

NLHV1T0434

48 V RF Antenna Switch Driver

The NLHV1T0434 MiniGate™ is an advanced high-voltage CMOS RF Antenna Switch Driver in ultra-small footprint.

Features

- Single Channel/High-Drive
- High-Speed/Low-Power
- Wide Operating V_{DD} Range: 3.0 V to 5.5 V
- Wide Output V_{CC} Range: 16 V to 50 V
- Low R_{DSon} :
 - NMOS = 10 Ω Max
 - PMOS = 200 Ω Max
- High output DC current: $I_{OL} \geq 130$ mA
- Max input frequency: 2 MHz minimum
- Low Static Current: I_{DDmax} , $I_{CCmax} = 100$ μ A
- Low Dynamic Current @ 100 kHz:
 - $I_{DDdynmax} = 0.2$ mA, $I_{CCdynmax} = 1.0$ mA
- Available in MSOP8-EP
- These Devices are Pb-Free, Halogen-Free/BFR-Free and are RoHS-Compliant



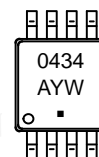
ON Semiconductor®

www.onsemi.com



**MSOP-8
Z SUFFIX
CASE 846AM**

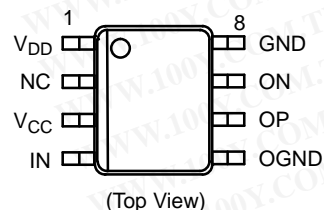
MARKING DIAGRAM



0434 = Specific Device Code
A = Assembly Location
Y = Year
W = Work Week
▪ = Pb-Free Package

(Note: Microdot may be in either location)

PIN CONNECTIONS



ORDERING INFORMATION

Device	Package	Shipping†
NLHV1T0434ZR2G	MSOP8-EP (Pb-Free)	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

勝特力材料 886-3-5753170
勝特力电子(上海) 86-21-34970699
勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

NLHV1T0434

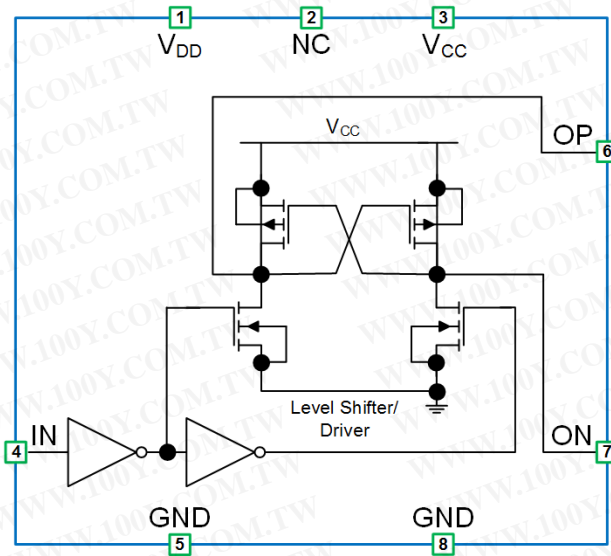


Figure 1. Block Diagram

Table 1. PIN ASSIGNMENT

Pin	Pin Name	Description
1	V _{DD}	Digital Power Supply
2	NC	No Connect
3	V _{CC}	High Voltage Supply
4	IN	Input
5	GND	Ground
6	OP	Non-Inverted Output
7	ON	Inverted Output
8	GND	Ground

Table 2. FUNCTION TABLE

Input	Output	
A	OP	ON
L	L	H
H	H	L

NLHV1T0434

Table 3. MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{DD}	Digital Supply Voltage	-0.5 to +7.0	V
V _{CC}	High-Voltage Supply Voltage	-0.5 to +55.0	V
V _{IN}	DC Input Voltage	-0.5 to +7.0	V
V _{OUT}	DC Output Voltage	-0.5 to V _{CC} + 0.5	V
I _{IK}	DC Input Diode Current V _{IN} < GND	-20	mA
I _{OK}	DC Output Diode Current V _{OUT} > V _{CC} , V _{OUT} < GND	±200	mA
I _O	DC Output Source/Sink Current	±200	mA
I _{CC}	DC Supply Current Per Supply Pin	±200	mA
I _{GND}	DC Ground Current per Ground Pin	±200	mA
T _{STG}	Storage Temperature Range	-65 to +150	°C
T _L	Lead Temperature, 1 mm from Case for 10 Seconds	260	°C
T _J	Junction Temperature Under Bias	150	°C
MSL	Moisture Sensitivity	Level 1	
F _R	Flammability Rating Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in	
V _{ESD}	ESD Withstand Voltage Human Body Mode (Note 2) Charged Device Model (Note 3)	> 4 > 2	kV
I _{LATCHUP}	Latchup Performance Above V _{CC} and Below GND at 125°C (Note 4)	±100	mA
SR _{VCC}	Minimum V _{CC} Rise Rate (Note 5)	5	µs/V

