

NLAS5223B, NLAS5223BL

超低0.35 Ωデュアル SPDTアナログ・スイッチ

NLAS5223Bは、サブミクロン・シリコン・ゲートCMOSテクノロジーで製造された高性能CMOSアナログ・スイッチです。 $V_{CC} = 4.3\text{ V}$ で0.35 Ωの超低 R_{ON} のデュアル独立型単極双投(SPDT)スイッチを内蔵しています。

ブレーク・ビフォア・メイク(BBM)スイッチングが保証されており、スイッチでドライバが短絡することはありません。

特長

- 超低 R_{ON} 、 $V_{CC} = 4.3\text{ V}$ で0.35 Ω (標準)
- NLAS5223Bは2.8 Vチップセットにインタフェース
- NLAS5223BLは1.8 Vチップセットにインタフェース
- 1.65~4.5 Vでの単一電源動作
- 0から V_{CC} までのフル信号処理能力
- 高オフチャネル絶縁
- 低スタンバイ電流、 $< 50\text{ nA}$
- 低歪み
- 0.15 Ωの R_{ON} 平坦性
- 高連続電流能力
 - ◆ $\pm 320\text{ mA}$ 、各スイッチ
- アナログ入力での大電流クランプ・ダイオード
 - ◆ $\pm 320\text{ mA}$ の連続電流能力
- パッケージ：
 - ◆ 1.4 x 1.8 x 0.75 mm WQFN10鉛フリー
 - ◆ 1.4 x 1.8 x 0.55 mm UQFN10鉛フリー
- 鉛フリー・デバイス

アプリケーション

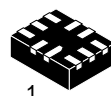
- 携帯電話オーディオ・ブロック
- スピーカおよびイヤホンの切り替え
- リングトーン・チップ/アンプの切り替え
- モデム



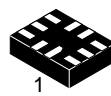
ON Semiconductor®

www.onsemi.jp

MARKING DIAGRAM



WQFN10
CASE 488AQ

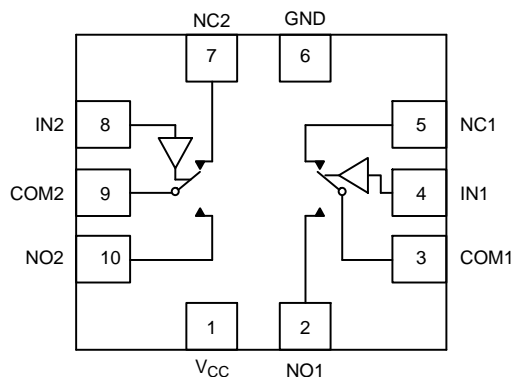


UQFN10
CASE 488AT



XX = Specific Device Code
AD = NLAS5223BMNR2G
AE = NLAS5223BLMNR2G
AP = NLAS5223BMUR2G
M̄ = Date Code/Assembly Location
▪ = Pb-Free Device

(Note: Microdot may be in either location)



FUNCTION TABLE

IN 1, 2	NO 1, 2	NC 1, 2
0	OFF	ON
1	ON	OFF

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 9 of this data sheet.

NLAS5223B, NLAS5223BL

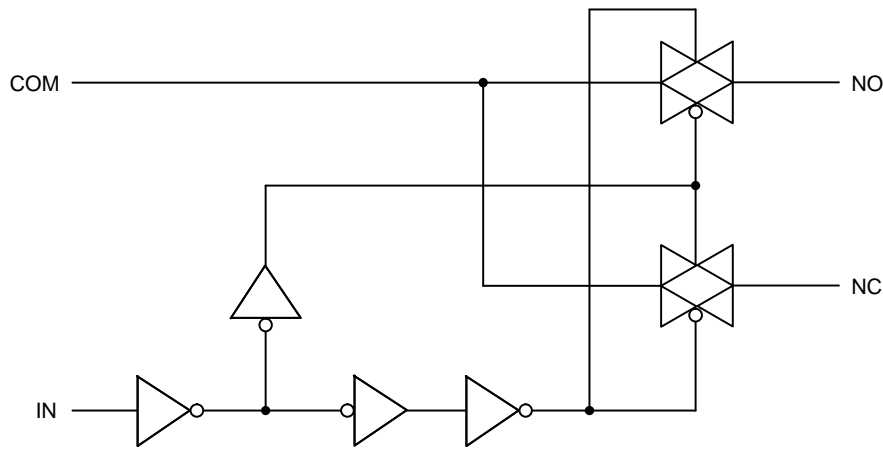


Figure 1. Logic Equivalent Circuit

PIN DESCRIPTION

QFN PIN #	Symbol	Name and Function
2, 5, 7, 10	NC1 to NC2, NO1 to NO2	Independent Channels
4, 8	IN1 and IN2	Controls
3, 9	COM1 and COM2	Common Channels
6	GND	Ground (V)
1	V _{CC}	Positive Supply Voltage

MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CC}	Positive DC Supply Voltage	-0.5 to +5.5	V
V _{IS}	Analog Input Voltage (V _{NO} , V _{NC} , or V _{COM})	-0.5 ≤ V _{IS} ≤ V _{CC} + 0.5	V
V _{IN}	Digital Select Input Voltage	-0.5 ≤ V _{IN} ≤ +5.5	V
I _{anl1}	Continuous DC Current from COM to NC/NO	±320	mA
I _{anl-pk1}	Peak Current from COM to NC/NO, 10% Duty Cycle, 100 ms = t _{ON} (Note 1)	±600	mA
I _{anl-pk2}	Instantaneous Peak Current from COM to NC/NO, 10% Duty Cycle, t _{ON} < 1 μs	±850	mA
I _{clmp}	Continuous DC Current into COM/NO/NC with Respect to V _{CC} or GND	±100	mA

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.

(参考訳)

最大定格を超えるストレスは、デバイスにダメージを与える危険性があります。これらの定格値を超えた場合は、デバイスの機能性を損ない、ダメージが生じたり、信頼性に影響を及ぼす危険性があります。

1. Defined as 10% ON, 90% OFF Duty Cycle.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V _{CC}	DC Supply Voltage	1.65	4.5	V
V _{IN}	Digital Select Input Voltage (OVT) Overvoltage Tolerance	GND	4.5	V
V _{IS}	Analog Input Voltage (NC, NO, COM)	GND	V _{CC}	V
T _A	Operating Temperature Range	-40	+85	°C
t _r , t _f	Input Rise or Fall Time, SELECT V _{CC} = 1.6 V – 2.7 V V _{CC} = 3.0 V – 4.5 V		20 10	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.

(参考訳)

推奨動作範囲を超えるストレスでは推奨動作機能を得られません。推奨動作範囲を超えるストレスの印加は、デバイスの信頼性に影響を与える危険性があります。

NLAS5223B, NLAS5223BL

NLAS5223B DC CHARACTERISTICS – DIGITAL SECTION (Voltages Referenced to GND)

Symbol	Parameter	Condition	V _{CC}	Guaranteed Limit		Unit
				25°C	-40°C to +85°C	
V _{IH}	Minimum High-Level Input Voltage, Select Inputs		3.0 4.3	1.4 2.0	1.4 2.0	V
V _{IL}	Maximum Low-Level Input Voltage, Select Inputs		3.0 4.3	0.7 0.8	0.7 0.8	V
I _{IN}	Maximum Input Leakage Current, Select Inputs	V _{IN} = V _{CC} or GND	4.3	±0.1	±1.0	μA
I _{OFF}	Power Off Leakage Current	V _{IN} = V _{CC} or GND	0	±0.5	±2.0	μA
I _{CC}	Maximum Quiescent Supply Current (Note 2)	Select and V _{IS} = V _{CC} or GND	1.65 to 4.5	±1.0	±2.0	μA

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.

(参考訳)

製品パラメータは、特別な記述が無い限り、記載されたテスト条件に対する電気的特性で示しています。異なる条件下で製品動作を行った時には、電気的特性で示している特性を得られない場合があります。

2. Guaranteed by design. Resistance measurements do not include test circuit or package resistance.

NLAS5223B DC ELECTRICAL CHARACTERISTICS – ANALOG SECTION

Symbol	Parameter	Condition	V _{CC}	Guaranteed Maximum Limit				Unit
				25°C		-40°C to +85°C		
				Min	Max	Min	Max	
R _{ON}	NC/NO On-Resistance (Note 3)	V _{IN} = V _{IL} or V _{IN} = V _{IH} V _{IS} = GND to V _{CC} I _{COM} = 100 mA	3.0 4.3		0.4 0.35		0.5 0.4	Ω
R _{FLAT}	NC/NO On-Resistance Flatness (Notes 3 and 4)	I _{COM} = 100 mA V _{IS} = 0 to V _{CC}	3.0 4.3		0.16 0.11		0.20 0.14	Ω
ΔR _{ON}	On-Resistance Match Between Channels (Notes 3 and 5)	V _{IS} = 1.5 V; I _{COM} = 100 mA V _{IS} = 2.2 V; I _{COM} = 100 mA	3.0 4.3		0.05 0.05		0.05 0.05	Ω
I _{NC(OFF)} I _{NO(OFF)}	NC or NO Off Leakage Current (Note 3)	V _{IN} = V _{IL} or V _{IH} V _{NO} or V _{NC} = 0.3 V V _{COM} = 4.0 V	4.3	-5.0	5.0	-50	50	nA
I _{COM(ON)}	COM ON Leakage Current (Note 3)	V _{IN} = V _{IL} or V _{IH} V _{NO} 0.3 V or 4.0 V with V _{NC} floating or V _{NC} 0.3 V or 4.0 V with V _{NO} floating V _{COM} = 0.3 V or 4.0 V	4.3	-10	10	-100	100	nA

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.

