

## 1.5A HIGH-SPEED, FLOATING LOAD DRIVER

### FEATURES

- Tough CMOS™ Construction
- Low Quiescent Current ..... 300  $\mu$ A Max
- Capacitive Inputs With 300 mV Hysteresis
- Both Inputs Must Be Driven to Drive Load
- Low Output Leakage
- High Peak Current Capability
- Fast Output Rise Time
- Outputs Individually Testable

### APPLICATIONS

- Squib Drivers
- Isolated Load Drivers
- Pulsers
- Safety Interlocks

### GENERAL DESCRIPTION

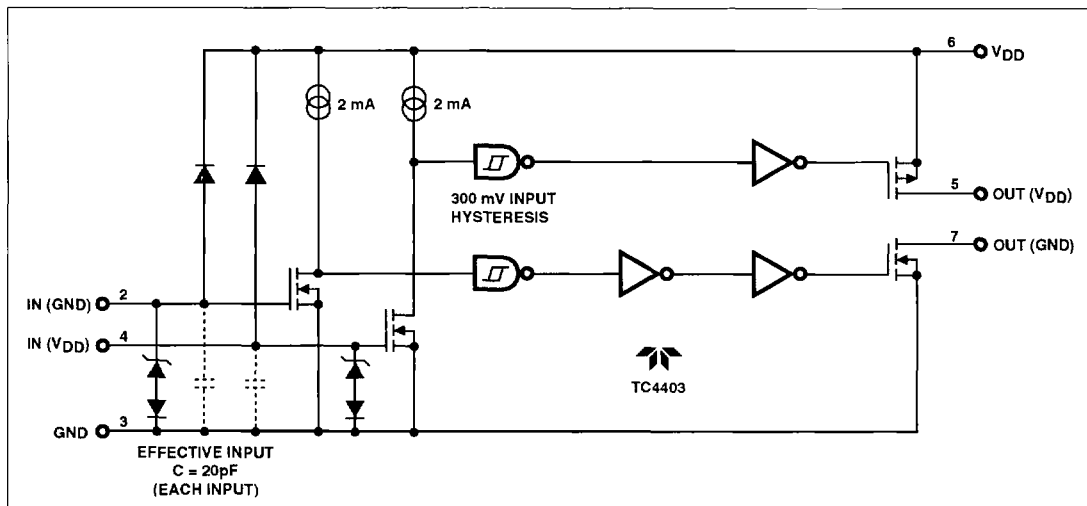
The TC4403 is a modified version of the TC4425 driver, intended to drive floating or isolated loads requiring high-current pulses. The load is intended to be connected between the outputs without other reference to supply or ground. Then, only when both logic inputs and the  $V_{DD}$  input are energized, is power supplied to the load. This construction allows the implementation of a wide variety of redundant input controllers.

The low off-state output leakage and independence of the two half-circuits permit a wide variety of testing schemes to be utilized to assure functionality. The high peak current capability, short internal delays, and fast output rise and fall times ensure sufficient power will be available to the load when it is needed. The TTL and CMOS compatible inputs allow operation from a wide variety of input devices. The ability to swing the inputs negative without affecting device performance allows negative biases to be placed on the inputs for greater safety. In addition, the capacitive nature of the inputs allows the use of series resistors on the inputs for extra noise suppression.

The TC4403 is built using Teledyne Components' new Tough CMOS process for outstanding ruggedness and reliability in harsh applications. Input voltage excursions above the supply voltage or below ground are clamped internally without damaging the device. The output stages are power MOSFETs with high-speed body diodes to prevent damage to the driver from inductive kickbacks.

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### FUNCTIONAL DIAGRAM



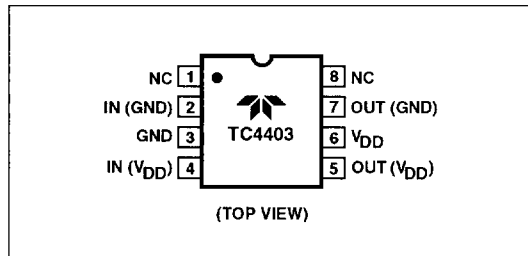
# 1.5A HIGH-SPEED, FLOATING LOAD DRIVER

## TC4403

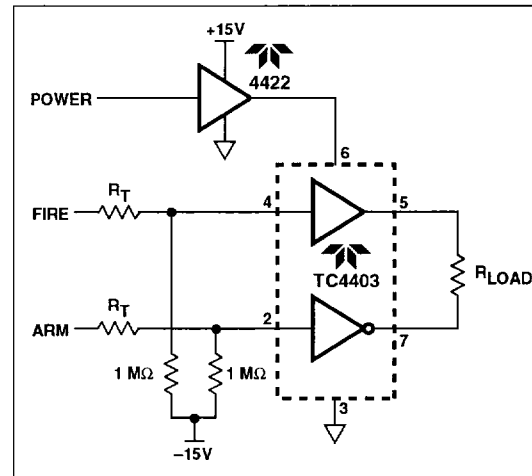
### ORDERING INFORMATION

Part No.	Package	Temperature Range
TC4403CPA	8-Pin PDIP	0°C to 70°C
TC4403EPA	8-Pin PDIP	-40°C to +85°C
TC4403MJA	8-Pin CerDIP	-55°C to +125°C

