

# DBL 1009

## PLL FM STEREO MULTIPLEX

Space merit by the package and wide supply voltage range.

### FEATURES

- Excellent pilot lamp turning-on sensitivity :  
 $V_{LAMP(ON)} = 9mV_{rms}$  (Typ.)
- Suitable for LED driving :  
 $I_{LAMP} = 20mA$  (Max.)
- Recommendable input voltage range :  
 $V_{IN} = 200 \sim 700mV_{rms}$
- Operating supply voltage range :  
 $V_{CC} = 3.5 \sim 12V$
- Excellent channel separation through entire audio frequency range :  
 $CH_{SEP} = 45dB$  (Typ.)
- Low distortion : THD = 0.08% (Typ.) at  $V_{IN} = 200mV_{rms}$  (stereo)
- VCO stop capability (The VCO is stopped when the Pin 7 is connected with the power supply line, and then the stereo indicator is turn off.)
- Easy adjustment (The monitored free running frequency of VCO is 38KHz at Pin 6.)

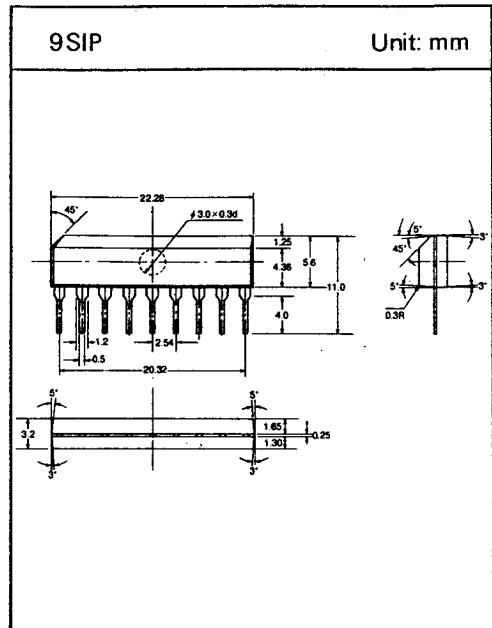
### APPLICATIONS

- Automotive and portable radios.

### MAXIMUM RATINGS (Ta=25°C)

Characteristic		Symbol	Rating	Unit
Supply Voltage		$V_{CC}$	12	V
Lamp Voltage		$V_{LAMP}$	16	V
Lamp Current	Continuation	$I_{LAMP}$	20	mA
	Peak		40	
Operating Temperature		$T_{opr}$	-30 ~ + 75	°C
Storage Temperature		$T_{stg}$	-55 ~ + 150	°C
Power Dissipation		$P_D$	500	mW

\* The power dissipation is derated above  $T_a = 25^\circ C$  in the proportion of  $4mW/^\circ C$



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## □ ELECTRICAL AC CHARACTERISTICS

(Unless otherwise specified,  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 8\text{V}$ ,  $f = 1\text{kHz}$ )

