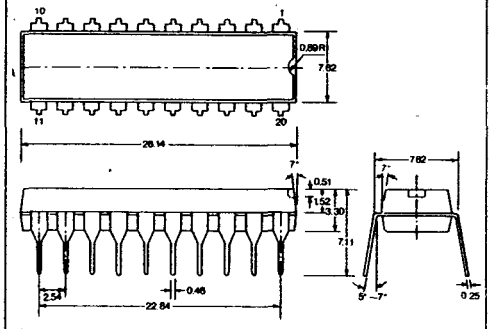
DBL 2009

DEFLECTION COMBINATION FOR A C-TV

20DIP Unit: mm



DBL 2009 is a monolithic integrated circuit designed for deflection combination in C-TV or C-Monitor receivers.

☐ FUNCTION

- ○ Sync separation
- ○ Vertical oscillation
- ○ Vertical drive
- ○ Horizontal AFC
- ○ Horizontal oscillation
- ○ X-ray protection

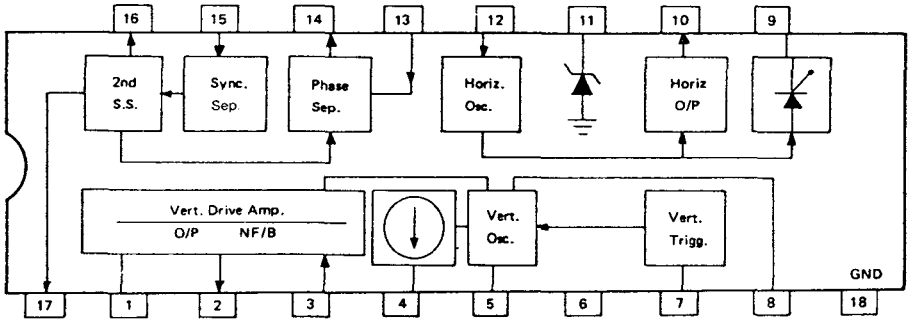
☐ MAXIMUM RATINGS(Ta=25°C)

Characteristic	Symbol	Rating	Unit
Vertical Supply Voltage	V_{CC}	16	V
Horizontal Supply Current	I_{CC}	25	mA
Power Dissipation(Ta = 75°C)	P_D	500	mW
Operating Temperature	T_{opr}	−20∼+75	°C
Storage Temperature	T_{stg}	−55∼+150	°C
Output Current(Pin 2, Pin 10 and Pin 16)	I_O	15	mA

☐ PIN CONNECTIONS AND PIN VOLTAGES.

(V_{CC} = 12V)

Pin No.	Functions	Voltage Values			Unit
		min.	typ.	max.	
1	Connected to Capacitor for Prevention of Parastic Oscillation		3.3		V
2	Vertical Output Pin		1.1		V
3	Feedback Input Pin for Vertical DC/AC Output Voltage		3.3		V
4	Connected to Resistor for Determination of the Vertical Osc Discharging Time Constant	3.3	4	4.2	V
5	Connected to Capacitor for Vertical Osc		7.1		V
6	Power Supply Pin for Vertical Oscillator		12		V
7	Vertical Sync Input Pin		5		V
8	Determination of Vertical Osc Frequency		5.1		V
9	Input Pin for X-Ray Protector		0		V
10	Output Pin for Horizontal Section		1		V
11	Power Supply Pin for Horizontal Oscillator	11.8	12.8	13.8	V
12	Connected to Horizontal Osc CR		6.5		V
13	FBP Input Pin For Phase Detector		3.6		V
14	Output Pin for Phase Detector		6.6		V
15	Video Signal Input Pin for Sync Separator		12.5		V
16	Output Pin for Sync Separator		1		V
17	Feedback Pin for Sync Separator		2.5		V
18	GND Pin		0		V



