

FM IF IC FOR REMOTE KEYLESS ENTRY SYSTEM

■ GENERAL DESCRIPTION

The **NJM2295A** is FM IF IC for the remote keyless entry system (RKE). It includes almost all functions of IF blocks, from the 1st. Mixer to the wave shaving circuit.

Exclusively designed **NJM2295A** is suited not only for the RKE, but for other FM signal receivers.

■ PACKAGE OUTLINE

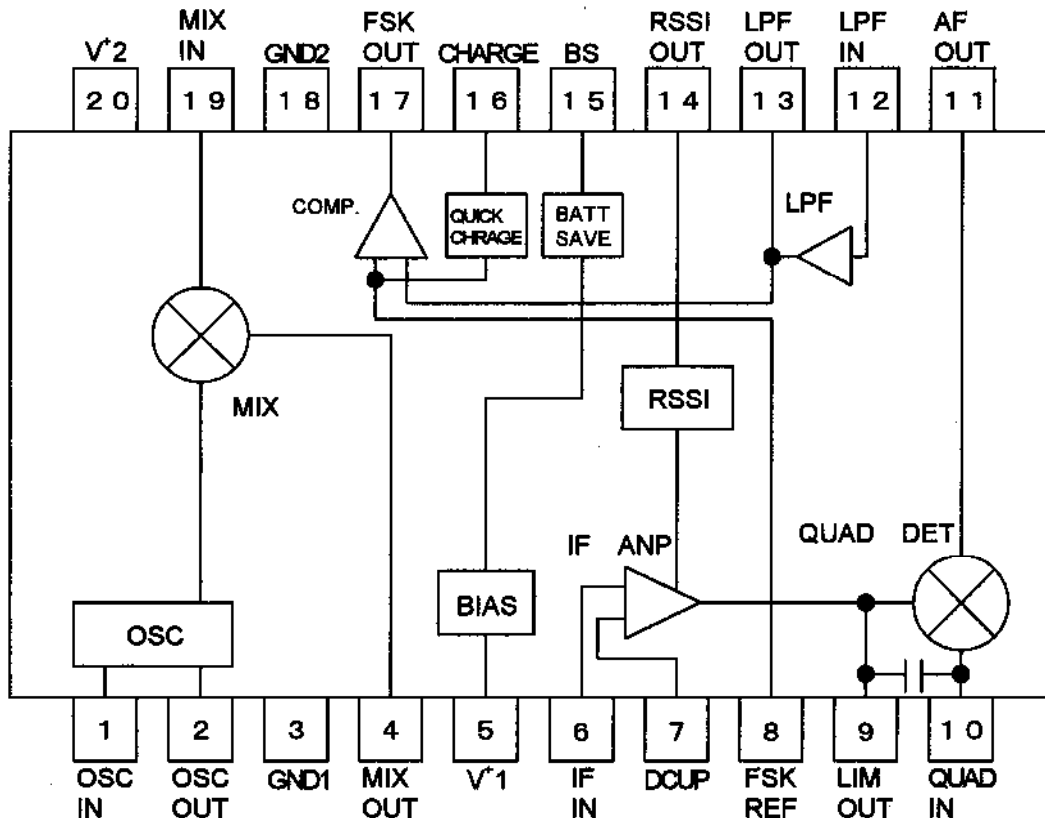


NJM2295AV

■ FEATURES

- Low Operating Current 5mA typ. at $V^+ = 5V$
- Low Operating Voltage +2.7V to 7.0V
- Local Oscillation Frequency 50 to 350MHz
- Mixer Active Frequency to 450MHz
- IF Frequency IF=10.7MHz
- 1st. Mixer Included
- RSSI Circuit Included
- FSK Wave Shaping Circuit
- Bipolar Technology
- Package Outline SSOP20

■ BLOCK DIAGRAM



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■ ABSOLUTE MAXIMUM RATINGS

(T_a=25°C)

