ORDER NO.PHAMOS0702011A1
E1

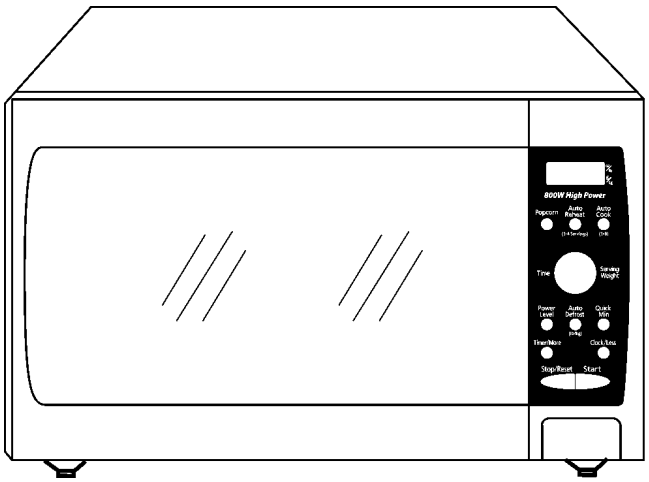
Service Manual

Microwave Oven

Simplified

NN-SD377S

APH(USA)
CPH(Canada)



Please file and use this manual together with the service manual for Model NN-S335BF/WF (ORDER NO. PHAMOS0501007C7)

Specification

Model	NN-SD377S APH	NN-SD377S CPH
Power Source:	120V AC Single Phase, 60Hz	
Power Requirement:	1230W	
Output:	800W	
Microwave Frequency:	2450MHz	
Timer:	30min.00 Sec/Stage (HIGH Power) ~ 5 Stage Maximum 90min.00 Sec/Stage (Other Power Levels) ~ 5 Stage Maximum	
Outside Dimensions:	346mm(13 $\frac{5}{8}$")(D) x 482mm(19")(W) x 284mm(11$\frac{1}{5}$")(H)	
Oven Cavity Dimensions:	330mm(13")(D) x 325mm(12$\frac{3}{4}$")(W) x 218mm(8$\frac{9}{16}$")(H)	
Weight:	24 lbs.(11.0kg)	
PbF	This product with PbF	
Specifications subject to change without notice.		

Panasonic®

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

WARNING

1. This product should be serviced only by trained, qualified personnel.
2. Though this product has been manufactured in compliance with:
   "Federal Performance Standard 21 CFR Subchapter J"(D.H.H.S): U.S.A. models
   or "Radiation Emitting Devices Act"(Health and Welfare Canada): Canadian models
   it is very important all repairs should be made in accordance with procedures described in this manual to avoid being exposed to excessive microwave radiation.
3. Check for radiation leakage before and after every servicing according to the "procedure for measuring radiation leakage."
4. If the unit cannot be repaired on site, advise the customer not to use until unit is repaired.
5. Any serviceman who learns of any accident pertaining to microwave radiation leakage including the oven operating with open door should immediately notify the appropriate address listed below and Center for Devices and Radiological Health, DHHS.

IN U.S.A. (PSTC)	Panasonic Services Company 50 Meadowland Parkway, Secaucus, New Jersey 07094 Attention: Technical Service Division. (201)348-7000	IN PUERTO RICO (PSC)	PSC San Gabriel Industrial Park 65th Infantry Ave. Km.9.5 Carolina, Puerto Rico 00985 (787)750-4300
		IN CANADA (PCI)	Panasonic Canada Inc. 5770 Ambler Drive, Mississauga, Ontario, L4W2T3 (905)624-5010

6. There are special components used in the microwave oven which are important for safety. These parts are marked with a ⚠ on the replacement parts list. It is essential that these critical parts should be replaced only with the manufacture's specified parts to prevent microwave leakage, shock, fire, or other hazards. Do not modify the orginal design.

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

(A) Do not operate or allow the oven to be operated with the door open.
(B) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:
   (1) Interlock operation
   (2) Proper door closing
   (3) Seal and sealing surfaces (arcing, wear, and other damage)
   (4) Damage to or loosening of hinges and latches.
   (5) Evidence of dropping or abuse
(C) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, waveguide or transmission line, and cavity for proper alignment, integrity and connections.
(D) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.
(E) A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.

CAUTION

About lead free solder (PbF)

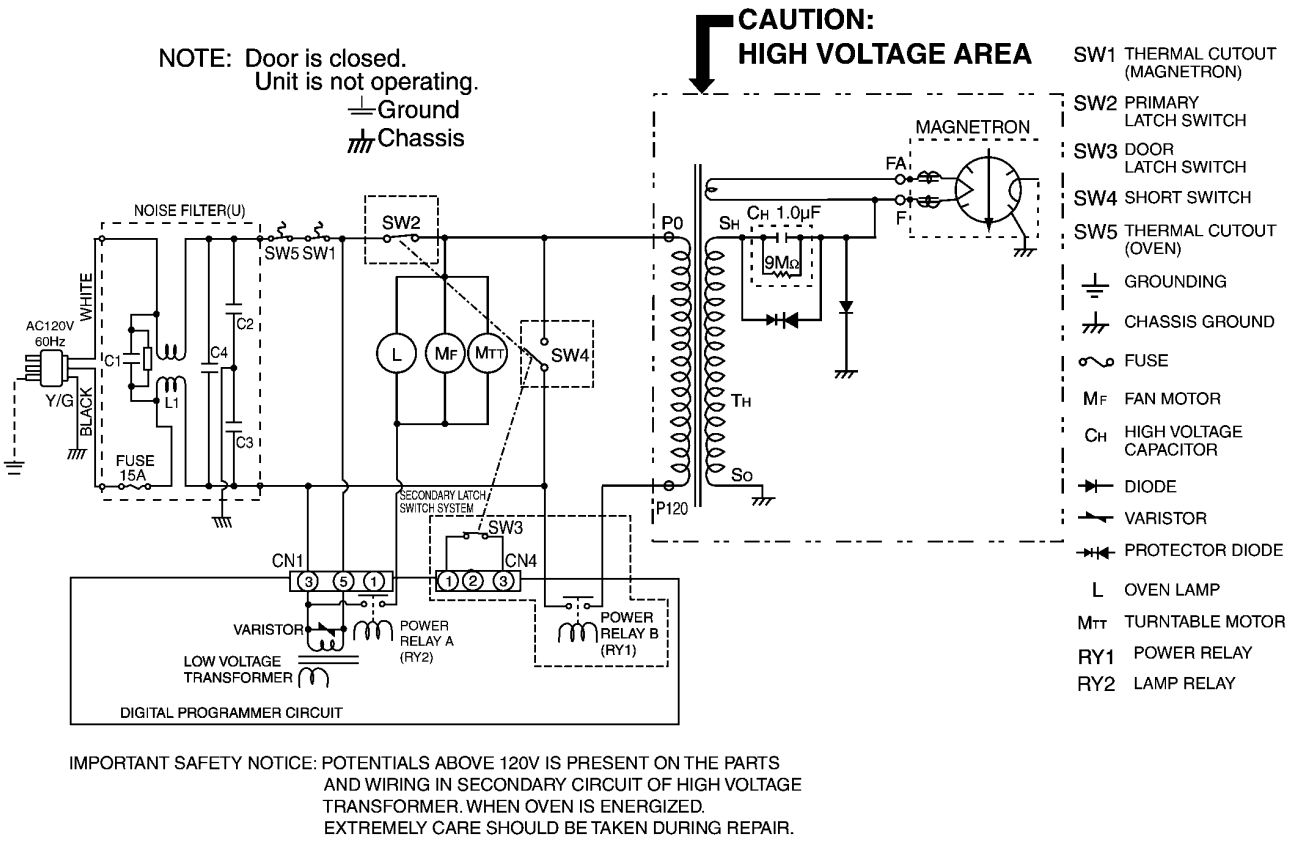
Distinction of PbF PCB: PCBs (manufactured) using lead free solder will have a PbF stamp on the PCB.

