

NEC
ELECTRON DEVICE

BIPOLAR ANALOG INTEGRATED CIRCUIT

μ PC1378H

VERTICAL DEFLECTION CIRCUIT OF COLOR TV

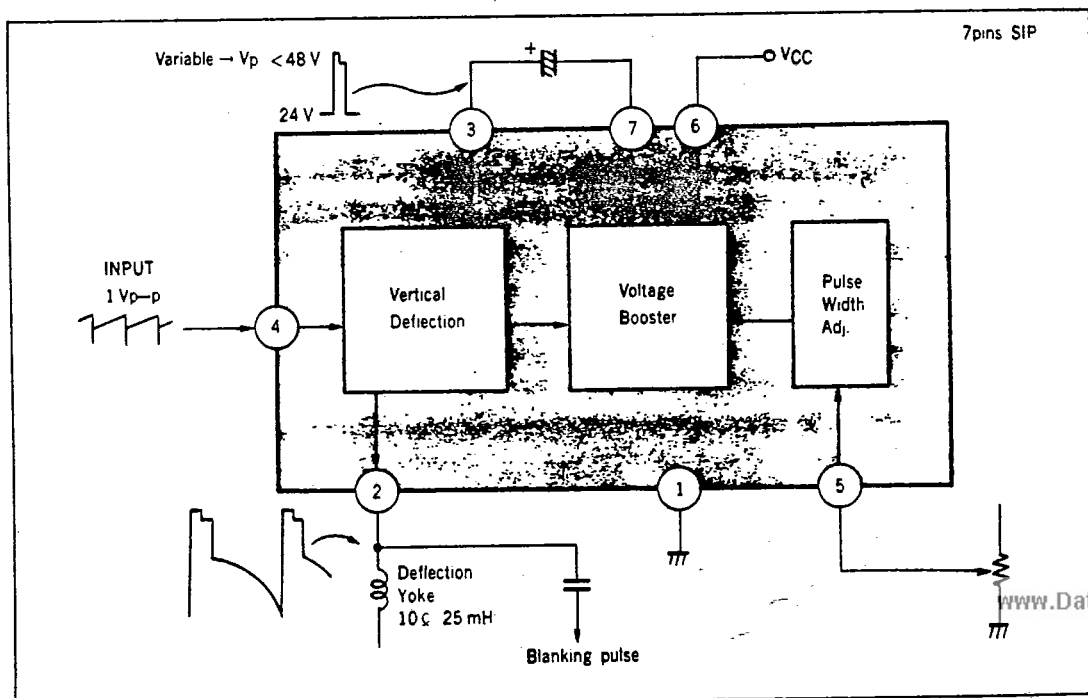
The μ PC1378H is a vertical deflection circuit suitable for color CRTs from 9 inches 90° deflection angle to 20 inches 100° deflection angle.

It is available for any color TV using IC or discrete components in the vertical ramp generator.

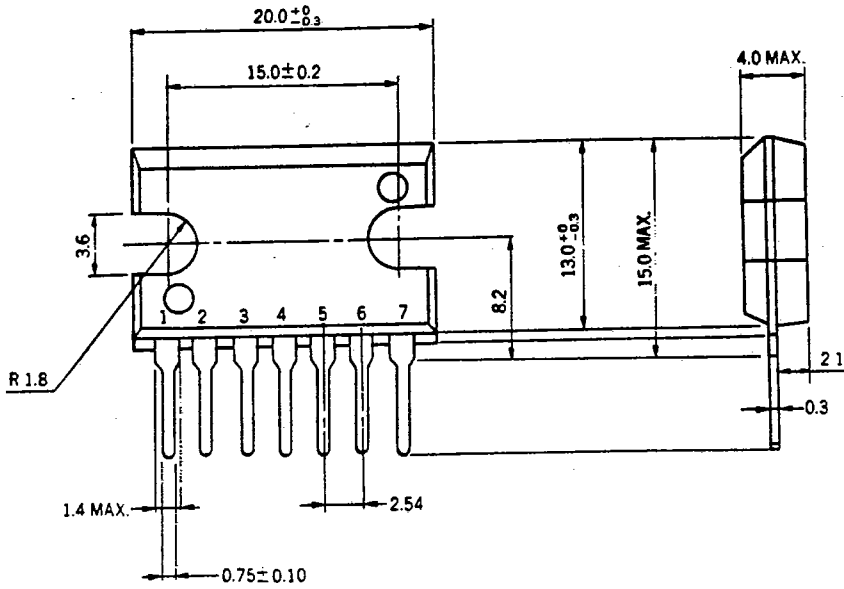
FEATURES

- The voltage booster circuit realizes particular high efficiency (24 V, 170 mA at 20 inches 100 degrees deflection angle set).
- Able to couple with any ramp generator, as it needs only ramp signal.
- Blanking pulse width is variable with a external bias circuit.

