



# THE DATASHEET OF AUIRS4427S



### Features

- Gate drive supply range from 6 V to 20 V
- CMOS Schmitt-triggered inputs
- 3.3V and 5V logic compatible
- Two independent gate drivers
- Matched propagation delay for both channels
- Outputs in phase with inputs
- Leadfree, RoHS compliant
- Automotive qualified\*

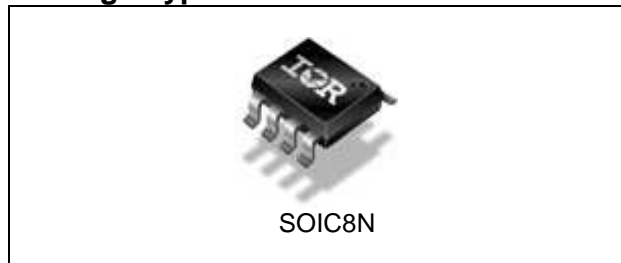
### Typical Applications

- Automotive General Purpose Dual Low Side Driver
- Automotive DC-DC converters
- Hybrid Power Train Drives
- Direct Fuel Injection

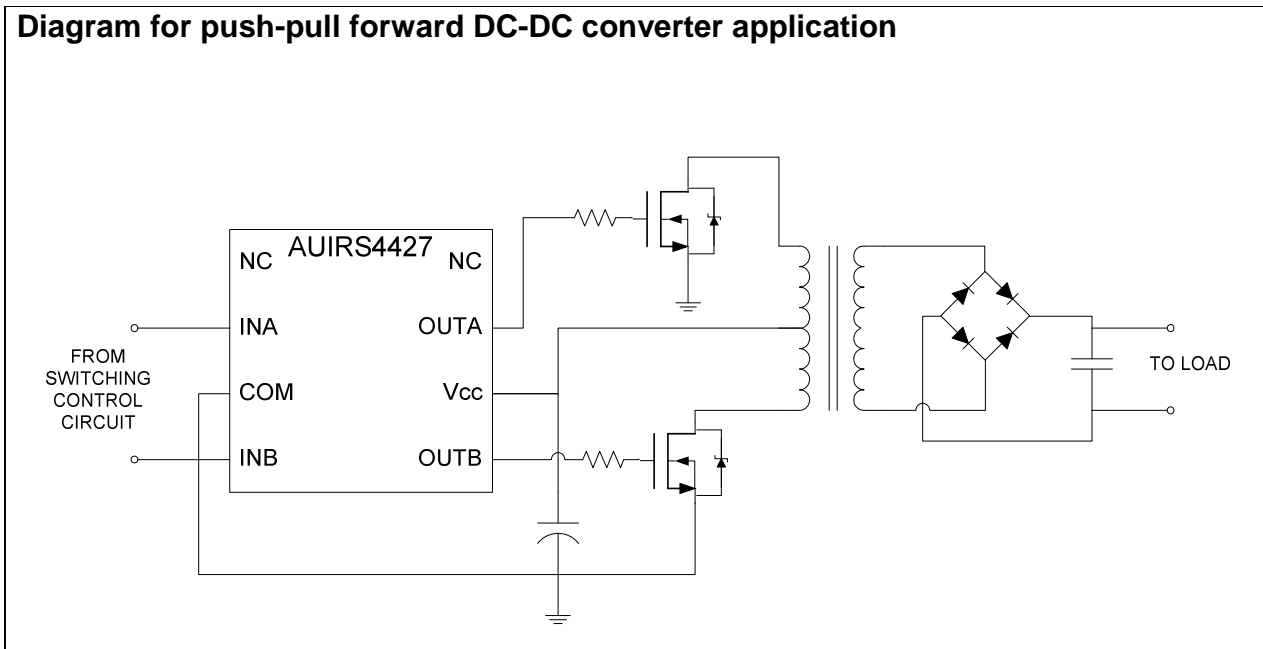
### Product Summary

Topology	General Driver
V <sub>OUT</sub>	6V - 20V
I <sub>o+</sub> & I <sub>o-</sub> (typical)	2.3A & 3.3A
t <sub>on</sub> & t <sub>off</sub> (typical)	50ns & 50ns