Caution:
- Pb free solder has a higher melting point than standard solder; Typically the melting point is 30 - 40˚C higher. Please use a high temperature soldering iron. In case of the soldering iron with temperature control, please set it to 370 ± 10˚C.
- Pb free solder will tend to splash when heated too high (about 600˚C).

CONTENTS

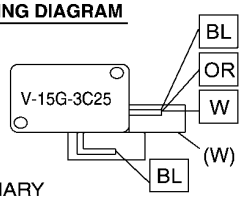
1 SCHEMATIC DIAGRAM

1.1. APH

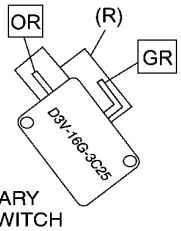


IMPORTANT SAFETY NOTICE: POTENTIALS ABOVE 120V IS PRESENT ON THE PARTS AND WIRING IN SECONDARY CIRCUIT OF HIGH VOLTAGE TRANSFORMER. WHEN OVEN IS ENERGIZED. EXTREMELY CARE SHOULD BE TAKEN DURING REPAIR.

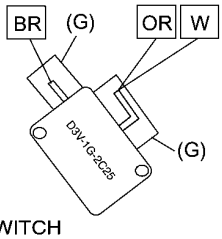
WIRING DIAGRAM



PRIMARY LATCH SWITCH TOP

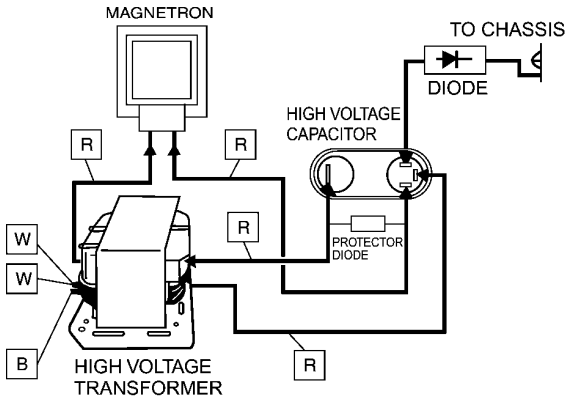


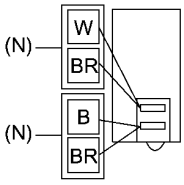
SECONDARY LATCH SWITCH BOTTOM(OUTSIDE)



SHORT LATCH SWITCH BOTTOM(INSIDE)

NOTE: * When replacing, check the lead wire color as shown.
***Colors shown by ( ) indicate colors of lead wire connector housing.**



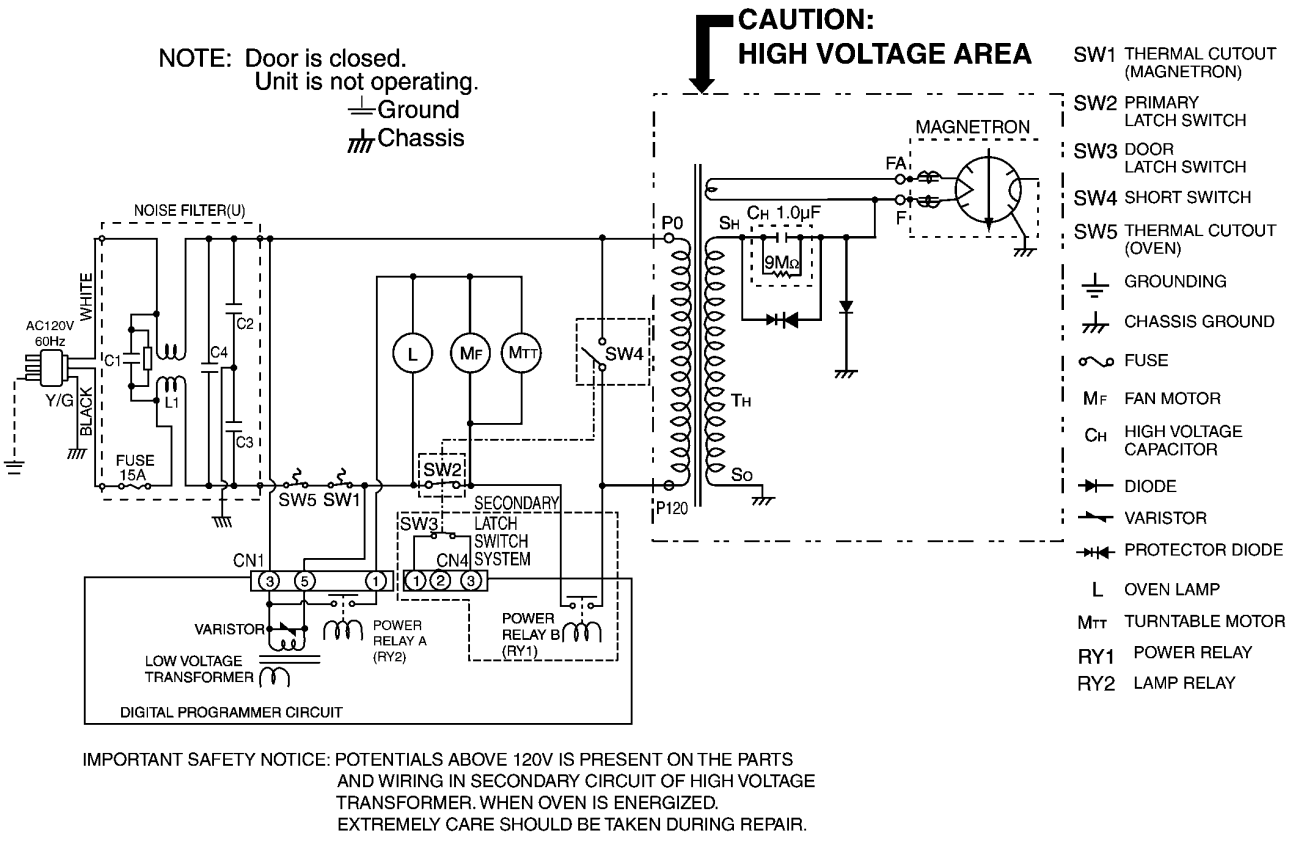


POWER RELAY B (RY1)

