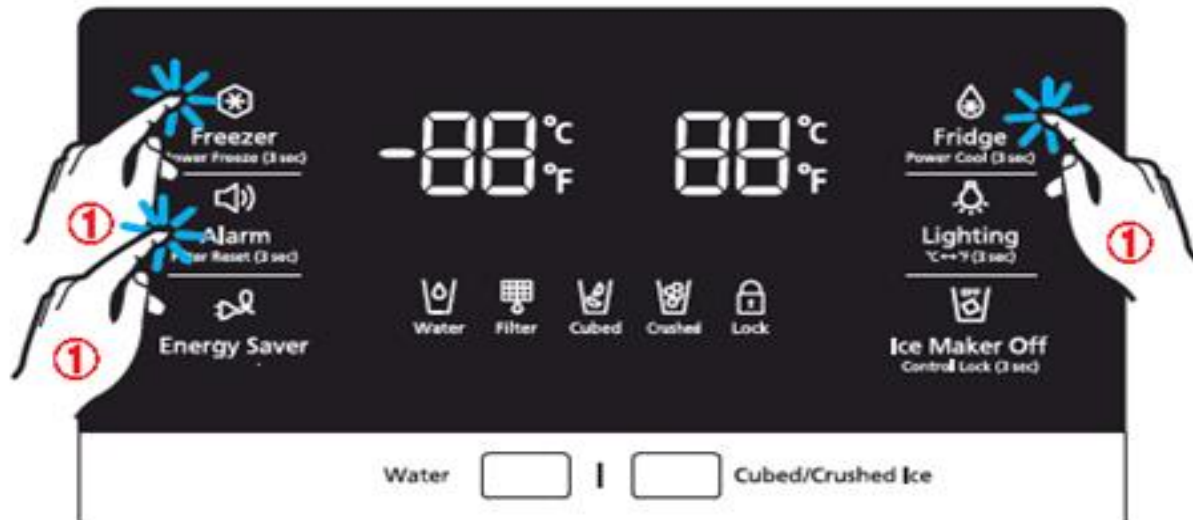


## Service Mode Access

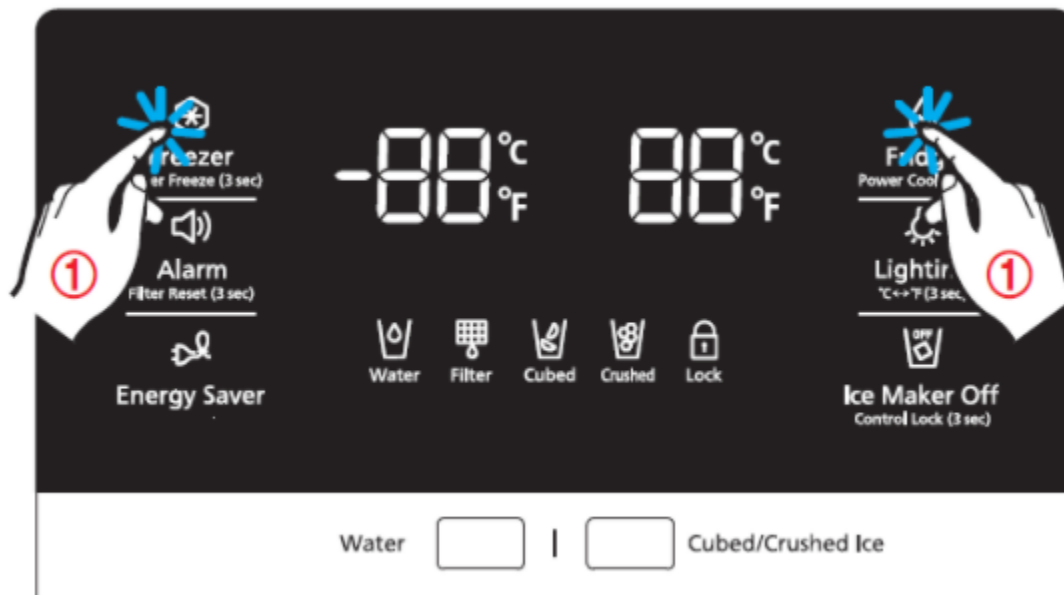
### Sales Mode (Demo Mode)

- No Heating or Cooling. No compressor Operation.
- Press Freezer + Fridge + Alarm buttons simultaneously for 3 seconds ( You will hear a Ding Dong ) to remove or put into sales mode.
- When in the sales mode, the display will show "O-FF" Removing power will not cancel this mode.



### Self Diagnosis

- Press Freezer and Fridge buttons simultaneously for 8-12 seconds, until the display quits blinking and beeps, then release the buttons and read Fault codes. ( Note: there will be no sound when both buttons are pressed at the same time )
- This will also cancel the fault code being displayed at start up if any.



