



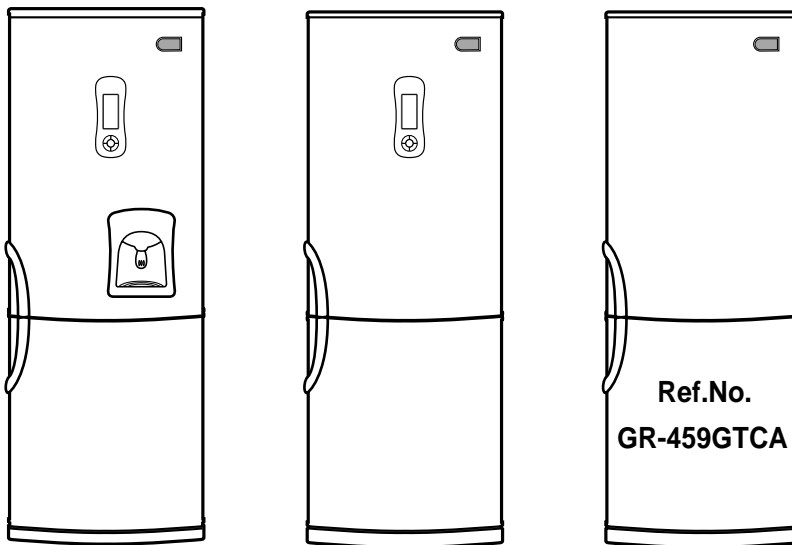
**LG**

<http://biz.lgservice.com>

# REFRIGERATOR

# SERVICE MANUAL

**CAUTION**  
BEFORE SERVICING THE UNIT, READ THE "SAFETY  
PRECAUTIONS" IN THIS MANUAL.



**MODEL: GR-459GTCA**

**COLOR : TITANIUM**

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# SAFETY PRECAUTIONS

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Please read the following instructions before servicing your refrigerator.

1. Check the set for electric losses.
2. Unplug prior to servicing to prevent electric shock.
3. Whenever testing with power on, wear rubber gloves to prevent electric shock.
4. If you use any kind of appliance, check regular current, voltage and capacity.
5. Don't touch metal products in the freezer with wet hands. This may cause frostbite.
6. Prevent water from following onto electric elements in the mechanical parts.
7. When standing up after having checked the lower section of the refrigerator with the upper door open, move with care to avoid hitting the upper door.
8. When tilting the set, remove any materials on the set, especially the thin plates(ex. Glass shelf or books.)
9. When servicing the evaporator, wear cotton gloves. This is to prevent injuries from the sharp evaporator fins.
10. Leave the disassembly of the refrigerating cycle to a specialized service center. The gas inside the circuit may pollute the environment.
11. When you discharge the refrigerant, wear the protective safety glasses or goggle for eye safety.
12. When you repair the cycle system in refrigerator, the work area is well ventilated. Especially if the refrigerant is R600a, there are no fire or heat sources. (No smoking)

# SERVICING PRECAUTIONS

## Features of refrigerant (R600a)

- Achromatic and odor less gas.
- Flammable gas and the ignition (explosion) at 494°C.
- Upper/lower explosion limit: 1.8%~8.4%/Vol.

## Features of the R600a refrigerator

- Charging of 60% refrigerant compared with a R134a model
- The suction pressure is below 1bar (abs) during the operation.
- Because of its low suction pressure, the external air may flow in the cycle system when the refrigerant leak, and it causes malfunction in the compressor.
- The displacement of compressor using R600a must be at least 1.7 times larger than that of R134a.
- Any type of dryer is applicable (XH-5, 7, 9).
- The EVAPORATOR or any other cycle part that has welding joint is hidden in the foam. (If not hidden inside, the whole electric parts must be tested with the LEAKAGE TEST according to the IEC Standard.)
- The compressor has label of the refrigerant R600a.
- Only the SVC man must have an access to the system.

## Installation place

- Must be well ventilated.
- Must be 20 m<sup>3</sup> or larger.
- Must be no-smoking area.
- No ignitable factors must be present.

## Utilities

- Refrigerant cylinder (MAX NET 300g)
- Manometer
- Vacuum pump (600ℓ/min)
- Piercing Clamp
- Quick coupler
- Hoses (5m-1EA, 1m-3EA)
- LOKRING
- Portable Leakage detector (3g/yearℓ)
- Nitrogen cylinder (for leakage test)
- Concentration gauge

## Make sure before Servicing

- Refrigerant  
Confirm the refrigerant by checking Name Plate and the label on the compressor, after opening the COVER ASSY, BACK-M/C.
- If the refrigerant is R600a, you must not weld or apply a heat source.

## Air Recharging in Compressor

Before refilling the refrigerant, you must perform the test according to Chapter 5 (TROUBLESHOOTING CHART). When the defects are found, you must discharge the residual refrigerant (R600a) in the outdoor. For discharging the refrigerant R600a, break the narrow portion of tube extension by hand or with a pipe cutter as shown in Figure 1. Leave it for 30min in outside to stabilize the pressure with ambient. Then, check the pressure by piercing the dryer part with piercing pliers. If the refrigerant is not completely discharged, let the refrigerator alone for more 30min in outside.

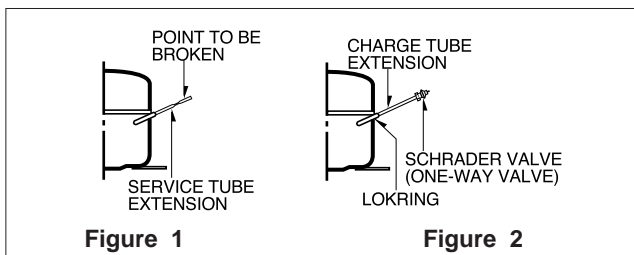


Figure 1

Figure 2

Attach the service tube installed with a Schrader valve (one-way valve) by using the LOKRING (Figure 2). Then, connect the Schrader valve (one-way valve) to the pump that is connected to the discharging hose leading to the outside. When discharging the residual refrigerant, repeat 3 cycle that includes 3min of the pump running->pump off->30sec of the compressor running.

After the refrigerant (R600a) is completely discharged, repair any defective parts and replace the dryer. At any case you must use the LOKRING for connecting or replacing any part in the cycle (No Fire, No Welding). Connect the Schrader valve to pump with the coupler. And then turn the pump on for vacuum state (Figure 3). Let the pump run until the low-pressure gauge indicates the vacuum (gauge pressure 0, absolute pressure -1atm or -760mmHg). Recommended vacuum time is 30 min. Charge the N<sub>2</sub> gas in order to check for leakage from welding points and the LOKRING. If leakages are found, repair the defects and repeat the vacuum process.

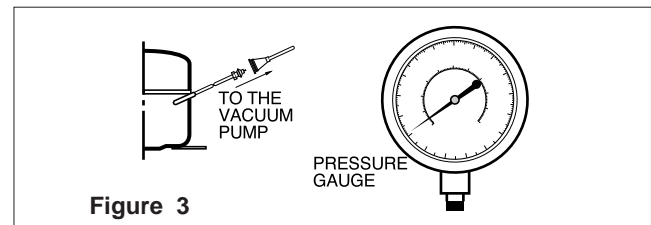


Figure 3

After the system is completely vacuumed, fill it with the refrigerant R600a up to what has been specified at your refrigerator Name Plate. The amount of refrigerant (R600a) must be precisely measured within the error of ±2g by an electron scale (Figure 4).

If you use the manifold connected with both the refrigerant (R600a) cylinder and the vacuum pump simultaneously, make sure the pump valve is closed (Figure 5).

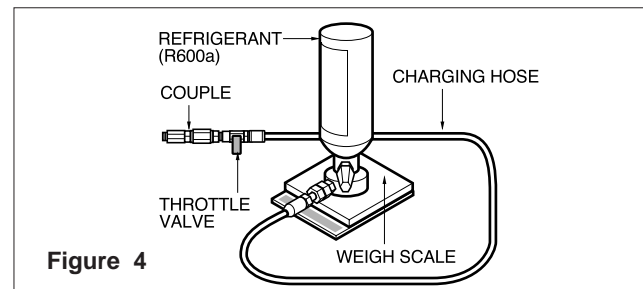


Figure 4

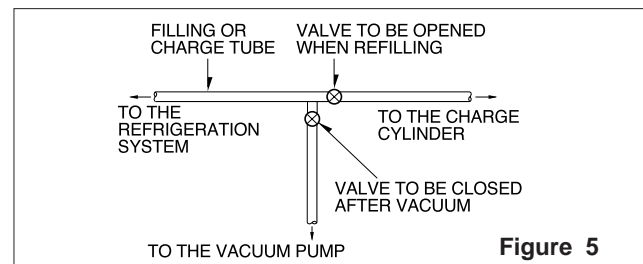


Figure 5

Connect the charging hose (that is connected to the refrigerant (R600a) cylinder) to the Schrader valve installed on the service tube. Then, charge the refrigerant (R600a) by controlling the Throttle valve. When you do so, do not fully open the Throttle valve because it may make damage to the compressor. Gradually charge the refrigerant (R600a) by changing open and close the Throttle Valve (5g at each time). The charging hose must use a one-way valve to prevent the refrigerant reflux. Close the Schrader valve cap after the refrigerant (R600a) is completely recharged.

After you completely recharge the refrigerant (R600a), perform the leakage test by using a portable leakage detector or soapy water. Test the low pressure (suction) parts in compressor off time and high pressure parts in compressor on time. If the leakages are found, restart from the refrigerant (R600a) discharging process and repairs defects of leaks.

After the leakage test, check the temperature of each parts of the cycle. Check with hands if the CONDENSER and the case (HOT-LINE pipe) that is contacted to the door gasket are warm. Confirm that frost is uniform distributed on the surface of the EVAPORATOR.

# SPECIFICATIONS

## 1. Ref. No: GR-459GK/QJ

ITEMS	SPECIFICATIONS
DIMENSIONS (mm)	595(W)X665(D)X2000(H)
NET WEIGHT (kg)	85
COOLING SYSTEM	Fan Cooling
TEMPERATURE CONTROL	Micom Control
DEFROSTING SYSTEM	Full Automatic
	Heater Defrost
DOOR FINISH	Pre-Coated Metal or Vinyl Coated Metal
OUT CASE	Painted Steel Sheet
INNER CASE	ABS
INSULATION	Polyurethane Foam
DEFROSTING DEVICE	Heater, Sheath & Heater, Cord-L
REFRIGERANT	R600a(60g)
LUBRICATION OIL	FREOL S10(280 cc)
COMPRESSOR	PTC Starting Type
EVAPORATOR	Fin Tube Type
CONDENSER	Wire Condenser
WATER DISPENSER	Water Tank (1EA)*

\* Optional Parts

## 2. Ref. No: GR-459GR/QQ

ITEMS	SPECIFICATIONS
DIMENSIONS (mm)	595(W)X665(D)X2000(H)
NET WEIGHT (kg)	85
COOLING SYSTEM	Fan Cooling
TEMPERATURE CONTROL	Micom Control
DEFROSTING SYSTEM	Full Automatic
	Heater Defrost
DOOR FINISH	Pre-Coated Metal or Vinyl Coated Metal
OUT CASE	Painted Steel Sheet
INNER CASE	ABS
INSULATION	Polyurethane Foam
DEFROSTING DEVICE	Heater, Sheath & Heater, Cord-L
REFRIGERANT	R600a(60g)
LUBRICATION OIL	FREOL S10(280 cc)
COMPRESSOR	PTC Starting Type
EVAPORATOR	Fin Tube Type
CONDENSER	Wire Condenser
WATER DISPENSER	Water Tank (1EA)*

\* Optional Parts

ITEMS	SPECIFICATIONS
REFRIGERATOR COMPARTMENT	Transparent Shelf (2EA) Folding Shelf (1EA) Wine Rack (1EA) Vegetable Container Cover (1EA) Magic Crisper (1EA) Vegetable Container (1EA) Vegetable Container Divider (1EA) Miracle Zone (1EA) Deodorizer (1EA)
DOOR BASKET	Dairy Basket (1EA) Egg Tray (1EA) Basket (2EA) Moving Basket (1EA) 2/ Bottle Basket (1EA) Bottle Guide (2EA or 0EA)
FREEZER COMPARTMENT	Tray Drawer (3EA) Twist Ice Tray (1EA) Ice Bank (1EA) Pizza Nook (2EA) Nook Guide (1EA)

ITEMS	SPECIFICATIONS
REFRIGERATOR COMPARTMENT	Transparent Shelf (3EA or 2EA) Folding Shelf (1EA)* Wine Rack (1EA)* Vegetable Container Cover (1EA) Magic Crisper (1EA)* Vegetable Container (1EA) Vegetable Container Divider (1EA)* Fresh Zone Container Cover (1EA) Fresh Zone Container (1EA)
DOOR BASKET	Dairy Basket (1EA) Egg Tray (1EA) Basket (2EA) Moving Basket (1EA) 2/ Bottle Basket (1EA) Bottle Guide (2EA or 0EA)
FREEZER COMPARTMENT	Tray Drawer (3EA) Twist Ice Tray (1EA) Ice Bank (1EA) Pizza Nook (2EA) Nook Guide (1EA)

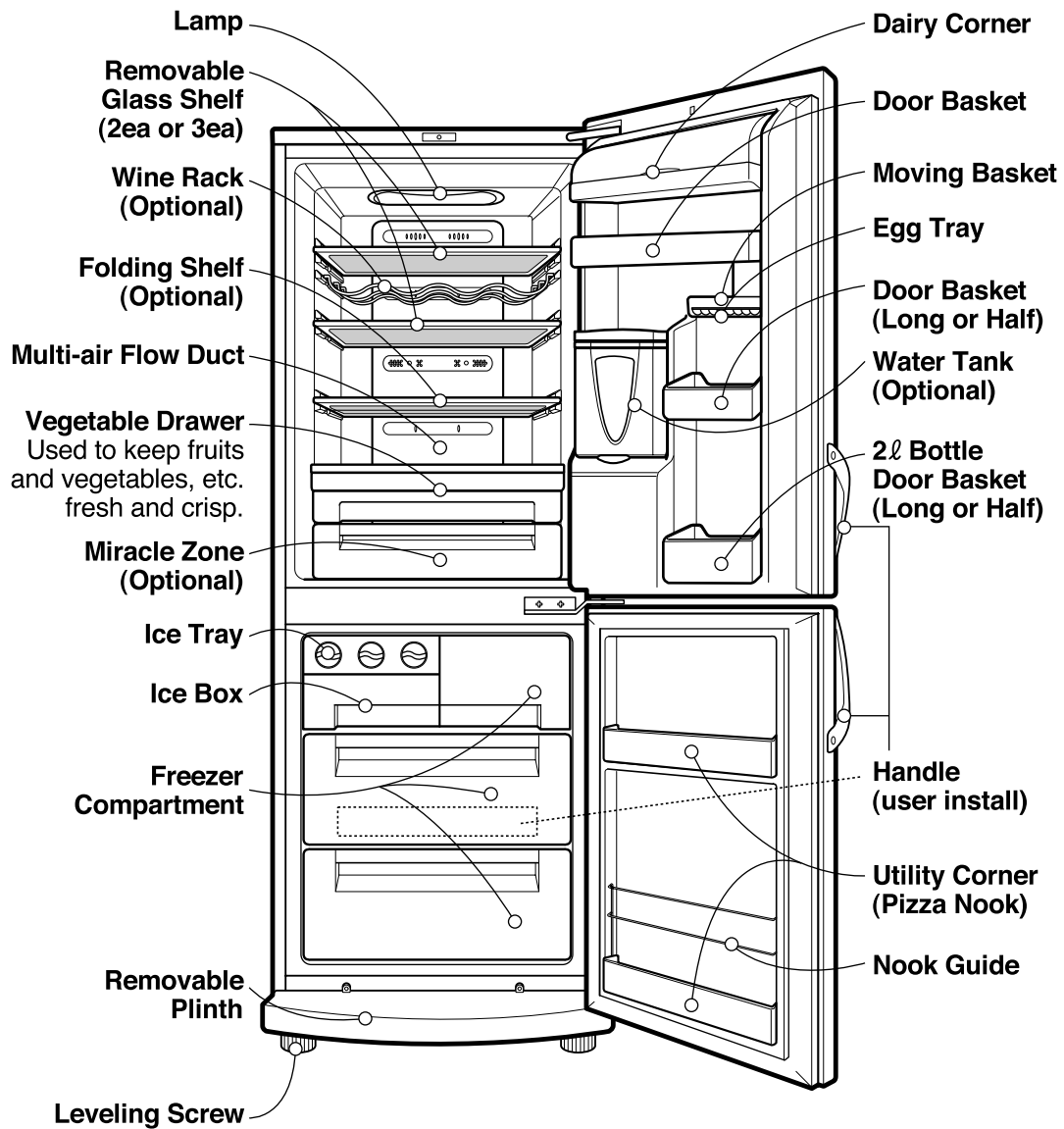
### 3. Ref. No: GR-459GC

ITEMS	SPECIFICATIONS
DIMENSIONS (mm)	595(W)X665(D)X2000(H)
NET WEIGHT (kg)	85
COOLING SYSTEM	Fan Cooling
TEMPERATURE CONTROL	Micom Control
DEFROSTING SYSTEM	Full Automatic Heater Defrost
DOOR FINISH	Pre-Coated Metal or Vinyl Coated Metal
OUT CASE	Painted Steel Sheet
INNER CASE	ABS
INSULATION	Polyurethane Foam
DEFROSTING DEVICE	Heater, Sheath & Heater, Cord-L
REFRIGERANT	R600a(60g)
LUBRICATION OIL	FREOL S10(280 cc)
COMPRESSOR	PTC Starting Type
EVAPORATOR	Fin Tube Type
CONDENSER	Wire Condenser

ITEMS	SPECIFICATIONS
REFRIGERATOR COMPARTMENT	Transparent Shelf (3EA) Vegetable Container Cover (1EA) Vegetable Container (1EA) Fresh Zone Container Cover (1EA) Fresh Zone Container (1EA)
DOOR BASKET	Egg Tray (1EA) Basket (3EA) Moving Basket (1EA) 2/ Bottle Basket (1EA) Bottle Guide (2EA)
FREEZER COMPARTMENT	Tray Drawer (3EA) Ice Tray (1EA) Pizza Nook (2EA) Nook Guide (1EA)

\* Optional Parts

# PARTS IDENTIFICATION



**NOTE :** This is a basic model. The shape of refrigerator is subject to change.

# INSTRUCTIONS FOR REVERSING DOOR SWING

---

This refrigerator allows the owner to change the door swing if desired. The hinging of the doors can be changed to the opposite side anytime you wish.

## **▲ Warning      Electric Shock Hazard**

Disconnect electrical supply to refrigerator before installing. Failure to do so could result in death or serious injury.

### **When reversing the door swing :**

Read the instructions all the way through before starting.

- Handle parts carefully to avoid scratching paint.
- Set screws/bolts down by their related parts to avoid using them in the wrong places.
- Provide a non-scratching work surface for the doors.

### **IMPORTANT**

Once you begin, do not move the cabinet until door-swing reversal is completed.

These instructions are for changing the hinges from the right side to the left side-if you ever want to change the hinges back to the right side, follow these same instructions and reverse all references to left and right.

Before Removing the Doors, empty and Remove all the Door Baskets of both Refrigerator/ Freezer Doors, including the Bank Dairy. Close both doors before removing hinge pins.

### **Caution :**

Do not let either door drop to the floor. Doing so could damage the Door Stop.

### **When reversing the door swing :**

Read the instructions all the way through before starting.

- Handle parts carefully to avoid scratching paint.
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Once you begin, do not move the cabinet until door-swing reversal is completed.

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you ever want to change the hinges back to the right side, follow these same

instructions and reverse all references to left and right.

## **▲ Warning      Electric Shock Hazard**

Disconnect electrical supply to refrigerator before starting the Door -reversal. Failure

to do so could result in death or serious injury.

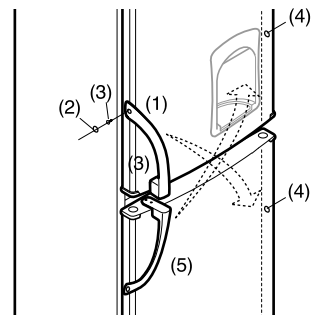
Before Removing the Doors ,empty and Remove all the Door Baskets of both Refrigerator/

Freezer Doors ,including the Bank Dairy. Close both doors before removing hinge pins

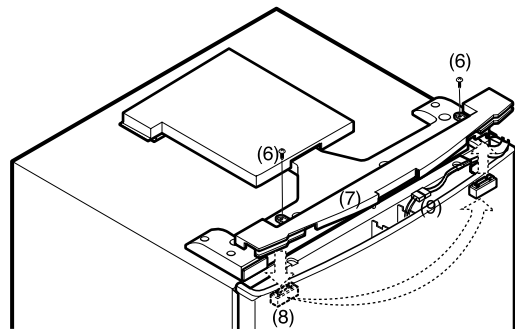
### **Caution :**

Do not let either door drop to the floor. Doing so could damage the Door Stop.

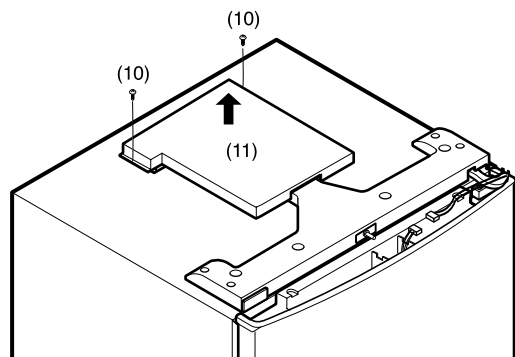
- 1) Remove screws(3) after removing a CAP(2) from the side of the refrigerator room HANDLE(1). Remove screws(2) on the bottom of the refrigerator room HANDLE(1). The freezer room HANDLE(5) may be also disassembled in a same may as the refrigerator room HANDLE(1).



- 2) Remove the screws(6) in the DECO COVER(7). Remove the DECO COVER(7) and move the COVER HINGE(8) to side of DECO COVER(7). Disassemble the Housing Connector(9) inside of the DECO COVER(7).

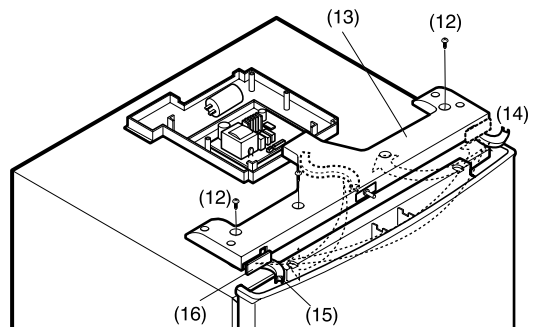


- 3) Remove the screws(10) in the COVER-PWB(11), and remove the COVER-PWB(11).



- 4) Remove the screws(12) in the TOP COVER FRONT(13) and remove the TOP COVER FRONT (13).

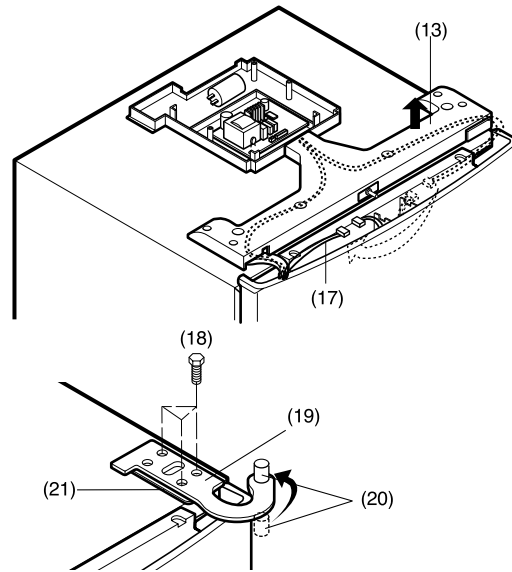
- 5) Remove the HOLDER CORD (14) placed in right and insert it to center. And then move COVER FRONT(16). Take out the HOLDER CORD(spare) (15) and to place in the center of TOP COVER FRONT(13), and insert to the left side.



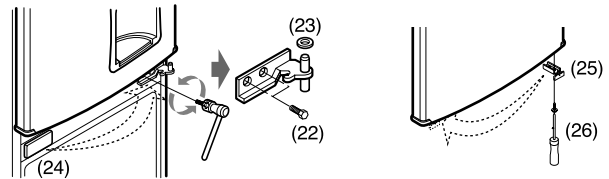


6) Take out the LEAD WIRE(17) assembly from the TOP COVER FRONT(13) and assemble it on left side.

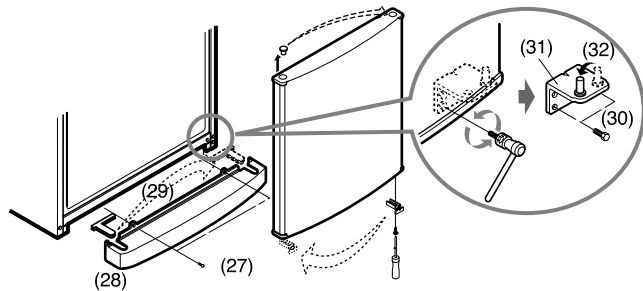
7) Remove bolts(18) securing HINGE-U(19). Unscrew of the hinge pin(20). Place HINGE-U and seat hinge upside down and apply them to left side of the refrigerator.  
NOTE: Seat hinge to be placed under the HINGE-U(19).



8) Remove bolts(22) securing HINGE-C(23) and then remove HINGE-C(23). Remove the freezer door. Move in left side of the refrigerator CAP(24). Move to left side of the refrigerator door BRACKET DOOR(25) and screw(26).



9) Remove screws(27) and COVER(28) and move CAP COVER(29). And remove bolts(30), HINGE-L(31), and move PIN(32).



10) Assemble the HINGE-L(31) → COVER(28) → Freezer Door → HINGE-C(23) → Refrigerator Door → HINGE-U(19) → TOP COVER FRONT(13) → COVER PWB(11) → Connect the Housing Connector(9) → DECO COVER(7) → HANDLE(1) (5)

**Note:**

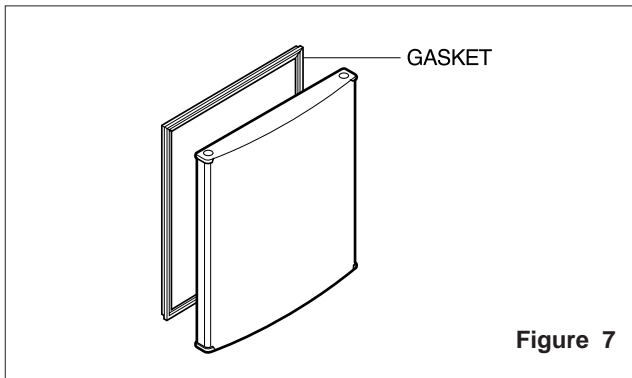
Reversing the doors is not covered by the warranty.

# DISASSEMBLY

## 1. DOOR

### ● Freezer Door

- 1) Refer to previous chapter "Instruction for Reversing Door Swing".
- 2) Pull out the Door Gasket to remove from the Door Foam Assy, F.

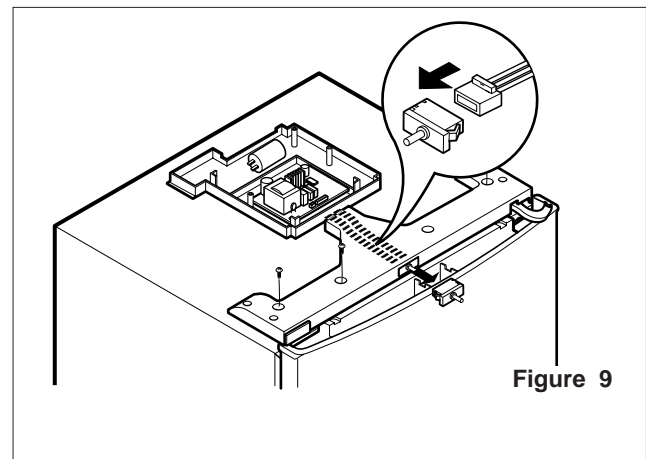


### ● Refrigerator Door

- 1) Refer to previous chapter "Instruction for Reversing Door Swing".
- 2) Pull out the Door Gasket to remove from the Door Foam Assy, R.

