



# BIPOLAR ANALOG INTEGRATED CIRCUIT

## $\mu$ PC1378H

### VERTICAL DEFLECTION CIRCUIT OF COLOR TV

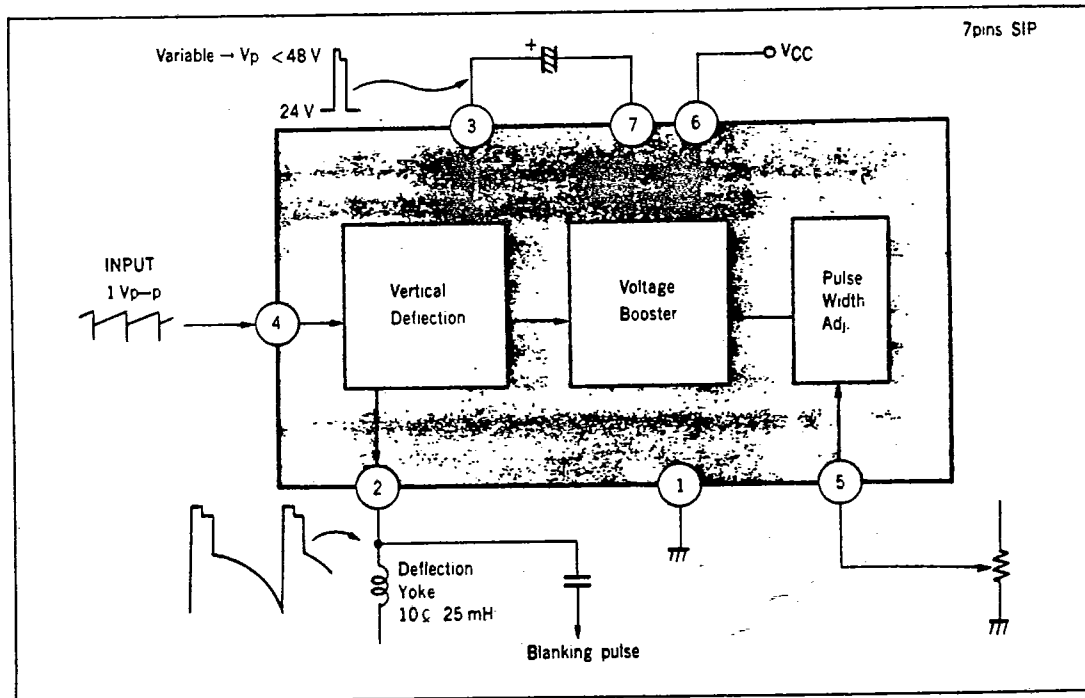
The  $\mu$ PC1378H is a vertical deflection circuit suitable for color CRTs from 9 inches 90° deflection angle to 20 inches 100° deflection angle.

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

#### FEATURES

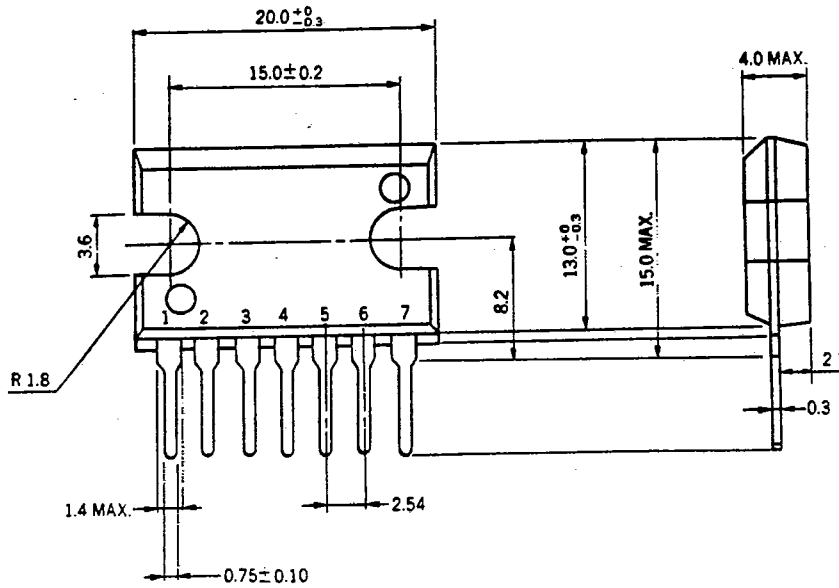
- The voltage booster circuit realizes particular high efficiency (24 V, 170 mA at 20 inches 100 degrees deflection angle set).
- Able to couple with any ramp generator, as it needs only ramp signal.
- Blanking pulse width is variable with a external bias circuit.

