

Any Power Combi , High Power, PSW7 Powerstar Inverter Service Manual for Service Training Course

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Summary

- 1、 Main Function;
- 2、 General Specification;
- 3、 Battery & Charger
- 4、 Alarm & Indicators
- 5、 Block Diagram
- 6、 Key Part Of The Electrical Schematic
- 7、 Inverter State Diagram
- 8、 Trouble shooting
- 9、 Something keep in mind
- 10、 RMA record

1、 Main Function

- Pure Sine-wave Combined Inverter & Charger.
- High Efficiency Using Line-Interactive Circuit Topology (Full Bridge Topology).
- 4-Step Progressive Charging & 7-Battery Type Selector.
- High Power, Multi-Stage Battery Charger.
- Bypass Function Without Battery (Option).
- Remote Control、 RS232、 USB Function.
- Power Saver Function (Below Than 25Watt).
- CE Safety.

2、General Specification

Input Wave form:	Sine wave(Utility or Generator)					
Nominal voltage:	120VAC		230VAC			
Low voltage trip:	90v ± 4%		184v/154v ± 4%			
Low voltage re engage:	100v ± 4%		194v/164v ± 4%			
High voltage trip:	140v ± 4%		253v ± 4%			
High voltage re engage:	135v ± 4%		243v ± 4%			
Max input AC voltage:	150VAC		270VAC			
Nominal input frequency:	50Hz or 60Hz (Auto detect)					
Low freq trip:	47 Hz for 50 Hz, 57Hz for 60 Hz					
High freq trip:	55 Hz for 50 Hz, 65 Hz for 60 Hz					
Output wave form:	(Bypass mode) same as input					
Overload protection:	Circuit breaker					
Short circuit protection:	Circuit breaker					
Transfer switch rating:	30 amp or 40 amp					
Efficiency on line transfer mode:	95%+					
Line transfer time:	10 ms Typical					
Bypass without battery connected:	Yes					
Max bypass current:	30 amp or 40 amp					
Bypass over load current:	35 amp or 45 amp: Alarm					
Inverter Specification / output						
Output wave form:	Pure sine wave or quasi sine wave					
Output continuos power watts:	1000	2000	3000	4000	5000	6000
Output continuos power VA:	1000	2000	3000	4000	5000	6000
Power factor:	0.9-1.0					
Nominal output voltage rms:	120/230VAC					
Output voltage regulation:	+/- 10% rms					
Output frequency:	50Hz ± 0.3Hz or 60Hz ± 0.3Hz					
Nominal efficiency:	>88%					
Surge ratings:	3000	6000	9000	12000	15000	18000
Short circuit protection:	Yes, fault after 10 secs					

3、 Battery & Charger

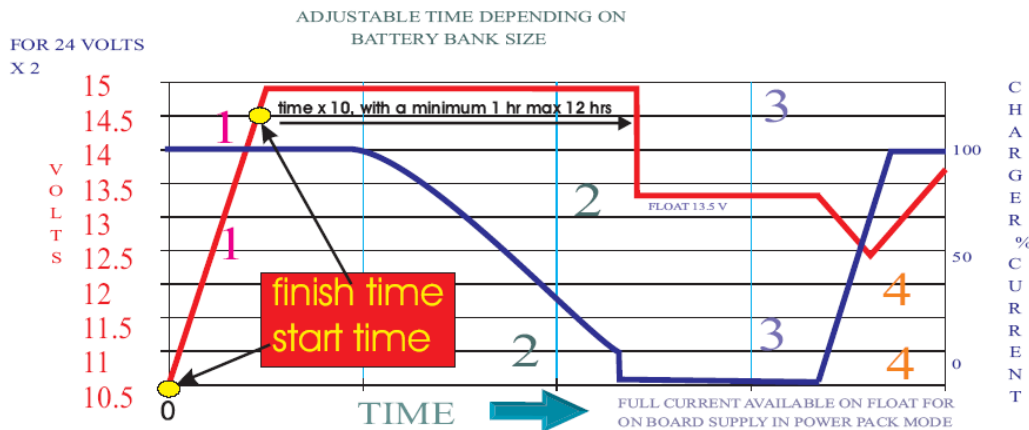
Charger Mode specification

Input voltage range:	95-127VAC	194-243VAC / 164-243VAC(W)
Output voltage:	Dependent on battery type	
Charge current:	35A / 70A	
Battery initial voltage for start up:	0-15.7v for 12v(*2 for 24v; *4 for 48v)	
Over charge protection shutdown:	15.7v for 12v(*2 for 24v; *4 for 48v)	

