



钰地半导体  
Tudi Semiconductor

## Product Specification

TUDI-MIC4423/4424/4425

Dual 3A Peak Low-Side MOSFET Drivers

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- research and development
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## Features

- High Peak Output Current:3A
- Wide Supply Voltage Operating Range:4.5V to 18V
- High Capacitive Load Drive Capability1000pF in 11ns(typical)
- Short Delay Times:35ns (typical)
- Matched Rise/Fall Times
- Low Output Impedance
- Low Supply Current
- Over-temperature Protection
- Under-voltage Lockout
- Non-overlapped Drive Tech
- ESD Protected:2.0kV
- Input withstands negative inputs up to 5V
- Available in Green SOP8 and DIP8

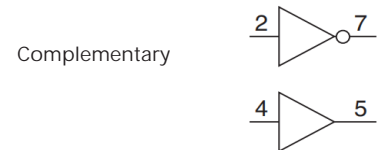
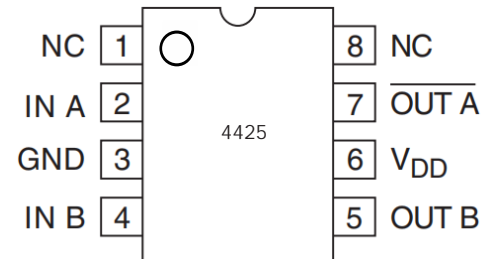
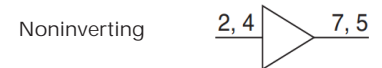
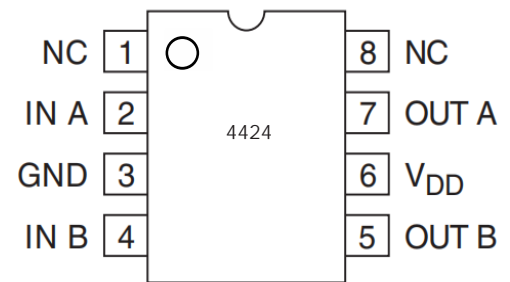
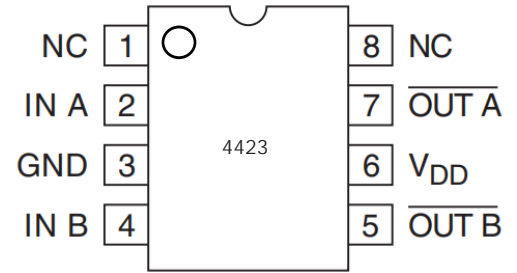
## Applications

- Wireless Power Transmitter
- Switch Mode Power Supplies
- Power MOSFET Drivers
- Pulse Transformer Drivers
- Line Drivers
- CCD Driver
- Class D Switching Amplifiers

## Description

The MIC4423/4424/4425 are matched dual power MOSFET drivers. Unique circuit design enables high speed operation capable of delivering peak currents of 3A into 1000pF capacitive loads.

Improved speed and drive capability are enhanced by matched rise and fall delay times. These matched delays maintain the integrity of input-to-output pulse-widths to reduce timing errors and clockskew problems. Dynamic switching losses are minimized with non-overlapped drive techniques. These devices are highly latch-up resistant 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. All terminals are fully protected against Electrostatic Discharge (ESD) up to 2.0 kV.





## Pin Description

Pin	Name	Description
1	NC	No connection
2	IN A	Input A
3	GND	Ground
4	In B	Input B
5	OUT B	Output of Channel B
6	VDD	Power Supply
7	OUTA	Output of Channel A
8	NC	No connection
-	PAD	Exposed Metal Pad

## Function Table

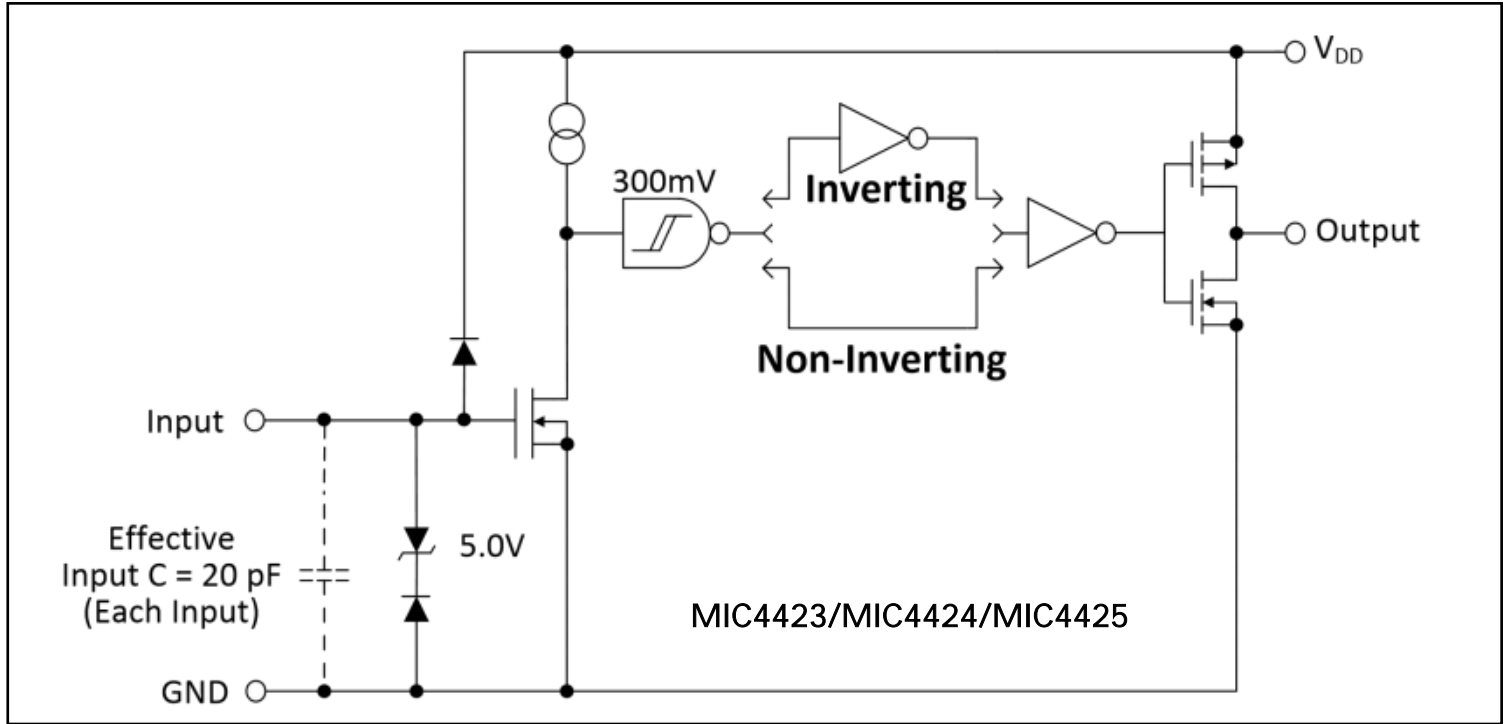
		MIC4423		MIC4424		MIC4425	
INA	INB	OUTA	OUT B	OUTA	OUTB	OUTA	OUTB
L	L	H	H	L	L	H	L
L	H	H	L	L	H	H	H
H	L	L	H	H	L	L	L
H	H	L	L	H	H	L	H

## Thermal Data

Parameter	Rating	Unit
Package Thermal Resistance	155(SOP8) 90(DIP8)	°CW



## Functional Block Diagram



### Note

1: MIC4423 has two inverting drivers, while the MIC4424 has two non-inverting drivers. The MIC4425 has one inverting and one non-inverting driver.

2: Ground any unused driver input.

## Absolute Maximum Ratings

Parameter	Min	Max	Unit
DC supply voltage $V_s$		26	V
Operating junction temperature	-40	85	
Storage temperature	-55	150	
Maximum input voltage	GND-5	VDD+0.3	V
Combined peak output current		3	A

Note: Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.



## Recommended Operating Conditions

Parameter	Rating	Unit
DC Supply Voltage	4.5-18	V
Operating ambient temperature	-40~85	°C

## Additional description

<b>Output A and B</b>
MOSFET driver outputs A and B are low-impedance,CMOS push-pull style outputs.The pull-down and pullup devices are of equal strength,making the rise and fall times equivalent.
<b>Inputs A and B</b>
MOSFET driver inputs A and B are high-impedance,TTL/CMOS compatible inputs.These inputs also have 300 mV of hysteresis between the high and low thresholds that prevents output glitching even when the rise and fall time of the input signal is very slow.
<b>Supply Input (VDD)</b>
The VDD input is the bias supply for the MOSFET driver and is rated for 4.5V to 18V with respect to the Ground pin.The VDD input should be bypassed with local ceramic capacitors.The value of these capacitors should be chosen based on the capacitive load that is being driven.A value of 1.0μF is suggested.
<b>Ground(GND)</b>
Ground is the device return pin.The Ground pin(s) should have a low-impedance connection to the bias supply source return.High peak current flows out the Ground pin(s) when the capacitive load is being discharged.
<b>Exposed Metal Pad</b>
The exposed metal pad of the DFN-8 package is not internally connected to any potential. Therefore,this pad can be connected to a ground plane or other copper plane on a Printed Circuit Board(PCB),to aid in heat removal from the package.



