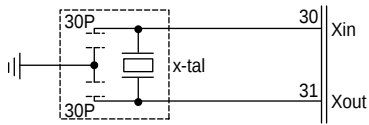


2. Oscillator

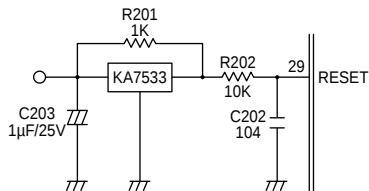


Port	Oscillating Fr eQUENCY
Xin	4.00MHz
Xout	4.00MHz

±0.5% Error

It is designed for clock generation and time calculation for synchronizing transmission and reception on the logic elements inside the MICOM. If the X-TAL specification changes, MICOM may make an error. The standard components should be used.

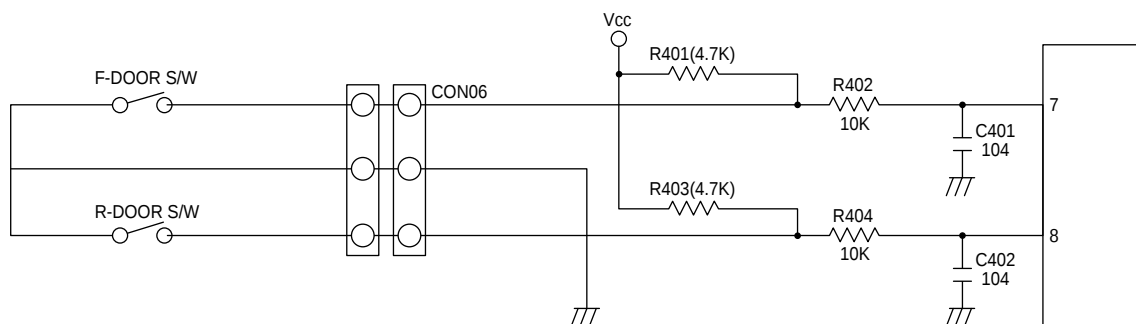
3. Reset Circuit



Port	Voltage
Xin	5V
Xout	5V

When power is supplied to MICOM, reset circuit initializes RAM and other parts on MICOM to initialize all programs. Reset voltage maintains “low” for hundreds of µsec comparing to MICOM Vcc voltage when power is input. It also maintains “high”(5V) during normal operation. But, when Vcc drops to 3.3V, reset port becomes “low”.

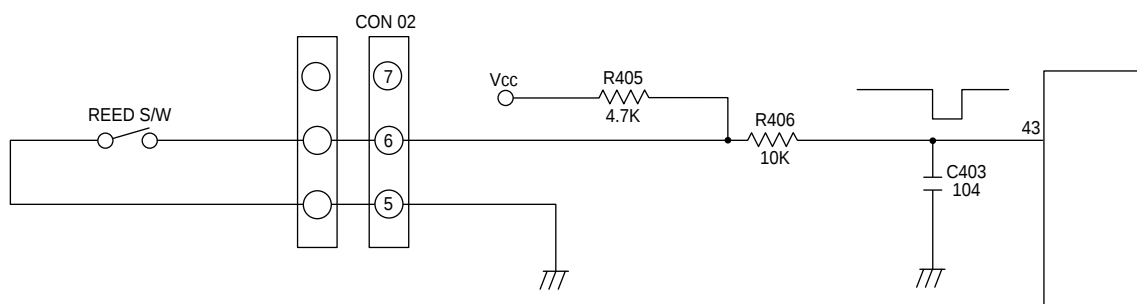
4. Door S/W Detector



DOOR	Door Conditions	Door S/W Contact	MICOM PIN NO	Micom Input Voltage
F	CLOSE	OPEN	# 7	“LOW”
	OPEN	CLOSE		“HIGH”
R	CLOSE	OPEN	# 8	“LOW”
	OPEN	CLOSE		“HIGH”

