

3A DUAL HIGH-SPEED POWER MOSFET DRIVERS

FEATURES

- High Peak Output Current 3A
- Wide Operating Range 4.5V to 18V
- High Capacitive Load Drive Capability 1800pF in 25nsec
- Short Delay Times <40nsec Typ.
- Matched Rise/Fall Times
- Low Supply Current
 - With Logic "1" Input 3.5mA
 - With Logic "0" Input 350µA
- Low Output Impedance 3.5Ω Typ.
- Latch-Up Protected ..Will Withstand 1.5A Reverse Current
- Logic Input Will Withstand Negative Swing Up to 5V
- ESD Protected 4kV
- Pinouts Same as TC1426/27/28; TC4426/27/28

GENERAL DESCRIPTION

The TC4423/4424/4425 are higher output current versions of the new TC4426/4427/4428 buffer/drivers, which, in turn, are improved versions of the earlier TC426/427/428 series. All three families are pin-compatible. The TC4423/4424/4425 drivers are capable of giving reliable service in far more demanding electrical environments than their antecedents.

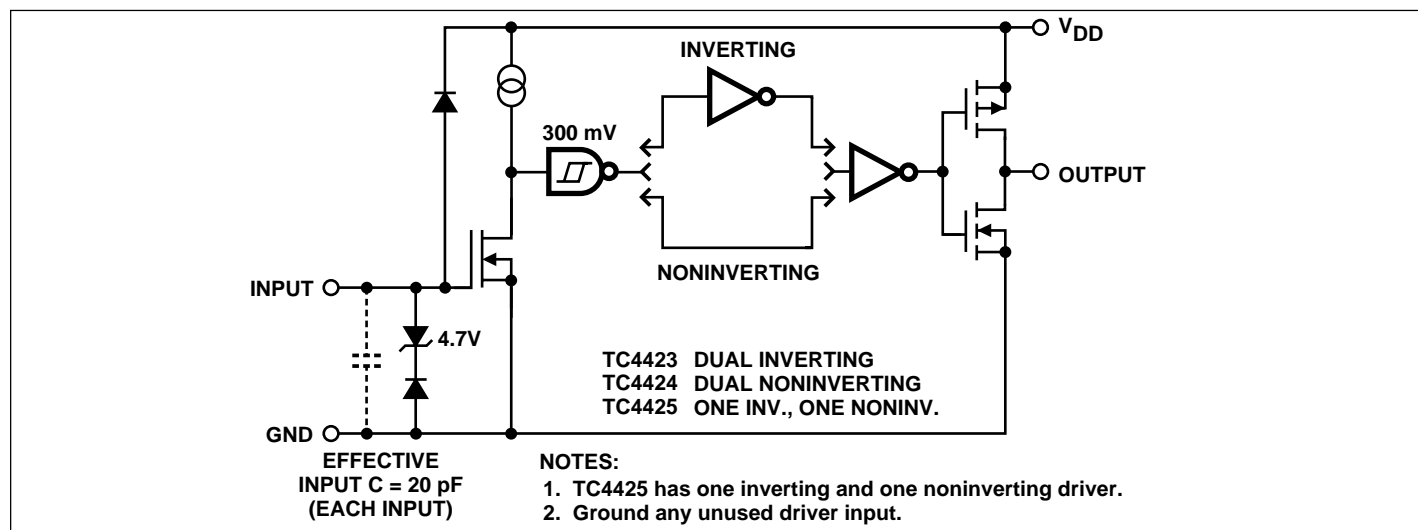
Although primarily intended for driving power MOSFETs, the TC4423/4424/4425 drivers are equally well-suited to driving any other load (capacitive, resistive, or inductive) which requires a low impedance driver capable of high peak currents and fast switching times. For example, heavily loaded clock lines, coaxial cables, or piezoelectric transducers can all be driven from the TC4423/4424/4425. The only known limitation on loading is the total power dissipated in the driver must be kept within the maximum power dissipation limits of the package.

ORDERING INFORMATION

Part No.	Package	Temperature Range
TC4423COE	16-Pin SOIC (Wide)	0°C to +70°C
TC4423CPA	8-Pin Plastic DIP	0°C to +70°C
TC4423EOE	16-Pin SOIC (Wide)	- 40°C to +85°C
TC4423EPA	8-Pin Plastic DIP	- 40°C to +85°C
TC4423MJA	8-Pin CerDIP	- 55°C to +125°C
TC4424COE	16-Pin SOIC (Wide)	0°C to +70°C
TC4424CPA	8-Pin Plastic DIP	0°C to +70°C
TC4424MJA	8-Pin CerDIP	- 55°C to +125°C

Part No	Package	Temperature Range
TC4424EOE	16-Pin SO Wide	- 40°C to +85°C
TC4424EPA	8-Pin Plastic DIP	- 40°C to +85°C
TC4425MJA	8-Pin CerDIP	- 55°C to +125°C
TC4425COE	16-Pin SO Wide	0°C to +70°C
TC4425CPA	8-Pin Plastic DIP	0°C to +70°C
TC4425EOE	16-Pin SO Wide	- 40°C to +85°C
TC4425EPA	8-Pin Plastic DIP	- 40°C to +85°C