#### BLOCK DIAGRAM

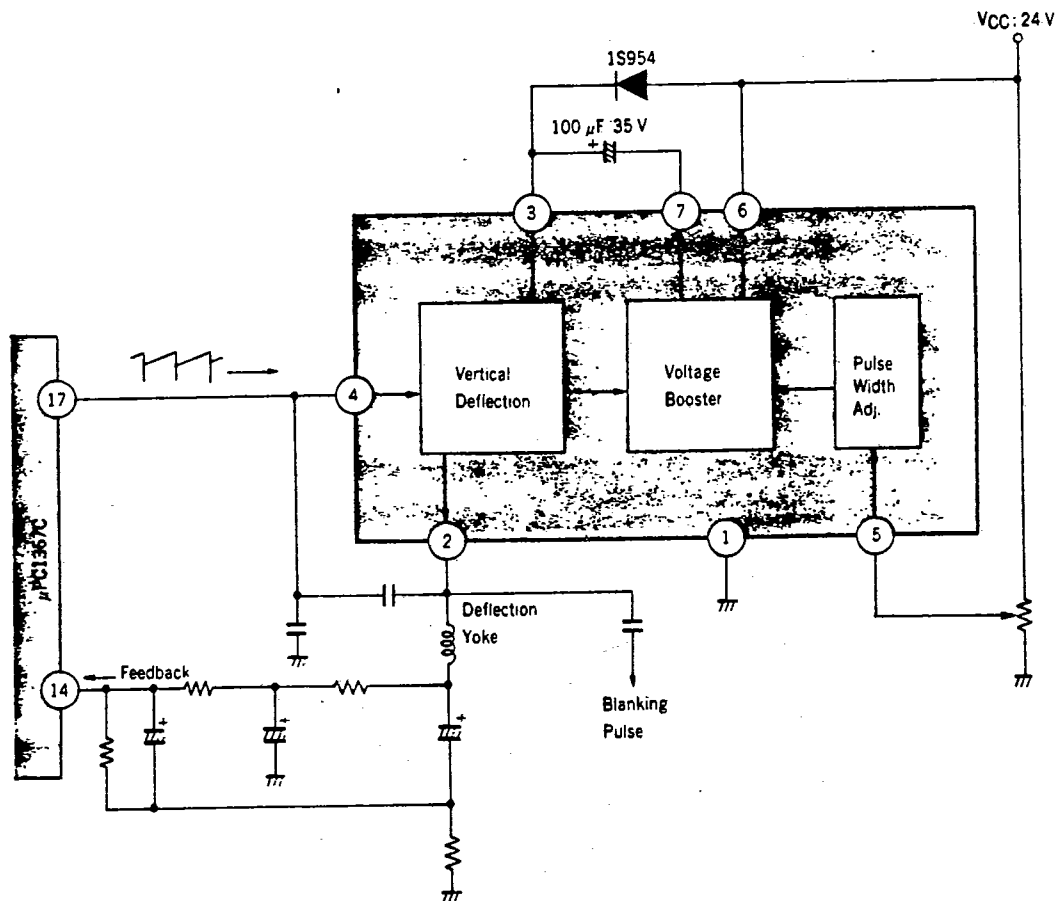


**μPC1378H**

**PACKAGE DIMENSIONS (Unit : mm)**



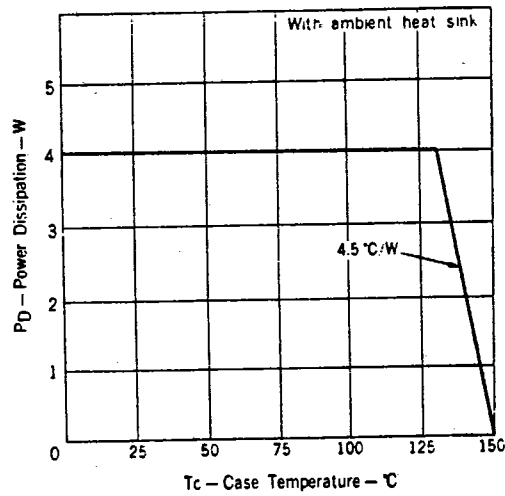
**APPLICATION**



**ABSOLUTE MAXIMUM RATINGS (Ta=25 °C)**

Power Supply Voltage	V <sub>CC</sub>	27	V	
Power Supply Current Drain	I <sub>CC</sub>	350	mA	
Power Dissipation	P <sub>D</sub>	4.0	W	
Junction Temperature	T <sub>j</sub>	+150	°C	
Storage Temperature	T <sub>stg</sub>	-40 to +150	°C	
Output Current	I <sub>DEF</sub>	-1.0 to +1.0	A	Pin 2
Terminal 3 Voltage	V <sub>3</sub>	60	V	Pin 3
Input Voltage	V <sub>4</sub>	2.0	V	Pin 4
Input Current	I <sub>4</sub>	5	mA	Pin 4
Pulse Adjust Voltage	V <sub>5</sub>	0 to V <sub>6</sub>	V	Pin 5
Terminal 6 Voltage	V <sub>6</sub>	27	V	Pin 6
Booster Output Current	I <sub>B</sub>	-1.0 to +0.2	A	Pin 7

**P<sub>D</sub> - T<sub>c</sub> CHARACTERISTIC**



$\mu$ PC1378H

NEC ELECTRON DEVICE

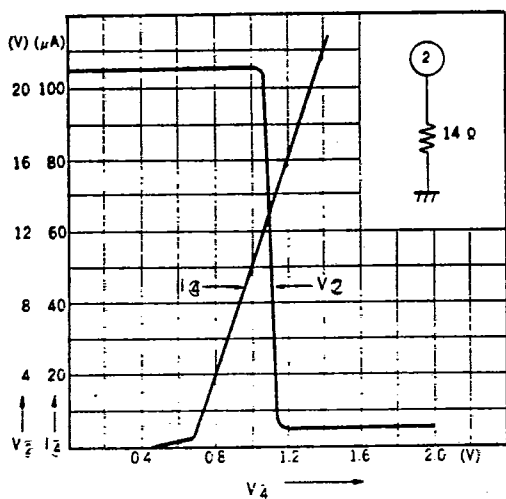
ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$ ,  $V_{CC}=24\text{ V}$ )