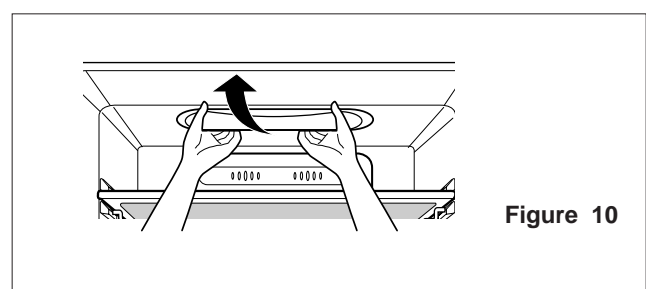
## 2. DOOR SWITCH

- 1) Unplug the power cord from the outlet.
- 2) Loosen five screws in upper part and disconnect Top Cover Front.
- 3) Disconnect Lead Wire from switch.
- 4) Disengage hook behind the switch by pressing it with hands.



## 3. REFRIGERATOR ROOM LAMP

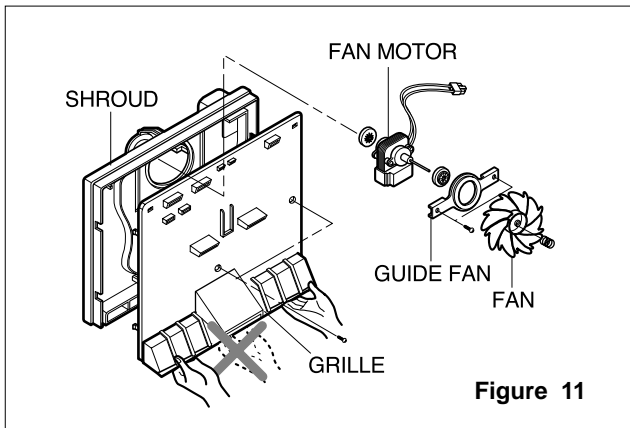
- 1) Unplug the power cord from the outlet.
- 2) Remove the room lamp lid by taking down while pulling its back projection.
- 3) Remove the lamp by turning it counterclockwise and replace new one.
- 4) Assemble in reverse order of disassembly.  
Replacement bulb must be the same specification as original.



- You must check the O-RING, which is made by rubber and prevent electric spark.
- Don't touch the lamp, in case of light on the long time. Because it can be very hot.
- Lamp capacity is MAX 30W.
- The lamp will remain "ON" for 7minutes if the door is left open and then it is "OFF" for safety. (If you reopen the door, the lamp is "On".)

#### 4. FAN AND FAN MOTOR

- 1) Remove freezer drawers.
- 2) Remove two cap screws and loosen two screws in Grille Fan.
- 3) Pull out the Grille Fan and Shroud, F.
- 4) Disconnect the housing of lead wire.
- 5) Separate the Fan Assy.
- 6) Lose 2 screw fixed to the Bracket.
- 7) Pull out Shroud, F remove the Fan Motor Assy.
- 8) Separate the Motor Bracket and Rubber.



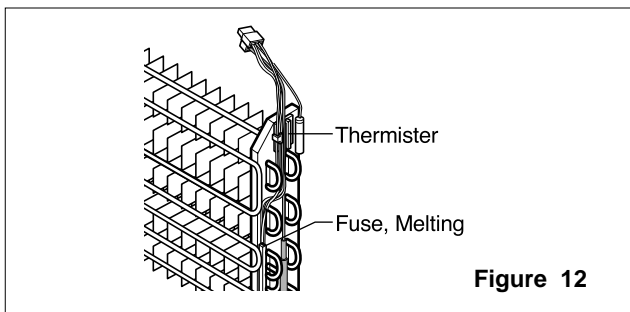
#### 5. DEFROST CONTROL ASSY

Defrost Control Assy consists of Thermistor and Fuse, Melting. Thermistor functions to defrost automatically and it is attached to metal side of the Evaporator and senses temperature.

Fuse, Melting is a kind of safety device for preventing overheating of the Heater when defrosting.

At the temperature of 77°C, it stops the emission of heat from the Heater.

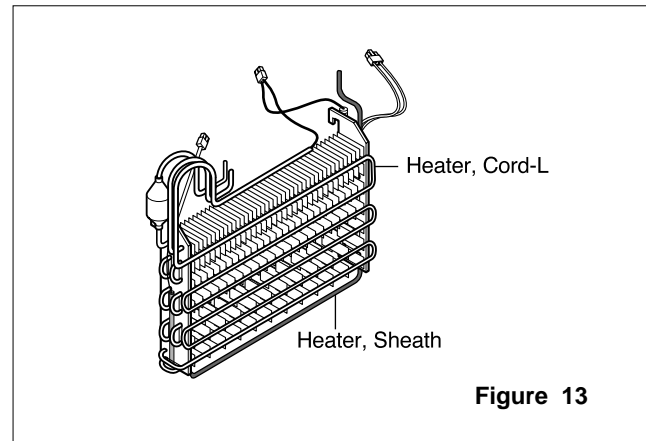
- 1) Pull out the Shroud, F after removing the Grille.
- 2) Separate the connector connected with the Defrost Control Assy and replace new one.



#### 6. HEATER, SHEATH & HEATER, CORD-L

In this refrigerator, Heater, Sheath & Heater, Cord-L are used for defrosting heater. During heating, the temperature of heater rises about 300~350°C. Therefore, be careful not to burn while servicing.

- 1) After removing the Grille and Shroud, separate the Heater, Sheath by disconnecting the connectors.
- 2) Exchanged Heater, Sheath and connected the housing.



- 3) If the Heater, Cord-L is defected, disconnect the connectors, and separate the Heater, Cord-L with Long Nose.
- 4) Replace and assembly the Heater, Cord-L and connect the connectors.

# ADJUSTMENT

## 1. COMPRESSOR

### 1) Role

The compressor intakes low temperature and low pressure gas evaporated from Evaporator of the Refrigerator, and condenses this gas to high temperature and high pressure gas, and then plays delivering role to Condenser.

### 2) Composition

The Compressor is Composed of Compressor Apparatus compressing gas, Compressor Motor moving Compressor Apparatus and Case protecting Compressor Apparatus and Motor. There is Relay Assy (one set of PTC-Starter and Over Load Protector (OLP)) in Compressor. On the other hand, because the Compressor consists of 1/1000mm processing precision components and is sealed after production in absence of dust or humidity, deal and repair with care.

### 3) Note for Usage

- (1) Be careful not to allow over-voltage and over-current.
- (2) No Strike  
If applying forcible power or strike (dropping or careless dealing), poor operation and noise may occur.
- (3) Use proper electric components appropriate to the Compressor.
- (4) Note to Keep Compressor.  
If Compressor gets wet in the rain and rust in the pin of Hermetic Terminal, the result may be poor operation and poor contact may cause.
- (5) Be careful that dust, humidity, and flux welding don't inflow in the Compressor inside in replacing the Compressor. Dust, humidity, and flux due to welding which inflows to Cylinder may cause lockage and noise.

## 2. PTC-STARTER

### 1) Composition of PTC-Starter

- (1) PTC (Positive Temperature Coefficient) is a no-contact semiconductor starting device which uses ceramic material and this material consists of BaTiO<sub>3</sub>.
- (2) The higher the temperature is, the higher becomes the resistance value. These features are used as starting device for the Motor.

### 2) Role of PTC-Starter

- (1) PTC is attached to Hermetic Compressor used for Refrigerator, Show Case and starts Motor.
- (2) Compressor for household refrigerator applies to single-phase induction Motor.  
For normal operation of the single-phase induction motor, in the starting operation flows in both main coil and sub-coil. After the starting is over, the current in subcoil is cut off. The proper features of PTC play all the above roles. So, PTC is used as a motor starting device.

### 3) PTC-Applied Circuit Diagram

- According to Starting Method for the Motor

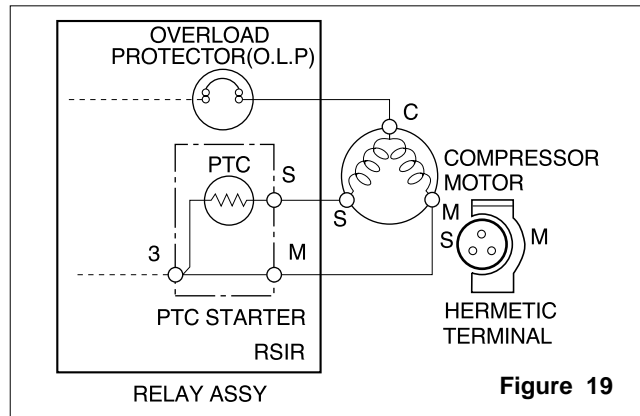


Figure 19

### 4) Motor Restarting and PTC Cooling

- (1) For restarting after power off during normal Compressor Motor operation, plug the power cord after 5 min. for pressure balance of Refrigerating Cycle and PTC cooling.
- (2) During normal operation of the Compressor Motor, PTC elements generate heat continuously. Therefore, if PTC isn't cooled for a while after the power has been shut off, Motor can't operate again.

### 5) Relation of PTC-Starter and OLP

- (1) If the power is off during operation of Compressor and the power is on before the PTC is cooled, (instant shut-off within 2 min. or reconnect a power plug due to misconnecting), the PTC isn't cooled and a resistance value grows. As a result, current can't flow to the sub-coil and the Motor can't operate and the OLP operates by flowing over current in only in the main-coil.
- (2) While the OLP repeats on and off operation about 3-5 times, PTC is cooled and Compressor Motor performs normal operation.  
If OLP doesn't operate when PTC is not cooled, Compressor Motor is worn away and causes circuit-short and fire. Therefore, use a properly fixed OLP without fail.

### 6) Note to Use PTC-Starter

- (1) Be careful not to allow over-voltage and over-current.
- (2) No Strike  
Don't apply a forcible power or strike.
- (3) Keep apart from any liquid.  
If liquid such as oil or water away enter the PTC, PTC materials it may break due to insulation breakdown of the material itself.
- (4) Don't change PTC at your convenience.  
Don't disassemble PTC and mold. If the exterior to the PTC-starter is damaged, resistance value is altered and it may cause poor starting of the compressor motor may cause.
- (5) Use a properly fixed PTC.

### 3. OLP (OVER LOAD PROTECTOR)

#### 1) Definition of OLP

- (1) OLP (OVER LOAD PROTECTOR) is attached to the Hermetic Compressor and protects the Motor by cutting off current in Compressor Motor in case of over-rising temperature by Bimetal in the OLP.
- (2) When over-voltage flows to Compressor motor, the Bimetal works by heating the heater inside the OLP, and the OLP protects Motor by cutting off current which flows to the Compressor Motor.

#### 2) Role of the OLP

- (1) The OLP is attached to the Hermetic Compressor used for the Refrigerator and Show Case and prevents the Motor Coil from being started in the Compressor.
- (2) Do not turn the Adjust Screw of the OLP in any way for normal operation of the OLP.  
(Composition and connection Diagram of OLP)

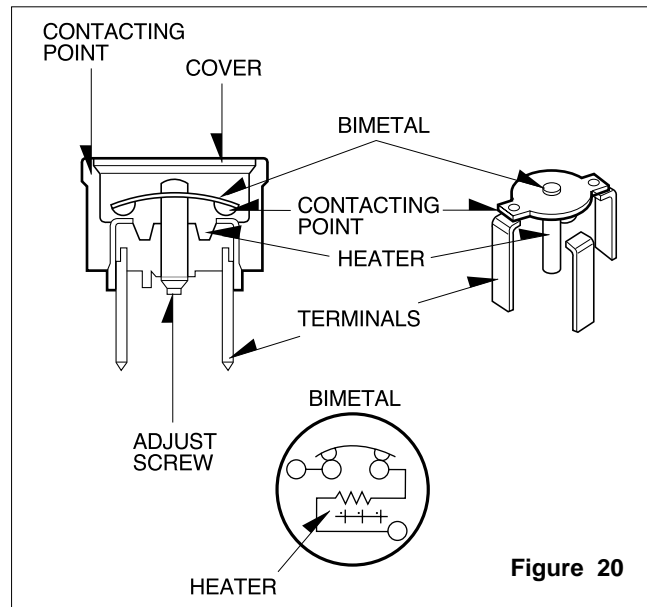
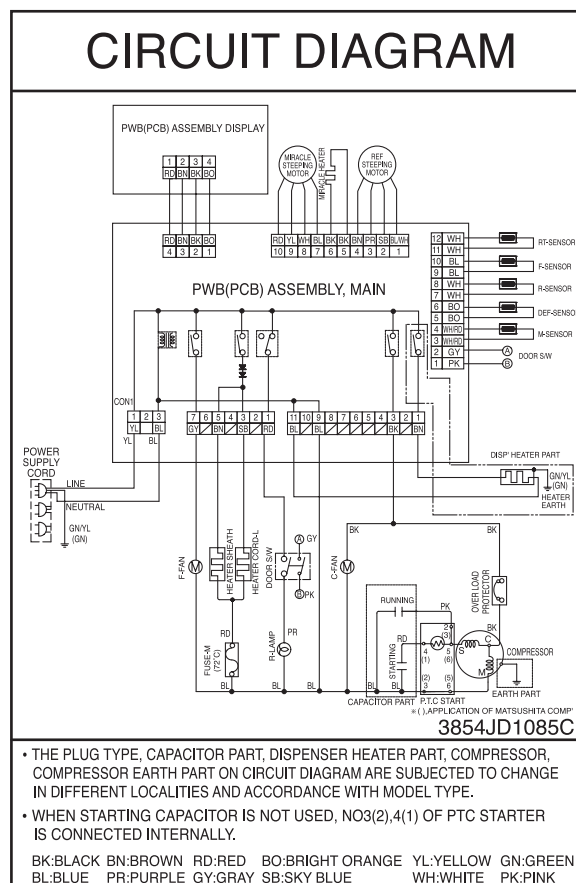


Figure 20

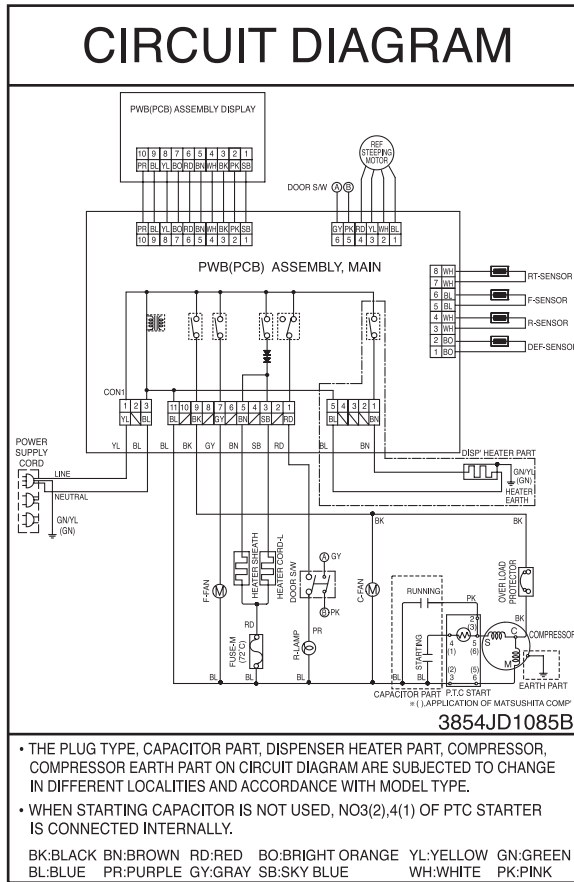
## CIRCUIT DIAGRAM

► BEST

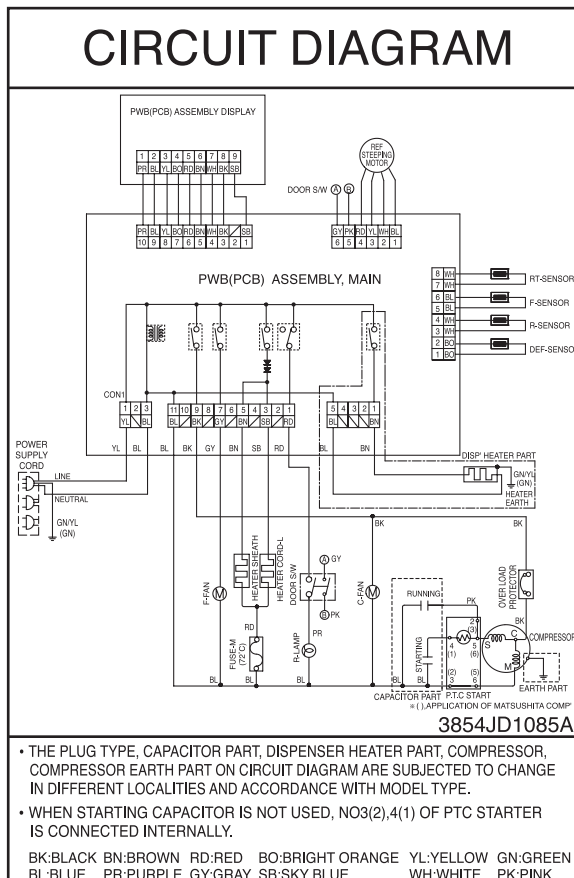


**NOTE :** 1. This is a basic diagram and specifications vary in different localities.

► BETTER

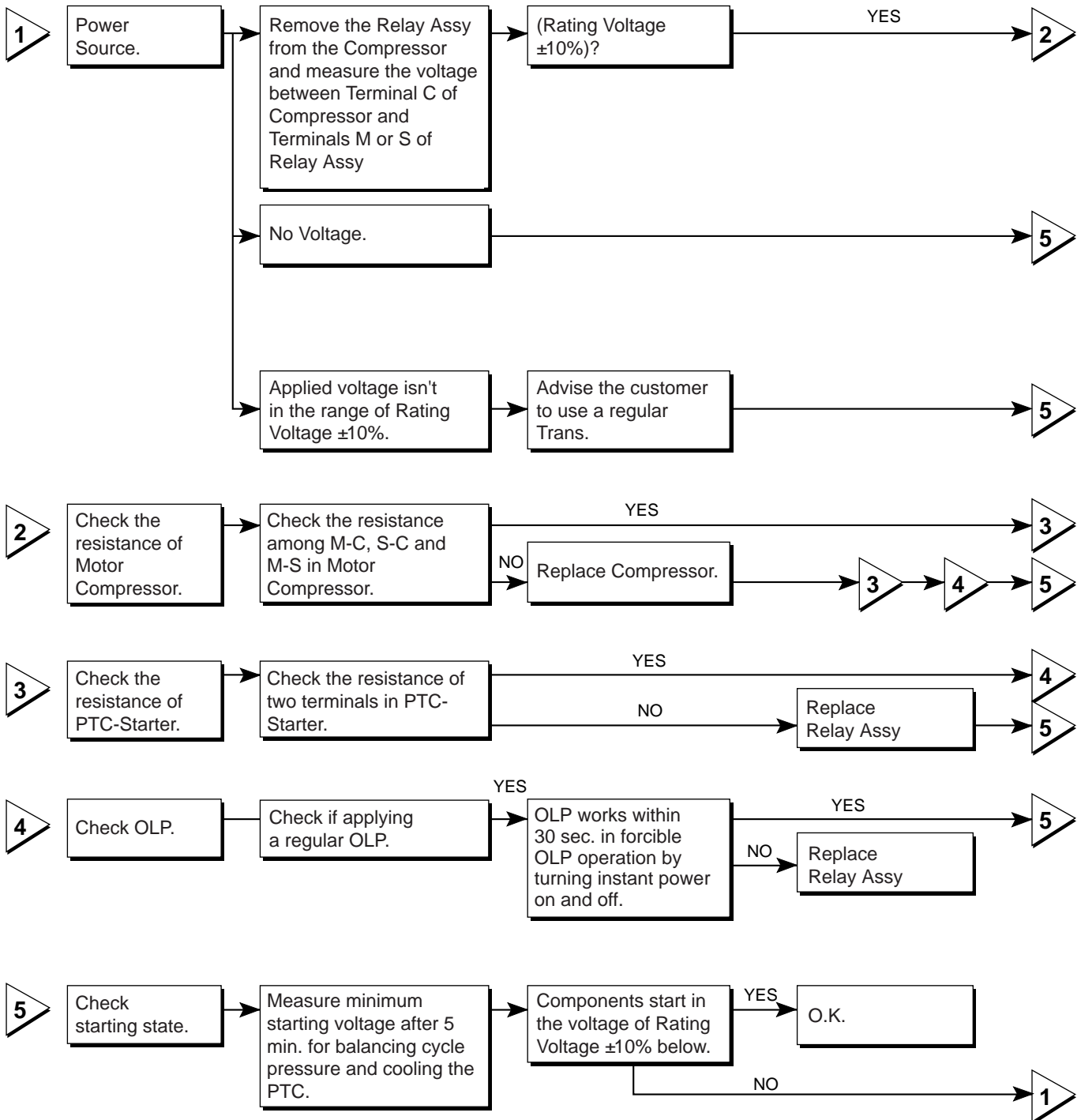


► GOOD



# TROUBLESHOOTING (Mechanical Part)

## 1. COMPRESSOR AND ELECTRIC COMPONENTS



## 2. RELAY ASSY (PTC AND OLP)

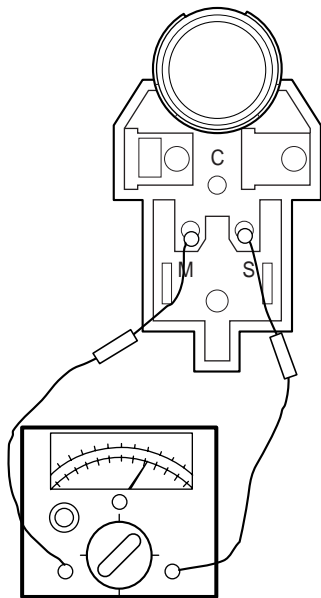
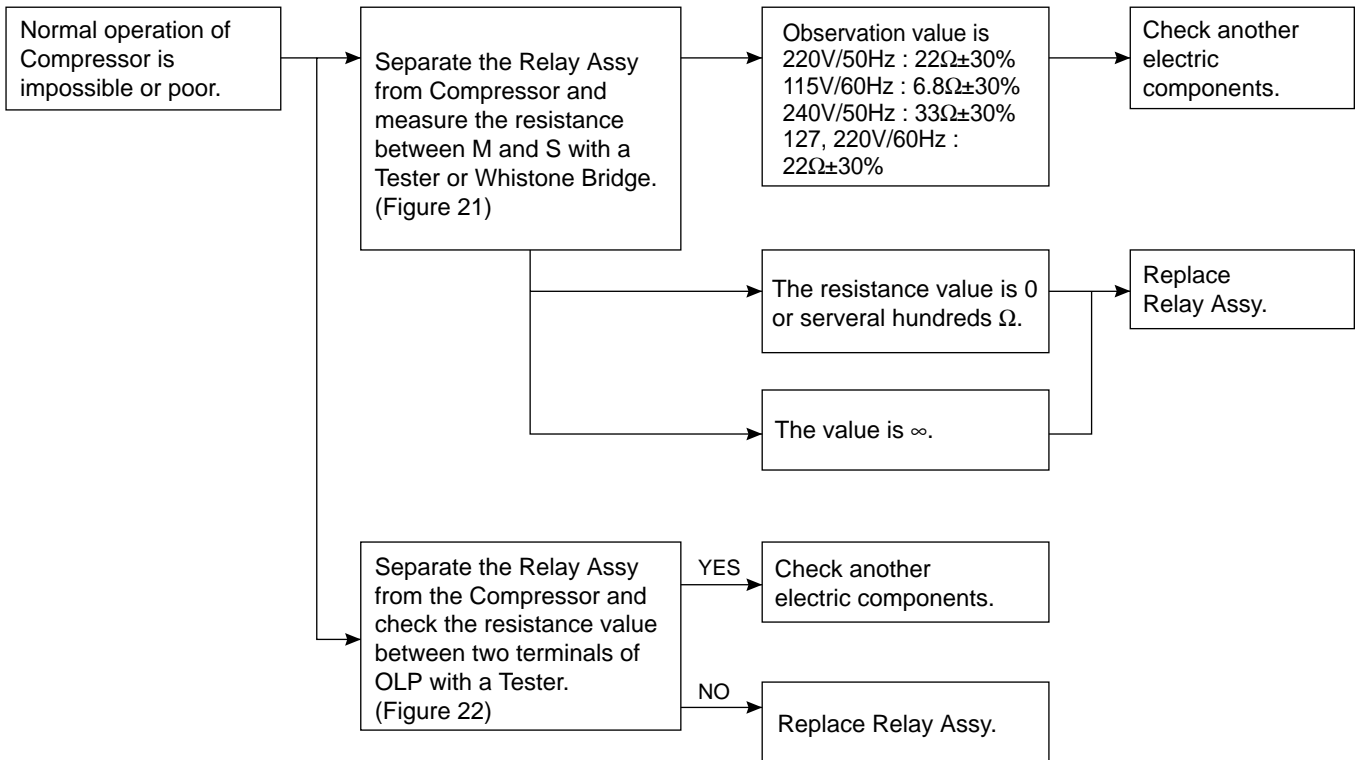


Figure 21

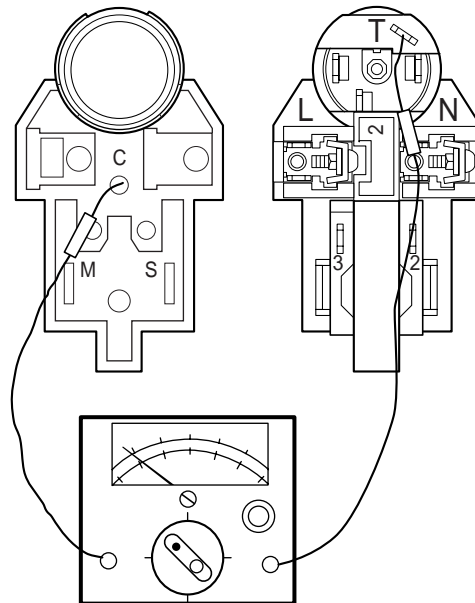
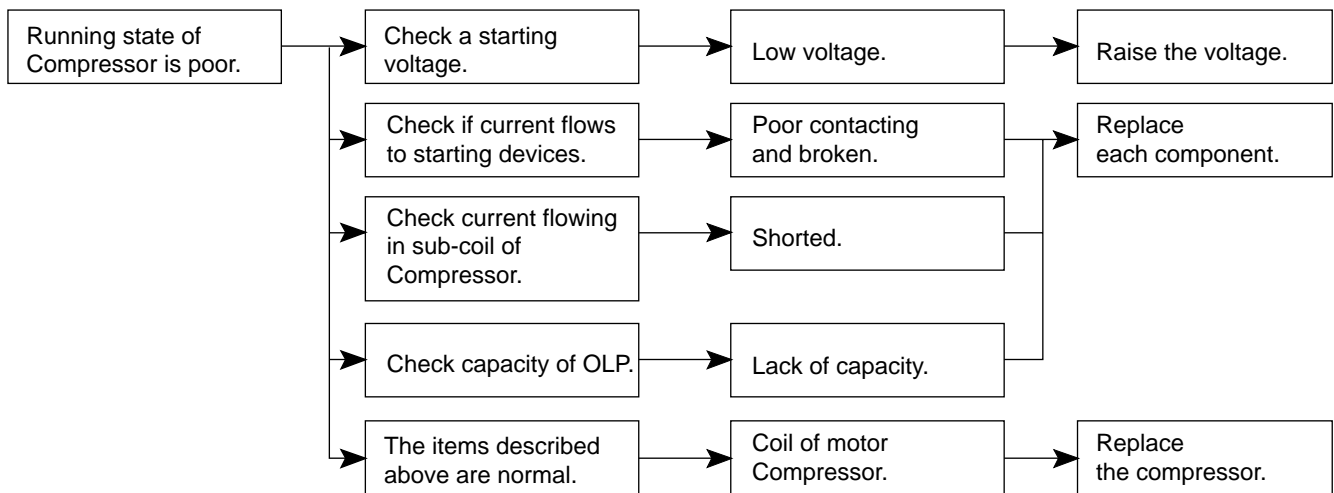
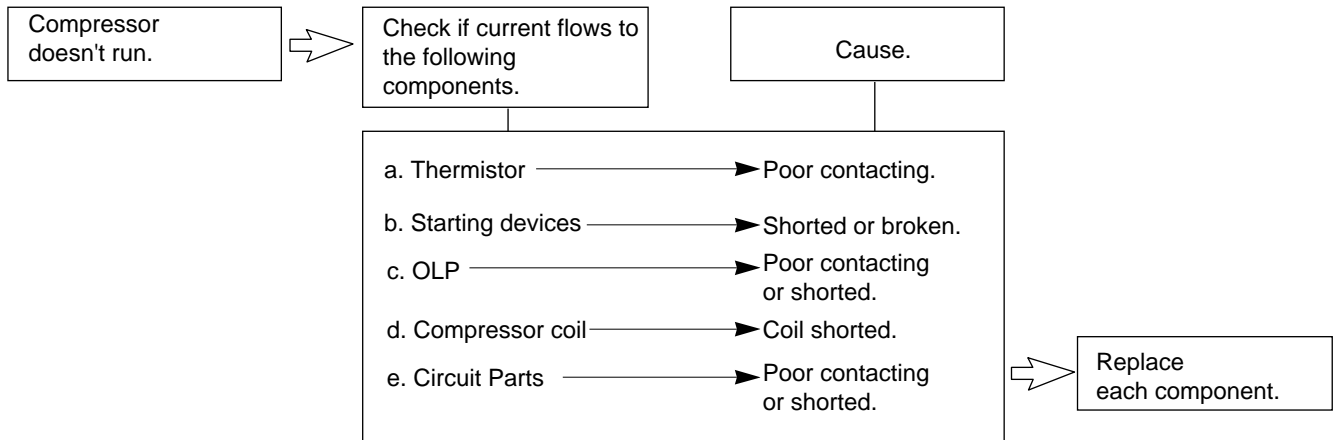


