0.4Ω 超低导通电阻、双通道、单刀双掷 (SPDT)模拟开关

UM2268 *QFN10 1.8×1.4*

描述

UM2268是一款双通道、低功率、单刀双掷（SPDT）模拟开关，工作电压范围为+1.8V至+4.4V。

UM2268可保证通道之间的导通电阻匹配（典型值0.04Ω），可保证信号范围内的导通电阻平坦度（典型值0.08Ω），具有高隔离度和低串扰的特性，从而在音频信号切换时提供出色的线性度和低失真。UM2268采用无铅QFN10封装（1.8mm×1.4mm×0.55mm）。

应用

- 便携式仪器
- 电池供电设备
- 计算机外设
- 扬声器和耳机切换
- 医疗设备
- 音频和视频切换

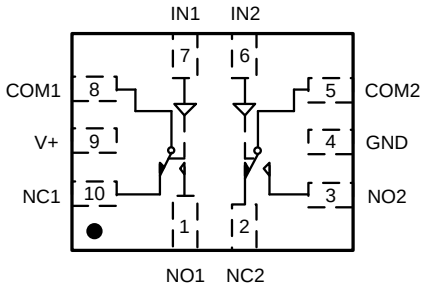
特性

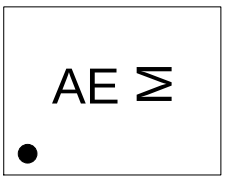
- V_{CC} 工作电压范围：+1.8V 至 +4.4V
- 低导通电阻：0.4Ω（典型值，4.4V 供电）
- 导通电阻匹配：0.04Ω（典型值）
- 导通电阻平坦度：0.08Ω（典型值）
- -3dB 带宽：80MHz
- 高隔离度：-78dB (100kHz)
- 低串扰：-93dB (100kHz)
- 兼容 TTL/CMOS 电平
- 开关先断后合
- 输入和输出轨对轨
- 无铅 (Pb) QFN10 封装

引脚配置

顶部视图

(Top View)





M: Month Code
UM2268
QFN10 1.8×1.4

订购信息

芯片型号	封装类型	丝印编码	发货数量
UM2268	QFN10 1.8×1.4	AE	3000pcs/7 Inch Tape & Reel

Pin Description

Pin Number	Pin Name	Function
1, 3	NO1, NO2	Normally-Open Terminal
10, 2	NC1, NC2	Normally-Closed Terminal
4	GND	Ground
8, 5	COM1, COM2	Common Terminal
7, 6	IN1, IN2	Digital Control Pin to Connect the COM Terminal to the NO or NC Terminals
9	V+	Power Supply

Function Table

LOGIC	NO	NC
0	OFF	ON
1	ON	OFF

Absolute Maximum Ratings

Symbol	Parameter	Limit	Unit
V_+	Supply Voltage	0 to +4.6	V
V_{IS}	Analog Switch Input Voltage	-0.3 to (V_{CC}+0.3)	
V_{IN}	Digital Select Input Voltage	0 to +4.6	
I_D	Continuous DC Current	250	mA
I_P	Peak Current	350	mA
T_O	Operating Temperature Range	-40 to +85	℃
T_{STG}	Storage Temperature Range	-65 to +150	
ESD	HBM	4000	V

Electrical Characteristics

V_+=+4.4V, GND=0V, T_A=-40℃ to +85℃, unless otherwise noted.

