



Fast Track Troubleshooting

Model:
RS25J500D*



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>

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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)

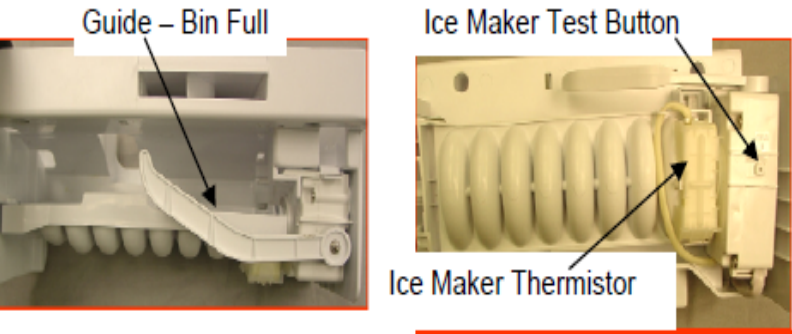


FLEX TRAY Ice Makers

When the initial power is applied, the ice tray will stand by for 2 hours. After the 2-hour standby time, the Ice Maker Sensor will check the temperature , when it is lower than 1.5°F for more than 5 minutes, it will do a harvest, with or without ice in the tray, then fill with water. 58 minutes after water is supplied to the Ice Tray, the Ice Maker Sensor temperature will be checked. When the Ice Maker Sensor maintains lower than 1.5°F for 5 minutes, it completes the harvest (if the ice bin is not sensed as full). Thermistor senses temperature to determine water fill on newer units

Filling the tray

After the water fill is completed, the ice maker sensor will evaluate the water volume one and a half minutes later. When it detects no or low water level, it will add more water. First supply time will be 1.5 sec, next one will be 1 sec and the last will be 2 sec.



Shattered Ice – Flex Tray

When all ice shatters, it's because of a bad tray or ice cube temp that is too cold (lower than -5 degrees). In some areas, there are water issues that can also cause shattered cubes. The temp in the freezer should not have any effect on this issue, as long as it's below 1.5 degrees F, as a properly installed sensor will not read the freezer temp, only the water/ice temp. Check the Ice tray for defects in the plastic. Ice that is too cold will shatter during harvest. This can be from the (1) sensor not reading the correct temp (2) or the sensor not mounted correctly (3). By programming the icemaker offset value to a lower number (4), the board not understanding the reading. To check the sensor, you must check the tray temp (not air temp) and compare it to the sensor reading. The sensor should read 3.7 volts at the main board connector when the cube temperature is 1 degree. After the fill, the sensor will read water temp 1.5 to 2.2 volts. To clear offsets, put unit into Diagnostics mode. Please note, some shattering is normal for a flex tray icemaker.

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

Press both buttons simultanequely for 8 seconds



If any LEDs blink, the corresponding sensors and components must be checked for an error.

* Self-diagnostics check list

NO	Error	LED Display
①	ICE MAKER SENSOR	Right - ① LED ON
②	MAIN PANEL COMMUNICATION ERROR	Right - ② LED ON
③	COMP ERROR	Right - ③ LED ON
④	REFRIGERATOR SENSOR	Right - ④ LED ON
⑤	Damper Heater Error	Right - ⑤ LED ON
⑥	ICE MAKER FUNCTION ERROR	Right - ⑦ LED ON
⑦	EXIT-SENSOR	Left - ① LED ON
⑧	FREEZER SENSOR	Left - ② LED ON
⑨	FREEZER DEFROST SENSOR	Left - ③ LED ON
⑩	FREEZER FAN ERROR	Left - ④ LED ON
⑪	CONDENSER FAN ERROR	Left - ⑤ LED ON
⑫	FREEZER DEFROST ERROR	Left - ⑦ LED ON

