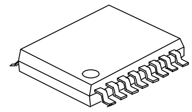
5V, 1:1 (SPST), 4-CHANNEL PRECISION SWITCHES



TSSOP-16

■ DESCRIPTION

The UTC **UMUX1111** is precision complementary metal-oxide semiconductor (CMOS) device that has four independently selectable single-pole / single-throw (SPST) switch. The device supports bidirectional analog and digital signals on the source (Sx) and drain (Dx) pins ranging from GND to V_{DD}.

Wide operating supply of 1.08V to 5.5V allows for use in a broad array of applications from medical equipment to industrial systems.

■ FEATURES

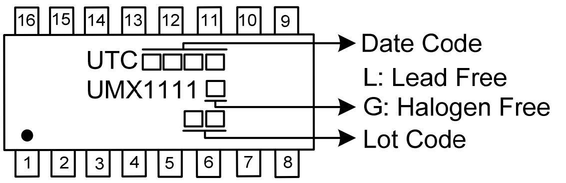
* 1.8V Logic compatible
* Wide supply range: 1.08V ~ 5.5V
* Rail to rail operation
* Fail-safe logic
* Bidirectional signal path
* Break-before-make switching

■ ORDERING INFORMATION

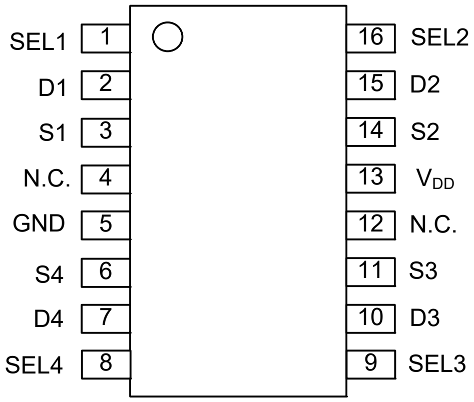
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UMUX1111L-P16-R	UMUX1111G-P16-R	TSSOP-16	Tape Reel

UMUX1111G-P16-R	
(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) P16: TSSOP-16
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ PIN CONFIGURATION



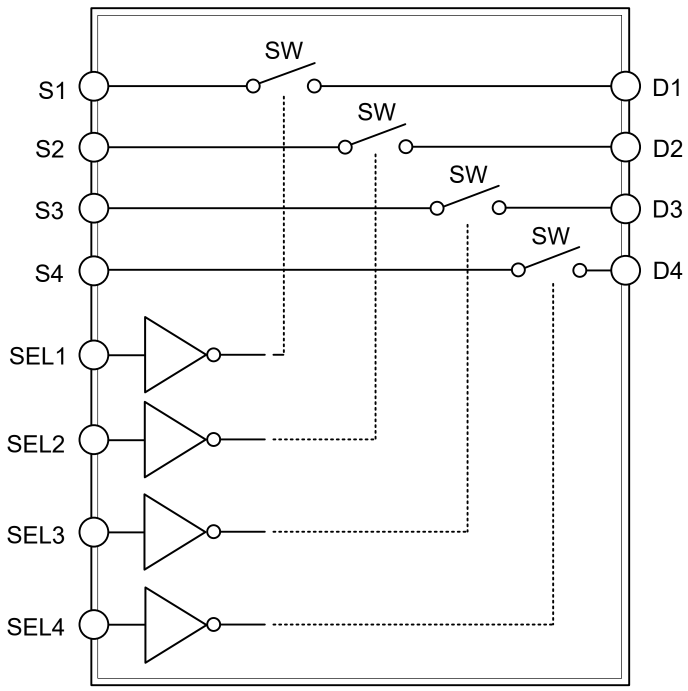
■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	SEL1	Logic control input 1
2	D1	Drain pin 1. Can be an input or output
3	S1	Source pin 1. Can be an input or output
4	N.C.	No internal connection
5	GND	Ground (0 V) reference
6	S4	Source pin 4. Can be an input or output
7	D4	Drain pin 4. Can be an input or output
8	SEL4	Logic control input 4
9	SEL3	Logic control input 3
10	D3	Drain pin 3. Can be an input or output
11	S3	Source pin 3. Can be an input or output
12	N.C.	No internal connection
13	V_{DD}	Positive power supply
14	S2	Source pin 2. Can be an input or output
15	D2	Drain pin 2. Can be an input or output
16	SEL2	Logic control input 2

