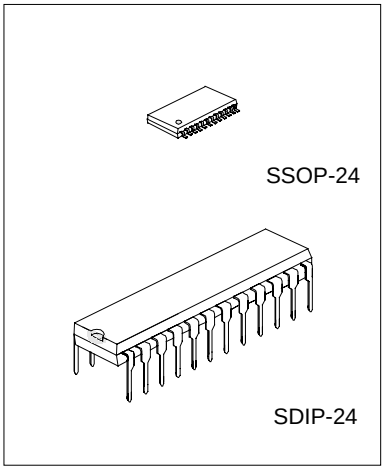
UTC TA8127 LINEAR INTEGRATED CIRCUIT

3V AM / FM 1 CHIP TUNER IC



*Pb-free plating product number: TA8127L

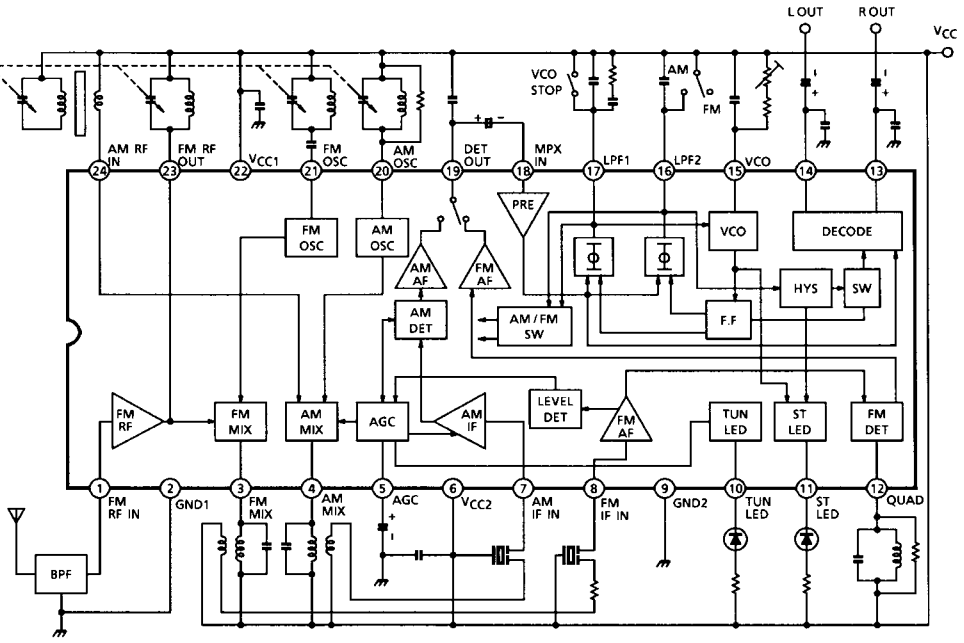
DESCRIPTION

The UTC TA8127 is the AM / FM 1 chip tuner IC, which is designed for Portable Radios and 3V Headphone Radios.

FEATURES

*Built-in FM F/E, AM / FM IF and FM MPX
*AM Detector Coil and IF Coupling Condenser are not needed.
*Operating Supply Voltage Range
Vcc=1.8~7.0V (Ta=25°C)

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (TA=25°C)

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	Vcc	8	V
LED Current	I_{LED}	10	mA
LED Voltage	V_{LED}	8	V
Power Dissipation SSOP SDIP	P_D (note)	 400 1200	mW
Operating Temperature	T_{OPR}	-25 to +75	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Note: Derated above 25°C in the proportion of 9.6mW/°C for SDIP and of 3.2mW/°C for SSOP.

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, Ta=25°C, Vcc=3V,F/E: f=83MHz, fm=1kHz
FM IF : f=10.7MHz, Δf=±22.5kHz, fm=1kHz
AM : f=1MHz, MOD=30%, fm=1kHz
MPX : fm=1kHz)