Figure 22

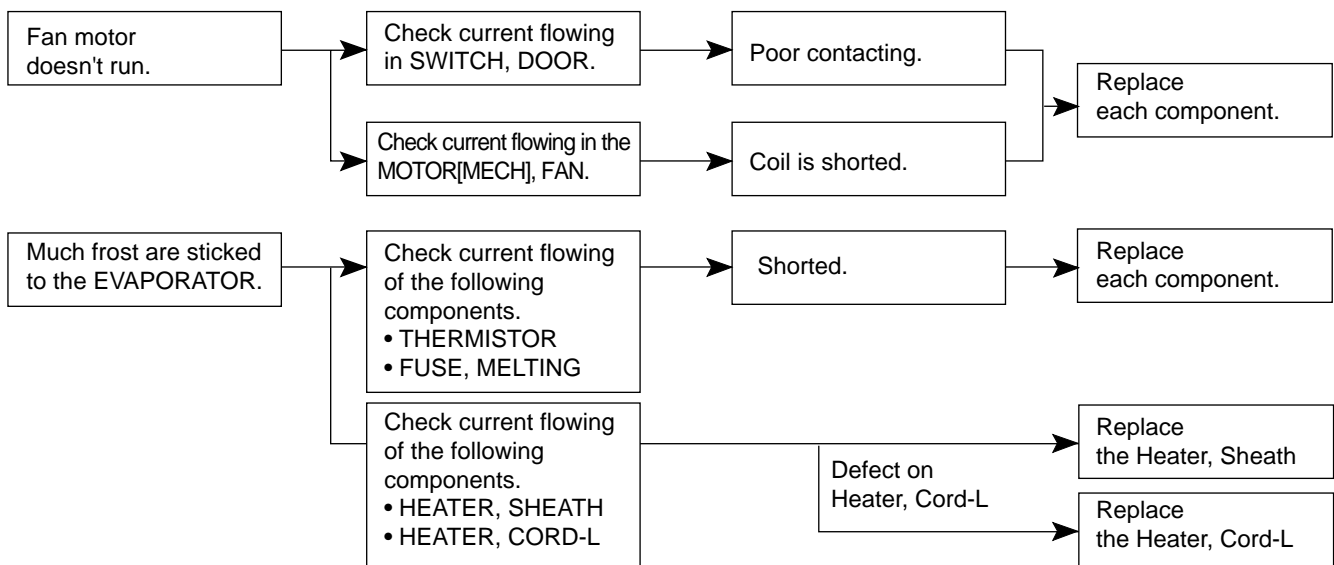


### 3. ANOTHER ELECTRIC COMPONENTS

#### ▼ Cooling is impossible



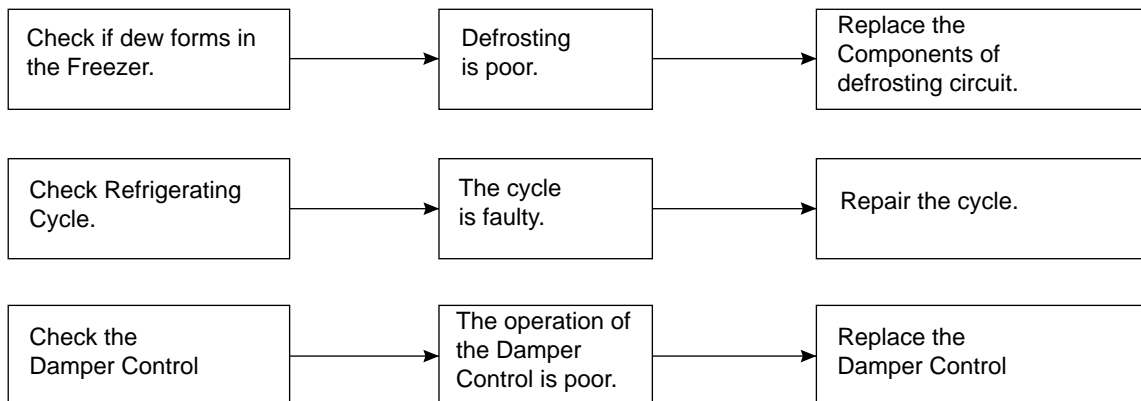
#### ▼ Cooling ability is poor



#### 4. SERVICE DIAGNOSIS CHART

COMPLAINT	POINTS TO BE CHECKED	REMEDY
Cooling is impossible.	<ul style="list-style-type: none"> <li>Is the power cord unplugged from the outlet?</li> <li>Check if the power switch is set to OFF.</li> <li>Check if the fuse of power switch is shorted.</li> <li>Measure the voltage of power outlet.</li> </ul>	<ul style="list-style-type: none"> <li>Plug to the outlet.</li> <li>Set the switch to ON.</li> <li>Replace a regular fuse.</li> <li>If voltage is low, wire newly.</li> </ul>
Cooling ability is poor.	<ul style="list-style-type: none"> <li>Check if the set is placed close to wall.</li> <li>Check if the set is placed close to stove, gas cooker and direct rays.</li> <li>Is the ambient temperature high or the room door closed?</li> <li>Check if put in is hot.</li> <li>Did you open the door of the set too often or check if the door is closed up?</li> <li>Check if the Damper Control is set to "cold-position".</li> </ul>	<ul style="list-style-type: none"> <li>Place the set with the space of about 10cm.</li> <li>Place the set apart from these heat appliances.</li> <li>Make the ambient temperature below.</li> <li>Put in foods after cooled down.</li> <li>Don't open the door too often and close it firmly.</li> <li>Set the control to mid-position.</li> </ul>
Foods in the Refrigerator are frozen.	<ul style="list-style-type: none"> <li>Is foods placed in cooling air outlet?</li> <li>Check if the control is set to "cold-position".</li> <li>Is the ambient temperature below 5°C?</li> </ul>	<ul style="list-style-type: none"> <li>Place foods in high temperature section. (Front Part)</li> <li>Set the control to "mid-position".</li> <li>Set the control to "warm-position".</li> </ul>
Dew or ice forms in the chamber of the set.	<ul style="list-style-type: none"> <li>Is liquid food stored?</li> <li>Check if put in is hot.</li> <li>Did you open the door of the set too often or check if the door is closed up.</li> </ul>	<ul style="list-style-type: none"> <li>Seal up liquid foods with wrap.</li> <li>Put in foods after cooled down.</li> <li>Don't open the door too often and close it firmly.</li> </ul>
Dew forms in the Exterior Case.	<ul style="list-style-type: none"> <li>Check if ambient temperature and humidity of surrounding air are high.</li> <li>Is there gap in the door packed?</li> </ul>	<ul style="list-style-type: none"> <li>Wipe dew with a dry cloth. This occurrence is solved naturally in low temperature and humidity.</li> <li>Fill up the gap.</li> </ul>
Abnormal noise generates.	<ul style="list-style-type: none"> <li>Are the set positioned in a firm and even place?</li> <li>Are any unnecessary objects set in the back side of the set?</li> <li>Check if the Tray Drip is not firmly fixed.</li> <li>Check if the cover of mechanical room in below and front side is taken out.</li> </ul>	<ul style="list-style-type: none"> <li>Adjust the Adjust Screw, and position in the firm place.</li> <li>Remove the objects.</li> <li>Fix it firmly on the original position.</li> <li>Place the cover at the original position.</li> </ul>
To close the door is not handy.	<ul style="list-style-type: none"> <li>Check if the door packing is dirty with filth such as juice.</li> <li>Is the set positioned in a firm and even place?</li> <li>Is too much food putted in the set?</li> </ul>	<ul style="list-style-type: none"> <li>Clean the door packing.</li> <li>Position in the firm place and adjust the Adjust Screw.</li> <li>Keep foods not to reach the door.</li> </ul>
Ice and foods smell unpleasant.	<ul style="list-style-type: none"> <li>Check if the inside of the set is dirty.</li> <li>Did you keep smelly foods without wrapping?</li> <li>It smells of plastic.</li> </ul>	<ul style="list-style-type: none"> <li>Clean the inside of the set.</li> <li>Wrap smelly foods.</li> <li>The new products smells of plastic, but it is eliminated after 1-2 weeks.</li> </ul>

● In addition to the items described left, refer to the followings to solve the complaint.



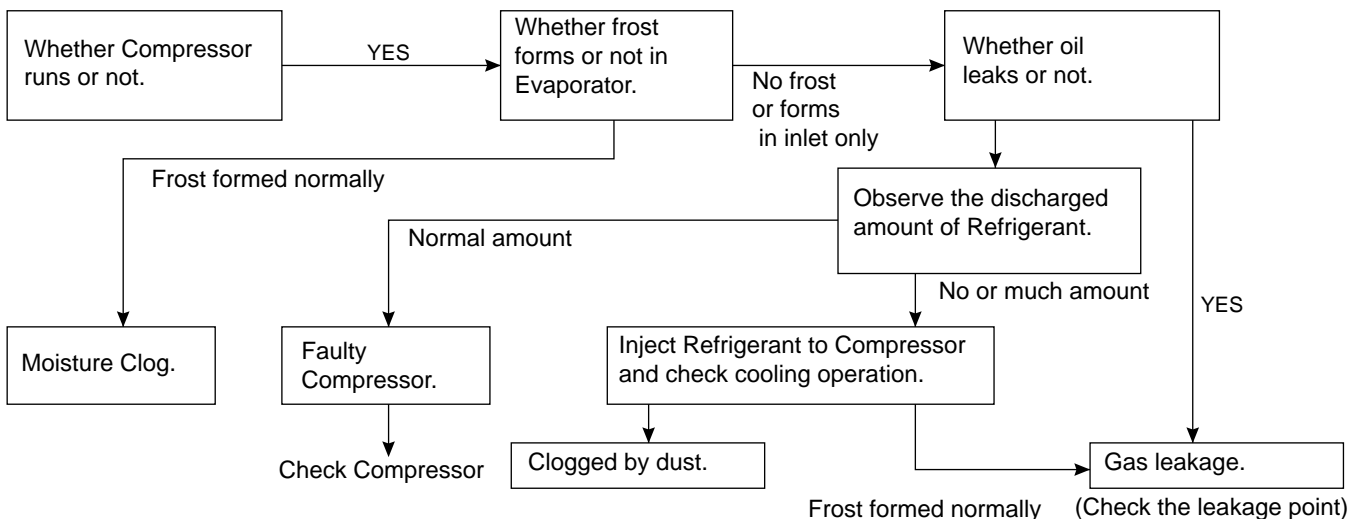
## 5. REFRIGERATING CYCLE

### ▼ Troubleshooting Chart

CAUSE		STATE OF THE SET	STATE OF THE EVAPORATOR	TEMPERATURE OF THE COMPRESSOR	REMARKS
LEAKAGE	PARTIAL LEAKAGE	Freezer room and Refrigerator don't cool normally.	Low flowing sound of Refrigerant is heard and frost forms in inlet only	A little high more than ambient temperature.	<ul style="list-style-type: none"> <li>A little Refrigerant discharges.</li> <li>Normal cooling is possible when injecting of Refrigerant the regular amount.</li> </ul>
	WHOLE LEAKAGE	Freezer room and Refrigerator don't cool normally.	Flowing sound of Refrigerant is not heard and frost isn't formed.	Equal to ambient temperature.	<ul style="list-style-type: none"> <li>No discharging of Refrigerant.</li> <li>Normal cooling is possible when injecting of Refrigerant the regular amount.</li> </ul>
CLOGGED BY DUST	PARTIAL CLOG	Freeze room and Refrigerator don't cool normally.	Flowing sound of Refrigerant is heard and frost forms in inlet only.	A little high more than ambient temperature.	<ul style="list-style-type: none"> <li>Normal discharging of refrigerant.</li> <li>The capillary tube is faulty.</li> </ul>
	WHOLE CLOG	Freezer room and Refrigerator don't cool.	Flowing sound of Refrigerant is not heard and frost isn't formed.	Equal to ambient temperature.	<ul style="list-style-type: none"> <li>Normal discharging of Refrigerant.</li> </ul>
MOISTURE CLOG		Cooling operation stops periodically.	Flowing sound of Refrigerant is not heard and frost melts.	Low than ambient temperature	<ul style="list-style-type: none"> <li>Cooling operation restarts when heating the inlet of capillary tube.</li> </ul>
DEFECTIVE COMPRESSION	COMP-RESSION	Freezer and Refrigerator don't cool.	Low flowing sound of Refrigerant is heard and frost forms in inlet only.	A little high than ambient temperature.	<ul style="list-style-type: none"> <li>The pressure of high pressure part in compressor is low.</li> </ul>
	NO COMP-RESSION	No compressing operation.	Flowing sound of Refrigerant is not heard and no frost.	Equal to ambient temperature.	<ul style="list-style-type: none"> <li>No pressure of high pressure part in the compressor.</li> </ul>

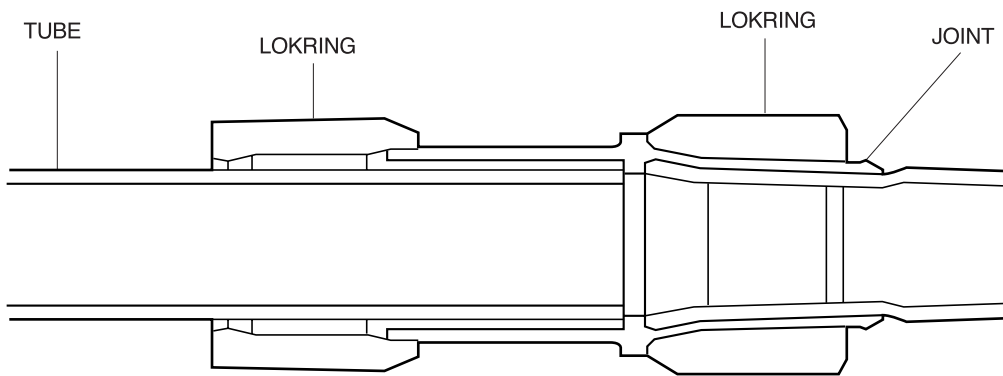
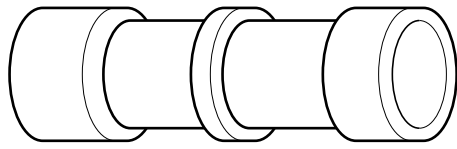
### ▼ Leakage Detection

- Observe discharging point of refrigerant which may be in the oil discharging part in the compressor and hole of evaporator.

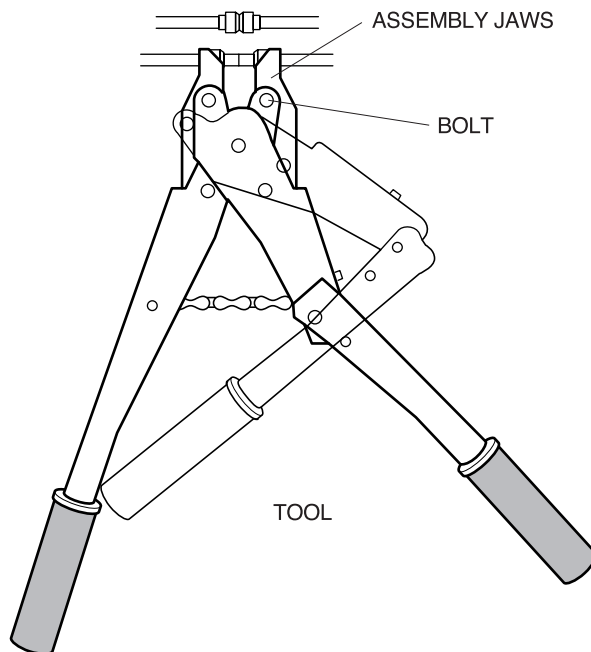


▼ General Control of Refrigerating Cycle

NO.	ITEMS	CONTENTS AND SPECIFICATIONS	REMARKS
1	WELDING ROD	(1) H 30 <ul style="list-style-type: none"> <li>• Chemical Ingredients Ag: 30%, Cu: 27%, Zn: 23%, Cd: 20%</li> <li>• Brazing Temperature: 710~840°C</li> </ul> (2) Bcup-2 <ul style="list-style-type: none"> <li>• Chemical Ingredients Cu: About 93%</li> <li>P: 6.8~7.5%</li> <li>The rest: within 0.2%</li> <li>• Brazing Temperature: 735~840°C</li> </ul>	<ul style="list-style-type: none"> <li>• Recommend H34 containing 34% Ag in the Service Center.</li> </ul>
2	FLUX	<ul style="list-style-type: none"> <li>• Ingredients and how to make Borax 30%</li> <li>Borax 35%</li> <li>Fluoridation kalium: 35%</li> <li>Water: 4%</li> <li>Mix the above ingredients and boil until they are transformed into liquid.</li> </ul>	<ul style="list-style-type: none"> <li>• Make amount for only day. Holding period: 1 day</li> <li>• Close the cover of container to prevent dust putting in the FLUX.</li> <li>• Keep it in a stainless steel container.</li> </ul>
3	LOKRING (Figure 23,24)	(1) Both of the tube is inserted up to the stop. (2) Both of the LOKRING is pushed up to the stop (3) The bending point is not too close to the joint ending. (4) During the assembly it is important that both ends remain completely within the joint.	<ul style="list-style-type: none"> <li>• For a hermetically sealed metal/metal connection, the tube ends have to be clean.</li> <li>• LOKPREP is distributed all of out-surface of the tube ends.</li> </ul>
4	DRIER ASM	(1) Assemble the drier within 30min. after unpacking. (2) Keep the unpacked drier at the temperature of 80~100°C.	<ul style="list-style-type: none"> <li>• Don't keep the drier in a outdoors because humidity damages to it.</li> </ul>
5	VACUUM	(1) When measuring with pirant Vacuum gauge the charging M/C, vacuum degree is within 1 Torr. (2) If the vacuum degree of the cycle inside is 10 Torr. below for low pressure and 20 Torr. for high pressure, it says no vacuum leakage state. (3) Vacuum degree of vacuum pump must be 0.05 Torr. below after 5 min. (4) Vacuum degree must be same to the value described item (2) above for more than 20 min.	<ul style="list-style-type: none"> <li>• Apply M/C Vacuum Gauge without fail.</li> <li>• Perform vacuum operation until a proper vacuum degree is built up.</li> <li>• If a proper vacuum degree isn't built up, check the leakage from the Cycle Pipe line part and Quick Coupler Connecting part.</li> </ul>
6	DRY AND AIR NITROGEN GAS	(1) The pressure of dry air must be more han 12~16kg/cm <sup>2</sup> (2) Temperature must be more than -20~-70°C. (3) Keep the pressure at 12~6kg/cm <sup>2</sup> also when substituting dry air for Nitrogen Gas.	
7	NIPPLE AND COUPLER	(1) Check if gas leaks with soapy water. (2) Replace Quick Coupler in case of leakage.	<ul style="list-style-type: none"> <li>• Check if gas leaks from joint of the Coupler.</li> </ul>
8	PIPE	<ul style="list-style-type: none"> <li>• Put all Joint Pipes in a clean box and cover tightly with the lid so that dust or humidity is not inserted.</li> </ul>	



**Figure 23. LOKRING**



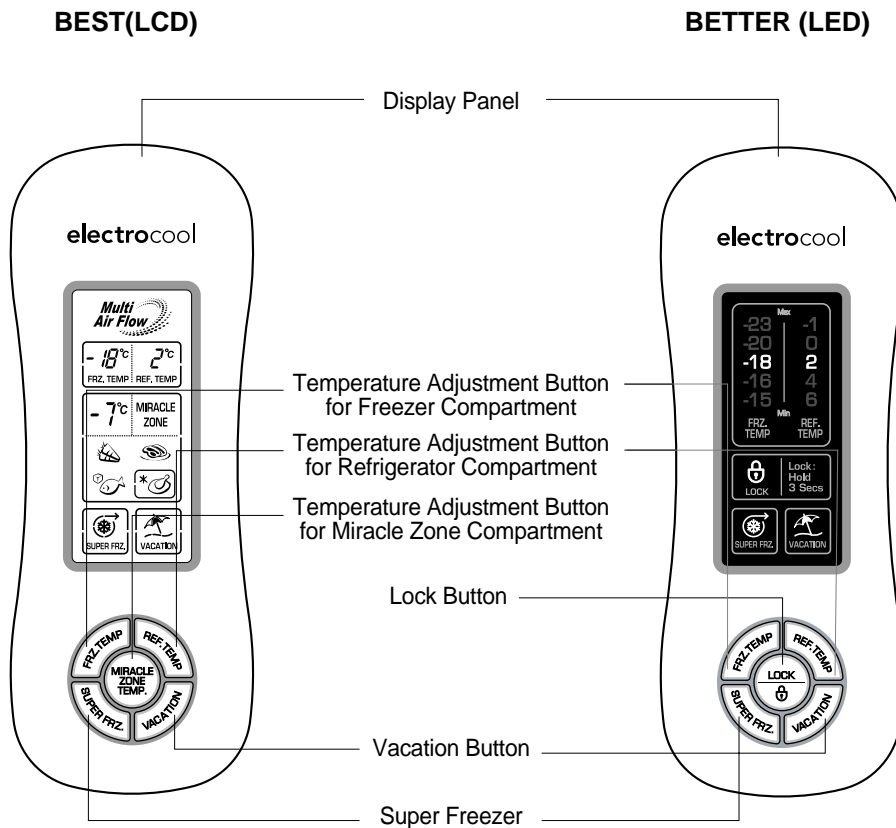
**Figure 24. LOKRING TOOL**

# MICOM FUNCTION & PCB CIRCUIT EXPLANATION

## 1. FUNCTION EXPOSITION

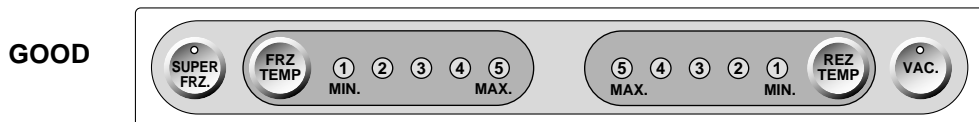
### 1) FUNCTION

- (1) When the appliance is plugged in, it is set to 2°C for the Refrigerator and -18°C for the Freezer. You can adjust the Refrigerator and the Freezer control temperature by pressing the FRZ. Temp button or REF. Temp button.
- (2) When the power is initially applied or restored after a power failure, it is automatically set to “-18°C/2°C” (in the case of GOOD MDL, it is automatically set to “3/3”)



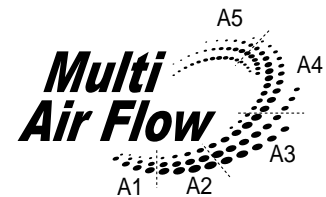
Control range of Freezer  
: -15°C ~ -23°C

Control range of Refrigerator  
: 6°C ~ -1°C



### • MULTI Air Flow SETTING

- 1) If door open, graphic is rotated in A1 → A2 → A3 → A4 → A5 continuously, and this status is maintained during door open.
- 2) Door close and after 1 minute, the rotation of graphic stops.

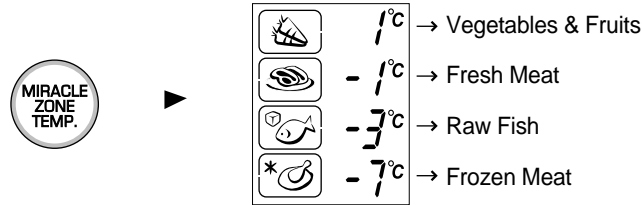


### • Back Light SETTING

- 1) When power is initially applied or restored after a power failure, the back light is on for 1minute.
- 2) In the status of back light' off, if any button is pushed or door open, the only back light is on for 20 seconds and the function of button is not worked.

## 2) MIRACLE ZONE (BEST MODEL)

- (1) You can select optimum temperature range depending on types of food stored.
- (2) 4 step of temperature selection including 1°C, -1°C, -3°C and -7°C is available.



## 3) SUPER FREEZING

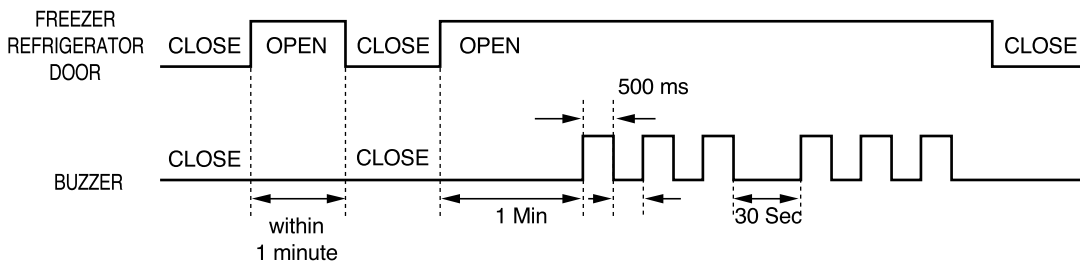
- (1) It is the function which increases the cooling speed of freezer by continuously operating compressor and freezer fan. When it's button is pressed, GRAPHIC is on.
- (2) Whenever selection switch is pressed, selection/release (GRAPHIC on/off) changes in turn.
- (3) If power is on after power cut, SUPER FREEZING function is canceled.
- (4) It shall be cancelled after compressor and freezer fan continuously operate for three hours.
- (5) If defrost starts during SUPER FREEZING, SUPER FREEZING operates for the rest of time after defrost is complete when SUPER FREEZING operation time is less than 90 minutes. If SUPER FREEZING operated for more than 90 minutes, the SUPER FREEZING shall operate for two hours before it stops.
- (6) If SUPER FREEZING is pressed during defrost, SUPER FREEZING GRAPHIC is on but SUPER FREEZING operation starts seven minutes after defrost is complete and it shall operate for three hours.
- (7) If SUPER FREEZING is selected within seven minutes after compressor has stopped, the compressor (compressor delays seven minutes) shall start after the balance of the delay time.
- (8) If VACATION button is pressed during the SUPER FREEZING, the SUPER FREEZING function is immediately released.

## 4) VACATION FUNCTION

- (1) When pressing the VACATION button, the VACATION GRAPHIC is on and its function is operated.
- (2) In the status of VACATION mode, regardless of current notch, freezer is controlled at -13°C and refrigerator is controlled at 7°C. (but, above temperature is displayed in the case of BEST model.)
- (3) In the status of VACATION mode, any other button except VACATION button is not worked.
- (4) When pressing the VACATION button again, VACATION GRAPHIC is off and its function is released. (Here, freezer and refrigerator is controlled at previous setting temperature.)

