

高速、双通道单刀双掷 (SPDT) 模拟开关

UM9636 QFN10 1.8×1.4

描述

UM9636是一款高速、低功率、双通道单刀双掷 (SPDT) 模拟开关，采用+2.7V 至 +12V 单电源供电。

UM9636的-3dB带宽为720MHz，在传输10MHz信号时端口间串扰位-67dB和隔离度为-58dB。该器件的宽带宽和低导通电阻使其能够以良好的信号完整性传递高速差分信号。开关是双向的，输出端的高速信号几乎没有衰减。其较高的抑制通道间串扰能力可将噪声干扰降至最低。UM9636 的主要应用包括精密仪器和便携式设备设计中的逻辑电平转换、脉冲发生器以及高速或低噪声信号开关。

该器件采用无铅 QFN10 1.8×1.4 封装。

应用

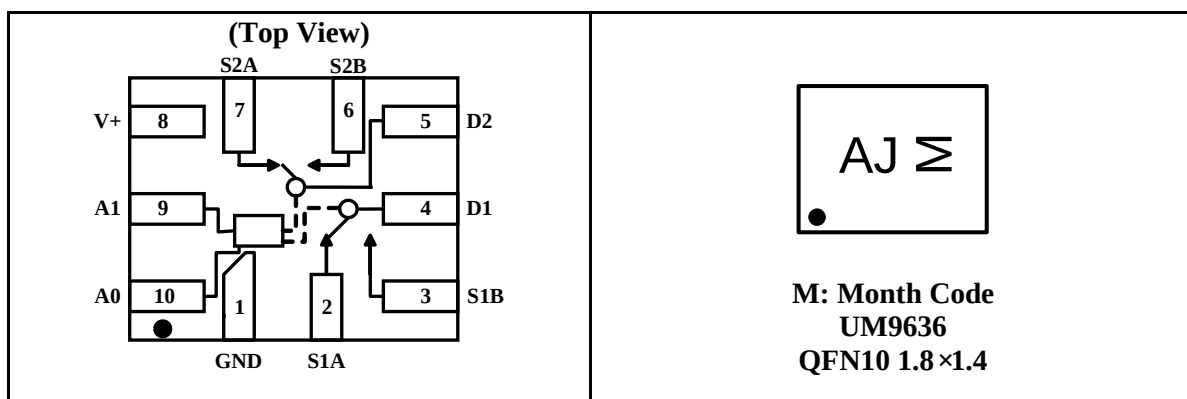
- 高端数据采集
- 医疗设备
- 精密仪器
- 高速通信设备
- 自动测试设备
- 采样和保持电路

特性

- 在 $V_{CC}=12V$ 时 R_{on} 典型值为 83Ω
- 通道导通电容: 6.5pF (典型值)
- -3dB 带宽典型值为 720MHz (或数据频率)
- 低串扰: 典型值 -67dB (10MHz)
- 高隔离度: 典型值 -58dB (10MHz)
- 低电压, 兼容 1.65 V CMOS/TTL
- 低电流消耗: 1 μ A
- V_{CC} 工作范围: +2.7V to +12V
- 无铅 QFN10 封装

引脚配置

顶部视图



订购信息

芯片型号	封装类型	丝印编码	发货数量
UM9636	QFN10 1.8×1.4	AJ	3000pcs/7 Inch Tape & Reel

Truth Table

Select Input		On Switches
A1	A0	UM9636
X	0	D1 to S1A
X	1	D1 to S1B
0	X	D2 to S2A
1	X	D2 to S2B

Pin Description

Pin	Name	Function
1	GND	Ground Connection
2	S1A	Data Ports
3	S1B	Data Ports
4	D1	Data Ports
5	D2	Data Ports
6	S2B	Data Ports
7	S2A	Data Ports
8	V+	Positive Supply Voltage
9	A1	Select Input
10	A0	Select Input

