

## FULL BALANCED MIXER

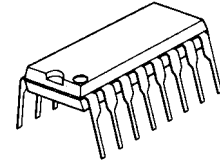
### ■ GENERAL DESCRIPTION

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.

### ■ FEATURES

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

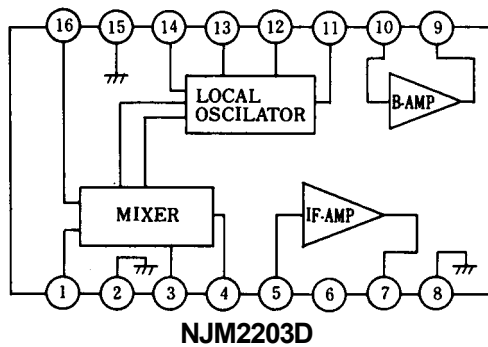
### ■ PACKAGE OUTLINE



**NJM2203D**

DIP16

### ■ BLOCK DIAGRAM

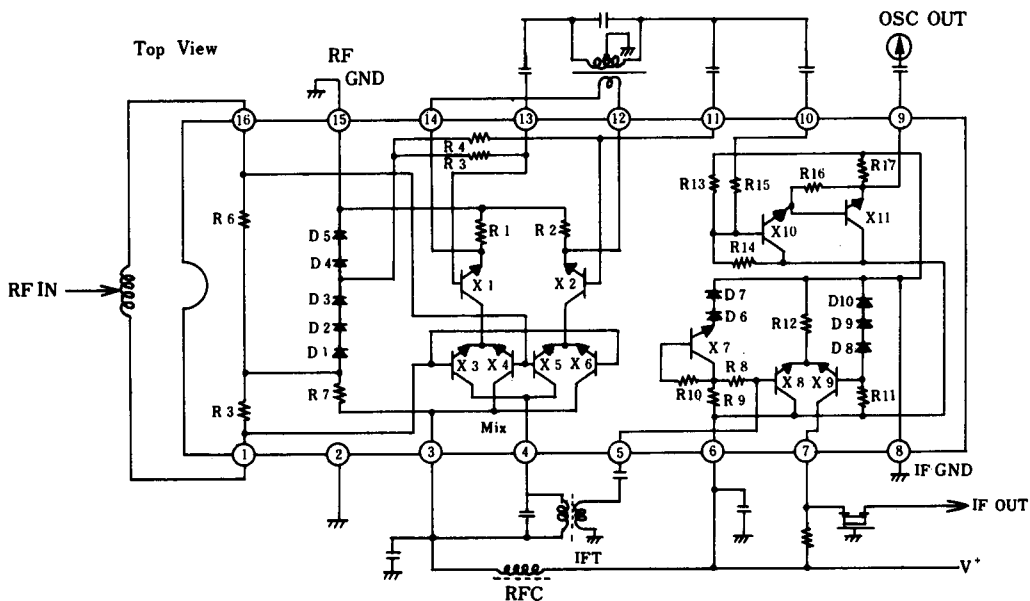


**NJM2203D**

### 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. $I_F$ OUT | 15. GND(RF)          |
| 8. GND (IF)  | 16. RF INPUT2        |

### ■ EQUIVALENT CIRCUIT



**NJM2203D**

# NJM2203

## ■ ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub>=25°C)

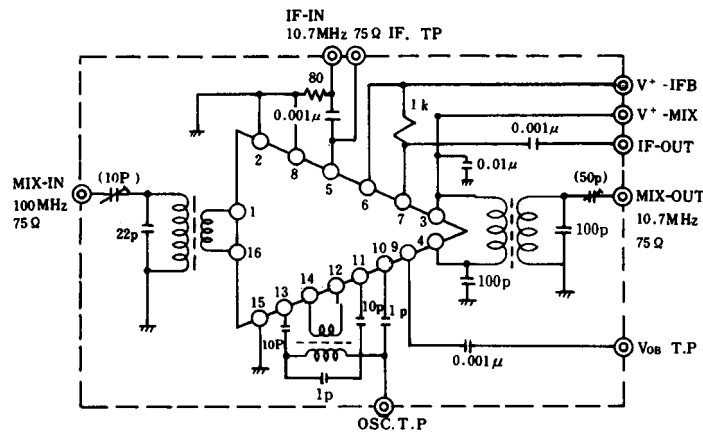
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup>	18	V
Power Dissipation	P <sub>D</sub>	500	mW
Operating Temperature Range	T <sub>opr</sub>	-20 to +75	°C
Storage Temperature Range	T <sub>stg</sub>	-40 to +125	°C

