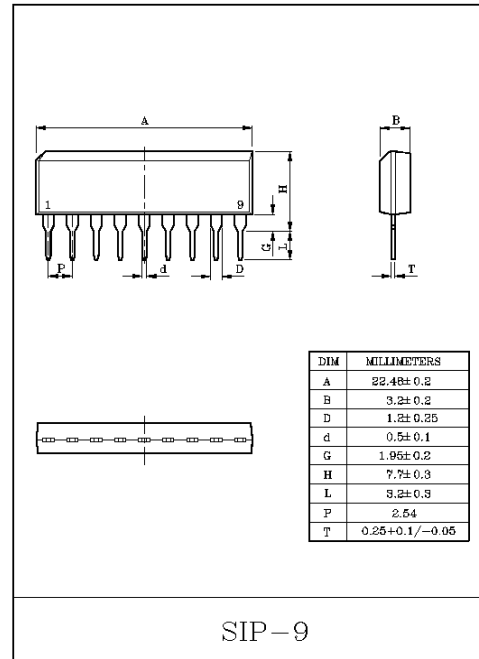


## FM STEREO MULTIPLEX FOR AUDIO

The KIA6043S is PLL FM stereo multiplex IC. It is suitable for automotive applications and portable radio applications because of space merit by the package and wide supply voltage range.

## FEATURES:

- Excellent Pilot Lamp Sensitivity  
:  $V_{L(ON)}=9mV_{rms}$  (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 :  $Sep=45dB(Typ.)$
- Low Distortion  
:  $THD=0.08\%(Typ.)$  at  $V_{IN}=200mV_{rms}(Stereo)$
- VCO Stop Capability (The VCO is stopped when the ⑦ pin 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 ⑥ pin.)



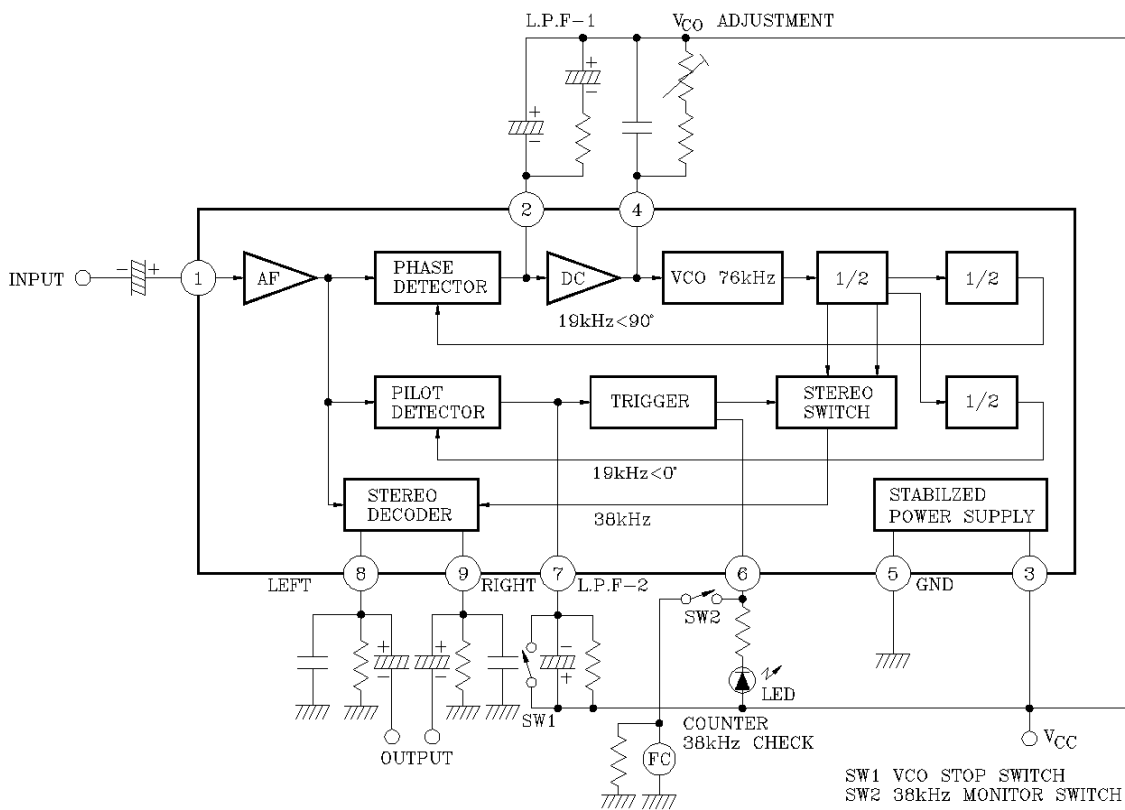
# KIA6043S

## MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	12	V
Lamp Voltage	V <sub>LAMP</sub>	16	V
Lamp Current	I <sub>LAMP</sub>	20	mA
Power Dissipation (Note)	P <sub>D</sub>	500	mW
Operating Temperature	T <sub>opr</sub>	-30~75	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C

