



Fast Track Troubleshooting

Model:
R H25H5611



CHECK BULLETIN:

Support Information:

HELP: 1-888-751-4086 (Tech Sup. – ASC/SSD)
1-866-894-0637 (Tech Sup. - FE/ME)

GSPN: <http://gspn3.samsungcsportal.com/main.jsp>

PLUS ONE: <http://my.plus1solutions.net/clientPortals/samsung>

IMPORTANT SAFETY NOTICE – “For Technicians Only” This service data sheet is intended for use by persons having electrical, electronic, and mechanical experience and knowledge at a level generally considered acceptable in the appliance repair trade. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible, nor assume any liability for injury or damage of any kind arising from the use of this data sheet.

Production Date 06/3/2015
Production AB

FORCE MODE turns compressor on / defrost

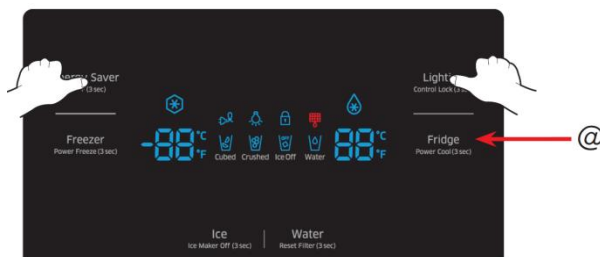
Energy Saver and Fridge

When it blinks let go of buttons and tap on Fridge, before display stops blinking. Toggle to the desired function.



Load Mode used to check what is currently running

- 1) In the normal operation, press Lighting and Energy Saver buttons simultaneously for 6 seconds, then the display panel will blink for 2 seconds.
- 2) Press Fridge Temp. button @ to get into this check mode with an audible tone.
- 3) Each illuminating LED segment stands for the component which has an output signal from the control board.
- 4) This mode will terminate automatically after 30 seconds



Diagnostic Mode shows the errors codes

Energy Saver and Lighting

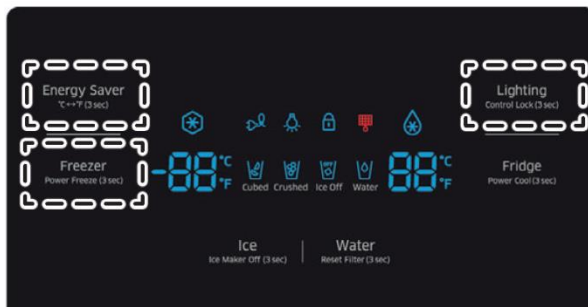
Keep holding until display stops blinking, if no errors recorded the screen will be blank. Wait 30 sec for normal operation



DEMO Mode lights remain on but heating and cooling switched off

Press Freezer – Fridge and Control Lock

When O – FF displays you have entered the store demo mode
Heating and cooling will be shut off (Repeat process to get out of this mode)



DC FAN MOTORS

Brushless DC Fan motors are used to save energy. The fans operate at two speeds. Fan speed information is read by the Main PCB. If the fan speed exceeds 600 RPM or the speed is too slow, or stopped the fan drive circuit is disabled, After 10 seconds the circuit tries again with 3 seconds of DC voltage. If the fan continues this activity for 5 cycles, 10 seconds off 3 seconds on, the fan drive circuit is disabled for 10 minutes.

TO TEST THE FAN CIRCUIT VOLTAGE.

Power off and back on to check the DC voltage to the motor, wait from 10 to 60 seconds for the fan voltage to kick in, and then check fan voltage, the average reading is 9 VDC. If you get 3 seconds of voltage every 10 seconds for the 5 fan power up cycles, then the Main PCB is good.

NOTE: You may need to put unit in FORCED FREEZE mode to activate the fans/compressor.

If the fan blade is blocked by ice, then defrost and check the motor again, after removing power from the unit.

If the evaporator is ice blocked and thus blocking the air flow, the fan will over RPM and is stopped. Remove ice and check the motor again. If everything is clear around the fan blade then the motor would be at fault. Continuous fan errors will be displayed on the front panel display. **PLEASE NOTE:** The door switches control the evaporator fan motors. Have them closed to test the motors. Delay time 10 – 60 seconds.

