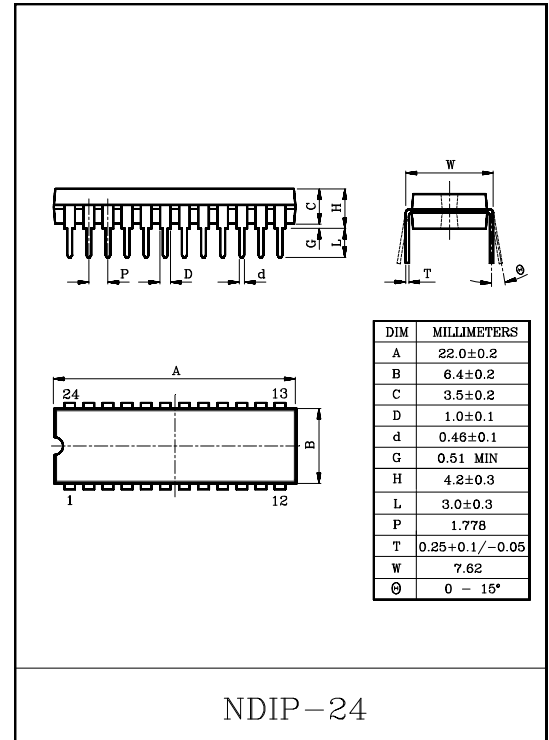


AM/FM IF + MPX (for Digital Tuning System)

KIA2057N is the AM/FM IF + MPX system IC, which is designed for DTS radios. This is included many functions and this can be used for digital tuning system with IF counter.

FEATURES

- Suitable for combination with digital tuning system which has IF counter.
- One terminal type AM/FM IF count output (auto stop signal) for IF counter of digital tuning system.
- Built-in mute circuit for IF count output.
- Adjustable for IF count output sensitivity by external resistance of pin ② (AM), and pin ③ (FM).
- For adopting ceramic discriminator and ceramic resonator, it is not necessary to adjust the FM quad detector circuit and MPX VCO circuit.
- Built-in AM local oscillator buffer output circuit.
- Built-in AM IF buffer output circuit for AM stereo.
- Operating supply voltage range ($T_a=25^\circ\text{C}$)
 $V_{CC}=3.5\sim 14\text{V}$