SYMBOL	COLOR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK
G	GREEN
N	NATURAL

(S-8L5)

1.2. CPH



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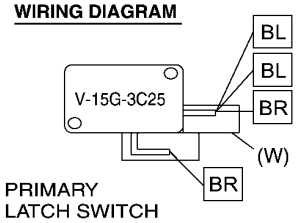
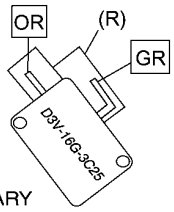
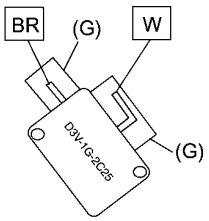


PRIMARY LATCH SWITCH TOP



SECONDARY LATCH SWITCH BOTTOM(OUTSIDE)



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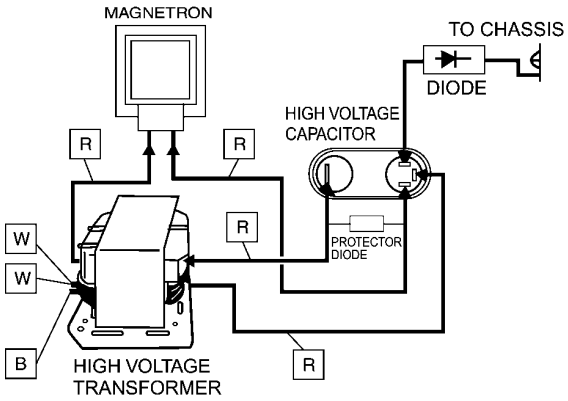
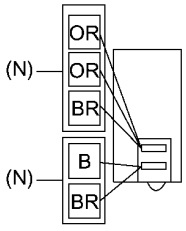




POWER RELAY B (RY1)

SYMBOL	COLOR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK
G	GREEN
N	NATURAL

(S-8L5)

2 CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

Unlike many other appliances, the microwave oven is high-voltage, high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

CAUTION
Servicemen should remove their watches whenever working close to or replacing the magnetron.

2.1. Check the grounding

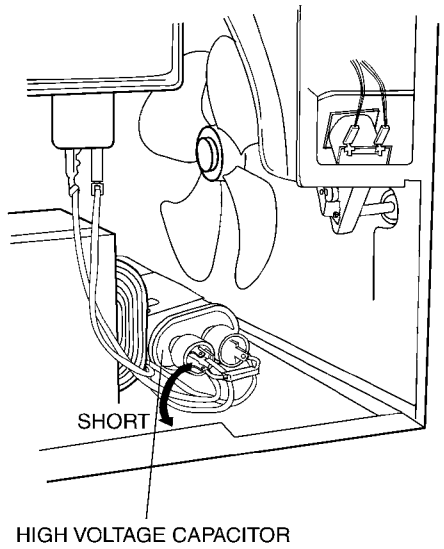
Do not operate on a 2-wire extension cord. The microwave oven is designed to be grounded when used. It is imperative, therefore, to make sure it is grounded properly before beginning repair work.

2.2. Warning about the electric charge in the high voltage capacitor

For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitor.When replacing or checking parts, remove the power plug from the outlet and short the terminal of the high voltage capacitor (terminal of lead wire from diode) to chassis ground with an insulated handle screwdriver to discharge.

WARNING
There is high-voltage present, with high-current capabilities in the circuits of the high voltage winding and filament winding of the high voltage transformer. It is extremely dangerous to work on or near these circuits with oven energized.
DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

WARNING
Never touch any circuit wiring with your hand nor with an insulated tool during operation.



Touch chassis side first then short to the high voltage capacitor terminal.

2.3. When parts must be replaced, remove the power plug from the outlet.

2.4. When the 15 Amp fuse is blown due to the operation of short switch:

WARNING
When the 15 Amp fuse is blown due to operation of the interlock monitor switch, you must replace all of the components (Primary latch switch, Door switch, Short switch and Power relay B (RY1)).

1. This is mandatory. Refer to “Adjustments and Measurement” for these switches.
2. When replacing the fuse, confirm that it has the appropriate rating for these models.
3. When replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.

2.5. Avoid inserting nails, wire, etc. through any holes in the unit during operation.

Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any other holes or gaps, because such objects may work as an antenna and cause microwave leakage.

2.6. Confirm after repair

1. After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing. Microwaves might leak if screws are not properly tightened.
2. Make sure that all electrical connections are tight before inserting the plug into the wall outlet.
3. Check for microwave energy leakage. (Refer to procedure for measuring microwave evergy leakage.)

CAUTION
MICROWAVE RADIATION
USE CAUTION NOT TO BECOME EXPOSED TO RADIATION FROM THE MICROWAVE MAGNETRON OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

IMPORTANT NOTICE
1.The following components have potentials above 2000V while the appliance is operated.
* Magnetron
* High voltage transformer
* High voltage diode
* High voltage capacitor
Pay special attention to these areas.
2.When the appliance is operated with the door hinge or magnetron adjusted incorrectly, the microwave leakage can exceed more than 5mW/cm^2. After repair or exchange, it is very important to check that magnetron and the door hinge is correctly installed.

3 MEASUREMENTS AND ADJUSTMENTS

WARNING

* For continued protection against radiation hazard, replace only with identical replacement parts (For touch models part No. J61415G10XN, Type No. V-15G-3C25 for primary latch switch; Part No. J61414T00AP, Type No. D3V-16G-3C25 for Secondary latch switch and Part No. J61784T00AP, Type No. D3V-1G-2C25 for short switch.)
* When the 20 Amp. fuse is blown due to the operation of the short switch, you must replace power relay B (part No. K6B1AZA00005, Type No.G5G-1A18VDC), Primary latch switch and the short switch. Then follow the installation procedures below.
* Interlock switch replacement In replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.
* Refer to schematic diagram to ensure proper connection.