Absolute Maximum Ratings

Symbol	Parameter	Limit	Unit
V+	Supply Voltage	-0.5 to +14V	V
V _{IS}	Analog Switch Input Voltage	-0.5 to (V _{CC} +0.3)	
V _{IN}	Digital Select Input Voltage	-0.5 to (V _{CC} +0.3)	
I _D	Continuous DC Current	50	mA
P _P	Peak Current, S or D (Pulsed 1 ms, 10 % Duty Cycle)	100	
P _D	Power Dissipation	0.28	W
T _O	Operating Temperature Range	-40 to +85	°C
T _{STG}	Storage Temperature Range	-65 to +150	
ESD	HBM		V
	I/O to GND	4000	
	All Pins	2000	

Electrical Characteristics

Symbol	Parameter	Test Conditions	V+ (V)	Temp	Limits (–40 °C to 85 °C)			Unit
					Min	Typ (Note 1)	Max	
DC Electrical Characteristics								
V _{ANALOG}	Analog Signal Range			Full			12	V
I _{CC}	Quiescent Supply Current	V _{IN} =0V, or V+	12	Room Full		0.01	0.5 1	μA
I _{GND}	Ground Current			Room Full	-0.5 -1	-0.01		
I _{IH}	Input Leakage Current, V _{IN} High	V _{AX} =1.65V	12	Full	-0.1	0.01	0.1	μA
I _{IL}	Input Leakage Current, V _{IN} Low	V _{AX} =0.5V	12	Full	-0.1	0.01	0.1	μA
I _{D(on)}	Channel On Leakage Current	V+=12V, V _D =V _S 11V/1V	12	Room Full	-1.0	±0.01	1.0 2.0	μA
I _{D(off)}	OFF State Leakage Current (Note 2)	V+=12V, V _D =1V/11V, V _S =11V/1V	12	Room Full	-11.0	±0.01	11.0 15.0	μA
I _{S(off)}			Room Full	-11.0	±0.01	11.0 15.0	μA	
V _{IH}	Input High Voltage		12	Full	1.65			V
V _{IL}	Input Low Voltage		12	Full			0.5	V
R _{ON}	On-Resistance (Note 3)	V _D =11.3V I _S =1mA	12	Room Full		83	110 125	Ω
ΔR _{ON}	On Resistance Match Between Channels (Note 3, 4, 5)	V _D =11.3V I _S =1mA	12	Room Full		2	4 6	Ω
R _{FLAT}	On Resistance Flatness (Note 3, 4, 6)	V _D =0.7, 6.5, 11.3V I _S =1mA	12	Room Full		33	45 50	Ω
AC Electrical Characteristics								
t _{ON}	Turn On Time	R _L =300Ω, C _L =35pF	12	Room Full		30	70 80	ns
t _{OFF}	Turn Off Time	R _L =300Ω, C _L =35pF	12	Room Full		15	55 65	ns
t _{BBM}	Break Before Make Time (Note 7)	R _L =300Ω, C _L =35pF	12	Room Full	5 2	15		ns
THD	Total Harmonic Distortion	Signal=1V _{RMS} , 20Hz to 20kHz, R _L =600Ω	12	Room		0.01		%
Charge Injection	Q _{INJ}	C _L =1nF, R _{GEN} =0Ω, V _{GEN} =0V	12	Room		23.5		pC
O _{IRR}	Off Isolation (Note 8)	R _L =50Ω, C _L =5pF, f=10MHz	12	Room		-58		dB
X _{TALK}	Crosstalk	R _L =50Ω, C _L =5pF, f=10MHz	12	Room		-67		dB
BW	-3dB Bandwidth	R _L =50Ω	12	Room		720		MHz
Capacitance								
C _{IN}	Control Pin Input Capacitance	f=1MHz		Room		3		pF
C _{OFF}	Switch Off Capacitance	f=1MHz	12	Room		2.0		pF
C _{ON}	Switch On Capacitance	f=1MHz	12	Room		7.7		pF

Note 1: Typically values are at T_A=+25 °C.