Charger curves (4 stage constant current) Battery types

4 step digital controlled progressive charge

Battery type:	Fast V	Float V (*2 for 24v; *4 for 48v)
Gel U.S.A	14.0	13.7
A.G.M. 1	14.1	13.4
A.G.M. 2	14.6	13.7
Sealed Lead Acid	14.4	13.6
Gel Euro	14.4	13.8
Open Lead acid	14.8	13.3
Calclum	15.1	13.6
De-sulphation	15.5 for 4 hrs	



THE NEW BATTERY CHARGERS AND BOOSTERS OFFER THE FASTEST CHARGE RATE CURRENTLY AVAILABLE

STEP 1 = CONSTANT CURRENT CHARGE

STEP 3 = CONSTANT VOLTAGE AT 13.5 VOLTS

STEP 2 = ABSORPTION CHARGE AT 14.4/14.8 V

STEP 4 = LOW VOLTAGE RESET TO STEP 1

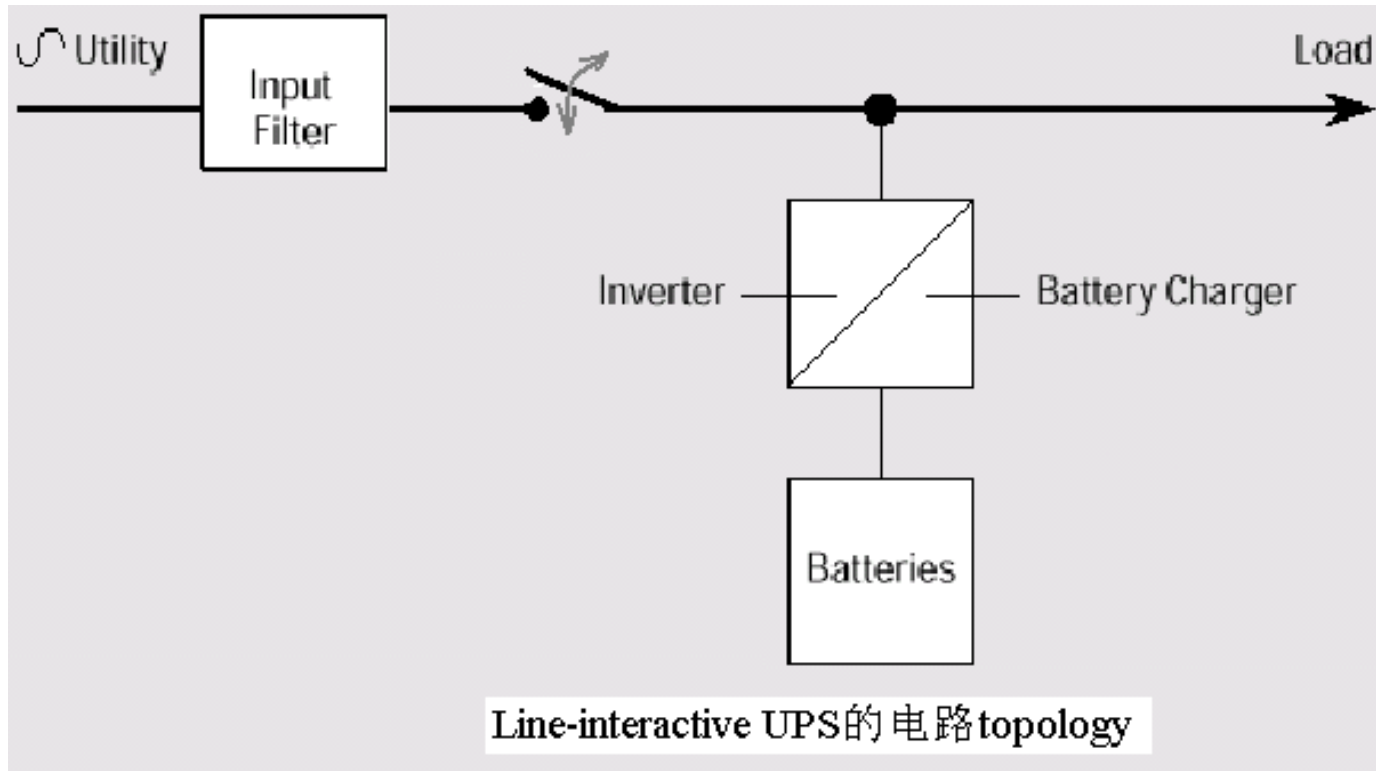
4.1、Indicator & Alarm

Status	Item	Indicator on top cover							LED on Remote control			Buzzer
		Utility POWER ON	INV ON	FAST CHARGE	FLOAT CHARGE	OVER TEMP TRIP	OVER LOAD TRIP	POWER SAVER ON	BATTERY CHARGE R	INVERTER	Alarm	
Line Mode	CC	√	×	√	×	×	×	×	√	×	×	×
	CV	√	×	√, blink	×	×	×	×	√	×	×	×
	Float	√	×	×	√	×	×	×	√	×	×	×
	Standby	√	×	×	×	×	×	×	×	×	×	×
Invert Mode	Inverter on	×	√	×	×	×	×	×	×	√	×	×