Symbol	Parameter	Test Conditions		Vcc (V)	Temp	Limits (-40℃ to 85℃)			Unit
						Min	Typ (Note 1)	Max	
V_+	Power Supply Range				Full	1.8		4.4	V
I_{CC}	Quiescent Supply Current	V_{IN}=V_+ or 0		4.4	Full			1.0	μA
I_{IN}	Input Leakage Current	V_{IN}=0V/4.4V		4.4	Full			1.0	μA
I_{OFF}	Power Off Leakage Current	V_{NO}/V_{NC}=3.3V/0.3V, V_{COM}=0.3V/3.3V		4.4	Full			1.0	μA
I_{ON}	Channel ON Leakage Current	V_{COM}=0.3V/3.3V V_{NO} or V_{NC}=0.3V/3.3V, or Floating		4.4	Full			1.0	μA
R_{ON}	On-Resistance (Note 2)	$V_{NO,}V_{NC}$ or V_{COM}=1.0V, I_{COM}=-100mA		4.4	Room Full		0.4	0.75 0.85	Ω
ΔR_{ON}	On Resistance Match Between Channels (Note 2, 3, 4)	$V_{NO,}V_{NC}$ or V_{COM}=1.0V, I_{COM}=-100mA		4.4	Room Full		0.04	0.15 0.20	Ω
R_{FLAT}	On Resistance Flatness (Note 2, 3, 5)	$V_{NO,}V_{NC}$ or V_{COM}=1.0V, 2.5V I_{COM}=-100mA		4.4	Room Full		0.08	0.12 0.20	Ω
V_{IH}	Input High Voltage			4.4	Full	2.0			V
V_{IL}	Input Low Voltage			4.4	Full			0.5	V
t_{ON}	Turn On Time	V_{IN}=2.1V to 0V, R_L=50Ω, C_L=35pF, V_{NO1} or V_{NC1}=V_{NO2} or V_{NC2}=2.1V, Test Circuit 1		4.4	Room		88		ns
t_{OFF}	Turn Off Time	V_{IN}=2.1V to 0V, R_L=50Ω, C_L=35pF, V_{NO1} or V_{NC1}=V_{NO2} or V_{NC2}=2.1V, Test Circuit 1		4.4	Room		16		ns
t_{BBM}	Break Before Make Time (Note 6)	V_{IN}=2.1V to 0V, R_L=50Ω, C_L=35pF, V_{NO1} or V_{NC1}=V_{NO2} or V_{NC2}=2.1V, Test Circuit 2		4.4	Room		6		ns
O_{IRR}	Off Isolation (Note 7)	V_{BIAS}=2.1V, Signal=0dBm, Test Circuit 3	100kHz	4.4	Room		-78		dB
			1MHz		Room		-58		dB
X_{TALK}	Crosstalk	V_{BIAS}=2.1V, Signal=0dBm, Test Circuit 4	100kHz	4.4	Room		-93		dB
			1MHz		Room		-90		dB
BW	-3dB Bandwidth	V_{BIAS}=2.1V, Signal=0dBm, Test Circuit 5		4.4	Room		80		MHz
Q	Charge Injection Select Input to Common I/O	V_G=0V, R_S=0Ω, C_L=1.0nF, Test Circuit 6		4.4	Room		4.0		pC
C_{ON}	HSD+ HSD- ON Capacitance (Note 8)			4.4	Room		56		pF

Note 1: Typically values are at V_+=4.4V and T_A=+25℃.
Note 2: Guaranteed by design. Resistance measurements do not include test circuit or package resistance.
Note 3: Parameter is characterized but not tested in production.
Note 4: ΔR_{ON}= | $R_{ON\ (NO1/NC1)} - R_{ON(NO2/NC2)}$ | measured at identical V_{CC}, temperature and voltage levels.
Note 5: Flatness is defined as the difference between the maximum and minimum value of On Resistance over the specified range of conditions.
Note 6: Guaranteed by design.
Note 7: Off Isolation=20 log10 [V_{COM}/$V_{NO/NC}$].
Note 8: T_A=+25℃, f=1MHz, Capacitance is characterized but not tested in production.

Electrical Characteristics

V_+=+2.7V to +3.6V, T_A=-40℃ to +85℃, unless otherwise noted.

Symbol	Parameter	Test Conditions		Vcc (V)	Temp	Limits (-40℃ to 85℃)			Unit
						Min	Typ (Note 1)	Max	
V_{NO}, V_{NC}, V_{COM}	Analog Signal Range				Full	0		V+	V
I_{IN}	Input Leakage Current	V_{IN}=0V/2.7V		2.7	Full			1.0	μA
I_{OFF}	Power Off Leakage Current	V_{NO}/V_{NC}=3.3V/0.3V, V_{COM}=0.3V/3.3V		3.6	Full			1.0	μA
I_{ON}	Channel ON Leakage Current	V_{COM}=0.3V/3.3V V_{NO} or V_{NC}=0.3V/3.3V, or Floating		3.6	Full			1.0	μA
R_{ON}	On-Resistance (Note 2)	V_{NO},V_{NC} or V_{COM}=1.0V, I_{COM}=-100mA		2.7	Room Full		0.75	1.10 1.20	Ω
ΔR_{ON}	On Resistance Match Between Channels (Note 2, 3, 4)	V_{NO},V_{NC} or V_{COM}=1.0V, I_{COM}=-100mA		2.7	Room Full		0.03	0.15 0.20	Ω
R_{FLAT}	On Resistance Flatness (Note 2, 3, 5)	V_{NO},V_{NC} or V_{COM}=1.0V, 2.5V I_{COM}=-100mA		2.7	Room Full		0.10	0.18 0.20	Ω
V_{IH}	Input High Voltage			3.0	Full	1.5			V
V_{IL}	Input Low Voltage			3.0	Full			0.4	V
t_{ON}	Turn On Time	V_{IN}=1.5V to 0V, R_L=50Ω, C_L=35pF, V_{NO1} or V_{NC1}=V_{NO2} or V_{NC2}=1.5V, Test Circuit 1		3.0	Room		100		ns
t_{OFF}	Turn Off Time	V_{IN}=1.5V to 0V, R_L=50Ω, C_L=35pF, V_{NO1} or V_{NC1}=V_{NO2} or V_{NC2}=1.5V, Test Circuit 1		3.0	Room		20		ns
t_{BBM}	Break Before Make Time (Note 6)	V_{IN}=1.5V to 0V, R_L=50Ω, C_L=35pF, V_{NO1} or V_{NC1}=V_{NO2} or V_{NC2}=1.5V, Test Circuit 2		3.0	Room		9.2		ns
O_{IRR}	Off Isolation (Note 7)	V_{BIAS}=2.1V, Signal=0dBm, Test Circuit 3	100kHz	3.0	Room		-78		dB
			1MHz		Room		-58		dB
X_{TALK}	Crosstalk	V_{BIAS}=2.1V, Signal=0dBm, Test Circuit 4	100kHz	3.0	Room		-93		dB
			1MHz		Room		-90		dB
BW	-3dB Bandwidth	V_{BIAS}=2.1V, Signal=0dBm, Test Circuit 5		3.0	Room		80		MHz
Q	Charge Injection Select Input to Common I/O	V_G=0V, R_S=0Ω, C_L=1.0nF, Test Circuit 6		3.0	Room		3.0		pC
C_{ON}	HSD+ HSD- ON Capacitance (Note 8)			3.0	Room		56		pF