### Package Type



### Diagram for push-pull forward DC-DC converter application

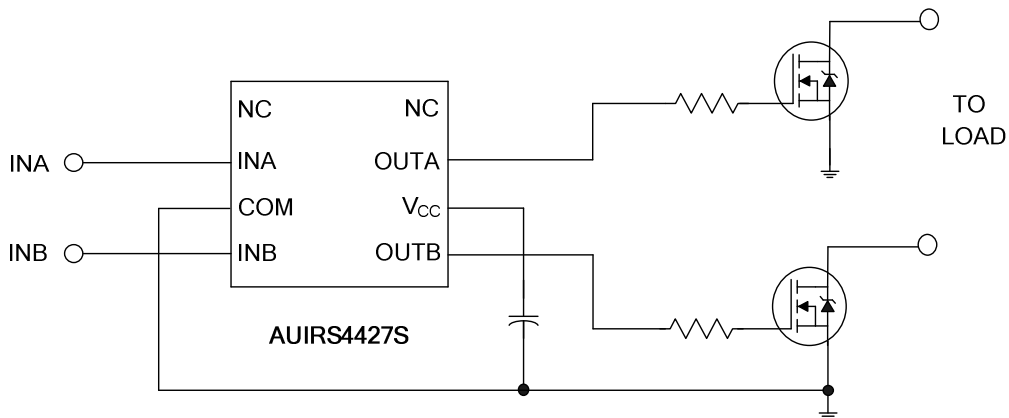


<b>Table of Contents</b>	<b>Page</b>
Diagram for push-pull forward dc-dc converter application	1
Description	3
Qualification Information	4
Absolute Maximum Ratings	5
Recommended Operating Conditions	5
Static Electrical Characteristics	6
Dynamic Electrical Characteristics	6
Functional Block Diagram	7
Input/Output Pin Equivalent Circuit Diagram	8
Lead Definitions	9
Lead Assignments	9
Application Information and Additional Details	10
Package Details: SOIC8	12
Package Details: SOIC8, Tape and Reel	13
Part Marking Information	14
Ordering Information	15
Important Notice	16

**Description**

The AUIRS4427S is a low voltage, high speed power MOSFET and IGBT driver. Proprietary latch immune CMOS technologies enable ruggedized monolithic construction. The logic input is compatible with standard CMOS or LSTTL output. The output drivers feature a high pulse current buffer stage designed for minimum driver cross-conduction. Propagation delays between two channels are matched.

**Typical Connection Diagram**



(Refer to Lead Assignments for correct pin configuration). This/These diagram(s) show electrical connections only. Please refer to our Application Notes and Design Tips for proper circuit board layout.

**Qualification Information<sup>†</sup>**

<b>Qualification Level</b>		Automotive (per AEC-Q100 <sup>††</sup> )	
		Comments: This family of ICs has passed an Automotive qualification. IR's Industrial and Consumer qualification level is granted by extension of the higher Automotive level.	
<b>Moisture Sensitivity Level</b>		SOIC8N	MSL3 <sup>†††</sup> 260°C (per IPC/JEDEC J-STD-020)
<b>ESD</b>	Machine Model	Class M3 (+/-200V) (per AEC-Q100-003)	
	Human Body Model	Class H3A (+/-4000V) (per AEC-Q100-002)	
	Charged Device Model	Class C5 (+/-1000V) (per AEC-Q100-011)	
<b>IC Latch-Up Test</b>		Class II, Level B (per AEC-Q100-004)	
<b>RoHS Compliant</b>		Yes	

† Qualification standards can be found at International Rectifier's web site <http://www.irf.com/>

†† Exceptions to AEC-Q100 requirements are noted in the qualification report.

††† Higher MSL ratings may be available for the specific package types listed here. Please contact your International Rectifier sales representative for further information.

**Absolute Maximum Ratings**

Absolute Maximum Ratings indicate sustained limits beyond which damage to the device may occur. All voltage parameters are absolute voltages referenced to COM. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions.