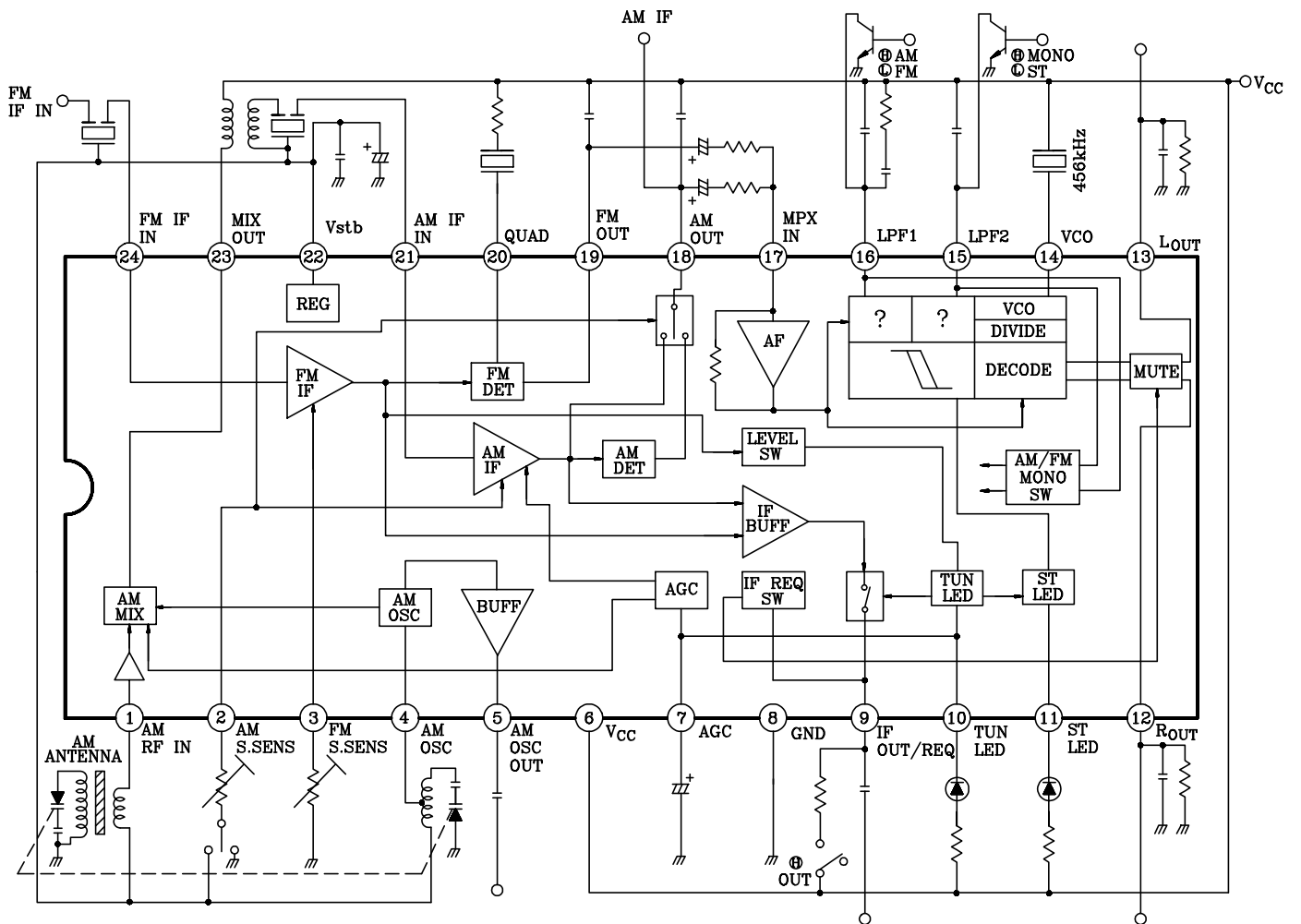
MAXIMUM RATINGS ($T_a=25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	14	V
LED Current	I_{LED}	10	mA
LED Voltage	V_{LED}	14	V
Power Dissipation	P_D (Note)	1200	mW
Operating Temperature	T_{opr}	-25~75	°C
Storage Temperature	T_{stg}	-55~150	°C

Note : Derated above 25°C in the proportion of $9.6\text{mW}/^\circ\text{C}$ for KIA2057N.

KIA2057N

BLOCK DIAGRAM



KIA2057N

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, Ta=25°C, V_{CC1}=5V, SW₃=OFF, SW₉=GND, SW₁₀=1