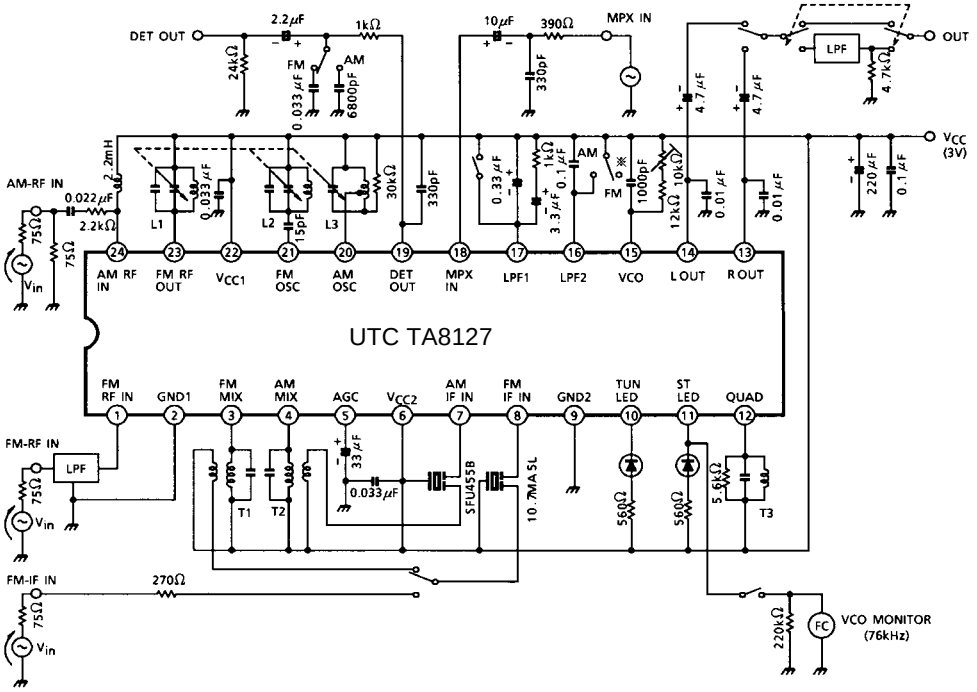
PARAMETER		SYMBOL	*	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Current		Icc(FM)	1	Vin=0, FM Mode		13.2	20.0	mA
		Icc(AM)	1	Vin=0, AM Mode		8.4	13.5	mA
F / E	Input Limiting Voltage	Vin(lim.)	1	-3dB Limiting		10.0		dBμV EMF
	Local OSC Voltage	V_{OSC}	2	f_{OSC}=72.3MHz		105		mVrms
FM IF	Input Limiting Voltage	Vin(lim.) IF	1	-3dB Limiting	40	46	53	dBμV EMF
	Recovered Output Voltage	V_{OD}	1	Vin=80dBμV EMF	55	80	110	mVrms
	Signal to Noise Ratio	S/N	1	Vin=80dBμV EMF		70		dB
	Total Harmonic Distortion	THD	1	Vin=80dBμV EMF		0.4		%
	AM Rejection Ratio	AMR	1	Vin=80dBμV EMF		32		dB
	Lamp ON Sensitivity	V_L	1	I_L=1mA	45	51	56	dBμV EMF
AM	Gain	Gv	1	Vin=26dBμV EMF	40	70	110	mVrms
	Recovered Output Voltage	VOD	1	Vin=60dBμV EMF	55	80	110	mVrms
	Signal to Noise Ratio	S/N	1	Vin=60dBμV EMF		42		dB
	Total Harmonic Distortion	THD	1	Vin=60dBμV EMF		1.0		%
	Lamp on Sensitivity	V_L	1	I_L=1mA	20	25	30	dBμV EMF
Pin 19 Output Resistance		R19	1	FM Mode AM Mode		0.75 12.5		kΩ

*TEST CIRCUIT

PARAMETER			SYMBOL	*	TEST CONDITIONS		MIN	TYP	MAX	UNIT
MPX	Input Resistance		RIN	-				24		kΩ
	Output resistance		ROUT	-				5		kΩ
	Max. Composite Signal Input Voltage		Vin(max.) STEREO	1	L+R=90%, P=10%, fm=1kHz, THD=3%			350		mVrms
	Separation		Sep	1	L+R=135mVrm, P=15mVrms	fm=100Hz		42		dB
						fm=1kHz	35	42		
						fm=10kHz		42		
	Total Harmonic Distortion	Monaural	THD (MONAURAL)	1	Vin=150mVrms			0.2		%
		Stereo	THD (STEREO)		L+R=135mVrm, P=15mVrms			0.2		%
	Voltage Gain		GV(MPX)	1	Vin=150 mVrms		-5	-3	-1	dB
	Channel Balance		C.B.	1	Vin=150 mVrms		-2	0	2	dB
	Stereo Lamp Sensitivity	ON	V_L(ON)	1	Pilot Input			8	16	mVrms
		OFF	V_L(OFF)		Pilot Input		2	6		mVrms
	Stereo Lamp Hysteresis		V_H	1	To LED turn off from LED turn on			2		mVrms
	Capture Range		C.R.	1	P=15mVrms			±3		%
	Signal to Noise Ratio		S/N	1	Vin=150mVrms			70		dB