## 5) DOOR OPEN ALARM

- (1) Buzzer shall give warnings if freezer, refrigerator, or home bar door is open for more than one minute.
- (2) Buzzer shall give warnings three times in 0.5 second interval, then three times on/off in 0.5 second interval in every thirty seconds.
- (3) Warnings are ceased when freezer, refrigerator and home bar doors are all closed.



## 6) BUZZER SOUND

- (1) When the button on the front Display is pushed, a Ding ~ sound is produced. (Refer to the BUZZER OPERATION CHECK)

## 7) REFRIGERATOR LAMP AUTO OFF

(1) To protect the risk of lamp heat, when Refrigerator door opens for 7 min., refrigerator lamp is auto off.

## 8) DEFROSTING (REMOVING FROST)

- (1) Defrosting starts each time the COMPRESSOR running time reaches 7 hours.
- (2) For initial power on or for restoring power, defrosting starts when the compressor running time reaches 4hours.
- (3) Defrosting stops if the sensor temperature reaches 10°C or more. If the sensor doesn't reach 10°C in 2hours, the defrost mode is malfunctioning. (Refer to the defect diagnosis function.)
- (4) Defrosting won't function if its sensor is defective(wires are cut or short circuited)

## 9) ELECTRICAL PARTS ARE TURNED ON SEQUENTIALLY

Electrical parts such as COMP. defrosting heater. freezer FAN. etc. are turned on in the following order to prevent noise and parts damage. Several parts are started at the same time at initial power on and are turned off together when TEST is completed.

	OPERATION STATE	ORDER
Initial power on	Temperature of Defrosting Sensor is 45°C or more (when unit is newly purchased or when moved)	<b>POWER ON</b> → in 1/2 second → <b>COMP ON</b> → in 1/2 second → <b>FREEZER FAN ON</b>
	Temperature of defrosting sensor is lower than 45°C (when power cuts, SERVICE)	<b>POWER ON</b> → in 1/2 second → <b>DEFROSTING HEATER ON</b> → in 5 second → <b>DEFROSTING HEATER OFF</b> in 1/2 second → <b>DAMPER HEATER ON</b> → in 3 second → <b>DAMPER HEATER OFF</b> → in 1/2 second → <b>DISPENSER HEATER ON</b> → in 3 second → <b>DISPENSER HEATER OFF</b> → in 1/2 second → <b>COMP ON</b> in 1/2 second → <b>FREEZER FAN ON</b>
	Reset to normal operation from TEST MODE	<b>TOTAL LOAD OFF</b> → in 7 minute → <b>COMP ON</b> → in 1/2 second → <b>FREEZER FAN ON</b>

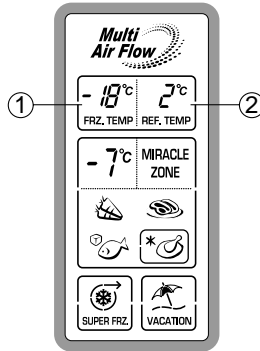
- NOTE)** (1) In the case of BEST/ BETTER model, dispenser heater is optional.  
 (2) Damper heater is only applied in the BEST model.  
 (3) Damper heater and Dispenser heater are not in the GOOD model.



## 10) DEFECT DIAGNOSIS FUNCTION

- (1) Automatic diagnosis makes servicing the refrigerator easy.
- (2) When a defect occurs, the buttons will not operate: but the tones, such as ding, will sound.
- (3) When the defect CODE removes the sign, it returns to normal operation (RESET).
- (4) The defect CODE shows on the Refrigerator and Freezer Display.

### ► BEST



- Show ERROR CODE on display panel.

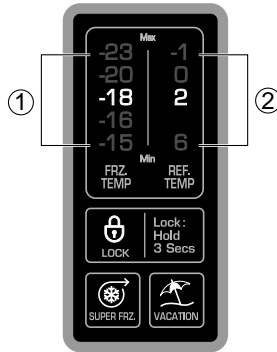
NO	Item	ERORR CODE		CONTENTS	REMARKS
		①	②		
1	Failure of Freezer sensor	Er	FS	Cut or short circuit wire	* Inspect Connecting wires On each sensor
2	Failure of Refrigerator sensor	Er	rS	Cut or short circuit wire	
3	Failure of defrost sensor	Er	dS	Cut or short circuit wire	
4	Poor of defrost	Er	dH	2hours later After starting defrost, If sensor doesn't be over 10°C	Snapping of defrost heater or Temperature fuse, pull-out of Connector (indicated minimum 2 Hours after failure occurs)
5	Failure of RT sensor	NOTE 1)		Cut or short circuit wire	* Inspect Connecting wires On each sensor
6	Failure of Miracle Zone sensor			Cut or short circuit wire	

**NOTE 1)** When the SUPER FRZ. button and FRZ. Temp button are pushed and held for 1 second or longer, operates as follow.

Miracle Zone sensor { If normal, all graphics at the LCD are on.  
 If abnormal, the graphics of temp and text of miracle zone at the LCD are off.

RT sensor { If normal, all graphics at the LCD are on.  
 If abnormal, the graphics of ①, ② at the LCD are off.

► BETTER

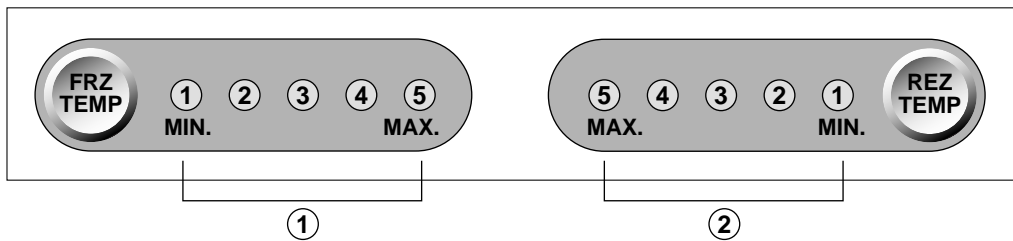


- Show ERROR CODE on display panel.

○ : ON    ● : OFF

Item	Failure of Freezer sensor		Failure of Refrigerator sensor		Failure of defrost sensor		Poor of defrost		Failure of RT sensor (NOTE2)	
	①	②	①	②	①	②	①	②	①	②
ERROR CODE	○	All off	○	All off	○	All off	●	All off	○	All off
	○		○		○		○		○	
	○		○		○		○		○	
	○		○		○		○		○	
	○		○		○		○		○	
	●		○		○		○		○	

► GOOD



- Show ERROR CODE on display panel.

○ : ON    ● : OFF

NO	Item	ERROR CODE	
		①	②
1	Failure of Freezer sensor	● ○ ○ ○ ○	All off
2	Failure of Refrigerator sensor	○ ● ○ ○ ○	All off
3	Failure of defrost sensor	○ ○ ● ○ ○	All off
4	Poor of defrost	○ ○ ○ ○ ●	All off
3	Failure of RT sensor (NOTE 2)	● ○ ● ○ ○	All off

**NOTE 2)** When the SUPER FRZ. button and FRZ. Temp button are pushed and held for 1 second or longer, ERROR CODE of RT sensor is expressed.

## 11) FUNCTION TEST

- (1) Function to check the testing function of PCB and refrigerator and to find where the trouble.
- (2) The test switch is on the MAIN PCB of refrigerator.  
TEST FUNCTION is released and RESET after MAX. 2hours regardless of TEST MODE.
- (3) If the buttons on TOP COVER is pushed during TEST MODE, Function is not operated and only BUZZER ring with "DING~"
- (4) After the end of TEST MODE, pull out the power cord and plug it in again(RESET).
- (5) If a ERROR occurs during the TEST MODE, TEST FUNCTION is released and DISPLAY represent ERROR CODE.
- (6) If the TEST swithch is pushed during ERROR CODE, TEST FUNCTION is not operated.

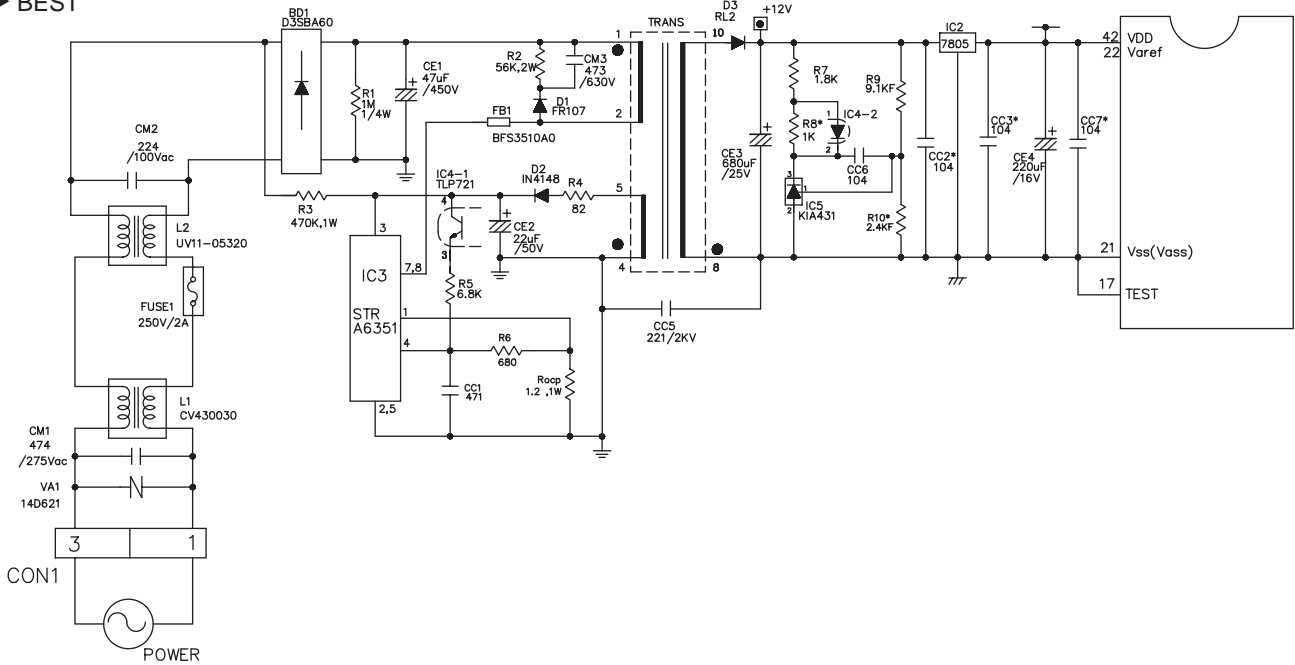
MODE	OPERATION	CONTENTS	REMARKS
TEST 1	Press TEST button once.	<ol style="list-style-type: none"> <li>1. Continuous operation of the compressor.</li> <li>2. Continuous operation of the freezer fan.</li> <li>3. STEPPING DAMPER OPEN.</li> <li>4. Defrosting Heater OFF.</li> <li>5. ALL Graphics ON.</li> <li>6. Miracle Zone DAMPER CLOSE (BEST model)</li> </ol>	
TEST 2	Press TEST button once in the state of TEST MODE 1.	<ol style="list-style-type: none"> <li>1. COMP OFF.</li> <li>2. FREEZER FAN OFF.</li> <li>3. STEPPING DAMPER CLOSE.</li> <li>4. Defrosting Heater ON.</li> <li>5. DISPLAY LCD shows 22 (BEST model)</li> <li>6. The 1st, 2nd, 3rd LED of DISPLAY is ON (BETTER/GOOD model)</li> </ol>	If DEFROST SENSOR is over 10°C, it returns to the NORMAL STATE.
NORMAL STATE	Press TEST button once in the state of TEST MODE 2.	Return to the initial condition. (RESET)	Comp starts after 7 minutes.

- **LED/LCD Check Function** : Press the SUPER FREEZE and FREEZE TEMP buttons at the same time. After 1 sec., all the GRAPHICS of the DISPLAY are ON simultaneously. If release the BUTTON, return to the previous condition.

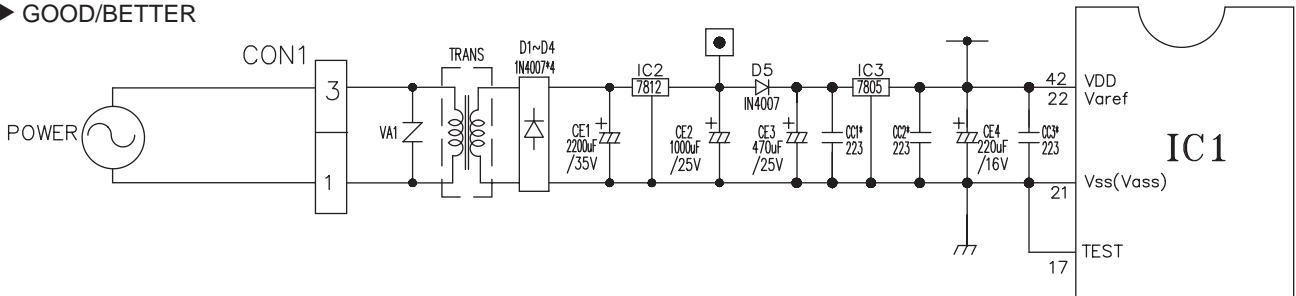
## 2. FUNCTION DESCRIPTION

### 1) POWER CIRCUITS

#### ► BEST



#### ► GOOD/BETTER



TRANS secondary side is composed of electric power circuits for RELAY driving electricity (12Vdc) and for supplying electricity to MICOM and IC (5Vdc). The voltage in each part is as follows.

#### ► BEST

PARTS	VA1	CE3	CE4
VOLTAGE	230Vac	12Vdc	5Vdc

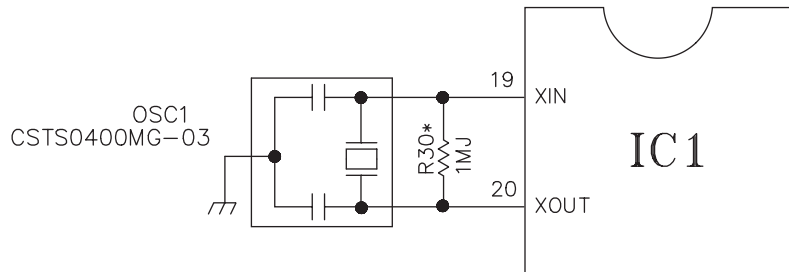
#### ► GOOD/BETTER

PARTS	VA1	CE1	CE2	CE3
VOLTAGE	230Vac	17Vdc	12Vdc	5Vdc

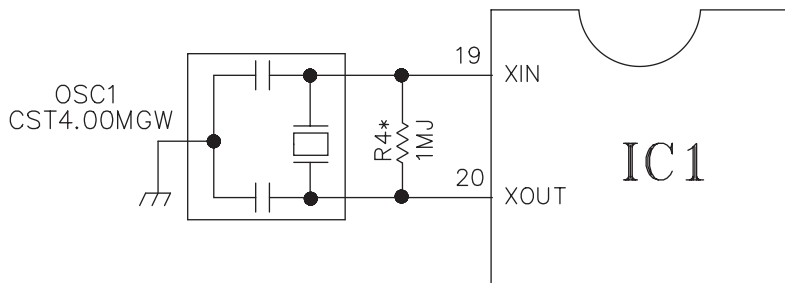
## 2) OSCILLATION CIRCUIT

CIRCUIT for occurring CLOCK which motivates the internal local element of IC1 to transmit and receive an information and BASIC TIME for calculating time. Use a proper form for OSC 1. Because in case that SPECIFICATION is changed, the calculated time in IC1 is changed or IC1 isn't able to operate.

► BEST



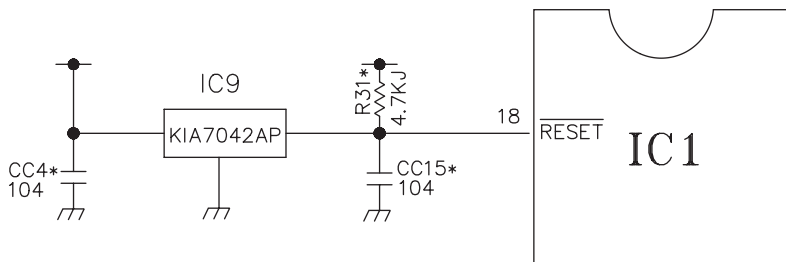
► GOOD/BETTER



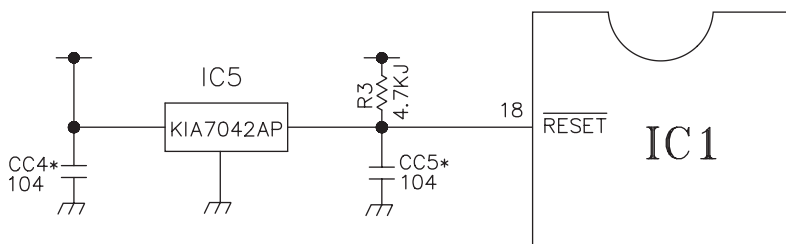
## 3) RESET CIRCUIT

All the internal parts of MICOM(IC1) return to the initial condition when the early power ON or apply power again in MICOM after temporary power failure. As a result, all the functions operate according to the early condition. At the early period of power ON the "LOW" voltage is applied in the RESET terminal of MICOM for the fixed time. The RESET terminal is 5V during the general operation.

► BEST



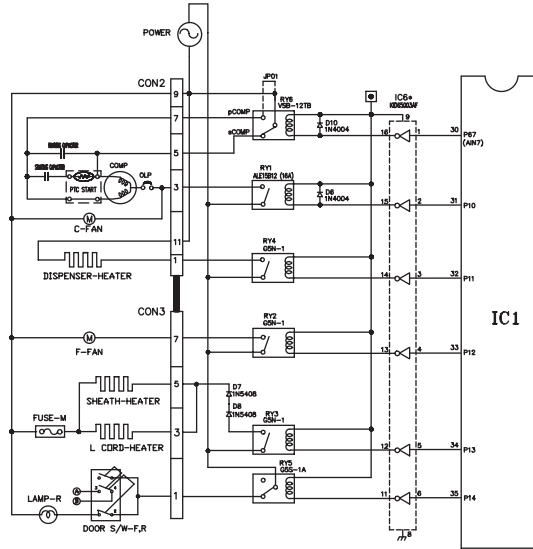
► GOOD/BETTER



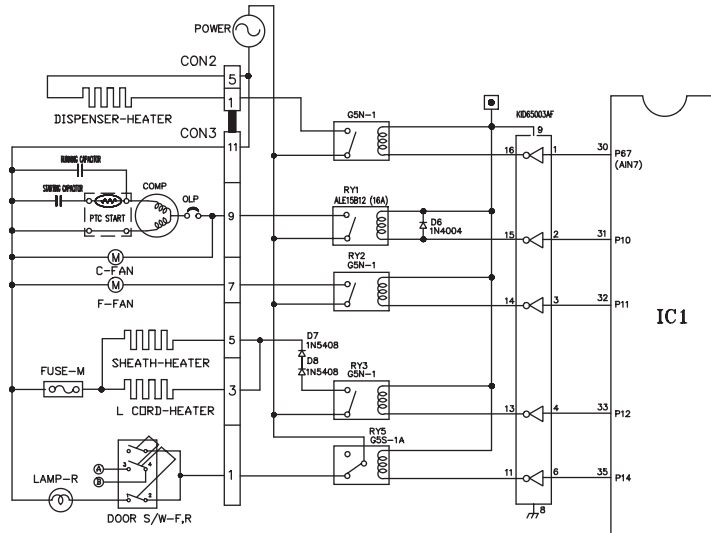
#### 4) LOAD/BUZZER OPERATION, DOOR OPENING SENSING CIRCUIT

##### (1) LOAD OPERATION CHECK

► BEST



► GOOD/BETTER



► BEST

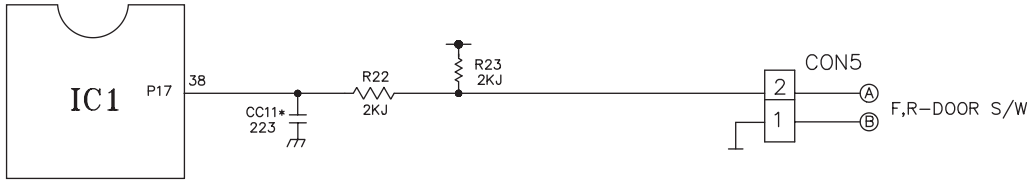
LOAD		COMP	FAN	DEFROST HEATER	LAMP	DISPENSER HEATER(OPTION)	TCM (OPTION)
MEASURING POINT (IC6)		NO.15	NO.13	NO.12	NO.11	NO.14	NO.16
STATE	ON	Below 1V					
	OFF	12V					

► GOOD/BETTER

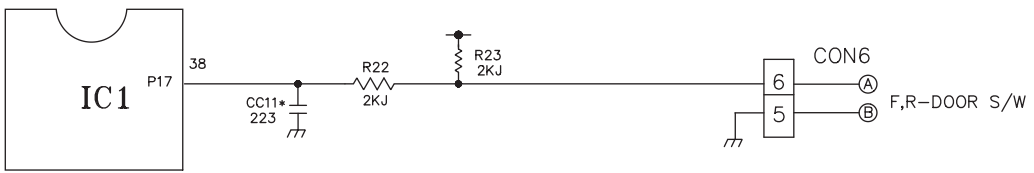
LOAD		COMP	FAN	DEFROST HEATER	LAMP	DISPENSER HEATER(OPTION)
MEASURING POINT (IC4)		NO.15	NO.14	NO.13	NO.11	NO.16
STATE	ON	Below 1V				
	OFF	12V				

(2) DOOR OPENING PERCEPTION CHECK

► BEST



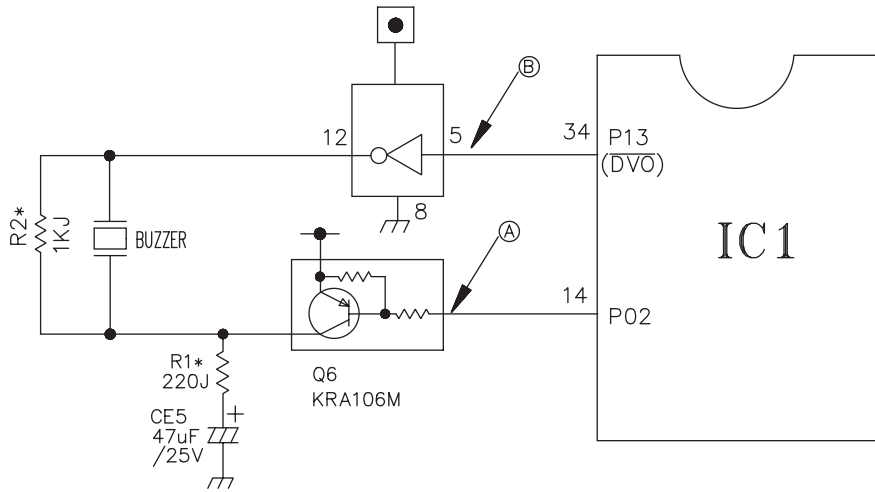
► GOOD/BETTER



MEASURING POINT REFRIGERATOR DOOR	NO.38 OF IC 1 (MICOM)
CLOSE	5V(S/W of (A) , (B) is OFF state)
OPEN	0V(S/W of (A) , (B) is ON state)

(3)BUZZER OPERATION CHECK

► GOOD/BETTER



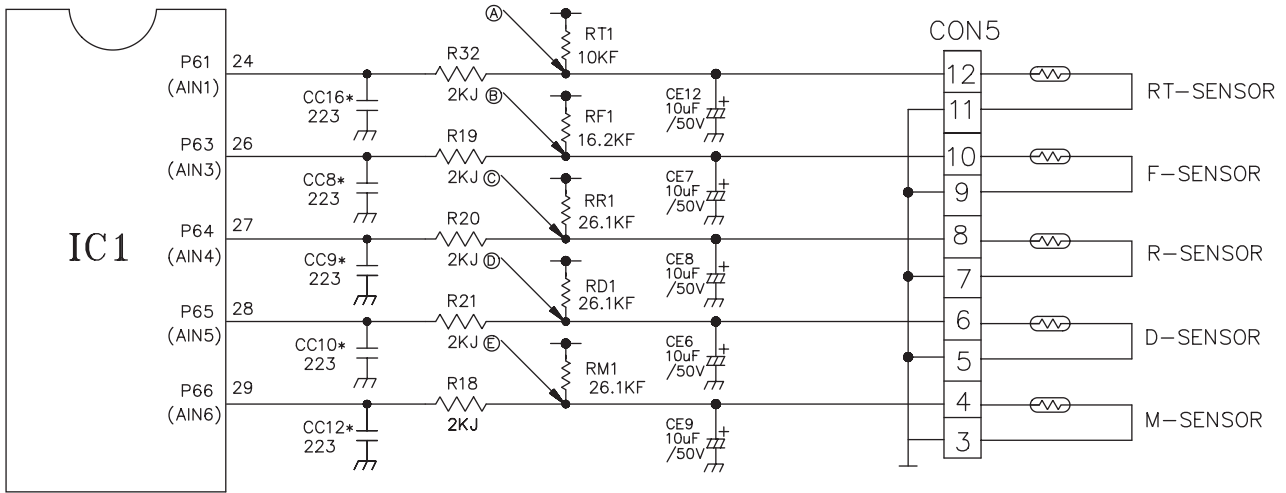
NOTE) In the case of Best model, BUZZER is in the LCD [Refer to DISPLAY CIRCUIT].

MEASUREMENT LOCATION \ CONDITION	Tone(Beep~) when the button on the display is pushed	Alam for open door (beep-beep-beep)	OFF
IC1 (A)			5V
IC1 (B)			0V

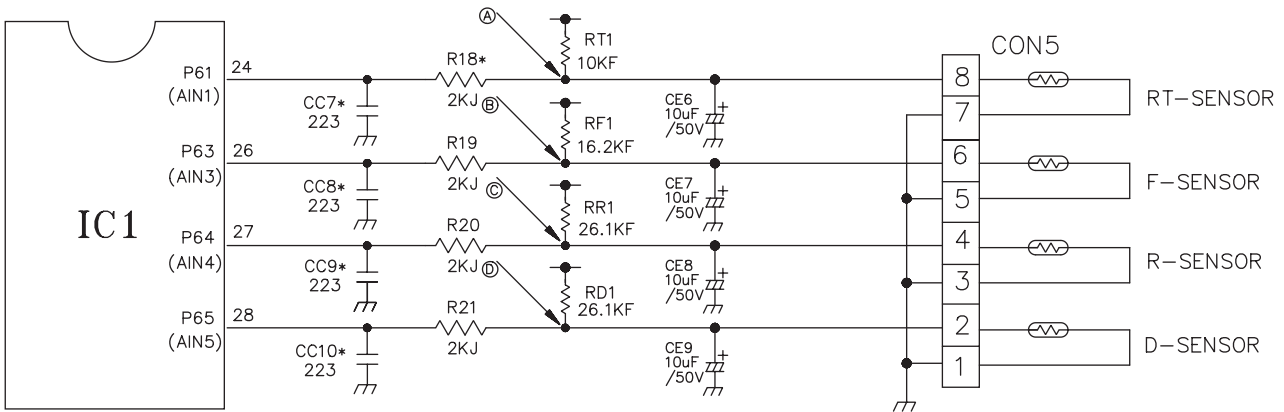


## 5) TEMP SENSOR CIRCUITS

### ► BEST



### ► GOOD/BETTER



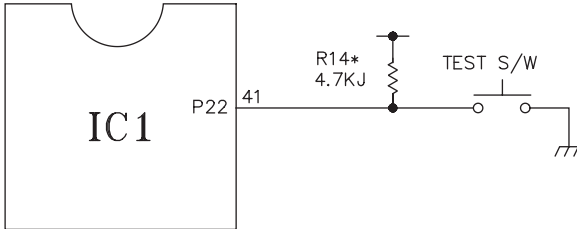
The above circuit reads the surrounding temperature, DEFROSTING temperature and FREEZER temperature, REFRIGERATOR temperature, MIRACLE ZONE temperature into MICOM(IC1). OPEN or SHORT state of each SENSOR is as follows.

