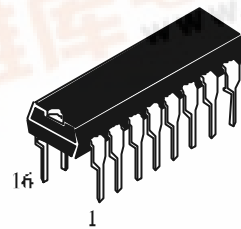


## IL91531 PARALLEL INPUT TONE/PULSE DIALER HIGH-PERFORMANCE SILICON-GATE CMOS

The IN91531N provides a 4-bit data input and a handshaking signal to serve as microcomputer interfaces. Under microcomputer control the IN91531N generates both a DTMF signal and a pulse output for telephone dialing. All necessary dual-tone frequencies and dial pulse outputs are derived from the widely used TV crystal standard, providing high accuracy and stability. The required sinusoidal waveform for individual tones is digitally synthesized on the chip, resulting in a waveform with very low total harmonic distortion.

- 4-bit parallel data input from microcomputer
- TTL compatible inputs and outputs
- Uses TV crystal standard (3.58 MHz) to derive all frequencies, providing high accuracy and stability
- Operating voltage: 2.5 to 5.5 Volts
- Selectable M/B ratio
- 10 PPS dial rate
- DTMF signaling of digits 0, 9, \*, #, A, B, C, and D
- Pulse signaling of 0 ~ 9, \*, #, and A
- High group tone pre-emphasis: 2 dB
- Low total harmonic distortion in DTMF signaling

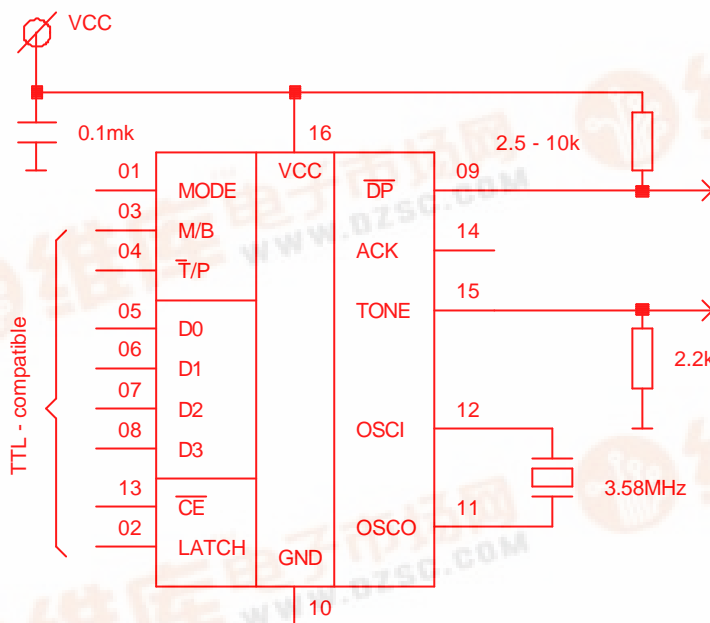


N SUFFIX  
PLASTIC

ORDERING INFORMATION  
IN91531N  
T<sub>A</sub> = -10° to 70° C

### PIN ASSIGNMENT

MODE	1 ●	16	V <sub>CC</sub>
LATCH	2	15	TONT
M/B	3	14	ACK
T/P	4	13	$\overline{CE}$
D0	5	12	OSCI
D1	6	11	OSCO
D2	7	10	GND
D3	8	9	DP



## IL91531

### DC ELECTRICAL CHARACTERISTICS ( $V_{CC}=3.5V, F_{OSC}=3.579545MHz, T_A = +25^{\circ}C$ )

Symbol	Parameter	Test Conditions	Guaranteed Limits		Unit
			Min	Max	
$V_{CC}$	Operating Voltage		2.5	5.5	V
$V_{IH}$	High-Level Input Voltage		0.8	1	$V_{CC}$
$V_{IL}$	Low-Level Input Voltage		0	0.2	$V_{CC}$
$I_{OL1}$	Minimum Output Sink Current, DP	$V_{CC} = 2.5 V, V_{OL} = 0.4V$	1		mA
$I_{OL2}$		$V_{CC} = 5.0 V, V_{OL} = 0.4V$	3		mA
$I_{CC}$	Maximum Supply Current (Stand-by)	$CE = V_{CC}$ All outputs unloaded		8	$\mu A$
$I_{CCP}$	Maximum Supply Current (Pulse)	$CE = GND$ All outputs unloaded		1	mA
$I_{CCT}$	Maximum Supply Current (Tone)	$CE = GND$ All outputs unloaded		1	mA
$I_{OHACK}$	Minimum Output Current, ACK Source	$V_{CC} = 5.0 V, V_{OH} = 2.4 V$	1.6		mA
$I_{OLACK}$	Minimum Output Current, ACK Sink	$V_{CC} = 5.0 V, V_{OL} = 0.4 V$	4.0		mA
$V_{OR}$	Single Row Tone Output Amplitude	$V_{CC} = 2.5 V, R_L = 2.2 k\Omega$	500		mVp-p
		$V_{CC} = 5.5 V, R_L = 2.2 k\Omega$		1500	
$V_{OC}$	Single Column Tone Output Amplitude	$V_{CC} = 2.5 V, R_L = 2.2 k\Omega$	500		mVp-p
		$V_{CC} = 5.5 V, R_L = 2.2 k\Omega$		1600	

### AC ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Condition	Guaranteed Limits			Unit
			Min	Typ	Max	
Make/break Ratio	M/B	M/B = $V_{CC}$		1/2		
		M/B = GND		2/3		
Make Time	$T_M$	M/B = 1/2		33.3		ms
		M/B = 2/3		40		
Break Time	$T_B$	M/B = 1/2		66.6		ms
		M/B = 2/3		60		
Inter-Digit Pause Time	$T_{IDP}$	M/B = 1/2		791		ms
		M/B = 2/3		763		
Predigit Pause	$T_{PDP}$	M/B = 1/2		35		ms
		M/B = 2/3		21		
Minimum Tone Duration	$T_{MFD}$			70		ms
Minimum Tone Inter-digit Pause	$T_{TIDP}$			70		ms
Tone Output Pre-digit Pause	$T_{TPDP}$			0		ms
Oscillator Set-up Time	$T_{START}$			5		ms



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