



# TF0227(1/2/3/5)

## Dual High Speed Low-Side Gate Driver

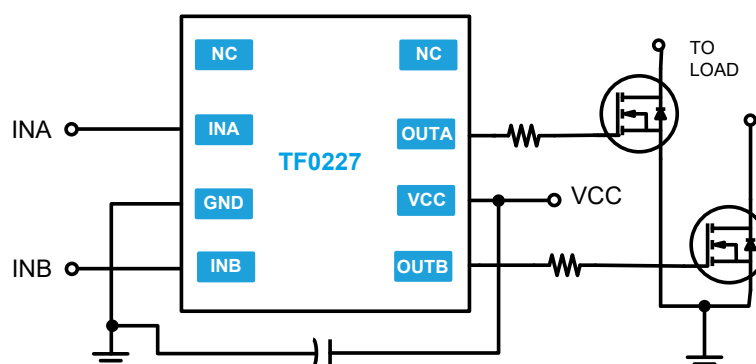
### Features

- Efficient, low-cost solution for driving MOSFETs and IGBTs
- Wide supply voltage operating range: 4.5V to 18V
- A wide range (1.5A-4A) of source/sink output current capability offerings
- Fast propagation delays (35ns typical)
- Fast rise and fall times
- Logic input (IN) 3.3V capability
- Extended temperature range: -40°C to +125°C

### Applications

- Switch mode power supplies
- Motor Drive
- Line Drivers
- DC-DC Converters

### Typical Application

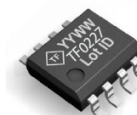


### Description

The TF0227(x), dual, high speed, low side MOSFET and IGBT drivers are capable of driving a range of source/sink peak capabilities. The TF0227(x) logic inputs are compatible with standard TTL and CMOS levels (down to 3.3V) to interface easily with MCUs. Fast and well matched propagation delays allow high speed operation, enabling a smaller, more compact power switching design using smaller associated components.

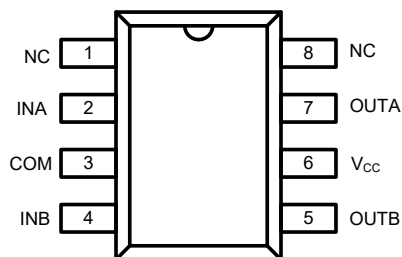
The TF0227(x) is offered in an SOIC-8(N) package and it operates over an extended -40 °C to +125 °C temperature range.

SOIC-8(N)



### Ordering Information

PART NUMBER	PACKAGE	PACK / Qty	MARK
TF0227-TAU	SOIC-8(N)	Tube / 100	YYWW TF0227
TF0227-TAH	SOIC-8(N)	T&R / 2500	Lot ID

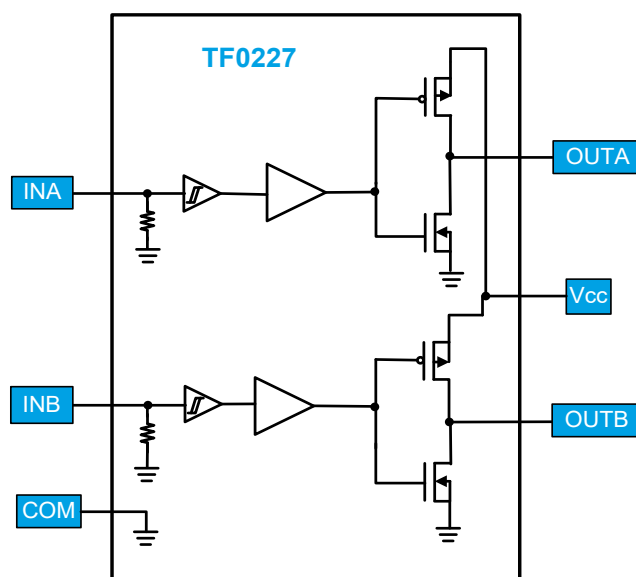


Top View: SOIC8

## Pin Descriptions

PIN NAME	PIN NUMBER	PIN DESCRIPTION
NC	1, 8	No Connect
INA	2	Logic input for A phase, in phase with OUTA.
COM	3	Supply return
INB	4	Logic input for B phase, in phase with OUTB.
OUTB	5	Gate driver output B phase
V <sub>CC</sub>	6	Supply input
OUTA	7	Gate driver output A phase

## Functional Block Diagram





## Absolute Maximum Ratings (NOTE1)

$V_{CC}$  - Low-side fixed supply voltage.....-0.3V to +22V  
 $V_{OUT}$  - Output voltage (OUTA/OUTB).....-0.3V to  $V_{CC}$  +0.3V  
 $V_{IN}$  - Logic input voltage (INA, INB).....-0.3V to  $V_{CC}$  +0.3V  
 ESD Protection on all pins.....2kV (HBM)

$P_D$  - Package power dissipation at  $T_A \leq 25^\circ\text{C}$   
 SOIC8 .....0.625W  
 SOIC8 Thermal Resistance **(NOTE2)**  
 $\theta_{JA}$ .....200  $^\circ\text{C}/\text{W}$   
 $T_J$  - Junction operating temperature.....+150  $^\circ\text{C}$   
 $T_L$  - Lead Temperature (soldering, 10 seconds).....+300  $^\circ\text{C}$   
 $T_{stg}$  - Storage temperature .....-55 to 150  $^\circ\text{C}$

**NOTE1** Stresses beyond 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 beyond 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.