Error items of self-diagnostics

NO	Error items	Details	How to Self-Diagnose
01	ICE MAKER SENSOR	Ice Maker sensor connector missing; contact failure, electric wire cut, shortcircuit; Ice Maker sensor failure; and so on	The voltage should be within the range of 4.5V ~ 1.0V between MAIN PCB CN90 #3 and #8
02	MAIN PANEL COMMUNICATION ERROR	Blinking all panel icon with alarm. Communication Error between main micom and panel micom	It needs a Oscilloscope to do the error check. So, it is more realistic checking the error after replacing Main or Panel PCB.
03	Compressor Error	When the Compressor falls starting When there is a IPM Fault error When there is abnormal crurrent detected at the Compressor When there is a Compressor restriction error When there is a low voltage error When there is a over voltage error	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 1. Check COMP wire connections(U,V,W) 2. Check PCB Bottom side solder(R1) 3. Other cases check the COMP cycle etc 1. Check COMP wire connections(U,V,W) 2. Check PCB Bottom side solder(R1) 3. Other cases check the COMP cycle etc 1. Check Input voltage under AC 53V(if Input Power is AC110~127V) or AC 106V(if Input Power is AC 220~240V) 2. Short resistor R312(DC link resistor) The voltage should be 7V~12V between MAIN PCB CN75 #3(ORANGE) and #10(GRAY).
04	REFRIGERATOR SENSOR	Refrigerator sensor connector missing ; contact failure, electric wire cut, short-circuit ; Refrigeratorsensor itself failure; and so on	The voltage should be within the range of 4.5V ~ 1.0V between MAIN PCB CN30 #5 and #7
05	Damper Heater Error	Damper Heater is sensed as open error due to Connector Slipped-Out or Open-Contact, Wire Cut.	Disconnect MAIN PCB CN76 from PCB, and read the resistance between Black and Brown wire terminals (Refer to the Wire Diagram for the resistance value). 0 Ohm ∞ Heater Short Ohm ∞ Wire Cut or Slipped-out Terminal.
06	ICE MAKER function ERROR	Ice-ejector and level failed three times or more	Push the test button on an I/M Ass'y and It should work.
07	Ambient Air SENSOR	Air sensor connector missing ; contact failure, electric wire cut, short-circuit; open air sensor itself failure; and so on	The voltage should be within the range of 4.5V ~ 1.0V between MAIN PCB CN30 #1 and #2
08	FREEZER SENSOR	Freezer sensor connector missing ; contact failed, electric wire cut, shortcircuit ; Freezer Room sensor itself failure	The voltage should be within the range of 4.5V ~ 1.0V between MAIN PCB CN30 #3 and #7
09	FREEZER DEFROST SENSOR	Freezer evaporator defrosting sensor connector missing; contact failure, electric wire cut, shortcircuit ; sensor itself failure; and so on	The voltage should be within the range of 4.5V ~ 1.0V between MAIN PCB CN30 #4 and #7
10	FREEZER FAN ERROR	Freezer Fan motor operation failure; feedback signal line contact failure, motor's electric wire missing; and so on.	The voltage should be 7V~12V between MAIN PCB CN75 #1(GRAY) and #4(YELLOW).
11	CONDENSER FAN ERROR	Condenser Fan motor operation failure; feedback signal line contact failure, motor's electric wire missing; and so on.	The voltage should be 7V~12V between MAIN PCB CN75 #1(GRAY) and #2(SKY BLUE).
12	FREEZER DEFROST ERROR	In the freezer room, if frost removal mode is finished due to limited time of 70 minutes. Error is displayed	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.

