

FM FRONT-END

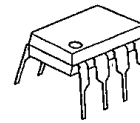
■ GENERAL DESCRIPTION

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 Intermodulation Characteristics by Double 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

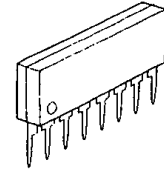
■ PACKAGE OUTLINE



NJM 2236 D/AD

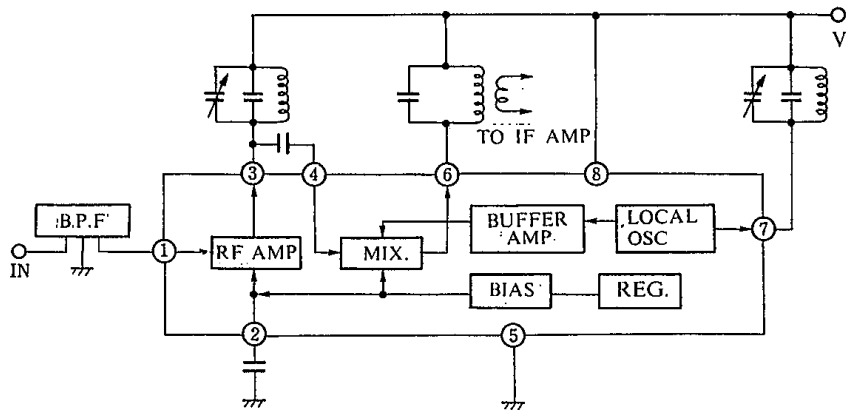


NJM 2236 M/AM



NJM 2236 AL

■ BLOCK DIAGRAM



NJM2236/2236A

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	8	V
Power Dissipation	P _D	(DIP8) 500 (DMP8) 300 (DIP8) 800	mW mW mW
Operating Temperature Range	T _{opr}	-20~75	°C
Storage Temperature Range	T _{stg}	-40~125	°C

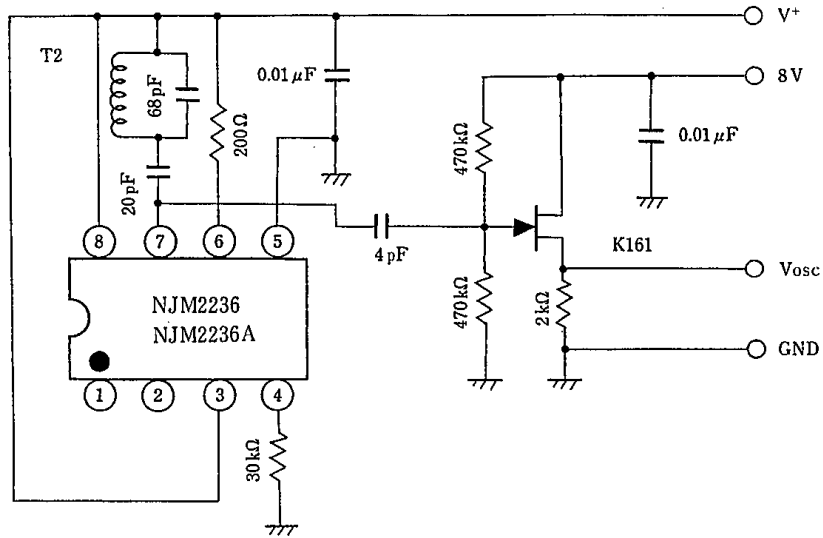
■ ELECTRICAL CHARACTERISTICS

(V⁺=5V, IM-Type V⁺=3V, f=83MHz, fm=1kHz, Δf=22.5kHz dev., Ta=25°C)