☐ ELECTRICAL CHARACTERISTICS

1. Horizontal Section(Ta = 25°C)

Characteristic	Symbol	Test Circuit	Test Conditions	Min.	Typ.	Max.	Unit
Regulated Voltage	V_{11}	2	19.9V Applied to 11-Pin via 470Ω	11.8	12.8	13.8	V
Supply Current	I_{CC}	2	19.9V Applied to 11-Pin via 470Ω	12.9	15	17.3	mA
Osc Frequency	f_{OH}	2	R_H = 12.6KΩ; C_H = 5.6nF	14734	15734	16734	Hz
Horizontal Pull-in Range	$\triangle f_{pH}$	1		±450	±650		Hz
AFC Loop Gain	f_C	1		577.5	750	1070	Hz/μS
Temperature Coefficient of f_{OH}	$\triangle f_{OH\text{-}Ta}$	2	C_H = 5.6nF; R_H = 12.6 KΩ; C_H and R_H Is Set Outside the Constant Temperature Bath	−6	−3	0	Hz/°C
Output Pulse Width	t_{HW}	1	Measure at 10-Pin	22.5	25	27.5	μS
f_{OH} Stability against V_{CC} Variation	$\triangle f_{OH\text{-}VCC}$	2	The Osc Frequency Difference with V_{CC} Varied from 11.5V to 12.8V	−100	0	100	Hz
Output Saturation Voltage	$V_{CE(sat)}$	2	12KΩ Inserted between 10-Pin and GND			0.3	V
Output High Voltage	V_{10H}	7	Adjust Current, at 10-Pin for −6.5mA	2.8	4.1	6.8	V
Osc Starting Supply Voltage	V_{OHS}	2	f_{OH} = 10KHz~20KHz		2	6	V

☐ ELECTRICAL CHARACTERISTICS

2. Vertical Section.(Ta-=25°C)

Characteristic	Symbol	Test Circuit	Test Conditions	Min.	Typ.	Max.	Unit
Osc Frequency	f_{OV}	3	R_V=6KΩ; C_V=2.2μF	55	60	65	Hz
Vertical Pull-in Range	$\triangle f_{PV}$	1			−10	−7.5	Hz
Temperature Coefficient of f_{OV}	$\triangle f_{OV\text{-}Td}$	3	R_V=6KΩ; C_V=2.2μF	−0.03	0	+0.03	Hz/°C
f_{OV} Stability against V_{CC} Variation	$\triangle f_{OV\text{-}VCC}$	3	Measure the Osc Frequency Difference with V_{CC} Varied from 14.4V to 9.6V	−2	0	2	Hz
Output High Voltage(1)	$V_{2h(1)}$	6	5V at Pin 1; 6V at Pin 3; 15V at Pin 6 Measure Voltage at Pin 2 with 15mA Drawn from Pin 2	9.5	11.5	13.5	V
Output High Voltage(2)	$V_{2h(2)}$	6	5V at Pin-1; 6V at Pin 3 15V at Pin 6 : Measure Voltage at Pin 2 with No Load Applied to Pin 2	12.8	13.7	14.5	V
Vertical Osc Starting Voltage	V_{OVS}	3	R_V=6KΩ; C_V=2.2μF; f_{OV}=40Hz~70Hz		5	9	V

☐ ELECTRICAL CHARACTERISTICS(continued)

