

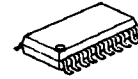
## FM IF IC FOR REMOTE KEYLESS ENTRY SYSTEM

### ■ 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

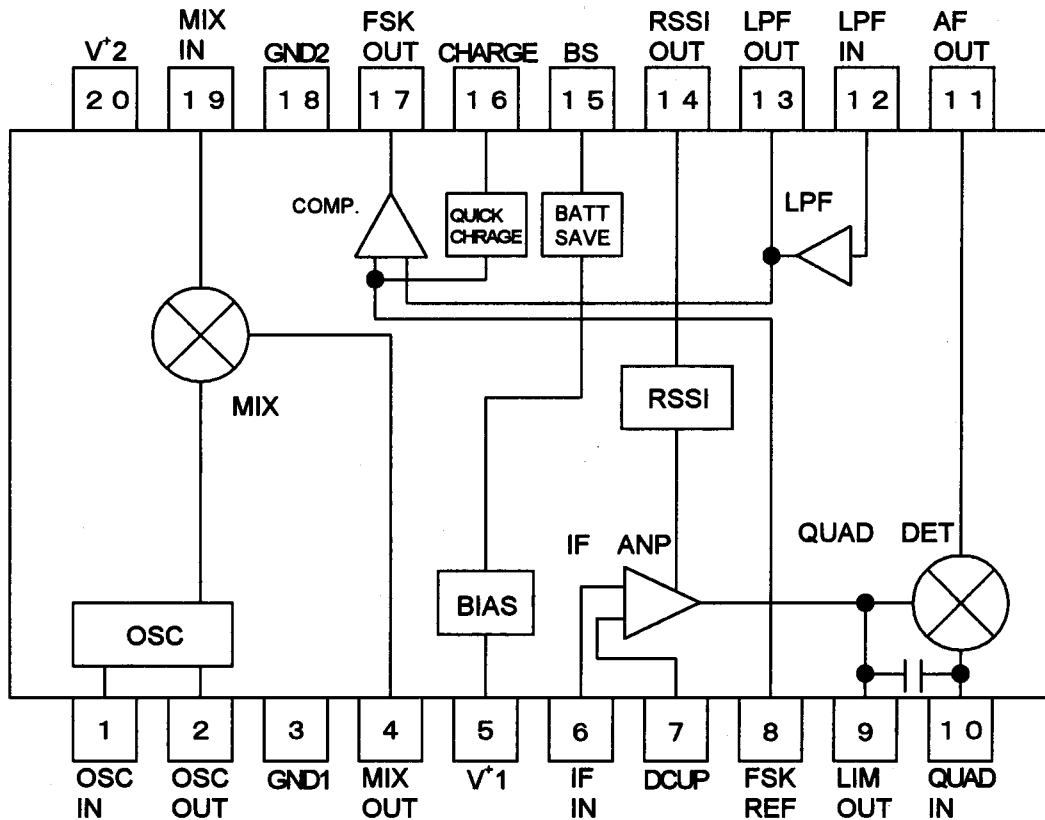


**NJM2295AV**

### ■ 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

( $T_a=25^{\circ}\text{C}$ )