## Service Mode Access

### Self Diagnosis continued

| LED |   | Item                       | Trouble contents                                                                                                                                                                                                                                                                | Diagnostic method                                                                                                                                                                                                                         |
|-----|---|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| F   | R |                            |                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                           |
| 1   | E | FZ-Sensor Error            | Display error : separation of sensor housing part, contact error, disconnection, short circuit.<br>Display error of detecting temperature of sensor : more than 149°F(+65°C) or less than -58°F(-50°C)                                                                          | The voltage of MAIN PCB CN30- "3" N76- "1": shall be between 4.5V~1.0V                                                                                                                                                                    |
| 2   |   | FF-Sensor Error            |                                                                                                                                                                                                                                                                                 | The voltage of MAIN PCB CN30- "6" N76- "1": shall be between 4.5V~1.0V                                                                                                                                                                    |
| 4   |   | FZ-DEF-Sensor Error        |                                                                                                                                                                                                                                                                                 | The voltage of MAIN PCB CN30- "5" N76- "1": shall be between 4.5V~1.0V                                                                                                                                                                    |
| 5   |   | FF-DEF-Sensor Error        |                                                                                                                                                                                                                                                                                 | The voltage of MAIN PCB CN30- "8" N76- "1": shall be between 4.5V~1.0V                                                                                                                                                                    |
| 6   |   | Ambient-Sensor Error       |                                                                                                                                                                                                                                                                                 | The voltage of MAIN PCB CN78- "8" CN78- "12": shall be between 4.5V~1.0V                                                                                                                                                                  |
| 7   |   | Flex room-Sensor Error     |                                                                                                                                                                                                                                                                                 | The voltage of MAIN PCB CN78- "9" CN76- "1": shall be between 4.5V~1.0V                                                                                                                                                                   |
| 13  |   | Humidity-Sensor Error      | Separation of sensor housing part, contact error, disconnection, short circuit                                                                                                                                                                                                  | The voltage of MAIN PCB CN30- "1" CN30- "7": shall be between 4.5V~1.0V                                                                                                                                                                   |
| 14  | E | Ice Maker(FF) Sensor Error | Display error : separation of sensor housing part, contact error, disconnection, short circuit.                                                                                                                                                                                 | The voltage of MAIN PCB CN90- "1" ↔ CN90- "7": shall be between 4.5V~1.0V                                                                                                                                                                 |
| 15  |   | Ice Room Sensor Error      | Display error of detecting temperature of sensor : more than 149°F(+65°C) or less than -58°F(-50°C)                                                                                                                                                                             | The voltage of MAIN PCB CN78- "10" CN78- "1": shall be between 4.5V~1.0V                                                                                                                                                                  |
| 21  |   | FZ-FAN Error               | Display error during operation of applicable fan motor : Feed back signal line contact error, motor wire separation, motor error                                                                                                                                                | The voltage of MAIN PCB CN76- "3"(Yellow) ↔ CN76- "1"(Gray): shall be between 7V~12V                                                                                                                                                      |
| 22  |   | FF-FAN Error               | Display error during operation of applicable fan motor : Feed back signal line contact error, motor wire separation, motor error                                                                                                                                                | The voltage of MAIN PCB CN76- "4"(Orange) ↔ CN76- "1"(Gray): shall be between 7V~12V                                                                                                                                                      |
| 23  |   | C-FAN Error                | Display error during operation of applicable fan motor : Feed back signal line contact error, motor wire separation, motor error                                                                                                                                                | The voltage of MAIN PCB CN76- "5"(Sky-blue) ↔ CN76- "1"(Gray): shall be between 7V~12V                                                                                                                                                    |
| 24  | E | FZ-DEF Error               | Separation of freezer compartment defrost heater housing part, contact error, disconnection, short circuit or temperature fuse error. Display error : the defrosting does not finish though freezer compartment defrost is heating continuously for more than 70 minutes.       | After separating MAIN PCB CN70 wire from PCB, resistance value between CN70 Brown ↔ CN70 Gray shall be 63(230) ohm ± 7%.<br>(Resistance value is varied by input power) 0 ohm : heater short, ∞ ohm : wire/bimetal open (Must power off)  |
| 25  |   | FF-DEF Error               | Separation of fresh food compartment defrost heater housing part, contact error, disconnection, short circuit or temperature fuse error. Display error : the defrosting does not finish though fresh food compartment defrost is heating continuously for more than 80 minutes. | After separating MAIN PCB CN70 wire from PCB, resistance value between CN70 White ↔ CN70 Gray shall be 120(440) ohm ± 7%.<br>(Resistance value is varied by input power) 0 ohm : heater short, ∞ ohm : wire/bimetal open (Must power off) |