Note 1: T_A=+25℃.

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

Note 3: Parameter is characterized but not tested in production.

Note 4: $\Delta R_{ON} = | R_{ON\,(NO1/NC1)} - R_{ON(NO2/NC2)} |$ measured at identical V_{CC}, temperature and voltage levels.

Note 5: Flatness is defined as the difference between the maximum and minimum value of On Resistance over the specified range of conditions.

Note 6: Guaranteed by design.

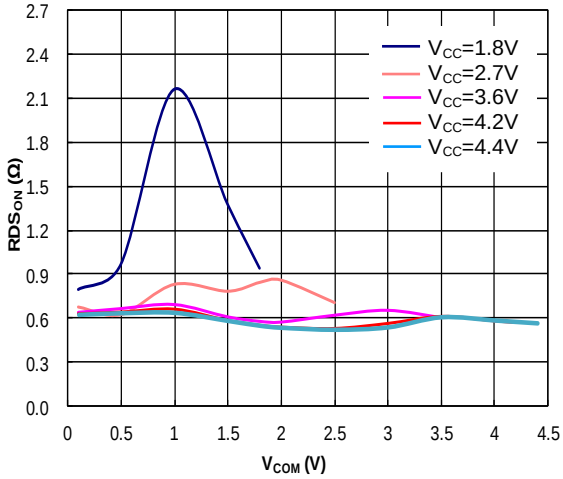
Note 7: Off Isolation=20 log10 [V_{COM}/$V_{NO/NC}$].

Note 8: T_A=+25℃, f=1MHz, Capacitance is characterized but not tested in production.

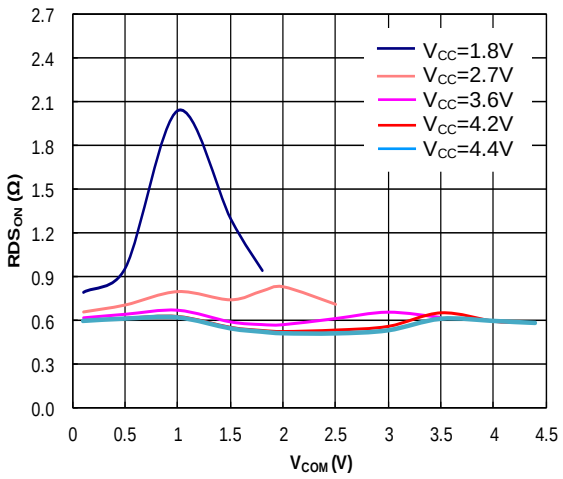
Typical Operating Characteristics

(T_A=+25 ℃, unless otherwise noted.)