Symbol	Definition	Min	Max	Units
$V_{CC}$	Fixed supply voltage	-0.3	20	V
$V_O$	Output voltage	-0.3	$V_{CC} + 0.3$	
$V_{IN}$	Logic input voltage	-0.3	$V_{CC} + 0.3$	
$P_D$	Package power dissipation @ $T_A \leq 25^\circ\text{C}$	—	0.625	W
$R_{thJA}$	Thermal resistance, junction to ambient	—	200	$^\circ\text{C}/\text{W}$
$T_J$	Junction temperature	—	150	$^\circ\text{C}$
$T_S$	Storage temperature	-55	150	
$T_L$	Lead temperature (soldering, 10 seconds)	—	300	

**Recommended Operating Conditions**

For proper operation, the device should be used within the recommended conditions. All voltage parameters are absolute voltages referenced to COM unless otherwise stated in the table. The offset rating is tested with supply of  $V_{CC} = 15\text{V}$ .

Symbol	Definition	Min	Max	Units
$V_{CC}$	Fixed supply voltage	6	20	V
$V_O$	Output voltage	0	$V_{CC}$	
$V_{IN}$	Logic input voltage	0	$V_{CC}$	
$T_A$	Ambient temperature	-40	125	$^\circ\text{C}$

**Static Electrical Characteristics**

$V_{CC} = 15V$ ,  $T_A = 25^{\circ}C$  unless otherwise specified. The  $V_{IN}$  and  $I_{IN}$  parameters are referenced to COM and are applicable to input leads: INA and INB. The  $V_O$  and  $I_O$  parameters are referenced to COM and are applicable to the output leads: OUTA and OUTB.

Symbol	Definition	Min	Typ	Max	Units	Test Conditions
$V_{IH}$	Logic "1" input voltage	2.5	—	—	V	
$V_{IL}$	Logic "0" input voltage	—	—	0.8	V	
$V_{OH}$	High level output voltage, $V_{BIAS} - V_O$	—	—	1.4		$I_O = 0\text{ mA}$
$V_{OL}$	Low level output voltage, $V_O$	—	—	0.15		$I_O = 20\text{ mA}$
$I_{IN+}$	Logic "1" input bias current	—	5	15	$\mu A$	$V_{IN} = 5V$
$I_{IN-}$	Logic "0" input bias current	-30	-10	—		$V_{IN} = 0V$
$I_{QCC}$	Quiescent $V_{CC}$ supply current	—	100	200		$V_{IN} = 0V$ or $5V$
$I_{O+}$	Output high short circuit pulsed current <sup>(†)</sup>	1.5	2.3	—	A	$V_O = 0V$ , $V_{IN} = 5V$ $PW \leq 10\ \mu s$
$I_{O-}$	Output low short circuit pulsed current <sup>(†)</sup>	1.5	3.3	—		$V_O = 15V$ , $V_{IN} = COM$ $PW \leq 10\ \mu s$