SENSOR	CHECK POINT	NORMAL (-30°C~50°C)	SHORT	OPEN
RT SENSOR	POINT A Voltage	0.5V ~ 4.5V	0V	5V
FREEZER SENSOR	POINT B Voltage			
REFRIGERATOR SENSOR	POINT C Voltage			
DEFROST SENSOR	POINT D Voltage			
MIRACLE ZONE SENSOR	POINT E Voltage			

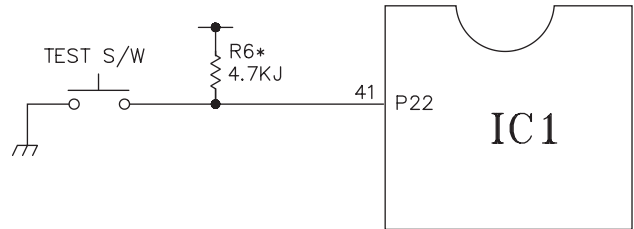
## 6) SWITCH INPUT CIRCUIT

The following circuit is a test switch input circuit for checking the refrigerator.

► BEST

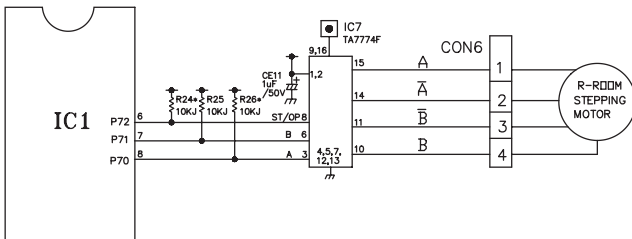


► GOOD/BETTER

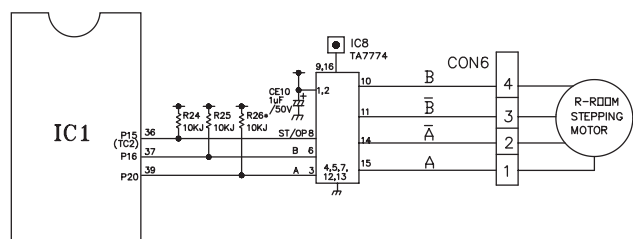


## 7) REFRIGERATOR DAMPER CIRCUIT

► BEST

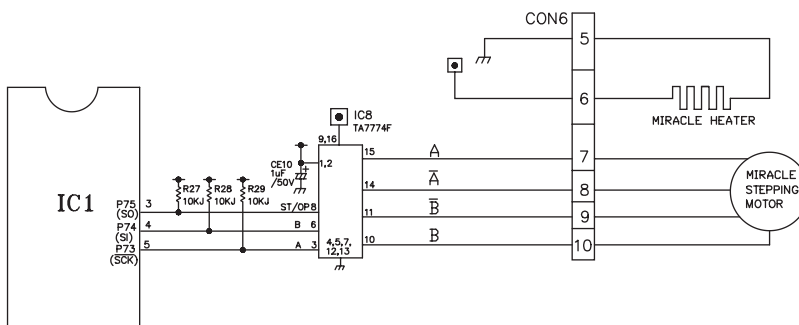


► GOOD/BETTER



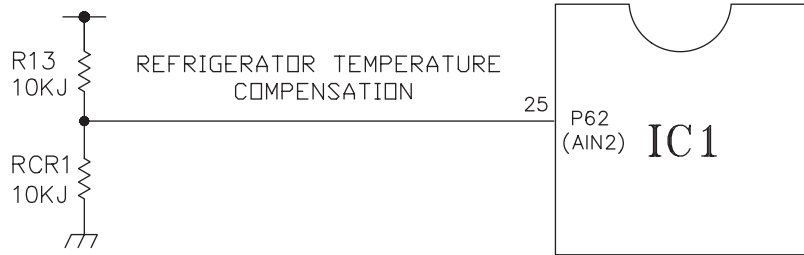
## 8) MIRACLE ZONE DAMPER CIRCUIT (BEST MODEL)

► BEST MODEL

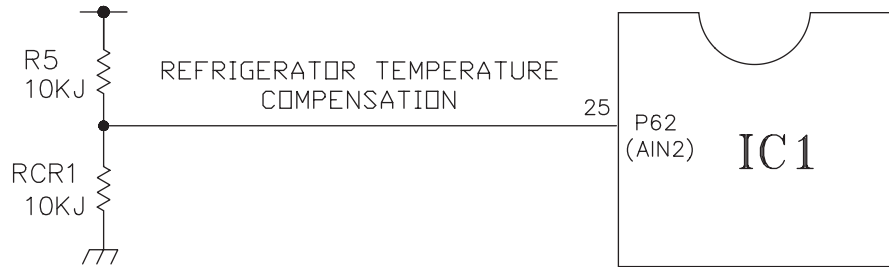


## 9) TEMPERATURE COMPENSATION

### ► BEST



### ► GOOD/BETTER



FREEZER ROOM		REMARKS
RESISTANCE VALUES(R1)	TEMPERATURE COMPENSATION	
180 kΩ	+2.5°C	COMPENSATE WARMLY ↑
56 kΩ	+2.0°C	
33 kΩ	+1.5°C	
18 kΩ	+1.0°C	
12 kΩ	+0.5°C	
10 kΩ	0°C	STANDARD
8.2 kΩ	-0.5°C	↓ COMPENSATE COOLLY
5.6 kΩ	-1.0°C	
3.3 kΩ	-1.5°C	
2 kΩ	-2.0°C	
470 Ω	-2.5°C	

• TEMPERATURE COMPENSATION TABLE by adjusting resistance values. (the temp difference compared to the present temp.)

eg) If the compensation resistance of freezer compartment is changed from 10K (present resistance) to 18K (revised resistance), the temp of freezer compartment goes up by +1.0°C.

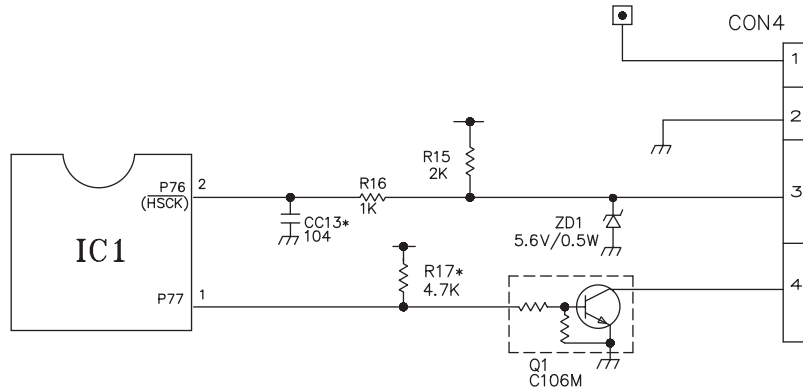
• TEMPERATURE COMPENSATION OF REFRIGERATOR ROOM

	Modification resistance	470 Ω	2 kΩ	3.3 kΩ	5.6 kΩ	8.2 kΩ	10 kΩ	12 kΩ	18 kΩ	33 kΩ	56 kΩ	180 kΩ
	Current resistance											
Refrigerator  (RCR)	470Ω	No change	0.5 °C Up	1 °C Up	1.5 °C Up	2 °C Up	2.5 °C Up	3 °C Up	3.5 °C Up	4 °C Up	4.5 °C Up	5 °C Up
	2 kΩ	0.5 °C Down	No change	0.5 °C Up	1 °C Up	1.5 °C Up	2 °C Up	2.5 °C Up	3 °C Up	3.5 °C Up	4 °C Up	4.5 °C Up
	3.3 kΩ	1 °C Down	0.5 °C Down	No change	0.5 °C Up	1 °C Up	1.5 °C Up	2 °C Up	2.5 °C Up	3 °C Up	3.5 °C Up	4 °C Up
	5.6 kΩ	1.5 °C Down	1 °C Down	0.5 °C Down	No change	0.5 °C Up	1 °C Up	1.5 °C Up	2 °C Up	2.5 °C Up	3 °C Up	3.5 °C Up
	8.2 kΩ	2 °C Down	1.5 °C Down	1 °C Down	0.5 °C Drop	No change	0.5 °C Up	1 °C Up	1.5 °C Up	2 °C Up	2.5 °C Up	3 °C Up
	10 kΩ	2.5 °C Down	2 °C Down	1.5 °C Down	1 °C Down	0.5 °C Down	No change	0.5 °C Up	1 °C Up	1.5 °C Up	2 °C Up	2.5 °C Up
	12 kΩ	3 °C Down	2.5 °C Down	2 °C Down	1.5 °C Down	1 °C Down	0.5 °C Down	No change	0.5 °C Up	1 °C Up	1.5 °C Up	2 °C Up
	18 kΩ	3.5 °C Down	3 °C Down	2.5 °C Down	2 °C Down	1.5 °C Down	1 °C Down	0.5 °C Down	No change	0.5 °C Up	1 °C Up	1.5 °C Up
	33 kΩ	4 °C Down	3.5 °C Down	3 °C Down	2.5 °C Down	2 °C Down	1.5 °C Down	1 °C Down	0.5 °C Down	No change	0.5 °C Up	1 °C Up
	56 kΩ	4.5 °C Down	4 °C Down	3.5 °C Down	3 °C Down	2.5 °C Down	2 °C Down	1.5 °C Down	1 °C Down	0.5 °C Down	No change	0.5 °C Up
180 kΩ	5 °C Down	4.5 °C Down	4 °C Down	3.5 °C Down	3 °C Down	2.5 °C Down	2 °C Down	1.5 °C Down	1 °C Down	0.5 °C Down	No change	

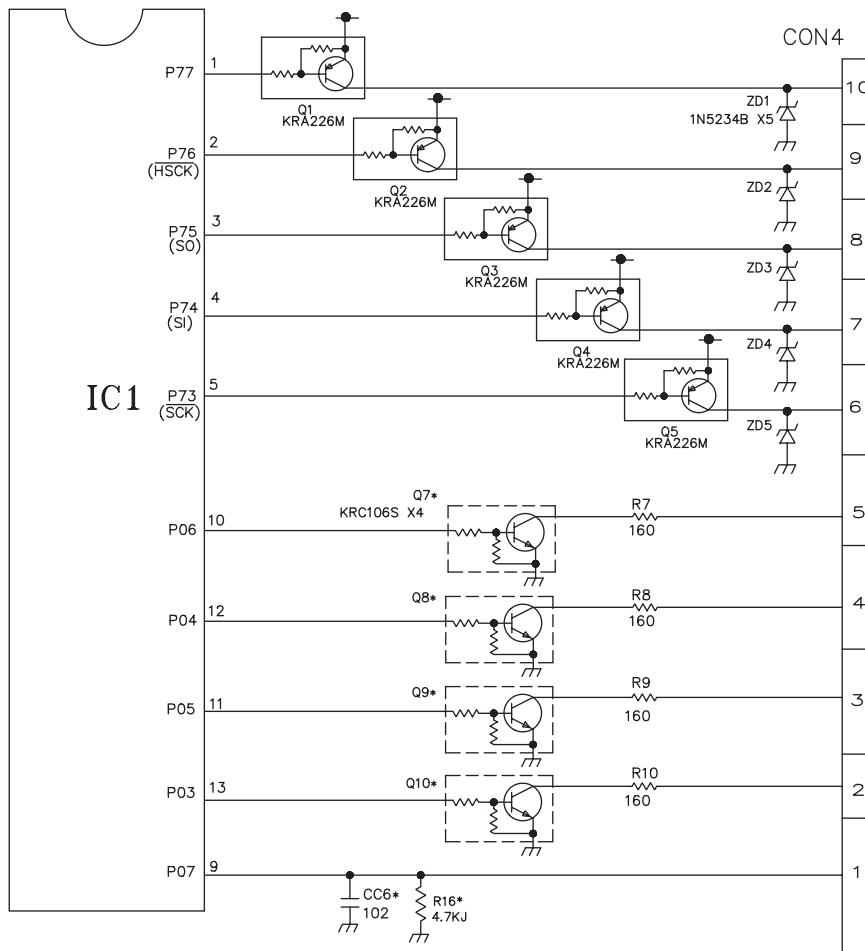
- This circuit is aimed to input the necessary temperature compensation values into the MICOM in order to adjust the refrigerator temperature which is different in each model.

## 10) LIGHTING CIRCUITS OF KEY BUTTON INPUT AND DISPLAY PARTS

► BEST

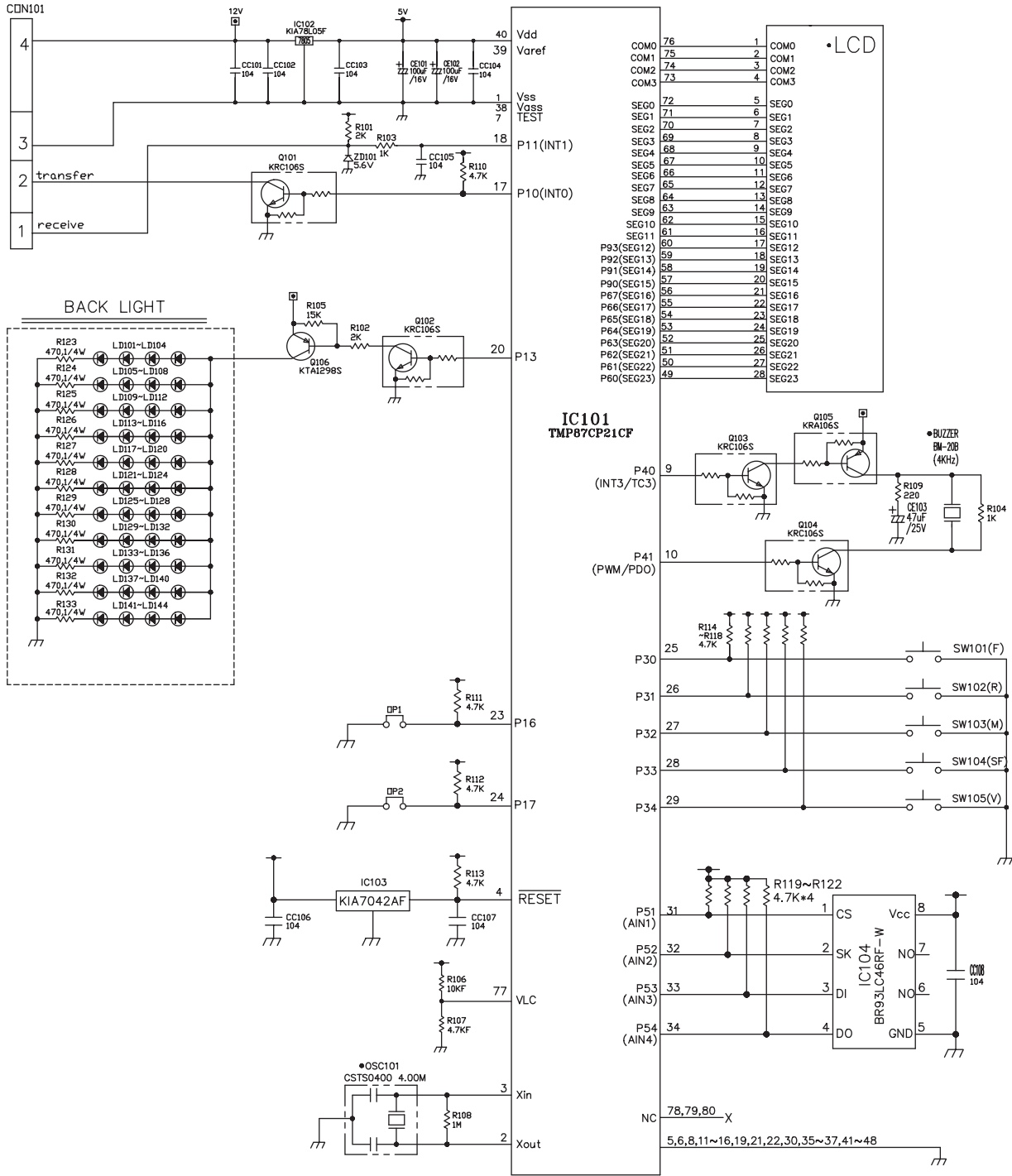


► GOOD/BETTER



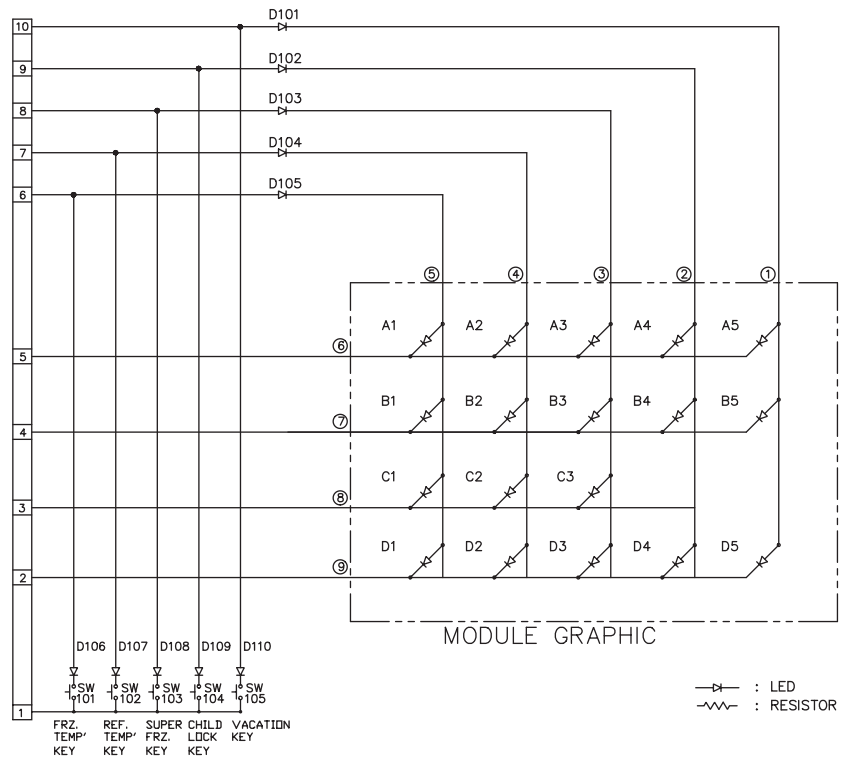
# 11) DISPLAY CIRCUIT

▶ BEST



(SCHEMATIC DIAGRAM)

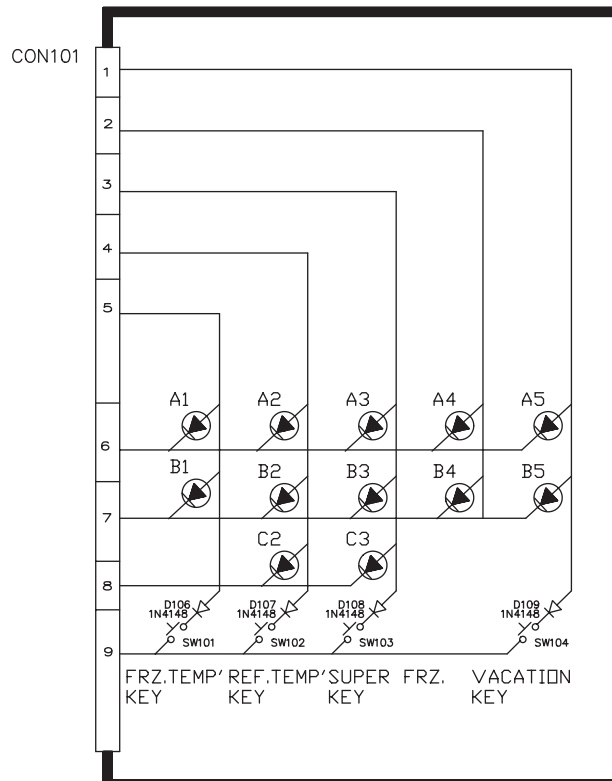
► BETTER



(SCHEMATIC DIAGRAM)

► GOOD

BETTER DISPLAY PCB



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### 3. SENSOR RESISTANCE CHARACTERISTICS TABLE

MEASURED TEMPERATURE	RESISTANCE OF FREEZER SENSOR	RESISTANCE OF DEFROST SENSOR, ROOM TEMPERATURE SENSOR
-20°C	22.3kΩ	77kΩ
-15°C	16.9kΩ	60kΩ
-10°C	13.0kΩ	47.3kΩ
-5°C	10.1kΩ	38.4kΩ
0°C	7.8kΩ	30kΩ
+5°C	6.2kΩ	24.1kΩ
+10°C	4.9kΩ	19.5kΩ
+15°C	3.9kΩ	15.9kΩ
+20°C	3.1kΩ	13kΩ
+25°C	2.5kΩ	11kΩ
+30°C	2.0kΩ	8.9kΩ
+40°C	1.4kΩ	6.2kΩ
+50°C	0.8kΩ	4.3kΩ

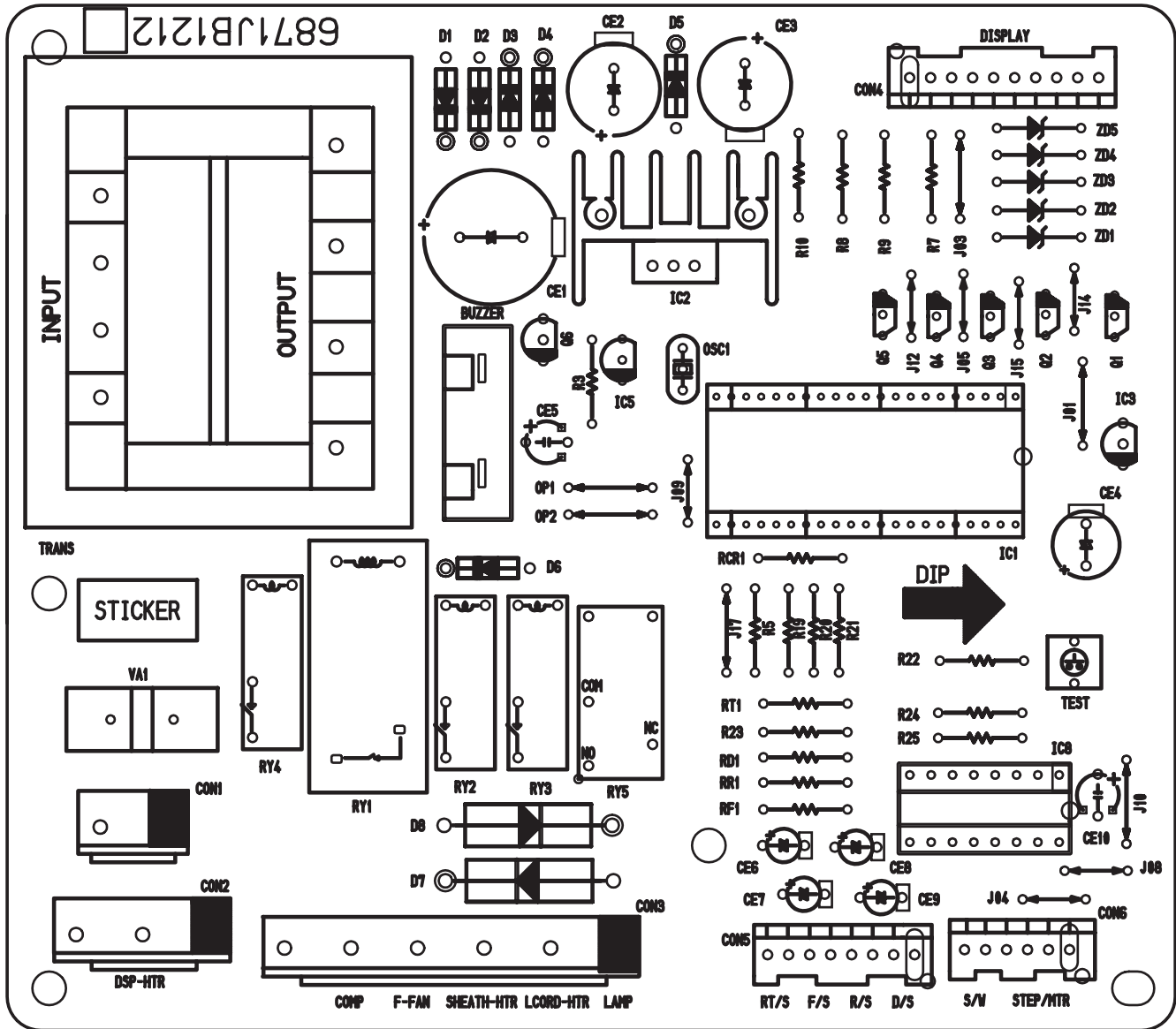
- The tolerance of sensor resistance is  $\pm 5\%$ .
- Be sure to measure the sensor resistance after keeping the sensor more than 3 minutes at a measuring temperature. (It needs delay due to sensor speed.)



