

3, 6 and 9 Seconds Simple Pure Speech

FEATURES

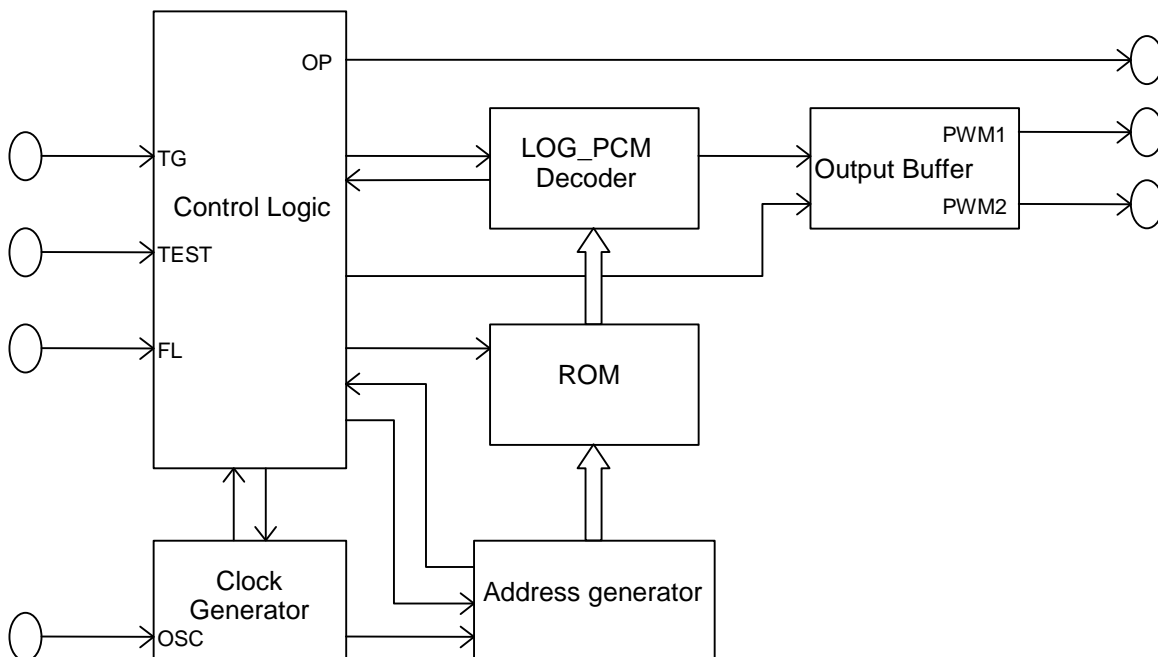
- Operating voltage: 2.4v ~ 6.0v
- Single word
- 1 trigger input PAD
- 1 Level option input
- 1 status output (Busy_high; Static_LED_fast; Static_LED_slow; Dynamic)
- Trigger mode selection: Edge/Level, Hold/Unhold, Retrigger/Irretrigger
- Debounce mode : Fast debounce: < 30us
- Slow debounce : ~10ms (S.R. = 6kHz)
- Play times: max. 8 (Total 8)
- PWM playing port; Drive speaker or buzzer directly
- Voice length: 3 seconds for MTS3103, 6 seconds for MTS3106 and 9 seconds for MTS3109 (S.R. = 6kHz) (Rom capacity = 18048*5 bit for MTS3103/ 36096*5 bit for MTS3106 / 54272*5 bit for MTS3109)
- Voice+Mute length : up to ~20 seconds. (S.R. = 6kHz)
- Voice algorithm : Log_PCM
- External resistor for system frequency.

GENERAL DESCRIPTION

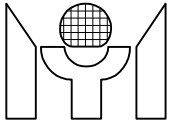
The MTS3103/6/9 is a single-chip synthesizing CMOS VLSI that can synthesize voice up to 3 seconds, 6 seconds and 9 seconds by Log_PCM algorithm.

Customers' speech data are edited and programmed into ROM by changing one mask during the device fabrication.