FM IF : f=10.7MHz, Δf=±22.5kHz, fm=1kHz

AM : f=1MHz, MOD=30%, fm=1kHz

MPX : fm=1kHz

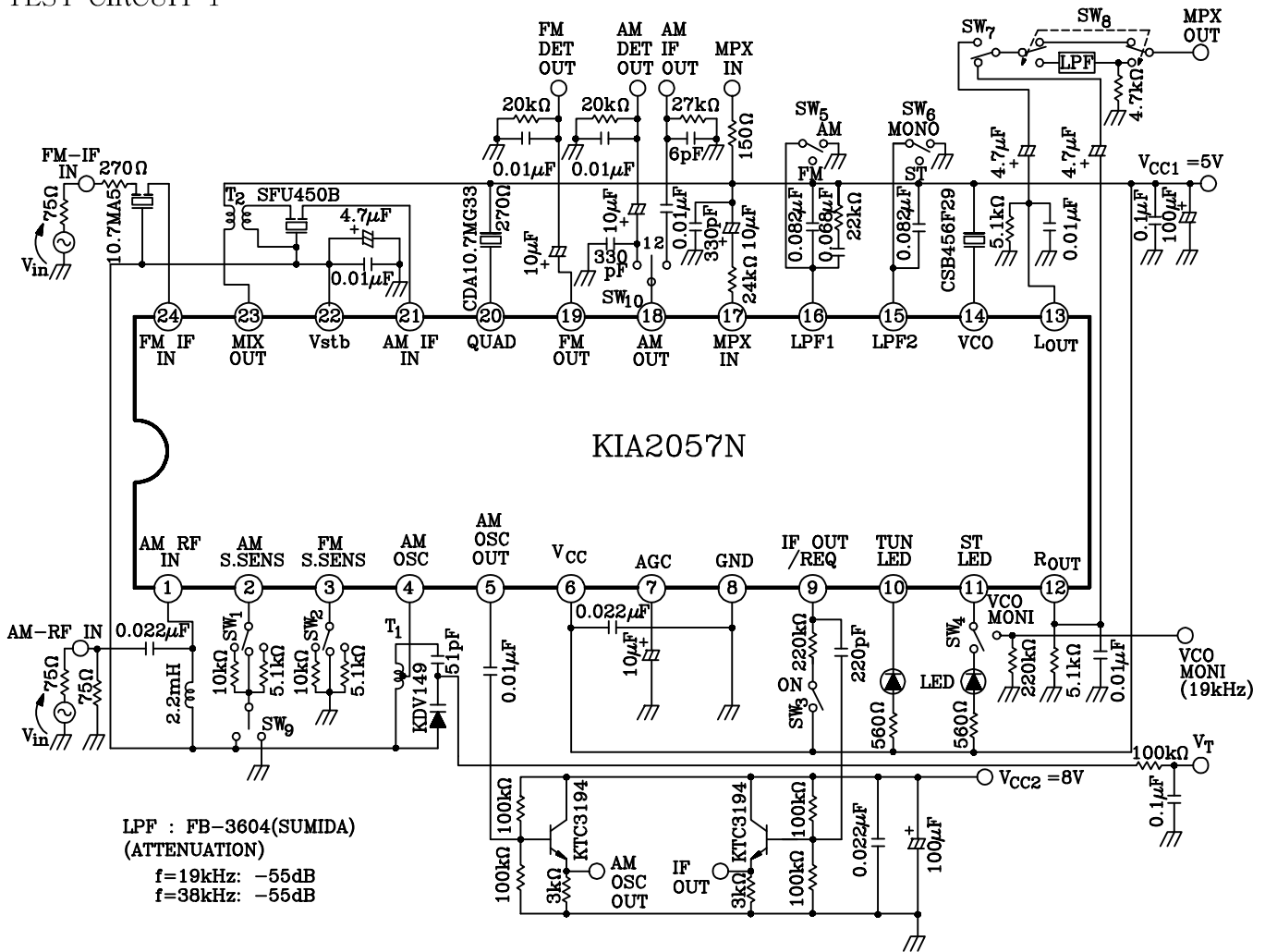
CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current		I _{CC} (FM)	1	V _{IN} =0, FM Mode	-	20	26	mA
		I _{CC} (AM)	1	V _{IN} =0, AM Mode	-	20	26	
FM IF	Input Limiting Voltage	V _{IN(lim)}	1	-3dB Limiting Point	38	43	48	dBμV EMF
	Recovered Output Voltage	V _{OD}	1	V _{IN} =80dBμV EMF	70	100	140	mV _{rms}
	Signal to Noise Ratio	S/N	1	V _{IN} =80dBμV EMF	-	70	-	dB
	Total Harmonic Distortion	THD	1	V _{IN} =80dBμV EMF	-	0.2	-	%
	AM Rejection Ratio	AMR	1	V _{IN} =80dBμV EMF	-	50	-	dB
	LED ON Sensitivity	V _L	1	I _L =1mA	43	48	53	dBμV EMF
	IF Count Output Voltage	V _{IF} (FM)	1	SW ₃ :ON, V _{IN} =80dBμV EMF	350	500	-	mV _{p-p}
	IF Count Output Sensitivity	I _{Fsens} (FM)	1	SW ₃ :ON, SW ₁ :0Ω	-	76	-	dBμV EMF
SW ₃ :ON, SW ₁ :5.1kΩ				-	62	-		
AM	Gain	G _v	1	V _{IN} =26dBμV EMF	37	70	105	mV _{rms}
	Recovered Output Voltage	V _{OD}	1	V _{IN} =60dBμV EMF	70	100	140	mV _{rms}
	Signal to Noise Ratio	S/N	1	V _{IN} =60dBμV EMF	-	45	-	dB
	Total Harmonic Distortion	THD	1	V _{IN} =60dBμV EMF	-	0.5	-	%
	LED ON Sensitivity	V _L	1	I _L =1mA	19	24	29	dBμV EMF
	Local OSC Buff Output Voltage	V _{OSC} (AM)	1	f _{osc} =1.45MHz	350	500	-	mV _{p-p}
				f _{osc} =27MHz	-	500	-	
	AM IF Output Voltage for AM Stereo	V _{IF} (ST)	1	SW ₉ :V _{stb} , V _{IN} =60dBμV EMF SW ₁₀ :2	800	1100	1400	mV _{p-p}
	IF Count Output Voltage	V _{IF} (AM)	1	SW ₃ :ON, V _{IN} =60dBμV EMF	350	500	-	mV _{p-p}
IF Count Output Sensitivity	I _{Fsens} (AM)	1	SW ₃ :ON, SW ₂ :0Ω	-	54	-	dBμV EMF	
			SW ₃ :ON, SW ₂ :5.1kΩ	-	30	-		

