



## MM5555/MM5556 chromatic frequency generator general description

The National Semiconductor MM5555/MM5556 chromatic frequency generator is an MOS/LSI frequency synthesizer designed to generate musical frequencies. The circuits provide thirteen semitone outputs, fully spanning the equal tempered octave. The divisors have been carefully selected to offer excellent tuning accuracy and to eliminate any "locked" (just-intoned) fifths. Output characteristics are fully compatible with the MM5554 Frequency Divider. The MM5555 or MM5556 is packaged in a 14-lead dual-in-line package.

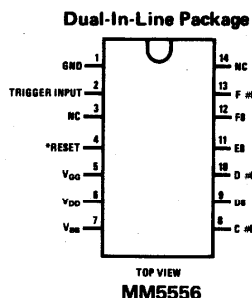
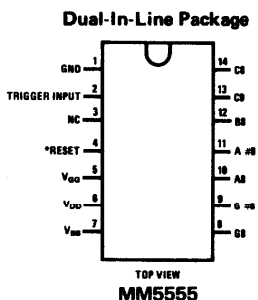
## features

- Single-phase squarewave input
- 7 kHz to 2.2 MHz input frequency
- Accuracy of 0.5129 cent

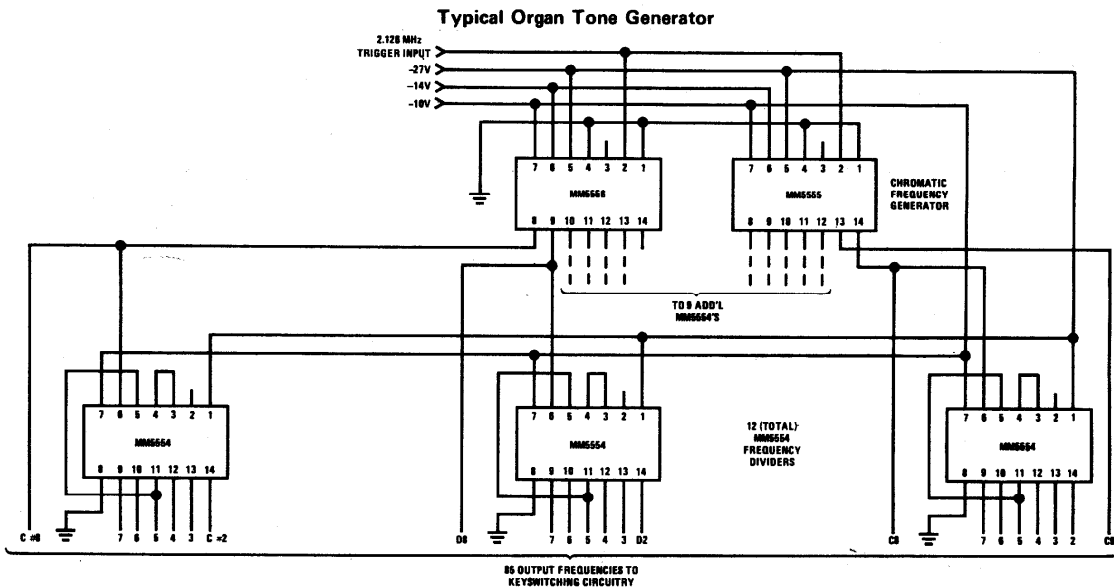
## applications

- Electronic organs
- Electronic music synthesizers
- Musical instrument tuners

## logic and connection diagrams



\*USED ONLY FOR TESTING.  
PIN 4 IS NORMALLY  
GROUNDED.



## output details (2.12608-MHz input)

MM5555

NOTE	DIVISOR	OUTPUT FREQUENCY	E.T.S. FREQUENCY	CENT ERROR
C8	508	4185.20	4186.01	-0.326
C9	254	8370.39	8372.02	-0.326
B8	269	7903.64	7902.13	+0.321
A #8	285	7459.93	7458.62	+0.295
A8	302	7040.00	7040.00	0
G #8	320	6644.00	6644.88	-0.221
G8	339	6271.82	6271.93	-0.082