Note 2: The high OFF State Leakage Current is because of pull down resistor

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

Note 4: Parameter is characterized but not tested in production.

Note 5: ΔR_{ON}= | R_{ON}(S1A/S1B)–R_{ON}(S2A/S2B) | measured at identical V_{CC}, temperature and voltage levels.

Note 6: Flatness is defined as the difference between the maximum and minimum value of On Resistance over the specified range of conditions.

Note 7: Guaranteed by design.

Note 8: Off Isolation=20log₁₀ [V_D/V_{SA/SB}].

Electrical Characteristics

Symbol	Parameter	Test Conditions	V+ (V)	Temp	Limits (–40 °C to 85 °C)			Unit
					Min	Typ (Note 1)	Max	
DC Electrical Characteristics								
V _{ANALOG}	Analog Signal Range			Full			5	V
I _{CC}	Quiescent Supply Current	V _{IN} =0V, or V+	5	Room Full		0.01	0.5 1	μA
I _{GND}	Ground Current			Room Full	-0.5 -1	-0.01		
I _{IH}	Input Leakage Current, V _{IN} High	V _{AX} =1.4V	5	Full	-0.1	0.01	0.1	μA
I _{IL}	Input Leakage Current, V _{IN} Low	V _{AX} =0.5V	5	Full	-0.1	0.01	0.1	μA
I _{D(on)}	Channel On Leakage Current	V+=5.5V, V _D =V _S 4.5V/1V	5.5	Room Full	-1.0	±0.01	1.0 2.0	μA
I _{D(off)}	OFF State Leakage Current (Note 2)	V+=5.5V, V _D =1V/4.5V, V _S =4.5V/1V	5.5	Room Full	-3.0	±0.01	3.0 5.0	μA
I _{S(off)}			5.5	Room Full	-3.0	±0.01	3.0 5.0	μA
V _{IH}	Input High Voltage		5	Full	1.4			V
V _{IL}	Input Low Voltage		5	Full			0.5	V
R _{ON}	On-Resistance (Note 3)	V _D =4V I _S =1mA	5	Room Full		300	350 400	Ω
ΔR _{ON}	On Resistance Match Between Channels (Note 3, 4, 5)	V _D =4V I _S =1mA	5	Room Full		6	12 15	Ω
AC Electrical Characteristics								
t _{ON}	Turn On Time	R _L =300Ω, C _L =35pF	5	Room Full		55		ns
t _{OFF}	Turn Off Time	R _L =300Ω, C _L =35pF	5	Room Full		30		ns
t _{BBM}	Break Before Make Time (Note 6)	R _L =300Ω, C _L =35pF	5	Room Full		36		ns
THD	Total Harmonic Distortion	Signal=1V _{RMS} , 20Hz to 20kHz, R _L =600Ω	5	Room		2.2		%
Charge Injection	Q _{INJ}	C _L =1nF, R _{GEN} =0Ω, V _{GEN} =0V	5	Room		10		pC
O _{IRR}	Off Isolation (Note 7)	R _L =50Ω, C _L =5pF, f=10MHz	5	Room		-58		dB
X _{TALK}	Crosstalk	R _L =50Ω, C _L =5pF, f=10MHz	5	Room		-68		dB
BW	-3dB Bandwidth	R _L =50Ω	5	Room		610		MHz
Capacitance								
C _{IN}	Control Pin Input Capacitance	f=1MHz		Room		3		pF
C _{OFF}	Switch Off Capacitance	f=1MHz	5	Room		2.1		pF
C _{ON}	Switch On Capacitance	f=1MHz	5	Room		8.1		pF

Note 1: Typically values are at T_A=+25 °C.

Note 2: The high OFF State Leakage Current is because of pull down resistor

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

Note 4: Parameter is characterized but not tested in production.