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CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
MPX	Max. Composite Signal Input Voltage	$V_{IN(MAX)}$ STEREO	1	L+R=90%, P=10% THD=3%, $SW_8 \rightarrow LPF:ON$	-	800	-	mV_{rms}	
	Separation	Sep.	1	L+R=180 mV_{rms} P=20 mV_{rms} $SW_8 \rightarrow LPF:ON$	fm=100Hz	-	45	-	dB
					fm=1kHz	35	45	-	
					fm=10kHz	-	45	-	
	Total Harmonic Distortion	Monaural	THD (MONO)	1	$V_{IN}=200mV_{rms}$ (MONO)	-	0.05	-	%
		Stereo	THD (ST)		L+R=180 mV_{rms} , P=20 mV_{rms} $SW_8 \rightarrow LPF:ON$	-	0.05	-	
	Voltage Gain		$G_V(MPX)$	1	$V_{IN}=200mV_{rms}$ (MONO)	-2	0	2	dB
	Channel Balance		C.B.	1	$V_{IN}=200mV_{rms}$ (MONO)	-2	0	2	dB
	Stereo Lamp Sensitivity	ON	$V_L(ON)$	1	Pilot Input	-	10	18	mV_{rms}
		OFF	$V_L(OFF)$			3	8	-	
Stereo LED Hysteresis		V_H	1	to LED turn OFF from LED turn ON	-	2	-	mV_{rms}	
Capture Range		C.R.	1	P=20 mV_{rms}	-	± 1.3	-	%	
Signal to Noise Ratio		S/N	1	$V_{IN}=200mV_{rms}$ (MONO)	-	78	-	dB	

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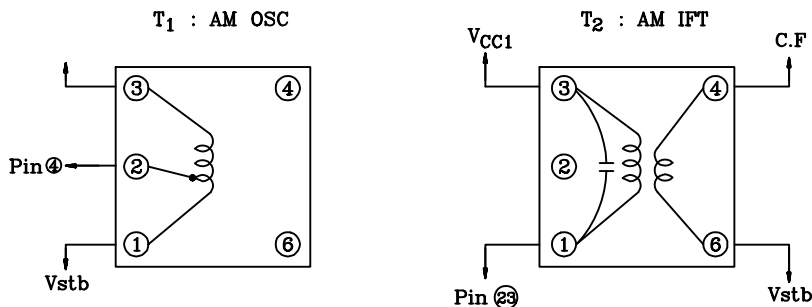
TEST CIRCUIT 1



COIL DATA (TEST CONDITION 1)

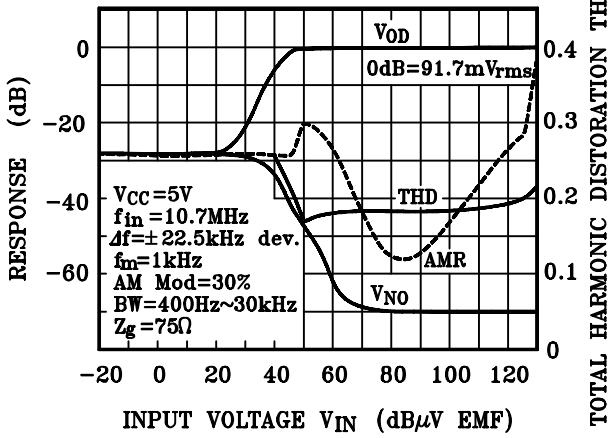
COIL No.	f	L (μH)	C ₀ (pF)	Q ₀	TURN				WIRE (mmΦ)	REF (COIL NO.)
					1-2	2-3	1-3	4-6		
T ₁ AM OSC	796kHz	288	-	115	13	73	-	-	0.08 UEW	⑤4147-1356-038
T ₂ AM IFT	455kHz	-	180	120	-	-	180	15	0.06 UEW	⑤2150-2162-165

⑤ : SUMIDA ELECTRIC Co., Ltd.

