M300 Inverter Power Supply Circuit & Troubleshooting

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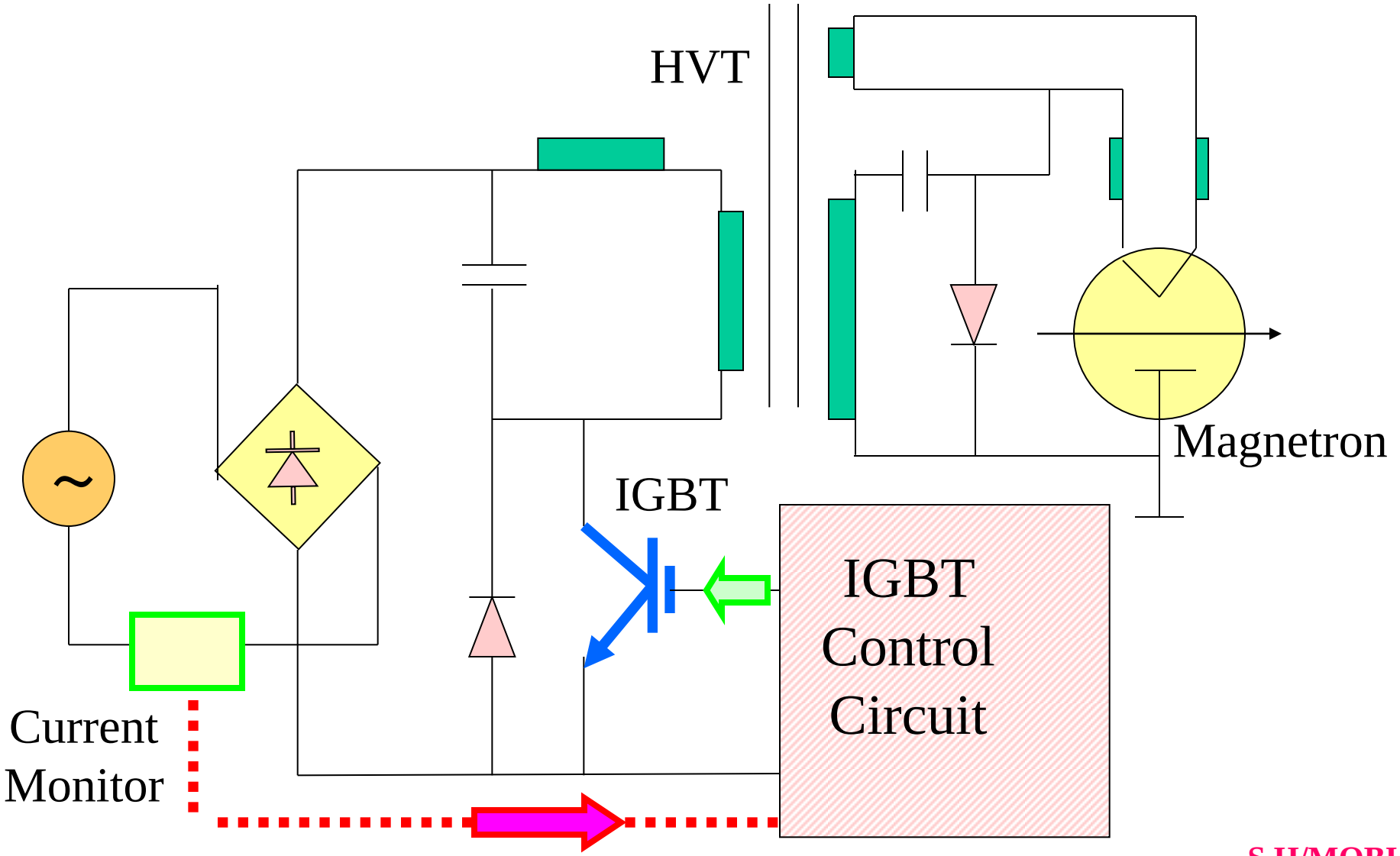
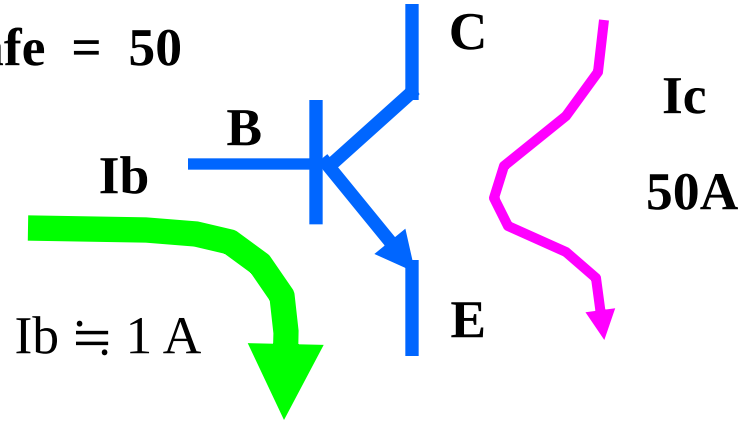
Basic Inverter Circuit



Why IGBT Employed?

Bipolar Transistor

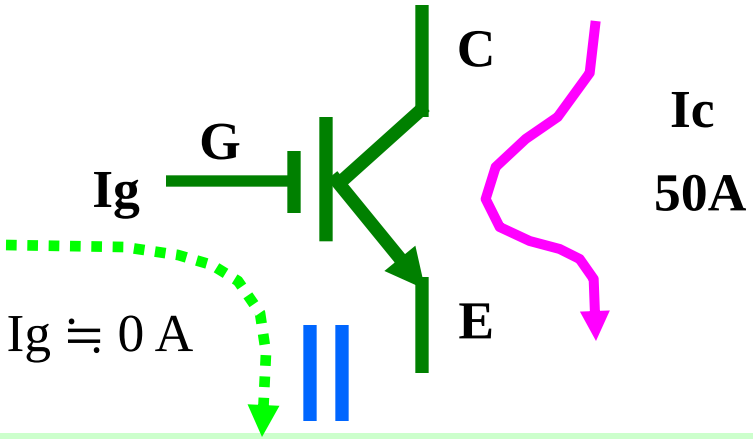
ex:hfe = 50



Big drive power required

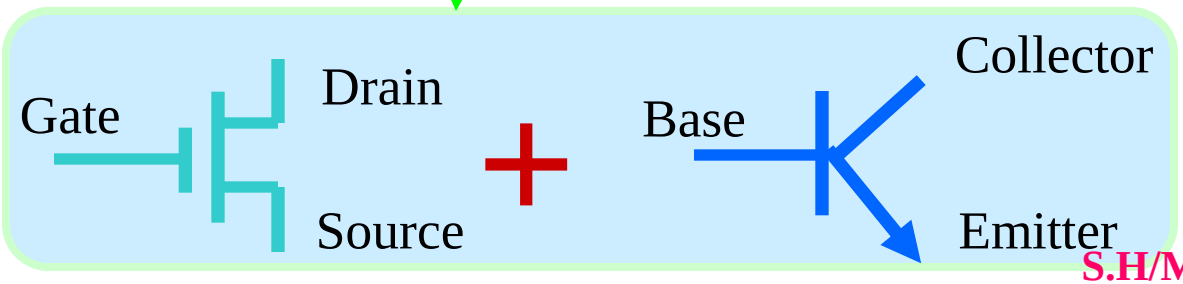
20 V x 1 A = 20 W

Isolated Gate Bipolar Transistor IGBT



No need of drive power
just need voltage drive only

20 V x 0 A = 0 W



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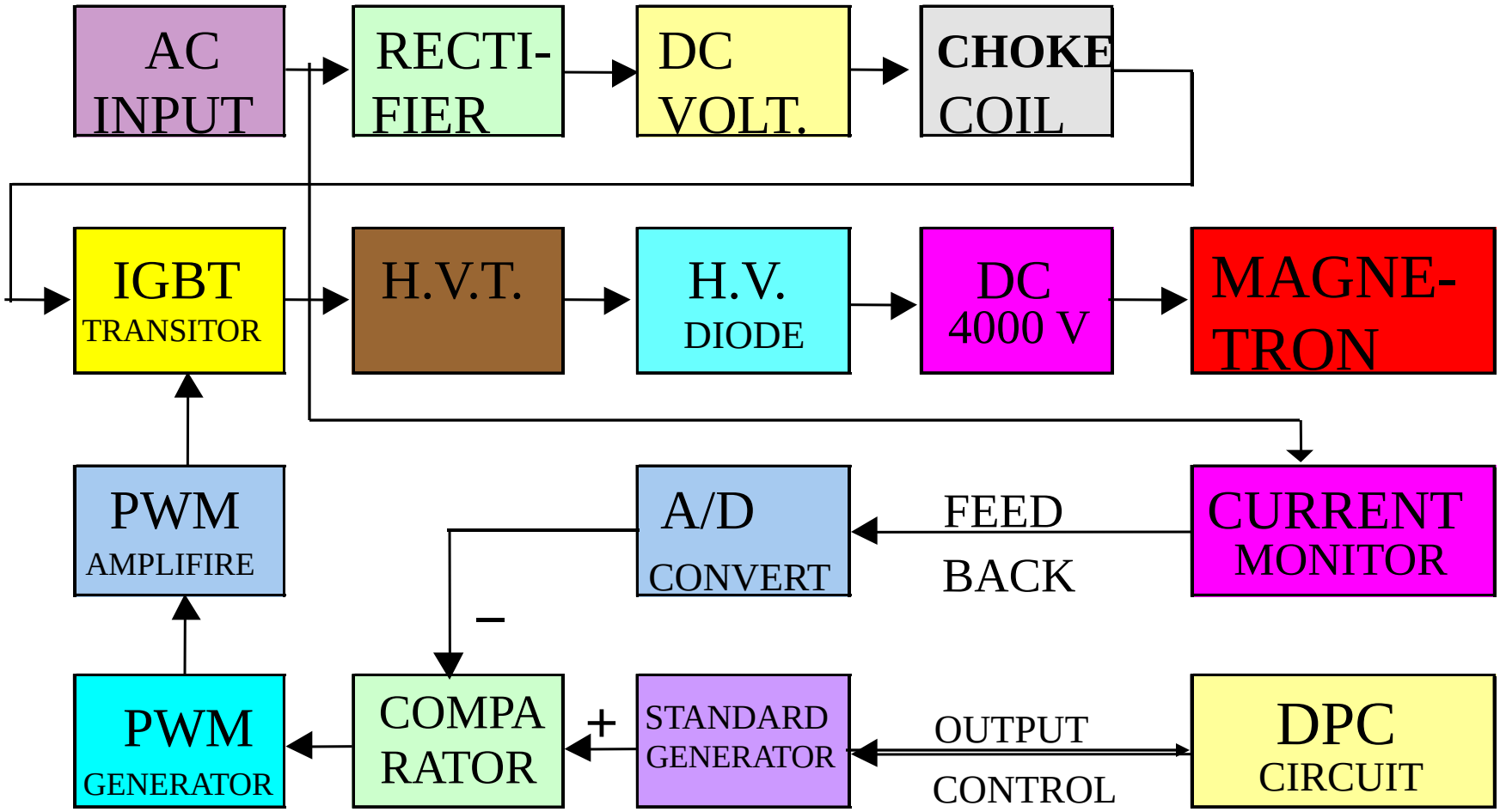
Block Diagram of Inverter Circuit