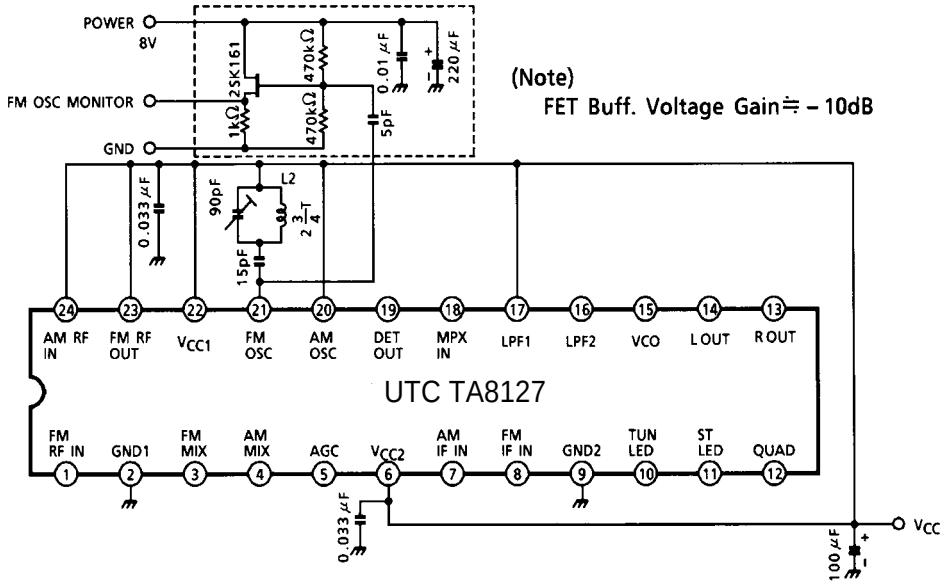
*TEST CIRCUIT

TEST CIRCUIT 1



NOTE: POLYESTER FILM CONDENSER
Using other types of condensers, there are some cases that the MPX does not do normal stereo action at high temperature or low temperature.

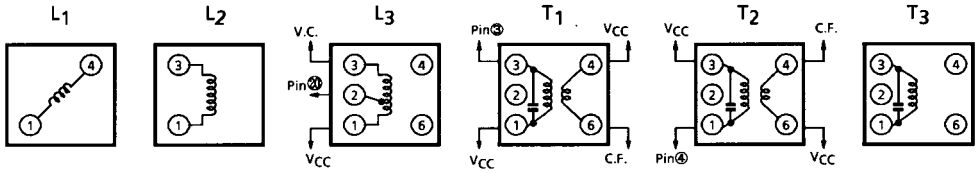
TEST CIRCUIT 2



COIL DATA

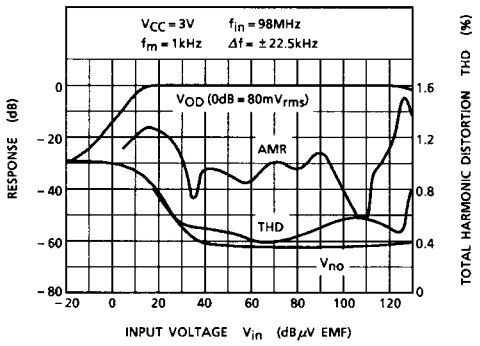
COIL NO.	TEST FREQ. (Hz)	L (μH)	Co (pF)	Qo	TURNS					WIRE (mmΦ)	REFERENCE
					1-2	2-3	1-3	1-4	4-6		
L1 FM RF	100M			100				2.5		0.5UEW	Ⓢ53T-037-202
L2 FM OSC	100M			100			2.75			0.5UEW	Ⓢ0258-244
L3 AM OSC	796K	288		115	13	73				0.08UEW	Ⓢ4147-1356-038
T1 FM MIX	10.7M		75	100			13		2	0.1UEW	Ⓢ2153-414-041
T2 AM MIX	455k		180	120			180		15	0.08UEW	Ⓢ2150-2162-165
T3 FM DET	10.7M		47	165			16			0.09UEW	Ⓢ2153-4095-122