FUNCTIONAL BLOCK DIAGRAM



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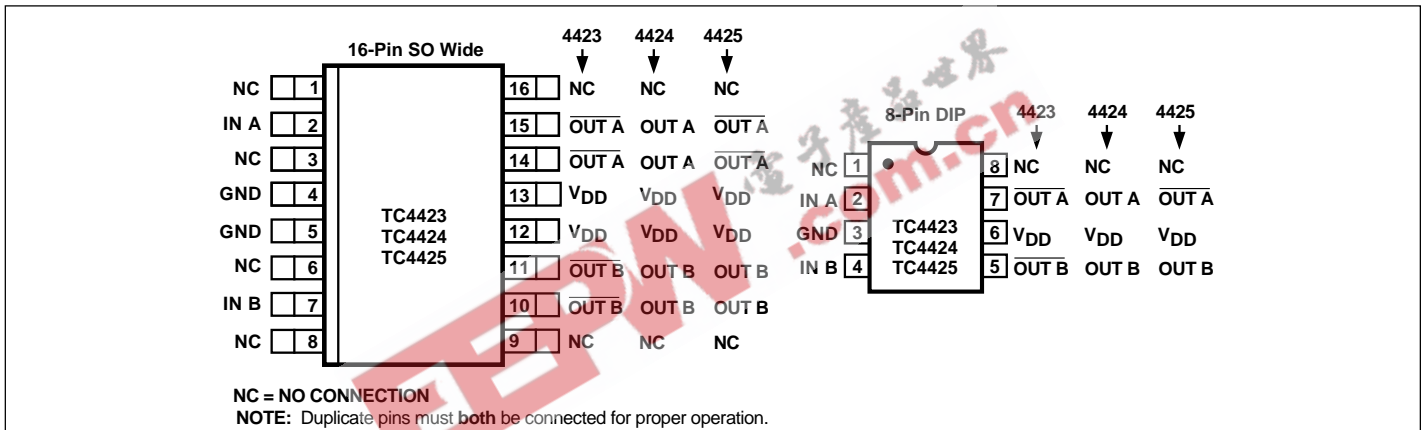
TC4423
TC4424
TC4425

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 $R_{\theta J-C}$ 55°C/W
 PDIP $R_{\theta J-A}$ 125°C/W
 PDIP $R_{\theta J-C}$ 45°C/W

SOIC $R_{\theta J-A}$ 155°C/W
 SOIC $R_{\theta J-C}$ 75°C/W
 Operating Temperature Range
 C Version 0°C to +70°C
 I Version - 25°C to +85°C
 E Version - 40°C to +85°C
 M Version - 55°C to +125°C
 Package Power Dissipation ($T_A \leq 70^\circ C$)
 Plastic DIP 730mW
 CerDIP 800mW
 SOIC 470mW

PIN CONFIGURATIONS



ELECTRICAL CHARACTERISTICS: $T_A = +25^\circ C$ with $4.5V \leq V_{DD} \leq 18V$, unless otherwise specified.

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Input						
V_{OH}	Logic 1 High Input Voltage		2.4	—	—	V
V_{IL}	Logic 0 Low Input Voltage		—	—	0.8	V
I_{IN}	Input Current	$0V \leq V_{IN} \leq V_{DD}$	- 1	—	1	μA
Output						
V_{OH}	High Output Voltage		$V_{DD} - 0.025$	—	—	V
V_{OL}	Low Output Voltage		—	—	0.025	V
R_O	Output Resistance, High	$I_{OUT} = 10\text{ mA}, V_{DD} = 18V$	—	2.8	5	Ω
R_O	Output Resistance, Low	$I_{OUT} = 10\text{ mA}, V_{DD} = 18V$	—	3.5	5	Ω
I_{PK}	Peak Output Current		—	3	—	A
I_{REV}	Latch-Up Protection Withstand Reverse Current	Duty Cycle $\leq 2\%$ $t \leq 300\ \mu\text{sec}$	1.5	—	—	A
Switching Time (Note 1)						
t_R	Rise Time	Figure 1, $C_L = 1800\text{pF}$	—	23	35	nsec
t_F	Fall Time	Figure 1, $C_L = 1800\text{pF}$	—	25	35	nsec
t_{D1}	Delay Time	Figure 1, $C_L = 1800\text{pF}$	—	33	75	nsec
t_{D2}	Delay Time	Figure 1, $C_L = 1800\text{pF}$	—	38	75	nsec
Power Supply						
I_S	Power Supply Current	$V_{IN} = 3V$ (Both Inputs) $V_{IN} = 0V$ (Both Inputs)	—	1.5 0.15	2.5 0.25	 mA mA

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TC4425

ELECTRICAL CHARACTERISTICS (Cont.) Over operating temperature range with $4.5V \leq V_{DD} \leq 18V$, unless otherwise specified.

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Input						
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	—	10	μA
Output						
V_{OH}	High Output Voltage		$V_{DD} - 0.025$	—	—	V
V_{OL}	Low Output Voltage		—	—	0.025	V
R_O	Output Resistance, High	$I_{OUT} = 10\text{ mA}, V_{DD} = 18V$	—	3.7	8	Ω
R_O	Output Resistance, Low	$I_{OUT} = 10\text{ mA}, V_{DD} = 18V$	—	4.3	8	Ω
I_{PK}	Peak Output Current		—	3	—	A
I_{REV}	Latch-Up Protection	Duty Cycle $\leq 2\%$ Withstand Reverse Current	1.5	—	—	A
			$t \leq 300\ \mu\text{sec}$			
Switching Time (Note 1)						
t_R	Rise Time	Figure 1, $C_L = 1800\text{pF}$	—	28	60	nsec
t_F	Fall Time	Figure 1, $C_L = 1800\text{pF}$	—	32	60	nsec
t_{D1}	Delay Time	Figure 1, $C_L = 1800\text{pF}$	—	32	100	nsec
t_{D2}	Delay Time	Figure 1, $C_L = 1800\text{pF}$	—	38	100	nsec
Power Supply						
I_S	Power Supply Current	$V_{IN} = 3V$ (Both Inputs) $V_{IN} = 0V$ (Both Inputs)	—	2	3.5	mA
			—	0.2	0.3	mA

NOTE: 1. Switching times guaranteed by design.