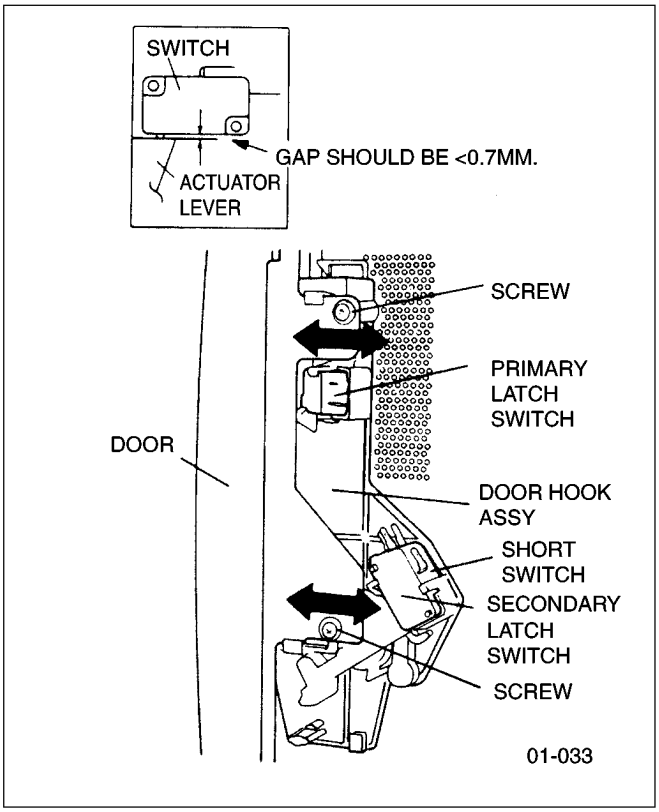
3.1. Adjustment of primary latch switch, secondary latch switch and short switch.

1. Mount the Primary latch switch, the Secondary latch switch and the Short switch to the door hook assembly as shown in ILL.

   NOTE:

   No specific individual adjustments during installation of the Primary latch switch, Secondary latch switch or Short switch to the door hook are required.

2. When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of the arrows in the illustration so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the door hook assembly to the oven assembly.
3. Reconnect the short switch and check the continuity of the monitor circuit and all latch switches again by following the component test procedures.



3.2. Measurement of microwave output

The output power of the magnetron can be determined by performing IEC standard test procedures. However,due to the complexity of IEC test procedures, it is recommended to test the magnetron using the simple method outlined below.

Necessary Equipment:

*1 liter beaker *Glass thermometer
*Wrist watch or stopwatch

NOTE:

Check the line voltage under load.Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurately as possible.

1. Fill the beaker with exactly one liter of tap water.Stir the water using the thermometer and record the water's temperature. (recorded as T1).
2. Place the beaker on the center of glass tray.
   Set the oven for High power and heat it for exactly one minute.
3. Stir the water again and read the temperature of the water. (recorded as T2).
4. The normal temperature rise at High power level for each model is as shown in table.

TABLE (1L-1min.test)

RATED OUTPUT	TEMPERATURE RISE
800W	Min. 12.6°F(7.0°C)

4 PROCEDURE FOR MEASURING MICROWAVE ENERGY LEAKAGE

WARNING

Check for radiation leakage after every servicing. Should the leakage be more than 2 mW/cm^2 (1mW/cm^2 for Canada) inform PSTC, PSC, or PCI immediately. After repairing or replacing any radiation safety device, keep a written record for future reference, as required by D.H.H.S. and Health and Welfare Canada regulation. This requirement must be strictly observed. In addition, the leakage reading must be recorded on the service repair ticket while in the customer's home.

NOTE:

The U.S. Government standard is 5 mW/cm^2 while in the customer's home. 2mW/cm^2 stated here is our own voluntary standard. (1mW/cm^2 for Canada)

4.1. Equipment

- Electromagnatic radiation monitor
- Glass thermometer 212°F or 100°C
- 600cc glass beaker

4.2. Procedure for measuring radiation leakage

Note before measuring.

- Do not exceed meter full scale deflection. Leakage monitor should initially be set to the highest scale.
- To prevent false readings the test probe should be held by the grip portion of the handle only and moved along the shaded area in Figure no faster than 1 inch/sec (2.5cm/sec).
- Leakage with the outer panel removed ..... less than 5mW/cm^2.
- Leakage for a fully assembled oven with door normally closed ..... less than 2mW/cm^2 (1mW/cm^2 for Canada).
- Leakage for a fully assembled oven [Before the latch switch (primary) is interrupted] while pulling the door ..... less than 2mW/cm^2.

1. Pour 275 ± 15cc (9ozs^s± 1/2oz) of 20°C ± 5°C (68° ± 9°F) water in a beaker which is graduated to 600cc, and place in the center of the oven.
2. Set the radiation monitor to 2450MHz and use it following the manufacturer´s recommended test procedure to assure correct results.
3. When measuring the leakage, always use the 2 inch (5cm) spacer supplied with the probe.
4. Tap the start pad or set the timer and with the magnetron oscillating, measure the leakage by holding the probe perpendicular to the surface being measured.

4.2.1. Measurement with the outer panel removed.

Whenever you replace the magnetron, measure for radiation leakage before the outer panel is installed and after all necessary components are replaced or adjusted. Special care should be taken in measuring around the magnetron.

WARNING

Avoid contacting any high voltage parts.

4.2.2. Measurements with a fully assembled oven.

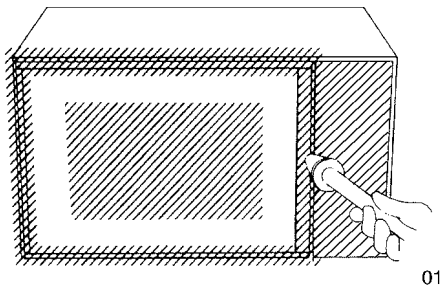
After all components, including outer panel are fully assembled, measure for radiation leakage around the door periphery, the door viewing window, the exhaust opening, control panel and air inlet openings.

4.3. Record keeping and notification after measurement

- After any adjustment or repair to a microwave oven, a leakage reading must be taken. Record this leakage reading on the repair ticket even if it is zero.

  A copy of this repair ticket and the microwave leakage reading should be kept by repair facility.
- Should the radiation leakage be more than 2 mW/cm^2 (1mW/cm^2 for Canada) after determining that all parts are in good condition, functioning properly, and genuine replacement parts as listed in this manual have been used, immediately notify PSTC, PSC or PCI.