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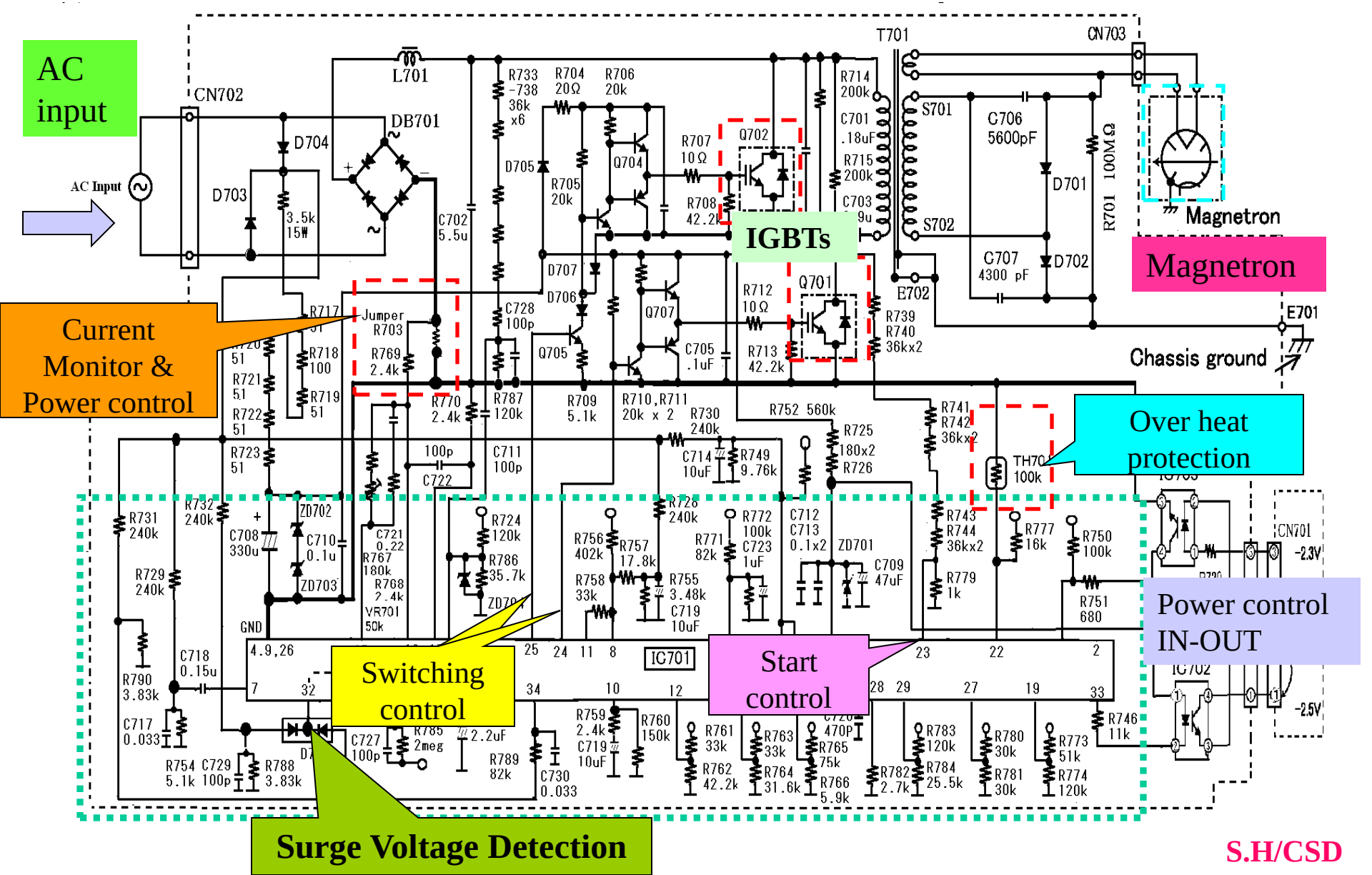
Inverter PCB Schematic Diagram



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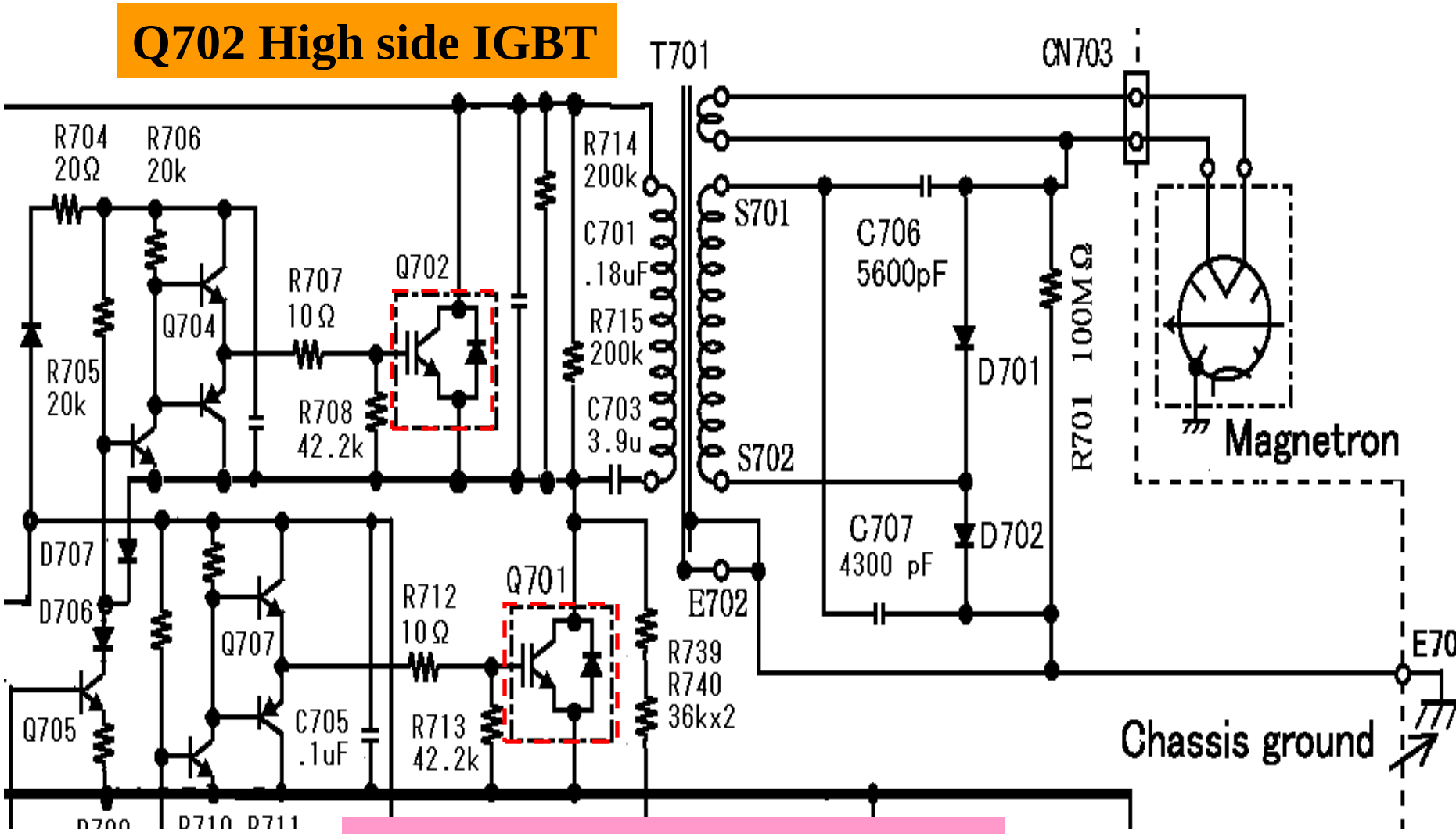
Schematic Diagram/Inverter IGBT area



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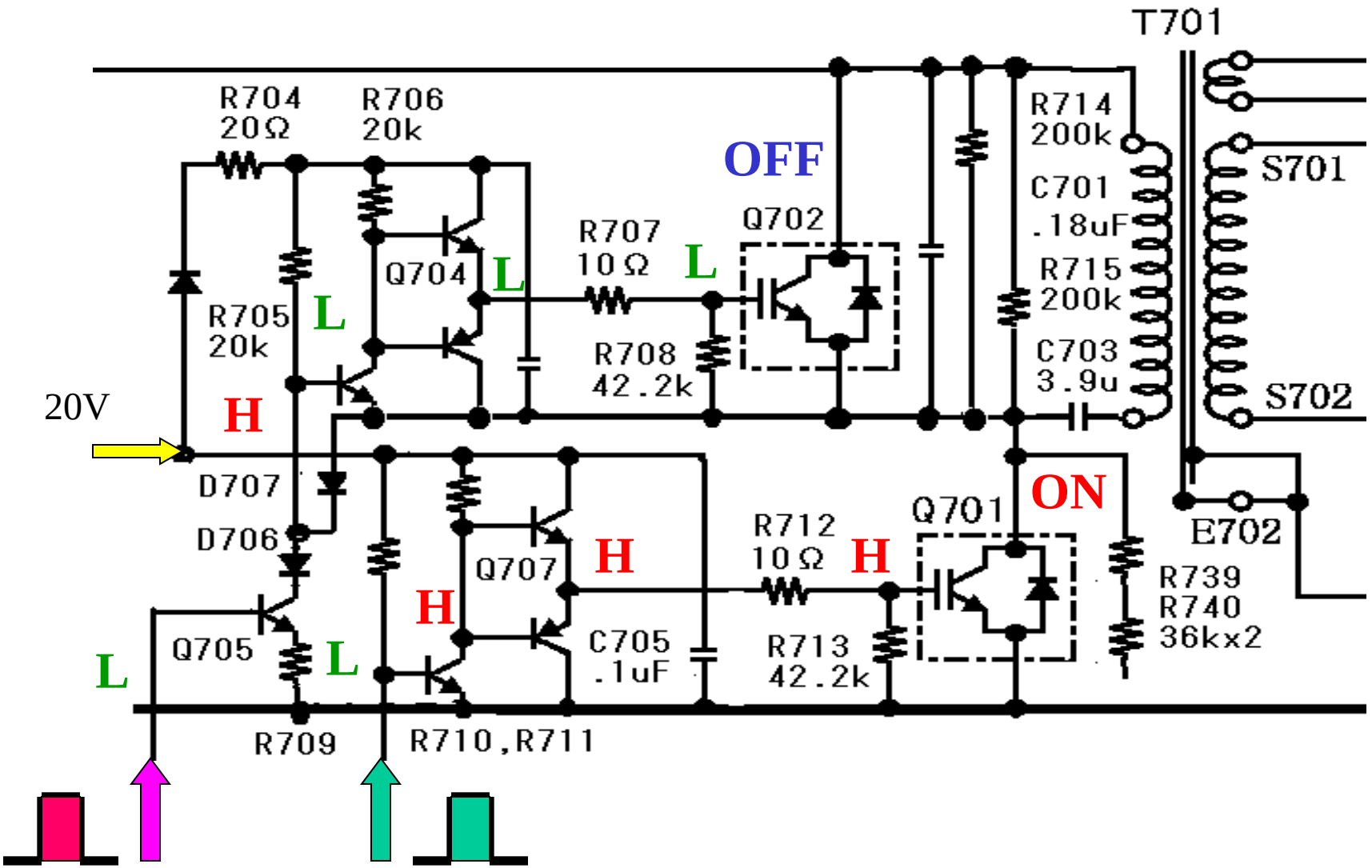
IGBT Switching Circuit