(参考訳)

製品パラメータは、特別な記述が無い限り、記載されたテスト条件に対する電気的特性で示しています。異なる条件下で製品動作を行った時には、電気的特性で示している特性を得られない場合があります。

3. Guaranteed by design. Resistance measurements do not include test circuit or package resistance.

4. Flatness is defined as the difference between the maximum and minimum value of On-resistance as measured over the specified analog signal ranges.

5. ΔR_{ON} = R_{ON(MAX)} - R_{ON(MIN)} between NC1 and NC2 or between NO1 and NO2.

NLAS5223B, NLAS5223BL

NLAS5223BL DC CHARACTERISTICS – DIGITAL SECTION (Voltages Referenced to GND)

Symbol	Parameter	Condition	V _{CC}	Guaranteed Limit		Unit
				25°C	-40°C to +85°C	
V _{IH}	Minimum High-Level Input Voltage, Select Inputs		3.0 4.3	1.3 1.6	1.3 1.6	V
V _{IL}	Maximum Low-Level Input Voltage, Select Inputs		3.0 4.3	0.5 0.6	0.5 0.6	V
I _{IN}	Maximum Input Leakage Current, Select Inputs	V _{IN} = 4.5 V or GND	4.3	±0.1	±1.0	μA
I _{OFF}	Power Off Leakage Current	V _{IN} = 4.5 V or GND	0	±0.5	±2.0	μA
I _{CC}	Maximum Quiescent Supply Current (Note 6)	Select and V _{IS} = V _{CC} or GND	1.65 to 4.5	±1.0	±2.0	μA

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.

(参考訳)

製品パラメータは、特別な記述が無い限り、記載されたテスト条件に対する電気的特性で示しています。異なる条件下で製品動作を行った時には、電気的特性で示している特性を得られない場合があります。

6. Guaranteed by design. Resistance measurements do not include test circuit or package resistance.

NLAS5223BL DC ELECTRICAL CHARACTERISTICS – ANALOG SECTION

Symbol	Parameter	Condition	V _{CC}	Guaranteed Maximum Limit				Unit
				25°C		-40°C to +85°C		
				Min	Max	Min	Max	
R _{ON}	NC/NO On-Resistance (Note 7)	V _{IN} = V _{IL} or V _{IN} = V _{IH} V _{IS} = GND to V _{CC} I _{COM} = 100 mA	3.0 4.3		0.4 0.35		0.5 0.4	Ω
R _{FLAT}	NC/NO On-Resistance Flatness (Notes 7 and 8)	I _{COM} = 100 mA V _{IS} = 0 to V _{CC}	3.0 4.3		0.16 0.11		0.20 0.14	Ω
ΔR _{ON}	On-Resistance Match Between Channels (Notes 7 and 9)	V _{IS} = 1.5 V; I _{COM} = 100 mA V _{IS} = 2.2 V; I _{COM} = 100 mA	3.0 4.3		0.05 0.05		0.05 0.05	Ω
I _{NC(OFF)} I _{NO(OFF)}	NC or NO Off Leakage Current (Note 7)	V _{IN} = V _{IL} or V _{IH} V _{NO} or V _{NC} = 0.3 V V _{COM} = 4.0 V	4.3	-10	10	-100	100	nA
I _{COM(ON)}	COM ON Leakage Current (Note 7)	V _{IN} = V _{IL} or V _{IH} V _{NO} 0.3 V or 4.0 V with V _{NC} floating or V _{NC} 0.3 V or 4.0 V with V _{NO} floating V _{COM} = 0.3 V or 4.0 V	4.3	-10	10	-100	100	nA

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.

(参考訳)

製品パラメータは、特別な記述が無い限り、記載されたテスト条件に対する電気的特性で示しています。異なる条件下で製品動作を行った時には、電気的特性で示している特性を得られない場合があります。

7. Guaranteed by design. Resistance measurements do not include test circuit or package resistance.

8. Flatness is defined as the difference between the maximum and minimum value of On-resistance as measured over the specified analog signal ranges.

9. ΔR_{ON} = R_{ON(MAX)} - R_{ON(MIN)} between NC1 and NC2 or between NO1 and NO2.

NLAS5223B, NLAS5223BL

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

Symbol	Parameter	Test Conditions	V _{CC} (V)	V _{IS} (V)	Guaranteed Maximum Limit					Unit
					25°C			-40°C to +85°C		
					Min	Typ*	Max	Min	Max	
t _{ON}	Turn-On Time	R _L = 50 Ω, C _L = 35 pF (Figures 3 and 4)	2.3 – 4.5	1.5			50		60	ns
t _{OFF}	Turn-Off Time	R _L = 50 Ω, C _L = 35 pF (Figures 3 and 4)	2.3 – 4.5	1.5			30		40	ns
t _{BMM}	Minimum Break-Before-Make Time	V _{IS} = 3.0 R _L = 50 Ω, C _L = 35 pF (Figure 2)	3.0	1.5	2	15				ns

		Typical @ 25, V _{CC} = 3.6 V	
C _{IN}	Control Pin Input Capacitance	3.5	
C _{NO/NC}	NO, NC Port Capacitance	60	
C _{COM}	COM Port Capacitance When Switch is Enabled	200	

*Typical Characteristics are at 25°C.

ADDITIONAL APPLICATION CHARACTERISTICS (Voltages Referenced to GND Unless Noted)

Symbol	Parameter	Condition	V _{CC} (V)	25°C	Unit
				Typical	
BW	Maximum On-Channel -3 dB Bandwidth or Minimum Frequency Response	V _{IN} centered between V _{CC} and GND (Figure 5)	1.65 – 4.5	19	MHz
V _{ONL}	Maximum Feed-through On Loss	V _{IN} = 0 dBm @ 100 kHz to 50 MHz V _{IN} centered between V _{CC} and GND (Figure 5)	1.65 – 4.5	-0.06	dB
V _{ISO}	Off-Channel Isolation	f = 100 kHz; V _{IS} = 1 V RMS; C _L = 5.0 pF V _{IN} centered between V _{CC} and GND (Figure 5)	1.65 – 4.5	-68	dB
Q	Charge Injection Select Input to Common I/O	V _{IN} = V _{CC} to GND, R _{IS} = 0 Ω, C _L = 1.0 nF Q = C _L × DV _{OUT} (Figure 6)	1.65 – 4.5	38	pC
THD	Total Harmonic Distortion THD + Noise	F _{IS} = 20 Hz to 20 kHz, R _L = R _{gen} = 600 Ω, C _L = 50 pF V _{IS} = 2.0 V RMS	3.0	0.08	%
VCT	Channel-to-Channel Crosstalk	f = 100 kHz; V _{IS} = 1.0 V RMS, C _L = 5.0 pF, R _L = 50 Ω V _{IN} centered between V _{CC} and GND (Figure 5)	1.65 – 4.5	-70	dB

10. Off-Channel Isolation = 20log₁₀ (V_{COM}/V_{NO}), V_{COM} = output, V_{NO} = input to off switch.

NLAS5223B, NLAS5223BL

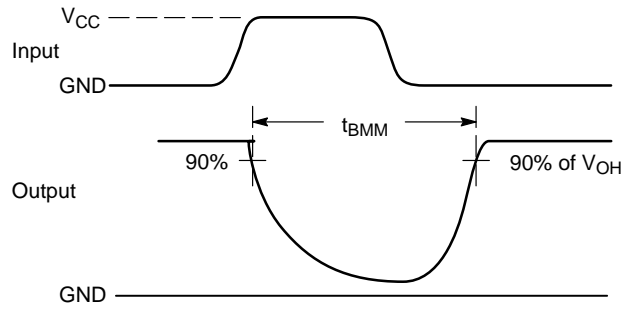
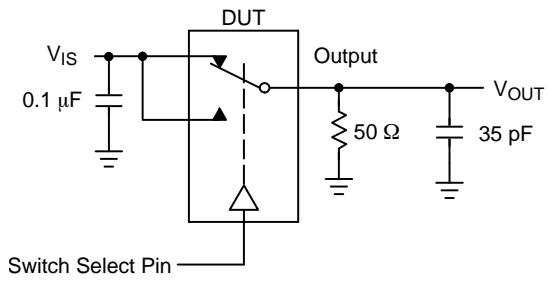


Figure 2. t_{BMM} (Time Break-Before-Make)

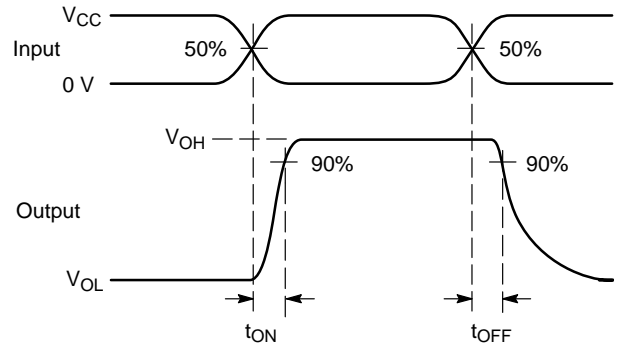
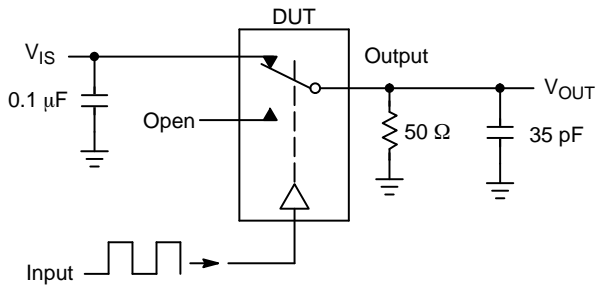