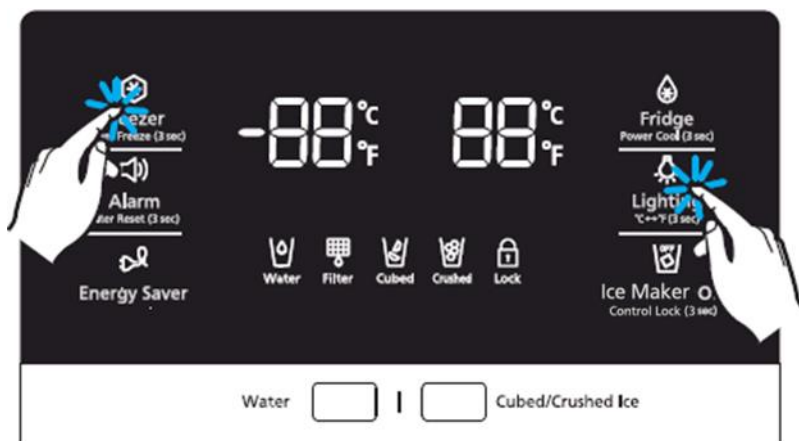
## Service Mode Access

### Self Diagnosis continued

|    |   |                                           |                                                                                                                                                                       |                                                                                                                                                                                                                                         |
|----|---|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 27 | E | Flex Zone-Damper-Heater Error             | Display error when open error is detected by damper heater : separation of Damper Heater housing part, contact error, disconnection, short circuit.                   | After separating MAIN PCB CN77 wire from PCB, resistance value between Black ↔ Brown wire shall be 135 ohm ± 7%.<br>0 ohm : heater short, ∞ Ohm : wire / bimetal Open.                                                                  |
| 39 |   | Ice Maker(FF) Function Error              | Display error when open error is detected by Heater : separation of Ice Pipe Heater housing part, contact error, disconnection, short circuit.                        | After changing the Ice Maker(R), plug the refrigerator power code again, and check the operation.                                                                                                                                       |
| 40 |   | Ice Room-FAN Error                        | Display error when the Ice Maker(FZ) kit operate moving ice over 3 times or it is not leveled.                                                                        | The voltage of MAIN PCB CN76-"2"(Black) ↔ CN76-"1"(Gray): shall be between 7V~12V                                                                                                                                                       |
| 41 |   | Display ↔ Main Mycom Communicati on Error | Main mycom ↔ Display "41-E" message and make a buzzing sound when the communication between displays does not work.                                                   | Actually, If there is not a problem, it is desirable to replace Main and Panel PCB With the oscilloscope after a cable problem confirming.                                                                                              |
| 61 | E | Ice Duct Heater Error                     | Display error when open error is detected by ice duct heater : separation of Ice Duct Heater housing part, contact error, disconnection, short circuit.               | After separating MAIN PCB CN70 wire from PCB, resistance value between CN70 Brown ↔ CN70 Gray shall be 63(230) ohm ± 7%.<br>(Resistance value is varied by input power) 0ohm : heater short, ∞ ohm : wire/bimetal open (Must power off) |
| 65 |   | Ice Room Bucket Heater Error              | Display error when open error is detected by ice room bucket heater : separation of Ice Room Bucket Heater housing part, contact error, disconnection, short circuit. | After separating MAIN PCB CN79 wire from PCB, resistance value between Yellow ↔ Pink wire shall be 135 ohm ± 7%.<br>0 ohm : heater short, ∞ Ohm : wire / bimetal Open.                                                                  |
| 81 |   | Comp starting Failure Error               | When the Compressor fails starting                                                                                                                                    | Check if there is a short between compressor terminals. Check IPM Voltage [Under 13.5V] Check if there is a short between IPM Pins [#1~33] Check the Compressor and the Cycle                                                           |
| 82 |   | IPM Fault Error                           | When there is a IPM Fault error                                                                                                                                       |                                                                                                                                                                                                                                         |
| 83 |   | Comp Abnormal current Detection Error     | When there is abnormal current detected at the Compressor                                                                                                             | Check the Compressor connections<br>Check the voltage of Resistance of R308 [0.09Ohm] Check the Compressor and the Cycle                                                                                                                |
| 84 | E | Motor Locked Over RPM Error               | When there is a Compressor restriction error                                                                                                                          | Check the voltage of Resistance of R308 [Short/Open] Check the voltage of both of C103 terminals [Unstable Voltage] Check the Compressor and the Cycle                                                                                  |
| 85 |   | Comp under voltage Error                  | When there is a low voltage error                                                                                                                                     | Check the voltage of Resistance of R513 [Short/Open]                                                                                                                                                                                    |
| 86 |   | Comp over voltage Error                   | When there is a over voltage error                                                                                                                                    | Check the voltage of Resistance of R501, R505, R509 [Short/Open]                                                                                                                                                                        |

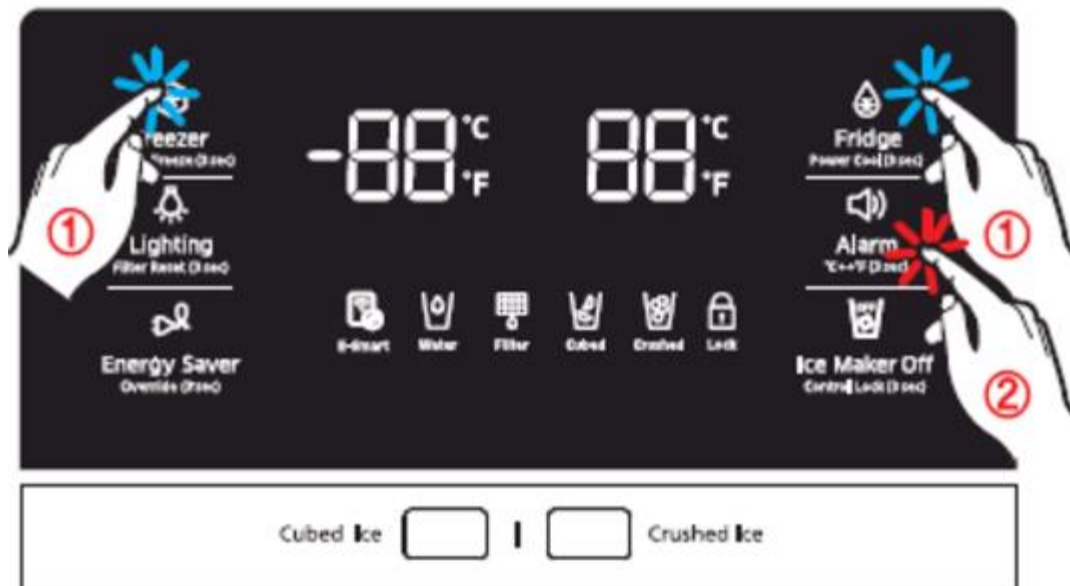
## Force Mode

- If Freezer Key + Lighting Key on the front of panel are pressed simultaneously for 8 seconds, it will be changed to the test mode and all displays on the front of panel will be off.
- If any key on the front of panel is pressed within 15 seconds after the test mode, it will be operated as below sequence : Manual operation1(FF) Manual operation2(OF r) -> manual defrost of fresh food compartments(rd) -> manual defrost of fresh and freezer compartments(Fd) -> cancel(Display all off)
- If any key on the front of panel is not pressed within 15 seconds after the test mode, the test mode will be canceled and it will be returned to previous mode.