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Power Control Circuit and It's Operation

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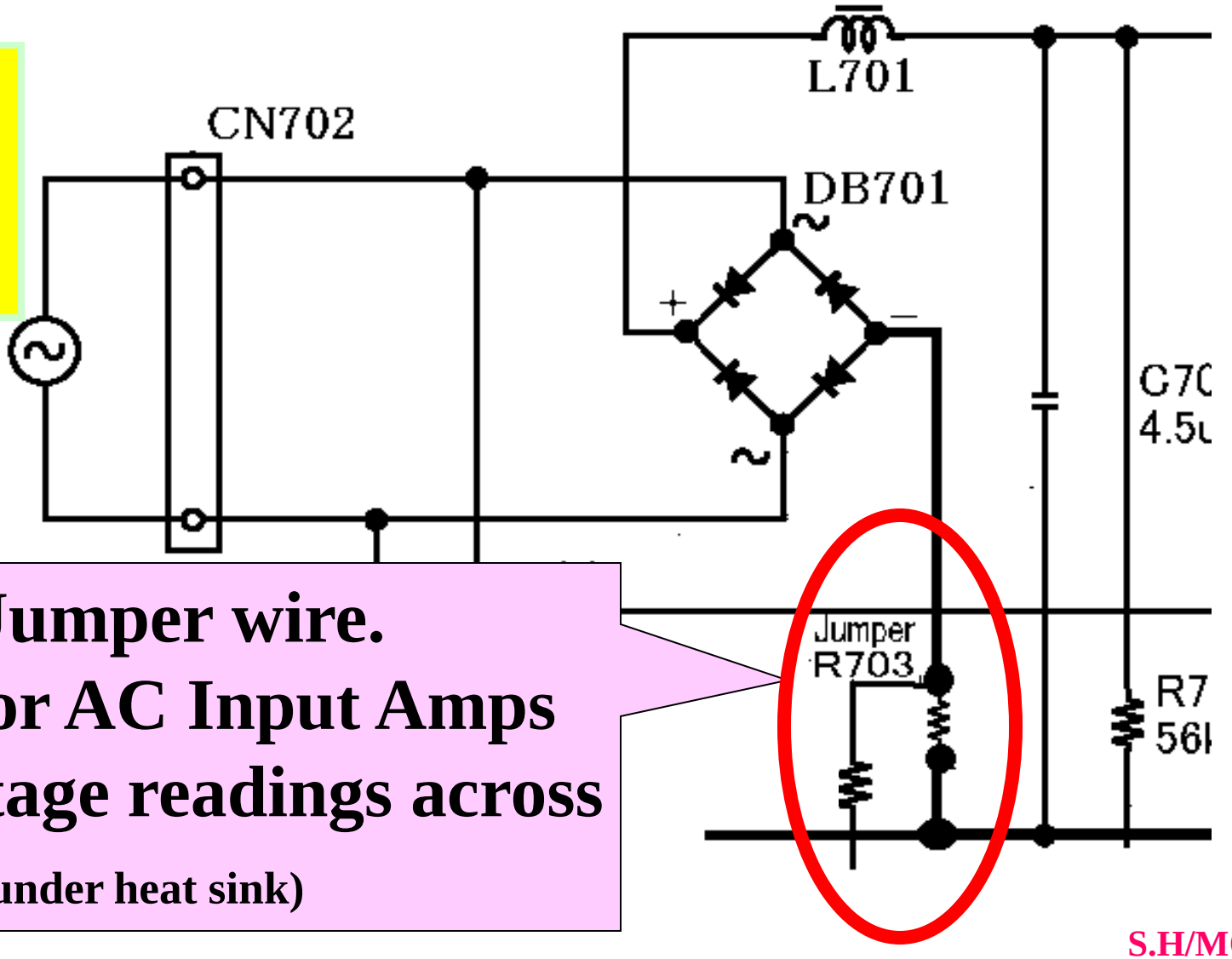
New Current Monitor Circuit

AC
230/240V
input



R703 Jumper wire.
Monitor AC Input Amps by voltage readings across R703.(under heat sink)

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Current Monitor Circuit

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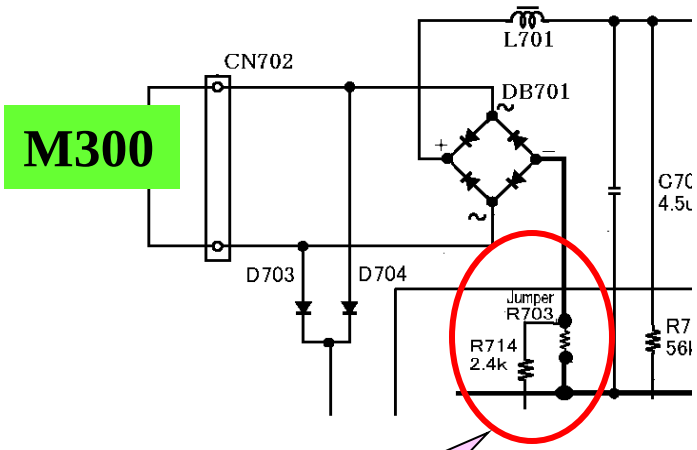
Current Monitor Circuit



R703 to monitor
AC Input Amps

R703 Jumper
Resistance Wire

Approx. 10 mΩ

75 mV

7.5A

AC
input

Voltage generates between Jumper(resistance) wire to be read and understand as Amperes flow

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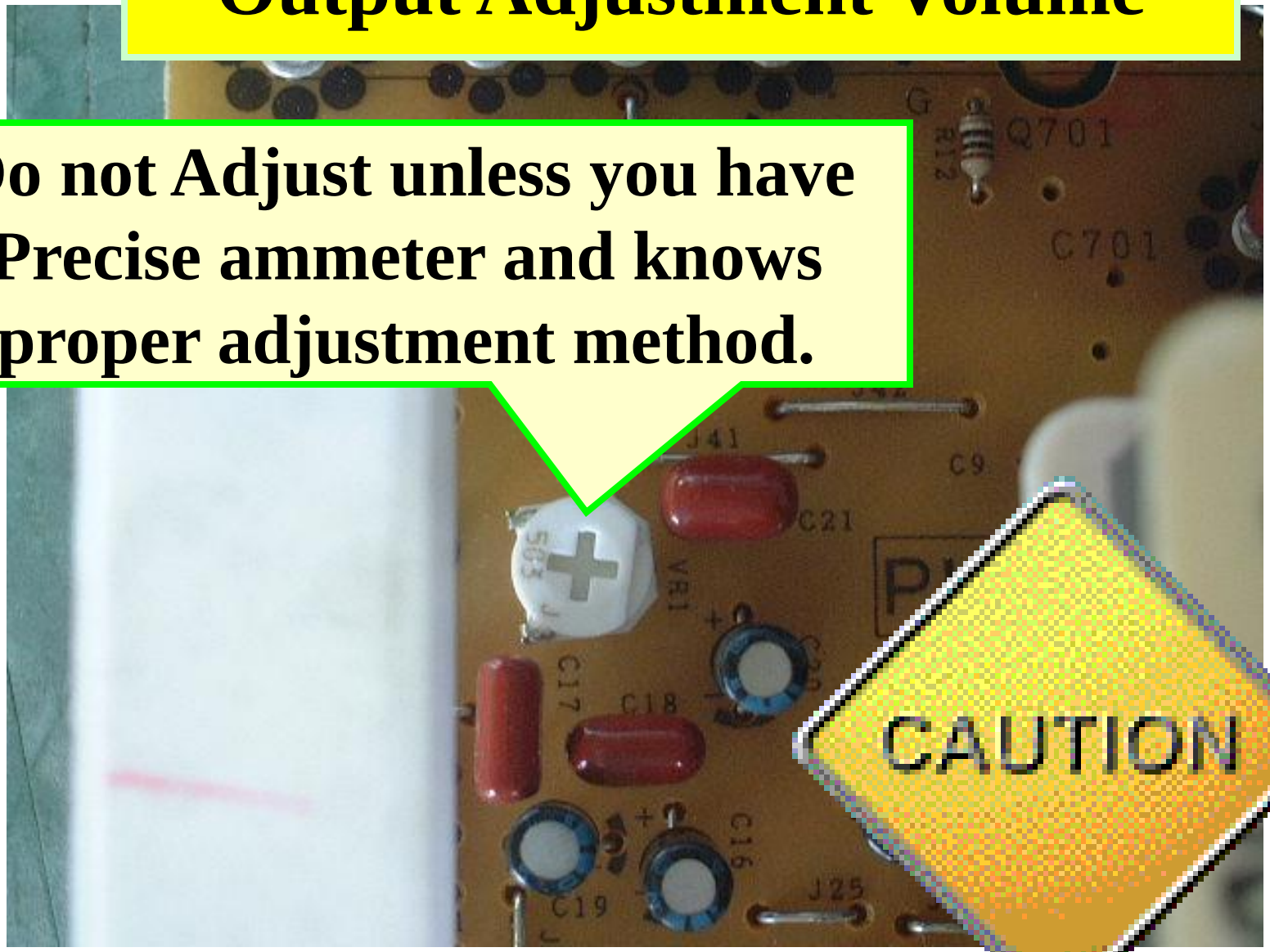
Output Adjustment Volume

Do not Adjust unless you have Precise ammeter and knows proper adjustment method.