Heat Release Ice Makers

Heat Release Ice production Explanation

38 minutes after the water fill is complete, the control board will check the temperature of the eject Thermistor, on the Ice Maker Head, if the Thermistor reads a temperature lower than 18.5 degrees for more than 5 seconds, then the ice production process is completed. The Ice maker will harvest if the ice bucket is not sensed as full. If a Fault Mode is detected with the Ice Maker operation, the Ice Maker stops working for 3 hours. Which means, the Ice Maker checks the operation every 3 hours until it works properly.

Heat Release I/M Test Mode

Press and hold the ICE TEST S/W for at least 1.5sec, the harvest function will start. If the ice maker Thermistor is below 0 degrees the Ice maker heater turns on for about 2 minutes. If the temperature exceeds 0 degrees, Ice maker heater turns on for 30 seconds. After the Ice maker heater turns on for 30 seconds, the heater turns off and then Ice maker harvest motor turns on. The motor will rotate in right direction for about 3 minutes, after this, water supply valve is turned on, then the valve is turned off, the test mode is completed. If the above operation is not carried out within 6 minutes, it will go into a fault mode.

FREEZER TEMPERATURE CONTROL BY THE ICE MAKER

Interior Temperature of the freezer will be set to -14 degrees Fahrenheit until the ice bucket is full. When the ice bucket is full, the freezer will maintain original set temperature. Also, whenever the ice is used, the freezer will again set to -14 degrees Fahrenheit. Selecting "Ice Off" will allow the freezer to be controlled by the set temperature. If water is not hooked up, the freezer will always be at -14 unless "Ice Off" is selected.

Temperature/Resistance/Voltage Chart for Samsung Refrigerators Sensors

Temp.	(Ω)	Volts	Temp.	(Ω)	Volts	Temp.	(Ω)	Volts	Temp.	(Ω)	Volts
-29.2°F	64227	4.326	1.4°F	28021	3.685	32.0°F	13290	2.853	62.6°F	6771	2.019
-27.4°F	61012	4.296	3.2°F	26760	3.64	33.8°F	12749	2.802	64.4°F	6521	1.974
-25.6°F	57977	4.264	5.0°F	25562	3.594	35.6°F	12233	2.751	66.2°F	6281	1.929
-23.8°F	55112	4.232	6.8°F	24425	3.548	37.4°F	11741	2.7	68.0°F	6052	1.885
-22.0°F	52406	4.199	8.6°F	23345	3.501	39.2°F	11271	2.649	69.8°F	5832	1.842
-20.2°F	49848	4.165	10.4°F	22320	3.453	41.0°F	10823	2.599	71.6°F	5621	1.799
-18.4°F	47431	4.129	12.2°F	21345	3.405	42.8°F	10395	2.548	75.2°F	5225	1.716
-16.6°F	45146	4.093	14.0°F	20418	3.356	44.6°F	9986	2.498	77.0°F	5000	1.675
-14.8°F	42984	4.056	15.8°F	19537	3.307	46.4°F	9596	2.449	78.8°F	4861	1.636
-13.0°F	40938	4.018	17.6°F	18698	3.258	48.2°F	9223	2.399	80.6°F	4690	1.596
-11.2°F	39002	3.98	19.4°F	17901	3.208	50.0°F	8867	2.35	86.0°F	4218	1.483
-9.4°F	37169	3.94	21.2°F	17142	3.158	51.8°F	8526	2.301	87.8°F	4072	1.447
-7.6°F	35433	3.899	23.0°F	16419	3.107	53.6°F	8200	2.253	89.6°F	3933	1.412
-5.8°F	33788	3.858	24.8°F	15731	3.057	55.4°F	7888	2.205	91.4°F	3799	1.377
-4.0°F	32230	3.816	26.6°F	15076	3.006	57.2°F	7590	2.158	95.0°F	3547	1.309
-2.2°F	30752	3.773	28.4°F	14452	2.955	59.0°F	7305	2.111	96.8°F	3428	1.277
-0.4°F	29350	3.729	30.2°F	13857	2.904	60.8°F	7032	2.064	100.4°F	3204	1.213

Make sure before measuring voltage of any DC component that circuit ground is used. Any marked GND on the main PCB will be your circuit ground. If Chassis ground is used, measurements will be incorrect.