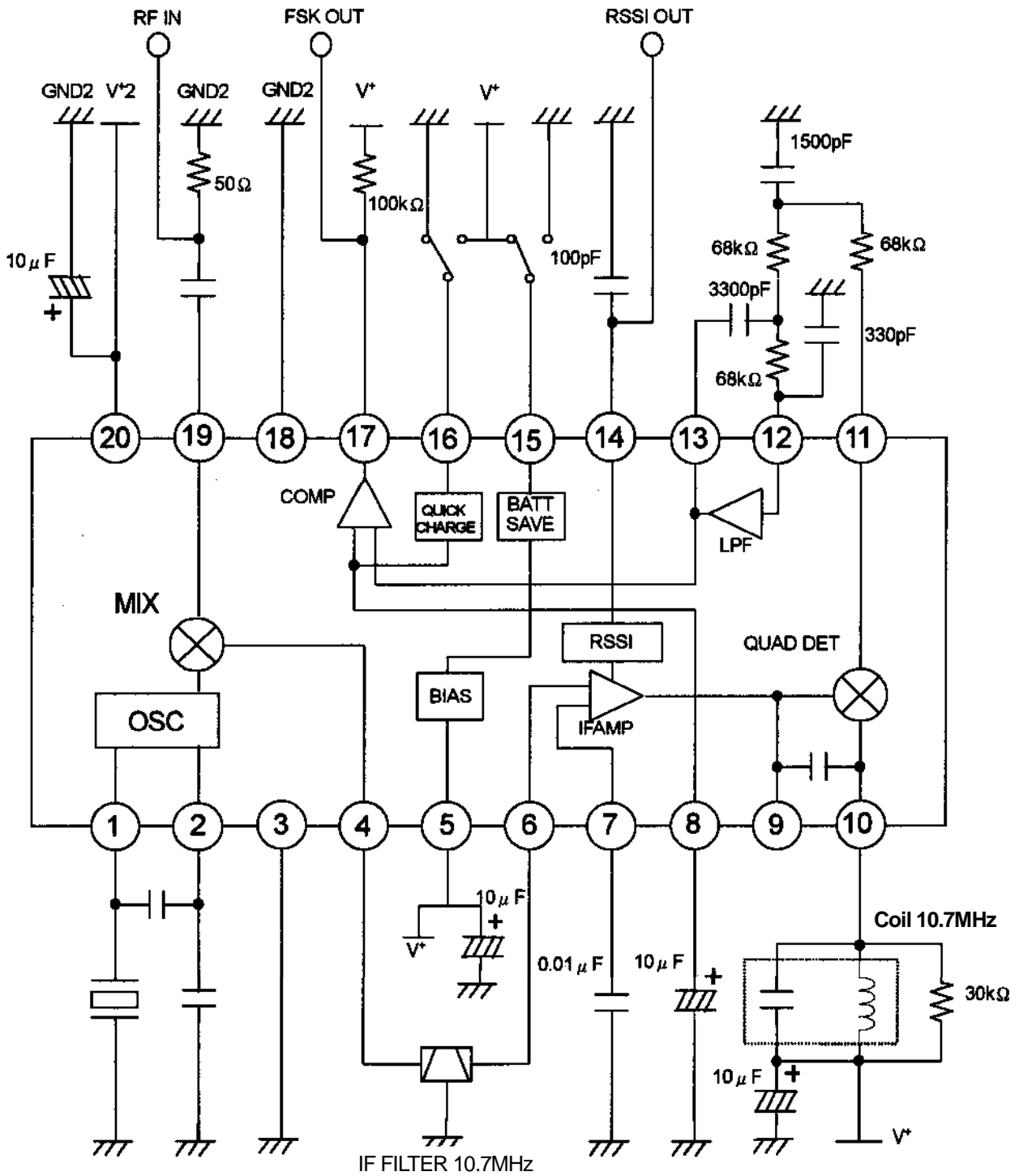
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	9.0	V
Power Dissipation	P _D	300	mW
Operating Temperature Range	T _{opr}	-40 to +85	°C
Storage Temperature Range	T _{stg}	-40 to +125	°C