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

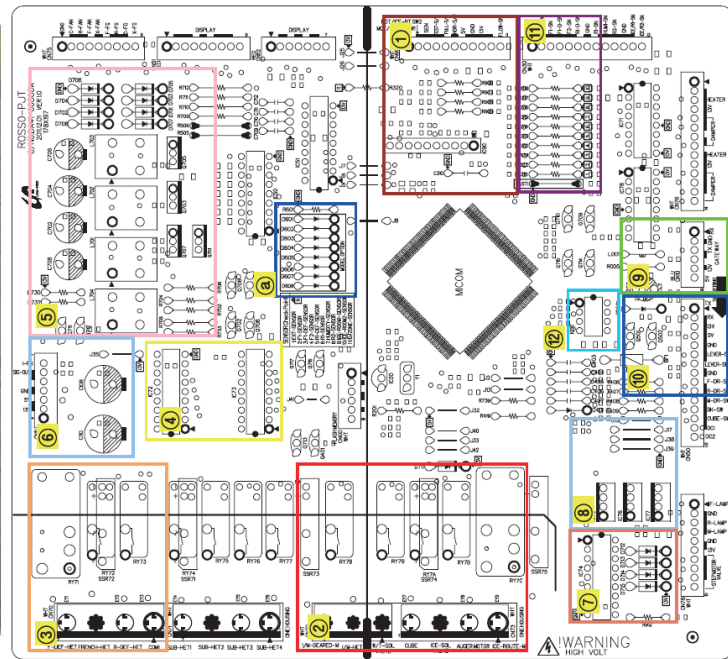
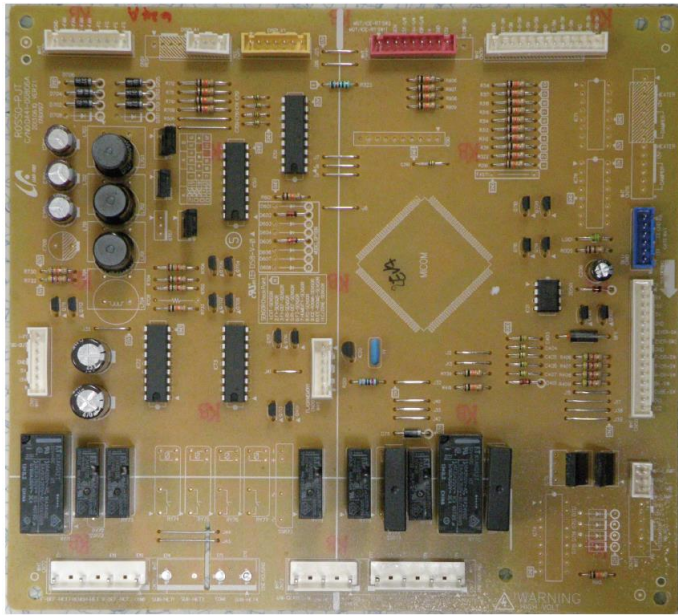


- Load Mode Check List

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	
7	ICE FULL	Bucket Ice Full	Fridge first digit d	Fridge (first) 8
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	
14	DISPENSER HEATER	Dispenser Heater On	Freezer second digit g	Fridge (first) 8
15	C-ROOM BOX-FAN	C-ROOM BOX-FAN ON	Fridge first digit c	
16	NORMAL CONDITIONS	⑤ & ⑥ All Off(22~33°C)	Fridge second digit e,f LED all Off	Fridge (second) 8
17	SHOWCASE DOOR HEATER	SHOWCASE DOOR HEATER ON	Freezer First Digit e	Freezer (first) 8

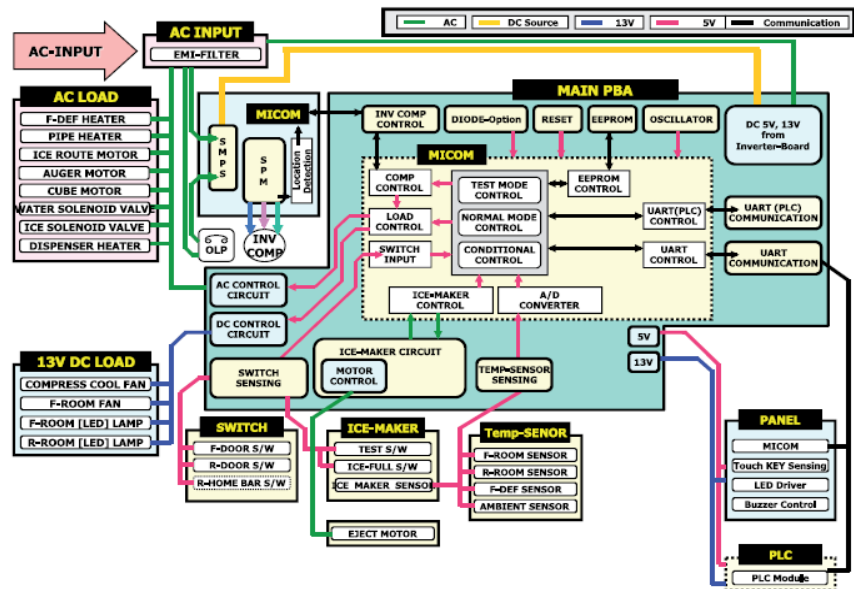
- ※ The FREEZER FAN and CONDENSER FAN are operated to Highest/High/Low rpm automatically according to the operational condition.
- ※ ② and ③ only explain the system operation state according to the ambient condition