## ■ ELECTRICAL CHARACTERISTICS (V<sup>+</sup>=12V, T<sub>a</sub>=25°C)

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

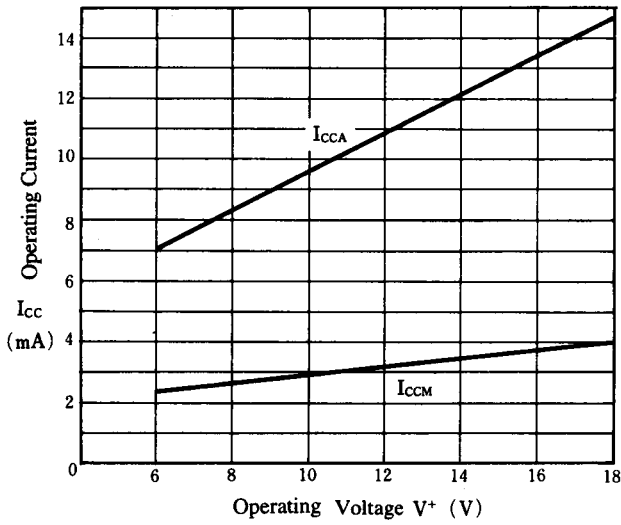
note : STC ; Specified Test Circuit

## ■ TEST CIRCUIT

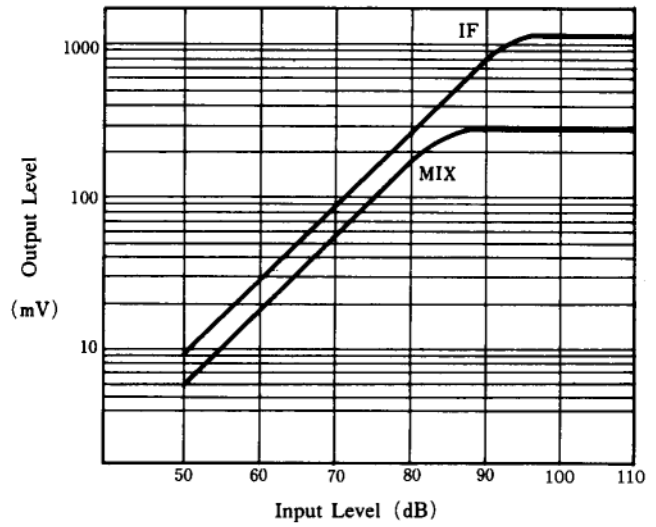


## ■ TYPICAL CHARACTERISTICS

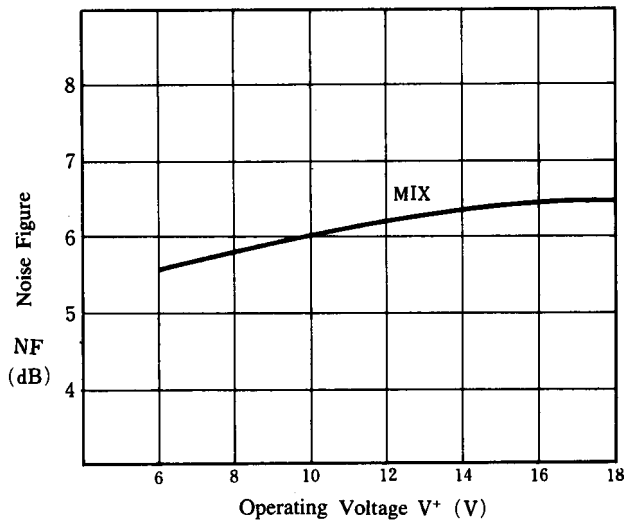
### Operating Current vs. Supply Voltage