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Measured with minimum pad spacing on an FR4 board, using 10 mm-by-1 inch, 2 ounce copper trace no air flow.
2. Tested to EIA / JESD22-A114-A.
3. Tested to JESD22-C101-A.
4. Tested to EIA / JESD78.
5. A faster V_{CC} rise rate could damage the output of the device.

Table 4. RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V _{DD}	Digital Supply Voltage	3.0	5.5	V
V _{CC}	High Voltage Supply Voltage	16	50	V
V _{IN}	Digital Input Voltage	0	5.5	V
V _{OUT}	Output Voltage	0	V _{CC}	V
T _A	Operating Free-Air Temperature	-55	+125	°C
Δt / ΔV	Input Transition Rise or Fall Rate	0	20	nS/V

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

NLHV1T0434

Table 5. DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V _{DD} (V)	V _{CC} (V)	T _A = 25°C			T _A = -55°C to +125°C		Unit
					Min	Typ	Max	Min	Max	
V _{IH}	High-Level Input Voltage		3.0 to 5.5	16 to 50	1.7	-	-	1.7	-	V
V _{IL}	Low-Level Input Voltage		3.0 to 5.5	16 to 50	-	-	0.4	-	0.4	V
V _{OH}	High-Level Output Voltage	V _{IN} = V _{IH} or V _{IL} , I _{OH} = -100 μA	3.0 to 5.5	16 to 50	V _{CC} - 0.5	V _{CC}		V _{CC} - 0.5		V
V _{OL}	Low-Level Output Voltage	V _{IN} = V _{IH} or V _{IL} , I _{OL} = 10 mA	3.0 to 5.5	16 to 50	-	0.04	0.2	GND	0.2	V
I _{IN}	Input Leakage Current	V _{IN} = 0 to 5.5 V	3.0 to 5.5	16 to 50	-	-	±10	-	±10	μA
I _{DD}	Quiescent Supply Current	V _{IN} = V _{DD} or GND	3.0 to 5.5	16 to 50	-	50	100	-	100	μA
I _{CC}	Quiescent Supply Current	V _{IN} = V _{DD} or GND	3.0 to 5.5	16 to 50	-	50	100	-	100	μA
R _{ONN}	Output NMOS ON Resistance	I _{OL} = 130 mA	3.0 to 5.5	16 to 50	-	4	10	-	10	Ω
R _{ONNFLAT}	Output NMOS ON Resistance Flatness	I _{OL} = 130 mA	3.0 to 5.5	16 to 50	-	0.4	2	-	3	Ω
R _{ONP}	Output PMOS ON Resistance	I _{OH} = -100 μA	3.0 to 5.5	16 to 50	-	60	200	-	200	Ω

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

NLHV1T0434

Table 6. AC ELECTRICAL CHARACTERISTICS (Input $t_r = t_f = 3.0$ ns)

