FM FRONT-END

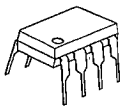
■ GENERAL DESCRIPTION

The NJM2236 is designed for FM front end application, which is suitable to portable radio, radio cassette, clock radio and TV with FM radio. Comparing with conventional types, supply voltage dependence,overload characteristics and spurious radiation characteristics are improved.

■ FEATURES

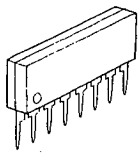
- Wide Operating Voltage (1.6~6.0V)
- Excellent Supply Voltage Dependence of Local Oscillator
- Improved Intermoduration Characteristics by Duble Balanced Mixer Circuit
- Low Spurious Radiation
- Build-In Clamping Diode for the Mixer Output
- Local Oscillator Voltage : NJM2236A (Typ.80mV)
  : NJM2236 (Typ.110mV)
- Package Outline DIP8, DMP8, SIP8
- Bipolar Technology

■ PACKAGE OUTLINE



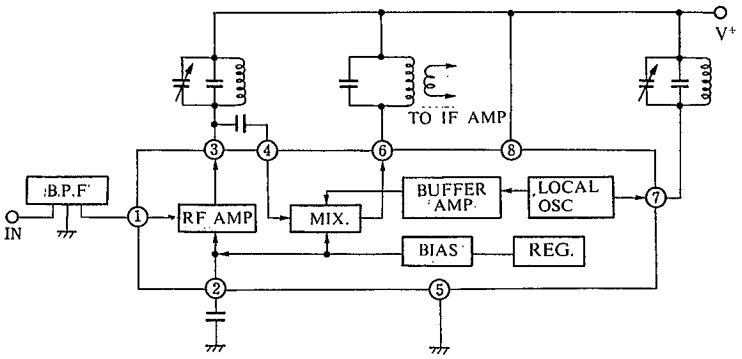
NJM2236D/AD

NJM2236M/AM



NJM2236AL

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

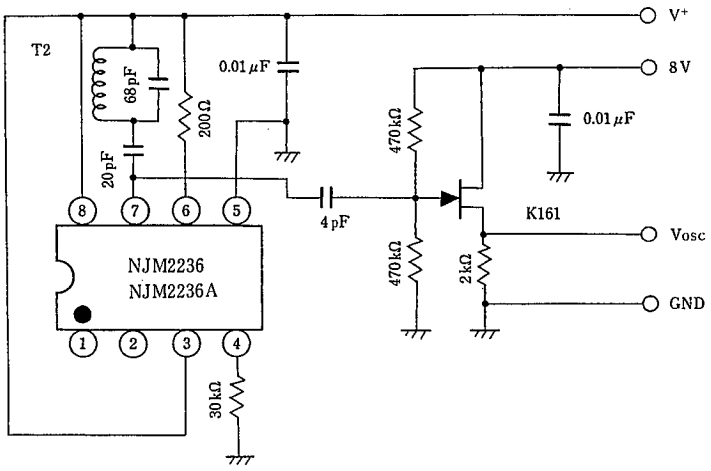
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	8	V
Power Dissipation	P_D	(DIP8) 500	mW
		(DMP8) 300	mW
		(DIP8) 800	mW
Operating Temperature Range	T_{opr}	−20~75	℃
Storage Temperature Range	T_{stg}	−40~125	℃

■ ELECTRICAL CHARACTERISTICS

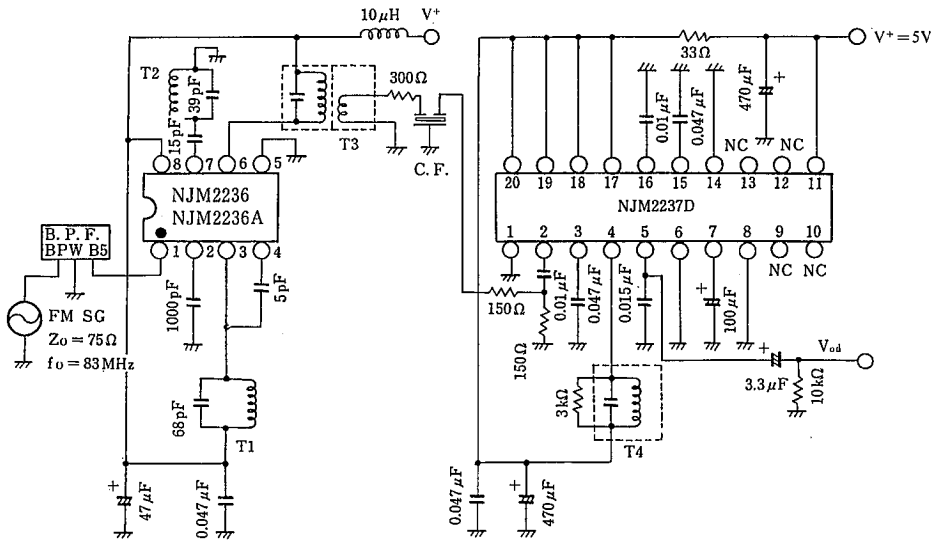
(V^+=5V, [M-Type V^+=3V], f=83MHz, fm=1kHz. △f=22.5kHz dev., Ta=25℃)