Main PCB

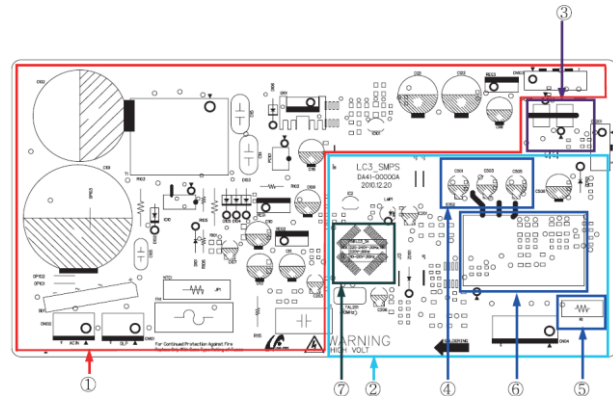


1. SMPS Circuit : Not used.
2. Ice Maker Circuit : Receiving the data of sensor, Hall S/W, Ice Route Micro S/W
3. Ice Maker Control Circuit : Controlling AC Load like motor, solenoid, heater related to ice making
4. Heater Control : Relays for F/R-def-heater, R-H/B-heater, Pipe-heater, Dispenser-heater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

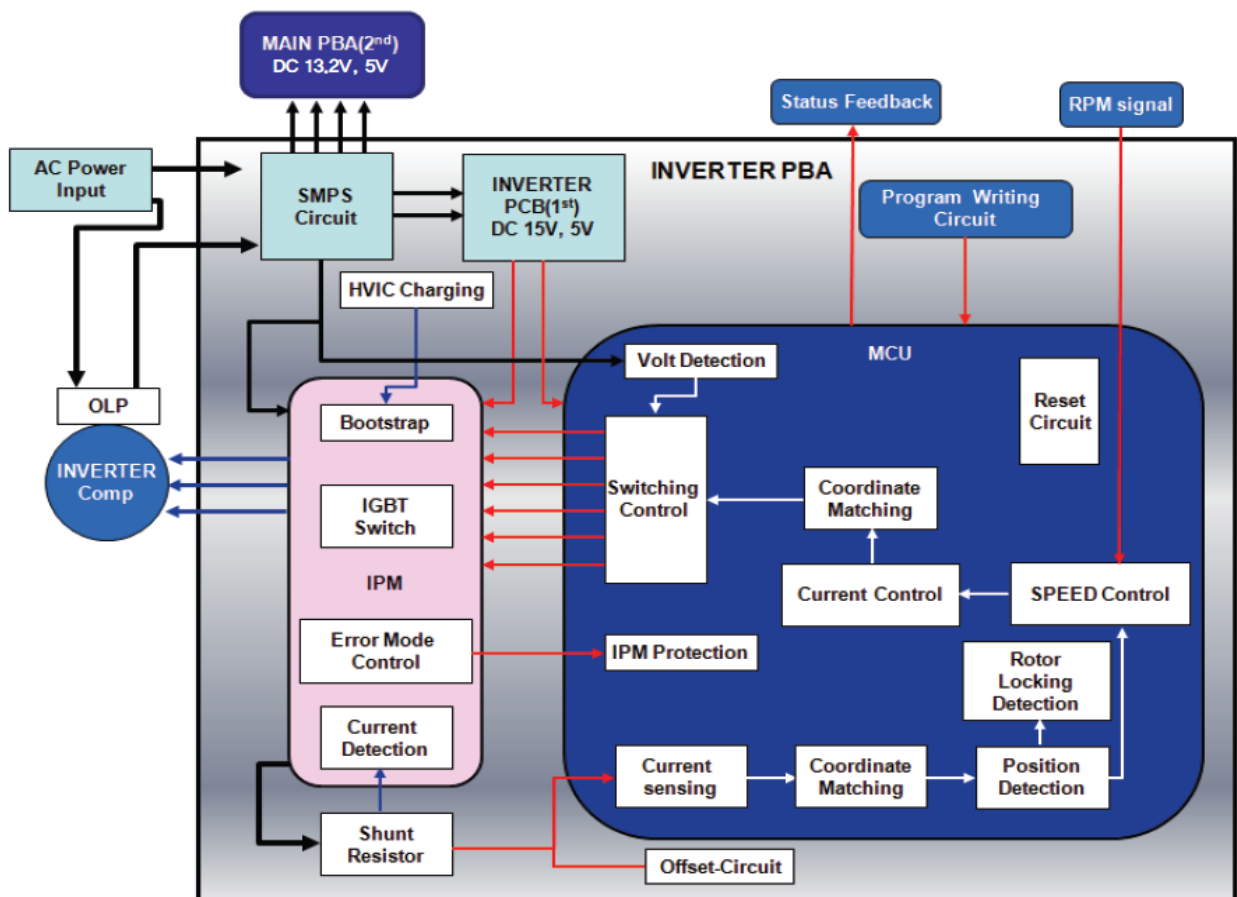
