

KEC

KOREA ELECTRONICS CO.,LTD.

**SEMICONDUCTOR
TECHNICAL DATA**

KIA6076F

BIPOLAR LINEAR INTEGRATED CIRCUIT

1.5V FM STEREO MULTIPLEX

The KIA6076F is FM PLL IC designed for low voltage operation (1.5V), which is suitable for stereo headphone radio. This can realize the low power dissipation.

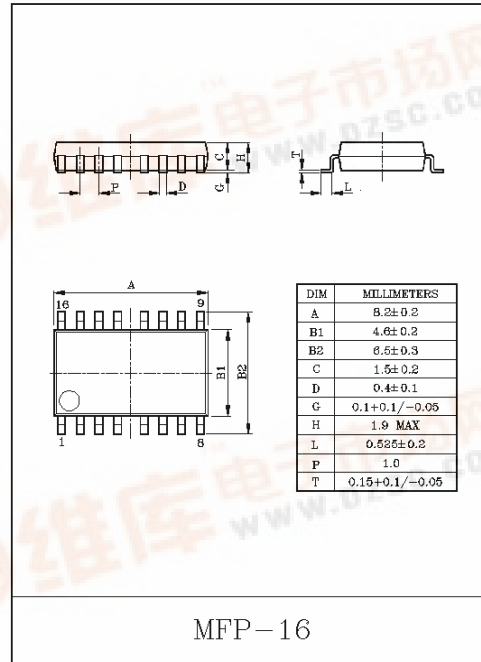
FEATURES

- LED driver for stereo indication ($V_{LED}=3\sim6V$).
- Adopting the LC type oscillator ($f_{VCO}=456kHz$).
- Built-in compulsive monaural function (V_{CC} stop, pin 13).
- Free running frequency monitor terminal.
pin 8 : $f_{FREE}=19kHz$.
- Excellent low supply current : $I_{CC}=0.8mA(Typ.)$
($V_{CC}=1.5V, T_a=25^{\circ}C$).
- Operating supply voltage range : $V_{CC(opr.)}=0.9\sim5V(T_a=25^{\circ}C)$.

