

SN751506, SN751516 DC PLASMA DISPLAY DRIVERS

SLDS034 – DECEMBER 1986 – REVISED JULY 1989

- Each Device Drives 32 Lines
- 180-V Open-Drain Parallel Outputs
- 220-mA Parallel Output Sink Current Capability
- CMOS-Compatible Inputs
- Strobe Input Provided
- Serial Data Output for Cascade Operation
- Inputs Have Built-In Electrostatic Discharge Protection

description

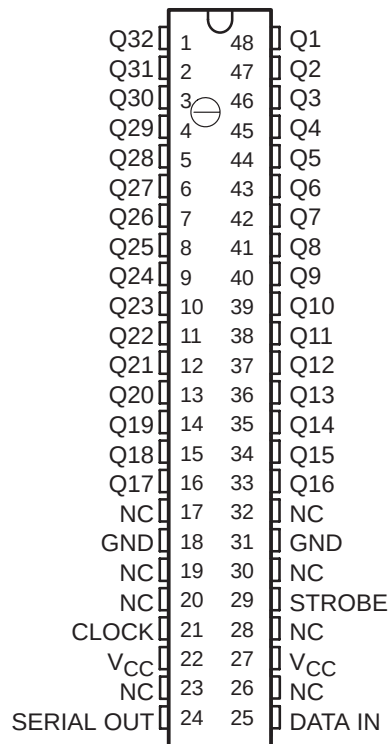
The SN751506 and the SN751516 are monolithic integrated circuits designed to drive the scan lines of a dc plasma panel display. The SN751516 pin sequence is reversed from the SN751506 for ease in printed-circuit-board layout.

Each device consists of a 32-bit shift register and 32 OR gates. Serial data is entered into the shift register on the high-to-low transition of the clock input. When STROBE is low, all Q outputs are in the off state. Outputs are open-drain JFET transistors with a breakdown voltage in excess of 180 V. The outputs have a 220-mA sink current capability in the on state. Only one Q output should be allowed to be in the on state at a time.

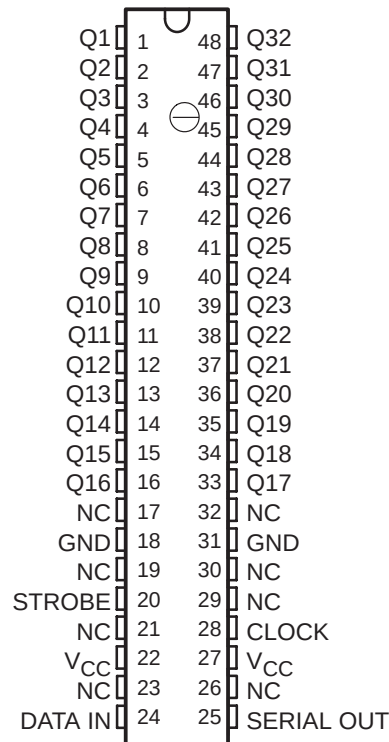
SERIAL OUT from the shift register can be used to cascade shift registers. This output is not affected by the STROBE input. All inputs are CMOS compatible with ESD protection built in.

The SN751506 and SN751516 are characterized for operation from 0°C to 70°C.

SN751506 . . . FT PACKAGE
(TOP VIEW)



SN751516 . . . FT PACKAGE
(TOP VIEW)



NC – No internal connection

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.



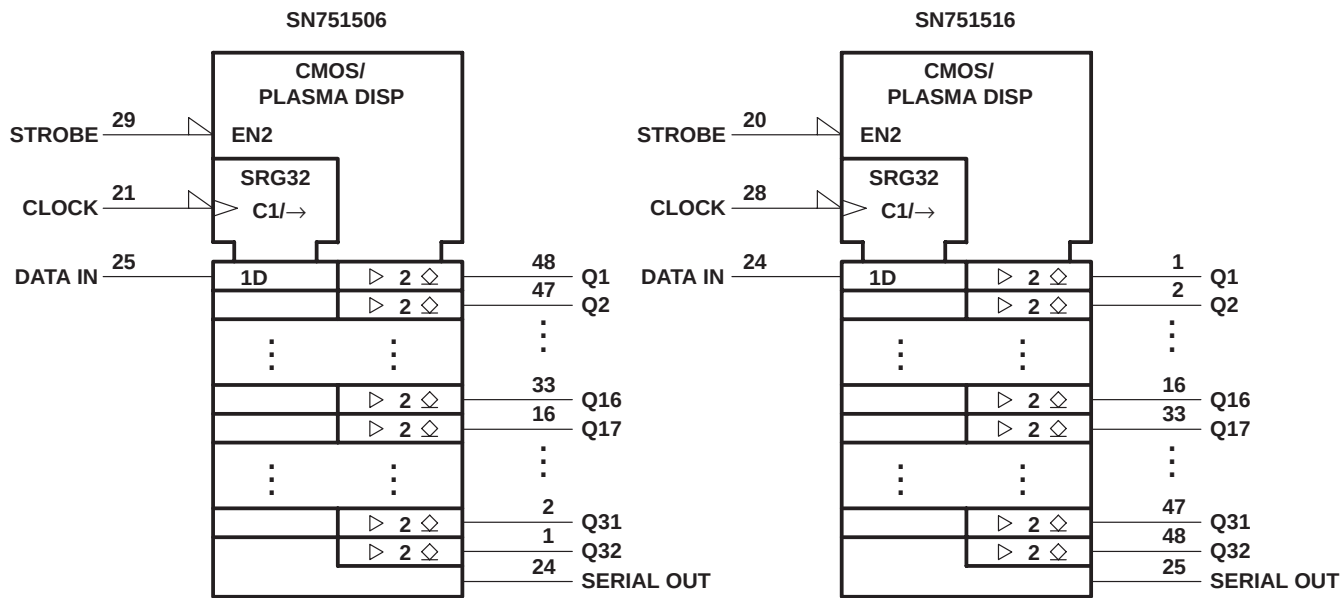
POST OFFICE BOX 655303 • DALLAS, TEXAS 75265
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77251-1443