## Load Mode

- If Freezer Key + Fridge Key are pressed simultaneously for 6 seconds, ALL ON/OFF will blink with 0.5 interval for 4 seconds.
- If take the finger off from above keys and press Alarm, load condition mode will be started.
- Load condition display function will maintain for 30 seconds and then normal condition will be returned automatically

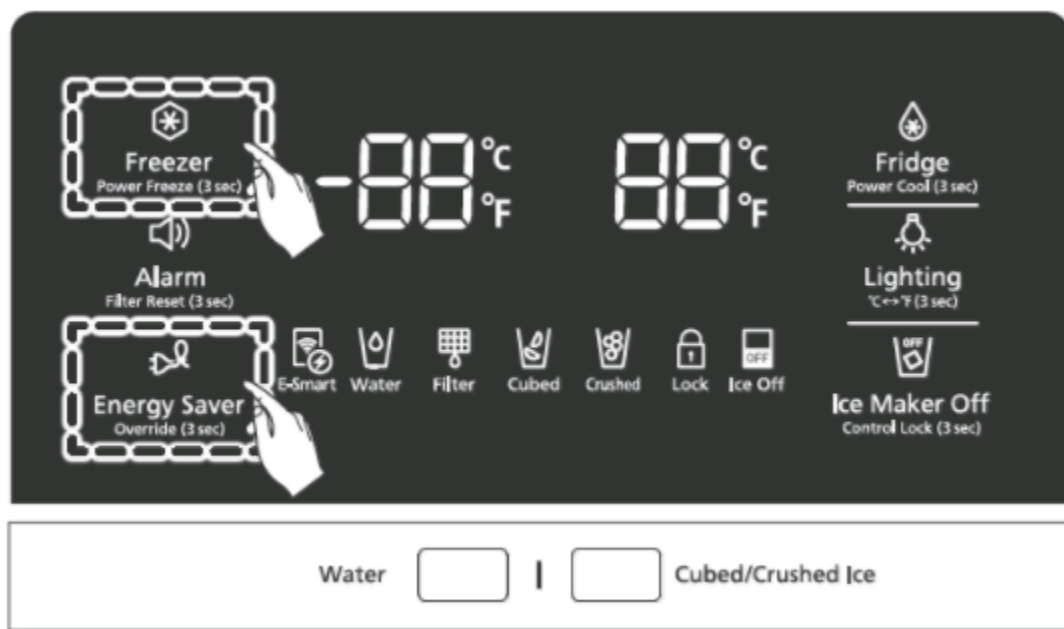


## Load Mode Continued

| Display LED              | Display contents               | Operation contents                                                     | Etc |
|--------------------------|--------------------------------|------------------------------------------------------------------------|-----|
| R-1-㉔                    | R-FAN High                     | When FF compartment FAN operates with high speed, applicable LED Blink |     |
| R-1-㉕                    | R-FAN Low                      | When FF compartment FAN operates with low speed, applicable LED Blink  |     |
| R-1-㉖                    | R-DEF Heater                   | When FF compartment defrost heater operates, LED Blink                 |     |
| R-1-㉗                    | START MODE                     | When refrigerator is plugged initially, LED Blink                      |     |
| R-1-㉘                    | Overload condition             | When ambient temperature is more than 93°F(35°C), LED Blink            |     |
| R-1-㉙                    | Low temperature condition      | When ambient temperature is less than 72°F(21°C), LED Blink            |     |
| R-1-㉚,㉛<br>(ALL LED Off) | Normal Condition               | When ambient temperature is between 73°F(22°C) and 91°F(34°C)          |     |
| R-1-㉜                    | Exhibition Mode                | LED Blink at the display mode.                                         |     |
| F-1-㉔                    | COMP.                          | When COMP operates, applicable LED Blink                               |     |
| F-1-㉕                    | F-FAN High                     | When FZ compartment FAN operates with high speed, applicable LED Blink |     |
| F-1-㉖                    | F-FAN Low                      | When FZ compartment FAN operates with low speed, applicable LED Blink  |     |
| F-1-㉗                    | F-DEF Heater                   | When FZ compartment defrost heater operates, LED Blink                 |     |
| F-1-㉘                    | C-FAN High                     | When C-FAN operates with high speed, applicable LED Blink              |     |
| F-1-㉙                    | C-FAN Low                      | When C-FAN operates with low speed, applicable LED Blink               |     |
| R-10-㉔                   | Damper Open                    | When damper open, applicable LED Blink                                 |     |
| R-10-㉖                   | I-DEFHEATER (Ice Maker HEATER) | When ice maker heater operates, LED Blink                              |     |
| R-10-㉗                   | Full Ice                       | When the Ice Maker's Bucket is full, applicable LED Blink              |     |
| F-10-㉔                   | Ice Room-FAN High              | When Ice Room-FAN operates with high speed, applicable LED Blink       |     |
| F-10-㉕                   | Ice Room-FAN Low               | When Ice Room-FAN operates with low speed, applicable LED Blink        |     |
| F-10-㉖                   | French Heater                  | When French Heater operates, applicable LED Blink                      |     |

## MAC Address Display Mode

- This function displays the MAC address of the Wi-Fi module on the refrigerator display.
- The refrigerator displays the MAC address of the Wi-Fi module for 1 minute.
  1. Press and hold the Freezer and Energy Saver buttons at the same time for 3 seconds.
  2. A Buzzer sounds. Four of the twelve Mac address of the Wi-Fi module are displayed in turns in the freezer and fridge temperature displays for 1 minute. For example, if the Wi-Fi module's MAC address is "11-22-33-44-55-66", the MAC address is displayed as follows:  
 "11 22" → "33 44" → "55 66" → ---- → "11 22" for 1 minute.
  3. After 1 minute, the display returns to the normal state and the Buzzer sounds again.
- If the Mac addresses are not available or there is no Wi-Fi module, '----' is displayed on the freezer and fridge temperature displays.