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

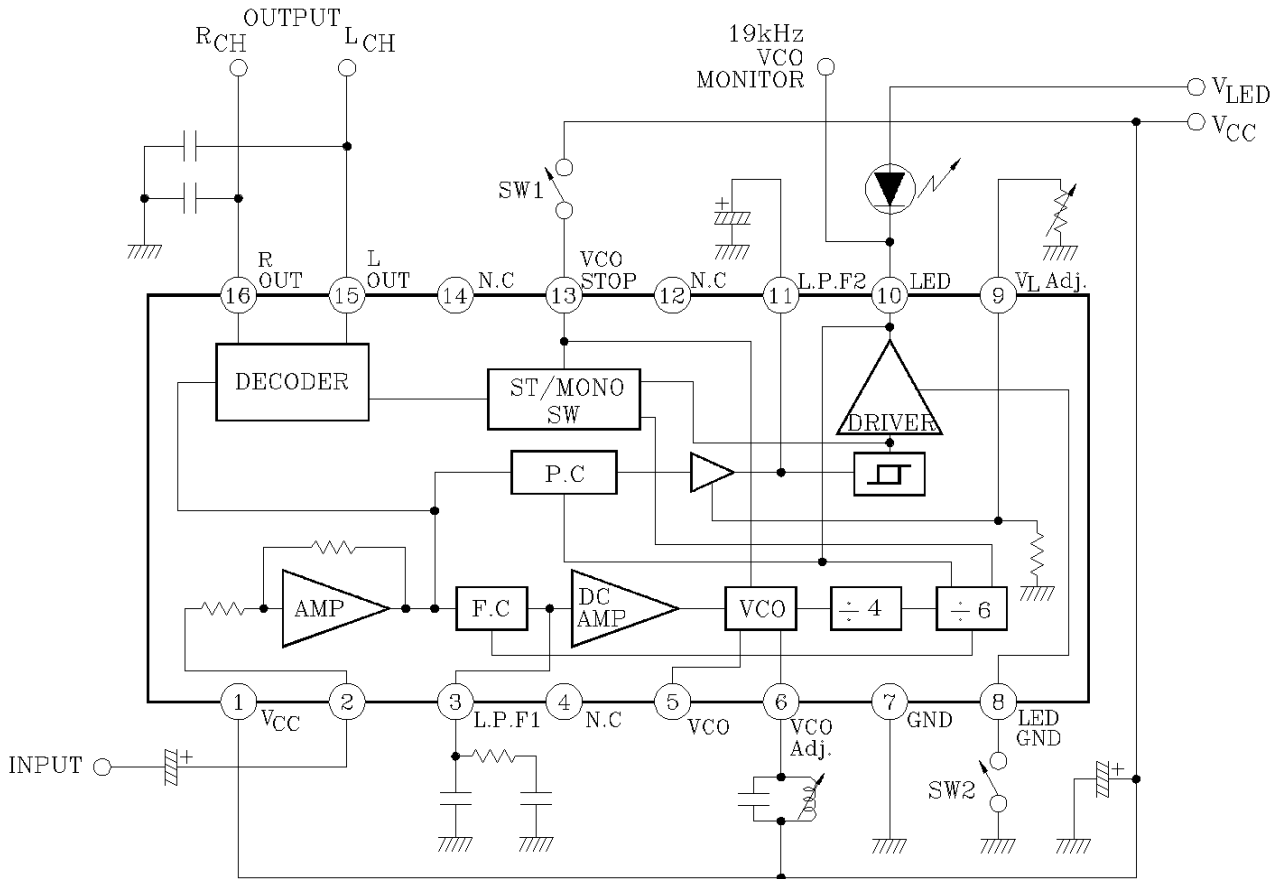
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	5	V
Lamp Current	I_{LAMP}	5	mA
Lamp Voltage	V_{LAMP}	6	V
Power Dissipation (Note)	P_D	350	mW
Operating Temperature	T_{opr}	-25~75	$^{\circ}C$
Storage Temperature	T_{stg}	-55~150	$^{\circ}C$

Note : Derated above $T_a=25^{\circ}C$ in the proportion of 2.8mW/ $^{\circ}C$ for KIA6076F



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BLOCK DIAGRAM



SW1 : VCO STOP SWITCH (COMPULSIVE MONAURAL)
 SW2 : VCO MONITOR SWITCH

Note : pin (4), (12), (14), are no connected.

DC CHARACTERISTICS

($V_{CC}=1.5V$, $T_a=25^{\circ}C$, Terminal voltage at no signal)

PIN NO.	ITEM	SYMBOL	TYP.	UNIT	PIN NO.	ITEM	SYMBOL	TYP.	UNIT
1	V_{CC}	V_1	1.5	V	9	V_L ADJUST	V_9	0.5	V
2	INPUT	V_2	0.6	V	10	LED	V_{10}	-	V
3	L.P.F.1	V_3	0.7	V	11	L.P.F.2	V_{11}	0.7	V
4	N.C.	V_4	-	V	12	N.C.	V_{12}	-	V
5	V_{CO}	V_5	0.8	V	13	V_{CO} STOP	V_{13}	-	V
6	V_{CO}	V_6	1.5	V	14	N.C.	V_{14}	-	V
7	GND	V_7	0	V	15	Lch OUTPUT	V_{15}	0.65	V
8	LED GND	V_8	0	V	16	Rch OUTPUT	V_{16}	0.65	V

