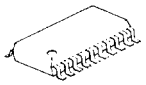
NARROW BAND FM IF IC

■ GENERAL DESCRIPTION

The NJM2292 is a narrow band FM IF IC designed for use in cordless telephones and amature radios, etc...It contains almost all blocks of the narrow band FM IF system-a mixer, an IF amplifier, an RSSI and a Quadrature detector, for example. It features low supply current to make a sharp reduction of total power consumption possible.

■ PACKAGE OUTLINE



NJM2292V

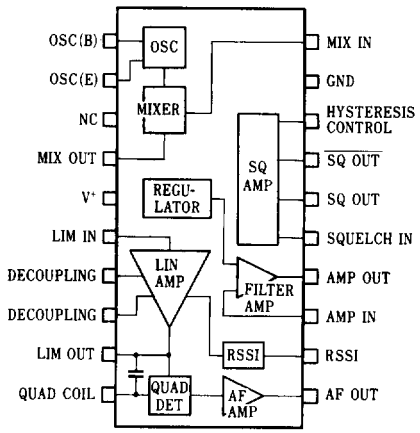
■ FEATURES

- Low Operating Voltage (1.8～7.0V)
- Low Operating Current (20mA typ. @V⁺=2.4V)
- Maximum input frequency (100MHz)
- A ceramic discriminator is available
- Package Outline SSOP20
- Bipolar Technology

■ APPLICATIONS

- Amature radios
- Cordless telephones, etc.

■ PIN CONFIGURATION



NJM2292V

■ MAXIMUM ABSOLUTE RATINGS

(Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	10	V
Power Dissipation	Pd	300	mW
Operating Temperature Range	Topr	−30～+85	℃
Storage Temperature Range	Tstg	−40～+125	℃

