

# 1.5A DUAL HIGH-SPEED POWER MOSFET DRIVERS

## FEATURES

- **High Peak Output Current** ..... 1.5A
- **Wide Operating Range** ..... 4.5V to 18V
- **High Capacitive Load Drive Capability** ..... 1000 pF in 25 nsec Typ
- **Short Delay Time** ..... 30 nsec Typ
- **Matched Rise, Fall and Delay Times**
- **Low Supply Current**
  - With Logic “1” Input ..... 1 mA Typ
  - With Logic “0” Input ..... 100  $\mu$ A Typ
- **Low Output Impedance** ..... 7 $\Omega$  Typ
- **Latch-Up Protected: Will Withstand 0.5A Reverse Current**
- **Input Will Withstand Negative Inputs Up to 5V**
- **ESD Protected** ..... 4 kV
- **Pinout Same as TC426/TC427/TC428**

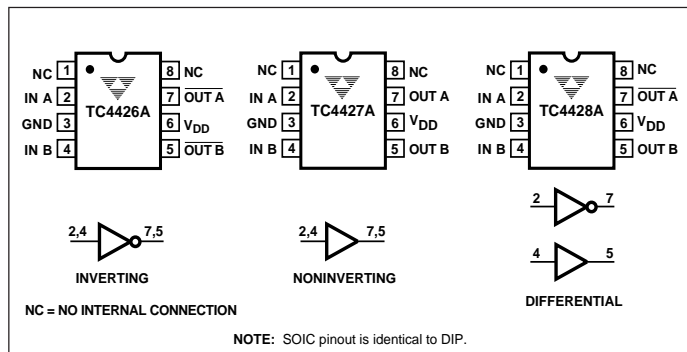
## GENERAL DESCRIPTION

The TC4426A/4427A/4428A are improved versions of the earlier TC426/427/428 family of buffer/drivers (with which they are pin compatible). They will not latch up under any conditions within their power and voltage ratings. They are not subject to damage when up to 5V of noise spiking (of either polarity) occurs on the ground pin. They can accept, without damage or logic upset, up to 500 mA of reverse current (of either polarity) being forced back into their outputs. All terminals are fully protected against up to 4 kV of electrostatic discharge.

As MOSFET drivers, the TC4426A/4427A/4428A can easily switch 1000 pF gate capacitances in under 30 ns, and provide low enough impedances in both the ON and OFF states to ensure the MOSFET's intended state will not be affected, even by large transients.

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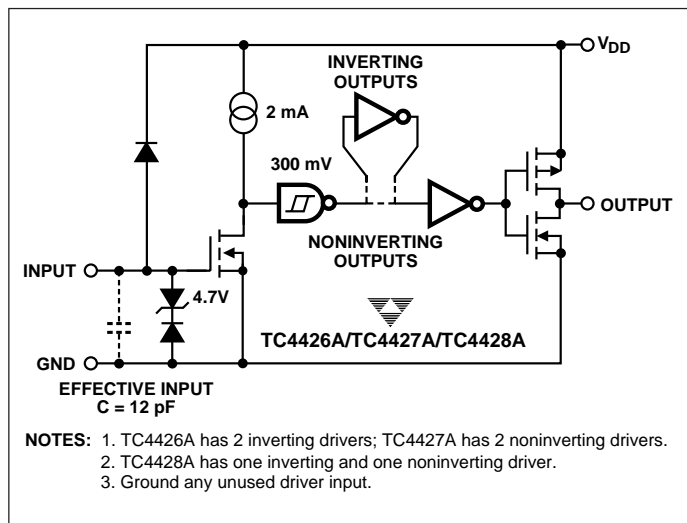
## PIN CONFIGURATIONS