Note 5: ΔR_{ON}= | R_{ON}(S1A/S1B)–R_{ON}(S2A/S2B) | measured at identical V_{CC}, temperature and voltage levels.

Note 6: Guaranteed by design.

Note 7: Off Isolation=20log₁₀ [V_D/V_{SA/SB}].

Electrical Characteristics

Symbol	Parameter	Test Conditions	V+ (V)	Temp	Limits (−40 °C to 85 °C)			Unit
					Min	Typ (Note 1)	Max	
DC Electrical Characteristics								
V _{ANALOG}	Analog Signal Range			Full			3	V
I _{CC}	Quiescent Supply Current	V _{IN} =0V, or V+	3	Room Full		0.01	0.5 1	μA
I _{GND}	Ground Current			Room Full	-0.5 -1	-0.01		
I _{IH}	Input Leakage Current, V _{IN} High	V _{AX} =1.4V	3	Full	-0.1	0.01	0.1	μA
I _{IL}	Input Leakage Current, V _{IN} Low	V _{AX} =0.5V	3	Full	-0.1	0.01	0.1	μA
I _{D(on)}	Channel On Leakage Current	V+=3.3V, V _D =V _S 3V/1V	3.3	Room Full	-1.0	±0.01	1.0 2.0	μA
I _{D(off)}	OFF State Leakage Current	V+=3.3V, V _D =1V/3V, V _S =3V/1V	3.3	Room Full	-1.0	±0.01	1.0 2.0	μA
I _{S(off)}			3.3	Room Full	-1.0	±0.01	1.0 2.0	μA
V _{IH}	Input High Voltage		3	Full	1.4			V
V _{IL}	Input Low Voltage		3	Full			0.5	V
R _{ON}	On-Resistance (Note 2)	V _D =1.5V I _S =1mA	3	Room Full		500	550 650	Ω
ΔR _{ON}	On Resistance Match Between Channels (Note 2, 3, 4)	V _D =1.5V I _S =1mA	3	Room Full		10	14 18	Ω
AC Electrical Characteristics								
t _{ON}	Turn On Time	R _L =300Ω, C _L =35pF	3	Room Full		96		ns
t _{OFF}	Turn Off Time	R _L =300Ω, C _L =35pF	3	Room Full		60		ns
t _{BBM}	Break Before Make Time (Note 5)	R _L =300Ω, C _L =35pF	3	Room Full		77		ns
THD	Total Harmonic Distortion	Signal=1V _{RMS} , 20Hz to 20kHz, R _L =600Ω	3	Room		2.2		%
Charge Injection	Q _{INJ}	C _L =1nF, R _{GEN} =0Ω, V _{GEN} =0V	3	Room		6.6		pC
O _{IRR}	Off Isolation (Note 6)	R _L =50Ω, C _L =5pF, f=10MHz	3	Room		-57		dB
X _{TALK}	Crosstalk	R _L =50Ω, C _L =5pF, f=10MHz	3	Room		-69		dB
BW	-3dB Bandwidth	R _L =50Ω	3	Room		525		MHz
Capacitance								
C _{IN}	Control Pin Input Capacitance	f=1MHz		Room		3.1		pF
C _{OFF}	Switch Off Capacitance	f=1MHz	3	Room		2.1		pF
C _{ON}	Switch On Capacitance	f=1MHz	3	Room		8.3		pF

Note 1: Typically values are at T_A=+25 °C.

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

Note 4: ΔR_{ON}= | R_{ON}(S1A/S1B) – R_{ON}(S2A/S2B) | measured at identical V_{CC}, temperature and voltage levels.