Ⓢ: SUMIDA ELECTRIC CO., LTD



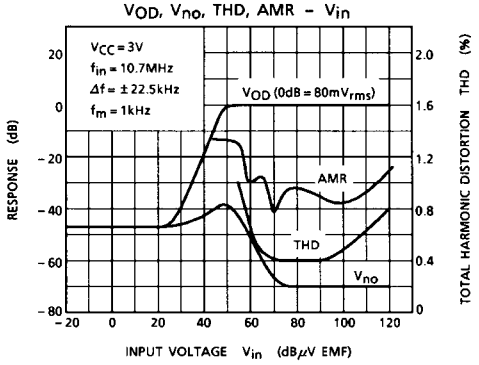
FM (F / E + IF)

V_{OD}, V_{no}, THD, AMR – V_{in}



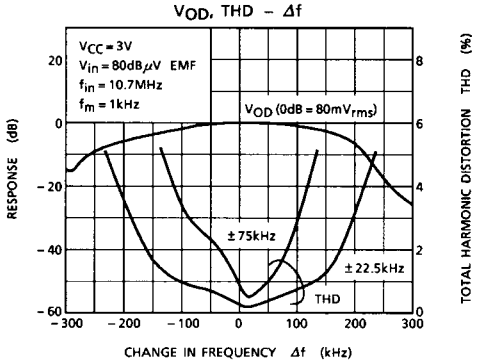
FM (IF)

V_{OD}, V_{no}, THD, AMR – V_{in}



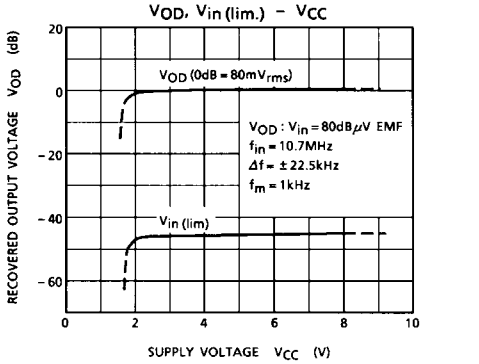
FM (IF)

V_{OD}, THD – Δf



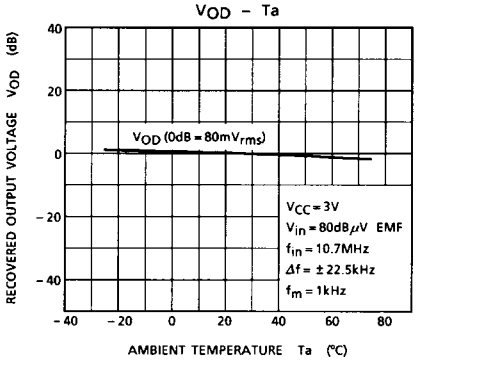
FM (IF)

V_{OD}, V_{in} (lim.) – V_{CC}



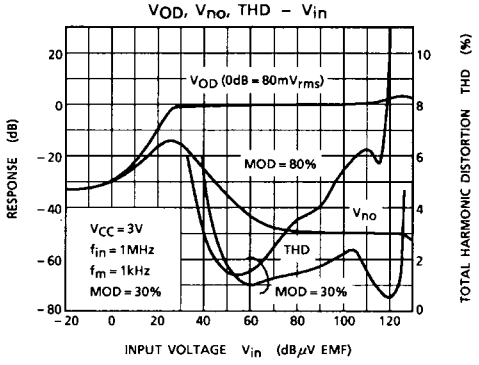
FM (IF)

