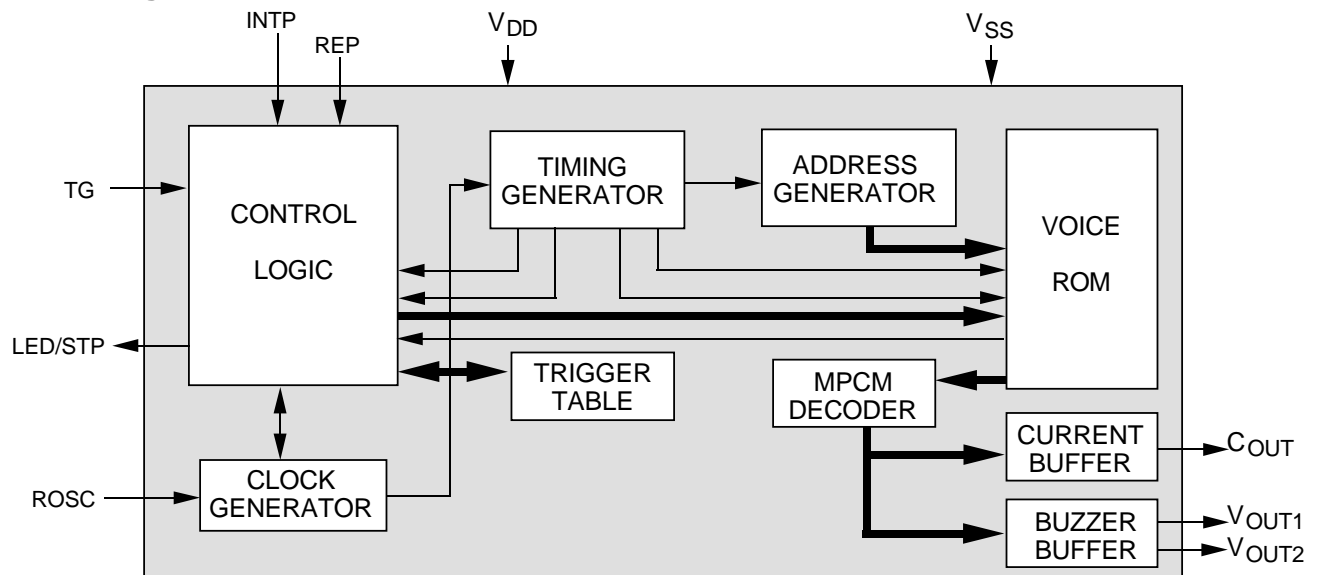


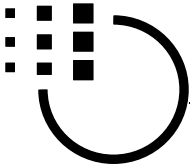
Features

- Single power supply can operate at 2.4V through 6V.
- Current output can drive 8 ohm speaker with a transistor, Vout can drive buzzer directly.
- The voice content is stored for 7-12 seconds for 13-24 seconds (21000h) including mute and should be multiples of 200h.
- Single section / phrase and single trigger.
- Automatic power down.
- A phrase is composed of repetitive sections.
- Interrupt function (INTP) stops the audio output at once.
- An LED function with 3Hz flash is provided to tell the audio status.
- A STOP pulse comes out when audio signal is finished.
- CDS input interface with 10ms debounce is provided for trigger pin, REP pin and INTP pin.
- Repeat pin was provided to keep audio output repeating.
- Built-in power on play function and is programmable.
- Programmable option for either Retrigger or not.
- Programmable option for either Level or Edge trigger type.
- Programmable option for either Holdable or Unholdable output type.
- Programmable option for repeat times up to 8 times.
- Programmable option for either LED display or STOP pulse on LED/STP pin.
- Can be programmed by MSM9159, MSM9141S, MSM9140.
- PDIP demo board M9007 is available.

Block Diagram



Specifications subject to change without notice, contact your sales representatives for the most recent information.