Sensor Res. > 100KΩ = Open

Sensor Res. < 2KΩ = Shorted



A Sensor Resistance over 100K ohm is considered OPEN
A Sensor Resistance under 2K ohm is considered Shorted
But Note that a sensor could also give wrong values if it is out of tolerance

ERROR CODE	ITEM	Description	How to do Self-Diagnosis
1 E	FREEZER SENSOR	Connector Slipped-Out or Open-Contact, Wire Cut or Short- Circuited, Abnormal Sensing Temp (+50°C and over or -50°C and lower).	The voltage should be within the range of 4.5V ~ 1.0V between MAIN PCB CN30 #3 and #7
2 E	FRIDGE SENSOR	Same as the above	The voltage should be within the range of 4.5V ~ 1.0V between MAIN PCB CN30 #5 and #7
4 E	FREEZER DEFROST SENSOR	Same as the above	The voltage should be within the range of 4.5V ~ 1.0V between MAIN PCB CN30 #4 and #7
5 E	FRIDGE DEFROST SENSOR	Same as the above	The voltage should be within the range of 4.5V ~ 1.0V between MAIN PCB CN30 #6 and #7
6 E	AMBIENT SENSOR	Same as the above	The voltage should be within the range of 4.5V ~ 1.0V between MAIN PCB CN30 #1 and #2
8 E	ICE MAKER SENSOR	Same as the above	The voltage should be within the range of 4.5V ~ 1.0V between MAIN PCB CN90 #3 and #8
13 E	HUMIDITY SENSOR	Separation of sensor housing part, contact error, disconnection, short circuit	The voltage should be within the range of 4.5V ~ 1.0V between MAIN PCB CN30 #7 and #9
21 E	FREEZER FAN ERROR	Bad Feed-Back Signaling Wire Contact, Motor Wire Slipped-Out, Defective Motor	The voltage should be 7V~12V between MAIN PCB CN75 #1(GRAY) and #4(YELLOW).
22 E	FRIDGE FAN ERROR	Same as the above	The voltage should be 7V~12V between MAIN PCB CN75 #1(GRAY) and #3(ORNAGE).
23 E	CONDENSER FAN ERROR	Same as the above	The voltage should be 7V~12V between MAIN PCB CN75 #1(GRAY) and #2(SKY BLUE).
24 E	FREEZER DEFROST ERROR	Connector Slipped-Out or Open- Contact, Wire Cut or Short- Circuited, Defective Thermistor, or When it keeps heating during Fridge Defrost even after it does defrosting for 80 minutes.	After separating MAIN PCB CN70 wire from PCB, resistance value between CN70 Brown ↔ Black(refer to the Circuit Diagram for the resistance value) When it is 0 Ohm, check if the Heater is short and when it is Ohm, check if the wire or the thermal fuse is open.
25 E	FRIDGE DEFROST ERROR	Connector Slipped-Out or Open- Contact, Wire Cut or Short- Circuited, Defective Thermistor, or When it keeps heating during Fridge Defrost even after it does defrosting for 80 minutes.	After separating MAIN PCB CN70 wire from PCB, resistance value between CN70 White ↔ Black(refer to the Circuit Diagram for the resistance value) When it is 0 Ohm, check if the Heater is short and when it is Ohm, check if the wire or the thermal fuse is open.
26 E	ICE MAKER FUNCTION ERROR	I/M Ice Ejection Horizontal Positioning Error ** Only for Dispenser models	After replacing Ice-Maker, plug in the unit and check its operation.