## **DC Fan Motor**

- Brush less 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.

## PBA Layout

### Main PBA

#### CN70 - AC LOAD

- ① : FF-DEF-HEATER
- ③ : FZ-DEF-HEATER
- ICE DUCT HEATER
- ⑤ : COMMON2 LINE(L)
- ⑦ : COMMON1 LINE(N)

#### CN70\_1 - AC LOAD

- ① : Main Valve
- ③ : ICE MAKER HEATER(FF)
- ⑤ : FRENCH-HEATER
- DISPENSER-HEATER

#### CN72 - AC LOAD

- ① : OPEN
- ③ : COMMON1 LINE(N)

#### CN73\_1 - AC LOAD

- ① : ICE WATER
- SOLENOIDE VALVE(FF)
- ③ : ICE COVER ROUTE
- ⑤ : Open
- ⑦ : Open

#### CN73 - AC LOAD

- ① : CUBE SOLENOIDE VALVE
- ③ : AUGER MOTOR
- ⑤ : WATER SOLENOIDE VALVE

#### CN78 - LAMP(LED)/Sensor

- ① : FZ LAMP(LED)
- ② : GND
- ③ : FF LAMP(LED)
- ④ : Open
- ⑤ : GND
- ⑥ : Open
- ⑦ : Open
- ⑧ : AMBIENT Sensor
- ⑨ : Open
- ⑩ : ICE ROOM Sensor
- ⑪ : +5V
- ⑫ : GND
- ⑬ : +12V

#### CN75 - Inverter

- ① : COMP. SIGNAL INPUT
- ② : +5V
- ③ : GND
- ④ : COMP. SIGNAL OUTPUT

#### CN50

- ① : LED PANEL TX
- ② : LED PANEL RX
- ③ : +12V
- ④ : +5V
- ⑤, ⑥ : GND
- ⑦ : ICE Switch
- ⑧ : WATER Switch
- ⑨ : ICE Route Switch 1
- ⑩ : ICE Route Switch 2

#### CN76 - BLDC Motor & door Switch

- ① : GND
- ② : Ice Room-FAN operation signal
- ③ : FZ-FAN operation signal
- ④ : FF-FAN operation signal
- ⑤ : C-FAN operation signal
- ⑥ : Ice Room-FAN signal input volt
- ⑦ : FZ-FAN signal input volt
- ⑧ : FF-FAN signal input volt
- ⑨ : C-FAN signal input volt
- ⑩ : GND
- ⑪ : FZ-Door Switch
- ⑫ : FF-Door Switch
- ⑬ : Mid DRAWER-DOOR Switch
- ⑭ : Open
- ⑮ : Open

#### CN51 - MID DRAWER ROOM DISPLAY

- ① : ICE Pipe Heater(FF) F/B
- ② : ICE Water Pipe Heater (FF)
- ③~④ : Mid Drawer Room LED Driver
- ⑤~⑥ : OPEN
- ⑦ : Mid Drawer Room Switch
- ⑧ : OPEN
- ⑨ : OPEN

#### CN79

- ① : +5V
- ② : GND
- ③ : Flow Sensor Out
- ④ : Test Switch(FF)
- ⑤ : Ice Water Pipe Heater(FZ)
- ⑥ : Open
- ⑦ : Ice Room Heater
- ⑧ : +12V
- ⑨ : +12V

#### CN77 - Damper & Valve

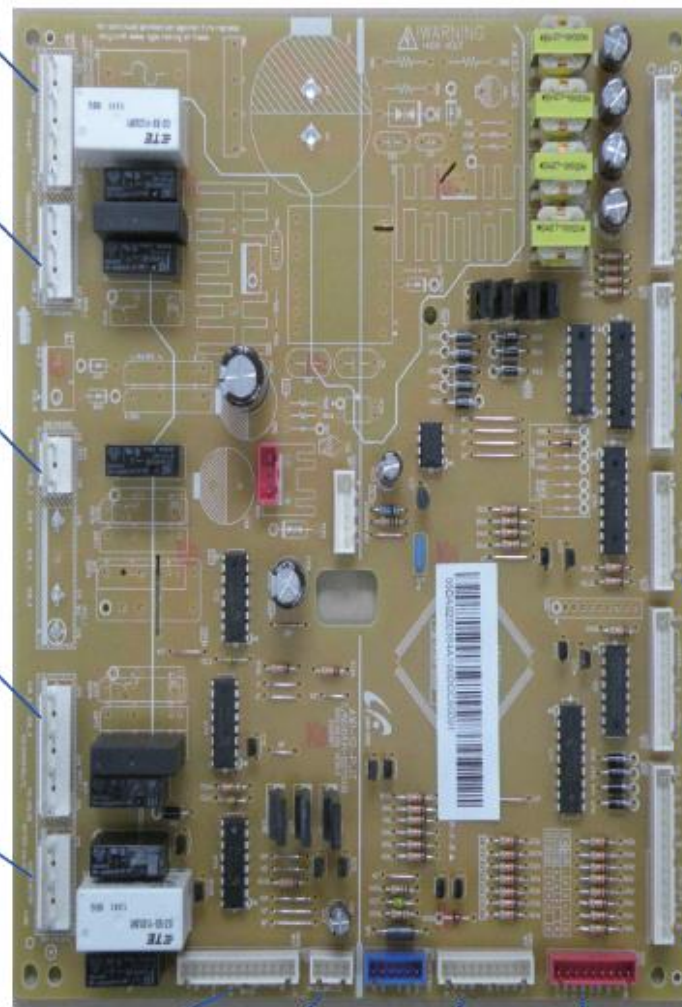
- ①~② : Damper Heater
- ③~⑥ : Damper Motor
- ⑦ : +12V
- ⑧~⑪ : Step Valve (Option)