Symbol	Parameter	Test Condition	V_{DD} (V)	V_{CC} (V)	$T_A = 25^\circ\text{C}$			$T_A = -55^\circ\text{C to } +125^\circ\text{C}$		Unit
					Min	Typ	Max	Min	Max	
t_{PHL}	High to Low Propagation Delay, IN to OP, ON	$C_L = 1$ nF	3.0 to 5.5	50	–	38	100	–	100	ns
				48	–	38	100	–	100	
				28	–	31	100	–	100	
				18	–	28	100	–	100	
		$C_L = 10$ pF	3.0 to 5.5	50	–	21	80	–	80	
				48	–	21	80	–	80	
				28	–	21	80	–	80	
				18	–	20	80	–	80	
t_{PLH}	Low to High Propagation Delay, IN to OP, ON	$C_L = 1$ nF	3.0 to 5.5	50	–	159	400	–	400	ns
				48	–	159	400	–	400	
				28	–	95	400	–	400	
				18	–	69	400	–	400	
		$C_L = 10$ pF	3.0 to 5.5	50	–	16	60	–	60	
				48	–	16	60	–	60	
				28	–	13	60	–	60	
				18	–	12	60	–	60	
t_F	Output Fall Time	$C_L = 1$ nF	3.0 to 5.5	50	–	28.5	100	–	100	ns
				48	–	28.5	100	–	100	
				28	–	19.3	100	–	100	
				18	–	14.5	100	–	100	
		$C_L = 10$ pF	3.0 to 5.5	50	–	4.1	50	–	50	
				48	–	4.1	50	–	50	
				28	–	3.0	50	–	50	
				18	–	2.1	50	–	50	
t_R	Output Rise Time	$C_L = 1$ nF	3.0 to 5.5	50	–	285.7	1000	–	1000	ns
				48	–	285.7	1000	–	1000	
				28	–	182.6	1000	–	1000	
				18	–	144.4	1000	–	1000	
		$C_L = 10$ pF	3.0 to 5.5	50	–	8.6	50	–	50	
				48	–	8.6	50	–	50	
				28	–	5.1	50	–	50	
				18	–	4.4	50	–	50	
I_{DD-DYN}	Dynamic Current at V_{DD}	$f = 100$ kHz; ON, OP open	3.0 to 5.5	16 to 50		0.1	0.2		0.2	mA
I_{CC-DYN}	Dynamic Current at V_{CC}	$f = 100$ kHz; ON, OP open	3.0 to 5.5	16 to 50		0.5	1.0		1.0	mA
f	Maximum Input Frequency	ON, OP open	3.0 to 5.5	16 to 50	2			2		MHz