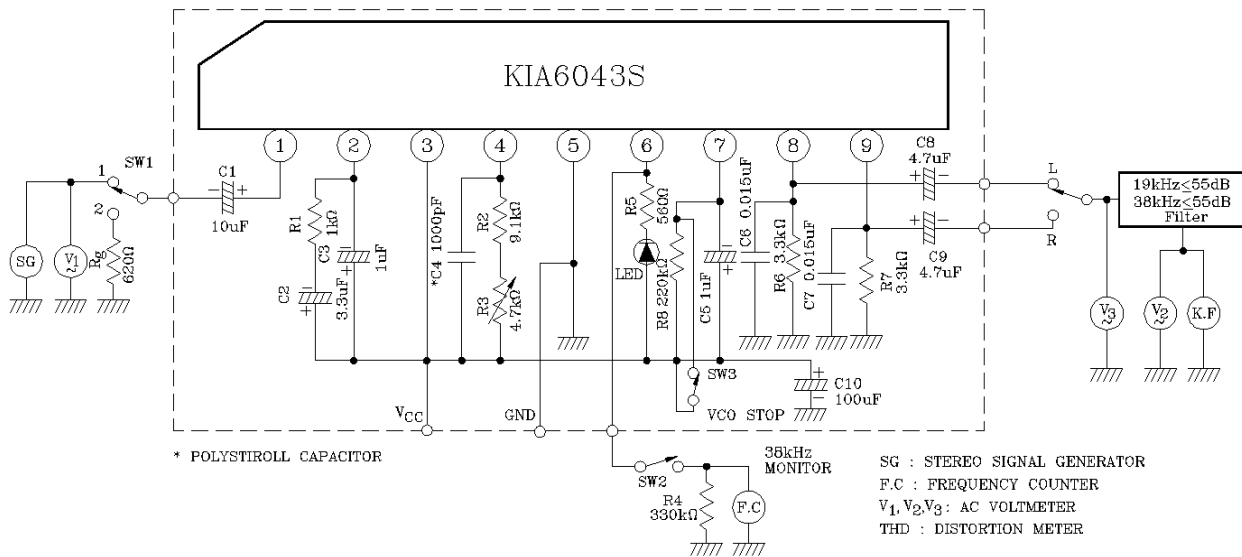
Note : Derated above Ta=25°C in the Proportion of 4mW/°C for KIA6043S

## BLOCK DIAGRAM



# KIA6043S

## TEST CIRCUIT



## ELECTRICAL CHARACTERISTICS

1. DC CHARACTERISTICS (T<sub>a</sub>=25°C, V<sub>CC</sub>=8V, Terminal Voltage at No Signal)

PIN NO.	ITEM	SYMBOL	Typ.	UNIT
1	INPUT	V <sub>1</sub>	3.5	V
2	L.P.F.1	V <sub>2</sub>	6.6	V
3	V <sub>CC</sub>	V <sub>3</sub>	8.0	V
4	VCO	V <sub>4</sub>	7.1	V
5	GND	V <sub>5</sub>	0	V
6	ST. LAMP	V <sub>6</sub>	-	V
7	L.P.F.2	V <sub>7</sub>	7.4	V
8	L-CH OUTPUT	V <sub>8</sub>	4.0	V
9	R-CH OUTPUT	V <sub>9</sub>	4.0	V

Note : No Describing terminals of KIA6043S denote no connection.