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	$\mu\text{s}$	2	$V_5=0\text{ V}$
Retrace Pulse Width - 2	$T_{2p(2)}$	1050	1200	1350	$\mu\text{s}$	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 $\Omega$ - Pin 4 24 V - 1.2 k $\Omega$ - Pin 7
Booster Discharging Saturation	$V_{S6-7}$	1.5	2.5	4.0	V	7	Pin 4 = Open Pin 1 - 33 $\Omega$ - GND.
Booster Charging Current - 1	$I_7(1)$	50	80	110	mA	7	24 V - 2 M $\Omega$ - 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 $\Omega$ - Pin 4 24 V - 33 $\Omega$ - Pin 2
Output Saturation - 2	$V_{S2-1(2)}$		0.9	1.5	V	2	$V_4=2.0\text{ V}$ 24 V - 33 $\Omega$ - Pin 2
Output Saturation - 3	$V_{S3-2}$	2.0	3.0	4.5	V	2	Pin 4 = Open Pin 2 - 33 $\Omega$ - GND.
Input Saturation	$V_{S4}$	1.0	2.0	3.0	V	4	24 V - 220 k $\Omega$ - 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 $\Omega$	4	$V_{4DC}=1.1\text{ V}$
J-C Thermal Resistance	$\theta_{j-c}$			4.5	$^\circ\text{C/W}$		With ambient heat sink