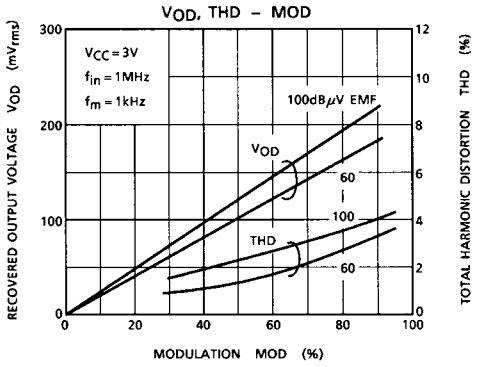
V_{OD} – Ta

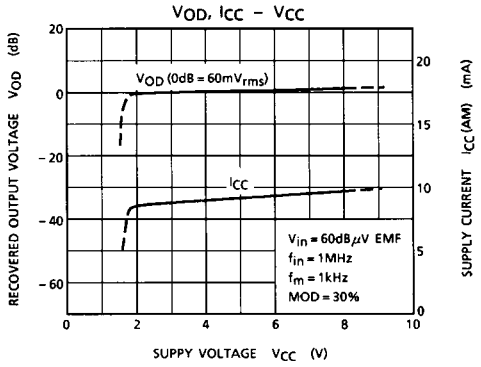


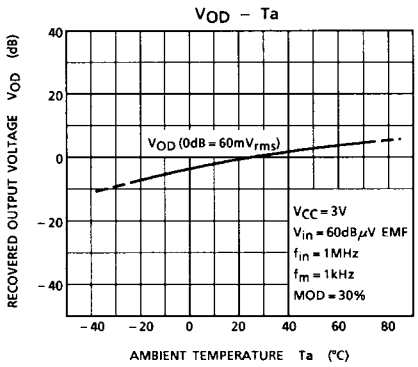
AM

V_{OD}, V_{no}, THD – V_{in}

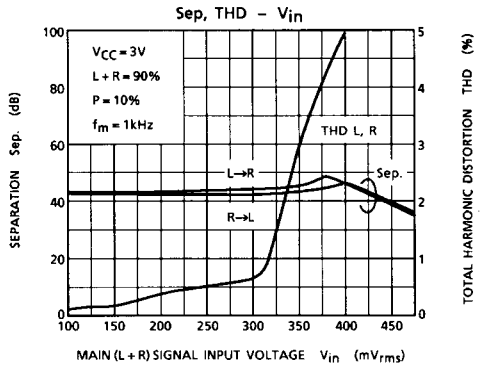


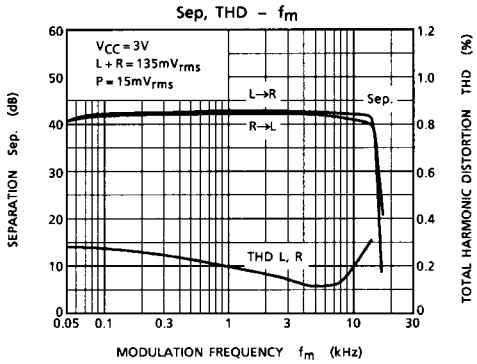

V_{OD}, THD – MOD
V_{CC} = 3V
f_{in} = 1MHz
f_m = 1kHz
100dBμV EMF
V_{OD}
60
100
THD
60
RECOVERED OUTPUT VOLTAGE V_{OD} (mV_{rms})
TOTAL HARMONIC DISTORTION THD (%)
MODULATION MOD (%)

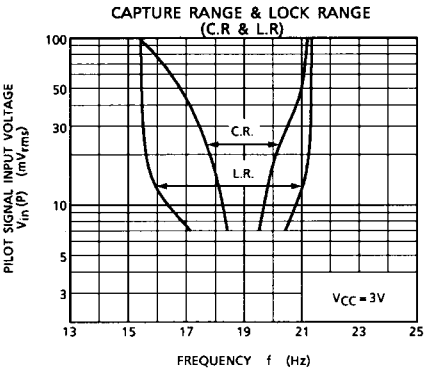

V_{OD}, I_{CC} – V_{CC}
V_{OD} (0dB = 60mV_{rms})
I_{CC}
V_{in} = 60dBμV EMF
f_{in} = 1MHz
f_m = 1kHz
MOD = 30%
RECOVERED OUTPUT VOLTAGE V_{OD} (dB)
SUPPLY CURRENT I_{CC} (AM) (mA)
SUPPY VOLTAGE V_{CC} (V)


V_{OD} – Ta
V_{OD} (0dB = 60mV_{rms})
V_{CC} = 3V
V_{in} = 60dBμV EMF
f_{in} = 1MHz
f_m = 1kHz
MOD = 30%
RECOVERED OUTPUT VOLTAGE V_{OD} (dB)
AMBIENT TEMPERATURE Ta (°C)

MPX


Sep, THD – V_{in}
V_{CC} = 3V
L + R = 90%
P = 10%
f_m = 1kHz
THD L, R
L→R
Sep.
R→L
SEPARATION Sep. (dB)
TOTAL HARMONIC DISTORTION THD (%)
MAIN (L + R) SIGNAL INPUT VOLTAGE V_{in} (mV_{rms})


Sep, THD – f_m
V_{CC} = 3V
L + R = 135mV_{rms}
P = 15mV_{rms}
L→R
Sep.
R→L
THD L, R
SEPARATION Sep. (dB)
TOTAL HARMONIC DISTORTION THD (%)
MODULATION FREQUENCY f_m (kHz)


CAPTURE RANGE & LOCK RANGE
(C.R & L.R)
C.R.
L.R.
V_{CC} = 3V
PILOT SIGNAL INPUT VOLTAGE V_{in} (P) (mV_{rms})
FREQUENCY f (Hz)