IL9270N
DTMF signal receiver
(analog HM9270)

IC IL9270N is (DTMF) signal two-channel receiver-decoder (code 2 from 8).IÑ is fabricated on CÌ Î S technology and containes bandpass filters on switched capacitors. IC checks length of incoming twochannel signal dispatches and pauses between them. Information output as 4-digit binary code.IC clocking is carried out from quartz(-crystal) resonator with frequency Fc= 3,579545 Ì Hz.

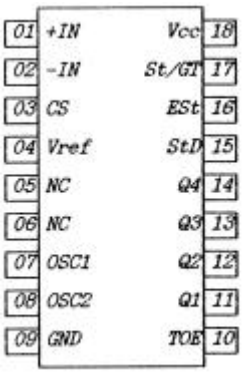
MAIN CHARACTERISTICS

demodulates all 16 standard DTMF signals
Low consumed capacitance: 15 mW
One power source: 5 V+-5%
quarts generator with frequency 3,58 mHz is used
three state outputs
probability of mistaken decoding is 1/10000

Package - plastic 18-connection DIP (type 2104.18-À)

APPLICATION
* Àutomatic Òelephone Station
* call alert paging
* remote control systems
* credit card systems
* button telephone systems
* answering mashine
* domestic auto systems

Arrangement and purpose of outputs



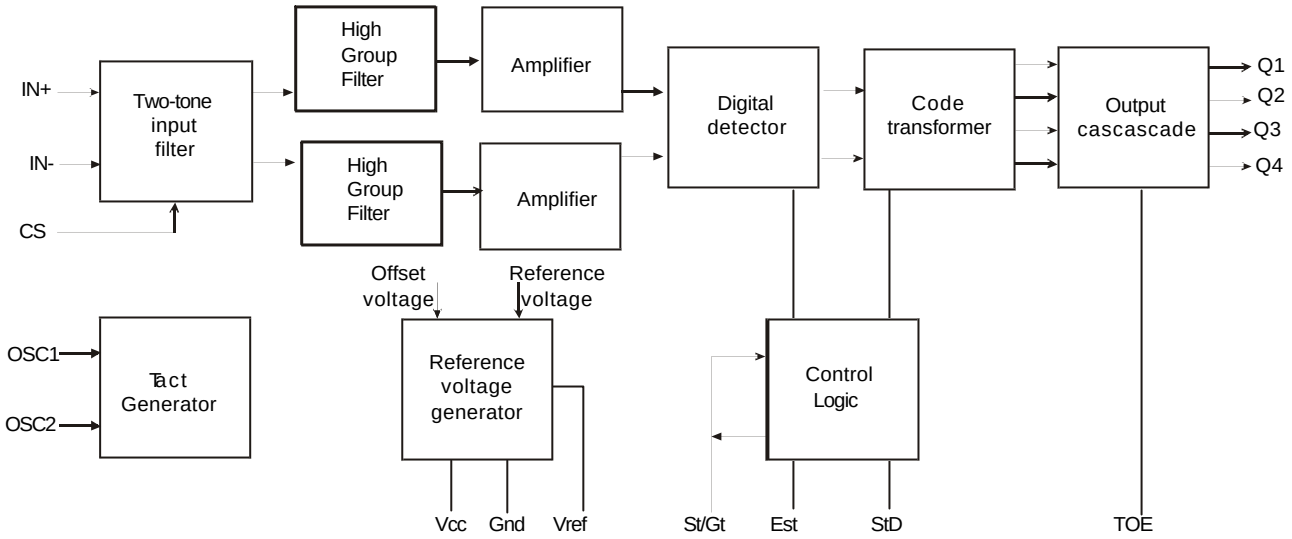
Pin	Symbol	Purpose
01	IN+	non inverting input Î A
02	IN-	inverting input Î A
03	CS	operational amplifier outputÎ A)
04	Vref	reference voltage output (Vcc/2)
05,06	NC	unconnected
07,08	OSC1,2	tact input/output.
09	GND	general
10	TOE	input of output inable
11·14	Q1-Q4	three state data output
15	StD	control outputèÿ
16	ESt	output of early control
17	St/GT	control input/output
18	Vcc	power +5 V

Korzhenevskogo 12, Minsk, 220064, Republic of Belarus
Fax: +375 (17) 278 28 22,
Phone: +375 (17) 278 07 11, 277 24 70, 277 24 61, 277 69 16
E-mail: belms@belms.belpak.minsk.by
URL: www.bms.by

BELMICROSYSTEMS

IL9270N

block-scheme



Reference table of received DTMF signal and code under formation

low group frequency, Hz	high group frequency, Hz	code under formation			
		Q4	Q3	Q2	Q1
697	1209	0	0	0	1
697	1336	0	0	1	0
697	1477	0	0	1	1
770	1209	0	1	0	1
770	1336	0	1	0	1
770	1477	0	1	1	0
852	1209	0	1	1	1
852	1336	1	0	0	0
852	1477	1	0	0	1
941	1209	1	0	1	0
941	1336	1	0	1	1
941	1477	1	1	0	0
697	1633	1	1	0	1
770	1633	1	1	1	0
852	1633	1	1	1	1
941	1633	0	0	0	

