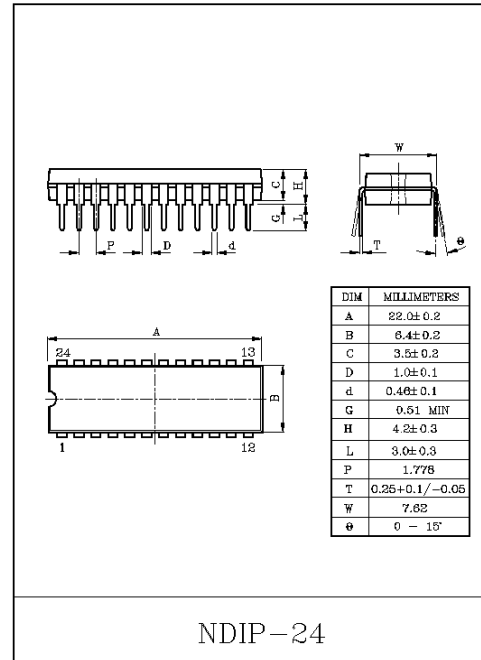


AM/FM IF + MPX (for Digital Tuning System)

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 ( $T_a=25^\circ\text{C}$ )  
 $V_{CC}=3.5\sim 14\text{V}$



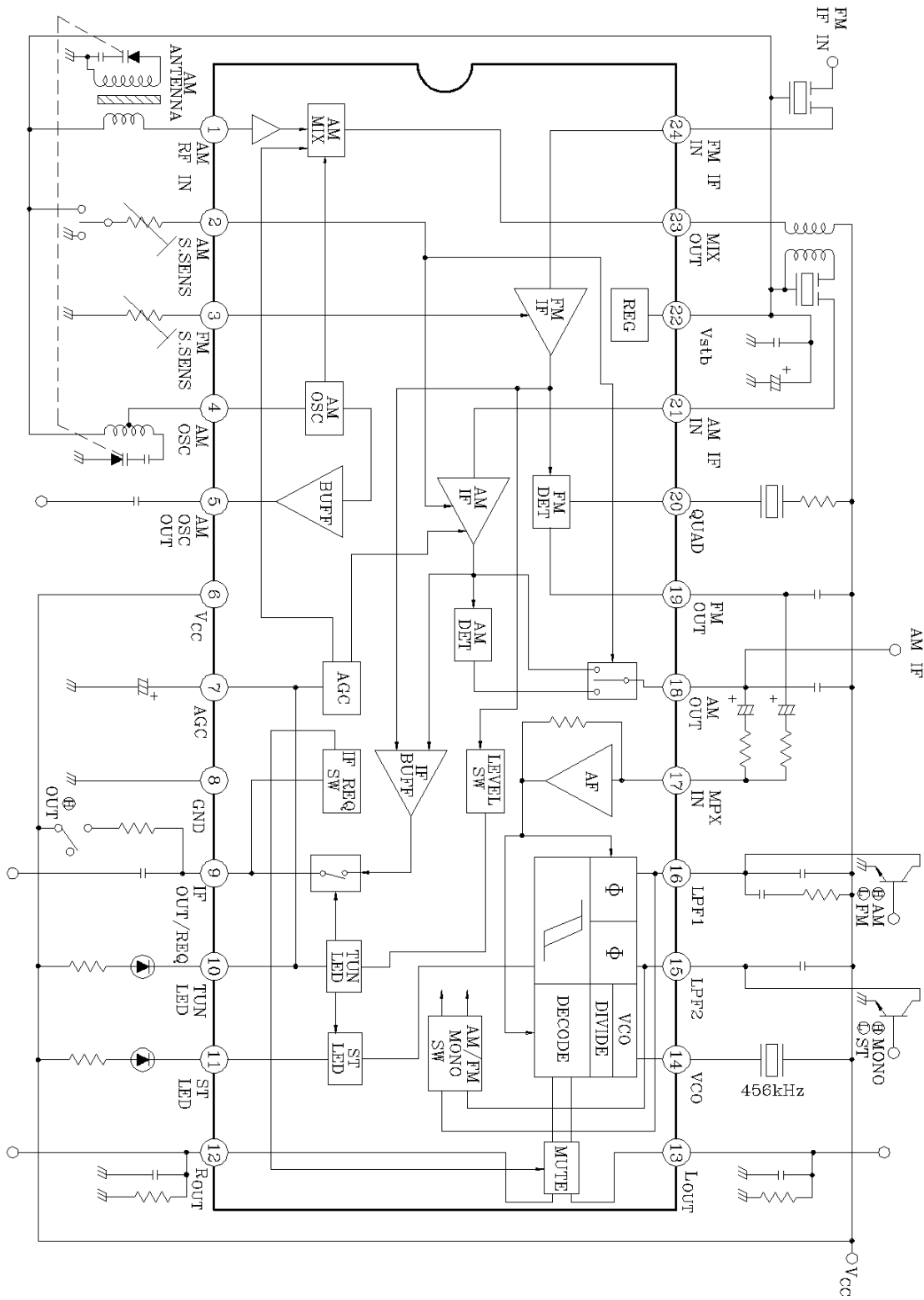
### MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ )

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 9.6mW/°C for KIA2057N.