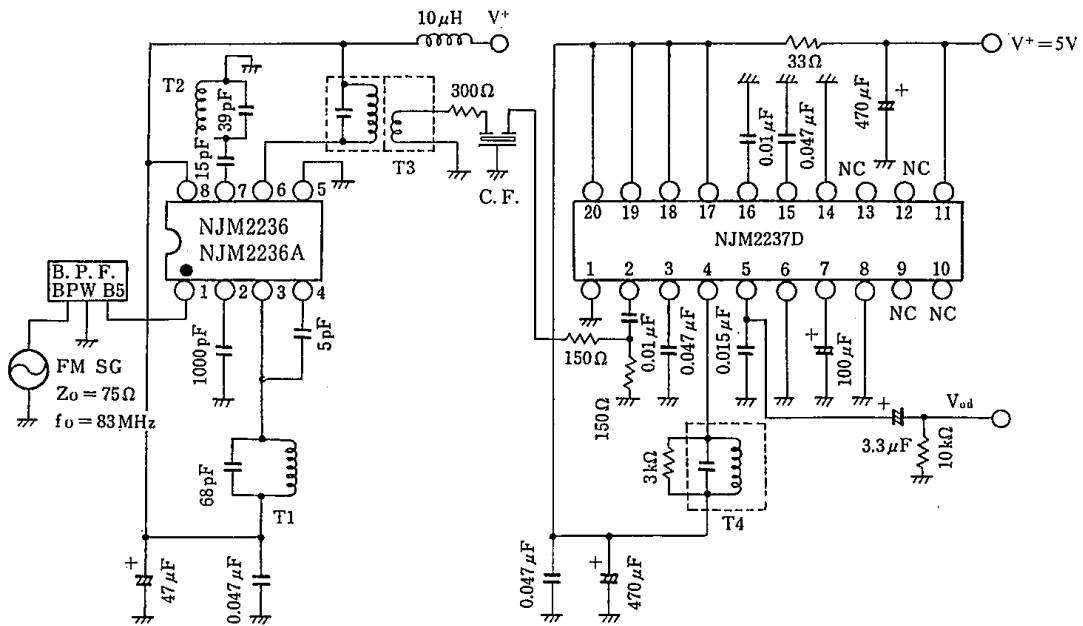
CHARACTERISTICS	SYMBOLS	CIRCUIT	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Operating Current	I _{CC}	2	V _{IN} =0	—	5.2	8.0	mA	
-3dB Limiting Sensitivity	V _{IN(lim)}	2		—	3.0	7.0	dBμ	
Quiescent Sensitivity	Q _S	2		—	11.0	—	dBμ	
Conversion Gain	G _C	—		—	31	—	dB	
Local OSC Voltage	NJM2236A	V _{OSC}	1	f _{osc} =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	—
	Capacitance	c _{op6}		—		4.8	—	pF
Local OSC Stop Voltage	V _{stop}	1		—	0.9	1.3	V	

