LZ1232M 32-Unit High Voltage MOS IC

Description

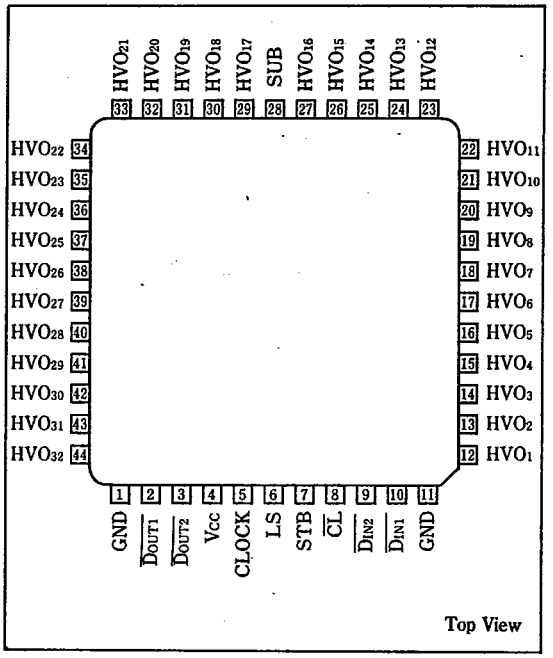
The LZ1232M is a 32-unit high voltage MOS IC fabricated using an N-channel DSA MOS process.

It consists of 32 high voltage MOS FETs (HVMOST) and low voltage logic circuit for controlling HVMOST gate input.

Transfer data is serially input to odd stage and even stage of a 16-bit shift register through data input pins. And the HVMOST is also simultaneously switched ON and OFF independent of the transfer data. The shift registers can be connected in serial fashion due to a built-in data output pins.

It can be used as a matrix driver for electroluminescent (EL) panels, plasma display panels, electrostatic printers, and as an interface for TTL high voltage circuit.