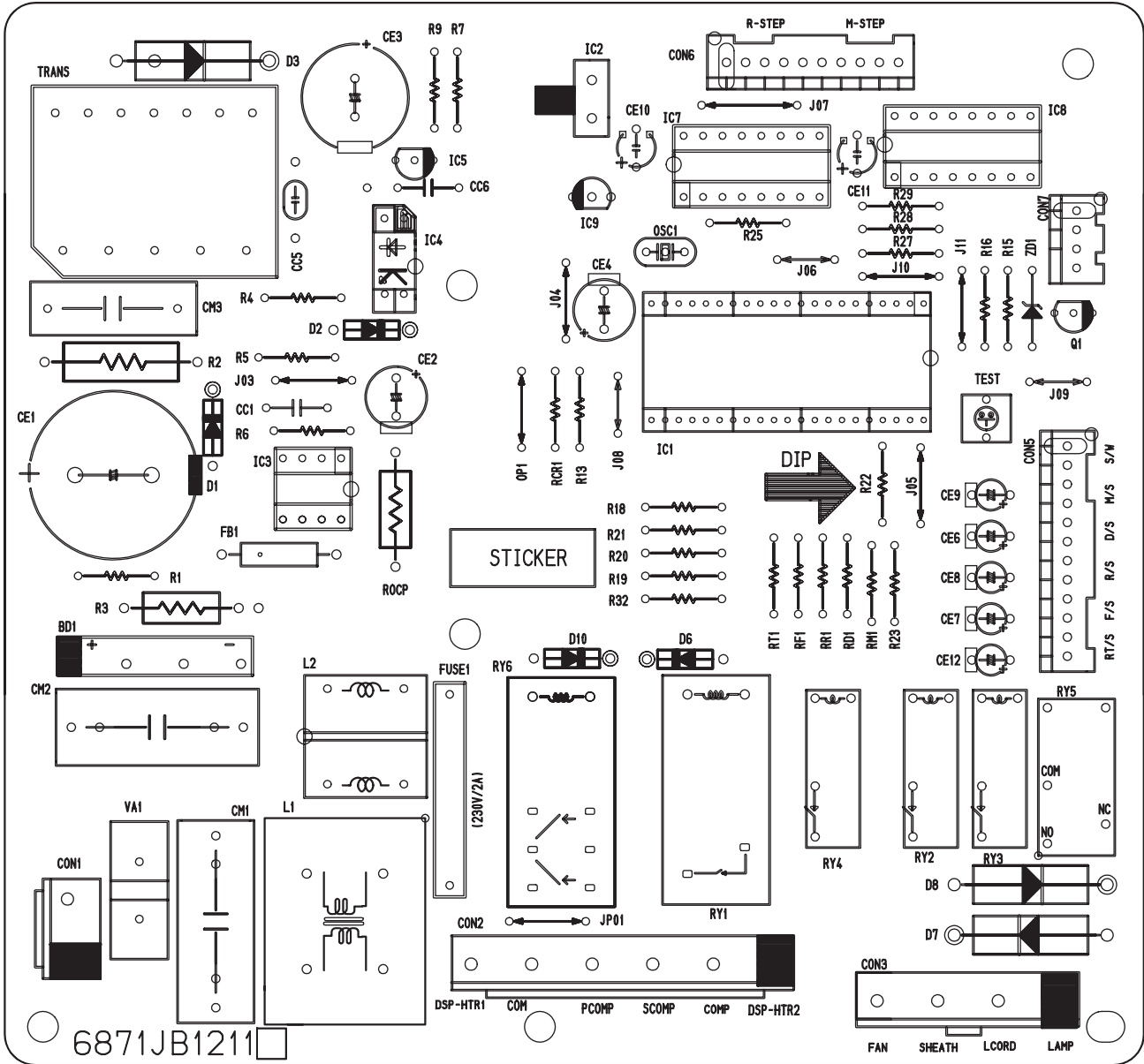
#### 4. MAIN PWB ASS'Y AND PARTS LIST

##### 1) MAIN PWB ASS'Y

▶ BEST



► GOOD/BETTER



## 2) REPLACEMENT PARTS LIST

▶ BEST

No	P/NO	DESCRIPTION	SPEC	MAKER	REMARK
1	6870JB8085B	PWB(PCB)	MY-PJT BEST	DOB SAN	T-1.6
2	6170JB2010A	TRANSFORMER,SMPS(COIL)	A3-PJT 12V 5A	HANYOUNG	TRANS
3	6630AQ9106C	CONNECTOR (CIRC),WAFER	YW396-07AV YEDNHD 7PIN 3.96MM STRAIGHT SN	YEDN HO	CON3
4	6630AQ9106A	CONNECTOR (CIRC),WAFER	YW396-03AV	YEDN HO	CON1
5	6630VM01111	CONNECTOR (CIRC),WAFER	YW396 YEDNHD 11P	YEDN HO	CON2
6	6630JB8007C	CONNECTOR (CIRC),WAFER	917782-1 AMP 4P 2.5MM STRAIGHT SN	AMP	CON4
7	6630JB8007L	CONNECTOR (CIRC),WAFER	917790-1 AMP 12P 2.5MM STRAIGHT SN	AMP	CON5
8	6630JB8007J	CONNECTOR (CIRC),WAFER	917788-1 AMP 10P 2.5MM STRAIGHT SN	AMP	CON6
9	01ZZJB2023V	IC, DRAWING	TMP87C46N 42PIN,SDIP BK MY-PJT BEST [MASK]	TOSHIBA	IC1(01ZZJB2023V)
10	01TZJB2023	-	-	TOSHIBA	IC1
11	01TD777400A	IC, DRAWING	TA77774AP 16,SDIP BK DRIVE,IC STEPPING MOTOR	TOSHIBA	IC7,8
12	01KE781200B	IC,LINEAR	K1A7812API KEC 3P BK REGULATOR	KEC	-
13	01KE781200M	IC,KEC	K1A7812PI 3DIP BK 12V 1A REFORM	KEC	-
14	01KE780500W	IC,LINEAR	K1A7805PI - - -	KEC	IC2
15	01STLM1001A	IC,STANDARD LOGIC	M54563FP MITSUBISHI 20 R/TP CONVERT	MITSUBISHI	-
16	01KE650030C	IC,KEC	K1D65003AF 16SDP BK 7CH DRIVER	KEC	IC6
17	01KE650830B	IC,KEC	K1D65083AF 20P SDP ST LED DRIVER(CTR ARRAY)	KEC	-
18	01KE704200A	IC,KEC	K1A7042P KEC 3P BK RESET	KEC	IC9
19	6920000001A	RELAY	AL1E15B12 MATSUSHITA 250VAC 16A 12VDC 1A NO VE	NAIS	RY1
20	6920JB2007A	RELAY	V5B-121B TAKAMISAWA DC12V 60MA 250V 1C	FUJITSU	RY6
21	6920JB2003A	RELAY	G5N-1A DMRDN 250VAC 15A 12VDC 1A JAPAN	DMRDN	RY2,3
22	6920JB2003A	RELAY	G5N-1A DMRDN 250VAC 15A 12VDC 1A JAPAN	DMRDN	RY4
23	6920JB2009A	RELAY	G5S-1 DMRDN 12V 3A 227V 1C	DMRDN	RY5
24	6212W5M002A	RESONATOR,CERAMIC	CST50400 MURATA 4MHZ +/-0.5% TP 15PF	MURATA	OSC1(CJ570-00012B)
25	6102JB8001B	VARISTOR	INR14D621 ILJIN UL/VDE BK 620V	SAM HWA	VSA1
26	6102W5V006A	VARISTOR	SVVC271D-14A SAMWHA UL/CSA/VDE TP	IL JIN	-
27	0DR154080AA	DIODE,RECTIFIERS	1N5408 BK DELTA DD201AD 1000V 3A 125A -SEC 5A	DELTA	D7,8
28	0DD400409AC	DIODE,RECTIFIERS	RECT1N4004 TP	DELTA	D6,D10
29	0CE2296J610	CAPACITOR,FIXED ELECTROLYTIC	22000UF SMS,SG 35V 20% FL BULK	SAM HWA	-
30	0CE1086J610	CAPACITOR,FIXED ELECTROLYTIC	10000UF SMS,SG 35V 20% FL BULK	SAM HWA	-
31	0CE1086H618	CAPACITOR,FIXED ELECTROLYTIC	10000UF SMS,SG 25V 20% FL TP 5	SAM HWA	-
32	0CE4776H618	CAPACITOR,FIXED ELECTROLYTIC	470UF SMS,SG 25V 20% FL TP 5	SAM HWA	-
33	0CE4766H618	CAPACITOR,FIXED ELECTROLYTIC	47UF SMS,SG 25V 20% FL TP 5	SAM HWA	-
34	0CE2276F638	CAPACITOR,FIXED ELECTROLYTIC	220UF SMS,SG 16V 20% FM5 TP 5	SAM HWA	-
35	0CE1066K638	CAPACITOR,FIXED ELECTROLYTIC	10UF SMS,SG(HR) 50V 20% FM5 TP 5	SAM HWA	CE6,7,8,9,12
36	0CE1051K638	CAPACITOR,FIXED ELECTROLYTIC	1UF SM,SA 50V 20% FM5 TP 5	SAM HWA	CE10,11
37	6908JB3002D	BUZZER	PQ272207PL -20C -2000 SUNWAY PIEZO 2KHZ 80DB <C	BUJEDN	BUZZER
38	0CG2231N409	CAPACITOR,FIXED FILM	0.022 UF D 100V J PE TP	SAM HWA	-
39	0CK1023K396A	CAPACITOR,FIXED CERAMIC(HIGH DIELECT	1NF 2012 50V 80%, -20% R/TP X7R	SAM HWA	-
40	0CK2230H908	CAPACITOR,FIXED CERAMIC(HIGH DIELECT	22NF 2012 50V 80%, -20% R/TP X7R	SAM HWA	CC8,9,10,11,12,16
41	0CK2230H908	CAPACITOR,FIXED CERAMIC(HIGH DIELECT	22000PF D 25V 80%, -20% TA A26	TAE YANG	-
42	0CK104DK94A	CAPACITOR,FIXED CERAMIC(HIGH DIELECT	100NF 2012 50V 80%, -20% R/TP F(Y5V)	SAM HWA	CC2,3,4,7,13,15
43	0CK104DK94A	CAPACITOR,FIXED CERAMIC(HIGH DIELECT	100NF 2012 50V 80%, -20% R/TP F(Y5V)	SAM HWA	-
44	0CK104OK949	CAPACITOR,FIXED CERAMIC(HIGH DIELECT	0.1UF D 50V 80%, -20% F(Y5V) TA52	SAM HWA	CC6
45	0RD2700H609	RESISTOR,FIXED CARBON FILM	270 OHM 1/2 W 5.00% TA52	SMART	-
46	0RD1002G609	RESISTOR,FIXED CARBON FILM	10K OHM 1/4 W 5% TA52	SMART	RCR1,R13,25,27,28,29
47	0RD1000H609	RESISTOR,FIXED CARBON FILM	100 OHM 1/2 W 5.00% TA52	SMART	-
48	0R1001E672	RESISTOR,METAL GLAZED(CHIP)	1K OHM 1/8 W 5% 2012 R/TP	R0HM	R8
49	0R1001G609	RESISTOR,FIXED CARBON FILM	1K OHM 1/4 W 5% TA52	SMART	R16
50	0R1001E672	RESISTOR,METAL GLAZED(CHIP)	2K OHM 1/8 W 5% 2012 R/TP	R0HM	-
51	0RD2001G609	RESISTOR,FIXED CARBON FILM	2K OHM 1/4 W 5% TA52	SMART	R15,18,19,20,21,22,23,32
52	0RD2702G609	RESISTOR,FIXED CARBON FILM	27K OHM 1/4 W 5.00% TA52	SMART	-
53	0RH4701L622	RESISTOR,METAL GLAZED(CHIP)	4.7K OHM 1/8 W 5% 2012 R/TP	R0HM	R14,17,31,33
54	0R14702E672	RESISTOR,METAL GLAZED(CHIP)	47K OHM 1/8 W 5% 2012 R/TP	R0HM	-
55	0RD14701G609	RESISTOR,FIXED CARBON FILM	4.7K OHM 1/4 W 5% TA52	SMART	-
56	0R1002E672	RESISTOR,METAL GLAZED(CHIP)	10K OHM 1/8 W 5% 2012 R/TP	R0HM	R26,24
57	0R1000E672	RESISTOR,METAL GLAZED(CHIP)	-	R0HM	-
58	0R1001E672	RESISTOR,METAL GLAZED(CHIP)	27K OHM 1/8 W 5% 2012 R/TP	R0HM	-
59	0RN1622G409	RESISTOR,FIXED METAL FILM	16.2K OHM 1/4 W 1.00% TA52	SMART	RF1
60	0R1004E672	RESISTOR,METAL GLAZED(CHIP)	1M OHM 1/8 W 5% 2012 R/TP	R0HM	R30
61	0RN1002G409	RESISTOR,FIXED METAL FILM	10K OHM 1/4 W 1.00% TA52	SMART	RT1
62	0RN2612G409	RESISTOR,FIXED METAL FILM	26.1K OHM 1/4 W 1.00% TA52	SMART	RR1,RD1,RM1
63	6901JB8001A	FUSE,ASSEMBLY	KORE-PJT N/S	SAM JU	-
64	3J03565D	FUSE, DRAWING	9A 250V - -	SAM JU	-
65	6500JB3001A	SENSOR	COMBI PCB JAMES-TEC RT SENSOR -	JAMES TEC	-
66	0TR106009AC	TRANSISTOR,BIPOLARS	KRA106M (KRA2206) KEC TP TD92M 50V 100MA	KEC	-
67	0TR106009AF	TRANSISTOR,BIPOLARS	KRC106M KEC TP TD92M 50V 100MA	KEC	-
68	0TR319809AA	TRANSISTOR	KTC3198-TP-Y KTC1815KKEC	KEC	-
69	6800R10012	SWITCH,TACT	JT1280A6 JEIL 12VDC 50MA -	JEIL	TEST
70	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	JP01
71	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	DP1
72	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	-
73	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	-
74	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	J03,04,05(10MM)
75	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	J10,11(10MM)
76	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	J07(12.5MM)
77	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	J06,08,09(8MM)
78	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	-
79	4920JB3007A	HEAT SINK	23.3*17*25 DRIVE IC STR R-S64,65,73 2PIN 1-SC	-	-
80	1SFB0302418	SCREW TAP TITE(S),BINDING HEAD	+ D3.0 L8.0 MSWR3/FZY	-	-
81	9VVF0120000	SOLDER(RDSIN WIRE) R50	D120	HEE SUNG	-
82	49111004	SOLDER,SOLDERING	NA HEESUNG METAL BAR SN 63% NA	-	-
83	59333105	FLUX	SGJ0.825-0.830 KOREA F.H-206	KOKI	-
84	0TR106009AF	TRANSISTOR,BIPOLARS	KRC106M KEC TP TD92M 50V 100MA	KEC	Q1
85	0DZMR00029A	DIODE,ZENERS	1N5232B MTDQRRA TP DD34 0.5W 5.6V 81MA .PF	DELTA	ZD1
86	0DB360000AA	DIODE,RECTIFIERS	D3SBA60 BK SHINDENGEN 600V 4A	SHINDENGEN	BD1
87	0DRSA00070A	DIODE,RECTIFIERS	RL2 SANKEN BK NDN 400V 2A 40A 50NSEC 10UA	SANKEN	D3
88	0DR107009AA	DIODE,RECTIFIERS	FR107 TP DELTA DD41 1000V 1A 3	DELTA	DI
89	0DD414809AD	DIODE,RECTIFIERS	1N4148 PYUNG CHANG TP52 DD35 100V 0.5A 0.5A 4	R0HM	D2
90	0CE2276F638	CAPACITOR,FIXED ELECTROLYTIC	220UF SMS,SG 16V 20% FM5 TP 5	RUBICON,SAM HWA	CE4
91	0CE476ZV660	CAPACITOR,FIXED ELECTROLYTIC	47UF HE 450V 20% BULK SNAP IN	SAM HWA	CE1
92	0CE687YH6E0	CAPACITOR,FIXED ELECTROLYTIC	680UF RX 25V 20% BULK SNAP IN	SAM HWA	CE3
93	0CE226AK638	CAPACITOR,FIXED ELECTROLYTIC	22UF KM 50V 20% FM5 TP 5	RUBICON,SAM HWA	CE2
94	01KE431000A	IC,KEC	K1A431 3 PIN TP - -	KEC	IC5
95	01TD721000A	IC,TOSHIBA	TLP721F 4P BK PHOTO COUPLER	TOSHIBA	IC4
96	01PMGSK003A	IC,POWER MANAGEMENT	STR-A6351 SANKEN 8 DIP ST SMPS 1 CHIP	SANKEN	IC3
97	0CK4710K519	CAPACITOR,FIXED CERAMIC(HIGH DIELECT	470PF 50V K B TA52	TAE YANG	CM1
98	0CQ47418670	CAPACITOR,FIXED FILM	0.47UF D 275V 20% M/PP NI R	PILKO	CM1,CM2
99	0CQ22418670	CAPACITOR,FIXED FILM	0.22UF D 275V 20% M/PP NI R	PILKO	-
100	0CQ4732V430	CAPACITOR,FIXED FILM	47000PF S 630V J W/PE NI R	SAM HWA	CM3
101	0CQ22418630	CAPACITOR,FIXED FILM	0.22UF D 100V M/PE NI R	SAM HWA	-
102	0RD1004G609	RESISTOR,FIXED CARBON FILM	1M OHM 1/4 W 5.00% TA52	SMART	R1
103	0RS5602K641	RESISTOR,FIXED METAL OXIDE FILM	56K OHM 2 W 5.00% F20	SMART	R2
104	0RS4703J609	RESISTOR,FIXED METAL OXIDE FILM	470K OHM 1 W 5% TA52	SMART	R3
105	0RS0121J609	RESISTOR,FIXED METAL OXIDE FILM	1.2 OHM 1 W 5% TA52	SMART	R0CP
106	0RD0822G609	RESISTOR,FIXED CARBON FILM	82 OHM 1/4 W 5.00% TA52	SMART	R4
107	0RD6801G609	RESISTOR,FIXED CARBON FILM	6.8K OHM 1/4 W 5.00% TA52	SMART	R5
108	0RD6800G609	RESISTOR,FIXED CARBON FILM	680 OHM 1/4 W 5.00% TA52	SMART	R6
109	0RD1801G609	RESISTOR,FIXED CARBON FILM	1.8K OHM 1/4 W 5.00% TA52	SMART	R7
110	0RN2401E409	RESISTOR,FIXED METAL FILM	2.4K OHM 1/8 W 1% TA52	SMART	R10
111	0RN9101G409	RESISTOR,FIXED METAL FILM	9.1K OHM 1/4 W 1.00% TA52	SMART	R9
112	-	-	-	-	-
113	0CK22102510	CAPACITOR,FIXED CERAMIC(HIGH DIELECT	220P 2KV K B S	TAE YANG	-
114	6210JB8001A	FILTER(CIRC),EMC	BFS3510A0 SAMWHA 52 -	SAM HWA	FB1
115	6200JB8003A	FILTER(CIRC),EMC	CV430030 TNC - -	TNC	L1
116	6200JB8007X	FILTER(CIRC),EMC	UV11-05320 TNC BK 0.5A 320MH	TNC	L2
117	0FZZJB3001A	FUSE, DRAWING	2A 250V - SLOW-BLOW LITTELFUSE,TRIAD	SAM JU	FUSE1
118	0CK22102510	CAPACITOR,FIXED CERAMIC(HIGH DIELECT	220P 2KV K B S	TAE YANG	CC5

▶ GOOD/BETTER

No	P/NO	DESCRIPTION	SPEC	MAKER	REMARK
1	6870JB8086	PWB(PCB)	MY-PJT BETTER	DOO SAN	T=1.6
2	6170JB2002M	TRANSFORMER,LOW VOLTAGE	260V 15V YES GR-MICOM	TAE SUNG	TRANS
3	6630AQ9106B	CONNECTOR (CIRC),WAFER	YW396 YEONHO 5P 3.96MM (5P-2,4)	YEON HO	CDN2
4	6630AQ9106A	CONNECTOR (CIRC),WAFER	YW396 YEONHO 3P 3.96MM (3P-2)	YEON HO	CDN1
5	6630VM01111	CONNECTOR (CIRC),WAFER	YW396 YEONHO 11P 3.96MM YW396-11AV (11P	YEON HO	CDN3
6	6630JB8007E	CONNECTOR (CIRC),WAFER	917784-1 AMP 6P 2.5MM STRAIGHT SN	AMP	CDN6
7	6630JB8007G	CONNECTOR (CIRC),WAFER	917786-1 AMP 8P 2.5MM STRAIGHT SN	AMP	CDN5
8	6630JB8007J	CONNECTOR (CIRC),WAFER	917788-1 AMP 10P 2.5MM STRAIGHT SN	AMP	CDN4
9	01ZZJB2023W	IC,DRAWING	TMP87C846N 42PIN SDIP BK	TOSHIBA	IC1(01ZZJB2023X)
10	01ZZJB2023Y	IC,DRAWING	TMP87C846N 42PIN SDIP BK	TOSHIBA	IC1(01ZZJB2023Z)
11	01TD777400A	IC,DRAWING	TA7774AP 16,SDIP BK DRIVE,IC STEPPING M	TOSHIBA	IC8
12	01KE781200B	IC,LINEAR	KIA7812API KEC 3P BK REGULATOR	KEC	IC2
13	-	-	-	-	-
14	01KE780500A	IC,LINEAR	KE7805 KEC 3SIP BK REGULATOR	KEC	IC3
15	01STLM1001A	IC,STANDARD LOGIC	M54563FP MITSUBISHI 20 R/TP CONVERT	MITSUBISH	-
16	01KE650030C	IC,KEC	KID65003AF 16SDP BK 7CH DRIVER	KEC	IC4
17	01KE650830B	IC,KEC	KID65083AF 20P SDP ST LED DRIVER(TR ARR	KEC	-
18	01KE704200A	IC,KEC	KIA7042P KEC 3P BK RESET	KEC	IC5
19	6920000001A	RELAY	ALE15B12 MATSUSHITA 250VAC 16A 12VDC 1A	NAIS	RY1
20	6920JB2007A	RELAY	VSB-12TB TAKAMISAWA DC12V 60MA 250V 1C	FUJITSU	-
21	6920JB2003A	RELAY	G5N-1A DMRON 250VAC 1.5A 12VDC 1A JAPA	DMRON	RY2,3
22	6920JB2003A	RELAY	G5N-1A DMRON 250VAC 1.5A 12VDC 1A JAPA	DMRON	RY4
23	6920JB2009A	RELAY	G5S-1 DMRON 12V 3A 227V 1C	DMRON	RY5
24	6212W5M002A	RESONATOR,CERAMIC	CST50400 MURATA 4MHZ +/-0.5% TP 15PF	MURATA	OSC1(J570-00012B)
25	6102JB8001B	VARIABLE	INR14D621 ILJIN UL/VDE BK 620V	SAM HWA	VA1
26	0DR154080AA	DIODE,RECTIFIERS	IN5408 BK DELTA DD201AD 1000V 3A 125A -	DELTA	D7,8
27	0DD400709AA	DIODE,RECTIFIERS	IN4007 MOTOROLA TP DD41 600V 1.5A 60A	DELTA	D1~5
28	0DD400409AC	DIODE,RECTIFIERS	RECTIN4004 TP	DELTA	D6
29	0CE2286J610	CAPACITOR,FIXED ELECTROLYTIC	2200UF SMS,SG 35V 20% FL BULK	SAM HWA	CE1
30	0CE1086J610	CAPACITOR,FIXED ELECTROLYTIC	1000UF SMS,SG 35V 20% FL BULK	SAM HWA	-
31	0CE1086H618	CAPACITOR,FIXED ELECTROLYTIC	1000UF SMS,SG 25V 20% FL TP 5	SAM HWA	CE2
32	0CE4776H618	CAPACITOR,FIXED ELECTROLYTIC	470UF SMS,SG 25V 20% FL TP 5	SAM HWA	CE3
33	0CE4766H618	CAPACITOR,FIXED ELECTROLYTIC	47UF SMS,SG 25V 20% FL TP 5	SAM HWA	CE5
34	0CE2276F638	CAPACITOR,FIXED ELECTROLYTIC	220UF SMS,SG 16V 20% FM5 TP 5	SAM HWA	CE4
35	0CE1066K638	CAPACITOR,FIXED ELECTROLYTIC	10UF SMS,SG 25V 20% FM5 TP 5	SAM HWA	CE6~CE9
36	0CE1051K638	CAPACITOR,FIXED ELECTROLYTIC	1UF SM,SA 50V 20% FM5 TP 5	SAM HWA	CE10
37	6908JB3002A	BUZZER	PQ272207PL-20C-2000 SUNWAY PIEZO 2KHZ 80DB	SUNWAY	BUZZER
38	0CQ2231N409	CAPACITOR,FIXED FILM	0.022 UF D 100V J PE TP	SAM HWA	-
39	0CK102DK96A	CAPACITOR,FIXED CERAMIC(HIGH DI	1NF 2012 50V 80%,-20% R/TP X7R	SAM HWA	CC6
40	0CK223DK96A	CAPACITOR,FIXED CERAMIC(HIGH DI	22NF 2012 50V 80%,-20% R/TP X7R	SAM HWA	CC1~3,7~11
41	0CK223DK96A	CAPACITOR,FIXED CERAMIC(HIGH DI	22NF 2012 50V 80%,-20% R/TP X7R	SAM HWA	-
42	0CK104DK94A	CAPACITOR,FIXED CERAMIC(HIGH DI	100NF 2012 50V 80%,-20% R/TP FY5V)	SAM HWA	CC5,CC4
43	0CK104DK94A	CAPACITOR,FIXED CERAMIC(HIGH DI	100NF 2012 50V 80%,-20% R/TP FY5V)	SAM HWA	-
44	0CK1040K949	CAPACITOR,FIXED CERAMIC(HIGH DI	0.1UF D 50V 80%,-20% FY5V) TA52	SAM HWA	-
45	0RD1600G609	RESISTOR,FIXED CARBON FILM	160 OHM 1/4 W 5% TA52	SMART	R7~R10
46	0RD1002G609	RESISTOR,FIXED CARBON FILM	10K OHM 1/4 W 5% TA52	SMART	R5,R24,R25
47	0RD1000H609	RESISTOR,FIXED CARBON FILM	100 OHM 1/2 W 5.00% TA52	SMART	-
48	0RJ2200E672	RESISTOR,METAL GLAZED(CHIP)	220 OHM 1/8 W 5% 2012 R/TP	ROHM	R1
49	0RJ1001E672	RESISTOR,METAL GLAZED(CHIP)	1K OHM 1/8 W 5% 2012 R/TP	ROHM	R2
50	0RJ2001E672	RESISTOR,METAL GLAZED(CHIP)	2K OHM 1/8 W 5% 2012 R/TP	ROHM	R18
51	0RD2001G609	RESISTOR,FIXED CARBON FILM	2K OHM 1/4 W 5% TA52	SMART	R19~23
52	0RD2702G609	RESISTOR,FIXED CARBON FILM	27K OHM 1/4 W 5.00% TA52	SMART	-
53	0RH4701L622	RESISTOR,METAL GLAZED(CHIP)	4.7K OHM 1/8 W 5% 2012 R/TP	ROHM	R6,R16,R28,R32
54	0RJ4702E672	RESISTOR,METAL GLAZED(CHIP)	47K OHM 1/8 W 5% 2012 R/TP	ROHM	-
55	0RD4701G609	RESISTOR,FIXED CARBON FILM	4.7K OHM 1/4 W 5% TA52	SMART	R3
56	0RJ1002E672	RESISTOR,METAL GLAZED(CHIP)	10K OHM 1/8 W 5% 2012 R/TP	ROHM	R26
57	0RD1002G609	RESISTOR,METAL GLAZED(CHIP)	10K OHM 1/4 W 5% TA52	SMART	RCR1
58	0RJ2702E672	RESISTOR,METAL GLAZED(CHIP)	27K OHM 1/8 W 5% 2012 R/TP	ROHM	-
59	0RD1002G609	RESISTOR,METAL GLAZED(CHIP)	16.2K OHM 1/4 W 1% TA52	SMART	RF1
60	0RJ1004E672	RESISTOR,METAL GLAZED(CHIP)	1M OHM 1/8 W 5% 2012 R/TP	ROHM	R4
61	0RN1002G409	RESISTOR,FIXED METAL FILM	10K OHM 1/4 W 1.00% TA52	SMART	RT1
62	0RN2612G409	RESISTOR,FIXED METAL FILM	26.1K OHM 1/4 W 1.00% TA52	SMART	RR1,RD1
63	6901JB8001A	FUSE ASSEMBLY	KORE-PJT N/S	SAM JU	-
64	3J03565D	FUSE,DRAWING	9A 250V - -	SAM JU	-
65	6500JB3001A	SENSOR	CMDBI PCB JAMES-TEC RT SENSOR -	JAMES TEC	-
66	0TR106009AC	TRANSISTOR,BIPOLARS	KRA106M (KRA2206) KEC TP TO92M 50V 100M	KEC	Q6
67	0TR226009AB	TRANSISTOR,BIPOLARS	KRA226M TP KEC TO-92S 800MILI AMP.	KEC	Q1~Q5
68	0TRKE80016A	TRANSISTOR,BIPOLARS	KEC KRC106S R/TP SOT23 50V 100MA	KEC	Q7~Q10
69	6600RRT001Z	SWITCH,TACT	JTP1280A6 JEIL 12VDC 50MA -	JEIL	TEST
70	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	DP1(10MM)
71	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	DP2(10MM)
72	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	-
74	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	J01,03,10,17(10MM)
75	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	-
77	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	(12.5MM)
78	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	J04,05,08,09,12,14,15(8MM)
79	4920JB3007A	HEAT SINK	23.3*17*25 DRIVE IC STR R-S64,65,73 2PI	-	(IC2)
80	1SBF0302418	SCREW TAP TITE(S),BINDING HEAD	+ D3.0 L8.0 MSWR3/FZY	-	-
81	9VWF0120000	SOLDER(ROSN WIRE) RS0	DI.20	HEE SUNG	-
82	49111004	SOLDER,SOLDERING	NA HEE SUNG METAL BAR SN 63% NA	-	-
83	59333105	FLUX	SG;0.825-0.830 KOREA F.H-206	KDKI	-