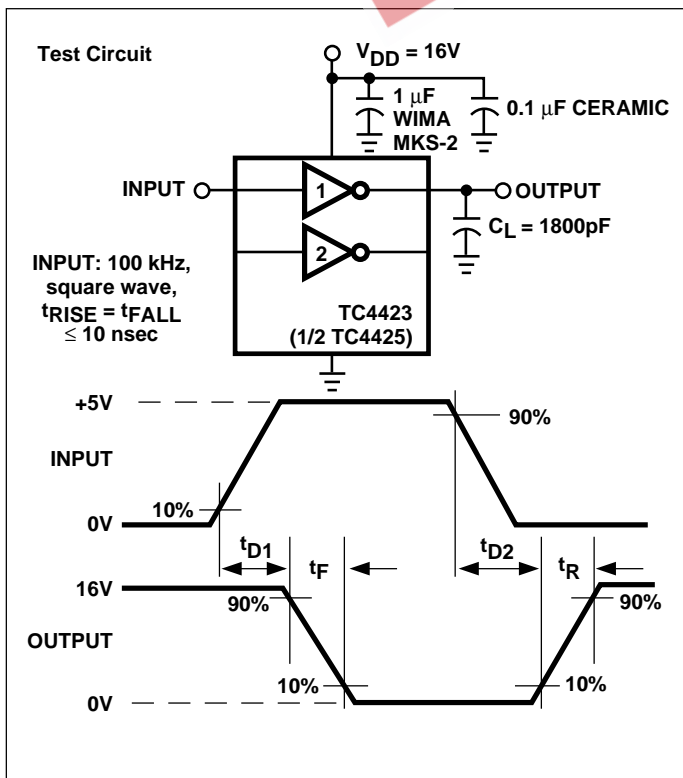


Figure 1. Inverting Driver Switching Time

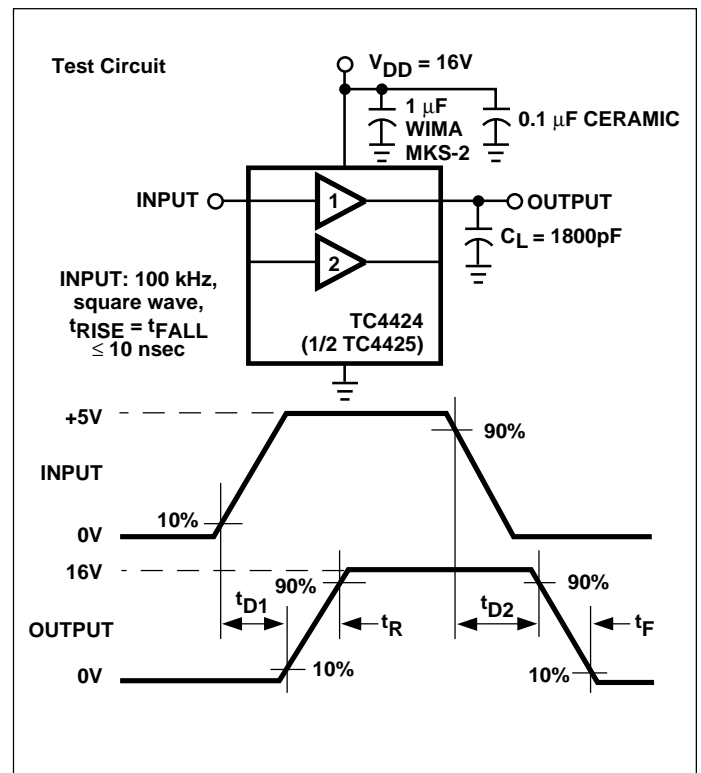
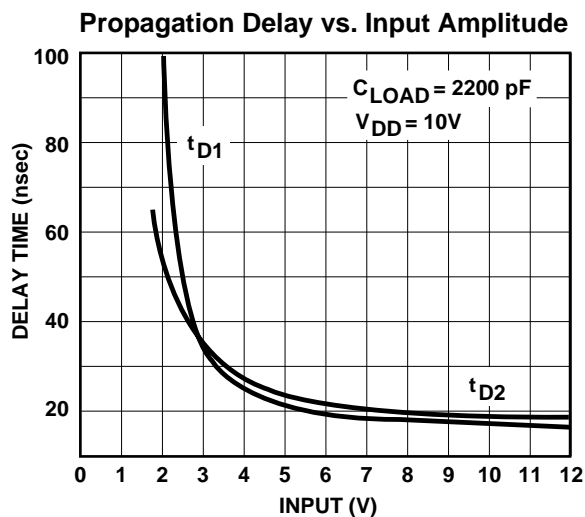
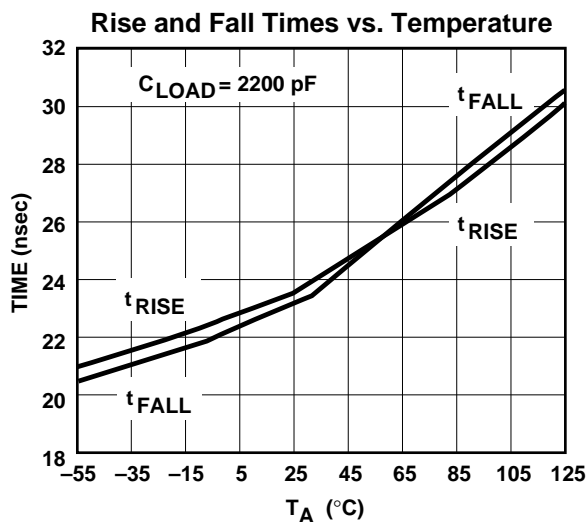
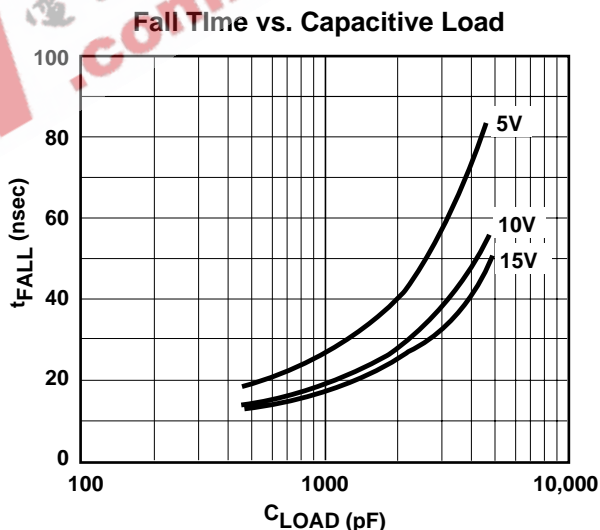
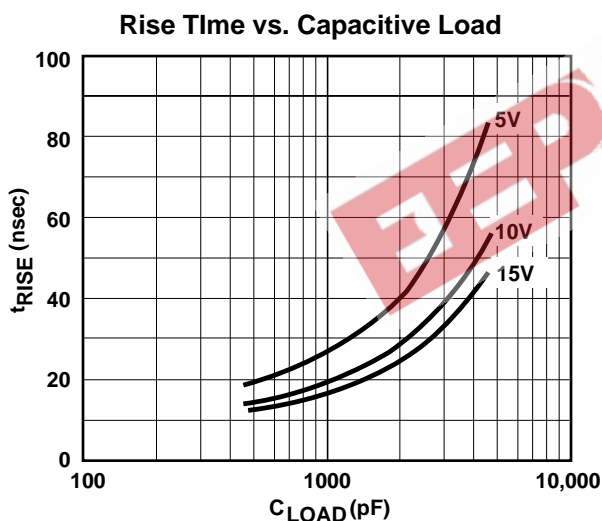
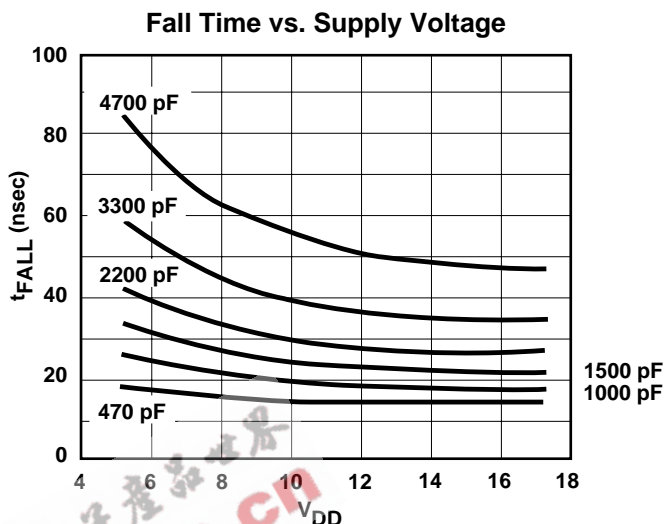
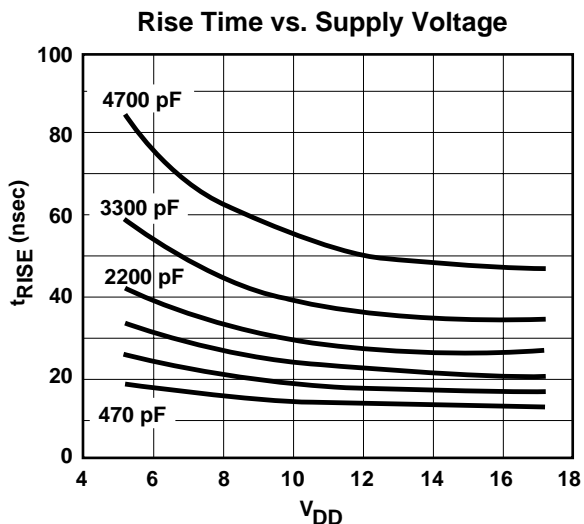


