

LC7350, 7351



CMOS LSI

T-75-07-07

Pulse Dialer with Redial Function

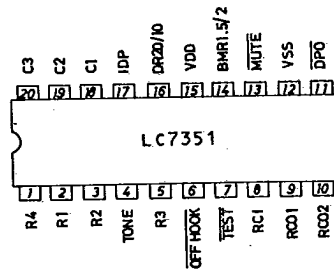
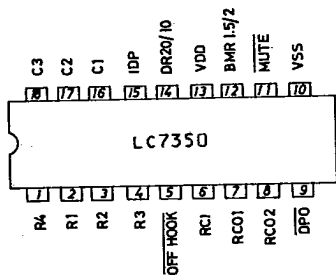
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The LC7350(18-pin package)/LC7351(20-pin package) are redial function-provided pulse dialer C-MOS LSIs for use in pushbutton telephones.

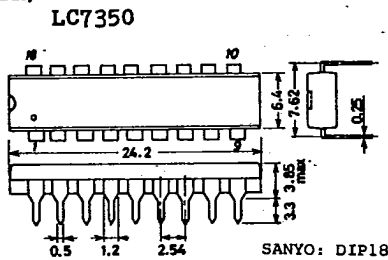
Features

- (1) Low voltage C-MOS process for direct operation from telephone line.
- (2) Possible to use single contact or standard 2-of-7 key pad.
- (3) Contains inexpensive R-C oscillator ($f_{OSC}=5kHz$ typ.).
- (4) Two selections of output pulse rate (20pps or 10pps).
- (5) Two selections of output pulse break/make ratio (1.5 or 2.0).
- (6) Two selections of inter-digit pause (400ms or 800ms (Note)).
- (7) Provides PBX redial mode ("#* key) with access code (2 digits or less).
- (8) Contains 20-digit FIFO (First-In-First-Out) buffer memory.
- (9) Key touch tone output (1250Hz/625Hz alternating pacifier tone) capability for LC7351(20-pin package).
- (10) Supply voltage/operating temperature ---- $V_{DD}=1.5$ to $3.5V/Topg=-30$ to $+70^{\circ}C$
- (11) Operating current ---- $I_{DD}=100\mu Amax(V_{DD}=3.5V)$, $I_{DD}=20\mu Amax(V_{DD}=1.5V)$
(Note) Inter-digit pause time 400ms/800ms is for DR=10pps.

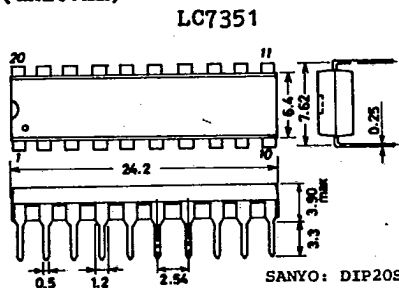
Pin Assignment



Case Outline 3007A-D18IC
(unit:mm)



Case Outline 3021B-D20SIC
(unit:mm)



