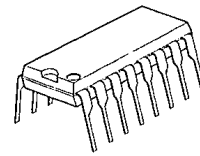


FULL BALANCED MIXER

■ **GENERAL DESCRIPTION**

The NJM2203D is a full balanced mixer integrated circuit for FM synthesizing tuner. The NJM2203D contains mixer, oscillator, buffer for oscillator output and IF amplifier circuits. By using this IC, RF circuit configuration is simplified and high reliability, stable operation, easy design and time saving adjustment are realized.

■ **PACKAGE OUTLINE**

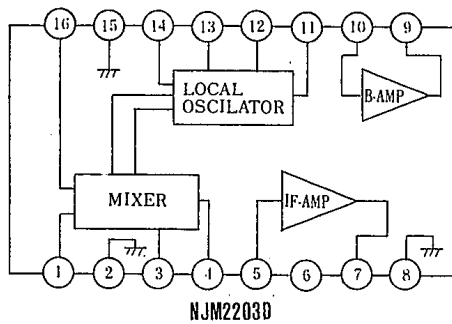


NJM2203D

■ **FEATURES**

- Minimum outer parts.
- Simplified circuit configuration
- Minimum frequency deviation with over input signal.
- Easy adjustment.
- Package Outline DIP16
- Bipolar Technology

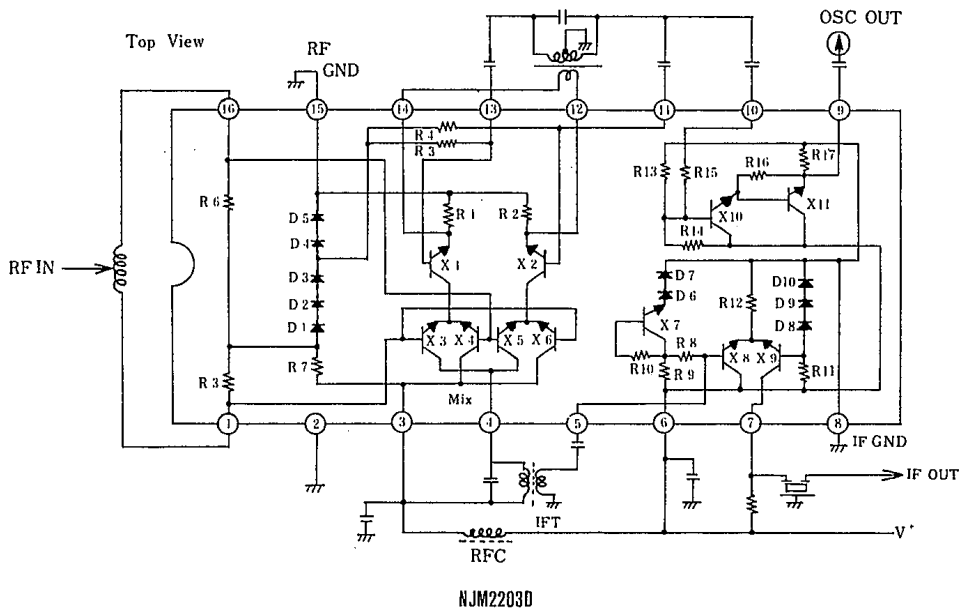
■ **BLOCK DIAGRAM**



PIN FUNCTION

- | | |
|--------------------|----------------------|
| 1. RF INPUT1 | 9. OSC OUT |
| 2. GND | 10. OSC Buffer INPUT |
| 3. V ^{+M} | 11. OSC1 |
| 4. Mix OUT | 12. OSC2 |
| 5. Mix INPUT | 13. OSC3 |
| 6. V ^{+A} | 14. OSC4 |
| 7. IF OUT | 15. GND(RF) |
| 8. GND(IF) | 16. RF INPUT2 |

■ **EQUIVALENT CIRCUIT**



NJM2203D



■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	18	V
Power Dissipation	P _d	500	mW
Operating Temperature Range	T _{opr}	-20~+75	°C
Storage Temperature Range	T _{stg}	-40~+125	°C

