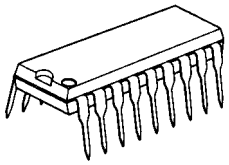
LOW POWER NARROW BAND FM IF

■ GENERAL DESCRIPTION

The **NJM3359** is a low power narrow band FM detector integrated circuit. for FM dual conversion of communication equipment. The **NJM3359** includes oscillator, limiting amplifier, AFC circuit, quadrature detect, operational amplifier, squelch circuit, scan-control and muting switch.

The **NJM3359** is a circuit of **NJM3357** plus one stage limiting IF amplifier and AFC output terminal.

■ PACKAGE OUTLINE



NJM3359D

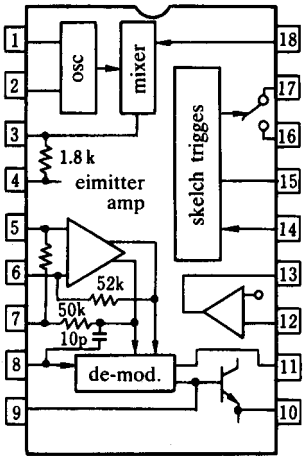
■ FEATURES

- Low Operating Current (3.6mA typ@V^+=6V)
- Input Limiting Voltage (2.0μVrms typ@-3dB)
- Minimum other parts.
- Package Outline DIP18
- Bipolar Technology

■ RECOMMENDED OPERATIONAL CODITION

- Operating Voltage 4 to 9V

■ PIN CONFIGURATION



NJM3359D

PIN FUNCTION

Pin No.	
1. crystal	10. de-modulator output
2. crystal	11. AFC
3. mixer output	12. filter input
4. V^+	13. filter output
5. limitter input	14. skelch input
6. de-coupling	15. scan, control
7. de-coupling	16. audio muting
8. detector input	17. GND
9. de-modulator input	18. RF input

■ ABSOLUTE MAXIMUM RATINGS

(T_a=25°C)

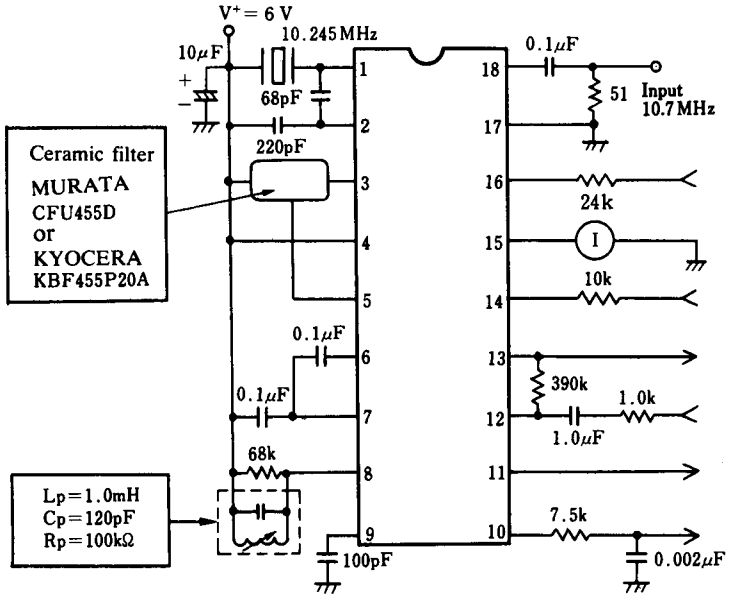
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	12	V
Input Voltage	V18	1.0	Vrms
Muting Function	V16	-0.7 to 12	V_{PK}
Operating Temperature Range	T_{opr}	-40 to 85	°C
Storage Temperature Range	T_{stg}	-40 to 125	°C

■ ELECTRICAL CHARACTERISTICS

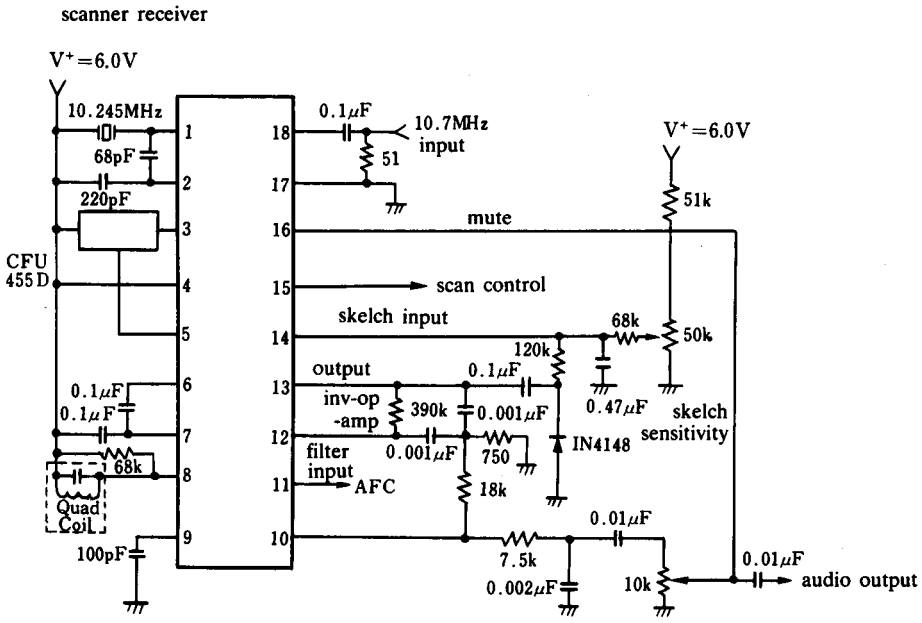
(V^+=6V, f_O=10.7MHz, Δf=±3.0kHz, fmod=1.0kHz, T_a=25°C)