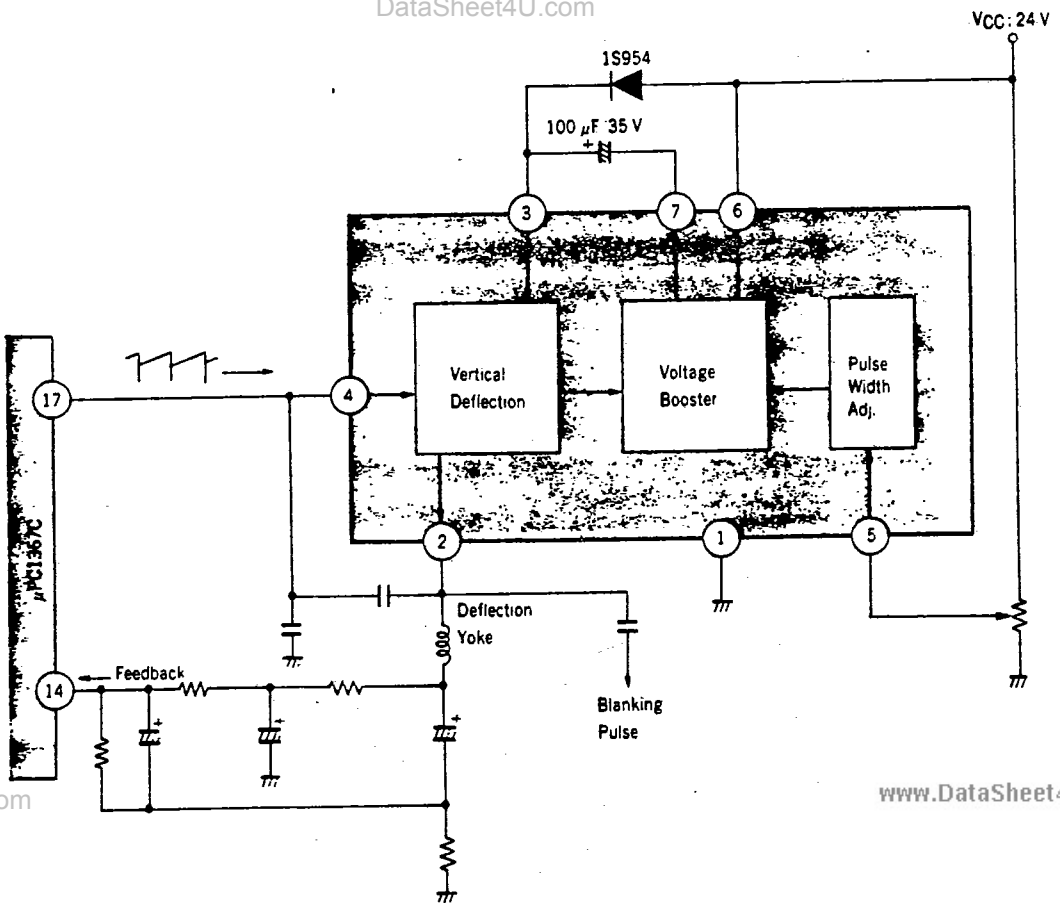
BLOCK DIAGRAM



PACKAGE DIMENSIONS (Unit : mm)