41 E	COMM ERROR	No communication between MICOM MAIN and PANEL(PC Er) error code will light up with alarming sounds.	It needs a Oscilloscope to do the error check. So, it is more realistic checking the error after replacing Main or Panel PCB.
71 E	Abnormally High Freezer Temperature	The Freezer Display blinks in the following conditions. - when the Freezer temperature increases abnormally - when the Freezer Door is being left open for a certain time with the inside temperature is high	The inside temperature has risen abnormally. See if the door is being left open for a long time or it there are hot food being put inside. When its root causes get cleared, it will stop blinking after a while.
72 E	Abnormally High Fridge Temperature	The Fridge Display blinks in the following conditions. - when the Fridge temperature increases abnormally - when the Fridge Door is being left open for a certain time with the inside temperature is high	The inside temperature has risen abnormally. See if the door is being left open for a long time or it there are hot food being put inside. When its root causes get cleared, it will stop blinking after a while.
81 E	COMP STARING FAILURE ERROR	When the Compressor fails starting	1. It will stop blinking after a while short(U,V,W) 2. Check IPM Pins short of Inverter PBA (No. #1 ~ 26) 3. Check IPM operating Voltage (under DC 13.5V) 4. Other cases check the COMP cycle etc
82 E	COMP IPM FAULT ERROR	When there is a IPM Fault error	
83 E	COMP ABNORMAL CURRENT DETECTION ERROR	When ther is abnormal crrunt detected at the Compressor	1. Check COMP wire connections(U,V,W) 2. Check PCB Bottom side solder(R1) 3. Other cases check the COMP cycle etc
84 E	COMP MOTOR LOCKED OVER RPM ERROR	When there is a Compressor restriction error	1. Check PCB Bottom side solder(R1) 2. Check Input voltage oscillation 3. Other cases check the COMP cycle etc
85 E	COMP UNDER VOLTAGE ERROR	When there is a low voltage error	1. Check input voltage under AC 55V(if input Power is AC110~127V) or AC 106V(if input Power is AC 220~240V) 2. Check the Resistor(R309, R310, R311)
86 E	COMP OVER VOLTAGE ERROR	When there is a over voltage error	1. Check input voltage over AC 155V(if input Power is AC110~127V) or AC 310V(if input Power is AC 220~240V) 2. Check the Resistor(R309, R310, R311)

Load Mode

- 1) In the normal operation, press Lighting and Energy Saver buttons simultaneously for 6 seconds, then the display panel will blink for 2 seconds.
- 2) Press Fridge Temp. button @ to get into this check mode with an audible tone.
- 3) Each illuminating LED segment stands for the component which has an output signal from the control board.
- 4) This mode will terminate automatically after 30 seconds