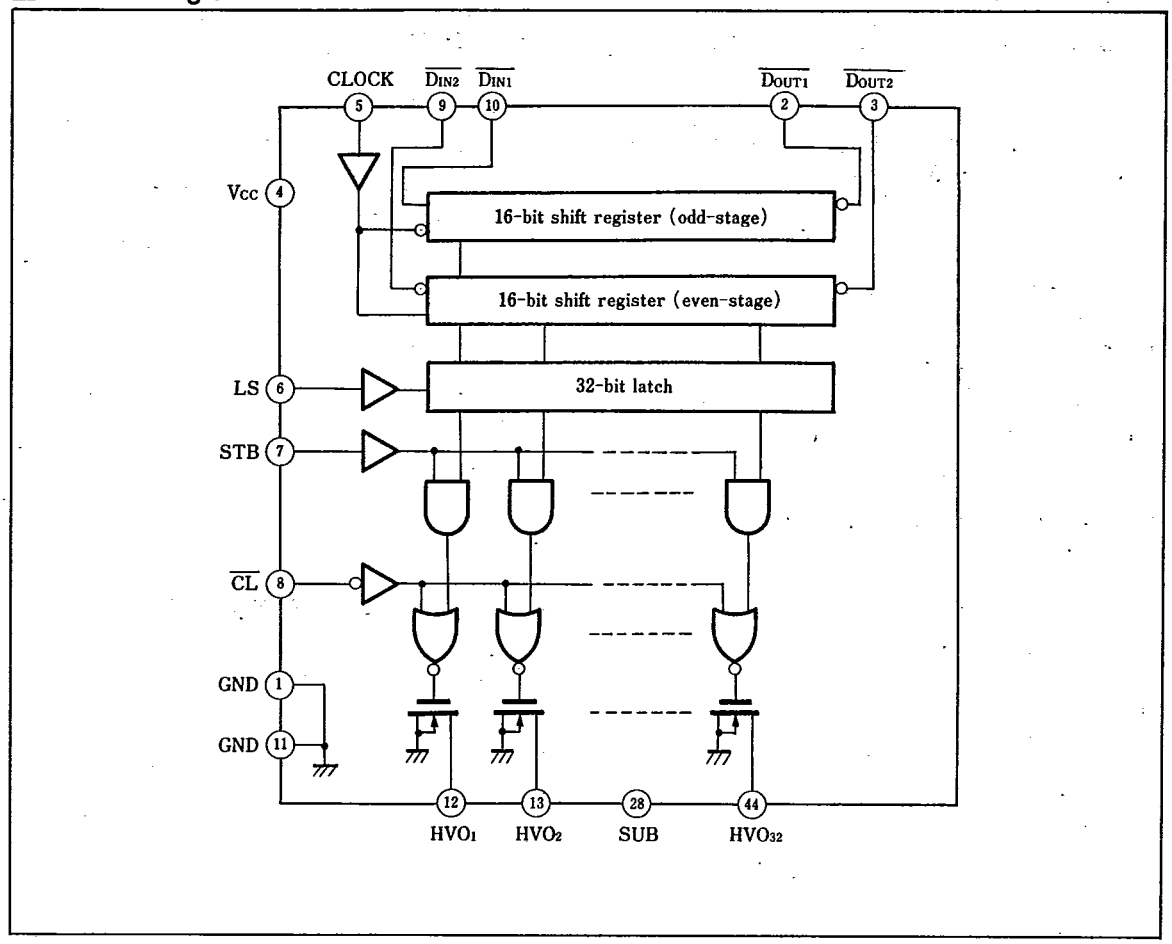
Pin Cnnections



Features

1. High voltage : 300V
2. No. of circuits : 32-unit/package
3. Output current : 45mA (TYP.)
4. High speed data transfer 4MHz clock (8MHz for transfer data)
5. +5V single power supply
6. TTL compatible
7. 44-pin quad flat package

Block Diagram



Truth Table

$\overline{D_{IN1,2}}$	$\overline{CL}$	STB	HVMOST
X	L	X	OFF
X	H	L	ON
L	H	H	ON
H	H	H	OFF

■ Absolute Maximum Ratings

(Ta=25℃)

Parameter	Symbol	Conditions	Rating	Unit	Note
Supply voltage	V_{CC}		−0.3 to +7	V	1
Input voltage	V_{IN}	Applied to all input pins	−0.3 to +7	V	1
Output voltage	V_{OUT}	Applied to data output pins	−0.3 to +7	V	1
	$V_{HVO(ON)}$		−0.3 to +300	V	1, 2
	$V_{HVO(OFF)}$		−0.3 to +350	V	1, 3
Power consumption	P_D	Ta≦25℃	600	mW	
Derating ratio	ΔP_D/℃	Ta>+25℃	5	mW/℃	
Operating temperature	T_{opr}		−20 to +70	℃	
Storage temperature	T_{stg}		−55 to +150	℃	

Note 1 : The maximum applicable voltage on any pin with respect to GND.
Note 2 : The maximum applicable voltage when HVMOST is ON.
Note 3 : The maximum applicable voltage when HVMOST is OFF.

■ DC Characteristics

(1) HVMOST Characteristics

(V_{CC}=+5V±10%)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Note
ON-state resistance	R_{OH}	HVMOST "ON" I_{HVO}=5mA, Ta=25℃			650	Ω	
Drain current	I_{HVO}	HVMOST "ON" V_{HVO}=300V, Ta=25℃	40			mA	1
Output leakage current	I_L	HVMOST "OFF" V_{HVO}=300V, Ta=−20 to +70℃			10	μA	2
Output total leakage current	I_{TL}	HVMOST "OFF" V_{HVO}=300V, Ta=20 to +70℃			30	μA	3

Note 1 : Duty cycle=0.1%, with 10μs ON-period
Note 2 : The value for one HVO output pin
Note 3 : The total leakage current of HVO

(2) Logic Characteristics

(V_{CC}=+5V±10%, Ta=−20 to +70℃)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Note
Supply voltage	I_{CC}	V_{IN}=0V			18	mA	
Input high voltage	V_{IH}		2.0		V_{CC}	V	
Input low voltage	V_{IL}		−0.3		0.8	V	
Output high voltage	V_{OH}	I_{IH}=−0.5mA	2.4			V	1
Output low voltage	V_{OL}	I_{OL}=0.5mA			0.4	V	1
Input leakage current	I_{IL}	V_{IN}=0V to V_{CC}			10	μA	

Note 1 : Applied to pins $\overline{D_{OUT1}}$ and $\overline{D_{OUT2}}$.

