

Features

- Programmable delay
- 1 MHz operation
- 1.0A peak current
- Matched rise/fall times
- Low power
- Rail to rail output
- Low output impedance
- Low input capacitance

Applications

- Uninterruptible power supplies
- IGBT driver
- DC-DC converters
- Motor control
- Power MOSFET drivers
- Switch mode power supplies

Ordering Information

Part No.	Temp. Range	Package	Outline #
EL7961CN	-40°C to +85°C	8-Pin P-DIP	MDP0031
EL7961CS	-40°C to +85°C	8-Lead SO	MDP0027
EL7971CN	-40°C to +85°C	8-Pin P-DIP	MDP0031
EL7971CS	-40°C to +85°C	8-Lead SO	MDP0027
EL7981CN	-40°C to +85°C	8-Pin P-DIP	MDP0031
EL7981CS	-40°C to +85°C	8-Lead SO	MDP0027

General Description

The EL7961/EL7971/EL7981 provides 1.0A peak current for many driver applications. The rising edge of the output can be delayed up to 1.5 μ s from the input edge. A resistor from DSET to GND sets the delay time for both channel A and B. This programmable delay is useful in applications requiring compensation for long switch turn off times. Pulling DSET high disables the delay block giving approximately 30 ns delay times.

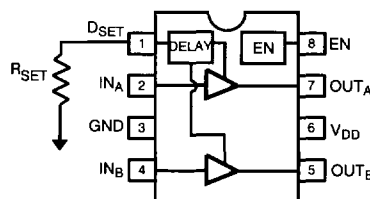
EL7961 - Non-Inverting

EL7971 - Inverting

EL7981 - Channel A - Inverting

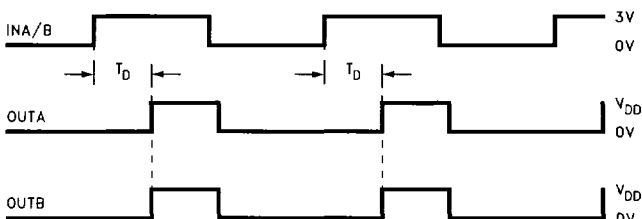
Channel B - Non-Inverting

Connection Diagram



7961-1

7961 Waveform Example



7961-4

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EL7961C/EL7971C/EL7981C**Dual Rising Edge Delay Driver****Absolute Maximum Ratings** ($T_A = 25^\circ\text{C}$)

Supply (V_{DD} to GND)	16.5V	Ambient Operating Temperature	-40°C to $+85^\circ\text{C}$
Input Pins	-0.3V below GND, $+0.3\text{V}$ above V_{DD}	Storage Temperature Range	-65°C to $+150^\circ\text{C}$
Operating Junction Temperature	125°C	Power Dissipation	SOIC 570 mW PDIP 1050 mW
Peak Output Current	2A		

Important Note:

All parameters having Min/Max specifications are guaranteed. The Test Level column indicates the specific device testing actually performed during production and Quality inspection. Elantec performs most electrical tests using modern high-speed automatic test equipment, specifically the LTX77 Series system. Unless otherwise noted, all tests are pulsed tests, therefore $T_J = T_C = T_A$.

Test Level	Test Procedure
I	100% production tested and QA sample tested per QA test plan QCX0002.
II	100% production tested at $T_A = 25^\circ\text{C}$ and QA sample tested at $T_A = 25^\circ\text{C}$, T_{MAX} and T_{MIN} per QA test plan QCX0002.
III	QA sample tested per QA test plan QCX0002.
IV	Parameter is guaranteed (but not tested) by Design and Characterization Data.
V	Parameter is typical value at $T_A = 25^\circ\text{C}$ for information purposes only.