3. Sync Separation Section. (Ta = 25°C)

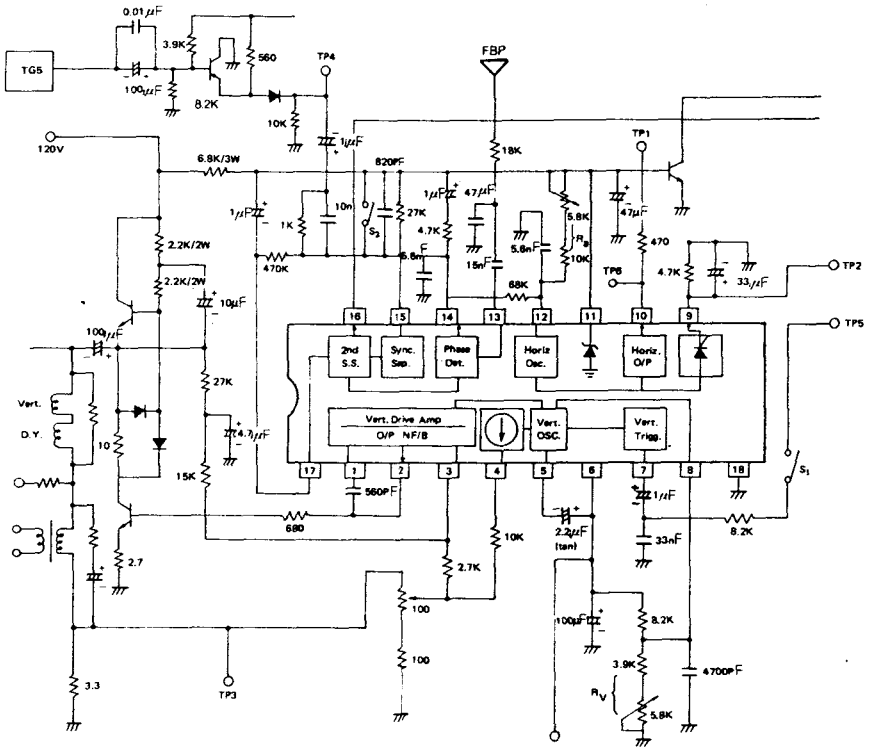
Characteristic	Symbol	Test Circuit	Test Conditions	Min	Typ.	Max.	Unit
Input Voltage	V_{15}	4	Negative Pulse Applied to Pin 15	0.2			V_{p-p}
Output Voltage	V_{16}	4	Measure at Pin 16	8	10		V_{p-p}
Output Pulse Width(1)	$t_{16}(1)$	4	APL = 50%; 2.5Vp-p applied at the Input Point	4.5	5	5.5	μs
Output Pulse Width(2)	$t_{16}(2)$	4	APL = 50%; $1.0V_{p-p}$ applied at the Input Point	4.5	5	5.5	μs

4. X-Ray Protection Section. (Ta=25°C)

Characteristic	Symbol	Test Circuit	Test Conditions	Min.	Typ.	Max.	Unit
Trigger Gate Voltage	V_{GT}	5	R = 4.7 Ω and C = 33 μF/16V as the External Parts for Pin 9	0.68	0.75	0.82	V
Temperature Coefficient of V_{GT}	$\triangle V_{GT\text{-}Ta}$	5	R = 4.7K Ω and C = 33 μF/16V as the EXternal Parts for Pin9		−2.5		mV/°C
V_{CC} Dependence of V_{GT}	$\frac{\triangle V_{GT}}{V_{CC}}$	5	R = 4.7K Ω and C = 33μF/16V as the External Parts for Pin 9		−30		mV/°C

☐ TEST CIRCUIT

1.