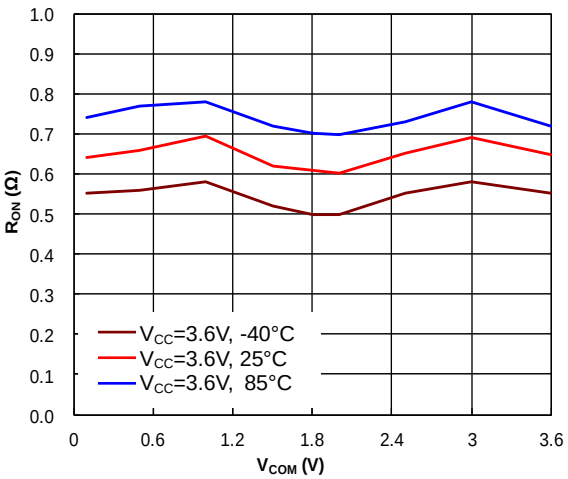
NC RDS_{ON}



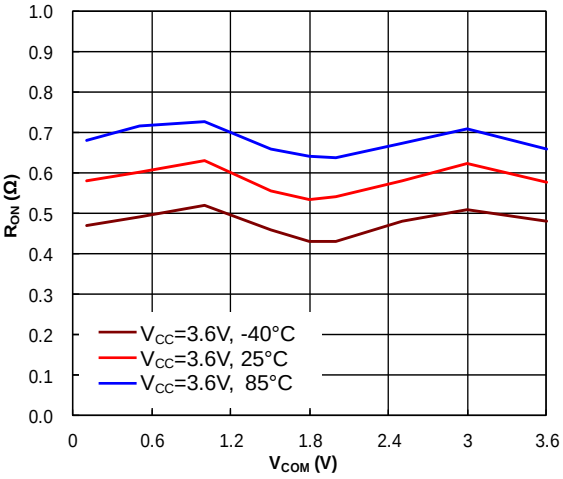
NO RDS_{ON}



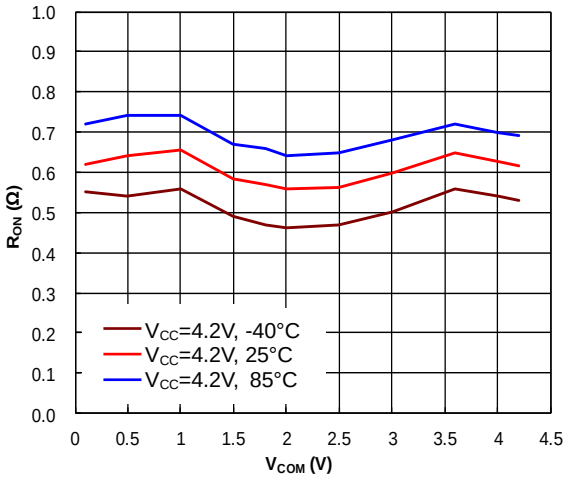
NC R_{ON} vs. V_{COM} (Temp)



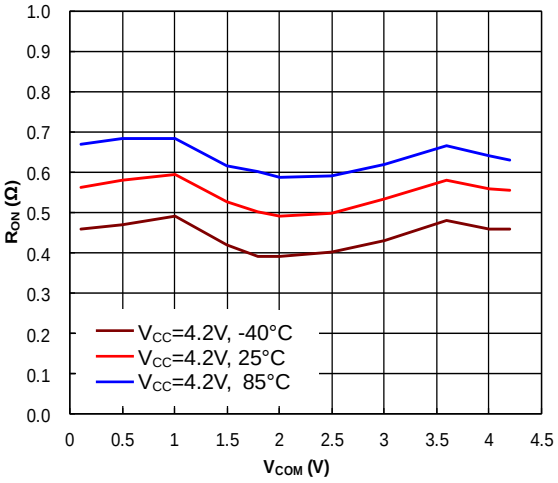
NO R_{ON} vs. V_{COM} (Temp)



NC R_{ON} vs. V_{COM} (Temp)



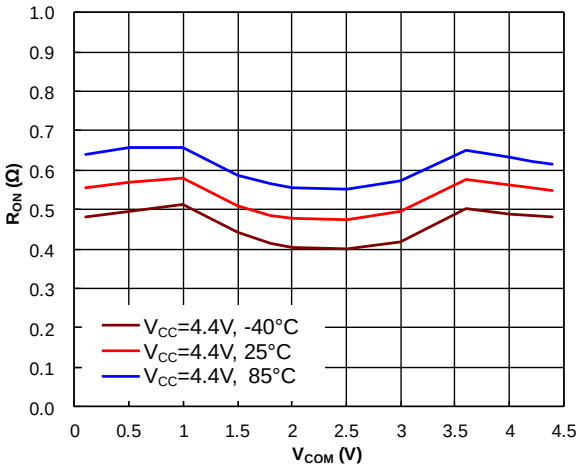
NO R_{ON} vs. V_{COM} (Temp)



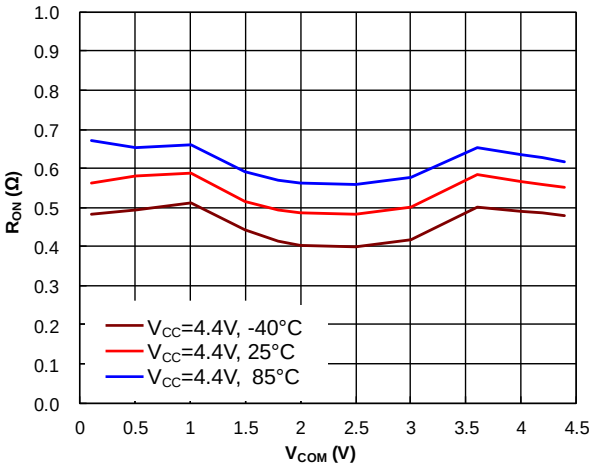
Typical Operating Characteristics (Continued)

(T_A=+25℃, unless otherwise noted.)