■ TRUTH TABLES

SELx	STATE
0	Channels ON
1	Channels OFF

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{DD}	-0.5 ~ 6	V
Logic Control Input pin Voltage (SELx)	V_{SEL}	-0.5 ~ 6	V
Logic Control Input pin Current (SELx)	I_{SEL}	±30	mA
Source or Drain Voltage (Sx, D)	V_S or V_D	-0.5 ~ V_{DD}+0.5	V
Source or Drain Continuous Current (Sx, D)	I_S or $I_{D\ (CONT)}$	±30	mA
Junction Temperature	T_J	+150	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Positive Power Supply Voltage	V_{DD}	1.08		5.5	V
Signal Path Input/Output Voltage (Source or Drain Pin) (Sx, D)	V_S or V_D	0		V_{DD}	V
Logic Control Input Pin Voltage (SELx)	V_{SEL}	0		5.5	V
Ambient Temperature	T_A	-40		+125	°C

■ ELECTRICAL CHARACTERISTICS (V_{DD} = 5V ±10%, T_A =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
ANALOG SWITCH							
On-Resistance	R_{ON}	V_S = 0V ~ V_{DD} I_{SD} =10mA Refer to On-Resistance	T_A =25°C		4	9.2	Ω
			T_A=-40°C~+125°C			10.1	Ω
On-Resistance Matching between Channels	ΔR_{ON}	V_S = 0V ~ V_{DD} I_{SD} = 10mA Refer to On-Resistance	T_A =25°C		0.2		Ω
			T_A=-40°C~+125°C			0.5	Ω
On-Resistance Flatness	R_{ON} FLAT	V_S = 0V ~ V_{DD} I_{SD} = 10mA Refer to On-Resistance	T_A =25°C		0.85		Ω
			T_A=-40°C~+125°C		2		Ω
Source Off Leakage Current (Note 1)	$I_{S(OFF)}$	V_{DD} = 5V, Switch Off V_D = 4.5V / 1.5V V_S = 1.5V / 4.5V Refer to Off-Leakage Current	T_A =25°C	-100	±20	100	nA
			T_A=-40°C~+125°C	-200		200	nA
Drain Off Leakage Current (Note 1)	$I_{D(OFF)}$	V_{DD} = 5V, Switch Off V_D = 4.5V / 1.5V V_S = 1.5V / 4.5V Refer to Off-Leakage Current	T_A =25°C	-100	±20	100	nA
			T_A=-40°C~+125°C	-200		200	nA
Channel On Leakage Current	$I_{D(ON)}$ $I_{S(ON)}$	V_{DD} = 5V, Switch On V_D =V_S=4.5V/1.5V Refer to On-Leakage Current	T_A =25°C	-100	±30	100	nA
			T_A=-40°C~+125°C	-500		500	nA
LOGIC INPUTS (SELx)							
Input Logic High	V_{IH}	T_A=-40°C~+125°C		1.49		5.5	V
Input Logic Low	V_{IL}	T_A=-40°C~+125°C		0		0.87	V
Input Leakage Current	I_{IH}, I_{IL}	T_A =25°C			±0.05		μA
Input Leakage Current	I_{IH}, I_{IL}	T_A=-40°C~+125°C				±0.5	μA
Logic Input Capacitance	C_{IN}	T_A =25°C			1		pF