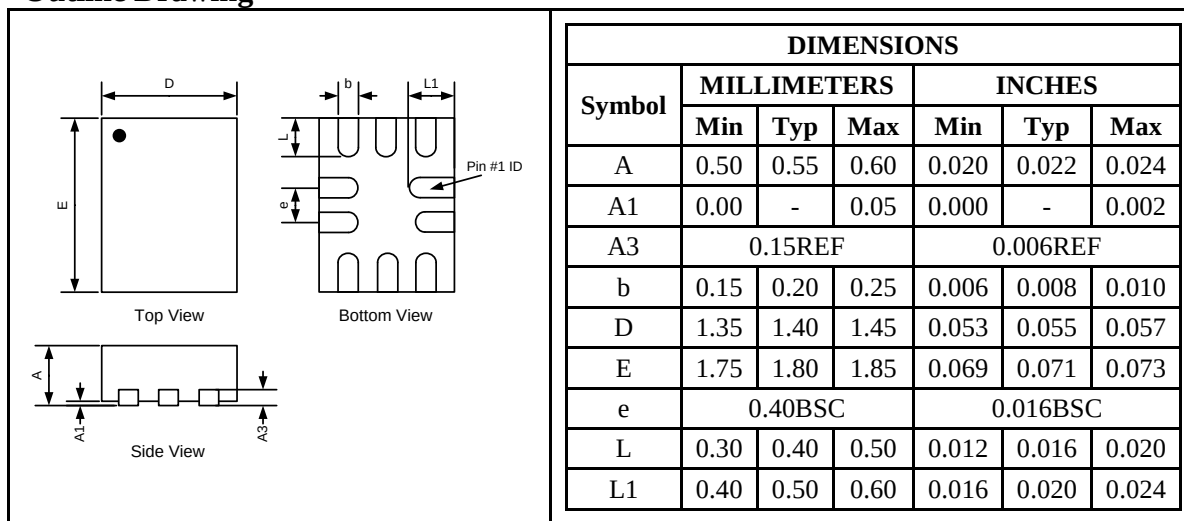
Note 5: Guaranteed by design.

Note 6: Off Isolation=20log₁₀ [V_D/V_{SA/SB}].

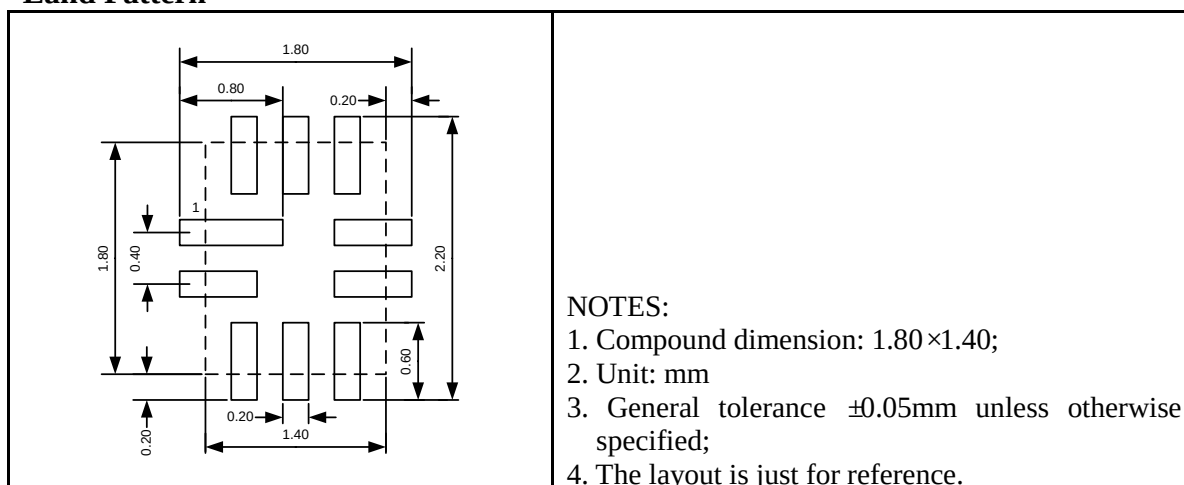
Package Information

UM9636: QFN10 1.80×1.40

Outline Drawing



Land Pattern



Tape and Reel Orientation



GREEN COMPLIANCE

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