4

■ TEST CIRCUIT 1



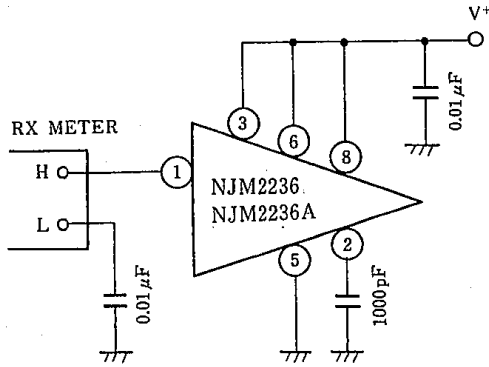
■ TEST CIRCUIT 2



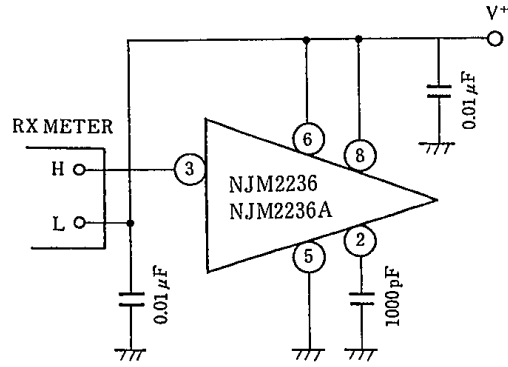
TEST CIRCUIT 3

Input, Output Impedance

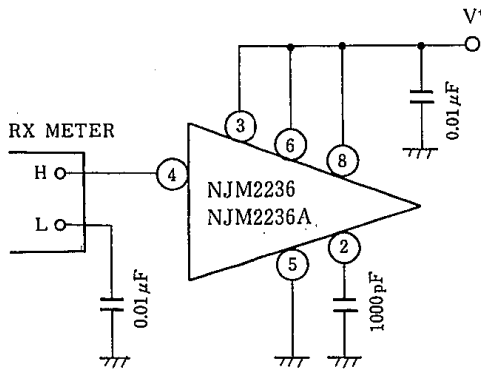
(1) rip 1



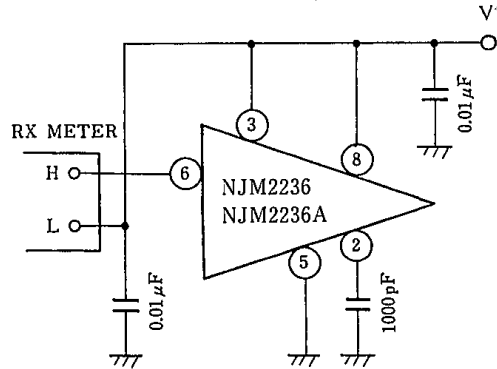
(2) rop 3, cop 3



(3) rip 4, cip 4



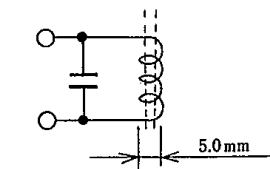
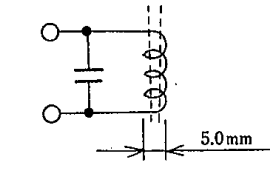
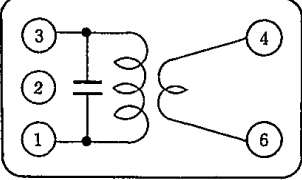
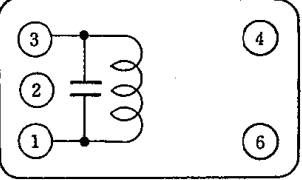
(4) rop 6, cop 6



4

■ TEST CIRCUIT COIL DATA

(Japan Band for 76.0MHz to 108.0MHz)

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

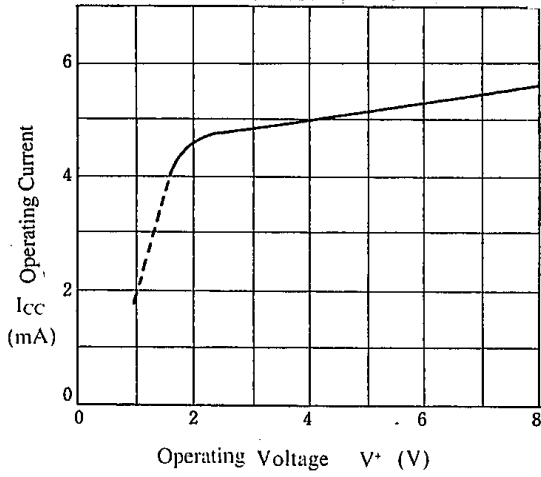
- Band Pass Filter (B. P. F.) : SOSHIN ELECTRIC Co., LTD. ...BPWB5
- Tuning Capacitor : ALPS ELECTRIC Co., LTD. ...VCB41E101

4

■ TYPICAL CHARACTERISTICS

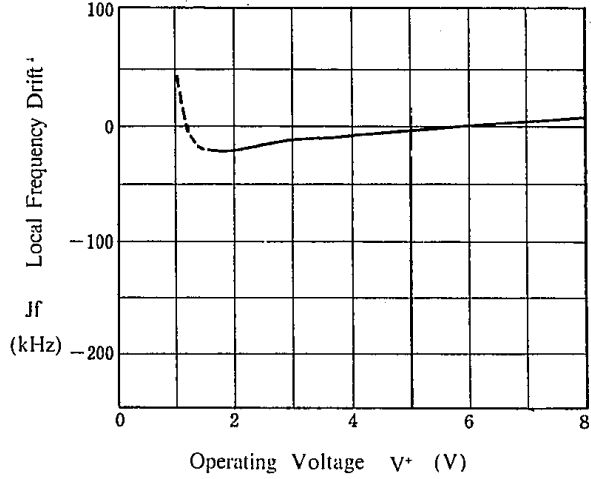
Operating Current vs. Operating Voltage

($V_{IN}=0, T_a=25^\circ\text{C}$)