## ORDERING INFORMATION

Part No.	Package	Temp. Range
TC4426ACOA	8-Pin SOIC	0°C to +70°C
TC4426ACPA	8-Pin Plastic DIP	0°C to +70°C
TC4426AEOA	8-Pin SOIC	-40°C to +85°C
TC4426AEPA	8-Pin Plastic DIP	-40°C to +85°C
TC4426AMJA	8-Pin CerDIP	-55°C to +125°C
TC4427ACOA	8-Pin SOIC	0°C to +70°C
TC4427ACPA	8-Pin Plastic DIP	0°C to +70°C
TC4427AEOA	8-Pin SOIC	-40°C to +85°C
TC4427AEPA	8-Pin Plastic DIP	-40°C to +85°C
TC4427AMJA	8-Pin CerDIP	-55°C to +125°C
TC4428ACOA	8-Pin SOIC	0°C to +70°C
TC4428ACPA	8-Pin Plastic DIP	0°C to +70°C
TC4428AEOA	8-Pin SOIC	-40°C to +85°C
TC4428AEPA	8-Pin Plastic DIP	-40°C to +85°C
TC4428AMJA	8-Pin CerDIP	-55°C to +125°C

## FUNCTIONAL BLOCK DIAGRAM



# 1.5A DUAL HIGH-SPEED POWER MOSFET DRIVERS

**TC4426A**  
**TC4427A**  
**TC4428A**

## ABSOLUTE MAXIMUM RATINGS\*

Supply Voltage .....	+22V
Input Voltage, IN A or IN B.. ( $V_{DD} + 0.3V$ ) to ( $GND - 5.0V$ )	
Maximum Chip Temperature .....	+150°C
Storage Temperature Range .....	- 65°C to +150°C
Lead Temperature (Soldering, 10 sec) .....	+300°C
Package Thermal Resistance	
CerDIP $R_{\theta J-A}$ .....	150°C/W
CerDIP $R_{\theta J-C}$ .....	50°C/W
PDIP $R_{\theta J-A}$ .....	125°C/W
PDIP $R_{\theta J-C}$ .....	42°C/W
SOIC $R_{\theta J-A}$ .....	155°C/W
SOIC $R_{\theta J-C}$ .....	45°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

## Package Power Dissipation ( $T_A \leq 70^\circ\text{C}$ )

Plastic .....	730mW
CerDIP .....	800mW
SOIC .....	470mW

\*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 operation sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

## ELECTRICAL CHARACTERISTICS: Over operating temperature range with $4.5V \leq V_{DD} \leq 18V$ , 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	$-0V \leq V_{IN} \leq V_{DD}$	$T_A = 25^\circ\text{C}$ $-40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$	-1 -10	—	1 10	$\mu\text{A}$
<b>Output</b>							
$V_{OH}$	High Output Voltage	DC Test		$V_{DD} - 0.025$	—	—	V
$V_{OL}$	Low Output Voltage	DC Test		—	—	0.025	V
$R_O$	Output Resistance	$V_{DD} = 18V, I_O = 10\text{mA}$	$T_A = 25^\circ\text{C}$ $0^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$ $-40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$	— — —	7 7 8	9 10 11	$\Omega$
$I_{PK}$	Peak Output Current	$V_{DD} = 18V$		—	1.5	—	A
$I_{REV}$	Latch-Up Protection Withstand Reverse Current	Duty Cycle $\leq 2\%$ $t \leq 300\mu\text{sec}$	$V_{DD} = 18V$	0.5	—	—	A
<b>Switching Time (Note 1)</b>							
$t_R$	Rise Time	Figure 1	$T_A = 25^\circ\text{C}$ $0^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$ $-40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$	— — —	25 27 29	35 40 40	nsec
$t_F$	Fall Time	Figure 1	$T_A = 25^\circ\text{C}$ $0^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$ $-40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$	— — —	25 27 29	35 40 40	nsec
$t_{D1}$	Delay Time	Figure 1	$T_A = 25^\circ\text{C}$ $0^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$ $-40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$	— — —	30 33 35	35 40 45	nsec
$t_{D2}$	Delay Time	Figure 1	$T_A = 25^\circ\text{C}$ $0^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$ $-40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$	— — —	30 33 35	35 40 45	nsec
<b>Power Supply</b>							
$I_S$	Power Supply Current	$V_{IN} = 3V$ (Both Inputs) $V_{IN} = 0V$ (Both Inputs)	$V_{DD} = 18V$	— —	1.0 0.1	2.0 0.2	mA

