

LZ1132BD/LZ1132BM/LZ1132BR

32-Unit High Voltage MOS IC

Description

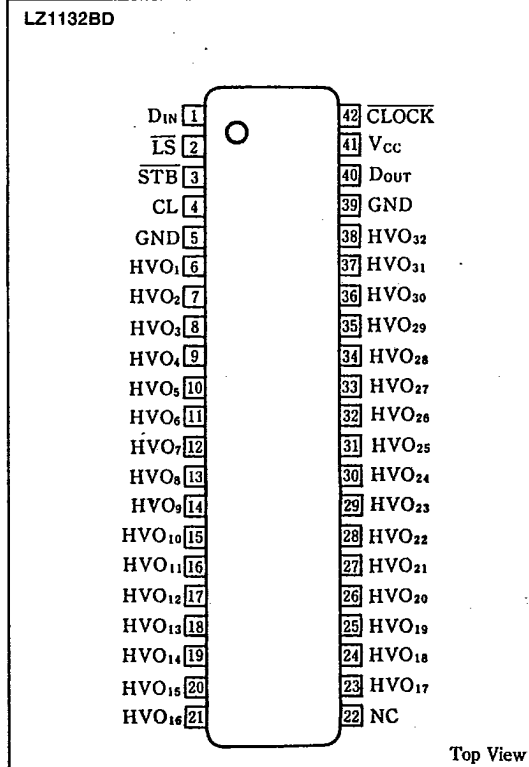
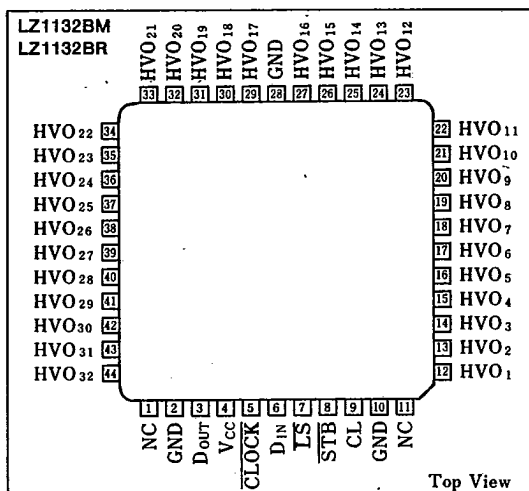
The LZ1132BD/LZ1132BM/LZ1132BR is a 300V 32-output-port monolithic IC fabricated using Sharp's advanced P-channel DMOS process. It can be used as a matrix driver for electroluminescent panels, plasma display panels, electrostatic printers.

Features

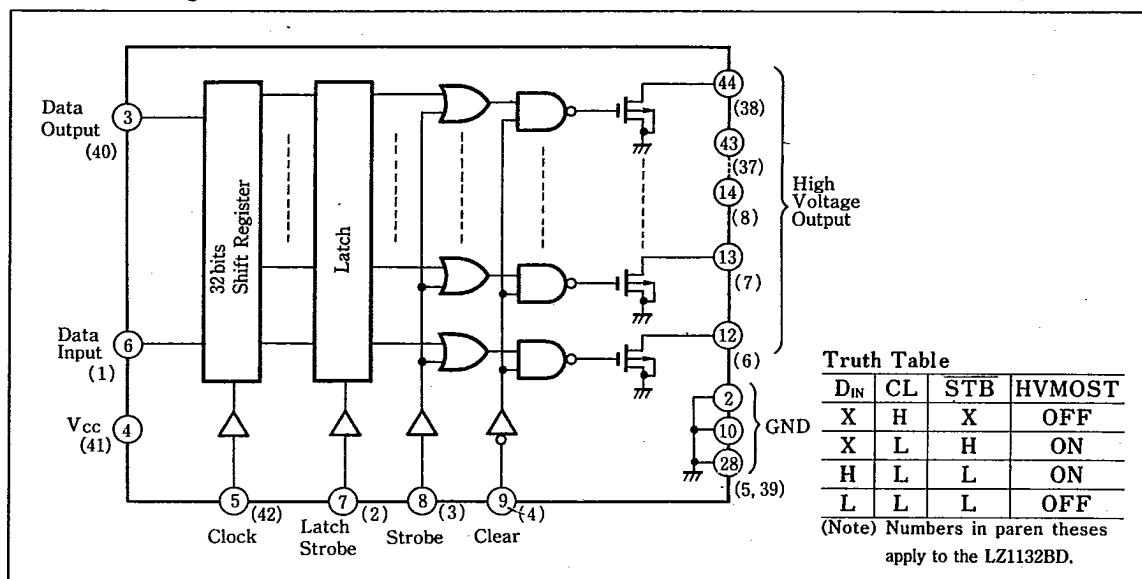
1. High voltage output 300 (MIN.)
2. Output current 45mA (TYP.) at $V_{HVO}=300V$
3. Internal 32-bit shift register circuit
4. Expandable circuit structure
5. High speed data transfer (clock frequency 4MHz)
6. Single power supply : -5V
7. DMOS process
8. 44-pin quad-flat package (LZ1132BM/LZ1132BR*)
42-pin dual-in-line package (LZ1132BD)

