EL7961C/EL7971C/EL7981C
Dual Rising Edge Delay Driver

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

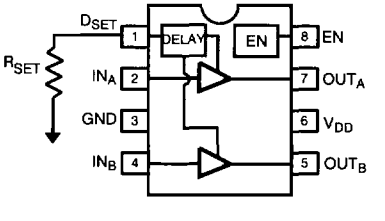
Ordering Information

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

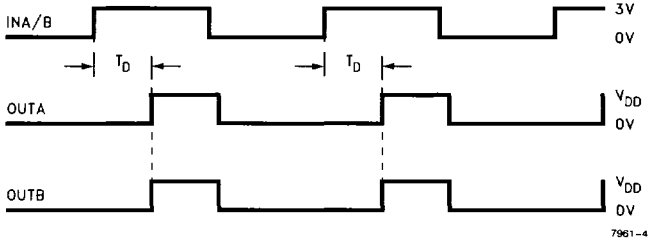
General Description
The EL7961/EL7971/EL7981 provides 1.0A peak current for many driver applications. The rising edge of the output can be delayed up to 1.5 μs from the input edge. A resistor from D_{SET} to GND sets the delay time for both channel A and B. This programmable delay is useful in applications requiring compensation for long switch turn off times. Pulling D_{SET} 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 Waveform Example



5

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Absolute Maximum Ratings (T_A = 25°C)

Supply (V_{DD} to GND)	16.5V	Ambient Operating Temperature		−40°C to +85°C
Input Pins	−0.3V below GND, +0.3V above V_{DD}	Storage Temperature Range		−65°C to +150°C
		Power Dissipation	SOIC	570 mW
Operating Junction Temperature	125°C		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°C and QA sample tested at T_A = 25°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°C for information purposes only.

DC Electrical Characteristics (T_A = 25°C, V_{DD} = 15V, C_{LOAD} = 1000 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_{HYS}	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
$V_{EN\ HYS}$	Enable Hysteresis			0.7		V	V
R_{OH}	Pull-up Resistance	I_{OUT} = −100 mA		5.0	10.0	I	Ω
R_{OL}	Pull-down Resistance	I_{OUT} = +100 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} = 5.1k Inputs = 15V			10.0	I	mA
$I_{DD\ OFF}$	Supply Current into V_{DD}	V_{EN} = 0V			1.5	I	mA
V_{DD}	Operating Voltage		4.5		15.0	I	V

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

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

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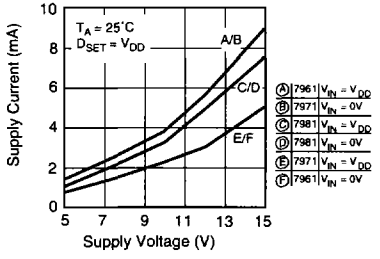
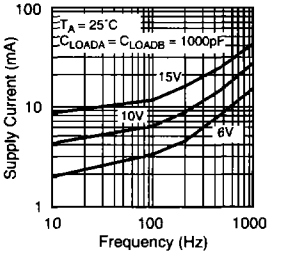
Dual Rising Edge Delay Driver

Typical Performance Curves

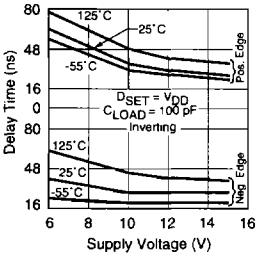
Quiescent Supply Current vs Supply Voltage



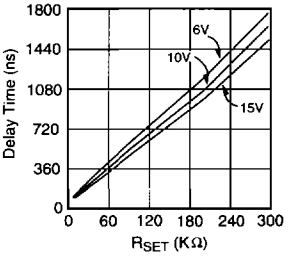
Average Supply Current vs Voltage and Frequency



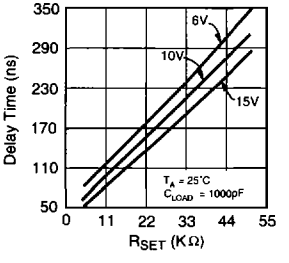
Delay Times vs Supply Voltage and Temperature