Figure 3. t_{ON}/t_{OFF}

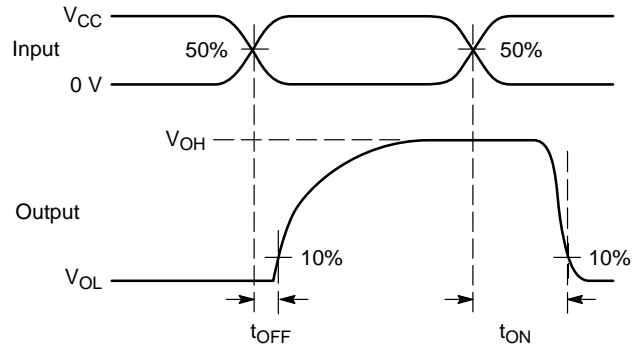
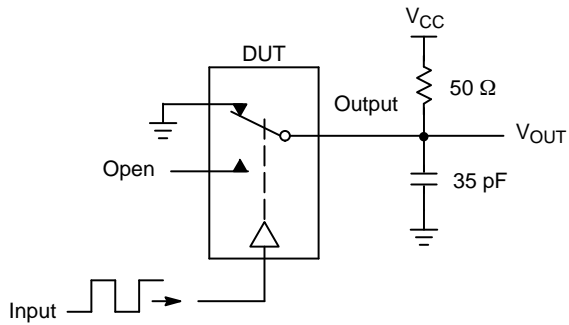
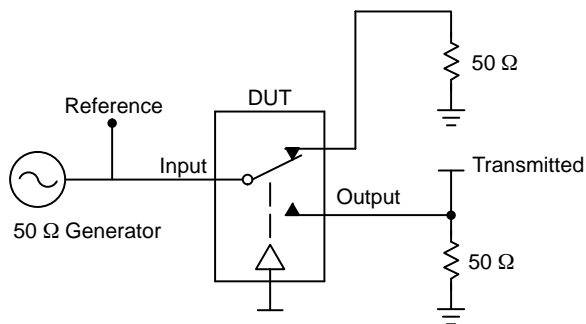


Figure 4. t_{ON}/t_{OFF}

NLAS5223B, NLAS5223BL



Channel switch control/s test socket is normalized. Off isolation is measured across an off channel. On loss is the bandwidth of an On switch. V_{ISO} , Bandwidth and V_{ONL} are independent of the input signal direction.

$$V_{ISO} = \text{Off Channel Isolation} = 20 \text{ Log} \left(\frac{V_{OUT}}{V_{IN}} \right) \text{ for } V_{IN} \text{ at } 100 \text{ kHz}$$

$$V_{ONL} = \text{On Channel Loss} = 20 \text{ Log} \left(\frac{V_{OUT}}{V_{IN}} \right) \text{ for } V_{IN} \text{ at } 100 \text{ kHz to } 50 \text{ MHz}$$

Bandwidth (BW) = the frequency 3 dB below V_{ONL}

V_{CT} = Use V_{ISO} setup and test to all other switch analog input/outputs terminated with 50 Ω

Figure 5. Off Channel Isolation/On Channel Loss (BW)/Crosstalk (On Channel to Off Channel)/ V_{ONL}

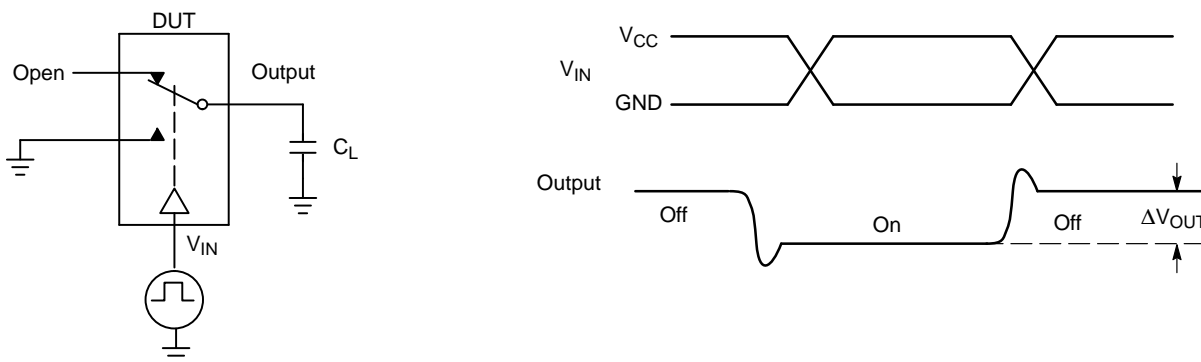
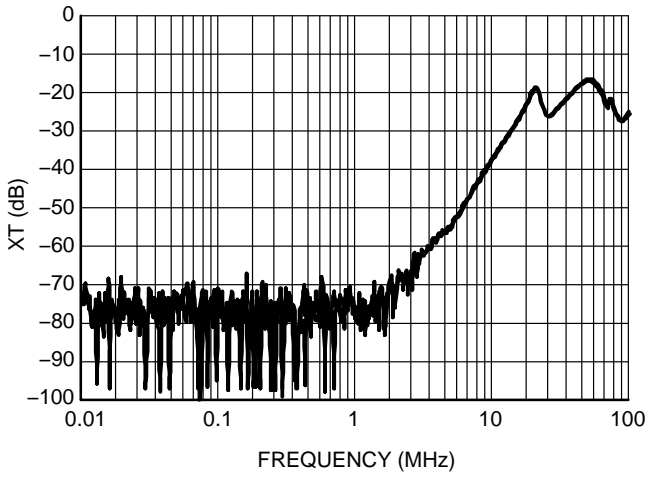