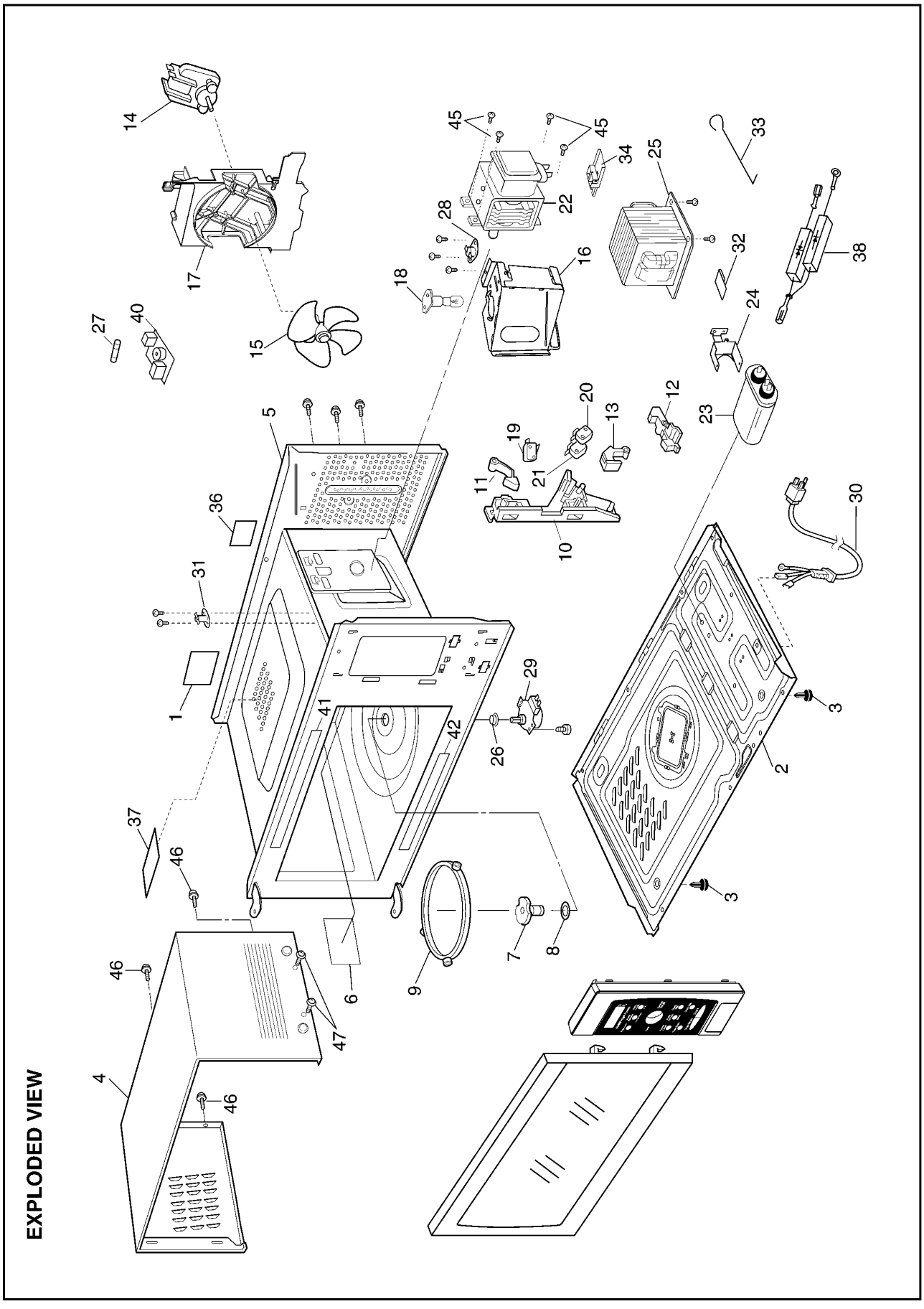
4.4. At least once a year, have the radiation monitor checked for calibration by its manufacturer.



MOVE PROBE ALONG SHADED AREA(//////)AROUND EXHAUST OPENINGS AND AROUND AIR INLET OPENING

5 EXPLODED VIEW AND PARTS LIST

5.1. EXPLODED VIEW



5.2. PARTS LIST

NOTE:

1. When ordering replacement part(s), please use part number(s) shown in this part list.
   Do not use description of the part.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacture's specified parts.

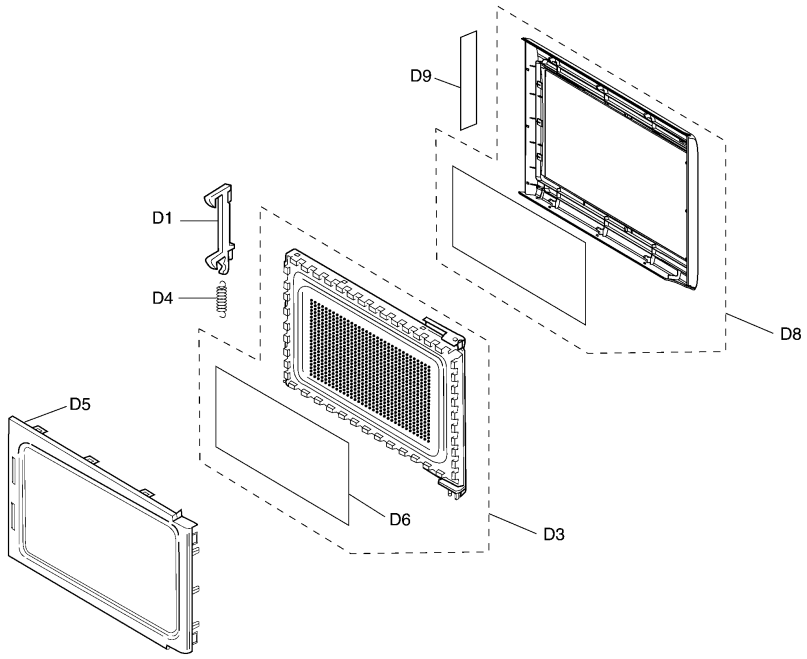
NOTE:

"A" parts are supplied by MOBU (Japan)

"F" parts are supplied by PHAMOS (China)

