

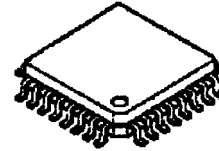
BASE BAND INTERFACE IC

■ GENERAL DESCRIPTION

The **NJW2303** is base band interface IC for cellular Phone system. It consists of speaker amplifier with limiter and noise canceller, microphone amplifier, and ringer driver. It also includes power down function which applies to low consumption power design.

The **NJW2303** is suitable for PCS, cellular phone, and any other handy wireless communication equipments.

■ PACKAGE OUTLINE

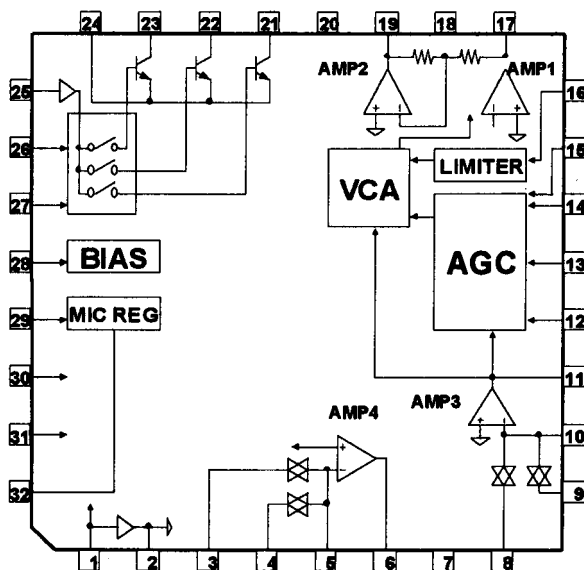


NJW2303F

■ FEATURES

- Operating Voltage (2.7 to 3.3V)
- Low Operating Current (2.2mA typ.)
- Internal Power-Down ON / OFF Switch
- Low Power-Down Operating Current (1μA MAX.)
- ⟨Power Amplifier⟩
 - Output Power Exceeds 40mW ($V^+=3V, R_L=32\Omega$)
 - Low Output Noise Voltage (-100dBV typ.)
 - Input Limit Level (-14dBV typ.)
- ⟨Microphone Amplifier⟩
 - Low Equivalent Input Noise Voltage ($2\mu V_{rms}$ typ.)
 - Internal Three Steps Ringer Driver
- Bi-CMOS Technology
- Package Outline QFP32

■ PIN CONFIGURATION



PIN FUNCTION

- | | |
|------------|--------------|
| 1. MICREF | 17. POWOUT1 |
| 2. POWREF | 18. PGND |
| 3. MICIN1 | 19. POWOUT2 |
| 4. MICIN2 | 20. V^+ |
| 5. MICIN3 | 21. RINOUT3 |
| 6. MICOUT | 22. RINOUT2 |
| 7. SGND | 23. RINOUT1 |
| 8. POWIN1 | 24. DGND |
| 9. POWIN2 | 25. RININ |
| 10. POWIN3 | 26. RINCNT1 |
| 11. POWFB | 27. RINCNT2 |
| 12. CRECT | 28. PD |
| 13. TC1 | 29. REGSD |
| 14. NRREF | 30. SMONI |
| 15. NRCNT | 31. SP / EAR |
| 16. TC2 | 32. REGOUT |

NJW2303

■ ABSOLUTE MAXIMUM RATINGS

(T_a=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	5	V
Power Dissipation	P _D	300	mW
Operating Temperature Range	T _{opr}	-20 to +75	°C
Storage Temperature Range	T _{stg}	-40 to +125	°C

