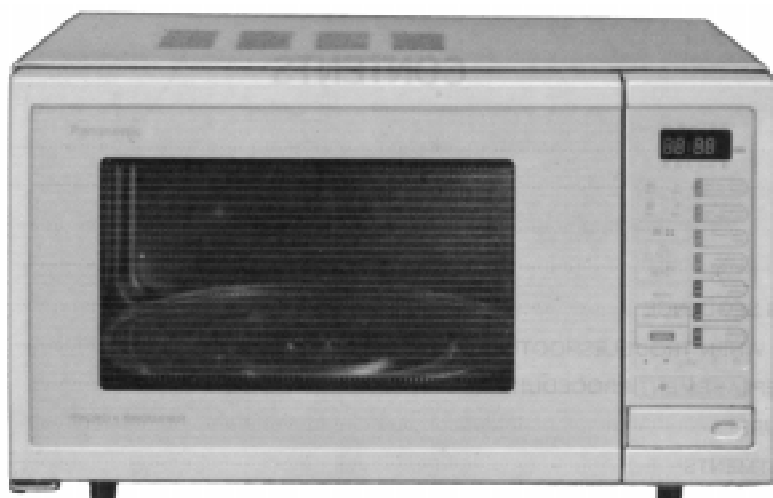


# Service Manual

Microwave Oven

**NN-K652**

**SPECIFICATIONS/ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ**  
**SCHEMATIC DIAGRAM/ПРИНЦИПИАЛЬНАЯ СХЕМА**  
**DESCRIPTION OF OPERATING SEQUENCE/ОБЩЕЕ ОПИСАНИЕ ОПЕРАЦИЙ**  
**CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING/МЕРЫ**  
**БЕЗОПАСНОСТИ ПРИ ПРОВЕДЕНИИ РЕМОНТНЫХ РАБОТ**  
**DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE/РАЗБОРКА И**  
**ПРОЦЕДУРА ЗАМЕНЫ ДЕТАЛЕЙ**  
**COMPONENT TEST PROCEDURE/ПРОВЕРКА ОТДЕЛЬНЫХ КОМПОНЕНТОВ**  
**MEASUREMENTS AND ADJUSTMENTS/ИЗМЕРЕНИЯ И РЕГУЛИРОВКИ**  
**TROUBLESHOOTING GUIDE/НЕИСПРАВНОСТИ И МЕТОДЫ ИХ**  
**УСТРАНЕНИЯ**  
**EXPLODED VIEW AND PARTS LIST/СБОРОЧНЫЕ ЧЕРТЕЖИ И СПИСКИ**  
**ЗАПАСНЫХ ЧАСТЕЙ**  
**DIGITAL PROGRAMMER CIRCUIT/ПЛАТА БЛОКА ВЫБОРА РЕЖИМОВ**  
**РАБОТЫ**

# Panasonic

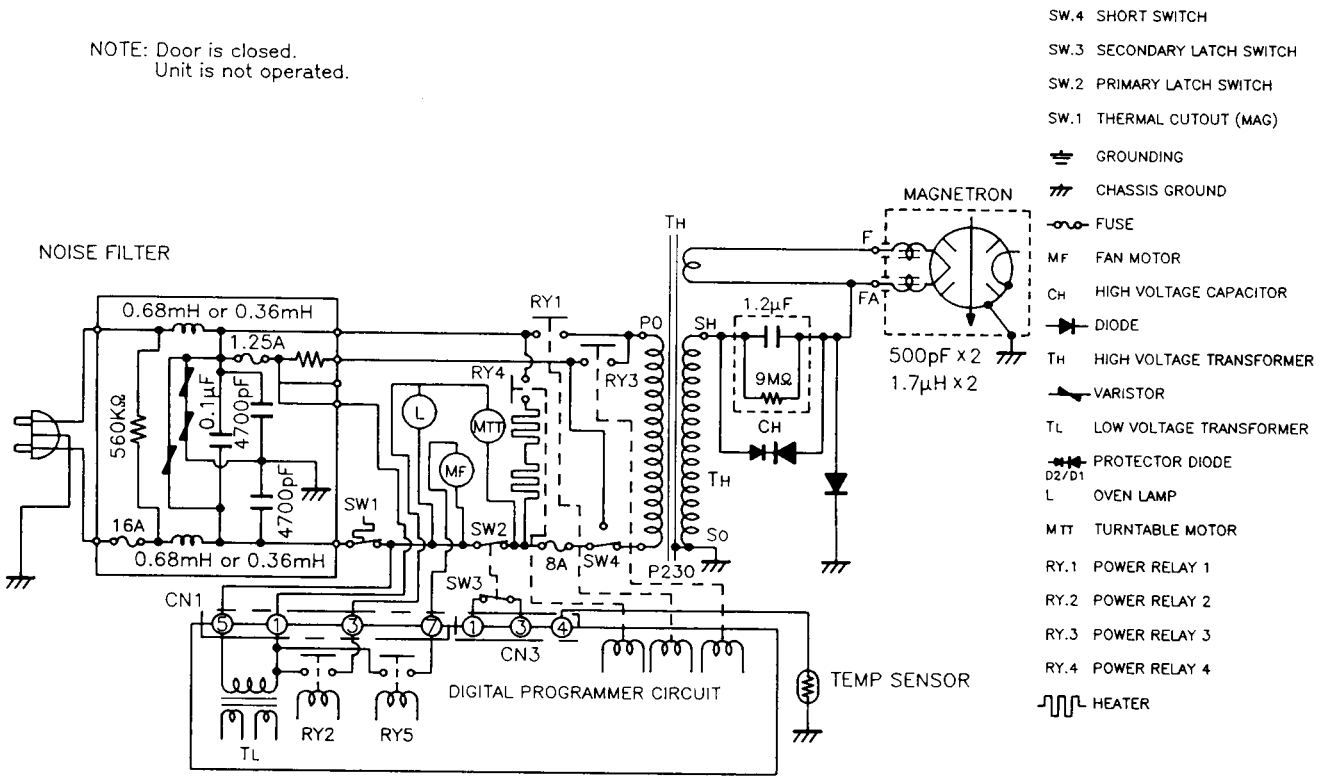
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**Specifications**

Power Source :	220-230 V AC Single Phase, 50 Hz
Power Requirement :	Microwave : 1,470W    Maximum : 2,770W
High Frequency Output :	900W (IEC-705)    Heater : 1,300 W
Microwave Frequency :	2,450 MHz
Timer :	99 min. 99 sec.
Outside Dimensions :	510 mm (W) × 360 mm (D) × 306 mm (H)
Oven Cavity Dimensions :	330 mm (W) × 330 mm (D) × 200 mm (H)
Weight :	17.5 kg
Specifications subject to change without notice.	

# SCHEMATIC DIAGRAM

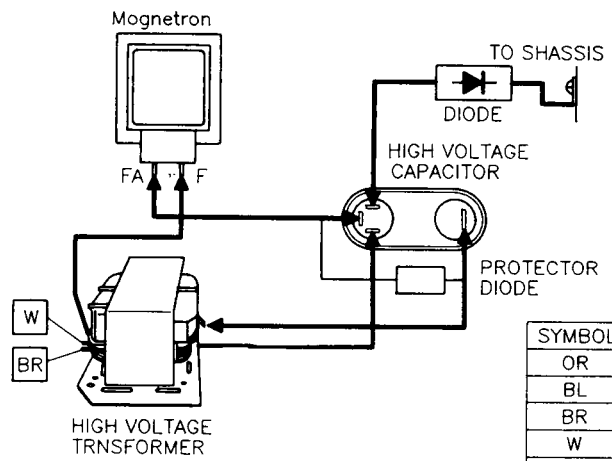
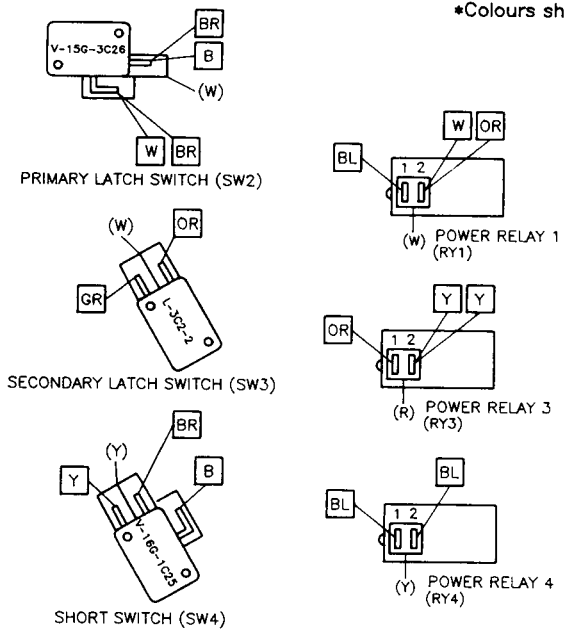
NOTE: Door is closed.  
Unit is not operated.



- SW.4 SHORT SWITCH
- SW.3 SECONDARY LATCH SWITCH
- SW.2 PRIMARY LATCH SWITCH
- SW.1 THERMAL CUTOUT (MAG)
- ⏏ GROUNDING
- ⏏ CHASSIS GROUND
- ⏏ FUSE
- MF FAN MOTOR
- CH HIGH VOLTAGE CAPACITOR
- ⏏ DIODE
- TH HIGH VOLTAGE TRANSFORMER
- ⏏ VARISTOR
- TL LOW VOLTAGE TRANSFORMER
- ⏏ PROTECTOR DIODE
- D2/D1
- L OVEN LAMP
- MTT TURNTABLE MOTOR
- RY.1 POWER RELAY 1
- RY.2 POWER RELAY 2
- RY.3 POWER RELAY 3
- RY.4 POWER RELAY 4
- ⏏ HEATER

## WIRING DIAGRAM

NOTE: \*When replacing, check the lead wire colour as shown.  
\*Colours shown by ( ) indicate colours of lead wire connector housing.



SYMBOL	COLOUR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK

## DESCRIPTION OF OPERATING SEQUENCE

### 1. Variable power cooking control

The coil of power relay 1 (RY1) is energized intermittently by the digital programmer circuit, when the oven is set at any power selection except for High power position. The digital programmer circuit controls the ON-OFF time of power relay 1 contacts in order to vary the output power of the microwave oven from "Warm" to "High" power. One complete ON and OFF cycle of power relay B is 22 seconds.

The relation between indications on the control panel and the output of the microwave oven is as shown in table.

**NOTE 1:** The ON/OFF time ratio does not correspond with the percentage of microwave power since approximately 2 seconds are required for heating of magnetron filament.

