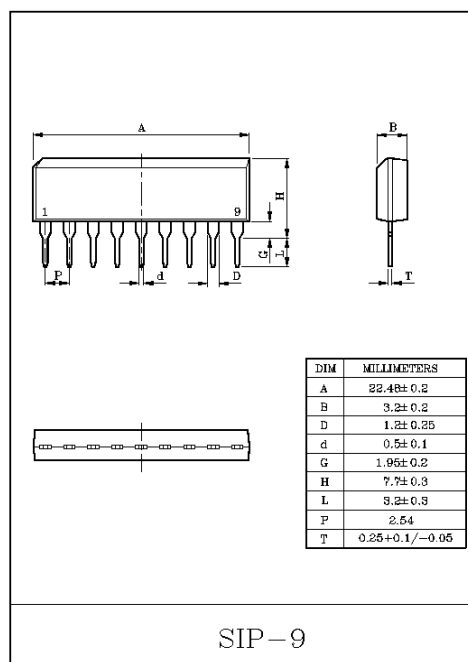


FM STEREO MULTIPLEX FOR AUDIO

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
: $V_{IN}=200\sim700mV_{rms}$
- Operating Supply Voltage Range : $V_{CC}=3.5\sim12V$
- 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.)

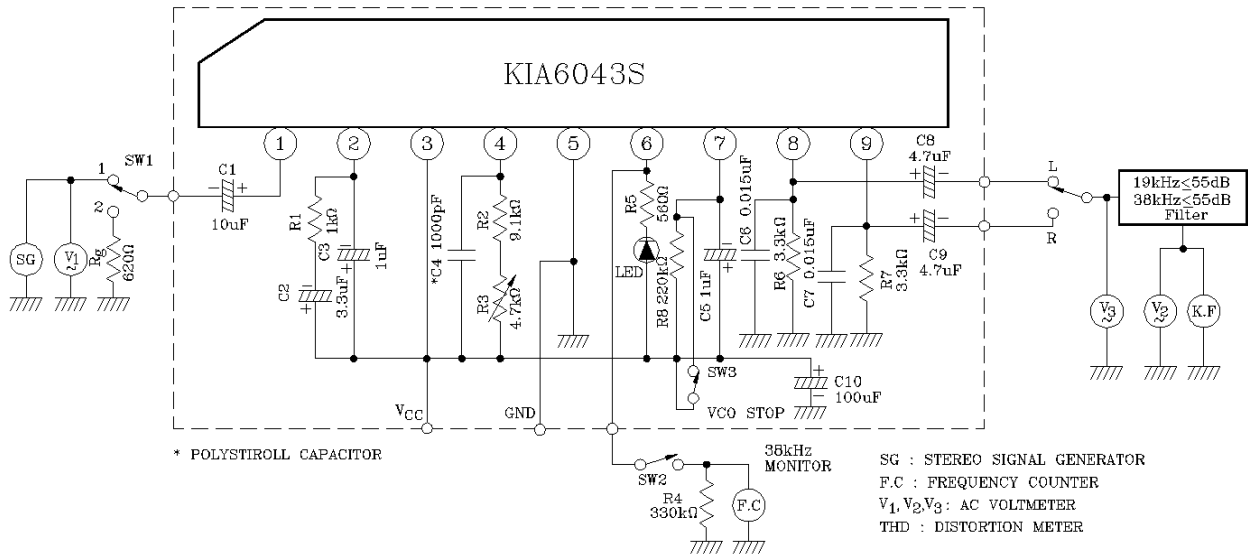


CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	12	V
Lamp Voltage	V_{LAMP}	16	V
Lamp Current	I_{LAMP}	20	mA
Power Dissipation (Note)	P_D	500	mW
Operating Temperature	T_{opr}	-30~75	℃
Storage Temperature	T_{stg}	-55~150	℃

Block diagram of a stereo FM receiver circuit. The circuit includes an input stage (1), an AF amplifier, a phase detector, a DC block, a VCO (76kHz), a 1/2 frequency divider, a pilot detector, a trigger, a stereo switch, a stereo decoder, a stabilized power supply, and a counter (38kHz). The output is split into left and right channels (8, 9) and a right channel (7). The circuit also includes a VCO stop switch (SW1), a 38kHz monitor switch (SW2), and an LED indicator. The VCO is adjusted via a VCO adjustment potentiometer. The counter is connected to a 38kHz check signal. The circuit is powered by a stabilized power supply and a VCC source.

