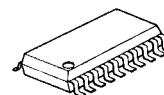


NARROW BAND FM IF IC

■ 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

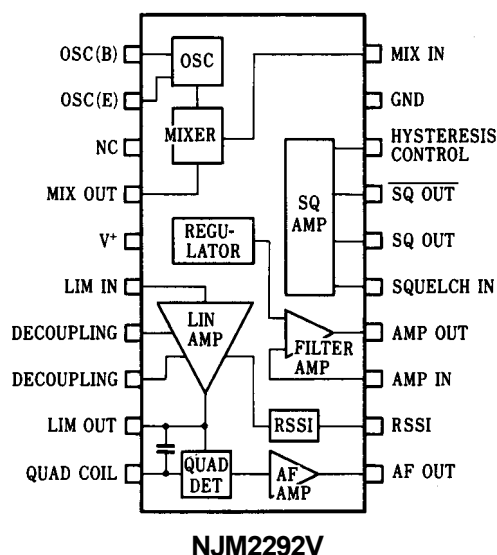
■ FEATURES

- Low Operating Voltage (1.8 to 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



■ ABSOLUTE MAXIMUM RATINGS

(T_a=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	10	V
Power Dissipation	P _d	300	mW
Operating Temperature Range	T _{opr}	-30 to +85	°C
Storage Temperature Range	T _{stg}	-40 to +125	°C