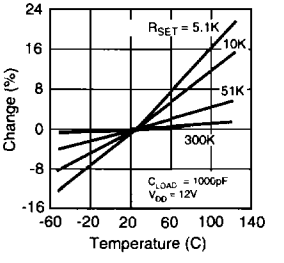
Output Rising Edge Delay vs R_{SET} and Supply Voltage



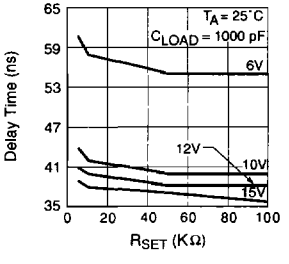
Output Rising Edge Delay vs R_{SET} and Supply Voltage (Detail)



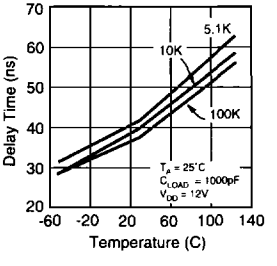
Output Rising Edge Delay Percentage Change vs Temperature



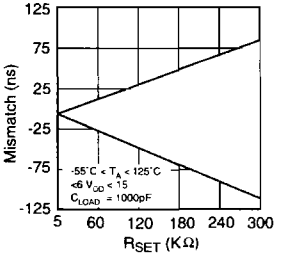
Output Falling Edge Delay vs R_{SET} vs V_{DD}



Output Falling Edge Delay vs Temperature and R_{SET}



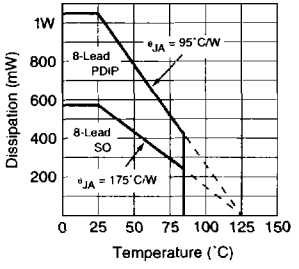
Output Rising Edge Delay Channel to Channel Mismatch vs R_{SET}



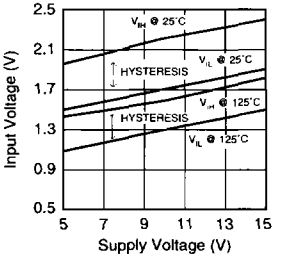
7961-2

Typical Performance Curves — Contd.

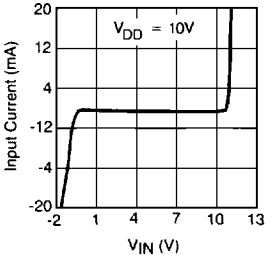
Max Power/Derating Curves 8-Pin Package



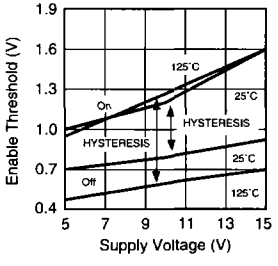
Input Threshold vs Supply Voltage



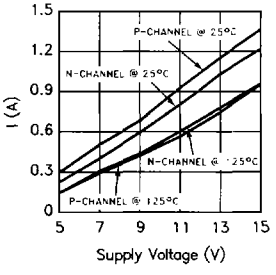
Input Current vs Input Voltage



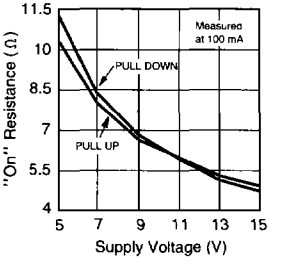
Enable Threshold vs Supply Voltage



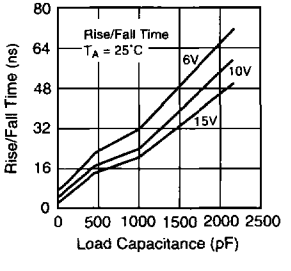
Peak Drive vs Supply Voltage



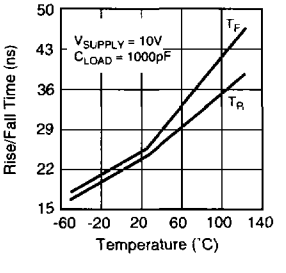
"On" Resistance vs Supply Voltage



Rise/Fall Time vs Load and Supply



Rise/Fall Time vs Temperature



7961-3