**2:** If microwave cooking is over 10 minutes, fan motor rotates for 1 minute after cooking to cool oven.

POWER SETTING	OUTPUT POWER(W) APPROX.	ON-OFF TIME OF POWER RELAY 1 (RY1)	
		ON(SEC)	OFF(SEC)
HIGH	900	22	0
MEDIUM	600	17	5
LOW	440	13	9
SIMMER	250	8	14
WARM	100	4	18
CYCLIC DEFROST	APPROX. 250W	Please refer to description of cyclic defrost	

### 2. Cyclic defrost

When defrost power and defrosting time is selected and Start pad is touched:

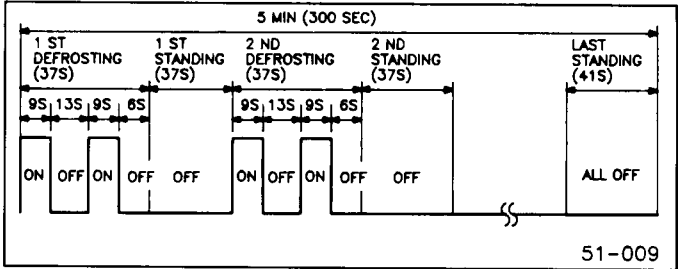
- (A) The digital programmer circuit (DPC) divides the total defrosting time into 8 equal periods, consisting of four defrosting periods, each followed by a standing period.
- (B) During defrosting power periods, power relay 1 is energized for 9 seconds and de-energized for 13 seconds by DPC.
- (C) During Standing periods, power relay 1 is always open resulting in no microwave power.

**NOTE:** Defrost time selected is converted into seconds by the DPC but display will show selected time in minutes and seconds as programmed. The total number of seconds is divided into 8 time periods. The remainder (seconds not equally divisible by 8) are added to the last standing time period.

**Example:** If Defrosting time is selected for 5 minutes, each operating period will be as follows :  
 5 minutes = 300 seconds  
 300/8 = 37 and remainder is 4 seconds.

The 4 seconds is added to the last time period.

**NOTE:** When defrosting time is selected for not more than 7 seconds, the power relay 1 will not be energized at all.



Grill No.	HEATER (RY4)	
	ON (SEC)	OFF (SEC)
1	33	0
2	24	9
3	17	16

### 3. Grill cooking

There are three variable grill power.

The digital programmer circuit generates the power relay 4 control signal at a ON-OFF time as shown in the table.

### 4. Combination cooking

Combination cooking is accomplished by microwave and grill cooking. It can select grill power (1~3) and microwave power (MED~WARM).

The digital programmer circuit controls ON-OFF time of power relay 4 as shown in the table.

**NOTE:** After grill and combination cooking, fan motor rotates for 1 minute to cool oven and electric components.

Combination No.	HEATER (RY4)		Possible select Microwave power
	ON (SEC)	OFF (SEC)	
1	33	0	MED ~ WARM
2	24	9	MED ~ WARM
3	17	16	MED ~ WARM

### 5. Auto Defrost, Auto Weight Cook and Auto Weight Combination Control

When those auto control feature is selected and Start pad is pressed:

(A) The digital programmer circuit determines the power level and cooking time to complete cooking and indicates the operating state in the display.

The table shows the corresponding cooking times for respective weights by categories.

(B) When cooking time in the display window has elapsed, the oven turns off automatically by the controlled signal from the digital programmer circuit.

**NOTE:** After Auto weight combination cooking, fan motor rotates for 1 minute to cool oven and electric components.

CATEGORY	SELECTED WEIGHT	TOTAL COOKING TIME
1. Def. Big Pieces	1000 g	30 Min. 00 Sec
3. Casserole	1000 g	5 Min. 30 Sec
13. Gratin	500 g	12 Min. 10 Sec

## 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.

#### 1. Check the earthing

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

#### 2. If the door lock, the door switch, the door seal or the door develops a malfunction, be sure not to operate the oven until complete repairs are made.

If the oven is operated with any of these parts in imperfect condition, hazardous microwave leakage might occur.

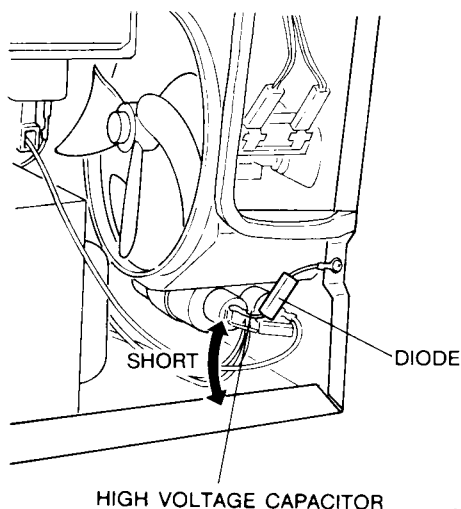
### WARNING

Never operate the oven until the following are confirmed:

- (A) The door is tightly closed.
- (B) There is no broken hinge or door arm.
- (C) The door seal is not damaged.
- (D) The door is not bent or warped.
- (E) There is no other visible damage.

#### 3. 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, wait 30 seconds and short the terminal of the high voltage capacitor (terminal of lead wire from diode) to chassis ground with an insulated jumper lead wire or an insulated handle screwdriver to discharge.



01-003

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

### Important Note

1. High voltage above 250 volts are existing on following parts during operation.

- \*Magnetron
- \*High Voltage Transformer
- \*High Voltage Diode
- \*High Voltage Capacitor

Unusual attention should be paid during repair or troubleshooting of product.

2. If the microwave oven is operated with incorrect installed door hinge or magnetron, it can cause microwave leakage of over 5mW/cm<sup>2</sup>.

Hence it is absolutely necessary to check if magnetron and door hinge are correctly and safely installed after repairs or replacement.

### WARNING

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

4. When parts must be replaced, always remove the power plug from the outlet, and discharge the high voltage capacitor.

#### 5. Confirm after repair

- (A) After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing. Microwave might leak if screws are not properly tightened.
- (B) Make sure that all electrical connections are tight before inserting the plug into the wall outlet.

6. Avoid inserting nails, wire, etc. through holes in 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.

7.

### CAUTION MICROWAVE RADIATION

Personnel should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating device if it is improperly used or connected all input and output microwave connections waveguides, flanges, and gasket must be secure. Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

8.

### CAUTION

High voltage parts may become uncovered when outer cabinet is removed.

## DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE

### 1. Magnetron

- (A) Discharge the high voltage capacitor.
- (B) Remove 1 screw holding thermal cutout mount plate.
- (C) Remove 1 screw holding air guide A.
- (D) Disconnect 2 high voltage lead wires from magnetron filament terminals.
- (E) Remove 4 screws holding the magnetron.

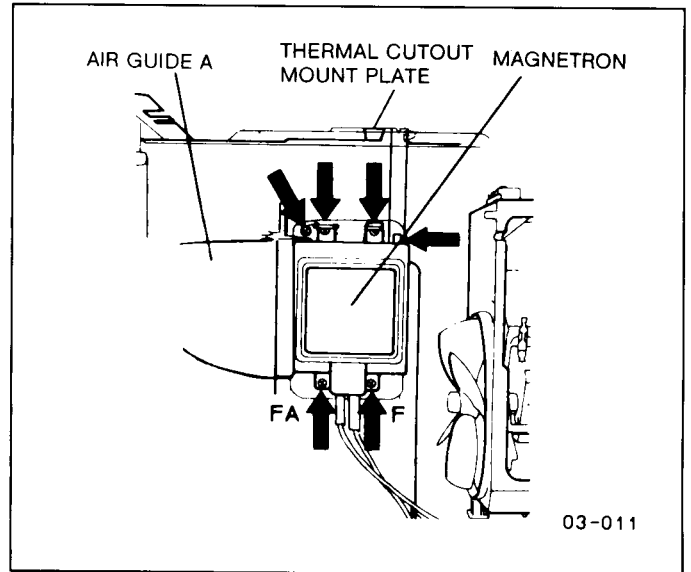
**NOTE:** After replacement of the magnetron, tighten mounting screws properly making sure there is no gap between the waveguide and the magnetron to prevent microwave leakage.

#### CAUTION

When replacing the magnetron, be sure the antenna gasket is in place.

#### CAUTION

When connecting 2 filament lead wires to the magnetron terminals, be sure to connect the lead wires in the correct position. The lead wire of high voltage transformer should be connected to "F terminal" and the lead wire from high voltage capacitor should be connected to "FA terminal".



### 2. Digital programmer circuit (DPC) and membrane key board.

**NOTE:** Be sure to ground any static electric charge built up on your body, before handling the DPC.

- (A) Disconnect all connectors from D.P.C.
- (B) Remove 2 screw holding escutcheon base and slide the escutcheon base upward slightly.
- (C) Release CN2 connector's lock of DPC by pushing both levers to inside and pull them upward, and remove flat cable of membrane key board.
- (D) Remove 2 screws holding DPC.

#### To replace membrane key board

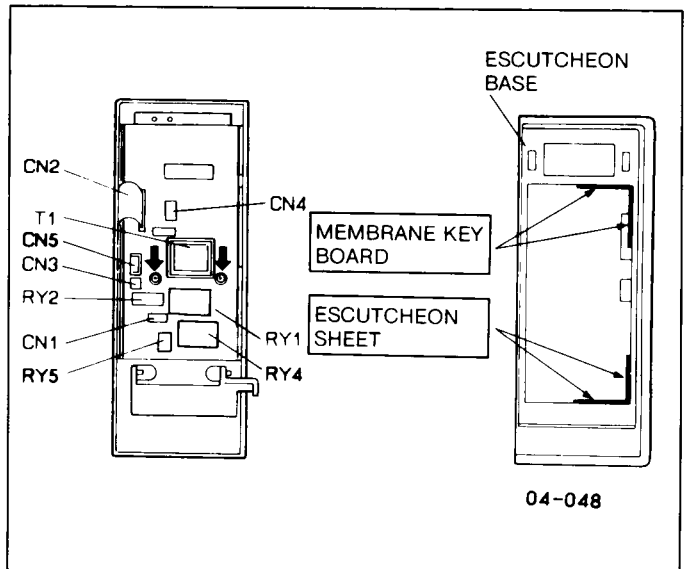
- (E) Remove escutcheon bracket from escutcheon base by freeing 4 catch hooks on the escutcheon base.
- (F) Peel off the tub of membrane key board from escutcheon base.
- (G) Peel off display filter from escutcheon base.
- (H) Push the upper part of key board (display window portion) from back of escutcheon base and peel off membrane key board completely from escutcheon base.

**NOTE:** 1. The membrane key board is attached to the escutcheon base with double faced adhesive tape. Therefore, applying hot air such as using of hair dryer is recommended for smoother removal.

2. When installing new membrane key board, make sure that the surface of escutcheon base is cleaned sufficiently so that any problems (shorted contacts or uneven surface) can be avoided.