BLOCK DIAGRAM



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1.0 PIN DESCRIPTION

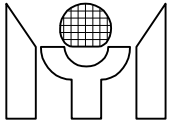
Pin Name	Pin Attr.	Description
VDD	Power	Positive power supply
TG	In	Trigger input, active high, pull low; with CDS interface
FL	In	Force edge mode be level mode, internal pull low
TEST	In	Test enable pad, high active, pull low
OP	Out	Status output
OSC	In	With resistor connecting to VDD for system clock generating
PWM1	Out	Voltage output to drive speaker or buzzer
PWM2	Out	Voltage output to drive speaker or buzzer
VSS	Power	Negative power supply

2.0 ABSOLUTE MAXIMUM RATING

SYMBOL	RATING	UNIT
VDD ~ VSS	-0.5 ~ +7.0	V
VIN (for input)	$VSS - 0.3 < VIN < VDD + 0.3$	V
VOOUT (for all outputs)	$VSS < VOOUT < VDD$	V
T (operating)	-10 ~ +60	V
T (storage)	-55 ~ +125	V

3.0 DC CHARACTERESTICS

Symbol	Parameter	Min	Typ.	Max.	Unit	Condition	
VDD	Operating Voltage	2.4	3.0	6.0	V		
I _{sb}	Supply Current	Standby	-	-	1	uA	V _{dd} =3.0V, I/O open
I _{op}		Operating	-	-	400	uA	V _{dd} =3.0v, No loading
I _{ih}	Input Current		-	-	-20	uA	V _{dd} =3.0v, V _{ip} =0v
I _{il}			-	-	20	uA	V _{dd} =3.0v, V _{ip} =3.0v
I _{ol}	Output Current		-	8	-	mA	V _{dd} =3.0v, V _{op} =0.8v
I _{oh}			-	-5	-	mA	V _{dd} =3.0v, V _{op} =2.5v
d F/F	Frequency Stability	-	-	± 5	%	$\frac{F_{osc}(4.5v)-F_{osc}(4.0)}{F_{osc}(4.5v)}$	
d F/F	Frequency Variation by Lot	-	-	± 10	%	V _{dd} =4.5V F _{osc} =384kHz	

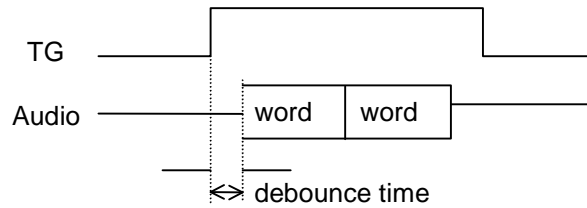


4.0 FUNCTION DIAGRAM

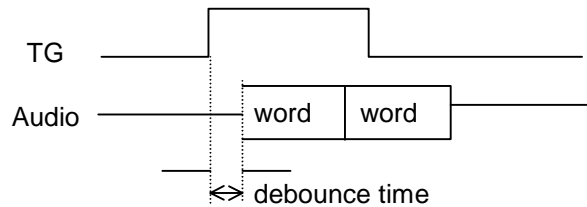
4.1 Edge / Level mode (If play time=2)

Edge mode

Trigger length > Voice length

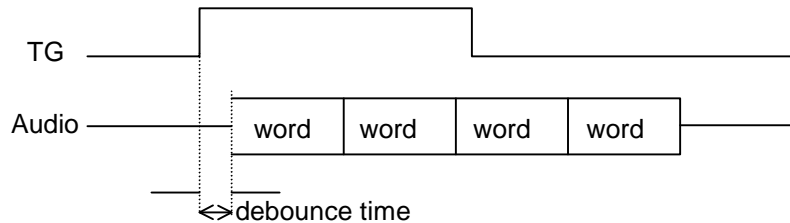


Trigger length < Voice length

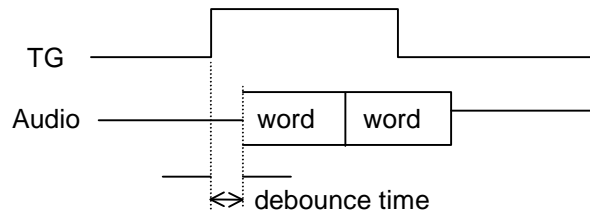


Level mode (or edge mode, FL PAD = HIGH)

