

LC7932,7932M

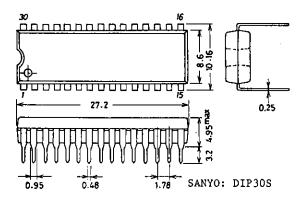
16-Bit LED Driver

The LC7932,7932M are LSIs that contain a 16-bit bidirectional shift register and are capable of direct driving a multiple lighting LED (dot matrix or dot array). The LC7932,7932M are especially suited for use in LED display panel, PPC photosensitive drum LED erase head applications.

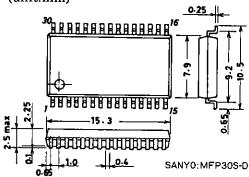
Features

- · Silicon gate C-MOS device capable of high-speed, high-current drive
- · High-speed shiftable 16-bit bidirectional shift register/16-bit latch/output control circuit/16-bit N-channel transistor open drain output transistor on chip
- · Serial shift data is shifted on the positive transition of the clock (CLOCK) pulse.
- The data latch circuit outputs input data when the latch control (LATCH) pin is at "L" level and holds output data when the latch control (LATCH) pin is at "H" level.
- · Maximum ratings of driver output: $V_0 = +15V$, $I_{OL} = 30 \text{mA(STATIC)}/120 \text{mA(DYNAMIC)}$.
- · Operating voltage of logic unit: $V_{DD} = 4.5V$ to 5.5V
- · Operating clock frequency: $f_{CLK} = DC$ to 5MHz(max)
- · Package: LC7932 : DIP30S LC7932M: MFP30S
- The bidirectional shift register is so designed as to cause a shift to occur in the SI to SO direction when L/R = L level and in the SO to SI direction when L/R = H level.
- · When a high level is applied to the LSET pin ("latch set"), the latch data is set to the high level. The latch data does not change when the LSET pin is low or open.

Package Dimensions 3061 [LC7932] (unit:mm)



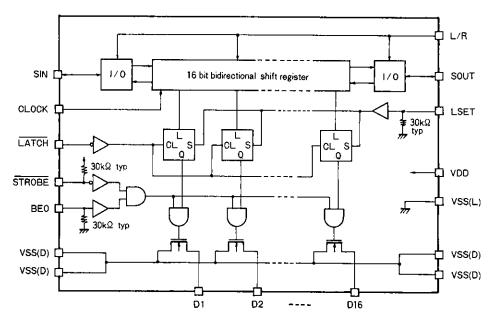
Package Dimensions 3073A [LC7932M] (unit:mm)



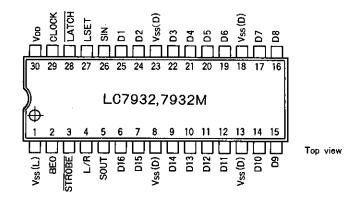
Absolute Maximum Rating	s at Ta = 2	5°C			u	ınit	
Maximum Supply Voltage	$ m V_{DD}$ m	ıax		-0.3 to +		V	
Input Voltage	$\mathbf{v_{I}}$			-0.3 to $V_{\rm DD}$ +	0.3	V	
Output Voltage	$V_{O}(1)$	SOUT(SIN) output	-0.3 to $V_{\rm DD}$ +	0.3	V	
	V _O (2)	D1 to D16	output,output Tr C	FF	15	V	
Output Current	I_{O}	D1 to D16	output,per output j	pin	30 ı	mΑ	
Operating Temperature	Topr			25 to -l	- 85	$^{\circ}\mathrm{C}$	
Storage Temperature	Tstg	(Note)		-35 to +	125	°C	
Allowable Power Dissipation	n Pd maz	c LC7932	Ta = 85°C		400 r	nW	
		LC7932M	$Ta = 85^{\circ}C$;	270 r	nW	
(Note) When mounting the	MFP pack	age version, do	not dip it in solder	r.			
Allowable Operating Condi	tions at Ta	1= -25°C to +	-85°C	min	typ	max	unit
Supply Voltage	V_{DD}	V_{DD}		4.5	υyp	5.5	V
Input "H"-Level Voltage	v_{IH}	SIN(SOUT),C	LOCK	0.8V _{DD}		v_{DD}	
t man and an analysis of the	- 111	LATCH, BEO		0.01		* DD	v
		STROBE,	,				
		LSET,L/R					
Input "L"-Level Voltage	$V_{\rm IL}$	SIN(SOUT),C	LOCK	V _{SS} (L)	0	2V _{DD}	V
	. IT	LATCH, BEO		4 22(T)	V.	2 v DD	V
		STROBE.	,				
		LSET,L/R					
Clock Frequency	fCLK	CLOCK	Duty:50%			5.0	MHz
Clock Pulse Width	$t_{W_{\Phi}}$	CLOCK	Duty.0070	75		9.0	
Clock Rise/Fall Time	t_r,t_f	CLOCK		10		200	ns
Data Setup Time	$t_{ m DS}$	SIN(SOUT)		100		200	ns
Sava Setap Time	°DS	CLOCK		100			ns
Data Hold Time	${ m t_{DH}}$	SIN(SOUT)		50			
_ ***** *******************************	VDN	CLOCK		30			ns
Latch Pulse Widh	t_{WL}	LATCH		100			ns
							-1.2
Electrical Characteristics at				min	typ	max	unit
Input "H"-Level Current	$I_{IH}(1)$	SIN(SOUT),C	LOCK,			10	μΑ
		LATCH,L/R	•				
T	$I_{IH}(2)$	BEO,LSET			170		μΑ
Input "L"-Level Current	$I_{IL}(1)$	SIN(SOUT),C	CLOCK,	-10			μΑ
	- 4-1	LATCH,L/R					
	I _{IL} (2)	STROBE			170		μΑ
Output "H"-Level Voltage	v_{OH}	SOUT(SIN)	$I_{OH} = -0.5 \text{mA},$	$V_{DD}-0.5$			V
0	4		$V_{DD} = 5V$				
Output "L"-Level Voltage	$V_{OL}(1)$	SOUT(SIN)	$I_{OL}=0.5mA$,			0.5	V
		_	$V_{DD} = 5V$				
	$V_{OL}(2)$	D1 to D16	$I_{OL} = 30 \text{mA}$			0.5	V
0	_		$V_{DD} = 5V$				
Output OFF-State	I _{OFF}	D1 to D16	$V_O = 15V$			20	μA
Leakage Current	_						
Input Capacitance	C_{IN}	CLOCK			5.0		pF
Operating Current	I_{DD}	V_{DD}	fCLK = 5MHz			5	mΑ
			$V_{DD} = 5V$				
			All outputs wit	h no load			