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
POWER SUPPLY							
V_{DD} Supply Current	I_{DD}	Logic Inputs = 0V or 5.5V	T_A =25°C		0.009		µA
			T_A=-40°C~+125°C			1	µA
DYNAMIC CHARACTERISTICS							
Transition Time between Channels	t_{TRAN}	V_S = 3V R_L = 200Ω, C_L = 15pF Refer to Transition Time	T_A =25°C		12		ns
			T_A=-40°C~+125°C			18	ns
Charge Injection	Q_C	V_S = 1V, R_S = 0Ω, C_L = 1nF, Refer to Charge Injection, T_A =25°C			1.5		pC
Off Isolation	O_{ISO}	R_L = 50Ω, C_L = 5pF f = 1MHz, Refer to Off isolation, T_A =25°C			-55		dB
		R_L = 50Ω, C_L = 5pF f = 10MHz, Refer to Off isolation T_A =25°C			-35		dB
Crosstalk	X_{TALK}	R_L = 50Ω, C_L = 5pF f = 1MHz, Refer to Channel-to-Channel Crosstalk , T_A =25°C			-65		dB
		R_L = 50Ω, C_L = 5pF f = 10MHz, Refer to Channel-to-Channel Crosstalk, T_A =25°C			-55		dB
Bandwidth	BW	R_L = 50Ω, C_L = 5pF Refer to Bandwidth, T_A =25°C			250		MHz
Source Off Capacitance	C_{SOFF}	f = 1MHz, T_A =25°C			6		pF
Drain Off Capacitance	C_{DOFF}	f = 1MHz, T_A =25°C			10		pF
On Capacitance	C_{SON} C_{DON}	f = 1MHz, T_A =25°C			18		pF

Note: When V_S is 4.5V, V_D is 1.5V, and vice versa.

■ ELECTRICAL CHARACTERISTICS (V_{DD} = 3.3V ±10%, T_A =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
ANALOG SWITCH							
On-Resistance	R_{ON}	V_S = 0V ~ V_{DD} I_{SD} =10mA Refer to On-Resistance	T_A =25°C		5.7	11	Ω
			T_A=-40°C~+125°C			12	Ω
On-Resistance Matching between Channels	ΔR_{ON}	V_S = 0V ~ V_{DD} I_{SD} = 10mA Refer to On-Resistance	T_A =25°C		0.2		Ω
			T_A=-40°C~+125°C			0.5	Ω
On-Resistance Flatness	R_{ON} FLAT	V_S = 0V ~ V_{DD} I_{SD} = 10mA Refer to On-Resistance	T_A =25°C		2.2		Ω
			T_A=-40°C~+125°C		2.5		Ω
Source Off Leakage Current (Note 1)	$I_{S(OFF)}$	V_{DD} = 3.3V, Switch Off V_D = 3V / 1V V_S = 1V / 3V Refer to Off-Leakage Current	T_A =25°C	-100	±20	100	nA
			T_A=-40°C~+125°C	-200		200	nA
Drain Off Leakage Current (Note 1)	$I_{D(OFF)}$	V_{DD} = 3.3V, Switch Off V_D = 3V / 1V V_S = 1V / 3V Refer to Off-Leakage Current	T_A =25°C	-100	±20	100	nA
			T_A=-40°C~+125°C	-200		200	nA

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
ANALOG SWITCH							
Channel On Leakage Current	$I_{D(ON)}$ $I_{S(ON)}$	V_{DD} = 3.3V, Switch On V_D = V_S=3V/1V Refer to On-Leakage Current	T_A =25°C	-100	±20	100	nA
			T_A=-40°C~+125°C	-500		500	nA
LOGIC INPUTS (SELx)							
Input Logic High	V_{IH}	T_A=-40°C~+125°C		1.35		5.5	V
Input Logic Low	V_{IL}	T_A=-40°C~+125°C		0		0.8	V
Input Leakage Current	I_{IH}, I_{IL}	T_A =25°C			±0.05		μA
Input Leakage Current	I_{IH}, I_{IL}	T_A=-40°C~+125°C				±0.5	μA
Logic Input Capacitance	C_{IN}	T_A =25°C			1		pF
POWER SUPPLY							
V_{DD} Supply Current	I_{DD}	Logic Inputs = 0V or 5.5V	T_A =25°C		0.005		μA
			T_A=-40°C~+125°C			1	μA
DYNAMIC CHARACTERISTICS							
Transition Time between Channels	t_{TRAN}	V_S = 2V R_L = 200Ω, C_L = 15pF Refer to Transition Time	T_A =25°C		14		ns
			T_A=-40°C~+125°C			22	ns
Charge Injection	Q_C	V_S = 1V, R_S = 0Ω, C_L = 1nF, Refer to Charge Injection, T_A =25°C			-1.5		pC
Off Isolation	O_{ISO}	R_L = 50Ω, C_L = 5pF f = 1MHz, Refer to Off isolation, T_A =25°C			-55		dB
		R_L = 50Ω, C_L = 5pF f = 10MHz, Refer to Off isolation T_A =25°C			-35		dB
Crosstalk	X_{TALK}	R_L = 50Ω, C_L = 5pF f = 1MHz, Refer to Channel-to-Channel Crosstalk , T_A =25°C			-65		dB
		R_L = 50Ω, C_L = 5pF f = 10MHz, Refer to Channel-to-Channel Crosstalk, T_A =25°C			-55		dB
Bandwidth	BW	R_L = 50Ω, C_L = 5pF Refer to Bandwidth, T_A =25°C			250		MHz
Source Off Capacitance	C_{SOFF}	f = 1MHz, T_A =25°C			6		pF
Drain Off Capacitance	C_{DOFF}	f = 1MHz, T_A =25°C			10		pF
On Capacitance	C_{SON} C_{DON}	f = 1MHz, T_A =25°C			18		pF