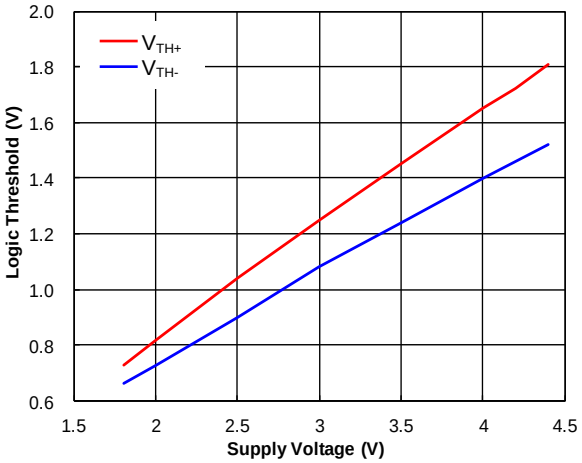
NC R_{ON} vs. V_{COM} (Temp)



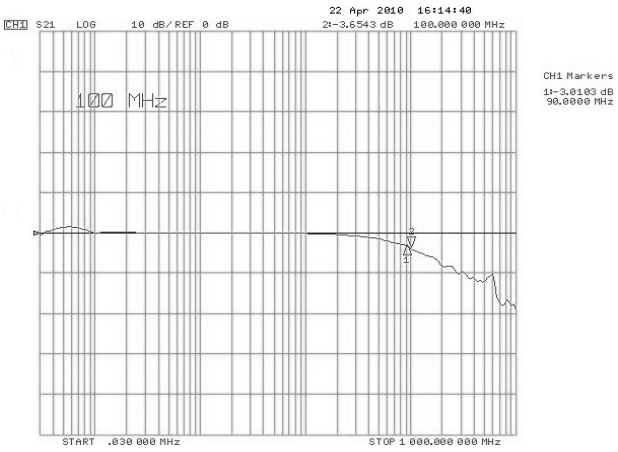
NO R_{ON} vs. V_{COM} (Temp)