Switching Charact	teristics	at Ta = 25 <u>°C</u>			min	typ	max t	unit
Clock Latch	t_{CL}	CLOCK,LATCH		$V_{DD} = 5V$	100			ns
Delay Width					*			
Latch Clock	t_{LC}	CLOCK,LATCH	•	$V_{DD} = 5V$	0			ns
Delay Width			,					
Output"H"-Level	$t_{PLH}(1)$	LATCH	$Dn; RL = 1.0k\Omega$	$V_{DD} = 5V$			400	ns
Propagation		D1 to <u>D16</u>	$\CL = 15pF$					
Delay Time	$t_{PLH}(2)$	BEO, STROBE	Dn; $\langle RL = 1.0k\Omega \rangle$	$V_{\rm DD} = 5V$			300	ns
•		D1 to 16	$\CL=15pF$					
	$t_{PLH}(3)$	CLOCK, SOUT(SIN)	SOUT,CL = 15pF	$V_{DD} = 5V$			200	ns
Output"L"-Level	$t_{PHL}(1)$	LATCH, LSET	$Dn; /RL = 1.0k\Omega$	$V_{\rm DD} = 5V$			200	ns
Propagation		D1 to <u>D16</u>	$\CL = 15pF$					
Delay Time	$t_{PHL}(2)$	BEO, STROBE	Dn; $\langle RL = 1.0k\Omega \rangle$	$V_{DD} = 5V$			100	ns
		D1 to D16	$\langle CL = 15pF \rangle$					
	$t_{PHL}(3)$	CLOCK, SOUT(SIN)	SOUT;CL = 15pF	$V_{\rm DD} = 5V$			200	ns

Equivalent Circuit



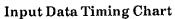
Pin Assignment

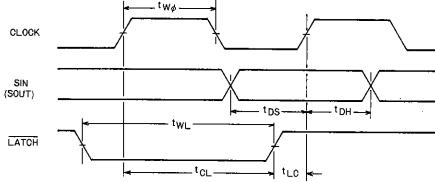


The package comes in two types - DIP30S and MFP30S.

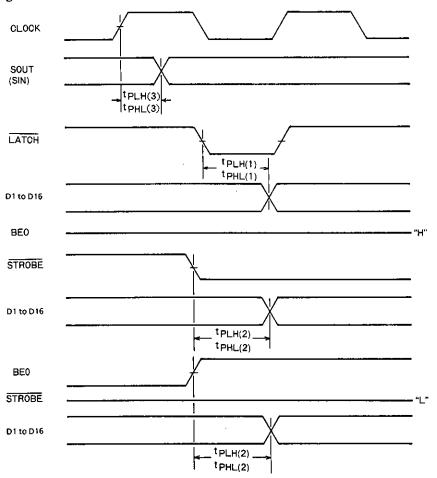
LED Driver ON/OFF Truth Table

Latch Data (Q)	BEO	STRÖBE	LED Driver
0	0	0	OFF
1	0	0	OFF
0	1	0	OFF
1	1 .	0	ON Driver ON
0	0	1	OFF
1	0	1	OFF
0	1	1	OFF
1	1	1	OFF

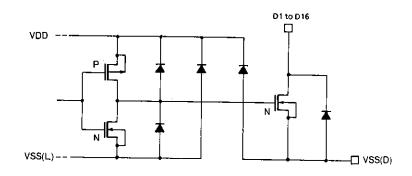




Output Data Timing Chart



Equivalent Circuit for Output Driver Section



(Note) L/R="H" level:()

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