Note: When V_S is 3V, V_D is 1V, and vice versa.

■ ELECTRICAL CHARACTERISTICS (V_{DD} = 1.8V ±10%, T_A =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
ANALOG SWITCH							
On-Resistance	R_{ON}	V_S = 0V ~ V_{DD} I_{SD} =10mA Refer to On-Resistance	T_A =25°C		40		Ω
			T_A=-40°C~+125°C			80	Ω
On-Resistance Matching between Channels	ΔR_{ON}	V_S = 0V ~ V_{DD} I_{SD} = 10mA Refer to On-Resistance	T_A =25°C		0.4		Ω
			T_A=-40°C~+125°C			1.5	Ω

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
ANALOG SWITCH							
Source Off Leakage Current (Note 1)	$I_{S(OFF)}$	V_{DD} =1.98V, Switch Off V_D = 1.62V / 1V V_S = 1V /1.62V Refer to Off-Leakage Current	T_A =25°C	-100	±5	100	nA
			T_A=-40°C~+125°C	-200		200	nA
Drain Off Leakage Current (Note 1)	$I_{D(OFF)}$	V_{DD} = 1.98V, Switch Off V_D = 1.62V / 1V V_S = 1V / 1.62V Refer to Off-Leakage Current	T_A =25°C	-100	±5	100	nA
			T_A=-40°C~+125°C	-200		200	nA
Channel On Leakage Current	$I_{D(ON)}$ $I_{S(ON)}$	V_{DD} = 1.98V, Switch On V_D =V_S=1.62V/1V Refer to On-Leakage Current	T_A =25°C	-100	±5	100	nA
			T_A=-40°C~+125°C	-500		500	nA
LOGIC INPUTS (SELx)							
Input Logic High	V_{IH}	T_A=-40°C~+125°C		1.07		5.5	V
Input Logic Low	V_{IL}	T_A=-40°C~+125°C		0		0.68	V
Input Leakage Current	I_{IH}, I_{IL}	T_A =25°C			±0.05		μA
Input Leakage Current	I_{IH}, I_{IL}	T_A=-40°C~+125°C				±0.5	μA
Logic Input Capacitance	C_{IN}	T_A =25°C			1		pF
POWER SUPPLY							
V_{DD} Supply Current	I_{DD}	Logic Inputs = 0V or 5.5V	T_A =25°C		0.001		μA
			T_A=-40°C~+125°C			0.85	μA
DYNAMIC CHARACTERISTICS							
Transition Time between Channels	t_{TRAN}	V_S = 1V R_L = 200Ω, C_L = 15pF Refer to Transition Time	T_A =25°C		25		ns
			T_A=-40°C~+125°C			44	ns
Charge Injection	Q_C	V_S = 1V, R_S = 0Ω, C_L = 1nF, Refer to Charge Injection, T_A =25°C			-0.5		pC
Off Isolation	O_{ISO}	R_L = 50Ω, C_L = 5pF f = 1MHz, Refer to Off isolation, T_A =25°C			-55		dB
		R_L = 50Ω, C_L = 5pF f = 10MHz, Refer to Off isolation T_A =25°C			-35		dB
Crosstalk	X_{TALK}	R_L = 50Ω, C_L = 5pF f = 1MHz, Refer to Channel-to-Channel Crosstalk , T_A =25°C			-65		dB
		R_L = 50Ω, C_L = 5pF f = 10MHz, Refer to Channel-to-Channel Crosstalk, T_A =25°C			-55		dB
Bandwidth	BW	R_L = 50Ω, C_L = 5pF Refer to Bandwidth, T_A =25°C			250		MHz
Source Off Capacitance	C_{SOFF}	f = 1MHz, T_A =25°C			6		pF
Drain Off Capacitance	C_{DOFF}	f = 1MHz, T_A =25°C			10		pF
On Capacitance	C_{SON} C_{DON}	f = 1MHz, T_A =25°C			18		pF

Note: When V_S is 1.62V, V_D is 1V, and vice versa.