### PIN CONFIGURATION



### TYPICAL APPLICATION



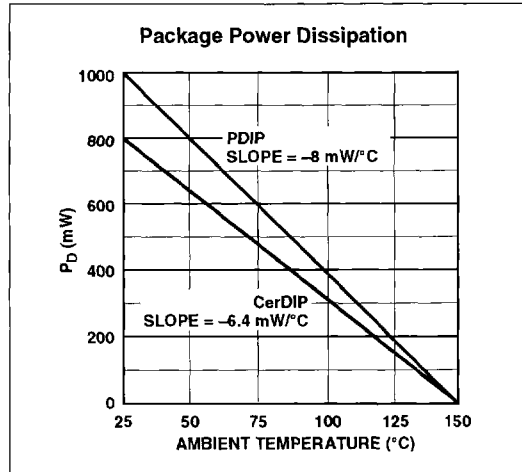
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## ABSOLUTE MAXIMUM RATINGS

Supply Voltage .....	+22V
Maximum Chip Temperature .....	+150°C
Storage Temperature Range .....	-65°C to +150°C
Lead Temperature (Soldering, 10 sec) .....	+300°C
Package Thermal Resistance	
CerDIP, R <sub>θJ-A</sub> .....	150°C/W
CerDIP, R <sub>θJ-C</sub> .....	50°C/W
PDIP, R <sub>θJ-A</sub> .....	125°C/W
PDIP, R <sub>θJ-C</sub> .....	42°C/W
Operating Temperature Range	
C Version .....	0°C to +70°C
E Version .....	-40°C to +85°C
M Version .....	-55°C to +125°C

Static-sensitive device. Unused devices must be stored in conductive material. Protect devices from static discharge and static fields. Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions above those indicated in the operational sections of the specifications is not implied. Exposure to Absolute Maximum Rating Conditions for extended periods may affect device reliability.



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**ELECTRICAL CHARACTERISTICS:** T<sub>A</sub> = +25°C with 4.5V ≤ V<sub>S</sub> ≤ 18V, unless otherwise specified.

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
<b>Input</b>						
V <sub>IH</sub>	Logic 1 High Input Voltage		2.4	—	—	V
V <sub>IL</sub>	Logic 0 Low Input Voltage		—	—	0.8	V
I <sub>IN</sub>	Input Current	0V ≤ V <sub>IN</sub> ≤ 5V	-1000	±10	+1000	nA
<b>Output</b>						
V <sub>OH</sub>	High Output Voltage		V <sub>DD</sub> -0.025	—	—	V
V <sub>OL</sub>	Low Output Voltage		—	—	0.025	V
R <sub>OS</sub>	Sourcing Output Resistance	I <sub>OUT</sub> = 10 mA, V <sub>DD</sub> = 18V	—	2.8	5	Ω
R <sub>OG</sub>	Grounding Output Resistance	I <sub>OUT</sub> = -10 mA, V <sub>DD</sub> = 18V	—	3.5	5	Ω
I <sub>PK</sub>	Peak Output Current		—	1.5	—	A
<b>Switching Time (Note 1)</b>						
t <sub>R</sub>	Rise Time	Figure 1, C <sub>L</sub> = 1800 pF	—	23	35	ns
t <sub>F</sub>	Fall Time	Figure 1, C <sub>L</sub> = 1800 pF	—	25	35	ns
t <sub>D1</sub>	Delay Time	Figure 1, C <sub>L</sub> = 1800 pF	—	33	75	ns
t <sub>D2</sub>	Delay Time	Figure 1, C <sub>L</sub> = 1800 pF	—	38	75	ns
<b>Power Supply</b>						
I <sub>S</sub>	Power Supply Current	V <sub>IN</sub> = 3V (Both Inputs)	—	1.5	2.5	mA
		V <sub>IN</sub> = 0V (Both Inputs)	—	0.15	0.25	mA

**NOTE:** 1. Switching times guaranteed by design.

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### ELECTRICAL CHARACTERISTICS:

Measured over operating temperature range with  $4.5V \leq V_S \leq 18V$  unless otherwise specified.