CHARACTERISTICS		SYMBOLS	CIRCUIT	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Operating Current		I_{CC}	2	V_{IN}=0	—	5.2	8.0	mA
−3dB Limiting Sensitivity		V_{IN}(lim)	2		—	3.0	7.0	dBμ
Quiescent Sensitivity		Q_S	2		—	11.0	—	dBμ
Conversion Gain		G_C	—		—	31	—	dB
Local OSC Voltage	NJM2236A	V_{OSC}	1	f_{OSC}=60MHz	40	80	120	mVrms
	NJM2236				70	110	180	mVrms
1 Pin Parallel Input Impedance	Resistance	r_{ip1}	3	f=83MHz	—	57	—	Ω
3 Pin Parallel Output Impedance	Resistance	r_{op3}	3		—	25	—	kΩ
	Capacitance	c_{op3}			—	2.0	—	pF
4 Pin Parallel Input Impedance	Resistance	r_{ip4}	3		—	2.7	—	kΩ
	Capacitance	c_{ip4}			—	3.3	—	pF
6 Pin Parallel Output Impedance	Resistance	r_{op6}	3	f=10.7MHz	—	100	—	kΩ
	Capacitance	c_{op6}			—	4.8	—	pF
Local OSC Stop Voltage		Vstop	1		—	0.9	1.3	V

■ TEST CIRCUIT 1



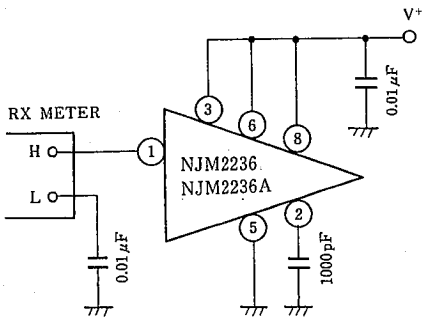
■ TEST CIRCUIT 2



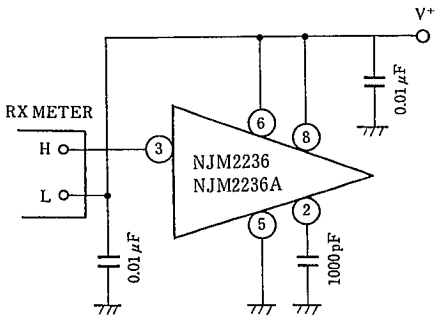
■ TEST CIRCUIT 3

Input, Output Impedance

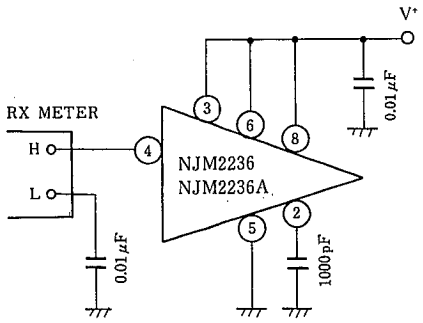
(1) rip 1



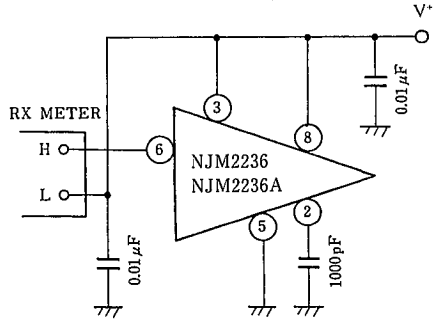
(2) rop 3, cop 3



(3) rip 4, cip 4

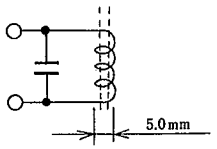
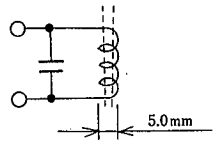
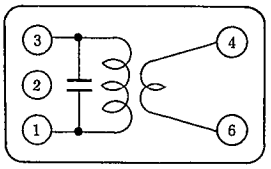
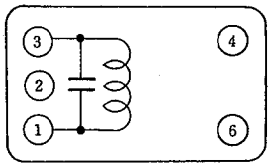


(4) rop 6, cop 6



■ TEST CIRCUIT COIL DATA

(Japan Band for 76.0MHz to 108.0MHz)