Copyright © 1989, Texas Instruments Incorporated

SN751506, SN751516
DC PLASMA DISPLAY DRIVERS

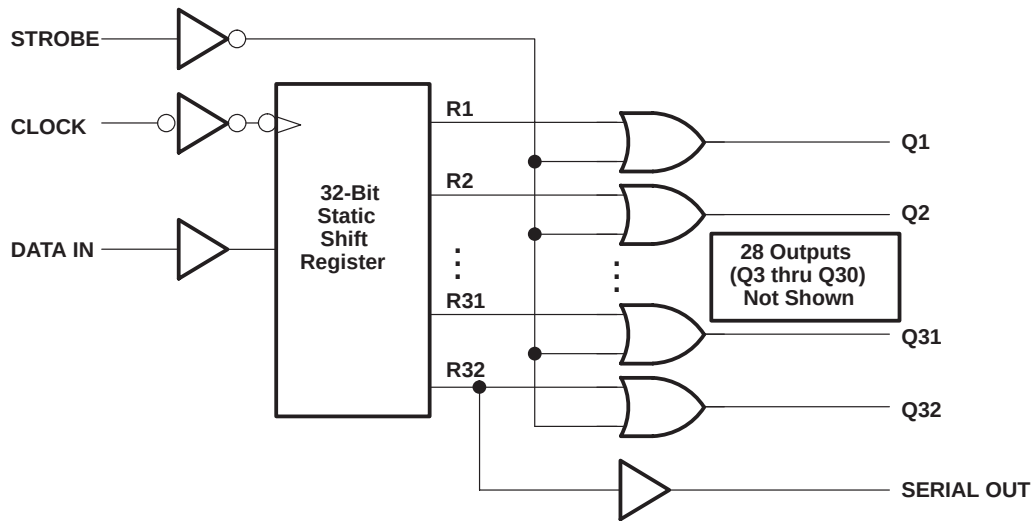
SLDS034 – DECEMBER 1986 – REVISED JULY 1889

logic symbols†



† These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagram (positive logic)



FUNCTION TABLE

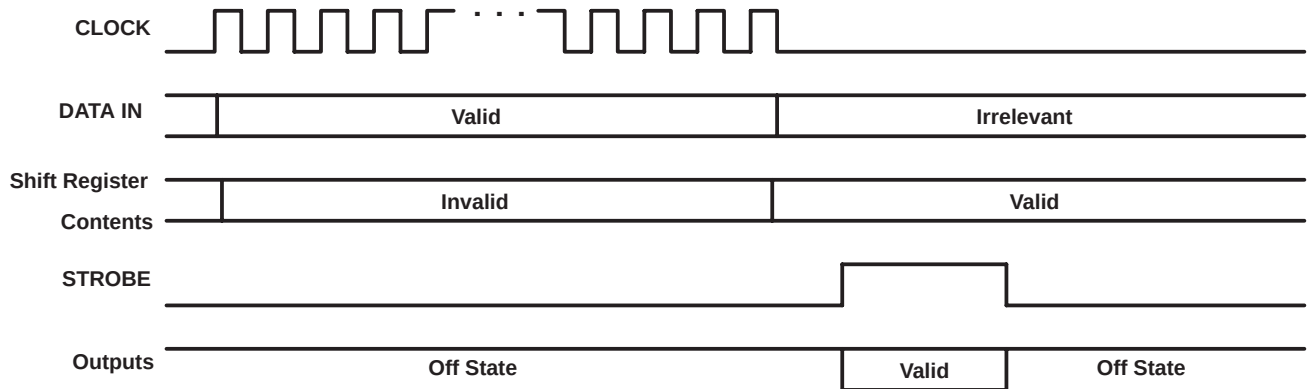
FUNCTION	CONTROL INPUTS		SHIFT REGISTERS R1 THRU R32	OUTPUTS	
	CLOCK	STROBE		SERIAL	Q1 THRU Q32
Load	↓	X	Load and shift‡	R32	Determined by STROBE
	No ↓	X	No change	R32	
Strobe	X	L	As determined above	R32	All high impedance R1 through R32
	X	H		R32	

H = high level, L = low level, X = irrelevant, ↓ = high-to-low transition.