■ ELECTRICAL CHARACTERISTICS (V_{DD} = 1.2V ±10%, T_A =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
ANALOG SWITCH							
On-Resistance	R_{ON}	V_S = 0V ~ V_{DD} I_{SD} =10mA Refer to On-Resistance	T_A =25°C		70		Ω
			T_A=-40°C~+125°C			105	Ω
On-Resistance Matching between Channels	ΔR_{ON}	V_S = 0V ~ V_{DD} I_{SD} = 10mA Refer to On-Resistance	T_A =25°C		0.4		Ω
			T_A=-40°C~+125°C			1.5	Ω
Source Off Leakage Current (Note 1)	$I_{S(OFF)}$	V_{DD} =1.32V, Switch Off V_D = 1V / 0.8V V_S = 0.8V / 1V Refer to Off-Leakage Current	T_A =25°C	-100	±5	100	nA
			T_A=-40°C~+125°C	-200		200	nA
Drain Off Leakage Current (Note 1)	$I_{D(OFF)}$	V_{DD} = 1.32V, Switch Off V_D = 1 V / 0.8V V_S = 0.8V / 1V Refer to Off-Leakage Current	T_A =25°C	-100	±5	100	nA
			T_A=-40°C~+125°C	-200		200	nA
Channel On Leakage Current	$I_{D(ON)}$ $I_{S(ON)}$	V_{DD} = 1.32V, Switch On V_D =V_S=1V / 0.8V Refer to On-Leakage Current	T_A =25°C	-100	±5	100	nA
			T_A=-40°C~+125°C	-500		500	nA
LOGIC INPUTS (SELx)							
Input Logic High	V_{IH}	T_A=-40°C~+125°C		0.96		5.5	V
Input Logic Low	V_{IL}	T_A=-40°C~+125°C		0		0.36	V
Input Leakage Current	I_{IH}, I_{IL}	T_A =25°C			±0.05		μA
Input Leakage Current	I_{IH}, I_{IL}	T_A=-40°C~+125°C				±0.5	μA
Logic Input Capacitance	C_{IN}	T_A =25°C			1		pF
POWER SUPPLY							
V_{DD} Supply Current	I_{DD}	Logic Inputs = 0V or 5.5V	T_A =25°C		0.001		μA
			T_A=-40°C~+125°C			0.7	μA
DYNAMIC CHARACTERISTICS							
Transition Time between Channels	t_{TRAN}	V_S = 1V R_L = 200Ω, C_L = 15pF Refer to Transition Time	T_A =25°C		55		ns
			T_A=-40°C~+125°C			190	ns
Charge Injection	Q_C	V_S = 1V, R_S = 0Ω, C_L = 1nF, Refer to Charge Injection, T_A =25°C			-0.5		pC
Off Isolation	O_{ISO}	R_L = 50Ω, C_L = 5pF f = 1MHz, Refer to Off isolation, T_A =25°C			-55		dB
		R_L = 50Ω, C_L = 5pF f = 10MHz, Refer to Off isolation T_A =25°C			-35		dB
Crosstalk	X_{TALK}	R_L = 50Ω, C_L = 5pF f = 1MHz, Refer to Channel-to-Channel Crosstalk , T_A =25°C			-65		dB
		R_L = 50Ω, C_L = 5pF f = 10MHz, Refer to Channel-to-Channel Crosstalk, T_A =25°C			-55		dB
Bandwidth	BW	R_L = 50Ω, C_L = 5pF Refer to Bandwidth, T_A =25°C			250		MHz

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
DYNAMIC CHARACTERISTICS						
Source Off Capacitance	C_{SOFF}	f = 1MHz, T_A =25°C		6		pF
Drain Off Capacitance	C_{DOFF}	f = 1MHz, T_A =25°C		10		pF
On Capacitance	C_{SON} C_{DON}	f = 1MHz, T_A =25°C		18		pF

Note: When V_S is 1V, V_D is 0.8V, and vice versa.