Trigger length > Voice length (including repeat voice)

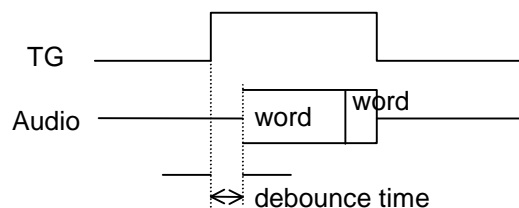


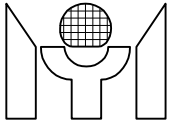
Trigger length < Voice length (including repeat voice)



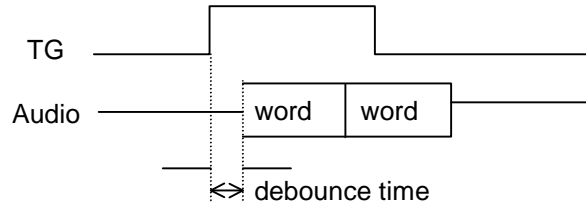
4.2 Hold/Unhold mode (If play time=2)

Hold mode

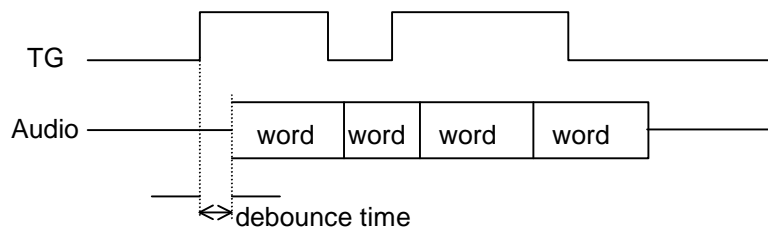




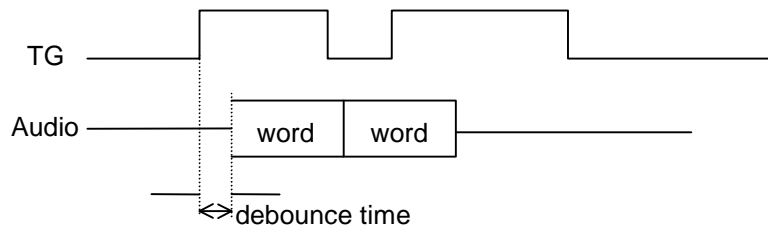
Unhold mode

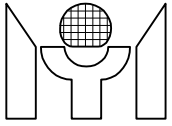


**4.3 Retrigger/Irretrigger mode (If play time=2)
Retrigger mode (Edge, Unhold mode)**



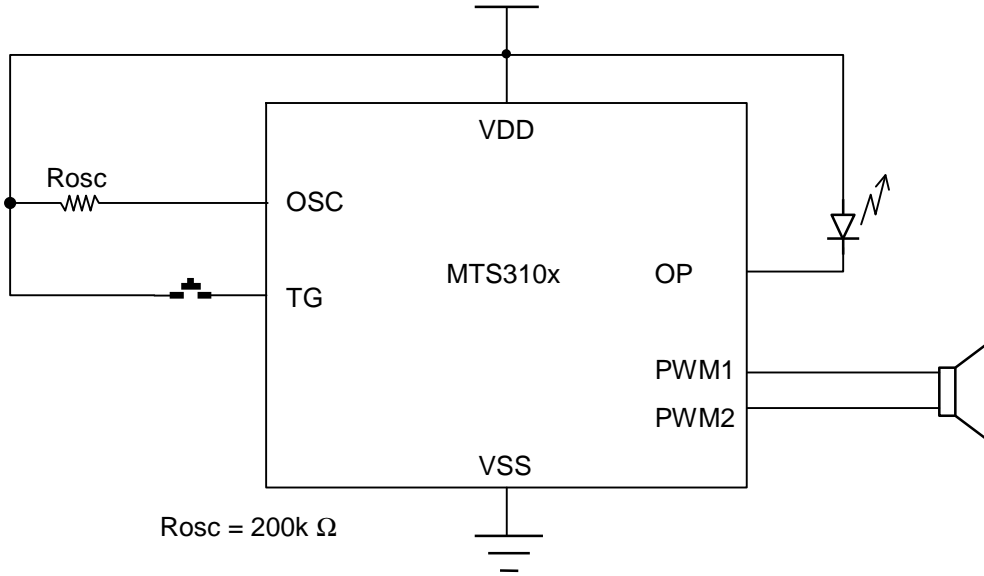
Irretrigger mode (Edge, Unhold mode)