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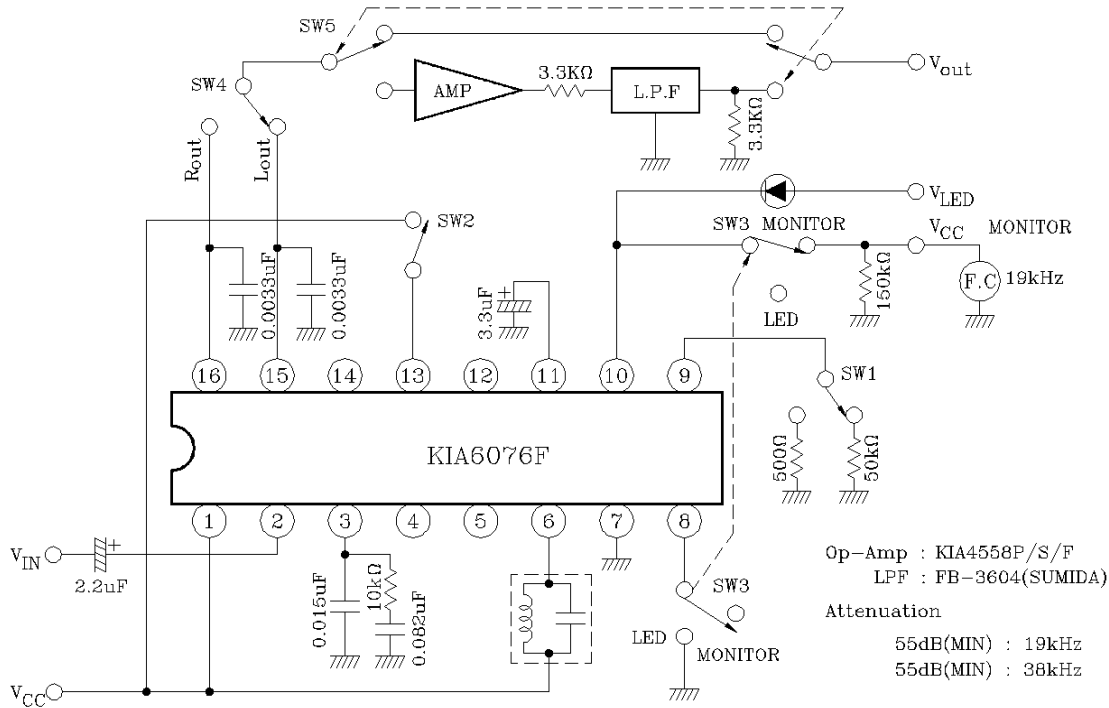
ELECTRICAL CHARACTERISTICS (AC) (Unless otherwise specified, $T_a=25^{\circ}\text{C}$, $V_{CC}=1.5\text{V}$, $f=1\text{kHz}$)

CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Supply Current		I_{CC}	-	at Lamp off	-	0.8	1.6	mA	
Input Resistance		R_{IN}	-		-	36	-	k Ω	
Output Resistance		R_{OUT}	-		-	15	-	k Ω	
Max. Composite Signal Input Voltage		$V_{IN}(\text{MAX.})$ (STEREO)	-	L+R=90%, P=10% SW1 \rightarrow R _{LED} =50k Ω SW5 \rightarrow LPF ON	-	250	-	mV _{rms}	
Separation		Sep.	-	L+R=90mV _{rms} P=10mV _{rms} SW1 \rightarrow R _{LED} =50k Ω SW5 \rightarrow LPF ON	fm=100Hz	-	30	-	dB
					fm=1kHz	22	35	-	
					fm=10kHz	-	30	-	
Total Harmonic Distortion	Monaural	THD (MONAURAL)	-	$V_{IN}=100\text{mV}_{rms}$, SW1 \rightarrow R _{LED} =500 Ω	-	0.2	1.5	%	
	Stereo	THD (STEREO)		L+R=90mV _{rms} , P=10mV _{rms} fm=1kHz, SW1 \rightarrow R _{LED} =50k Ω SW5 \rightarrow LPF ON	-	0.4	-		
Voltage Gain		G_v	-	$V_{IN}=100\text{mV}_{rms}$, SW1 \rightarrow R _{LED} =500 Ω	-4	-2	1	dB	
Channel Balance		C.B.	-	$V_{IN}=100\text{mV}_{rms}$, SW1 \rightarrow R _{LED} =500 Ω	-	0	2.0	dB	
Lamp ON Sensitivity		$V_L(\text{ON})$	-	Pilot Input	-	-	-	5	
Lamp OFF Sensitivity		$V_L(\text{OFF})$	-						SW1 \rightarrow R _{LED} =500 Ω
Stereo Lamp Hysteresis		V_H	-	to turn-off from turn-on	-	3	-	mV _{rms}	
Capture Range		C.R.	-	P=10mV _{rms}	-	± 3	-	%	
Carrier Leak	19kHz	C.L.	-	P=10mV _{rms} , SW1 \rightarrow R _{LED} =50k Ω L+R=90mV _{rms}	-	30	-	dB	
	38kHz				-	50	-		
SCA Rejection Ratio		SCA Rej.	-	P=10mV _{rms} , L+R=80mV _{rms} SCA=10mV _{rms} , $f_{SCA}=67\text{kHz}$, SW1 \rightarrow R _{LED} =50k Ω	-	70	-	dB	
Signal to Noise Ratio		S/N	-	$V_{IN}=100\text{mV}_{rms}$, $R_g=620\Omega$	-	65	-	dB	