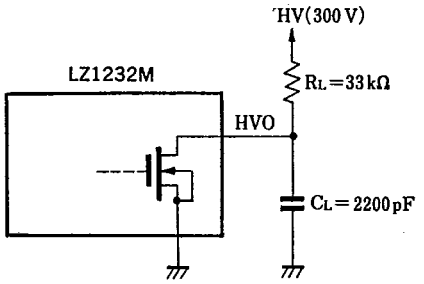
■ AC Characteristics

(V_{CC}=+5V±10%, Ta=−20 to +70℃)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Note
Clock frequency	f_ϕ				4	MHz	
Clock pulse width	t_ϕ, $t_{\bar{\phi}}$		100			ns	
$\overline{D_{IN}}$ setup time	t_{DS}		60			ns	
$\overline{D_{IN}}$ hold time	t_{DH}		60			ns	
LS pulse width	t_{LP}		50			ns	
Clock to LS delay	t_{CL}		50			ns	
LS to clock delay	t_{LC}		0			ns	
$\overline{D_{OUT}}$ delay	t_{PD}	C_L (D_{OUT})=30pF			190	ns	
LS to STB delay	t_{LSB}		0			ns	
LS to $\overline{CL}$ delay	t_{LCL}		0			ns	
STB pulse width	t_{SP}		1			μs	
$\overline{CL}$ pulse width	t_{CLP}		1			μs	
HVO fall time	t_{PL}	C_L (HVO)=2,200pF, R_L=33kΩ			50	μs	
HVO rise time	t_{PH}	C_L (HVO)=2,200pF, R_L=33kΩ			340	μs	1

Note 1 : The output delay depends on the load condition.

Test conditions
Input pulse level : 0.8 to 2.0V
Input rise/fall time : 20ns
Time measurement level : 50%
HVO output load condition : See figure.