#### CN90 - Ice Maker

- ① : Sensor(FF)
- ② : Motor Driver INB
- ③ : Horizontal Switch
- ④ : Motor Driver Vs2B
- ⑤ : +5V
- ⑥ : Open
- ⑦ : GND
- ⑧ : GND
- ⑨ : Sensor(FZ)
- ⑩ : Test Switch(FZ)
- ⑪ : Motor Driver INA
- ⑫ : Hall IC Output
- ⑬ : +5V
- ⑭ : GND

#### CN30 - Sensor

- ① : GND
- ② : +5V
- ③ : Humidity
- ④ : FZ-Sensor
- ⑤ : FZ-DEF-Sensor
- ⑥ : FF-Sensor
- ⑦ : IR-Sensor
- ⑧ : FF-DEF-Sensor
- ⑨ : Pantry Room-Sensor

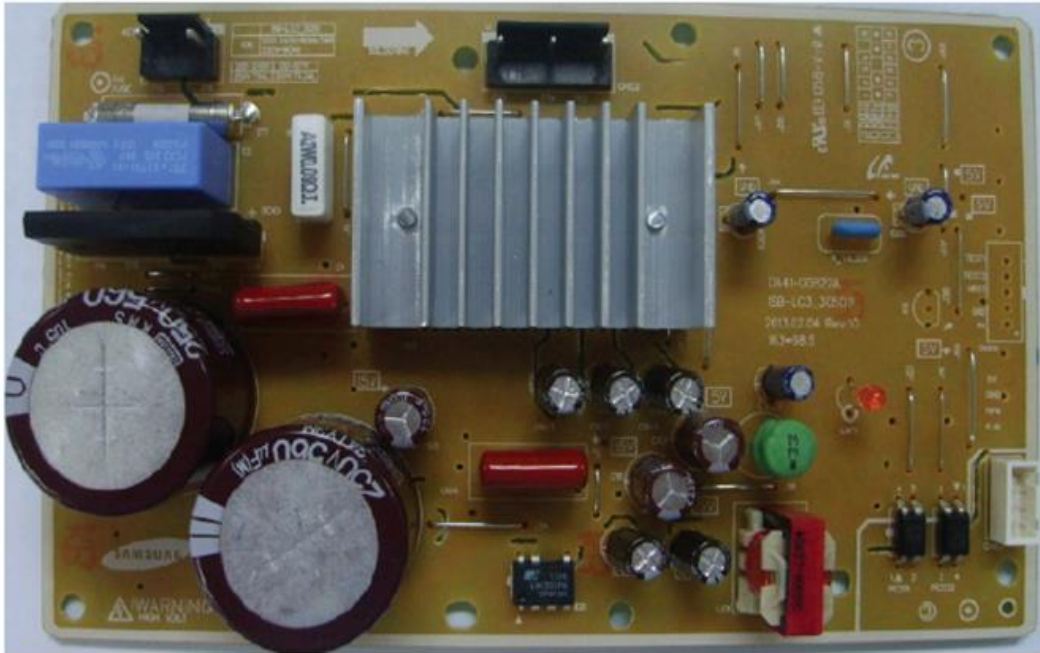


## PBA Layout

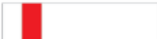
### Inverter PBA

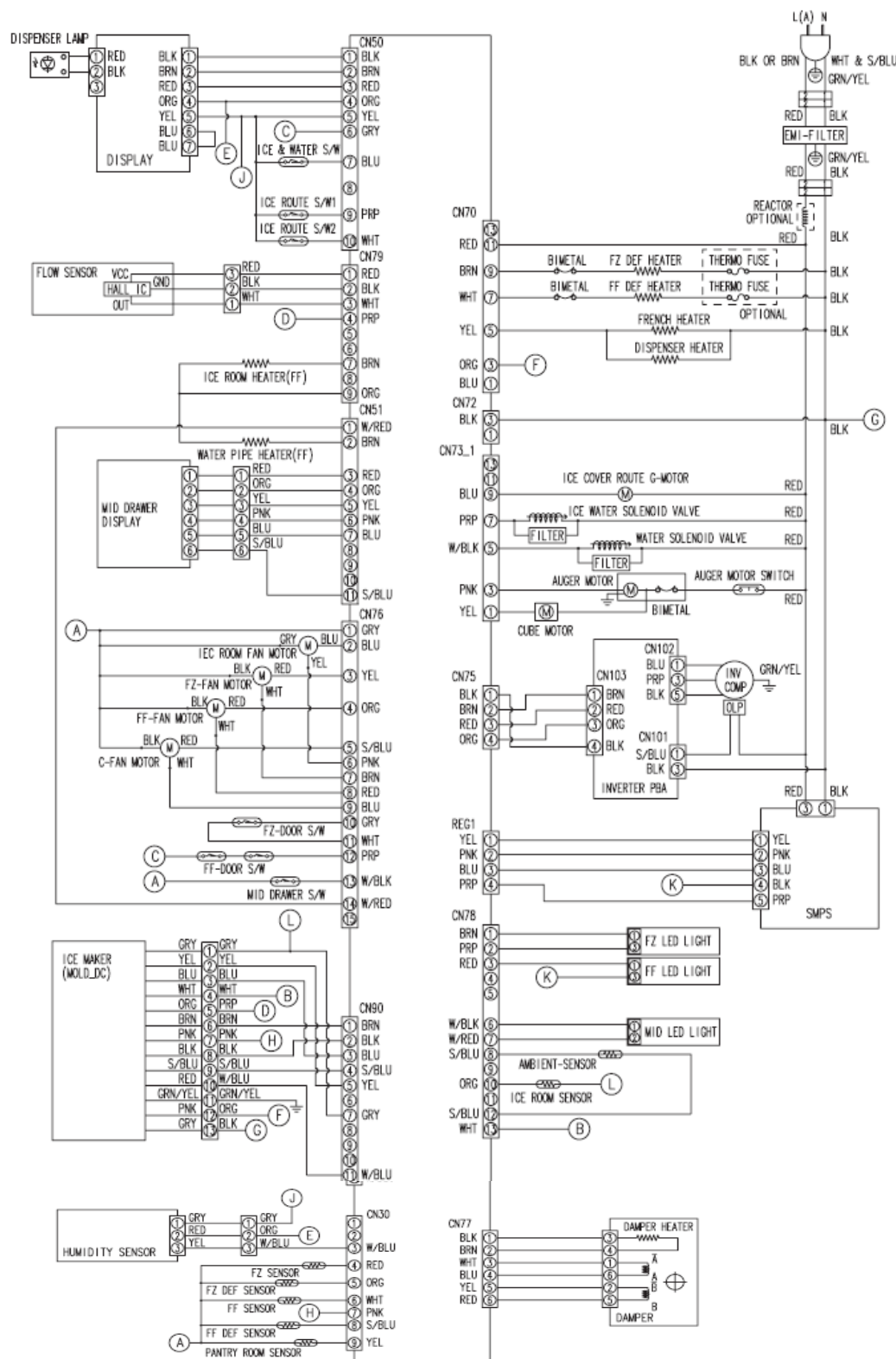
AC 115V

COMP



- ① : DC 5V
- ② : GND
- ③ : COMP. RPM
- ④ : COMP. Feedback

| LED Blinking Frequency                                                             | Protecting Functions       | Remarks                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Normal Operation           | N/A                                                                                                                                                                                                                       |
|  | Starting Failure           | 1. Short between COMP U, V, and W phase(CN04)<br>2. Short among IPM Pins(No. #1~26)                                                                                                                                       |
|  | SPM Fault                  | 3. Drop the IPM operating Voltage under DC 13.5V<br>4. Other cases, check the COMP, cycle, etc.                                                                                                                           |
|  | Abnormal Current Detection | 1. Open the COMP wire(CN102)<br>2. Bad condition of R 1(ex. Bad soldering)<br>3. Other cases, check the COMP, cycle, etc.                                                                                                 |
|  | Motor Locked / Over RPM    | 1. Operating the locked rotor COMP with in 5 seconds.<br>2. Operating the COMP under 1000RPM more than 5 seconds.<br>3. Occur the huge change of input voltage in a moment<br>4. Other cases, check the COMP, cycle, etc. |
|  | Under Voltage              | 1. Drop the input voltage under AC 53V<br>2. Short resistor R525(DC link resistor)                                                                                                                                        |
|  | Over Voltage               | 1. Increase the input voltage over AC 155V<br>2. Short resistor among R522, R523 and R524 (DC link resistor)                                                                                                              |



