

Preliminary W91082N



TONE GENERATOR WITH μ C SERIAL INTERFACE

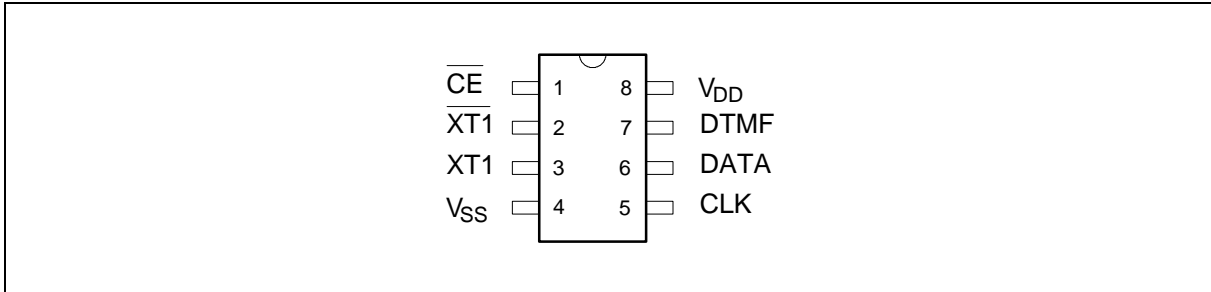
GENERAL DESCRIPTION

The W91082N is Si-gate CMOS IC that provides DTMF signals. It can be programmed by a μ C to generate 16 dual tones and 8 single tones from the DTMF pin. The W91082N provides a serial mode interface for various applications such as cordless, KTS, PBX and Caller ID system.

FEATURES

- Operating voltage: 2.0V–5.5V
- Generate 16 dual tones and 8 single tones
- Serial mode interface with μ C
- Uses 3.579545 MHz crystal or ceramic resonator
- Packaged in 8-pin plastic DIP