Description

The MSSI241C is an one time programmable CMOS VLSI ASIC that can memorize voice for 13-24 seconds using 6-bit MOSEL qualified coding method (MPCM). Most of the necessary circuit are built in like oscillator, ROM, DAC and interface logic. Versatile functions can be performed with minimum external components. Customer voice data will be edited and built in by MOSEL writer in an instant time base.

Ordering Information

MSSI241Cs

MSSI241C-pqrs

pqr:production code{001,...,999}

s:package type post fix:

Post fix	Package	Pin/Pad Configuration	Dimension
blank	dice	page 6	page 6
P	14L PDIP	page 3	page 8

Pad Description

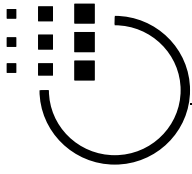
PDIP Pin #	Pad #	Signal Name	I/O	Active	Function
1	1	VDD	Power		Positive power supply
2	2	ROSC	I		Oscillator Resistor input
4	3	CLK	I		Clock for programming
5	4	COUT	O		Audio signal current output (for speaker)
6	5	INTP	I	H	Interrupt input, internal pull low, high active
7	6	REP	I	H	Repeat pin, high active
8	7	LED/STP	O		LED signal output / One shot stop signal output
9	8	VOUT1	O		Audio signal voltage output (for buzzer)
10	9	VOUT2	O		Audio signal voltage output (for buzzer)
13	10	TG	I		Trigger input, internal pull low, high active
14	11	VSS	Power		Negative power supply

DC Characteristics at 3.0V

Symbol	Parameter	Valid	Min.	Typ.	Max.	Unit	Conditions
I SB	StandBy current	VDD			1	uA	
I OP	Operating current	VDD			300	uA	I/O=open
V IH	Input high voltage	note 1				V	
V IL	Input low voltage	note 1				V	
I OH	Output high current	STP		-3			
I OL	Output low current	STP		3			
I LED	LED sink current	LED		10		mA	
I OHV	Output current high	VOUTs		-5		mA	
I OLV	Output current low	VOUTs		5		mA	
I CO	Current output	COUT		4.6		mA	Full Scale
R1	Oscillation Resistor	ROSC		810		Kohm	S.R. = 6 KHz
	Oscillation Resistor	ROSC				Kohm	S.R. = 9 KHz
	Oscillation Resistor	ROSC				Kohm	S.R. = 12 KHz
β F/F@v	Fosc stability				5	%	[F(3.0V)-F(2.7V)]/F(3.0V)
β F/F@L	Fosc variation				10	%	

note 1 :=TG, INTP, REP

Specifications subject to change without notice, contact your sales representatives for the most recent information.



DC Characteristics at 4.5V

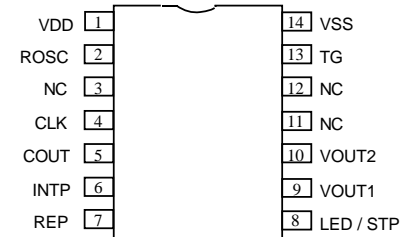
Symbol	Parameter	Valid	Min.	Typ.	Max.	Unit	Conditions
I _{SB}	StandBy current	VDD			1	uA	
I _{OP}	Operating current	VDD			500	uA	I/O=open
V _{IH}	Input high voltage	note 1				V	
V _{IL}	Input low voltage	note 1				V	
I _{OH}	Output high current	STP		-5		mA	
I _{OL}	Output low current	STP		5		mA	
I _{LED}	LED sink current	LED		10		mA	
I _{OHV}	Output current high	VOUTs		-11		mA	
I _{OLV}	Output current low	VOUTs		11		mA	
I _{CO}	Current output	COU		7		mA	Full Scale
R1	Oscillation Resistor	ROSC		870		Kohm	S.R. = 6 KHz
	Oscillation Resistor	ROSC				Kohm	S.R. = 9 KHz
	Oscillation Resistor	ROSC				Kohm	S.R. = 12 KHz
β _{F/F@V}	Fosc stability				5	%	[F(4.5V)-F(4.0V)]/F(4.5V)
β _{F/F@L}	Fosc variation				10	%	