■ ELECTRICAL CHARACTERISTICS

(V⁺=5.0V, T_a=25°C, f_{mod}=1kHz, f_{mix}=320MHz, f_{IF}=10.7MHz, f_{dev}=±10kHz)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V ⁺		2.7	-	7.0	V
No signal Operating Current	I _{CCQ}		-	5.0	7.5	mA
Battery saving Operating Current	I _{CCS}		-	-	10	μA
Mixer Gain 1	G _{mix1}	RL=No Connect.	13.5	18.5	22.5	dB
Mixer Gain 2	G _{mix2}	320MHz Gain - 450MHz Gain	-	1	3	dB
Mixer Sept Point	IP		-	103	-	dBμVEMF
Mixer Input Resistance	R _{inM}	f=320MHz	-	1	-	kΩ
Mixer Input Capacity	C _{inM}	f=320kHz	-	2	-	pF
Mixer Output Resistance	R _{oM}		-	330	-	Ω
IF amplifier Input Resistance	R _{inIF}		-	330	-	Ω
Signal to Noise Ratio 1	S / N1	Mixer Input, V _{IN} =80dBμVEMF	-	60	-	dB
Signal to Noise Ratio 2	S / N2	IF input, V _{IN} =80dBμVEMF	-	60	-	dB
Signal to Noise Ratio 3	S / N3	IF input, V _{IN} =35dBμVEMF	-	25	-	dB
-3dB limiting sensitivity	Slim	Mixer Input	-	22	27	dBμVEMF
Demodulated Output Level	V _{od}	IF input, V _{IN} =60dBμVEMF	80	150	-	mVrms
AM Rejection Ratio	AMR	IF input, V _{IN} =80dBμVEMF, AM=30%	-	50	-	dB
Duty ratio of Wave Shaped Output	DR	IF input, V _{IN} =60dBμVEMF	40	50	60	%
RSSI Output Voltage 1	RSSI1	IF input, V _{IN} =20dBμVEMF	0.35	0.55	0.70	V
RSSI Output Voltage 2	RSSI2	IF input, V _{IN} =60dBμVEMF	0.7	1.00	1.3	V
RSSI Output Voltage 3	RSSI3	IF input, V _{IN} =100dBμVEMF	1.30	1.75	2.15	V
RSSI Output Resistance	RSSIR		-	48	-	kΩ
Quick Charge / discharge current	I _{ch}		35	70	120	μA
Low Level Output Voltage of FSK-OUT	V _{fskL}	I _L =100μA	-	0.1	0.4	V
High Level Leak Current of FSK-OUT Terminal	I _{fskH}		-	-	2	μA

APPLICATION CIRCUIT



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■ TERMINAL FUNCTION

PIN No.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT
1	OSC IN	SAW is oscillation input terminal.	
2	OSC OUT	Oscillation Output Terminal.	
19	MIX IN	Mixer input terminal. Input impedance : Parallel resistance : 1kΩ Parallel capacity : 2pF	
4	MIX OUT	Output terminal for mixer. Output resistance is 330Ω at typical.	
6	IF IN	Limiter input terminal. Input resistance is 330Ω at typical.	
7	DEC	Decoupling terminal for bias.	

■ TERMINAL FUNCTION

PIN No.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT
9	LIM OUT	Output terminal for limiter amplifier. Typical input impedance is 300 ohms.	
10	QUAD IN	Input terminal of a quadrature detection circuit. Connect with a ceramic discriminator.	
14	RSSI OUT	RSSI output terminal.	
11	AF OUT	Demodulated signal output.	
12	LPF IN	Input terminal of a low pass filter. This terminal is biased from the AF-OUT terminal (11pin) through an external RC filter.	

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■ TERMINAL FUNCTION

PIN No.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT
13	LPF OUT	Output terminal of a low pass filter.	
8	FSK REF	Reference input terminal of a wave shaping comparator. Connected with an external capacitor.	
17	FSK OUT	Output terminal of a wave shaping circuit. The Wave shaped signal inverted for the LPF output comes out.	
15	BS	Control terminal of a battery saving circuit. H : This circuit is ON. L : This circuit is OFF.	
16	CHARGE	Control terminal of a quick charge / discharge circuit. H : This circuit is ON. L : This circuit is OFF.	
5	V ⁺ 1	On and after IF supply voltage.	-
3	GND1	On and after IF ground.	-
20	V ⁺ 2	Supply voltage for mixer and OSC.	-
18	GND2	Ground for mixer and OSC	-

[CAUTION]
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