■ PARAMETER MEASUREMENT INFORMATION

1. On-resistance

The on-resistance of a device is the ohmic resistance between the source (Sx) and drain (Dx) pins of the device. The on-resistance varies with input voltage and supply voltage. The symbol R_{ON} is used to denote on-resistance. The measurement setup used to measure R_{ON} is shown in Figure 1. Voltage (V) and current (I_{SD}) are measured using this setup and R_{ON} is computed with $R_{ON} = V / I_{SD}$:

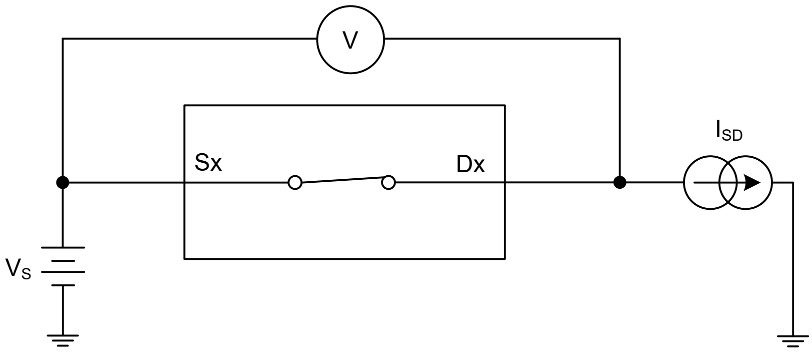


Figure 1. On-Resistance measurement setup

2. Off-leakage current

There are two types of leakage currents associated with a switch during the off state:

1. Source off-leakage current
2. Drain off-leakage current

Source leakage current is defined as the leakage current flowing into or out of the source pin when the switch is off. This current is denoted by the symbol $I_{S(OFF)}$.

Drain leakage current is defined as the leakage current flowing into or out of the drain pin when the switch is off. This current is denoted by the symbol $I_{D(OFF)}$.

The setup used to measure both off-leakage currents is shown in Figure 2.

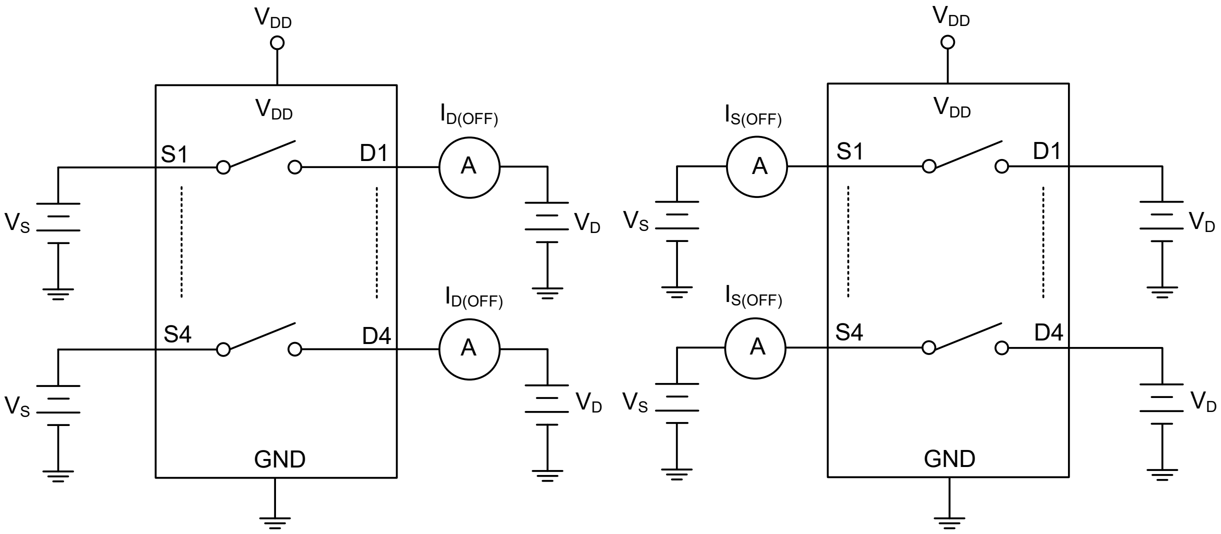


Figure 2. Off-leakage measurement setup

■ PARAMETER MEASUREMENT INFORMATION (Cont.)