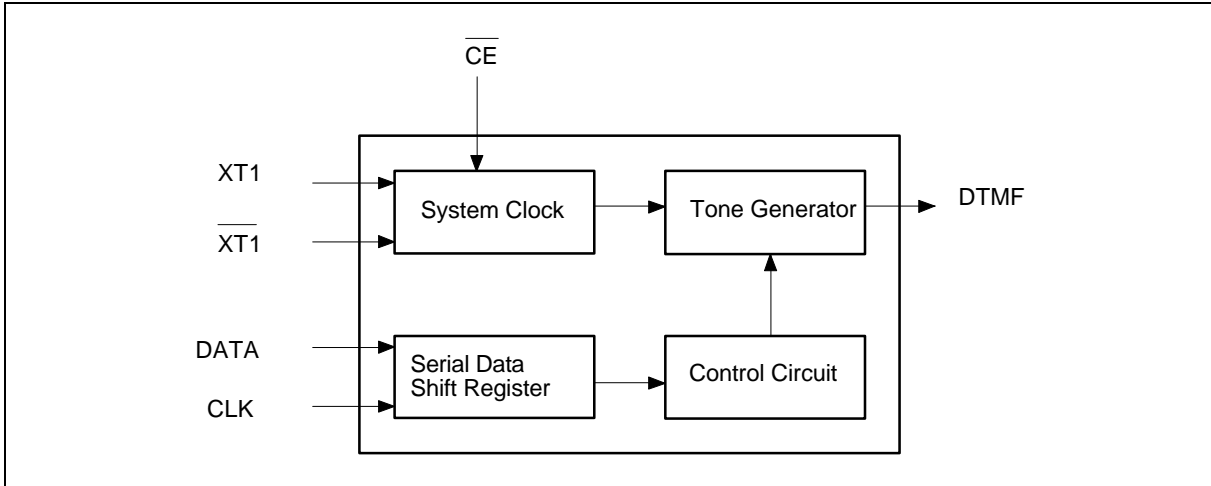
PIN CONFIGURATION



PIN DESCRIPTION

SYMBOL	PIN NO.	I/O	FUNCTION
$\overline{\text{CE}}$	1	I	Chip enable signal, low active.
XT1, $\overline{\text{XT1}}$	3, 2	I, O	A built-in inverter provides oscillation with an inexpensive 3.579545 MHz crystal or ceramic resonator. The crystal frequency deviation is $\pm 0.02\%$.
DATA	6	I	Data input pin for serial receiving.
CLK	5	I	Clock input pin for serial receiving.
DTMF	7	O	DTMF signal output pin.
V_{DD} , V_{SS}	8, 4	I	Power input pins.

BLOCK DIAGRAM



FUNCTIONAL DESCRIPTION

The W91082N is a Tone generator with μC serial interface.

When chip enable ($\overline{\text{CE}}$ pin goes to low level), the DATA and CLK pins receive the correspondent code to generate a DTMF signal.

The W91082N defines every digit to have 5 bits code, and D0 (LSB) as the first received bit. The W91082N latches the data on the falling edge of the clock. The relationship between the digital codes and the tone output frequency is shown in Table1. The control timing waveform is shown in Figure 1.