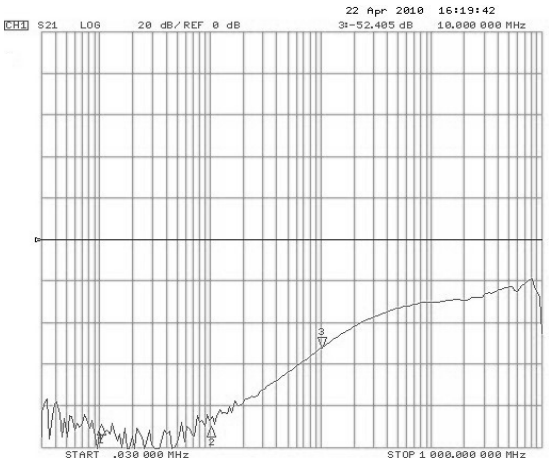
Logic Threshold vs. Supply Voltage



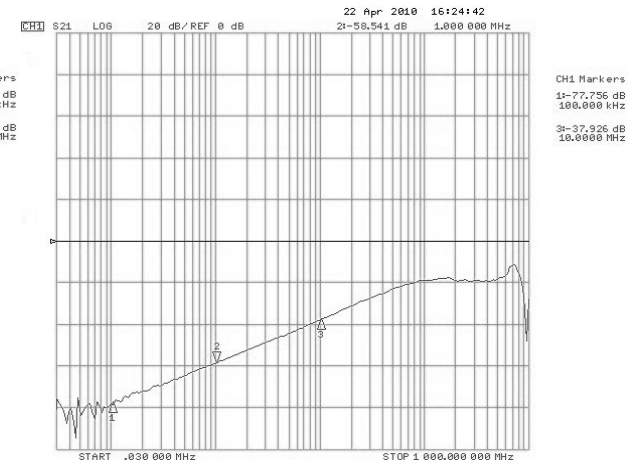
Bandwidth



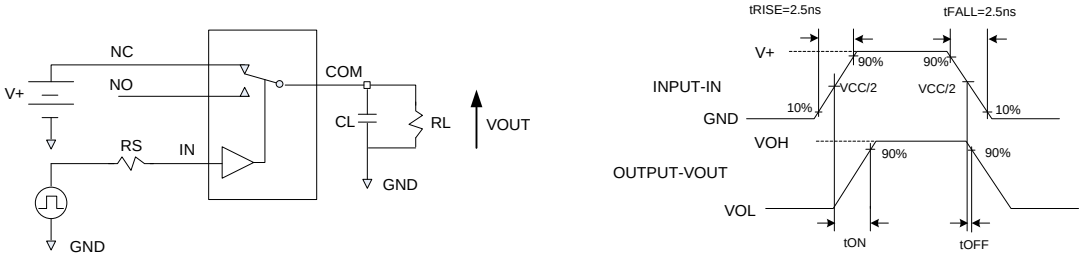
Crosstalk



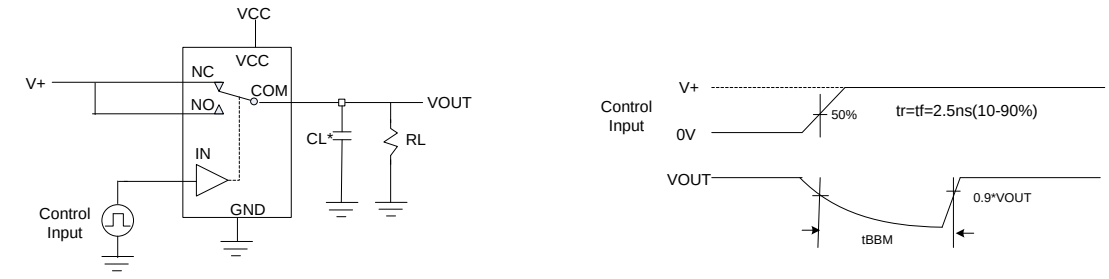
Off Isolation



Test Circuits

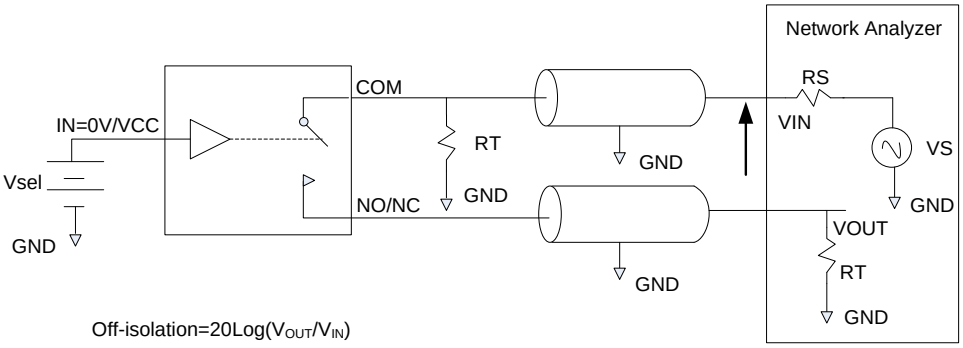


Test Circuit 1. Switching Timing (t_{ON}, t_{OFF})



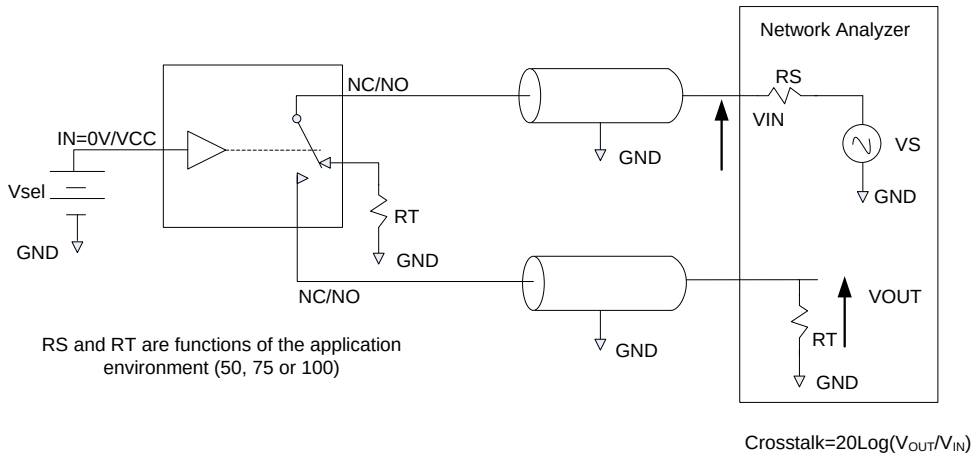
CL* includes fixture and stray capacitance