3. On-leakage current

Source on-leakage current is defined as the leakage current flowing into or out of the source pin when the switch is on. This current is denoted by the symbol $I_{S(ON)}$.

Drain on-leakage current is defined as the leakage current flowing into or out of the drain pin when the switch is on. This current is denoted by the symbol $I_{D(ON)}$.

Either the source pin or drain pin is left floating during the measurement. Figure 3 shows the circuit used for measuring the on-leakage current, denoted by $I_{S(ON)}$ or $I_{D(ON)}$.

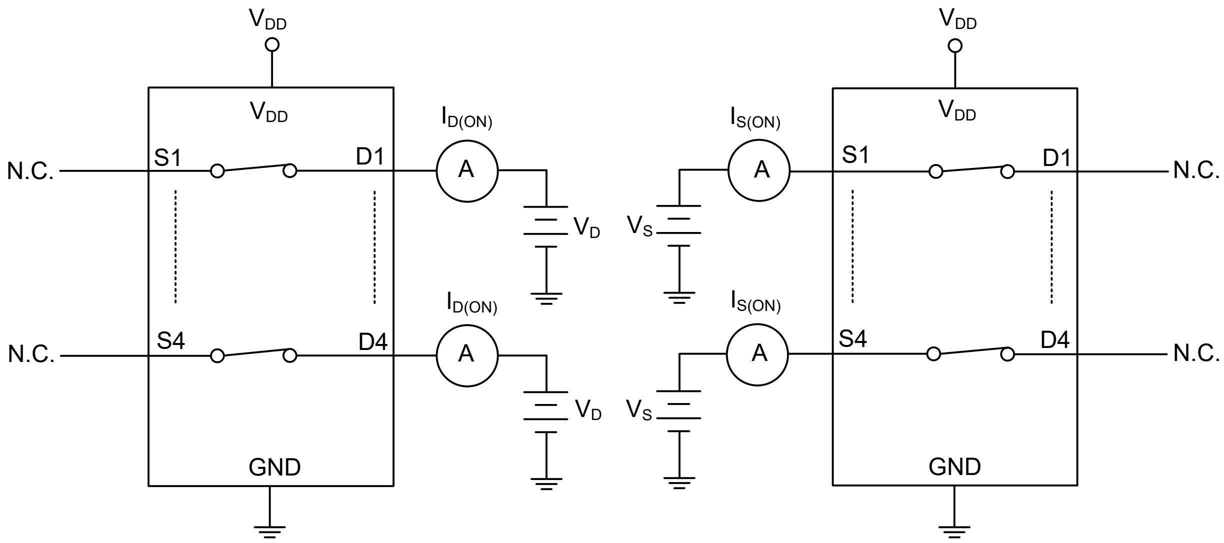


Figure 3. On-leakage measurement setup

4. Transition time

Transition time is defined as the time taken by the output of the device to rise or fall 10% after the address signal has risen or fallen past the logic threshold. The 10% transition measurement is utilized to provide the timing of the device. System level timing can then account for the time constant added from the load resistance and load capacitance. Figure 4 shows the setup used to measure transition time, denoted by the symbol $t_{TRANSITION}$.