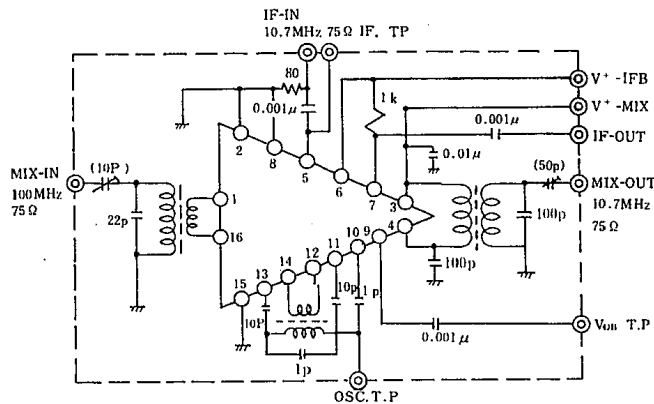
■ ELECTRICAL CHARACTERISTICS

(V⁺=12V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current (MIX)	I _{CCM}	STC, no signal	2.5	3.2	3.8	mA
Supply Current (IF+B)	I _{CCA}	STC, no signal	8.8	11.0	13.2	mA
Conversion Power Gain (MIX)	P _G	STC, f _{osc} =100MHz, V _{in} =1mV	21	24	27	dB
Noise Figure (MIX)	NF	STC	—	6.0	7.0	dB
Local Oscillator Voltage (OSC)	V _{OSC}	STC, f _{osc} =110.7MHz	1.0	1.3	—	V
Voltage Gain (IF)	V _G	STC, f _{IF} =10.7MHz, V _{IN} =10mV	22	28	—	mV/mV
Input Resistance (IF)	R _i (IN)	f=10.7MHz, V _{IN} =10mV	—	3.2	—	kΩ
Input Capacitance (IF)	C _i (IN)	f=10.7MHz, V _{IN} =10mV	—	3.8	—	pF
Local Osc. Buffer Output (O)	V _{OB}	STC, f _{OSC} =110.7MHz	0.5	0.6	—	V
Input Resistance (O-Buf)	R _O (IN)	f=110.7MHz, V _{IN} =100mV	—	1.7	—	kΩ
Input Capacitance (O-Buf)	C _O (IN)	f=110.7MHz, V _{IN} =100mV	—	3.1	—	pF
Output Resistance (O-Buf)	R _O (OUT)	f=110.7MHz, V _{IN} =100mV	—	160	—	Ω