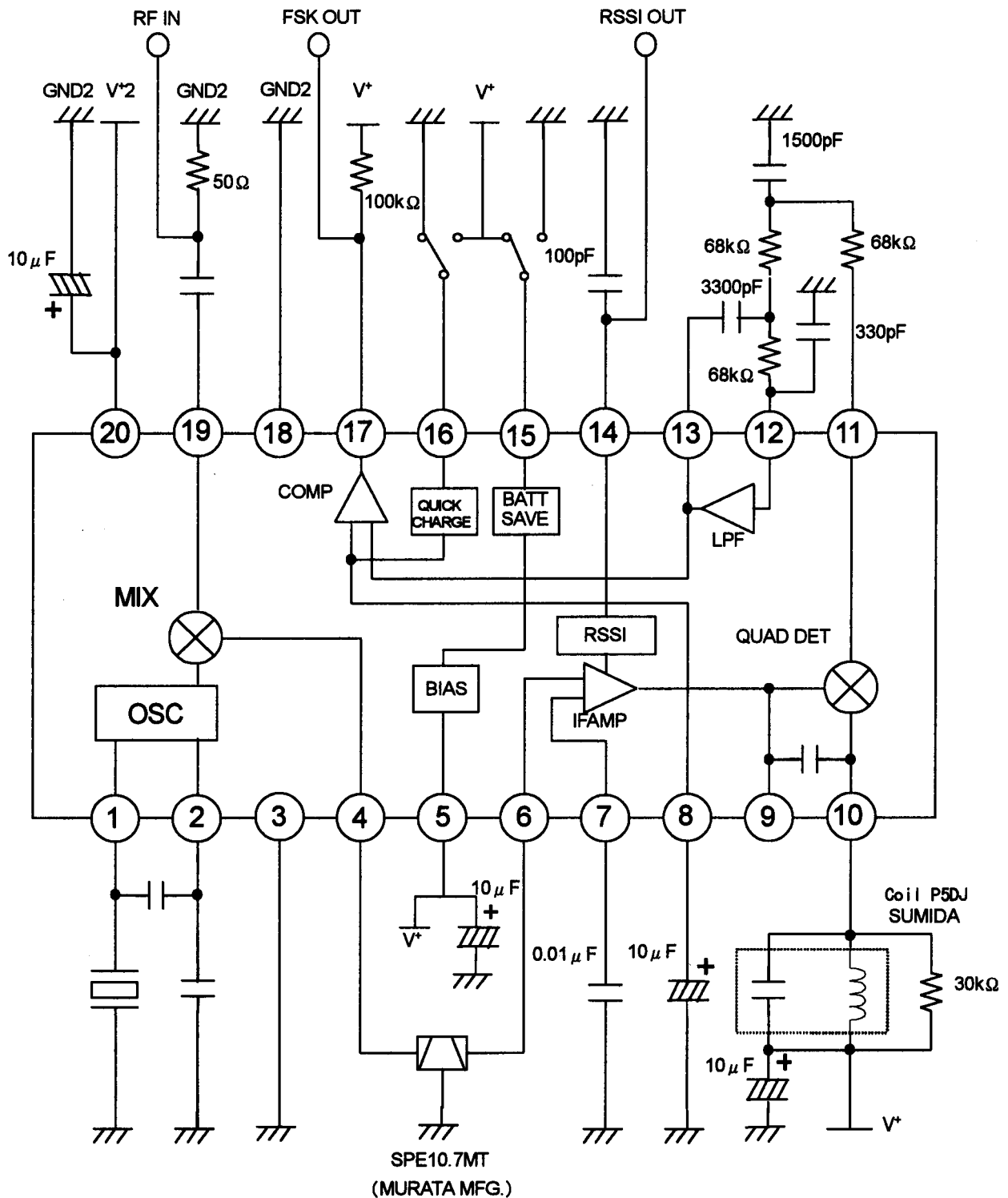
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V^+$	9.0	V
Power Dissipation	$P_D$	300	mW
Operating Temperature Range	$T_{opr}$	-40 to +85	$^{\circ}\text{C}$
Storage Temperature Range	$T_{stg}$	-40 to +125	$^{\circ}\text{C}$

## ■ ELECTRICAL CHARACTERISTICS

( $V^+=5.0\text{V}$ ,  $T_a=25^{\circ}\text{C}$ ,  $f_{mod}=1\text{kHz}$ ,  $f_{mix}=320\text{MHz}$ ,  $f_{IF}=10.7\text{MHz}$ ,  $f_{dev}=\pm 10\text{kHz}$ )

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	$\mu\text{A}$
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	-	dB $\mu\text{VEMF}$
Mixer Input Resistance	$R_{inM}$	$f=320\text{MHz}$	-	1	-	$\text{k}\Omega$
Mixer Input Capacity	$C_{inM}$	$f=320\text{kHz}$	-	2	-	pF
Mixer Output Resistance	$R_{oM}$		-	330	-	$\Omega$
IF amplifier Input Resistance	$R_{inIF}$		-	330	-	$\Omega$
Signal to Noise Ratio 1	S / N1	Mixer Input, $V_{IN}=80\text{dB}\mu\text{VEMF}$	-	60	-	dB
Signal to Noise Ratio 2	S / N2	IF input, $V_{IN}=80\text{dB}\mu\text{VEMF}$	-	60	-	dB
Signal to Noise Ratio 3	S / N3	IF input, $V_{IN}=35\text{dB}\mu\text{VEMF}$	-	25	-	dB
-3dB limiting sensitivity	Slim	Mixer Input	-	22	27	dB $\mu\text{VEMF}$
Demodulated Output Level	Vod	IF input, $V_{IN}=60\text{dB}\mu\text{VEMF}$	80	150	-	mVrms
AM Rejection Ratio	AMR	IF input, $V_{IN}=80\text{dB}\mu\text{VEMF}$ , AM=30%	-	50	-	dB
Duty ratio of Wave Shaped Output	DR	IF input, $V_{IN}=60\text{dB}\mu\text{VEMF}$	40	50	60	%
RSSI Output Voltage 1	RSSI1	IF input, $V_{IN}=20\text{dB}\mu\text{VEMF}$	0.35	0.55	0.70	V
RSSI Output Voltage 2	RSSI2	IF input, $V_{IN}=60\text{dB}\mu\text{VEMF}$	0.7	1.00	1.3	V
RSSI Output Voltage 3	RSSI3	IF input, $V_{IN}=100\text{dB}\mu\text{VEMF}$	1.30	1.75	2.15	V
RSSI Output Resistance	RSSIR		-	48	-	$\text{k}\Omega$
Quick Charge / discharge current	I <sub>ch</sub>		35	70	120	$\mu\text{A}$
Low Level Output Voltage of FSK-OUT	V <sub>fskL</sub>	IL=100 $\mu\text{A}$	-	0.1	0.4	V
High Level Leak Current of FSK-OUT Terminal	I <sub>fskH</sub>		-	-	2	$\mu\text{A}$

## APPLICATION CIRCUIT



# NJM2295A

## ■ 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.	

# NJM2295A

## ■ 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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