■ ELECTRICAL CHARACTERISTICS

(T_a=25°C, V⁺=3V, f=1kHz)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Overall							
Operating Voltage	V ⁺		2.7	3.0	3.3	V	
Operating Current 1	I _{cc1}		-	2.2	3.0	mA	
Operating Current 2	I _{cc2}	Power Down Mode	-	-	1.0	μA	
Microphone Reference Voltage	MIC _{ref}		-	1.1	-	V	
Power Amplifier Reference Voltage	POW _{ref}		-	1.1	-	V	
Control High Level Voltage	V _{thH}		2.1	-	V ⁺	V	
Control Low Level Voltage	V _{thL}		0	-	0.6	V	
Power Amplifier							
Output Voltage 1	POW1	R _L =32Ω, THD=10% BTL	3	6	-	mW	
Output Voltage 2	POW2	R _L =32Ω, THD=10% (Sound Monitor Mode) BTL	40	60	-	mW	
Voltage Gain	A _v	A _v =17pin /11pin	5.0	6.0	7.0	dB	
Noise Reduction Operating Input Level	NRin	15pin=0.2V	-63	-60	-57	dBV	
Noise Reduction Level	ATT	11pin Level=-50dBV 15pin=0.3V	SINGLE	-	-30	-15	dB
Reference Voltage	NRref		1.19	1.25	1.31	V	
NRCNT Input Voltage Range	VNR	11pin Level=-10dBV	0.1	-	0.5	V	
Limit Level	Limit		SINGLE	-16	-14	-12	dBV
Analog Switch On Resistance	R _{ON}		-	200	400	Ω	
AMP2 Mute Level	Mute	Mute=19pin - 17pin	-	-	-60	dB	
Output Noise Voltage	V _{NO}	A - Weigthing	BTL	-	-100	-	dBV
Output Offset Voltage	V _{OS}		-30	0	30	mV	
Total Harmonic Distortion	THD		BTL	-	0.2	-	%
Microphone Amplifier							
Microphone Regulator Output 1	Reg1	R _L =2kΩ	2.3	2.4	2.5	V	
Microphone Regulator Output 2	Reg2	R _L =2kΩ, Power OFF	-	-	0.01	V	
Voltage Gain	A _v	f=3kHz	-	40	-	dB	
Analog Switch On Resistance	R _{ON}		-	200	400	Ω	
Maximum Output Voltage Swing	V _{OM}	R _L =5kΩ, THD=3%	0.6	0.65	-	V _{rms}	
Equivalent Input Noise Voltage	V _{ni}	R _S =50Ω, A - Weigthing	-	2	6	μV _{rms}	
Total Harmonic Distortion	THD		-	0.2	-	%	
Ringer Driver							
Low Level Output Voltage 1	R _{O1}	I _O =200mA	-	0.2	0.4	V	
Low Level Output Voltage 2	R _{O2}	I _O =100mA	-	0.2	0.4	V	
Low Level Output Voltage 3	R _{O3}	I _O =50mA	-	0.2	0.4	V	

■ SWITCHING PIN FUNCTION

PIN NO.	PIN NAME	SWITCHING FUNCTION	LEVEL	FUNCTION
28	PD	Power ON / OFF	H	Power ON
			L	Power OFF
29	REGSD	Microphone Regulator ON / OFF	H	Microphone Regulator ON
			L	Microphone Regulator OFF
30	SMONI	Sound Monitor Mode	H	Limiter Circuit OFF
			L	Limiter Circuit ON
31	SP / EAR	Speaker, Earphone Microphone	H	IN1 Input, BTL Function
			L	IN2 Input, SINGLE Function

■ RINGER OUTPUT

PIN NO.	PIN NAME	RINGER OUTPUT LEVEL	RINCNT2 (27pin)	RINCNT1 (26pin)
21	RINOUT 1	SMALL	L	H
22	RINOUT 2	MEDIUM	H	L
23	RINOUT 3	LARGE	H	H