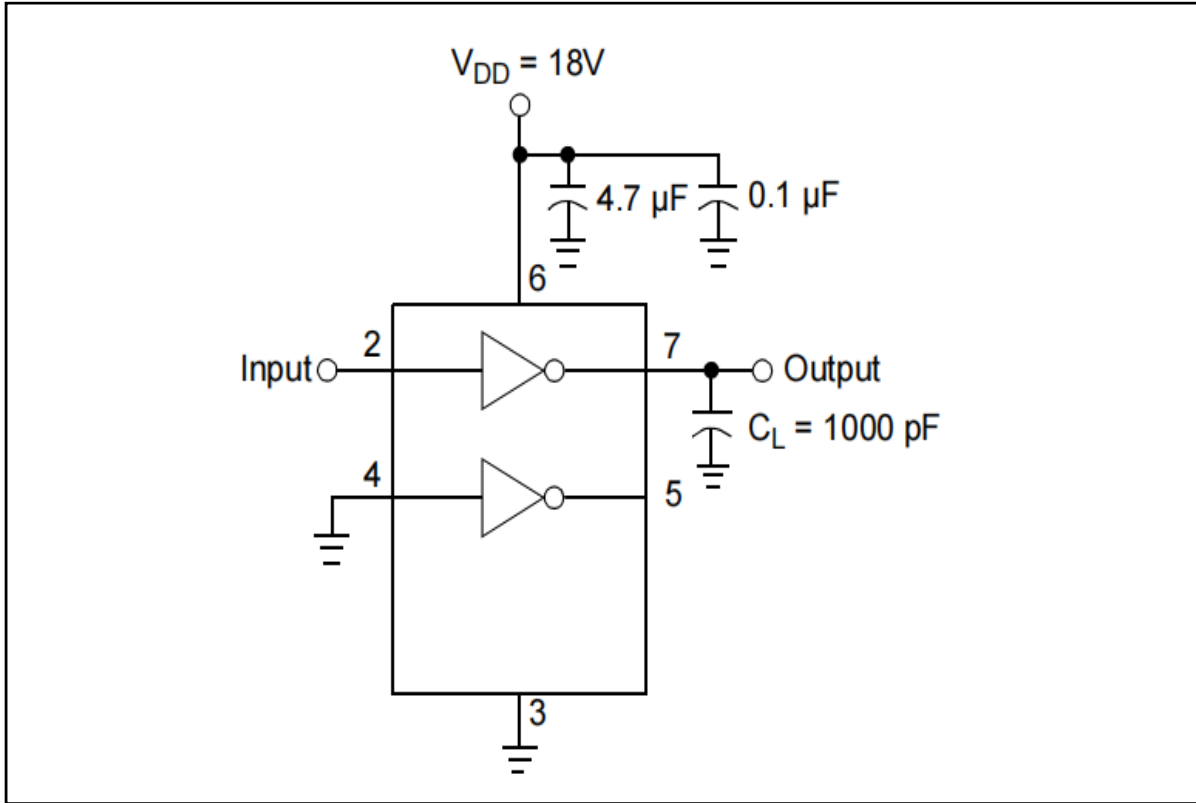
## Electrical Characteristics

(Typical values are tested at  $T_A=25^\circ\text{C}$ ,  $V_{DD}=18\text{V}$ )

