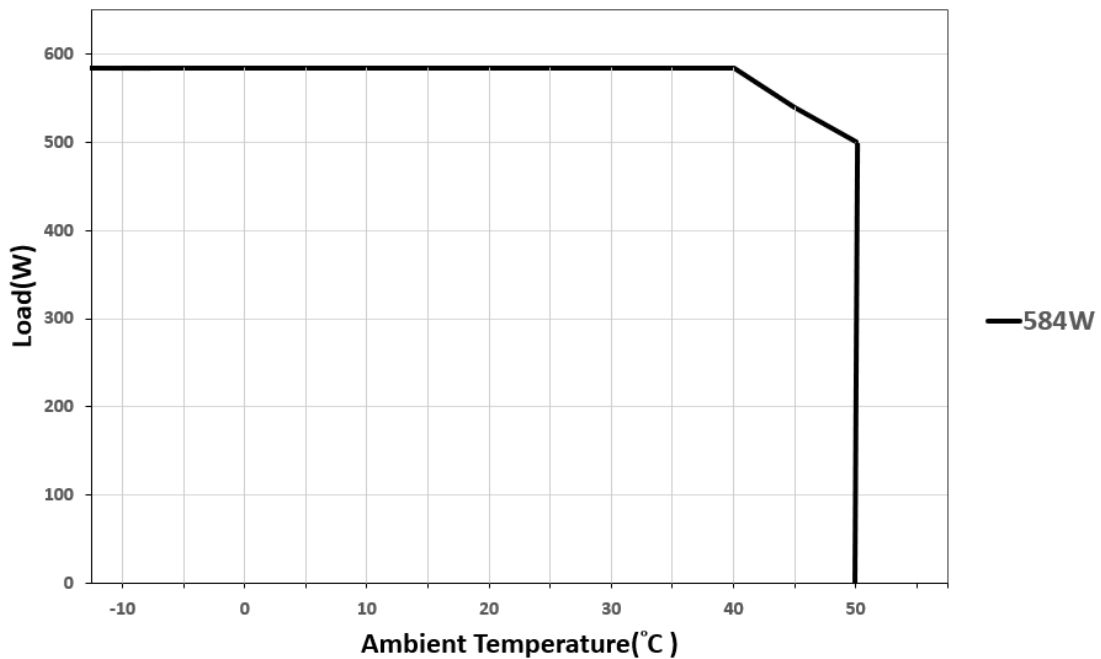


Figure 4-1



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5. Safety & EMC:

ITEM	CONDITION	SPECIFICATION
5.1 Safety Standard	IEC/EN 60335-1 IEC/EN 60335-2-29 UL1012 CAS107.1	
5.2 EMC Emissions	CISPR 14-1 EN55014-1 EN61000-3-2 EN61000-3-3	Note: To ensure optimal EMI performance, the end user's output cable should include a core (Model A8H259285129, EROCORE).
5.3 EMC Immunity	IEC 61000-4-2 Air:8KV, Contact:4KV IEC 61000-4-3 IEC 61000-4-4 EFT. $\pm 1KV$ IEC 61000-4-5 line to line: $\pm 1KV$, line to ground: $\pm 2KV$ IEC 61000-4-6 IEC 61000-4-11	Normal operation shall be continued