### 3) PWB ASS'Y, DISPLAY AND PARTS LIST

▶ BEST

No	P/NO	DESCRIPTION	SPEC	MAKER	REMARK
1	6304TVD003	LCD(LIQUID CRYSTAL DISPLAY)	VDS TN MONO MY 2M COMBI(A-VTD-327TP1)	VDS	-
2	-	-	-	-	-
3	-	-	-	-	-
4	6870JB8097	PWB	FR-4	-	-
5	-	REFLECTOR	PC ABS	-	-
6	-	확산 SHEET	MTN-WX5(42.5*93MM)	-	투과율35%
7	-	WAFER	SMAW250-04	YEON-HO	CON101
8	-	-	-	-	-
9	-	-	-	-	-
10	-	-	-	-	-
11	01ZZJB2029	IC,DRAWING	TMP87CP21CF 80,QFP BK MY-PJT	TOSHIBA	IC101(J=K)
12	-	-	-	-	-
13	01STLKE002A	IC,STANDARD LOGIC	KIA78L05F KEC SOT-89 TP REGULATOR	KEC	IC102
14	01STLKE003A	IC,STANDARD LOGIC	KIA7042AF KEC SOT-89 TP RESET IC	KEC	IC103
15	01RH934600D	IC,RDHM	BR93LC46RF-W 8PIN SDP BK EEPROM	ROHM	IC104
16	01STLKE004A	IC,STANDARD LOGIC	KRA106S KEC SOT-23 TP TRANSISTOR	KEC	Q105
17	01STLKE005A	IC,STANDARD LOGIC	KRC106S KEC SOT-23 TP TRANSISTOR	KEC	Q101~Q104
18	01STLKE006A	IC,STANDARD LOGIC	KTA1298 KEC SOT-23 TP TRANSISTOR	KEC	Q106
19	-	-	-	-	-
20	-	-	-	-	-
21	6212W5M002A	RESONATOR,CERAMIC	CSTS0400 MURATA 4MHZ +/-0.5% TP 15PF	MURATA	OSC101
22	-	-	-	-	-
23	-	-	-	-	-
24	-	-	-	-	-
25	0CE107VF6DC	CAPACITOR,FIXED ELECTROLYTIC	100UF MV 16V 20% R/TP(SMD) SMD	RUBYCON	CE101,CE102
26	-	-	-	-	-
27	0CE476VH6DC	CAPACITOR,FIXED ELECTROLYTIC	47UF MV 25V 20% R/TP(SMD) SMD	RUBYCON	CE103
28	-	-	-	-	-
29	0CK104DK94A	CAPACITOR,FIXED CERAMIC(HIGH	100NF 2012 50V 80%,-20% R/TP F(Y5V)	MURATA	CC101~CC107
30	-	-	-	-	-
31	-	-	-	-	-
32	0RJ1000G676	RESISTOR,METAL GLAZED(CHIP)	100 OHM 1/4 W 5% 3216 R/TP	ROHM	-
33	0RJ2200E672	RESISTOR,METAL GLAZED(CHIP)	220 OHM 1/8 W 5% 2012 R/TP	ROHM	R109
34	0RJ4700G676	RESISTOR,METAL GLAZED(CHIP)	470 OHM 1/4 W 5% 3216 R/TP	ROHM	R123~R133
35	0RJ6800G676	RESISTOR,METAL GLAZED(CHIP)	680 OHM 1/4 W 5% 3216 R/TP	ROHM	-
36	-	-	-	-	-
37	0RJ4701E472	RESISTOR,METAL GLAZED(CHIP)	4.7K OHM 1/8 W 1% 2012 R/TP	ROHM	R107
38	0RJ1001E672	RESISTOR,METAL GLAZED(CHIP)	1K OHM 1/8 W 5% 2012 R/TP	ROHM	R103,R104
39	0RJ2001E672	RESISTOR,METAL GLAZED(CHIP)	2K OHM 1/8 W 5% 2012 R/TP	ROHM	R101,R102
40	0RJ4701E672	RESISTOR,METAL GLAZED(CHIP)	4.7K OHM 1/8 W 5% 2012 R/TP	ROHM	R110~122
41	0RJ1502E672	RESISTOR,METAL GLAZED(CHIP)	15K OHM 1/8 W 5% 2012 R/TP	ROHM	R105
42	0RJ1004E672	RESISTOR,METAL GLAZED(CHIP)	1M OHM 1/8 W 5% 2012 R/TP	ROHM	R108
43	0RJ4702E672	RESISTOR,METAL GLAZED(CHIP)	47K OHM 1/8 W 5% 2012 R/TP	ROHM	-
44	0RJ1201E472	RESISTOR,METAL GLAZED(CHIP)	1.2K OHM 1/8 W 1% 2012 R/TP	ROHM	-
45	0RJ1002E472	RESISTOR,METAL GLAZED(CHIP)	10K OHM 1/8 W 1% 2012 R/TP	ROHM	R106
46	0DZRM00188A	DIODE,ZENERS	RLZ ROHM R/TP LLDS(LL-34) 500MW 5.6V 20	ROHM	ZD101
47	-	WIRE,JUMP	-	-	OP1,OP2
48	6908JB8003A	BUZZER	BM-20B BUJEON PIEZO 4KHZ 85DB	BUJEON	BUZZER
49	6600RRT002J	SWITCH,TACT	JTP1138A JEIL 12VDC 50MA SMD	JEIL	SW101~SW105
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
53	0DLSU0029AA 0DLRH0188AA	LED	SEJUL SEMICON SSC570YG TP GREEN/YELLOW ROHM SML-310MT R/TP GREEN/YELLOW	SEJUL-SEMICON ROHM	LD101~LD144
54	-	-	-	-	-

▶ BETTER

No	P/NO	DESCRIPTION	SPEC	MAKER	REMARK
1	-	SMD LED	1.6*0.8 0.8T	ROHM	-
-	-	SMD LED	1.6*0.8 0.8T	LEDTEK	-
2	6870JB8098A	PWB(PCB)	MY-PJT BETTER DISPLAY	-	-
3	-	REFLECTOR	PCABS	-	-
4	4140JB2003A	NAME PLATE,P<H	MY-PJT(BETTER)	-	-
5	6630AQ9159J	WAFER	#SMAW250-10	YEON HO	CON101
6	6600RRT001M	SWITCH,TACT	JTP1138A JEIL 125VDC 50M	JEIL	SW101~105
-	-	-	-	-	-
7	0DD400409AC	DIODE,RECTIFIE	RECT1N4004 TP	DELTA,PYUNG CHANG	D101~105
-	-	-	-	-	-
8	0DD414809BB	DIODE,SWITCHIN	1N4148 TP ROHM D035 75V	DELTA,PYUNG CHANG	D106~110
-	-	DIODE,SWITCHIN	1N4148 TP ROHM D035 75V	DELTA,PYUNG CHANG	-

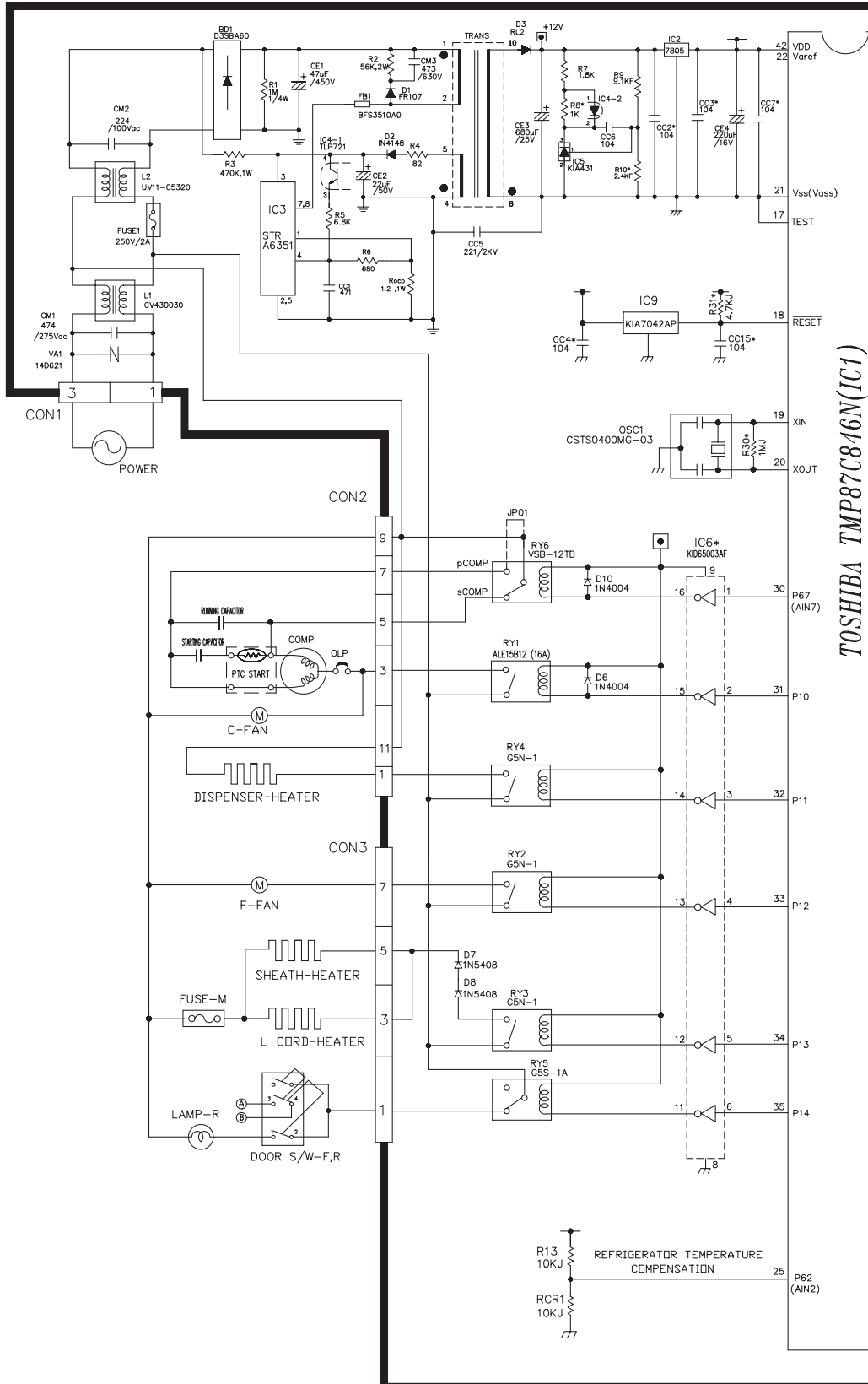
▶ GOOD

No	P/NO	DESCRIPTION	SPEC	MAKER	REMARK
1	6870JB8099A	PWB(PCB)	MY-PJT GOOD DISPLAY	DOO SAN	T=1.6
2	-	-	-	-	T=1.6
3	6631JB2008C	HARNESS,JOINT	MY-PJT(GOOD) I-MICOM XSCR	-	CON101
4	-	-	-	-	-
5	6600RRT002K	SWITCH,TACT	JTP1230A JEIL 12VDC 50MA -	NAMAE	SW101,102
6	6600RRT004E	SWITCH,TACT	JTP1240RHT NAMAE 12VDC 50MA (LED,RED)	NAMAE	SW103,104
7	0DLLE0059AB	LED	LEDTECH ELECTRONICS LT8323-41-BC9 TP YELLOW-	LEDTECH	A1~A5,B1~B5
8	-	-	-	-	-
-	0DD414809AA	DIODE,SWITCHING	1N4148 ROHM TP26 D035 100V 450MA 2A 3NS 5UA	PYUNG CHANG DELTA	D106,107,108,109
10	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	J101
11	-	-	-	-	-
12	9VWF0120000	SOLDER(ROSN WIRE)	D1.20	HEE SUNG	-
13	49111004	SOLDER,SOLDERING	NA HEESUNG METAL BAR SN 63% NA	-	-
14	59333105	FLUX	SG;0.825-0.830 KOREA F.H-206	KOKI	-

5. PWB circuit drawing- The PWB circuit drawing may change without notice.

▶ BEST

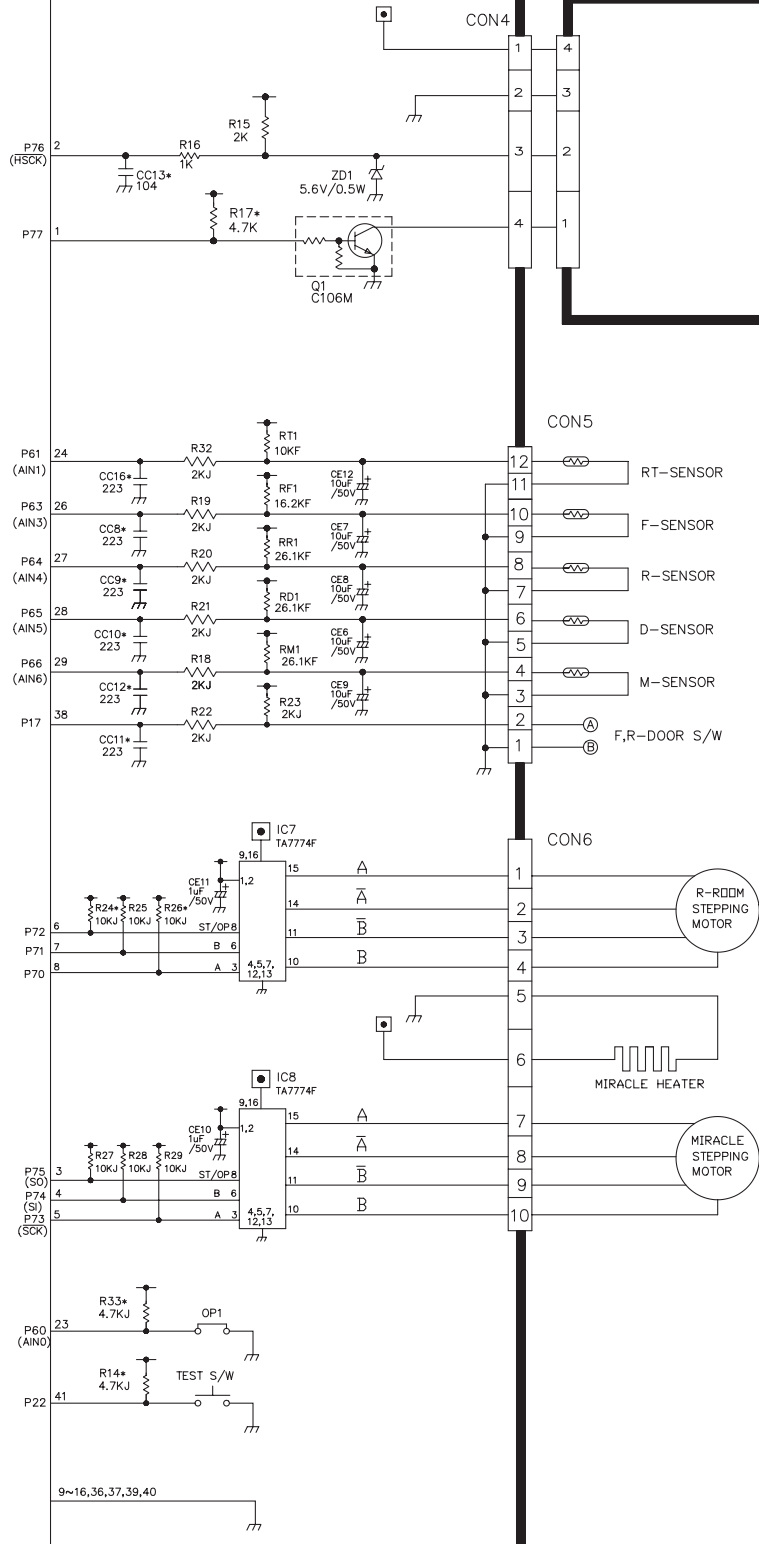
PWB ASSEMBLY,MAIN



TOSHIBA TMP87C846N(IC1)

CIRCUIT DIAGRAM

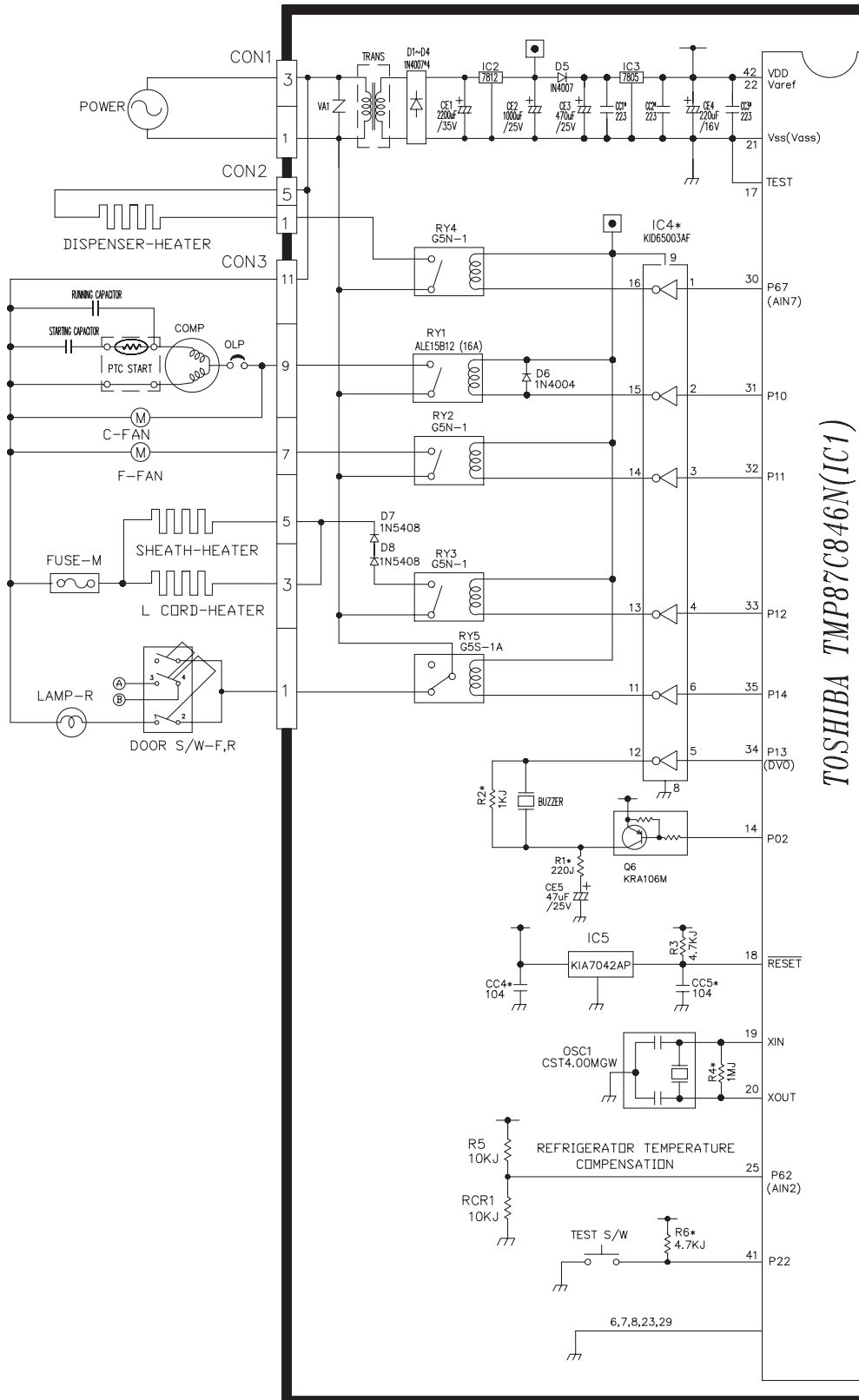
# BEST DISPLAY PCB





▶ GOOD/BETTER

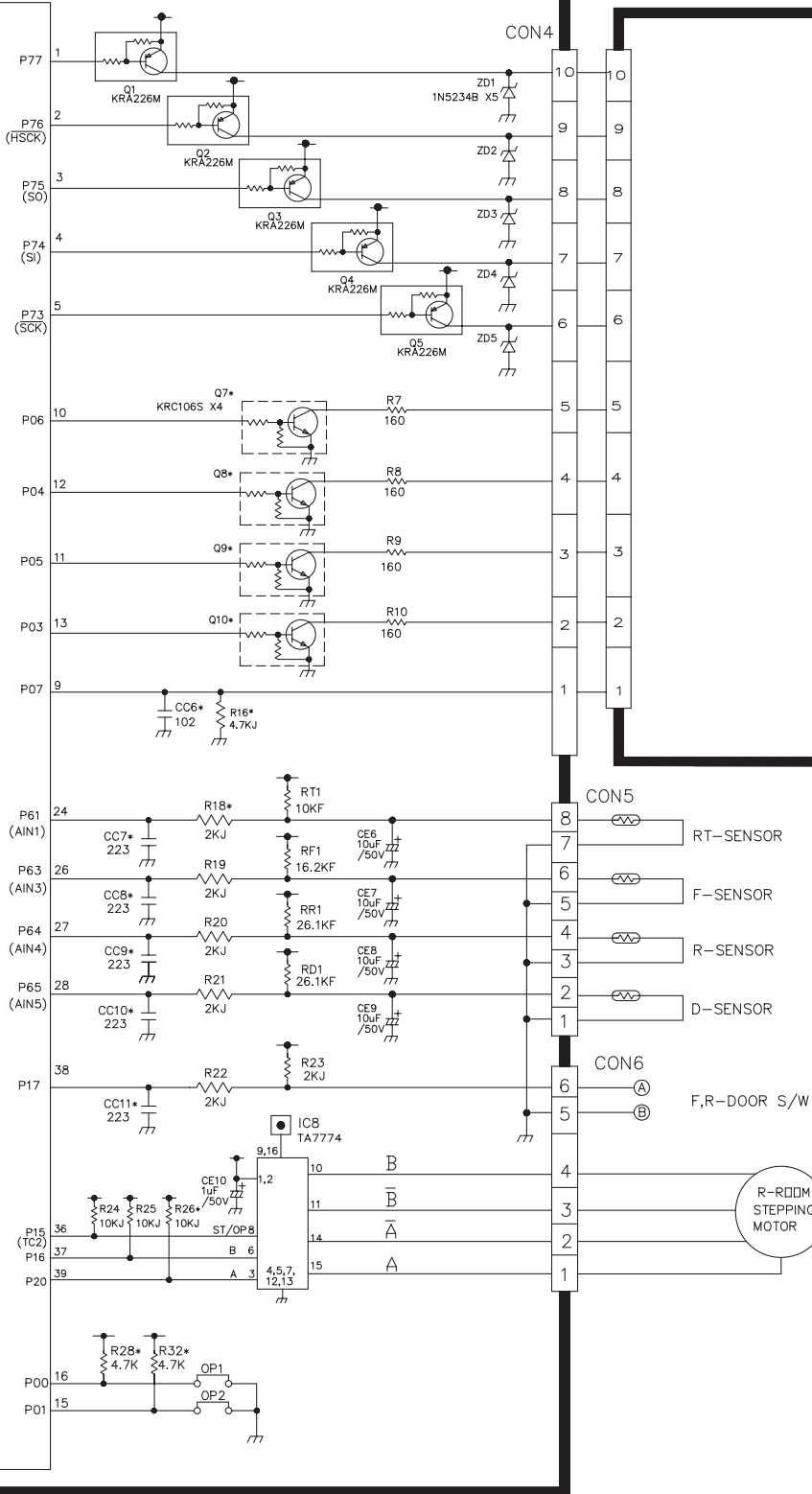
PWB ASSEMBLY, MAIN



TOSHIBA TMP87C846N(IC1)

CIRCUIT DIAGRAM

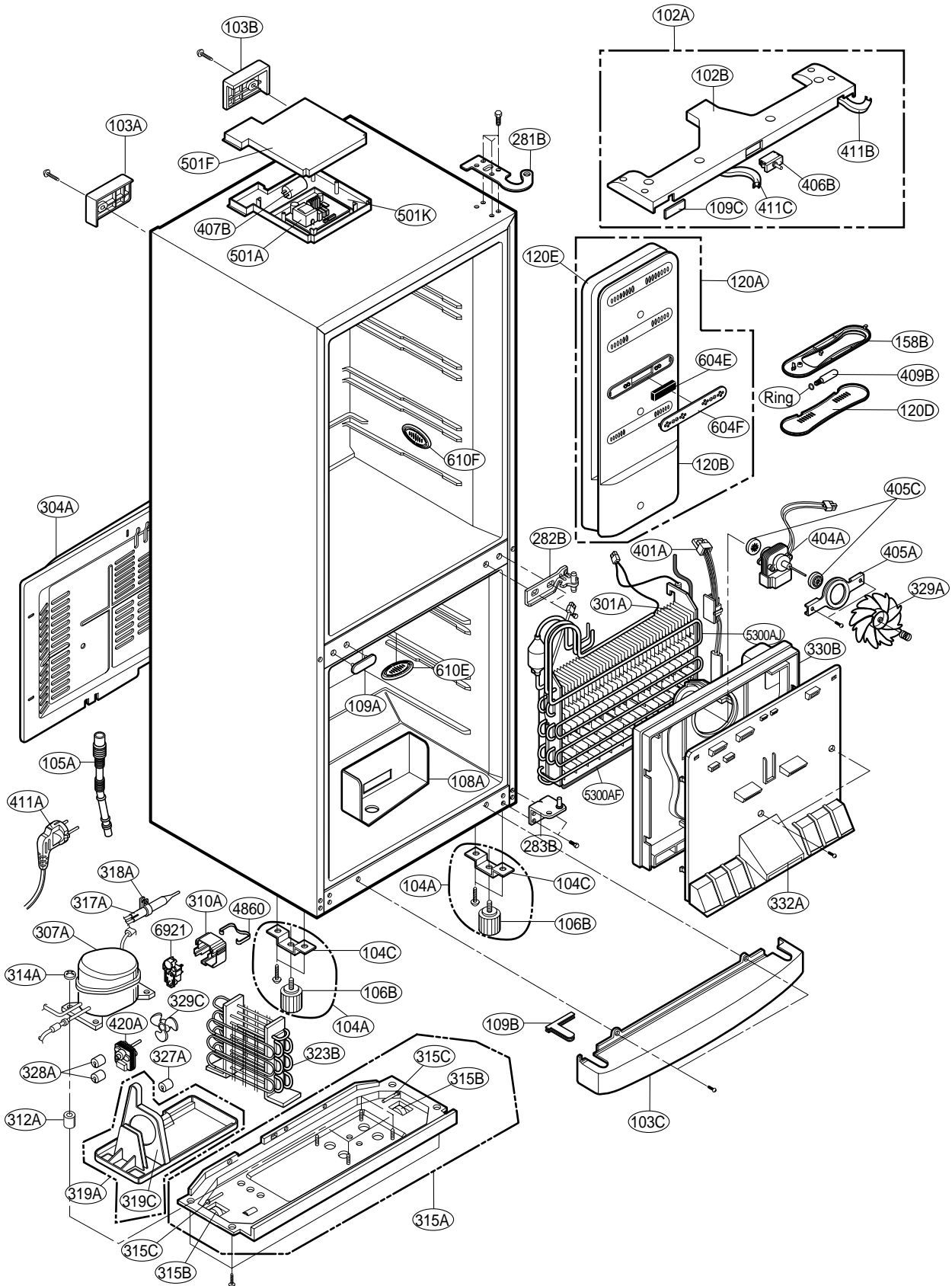
GOOD/BETTER DISPLAY PCB



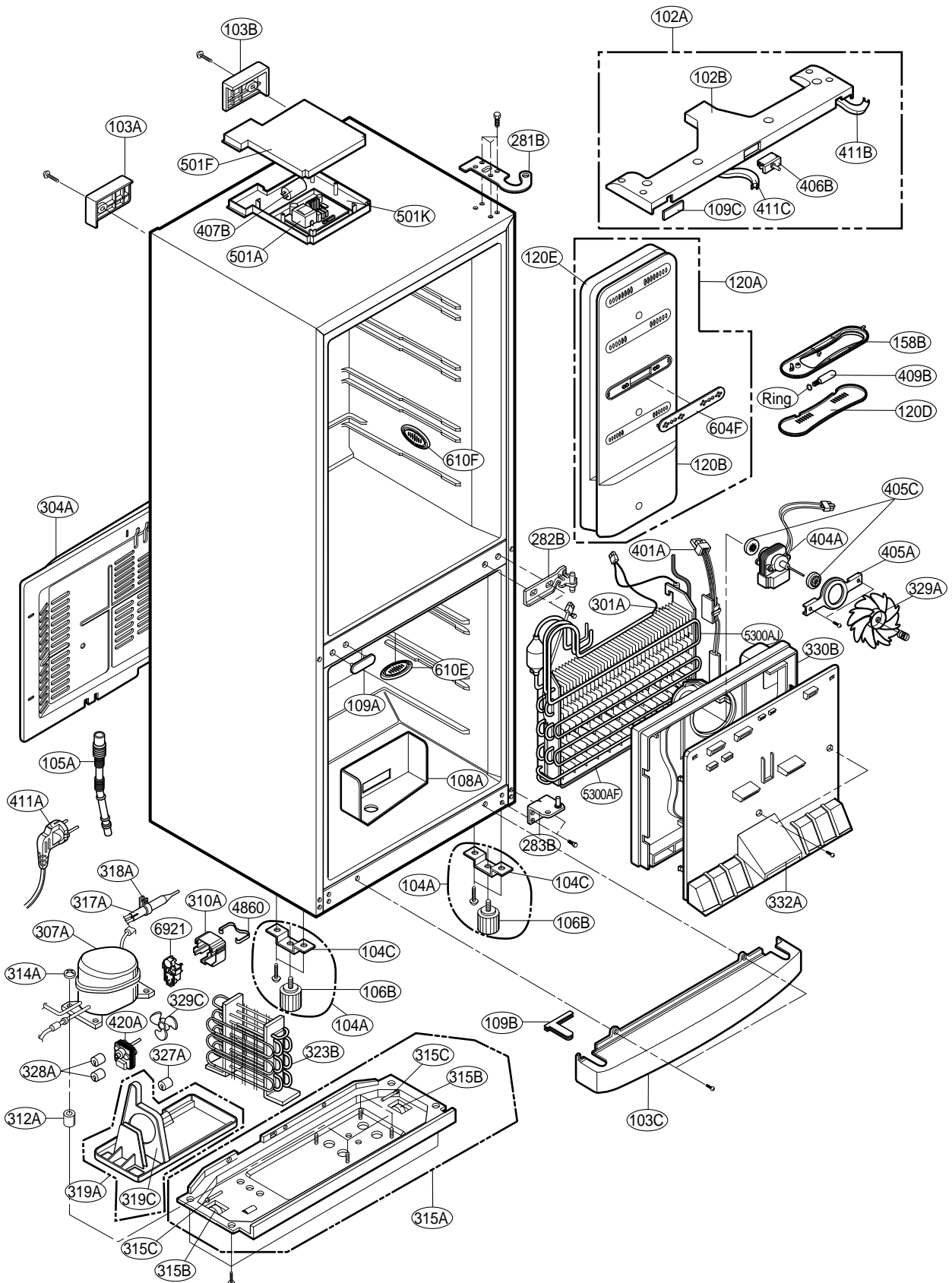
# EXPLODED VIEW & REPLACEMENT PARTS LIST