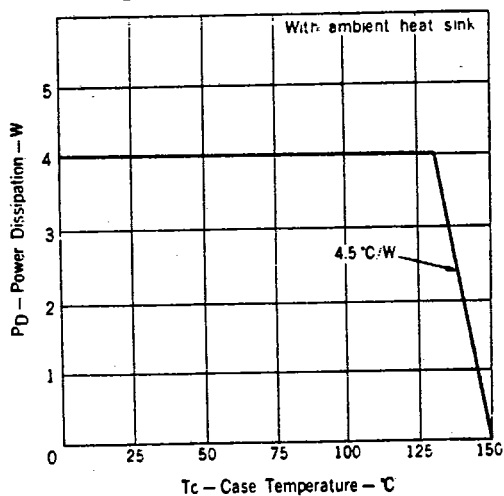
APPLICATION



ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

Power Supply Voltage	V_{CC}	27	V	
Power Supply Current Drain	I_{CC}	350	mA	
Power Dissipation	P_D	4.0	W	
Junction Temperature	T_j	+150	$^\circ\text{C}$	
Storage Temperature	T_{stg}	-40 to +150	$^\circ\text{C}$	
Output Current	I_{DEF}	-1.0 to +1.0	A	Pin 2
Terminal 3 Voltage	V_3	60	V	Pin 3
Input Voltage	V_4	2.0	V	Pin 4
Input Current	I_4	5	mA	Pin 4
Pulse Adjust Voltage	V_5	0 to V_6	V	Pin 5
Terminal 6 Voltage	V_6	27	V	Pin 6
Booster Output Current	I_B	-1.0 to +0.2	A	Pin 7

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 $P_D - T_c$ CHARACTERISTIC

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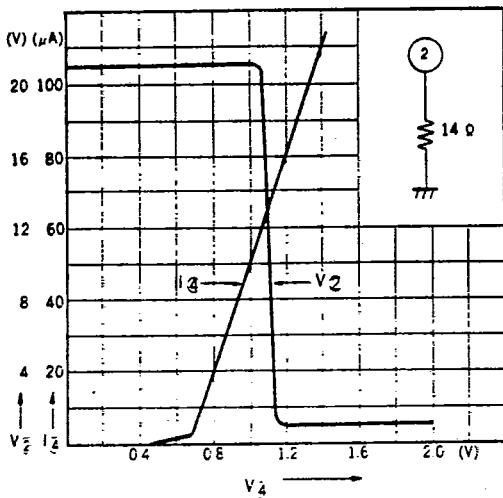
ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$, $V_{CC}=24\text{ V}$)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	PIN	CONDITION
Power Supply Current Drain	I_{CC}	130	150	170	mA	3+6	Standard Operation
Output Current	I_{DEF}	850	1000	1150	mA	2	Standard Operation
Output DC Voltage	V_{ODC}	12.1	12.6	13.1	V	2	Standard Operation
Retrace Pulse Voltage - 1	$V_{2p(1)}$	47		55	V	2	$V_5=0\text{ V}$
Retrace Pulse Voltage - 2	$V_{2p(2)}$	38		45	V	2	$V_5=8\text{ V}$
Retrace Pulse Width - 1	$T_{2p(1)}$	800	950	1100	μs	2	$V_5=0\text{ V}$
Retrace Pulse Width - 2	$T_{2p(2)}$	1050	1200	1350	μs	2	$V_5=8\text{ V}$
Idling Current	I_Q	20	35	50	mA	3	I_3 , No Output
Booster Charging Saturation	V_{S7-1}		1.5	2.0	V	7	24 V - 2 M Ω - Pin 4 24 V - 1.2 k Ω - Pin 7
Booster Discharging Saturation	V_{S6-7}	1.5	2.5	4.0	V	7	Pin 4 = Open Pin 1 - 33 Ω - GND.
Booster Charging Current - 1	$I_7(1)$	50	80	110	mA	7	24 V - 2 M Ω - Pin 4
Booster Charging Current - 2	$I_7(2)$	50	80	110	mA	7	$V_4=1.0\text{ V}$
Output Saturation - 1	$V_{S2-1(1)}$		0.9	1.5	V	2	24 V - 220 k Ω - Pin 4 24 V - 33 Ω - Pin 2
Output Saturation - 2	$V_{S2-1(2)}$		0.9	1.5	V	2	$V_4=2.0\text{ V}$ 24 V - 33 Ω - Pin 2
Output Saturation - 3	V_{S3-2}	2.0	3.0	4.5	V	2	Pin 4 = Open Pin 2 - 33 Ω - GND.
Input Saturation	V_{S4}	1.0	2.0	3.0	V	4	24 V - 220 k Ω - Pin 4
Voltage Gain	A_{VO}	25	35	45	dB		$f_{in}=1\text{ kHz}$, $R_L=1\ \Omega$
Input Resistance	R_{in}	4.5	5.5	6.5	k Ω	4	$V_{4DC}=1.1\text{ V}$
J-C Thermal Resistance	θ_{j-c}			4.5	$^\circ\text{C/W}$		With ambient heat sink