Figure 2. Noninverting Driver Switching Time

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TC4424
TC4425

TYPICAL CHARACTERISTICS

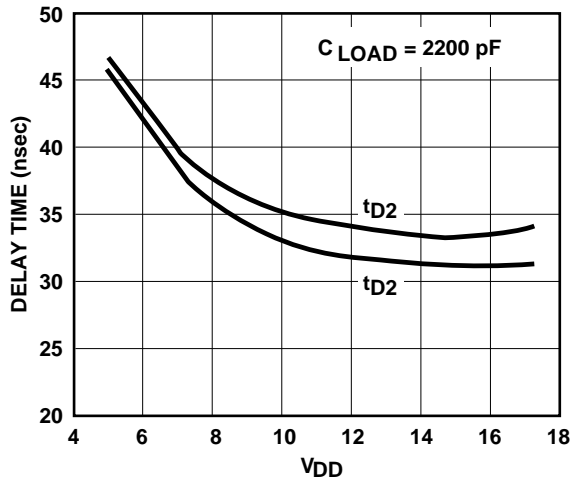


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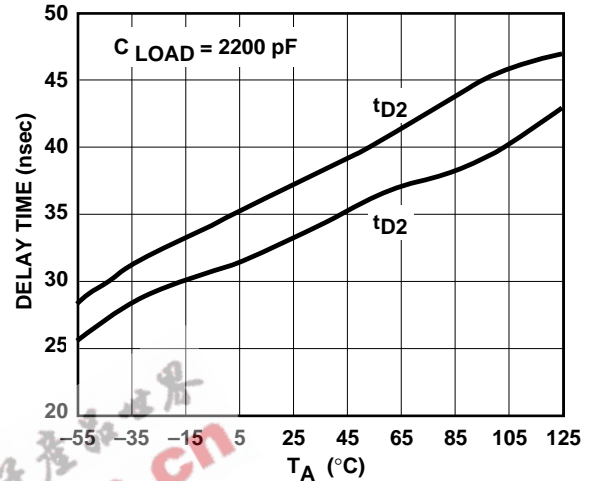
TC4423
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TC4425

TYPICAL CHARACTERISTICS (Cont.)

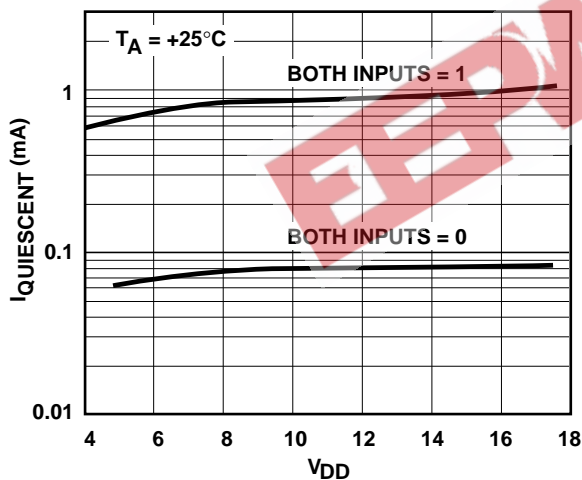
Propagation Delay Time vs. Supply Voltage