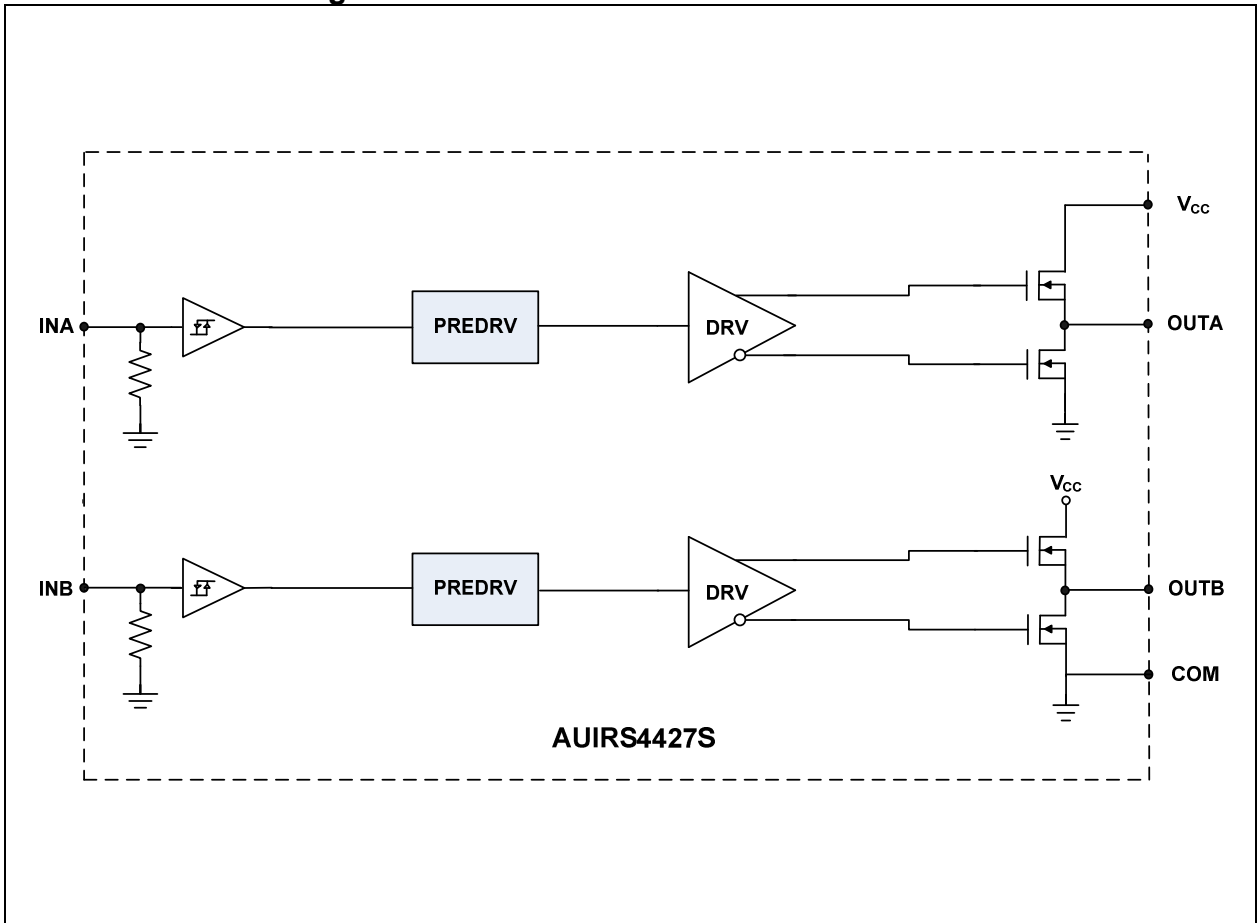
(†) Guaranteed by design

**Dynamic Electrical Characteristics**

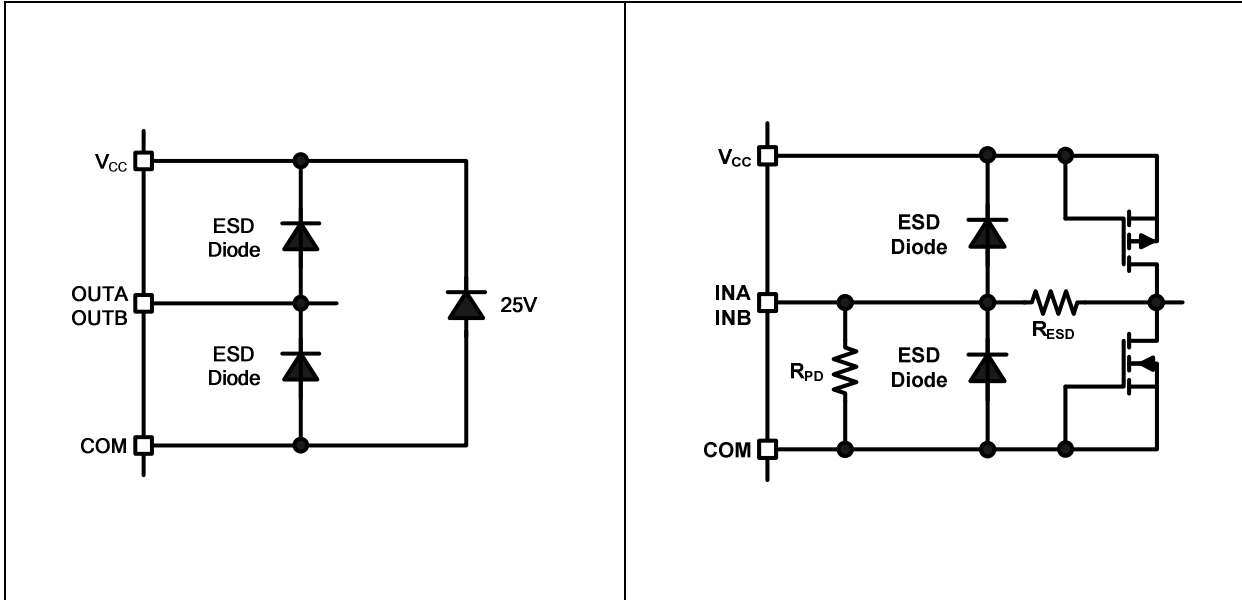
$V_{CC} = 15V$ ,  $T_A = 25^{\circ}C$ , and  $C_L = 1000pF$  unless otherwise specified.