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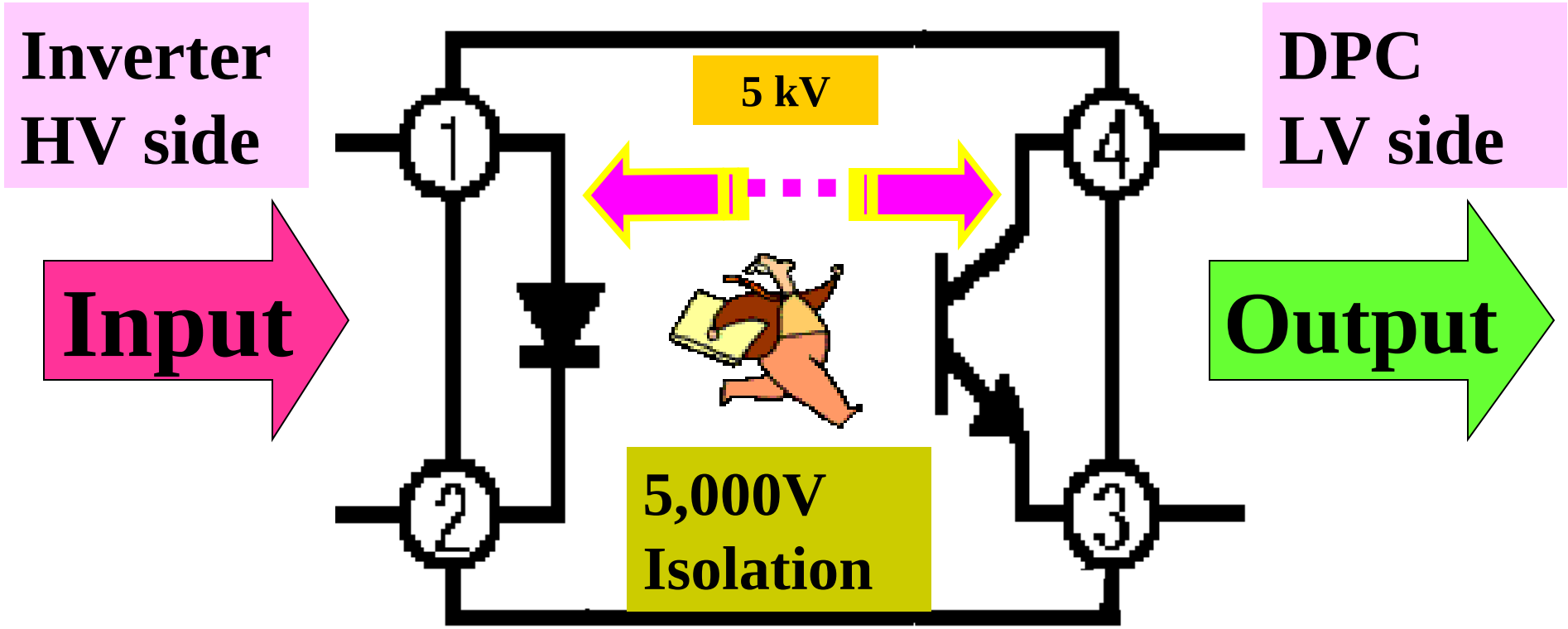
HV Isolation Photo-Coupler IC



To isolate 5 kV between High voltage Inverter section and Low voltage DPC section

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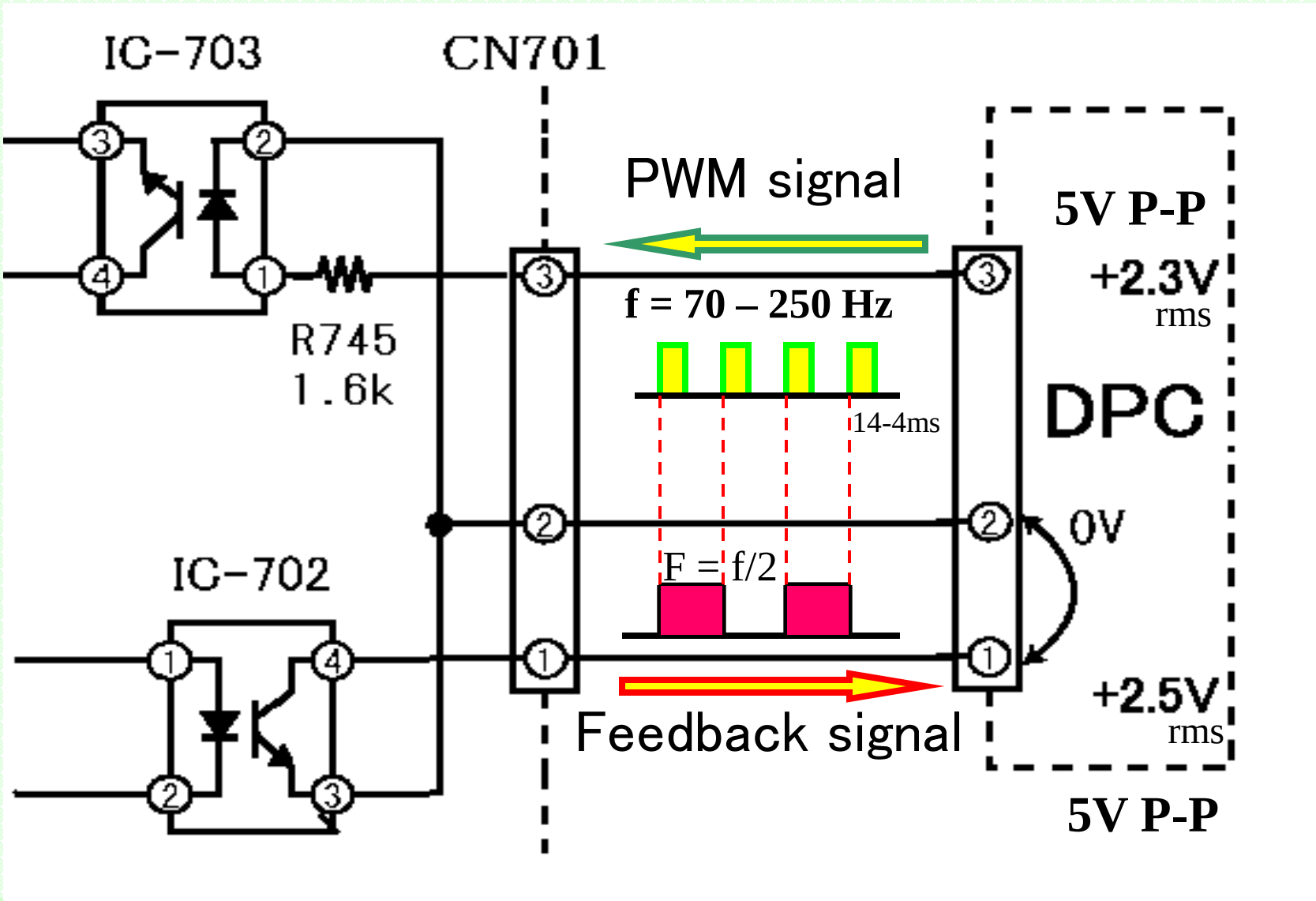
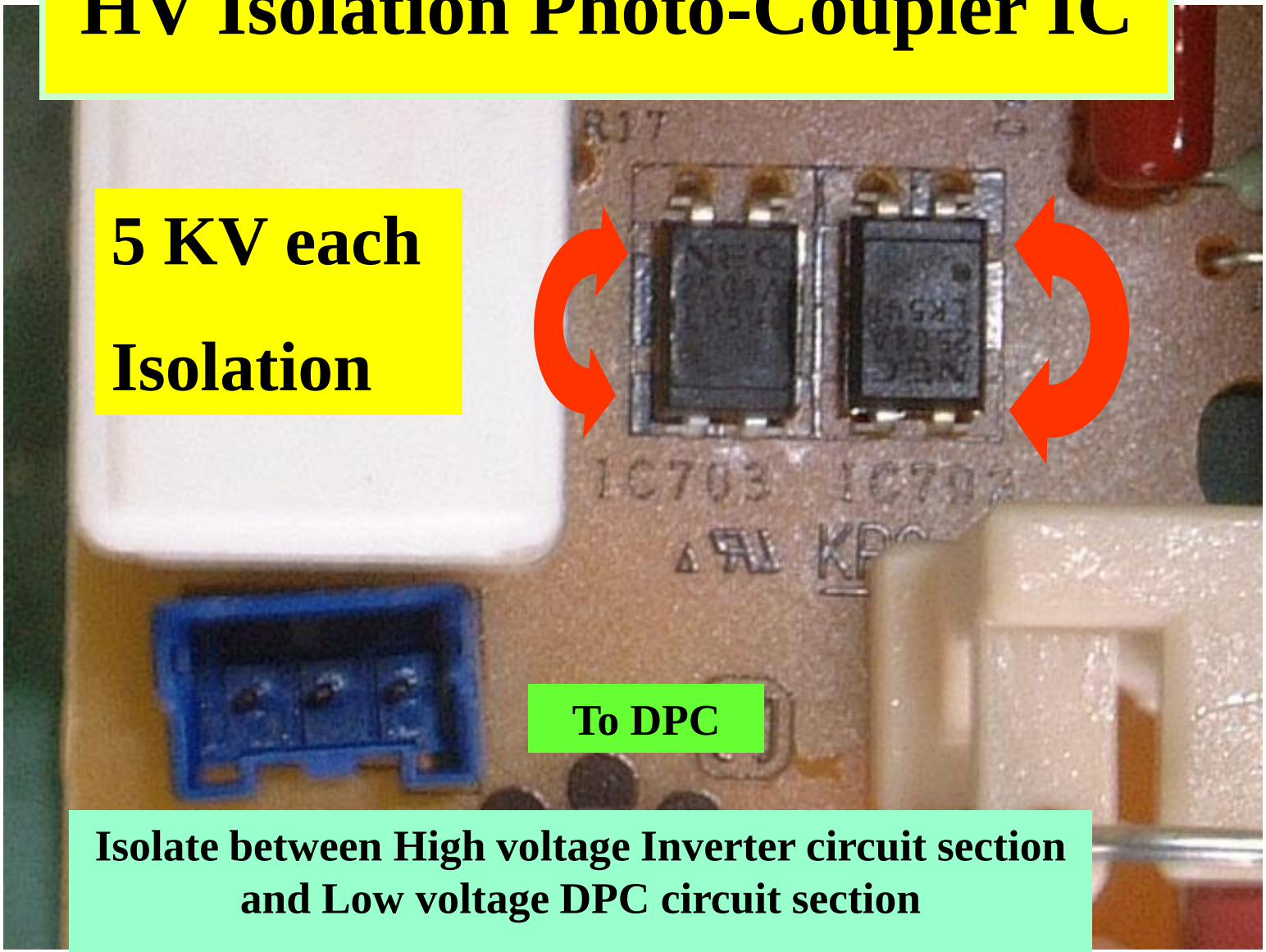
DPC and Inverter Control Circuit



HV Isolation Photo-Coupler IC



Isolate between High voltage Inverter circuit section and Low voltage DPC circuit section