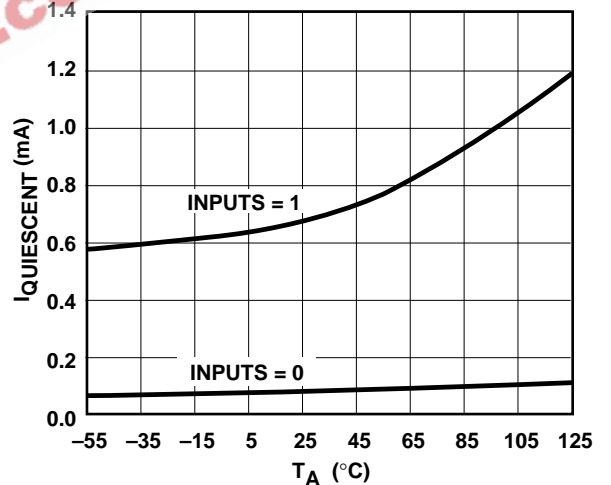
Delay Time vs. Temperature



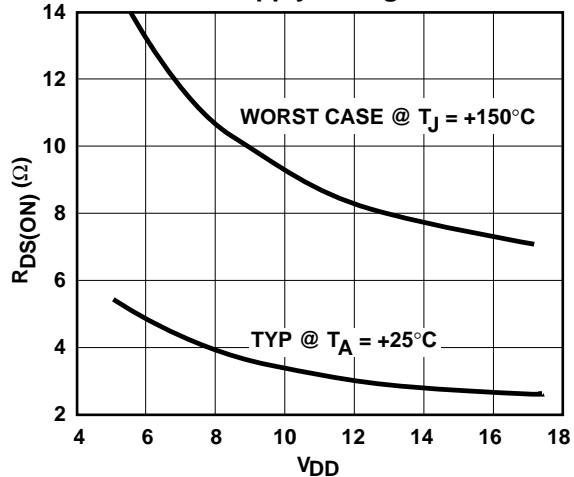
Quiescent Current vs. Supply Voltage



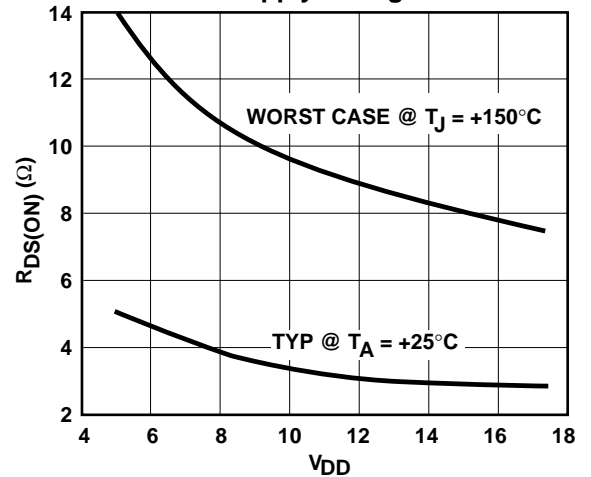
Quiescent Current vs. Temperature



Output Resistance (Output High) vs. Supply Voltage



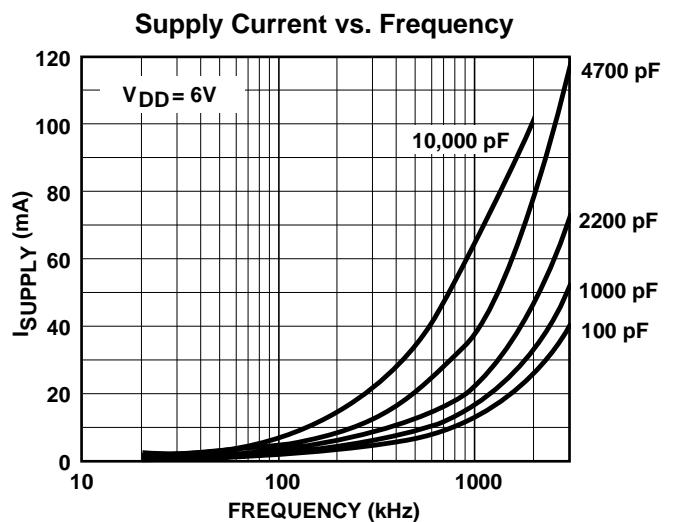
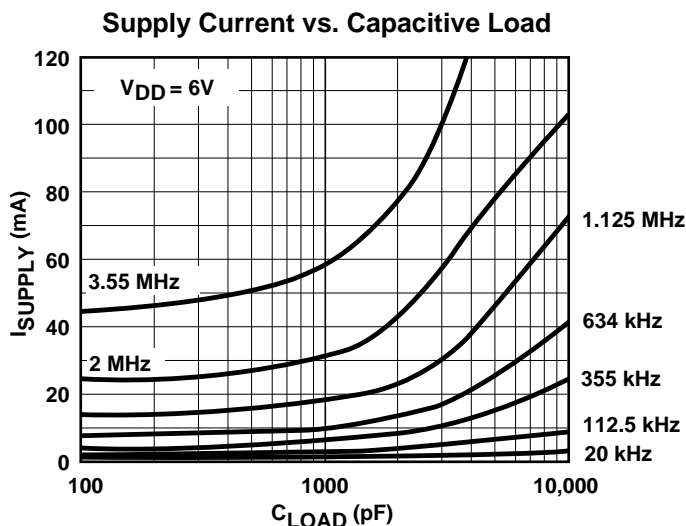
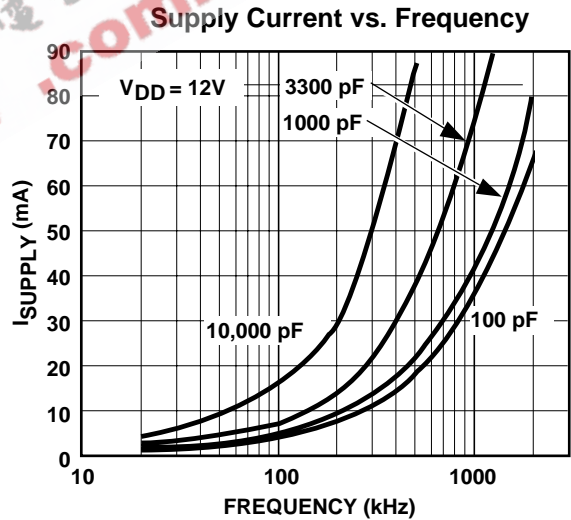