A. Diode option setting part



Inverter PCB



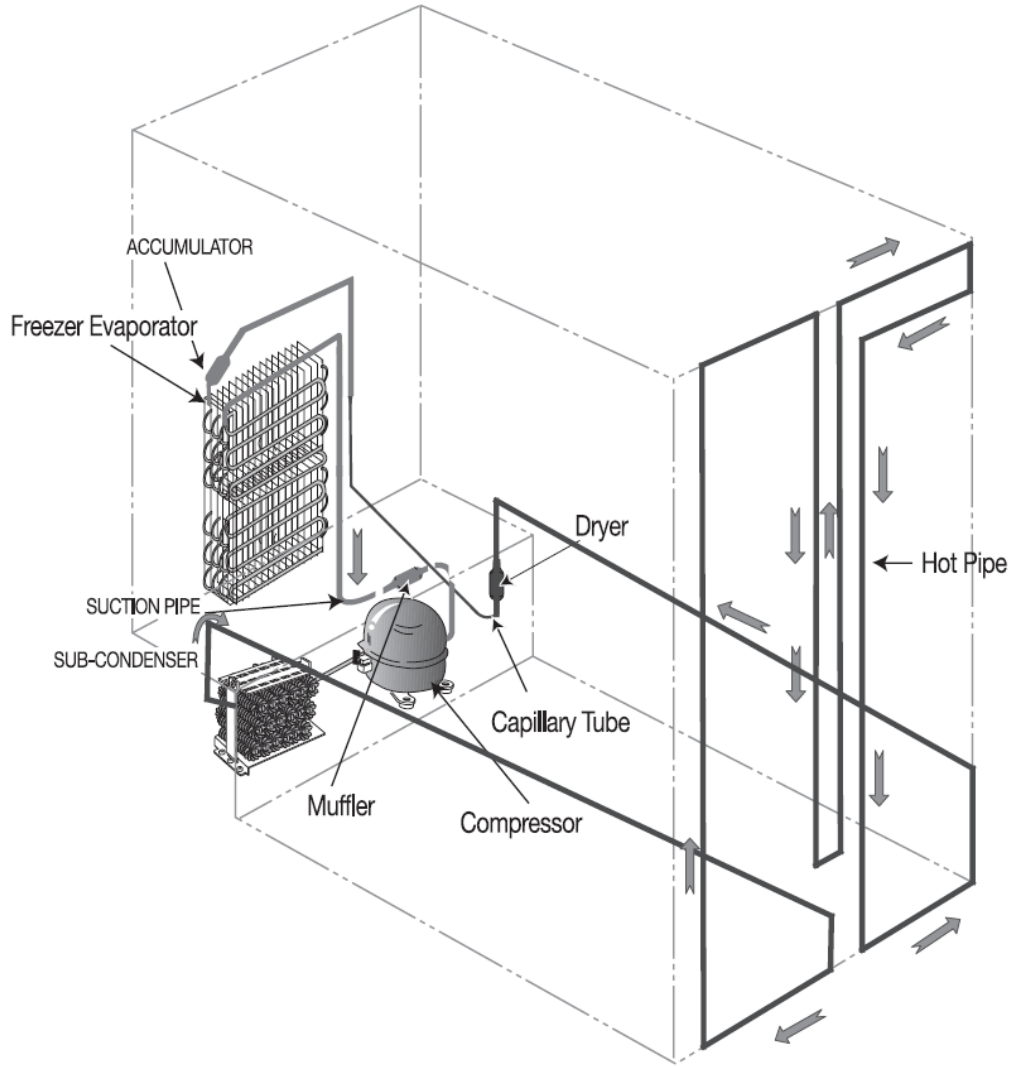
1. PCB Power Supply : From the SMPS circuit, it supplies 15V and 5V for the Main PBA control and supplies 15V and 5V to the Inverter circuit for the Compressor control.
2. Inverter Control Circuit : Fridge Compressor Control Circuit.
3. COMP Driving / Feedback Circuit It receives the COMP operation signals 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.