3. Alignment position of membrane key board and escutcheon sheet are as follows (See figure);

Membrane key board: Right and upper edges  
Escutcheon sheet: Right and lower edges



### 3. Low voltage transformer and/or power relays

**NOTE:** Be sure to ground any static electric charge built up on your body before handling the DPC.

- (A) Using solder wick or a desoldering tool and 30W soldering iron, carefully remove all solder from the terminal pins of the low voltage transformer and/or power relays.

**NOTE:** Do not use a soldering iron or desoldering tool of more than 30 watts on DPC contacts.

- (B) With all the terminal pins cleaned and separated from DPC contacts, remove the defective transformer/power relays and install new transformer/power relays making sure all terminal pins are inserted completely. Resolder all terminal contacts carefully.

**4. Fan motor**

- (A) Disconnect 2 lead wires from fan motor terminals.
- (B) Remove the noise filter by freeing catch hooks.
- (C) Disconnect 4 high voltage lead wires from high voltage capacitor terminals.
- (D) Remove 5 screws holding fan motor and orifice assy and detach the orifice assy with fan motor from oven assy.
- (E) Remove fan blade from the fan motor shaft by pulling it straight out.
- (F) Separate the fan motor from the orifice assy by freeing 2 catch hooks on the orifice assy.

**5. Door assembly**

**Note:** Door A can be replaced without removing the door C.

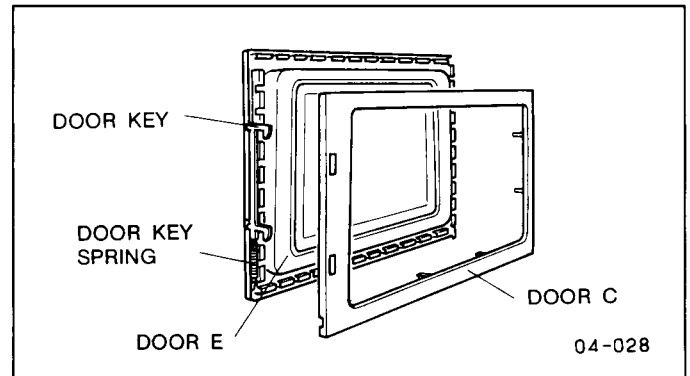
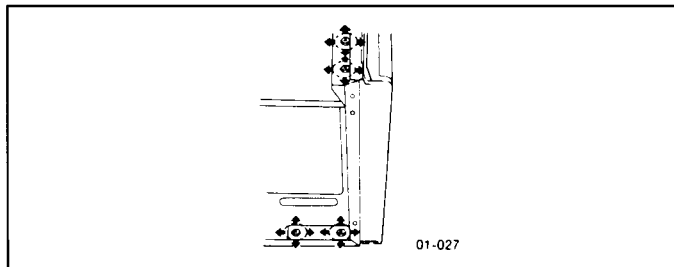
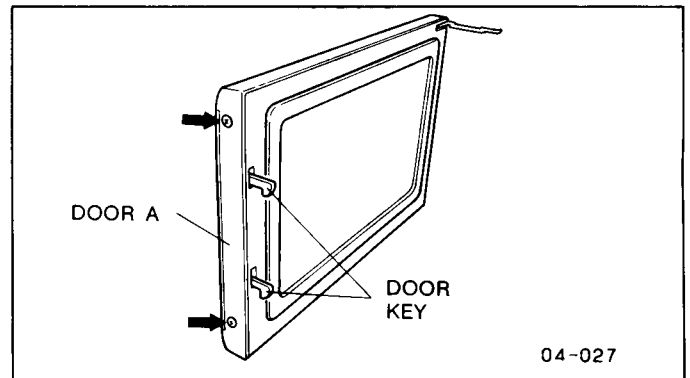
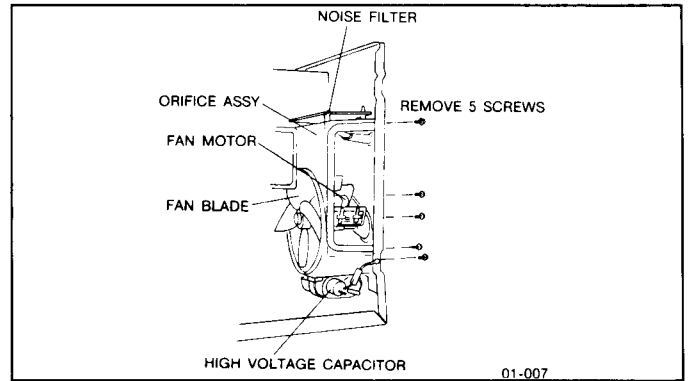
- (A) Remove door A by removing 2 screws holding side frames of its.
- (B) Separate door C from door E by inserting flat blade screwdriver between them.

**Note:** Door C is attached to door E by hooks. The hooks may be damaged or broken when separating these. When you replace door E, please use door C enclosed with door E. When you need to replace door key or door key spring, please arrange to prepare door C also for safety sake.

- (C) Remove door key or door key spring.

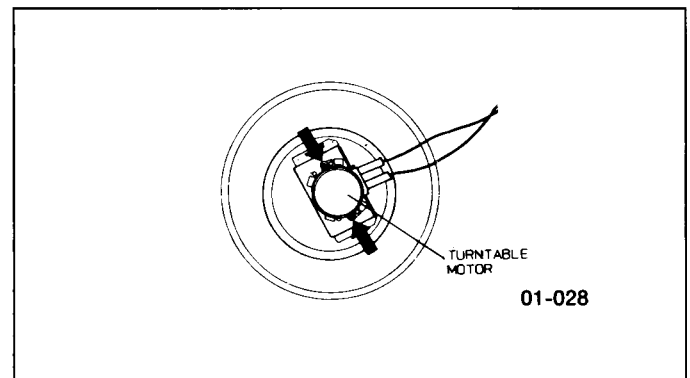
**After replacement of the defective component parts of the door, reassemble it and follow the instructions below for proper installation and adjustment so as to prevent an excessive microwave leakage.**

- (1) When mounting the door to the oven, be sure to adjust the door parallel to the bottom line of the oven face plate by moving the upper hinge and lower hinge in the direction necessary for proper alignment.
- (2) Adjust so that the door has no play between the inner door surface and oven front surface. If the door assembly is not mounted properly, microwave may leak from the clearance between the door and oven.
- (3) Perform the microwave leakage test.



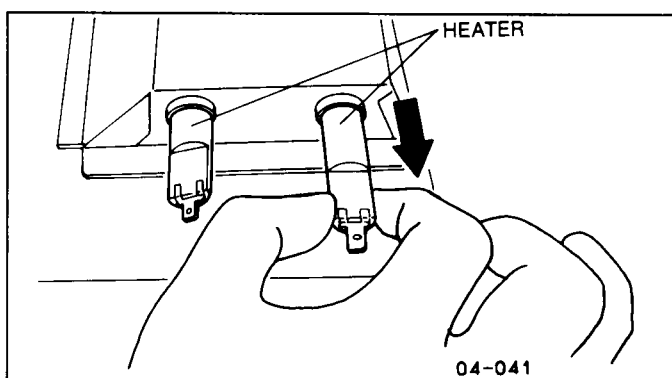
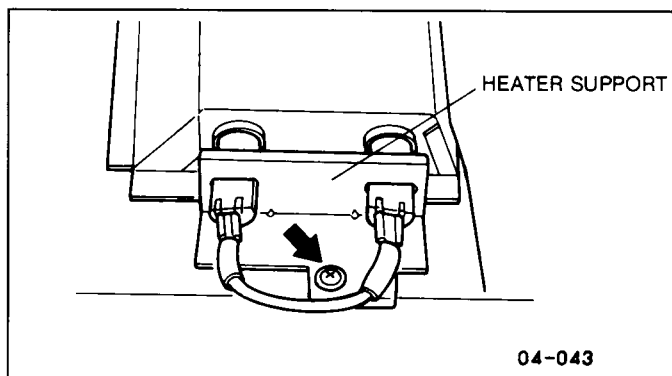
**6. Turntable motor**

- (A) Remove 2 screws holding motor cover.
- (B) Disconnect 2 lead wires connected to the turntable motor.
- (C) Remove the turntable motor by removing 2 screws.



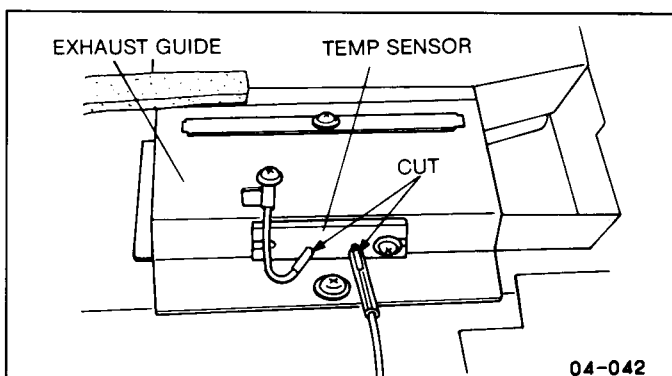
### 7. Quartz heater

- (A) Disconnect lead wires from heater terminals.
- (B) Remove 1 screw holding heater support.
- (C) Remove the heater by pulling it out.



### 8. Temp sensor (thermal protector)

- (A) Cut lead wire at the top of sensor terminals.
- (B) Remove 1 screw holding the temp sensor and replace with new one.
- (C) Solder the lead wires securely to the sensor terminals.





## COMPONENT TEST PROCEDURE

### CAUTION

1. High voltage is present at the high voltage terminal of the high voltage transformer during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

### 1. High voltage transformer

- (A) Remove connections from the transformer terminals and check continuity.
- (B) Normal (cold) resistance readings should be as follows:
  - Secondary winding ..... Approx. 80Ω ~ 120Ω
  - Filament winding ..... Approx. 0Ω
  - Primary winding ..... Approx. 0Ω ~ 3Ω

### 2. High voltage capacitor

- (A) Check continuity of capacitor with meter on highest OHM scale.
- (B) A normal capacitor will show continuity for a short time, and then indicate 9MΩ once the capacitor is charged.
- (C) A shorted capacitor will show continuous continuity.
- (D) An open capacitor will show constant 9MΩ.
- (E) Resistance between each terminal and chassis should be infinite.

### 3. Magnetron

Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose for an open filament or shorted magnetron.

- (A) Isolate magnetron from the circuit by disconnecting the leads.
- (B) A continuity check across magnetron filament terminals should indicate one ohm or less.
- (C) A continuity check between each filament terminal and magnetron case should read open.