note 1 :=TG, INTP, REP

Absolute Maximum Rating

Symbol	Rating	Unit
V _{DD} - V _{SS}	-0.5 ~ +7.0	V
V _{IN}	V _{SS} -0.3 < V _{IN} < V _{DD} +0.3	V
V _{OUT}	V _{SS} < V _{OUT} < V _{DD}	V
T (Operating)	0 ~ +70	°C
T (Storage)	-55 ~ +125	°C

Pin Configurations

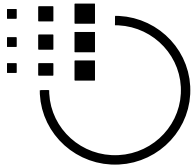


300 MIL P DIP

AC Characteristics at 6000 Hz S.R.

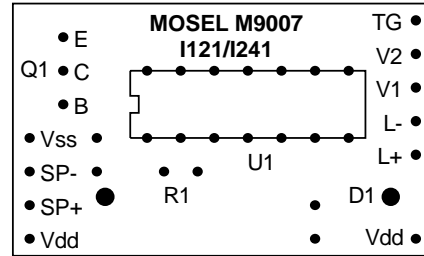
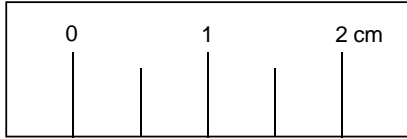
Timing	Description	Min.	Typ.	Max.	Unit	Remark
t _{ONL}	LED turn on time (fix 3 Hz)	-	170	-	ms	SRD
t _{OFL}	LED turn off time (fix 3 Hz)	-	170	-	ms	SRD
t _T	Trigger Pulse width (normal)	10	-	-	ms	SRD
t _{VSAS}	Voice start to audio start	-	-	-	us	SRD
t _{ASDS}	Audio start to LED start	-	-	-	us	SRD
t _{VEAE}	Voice end to audio end	-	-	-	us	SRD
t _{AESS}	Audio end to STOP start	-	-	-	us	SRD
t _{AEDE}	Audio end to LED end	-	-	-	us	SRD
t _{STP}	Stop pulse width	-	20	-	us	SRD
t _P	Power Rise up time	-	-	1	ms	
t _R	Power ripple width	-	-	1	ms	