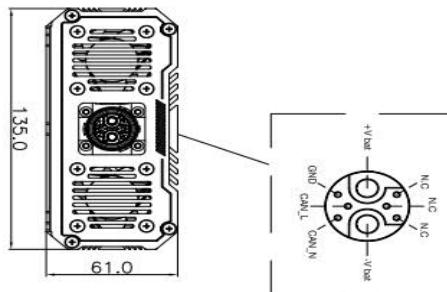
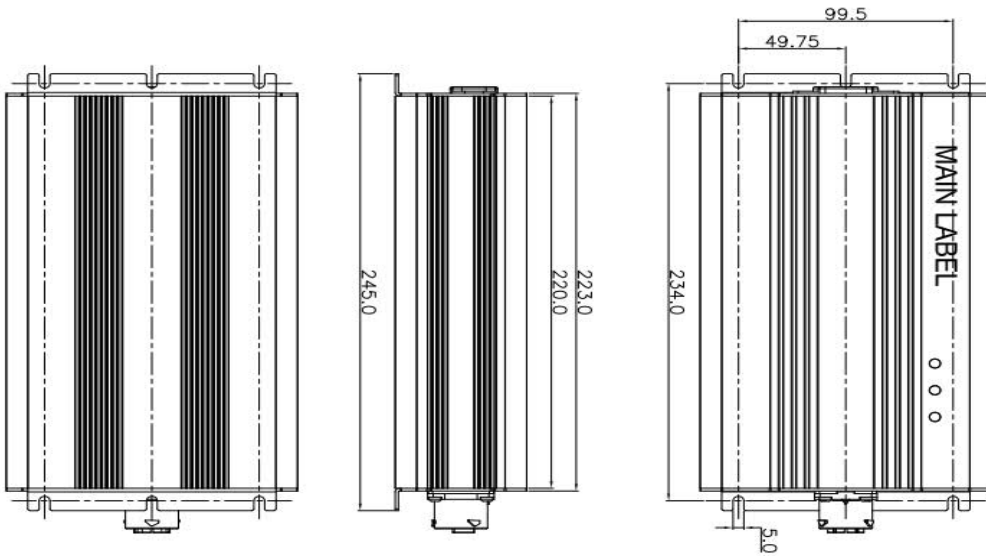
6. Mechanical:

ITEM	CONDITION	SPECIFICATION
6.1 Dimension (Length x Width x Height)	245mm * 135mm * 61mm	
6.2 Weight		$\leq 1.8Kg$
6.3 Input Socket	AC Inlet	C14
6.4 Output Cable	Connector Chogori Mate60 series	Mate60 2+6 Material No:38206D2K02
6.5 Protection Class	IP20	



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DRAWING:





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7. CAN Communication: (Option)

a. CAN Parameters

Name	Value
Identifier length	11-Bits, Standard format
Byte Order	Little Endian (LSB has lower address)
Bit Timing	Compliant with ISO11898-1 (CAN 2.0B)
Baud Rate	500kbs
Time Quanta (TQ)	100ns
Bit time	2000ns

b. Key message of 500

Function: BMS Control

Bytes: 8bytes

Cycle: 500ms

Request/Respond: Request

Sender: BMS

Data	Data type	Byte	Bit	Value	Remark
Query	U8	0		0x01 0x02 0x03	Default 0x01 0x01: query Charger INFO 1 0x02: query Charger INFO 2 0x03: query Charger MFR Data
OnOff_Charger	U8	1		0x00 0x01	0x00: turn off charger 0x01: turn on charger If not received turn on command within 5sec, CAN bus timeout, Charger turn off
Reserved	U8	2-7			Default, sending 0x55 to charger



Electrical Specification

- c. Key message of 501
 Function: Charger INFO 1
 Bytes: 8bytes
 Request/Respond: Respond
 Sender: Charger

Data	Data type	Byte	Bit	Value	Unit	Remark
Charger_Output_V	U16	0-1	0-15	0-65535	0.01V	Charger voltage
Charger_Output_C	U16	2-3	16-31	0-65535	0.01A	Charger current
Charger_Temperature_Ambient	I8	4	32-39	-128 ~ 127	1°C	Charger ambient temperature
Charger_Status_MainsInput	Bool	5	40	0-1		0: Incorrect or plug out 1: correct
Charger_Status_Charging	Bool	5	41	0-1		0: Stop Charging 1: Charging
Charger_Status_BAT Fully	Bool	5	42	0-1		0: Not Fully Charged 1: Battery full
Charger_Status_Error	Bool	5	43	0-1		0: Normal 1: Error Occurred, Status Codes present more details
Reserved	Bool	5	44-47			Reserved
Charger_Task_Code	U8	6	48-55	0-255		Status code, refer figure 7-1 ~ figure 7-3
Charger_Mode_Code	U8	7	56-63	0-255		Process code, refer figure 7-4