DPC is Isolated from High Voltage

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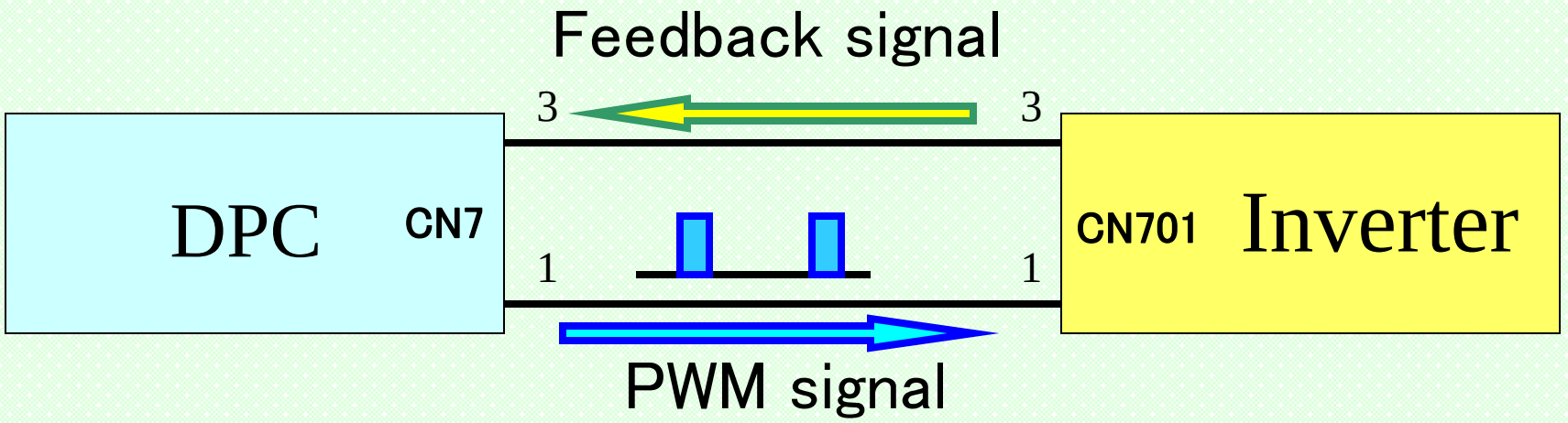
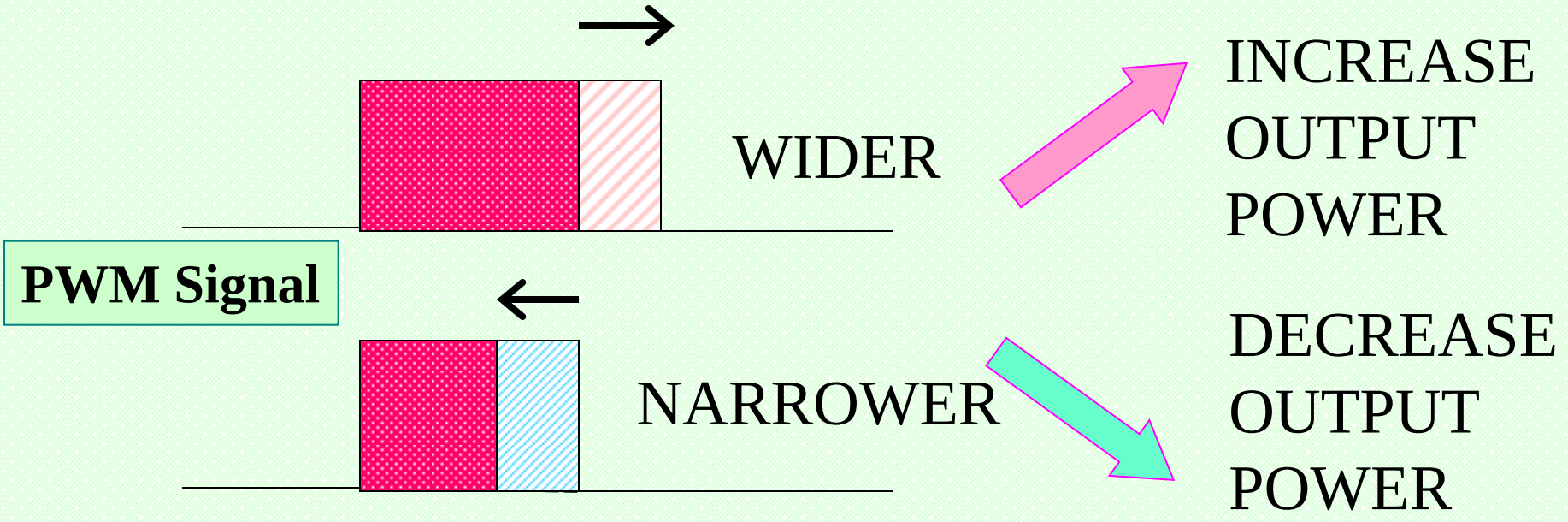
Signal flow between DPC and Inverter





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Inverter Circuit Troubleshooting

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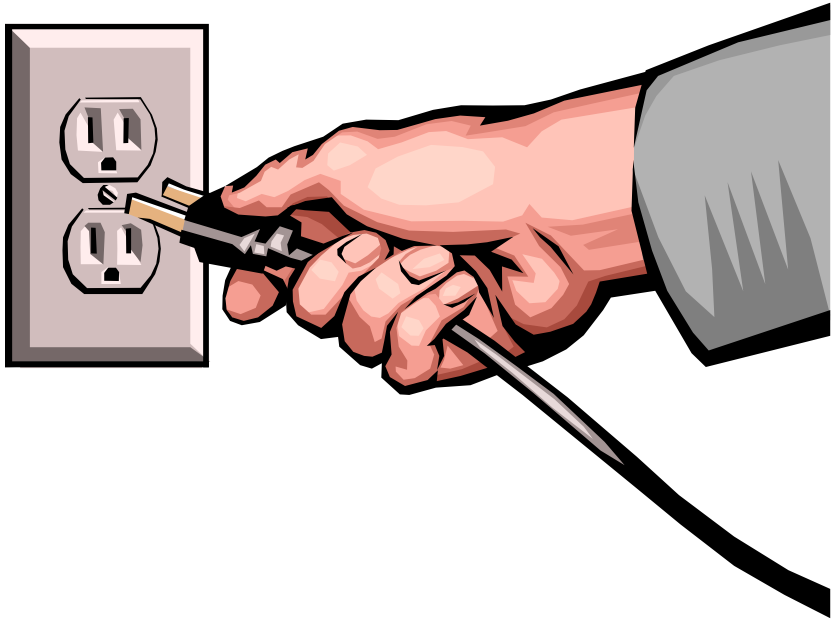
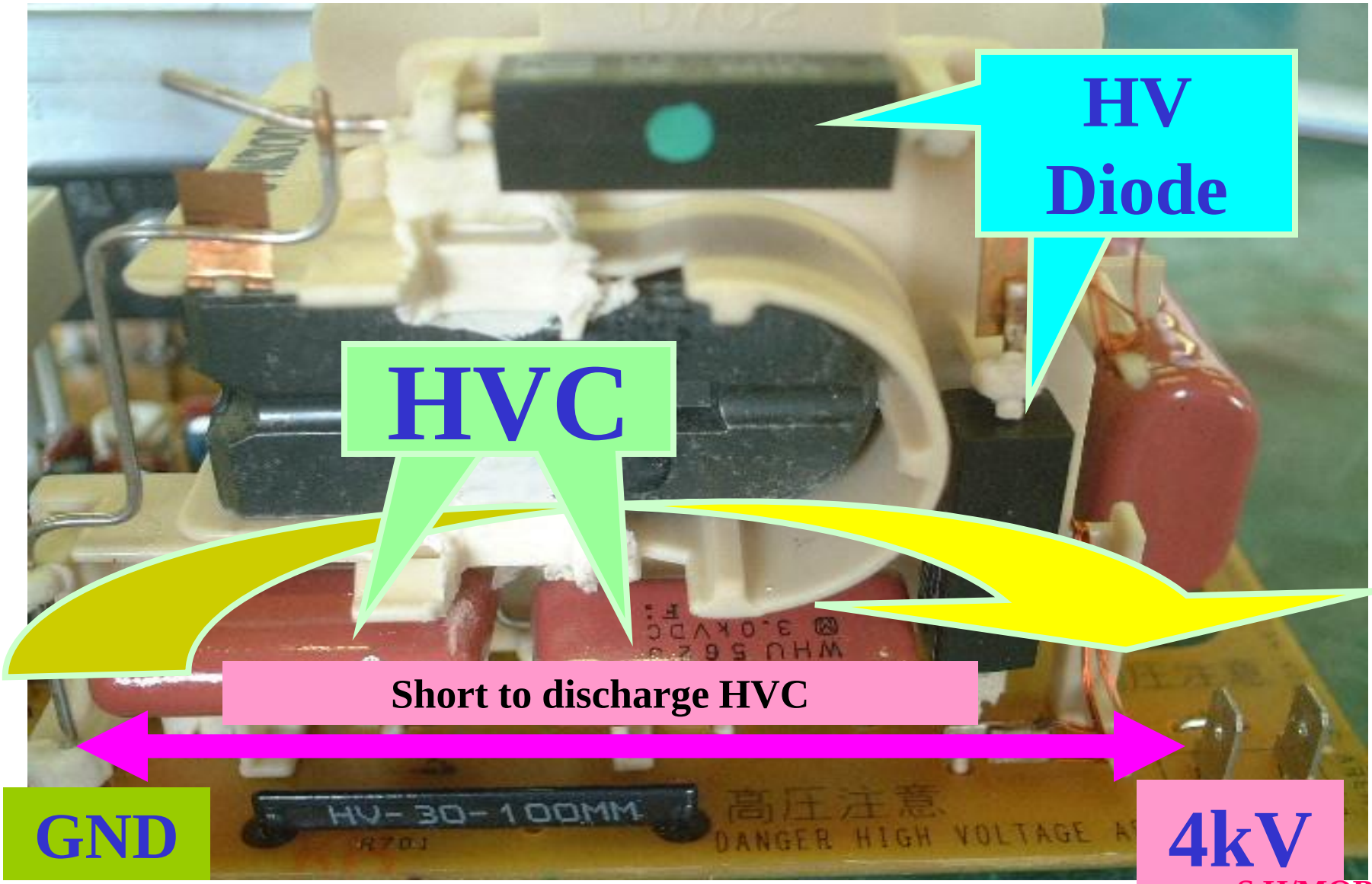
Troubleshooting Steps