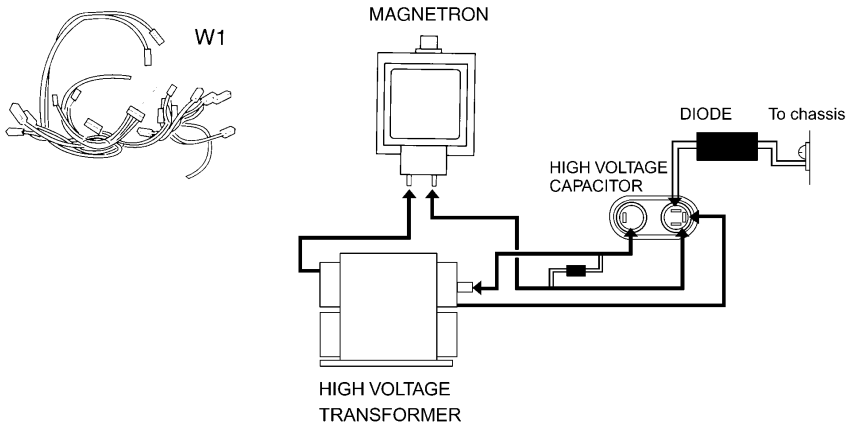
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
1		F00078L50SAP	NAME PLATE	1	APH
1		F00078L50SCP	NAME PLATE	1	CPH
2		F10018H40XP	BASE	1	
3		F10084T00AP	RUBBER FOOT	2	
4		F110D6E70SXP	CABINET BODY(U)	1	
5	⚠	F200A8L50AP	OVEN(U)	1	
6		F20556S20AP	COVER	1	
7		F21316E70XP	PULLY SHAFT	1	
8		F2177-F80	WASHER		
9		F290D6S10XP	ROLLER RING(U)	1	
10	⚠	F3020-1200	DOOR HOOK	1	
11		F3136-1200	HOOK LEVER A	1	
12		F31374650AP	HOOK LEVER B	1	
13		F31384650AP	HOOK LEVER C	1	
14		F400A6S20AP	FAN MOTOR	1	
15		F4008-1E60	FAN BLADE	1	
16		F40258H00XP	AIR GUIDE A	1	
17		F41446S10XP	ORIFICE	1	
18		F612E5U40AP	INCANDESCENT LAMP (U)	1	
19	⚠	J61415G10XN	MICRO SWITCH	1	V-15G-3C25 (PRIMARY LATCH SWITCH)
20	⚠	J61414T00AP	MICRO SWITCH	1	D3V-16G-3C25 (SECONDARY LATCH SWITCH)
21	⚠	F61785U30XN	SHORT SWITCH	1	D3V-1G-2C25 (SHORT SWITCH)
22	⚠	2M210-M1KLP	MAGNETRON	1	APH
22	⚠	2M210-M1JP	MAGNETRON	1	CPH
23	⚠	F6090-1H70	H.V.CAPACITOR	1	
24		F60376S10XP	CAPACITOR BRACKET	1	
25	⚠	F621B8C50AP	H.V.TRANSFORMER	1	
26		F21766S10XP	SEAL	1	
27	⚠	A6331-1600	FUSE	1	15A,125V
28	⚠	F61456S10XP	THERMAL CUTOUT	1	60°C ON,180°C OFF
29		F63266S30AP	TURNTABLE MOTOR	1	
30	⚠	F900C6S20AP	AC CORD W/PLUG	1	APH
30	⚠	F900C6S20CP	AC CORD W/PLUG	1	CPH
31	⚠	F61456N00AP	THERMAL CUTOUT	2	-20°C ON,120°C OFF
32		F60366S10XP	CAPACITOR INSTALLATION BRACKET	1	
33		F11656S10XP	REINFORCE BRACKET	1	
34		F60706S10XP	INSULATE BRACKET	1	
36		F00069660AP	CAUTION LABEL	1	APH
36		F00067600CP	CAUTION LABEL	1	CPH
37		F00338L50AP	FUSE LABEL	1	
38	⚠	F605V6N60XP	DIODE (U)	1	
40		F692Y8L50AP	NOISE FILTER (U)	1	
41		F00067C50AP	CAUTION LABEL	1	APH
41		F00067C50CP	CAUTION LABEL	1	CPH
42		F03348L50AP	MENU LABEL	1	APH
42		F03348L50CP	MENU LABEL	1	CPH
45		XTWFA4+12T	SCREW	4	FOR MAGNETRON
46		XTTAFE4T12A0	SCREW	3	FOR CABINET BODY
47		XTTFA4+6BFZ	SCREW	2	FOR CABINET BODY SIDE

5.3. DOOR ASSEMBLY



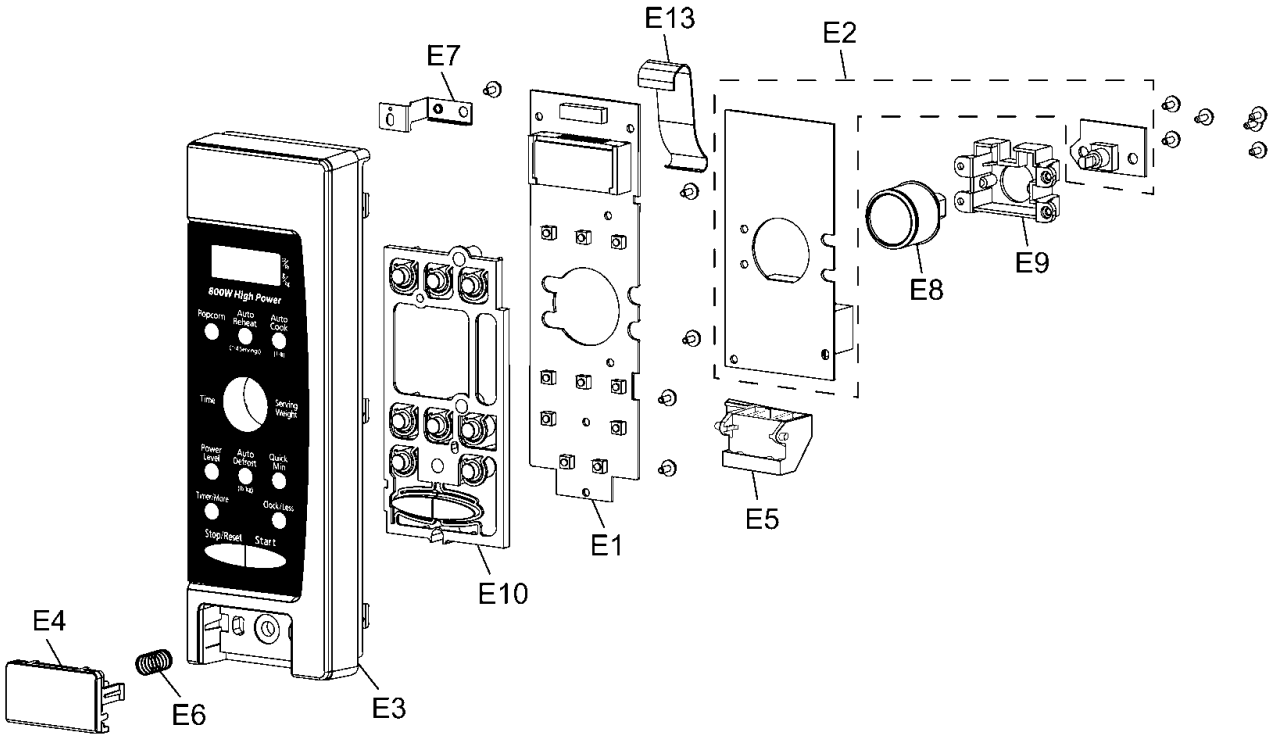
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
D1		F30188H00XP	DOOR KEY A	1	
D3	⚠	F302K8H50QP	DOOR E (U)	1	
D4		F30215G10XN	DOOR KEY SPRING	1	
D5	⚠	F30858H00XP	DOOR C	1	
D6	⚠	F31455G10AP	DOOR SCREEN A	1	
D8	⚠	F302A8L50SAP	DOOR A (U)	1	APH
D8	⚠	F302A8L50SCP	DOOR A (U)	1	CPH
D9		F02459660AP	DHHS LABEL	1	APH
D9		F04114180CP	HC LABEL	1	CPH