- d. Key message of 502
 Function: Charger INFO 2
 Bytes: 8bytes
 Request/Respond: Respond
 Sender: Charger

Data	Data type	Byte	Bit	Value	Unit	Remark
Charger_Temperature_HeatSink1	I8	0	0-7	-128 ~ 127	1°C	Charger heatsink temperature 1
Charger_Temperature_HeatSink2	I8	1	8-15	-128 ~ 127	1°C	Charger heatsink temperature 2
Reserved	U16	2	16-23			Reserved
Default_FW_Model	U8	3	24-31			01 : 58.8V 02 : 56V 03 : 54.6V



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						04 : 52V 05 : 50.4V 06 : 58.4V
Setup_Charger_Current	U8	4-5	32-47			Setup Charger Current
Setup_Charger_Voltage	U8	6-7	48-63			Setup Charger Voltage

- e. Key message of 503
 Function: Charger MFR Data
 Bytes: 8bytes
 Request/Respond: Respond
 Sender: Charger

Data	Data type	Byte	Bit	Value	Default	Remark
MFR_Firmware_Version	U16	0-1		0-65535		Ex: 0x0102 = V1.2(Major. Minor)
MFR_Hardware_Version	U16	2-3		0-65535		Ex: 0x0102 = V1.2(Major. Minor)
MFR_Date_Year	U16	4-5		0-9999	2024	Year of Manufacturing
MFR_Date_Month	U8	6		0-12	2	Month of Manufacturing
MFR_Date_Day	U8	7		0-31	1	Date of Manufacturing

Task name	Dec value	Hex value	Comment
CHG_Taskoff	0	0	
CHG_Init	1	1	
CHG_OFF	2	2	
CHG_ON	3	3	
CHG_STB	4	4	
CHG_PRECHG	5	5	
CHG_NORCHG	6	6	
CHG_FULL	7	7	
CHG_DISCHG	8	8	
CHG_Emergency	9	9	
CHG_EmergencyDone	10	A	
CHG_ONPchk	11	B	
CHG_PchgPchk	12	C	
CHG_NchgPchk	13	D	
CHG_NchgFchk	14	E	
CHG_EmergencyPchk	15	F	



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Figure 7-1

Task name	Dec value	Hex value	Comment
CHG_Fail	20	14	
CHG_FailLock	21	15	
CHG_FailRcov	22	16	
CHG_OVP	23	17	
CHG_UVP	24	18	
CHG_OCP	25	19	
CHG_MCUOTP	26	1A	
CHG_PWROTP	27	1B	
CHG_VINOUPV	28	1C	
CHG_Tout	30	1E	
CHG_CANTout	31	1F	
CHG_PCHGTout	32	20	
CHG_NCHGTout	33	21	

Figure 7-2

Task name	Dec value	Hex value	Comment
Bat_Absent_InOn	50	32	
Bat_Absent_InPchg	51	33	
Bat_Absent_InNchg	52	34	
Bat_Absent_InFull	53	35	
Bat_Fail_InOn	54	36	
Bat_Fail_InPchg	55	37	
Bat_Fail_InNchg	56	38	
Bat_Fail_InN2P	57	39	
Bat_Warn	60	3C	
ForceOn	70	46	
BurninRoom	71	47	

Figure 7-3



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Mode name	Dec value	Hex value	Comment
SYS_Init	0	0	
SYS_STB	1	1	
SYS_CanCHG	2	2	
SYS_Factory	3	3	
SYS_Cal	4	4	
SYS_AutoCHG	5	5	
SYS_FwBoot	6	6	

Figure 7-4