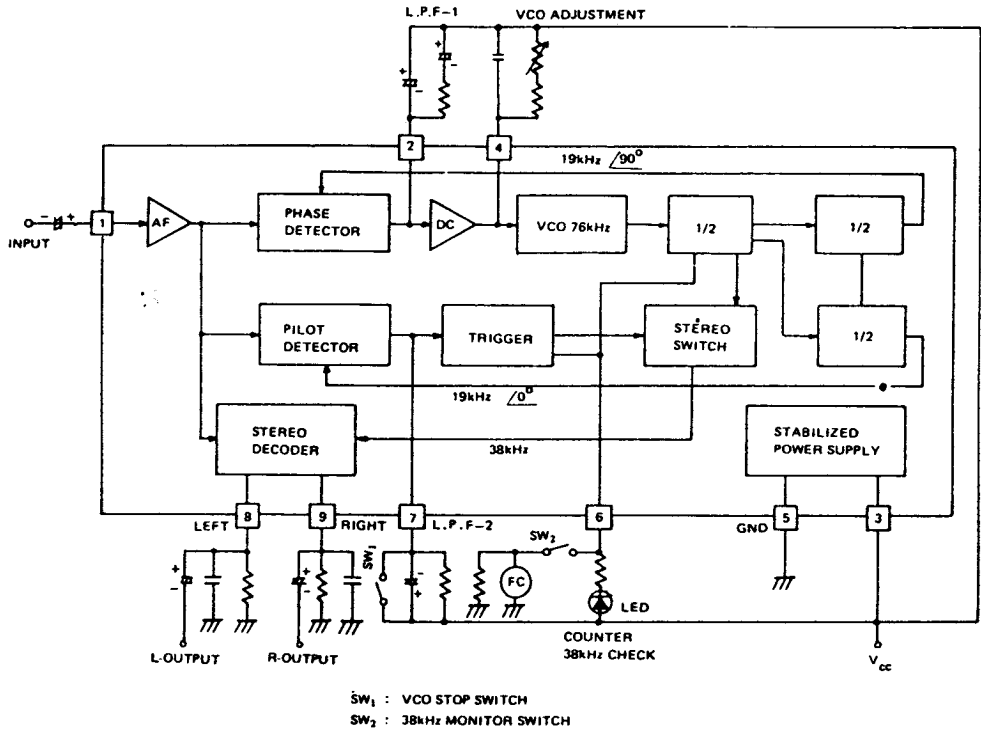
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit	
Supply Current		$I_{CC}$	at Lamp Off	—	11	18	mA	
Input Resistance		$R_{IN}$	—	—	33	—	k $\Omega$	
Max. Composite Signal Input Voltage		$V_{IN(MAX)}$ (Stereo)	L + R = 90%, P = 10%, THD = 1%	—	900	—	mVrms	
Channel Separation		$CH_{SEP}$	L + R = 180mVrms, P = 20mVrms	36	45	—	dB	
Total Harmonic Distortion	Monaural	THD (Monaural)	$V_{IN} = 200\text{mVrms}$	—	0.08	0.3	%	
Distortion	Stereo	THD (Stereo)	L + R = 180mVrms, P = 20mVrms	—	0.08	—	%	
Voltage Gain		$G_V$	$V_{IN} = 200\text{mVrms}$	-2	0.5	+2	dB	
Channel Balance		$CH_{BAL}$	$V_{IN} = 200\text{mVrms}$	—	0	1.5	dB	
Lamp Sensitivity	ON	$V_{L(ON)}$	Pilot Input	—	10	15	mVrms	
	OFF	$V_{L(OFF)}$		2	6	—	mVrms	
Stereo Lamp Hysteresis		$V_H$	To Turn Off from Lamp Turn On	—	3	—	mVrms	
Capture Range		C.R.	P = 20mVrms	—	$\pm 3$	—	%	
Carrier Leak	19kHz	C.L.	L + R = 180mVrms, P = 20mVrms	—	34	—	dB	
	38kHz			—	42	—		
Signal to Noise Ratio		S/N	$V_{IN} = 180\text{mVrms}$ , $f = 1\text{kHz}$ $R_g = 620\Omega$	—	74	—	dB	
Output Current(pin 8, pin 9)		$I_{OUT}$	$R_L = 3.3\text{k}\Omega$	$V_{CC} = 3.5\text{V}$	—	0.3	0.6	mA
				$V_{CC} = 8\text{V}$	—	1.2	1.8	
				$V_{CC} = 12\text{V}$	—	1.4	2.1	