Note : Carrier Leak of 38kHz is only carrier.

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TEST CIRCUIT



SW1 : Lamp (Stereo Indicator) ON/OFF Check

Lamp ON SW1 : 50k Ω
Lamp OFF SW1 : 500 Ω

SW2 : VCO Stop Switch pin (13) connected to V_{CC} (Compulsive Monaural)

SW3 : VCO Monitor
At Monitor Mode, pin (10) is connected to the resistor (150k Ω) at Test Circuit.
In case that the input has no pilot signal and pin (8) is connected to GND, it is possible to check the VCO frequency, too.

SW4 : Lout/Rout Switchover

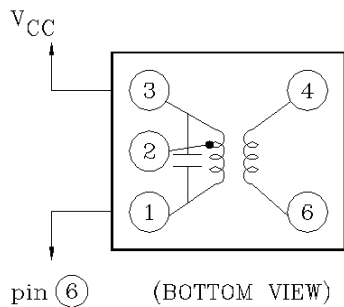
SW5 : Low Pass Filter Switchover

Note : In the test of ELECTRICAL CHARACTERISTIC

Monaural Mode (V_{IN}=100mV_{rms}) SW1 : 500 Ω

Stereo Mode (L+R=90mV_{rms}, P=10mV_{rms}) SW1 : 50k Ω

COIL DATA (TEST CIRCUIT)



C ₀ (pF)	f (kHz)	Q ₀	TURNS		
			1-2	2-3	4-6
180	455	110	146	6	13

(K) : KSAD106

(S) : 44M-037-935C

WITE : 0.07mm ϕ UEW

Note ; (K) : KWANGSUNG ELECTRIC CO., LTD. (Tel : (02) 716-0034)

(S) : SUMIDA ELECTRIC CO., LTD.

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EXPLANATION OF INTERNAL CIRCUITS AND FUNCTIONS

(1) Input Circuit

This circuit is composed of the inverted amplifier as shown Fig.1.

In case of the large signal input, R_f (the external resistance, in series) can reduce the voltage gain.

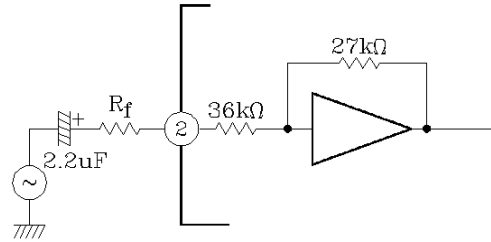


Fig. 1

(2) Lamp-ON Sensitivity and Stereo/Monaural Sensitivity

It is possible to adjust the Lamp-on sensitivity and the Stereo sensitivity by the external resistance (R_T) which is connected to the terminal pin⑨.

The output current (I_o) of the synchronous detector is determined by the input pilot signal. As the value of R_T is larger, the Lamp-on sensitivity and the Stereo Sensitivity become more increasing, because the current (I_1) of Q1 is decreasing, and the current (I_2) is increasing.