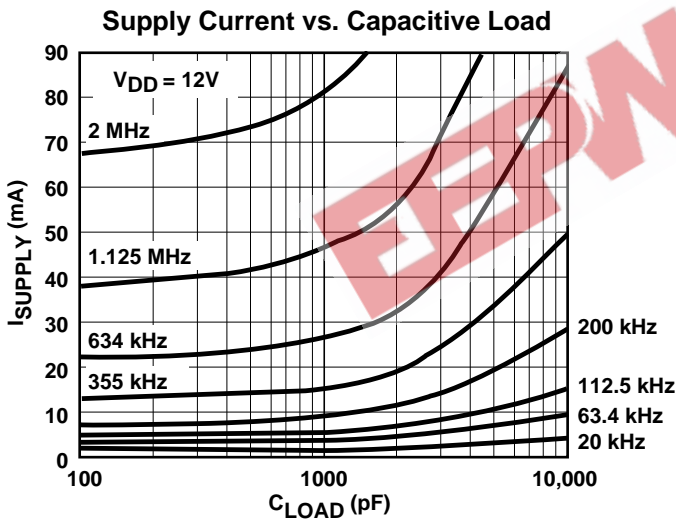
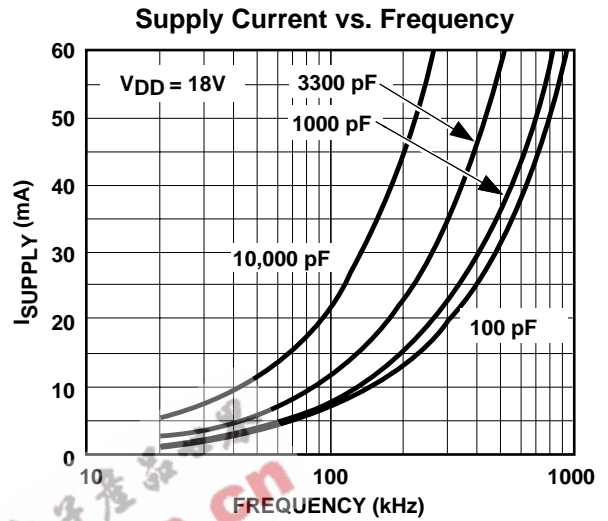
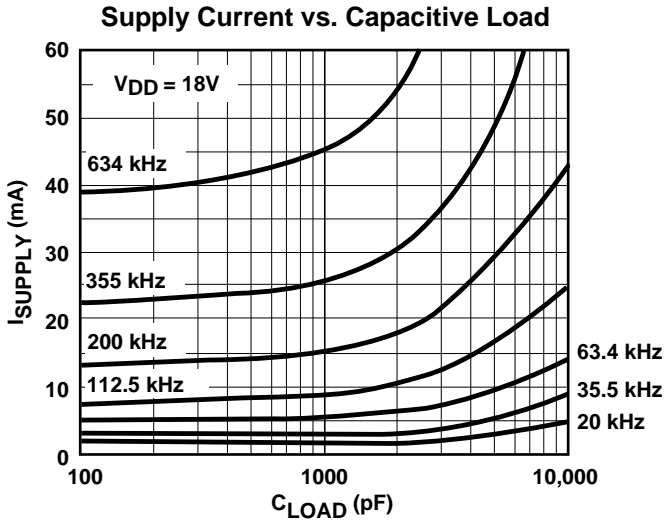
Output Resistance (Output Low) vs. Supply Voltage



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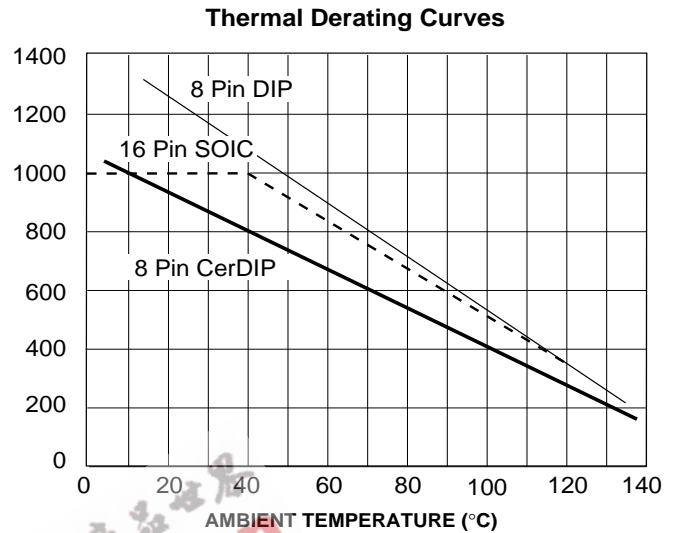
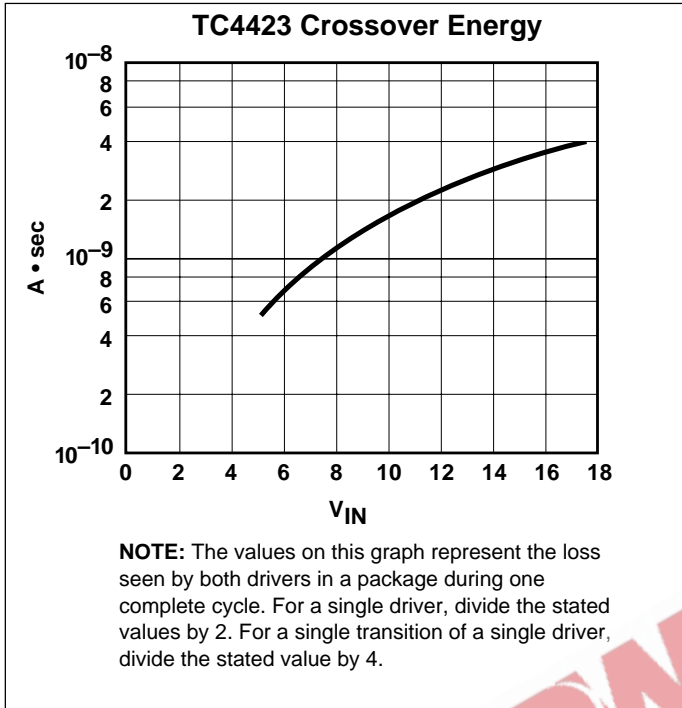
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SUPPLY CURRENT CHARACTERISTICS (Load on Single Output Only)