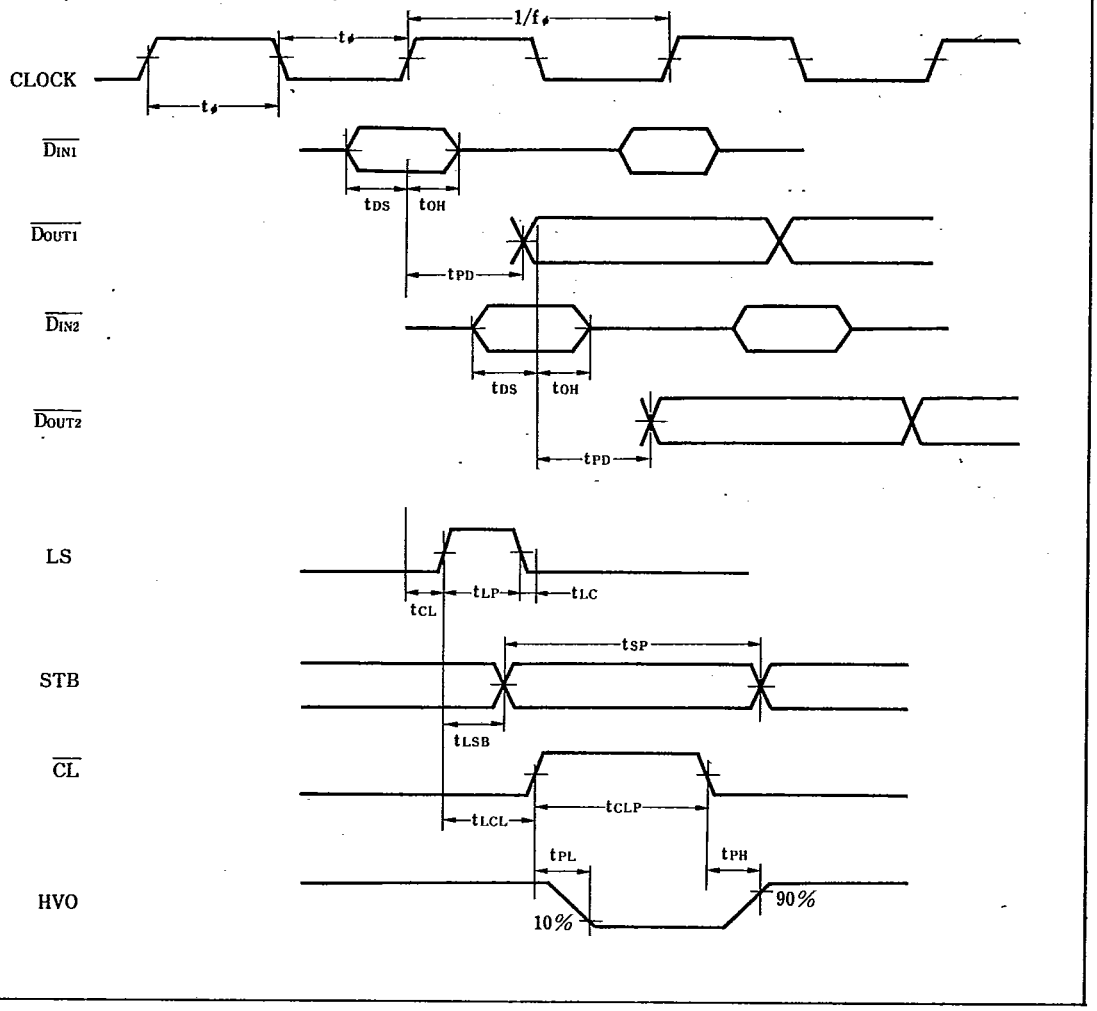
■ Capacitance

(V_{CC}=0V, f=1MHz, Ta=25℃)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input capacitance	C_{IN}	V_{IH}=0V		5	10	pF
Output capacitance	C_{HVO}	V_{HVO}=0V		17	30	pF

All pins except for the pin under measurement are grounded.

AC Timing Diagram



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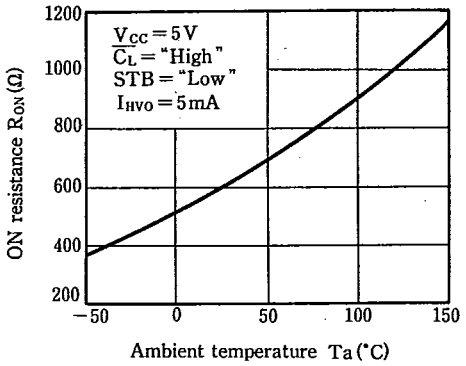
Capacitance

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input capacitance	C_{IN}	V_{IN}=0V		5	10	pF
Output capacitance	C_{HVO}	V_{HVO}=0V		17	30	pF

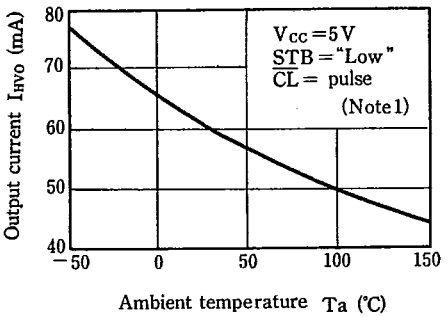
All pin except pin under measurement are connected to GND.

■ Electrical Characteristic Curves

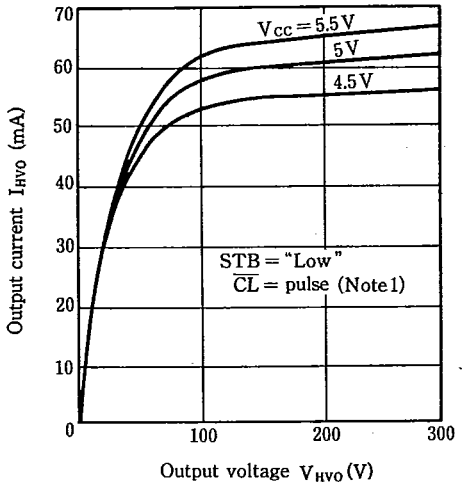
ON resistance vs. Ambient temperature



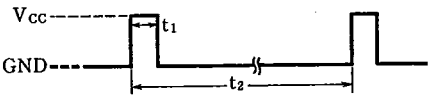
Output current vs. Ambient temperature



Output current vs. Output voltage



Note1 : Apply below pulse to the CL



$t_1 = 10\,\mu s$
$t_2 = 10\,ms$
D (duty cycle) = 0.1 %