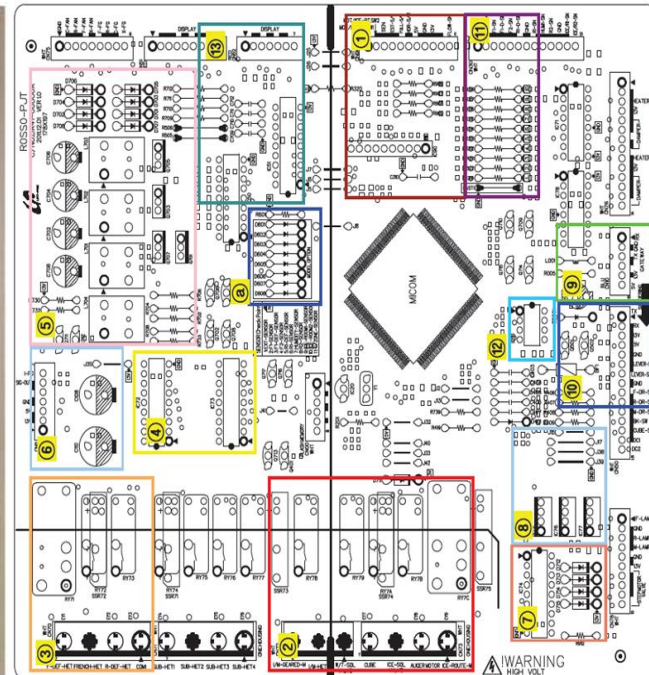
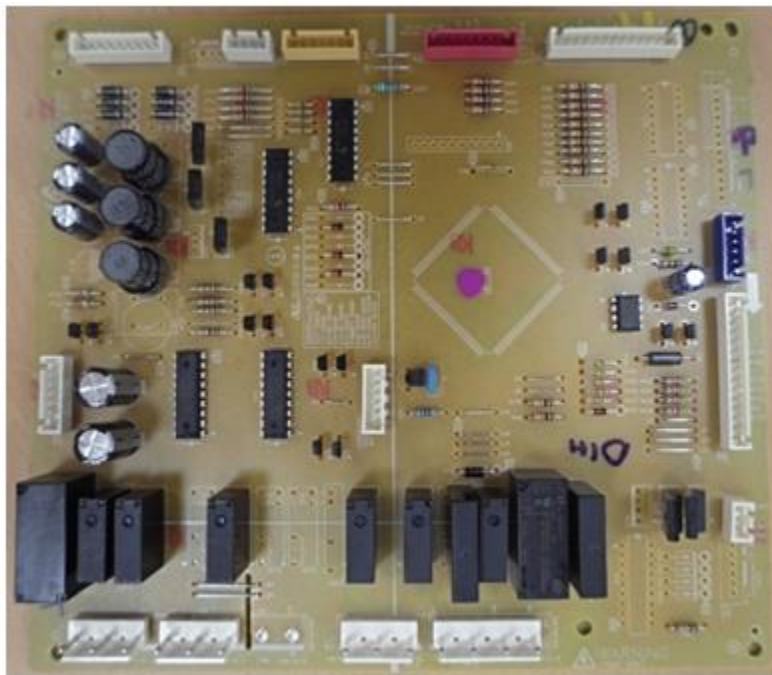
Press both button for 8 seconds at the same time



- Load Mode Check List

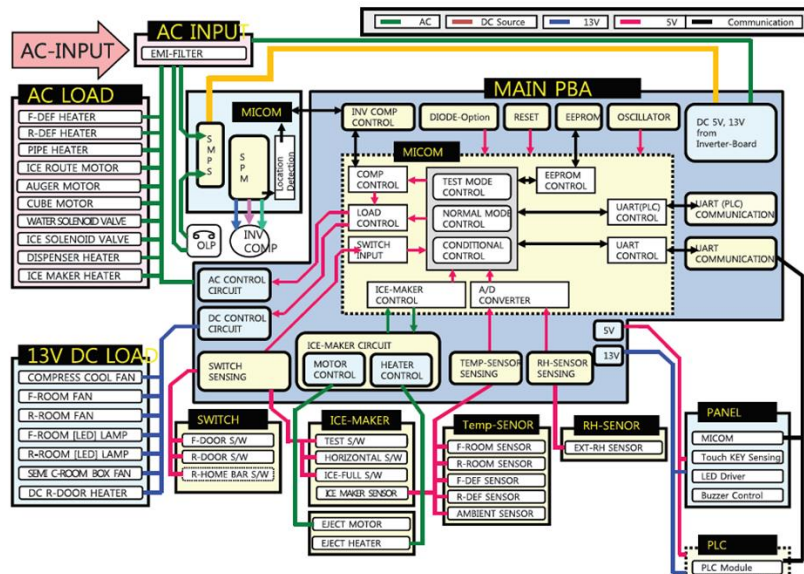
NO	Item	Description	Display	Digital no.
1	FRIDGE FAN HIGH	R-FAN HIGH RPM	Fridge second digit a	Fridge (second) 8
2	FRIDGE FAN LOW	R-FAN LOW RPM	Fridge second digit b	
3	FRIDGE DEFROST HEATER	R-DEF HEATER ON	Fridge second digit c	
4	OVER-LOAD MODE	Over 34°C Ambient Temp	Fridge second digit e	
5	LOW-TEMP MODE	Less than 21°C Ambient Temp	Fridge second digit f	
6	EXHIBIT MODE	Exhibition Mode On	Fridge second digit g	Fridge (first) 8
7	ICE FULL	Bucket Ice Full	Fridge first digit d	
8	COMPRESSOR	COMP On	Freezer second digit a	Fridge (second) 8
9	FREEZER FAN HIGH	F-FAN HIGH RPM	Freezer second digit b	
10	FREEZER FAN LOW	F-FAN LOW RPM	Freezer second digit c	
11	FREEZER DEFROST HEATER	F-DEF HEATER ON	Freezer second digit d	
12	CONDENSER FAN HIGH	C-FAN HIGH RPM	Freezer second digit e	
13	CONDENSER FAN LOW	C-FAN LOW RPM	Freezer second digit f	Fridge (first) 8
14	DISPENSER HEATER	Dispenser Heater On	Freezer second digit g	
15	C-ROOM BOX-FAN	C-ROOM BOX-FAN ON	Fridge first digit c	Fridge (second) 8
16	NORMAL CONDITIONS	⑤ & ⑥ All Off(22~33°C)	Fridge second digit e,f LED all Off	
17	SHOWCASE DOOR HEATER	SHOWCASE DOOR HEATER ON	Freezer First Digit e	Freezer (first) 8