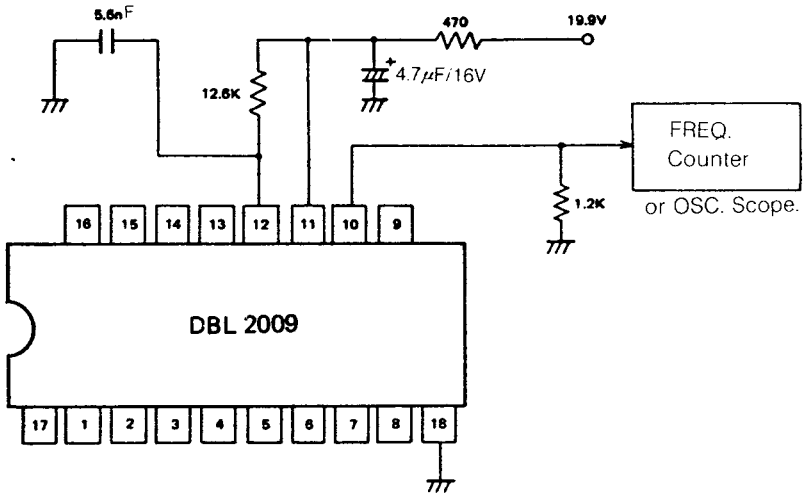


TEST PROCEDURE FOR TEST CIRCUIT 1

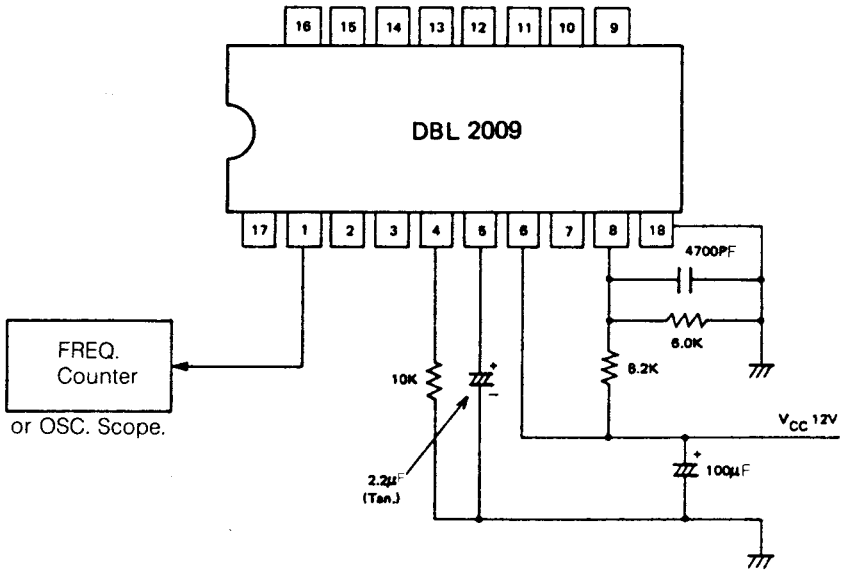
1. Horizontal Pull-in Range
   - O With SW1 in ON and SW2 in OFF positions, adjust horizontal hold volume, at the point that the horizontal sync is just pulled in by monitoring TV screen. Turn SW2 ON and measure the frequency at TP1.
   - O Pull-in range is given by the frequency difference between the measured frequency and 15.734KHz.
2. AFC Loop Gain
   - O With SW1 in On and SW2 in OFF positions, monitoring Pin14 waveform with horizontal interval and using horizontal hold volume adjust $\triangle t$ to $2\mu s$.
   - O Turn SW2 ON and meausre the frequency f_1 at TP1.
   - O With same procedure as above, measure the frequency f_2 when $\triangle t$ is $3\mu s$.
   - O Loop gain is given by $fc = f(\triangle t = 3\mu s) - f(\triangle t = 2\mu s)$.
3. Horizontal Output Pulse Width
   - O With SW1 in ON and SW2 in OFF positions, measure the pulse width at TP6 when the horizontal Sync is synchronized.(measuring point : $1/2\ V_{p\text{-}p}$)
4. Vertical Pull-in Range
   - O With SW1 in ON and SW2 in OFF positions, adjust vertical hold volume at the point that the vertical sync is just pulled in by monitoring TV screen. Turn SW1 OFF and measure the frequency at TP3.
   - O Pull-in range is given by the frequency difference between the measured frequency and 59.94Hz.

☐ TEST CIRCUITS(Continued)