	Power saver	×	×	×	×	×	×	√	×	×	×	×
Alarm Mode	Battery Low	×	√	×	×	×	×	×	×	√	√	beep 0.5s every 5s
	Battery High	×	√	×	×	×	×	×	×	√	√	beep 0.5s every 1s
	Overload on invert mode	×	√	×	×	×	√	×	×	√	√	Refer to "Audible alarm"
	OverTemp on invert mode	×	√	×	×	√	×	×	×	√	√	Beep 0.5s every 1s
	OverTemp on line mode	√	×	√	×	√	×	×	√	×	√	beep 0.5s every 1s
	Over charge	√	×	√	×	×	×	×	√	×	√	beep 0.5s every 1s

4.2、 Indicator & Alarm

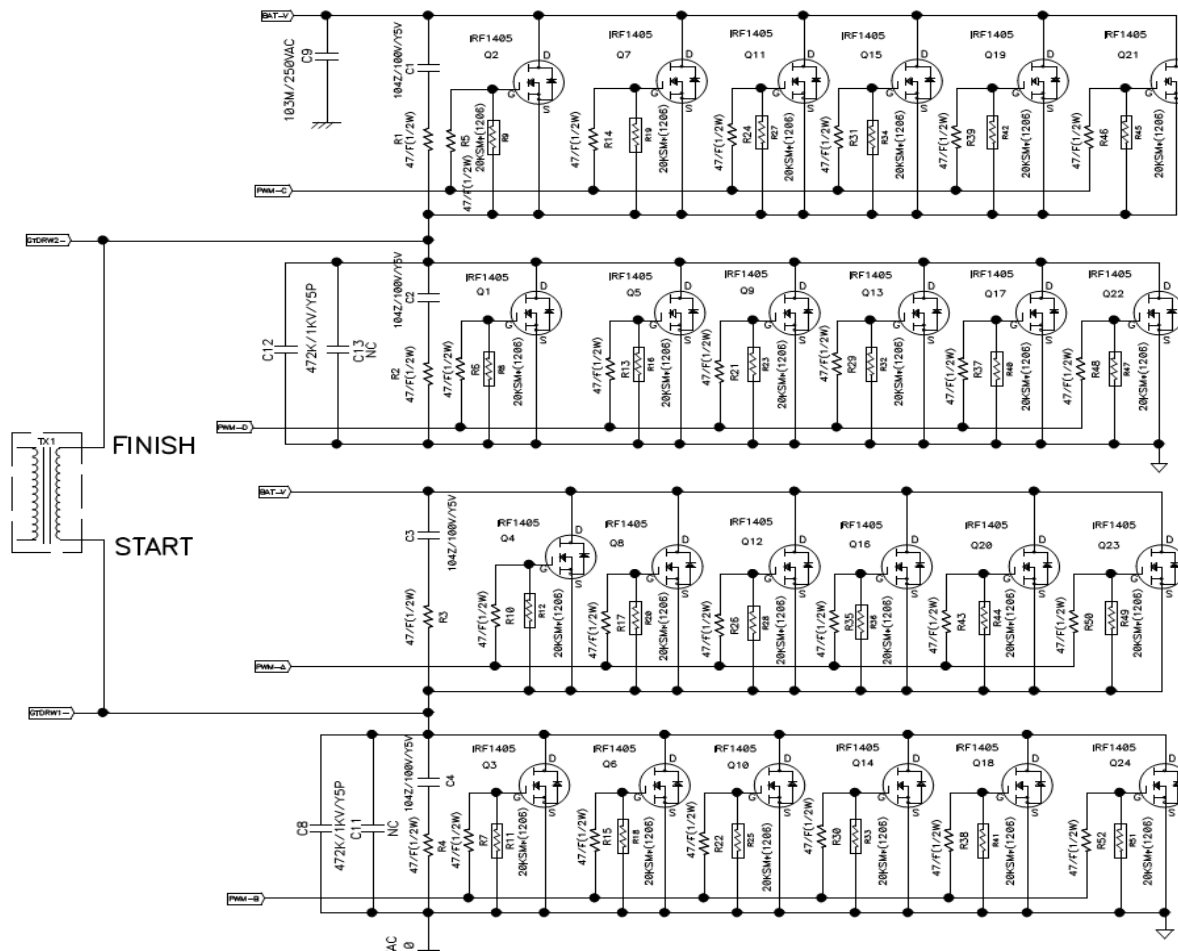
Status	Item	Indicator on top cover							LED on Remote control			Buzzer
		Utility POWER ON	INV ON	FAST CHARGE	FLOAT CHARGE	OVER TEMP TRIP	OVER LOAD TRIP	POWER SAVER ON	BATTERY CHARGE R	INVERTER	Alarm	
Fault Mode	Fan lock	×	×	×	×	×	×	×	×	×	×	beep continuous
	Battery High	×	√	×	×	×	×	×	×	√	×	beep continuous
	Inverter mode overload	×	×	×	×	×	√	×	×	×	×	beep continuous
	OverTemp	×	×	×	×	√	×	×	×	×	×	beep continuous
	Over charge	×	×	√	×	×	×	×	×	√	×	beep continuous
	Back Feed Short	×	×	×	×	×	×	×	×	×	×	beep continuous