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

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TC4426A  
TC4427A  
TC4428A

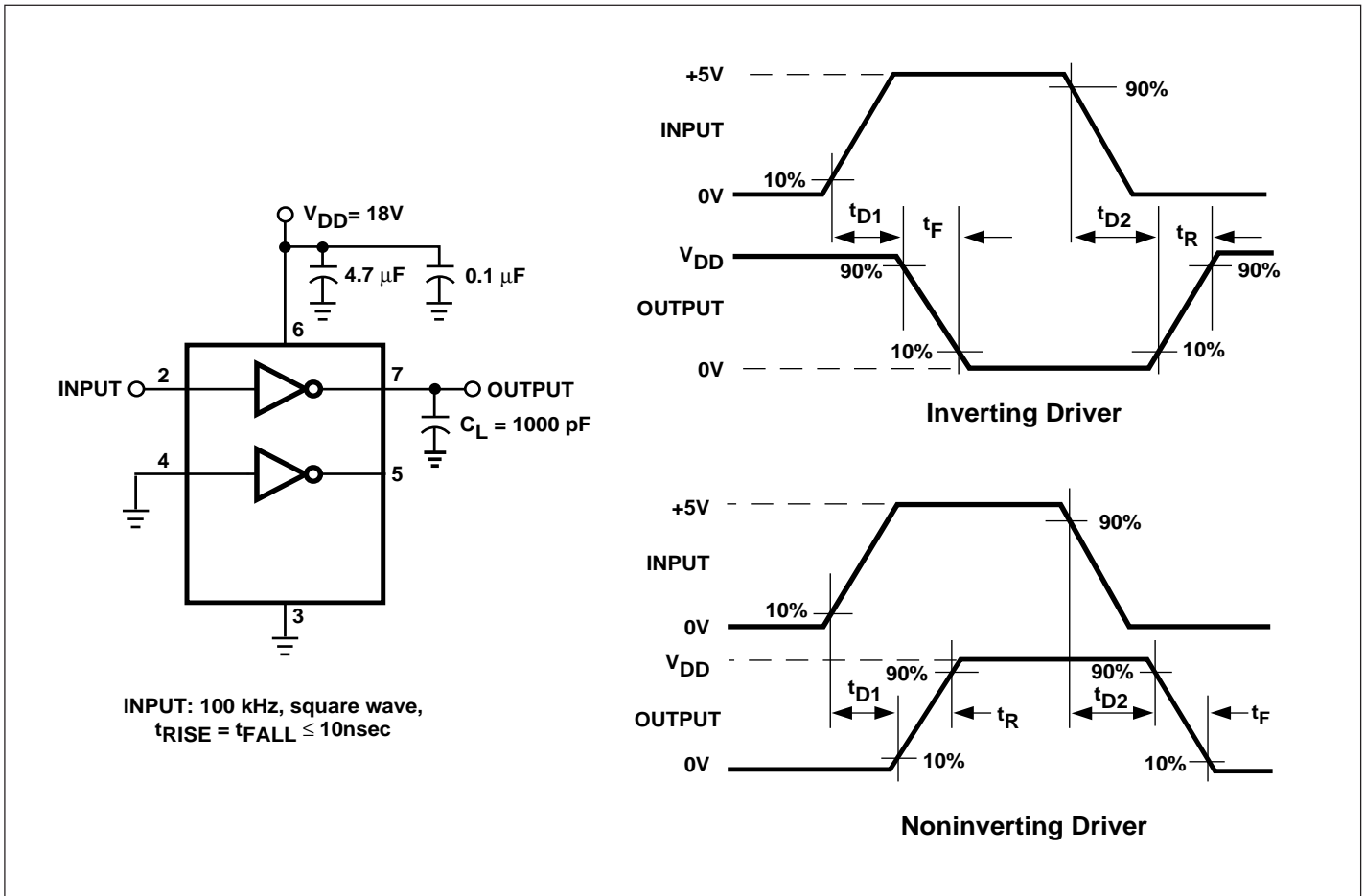


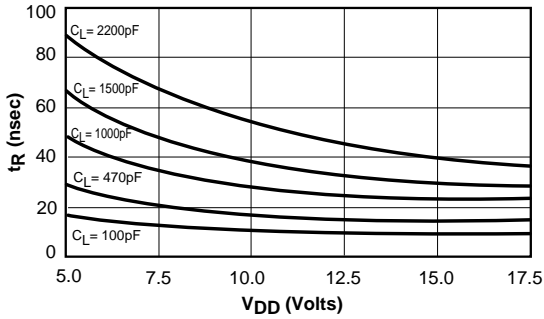
Figure 1. Switching Time Test Circuit

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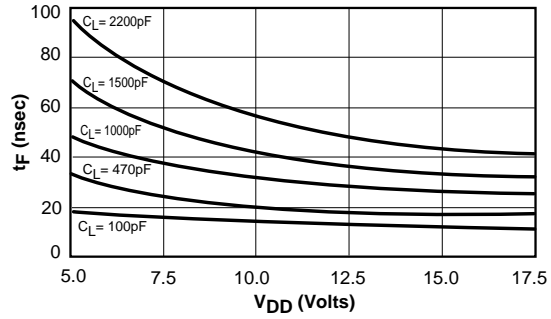