### 4. Diode

- (A) Isolate the diode from the circuit by disconnecting the leads.
- (B) With the ohmmeter set on the highest resistance scale, measure the resistance across the diode terminals. Reverse the meter leads and again observe the resistance reading. Meter with 6V, 9V or higher voltage batteries should be used to check the front-to-back resistance of the diode, otherwise an infinite resistance may be read in both directions.  
A normal diode's resistance will be infinite in one direction and several hundred kΩ in the other direction.

### 5. Membrane key board (Membrane switch assembly)

Check continuity between switch terminals, by tapping an appropriate pad on the key board. The contacts assignment of the respective pads on the key board is as shown in digital programmer circuit.

### 6. Temp sensor (Thermal protector)

A temp sensor is mounted on top of the oven cavity at the left side. Its purpose is to automatically shut off the oven in case the cavity overheats for any reason.

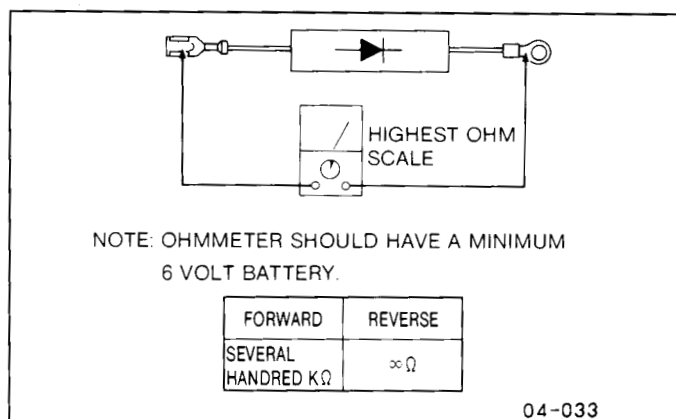
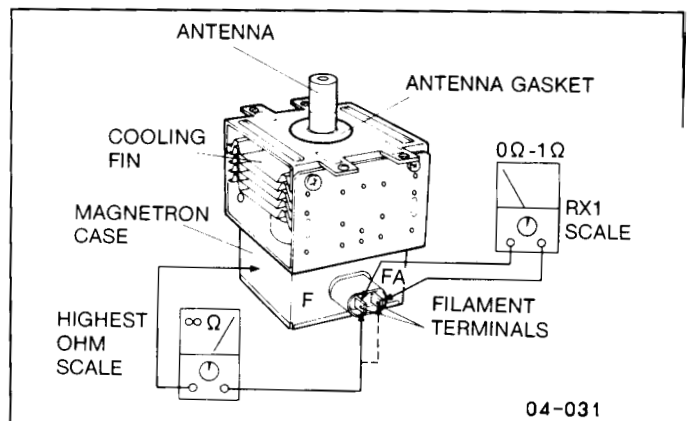
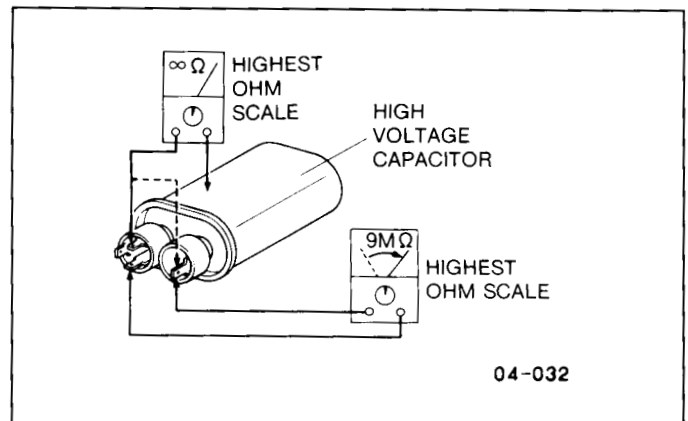
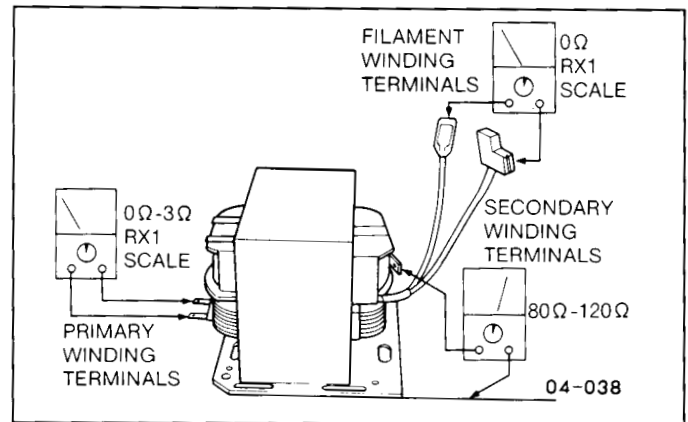
The thermal protector will operate at 257°F (125°C).

The device is connected to the DPC on touch control models. When the thermal protector exceeds its temperature it will turn off the power to oven cavity and display will go to reset mode.

The cooking program can be reset after cool-down.

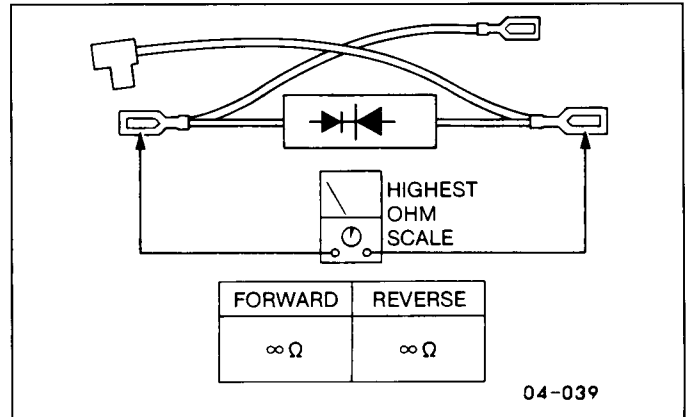
#### THERMISTOR RESISTANCE VALUE

30K-120K at 10°C-30°C (50°F-86°F)



**7. Protector diode**

- (A) Isolate the protector diode assembly from the circuit by disconnecting its leads.
- (B) With the ohmmeter set on the highest resistance scale, measure the resistance across the protector diode terminals. Reverse the meter leads and again observe the resistance reading. A normal protector diode's resistance will be infinite in both directions. It is faulty if it shows continuity in one or both directions.



## MEASUREMENTS AND ADJUSTMENTS

### 1. Adjustment of Primary latch switch, Secondary latch switch and short switch

(A) When mounting Primary latch switch, Secondary latch switch and short switch to door hook assembly, mount the Primary latch switch, the Secondary latch switch and the short switch to the door hook assembly as shown in Figure.

**NOTE:** No specific adjustment during installation of Primary latch switch, Secondary latch switch and short switch to the door hook is necessary.

(B) When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of arrow in Figure 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.

### 2. Measurement of microwave output

The output power of the magnetron can be determined by performing IEC standard test procedures. However, it is possible to test the magnetron by following procedure outlined below.

Necessary equipment:

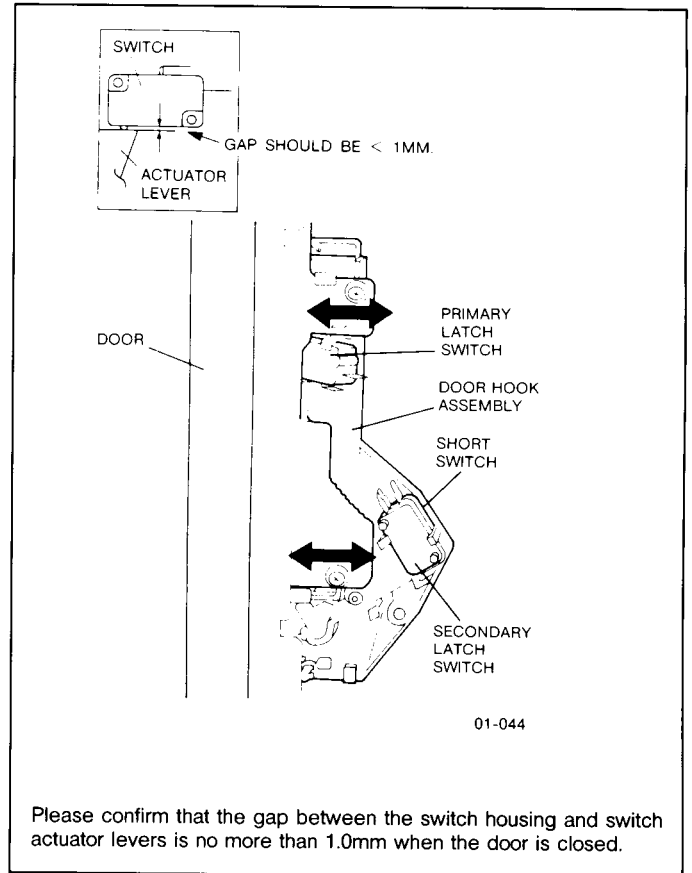
- \* 1 litre beaker
- \* Glass thermometer
- \* Wrist watch or stopwatch

**NOTE:** Check the line voltage under load to ensure it meets specifications. Low voltage condition will cause a reduction in magnetron output. Temperature readings and heating time, should be as accurate as possible.

Output power performance test procedure.


- (A) Fill the beaker with exactly one litre of tap water.  
Stir the water using the thermometer and note the temperature.  
(Record as T1)
- (B) Place the beaker in the center of cook plate.  
Set the oven for High power and heat for exactly one minute.
- (C) After completion of the heating cycle, stir the water again with the thermometer and note the temperature.  
(Record as T2).

The normal temperature rise (T1—T2), for these models should be more than 8.0°C using the High power selection with the oven operating at the specified line voltage.



## TROUBLESHOOTING GUIDE

### CAUTION

1. Check grounding before checking for trouble.
2. Be careful of the high voltage circuit.
3. Discharge high voltage capacitor.
4. When checking the continuity of the switches or the high voltage transformer, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter.
5. Do not touch any parts of the circuitry on the digital programmer circuit, since static electric discharge may damage this control panel.  
Always touch yourself to ground while working on this panel to discharge any static charge in your body.
6. A 230V AC is present at the shaded area  of the digital programmer circuit (Terminals of power relays and primary circuit of low voltage transformer). When troubleshooting, be cautious of possible electrical shock hazard.

First of all operate the microwave oven following the correct operating procedures described in order to find the exact cause of any trouble.