5、Block Diagram



6.1、Key Part Of The Electrical Schematic

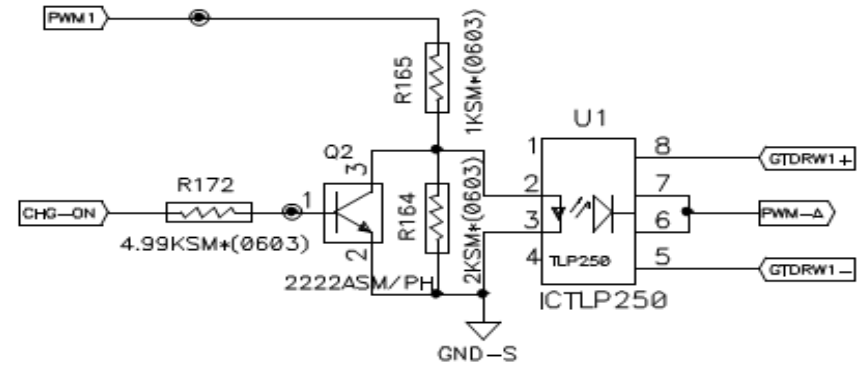
□ PSDR Section (Full Bridge)



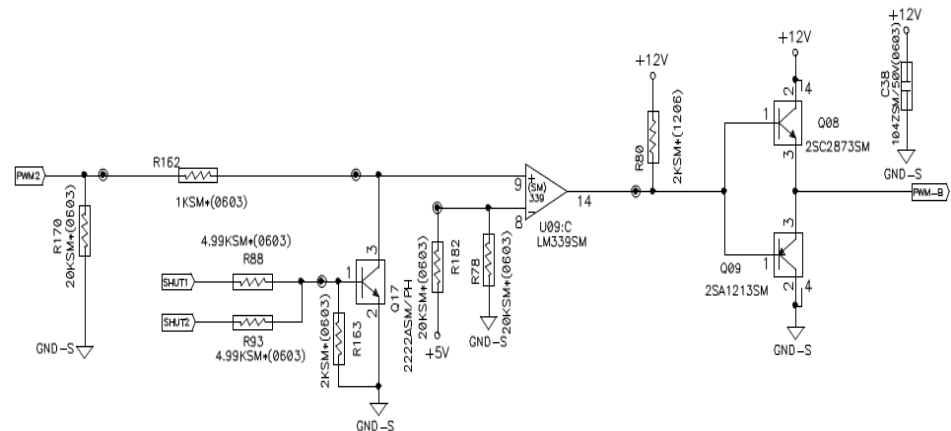
6.2、 Key Part Of The Electrical Schematic