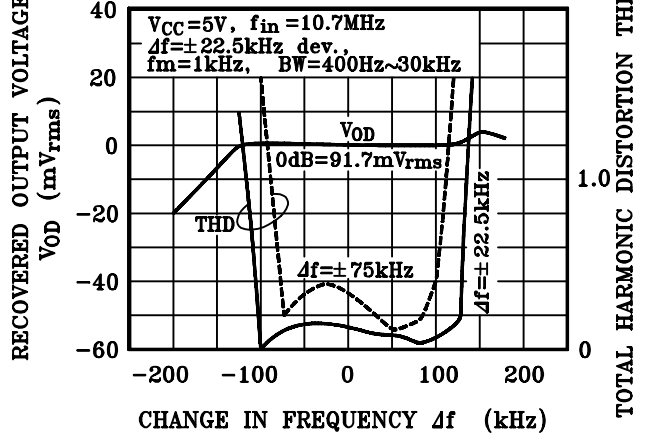


FM(IF)

$V_{OD}, V_{NO}, THD, AMR - V_{IN}$

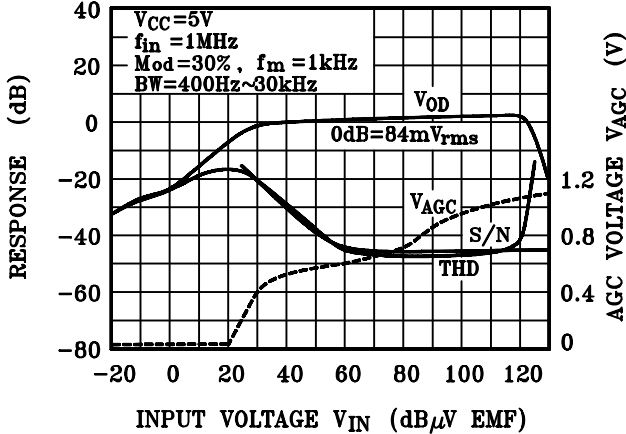


$V_{OD}, THD - \Delta f$

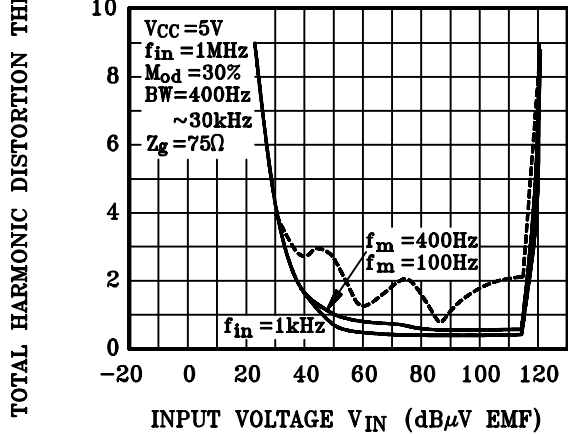


AM

$V_{OD}, V_{NO}, THD, V_{AGC} - V_{IN}$

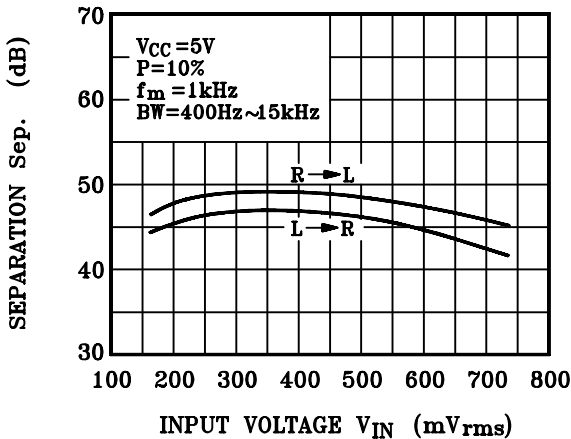


$THD - V_{IN}$



MPX

$Sep - V_{IN}$



CAPTURE RANGE & LOCK RANGE