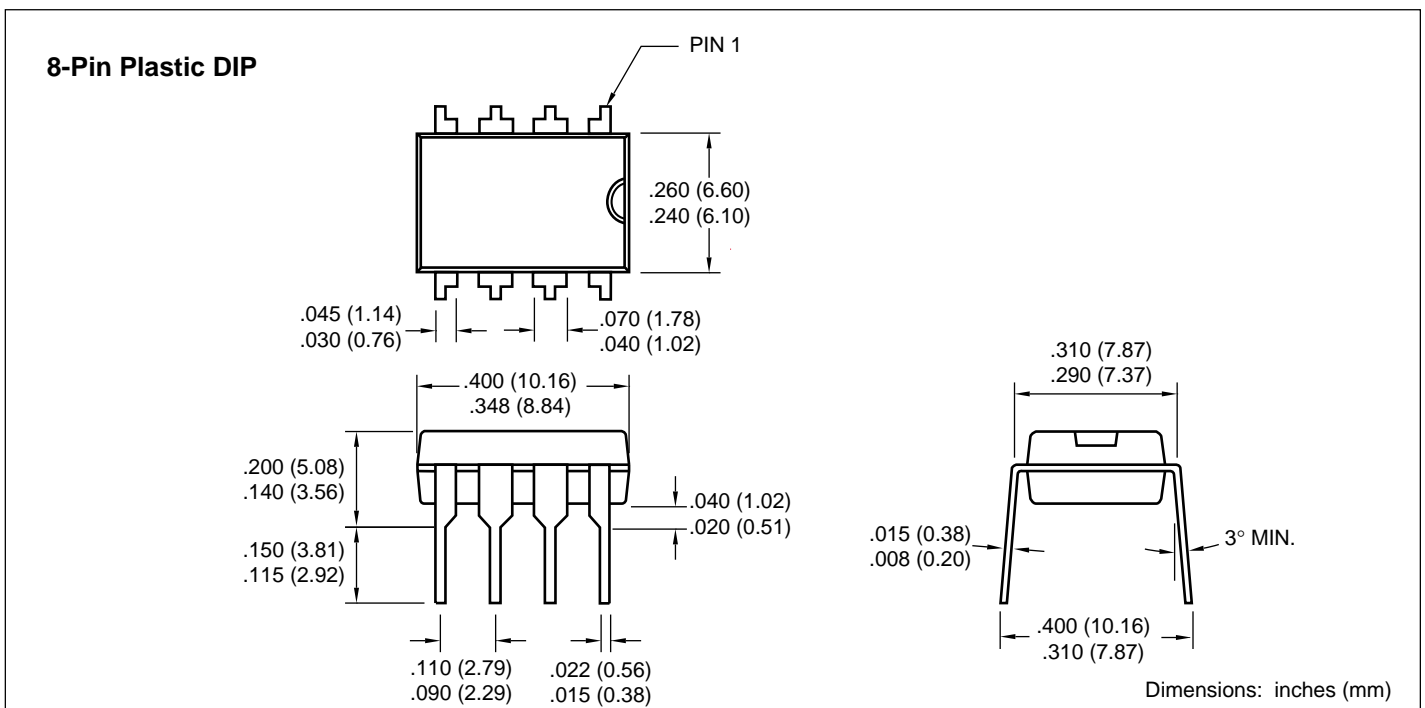
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TC4424
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*Static-sensitive device. Unused devices must be stored in conductive material. Protect devices from static discharge and static fields. Stresses above those listed under Absolute Maximum Ratings (See page 2) 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.