□ Driver Section

1/Driver of the Up Bridge;

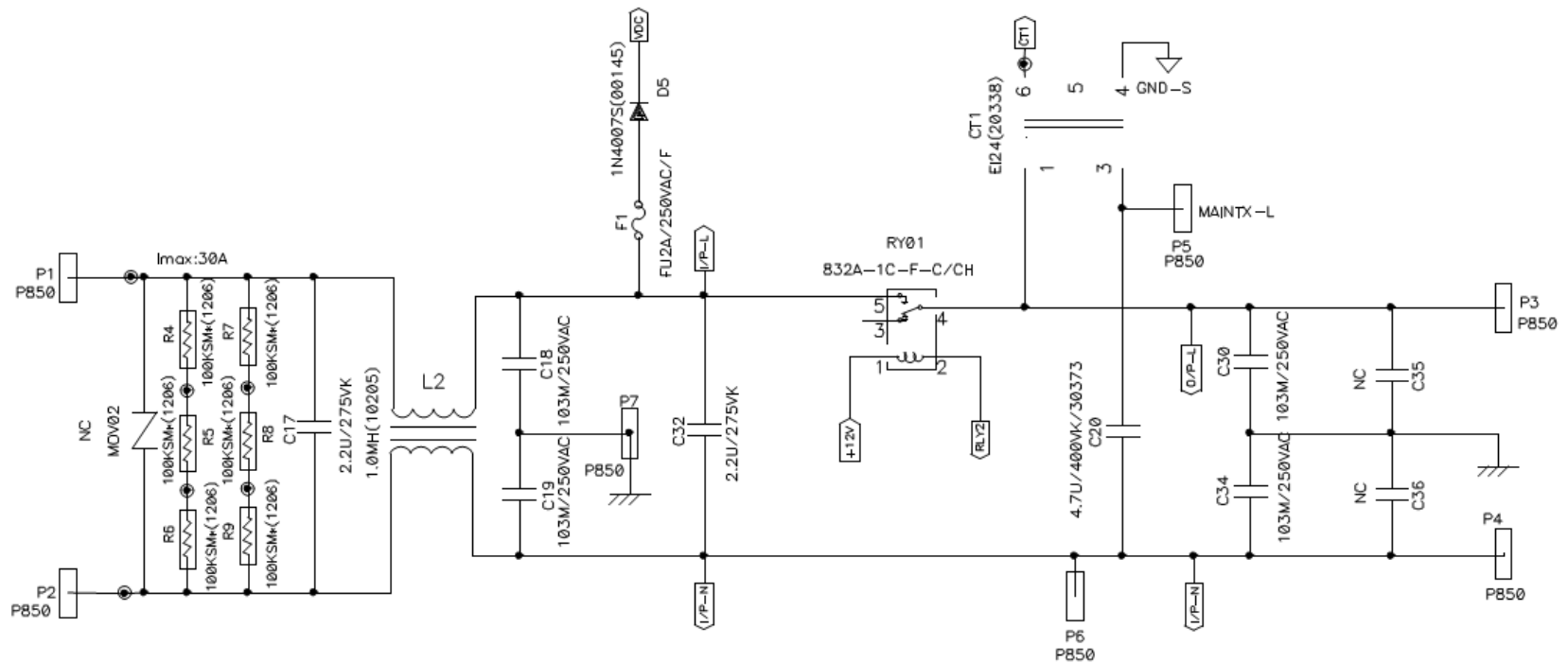


2/Driver of the Down Bridge;