NLHV1T0434

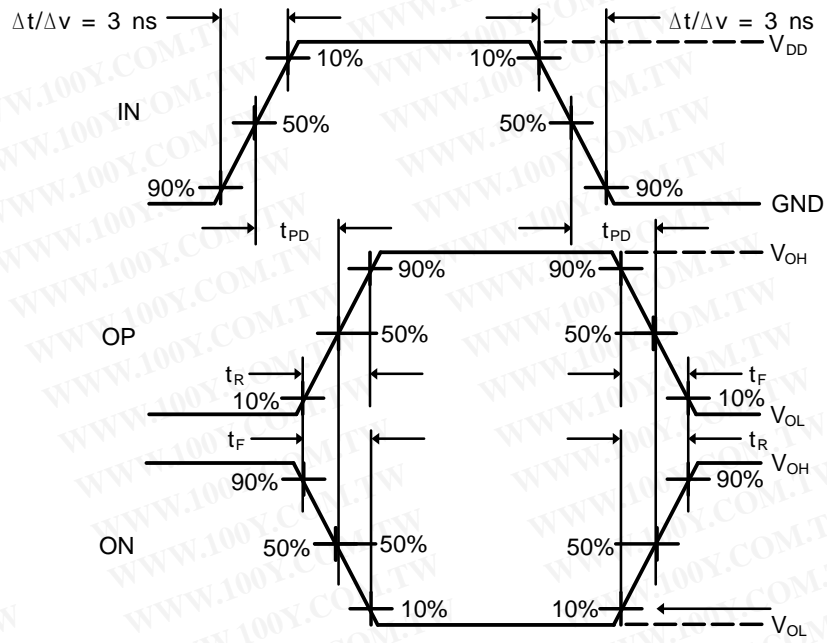


Figure 2. Switching Waveforms

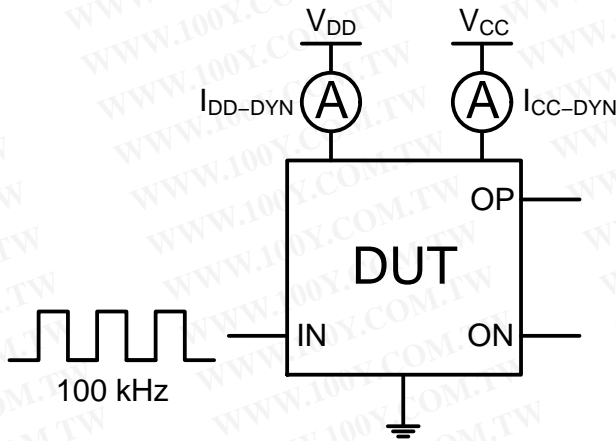
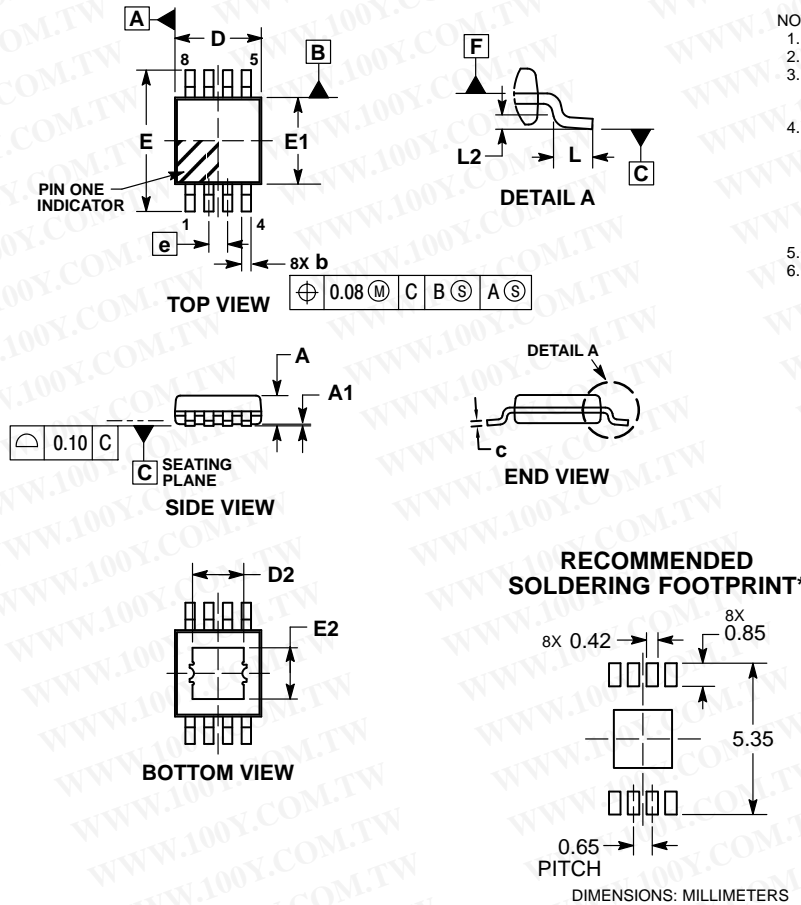


Figure 3. Test Set-up for Dynamic Current

NLHV1T0434

PACKAGE DIMENSIONS

MSOP8 EP, 3x3
CASE 846AM
ISSUE O



- NOTES:
1. DIMENSIONS AND TOLERANCING PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSIONS: MILLIMETERS.
 3. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.10 MM IN EXCESS OF MAXIMUM MATERIAL CONDITION.
 4. DIMENSION D DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.15 MM PER SIDE. DIMENSION E DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 MM PER SIDE. DIMENSIONS D AND E ARE DETERMINED AT DATUM F.
 5. DATUMS A AND B TO BE DETERMINED AT DATUM F.
 6. A1 IS DEFINED AS THE VERTICAL DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT ON THE PACKAGE BODY.

DIM	MILLIMETERS	
	MIN	MAX
A	---	1.10
A1	0.05	0.15
b	0.25	0.40
c	0.13	0.23
D	2.90	3.10
D2	1.78	REF
E	4.75	5.05
E1	2.90	3.10
E2	1.42	REF
e	0.65 BSC	
L	0.40	0.70
L2	0.254 BSC	

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-34970699
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

MiniGate is a trademark of Semiconductor Components Industries, LLC.

ON Semiconductor and are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marketing.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
 Literature Distribution Center for ON Semiconductor
 19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
 USA/Canada
Europe, Middle East and Africa Technical Support:
 Phone: 421 33 790 2910

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative