Electronic Organ Circuits

MM5559 serial-to-parallel converter

general description

The MM5559 serial-to-parallel converter provides 33 bits of conversion in a single package. A serial output facilitates cascading these devices to provide larger conversions.

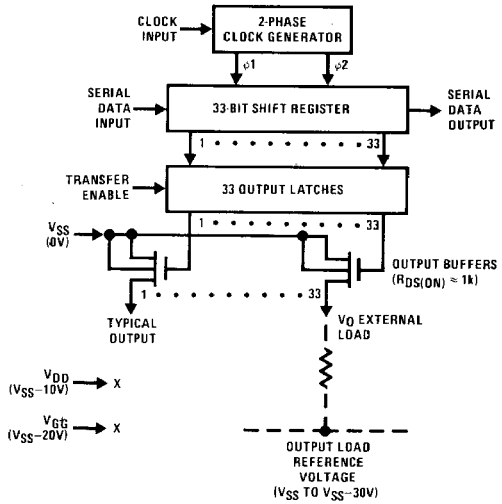
applications

- Matrix displays and printers
- Musical instrument keyboard/tone generator interface controllers

features

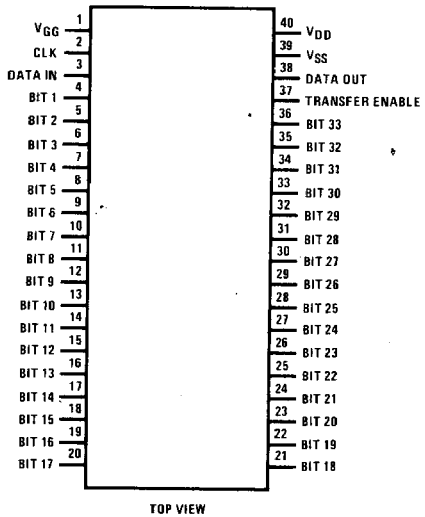
- 33 Parallel outputs
- Serial output
- DC-to-250 kHz operation

logic and connection diagrams



33-Bit Serial-to-Parallel Converter

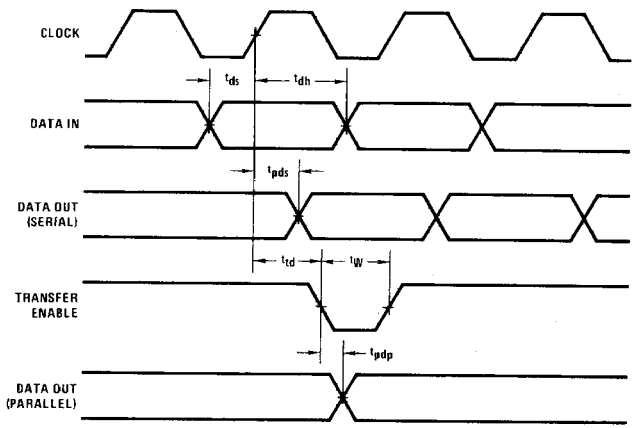
Dual-In-Line Package



TOP VIEW

Order Number MM5559N
See Package 24

timing diagram



absolute maximum ratings

Voltage At Any Pin	V_{SS} + 0.3 to V_{SS} − 25V	Storage Temperature	−55°C to +100°C
Voltage At Any Output Pin	V_{SS} + 0.3 to V_{SS} − 33V	Lead Temperature (Soldering, 10 seconds)	300°C
Operating Temperature	0°C to +70°C		

dc electrical characteristics

T_A within operating range, V_{SS} = 0V, V_{DD} = −10V, ±10%, V_{GG} = −20V ±10%, output load reference voltage = 0V to −30V (via external load resistor)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Data Input Voltages					
Logic High Level		$V_{SS}-2.2$		V_{SS}	V
Logic Low Level		$V_{SS}-11$		$V_{SS}-7$	V
Clock and Transfer Enable Input Voltages					
Logic High Level		$V_{SS}-1.0$		V_{SS}	V
Logic Low Level		$V_{SS}-11$		$V_{SS}-8.6$	V
Input Capacitance				7	pF
Input Leakage Current	T_A = 25°C, V_{IN} = $V_{SS}-11$			10	μA
Clock Input Frequency	Duty Cycle = 50%	0		250	kHz
Rise and Fall Times	$V_{SS}-2.2$ through $V_{SS}-8.6$			0.2	μs
Transfer Enable Input					
Pulse Width	Time at $V_{SS}-8.6$	1.6			μs
Rise and Fall Times				0.2	μs
Parallel Outputs					
Output Voltage	I_O = 2 mA	$V_{SS}-2$			V
Leakage Current	T_A = 25°C, V_O = $V_{SS}-30$			10	μA
Serial Output Voltages					
Logical High Level	Loaded 56 kΩ to V_{DD}	$V_{SS}-2$		V_{SS}	V
Logical Low Level	Loaded 560 kΩ to V_{SS}	V_{DD}		$V_{SS}-8$	V
Power Supply Currents					
Drain Supply, I_{DD}				10	mA
Gate Supply, I_{GG}	(Note 1)		7.5	20	mA

Note 1: The magnitude of I_{GG} is modulated by the parallel output data; the current is inversely proportional to the number of outputs that are high (sourcing current). The typical value of 7.5 mA is representative of an alternating 1's and 0's output pattern.

ac electrical characteristics

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
t_{ds} Data Setup Time	Referenced from $V_{SS}-7$ on Data In to $V_{SS}-8.6$ on Clock In	0.4			μs
t_{dh} Data Hold Time		0.2			μs
t_{td} Transfer Delay	Referenced from $V_{SS}-8.6$	0.6			μs
t_W Transfer Strobe Width		1.6			μs
Propagation Delay					
t_{pds} Serial	High-to-Low (V_{SS} to V_{DD})	3.0			μs
	Low-to-High	1.2			μs
t_{pdp} Parallel	Low-to-High with 10 kΩ Load	1.2			μs