5.4. WIRING MATERIALS



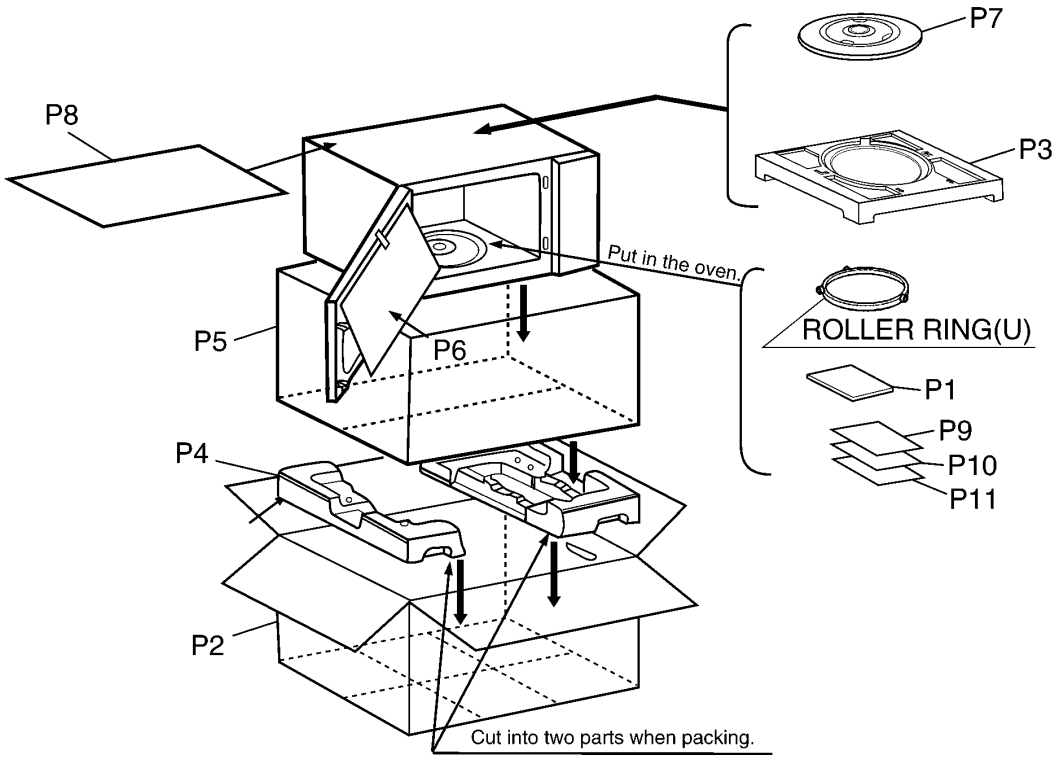
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
W1		F030A8L50AP	LEAD WIRE HARNESS	1	APH
W1		F030A8L50CP	LEAD WIRE HARNESS	1	CPH

5.5. ESCUTCHEON BASE ASSEMBLY



Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
E1		F603L8L50AP	D.P.CIRCUIT (AU)	1	APH
E1		F603L8L50CP	D.P.CIRCUIT (AU)	1	CPH
E2		F603Y8L50AP	D.P.CIRCUIT (DU)	1	APH
E2		F603Y8L50CP	D.P.CIRCUIT (DU)	1	CPH
E3		F800L8L50SAP	ESCUTCHEON BASE (U)	1	APH
E3		F800L8L50SCP	ESCUTCHEON BASE (U)	1	CPH
E4		F891P8H00SXP	DOOR OPENING BUTTON (U)	1	
E5		F82566K10AP	DOOR OPENING LEVEL	1	
E6		F80375K00AP	COOK BUTTON SPRING	1	
E7		F90098H00XP	GROUNDING PANEL	1	
E8		F803G7D00SAP	POP-UP DIAL (U)	1	
E9		F80188H00XP	BACKSTOP	1	
E10		F82988L50KAP	BUTTON	1	
E13		F66168H00EP	FLAT CABLE	1	

