LASERDYNE CORPORATION

MODEL 7900 DTMF MODEM

DESCRIPTION

The 7900 is a binary coded DTMF Modulator/Demodulator designed in a 32 pin Dip hybrid I.C. package. The device is capable of interfacing directly to existing hexadecimal microprocessor busses (without UART's) for data communications and electronic PABX's. Either half duplex 2-wire or full duplex 4-wire DTMF telephone transmission may be implemented.

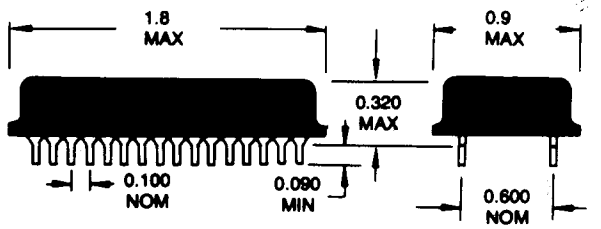
PACKAGE INFORMATION

32 Pin Dual In-Line Package (dimensions in inches)

Mechanical Characteristics

Substrate ..... Metallized, 96% alumina
Cover ..... Gold Flashed, deep drawn Brass
Pins ..... Tinned Kovar

LEAD TEMPERATURE (during soldering)
At distance 1/6 ± 1/32 inch from case for
10 seconds max. ..... 200° C



7900 PIN ASSIGNMENT

Function	Pin	Pin	Function
N/C	1	32	N/C
N/C	2	31	N/C
ANY DATA*	3	30	$\overline{\text{BIN}}$ 1 IN
AUTO ADVANCE**	4	IN 29	$\overline{\text{BIN}}$ CLOCK
+Vs	5	28	$\overline{\text{BIN}}$ 2 IN
GND	6	27	$\overline{\text{BIN}}$ 4 IN
1633 OUT INHIBIT***	7	26	$\overline{\text{BIN}}$ 8 IN
N/C	8	25	DTMF OUT
DTMF IN	9	24	TP
N/C	10	23	TP
N/C	11	22	BIN 1 OUT
N/C	12	21	BIN 2 OUT
447 KHz CLOCK	13 OUT	20	BIN 4 OUT
RX STROBE OUT	14	19	BIN 8 OUT
N/C	15	18	N/C
N/C	16	17	N/C

*ANY DATA: POSITIVE PULSE FROM MODULATOR CONCIDENT WITH DTMF TONES.

**AUTO ADVANCE: 10ms POSITIVE PULSE FROM MODULATOR CONCIDENT WITH END OF INTER-DIGIT INTERVAL

***1633 OUT INHIBIT: 1633 RX DATA-OUT DISABLE

7900 TRUTH TABLE

DIGITS	DTMF FREQ. HZ	MOD DATA IN 26	27	28	30	29	DEMOD DATA OUT 19	20	21	22	14
		$\overline{8}$	$\overline{4}$	$\overline{2}$	$\overline{1}$	$\overline{Cp}$	8	4	2	1	STR
1	697 + 1209	1	1	1	0	0	0	0	0	1	1
2	697 + 1336	1	1	0	1	0	0	0	1	0	1
3	697 + 1477	1	1	0	0	0	0	0	1	1	1
4	770 + 1209	1	0	1	1	0	0	1	0	0	1
5	770 + 1336	1	0	1	0	0	0	1	0	1	1
6	770 + 1477	1	0	0	1	0	0	1	1	0	1
7	852 + 1209	1	0	0	0	0	0	1	1	1	1
8	852 + 1336	0	1	1	1	0	1	0	0	0	1
9	852 + 1477	0	1	1	0	0	1	0	0	1	1
0	941 + 1336	0	1	0	1	0	1	0	1	0	1
*	941 + 1209	0	1	0	0	0	1	0	1	1	1
#	941 + 1477	0	0	1	1	0	1	1	0	0	1
A SPARE	697 + 1633	0	0	1	0	0	1	1	0	1	1
B SPARE	770 + 1633	0	0	0	1	0	1	1	1	0	1
C SPARE	852 + 1633	0	0	0	0	0	1	1	1	1	1
D SPARE	941 + 1633	1	1	1	1	0	0	0	0	0	1

PERFORMANCE SPECIFICATIONS, DTMF DEMODULATOR (Vs=12v., Ta=25° C)

PARAMETER	CONDITION	MIN	TYPICAL	MAX	UNITS
Input Level, High	Each Tone			+6	dBm
Input Level, Low	Each Tone	-24			dBm
Input Impedance			43		k ohm
Dial Tone Rejection	Note 1		36		dB
Twist	Hi/Lo grp	-8		+4	dB
Guard Time	Note 2			39	mS
Fault Time	Note 3		12		mS
In Band Tone Rejection	Note 4		17		dB
Detect Bandwidth		±1.5%+2Hz	±2.3		% of Nominal
Invalid Tone Reject Limit	Tones Pulsed	-3.5		+3.5	% of Nominal
Tone Pair Duration, Invalid				12	mS
60 and 12 Hz Rejection			40		dB
Signal to Noise Ratio	3kHz White Noise ($Pe=10^{-4}$)		14		dB
Talk-Off (Speech Simulations)	Strobe Note 5		2	10	HITS
D.C. Input Blocking Voltage	Pin 1 to ground			50	Volts
Operating Voltage		10.8	12	13.2	V
Operating Current			30		mA
Operating Temperature		0		+70	oC
Storage Temperature		-30		+85	oC
Output Level, Logic "1"	I Source = 2.0 mA	V-0.5	(+) Supply		V
Output Level, Logic "0"			(-) Ground	Vg+0.3	V
Output Rise or Fall Time	10% to 90% of total			4	uS
Interdigit Interval	(w/30pf load)	15			mS

NOTES:
1. Precise dial tone (350-440Hz) present at -10 dBm.
2. Guard time is defined as the receiver response time to a tone input pulse.
3. Fault time is the time a tone pulse may be interrupted without the receiver output resetting.
4. Third frequency is 1700 Hz to 4000 Hz and a -1 dB with respect to high group tone.
5. Based on Mitel test tape (CM7290). Equivalent to 100 hrs exposure on speech signals.

PERFORMANCE SPECIFICATIONS DTMF MODULATOR (Vs=12v., Ta=25° C)

PARAMETERS	MIN	TYPICAL	MAX	UNITS
Signal Outputs				
DTMF (900 ohm load)		2		VPP
Tone Stability			±1	%
Distortion			3	%
Data Inputs				
Input Z	1			Mohm
Data High (1)		(+)Vs		V
Data Low (0)		(-)Vs		V
Data Outputs				
Data Output High (1)		(+)Vs		V
Data Output Low (0)		(-)Vs		V
Data Output Source Current			10	ma
Power				
Operating Voltage (+)Vs - (-)Vs	8		18	V
Operating Current (Full Operation)		6	10	ma
Twist (Hi/Lo)		3.0		db

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