# KIA2057N

BLOCK DIAGRAM



# KIA2057N

## ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, Ta=25°C, V<sub>CC1</sub>=5V, SW<sub>3</sub>=OFF, SW<sub>9</sub>=GND, SW<sub>10</sub>=1

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

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

MPX : fm=1kHz

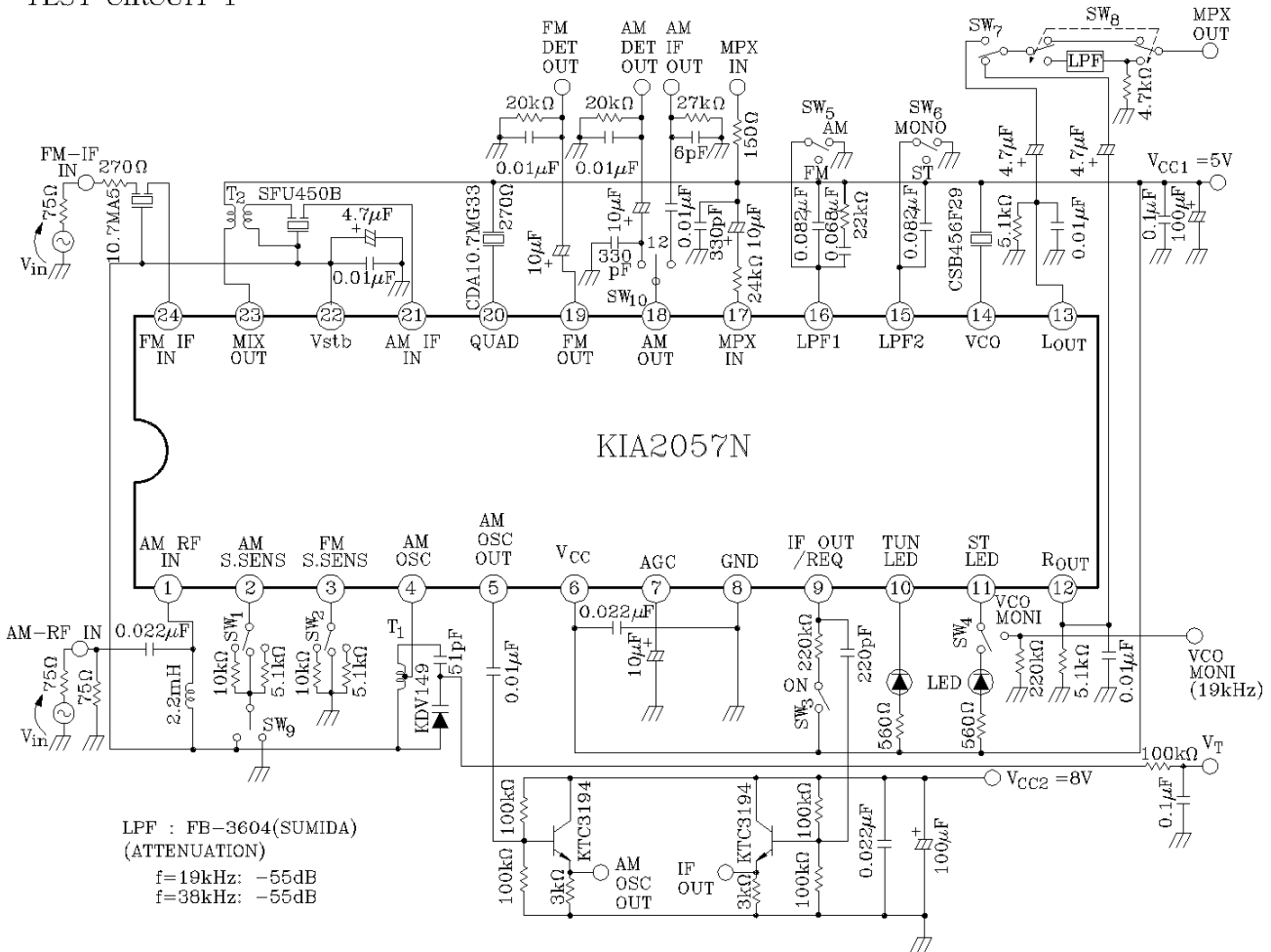
CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current		I <sub>CC</sub> (FM)	1	V <sub>IN</sub> =0, FM Mode	-	20	26	mA
		I <sub>CC</sub> (AM)	1	V <sub>IN</sub> =0, AM Mode	-	20	26	
FM IF	Input Limiting Voltage	V <sub>IN(lim)</sub>	1	-3dB Limiting Point	38	43	48	dBμV EMF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