SRD : Sample Rate Dependent



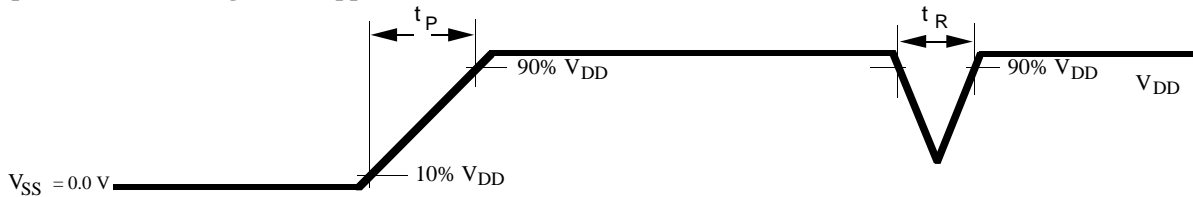
Demo Board M9007 Information

Single Side PCB
for PDIP chip

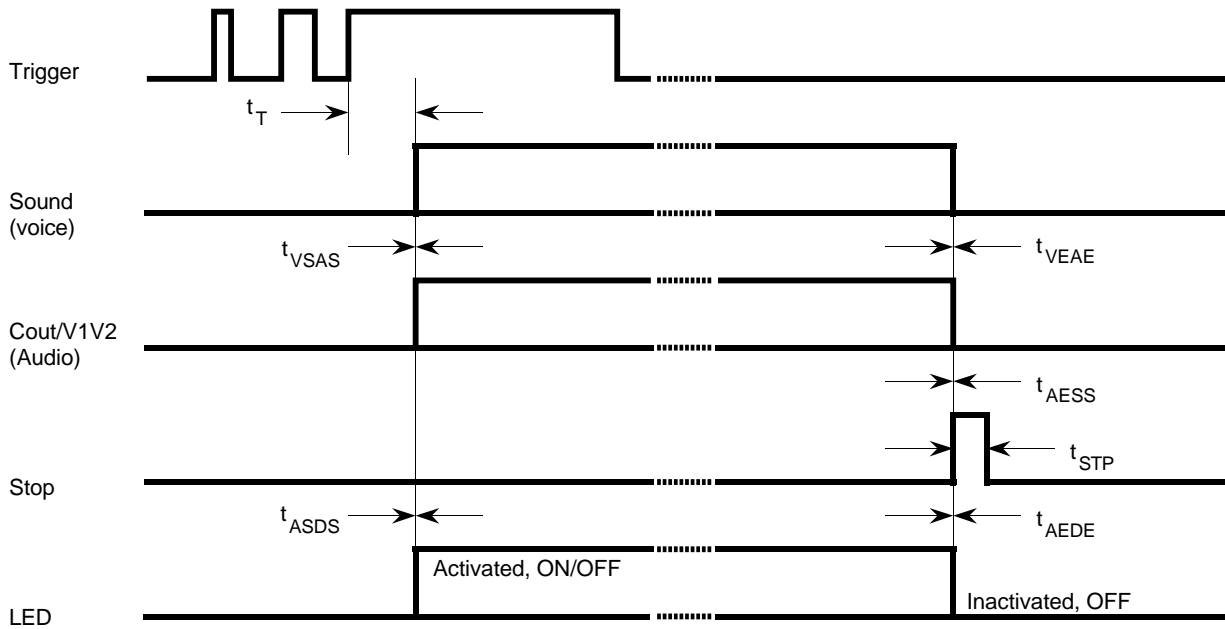


Timing Critical

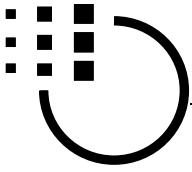
I. Acceptable Power On Signal & Ripple



II. To play a voice sound

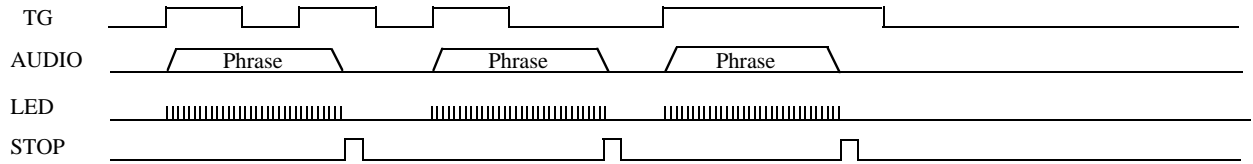


Specifications subject to change without notice, contact your sales representatives for the most recent information.