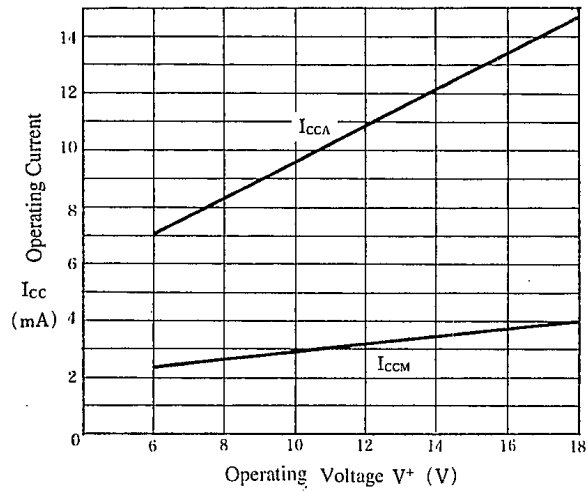
note: STC: Specified Test Circuit

■ TEST CIRCUIT

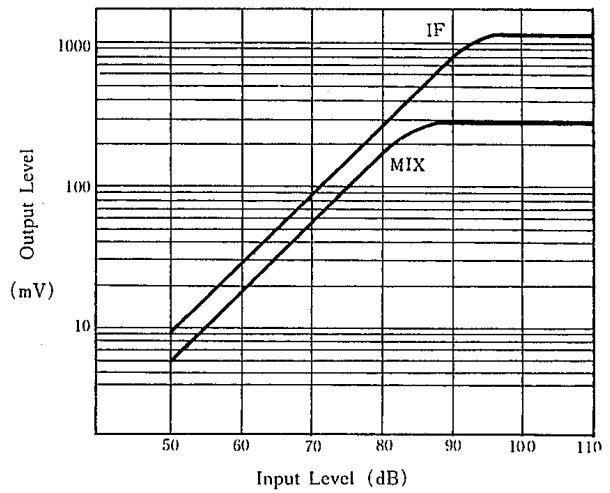


■ TYPICAL CHARACTERISTICS

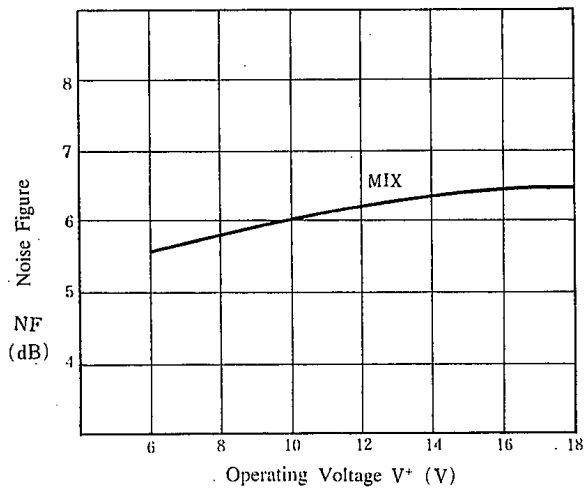
Operating Current vs. Supply Voltage



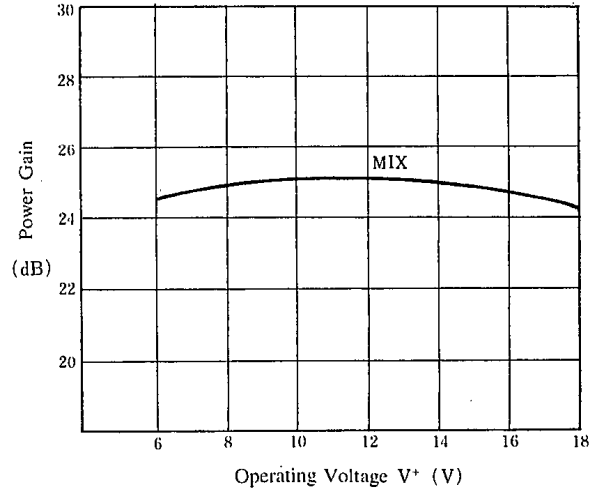
Output Level vs. Input Level



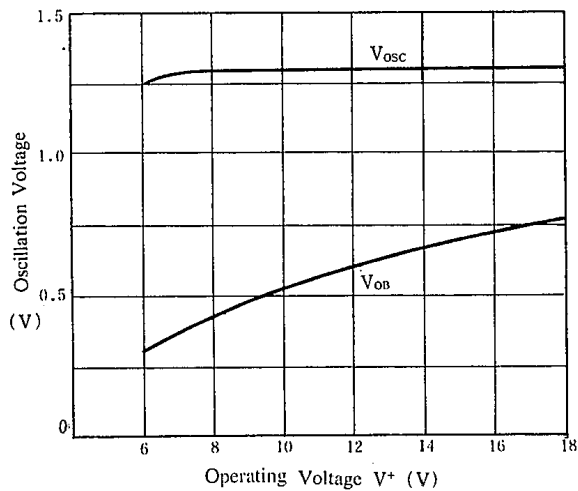
Noise Figure vs. Operating Voltage



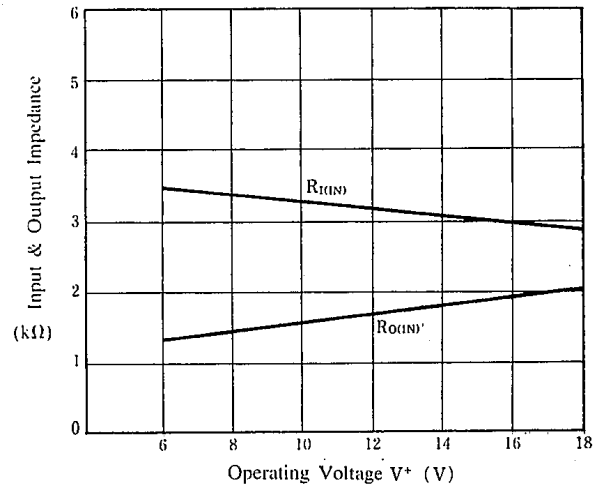
Power Gain vs. Operating Voltage



Oscillation Voltage vs. Operating Voltage

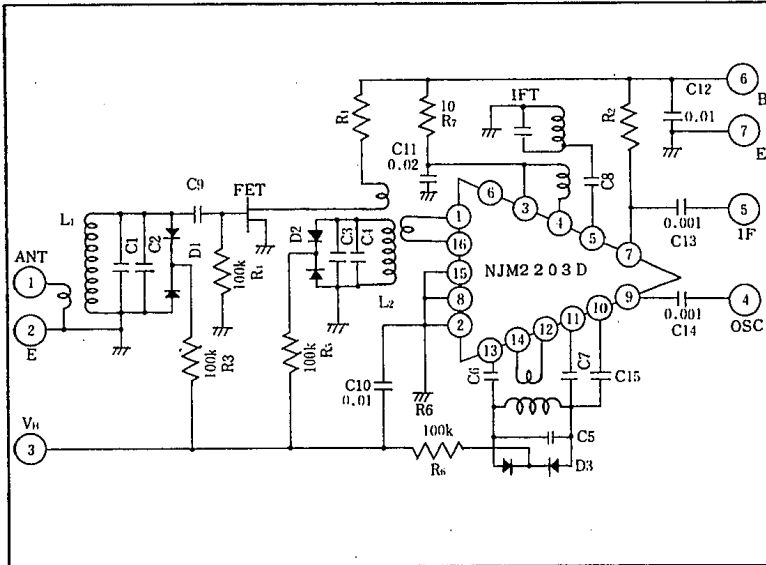