KIA6043S

TEST CIRCUIT



ELECTRICAL CHARACTERISTICS

1. DC CHARACTERISTICS (Ta=25°C, V_{CC}=8V, Terminal Voltage at No Signal)

PIN NO.	ITEM	SYMBOL	Typ.	UNIT
1	INPUT	V ₁	3.5	V
2	L.P.F.1	V ₂	6.6	V
3	V _{CC}	V ₃	8.0	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	4.0	V
9	R-CH OUTPUT	V ₉	4.0	V

Note : No Describing terminals of KIA6043S denote no connection.

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2. AC ELECTRICAL CHARACTERISTICS

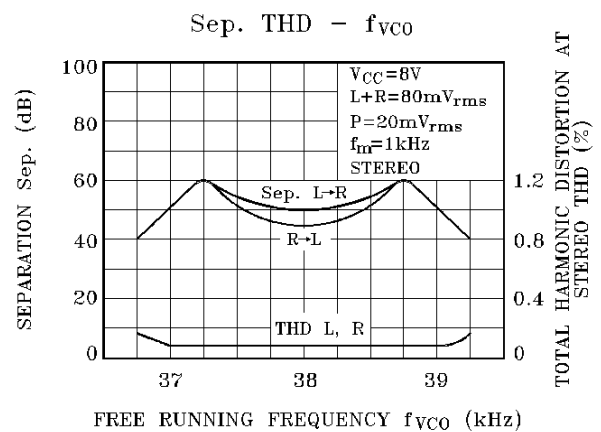
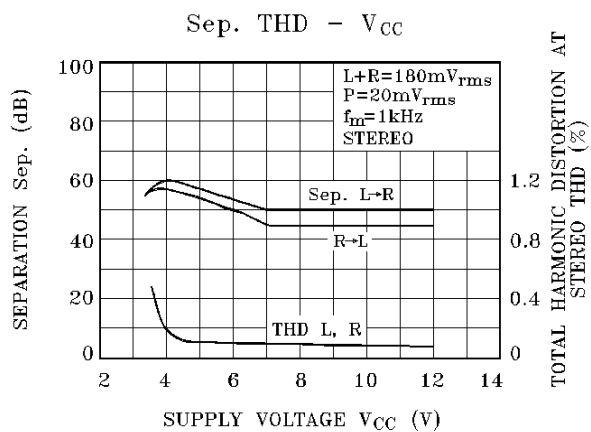
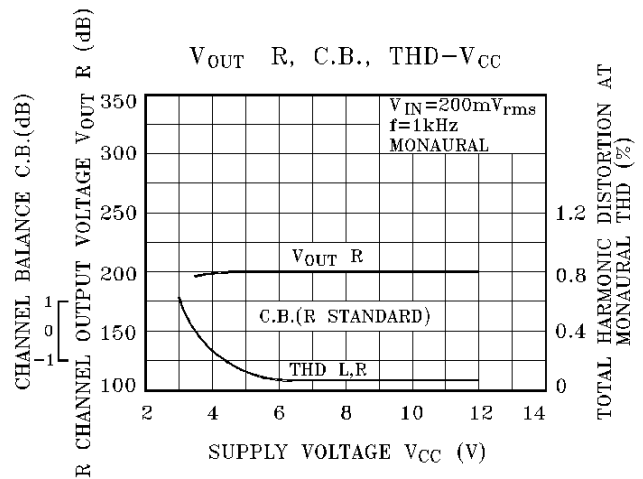
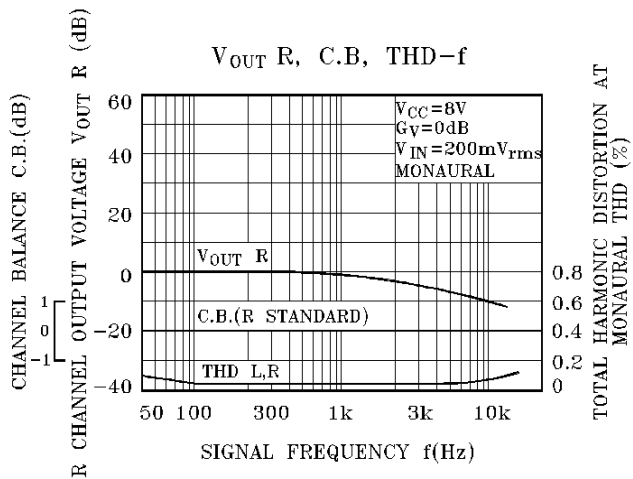
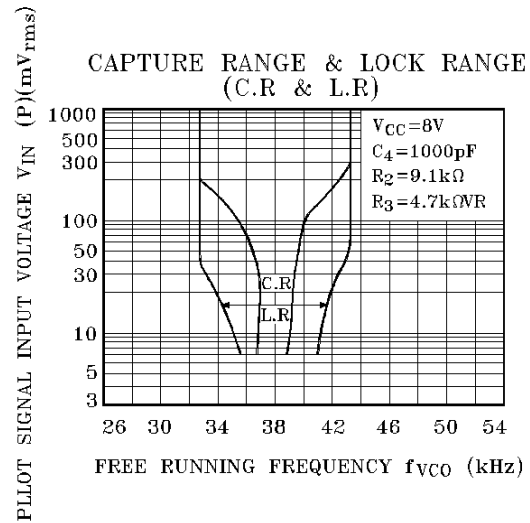
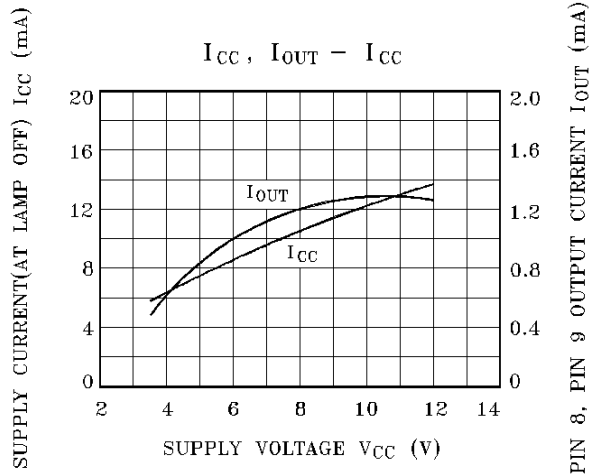
(Unless otherwise specified, Ta=25℃, V_{CC}=8V, f=1kHz)