Figure 6. Charge Injection: (Q)

NLAS5223B, NLAS5223BL



**Figure 7. Cross Talk vs. Frequency
@ $V_{CC} = 4.3\text{ V}$**

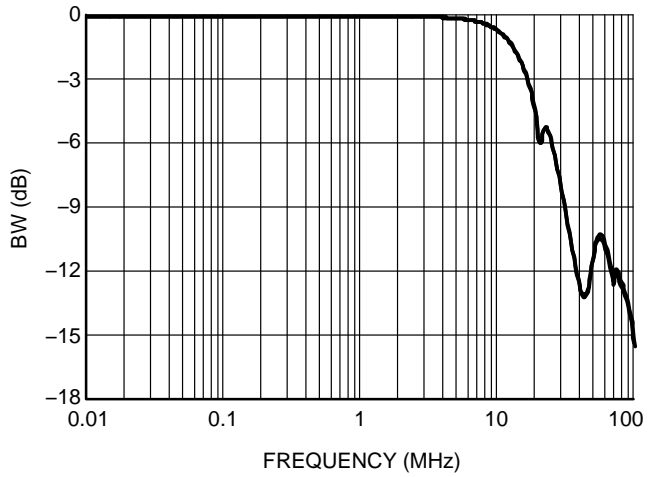


Figure 8. Bandwidth vs. Frequency

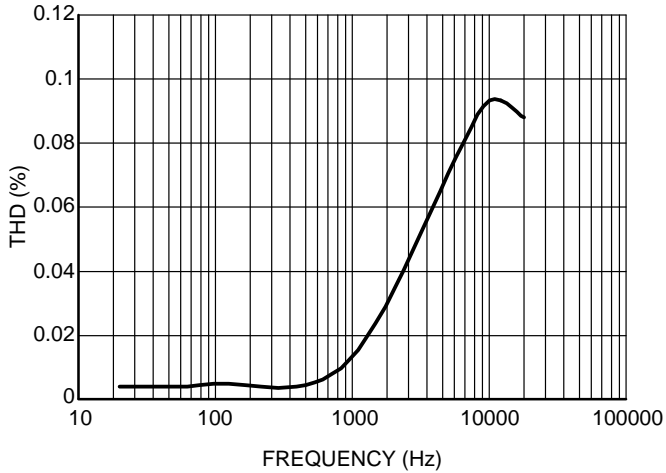
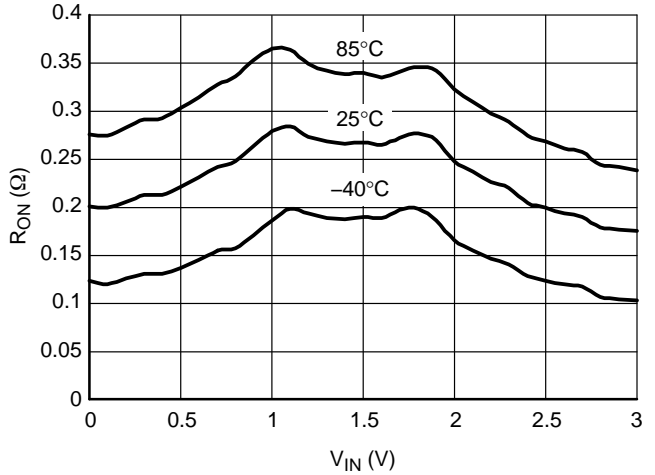
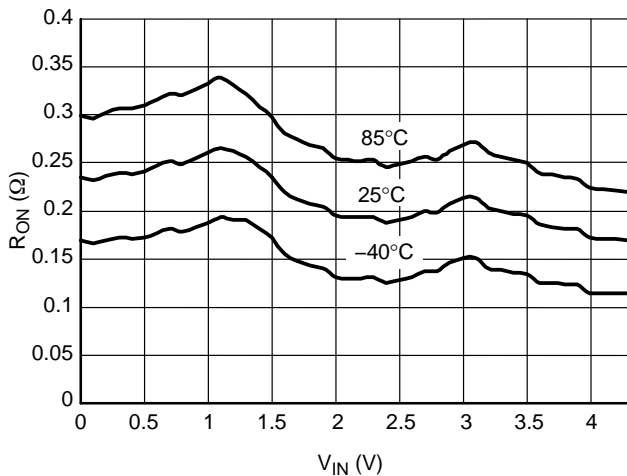