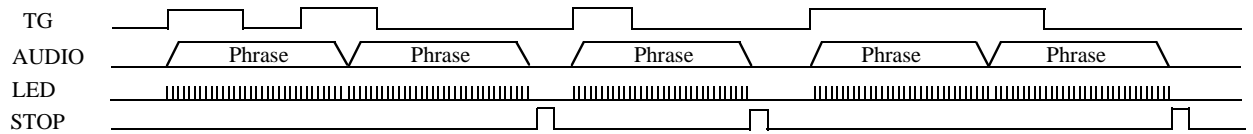


Timing Diagram

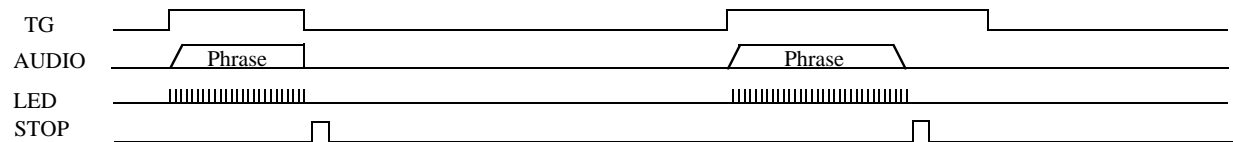
I. Edge/Unholdable / Irretrigger Option



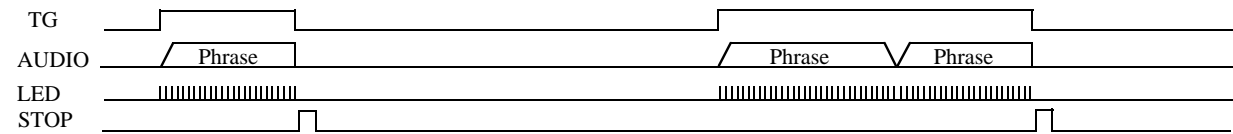
II. Level/Unholdable / Irretrigger Option



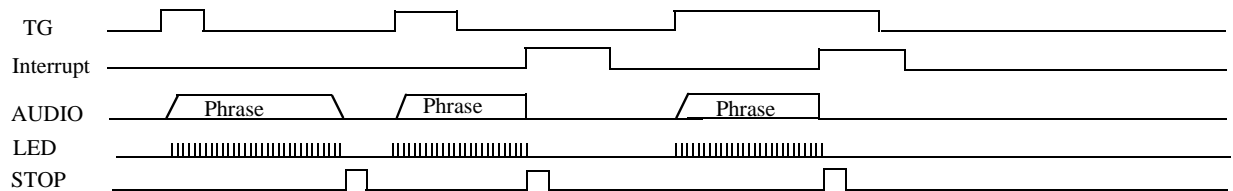
III. Edge/Holdable Trigger Mask



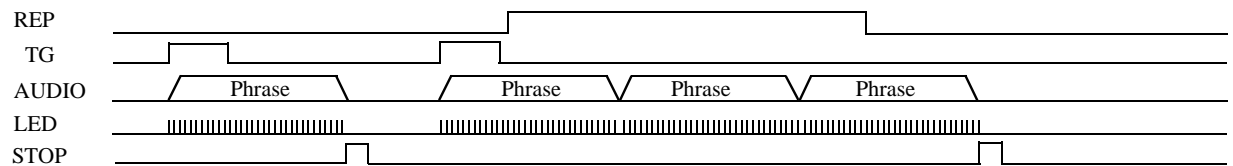
IV. Level/Holdable Trigger Option

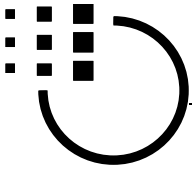


V. Interrupt Pin Function (LED Or Stop)



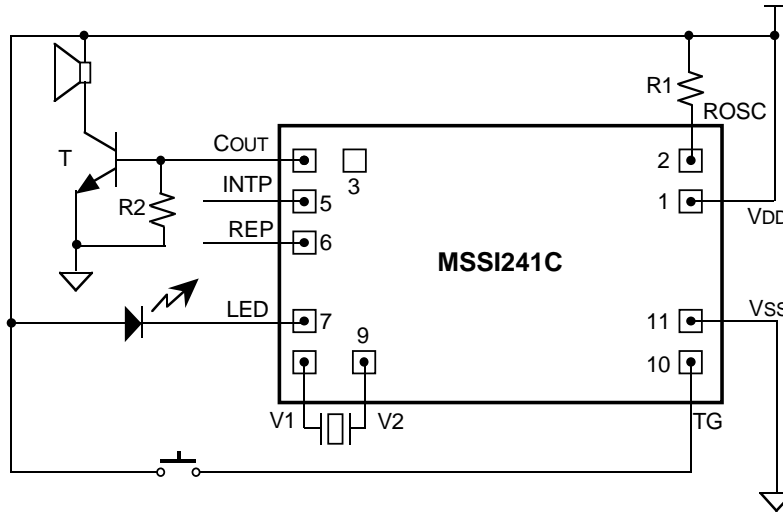
VI. Repeat Pin Function





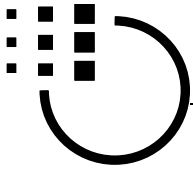
Application Circuit & Bonding Information