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
<b>Input</b>						
$V_{IH}$	Logic 1 High Input Voltage		2.4	—	—	V
$V_{IL}$	Logic 0 Low Input Voltage		—	—	0.8	V
$I_{IN}$	Input Current	$0V \leq V_{IN} \leq V_{DD}$	-10,000	$\pm 10$	+10,000	nA
<b>Output</b>						
$V_{OH}$	High Output Voltage		$V_{DD}-0.025$	—	—	V
$V_{OL}$	Low Output Voltage		—	—	0.025	V
$R_{OS}$	Sourcing Output Resistance	$V_{IN} = 2.4V$ $I_{OUT} = 10\text{ mA}$ , $V_{DD} = 18V$	—	3.7	8	$\Omega$
$R_{OG}$	Grounding Output Resistance	$V_{IN} = 2.4V$ $I_{OUT} = -10\text{ mA}$ , $V_{DD} = 18V$	—	4.3	8	$\Omega$
<b>Switching Time (Note 1)</b>						
$t_R$	Rise Time	Figure 1, $C_L = 1800\text{ pF}$	—	28	60	ns
$t_F$	Fall Time	Figure 1, $C_L = 1800\text{ pF}$	—	32	60	ns
$t_{D1}$	Delay Time	Figure 1, $C_L = 1800\text{ pF}$	—	32	100	ns
$t_{D2}$	Delay Time	Figure 1, $C_L = 1800\text{ pF}$	—	38	100	ns
<b>Power Supply</b>						
$I_S$	Power Supply Current	$V_{IN} = 3V$ (Both Inputs) $V_{IN} = 0V$ (Both Inputs)	—	2 0.2	3.5 0.3	mA mA

NOTE: 1. Switching times guaranteed by design.

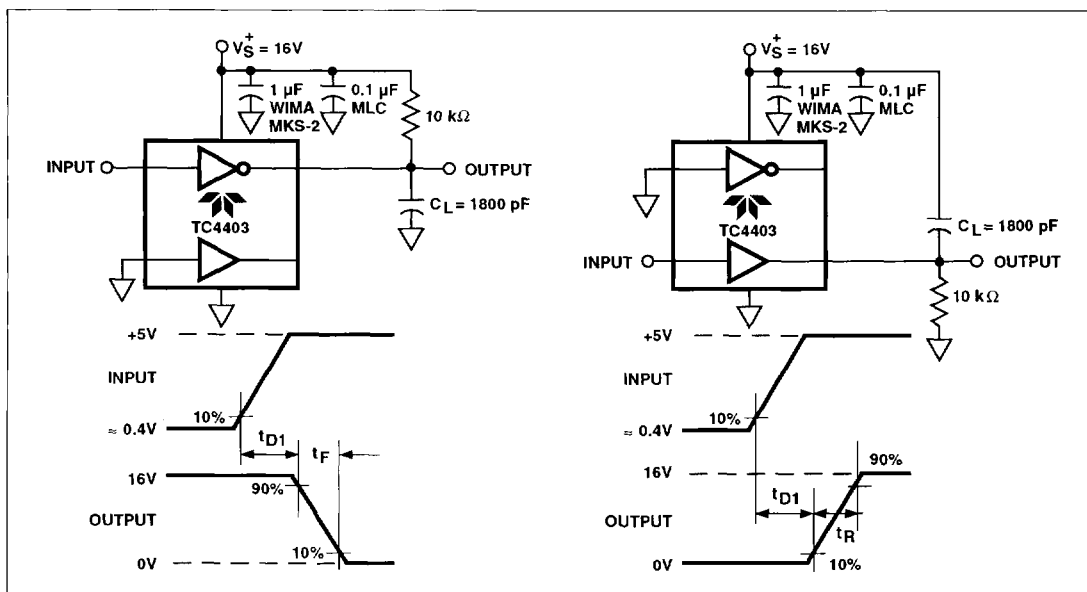
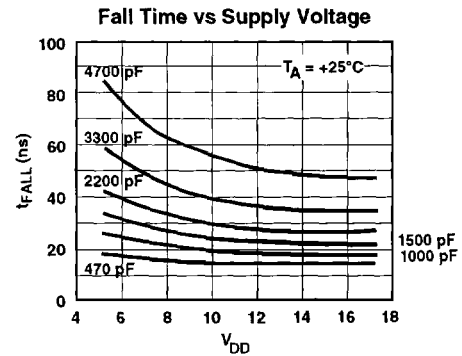
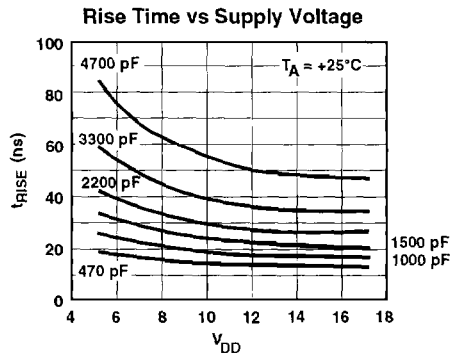