However, in case that the terminal pin⑨ is open, the Stereo Sensitivity is too increasing, the stereo switch remains turned-on, without pilot signal. Therefore, the value of R_T is efficient about $10k\Omega \sim 50k\Omega$

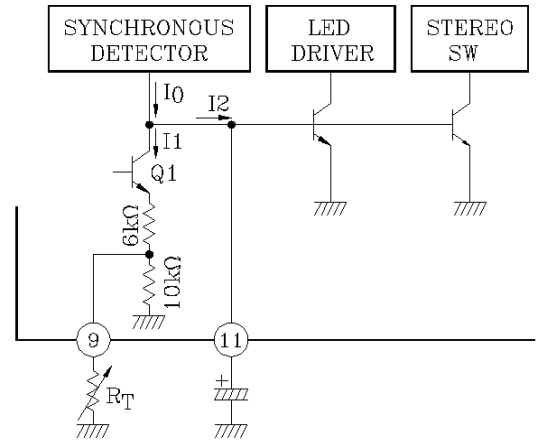


Fig. 2

(3) f_{VCO} Monitor

The LED terminal pin⑩ can be used as f_{VCO} (19kHz) monitor terminal, in case that the terminal pin⑧ is open, as Fig.3.

Under unlocked condition, in case that the terminal pin⑧ is connected to GND, it can be done, too.

In case that the LED indicator is not necessary, it is better that the terminal pin⑧ is open, because of the save of the supply current.

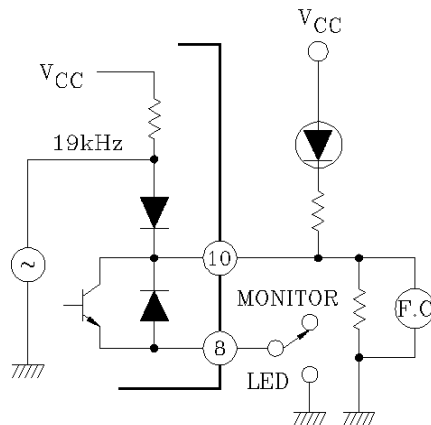


Fig. 3

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(4) Compulsive Monaural function

In Case that the terminal pin⑬ is connected to V_{CC} as Fig.4, this item becomes compulsive monaural mode, That causes the V_{CO} stopping. Connected as Fig.5, switchover between AM/FM mode is possible with one-make switch.

(5) Anti-birdy Effect

KIA6076F have beat-prevent performance, because switching wave (38kHz) hardly has a number of odd harmonic frequency of 38kHz in internal circuit.