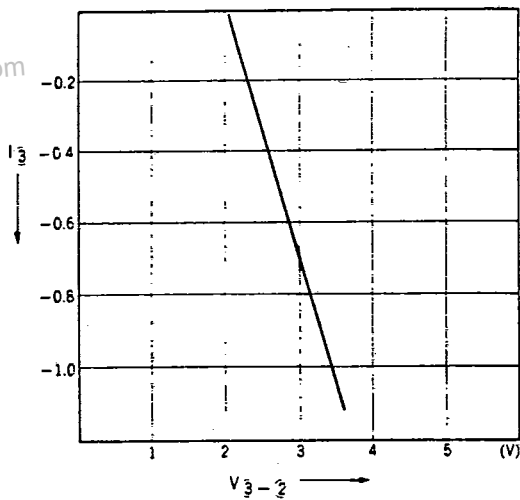
TYPICAL CHARACTERISTICS

1. Deflection Amplifier

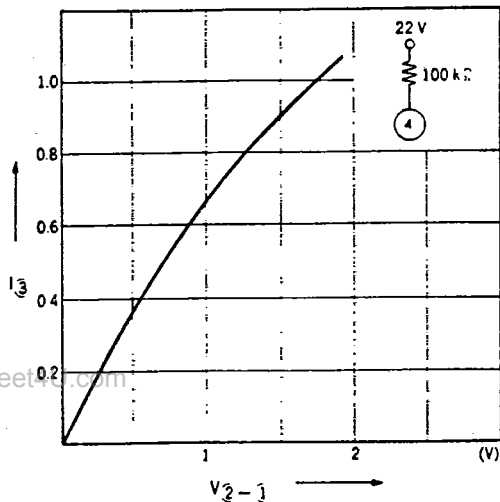
Input-Output Characteristic



Output Saturation (1)