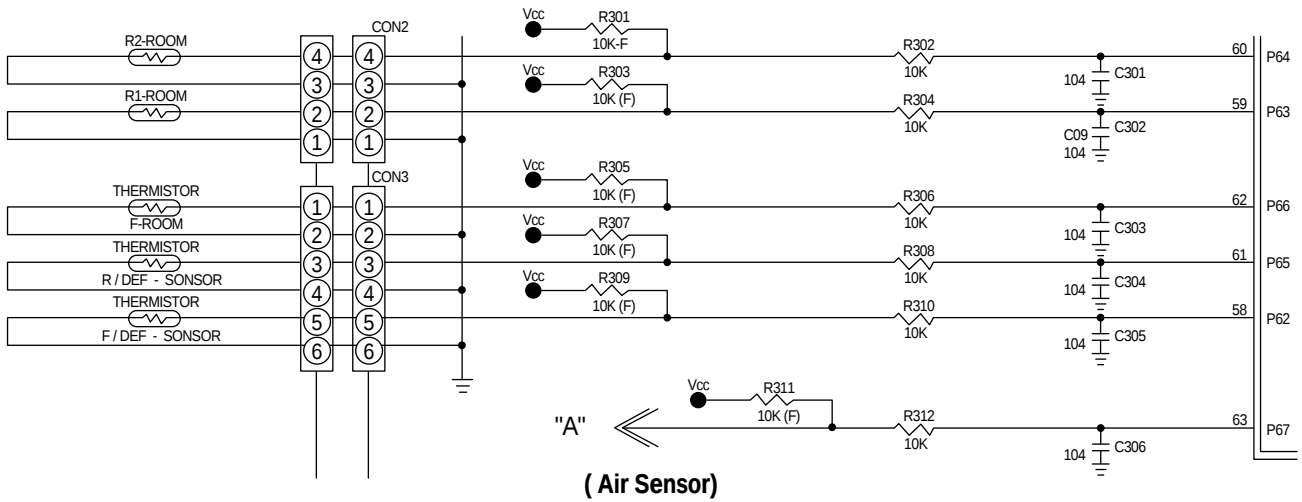
- 1) If door is open, door S/W contact is closed. Then MICOM receives “low” signal and detects door open.
- 2) If door is closed, door S/W contact is open. Then MICOM receives “high” signal and detects door close.

5. “V” Motor Position Detector(Reed S/W)



- 1) The position of “V” motor for controlling the G.A–fuzzy of the temperature in the refrigeration room is detected by the reed switch.
- 2) When MICOM Pin 43 changes ‘high’ to ‘low’ by the operation of fan, MICOM detects the position of “V” motor.

6. Temperature Sensor



When Sensor is open	When sensor is cut off
MICOM input “HIGH”	MICOM input “LOW”

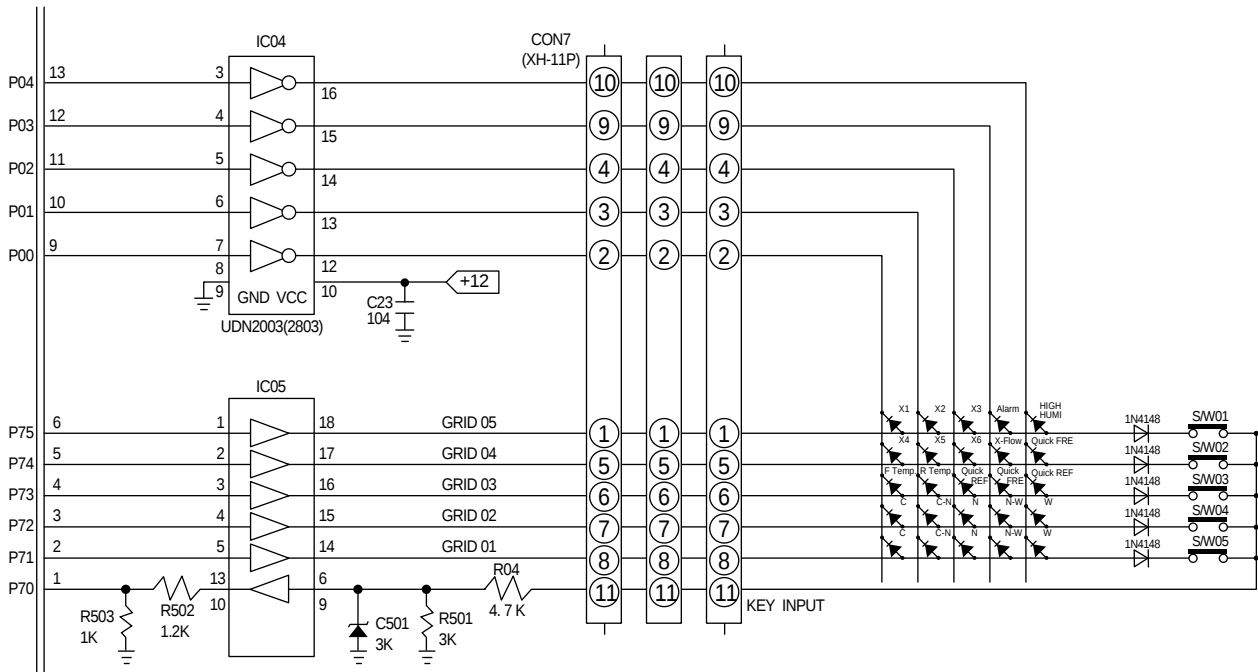
1) The sensor uses the characteristics of thermistor. If temperature goes higher, resistance goes lower. On the contrary, if temperature goes lower, resistance goes higher.