# KIA6043S

## 2. AC ELECTRICAL CHARACTERISTICS

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

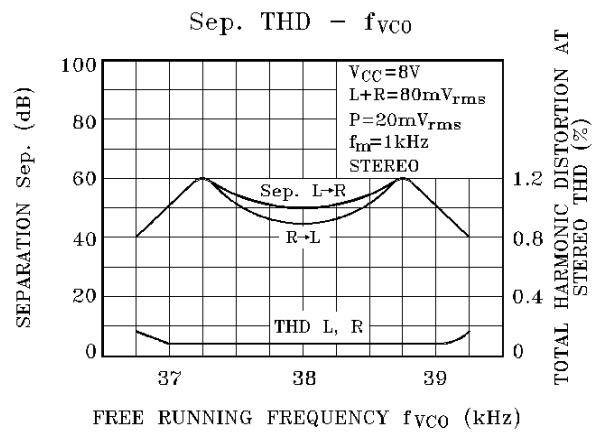
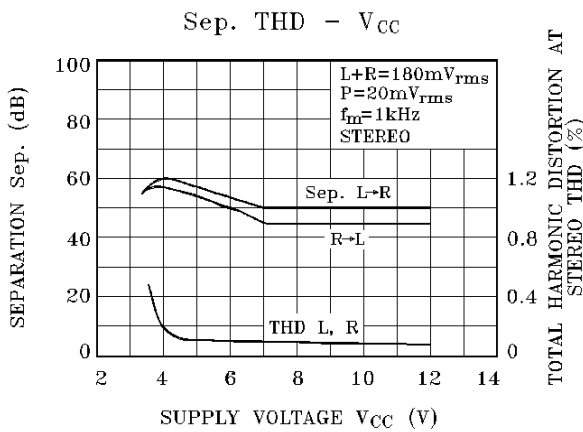
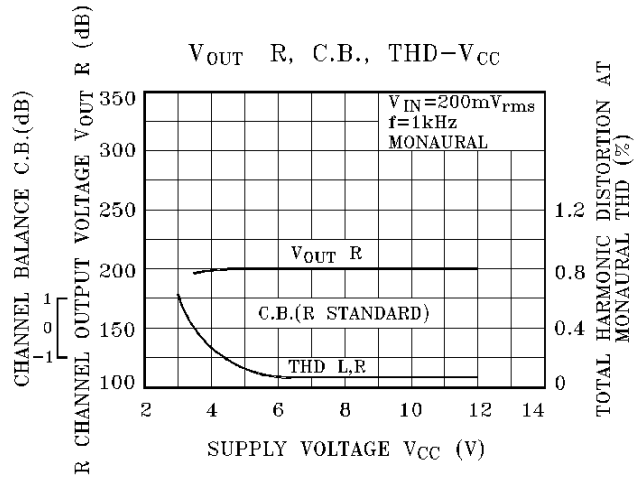
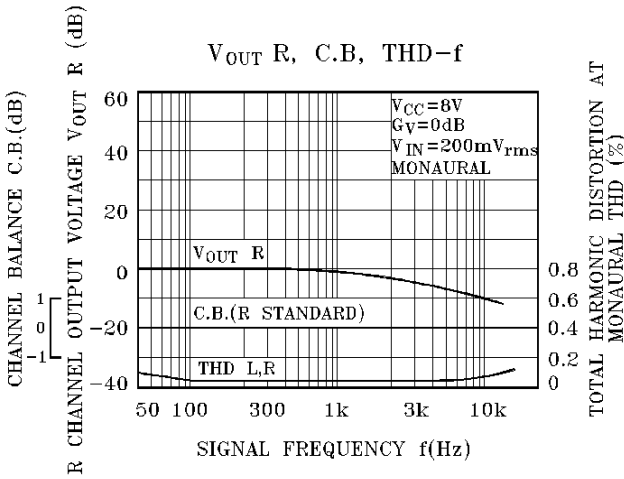
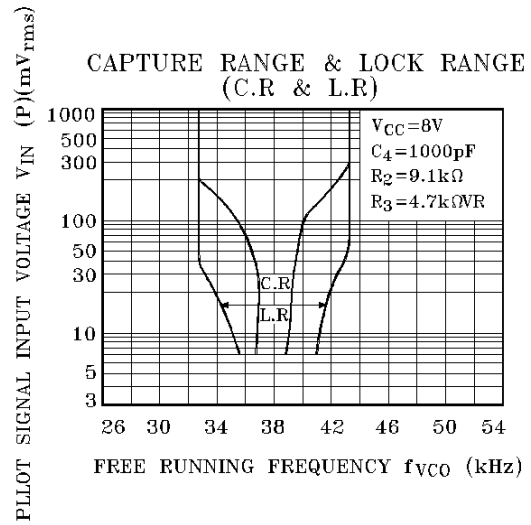
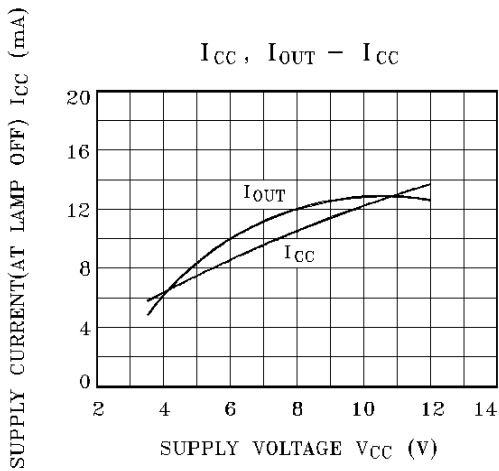
CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Supply Current		$I_{CC}$	-	at Lamp off	-	11	18	mA	
Input Resistance		$R_{IN}$	-		-	33	-	$k\Omega$	
Max. Composite Signal Input Voltage		$V_{IN\ MAX}$ (stereo)	-	L+R=90%, P=10%	-	900	-	$mV_{rms}$	
Separation		Sep.	-	L+R=180 $mV_{rms}$ P=20 $mV_{rms}$	36	45	-	dB	
Total Harmonic Distortion	Monaural	THD (monaural)	-	$V_{IN}=200mV_{rms}$	-	0.08	0.3	%	
	Stereo	THD (stereo)	-	L+R=180 $mV_{rms}$ P=20 $mV_{rms}$	-	0.08	-	%	