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	-	kΩ
Max. Composite Signal Input Voltage		V _{IN} MAX (stereo)	-	L+R=90%, P=10%	-	900	-	mV _{rms}
Separation		Sep.	-	L+R=180mV _{rms} P=20mV _{rms}	36	45	-	dB
Total Harmonic Distortion	Monaural	THD (monaural)	-	V _{IN} =200mV _{rms}	-	0.08	0.3	%
	Stereo	THD (stereo)	-	L+R=180mV _{rms} P=20mV _{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=20mV _{rms}	-	±3	-	%
Carrier Leak	19kHz	C.L.	-	L+R=180mV _{rms} P=20mV _{rms}	-	34	-	dB
	38kHz				-	42	-	
SCA Rejection Ratio		SCA Rej.	-	L+R=160mV _{rms} P=20mV _{rms} SCA=20mV _{rms} f _{SCA} =67kHz	-	70	-	dB
Signal to Noise Ratio		S/N	-	V _{IN} =200mV _{rms} , f=1kHz R _g =620Ω	-	74	-	dB
Output Current (pin ⑧, pin ⑨)		I _{OUT}	-	R _L =3.3kΩ	V _{CC} =3.5V	-	0.3	mA
					V _{CC} =8.0V	-	1.2	
					V _{CC} =12V	-	1.4	