**NOTE2** When mounted on a standard JEDEC 2-layer FR-4 board.

## Recommended Operating Conditions

Symbol	Parameter	MIN	MAX	Unit
$V_{CC}$	Supply voltage	4.5	18	V
$V_{OUT}$	Output voltage (OUTA/OUTB)	0	$V_{CC}$	V
$V_{IN}$	Logic input voltage (INA, INB)	0	5	V
$T_A$	Ambient temperature	-40	125	$^\circ\text{C}$



## Electrical Characteristics (NOTE3)

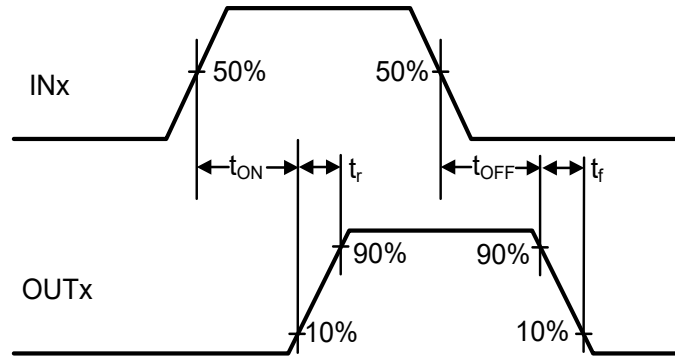
$V_{BIAS}$  (4.5V <  $V_{CC}$  < 18V),  $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise specified.

Symbol	Parameter	Conditions	MIN	TYP	MAX	Unit
<b>DC Characteristics</b>						
$V_{IH}$	Logic "1" input voltage		2.4			V
$V_{IL}$	Logic "0" input voltage				0.7	
$I_{IN+}$	Logic "1" input bias current	$V_{IN} = 3.3V$			10	$\mu\text{A}$
$I_{IN-}$	Logic "0" input bias current	$V_{IN} = 0V$			10	
$V_{OH}$	High level output voltage, $V_{BIAS} - V_O$	$I_{OUT} = -10\text{mA}$		30	100	mV
$V_{OL}$	Low level output voltage	$I_{OUT} = 10\text{mA}$		16	50	
$I_{CCQ}$	$V_{CC}$ quiescent supply current	$V_{IN} = 0V$ or $3.3V$		40	100	$\mu\text{A}$
$I_{O+}$	Output high short circuit pulsed current	TF0227, $V_{CC} = 14V$		4.0		A
$I_{O-}$	Output low short circuit pulsed current	TF0227, $V_{CC} = 14V$		4.0		A
$I_{O+}$	Output high short circuit pulsed current	TF02271, $V_{CC} = 14V$		1.5		A
$I_{O-}$	Output low short circuit pulsed current	TF02271, $V_{CC} = 14V$		1.5		A
$I_{O+}$	Output high short circuit pulsed current	TF02272, $V_{CC} = 14V$		2.5		A
$I_{O-}$	Output low short circuit pulsed current	TF02272, $V_{CC} = 14V$		2.5		A
$I_{O+}$	Output high short circuit pulsed current	TF02273, $V_{CC} = 14V$		2.3		A
$I_{O-}$	Output low short circuit pulsed current	TF02273, $V_{CC} = 14V$		3.3		A
$I_{O+}$	Output high short circuit pulsed current	TF02275, $V_{CC} = 18V$		2.5		A
$I_{O-}$	Output low short circuit pulsed current	TF02275, $V_{CC} = 18V$		5.0		A
$R_{OH}$	Output Resistance, High, TF0227	$I_{OUT} = -10\text{mA}$ , $V_{CC} = 14V$		1.5		$\Omega$
$R_{OL}$	Output Resistance, Low, TF0227	$I_{OUT} = 10\text{mA}$ , $V_{CC} = 14V$		1		$\Omega$
$R_{OH}$	Output Resistance, High, TF02271/3/5	$I_{OUT} = -10\text{mA}$ , $V_{CC} = 14V$		TBD		
$R_{OL}$	Output Resistance, Low, TF02271/3/5	$I_{OUT} = 10\text{mA}$ , $V_{CC} = 14V$		TBD		

**NOTE3** The  $V_{IN}$  and  $I_{IN}$  parameters are applicable to the logic input pin: INA and INB. The  $V_O$  and  $I_O$  parameters are applicable to the output pins: OUTA and OUTB.