Input & Output Impedance vs. Operating Voltage



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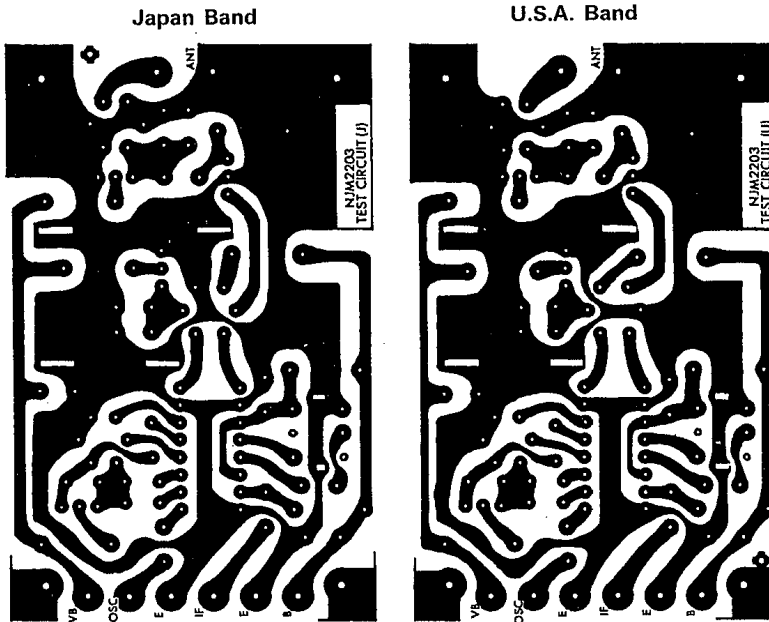
TYPICAL APPLICATION



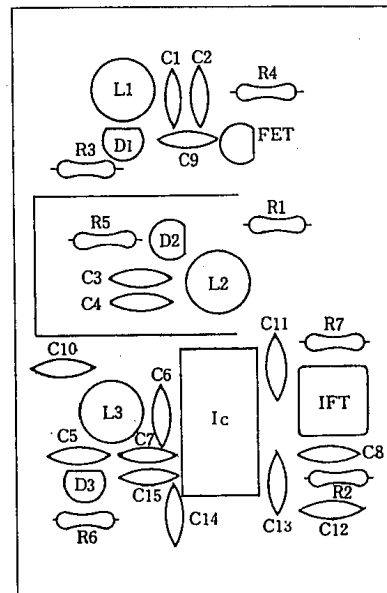
	76~90MHz	88~108MHz	
L1	VS-32	VS-35	TAKI
L2	VS-33	VS-36	"
L3	VS-34	VS-37	"
D1,2,3	SVC202A,B	SVC202A,B	
C1	6	1.5	
C2	6	4	
C3	7	6	
C4	12	7	
C5	15	15	
C6,7	5	10	
C8	120	120	
R1	150	150	
R2	330	330	
FET	2SK168E,F	2SK168E,F	HITACHI
IFT	154FC-41921N		TOKO

4

PATTERN EXAMPLE OF ABOVE CIRCUIT



Parts Arrangement



(Backside View)

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.