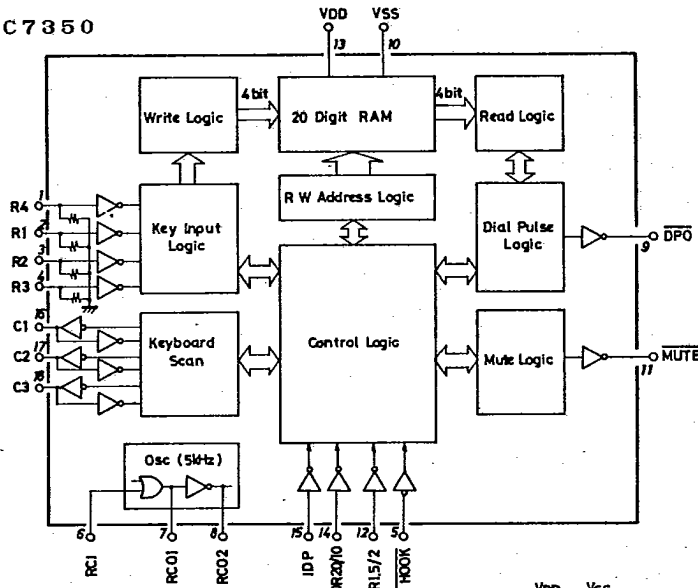
8067KI/7184KI, TS No. 1529-1/4

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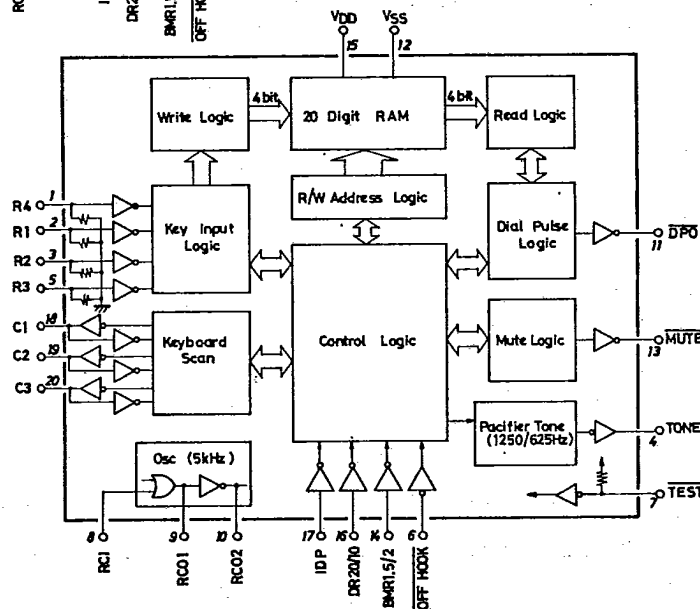
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Equivalent Circuit Block Diagram

LC7350



LC7351

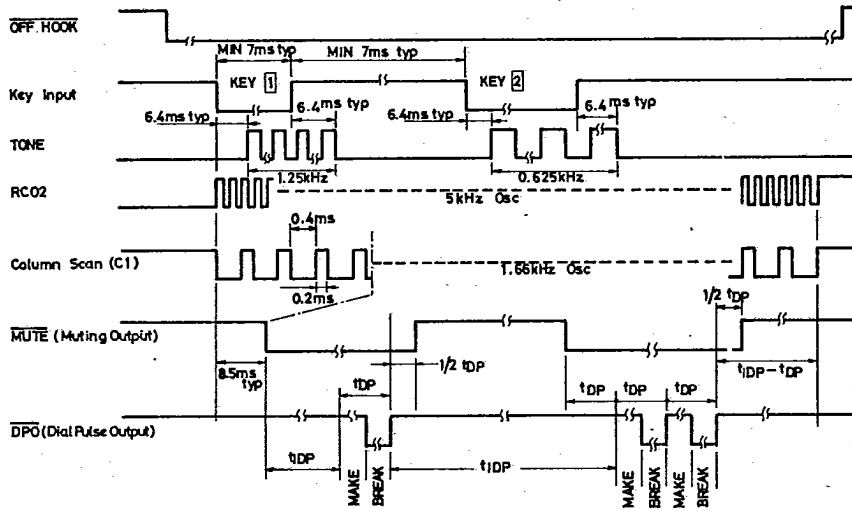


Function Table

(fosc=5kHz)

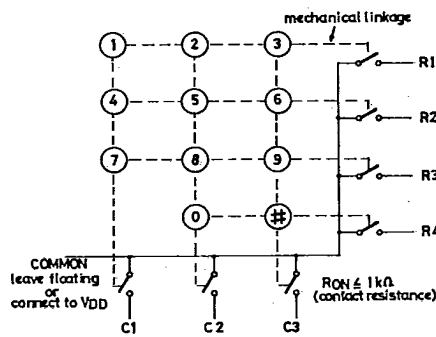
Function	Pin Name	Input Logic Level	Selection
Dial Pulse Rate	DR20/10	VSS	10pps (t _{DP} =100msec)
		VDD	20pps (t _{DP} =50msec)
Make/Break Ratio	BMR 1.5/2.0	VSS	Make=33 1/3(%) Break=66 2/3(%)
		VDD	Make=40(%) Break=60(%)
Inter-Digit Pause	IDP	-	D.P.R=10pps D.P.R=20pps
		VSS	t _{IDP} =800ms t _{IDP} =400msec
		VDD	t _{IDP} =400ms t _{IDP} =200ms

Timing

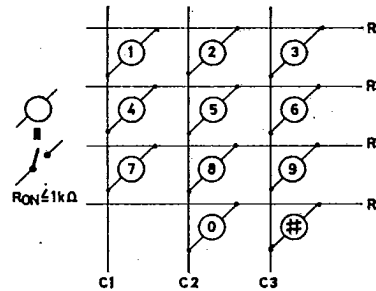


Keyboard Interface

Standard 2 of 7 Keyboard



Single Contact Keyboard



Absolute Maximum Ratings at Ta=25±2°C, VSS=0V

Parameter	Symbol	Value	Unit
Maximum Supply Voltage	V _{DD} max	-0.3 to +5.5	V
Maximum Input Voltage	V _I max	-0.3 to V _{DD} +0.3	V
Maximum Output Voltage	V _O max	-0.3 to V _{DD} +0.3	V
Allowable Power Dissipation	P _d max	150	mW
Operating Temperature	T _{op}	-30 to +70	°C
Storage Temperature	T _{stg}	-40 to +125	°C