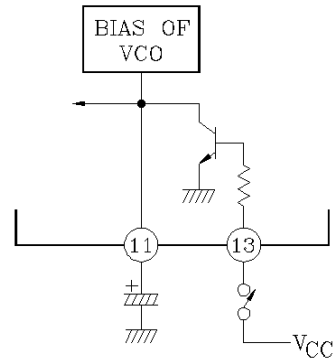


Fig. 4

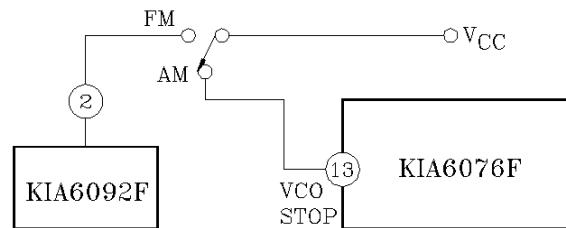
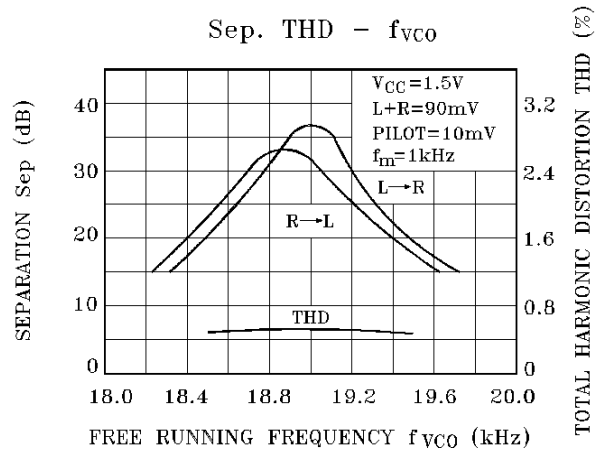
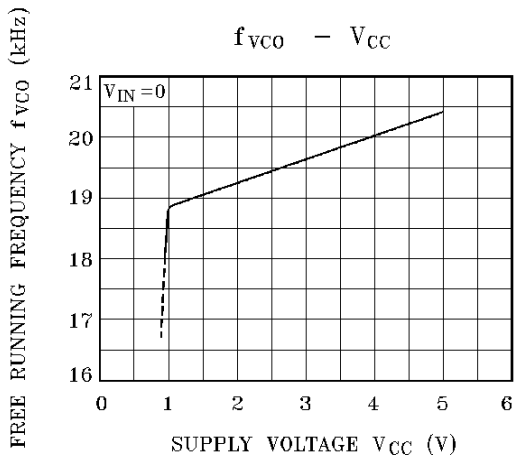
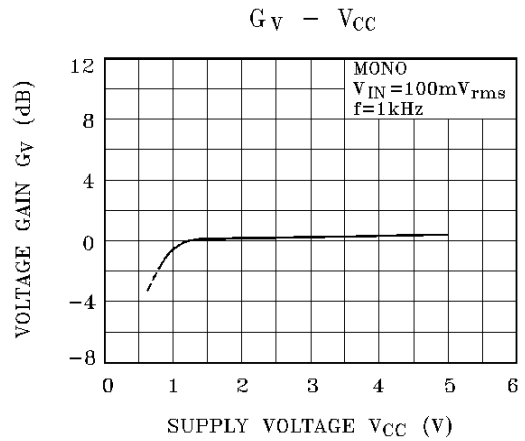
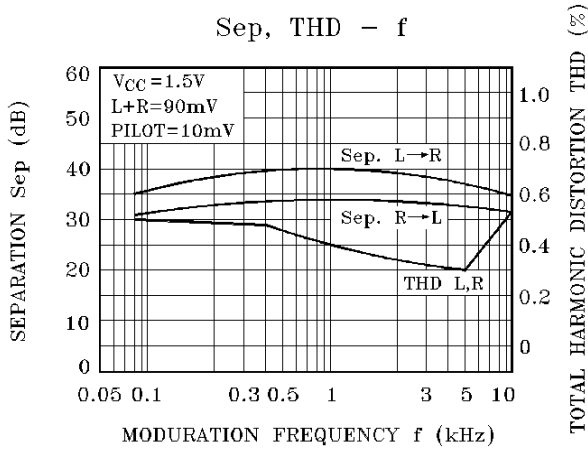
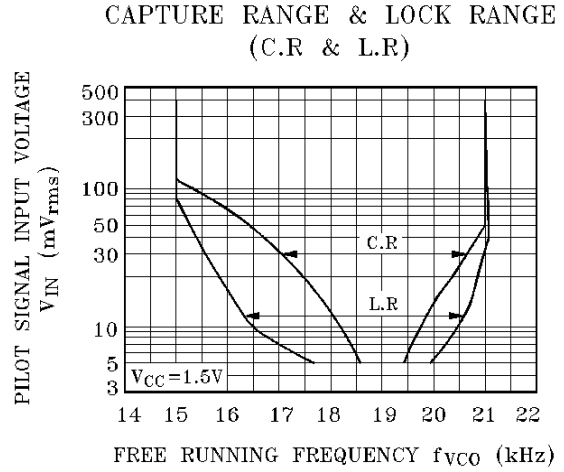
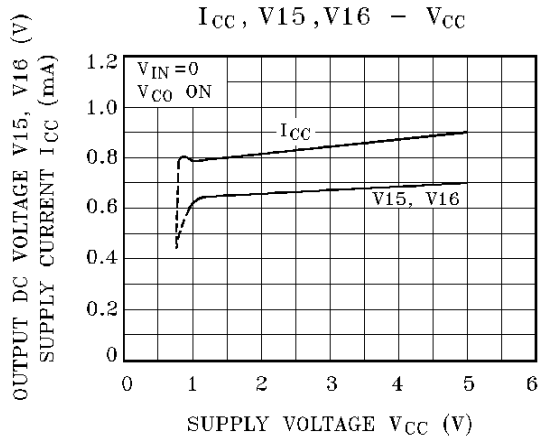


Fig. 5

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