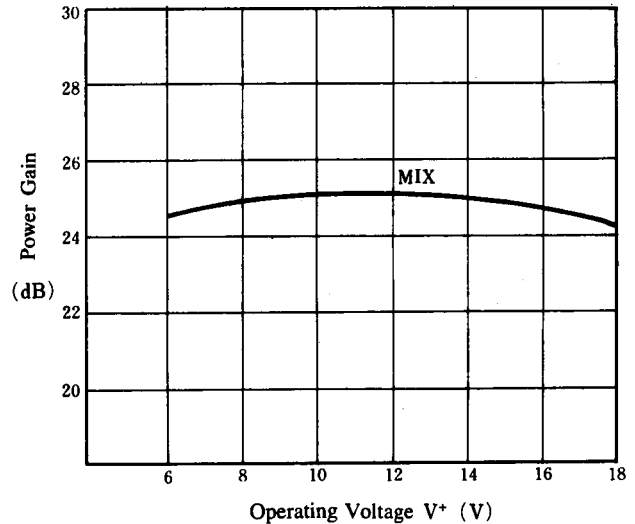
### Output Level vs. Input Level



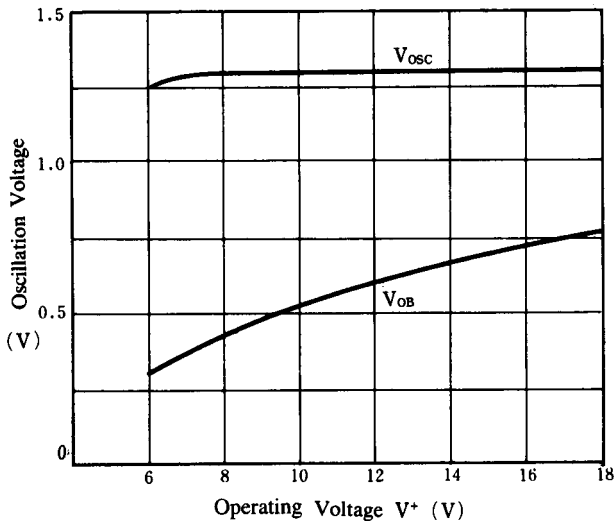
### Noise Figure vs. Operating Voltage



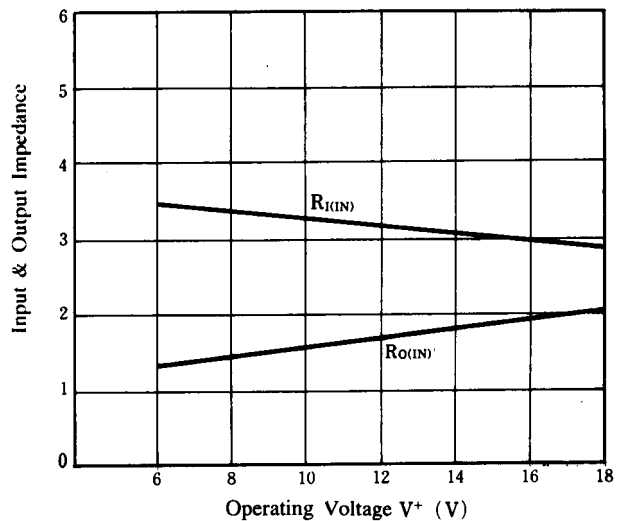
### Power Gain vs. Operating Voltage



### Oscillation Voltage vs. Operating Voltage

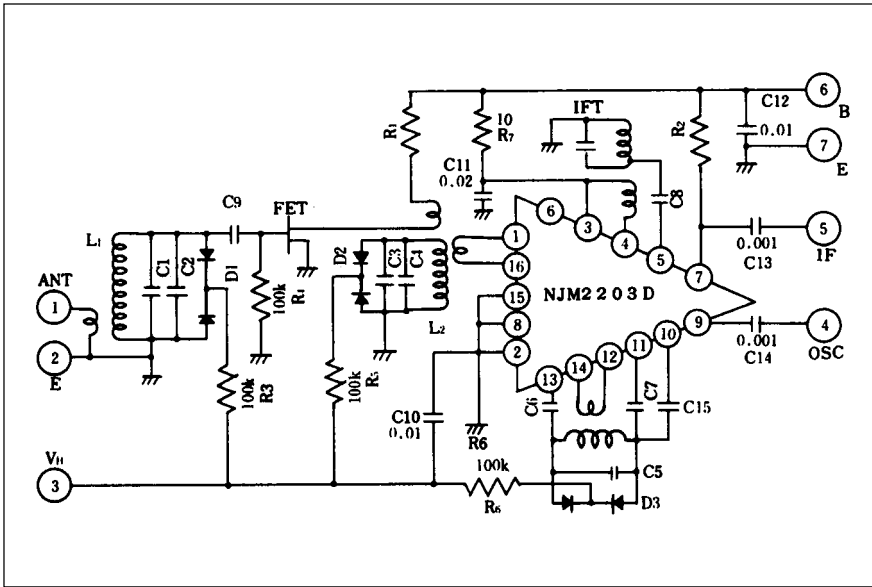


### Input & Output Impedance vs. Operating Voltage



# NJM2203

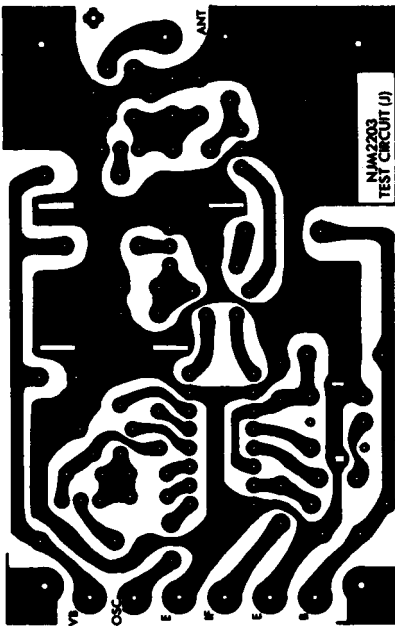
## ■ TYPICAL APPLICATION



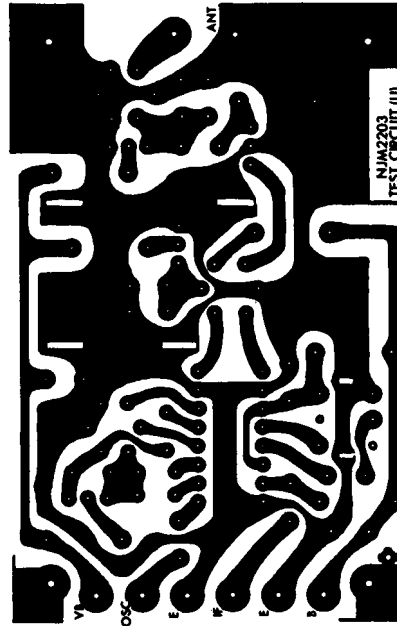