Switching Characteristics						
$t_r$	Turn-on rise time, TF0227	$C_L = 1000\text{pF}, V_{CC} = 14\text{V}$		20	40	ns
$t_f$	Turn-off fall time, TF0227	$C_L = 1000\text{pF}, V_{CC} = 14\text{V}$		20	40	ns
$t_r$	Turn-on rise time, TF02271/3/5	$C_L = 1000\text{pF}, V_{CC} = 14\text{V}$		TBD		
$t_f$	Turn-off fall time, TF02271/3/5	$C_L = 1000\text{pF}, V_{CC} = 14\text{V}$		TBD		
$t_{on}$	Turn-on propagation delay	$C_L = 1000\text{pF}, V_{CC} = 14\text{V}$		40	100	ns
$t_{off}$	Turn-off propagation delay	$C_L = 1000\text{pF}, V_{CC} = 14\text{V}$		35	50	ns

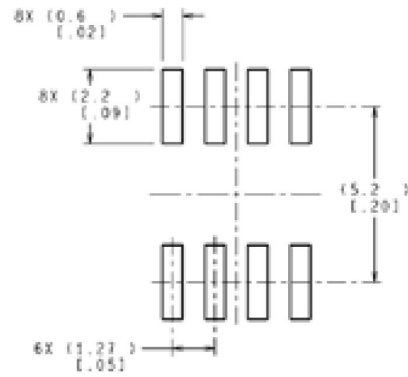
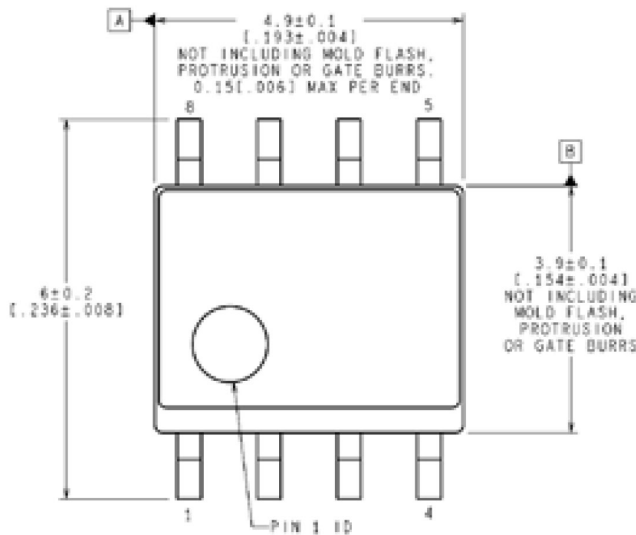


**Figure 1.** Switching Time Waveform Definitions

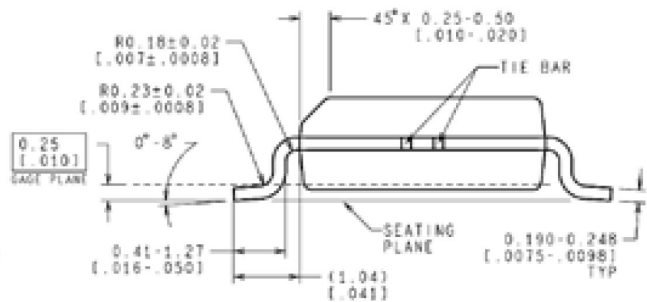
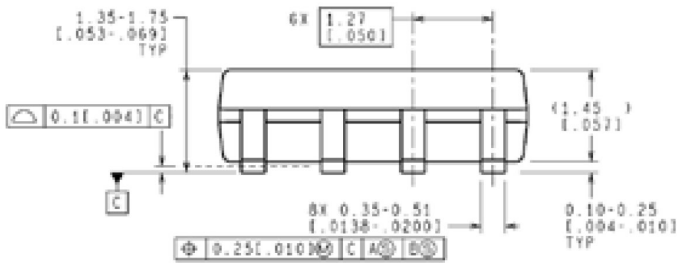


# Package Dimensions (SOIC-8 N)

Please contact support@tfsemi.com for package availability.



RECOMMENDED LAND PATTERN



CONTROLLING DIMENSION IS MILLIMETER  
VALUES IN [ ] ARE INCHES  
DIMENSIONS IN ( ) FOR REFERENCE ONLY

NOTES: UNLESS OTHERWISE SPECIFIED

1. REFERENCE JEDEC REGISTRATION MS-012, VARIATION AA.



## Revision History

Rev.	Change	Owner	Date
1.0	First release, Advance Info datasheet	Keith Spaulding	9/15/2017
1.1	Spec change match to early production data	Keith Spaulding	2/2/2018

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