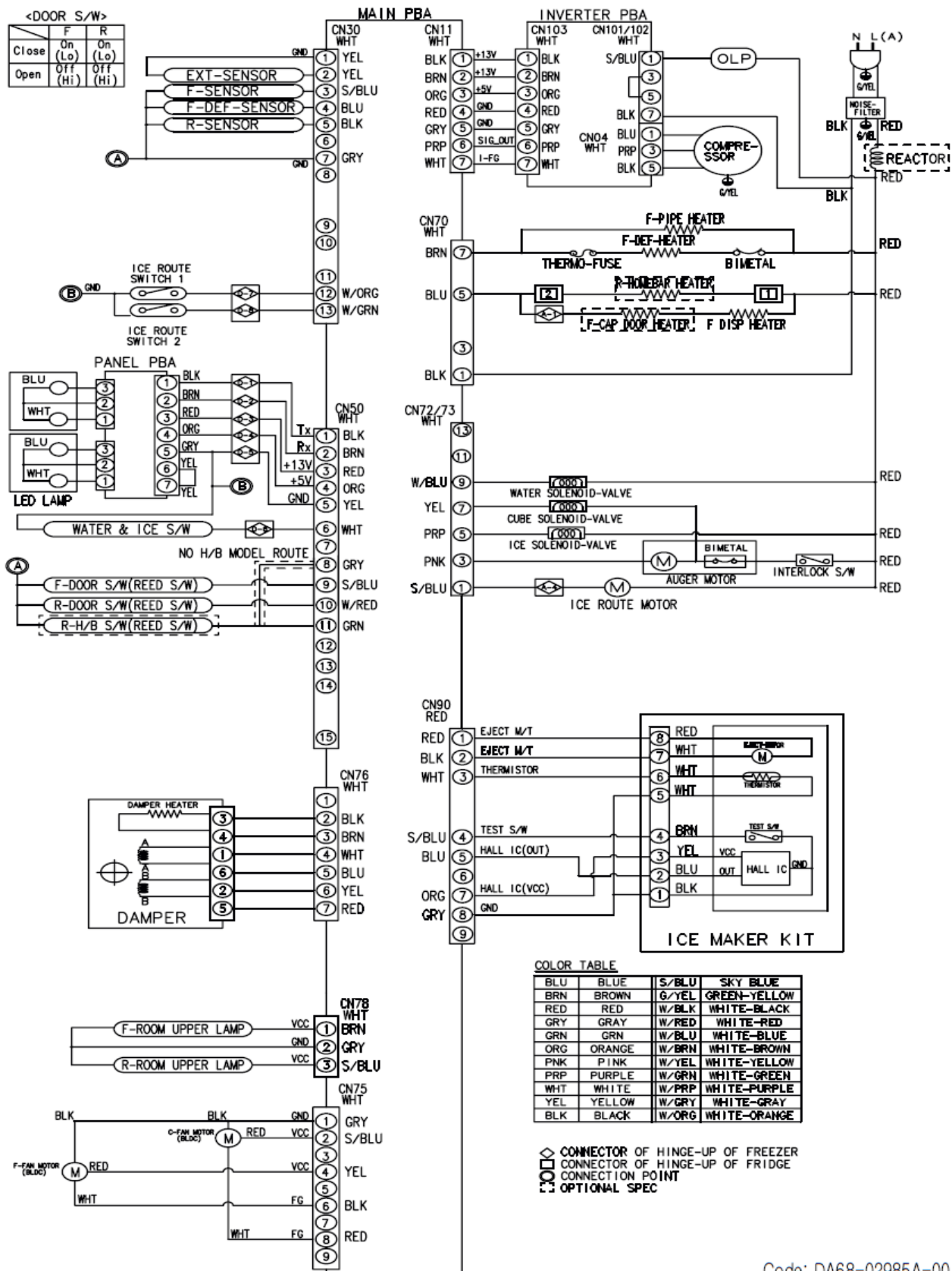
The LED is tuned on for 1 second and then off for 2 seconds.

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 3. Check IPM operating Voltage(under DC 13.5V) 4. Other cases, check the COMP, cycle, etc.
	SPM Fault	1. Check COMP wire connections(U,V,W) 2. Check PCB Bottom side soldering state 3. 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

RS5000HA-1EVAP



Code: DA68-02985A-00