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

# KIA2057N

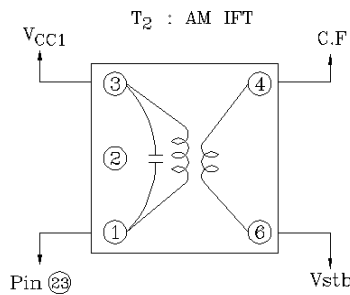
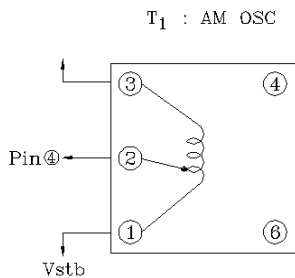
TEST CIRCUIT 1



COIL DATA (TEST CONDITION 1)

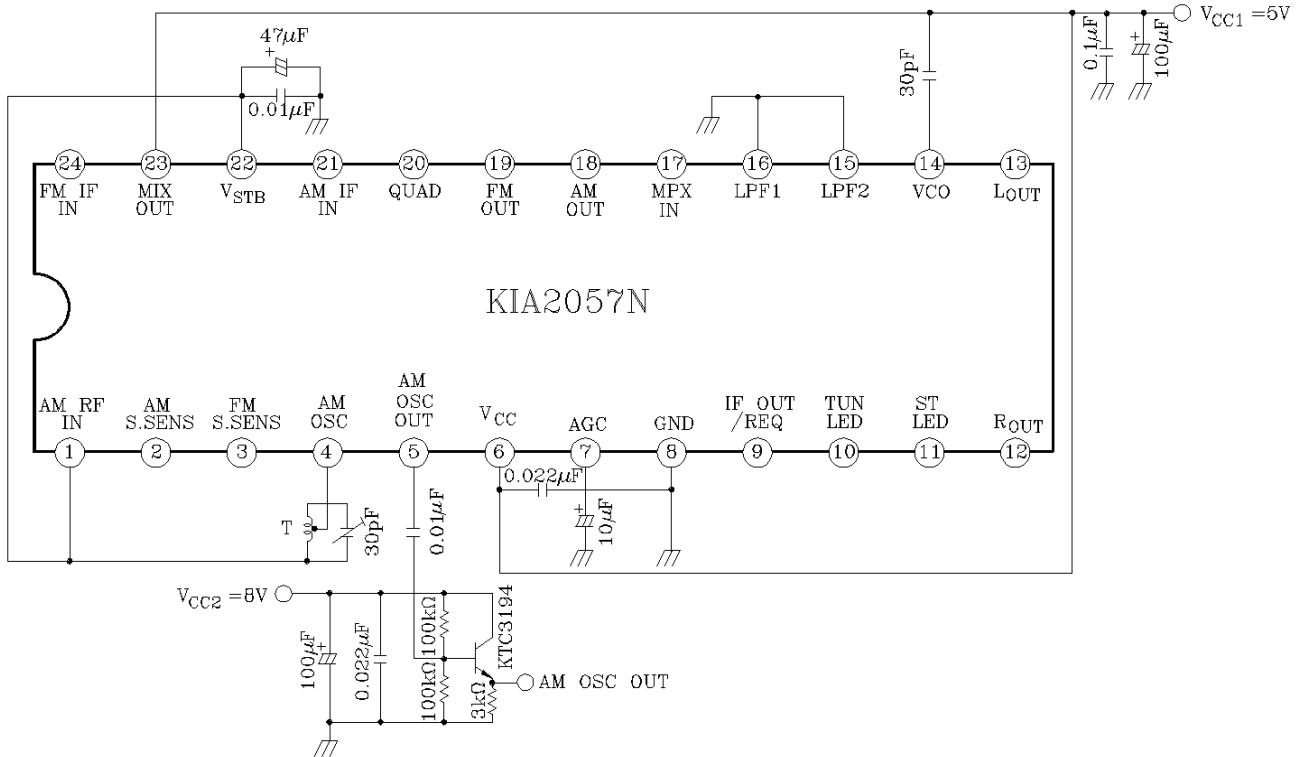
COIL No.	f	L ( $\mu$ H)	C <sub>0</sub> (pF)	Q <sub>0</sub>	TURN				WIRE (mm $\phi$ )	REF (COIL NO.)
					1-2	2-3	1-3	4-6		
T <sub>1</sub> AM OSC	796kHz	288	-	115	13	73	-	-	0.08 UEW	⑤4147-1356-038
T <sub>2</sub> AM IFT	455kHz	-	180	120	-	-	180	15	0.06 UEW	⑥2150-2162-165

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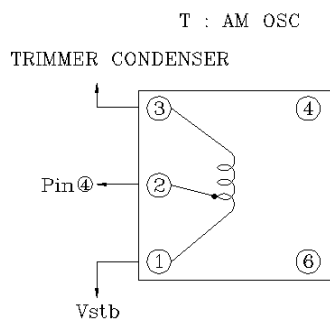
## TEST CIRCUIT 2



## COIL DATA (TEST CIRCUIT 2)

COIL No.	f	L ( $\mu$ H)	C <sub>0</sub> (pF)	Q <sub>0</sub>	TURN				WIRE (mm $\phi$ )	REF (COIL NO.)
					1-2	2-3	1-3	4-6		
T AM OSC	7.96MHz	1.4	-	84	1	6	7	-	0.08 UEW	①7PL-1344Y

① Toko co., Ltd.



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