‡ R32 takes on the state of R31, R31 takes on the state of R30, . . . R2 takes on the state of R1, and R1 takes on the state of the data input.

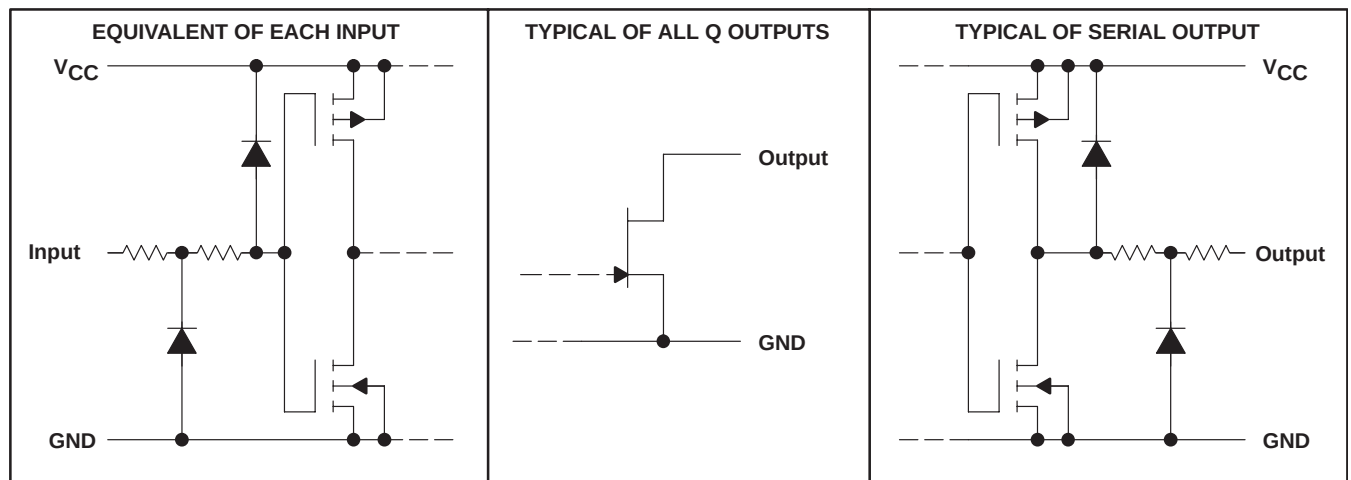


typical operating sequence



† Only 1 bit in 32 should be low in the input data.

schematics of inputs and outputs



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage range, V_{CC} (see Note 1)	–0.4 V to 7 V
On-state Q output voltage range, V_O	–0.4 V to 125 V
Off-state Q output voltage range, V_O	–0.4 V to 180 V
Input voltage range, V_I	–0.4 V to $V_{CC} + 0.4$ V
Serial output voltage range	–0.4 V to $V_{CC} + 0.4$ V
Q output on-state time duration (see Note 2)	100 μ s
Q output duty cycle (see Note 2)	1/200
Continuous total power dissipation at (or below) 25°C free-air temperature (see Note 3)	1025 mW
Operating free-air temperature range, T_A	0°C to 70°C
Storage temperature range	–55°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	260°C

- NOTES: 1. Voltage values are with respect to GND.
2. Only one Q output should be on at a time.
3. For operation above 25°C free-air temperature, derate linearly to 656 mW at 70°C at the rate of 8.2 mW/°C.

SN751506, SN751516

DC PLASMA DISPLAY DRIVERS

SLDS034 – DECEMBER 1986 – REVISED JULY 1989

recommended operating conditions

		MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}		4	5	6	V
Peak on-state Q output voltage, $V_{O(on)}$				110	V
High-level input voltage, V_{IH}	$V_{CC} = 4\text{ V}$	3.2			V
	$V_{CC} = 6\text{ V}$	4.8			
Low-level input voltage, V_{IL}	$V_{CC} = 4\text{ V}$			0.8	V
	$V_{CC} = 6\text{ V}$			1.2	
Output current, I_O ($T_A = 25^\circ\text{C}$)				220	mA
Clock frequency, f_{clock}				200	kHz
Pulse duration, CLOCK high or low, $t_{w(\text{CLK})}$		1.5 [†]			μs
Pulse duration, DATA, t_{wD}		5			μs
Pulse duration, STROBE, $t_{w(\text{STRB})}$		2			μs
Setup time, DATA IN before CLOCK $\downarrow$, t_{su}		1			μs
Hold time, DATA IN after CLOCK $\downarrow$, t_h		1.2			μs
Operating free-air temperature, T_A		0		70	$^\circ\text{C}$