	76 to 90MHz	88 to 108MHz	
L1	VS-32	VS-35	TAIKI
L2	VS-33	VS-36	TAIKI
L3	VS-34	VS-37	TAIKI
D1, D2, D3	SVC202A, B	SVC202A, B	
C1	6	1.5	
C2	6	4	
C3	7	6	
C4	12	7	
C5	15	15	
C6, 7	5	10	
C8	120	120	
R1	150	150	
R2	330	330	
FET	2SK168E, F	2SK168E, F	HITACHI
IFT	154FC-41921N		TOKO

## ■ PATTERN EXAMPLE OF ABOVE CIRCUIT

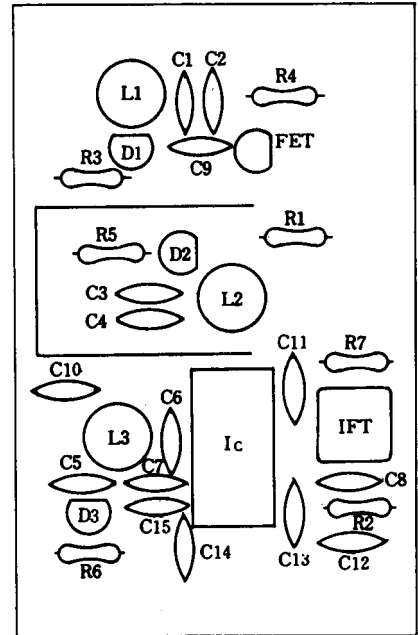
Japan Band



U.S.A. Band



Parts Arrangement



(Backside View)

[CAUTION]  
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