TC4426A  
TC4427A  
TC4428A

## TYPICAL CHARACTERISTICS

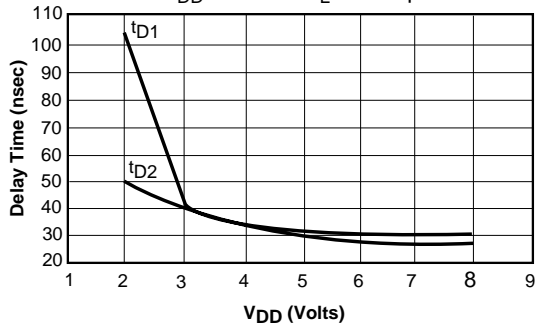
**Rise Time vs. Supply Voltage**  
Temperature = 25°C



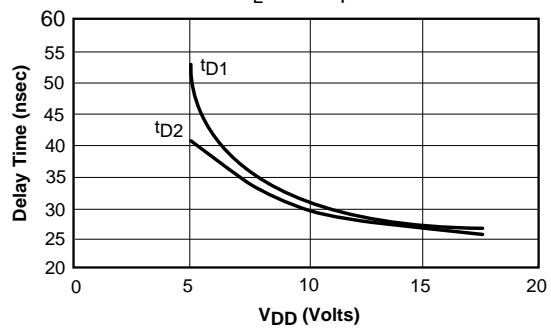
**Fall Time vs. Supply Voltage**  
Temperature = 25°C



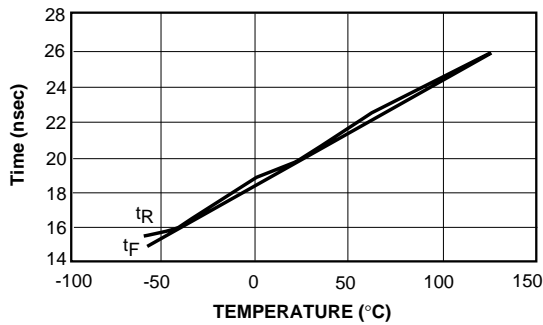
**Effect of Input Amplitude on Delay**  
VDD = 10V CL = 1000pF