Symbol	Definition	Min	Typ	Max	Units	Test Conditions
$t_{on}$	Turn-on propagation delay	—	50	95	ns	Figure 2
$t_{off}$	Turn-off propagation delay	—	50	95		
$t_r$	Turn-on rise time	—	25	55		
$t_f$	Turn-off fall time	—	25	55		

**Functional Block Diagram**



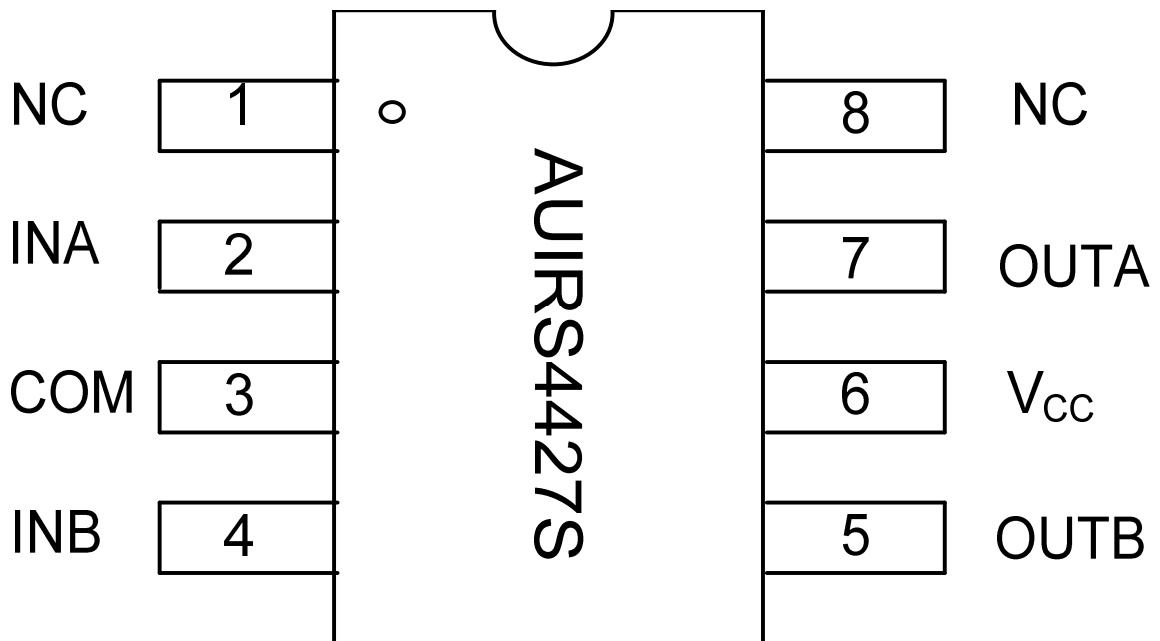
**Input/Output Pin Equivalent Circuit Diagrams**