Ta = -30 to +70 °C

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Allowable Operating Conditions at Ta=-30 to +70°C, V _{SS} =0V		min	typ	max	unit
Supply Voltage	V _{DD}	+1.5		+3.5	V
"H"-Level Input Voltage	V _{IH1} R1, R2, R3, R4, C1, C2, C3	0.7V _{DD}		V _{DD}	V
	V _{IH2} OFF-HOOK, TEST(LC7351 only)	0.8V _{DD}		V _{DD}	V
	V _{IH3} BMR1.5/2.0, DR20/10, IDP	0.9V _{DD}		V _{DD}	V
"L"-Level Input Voltage	V _{IL1} R1, R2, R3, R4, C1, C2, C3	V _{SS}	0.3V _{DD}		V
	V _{IL2} OFF-HOOK, TEST(LC7351 only)	V _{SS}	0.2V _{DD}		V
	V _{IL3} BMR1.5/2.0, DR20/10, IDP	V _{SS}	0.1V _{DD}		V
External Constants for Oscillation Guarantee	R _O	(LC7350)	176	300	360 kohm
		(LC7351)	176	220	360 kohm
	C _O	(LC7350)	243	270	396 pF
		(LC7351)	243	360	396 pF
	R _I	(LC7350)	675	820	1650 kohm
	(LC7351)	675	1200	1650 kohm	
Oscillation Frequency	f _{OSC} RCO2		5.0		kHz
Key Contact Resistance	R _{KI}			1.0	kohm
Keyboard Capacitance	C _{KI}			50	pF
Electrical Characteristics at Ta=25±2°C, V_{SS}=0V *V_{CC}(pin)		min	typ	max	unit
"H"-Level Input Current	I _{IH1} V _{IN} =V _{DD} , *1.5 to 3.5V, (*)			1.0	uA
	I _{IH2} " , *1.5V, (R1, R2, R3, R4)	3.0			uA
	I _{IH2} " , *3.5V, (")			60	uA
"L"-Level Input Current	I _{IL1} V _{IN} =V _{SS} , *1.5 to 3.5V, (*)	-1.0			uA
	I _{IL2} " , *1.5V, (TEST)			-3.0	uA
	I _{IL2} " , *3.5V, (TEST)	-140			uA
"L"-Level Input Floating Voltage	V _{IFL} Input pin open, *1.5 to 3.5V, (R1, R2, R3, R4)	V _{SS}	0.3V _{DD}	-0.3	V
"H"-Level Output Voltage	V _{OH1} I _{OH} =20uA, *1.5V, (DPO, MUTE)	V _{DD} -0.5			V
	V _{OH1} I _{OH} =125uA, *3.5V, (")	V _{DD} -1.0			V
	V _{OH2} I _{OH} =20uA, *1.5V, (TONE)	V _{DD} -0.5			V
	V _{OH2} I _{OH} =125uA, *3.5V, (")	V _{DD} -1.0			V
"L"-Level Output Voltage	V _{OL1} I _{OL} =20uA, *1.5V, (DPO, MUTE)			0.4	V
	V _{OL1} I _{OL} =125uA, *3.5V, (")			0.4	V
	V _{OL2} I _{OL} =20uA, *1.5V, (TONE)			0.4	V
	V _{OL2} I _{OL} =125uA, *3.5V, (")			0.4	V
Operating Current	I _{DD1} (DR=10pps, *1.5V, (V _{DD})) (All output pins: open, *3.5V (V _{DD}))			20	uA
Quiescent Current	I _{DD2} OFF-HOOK=V _{DD} , All output pins: open, *1.5 to 3.5V, (V _{DD})	0.1	1.0		uA
Frequency Deviation	Δfo/fo R _O =300kohms, C _O =270pF, R _I =820kohms				
	220 , 360 , 1.2Mohms				
	*1.5 to 2.5V, (RCI, RCO1, RCO2)	-3		+3	%
	*2.5 to 3.5V, (")	-3		+3	%
Data Retention Voltage	V _{DR} (OFF-HOOK=V _{DD} , (V _{DD}))		1.0		V
Data Retention Current	I _{DR} (All output pins: open, *1.0V, (V _{DD}))			0.4	uA

(*): OFF-HOOK, RCI, DR20/10, BMR1.5/2.0, IDP