Figure 9. Total Harmonic Distortion



**Figure 10. On-Resistance vs. Input Voltage
@ $V_{CC} = 3.0\text{ V}$**



**Figure 11. On-Resistance vs. Input Voltage
@ $V_{CC} = 4.3\text{ V}$**

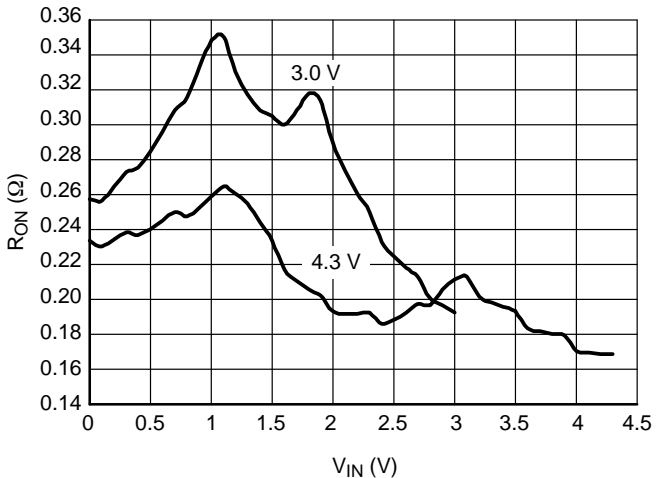


Figure 12. On-Resistance vs. Input Voltage

NLAS5223B, NLAS5223BL

ORDERING INFORMATION

Device	Package	Shipping†
NLAS5223BMNR2G	WQFN10 (Pb-Free)	3000 / Tape & Reel
NLAS5223BLMNR2G	WQFN10 (Pb-Free)	3000 / Tape & Reel
NLAS5223BMUR2G	UQFN10 (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 Specifications Brochure, BRD8011/D.

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

ON Semiconductor®

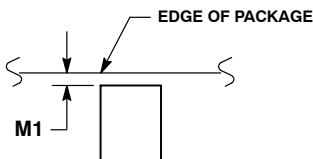
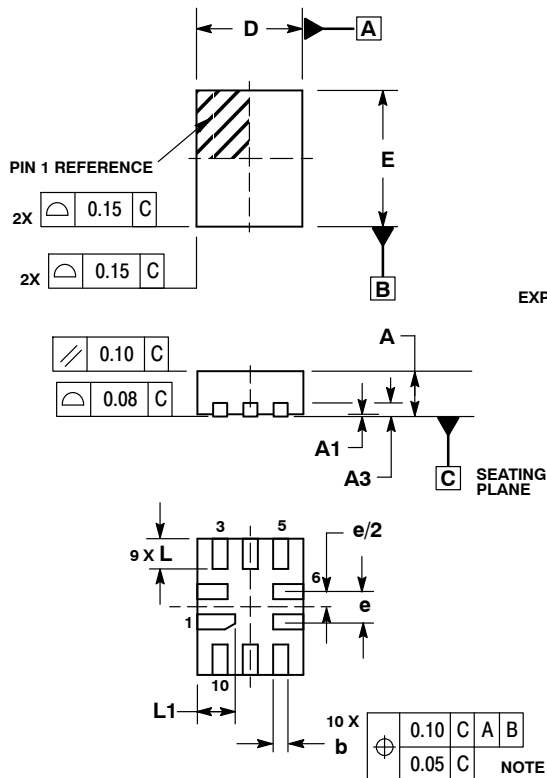


WQFN10, 1.4x1.8, 0.4P
CASE 488AQ-01
ISSUE C

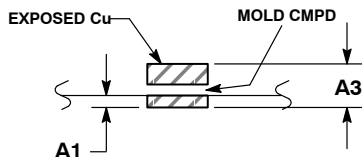
DATE 19 JUN 2007



1
SCALE 5:1



DETAIL A
Bottom View
(Optional)



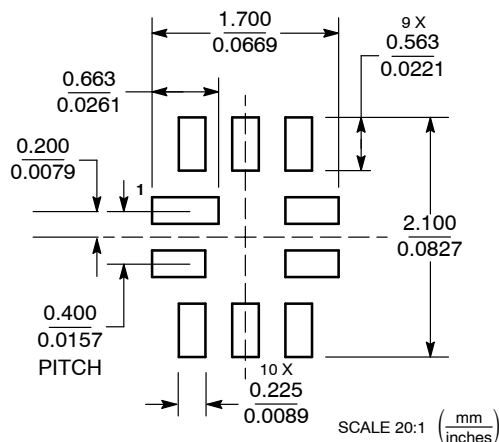
DETAIL B
Side View
(Optional)

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.25 AND 0.30 MM FROM TERMINAL.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.
5. EXPOSED PADS CONNECTED TO DIE FLAG. USED AS TEST CONTACTS.