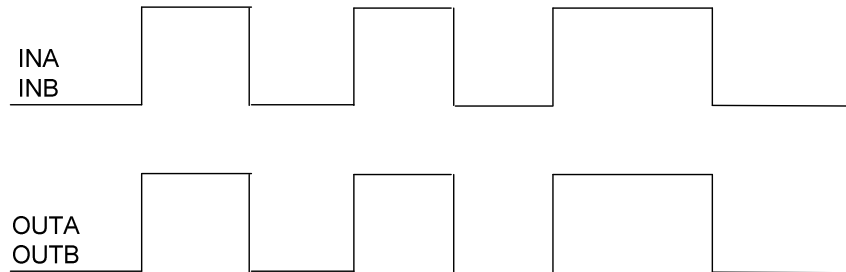
**Lead Definitions**

PIN	Symbol	Description
1	NC	No connection
2	INA	Logic input for gate driver output (OUTA), in phase
3	COM	Ground
4	INB	Logic input for gate driver output (OUTB), in phase
5	OUTB	Gate drive output B
6	V <sub>CC</sub>	Supply voltage
7	OUTA	Gate drive output A
8	NC	No connection

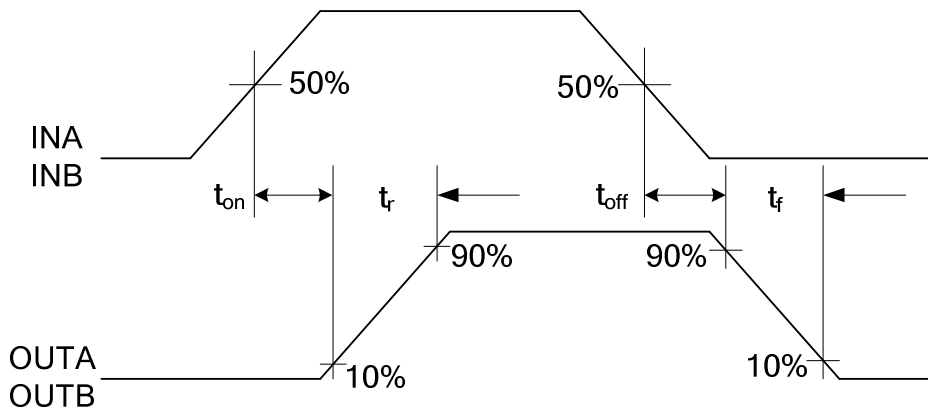
**Lead Assignments**



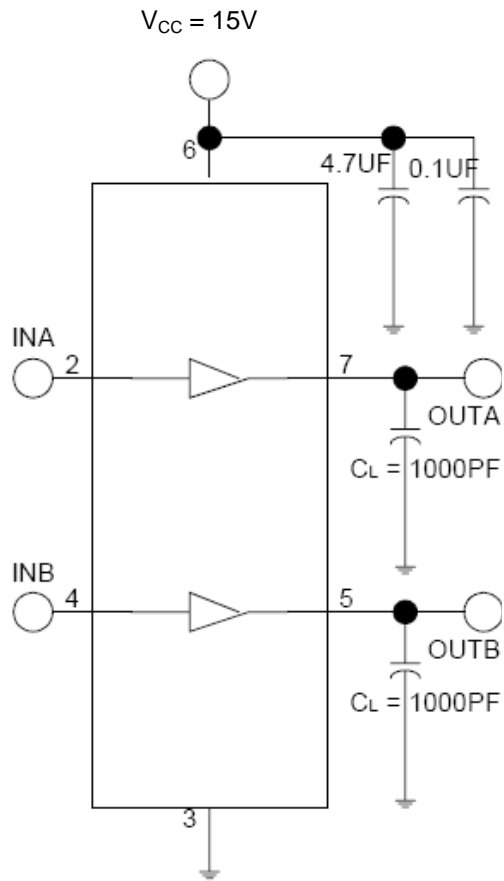
**Application Information and Additional Details**