[†] The minimum clock period is 5 μs .

electrical characteristics, $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$

PARAMETER			TEST CONDITIONS	MIN	TYP	MAX	UNIT
V_{OH}	High-level output voltage	SERIAL OUT	$I_{OH} = -0.1\text{ mA}$	4.5			V
V_{OL}	Low-level output voltage	Q outputs	$I_{OL} = 180\text{ mA}$		6	10	V
		SERIAL OUT	$I_{OL} = 0.1\text{ mA}$			0.5	
$I_{O(off)}$	Off-state output current	Q outputs	$V_{OH} = 110\text{ V}$			1	μA
I_{OL}	Low-level output current	Q outputs	$V_{OL} = 16\text{ V}$	220			mA
I_{IH}	High-level input current		$V_I = V_{CC}$			1	μA
I_{IL}	Low-level input current		$V_I = 0$			-1	μA
C_i	Input capacitance					15	pF
I_{CC}	Supply current		All Q outputs off			1	mA
			One Q output on		20	40	

switching characteristics, $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$

PARAMETER			TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{pd}	Propagation delay time, CLOCK to SERIAL OUT		$C_L = 15\text{ pF}$		0.2	0.5	μs
t_{DHL}	Delay time, high-to-low-level Q output from STROBE or CLOCK inputs		$C_L = 150\text{ pF}$, $R_L = 470\ \Omega$, See Figures 2 and 3		0.2 [‡]	0.6	μs
t_{DLH}	Delay time, low-to-high-level Q output from STROBE or CLOCK inputs				0.35 [‡]	1	μs
t_{THL}	Transition time, high-to-low-level Q output				0.1	0.3	μs
t_{TLH}	Transition time, low-to-high-level Q output				0.35	1	μs

[‡] Typical values are for clock inputs. Typical values from STROBE will be less.



PARAMETER MEASUREMENT INFORMATION

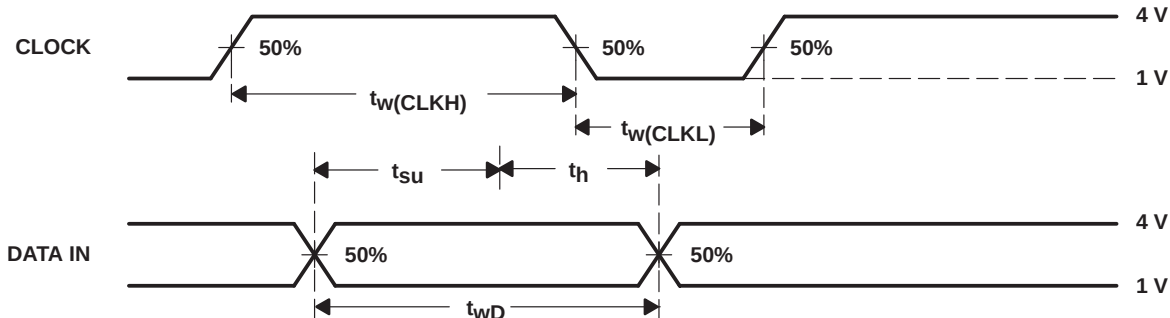


Figure 1. Input Timing Voltage Waveforms

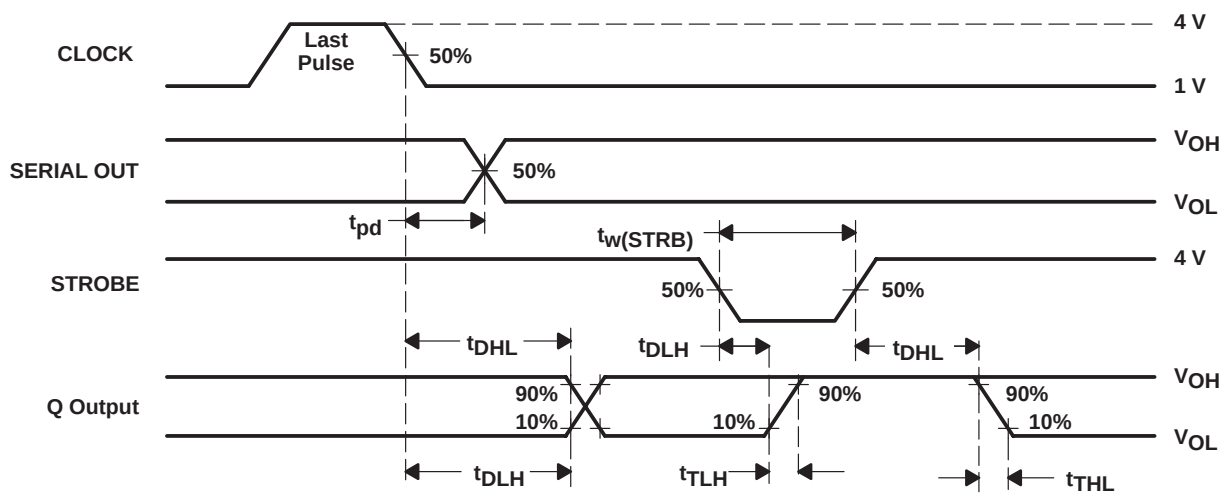
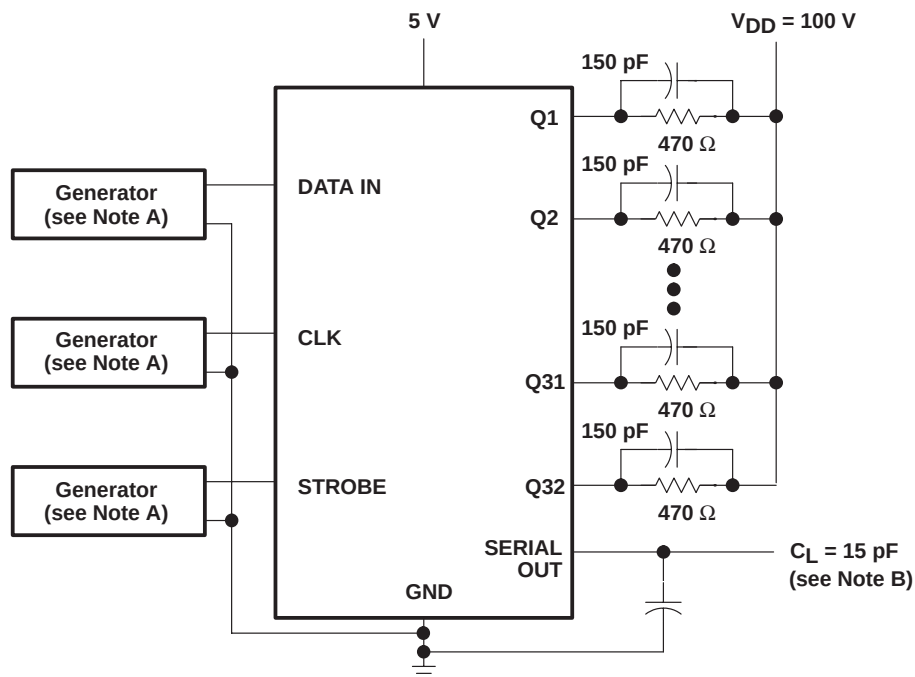


Figure 2. Switching Characteristics

SN751506, SN751516 DC PLASMA DISPLAY DRIVERS

SLDS034 – DECEMBER 1986 – REVISED JULY 1889

PARAMETER MEASUREMENT INFORMATION



- NOTES: A. Input pulses are supplied by generators having the following characteristics: $t_w = 1.25 \mu\text{s}$, $\text{PRR} \leq 200 \text{ kHz}$, $t_r \leq 30 \text{ ns}$, $t_f \leq 30 \text{ ns}$, $Z_O = 50 \Omega$.
B. C_L includes probe and jig capacitance.