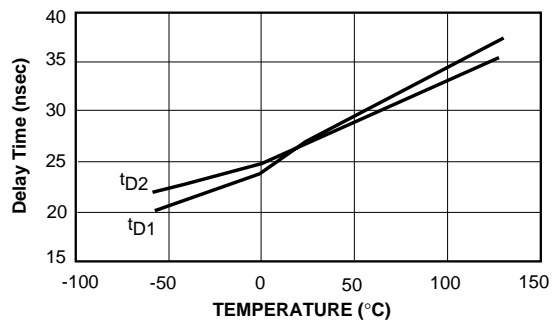
**Propagation Delay Time vs. Supply Voltage**  
CL = 1000pF



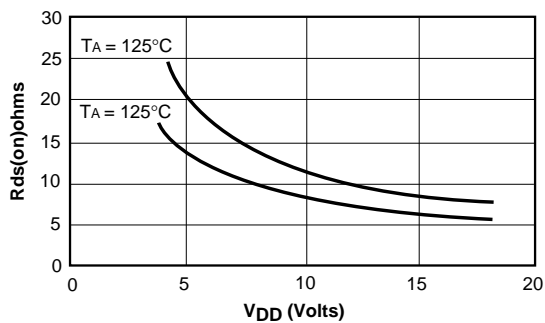
**Rise and Fall Times vs. Temperature**  
VDD = 18V CL = 1000pF



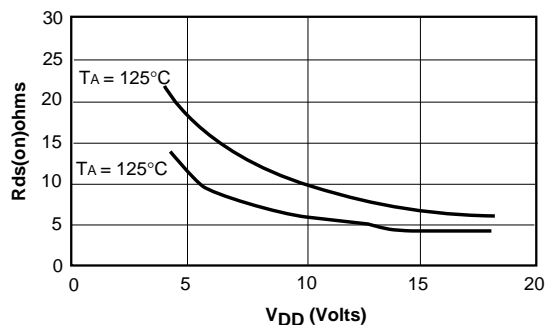
**Propagation Delay Time vs. Temperature**  
VDD = 18V CL = 1000pF



**High-State Output Resistance**



**Low State Output Resistance**

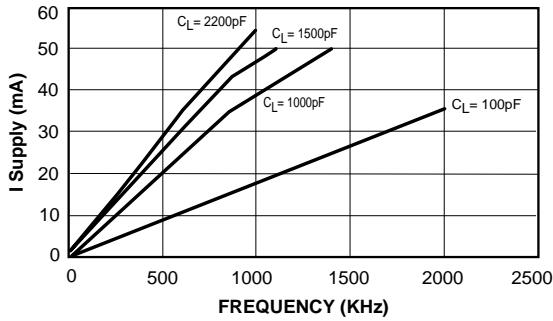


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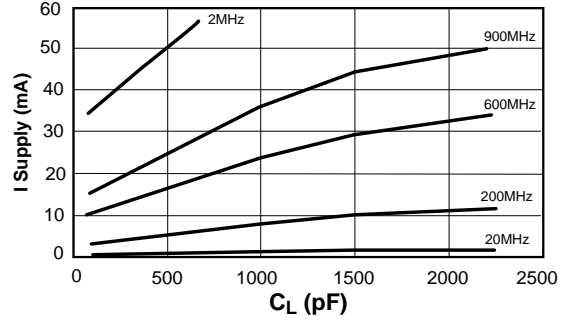
TC4426A  
TC4427A  
TC4428A

## TYPICAL CHARACTERISTICS (Cont.)

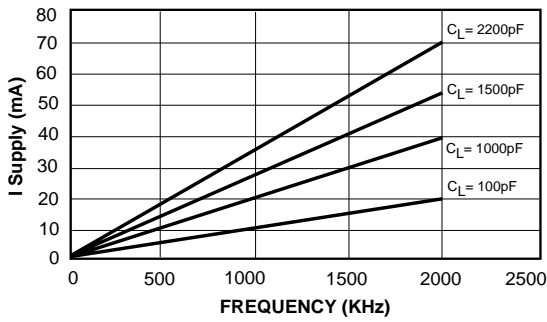
**Supply Current vs. Frequency**  
 $V_{DD} = 18V$