## Voltage / Resistance Conversion Table

| °C  | °F    | Voltage | Ω      | °C | °F    | Voltage | Ω     | °C | °F    | Voltage | Ω    |
|-----|-------|---------|--------|----|-------|---------|-------|----|-------|---------|------|
| -50 | -58   | 4.694   | 153319 | -5 | 23    | 3.107   | 16419 | 40 | 104   | 1.153   | 2997 |
| -49 | -56.2 | 4.677   | 144794 | -4 | 24.8  | 3.057   | 15731 | 41 | 105.8 | 1.124   | 2899 |
| -48 | -54.4 | 4.659   | 136798 | -3 | 26.6  | 3.006   | 15076 | 42 | 107.6 | 1.095   | 2805 |
| -47 | -52.6 | 4.641   | 129294 | -2 | 28.4  | 2.955   | 14452 | 43 | 109.4 | 1.068   | 2714 |
| -46 | -50.8 | 4.622   | 122248 | -1 | 30.2  | 2.904   | 13857 | 44 | 111.2 | 1.040   | 2627 |
| -45 | -49   | 4.602   | 115631 | 0  | 32    | 2.853   | 13290 | 45 | 113   | 1.014   | 2543 |
| -44 | -47.2 | 4.581   | 109413 | 1  | 33.8  | 2.802   | 12749 | 46 | 114.8 | 0.988   | 2462 |
| -43 | -45.4 | 4.560   | 103569 | 2  | 35.6  | 2.751   | 12233 | 47 | 116.6 | 0.963   | 2384 |
| -42 | -43.6 | 4.537   | 98073  | 3  | 37.4  | 2.700   | 11741 | 48 | 118.4 | 0.938   | 2309 |
| -41 | -41.8 | 4.514   | 92903  | 4  | 39.2  | 2.649   | 11271 | 49 | 120.2 | 0.914   | 2237 |
| -40 | -40   | 4.490   | 88037  | 5  | 41    | 2.599   | 10823 | 50 | 122   | 0.891   | 2167 |
| -39 | -38.2 | 4.465   | 83456  | 6  | 42.8  | 2.548   | 10395 | 51 | 123.8 | 0.868   | 2100 |
| -38 | -36.4 | 4.439   | 79142  | 7  | 44.6  | 2.498   | 9986  | 52 | 125.6 | 0.846   | 2036 |
| -37 | -34.6 | 4.412   | 75077  | 8  | 46.4  | 2.449   | 9596  | 53 | 127.4 | 0.824   | 1973 |
| -36 | -32.8 | 4.385   | 71246  | 9  | 48.2  | 2.399   | 9223  | 54 | 129.2 | 0.803   | 1913 |
| -35 | -31   | 4.356   | 67634  | 10 | 50    | 2.350   | 8867  | 55 | 131   | 0.783   | 1855 |
| -34 | -29.2 | 4.326   | 64227  | 11 | 51.8  | 2.301   | 8526  | 56 | 132.8 | 0.762   | 1799 |
| -33 | -27.4 | 4.296   | 61012  | 12 | 53.6  | 2.253   | 8200  | 57 | 134.6 | 0.743   | 1745 |
| -32 | -25.6 | 4.264   | 57977  | 13 | 55.4  | 2.205   | 7888  | 58 | 136.4 | 0.724   | 1693 |
| -31 | -23.8 | 4.232   | 55112  | 14 | 57.2  | 2.158   | 7590  | 59 | 138.2 | 0.706   | 1642 |
| -30 | -22   | 4.199   | 52406  | 15 | 59    | 2.111   | 7305  | 60 | 140   | 0.688   | 1594 |
| -29 | -20.2 | 4.165   | 49848  | 16 | 60.8  | 2.064   | 7032  | 61 | 141.8 | 0.670   | 1547 |
| -28 | -18.4 | 4.129   | 47431  | 17 | 62.6  | 2.019   | 6771  | 62 | 143.6 | 0.653   | 1502 |
| -27 | -16.6 | 4.093   | 45146  | 18 | 64.4  | 1.974   | 6521  | 63 | 145.4 | 0.636   | 1458 |
| -26 | -14.8 | 4.056   | 42984  | 19 | 66.2  | 1.929   | 6281  | 64 | 147.2 | 0.620   | 1416 |
| -25 | -13   | 4.018   | 40938  | 20 | 68    | 1.885   | 6052  | 65 | 149   | 0.604   | 1375 |
| -24 | -11.2 | 3.980   | 39002  | 21 | 69.8  | 1.842   | 5832  | 66 | 150.8 | 0.589   | 1335 |
| -23 | -9.4  | 3.940   | 37169  | 22 | 71.6  | 1.799   | 5621  | 67 | 152.6 | 0.574   | 1297 |
| -22 | -7.6  | 3.899   | 35433  | 23 | 73.4  | 1.757   | 5419  | 68 | 154.4 | 0.560   | 1260 |
| -21 | -5.8  | 3.858   | 33788  | 24 | 75.2  | 1.716   | 5225  | 69 | 156.2 | 0.546   | 1225 |
| -20 | -4    | 3.816   | 32230  | 25 | 77    | 1.675   | 5039  | 70 | 158   | 0.532   | 1190 |
| -19 | -2.2  | 3.773   | 30752  | 26 | 78.8  | 1.636   | 4861  | 71 | 159.8 | 0.519   | 1157 |
| -18 | -0.4  | 3.729   | 29350  | 27 | 80.6  | 1.596   | 4690  | 72 | 161.6 | 0.506   | 1125 |
| -17 | 1.4   | 3.685   | 28021  | 28 | 82.4  | 1.558   | 4526  | 73 | 163.4 | 0.493   | 1093 |
| -16 | 3.2   | 3.640   | 26760  | 29 | 84.2  | 1.520   | 4369  | 74 | 165.2 | 0.481   | 1063 |
| -15 | 5     | 3.594   | 25562  | 30 | 86    | 1.483   | 4218  | 75 | 167   | 0.469   | 1034 |
| -14 | 6.8   | 3.548   | 24425  | 31 | 87.8  | 1.447   | 4072  | 76 | 168.8 | 0.457   | 1006 |
| -13 | 8.6   | 3.501   | 23345  | 32 | 89.6  | 1.412   | 3933  | 77 | 170.6 | 0.446   | 978  |
| -12 | 10.4  | 3.453   | 22320  | 33 | 91.4  | 1.377   | 3799  | 78 | 172.4 | 0.435   | 952  |
| -11 | 12.2  | 3.405   | 21345  | 34 | 93.2  | 1.343   | 3670  | 79 | 174.2 | 0.424   | 926  |
| -10 | 14    | 3.356   | 20418  | 35 | 95    | 1.309   | 3547  | 80 | 176   | 0.414   | 902  |
| -9  | 15.8  | 3.307   | 19537  | 36 | 96.8  | 1.277   | 3428  | 81 | 177.8 | 0.404   | 877  |
| -8  | 17.6  | 3.258   | 18698  | 37 | 98.6  | 1.253   | 3344  | 82 | 179.6 | 0.394   | 854  |
| -7  | 19.4  | 3.208   | 17901  | 38 | 100.4 | 1.213   | 3204  | 83 | 181.4 | 0.384   | 832  |
| -6  | 21.2  | 3.158   | 17142  | 39 | 102.2 | 1.183   | 3098  | 84 | 183.2 | 0.375   | 810  |

## Sealed System Diagram