2) MICOM input voltage is counted by sensor as follows.

$$V_F = \frac{R_{TH}}{R_{TH} + R_{24}} \times V_{CC} \quad (V_{CC} : 5V, R_{TH} : \text{Sensor resistance})$$

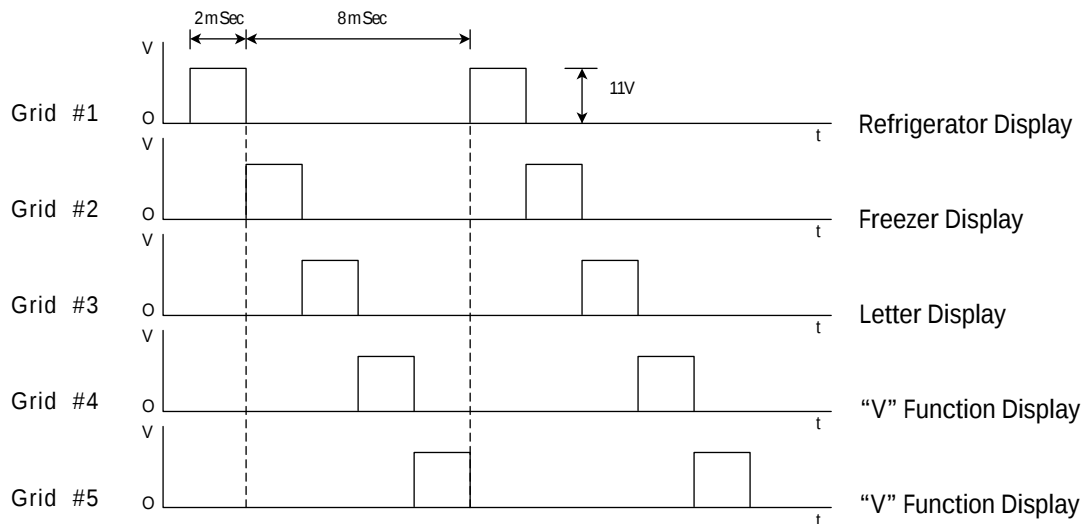
3) For the resistance information on temperature and MICOM input voltage, please refer the conversion table. (Page. 41)

7. Key scan and display circuitry



1) Key scan and display operation

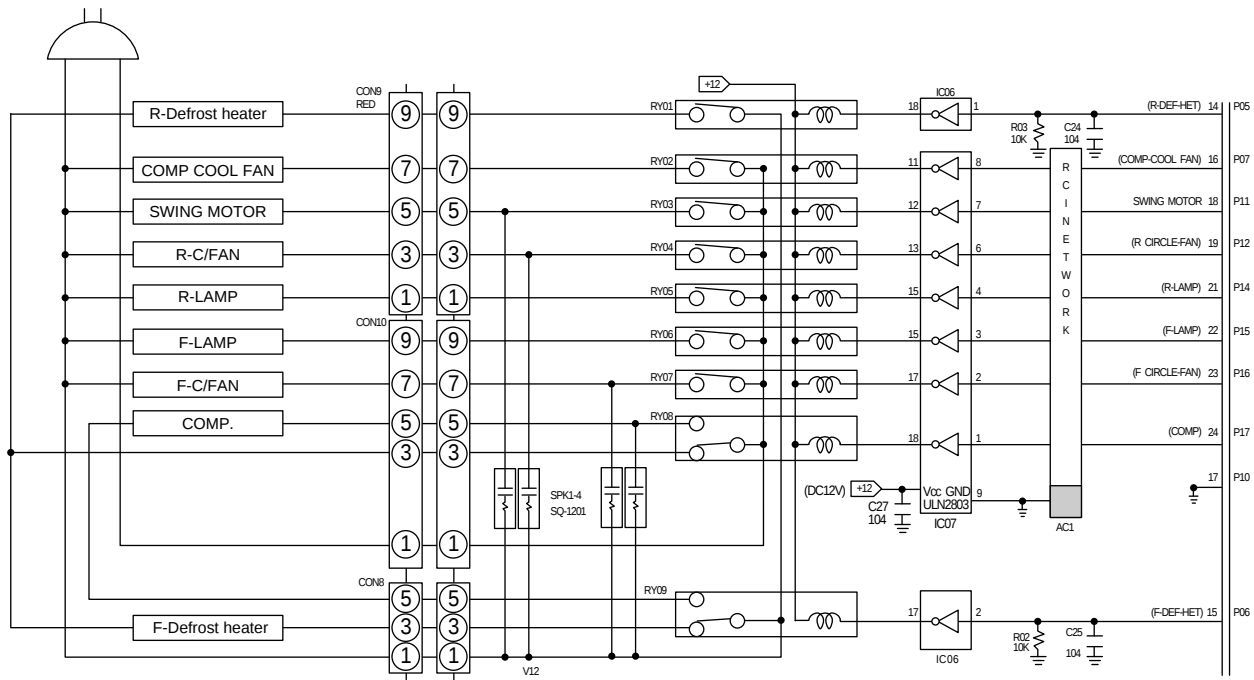
As shown in the following waveform, MICOM pins #2 ~ #6 output are high for 2msec per 10msec. MICOM pin #2 $\bar{A}$ #3 $\bar{A}$ #4 $\bar{A}$ #5 $\bar{A}$ #6 output repeats. The signal is output through IC05(UDN 2981A). At that time, the peak to peak voltage of square signal registers around 11V. The grid #1 ~#5 waveforms are as follows.