DC Electrical Characteristics ($T_A = 25^\circ\text{C}$, $V_{DD} = 15\text{V}$, $C_{LOAD} = 1000\text{ pF}$ unless otherwise specified)

Parameter	Description	Test Conditions	Min	Typ	Max	Test Level	Units
Input/Output							
V_{IH}	Logic "1" Input Voltage		3.0	2.4		I	V
I_{IH}	Logic "1" Input Current			0.1	10.0	I	μA
V_{IL}	Logic "0" Input Voltage			1.8	0.8	I	V
I_{IL}	Logic "0" Input Current			0.1	10.0	I	μA
V_{HVS}	Input Hysteresis			0.5		V	V
V_{ENH}	Enable Threshold	Positive Edge	2.8	1.6		I	V
V_{ENL}	Disable Threshold	Negative Edge		0.9	0.6	I	V
V_{ENHYS}	Enable Hysteresis			0.7		V	V
R_{OH}	Pull-up Resistance	$I_{OUT} = -100\text{ mA}$		5.0	10.0	I	Ω
R_{OL}	Pull-down Resistance	$I_{OUT} = +100\text{ mA}$		5.0	10.0	I	Ω
I_{PK}	Peak Output Current			1.0		IV	A
I_{DC}	Continuous Output Current Source/Sink		50.0			IV	mA
Power Supply							
I_{DD}	Supply Current into V_{DD}	$R_{SET} = 5.1\text{ k}$ Inputs = 15V			10.0	I	mA
$I_{DD OFF}$	Supply Current into V_{DD}	$V_{EN} = 0\text{V}$			1.5	I	mA
V_{DD}	Operating Voltage		4.5		15.0	I	V

EL7961C/EL7971C/EL7981C

Dual Rising Edge Delay Driver

EL7961C/EL7971C/EL7981C

AC Electrical Characteristics ($T_A = 25^\circ\text{C}$, $V_{DD} = 15\text{V}$, $C_{LOAD} = 1000\text{ pF}$ unless otherwise specified)

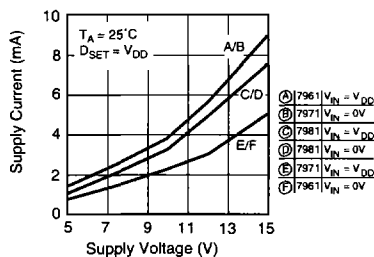
Parameter	Description	Test Conditions	Min.	Typ.	Max.	Test Level	Units
Switching Characteristics							
t_R	Rise Time	$C_L = 500\text{ pF}$ $C_L = 1000\text{ pF}$		15.0 20.0	40.0	IV	ns
t_F	Fall Time	$C_L = 500\text{ pF}$ $C_L = 1000\text{ pF}$		15.0 20.0	40.0	IV	ns
$t_{D\text{ ON}}$	Turn On Delay Time	$D_{SET} = V_{DD}$	10.0	30.0	50.0	IV	ns
		$R_{SET} = 5.1\text{k}$	30.0	60.0	120.0	I	ns
		$R_{SET} = 200\text{k}$	750.0	1150.0	1500.0	I	ns
$t_{D\text{ OFF}}$	Turn Off Delay Time	$D_{SET} = V_{DD}$		30.0	50.0	IV	ns
$t_{D\text{ MISMATCH}}$	Channel A to B Turn On Delay Mismatch	$R_{SET} = 200\text{k}$			± 15.0	I	%

EL7961C/EL7971C/EL7981C

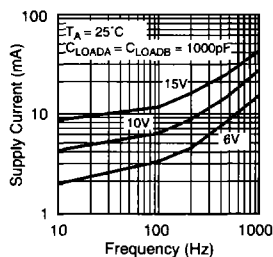
Dual Rising Edge Delay Driver

Typical Performance Curves

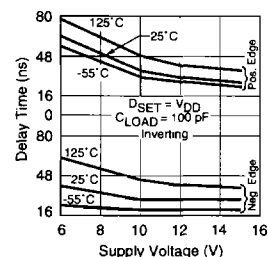
Quiescent Supply Current
vs Supply Voltage



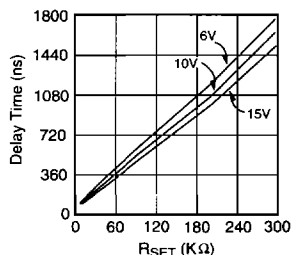
Average Supply Current
vs Voltage and Frequency