## □ ELECTRICAL DC CHARACTERISTICS ( $V_{CC} = 8\text{V}$ , Terminal Voltage at No Signal)

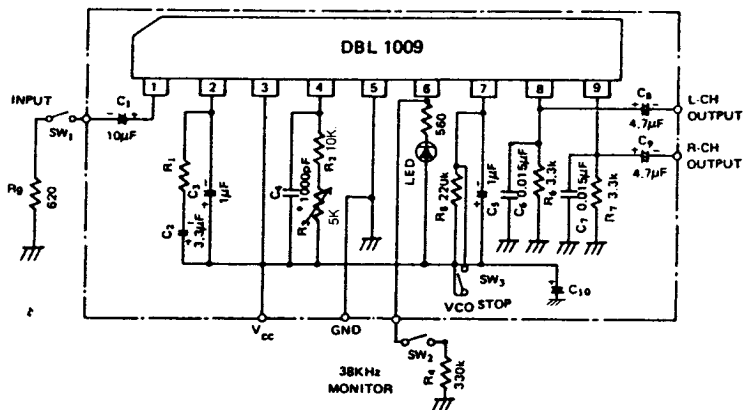
Characteristic	Symbol	Rating	Unit
Terminal 1. (Input)	$V_1$	3.5	V
2. (L.P.F 1)	$V_2$	6.6	V
3. ( $V_{CC}$ )	$V_3$	8	V
4. (VCO)	$V_4$	7.1	V
5. (GND)	$V_5$	0	V
6. (ST.LAMP)	$V_6$	—	V
7. (L.P.F 2)	$V_7$	7.4	V
8. (L-CH Output)	$V_8$	4	V
9. (R-CH Output)	$V_9$	4	V

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## □ BLOCK DIAGRAM



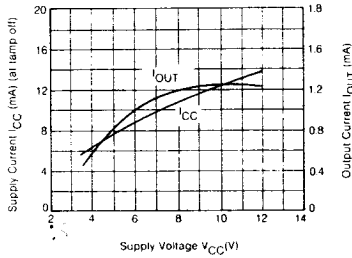
## □ TEST CIRCUIT



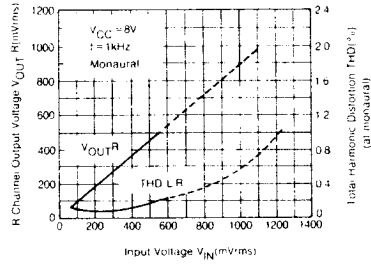
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## TYPICAL PERFORMANCE CHARACTERISTICS

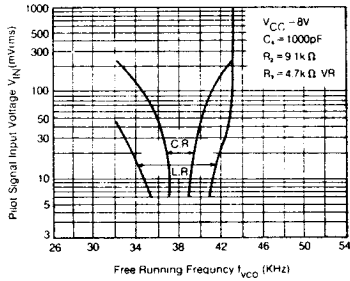
$I_{CC}, I_{OUT} - V_{CC}$



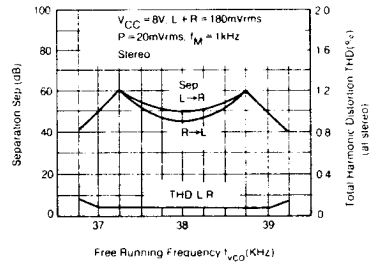
$V_{OUT}, R, THD - V_{IN}$



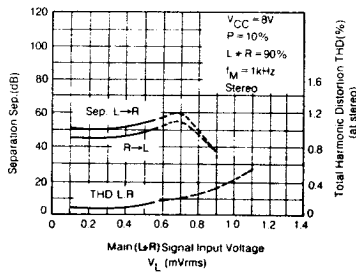
C.R & L.R



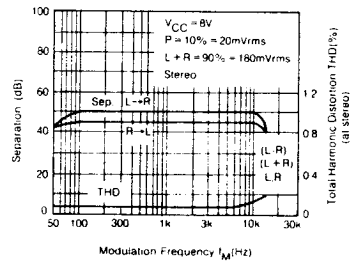
THD, Sep. -  $f_{VCO}$



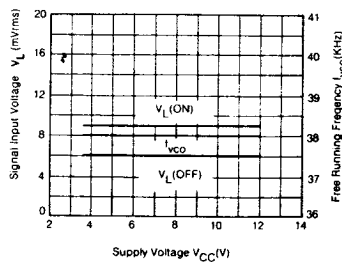
THD, Sep. -  $V_{IN}$



THD, Sep -  $f_M$



$V_{IN}, f_{VCO} - V_{CC}$



THD, Sep. -  $V_{CC}$