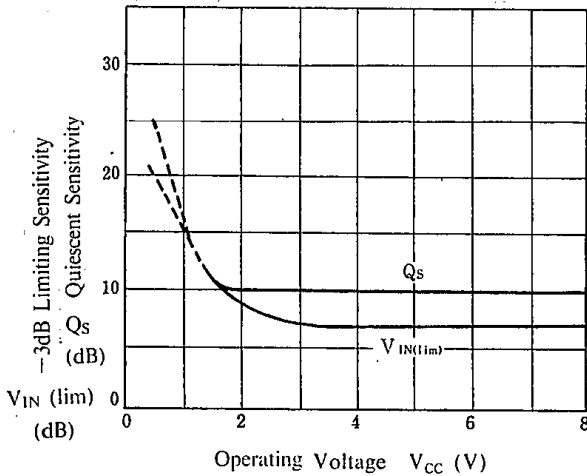
Local Frequency Drift vs. Operating Voltage

($V_{IN}=0, T_a=25^\circ\text{C}$)



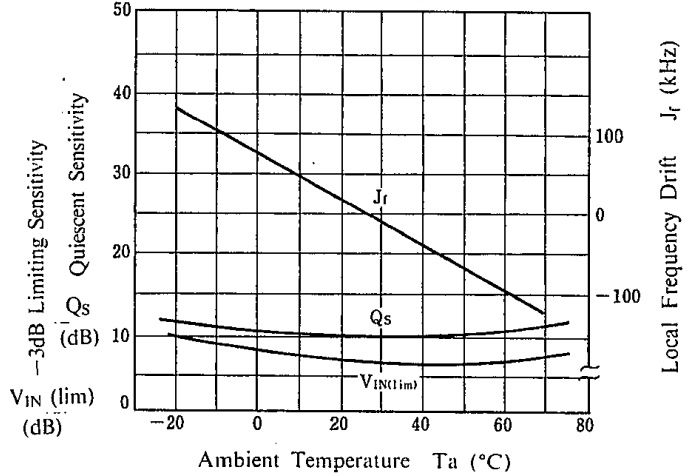
$V_{IN}(\text{lim}), Q_s$ vs. V_{CC}

($f=63\text{MHz}, f_m=1\text{kHz}, J_r=22.5\text{kHzdev.}, T_a=25^\circ\text{C}$)



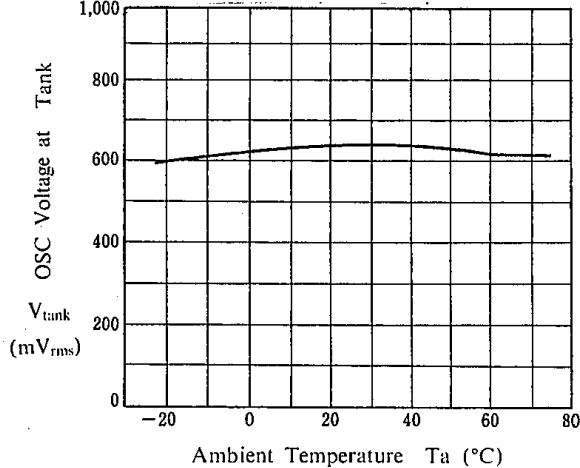
$V_{IN}(\text{lim}), Q_s, J_f$ vs. T_a

($V^+=5\text{V}, f=83\text{MHz}, f_m=1\text{kHz}, J_r=22.5\text{kHzdev. (only IC)}$)



V_{tank} vs. T_a

($V^+=5\text{V}, f_{\text{osc}}=72.3\text{MHz (Only IC)}$)



MEMO

[CAUTION]

The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.