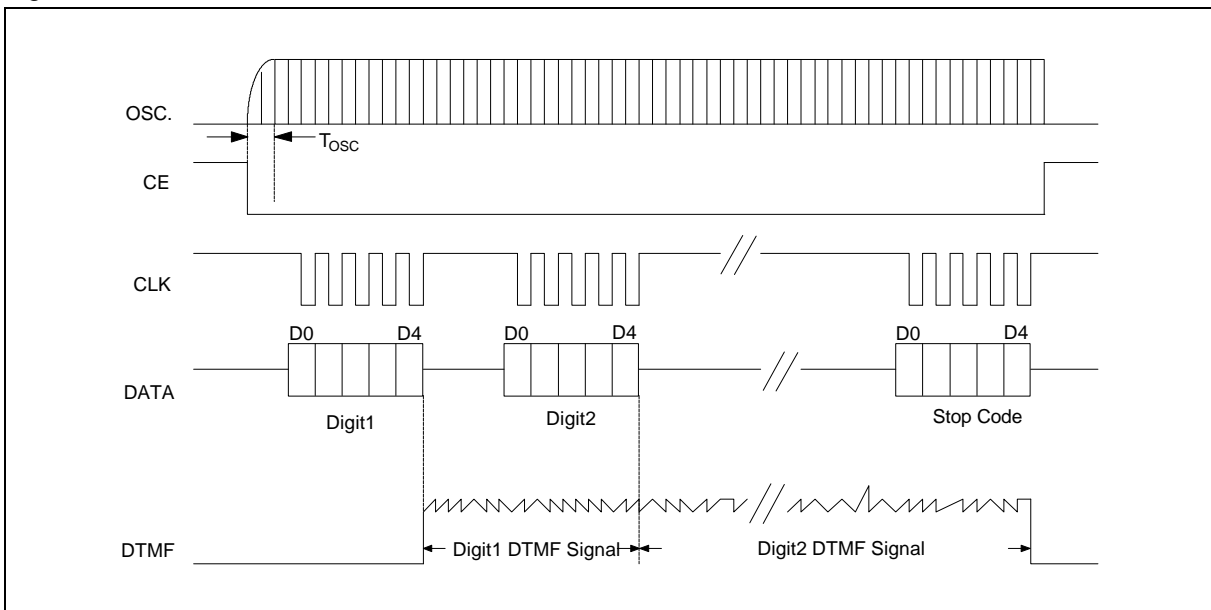


Figure 1. Serial interface control timing waveform

Preliminary W91082N



DIGIT	D4	D3	D2	D1	D0	TONE OUTPUT FREQUENCY (Hz)
1	0	0	0	0	1	697+1209
2	0	0	0	1	0	697+1336
3	0	0	0	1	1	697+1477
4	0	0	1	0	0	770+1209
5	0	0	1	0	1	770+1336
6	0	0	1	1	0	770+1477
7	0	0	1	1	1	852+1209
8	0	1	0	0	0	852+1336
9	0	1	0	0	1	852+1477
0	0	1	0	1	0	941+1336
*	0	1	0	1	1	941+1209
#	0	1	1	0	0	941+1477
A	0	1	1	0	1	697+1633
B	0	1	1	1	0	770+1633
C	0	1	1	1	1	852+1633
D	0	0	0	0	0	941+1633
	1	0	0	0	0	697
	1	0	0	0	1	770
	1	0	0	1	0	852
	1	0	0	1	1	941
	1	0	1	0	0	1209
	1	0	1	0	1	1336
	1	0	1	1	0	1477
	1	0	1	1	1	1633
DTMF OFF	1	1	-	-	-	

Table 1. The relationship between data input and tone output frequency



ABSOLUTION MAXIMUM RATINGS

PARAMETER	SYMBOL	RATING	UNIT
DC Supply Voltage	VDD-VSS	-0.3 to +7.0	V
Input/Output Voltage	VIL	VSS -0.3	V
	VIH	VDD +0.3	
	VOL	VSS -0.3	
	VOH	VDD +0.3	
Power Dissipation	PD	120	mW
Operating Temperature	TOPR	-0.5 to +70	°C
Storage Temperature	TSTG	-55 to +125	°C

Note: Exposure to conditions beyond those listed under Absolute Maximum Ratings may adversely affect the life and reliability of the device.

ELECTRICAL CHARACTERISTICS

DC CHARACTERISTICS

(VDD-VSS = 2.5V. Fosc = 3.58 MHz, TA = 25° C, All outputs unloaded.)

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Operating Voltage	VDD	-	2.0	-	5.5	V
Operating Current	IOP	$\overline{CE} = 0$, Unloaded	-	0.3	1.0	mA
Standby Current	ISB	$\overline{CE} = 1$, Unloaded	-	-	1	μA
Tone Output Voltage	VTO	Row group RL = 10 KΩ	-	150	170	mVrms
DTMF Distortion	THD	RL = 10 KΩ VDD = 2.0 to 5.5V	-	-30	-23	dB
DTMF Output DC Level	VTDC	VDD = 2.0 to 5.5V	1.0	-	3.0	V
DTMF Output Sink Current	ITL	VTO = 0.5V	0.2	-	-	mA

Preliminary W91082N



AC CHARACTERISTICS

(V_{DD}-V_{SS} = 2.5V , F_{OSC} = 3.58 MHz , T_A = 25° C, All outputs unloaded.)

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
OSC. Starting Time	T _{OSC}	-	-	-	10	mS
Clock Input Rate	F _{CLK}	-	-	100	500	KHz
System Frequency	F _{OSC}	-	-	3.5795	-	MHz



Headquarters

No. 4, Creation Rd. III,
Science-Based Industrial Park,
Hsinchu, Taiwan
TEL: 886-3-5770066
FAX: 886-3-5792766
<http://www.winbond.com.tw/>
Voice & Fax-on-demand: 886-2-27197006

Taipei Office

11F, No. 115, Sec. 3, Min-Sheng East Rd.,
Taipei, Taiwan
TEL: 886-2-27190505
FAX: 886-2-27197502

Winbond Electronics (H.K.) Ltd.

Rm. 803, World Trade Square, Tower II,
123 Hoi Bun Rd., Kwun Tong,
Kowloon, Hong Kong
TEL: 852-27513100
FAX: 852-27552064

Winbond Electronics North America Corp.

Winbond Memory Lab.
Winbond Microelectronics Corp.
Winbond Systems Lab.
2727 N. First Street, San Jose,
CA 95134, U.S.A.
TEL: 408-9436666
FAX: 408-5441798

Note: All data and specifications are subject to change without notice.

Publication Release Date: February 1998