Test Circuit 2. Break-Before-Make Timing

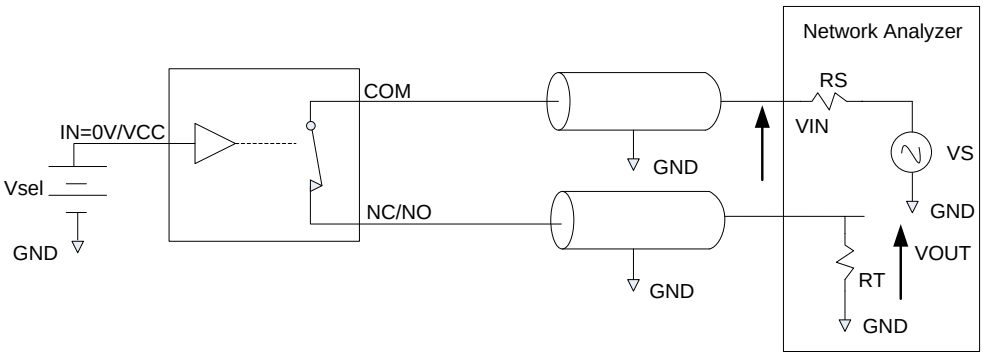


Off-isolation=20Log(V_{OUT}/V_{IN})