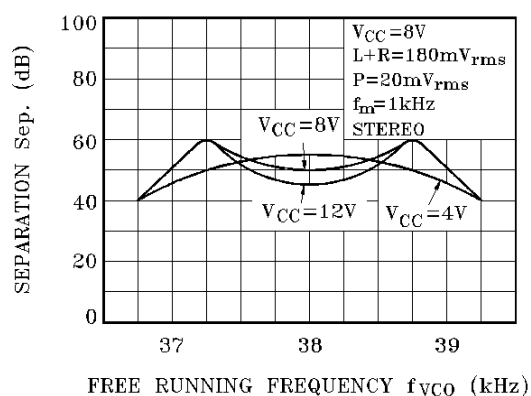
KIA6043S

EXTERNAL PARTS TABLE

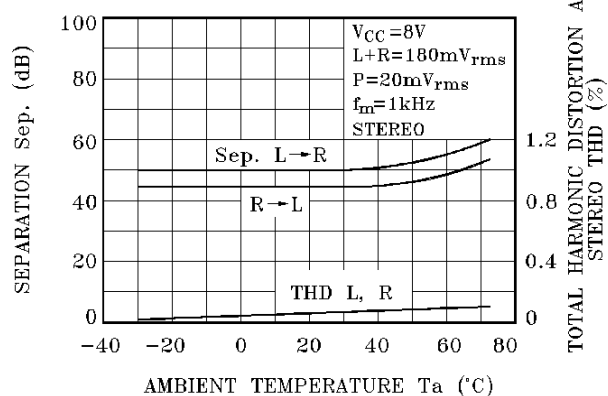
PARTS NUMBER	TYPICAL	PURPOSE	INFLUENCE		NOTE
			SMALLER THAN TYP.	GREATER THAN TYP.	
C ₁	10μF	Coupling	Sep. is bad at 50~300Hz	"POP" Noise is High	Input
C ₂	3.3μF	L.P.F at PLL	THD is bad at 5k~10kHz (stereo)	Narrow Capture Range	-
C ₃	1μF				
R ₁	1kΩ				
C ₄	1000pF	VCO Free Running Frequency adjustment	C4: Small→Wide Capture Range and Large Gitter C4: Large→Narrow Capture Range		-
R ₂	9.1kΩ				
R ₃	4.7kΩ VR				
R ₄	330kΩ	Monitor Load	-		-
R ₅	560Ω	Rush Current Limiter	IC is Damaged by the Rush Current	Lamp is Dark	I _{LAMP} ≤20mA
LED	-	Stereo Indicator			
C ₆	0.015μF	Load and Deemphasis	Deemphasis (50μsec)		C ₆ =0.022μF for 75μsec
R ₆	3.3kΩ		Output Voltage is small	THD is Bad for Low V _{CC}	
C ₇	0.015μF	"	"		"
R ₇	3.3kΩ				
C ₈	4.7μF	Output Coupling	Frequency Response is Bad	"POP" Noise is Large	L-CH R-CH
C ₉	4.7μF	"			
R ₈	220kΩ	Lamp Sensitivity Adjustment	V _{L(ON)} is Large	V _{L(ON)} is Small	-
C ₅	1μF	L.P.F at Lamp	THD is Bad at 50~300Hz	Slow Lamp Response	-



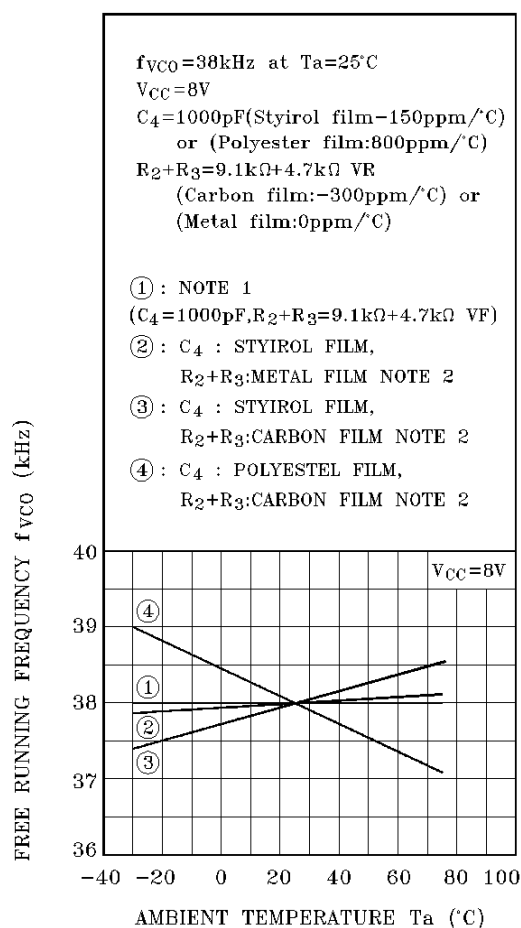
Sep. - f_{VCO}



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.