2. f_{OH} and Δf_{OH}

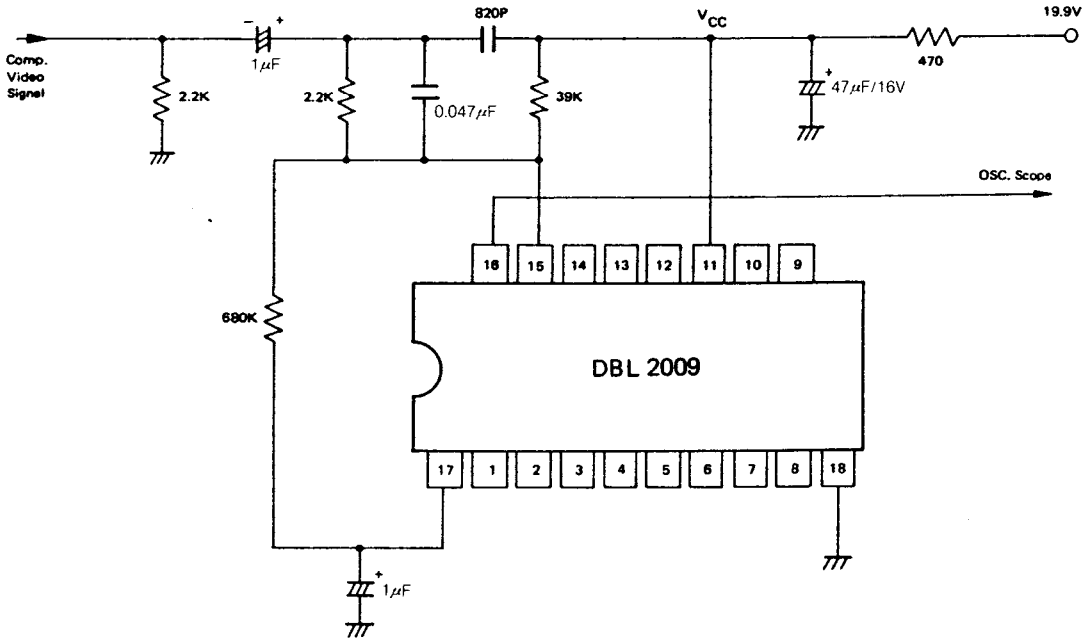


3. f_{OV} and Δf_{OV}

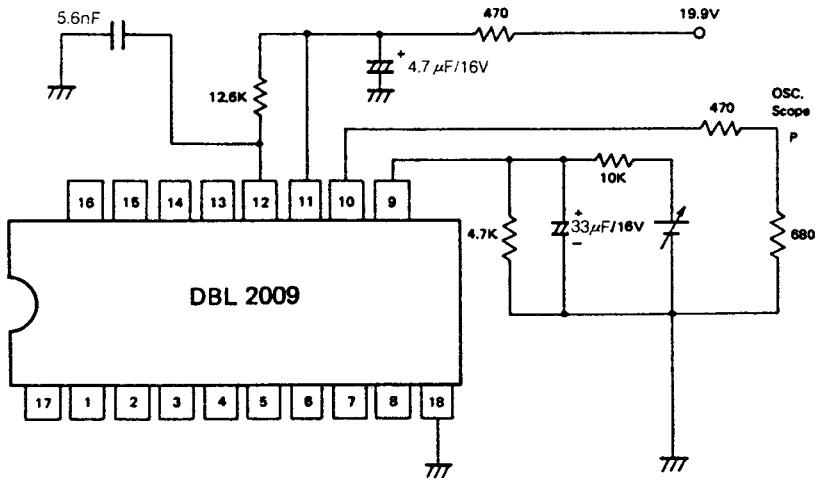


☐ TEST CIRCUITS(Continued)

4. Sync. Separation

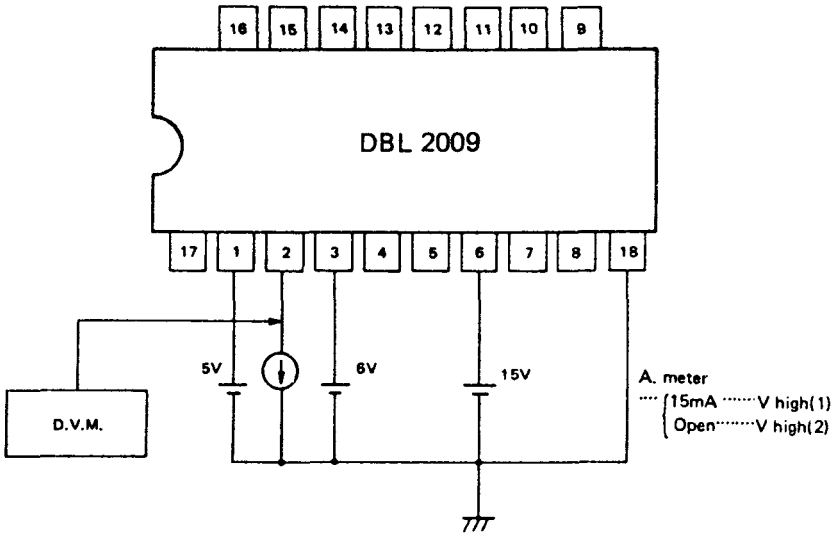


5. **X-Ray Protection Block**



☐ TEST CIRCUITS(Continued)

6. Vertical Output



7. Horizontal Output