Voltage Gain		$G_V$	-	$V_{IN}=200mV_{rms}$	-2.0	0.5	+2.0	dB	
Channel Balance		C.B.	-	$V_{IN}=200mV_{rms}$	-	0	1.5	dB	
Lamp Sensitivity	ON	$V_{L(ON)}$	-	Pilot Input	-	9	15	$mV_{rms}$	
	OFF	$V_{L(OFF)}$	-		2	6	-	$mV_{rms}$	
Stereo Lamp Hysteresis		$V_H$	-	To Turn Off from Lamp Turn On	-	3	-	$mV_{rms}$	
Capture Range		C.R.	-	P=20 $mV_{rms}$	-	$\pm 3$	-	%	
Carrier Leak	19kHz	C.L.	-	L+R=180 $mV_{rms}$ P=20 $mV_{rms}$	-	34	-	dB	
	38kHz				-	42	-		
SCA Rejection Ratio		SCA Rej.	-	L+R=160 $mV_{rms}$ P=20 $mV_{rms}$ SCA=20 $mV_{rms}$ $f_{SCA}=67\text{kHz}$	-	70	-	dB	
Signal to Noise Ratio		S/N	-	$V_{IN}=200mV_{rms}$ , $f=1\text{kHz}$ $R_g=620\Omega$	-	74	-	dB	
Output Current (pin ⑧, pin ⑨)		$I_{OUT}$	-	$R_L=3.3k\Omega$	$V_{CC}=3.5\text{V}$	-	0.3	0.6	mA
					$V_{CC}=8.0\text{V}$	-	1.2	1.8	
					$V_{CC}=12\text{V}$	-	1.4	2.1	