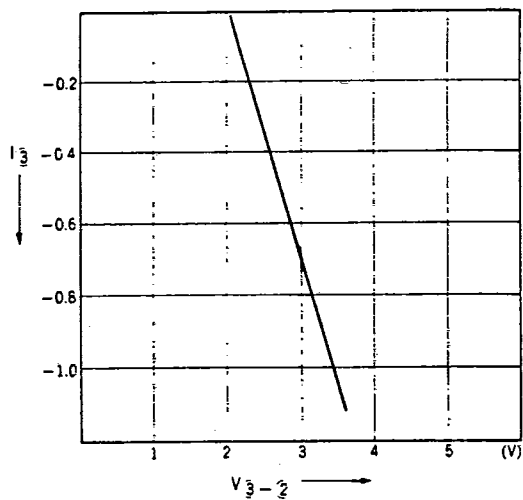
TYPICAL CHARACTERISTICS

1. Deflection Amplifier

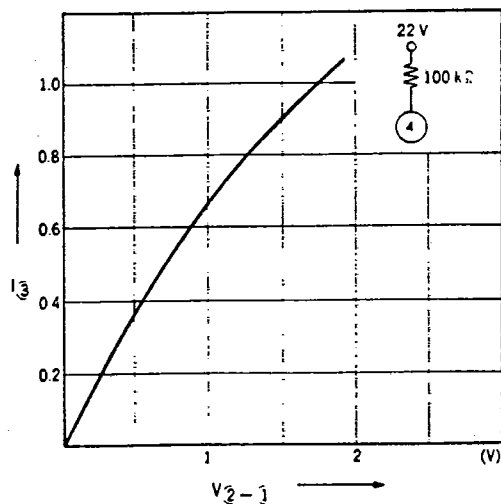
Input-Output Characteristic



Output Saturation (1)