PACKAGE DIMENSIONS

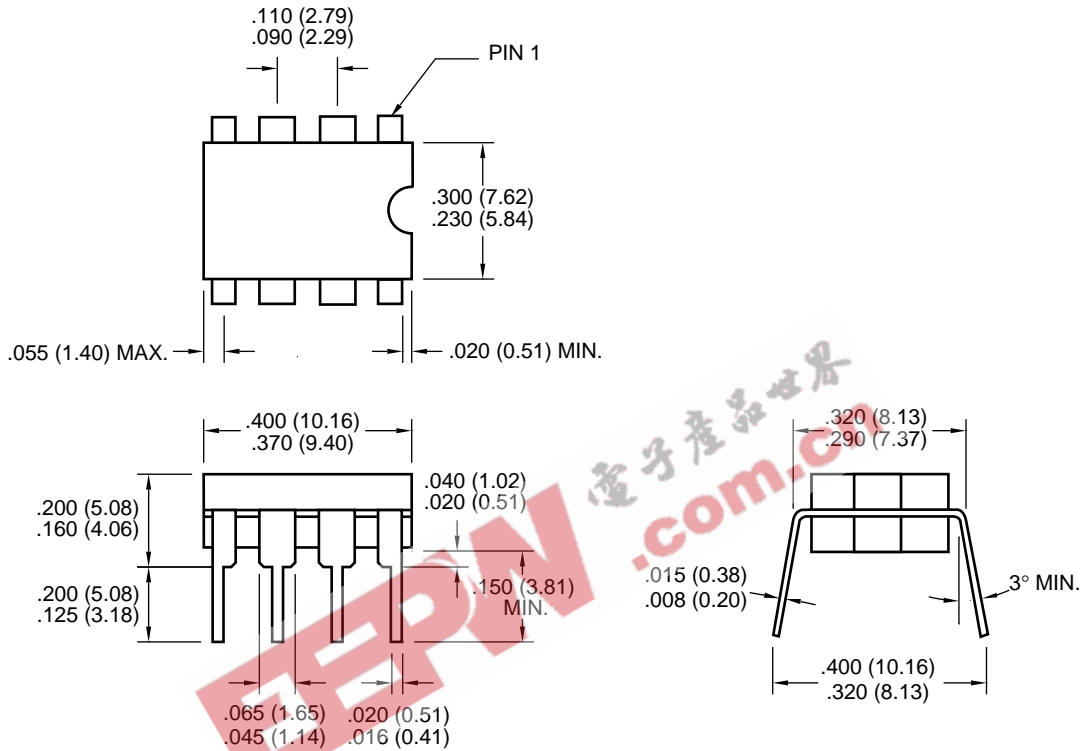


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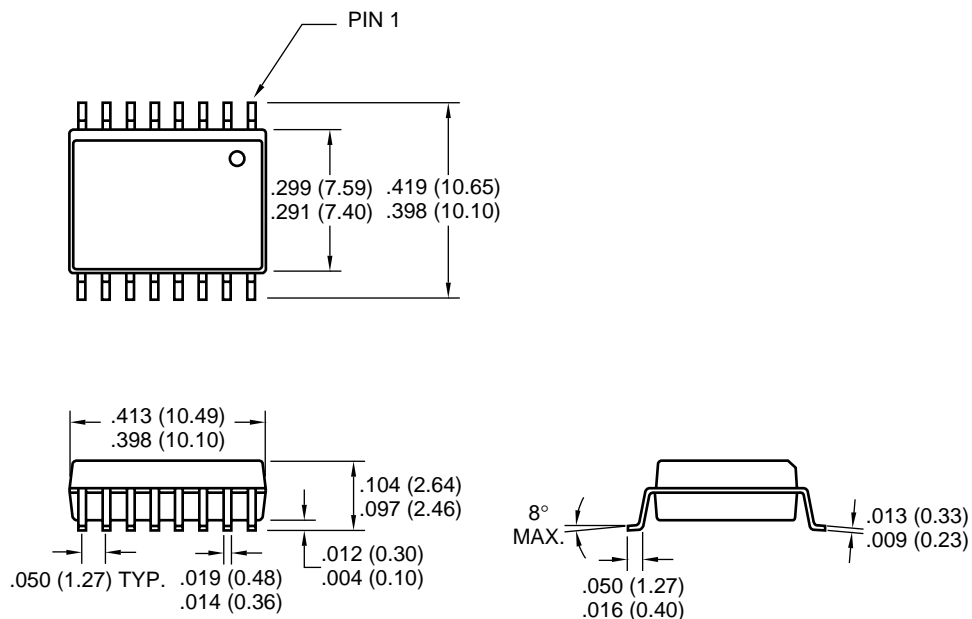
TC4423
TC4424
TC4425

PACKAGE DIMENSIONS (Cont.)

8-Pin CerDIP



16-Pin Plastic SOIC (Wide)



Dimensions: inches (mm)



WORLDWIDE SALES AND SERVICE

AMERICAS

Corporate Office

2355 West Chandler Blvd.
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Tel: 631-273-5305 Fax: 631-273-5335

San Jose

Microchip Technology Inc.
2107 North First Street, Suite 590
San Jose, CA 95131
Tel: 408-436-7950 Fax: 408-436-7955

Toronto

6285 Northam Drive, Suite 108
Mississauga, Ontario L4V 1X5, Canada
Tel: 905-673-0699 Fax: 905-673-6509

ASIA/PACIFIC

China - Beijing

Microchip Technology Beijing Office
Unit 915
New China Hong Kong Manhattan Bldg.
No. 6 Chaoyangmen Beidajie
Beijing, 100027, No. China
Tel: 86-10-85282100 Fax: 86-10-85282104

China - Shanghai

Microchip Technology Shanghai Office
Room 701, Bldg. B
Far East International Plaza
No. 317 Xian Xia Road
Shanghai, 200051
Tel: 86-21-6275-5700 Fax: 86-21-6275-5060

Hong Kong

Microchip Asia Pacific
RM 2101, Tower 2, Metroplaza
223 Hing Fong Road
Kwai Fong, N.T., Hong Kong
Tel: 852-2401-1200 Fax: 852-2401-3431

India

Microchip Technology Inc.
India Liaison Office
Divyasree Chambers
1 Floor, Wing A (A3/A4)
No. 11, OIShaughnessey Road
Bangalore, 560 025, India
Tel: 91-80-2290061 Fax: 91-80-2290062

Japan

Microchip Technology Intl. Inc.
Benex S-1 6F
3-18-20, Shinyokohama
Kohoku-Ku, Yokohama-shi
Kanagawa, 222-0033, Japan
Tel: 81-45-471-6166 Fax: 81-45-471-6122

Korea

Microchip Technology Korea
168-1, Youngbo Bldg. 3 Floor
Samsung-Dong, Kangnam-Ku
Seoul, Korea
Tel: 82-2-554-7200 Fax: 82-2-558-5934

ASIA/PACIFIC (continued)

Singapore

Microchip Technology Singapore Pte Ltd.
200 Middle Road
#07-02 Prime Centre
Singapore, 188980
Tel: 65-334-8870 Fax: 65-334-8850

Taiwan

Microchip Technology Taiwan
11F-3, No. 207
Tung Hua North Road
Taipei, 105, Taiwan
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EUROPE

Australia

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Australia
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Denmark

Microchip Technology Denmark ApS
Regus Business Centre
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Ballerup DK-2750 Denmark
Tel: 45 4420 9895 Fax: 45 4420 9910

France

Arizona Microchip Technology SARL
Parc d'Activite du Moulin de Massy
43 Rue du Saule Trapu
Batiment A - 1er Etage
91300 Massy, France
Tel: 33-1-69-53-63-20 Fax: 33-1-69-30-90-79

Germany

Arizona Microchip Technology GmbH
Gustav-Heinemann Ring 125
D-81739 Munich, Germany
Tel: 49-89-627-144 0 Fax: 49-89-627-144-44

Germany

Analog Product Sales
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Italy

Arizona Microchip Technology SRL
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Palazzo Taurus 1 V. Le Colleoni 1
20041 Agrate Brianza
Milan, Italy
Tel: 39-039-65791-1 Fax: 39-039-6899883

United Kingdom

Arizona Microchip Technology Ltd.
505 Eskdale Road
Winnersh Triangle
Wokingham
Berkshire, England RG41 5TU
Tel: 44 118 921 5869 Fax: 44-118 921-5820

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