

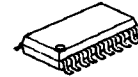
## FM IF IC FOR REMOTE KEYLESS ENTRY SYSTEM

### ■ 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

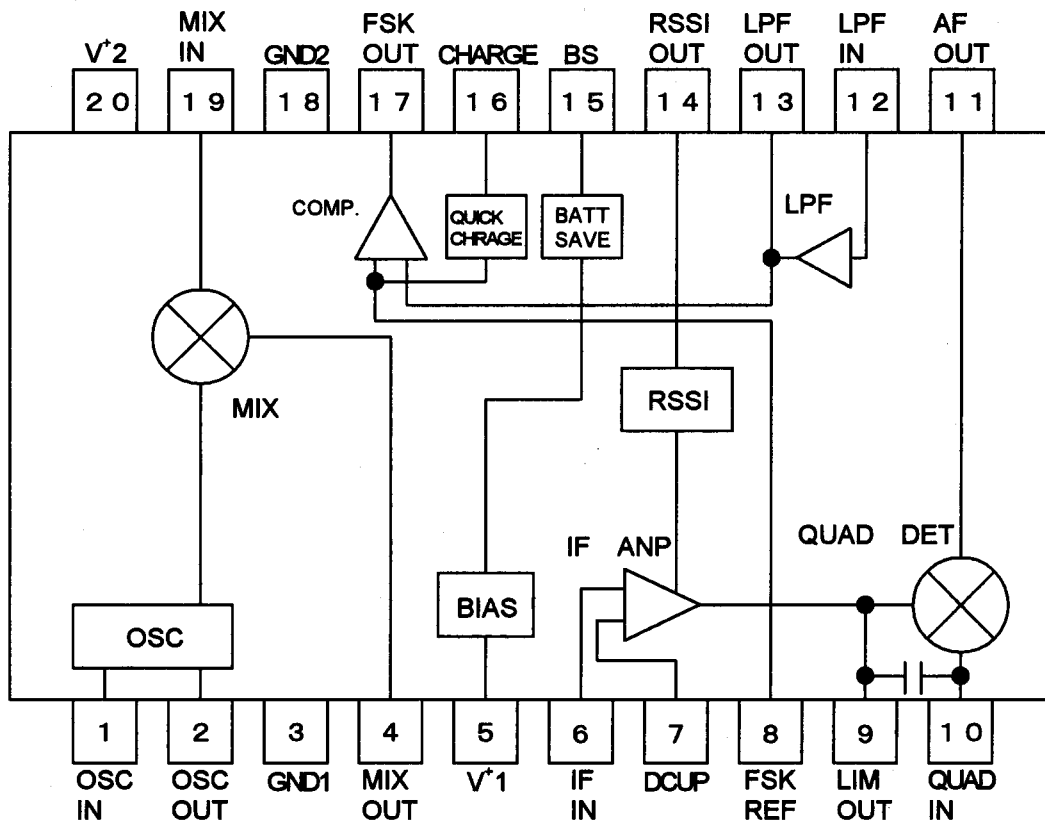


**NJM2295AV**

### ■ 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



# NJM2295A

## ■ ABSOLUTE MAXIMUM RATINGS

(T<sub>a</sub>=25°C)

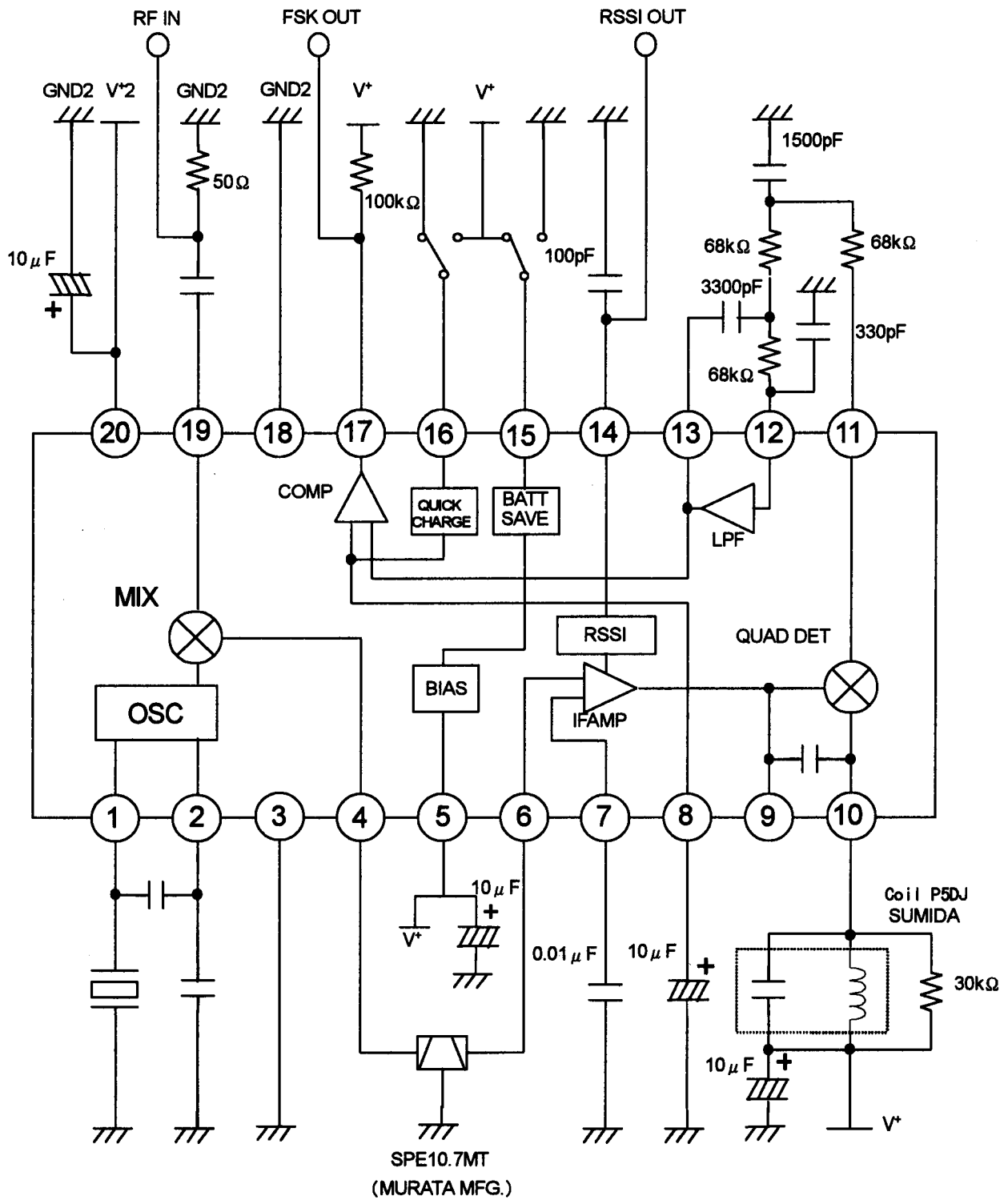
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup>	9.0	V
Power Dissipation	P <sub>D</sub>	300	mW
Operating Temperature Range	T <sub>opr</sub>	-40 to +85	°C
Storage Temperature Range	T <sub>stg</sub>	-40 to +125	°C