1.Unplug Oven



2.Discharge high voltages remaining in HVC in PCB

How to Discharge High Voltage Capacitors



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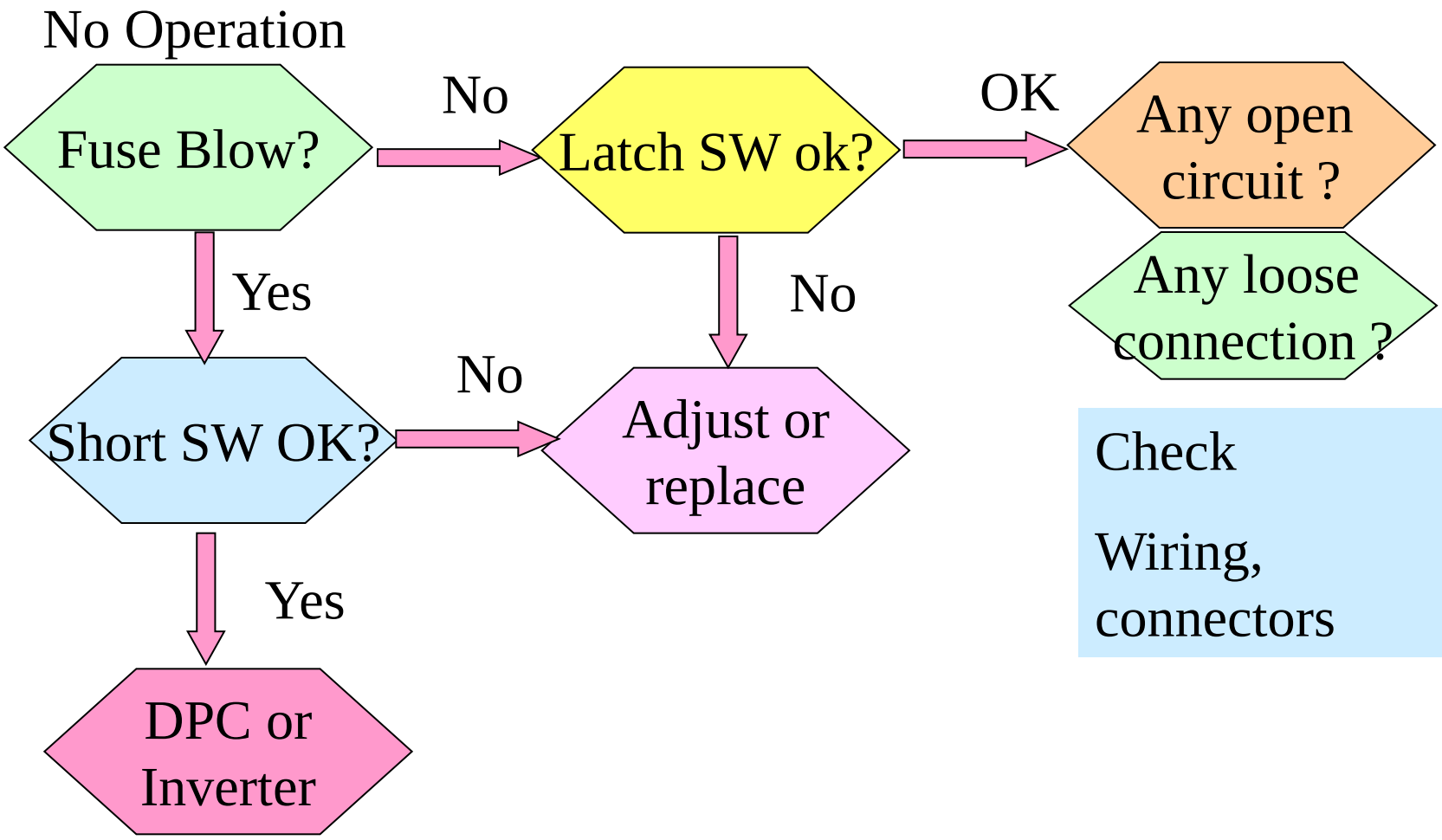
Troubleshoot work flow



Check

Wiring, connectors

Q701,Q702,DB701 etc. Follow to next…….

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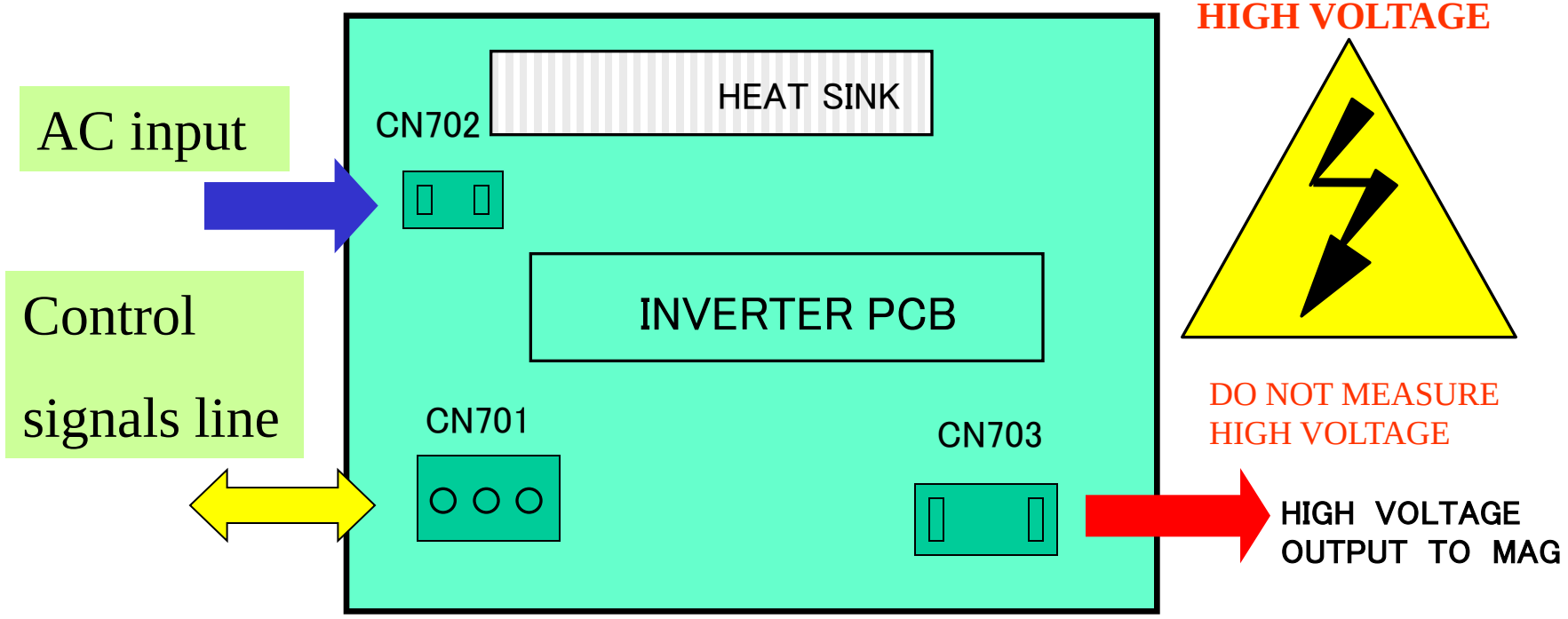
3. Unplug all connectors and remove PCB from Oven

WARNING:Make sure to isolate PCB from Oven

Unplug connectors



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4.Check Continuity across CN2 Connector pins

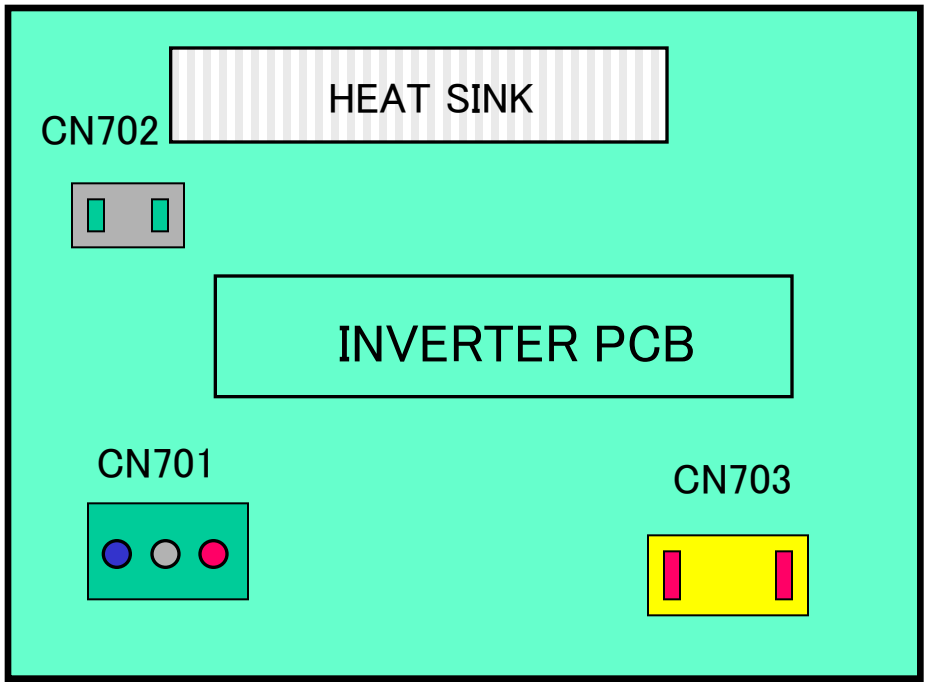
Check Across CN702 pins

80 – 200k Ω
is normal

Change Polarity

If it is smaller Ω

Follow Next step



Check

Diode bridge, IGBT's & High voltage diodes by Ohm meter

NOTE:Make sure to check if the related circuit and components are any damaged such as burnt resistors.

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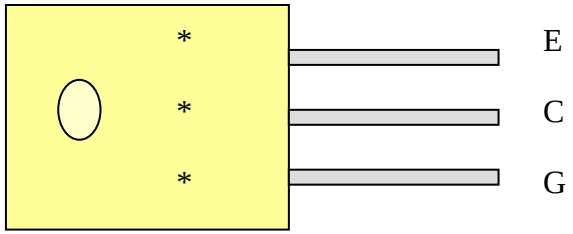
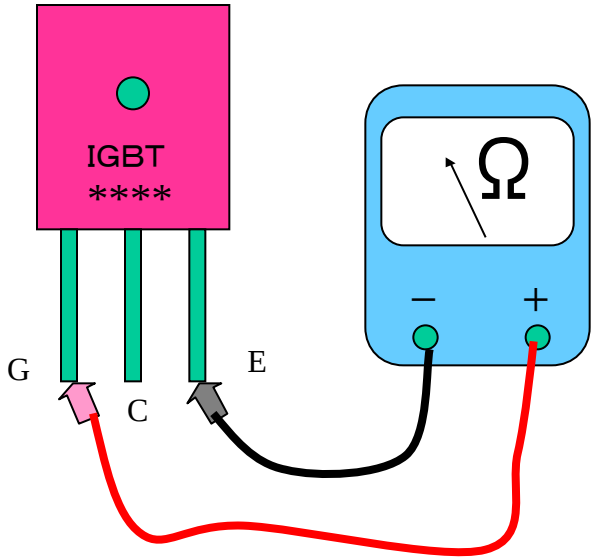
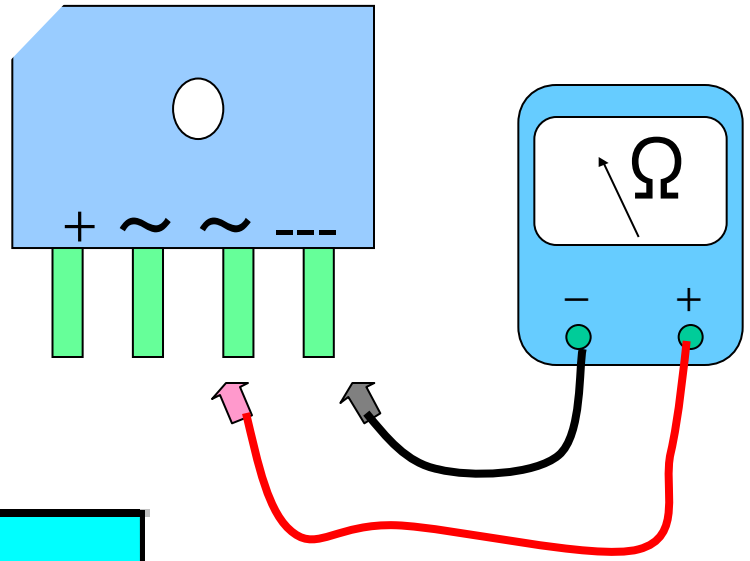
5.How to Check Q701 & Q702





