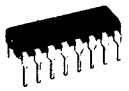
No.C288B



3006

LA1230

Monolithic Linear Integrated Circuit

FM IF SYSTEM

The LA1230 is a high density monolithic IC developed by SANYO for use in FM IF system, and it provides most of the functions required in FM IF stages of an FM tuner.

In the block diagram shown on page 6, an internal functional block diagram of the LA1230 and its peripheral circuits for general application are given.

The IF amplifier/limiter stage consists of six stages of dual-ended differential amplifiers having good AMR characteristic, and a signal meter drive stage coupled in parallel with the amplifier/limiter stage is composed of three stages of level detectors and a drive circuit for extending the linearity range of the signal meter deflection.

The FM detector stage consists of a double-balanced quadrature detector circuit and has an AF preamplifier and a muting control circuit as auxiliary circuits.

The muting drive stage contains a level detector responsive to S/N in the carrier signal under a low signal input condition, a circuit to detect a DC output signal of an S-curve supplied from the FM detector during tuning-off operation, and a drive circuit, and operates to reduce interstation noise and other noises such as transient sound which would be caused by muting operations (in conventional circuitry).

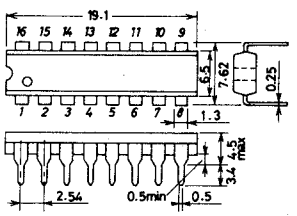
The AFC output and tuning meter drive stage have an additional clamp circuit which clamps the output voltage to a level of ±0.7V, thereby improving the AFC operation range, variations from the tuning meter deflection and symmetrical characteristics for the above.

A DC-stabilized circuit having approximately constant current comsumption against a power supply voltage variation of 8.5V to 16V is also added.

Functions

1. IF amplification and limitation
2. Quadrature detector
3. AF preamplifier
4. Muting operation at low signal input
5. Muting operation at tuning in/off operation
6. Signal meter drive output
7. AFC and FM tuning meter drive output
8. Delayed AGC drive output
9. Multipath output

Case Outline 3006
(unit:mm)



Features

1. High limiting sensitivity : (12uV typ.)
2. Low distortion : (*0.1% typ.)
3. High demodulation output (350mV typ.)
4. Muting circuit with less transient noise.
5. Signal meter drive output proportional to signal input level in dB.
6. Tuning meter drive output having good symmetry.
7. Band limitable, clamped AFC output
8. Delayed AGC drive output for Front End circuit.
9. Stabilized DC circuit for operating voltage range of 9 to 14 V.

* Distortion ratio depends upon phase linearity of the phase-shift circuit used.

These specifications are subject to change without notice.

Maximum Ratings at Ta=25°C

Maximum Supply Voltage	$V_{CC}max$	pin 11	16	V
Maximum Input Voltage	v_i	pin 1 to 2	±1	V_{p-p}
Maximum Dissipation Current	I_{CC}	pin 11	40	mA
Maximum Flow-in Current	I_2	pin 2	±0.2	mA
Maximum Flow-out Current	$I_{10}, I_{12}, I_{13}, I_{15}$		2	mA
Allowable Dissipation Power	$P_d max$		650	mW
Operating Temperature	T_{opg}		-20 to +70	°C
Storage Temperature	T_{stg}		-40 to +125	°C

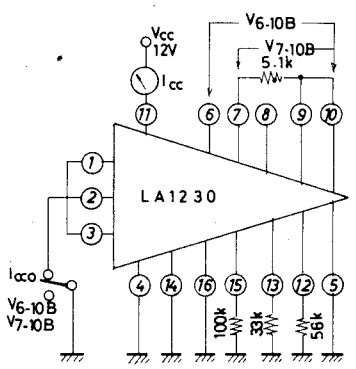
Recommended Operation Condition at Ta=25°C

Recommended Supply Voltage	V_{CC}	12	V

Operation Characteristics at Ta=25°C, V_{CC}=12V, f=10.7MHz

			min	typ	max	unit
Quiescent Current	I_{CCO}			20	30	mA
Off Set Voltage	V6-10B	no signal	-500		+500	mV
	V_{7-10B}	no signal, R_{7-10} =5.1k ohm	-250		+250	mV
Dissipation Current	I_{CC}	v_{in}=100dB		23	33	mA
Input Limiting Voltage	$v_{in(lim)}$	3dB down, 400Hz-100%mod		22	28	dB
Detector Output	v_o	v_{in}=100dB, 400Hz-100%mod	240		460	mV
S/N		v_{in}=100dB, 400Hz-100% mod	67	70		dB
Muting Sensitivity	$v_{in(mut)}$	V_{12}=1.4V	20	26	32	dB
Muting Attenuation	Mut(att)	V_5=2V, 400Hz-100%mod	60			dB
Muting Driving Output	V_{12}(1)	no signal	4.4		6.0	V
	(2)	v_{in}=100dB, V_{CC}=16V			0.3	V
Signal Meter Driving Output	V_{13}(1)	no signal			0.1	V
	(2)	v_{in}=70dB	1.5	2.5		V
	(3)	v_{in}=100dB	4.5	5.6		V
AGC Output	V_{15}(1)	no signal	4.2		5.5	V
	(2)	v_{in}=100dB			0.5	V
Total Harmonic Distortion	THD	v_{in}=100dB		0.1	0.3	%
AM Rejection Ratio	AMR	v_{in}=100dB, FM:400Hz100% AM:1kHz30%	45	55		dB
Muting Bandwidth	BW(mut)	v_{in}=100dB, V_{12}=1.4V	140		370	kHz

DC Test Curcuit



AC Test Circuit