2) Key Scan

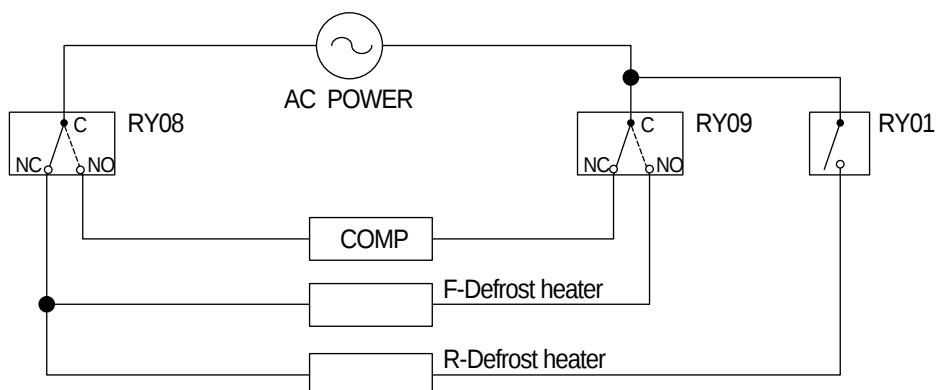
The grid waveform of each output is supplied to each button line through switching diode (IN4148). The grid #1 signal goes to the setting button of refrigerator. Then, refrigerator button is pressed, around 4.5V goes to IC05(UAN2981A) pin 8 through key input line. MICOM detects the refrigerator button pressed after MICOM pin1 receives the signal.

8. Load Operation



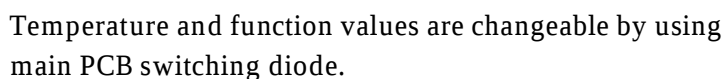
If MICOM outputs “high” signal to driver-IC(ULN 2803) according to each load operation conditions, IC turns on and DC 12V flows to ground through the relevant relay coil. Then, core is magnetized by the coil current, and relay contact switches on. When relay contact is on, AC POWER is supplied to the relevant operation load, then which will be activated. If MICOM outputs “low” signal, load operation stops with the relevant relay contact off.

1) Compressor and Defrost Heater



As above block diagram, the commons of compressor relay(RY 08) and defrost heater relay(RY 09, RY 01) are respectively connected to AC POWER line. If relay is not activated(OFF) contact maintains NC, and compressor and defrost heater are all off, activated and contact is switched on. Then, AC POWER is supplied to compressor activated. On the contrary, if defrost heater relay operates, defrost heater is activated. Compressor and defrost heater do not operate simultaneously under any conditions of relay.

RELAY		Load	Remark
COMP	Defrost H		
on	off	Comp Operation	Defrost-Heater Power Off
on	on	Comp off, Defrost-Heater Off	
off	on	Defrost-Heater On	Comp Power Off
off	off	Comp Off, Defrost-Heater Off	



- (Only initial power-on allows reading option function)

1) Power circuit

PCB sub ass'y (Inverter PCB) is activated with AC POWER input when the refrigerator door is open and R-lamp relay(RY05) is activated. If the AC POWER is supplied to the power block, the smooth capacitor(C3) gets around VOLTAGE DC(VOLTAGE AC X 2) AC POWER through rectification.