1. Typical Application

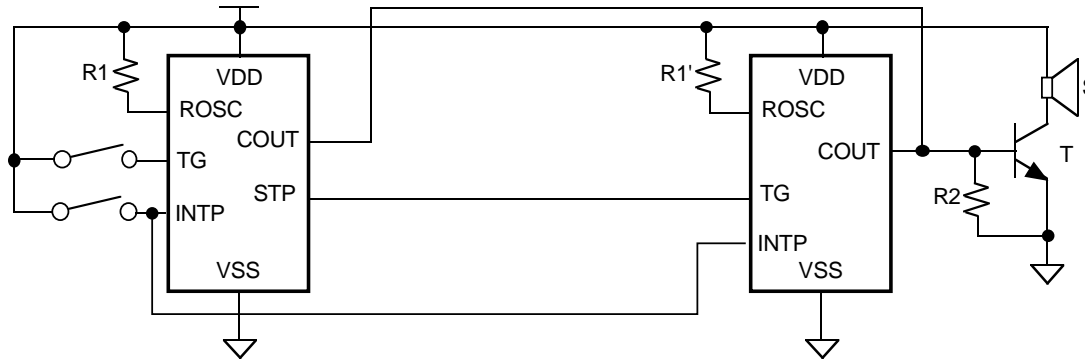


DIE SIZE: 2760um X 4440um
Pad size = 90 um X 90 um
Substrate should be bonded to VSS

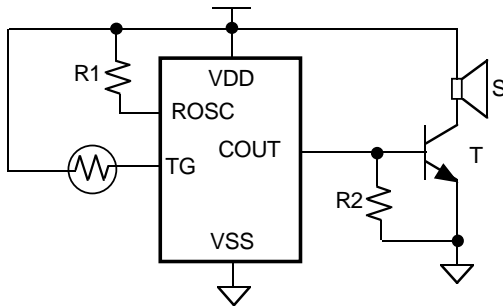
Index	Designation	X	Y
1	VDD	535	4193
2	ROSC	325	4191
3	CLK	130	372
4	COUT	154	136
5	INTP	698	141
6	REP	1139	141
7	LED/STP	2258	141
8	VOUT1	2530	213
9	VOUT2	2538	397
10	TG	2462	4197
11	VSS	2258	4214



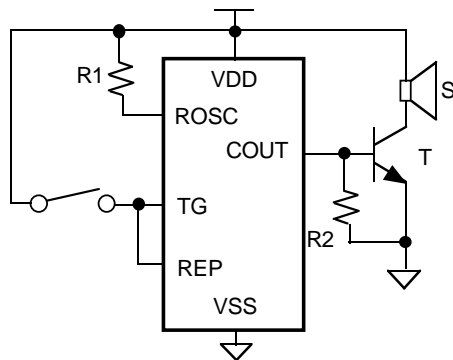
2. Cascade Application (To get longer than 12/24 seconds) you have to avoid these two chips play at the same time, it might danger the speaker