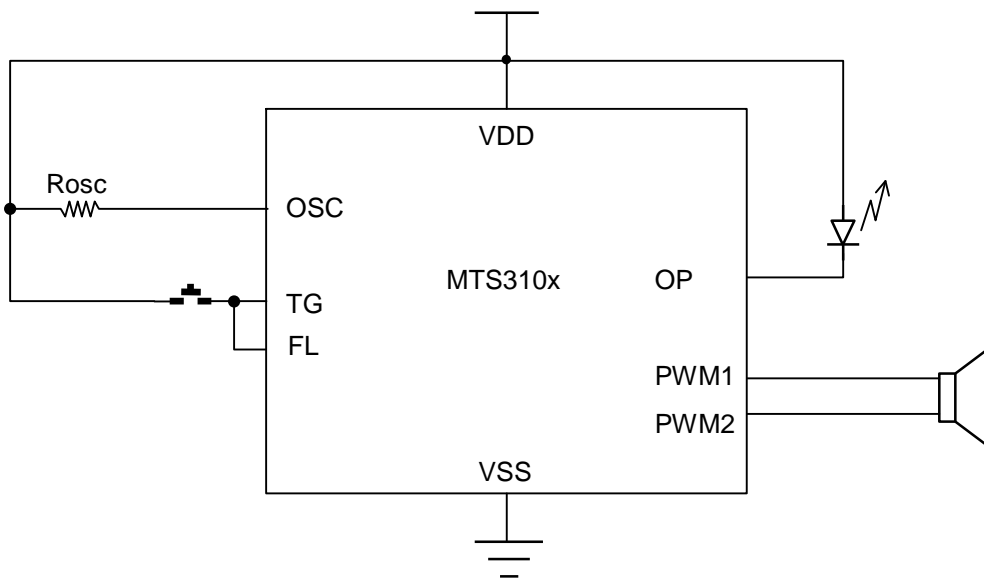


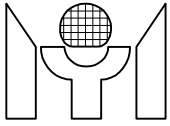
5.0 APPLICATION CIRCUIT

5.1 External resistor, Drive speaker, LED

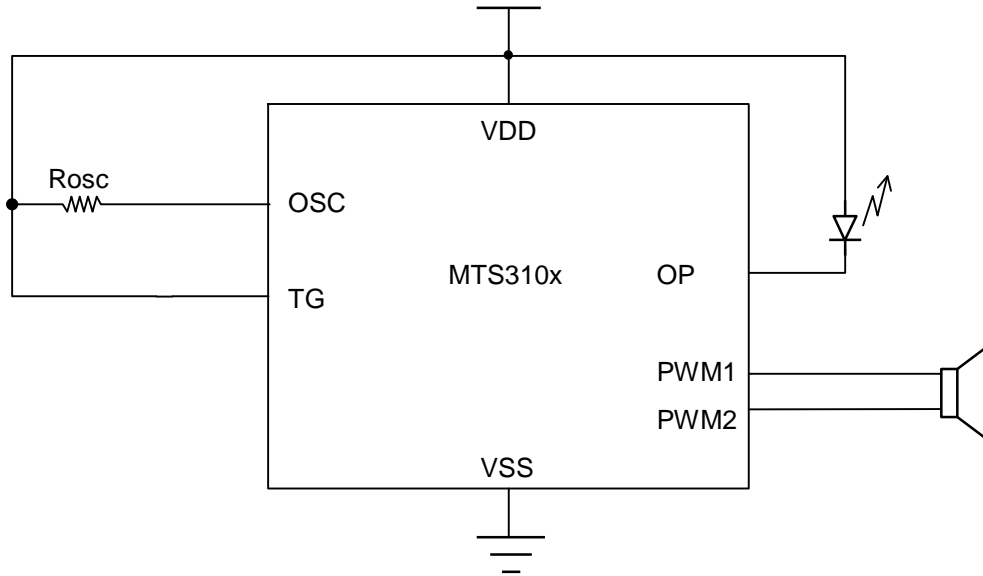


5.2 Internal option is edge mode, by PAD option to Level mode.

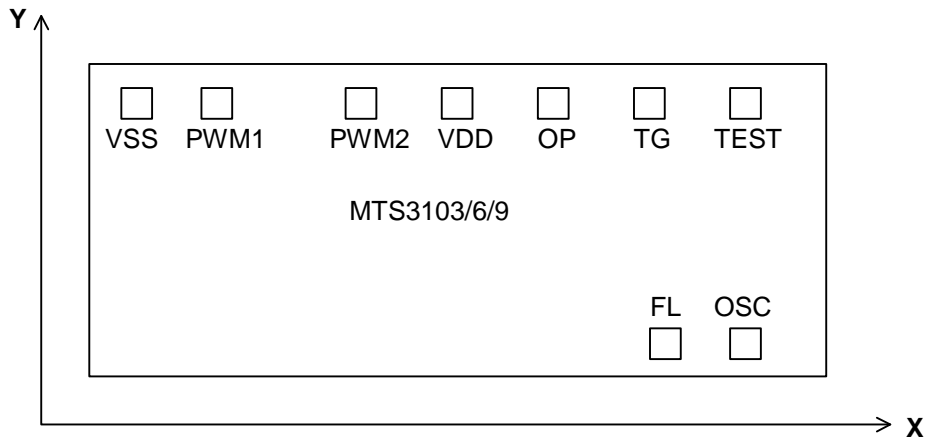




5.3 Power on play

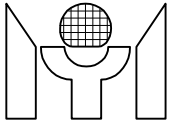


6.0 BONDING DIAGRAM



(1) MTS3103

DIE SIZE = 2026 x 960 μm^2 (X * Y)		
PIN NAME	X(μm)	Y(μm)
PAD_FL	1550.00	126.20
PAD_OSC	1764.80	126.20
VSS	309.80	719.60
PAD_PWM1	531.00	733.40
PAD_PWM2	954.20	733.40
VDD	1206.80	743.40
PAD_OP	1382.20	743.40
PAD_TG	1593.60	743.40
PAD_TEST	1802.40	743.40



(2) MTS3106

DIE SIZE = 2026 x 1188 μm^2 (X * Y)		
PIN NAME	X(μm)	Y(μm)
PAD_FL	1550.00	126.20
PAD_OSC	1764.80	126.20
VSS	309.80	946.40
PAD_PWM1	531.00	960.20
PAD_PWM2	954.20	960.20
VDD	1206.80	970.20
PAD_OP	1382.20	970.20
PAD_TG	1593.60	970.20
PAD_TEST	1802.40	970.20

(3) MTS3109

DIE SIZE = 2026 x 1474 μm^2 (X * Y)		
PIN NAME	X(μm)	Y(μm)
PAD_FL	1550.00	126.20
PAD_OSC	1764.80	126.20
VSS	309.80	1233.40
PAD_PWM1	531.00	1247.20
PAD_PWM2	954.20	1247.20
VDD	1206.80	1257.20
PAD_OP	1382.20	1257.20
PAD_TG	1593.60	1257.20
PAD_TEST	1802.40	1257.20