### [TROUBLE 1] Oven does not start cooking

	SYMPTOM	CAUSE	CORRECTIONS	
1.	Oven is dead. Fuses are OK. No display and no operation at all.	1. Open or loose lead wire harness	Check fan motor when thermal cutout is defective.	
		2. Open thermal cutouts (Magnetron)		
2.	Oven does not accept key input (Program)	3. Open low voltage transformer	Refer to operation procedure.	
		4. Defective DPC		
		1. Key input is not in-sequence		Refer to DPC troubleshooting.
		2. Open or loose connection of membrane key pad to DPC (Flat cable)		
3. Shorted or open membrane key board	Adjust door and latch switches.			
4. Defective DPC				
3.	Oven lamp and turntable motor turn on when oven is plugged in with door closed.	1. Misalignment or loose wiring of secondary latch switch.	Adjust door and latch switches.	
		2. Defective secondary latch switch		
4.	Timer starts count down but no microwave oscillation.	1. Off-alignment of latch switches	Adjust door and latch switches.	
		2. Defective primary latch switch		
		3. Open or loose wiring of power relay 1 (RY1)	Check high voltage component according to component test procedure and replace if it is defective.	
		4. Defective power relay 1 (RY1)		
		5. Defective DPC.		
		6. Open or loose connection of high voltage circuit especially magnetron filament circuit		
		NOTE: Large contact resistance will bring lower magnetron filament voltage and causing magnetron to lower output and/or intermittent oscillation.		
		7. Defective high voltage component		
		H.V. Transformer		
		H.V. Capacitor		
		H.V. Diode		
		Magnetron		

**[TROUBLE 2] Fuse is blown**

	SYMPTOM	CAUSE	CORRECTIONS
1.	8A fuse is blown.	1. Shorted lead wire harness 2. Shorted H.V. Capacitor 3. Shorted H.V. Diode 4. Defective magnetron 5. Shorted H.V. Transformer 6. Protector diode	Replace H.V. Diode and protector diode (*NOTE) Replace magnetron and protector diode (*NOTE) Replace H.V. Transformer and protector diode (*NOTE)
2.	1.25A fuse is blown.	1. Defective primary latch switch and short switch	Check adjustment of latch switches and door
3.	16A is blown.	1. Shorted lead wire harness 2. Shorted heater 3. Defective power relays 4. Defective DPC	
		※NOTE: Be sure to replace protector diode together with those H.V. Components. In this case, only D2 of protector diode may be shorted due to faulty H.V. Component. Therefore, if protector diode is not replaced together, high voltage transformer will be damaged (over heated).	

**[TROUBLE 3] Other troubles**

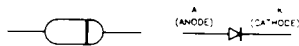
	SYMPTOM	CAUSE	CORRECTIONS
1.	Microwave output is low. Oven takes longer time to cook food.	1. Decrease in power source voltage 2. Open or loose wiring of magnetron filament circuit (Intermittent oscillation) 3. Aging change of magnetron	Consult electrician
2.	Turntable motor and oven lamp turn on when door is opened.	1. Shorted primary latch switch	
3.	Loud buzzing noise can be heard.	1. Loose fan and fan motor 2. Loose screws on H.V. Transformer	
4.	Oven stops operation during cooking	1. Off alignment of latch switches 2. Open or loose wiring of primary and secondary latch switch 3. Operation of thermal cutout (Magnetron)	Adjust door and latch switches.
5.	"88:88" appears in display window after 1 minute elapsed in the all cooking mode.	1. Open or loose wiring of oven temp sensor 2. Defective oven temp sensor 3. Defective DPC.	

**(TROUBLE 4) Trouble related to Digital programmer circuit**

SYMPTOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No Display when oven is first plugged in	1	Fuse pattern of DPC	Normal	STEP 2
			Open	Shorted circuit of ZNR, L. V. T., Oven Lamp, etc. Replace DPC
	2	Low voltage transformer (LVT) secondary voltage	Abnormal 0V	LVT
			Normal	→ Step 3
	3	IC-1 pin 34 voltage (Emitter of Q1)	Abnormal	ZD1,Q1
			Normal = 5V	→ Step 4
	4	IC-1 pin 36 voltage (14 pin of IC-2)	Abnormal	IC-2
			Normal	→ IC-1, CX1, DISPLAY
No key input	1	Membrane switch continuity	Abnormal	Membrane switch
			Normal	IC-1
No beep sound	1	IC-1 pin 25 voltage	Abnormal	IC-1
			Normal	BZ
Power relay 2(RY-2) does not turn on even though the program has been set and the start pad is tapped	1	IC-1 pin 3 voltage while operation	Abnormal	IC-1
			Normal = 5V	→ Step 2
	2	short circuit between pin 1 and pin 12 of IC-2	Still not turn on	RY-2
			RY-2 turns on	IC-2
No microwave oscillation at any power setting	1	IC-1 pin 6 and pin 14 voltages while operation at high power	Abnormal	IC-1
			Normal 6---5V, 14---5V	→ Step 2
	2	Q4 transistor	Abnormal	Q4
			Normal	IC-2, RY-1
Dark or unclear display	1	Replace display and check operation	Normal	DISPLAY
			Abnormal	IC-1
Missing or lighting of unnecessary segment	1	Replace IC-1 and check operation	Normal	IC-1
			Abnormal	DISPLAY

**HOW TO CHECK THE SEMICONDUCTORS USING AN OHM METER**

Diode



	FORWARD	REVERSE
A-K	SMALL	∞

Transistor

**NPN Transistor**

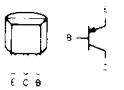
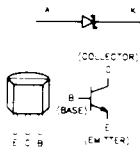
2SC.....

2SD.....

**PNP Transistor**

2SA.....

2SB.....

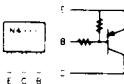


	FORWARD	REVERSE
B-E	SMALL	∞
B-C	SMALL	∞
C-E	∞	∞

	FORWARD	REVERSE
E-B	SMALL	∞
C-B	SMALL	∞
C-E	∞	∞

Digital Transistor

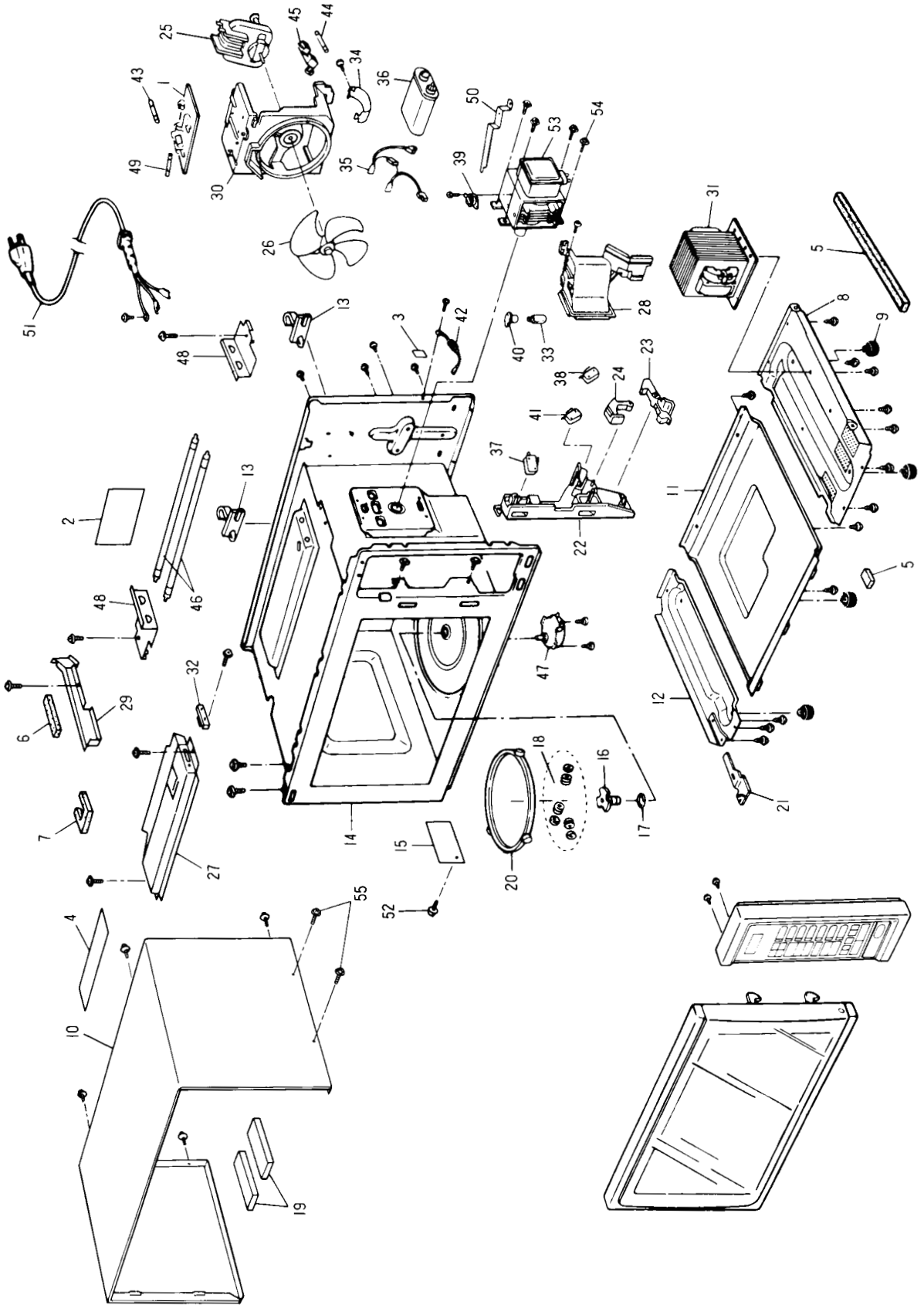
**PNP Transistor**



	FORWARD	REVERSE
E-B	10kΩ ~ 30kΩ	10kΩ ~ 30kΩ
C-B	50kΩ ~ 90kΩ	∞
C-E	40kΩ ~ 80kΩ	∞

EXPLODED VIEW AND PARTS LIST

EXPLODED VIEW



## PARTS LIST

NOTE 1: When ordering replacement part(s), please use part number(s) shown in this parts list.

Do not use description of the part.

2: Important safety notice:

Components identified by  $\triangle$  mark have special characteristics important for safety.

When replacing any of these components, use only manufacturer's specified parts.

3: Items marked \* supplied by MELUK.