3. CDS Application

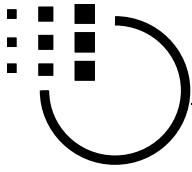


4. Equivalent to Level type trigger under "Edge option"

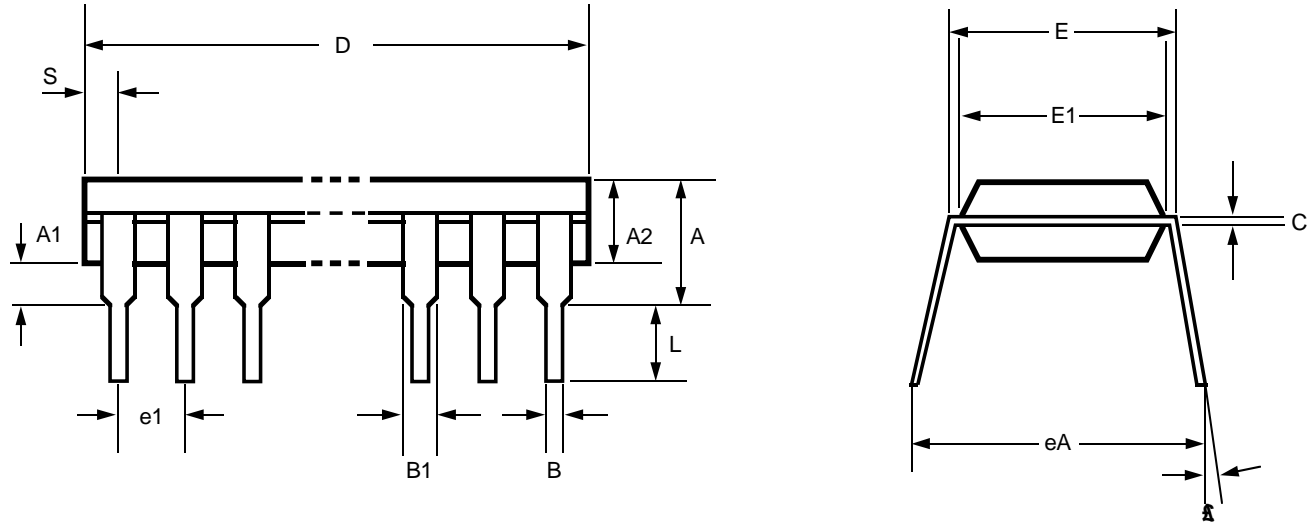


Application Note:

1. R1 = 1.2 M Ω , T(transistor) = $\beta > 130$, S(speaker) = 1/4 w, 8 Ω ; all typical.
2. R2 = 470 Ω (typical) to bypass extra current into base to get rid of waveform saturation on collector .
3. Piezo buzzer resonant frequency is around 1K Hz.
4. Input switch could be replaced by CDS.
5. VOUT1,VOUT2 are tristate during stand by .
6. If using MSM9159 writer, use its new version MSM9159B to program MSSI121/241/241B chips. Do not use the old version MSM9159 writer. The difference between two version of writer should refer to its data sheet (PID 330B).
7. Power on play function plays only one time regardless the number to repeat.



14L 300mil PDIP Information



Note:

- 1.Dimension D Max & S include mold flash or tie bar burrs.
- 2.Dimension E1 does not include interlead flash.
- 3.Dimension D & E1 include mold mismatch and are determined at the mold parting line.
- 4.Dimension B1 does not include dambar protrusion/infrusion.
- 5.Controlling dimension is inch.
- 6.General appearance spec. should base on final visual inspection spec.

Symbol	Dimension in Inch	Dimension in mm
	minimal/maximal	minimal/maximal
A	- / 0.175	- / 4.45
A1	0.010 / -	0.25 / -
A2	0.125 / 0.135	3.18 / 3.43
B	0.016 / 0.022	0.41 / 0.56
B1	0.058 / 0.064	1.47 / 1.63
C	0.008 / 0.014	0.20 / 0.36
D	- / 0.770	- / 19.56
E	0.290 / 0.310	7.37 / 7.87
E1	0.245 / 0.255	6.22 / 6.48
e1	0.090 / 0.110	2.29 / 2.79
L	0.120 / 0.140	3.05 / 3.56
A	0° / 15°	0° / 15°
eA	0.335 / 0.375	8.51 / 9.53
S	- / 0.090	- / 2.29

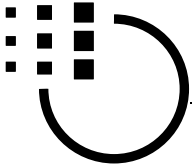
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 #1 Creation Road I,
 Science - based Industrial Park,
 Hsinchu, 30077
 Taiwan, ROC
 "audio_reply@mosel.com.tw"
 TEL: 886-3-5770055
 FAX: 886-3-5772788
 FAX: 886-3-5784732