MILLIMETERS		
DIM	MIN	MAX
A	0.70	0.80
A1	0.00	0.050
A3	0.20	REF
b	0.15	0.25
D	1.40	BSC
E	1.80	BSC
e	0.40	BSC
L	0.30	0.50
L1	0.40	0.60
M1	0.00	0.05

MOUNTING FOOTPRINT



DOCUMENT NUMBER:	98AON20791D	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	WQFN10, 1.4 X 1.8, 0.4P	PAGE 1 OF 1

ON Semiconductor and ON are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. 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. ON Semiconductor does not convey any license under its patent rights nor the rights of others.

MECHANICAL CASE OUTLINE

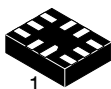
PACKAGE DIMENSIONS

ON Semiconductor®

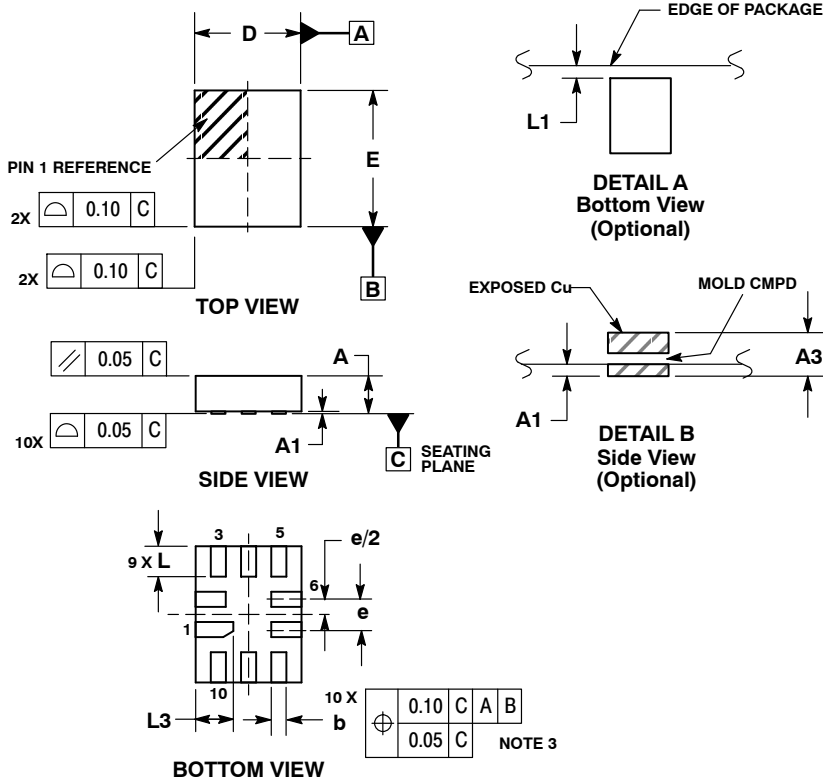


UQFN10 1.4x1.8, 0.4P CASE 488AT-01 ISSUE A

DATE 01 AUG 2007

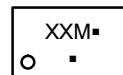


SCALE 5:1



- NOTES:
- DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 - CONTROLLING DIMENSION: MILLIMETERS
 - DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.25 AND 0.30 MM FROM TERMINAL.
 - COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

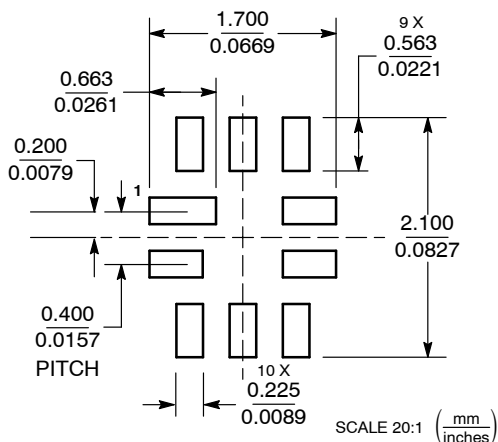
GENERIC MARKING DIAGRAM*



- XX = Specific Device Code
 - M = Date Code
 - = Pb-Free Package
- (Note: Microdot may be in either location)

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present.

MOUNTING FOOTPRINT



DOCUMENT NUMBER:	98AON22493D	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	10 PIN UQFN, 1.4 X 1.8, 0.4P	PAGE 1 OF 1

ON Semiconductor and ON are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. 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. ON Semiconductor does not convey any license under its patent rights nor the rights of others.

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-Marking.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:

Email Requests to: orderlit@onsemi.com

ON Semiconductor Website: www.onsemi.com

TECHNICAL SUPPORT

North American Technical Support:
Voice Mail: 1 800-282-9855 Toll Free USA/Canada
Phone: 011 421 33 790 2910

Europe, Middle East and Africa Technical Support:

Phone: 00421 33 790 2910

For additional information, please contact your local Sales Representative