Figure 3. Test Circuit

TYPICAL CHARACTERISTICS

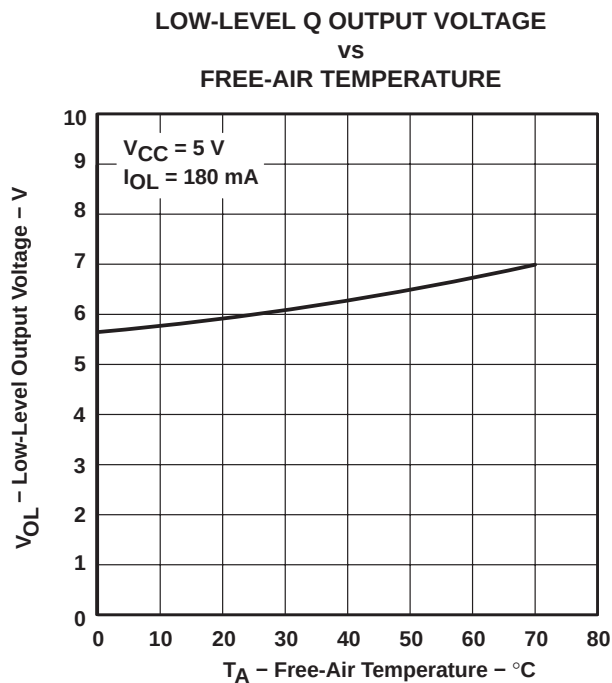


Figure 4

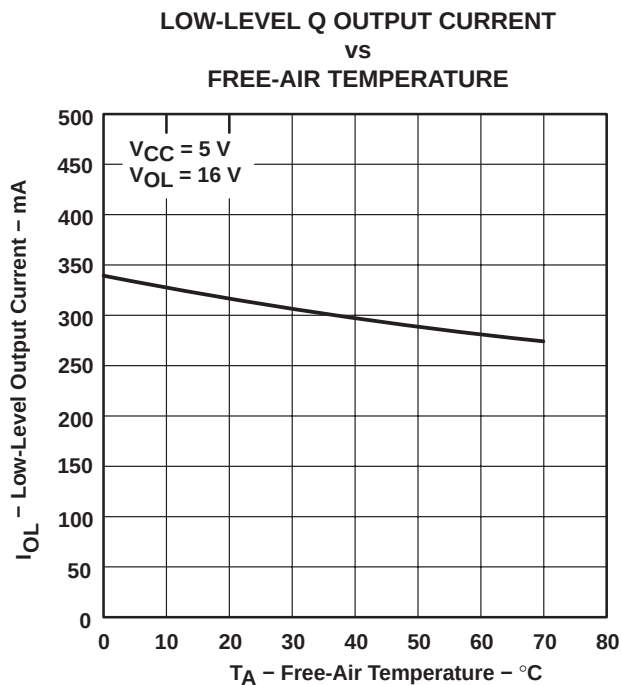


Figure 5

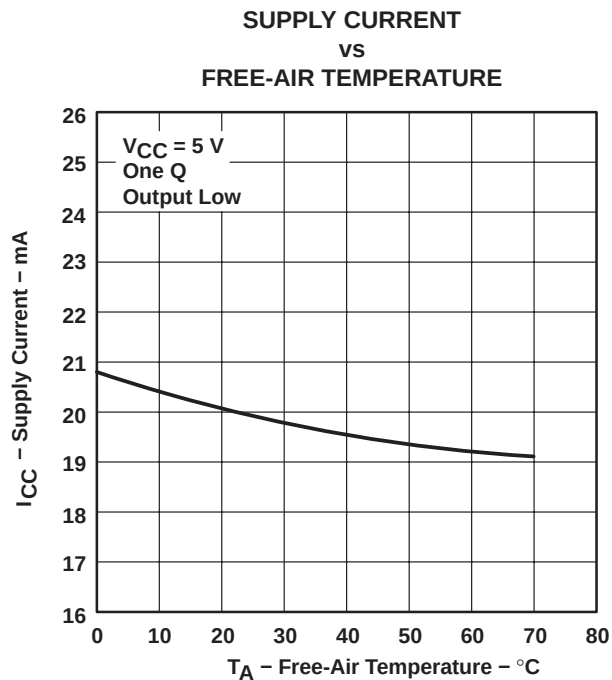


Figure 6

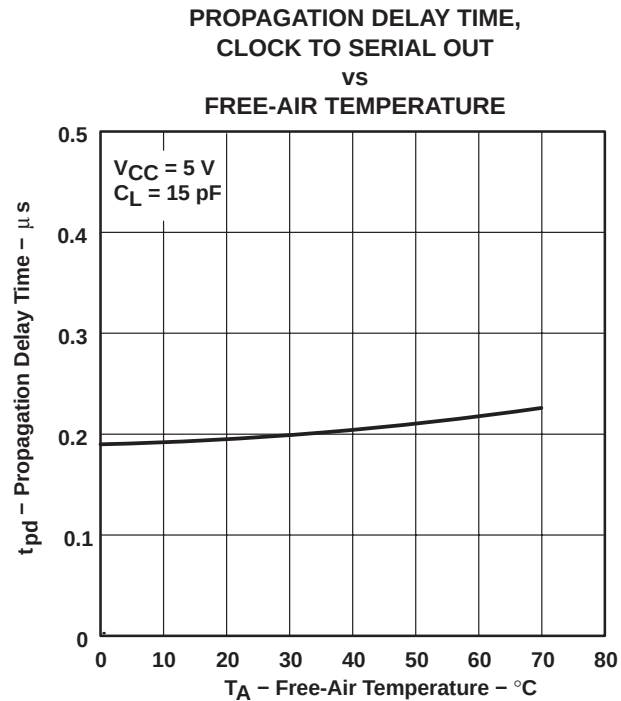


Figure 7

TYPICAL CHARACTERISTICS

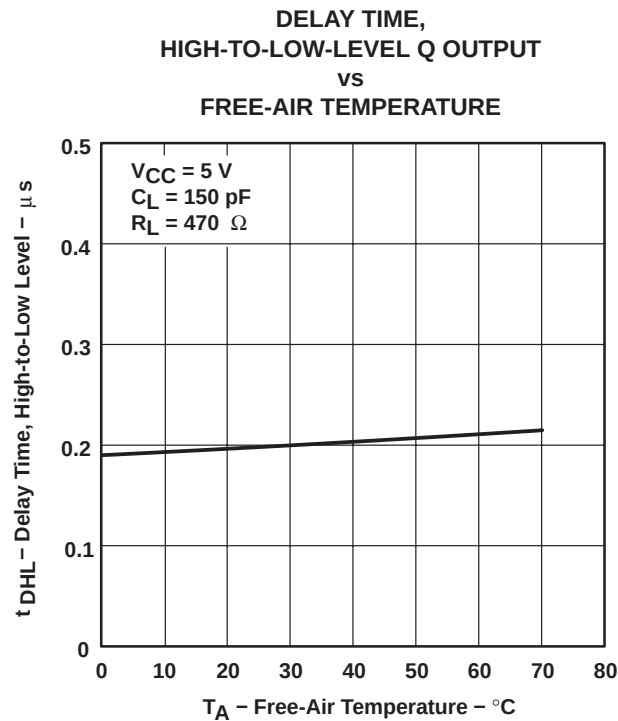


Figure 8