MM5556

NOTE	DIVISOR	OUTPUT FREQUENCY	E.T.S. FREQUENCY	CENT ERROR
F =8	359	5922.23	5919.91	+0.658
F8	380.5	5587.60	5587.65	-0.017
E8	403	5275.63	5274.04	+0.507
D =8	427	4979.11	4978.03	+0.364
D8	452.5	4698.52	4698.64	-0.042
C =8	479.5	4433.95	4434.92	-0.368

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## absolute maximum ratings

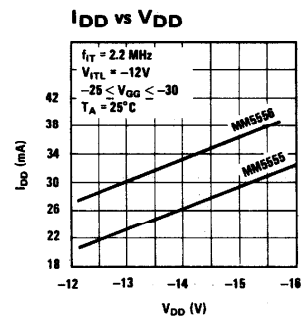
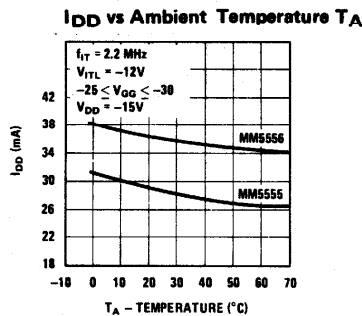
	SYMBOL	MIN	MAX	UNITS		SYMBOL	MIN	MAX	UNITS
Clock Generator Voltage	$V_{GG}$	+0.3	-33	V	Power Dissipation	$P_D$	-	800	mW
Logic Supply Voltage	$V_{DD}$	+0.3	-25	V	Storage Temperature	$T_S$	-55	+100	°C
Buffer Supply Voltage	$V_{BB}$	+0.3	-18	V	Operating Temperature	$T_A$	0	+70	°C
Trigger Input Voltage	$V_{IT}$	+0.3	-18	V					

## electrical characteristics

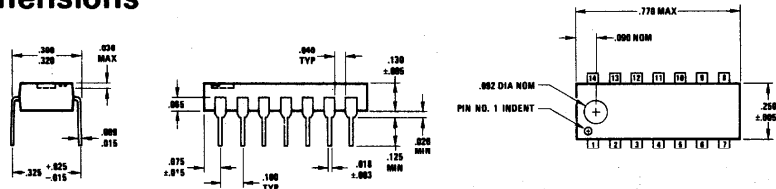
$T_A$  within operating range ( $V_{GG} = -27V \pm 2V$ ,  $V_{DD} = -14V \pm 1V$ ,  $V_{BB} = -10V \pm 0.5V$ ), unless otherwise noted.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
Trigger Input Frequency	$f_{IT}$	7.0	2126.08	2200	kHz
Capacitance	$C_{IT}$	-	-	7.0	pF/pkg
Rise and Fall Times (10% to 90% at 2.2 MHz)	$t_r, t_f$	-	-	30	ns
Pulse Width (at -5.0V)	$p_w$	0.4T	-	0.6T	$(T = \frac{1}{f_{IT}})$
Logical High Level	$V_{ITH}$	+0.3	0	-2.0	V
Logical Low Level	$V_{ITL}$	-8.0	-10	-16	V
Leakage Current	$I_{ITL}$	-	-	1.0	$\mu A$
Buffer Outputs: (loaded 20 k $\Omega$ to ground and 20 k $\Omega$ to $V_{BB}$ , $T_A = 25^\circ C$ )					
Logical High Level	$V_{OH}$	0	-	-1.0	V
Logical Low Level	$V_{OL}$	-8.0	-	$V_{BB}$	V
C8 Duty Cycle	-	-	50	-	%
C #8 thru C9 Duty Cycle	-	-	30	-	%
Supply Currents: (no output loads, $T_A = 25^\circ C$ )					
Clock Generator Supply	$I_{GG}$	1.5	3.0	3.5	mA
Logic Supply	$I_{DD}$	16	26	34	mA
Buffer Supply	$I_{BB}$	22	33	40	mA
		-	-	25	$\mu A$

## typical performance characteristics



## physical dimensions



Molded Dual-In-Line Package (N)  
 Order Number MM5555/MM5556N

Manufactured under one or more of the following U.S. patents: 3083262, 3189758, 3231797, 3303356, 3317671, 3323071, 3381071, 3408542, 3421025, 3426423, 3440498, 3518750, 3519897, 3557431, 3560765, 3566218, 3571630, 3579509, 3593069, 3597640, 3607469, 3617859, 3631312, 3633052, 3638131, 3648071, 3651565.

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