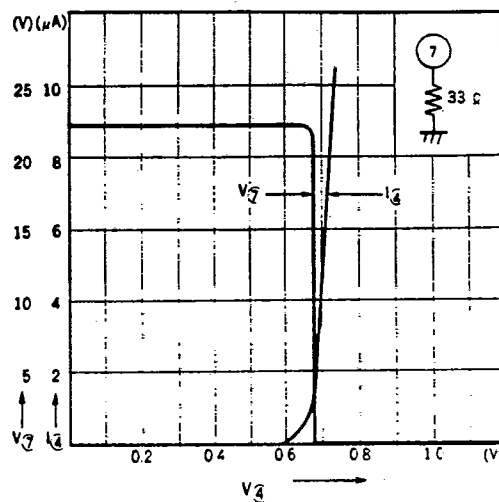


Output Saturation

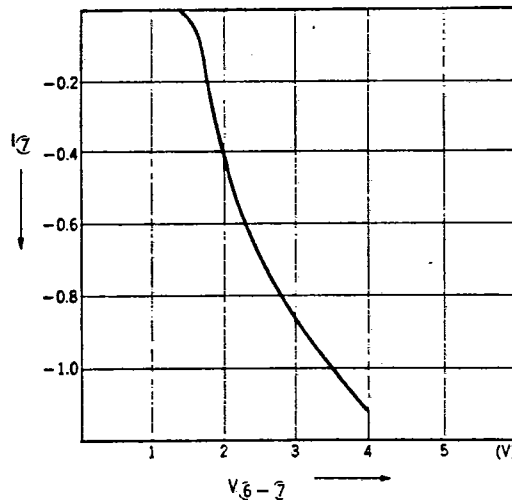


2. Voltage Booster

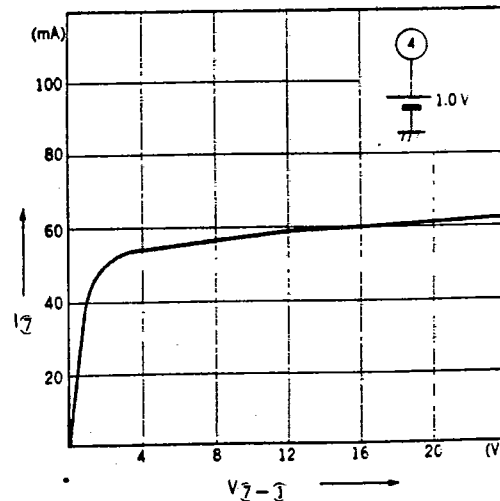
Input-Output Characteristic



Discharge Characteristic



Charge Characteristic

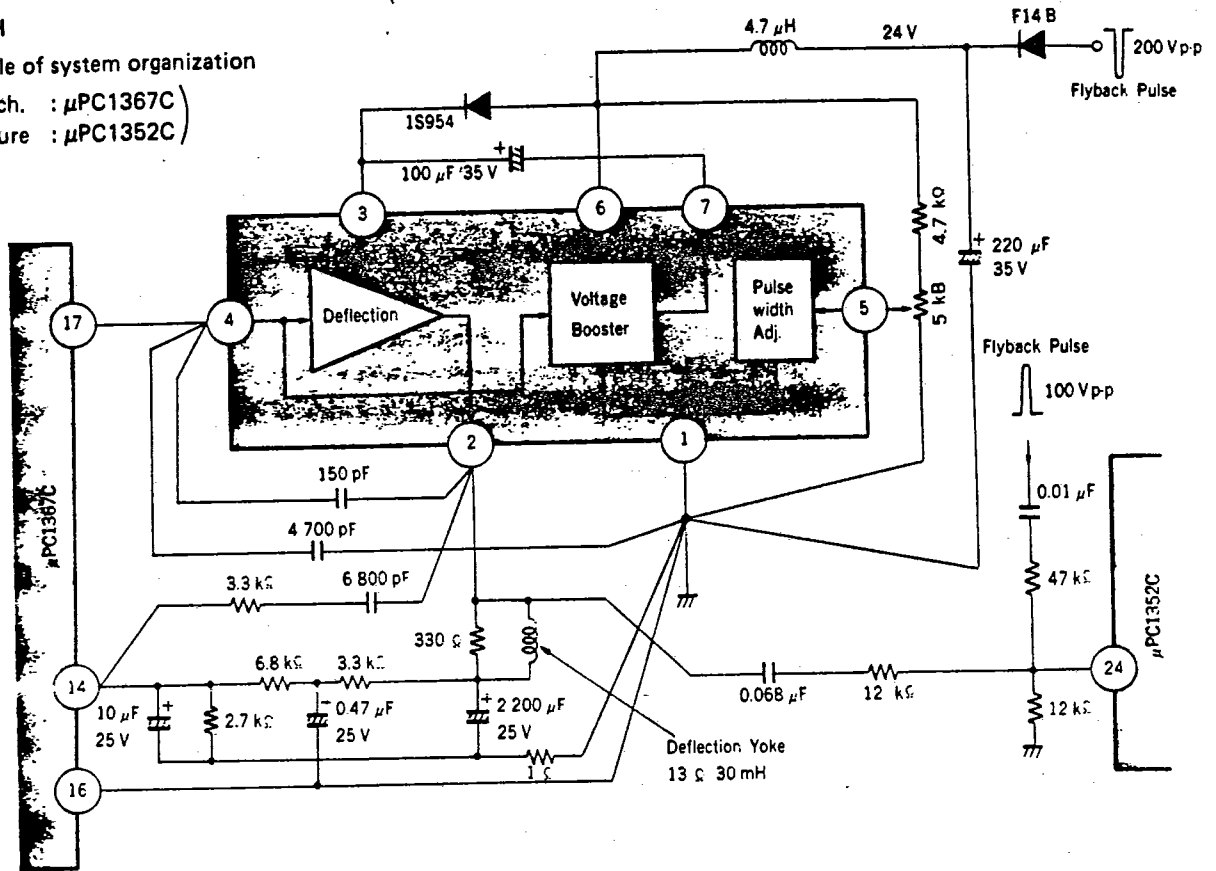


**μPC1378H**

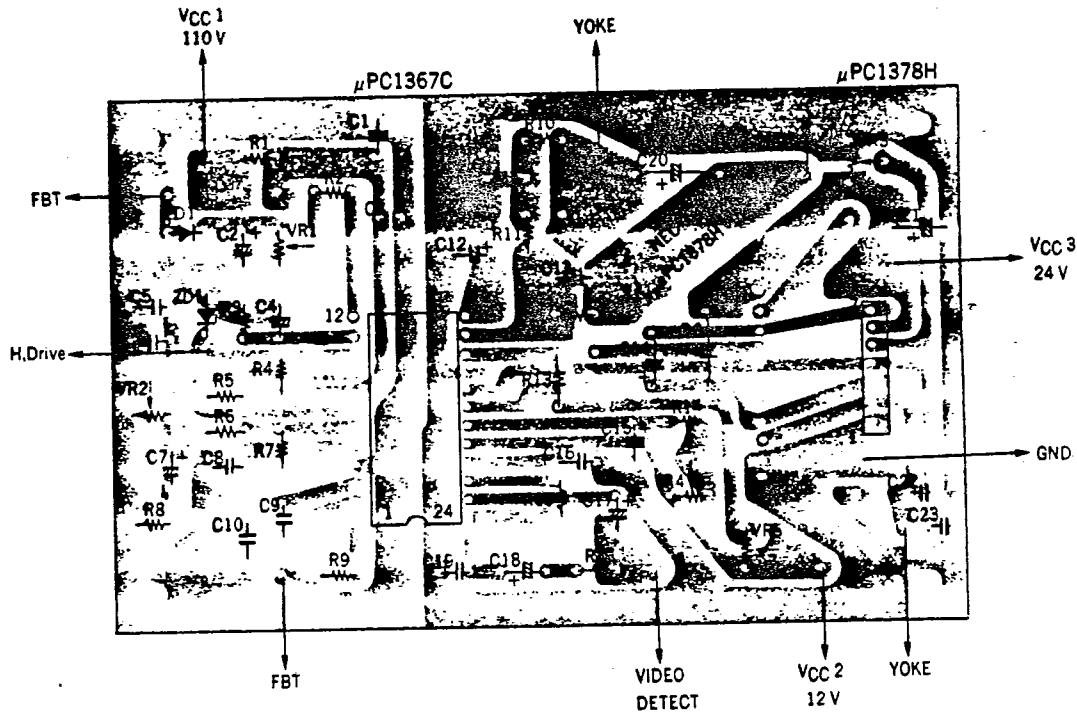
**μPC1378H**

Example of system organization

(Synch. : μPC1367C)  
(Picture : μPC1352C)



**PRINT PATTERN AND LAYOUT**



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

**COMPONENTS**

R1	8.2 kΩ	3 W	C1	10 μF	150 V
R2	1 kΩ	1/4 W	C2	10 μF	50 V
R3	12 kΩ	1/4 W	C3	0.01 μF	
R4	2.2 kΩ	1/4 W	C4	3.3 μF	16 V
R5	4.7 kΩ	1/4 W	C5	10 000 pF	