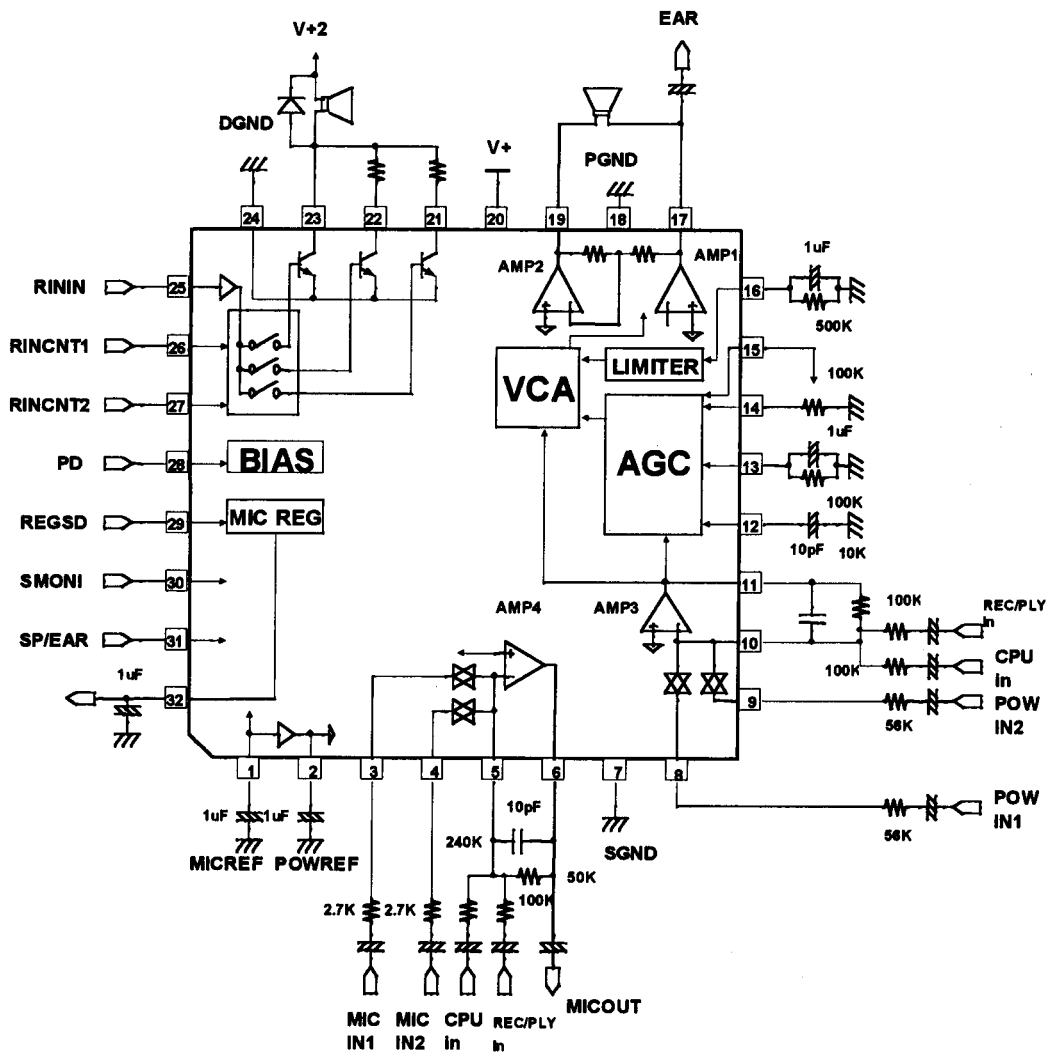
■ PIN INFORMATION

PIN	PIN NAME	FUNCTION	PIN	PIN NAME	FUNCTION
1	MICREF	Mic. Amplifier Reference	17	POWOUT1	Power Amplifier Output 1
2	POWREF	Power Amplifier Reference	18	PGND	Power Ground
3	MICIN 1	Mic. Amplifier Input 1	19	POWOUT2	Power Amplifier Output 2
4	MICIN 2	Mic. Amplifier Input 2	20	V ⁺	Power Supply
5	MICIN 3	Mic. Amplifier Input 3	21	RINOUT 3	Ringer Output 3
6	MICOUT	Mic. Amplifier Output	22	RINOUT 2	Ringer Output 2
7	SGND	System Ground	23	RINOUT 1	Ringer Output 1
8	POWIN 1	Power Amplifier Input 1	24	DGND	Digital Ground
9	POWIN 2	Power Amplifier Input 2	25	RININ	Ringer Input
10	POWIN 3	Power Amplifier Input 3	26	RINCNT 1	Ringer Control 1
11	POWFB	Feed Back Pin	27	RINCNT 2	Ringer Control 2
12	CRECT	Cap. for Rectification Circuit	28	PD	Power Down Control
13	TC 1	NR Circuit Time Constant	29	REGSD	Mic. Regulator ON / OFF
14	NRREF	Reference Voltage	30	SMONI	Sound Monitor Switching
15	NRCNT	NR Operating Level Control	31	SP / EAR	Speaker / Earphone Mic. SW
16	TC2	Limit Circuit Time Constant	32	REGOUT	Regulator Output

NR : Noise Reduction

NJW2303

APPLICATION CIRCUIT



[CAUTION]
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