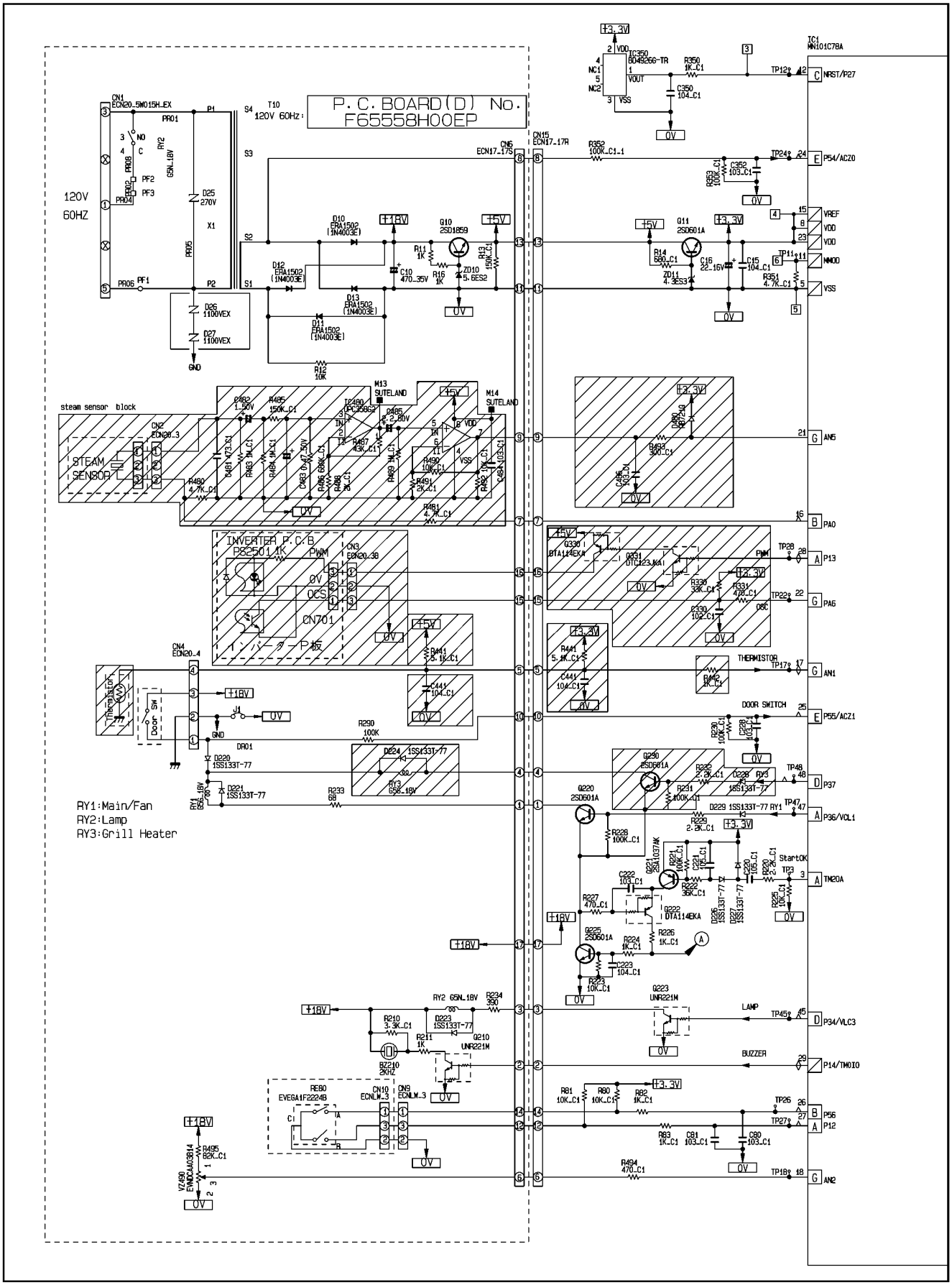
5.6. PACKING AND ACCESSORIES

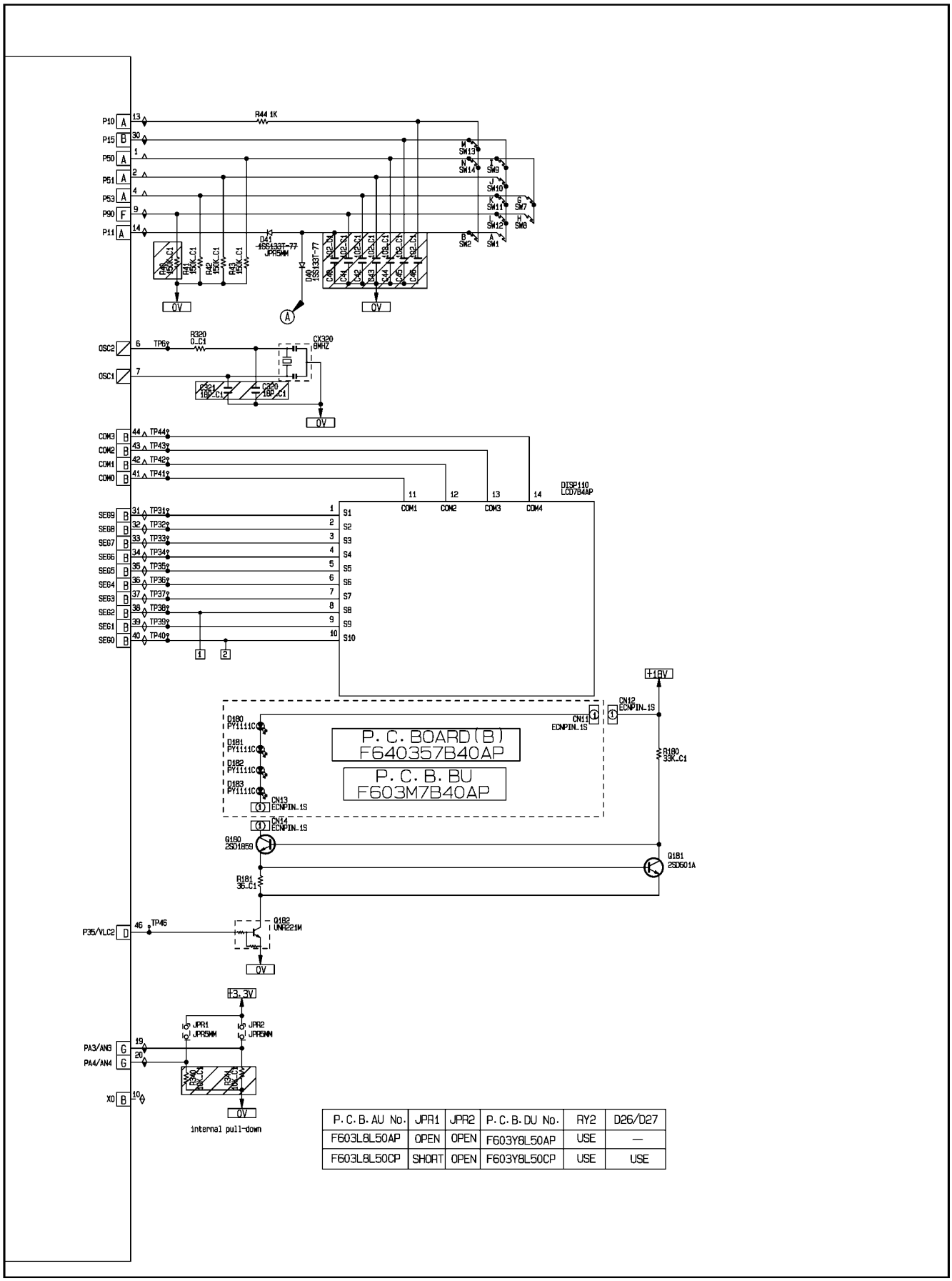


Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
P1		F00038L50AP	INSTRUCTION MANUAL	1	APH
P1		F00038L50CP	INSTRUCTION MANUAL	1	CPH
P2		F01028L50SAP	PACKING CASE,PAPER	1	APH
P2		F01028L50SCP	PACKING CASE,PAPER	1	CPH
P3		F01047K10XP	UPPER FILLER	1	
P4		F01058H00XP	LOWER FILLER	1	
P5		F01068100XN	P.E.BAG	1	
P6		F01075G10XN	DOOR SHEET	1	
P7		A06015G10XN	COOKING TRAY	1	
P8		F01924T00AP	SHEET	1	
P9		F00065G40AP	CAUTION LABEL	1	APH
P10		F04317D00CP	UPPER-CABINET TEMPLATE	1	CPH
P11		F04458L50SCP	OVERLAY	1	CPH

6 DIGITAL PROGRAMMER CIRCUIT

6.1. SCHEMATIC DIAGRAM





P. C. B. AU No.	JPR1	JPR2	P. C. B. DU No.	RY2	D26/D27
F603L8L50AP	OPEN	OPEN	F603Y8L50AP	USE	—
F603L8L50CP	SHORT	OPEN	F603Y8L50CP	USE	USE

6.2. PARTS LIST

Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
BZ210		L0DDEA000014	BUZZER	1	2.0KHz
C10		AECETK1V471B	AL CHEM CAPACITOR	1	470µF/35V
C16		AECETS1C220B	AL CHEM CAPACITOR	1	22µF/16V
CX320		EF0EC8004A4	CERAMIC RESONATOR	1	8.00MHz
DISP110		L5AAAEC00061	LCD	1	
DISPL1		F66177D60AP	LCD HOLDER	1	
D10-D13		B0EAKT000025	DIODE	4	
D220,D221,D223		MA2C19600E	DIODE	3	
D25		D4EAY271A036	VARSITOR	1	270V
D26,D27		D4EAY112A036	VARSITOR	2	1100V (CPH)
IC1		MN101C78ADY	L.S.I.	1	
IC350		C0EBE0000401	IC	1	
Q10,Q180		B1BAAJ000003	TRANSISTOR	2	
Q220,D221,D223		MA2C19600E	CHIP TRANSISTOR	3	
VZ490		D3CA6103A017	VARISTOR	1	
RY1		K6B1AZA00005	POWER RELAY	1	
RY2		K6B1AZA00011	POWER RELAY	1	
T10		G4C2AAD00005	LOW VOLTAGE TRANSFORMER	1	
ZD10		B0BA5R600016	ZENER DIODE	1	
ZD11		B0BA4R400002	ZENER DIODE	1	
SW1,SW2,SW7-SW14		EVQ11L05R	SWITCH	10	
RE80		EVEJ1HF2224B	REVOLVING ENCODER	1	