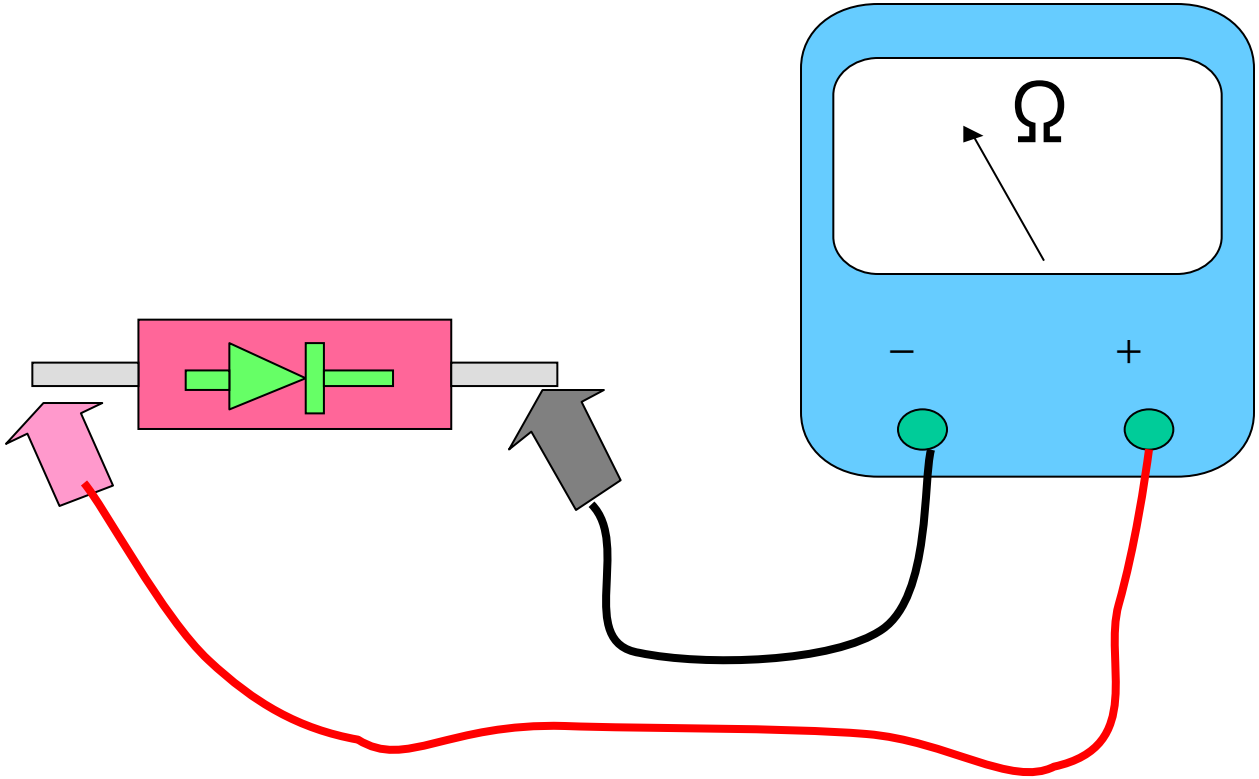
	Forward	Reverse
E-C	Some Ω	∞ Ω
E-G	∞ Ω	∞ Ω
C-G	∞ Ω	∞ Ω

7. Check Bridged diode DB701



	Forward	Reverse
+ – –	Some Ω	∞ Ω
~ – ~	∞ Ω	∞ Ω
+– ~,– – ~	Some Ω	∞ Ω

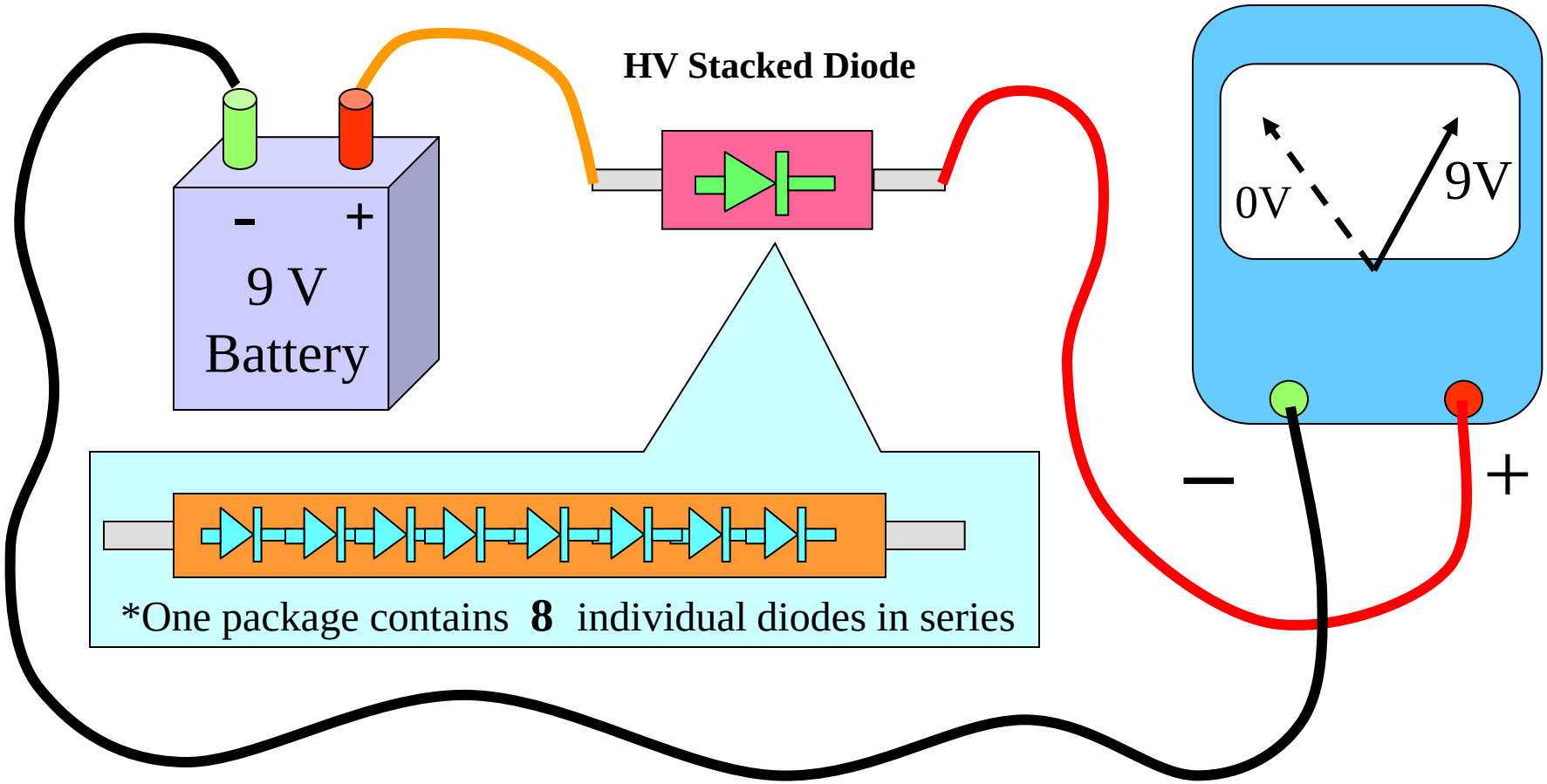
8.Check High Voltage Diodes



Forward	Reverse
Some Ω	∞ Ω

Fault diode can be checked by even R X 1

9.Check High Voltage Diodes W/9V Battery



Forward	Reverse
9 Volts	0 Volt

Inverter PCB Defect Analysis

DB701,Q701,Q702	69	39.4%
R730	16	9.1%
R704	14	8.0%
R731	7	4.0%
R752	5	2.9%
R729	4	2.3%
C701	2	1.1%
R769	2	1.1%
Others	6	3.4%
OK	36	20.6%
Cracked	14	8.0%
Total	175	100%

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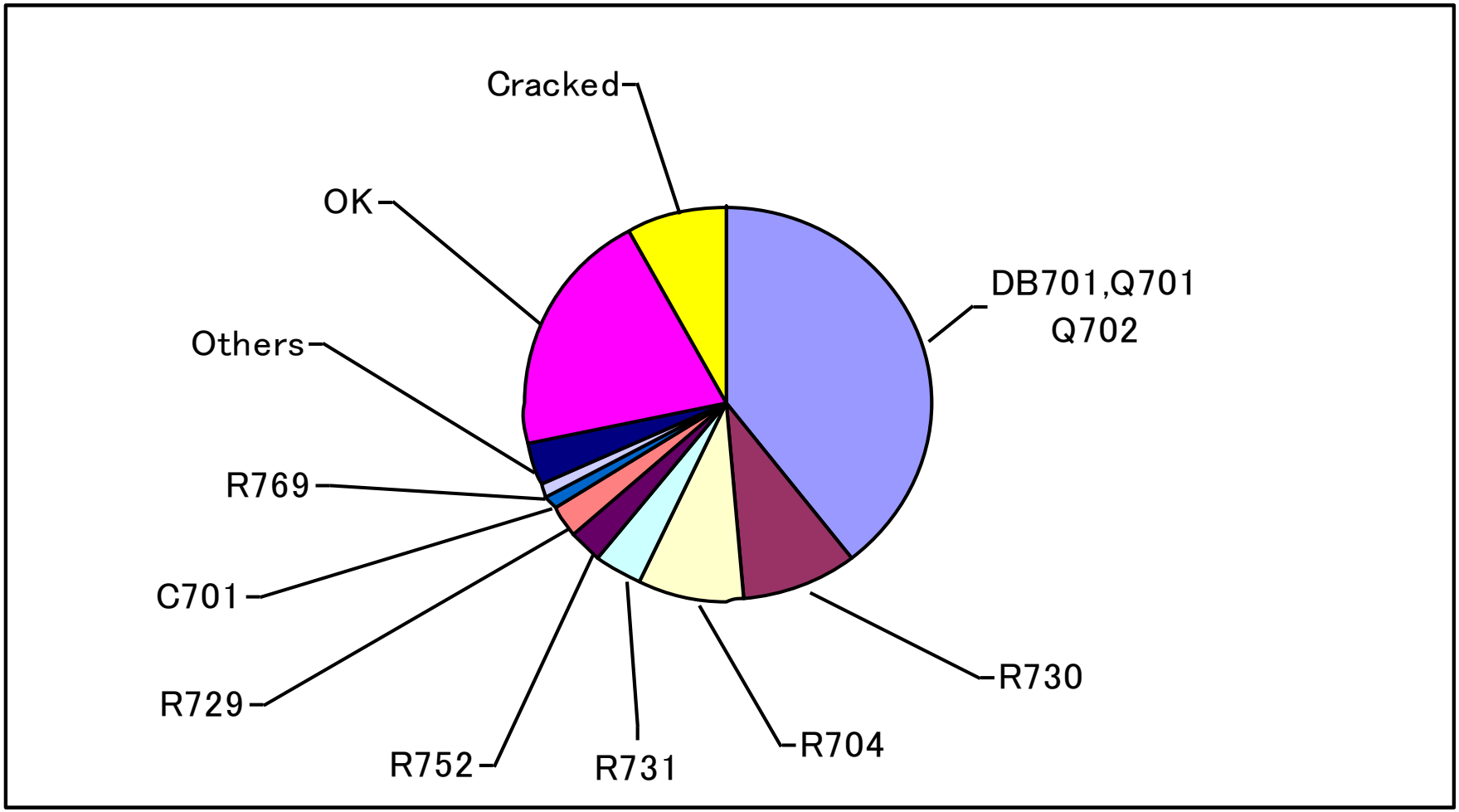
Inverter PCB Fault Cause Analysis