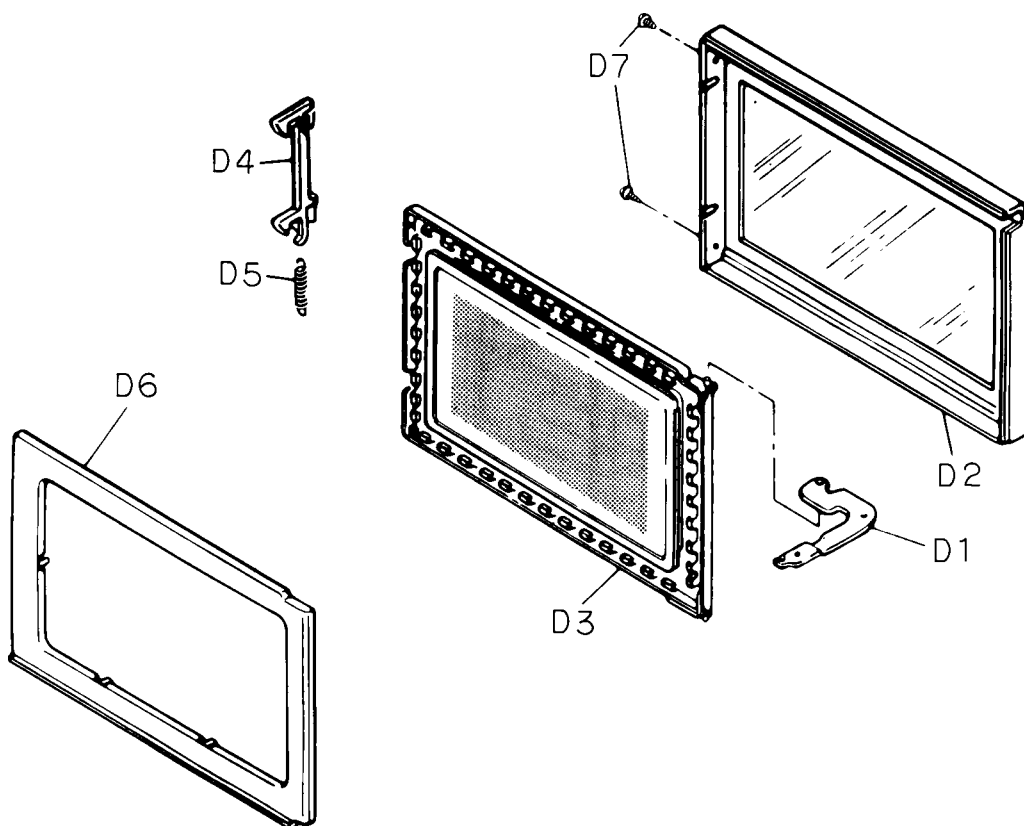
Ref. No.		Part No.	Part Name & Description	Pcs/ Set	Remarks
1	$\triangle$	A692Y5860GP	NOISE FILTER (U)	1	
2		ANE00062Q0EP	CAUTION LABEL	1	
3		ANE0033770XN	FUSE LABEL	1	
4		A01505870EP	CAUTION LABEL	1	
5		ANE000Z000AA	CUSHION RUBBER A	2	
6		ANE000Z000AB	CUSHION RUBBER C	1	
7		ANE0963000AN	CUSHION RUBBER D	1	
8		A10016520GP	BASE	1	
9		ANE1008-3W0	RUBBER FOOT	4	
10		A10096520HXN	CABINET BODY (U)	1	
11		A10266520GP	BASE C	1	
12		A11296520GP	BASE B	1	
13		A11406520GP	STOPPER	2	
14		A200A6520GP	OVEN	1	
15		A20556520GP	COVER	1	
16		A21315870GP	PULLEY SHAFT	1	
17		ANE2177-F80	WASHER	1	
18		A202K5870GP	ROLLER B (U)	1	(NOTE 4)
19		A22586520GP	ADIABATIC MATERIAL	2	
20		A290D5870GP	ROLLER RING (U)	1	
21		A30075540GP	LOWER HINGE	1	
22		A30204310AG	DOOR HOOK	1	
23		A31374650AP	HOOK SPACER B	1	
24		A31384650AP	HOOK SPACER C	1	
25	$\triangle$	A400A4760JP	FAN MOTOR	1	(AC,26W,SINGLE)
26		ANE40086W0AP	FAN	1	
27		A40246520GP	EXHAUST GUIDE	1	
28		A40254760JP	AIR GUIDE A	1	
29		A40266520GP	AIR GUIDE B	1	
30		A41445540AP	ORIFICE	1	
31	$\triangle$	A600B6520GP	H.V.TRANSFORMER	1	(1.5KVA)
32	$\triangle$	A601L5150AP	TEMP SENSOR	1	
33		A60304080BP	INCANDESCENT LAMP	1	(20W,240V)
34		A60374760GP	CAPACITOR BRACKET	1	
35		A606V4760JP	PROTECTOR DIODE	1	
36	$\triangle$	A60906520GP	H.V.CAPACITOR	1	(1.2 $\mu$ F,AC2100V)



Ref. No.		Part No.	Part Name & Description	Pcs/ Set	Remarks
37	△	ANE6142-F60	MICROSWITCH	1	(V-15G-3C26) PRIMARY LATCH SWITCH
38	△	A61425180AP	MICROSWITCH	1	(L-3C2-2) SWCONDARY LATCH SWITCH
39	△	A61454000AP	THERMAL CUTOUT	1	
40	△	A61524000AP	SOCKET	1	
41	△	ANE6161-3X0	MICRO SWITCH	1	(V-16G-1C25) SHORT SWITCH
42		A62024000AP	DIODE,SI	1	
43	△	ANE6230P10GN	FUSE	1	(16A)
44	△	ANE6230Z70BP	FUSE	1	(8A)
45		A62314000AP	FUSE HOLDER	1	
46	△	A630G6520GP	HEATER	2	
47	△	A63264760JP	TURNTABLE MOTOR	1	(AC,3W,SINGLE)
48		A64606520GP	HEATER MOUNTING PLATE	2	
49	△	ANE6595Q50GS	FUSE	1	(1.25A)
50		A66266520GP	THERMAL CUTOUT MOUNT	1	
51	△	A900A5870GP	AC CORD W/PLUG	1	
52		XST4+5VS	SCREW	1	4X5 (FOR COVER)
53	△	2M210-M1E	MAGNETRON	1	
54		XTWANE4+10RU	SCREW	4	4X10 (FOR MAGNETRON)
55		XTT4+6BN	SCREW	2	4X6 (FOR CABINET BODY)
※		E08877050AP	CAVITY SPRAY PAINT	1	SPRAY CAN, FOR REPAIR OF PAINTED OVEN CAVITY
※		E08877000AP	TOUCH-UP PAINT	1	BOTTLE WITH BRUSH, FOR REPAIR OF PAINTED OVEN CAVITY

**NOTE 4 :** When ordering the roller B assy, three rollers will be shipped.  
 When replacing the roller B, three rollers should be replaced at the same time.  
 Otherwise the glass cooking tray may not turn smoothly.

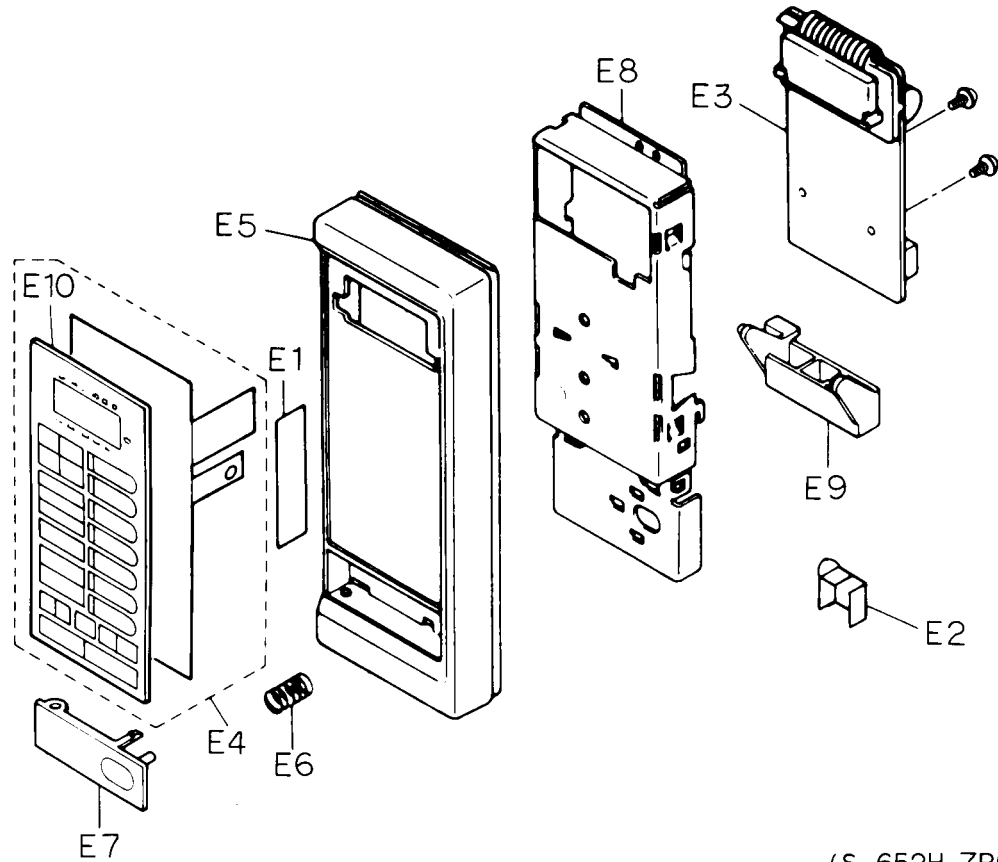
**DOOR ASSEMBLY**



(S-652H ZPG)

Ref. No.	Part No.	Part Name & Description	Pcs/ Set	Remarks
D1	A300B5850AP	UPPER HINGE	1	
D2	A302A6520HGP	DOOR A (U)	1	
D3	A302K5870GP	DOOR E (U)	1	
D4	A30184650AP	DOOR KEY	1	
D5	A30214000AP	DOOR KEY SPRING	1	
D6	A30855870GP	DOOR C	1	
D7	XTBANE3+8BC	SCREW	2	3X8