PARAMETER	PIN	MIN.	TYP.	MAX.	UNIT
Operating Current	PIN 4,8				
Squelch OFF		-	3.6	6.0	mA
Squelch ON		-	5.4	7.0	mA
Input Sensitivity (S / N : 20dB)		-	8.0	-	μVrms
Input Limitting Voltage (-3dB)		-	2.0	-	μVrms
Mixer Voltage Gain	PIN 18 - PIN 3 Open	-	33	-	dB
Mixer Intercept Point	50Ω input	-	-1.0	-	dBm
Mixer Input Resistance		-	3.6	-	kΩ
Mixer Input Capacitance		-	2.2	-	pF
Recovered Audio Output Voltage	PIN 10, V_{IN}=1.0mVrms	450	700	-	mVrms
Detector Center Frequency Slope	PIN 10	-	0.3	-	V / kHz
AFC Center Frequency Slope	PIN 11, R_L=∞	-	12	-	V / kHz
Filter Gain	f_{IN}=10kHz, V_{IN}=5mV	40	51	-	dB
Squelch Threshold Voltage	PIN 14, 10kΩ	-	0.62	-	Vdc
Scan Control Current	PIN 15				
	PIN 14 - High	-	0.01	1.0	μA
	- Low	2.0	2.4	-	mA
Mute Switch Impedance	PIN 16 - GND				
	PIN14 - High	-	5.0	10	Ω
	- Low	-	1.5	-	MΩ

■ TEST CIRCUIT



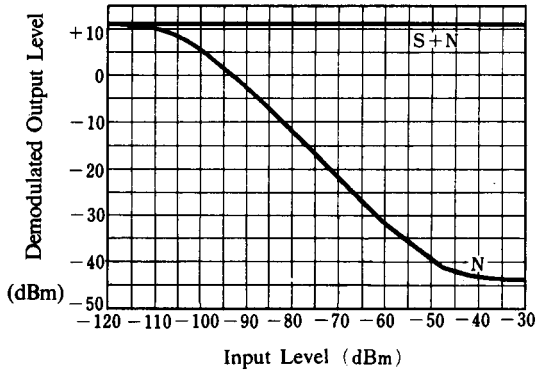
■ APPLICATION EXAMPLE



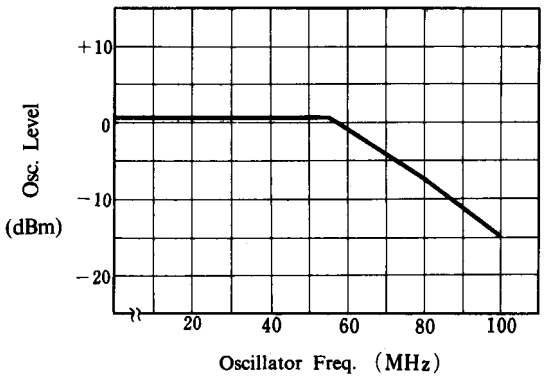
■ TYPICAL CHARACTERISTICS

Input - Output

(V^+=6.0V, f_{in}=10.7MHz, Δf=±3kHz, f_{mod}=1kHz)

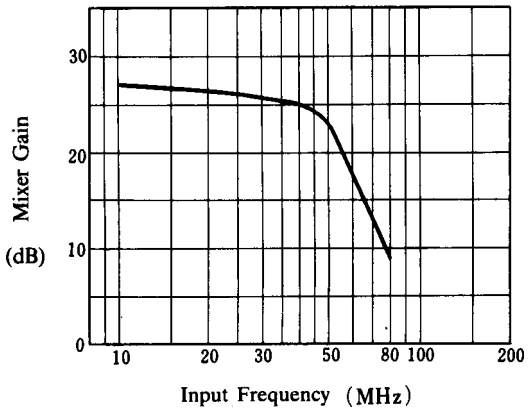


Local OSC Frequency

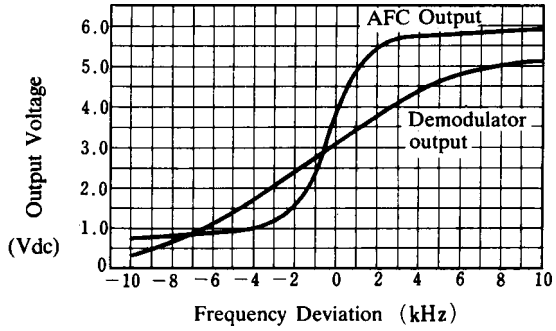


Mixer Gain vs. Input Frequency

(2nd IF=455kHz, adjust Local OSC frequency)

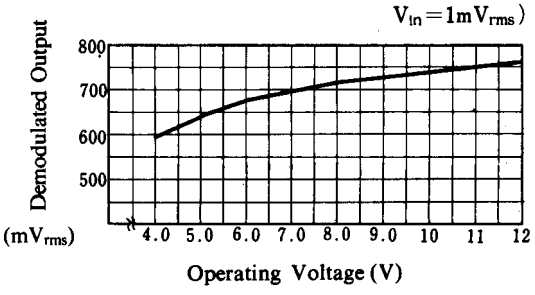


AFC Characteristics



Demodulator Output

(f_{in}=10.7MHz, f_{mod}=1kHz, Δf=±3kHz, V_{in}=1mV_{rms})



Temperature Characteristics

(V^+=6.0V, f_{in}=10.7MHz, f_{mod}=1kHz, Δf=±3kHz, S/N : V_{in}=1mV_{rms}, Sensitivity : V_{in}=8.0μV_{rms})