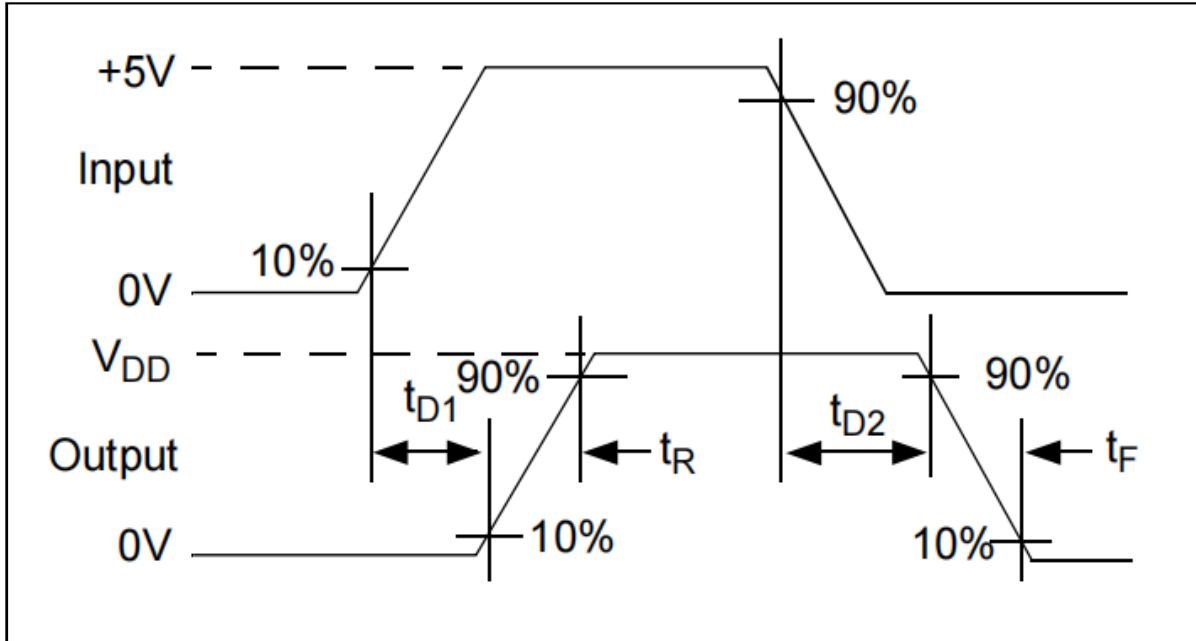
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Input</b>						
Input Signal High Threshold	$V_{IH}$		1.8			V
Input Signal Low Threshold	$V_{IL}$				0.7	V
Input Signal Hysteresis	$V_{HYS}$			0.3		V
Input Current	$I_{in}$	OV $V_{In}$ VDD			$\pm 1$	$\mu\text{A}$
<b>Output</b>						
Pull-Up Resistance	$R_{oH}$	Source Current = 10mA		2.0		
Pull-Down Resistance	$R_{oL}$	Sink Current = -10mA		2.0		
Peak Output Current	$I_{pk}$	Source Current, $f=1\text{kHz}$ , $CL=1000\text{pF}$		3		A
		Sink Current, $f=1\text{kHz}$ , $CL=1000\text{pF}$		3		
Continuous Output Current	$I_{oc}$	Source /Sink Current		$\pm 200$		mA
<b>Power supply Current</b>						
Power Supply Current	$I_{cc}$	$V_{INA}=V_{INB}=3\text{V}$		0.9		mA
		$V_{INA}=V_{INB}=0\text{V}$		0.5		
Operating Voltage Range	VDD		4.5		18	V
Under-Voltage Lockout ONThreshold				3.6	4	V
Under-Voltage LockoutHysteresis				0.5		V
<b>Switching characteristics</b>						
Rise Time	$t_R$	$CL=1000\text{pF}$		11		ns
Fall Time	$t_F$	$CL=1000\text{pF}$		11		ns
Turn-On Delay Time	$t_{D1}$	Non-inverting Input		34		ns
		Inverting Input		44		ns
Turn-Off Delay Time	$t_{D2}$	Non-inverting Input		34		ns
		Inverting Input		44		ns
<b>Over-temperature protection</b>						
Thermal Shutdown Threshold				150		
Thermal Shutdown ThresholdHysteresis				25		



## Switching Time Test Circuit



Inverting Driver



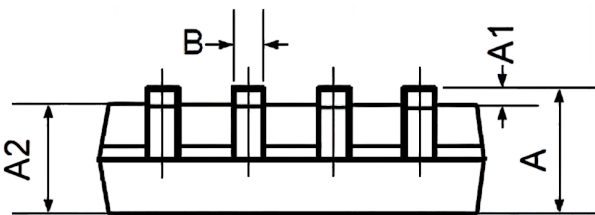
Non-Inverting Driver

## Order information

Order Number	Package	Package Quantity	Marking On The park	Temperature
MIC4423BM-TR-TUDI	SOP8	Tape,Reel,2500	4423BM	-40°C to 85°C
MIC4423BN-TUDI	DIP8	Tube,50,A box of 2000	MIC4423BN	
MIC4424BM-TR-TUDI	SOP8	Tape,Reel,2500	4424BM	
MIC4424BN-TUDI	DIP8	Tube,50,A box of 2000	MIC4424BN	
MIC4425BM-TR-TUDI	SOP8	Tape,Reel,2500	4425BM	
MIC4425BN-TUDI	DIP8	Tube,50,A box of 2000	MIC4425BN	



Package SOP8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
B	0.330	0.510	0.013	0.020
C	0.190	0.250	0.007	0.010
D	4.780	5.000	0.188	0.197
E	3.800	4.000	0.150	0.157
E1	5.800	6.300	0.228	0.248
e	1.270TYP		0.050TYP	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Package DIP8



Symbol	Min	Non	Max
A1	6.28	6.33	6.38
A2	6.33	6.38	6.43
A3	7.52	7.62	7.72
A4	7.80	8.40	9.00
B1	9.15	9.20	9.25
B2	9.20	9.25	9.30
C		5.57	
D		1.52	
E	0.43	0.45	0.47
F		2.54	
G		0.25	
H	1.54	1.59	1.64
I	3.22	3.27	3.32
R		0.20	
M1	9°	10°	11°
M2	11°	12°	13°



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