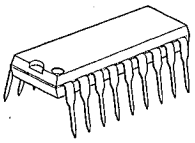
LOW POWER NARROW BAND FM IF

■ 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

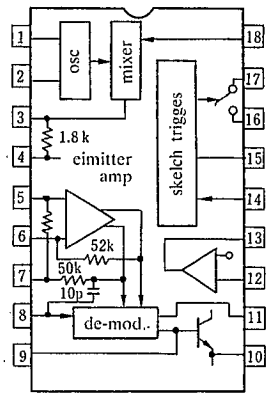
■ FEATURES

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

■ RECOMMENDED OPERATIONAL CONDITION

- Operating Voltage 4~9V

■ PIN CONFIGURATION



NJM3359D

PIN FUNCTION

Pin No.

1. crystal
2. crystal
3. mixer output
4. V⁺
5. limitter input
6. dc-coupling
7. dc-coupling
8. detector input
9. dc-modulator input
10. de-modulator output
11. AFC
12. filter input
13. filter output
14. skelch input
15. scan, control
16. audio muting
17. GND
18. RF input

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

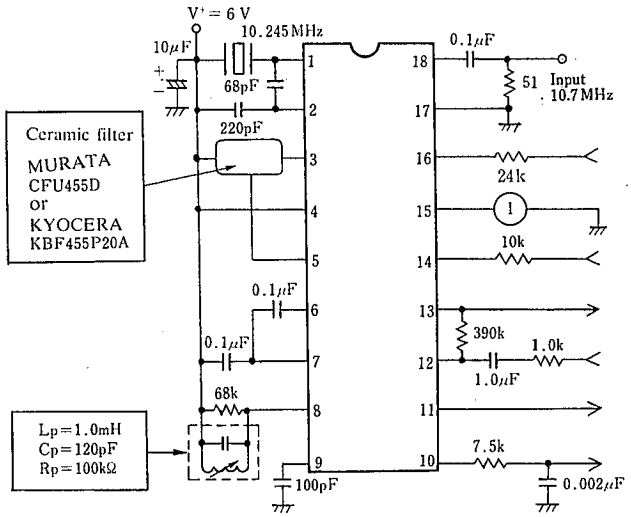
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	12	V
Input Voltage	V_{IN}	1.0	V_{rms}
Muting Function	V_{16}	−0.7～12	V_{PK}
Operating Temperature Range	T_{opr}	−20～75	℃
Storage Temperature Range	T_{stg}	−40～125	℃

■ ELECTRICAL CHARACTERISTICS

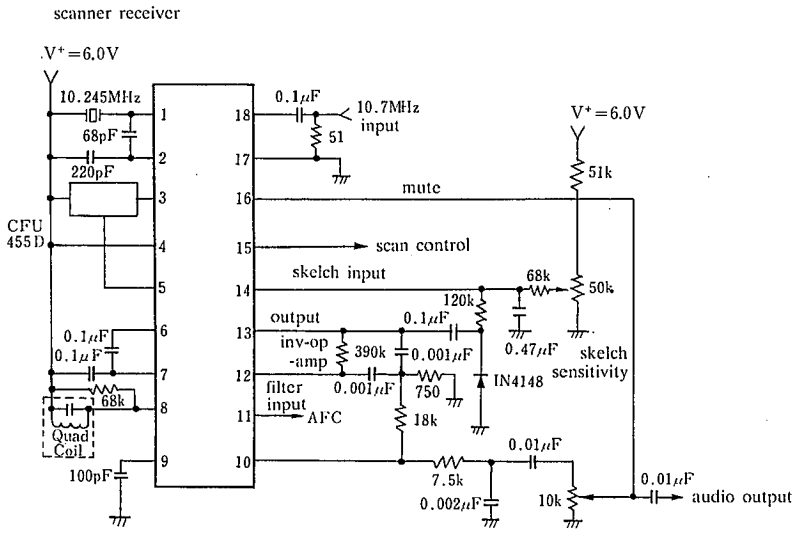
(V^+=6V, fo=10.7MHz, △f=±3.0kHz, f_{mod}=1.0kHz, Ta=25℃)