**Figure 1: Input/output Timing Diagram**

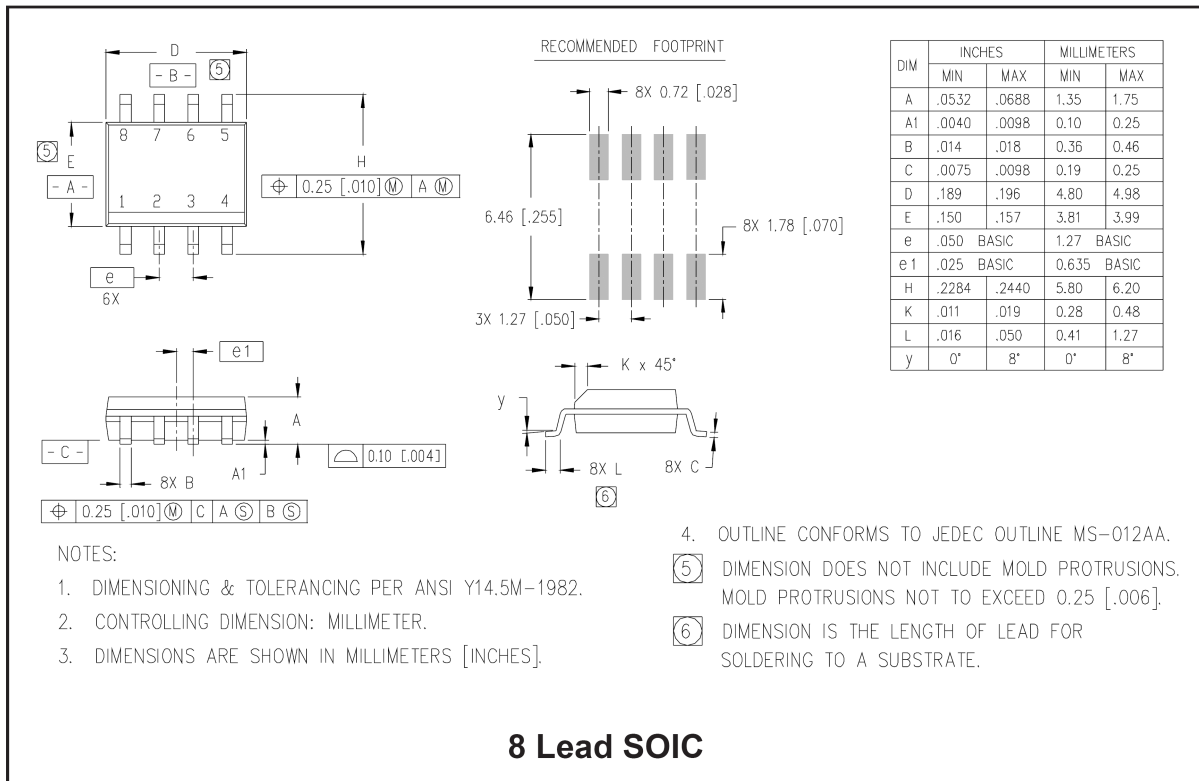


**Figure 2: Switching Time Waveform Definitions**

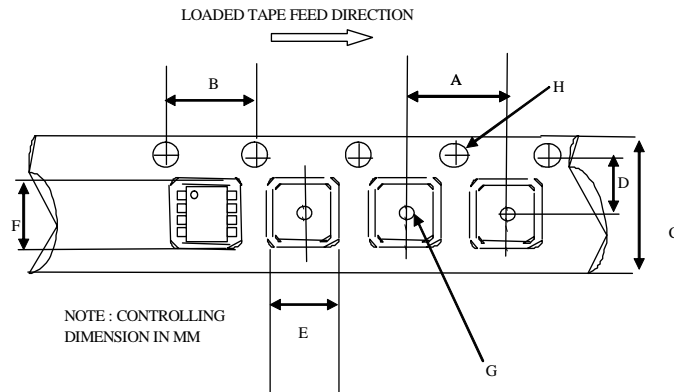


**Figure 3: Switching Time Test Circuit**

**Package Details, SOIC8N**

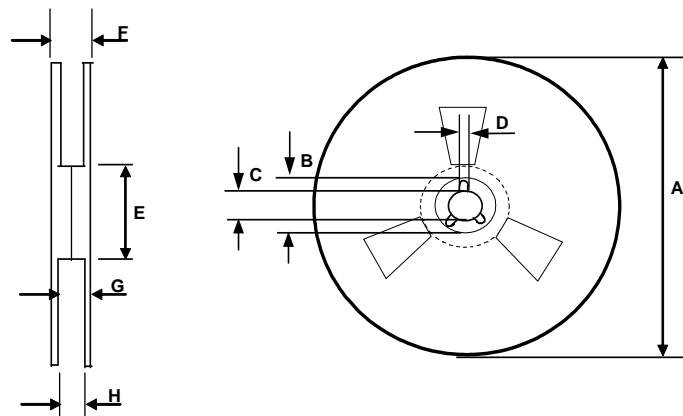


**Package details: SOIC8N, Tape and Reel**



CARRIER TAPE DIMENSION FOR 8SOICN

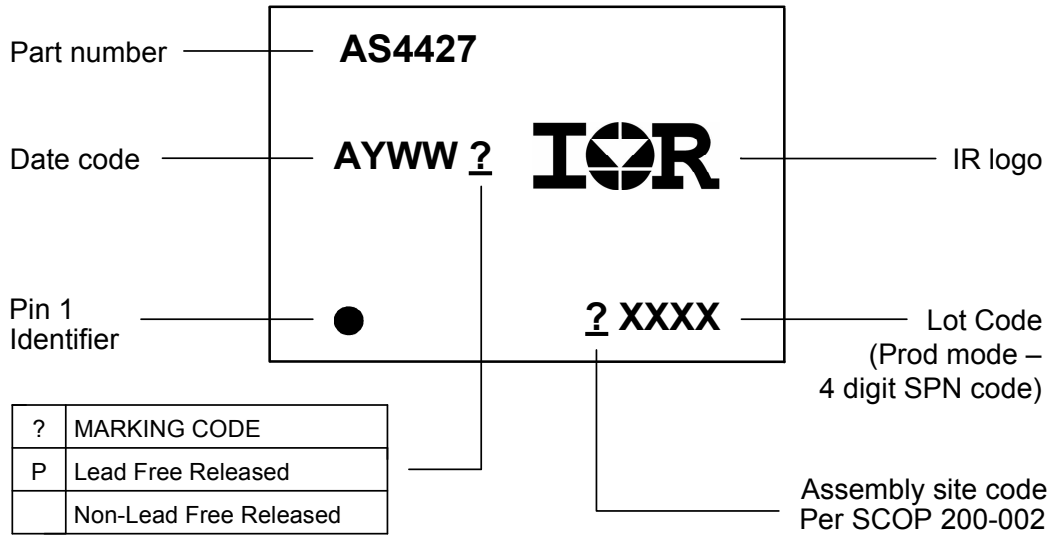
Code	Metric		Imperial	
	Min	Max	Min	Max
A	7.90	8.10	0.311	0.318
B	3.90	4.10	0.153	0.161
C	11.70	12.30	0.46	0.484
D	5.45	5.55	0.214	0.218
E	6.30	6.50	0.248	0.255
F	5.10	5.30	0.200	0.208
G	1.50	n/a	0.059	n/a
H	1.50	1.60	0.059	0.062



REEL DIMENSIONS FOR 8SOICN

Code	Metric		Imperial	
	Min	Max	Min	Max
A	329.60	330.25	12.976	13.001
B	20.95	21.45	0.824	0.844
C	12.80	13.20	0.503	0.519
D	1.95	2.45	0.767	0.096
E	98.00	102.00	3.858	4.015
F	n/a	18.40	n/a	0.724
G	14.50	17.10	0.570	0.673
H	12.40	14.40	0.488	0.566

**Part Marking Information**



**Ordering Information**

Base Part Number	Package Type	Standard Pack		Complete Part Number
		Form	Quantity	
AUIRS4427S	SOIC8N	Tube/Bulk	95	AUIRS4427S
		Tape and Reel	2500	AUIRS4427STR

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