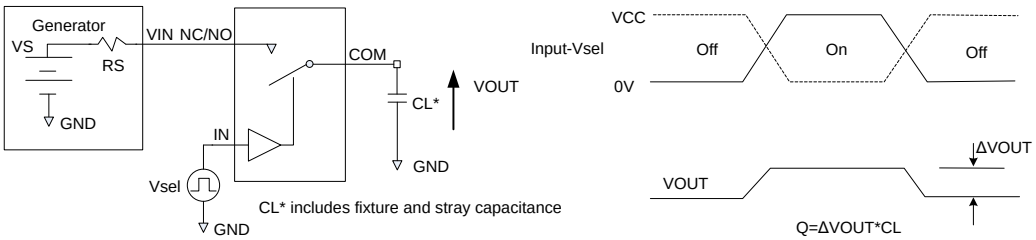
Test Circuit 3. Off-Isolation



Test Circuit 4. Channel-to-Channel Crosstalk



Test Circuit 5. Bandwidth

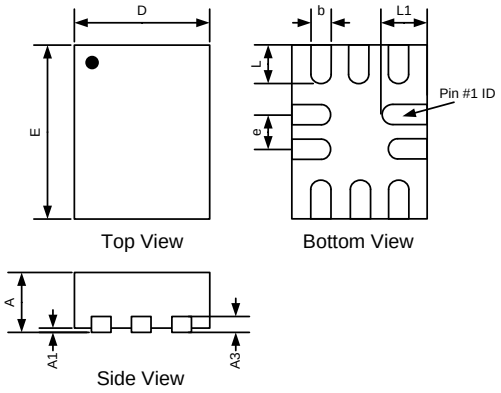


Test Circuit 6. Charge Injection Test

Package Information

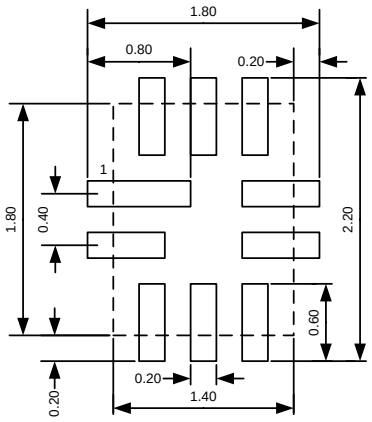
QFN10 1.8×1.4

Outline Drawing



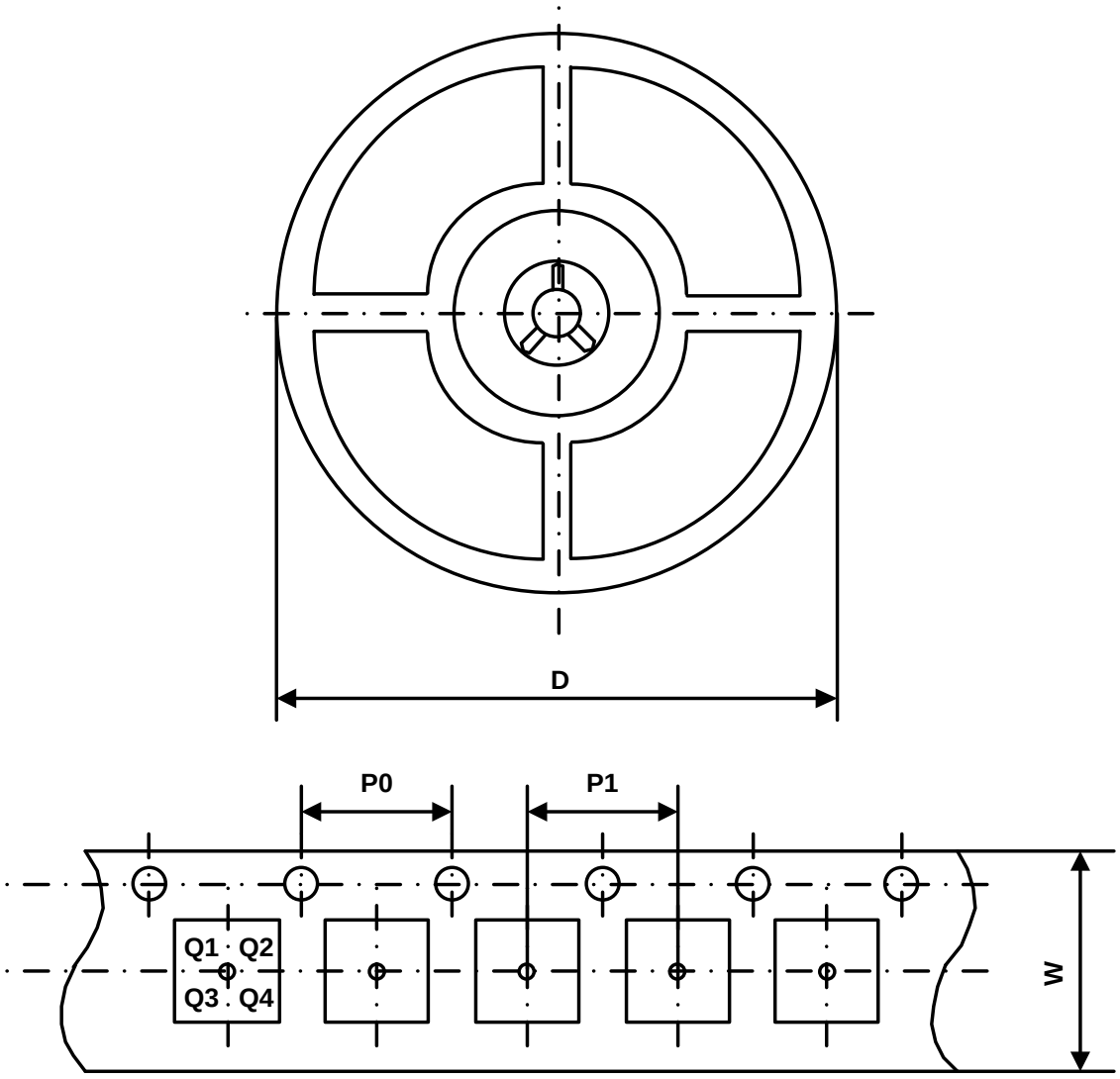
DIMENSIONS						
Symbol	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	0.50	0.55	0.60	0.020	0.022	0.024
A1	0.00	-	0.05	0.000	-	0.002
A3	0.15REF			0.006REF		
b	0.15	0.20	0.25	0.006	0.008	0.010
D	1.35	1.40	1.45	0.053	0.055	0.057
E	1.75	1.80	1.85	0.069	0.071	0.073
e	0.40BSC			0.016BSC		
L	0.30	0.40	0.50	0.012	0.016	0.020
L1	0.40	0.50	0.60	0.016	0.020	0.024

Land Pattern



NOTES:
1. Compound dimension: 1.80×1.40;
2. Unit: mm
3. General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

Packing Information



Part Number	Package Type	Carrier Width (W)	Pitch (P0)	Pitch (P1)	Reel Size (D)	PIN 1 Quadrant
UM2268	QFN10 1.8×1.4	8 mm	4 mm	8 mm	180 mm	Q1

GREEN COMPLIANCE

Union Semiconductor is committed to environmental excellence in all aspects of its operations including meeting or exceeding regulatory requirements with respect to the use of hazardous substances. Numerous successful programs have been implemented to reduce the use of hazardous substances and/or emissions.
All Union components are compliant with the RoHS directive, which helps to support customers in their compliance with environmental directives. For more green compliance information, please visit:
http://www.union-ic.com/index.aspx?cat_code=RoHSDeclaration

IMPORTANT NOTICE

The information in this document has been carefully reviewed and is believed to be accurate. Nonetheless, this document is subject to change without notice. Union assumes no responsibility for any inaccuracies that may be contained in this document, and makes no commitment to update or to keep current the contained information, or to notify a person or organization of any update. Union reserves the right to make changes, at any time, in order to improve reliability, function or design and to attempt to supply the best product possible.