Main PCB

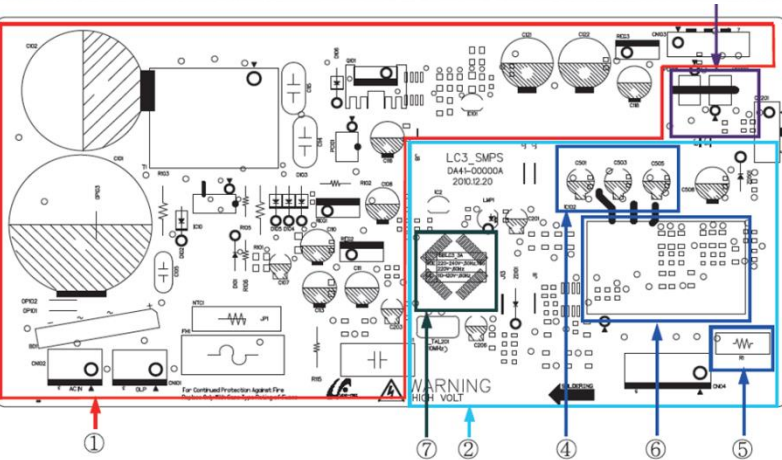


0. SMPS Circuit : Not used.
1. Ice Maker Circuit : Receiving the data of sensor, Hall S/W, Ice Route Micro S/W
2. Ice Maker Control Circuit : Controlling AC Load like motor, solenoid, heater related to ice making
3. Heater Control : Relays for F/R-def-heater, R-H/B-heater, Pipe-heater, Dispenser-heater F/R-cap-heater, DC-door-heater
4. Driver IC : Using MICOM signal to control relays.
5. BLDC Fan Control circuit : Supplying the power to the fan motor using PWM
6. Inverter Communication circuit : Sending operating RPM signal & receiving error feedback.
7. Step Valve control circuit : using motor driver IC to control step valve motor
8. Lamp control circuit : Controlling F&R room lamp
9. PLC circuit : Power Line Communication Circuit
10. Display communication circuit (UART) and Dispenser lever, H/B, Door switch signal
11. Sensor circuit : sensing several sensors signal.
12. EEPROM : memory for data saving.
13. Cool Select Zone control circuit