R6	1.8 kΩ	1/4 W	C6	5 600 pF	
R7	33 kΩ	1/4 W	C7	1 μF	16 V
R8	3.9 kΩ	1/4 W	C8	0.01 μF	
R9	100 kΩ	1/4 W	C9	0.1 μF	
R10	3.3 kΩ	1/4 W	C10	0.01 μF	
R11	6.8 kΩ	1/4 W	C11	0.47 μF	16 V
R12	2.7 kΩ	1/4 W	C12	0.47 μF	16 V (Tantalum)
R13	91 kΩ	1/4 W	C13	10 μF	25 V (Tantalum)
R14	6.8 kΩ	1/4 W	C14	100 μF	35 V
R15	2 MΩ	1/4 W	C15	3.3 μF	16 V (Tantalum)
R16	470 Ω	1/4 W	C16	0.027 μF	
R17	1 Ω	1/4 W	C17	10 μF	16 V
VR1	10 kΩ		C18	2.2 μF	16 V
VR2	2 kΩ		C19	1 500 pF	
VR3	10 kΩ		C20	2 200 μF	25 V
VR4	10 kΩ		C21	100 μF	35 V
VR5	300 kΩ		C22	220 pF	
			C23	0.022 μF	
			D1	1S953	
			D2	1S954	
			ZD1	RD6.2E	

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Datasheets for electronic components.