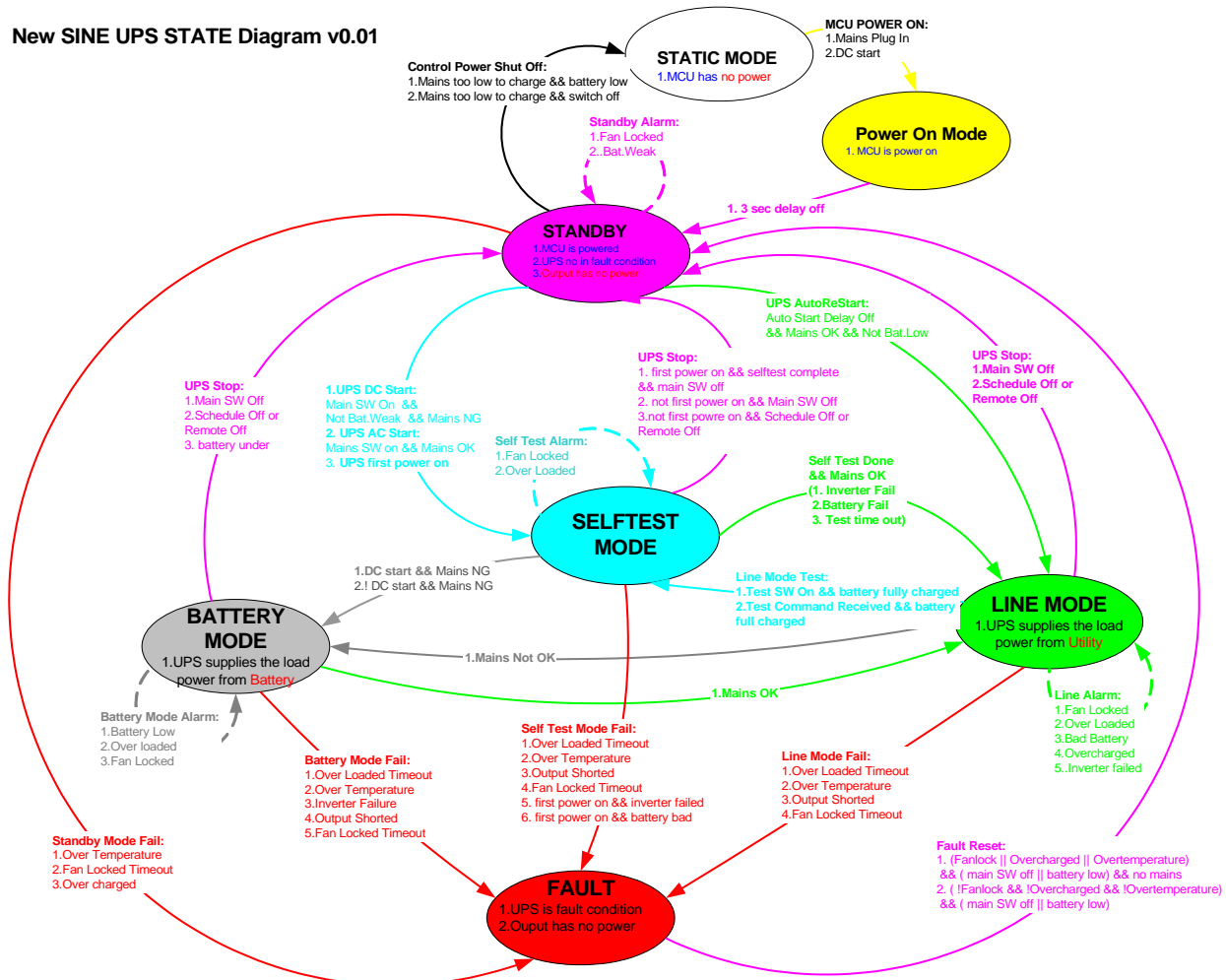


6.3、 Key Part Of The Electrical Schematic

□ Line-Mode & Bat-Mode Transfer Section



7、 Inverter State Diagram



8、 Trouble Shooting

□ The most possible failure components are listed as following:

1、 UPS fault at the battery mode (IGBT Damage Q1~Q24)

INV Mode	IGBE Type
1012/1012E	IRF8113
1024/2024/3024/4024 1024E/2024E/3024E/4024E	IRF3205
3012/5024/6024 3012E/5024E/6024E	IRF1405
3048/3048E	IRF3710
4048/4048E/5048E/6048E	IRF4310

2、 Driver Resistor (R5/R6/R7/R10... ;R8/R9/R11/R12...)

R5/R6/R7/R10.....: 47Ohm 1/2W Dip type;

R8/R9/R11/R12....: 20Kohm 1206 type;

3、 Driver Circuit (Refer to Driver Section)

Optocoupler U1/U2: IC TLP250;

FET Q03/Q05/Q08/Q09 : 2SC2873 SMD;

9、 Something Keep In Mind

- High voltage,
Do not open unless qualified to so;
- Battery is very dangerous
- After replacing the defective component or PCB and before re-plug the input power cord into the wall socket, make sure all power connections have been checked.

10、 RMA Record

- When you maintain the UPS, please record the below information and feedback to Sunray Power for further analysis and improvement.

Model name	Series number	UPS failure description	Which component failed

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