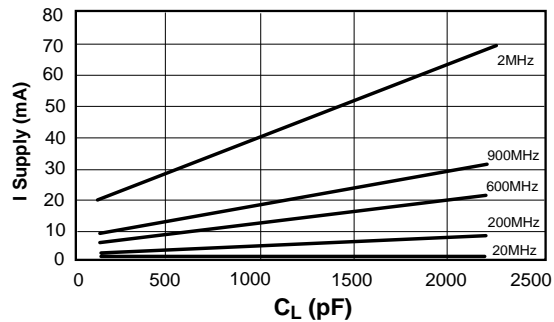
**Supply Current vs. Capacitance Load**  
 $V_{DD} = 18V$



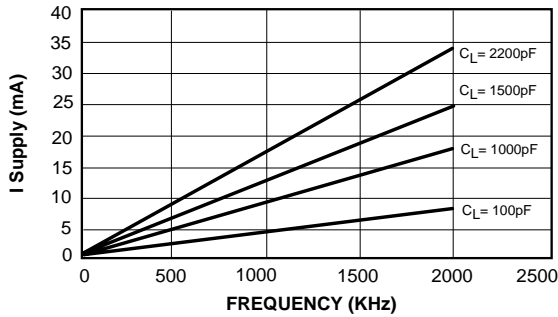
**Supply Current vs. Frequency**  
 $V_{DD} = 12V$



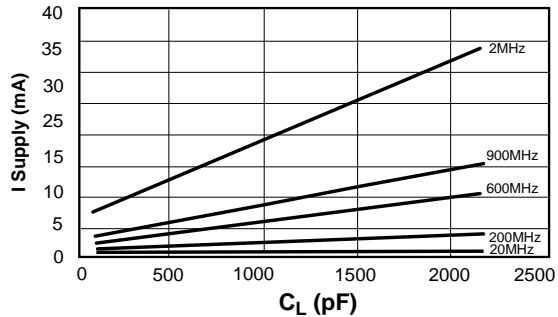
**Supply Current vs. Capacitance Load**  
 $V_{DD} = 12V$



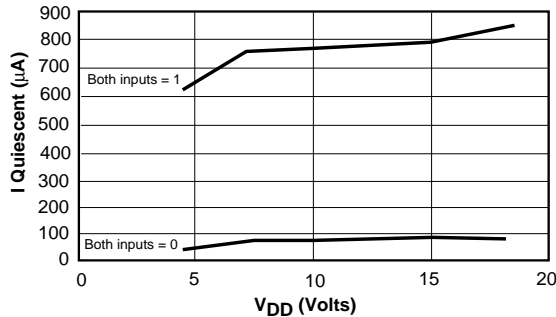
**Supply Current vs. Frequency**  
 $V_{DD} = 6V$



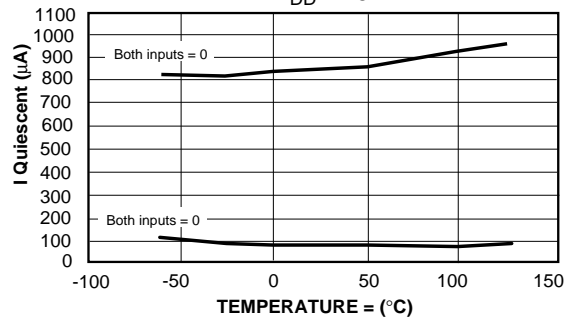
**Supply Current vs. Capacitance Load**  
 $V_{DD} = 6V$



**Quiescent Supply Current vs. Voltage**  
TEMPERATURE = 25°C



**Quiescent Supply Current vs. Temperature**  
 $V_{DD} = 18V$



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