* Reversed bend pin

Pin Connections



Block Diagram



Absolute Maximum Ratings

(T_a = 25°C)

Parameter	Symbol	Conditions	Ratings	Unit	Note
Supply voltage	V _{CC}		-7 to +0.3	V	1
Input voltage	V _{IN}	Applied to all input pins.	-7 to +0.3	V	1
Output voltage	V _{OUT}	Applied to the data output	-7 to +0.3	V	1
	V _{HVO(ON)}		-300 to +0.3	V	1,2
	V _{HVO(OFF)}		-350 to +0.3	V	1,3
Power consumption	P _D	T _a ≤ 25°C	600	mW	
P _D derating ratio	ΔP _D /°C	T _a > +25°C	5	mW/°C	
Operating temperature	T _{OPR}		-20 to +70	°C	
Storage temperature	T _{STG}		-55 to +150	°C	

Note 1: The maximum applicable voltage on any pin with respect to GND.

Note 2: The maximum applicable voltage when HV MOST is ON. D (duty cycle) = 0.1%, ON time = 10 μs

Note 3: The maximum applicable voltage when HV MOST is OFF.

DC Characteristics

(1) HV MOST Characteristics

(V_{CC} = -5V ± 10%)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Note
ON-state resistance	R _{ON}	HV MOST "ON" I _{HVO} = -1mA, T _a = 25°C		1.0	1.3	Ω	
Output current	I _{HVO}	HV MOST "ON" V _{HVO} = -300V, T _a = 25°C	-40	-45		mA	1
Output leakage current	I _L	HV MOST "OFF" V _{HVO} = -300V, T _a = -20 to +70°C			10	μA	2
Total output leakage current	I _{TL}	HV MOST "OFF" V _{HVO} = -300V, T _a = -20 to 70°C			30	μA	3

Note 1: Duty cycle = 0.1%, ON time = 10 μs

Note 2: Value for each HV MOST output pin.

Note 3: Sum of total output leakage current.

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T-43-24

(2) Logic Section Characteristics

(V_{CC}=5V±10%, T_a=-20 to +70°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Supply voltage	I _{CC}	V _{IN} =0V		-8	-16	mA
Input "High" voltage	V _{IH}		-0.8		0.3	V
Input "Low" voltage	V _{IL}		V _{CC}		-2.4	V
Output "High" voltage	V _{OH}	I _{OH} =-0.2mA; applied to $\overline{D_{OUT}}$	-0.5			V
Output "Low" voltage	V _{OL}	I _{OL} =1.6mA; applied to $\overline{D_{OUT}}$			-2.5	V
Input leakage current	I _{IL}	V _{IN} =0V to V _{CC}			10	μA

AC Characteristics

(V_{CC}=5V±10%, T_a=-20 to +70°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Note
Clock frequency	f _φ				4	MHz	
Clock pulse width	t _φ , t _φ ⁻		125			ns	
$\overline{D_{IN}}$ setup time	t _{DS}		60			ns	
$\overline{D_{IN}}$ hold time	t _{DH}		60			ns	
LS pulse width	t _{LP}		150			ns	
Clock to LS delay	t _{CL}		0			ns	
LS to clock delay	t _{LC}		0			ns	
$\overline{D_{OUT}}$ delay	t _{PD}	C _L ($\overline{D_{OUT}}$)=30pF			250	ns	
LS to STB delay	t _{LSB}		0			ns	
LS to CL delay	t _{LCL}		0			ns	
STB pulse width	t _{SP}		1			μs	
CL pulse width	t _{CLP}		1			μs	
HVO fall time	t _{PL}	C _L (HVO)=900pF, R _L =20kΩ			60	μs	
HVO rise time	t _{PH}	C _L (HVO)=900pF, R _L =20kΩ			15	μs	1

Note 1: Output delay time varies depending on load condition.

