

IL9270N

DTMF signal receiver

(analog HM9270)

IC IL9270N is (DTMF) signal two-channel receiver-decoder (code 2 from 8). It is fabricated on CMOS technology and contains 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 $F_c = 3,579545 \text{ MHz}$.

MAIN CHARACTERISTICS

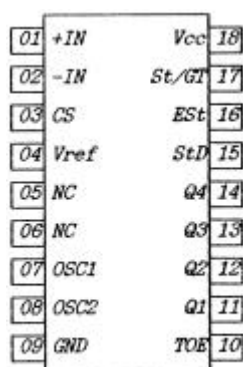
demodulates all 16 standard DTMF signals
 Low consumed capacitance: 15 mW
 One power source: 5 V \pm 5%
 quartz generator with frequency 3,58 MHz is used
 three state outputs
 probability of mistaken decoding is 1/10000

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

APPLICATION

- * Automatic Telephone Station
- * call alert paging
- * remote control systems
- * credit card systems
- * button telephone systems
- * answering mashine
- * domestic auto systems

Arrangement and purpose of outputs

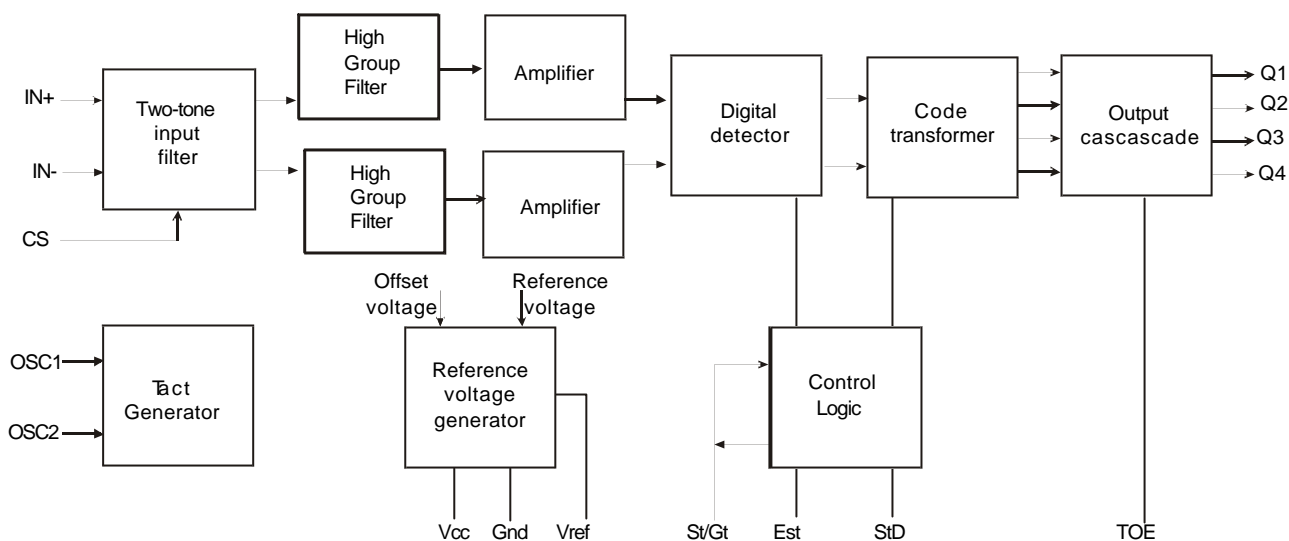


Pin	Symbol	Purpose
01	IN+	non inverting input $\hat{I} A$
02	IN-	inverting input $\hat{I} A$
03	CS	operational amplifier output $\hat{I} A$
04	Vref	reference voltage output ($V_{cc}/2$)
05,06	NC	unconnected
07,08	OSC1,2	tact input/output.
09	GND	general
10	TOE	input of output inable
11-14	Q1-Q4	three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



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block-scheme



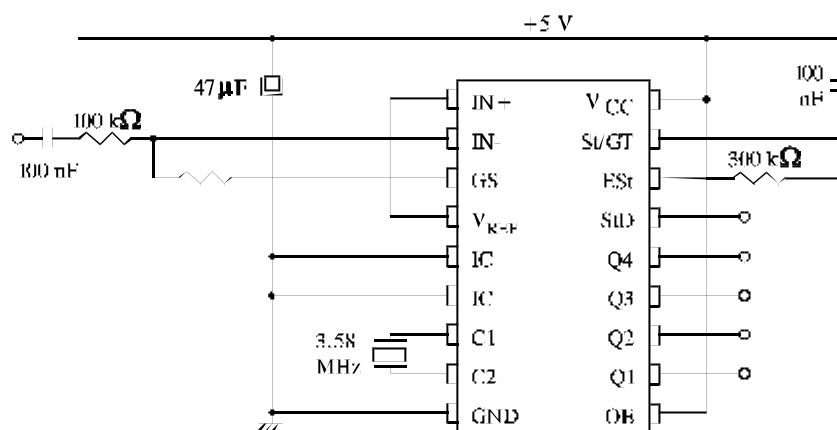
Reference table of received DTMF signal and code under formation

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	0

ИÑ IL9270 connection scheme



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DC ELECTRICAL CHARACTERISTICS ($V_{CC} = 5 V \pm 5\%$, $T_A = +25^\circ C$)

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			M Ω
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		k Ω

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

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 ($V_{CC} = 5.0 V$, $T_A = +25^\circ C$, $F_{CLK} = 3.579545 Mhz$)

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 Adjustment"
t_{DO}	Rejectable Interdigit Pause	20		ms	



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Time diagram