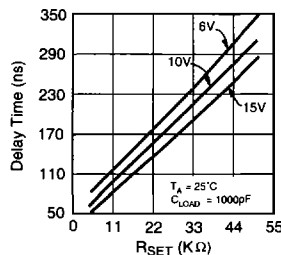
Delay Times vs Supply
Voltage and Temperature



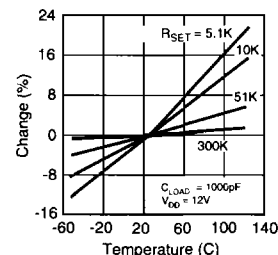
Output Rising Edge Delay
vs RSET and Supply Voltage



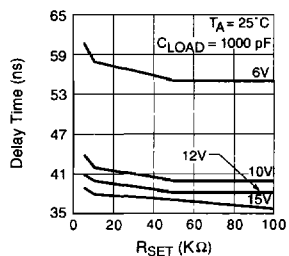
Output Rising Edge Delay
vs RSET and Supply Voltage (Detail)



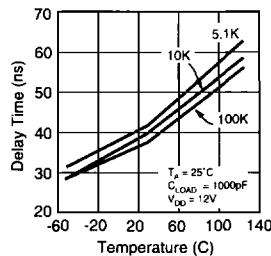
Output Rising Edge
Delay Percentage Change
vs Temperature



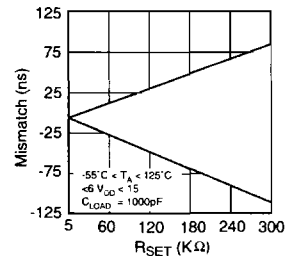
Output Falling Edge Delay
vs RSET vs VDD



Output Falling Edge Delay
vs Temperature and RSET



Output Rising Edge Delay
Channel to Channel Mismatch
vs RSET



7961-2

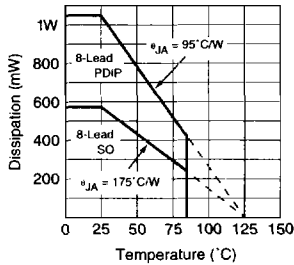
EL7961C/EL7971C/EL7981C

Dual Rising Edge Delay Driver

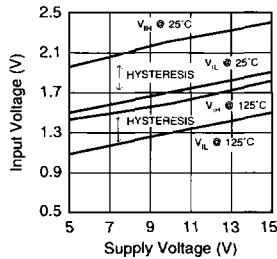
EL7961C/EL7971C/EL7981C

Typical Performance Curves — Contd.

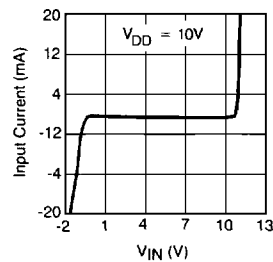
Max Power/Derating Curves
8-Pin Package



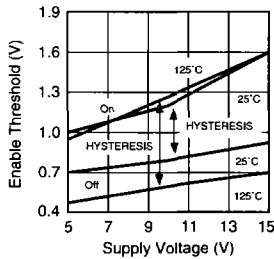
Input Threshold
vs Supply Voltage



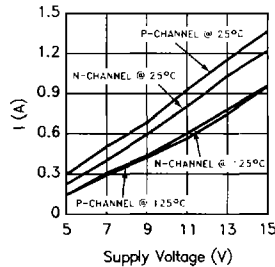
Input Current
vs Input Voltage



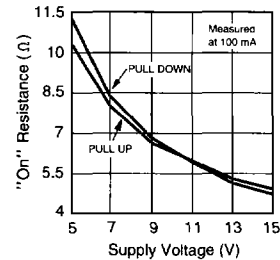
Enable Threshold
vs Supply Voltage



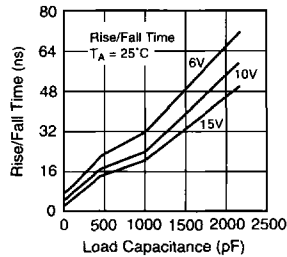
Peak Drive
vs Supply Voltage



"On" Resistance
vs Supply Voltage



Rise/Fall Time
vs Load and Supply



Rise/Fall Time
vs Temperature