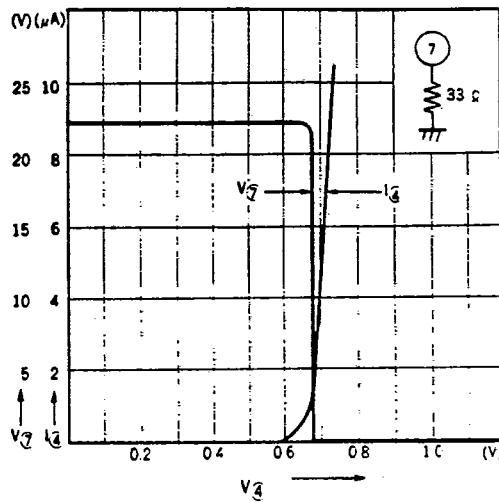


Output Saturation

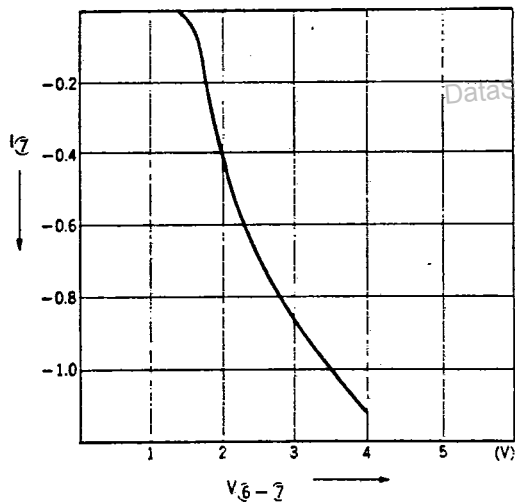


2. Voltage Booster

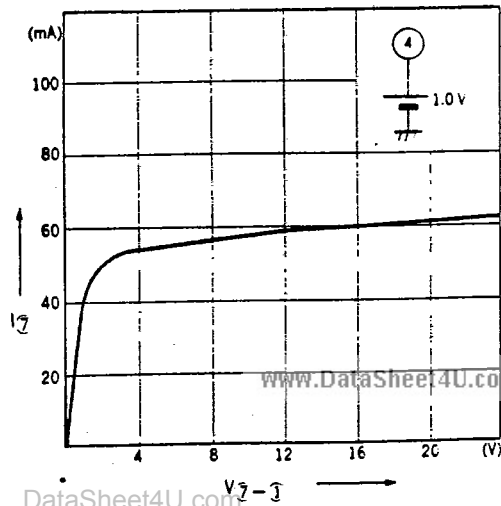
Input-Output Characteristic



Discharge Characteristic

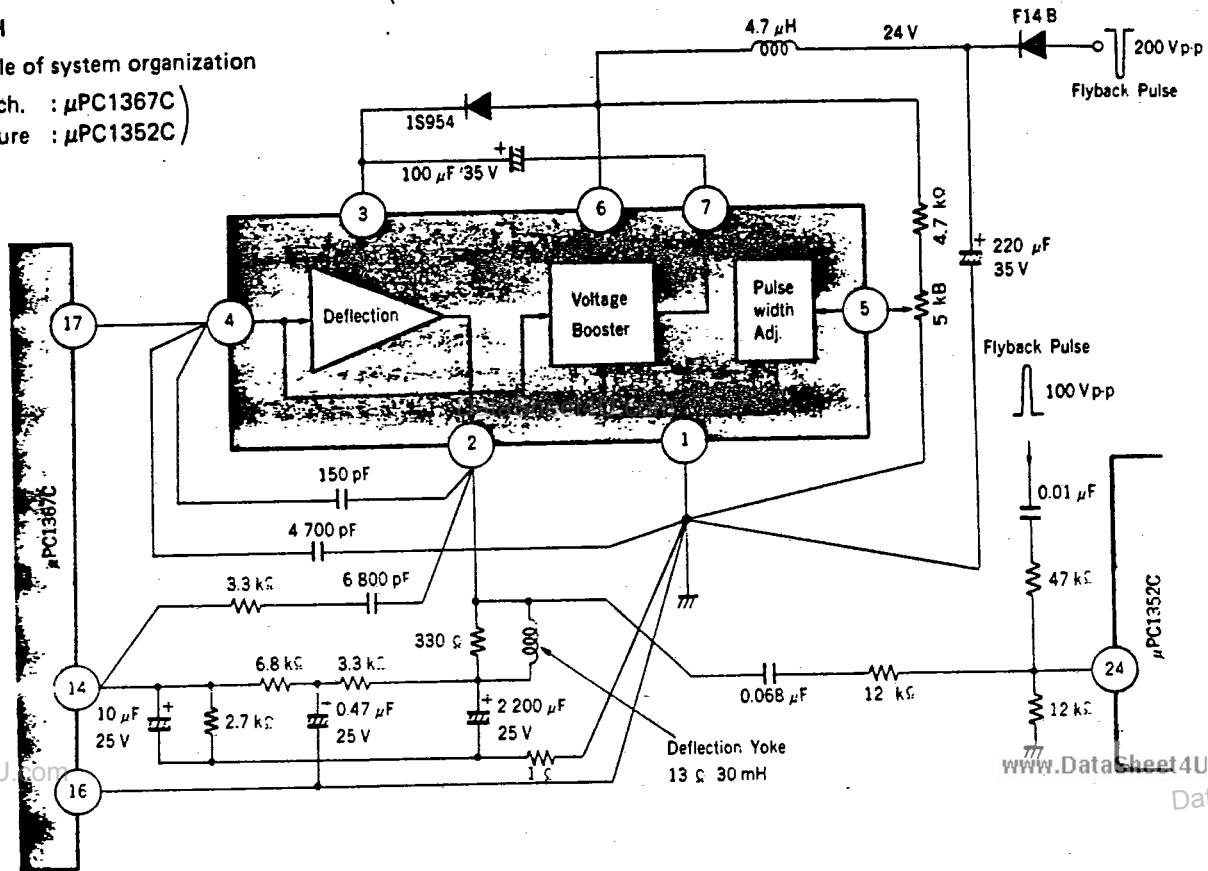


Charge Characteristic

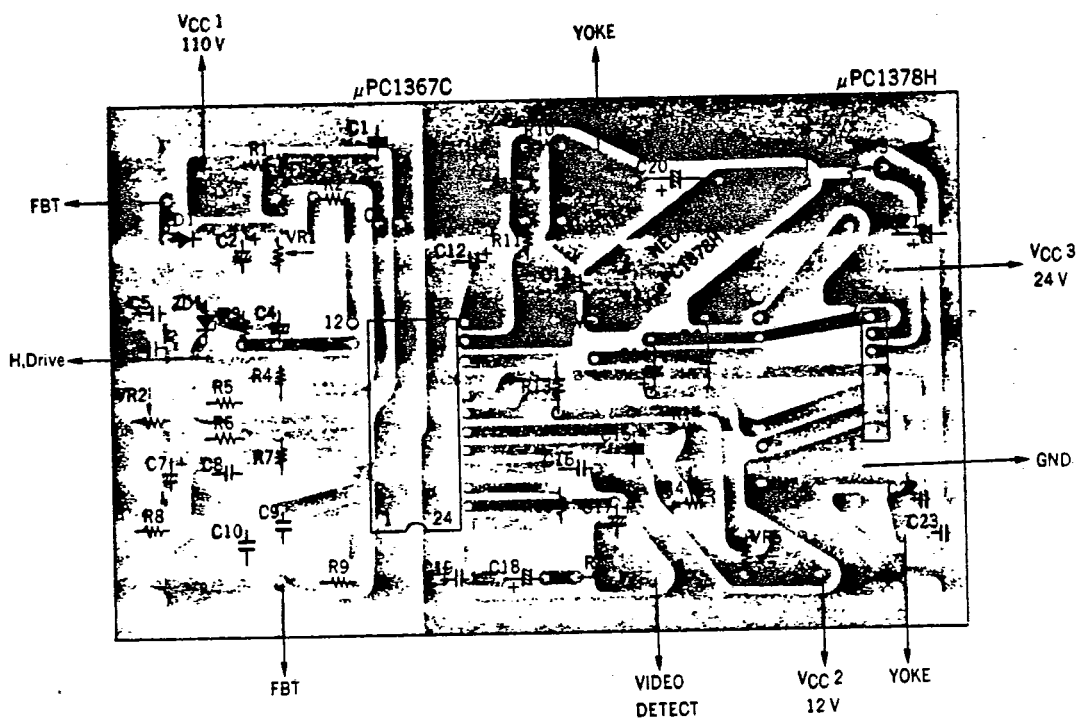


μ PC1378H

Example of system organization

(Synch. : μ PC1367C)
(Picture : μ PC1352C)

PRINT PATTERN AND LAYOUT



JUMP : μPC1367C Pin ⑭ - 3.3 kΩ - 6 800 pF - μPC1378H Pin ②

COMPONENTS

R1	8.2 kΩ	3 W
R2	1 kΩ	1/4 W
R3	12 kΩ	1/4 W
R4	2.2 kΩ	1/4 W
R5	4.7 kΩ	1/4 W
R6	1.8 kΩ	1/4 W
R7	33 kΩ	1/4 W