## ■ ELECTRICAL CHARACTERISTICS

(V<sup>+</sup>=5.0V, T<sub>a</sub>=25°C, f<sub>mod</sub>=1kHz, f<sub>mix</sub>=320MHz, f<sub>IF</sub>=10.7MHz, f<sub>dev</sub>=±10kHz)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V <sup>+</sup>		2.7	-	7.0	V
No signal Operating Current	I <sub>ccq</sub>		-	5.0	7.5	mA
Battery saving Operating Current	I <sub>ccs</sub>		-	-	10	μA
Mixer Gain 1	G <sub>mix1</sub>	RL=No Connect.	13.5	18.5	22.5	dB
Mixer Gain 2	G <sub>mix2</sub>	320MHz Gain - 450MHz Gain	-	1	3	dB
Mixer Sept Point	IP		-	103	-	dBμVEMF
Mixer Input Resistance	R <sub>inM</sub>	f=320MHz	-	1	-	kΩ
Mixer Input Capacity	C <sub>inM</sub>	f=320kHz	-	2	-	pF
Mixer Output Resistance	R <sub>oM</sub>		-	330	-	Ω
IF amplifier Input Resistance	R <sub>inIF</sub>		-	330	-	Ω
Signal to Noise Ratio 1	S / N1	Mixer Input, V <sub>IN</sub> =80dBμVEMF	-	60	-	dB
Signal to Noise Ratio 2	S / N2	IF input, V <sub>IN</sub> =80dBμVEMF	-	60	-	dB
Signal to Noise Ratio 3	S / N3	IF input, V <sub>IN</sub> =35dBμVEMF	-	25	-	dB
-3dB limiting sensitivity	Slim	Mixer Input	-	22	27	dBμVEMF
Demodulated Output Level	V <sub>od</sub>	IF input, V <sub>IN</sub> =60dBμVEMF	80	150	-	mVrms
AM Rejection Ratio	AMR	IF input, V <sub>IN</sub> =80dBμVEMF, AM=30%	-	50	-	dB
Duty ratio of Wave Shaped Output	DR	IF input, V <sub>IN</sub> =60dBμVEMF	40	50	60	%
RSSI Output Voltage 1	RSSI1	IF input, V <sub>IN</sub> =20dBμVEMF	0.35	0.55	0.70	V
RSSI Output Voltage 2	RSSI2	IF input, V <sub>IN</sub> =60dBμVEMF	0.7	1.00	1.3	V
RSSI Output Voltage 3	RSSI3	IF input, V <sub>IN</sub> =100dBμVEMF	1.30	1.75	2.15	V
RSSI Output Resistance	RSSI <sub>R</sub>		-	48	-	kΩ
Quick Charge / discharge current	I <sub>ch</sub>		35	70	120	μA
Low Level Output Voltage of FSK-OUT	V <sub>fskL</sub>	I <sub>L</sub> =100μA	-	0.1	0.4	V
High Level Leak Current of FSK-OUT Terminal	I <sub>fskH</sub>		-	-	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 <sup>+</sup> 1	On and after IF supply voltage.	-
3	GND1	On and after IF ground.	-
20	V <sup>+</sup> 2	Supply voltage for mixer and OSC.	-
18	GND2	Ground for mixer and OSC	-

[CAUTION]  
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