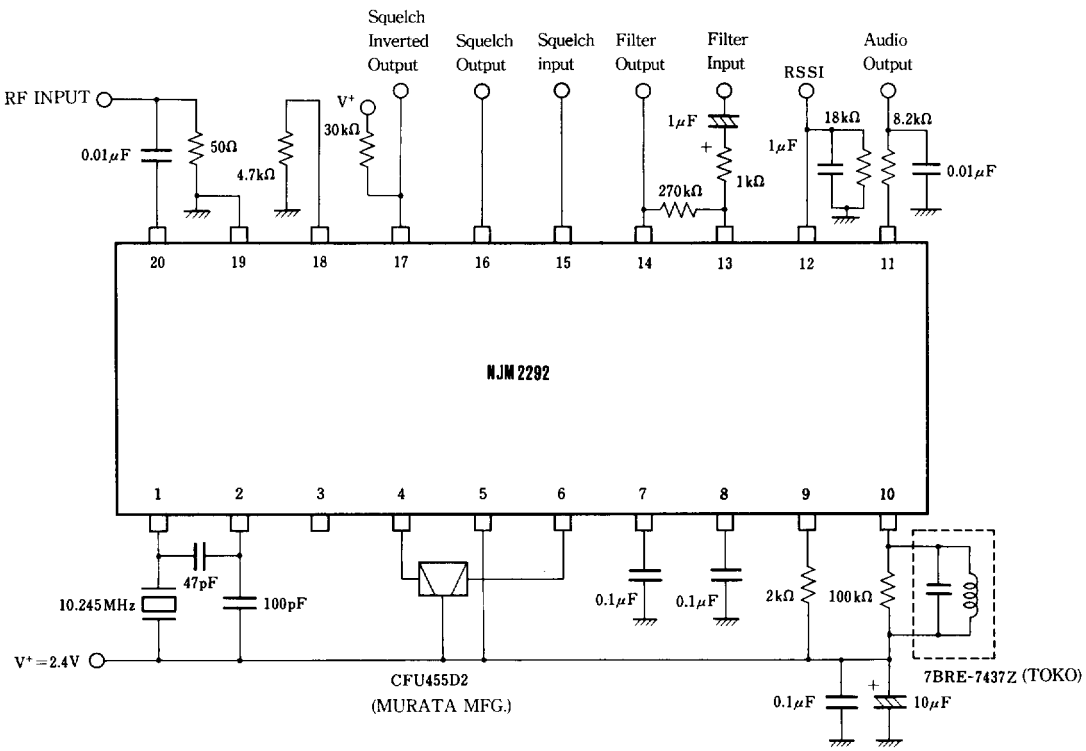
6

■ ELECTRICAL CHARACTERISTICS

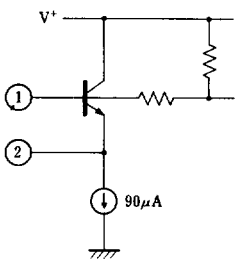
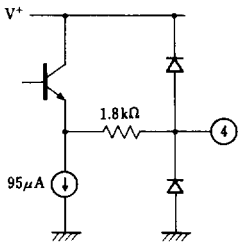
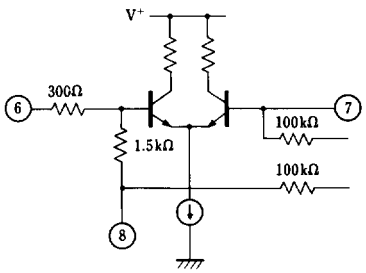
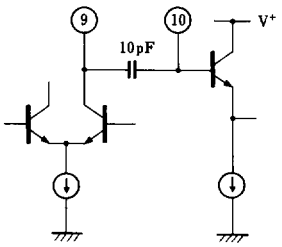
(V^+=2.4V, fc=21.7MHz, fmod=1kHz 1mV, fdev=±3kHz, Ta=25℃)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I_{CC}	No signal, Squelch off		2.0	2.7	mA
Mixer						
Gain	G_{MIX}		20	25		dB
Input resistance	R_{MIX}		2.7	3.6	4.5	kΩ
Limiting sensitivity	LIMIT	−3dB limiting		3.0		μV_{rms}
Audio output voltage	V_{OUT}		50	70		mV_{rms}
Filter amplifier gain	Af	V_i =1mV_{rmsy}, 1kHz	45	48		dB
Filter amplifier output voltage	V_{ref}		0.75	0.9	1.05	V
RSSI maximum output voltage	V_{RMAX}	R_{rs}=18kΩ, IF_{in}=100mV_{rms}	0.65	0.9	1.2	V
RSSI minimum output voltage	V_{RMIN}	R_{rs}=18kΩ, NO signal			0.5	V
Squelch Hysteresis	Hys	R_{hys}=4.7kΩ	30	80	105	mV
Squelch output voltage High level	S_{PHI}		1.0	1.4	1.8	V
Low level	S_{PLO}				0.2	V
Squelch inverted output voltage High level	S_{NHI}	30kΩ pull up	2.2			V
Low level	S_{NLO}	30kΩ pull up			0.2	V

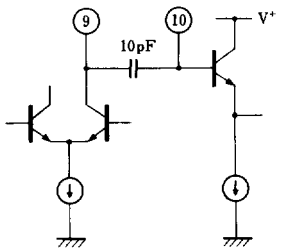
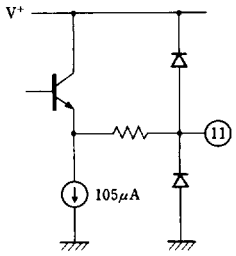
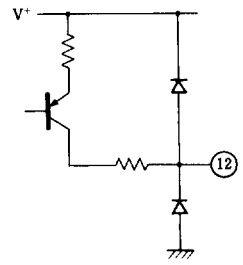
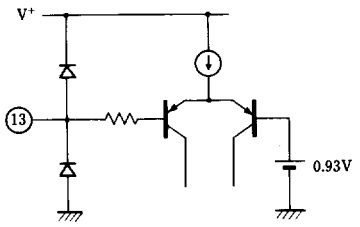
■ TEST CIRCUIT



■ TERMINAL FUNCTION (V⁺=2.4V)

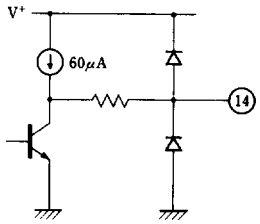
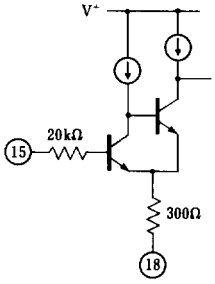
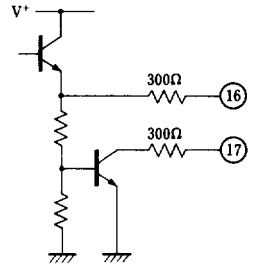
PIN NO.	SYMBOL	PIN VOL TAGE (typ.)	FUNCTION	EQUIVARENT CIRCUIT
1	OSC IN	2.4V	These terminals are connected with a crystal resonator to construct a colpitts circuit.	
2	OSC OUT	1.7V		
3	NC		No connection.	
4	MIX OUT	1.47V	Amixer output.	
5	V⁺	2.4V	Supply voltage.	
6	LIM IN	1.59V	A limiter input and decoupling terminals. The 7 and 8 pins are connected with about 100μF capacitors. (ESD protection diodes are connected internally with each terminal.)	
7	DEC1	1.59V		
8	DEC2	1.59V		
9	LIM OUT	–	A limiter output	

■ TERMINAL FUNCTION (V⁺=2.4V)

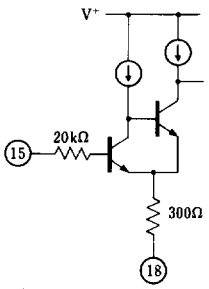
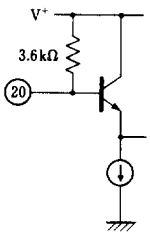
PIN NO.	SYMBOL	PIN VOLTAGE (typ.)	FUNCTION	EQUIVARENT CIRCUIT
10	QUAD COIL	–	A quadrature detector input.	
11	AF OUT	1.18V	The output of the FM demodulated signal.	
12	RSSI	–	An RSSI output. The output current signal is in logarithmic proportion to the input signal.	
13	AMP IN	–	An operational amplifier inverted input.	

6

■ TERMINAL FUNCTION (V⁺=2.4V)

PIN NO.	SYMBOL	PIN VOL TAGE (typ.)	FUNCTION	EQUIVARENT CIRCUIT
14	AMP OUT	–	An operational amplifier output.	
15	SQ IN	–	A squelch amplifier input. (ESD protection diodes are connected internally with this terminal.)	
16	SQ OUT	–	A squelch amplifier input. (ESD protection diodes are connected internally with this terminal.)	
17	$\overline{\text{SQ OUT}}$	–	A squelch amplifier inverted output. (ESD protection diodes are connected internally with this terminal.)	

■ TERMINAL FUNCTION (V⁺=2.4V)

PIN NO.	SYMBOL	PIN VOLTAGE (typ.)	FUNCTION	EQUIVARENT CIRCUIT
18	HYSTERESIS CONTROL	–	A hysteresis control terminal. (ESD protection diodes are connected internally with this terminal.)	
19	GND	0V	Ground.	
20	MIX IN	2.4V	A mixer input.	

6