2) Lamp

If power is supplied to the PCB sub ass'y, diac(DB4) is activated. When C4 is over 35C / DC, voltage is supplied to TR Q2 base by the continuity of diac. Then, TR Q2 is activated.

When TR Q2 is activated, current flows to C5 – C6 – CH1 – PT1 – R9. At that time, current flows to PT2 and PT3.

If the discharge of capacitor C6 is completed, reverse current flows to PT2 and PT3 and TR Q2 turns off TR Q3 turns on. The current flows to PT1 – CH1 – C6 – C5 – C8.

Lamp light up by the repetition of TR Q2, Q3 on / off. Its frequency range is 30~40KHz during on / off.

3) PTC and PTC protector

PTC is designed to smooth the lighting and to lengthen lamp's life by heating filament of lamp. The PTC protector prevents damage from PTC by cutting off power through triac if filament emits high voltage at the beginning of lighting.

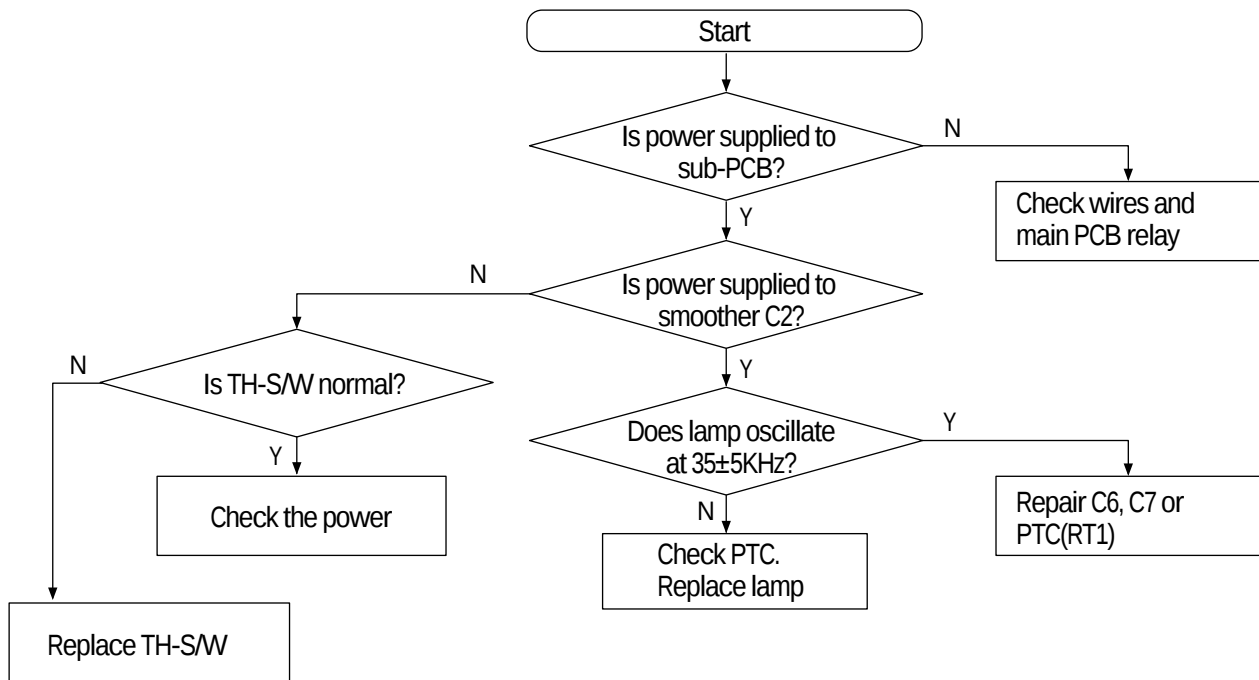
To check the PTC, measure resistance ($150W \pm 25\%$ is normal). But, PTC resistance can be changed by the ambient temperature and PTC operation. The above resistance value is counted in 20 sec after lamp is off with the temperature 25°C.

4) Troubleshooting

Precautions

1. Is the power cord well connected to wall outlet?
2. Be careful of high-voltage discharge because high voltage DC power is supplied to SUB-PCB.

① When the light doesn't come on in the refrigerator



- * PTC should be inspected before replacing lamp.
- * Be careful of high voltage discharge, when repairing unit.