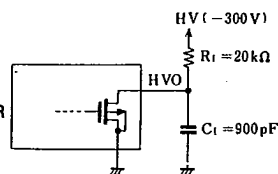
Test conditions

Input rise/fall time: 20 ns

Time measurement level: 50%

HVO output load conditions (figure at right).

LZ1132BD/BM/BR



Capacitance

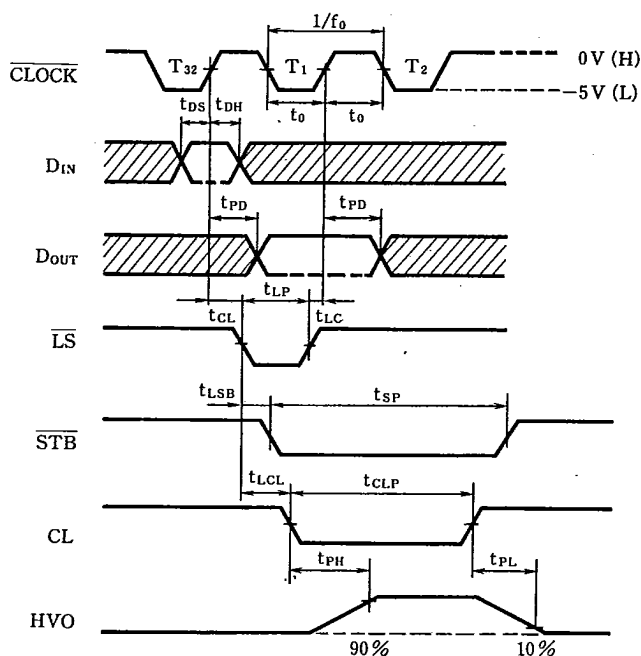
(V_{CC}=0V, f=1MHz, T_a=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input capacitance	C _{IN}	V _{IN} =0V		6	10	pF
Output capacitance	C _{HVO}	V _{HVO} =0V		17	30	pF

All pins except pin being measurement are connected to GND.

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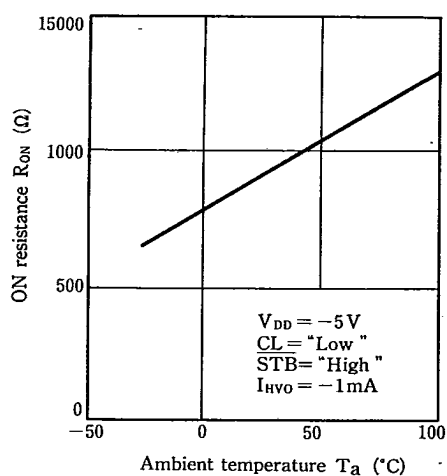
AC Timing Diagram



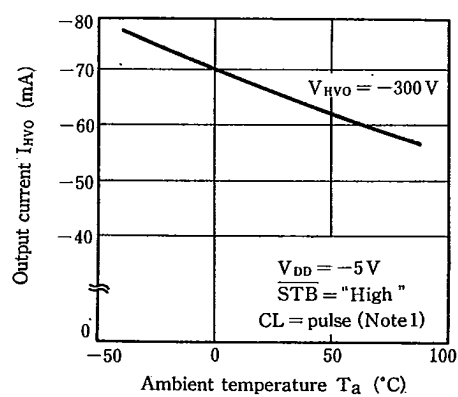
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Electrical Characteristic Curve

ON resistance vs. Ambient temperature



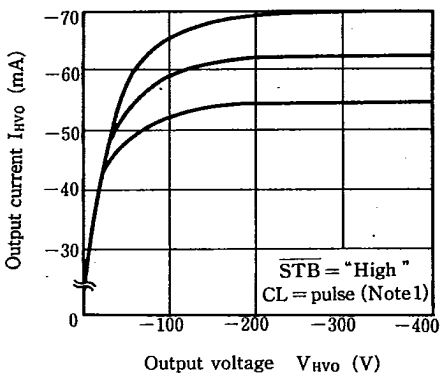
Output current vs. Ambient temperature



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T-43-24

Output current vs. Output voltage



Note1 : Apply below pulse to the CL.