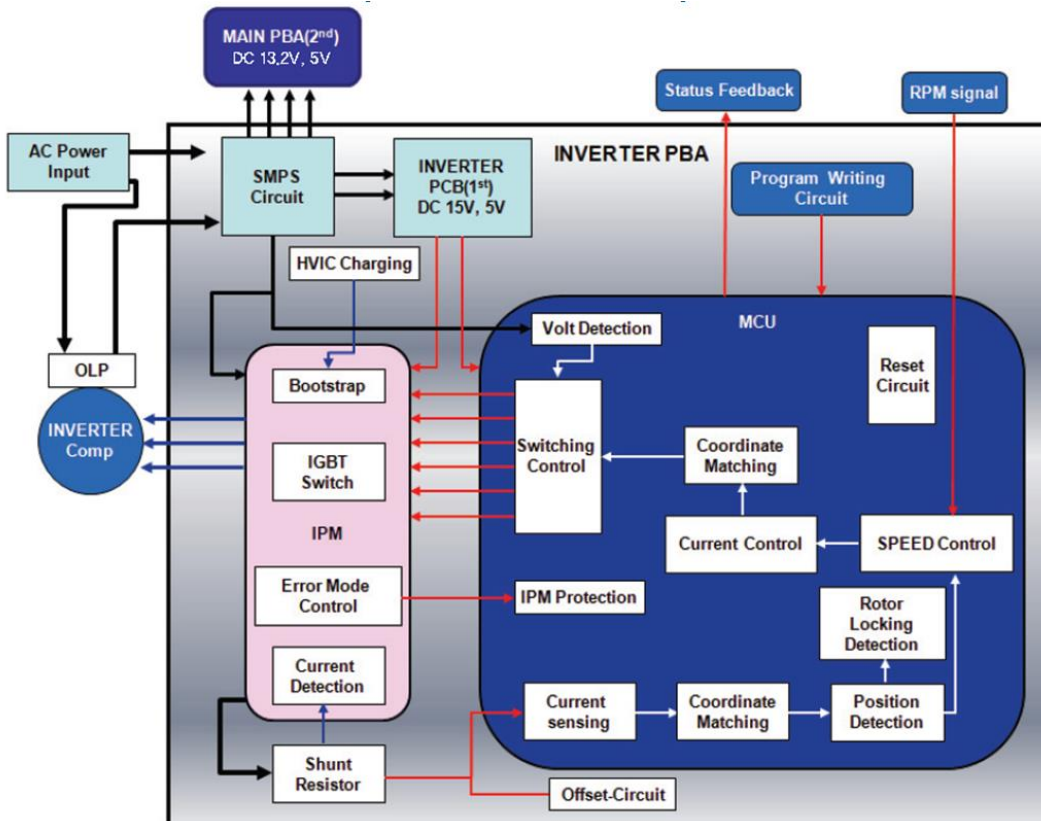
A. Diode option setting part



Inverter PCB



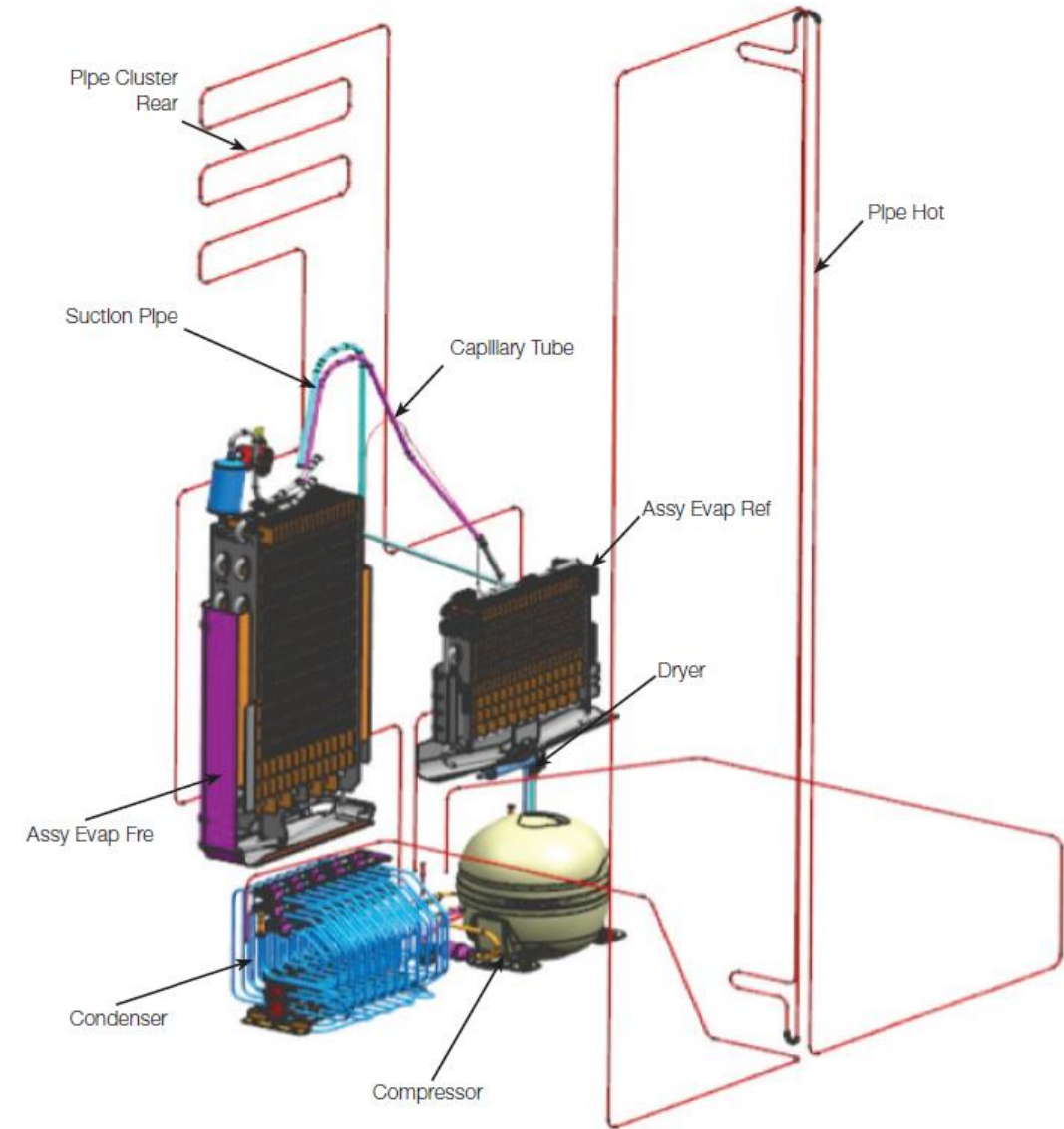
1. **PCB Power Supply** : From the SMPS circuit, it supplies 15V and 5V for the Main PBA control and supplies 15V and 5V to the inverter circuit for the Compressor control.
2. **Inverter Control Circuit** : Fridge Compressor Control Circuit.
3. **COMP Driving / Feedback Circuit** : It receives the COMP operation signals from the Main PBA and feedbacks the inverter errors to the Main PBA.
4. **BOOTSTRAP Charger** : It is an independent power circuit for the driving of the IMP High-Phase IGBT.
5. **Current Pickup Circuit** : It pickups the currents taken by the Shunt resistance and does the PWM DUTY control.
6. **IPM (FNE41060)**
7. **Micom (MN103SFC2D)**



If the Failure Condition is detected while the compressor is operating, stop the Compressor operating immediately and wait for 5 minutes. During these 5 minutes, the RPM command signal is not available. Even if the RPM command that orders the compressor to run is sent, the compressor does not work and keep standing by.

The LED is tuned on for 1 second and then off for 2 seconds.

LED Blinking Frequency	Protecting Functions	Remarks
	Normal Operation	N/A
	Starting Failure	1. Check the COMP terminals short(U,V,W) 2. Check IPM Pins short of Inverter PBA
	SPM Fault	3. Check IPM operating Voltage(under DC 13.5V) 4. Other cases, check the COMP, cycle, etc.
	Abnormal Current Detection	1. Check COMP wire connections(U,V,W) 2. Check PCB Bottom side soldering state 3. Other cases, check the COMP, cycle, etc.
	Motor Locked / Over RPM	1. Check PCB Bottom side soldering state. 2. Check Input voltage oscillation 3. Other cases, check the COMP, cycle, etc.
	Under Voltage	1. Check input voltage under AC 53V(Input Power AC110~127V) or AC 106V(Input Power AC 220 ~ 240V) 2. Check PCB Bottom side soldering state.
	Over Voltage	1. Check input voltage over AC 155V(Input Power AC110~127V) or AC 310V(Input Power AC 220 ~ 240V) 2. Check PCB Bottom side soldering state.



Wiring Diagram