R8	3.9 kΩ	1/4 W
R9	100 kΩ	1/4 W
R10	3.3 kΩ	1/4 W
R11	6.8 kΩ	1/4 W
R12	2.7 kΩ	1/4 W
R13	91 kΩ	1/4 W
R14	6.8 kΩ	1/4 W
R15	2 MΩ	1/4 W
R16	470 Ω	1/4 W
R17	1 Ω	1/4 W
VR1	10 kΩ	
VR2	2 kΩ	
VR3	10 kΩ	
VR4	10 kΩ	
VR5	300 kΩ	

C1	10 μF	150 V
C2	10 μF	50 V
C3	0.01 μF	
C4	3.3 μF	16 V
C5	10 000 pF	
C6	5 600 pF	
C7	1 μF	16 V
C8	0.01 μF	
C9	0.1 μF	
C10	0.01 μF	
C11	0.47 μF	16 V
C12	0.47 μF	16 V (Tantalum)
C13	10 μF	25 V (Tantalum)
C14	100 μF	35 V
C15	3.3 μF	16 V (Tantalum)
C16	0.027 μF	
C17	10 μF	16 V
C18	2.2 μF	16 V
C19	1 500 pF	
C20	2 200 μF	25 V
C21	100 μF	35 V
C22	220 pF	
C23	0.022 μF	
D1	1S953	
D2	1S954	
ZD1	RD6.2E	