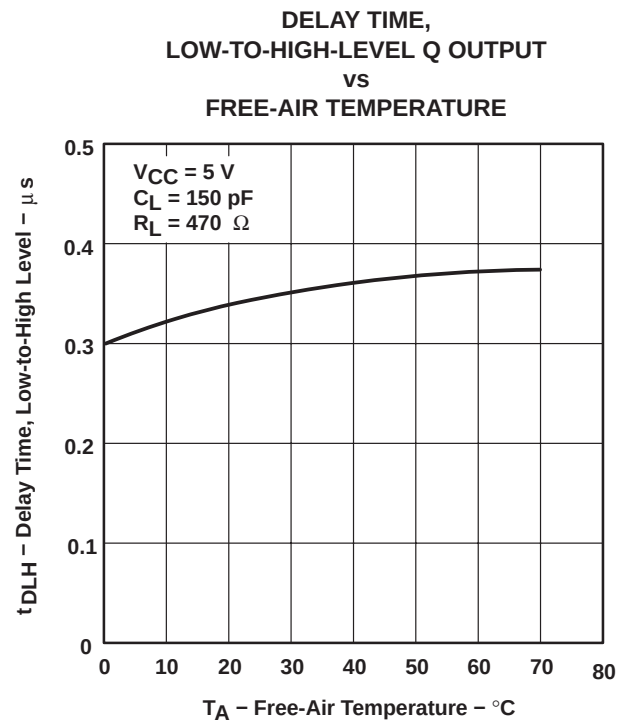


Figure 9

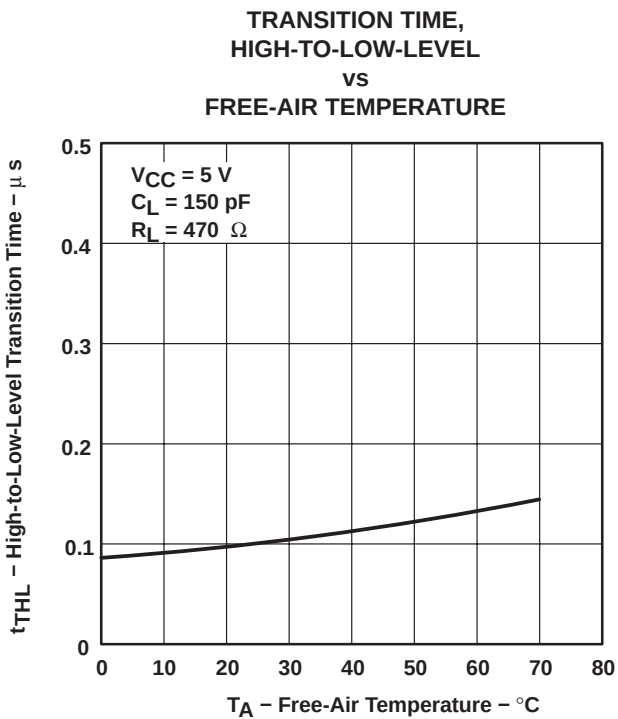


Figure 10

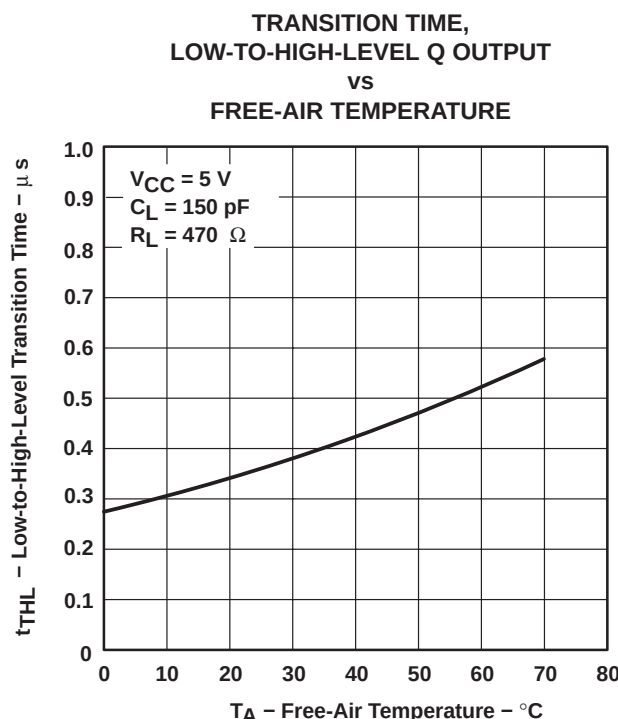


Figure 11

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
SN751506FT	OBSOLETE	DFP	FT	48		TBD	Call TI	Call TI
SN751516FT	OBSOLETE	DFP	FT	48		TBD	Call TI	Call TI
SN751516FT	OBSOLETE	DFP	FT	48		TBD	Call TI	Call TI