175 pieces repair data

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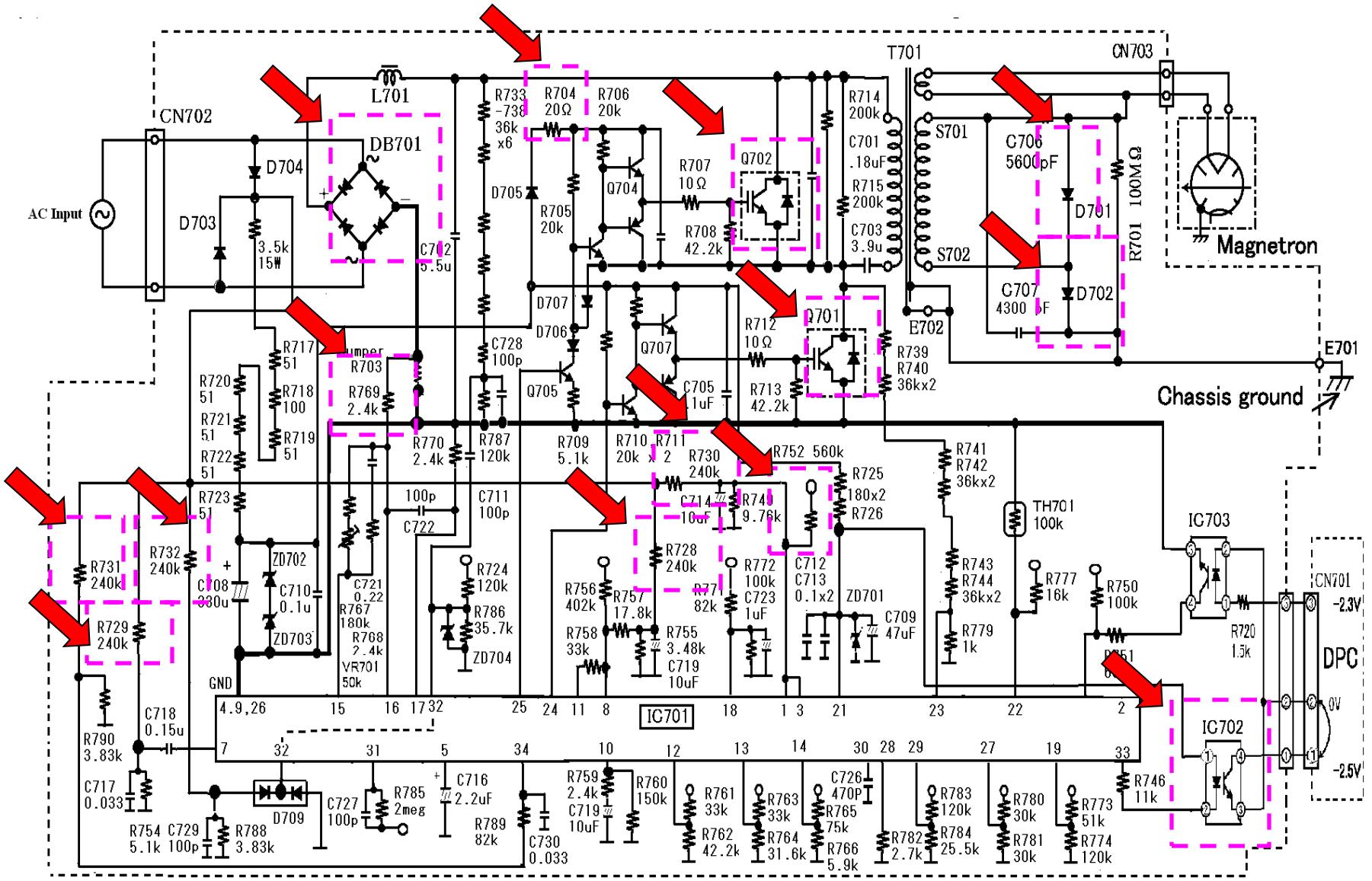
Where Component Failed



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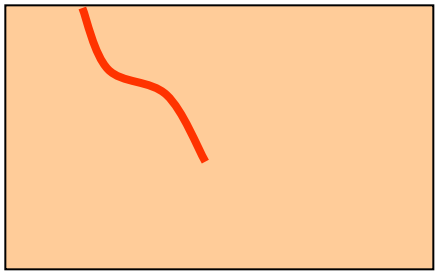
Up to this stage,

you can fix over 95% of faulty Inverter PCB

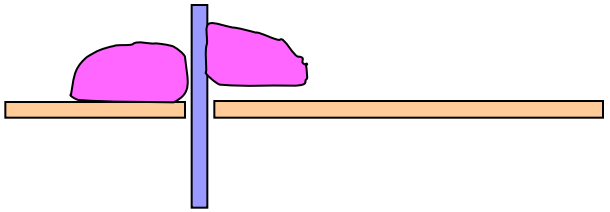
but if not…….

More area to be checked is;

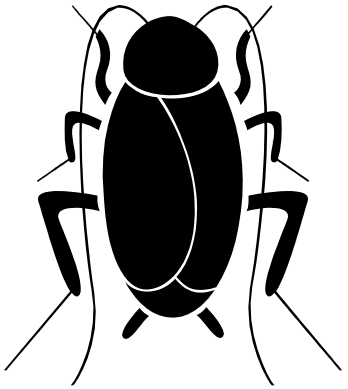
1. Cracking PCB



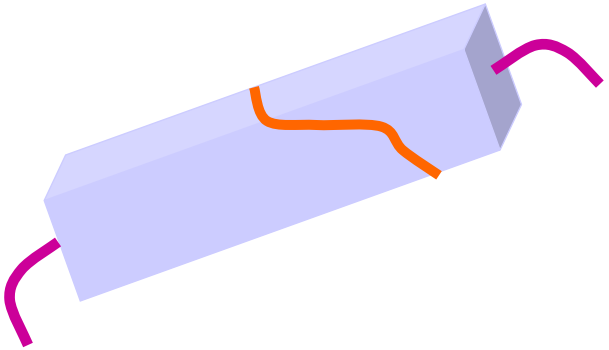
3. Cold solder joint



2.Cockroaches



4.Broken/Missing component



Before test Inverter

Make sure ;

1. Install it in its original place

DO NOT use extension cable

2. Install AIR GUIDE

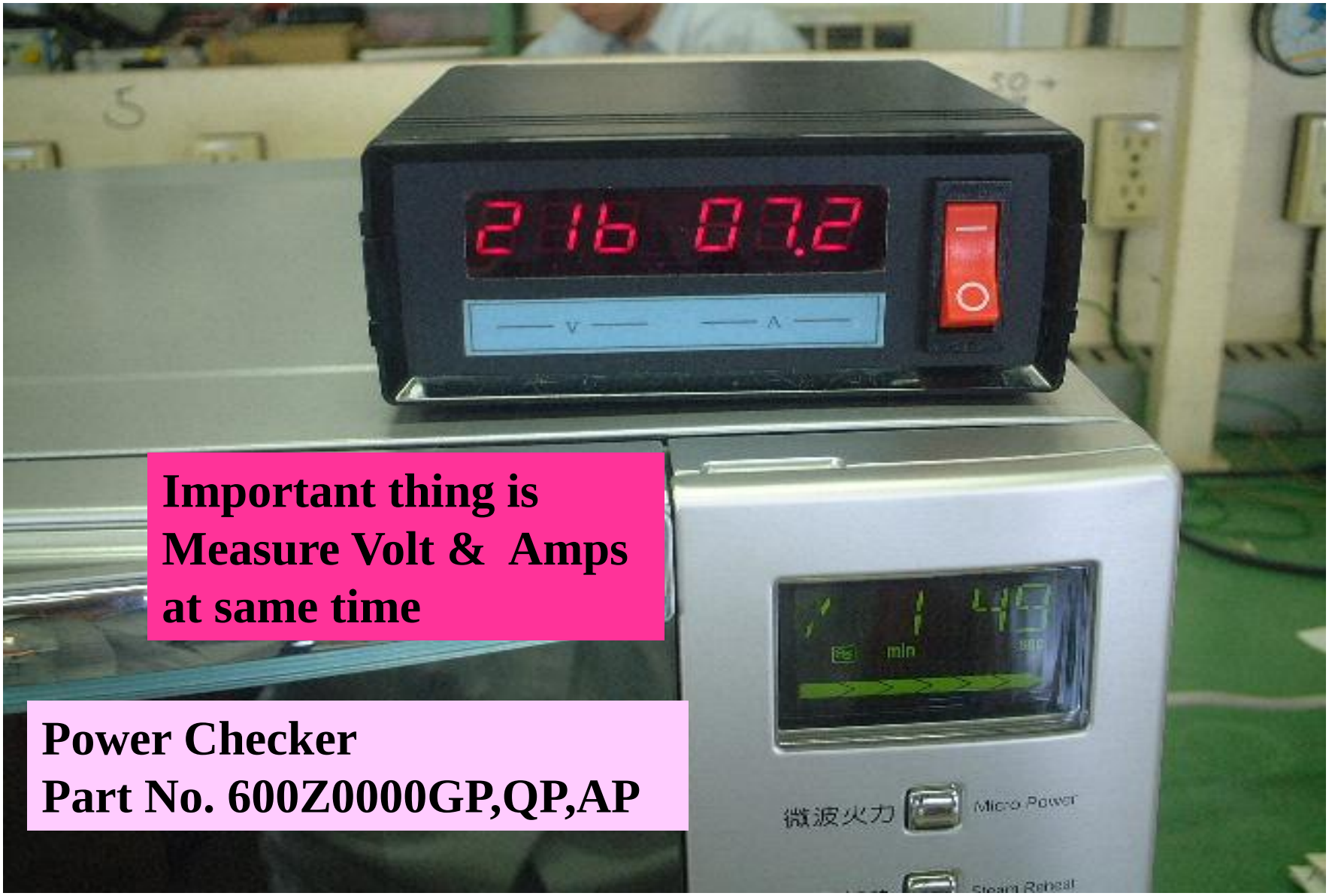
If not, overheat and damage again

3. Secure grounding

4. Wiring Properly

5. Place water load and clear Inverter area

Input Amps Check



Important thing is Measure Volt & Amps at same time

Power Checker
Part No. 600Z0000GP,QP,AP

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Thank You !!