IÑ IL9270 connection scheme

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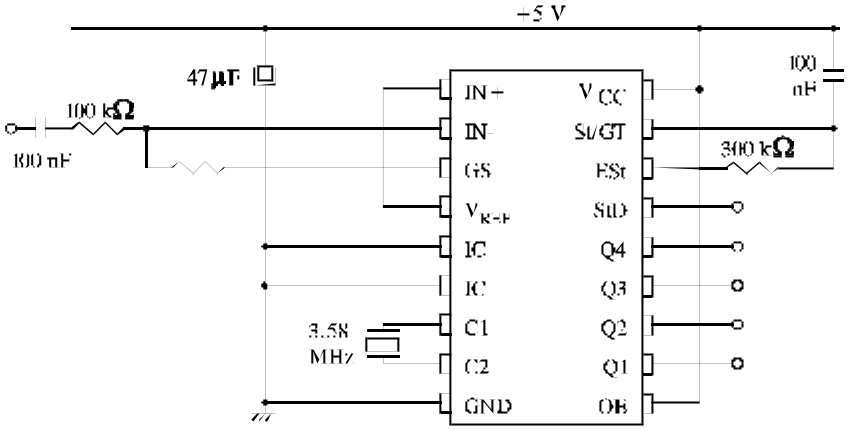

DC ELECTRICAL CHARACTERISTICS(V_{CC} = 5 V ± 5%, T_A = +25°C)

Symbol	Parameter	Test Conditions	Guaranteed Limits			Unit
			Min	Typ	Max	
V_{CC}	Supply Voltage		4.75		5.25	V
I_{CC}	Supply Current			3.0	9.0	mA
I_{SO}	Maximum Pull Up (Source) Current	OE = 0 V			24	µA
I_{OL}	Minimum Output-Low (Sink) Current	V_{OUT} =0.4 V	0.8			mA
I_{OH}	Minimum Output-High (Source) Current	V_{OUT} =4.6 V	0.35			mA
V_{TSt}	Steering Threshold Voltage		2.2		2.5	V
R_{IN}	Input Impedance (Signal Inputs 1,2)	@ 1 KHz	8			MΩ
V_{REF}	Output Voltage	No Load	2.4		2.8	V
A_{VOL}	DC Open Loop Voltage Gain			65		dB
R_{OR}	Output Resistance			10		kΩ

AC ELECTRICAL CHARACTERISTICS (V_{CC} = 5.0 V, T_A =+25°C, F_{CLK} = 3.579545 MHz)

Parameter		Guaranteed Limits			Unit	Notes
		Min	Typ	Max		
SIGNAL CONDITION						
Valid Input Signal	MIN			27.5	mV_{RMS}	
Level (each tone of composite signal)	MAX	883			m V_{RMS}	
Freq. Deviation Accept Limit				±1.5	%	
Freq. Deviation Reject Limit		±3.5			%	
Third Tone Tolerance			-16		dB	
Dial Tone Tolerance		18	22			

TIMING REQUIREMENTS (V_{CC} = 5.0 V, T_A = +25°C, F_{CLK} = 3.579545 Mhz)

Symbol	Parameter	Guaranteed Limits		Notes

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		Min	Max	Unit	
t_{DP}	Tone Present Detection Time	5	14	ms	
t_{DA}	Tone Absent Detection Time	0.5	8.5	ms	
t_{REC}	Maximum Tone Duration Accept		40	ms	(User Adjustable)
$\overline{t_{REC}}$	Minimum Tone Duration Reject	20		ms	
t_{ID}	Acceptable Interdigit Pause		40	ms	Refer to "Guard Time
t_{DO}	Rejectable Interdigit Pause	20		ms	Adjustment

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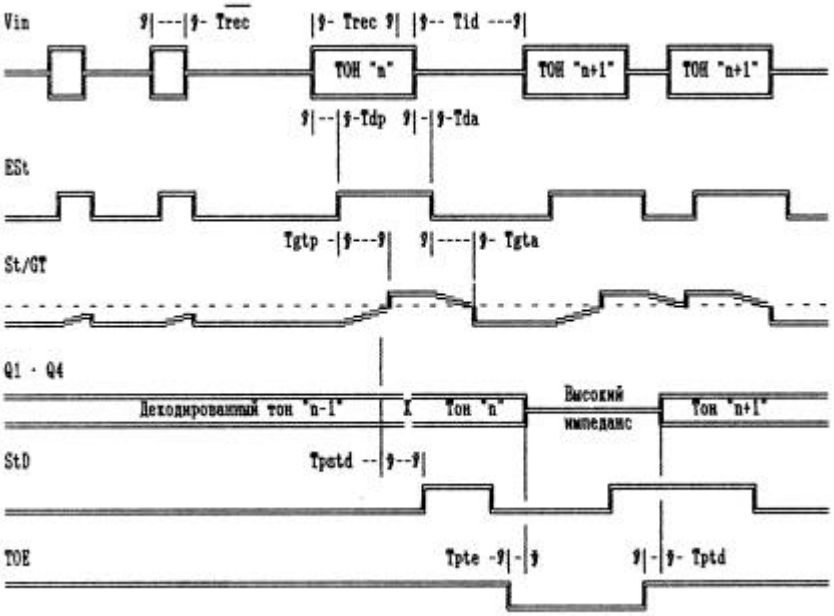
Time diagram



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