**ESCUTCHEON BASE ASSEMBLY**

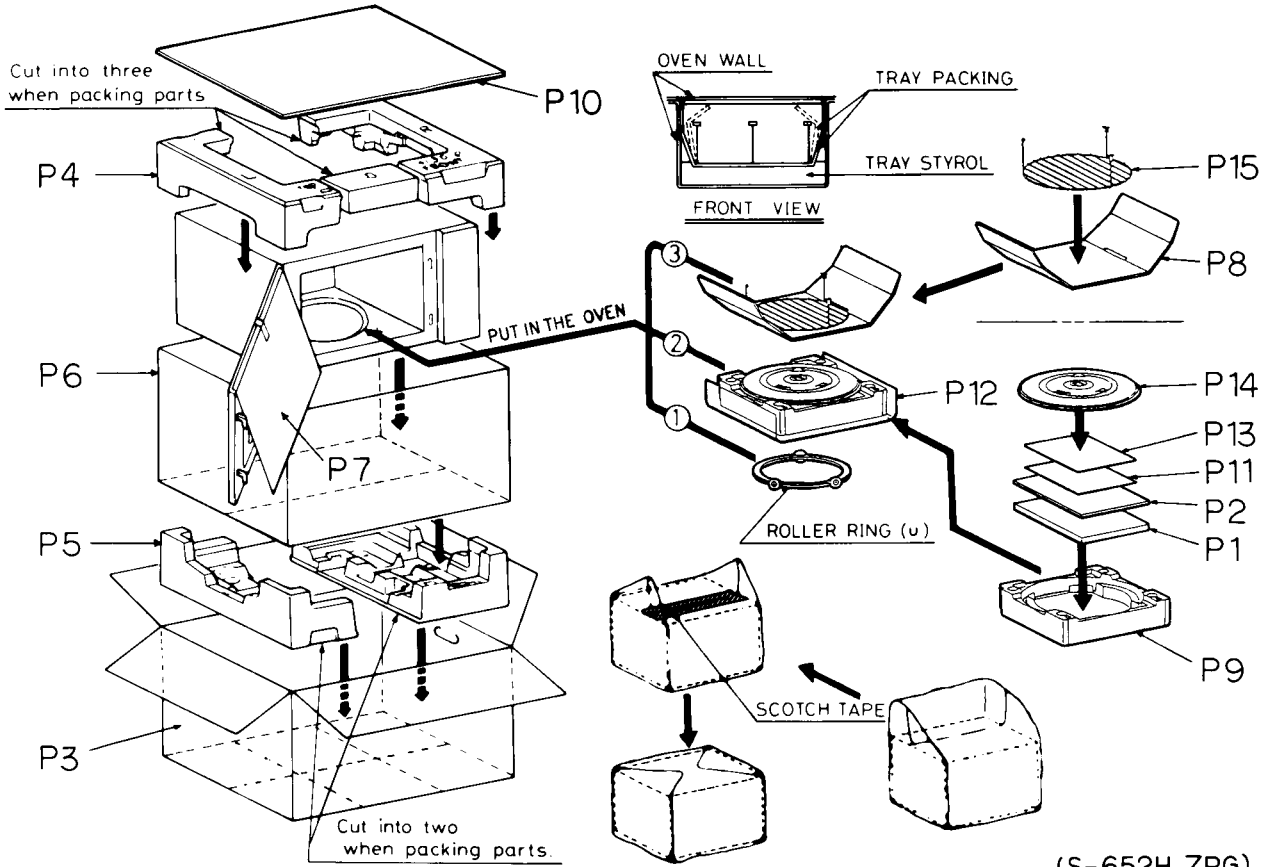


(S-652H ZPG)

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
E1	A01576520HZP	NAME PLATE	1	
E2	A23226520GP	SPACER	1	
E3	△ A603L6520UP	D.P.CIRCUIT (U)	1	RTL (W/COMPONENT)
E4	△ A630Y6520HEP	MEMBRANE SWITCH (U)	1	(W/ESCUTCHEON SHEET)
E5	A80345540HAQ	ESCUTCHEON BASE	1	(NOTE 5)
E6	ANE80378A0AG	COOK BUTTON SPRING	1	
E7	A80725540HAQ	DOOR OPENING BUTTON	1	
E8	A81275690AP	BACK PANEL	1	
E9	A82565540AP	DOOR OPENING LEVER	1	
E10	A83376520HEP	ESCUTCHEON SHEET	1	

NOTE 5 : Please order name plate together.

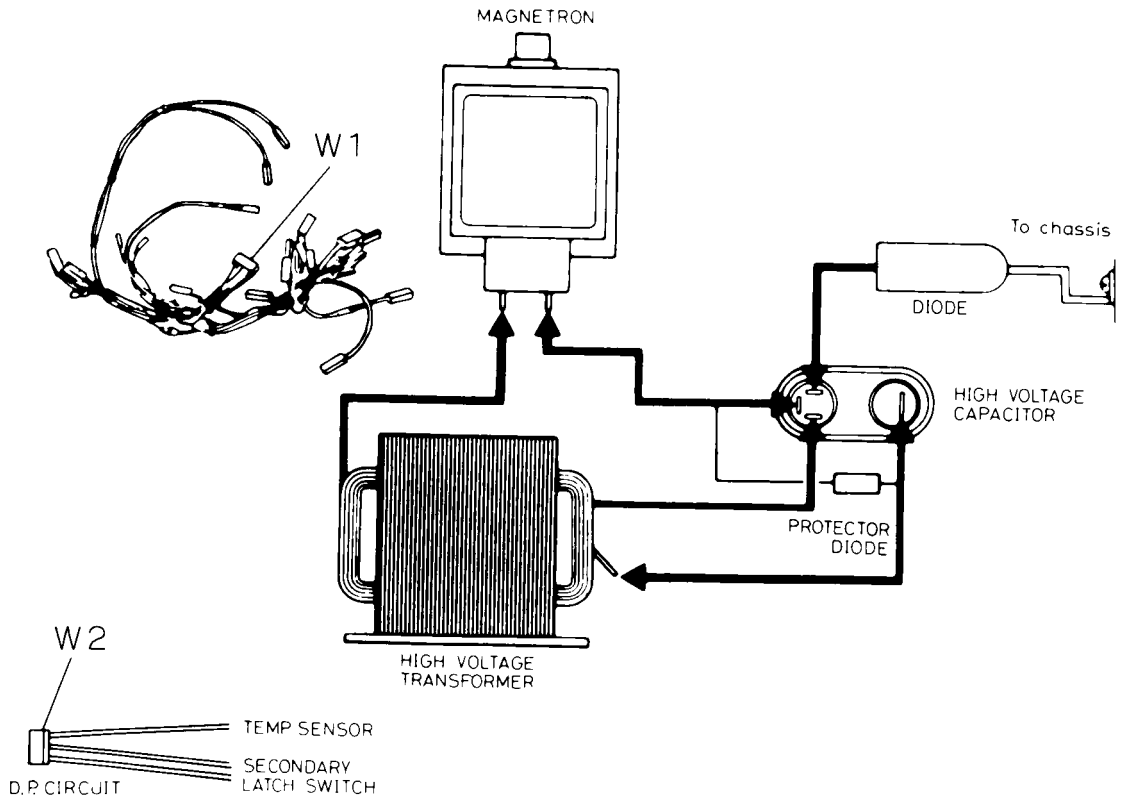
**PACKING AND ACCESORIES**



(S-652H ZPG)

Ref. No.	Part No.	Part Name & Description	Pcs/ Set	Remarks
P1	A000B6240ZP	COOK BOOK	1	
P2	A00036520ZP	INSTRUCTION BOOK	1	
P3	A01026520HZP	PACKING CASE,PAPER	1	
P4	A01044850KN	UPPER FILLER	1	
P5	A01054850KN	LOWER FILLER	1	
P6	A01064830AP	VINYL COVER	1	
P7	ANE01072Q0AP	DOOR SHEET	1	
P8	A01086520EP	TRAY PACKING	1	
P9	A01136520GP	TRAY STYROL	1	
P10	A01264800XN	REINFORCE MATERIAL	1	
P11	ANE0169Q50GN	SERVICE CENTER LIST	1	
P12	A0192-1100	PACKING	1	
P13	A03346520HZP	MENU LABEL	1	
P14	A06017210QP	COOKING TRAY	1	
P15	A06025870UP	OVEN RACK	1	

**WIRING MATERIAL**



(S-652H ZPG)

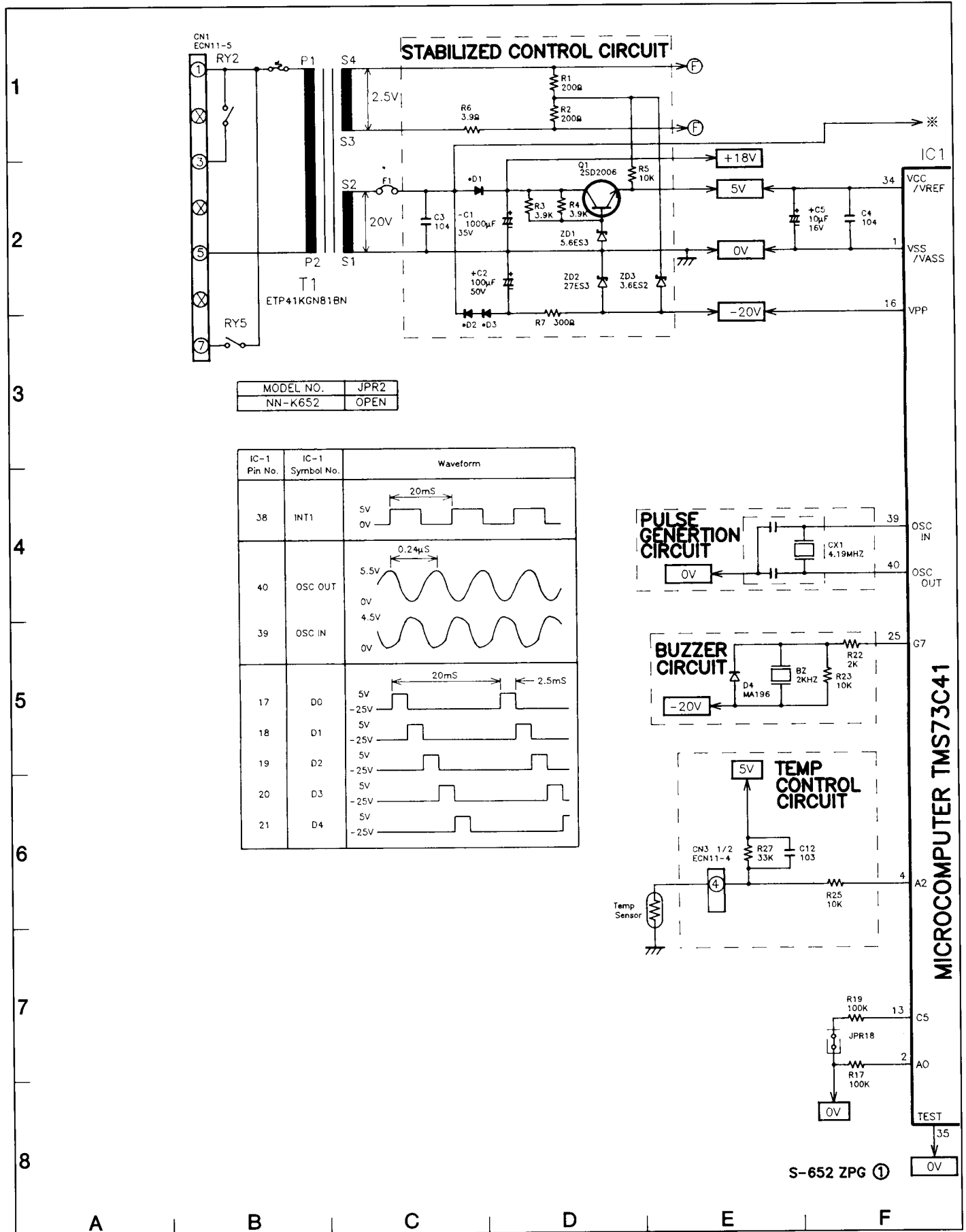
Ref. No.	Part No.	Part Name & Description	Pcs/ Set	Remarks
W1	A030A6520GP	LEAD WIRE HARNESS	1	
W2	A03536520GP	LEAD WIRE	1	