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 7F, #102 Section 3,
 Ming Chung E. Road,
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 TEL: 886-2-5451213
 FAX: 886-2-5451214

China
 (Vitellic HKG ShenZhen)
 Room #209,
 #19 ZhenHua road,
 ShenZhen, China
 TEL: 86-755-334-5766
 FAX: 86-755-332-3995

Hongkong
 #19 Dai Fu Street,
 Taipo Industrial Estate,
 Taipo, N.T.
 Hongkong
 TEL: 852-2388-8277 (MKO)
 TEL: 852-2665-4883
 FAX: 852-2664-2406
 FAX: 852-2770-8011 (MKO)

U.S.A.
 #3910 North First Street,
 San Jose,
 CA. 65134-1501
 U.S.A.
 TEL: 1-408-433-6000
 FAX: 1-408-433-0952



To : Mosel Vitelic Inc. 886-3-577-2788 (fax)
 Attn : Sales & Marketing Department

Product Request Form

I hereby request MVI to start preparing produce **MSSI241C** which is specified as below description. I already read this data sheet PID242 * and understand **MSSI241C** completely and know how to specify to fit my requirement. Its voice storage limitation is 21000h.

General Descriptions		Chip descriptions			
Customer	_____	Title :	Sample	_____ Hz	
	Cannot proceed when empty	<input type="checkbox"/> Edge <input type="checkbox"/> Level	Rate	_____	
Agent	_____	<input type="checkbox"/> No use and don't care	Output	<input type="checkbox"/> Buzzer (F fr =1KHz)	
Sales	_____	<input type="checkbox"/> Power on play once	Device	<input type="checkbox"/> Speaker (0.25W, 8 ohm, 1" diam.)	
Repr'tives	Who is MVI sales you contact ?	<input type="checkbox"/> No play when power on		<input type="checkbox"/> Other: _____	
Providing to MVI	<input type="checkbox"/> 8-bit PCM sound files <input type="checkbox"/> .WAV sound files <input type="checkbox"/> DAT or equivalent <input type="checkbox"/> application is special, see our written memo <input type="checkbox"/> Others _____		Working Voltage	<input type="checkbox"/> 2.5 V <input type="checkbox"/> 3.0 V <input type="checkbox"/> 3.5 V <input type="checkbox"/> 4.0 V <input type="checkbox"/> 4.5 V <input type="checkbox"/> 5.0 V <input type="checkbox"/> 5.5 V <input type="checkbox"/> 6.0 V	
Service Required from MVI	<input type="checkbox"/> EPROMs with data inside <input type="checkbox"/> files to be programmed into EPROM <input type="checkbox"/> emulation board & Eprom <input type="checkbox"/> Confirm table <input type="checkbox"/> Others _____	<input type="checkbox"/> Holdable & Irretriggerable <input type="checkbox"/> Unholdable & Irretriggerable <input type="checkbox"/> Unholdable & Retriggerable <input type="checkbox"/> No use & don't care <input type="checkbox"/> LED/STP = Busy output <input type="checkbox"/> LED/STP = 3Hz LED flasher <input type="checkbox"/> No use and don't care	Power Source	<input type="checkbox"/> Battery size "D" <input type="checkbox"/> Battery size "AA" <input type="checkbox"/> Battery size "AAA" <input type="checkbox"/> other size = _____ <input type="checkbox"/> Mains <input type="checkbox"/> Other _____	

Voice content	Voice Length		Mute(behind) length		Total Length	total play times	
	seconds	Hex	seconds	Hex		1≤	≤8
	s	≤21000h 00h	s	00h	≤21000h 00h	1≤	≤8

Company Name : _____ Fax number : _____
 Signature : _____ Date : _____
 Department/Section : _____ Position Title : _____