Ref. No : GR-459GK/QJ

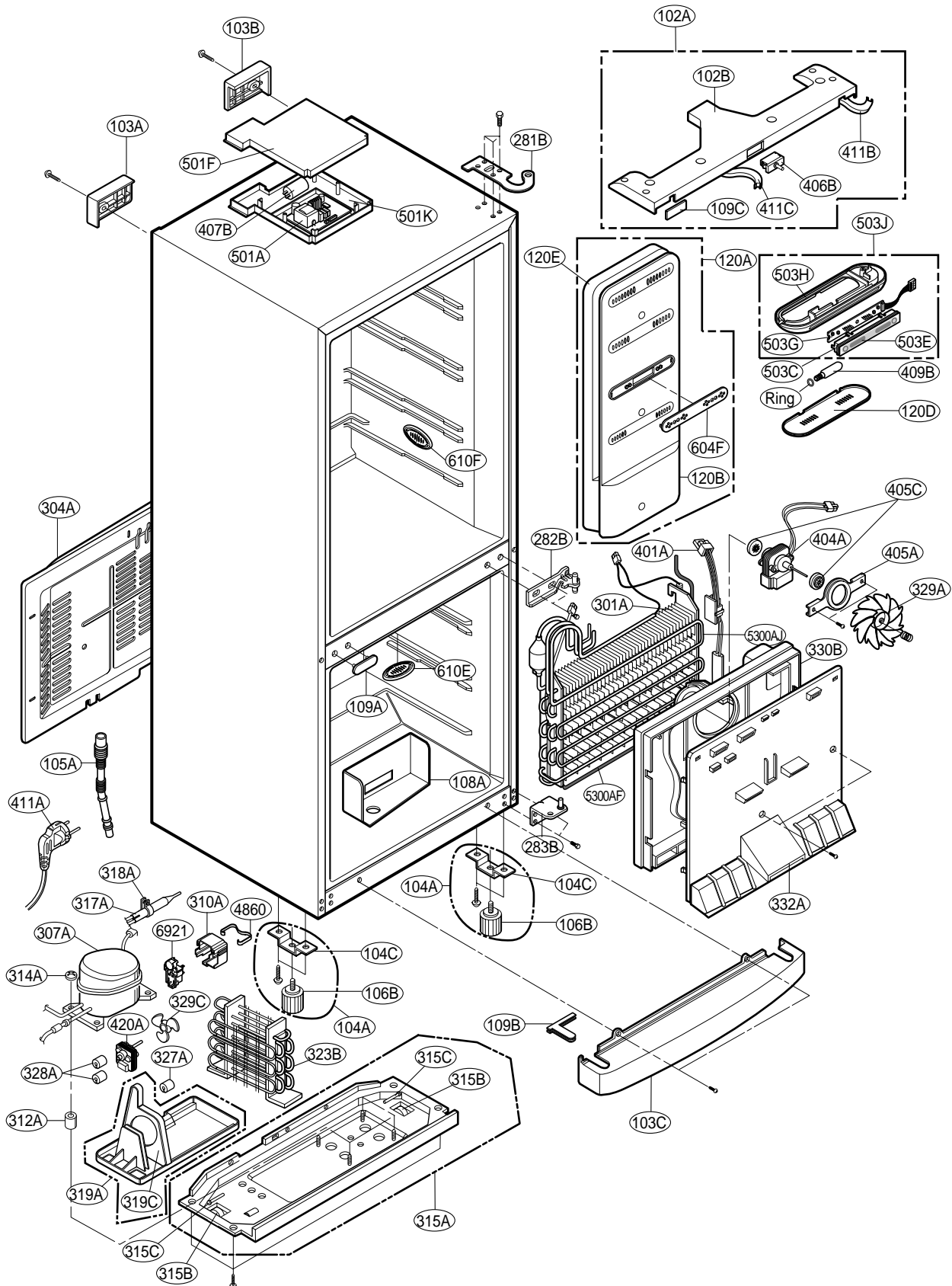
▼ The parts of refrigerator and the shape of each part are subject to change in different localities.



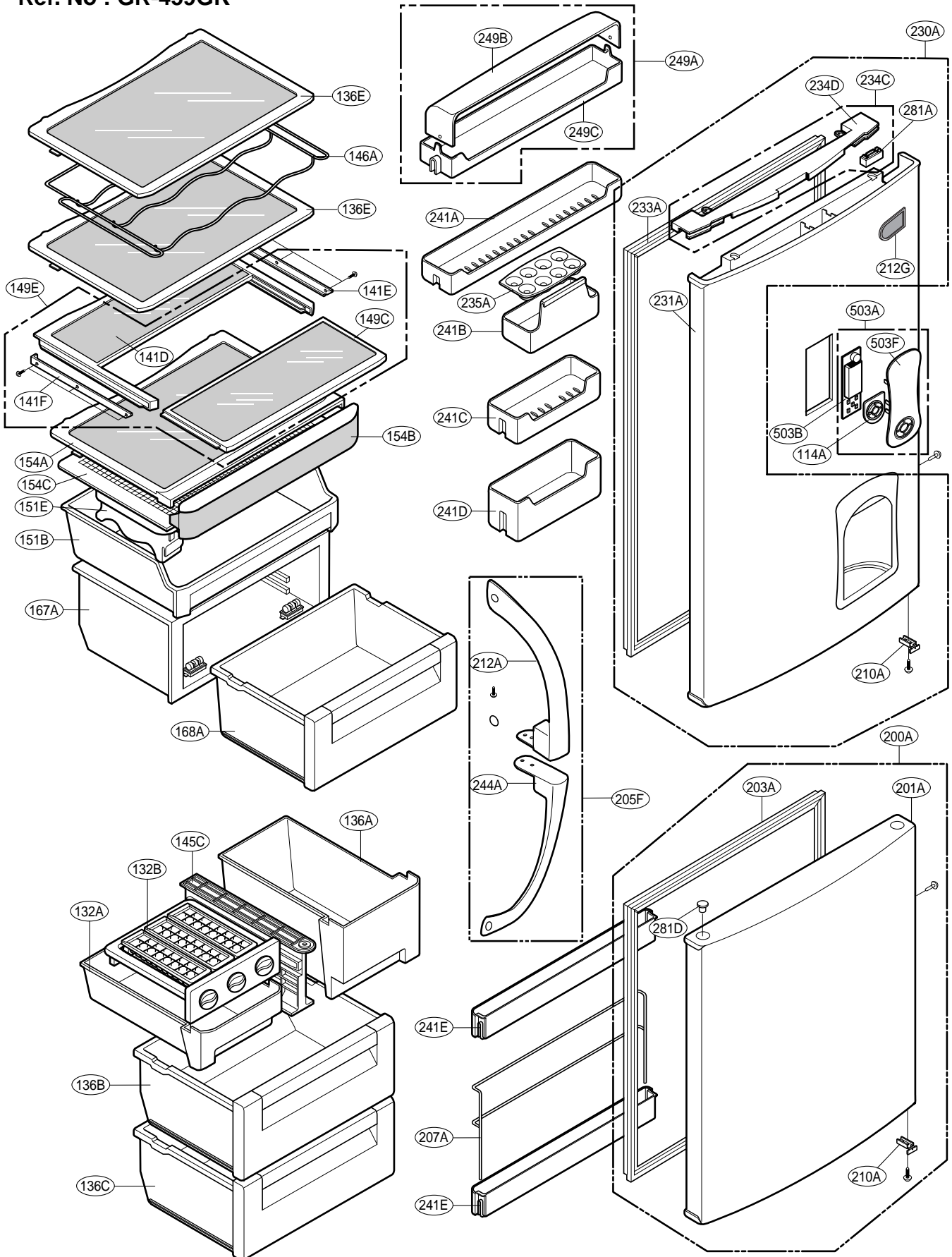
Ref. No : GR-459GR/QQ



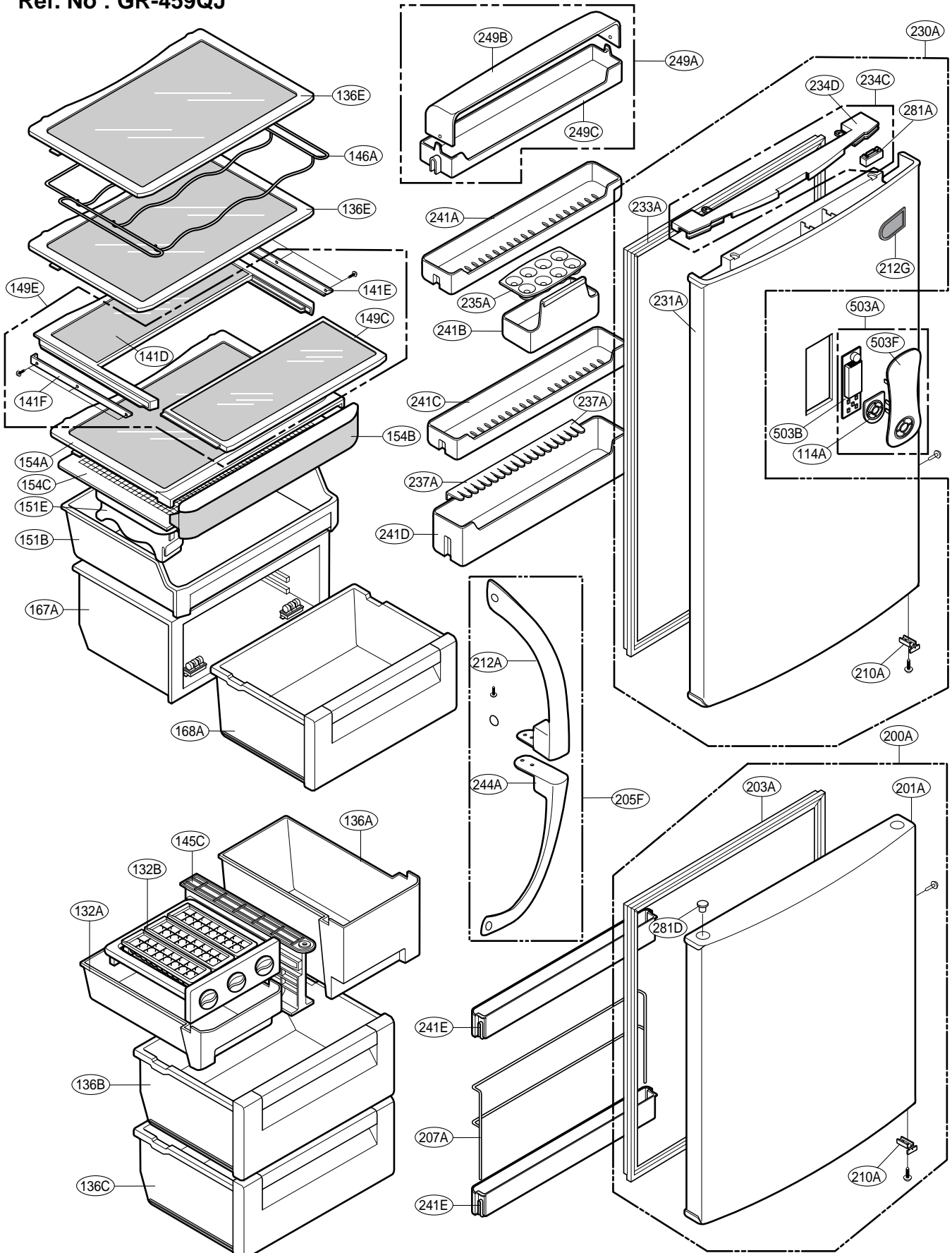
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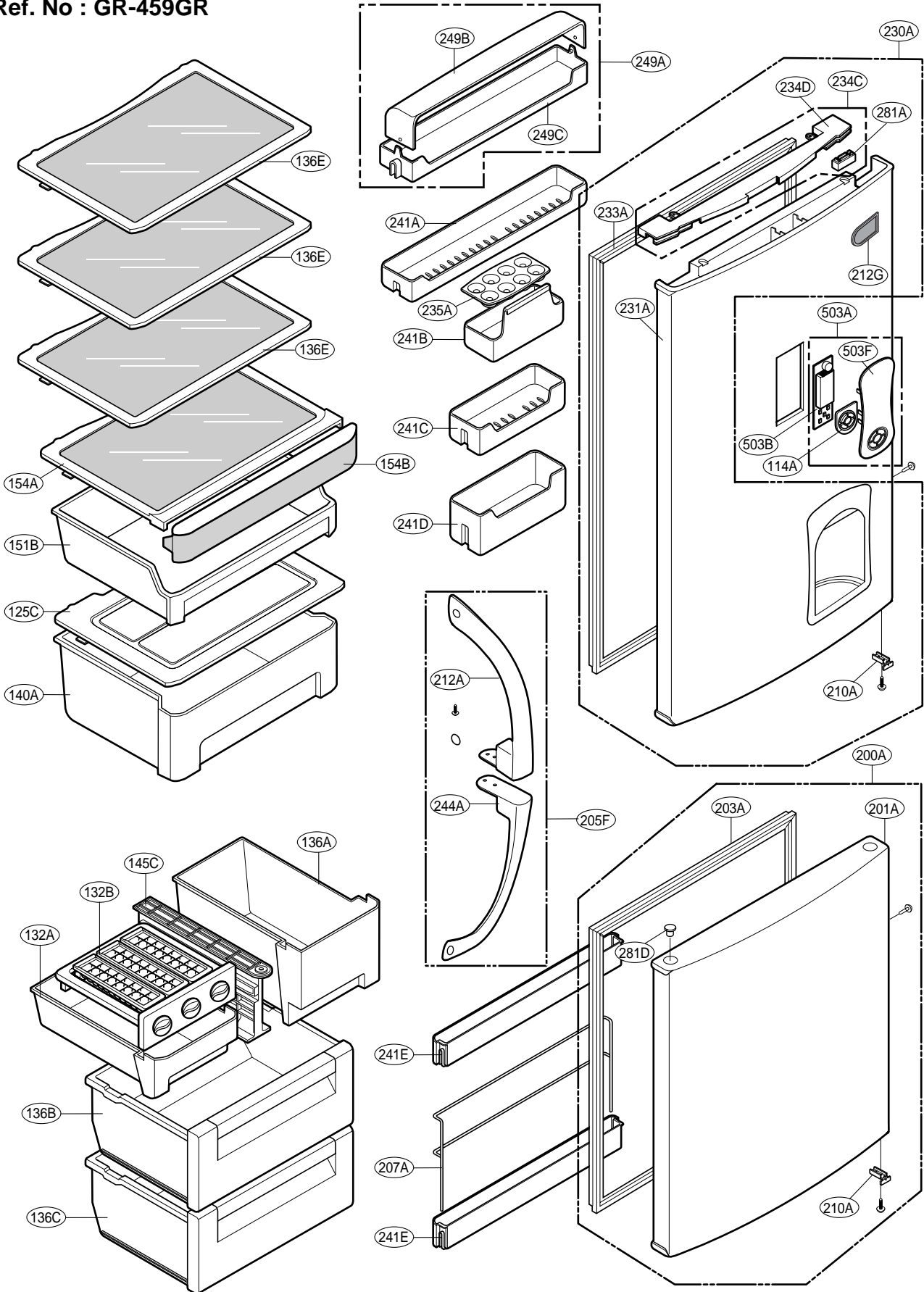
Ref. No : GR-459GK



Ref. No : GR-459QJ

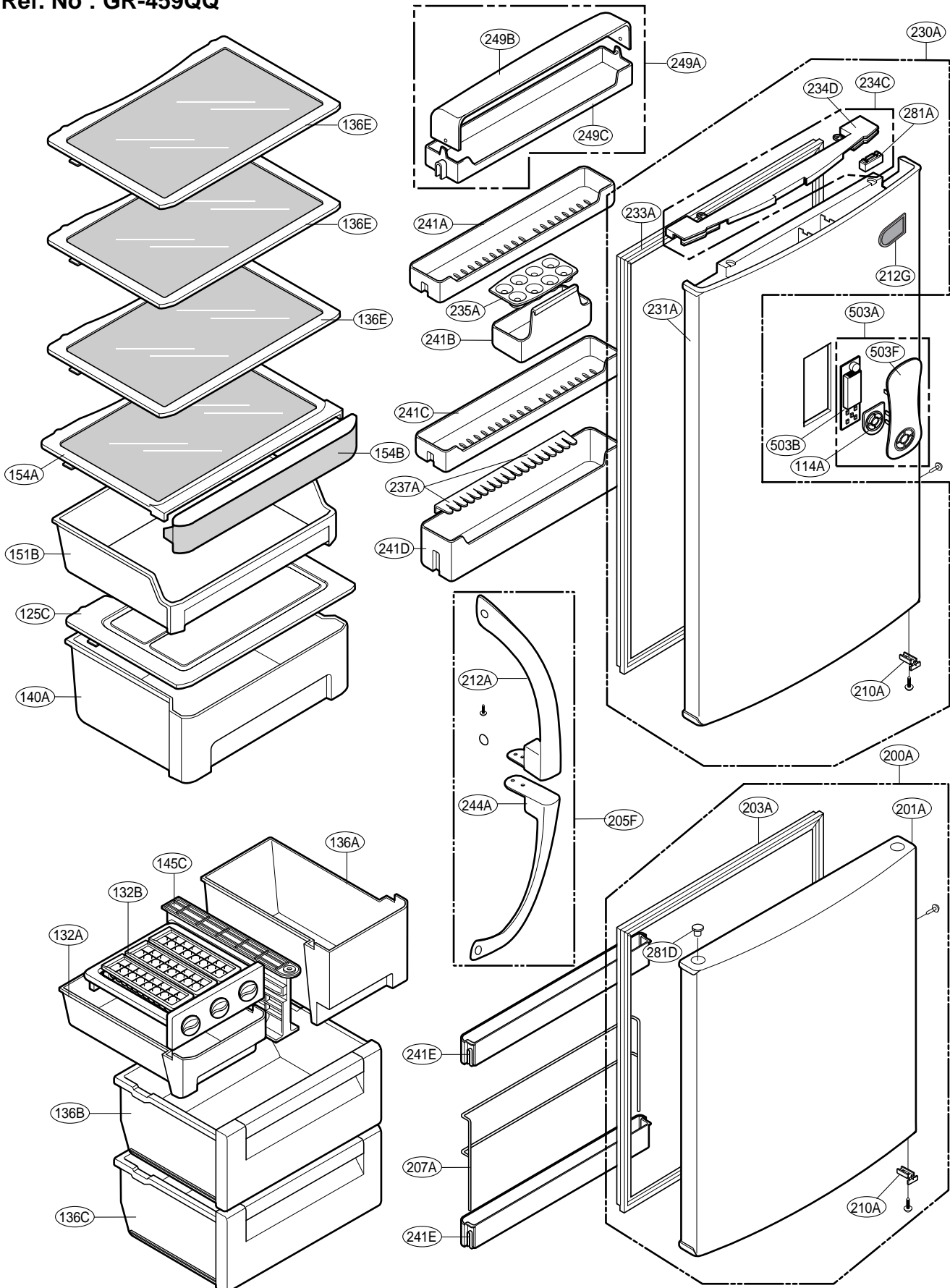


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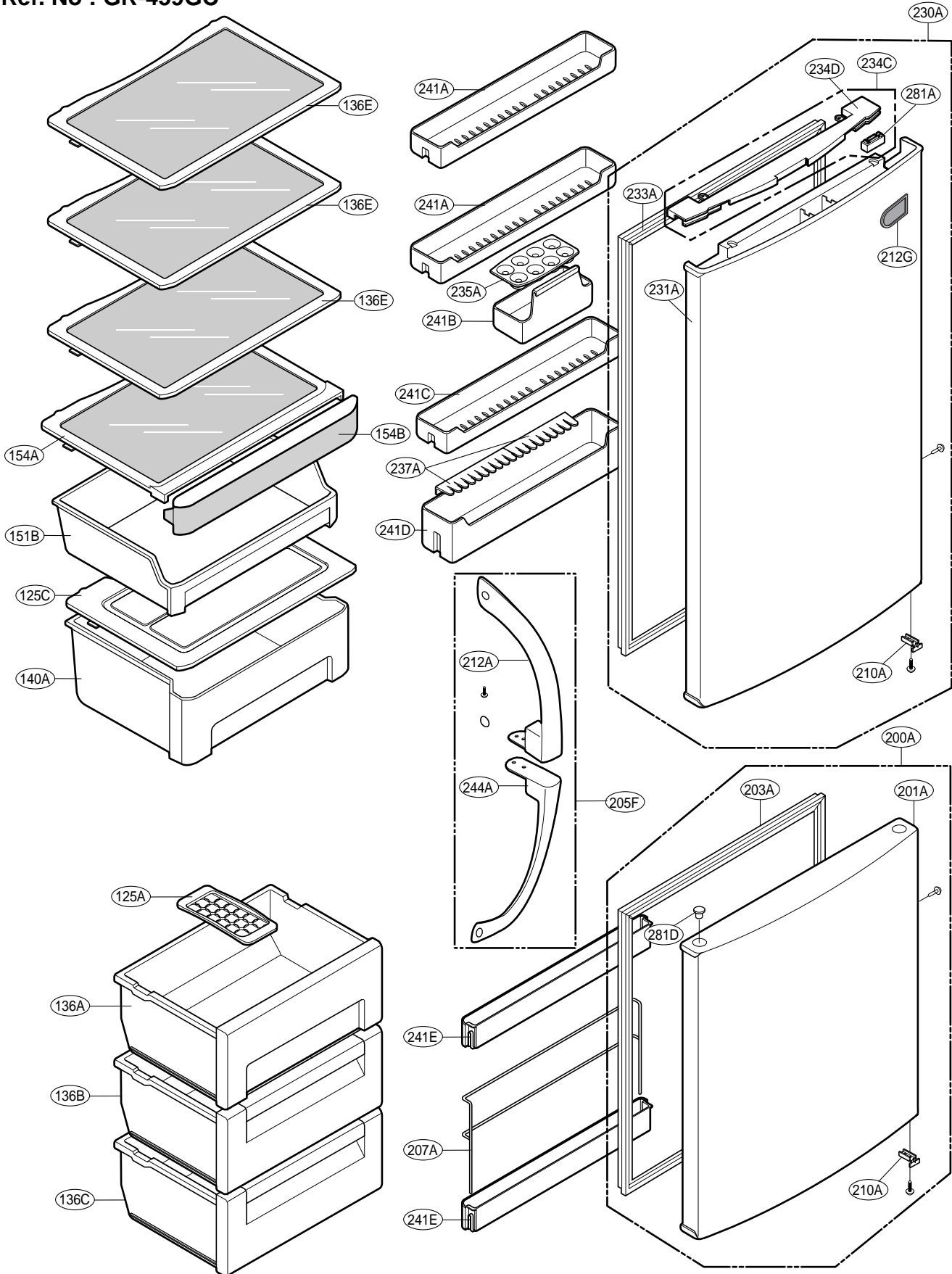




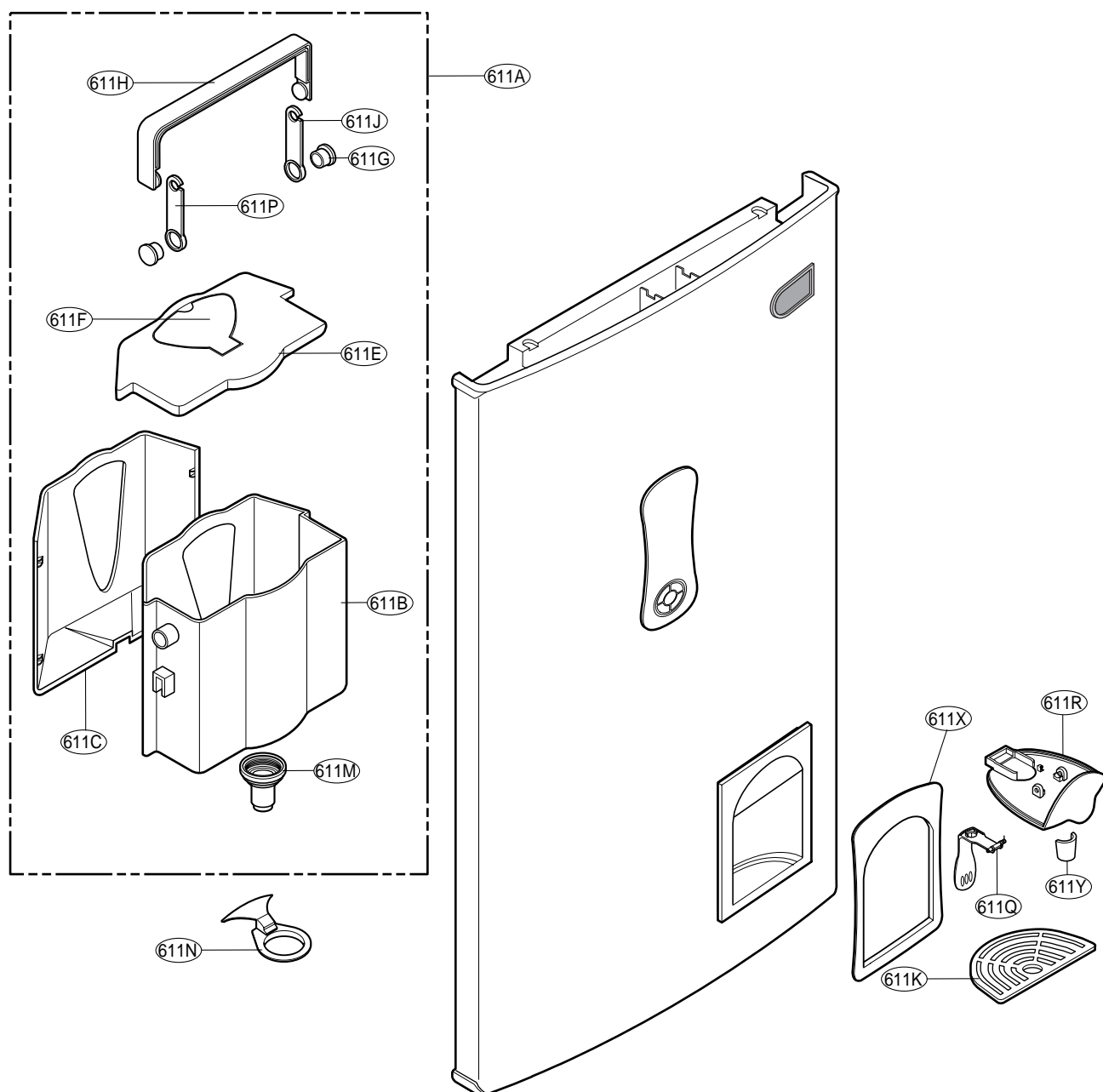
Ref. No : GR-459QQ



Ref. No : GR-459GC



Ref. No : GR-459GK/GR





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