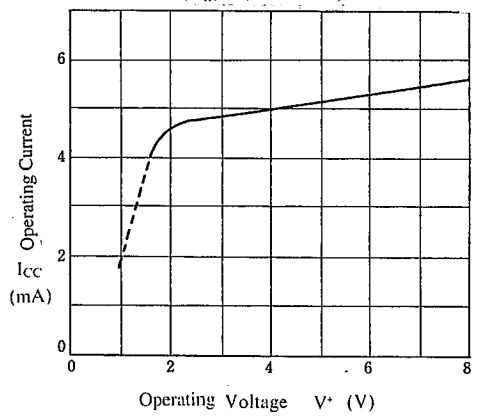
COIL	fo	Qo	TURNS	Co	
T1 RF Coil	100MHz	100	0.7mmφ 2 1/4 (Japan Band) SUMIDA 0295−057	22pF (ext.)	 Ferrite Core
T2 osc Coil	100MHz	100	0.7mmφ 2 1/2 (Japan Band) SUMIDA 0295−056	30pF (ext.)	 Ferrite Core
T3 FM IFT Coil	10.7MHz	①−③ 90	①−③ 11T ④−⑥ 2T Wire : 0.12mmφ UEW SUMIDA 2153−414−041	①−③ 82pF	 Bottom View
T4 FM DET Coil	10.7MHz	①−③ 100	①−③ 10T Wire : 0.12mmφ UEW SUMIDA 2153−4095−331	①−③ 150pF	 Bottom View

- Band Pass Filter (B. P. F.) : SOSHIN ELECTRIC Co., LTD. ···BPWB5
- Tuning Capacitor : ALPS ELECTRIC Co., LTD. ···VCB41E101

■ TYPICAL CHARACTERISTICS

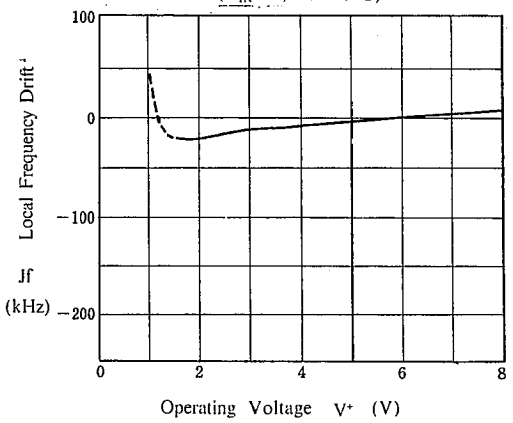
Operating Current vs. Operating Voltage

(V_{IN}=0, Ta=25°C)



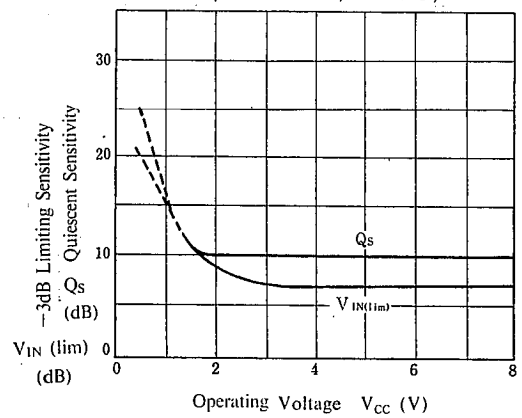
Local Frequency Drift vs. Operating Voltage

(V_{IN}=0, Ta=25°C)



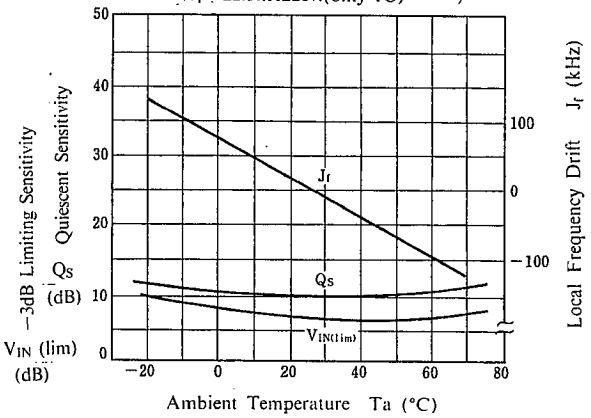
V_{IN}(lim), Q_S vs. V_{CC}

(f=63MHz, f_m=1kHz, J_f=22.5kHzdev., Ta=25°C)



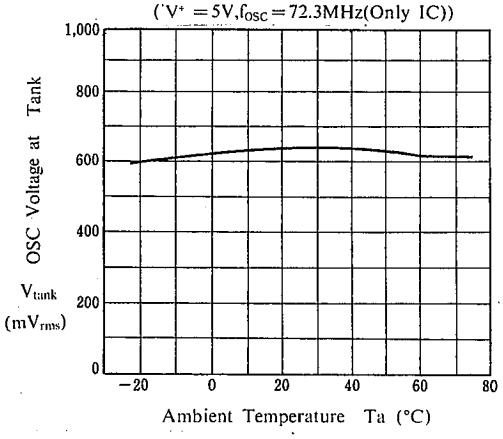
V_{IN}(lim), Q_S, J_f vs. T_a

(V+ =5V, f=83MHz, f_m=1kHz, J_f=22.5kHzdev.(only IC))



V_{tank} vs. T_a

(V+ =5V, f_{OSC}=72.3MHz(Only IC))



MEMO