# KIA6043S

EXTERNAL PARTS TABLE

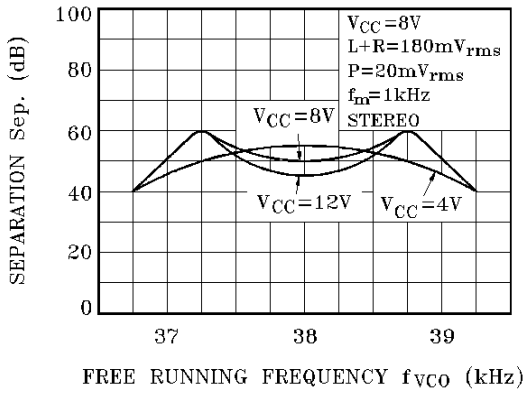
PARTS NUMBER	TYPICAL	PURPOSE	INFLUENCE		NOTE
			SMALLER THAN TYP.	GREATER THAN TYP.	
C <sub>1</sub>	10 $\mu$ F	Coupling	Sep. is bad at 50~300Hz	"POP" Noise is High	Input
C <sub>2</sub>	3.3 $\mu$ F	L.P.F at PLL	THD is bad at 5k~10kHz (stereo)	Narrow Capture Range	-
C <sub>3</sub>	1 $\mu$ F				
R <sub>1</sub>	1k $\Omega$				
C <sub>4</sub>	1000pF	VCO Free Running Frequency adjustment	C <sub>4</sub> : Small→Wide Capture Range and Large Gitter C <sub>4</sub> : Large→Narrow Capture Range		-
R <sub>2</sub>	9.1k $\Omega$				
R <sub>3</sub>	4.7k $\Omega$ VR				
R <sub>4</sub>	330k $\Omega$	Monitor Load	-		-
R <sub>5</sub>	560 $\Omega$	Rush Current Limiter	IC is Damaged by the Rush Current	Lamp is Dark	I <sub>LAMP</sub> ≤ 20mA
LED	-	Stereo Indicator			
C <sub>6</sub>	0.015 $\mu$ F	Load and Deemphasis	Deemphasis (50 $\mu$ sec)		C <sub>6</sub> =0.022 $\mu$ F for 75 $\mu$ sec
R <sub>6</sub>	3.3k $\Omega$		Output Voltage is small	THD is Bad for Low V <sub>CC</sub>	
C <sub>7</sub>	0.015 $\mu$ F	"	"		"
R <sub>7</sub>	3.3k $\Omega$				
C <sub>8</sub>	4.7 $\mu$ F	Output Coupling	Frequency Response is Bad	"POP" Noise is Large	L-CH R-CH
C <sub>9</sub>	4.7 $\mu$ F	"			
R <sub>8</sub>	220k $\Omega$	Lamp Sensitivity Adjustment	V <sub>L(ON)</sub> is Large	V <sub>L(ON)</sub> is Small	-
C <sub>5</sub>	1 $\mu$ F	L.P.F at Lamp	THD is Bad at 50~300Hz	Slow Lamp Response	-

# KIA6043S

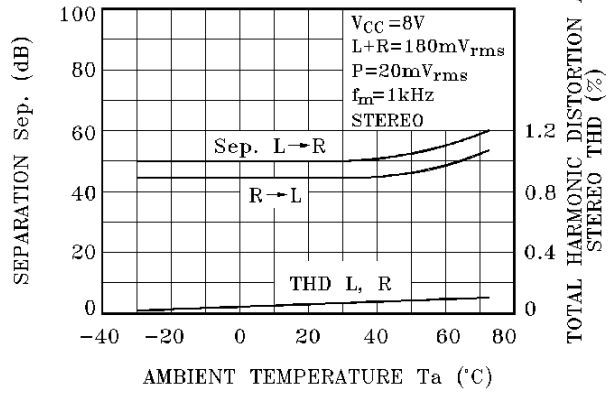


# KIA6043S

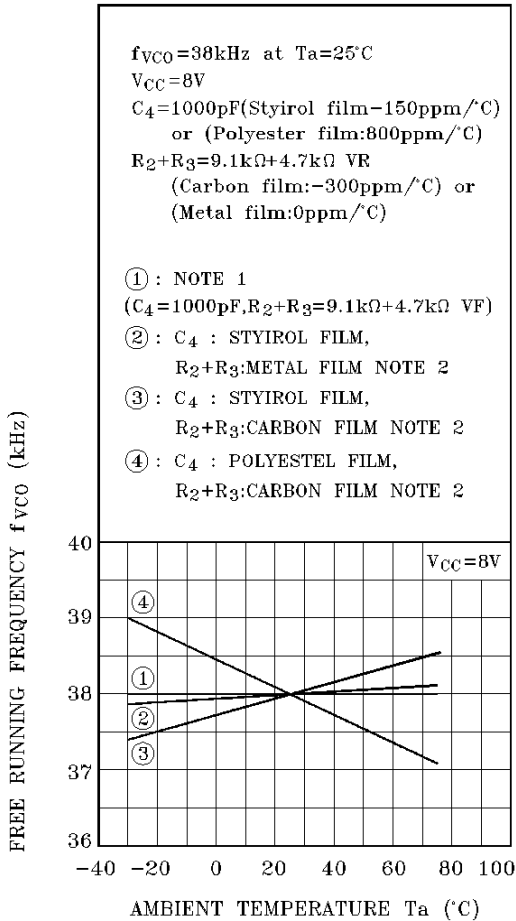
Sep. -  $f_{VCO}$



Sep., THD -  $T_a$



$f_{VCO}$  -  $T_a$



Note 1) ① : With IC only put into a temperature test chamber

Note 2) ② ③ ④ : With IC, resistors and capacitors put into a temperature test chamber.