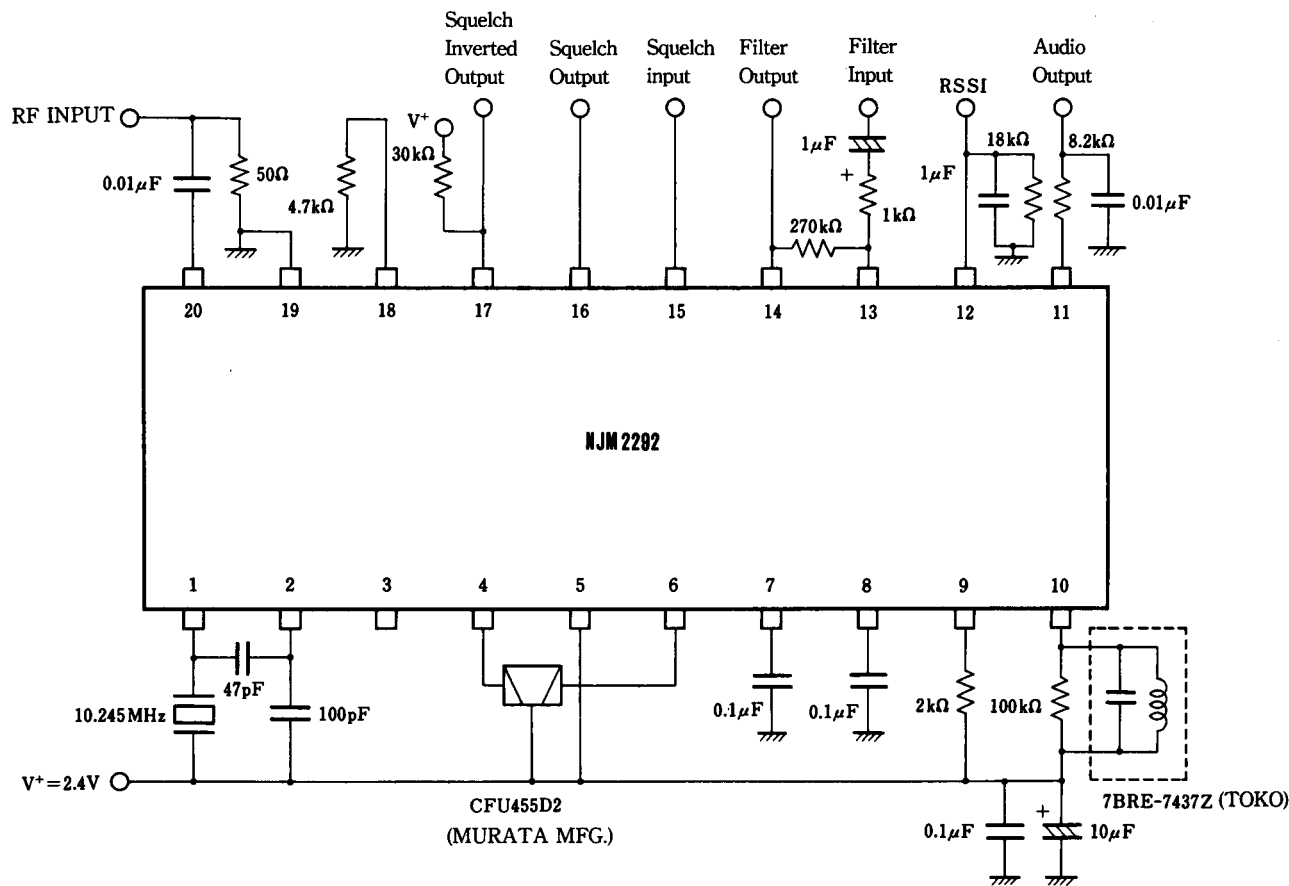
NJM2292

■ ELECTRICAL CHARACTERISTICS

($V^+=2.4\text{V}$, $f_c=21.7\text{MHz}$, $f_{\text{mod}}=1\text{kHz}$ 1mV, $f_{\text{dev}}=\pm 3\text{kHz}$, $T_a=25^\circ\text{C}$)

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	k Ω
Limiting sensitivity	LIMIT	-3dB limiting		3.0		μVrms
Audio output voltage	V_{OUT}		50	70		mVrms
Filter amplifier gain	A_f	$V_i=1\text{mVrms}$, 1kHz	45	48		dB
Filter amplifier output voltage	V_{ref}		0.75	0.9	1.05	V
RSSI maximum output voltage	V_{RMAX}	$R_{\text{rs}}=18\text{k}\Omega$, $I_{\text{F}}=100\text{mVrms}$	0.65	0.9	1.2	V
RSSI minimum output voltage	V_{RMIN}	$R_{\text{rs}}=18\text{k}\Omega$, No signal			0.5	V
Squelch Hysteresis	Hys	$R_{\text{hys}}=4.7\text{k}\Omega$	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}	30k Ω pull up	2.2			V
Low level	S_{NLO}	30k Ω pull up			0.2	V

■ TEST CIRCUIT



■ TERMINAL FUNCTION ($V^+=2.4V$)

PIN NO.	SYMBOL	PIN VOLTAGE(typ.)	FUNCTION	EQUIVALENT 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	

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■ TERMINAL FUNCTION ($V^+ = 2.4V$)

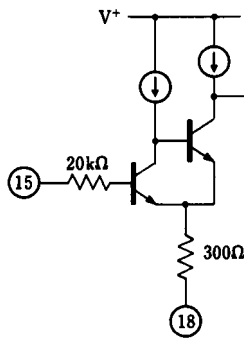
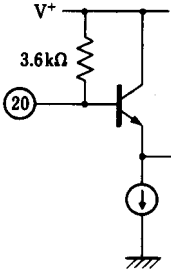
PIN NO.	SYMBOL	PIN VOLTAGE(typ.)	FUNCTION	EQUIVALENT CIRCUIT
10	QUAD COIL	-	A quadrature detector input	
11	AF OUT	1.18V	The output of the FM demodulated signal.	
12	RSSI	-	An RSSI output. The output current signal is in logarithmic proportion to the input signal.	
13	AMP IN	-	An operational amplifier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

■ TERMINAL FUNCTION ($V^+ = 2.4V$)

PIN NO.	SYMBOL	PIN VOLTAGE(typ.)	FUNCTION	EQUIVALENT 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.)	

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■ TERMINAL FUNCTION (V⁺=2.4V)

PIN NO.	SYMBOL	PIN VOL-TAGE(typ.)	FUNCTION	EQUIVALENT 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	

[CAUTION]
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