Figure 1 Switching Time Test Circuits

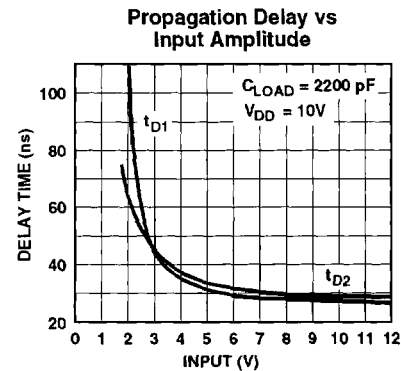
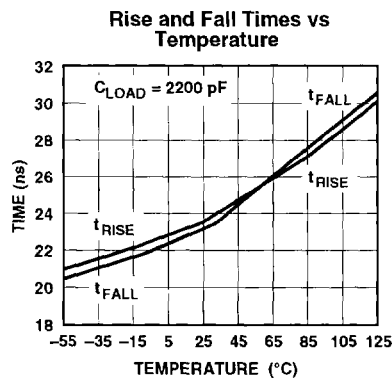
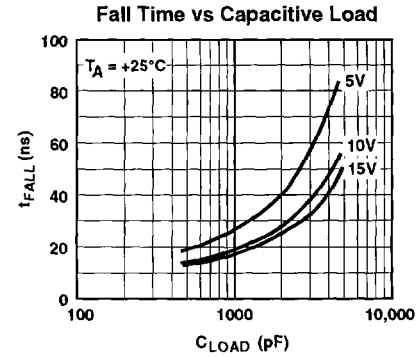
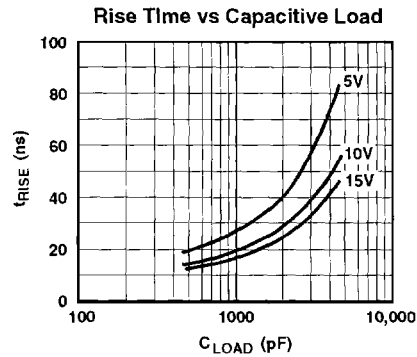
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## TYPICAL CHARACTERISTICS CURVES



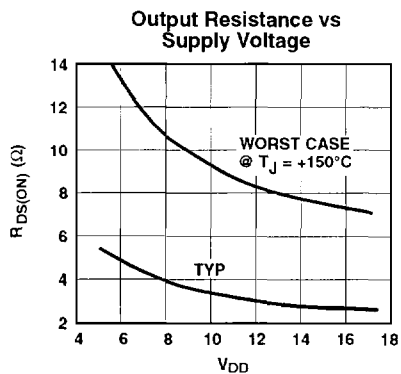
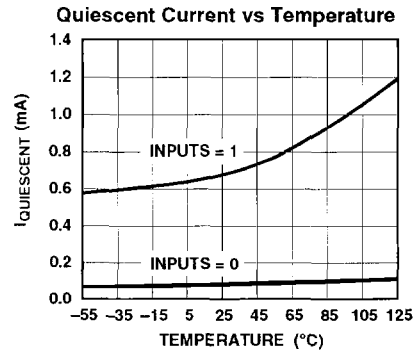
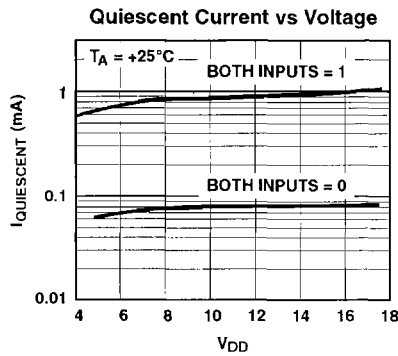
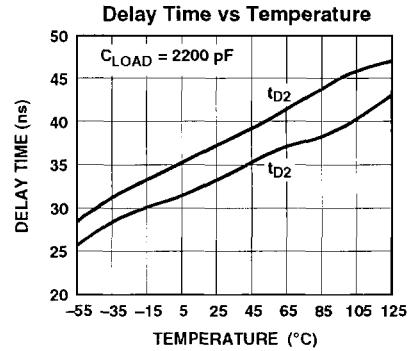
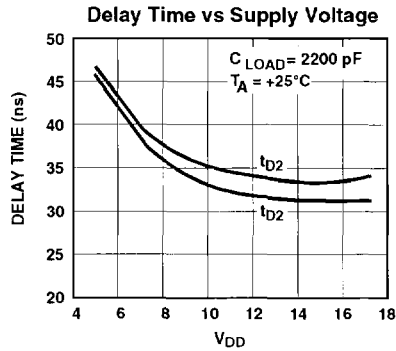
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## TYPICAL CHARACTERISTICS CURVES (Cont.)



## BONDING DIAGRAM