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

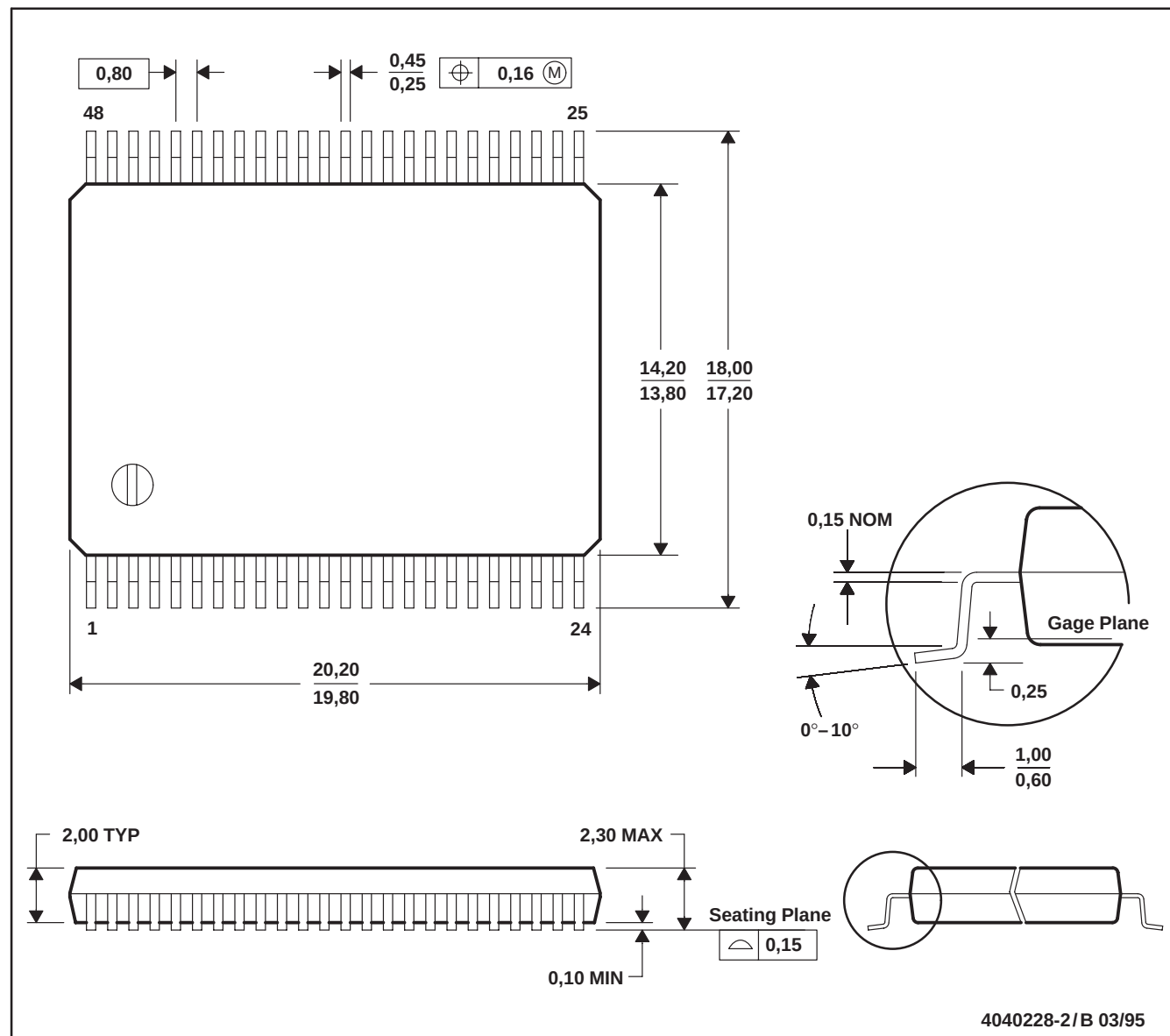
⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

FT (R-PDFP-G48)

PLASTIC DUAL FLATPACK



- NOTES: A. All linear dimensions are in millimeters.
 B. This drawing is subject to change without notice.
 C. Contact field sales office to determine if a tighter coplanarity requirement is available for this package.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products

Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
RF/IF and ZigBee® Solutions	www.ti.com/lprf

Applications

Audio	www.ti.com/audio
Automotive	www.ti.com/automotive
Broadband	www.ti.com/broadband
Digital Control	www.ti.com/digitalcontrol
Medical	www.ti.com/medical
Military	www.ti.com/military
Optical Networking	www.ti.com/opticalnetwork
Security	www.ti.com/security
Telephony	www.ti.com/telephony
Video & Imaging	www.ti.com/video
Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2008, Texas Instruments Incorporated