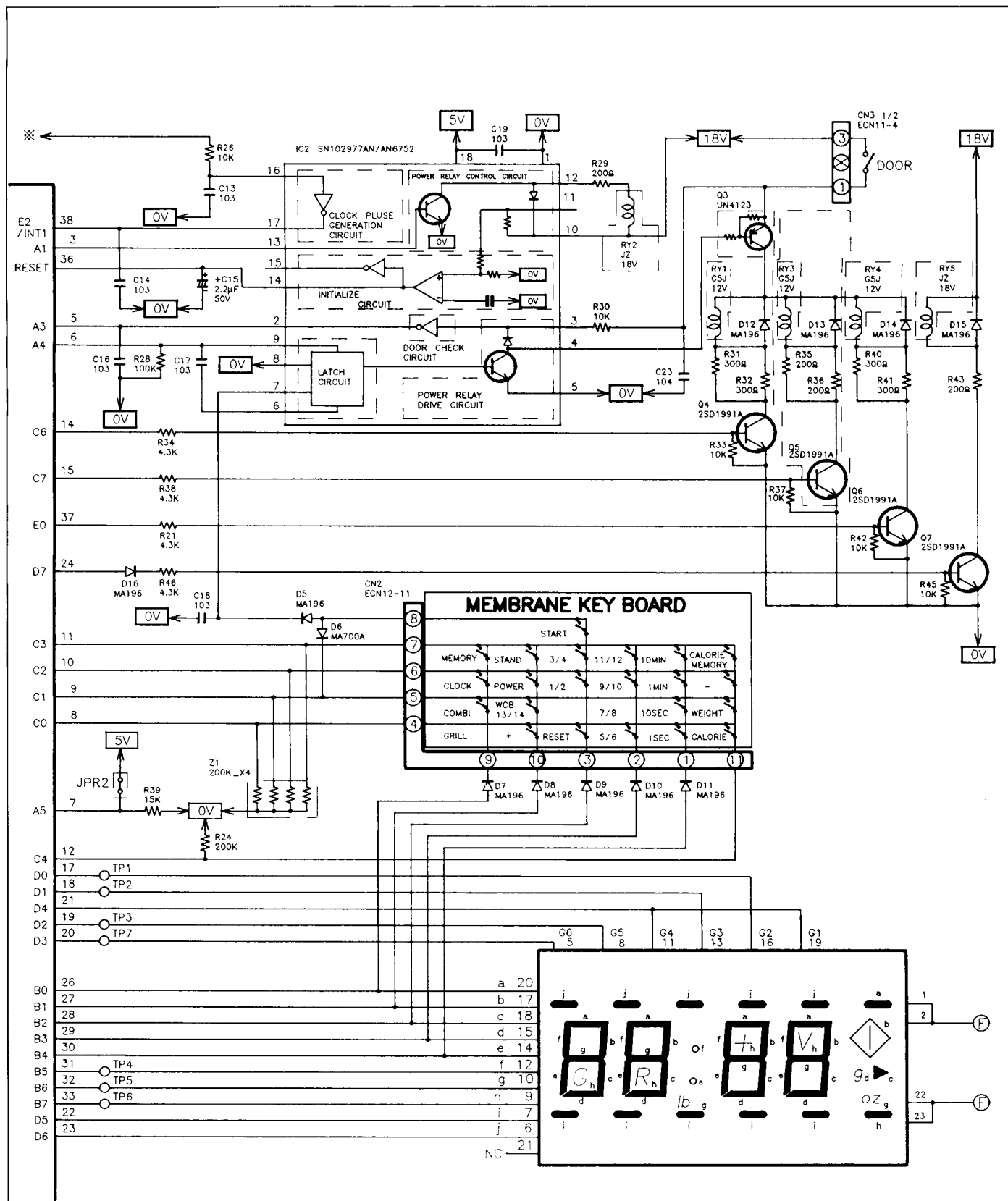
Ref. No.	Part No.	Part Name & Description	Pcs/ Set	Remarks
<b>REF NO. 1 NOISE FILTER (U)</b>				
C1	ECQU2A104MN	POLYESTER CAPACITOR	2	0.1 $\mu$ F, 250V, +20%
C2,3	△ ECKDNS472MEX	CERAMIC CAPACITOR	4	0.0047 $\mu$ F, 250V, +20%
CN1	AEEMMA00703W	CONNECTOR	2	3PIN
F1	A62316010BP	FUSE HOLDER	2	
F2	A62316000GP	FUSE HOLDER	2	
L1	A621A5540GP	FILTER COIL	1	
R1	ERF10ZXJ240Z	RESISTOR	2	24 $\Omega$ , 10W, $\pm$ 5%
R2	ERD25FJ564S	CARBON FILM RESISTOR	2	560K $\Omega$ , 1/4W, $\pm$ 5%
ZNR1	ERZC10DK621F	VARISTOR	2	

<b>PARTS LIST FOR MICROWAVE OVEN TRIM KITS</b>						
<p>Exploded View</p>	Trim kit Model No.	Top and Bottom Strip Ref No:1.2	Pcs/ Set	Side Strip Ref No:3.4	Pcs/ Set	Microwave Oven Model No.
	NN-TK752	A1603A290HGP	2	A1601A290HGP	2	
<p><b>NOTE:</b> The top and bottom strips have the same part number and the left and right side strips also have the same part number. These parts will be supplied on one piece per one part number.</p>						

# DIGITAL PROGRAMMER CIRCUIT

## SCHEMATIC DIAGRAM





S-652 ZPG ②



# DIGITAL PROGRAMMER CIRCUIT

## PARTS LIST

Ref. No.	Part No.	Description	Pcs/Set	Remarks	Ref. No.	Part No.	Description	Pcs/Set	Remarks
BZ	AEFB22EP2002	BUZZER	1	2.0KHZ	RY1,3,4	△ AEG5J1EM12B	POWER RELAY	3	(12V)
C1	ECEA1VU102E	ELECTROLYTIC CAPACITOR,AL	1	1000 μ F/35V/20%	RY2,5	△ AEAJZDC18A	POWER RELAY	2	(18V)
C2	ECEA1HU101B	ELECTROLYTIC CAPACITOR,AL	1	100 μ F/50V/20%	SPACER	A82845570AP	SPACER CUSHION	1	FOR DISP
C3,4,23	AECF50F104Z	CERAMIC CAPACITOR	3	0.1 μ F/50V/ -20%+80%	T1	△ A62495860BP	L.V.TRANSFORMER	1	41KGN81BN
C5	ECEA1CKA100B	ELECTROLYTIC CAPACITOR,AL	1	10 μ F/16V/20%	Z1	AEXBM4X204JT	COMPOUND-RESISTOR	1	200KΩX4
C12,13,14, 18,19	ECBT1E103ZF5	CERAMIC CAPACITOR	7	0.01 μ F/25V/ -20%+80%	ZD1	AEDZ5R6ES3T1	ZENER DIODE,SI	1	
C15	ECEA1HKA2R2B	ELECTROLYTIC CAPACITOR,AL	1	2.2 μ F/50V/20%	ZD2	AEDZ27ES3T1	ZENER DIODE,SI	1	
CN1	AEEMMA05507W	CONNECTOR	1	7PIN	ZD3	AEDZ3R6ES2T1	ZENER DIODE,SI	1	
CN2	AEEM11FDZBTM	CONNECTOR	1	11PIN					
CN3	AEEMMC00D04W	CONNECTOR	1	4PIN					
CX1	AEFFT4R19GWT	CERAMIC RESONATOR	1	4.19MHZ					
D1,2,3	AEDNERA1502	DIODE,SI	3	(0.1A)					
D4,5,7,8,9, 10,11,12,13, 14,15,16	MA196	DIODE,SI	12	(0.1A)					
D6	MA700A	DIODE,SI	1	(0.03A)					
DISP	A64566520GP	FLUORESCENT TUBE	1						
IC1	AEICC4177036	L.S.I	1						
IC2	AN6752	IC	1						
Q1	2SD2006QRTA	TRANSISTOR,SI,1.2W	1	(120MHZ)					
Q3	UN4123	TRANSISTOR,SI,300MW	1						
Q4,5,6,7	2SD1991AQSTA	TRANSISTOR,SI,400MW	4	(150MHZ)					
R1,2,29,35, 36,43	ERDS2TJ201T	CARBON FILM RESISTOR	6	200Ω,1/4W ±5%					
R3,4	ERDS2TJ392T	CARBON FILM RESISTOR	2	3.9KΩ,1/4W ±5%					
R5,23,25,26, 30,33,37,42, 45	ERDS2TJ103T	CARBON FILM RESISTOR	9	10KΩ,1/4W ±5%					
R6	ERDS2TJ3R9T	CARBON FILM RESISTOR	1	3.9Ω,1/4W ±5%					
R7,31,32,40, 41	ERDS2TJ301T	CARBON FILM RESISTOR	5	300Ω,1/4W ±5%					
R17,19,28	ERDS2TJ104T	CARBON FILM RESISTOR	3	100KΩ,1/4W ±5%					
R21,34,38,46	ERDS2TJ432T	CARBON FILM RESISTOR	4	4.3KΩ,1/4W ±5%					
R22	ERDS2TJ202T	CARBON FILM RESISTOR	1	2KΩ,1/4W ±5%					
R24	ERDS2TJ204T	CARBON FILM RESISTOR	1	200KΩ,1/4W ±5%					
R27	ERDS2TJ333T	CARBON FILM RESISTOR	1	33KΩ,1/4W ±5%					
R39	ERDS2TJ153T	CARBON FILM RESISTOR	1	15KΩ,1/4W ±5%					

## SERVICE FIXTURES AND TOOLS

### EXTENSION CABLES

NOTE: To be used when repairing the DPC board assembly directly on the oven for easy access of the board.

Ref. No.	Part No.	Description	Pcs/Set	Remarks
	AT40M004	4 pin Extension Cable	1	Cable No.16
	AT40E006	1 pinX6 Extension Cable	1	Cable No.9
	AT40M007	7 pin Extension Cable	1	Cable No.37

### DPC COMMON CHECKER AND ITS CABLE

NOTE: To be used only when DPC common checker is available.

Ref. No.	Part No.	Description	Pcs/Set	Remarks
	ANE600ZK70GP	DPC. Common Checker	1	
	AT30A6520GP	DPC. Checker Cable	1	NOTE