PARAMETER	PIN	MIN.	TYP.	MAX.	UNIT
Operating Current	P_{IN} 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	P_{IN}18 – P_{IN}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	P_{IN}10, V_{IN}=1.0mVrms	450	700	—	mVrms
Detector Center Frequency Slope	P_{IN}10	—	0.3	—	V/kHz
AFC Center Frequency Slope	P_{IN}11, R_L=∞	—	12	—	V/kHz
Filter Gain	f_{in}=10kHz, V_{IN}=5mV	40	51	—	dB
Squelch Threshold Voltage	P_{IN}14, 10kΩ	—	0.62	—	V_{dc}
Scan Control Current	P_{IN}15				
	P_{IN}14 – High	—	0.01	1.0	μA
	– Low	2.0	2.4	—	mA
Mute Switch Impedance	P_{IN}16 – GND				
	P_{IN}14 – High	—	5.0	10	Ω
	– Low	—	1.5	—	MΩ

■ TEST CIRCUIT



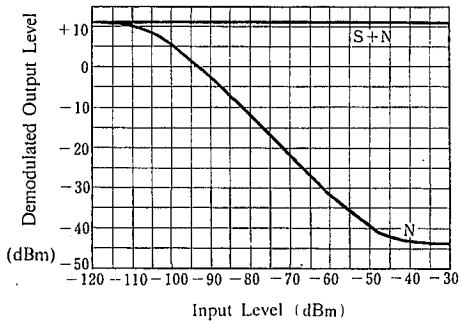
■ APPLICATION EXAMPLE



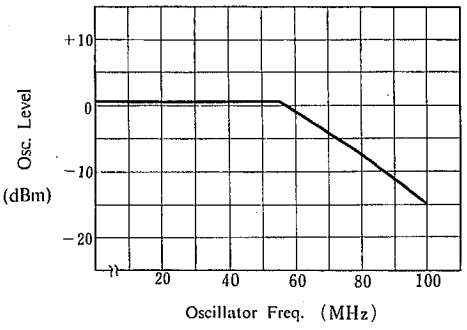
■ TYPICAL CHARACTERISTICS

Input-Output

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

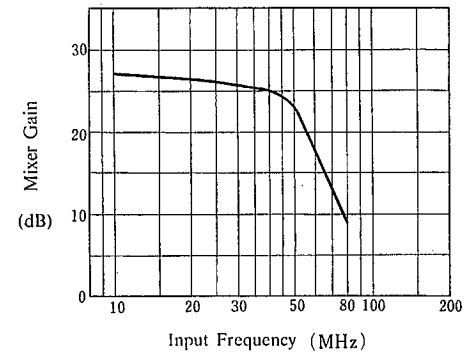


Local OSC Frequency

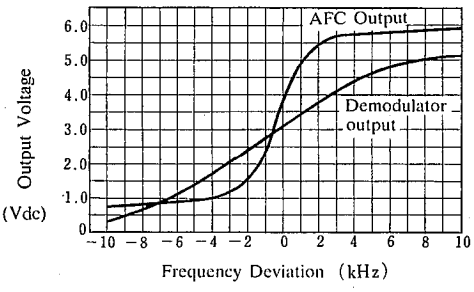


Mixer Gain vs. Input Frequency

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

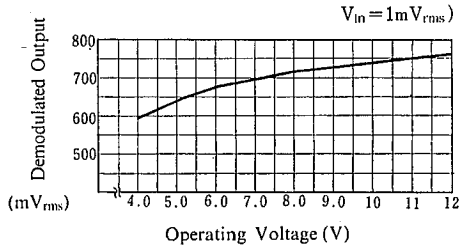


AFC Characteristics



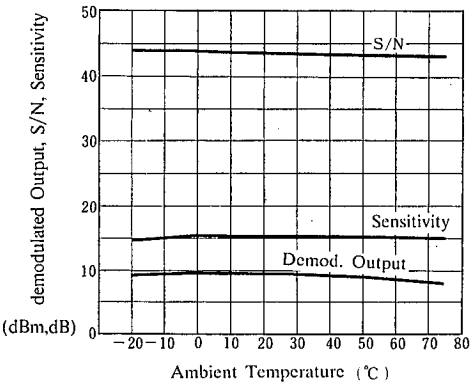
Demodulator Output

(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})



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