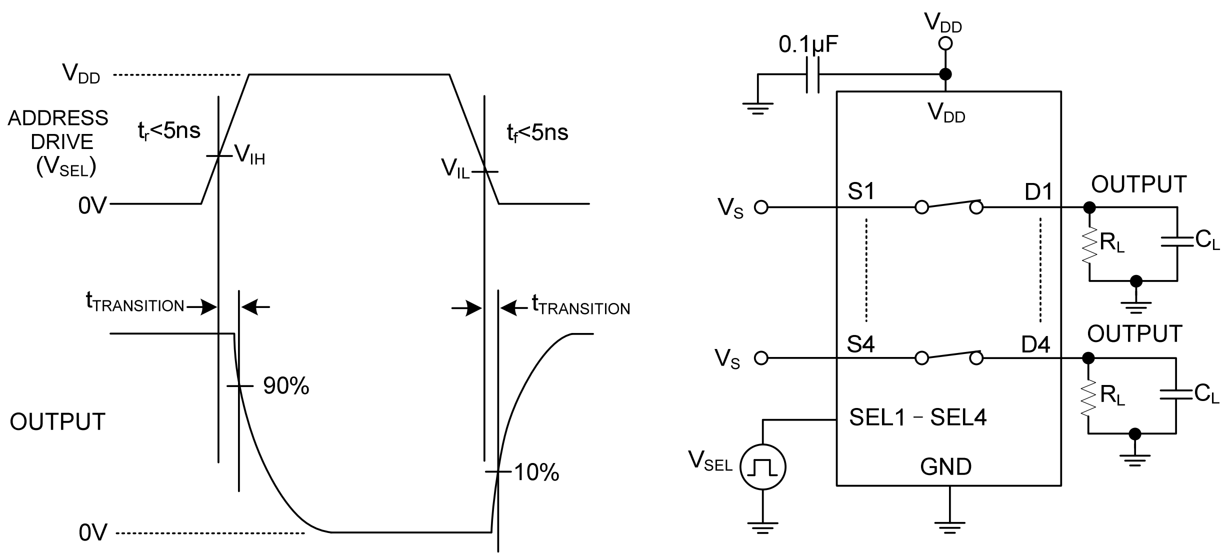


Figure 4. Transition-time measurement setup

■ PARAMETER MEASUREMENT INFORMATION (Cont.)

5. Charge injection

The UTC **UMUX1111** devices have a transmission-gate topology. Any mismatch in capacitance between the NMOS and PMOS transistors results in a charge injected into the drain or source during the falling or rising edge of the gate signal. The amount of charge injected into the source or drain of the device is known as charge injection, and is denoted by the symbol QC. Figure 5 shows the setup used to measure charge injection from source (Sx) to drain (Dx).

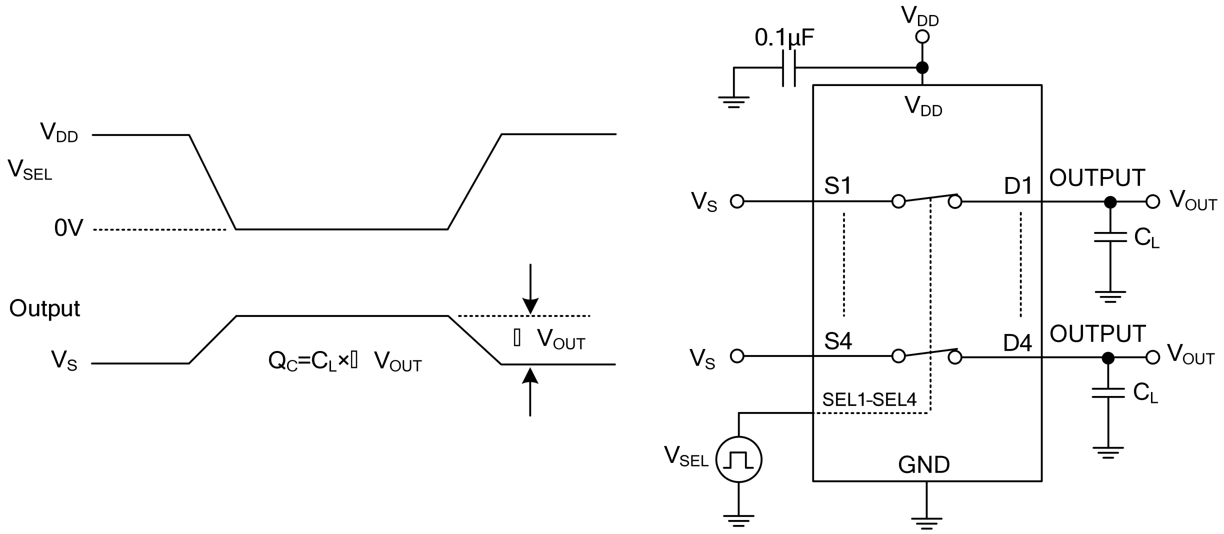


Figure 5. Charge-injection measurement setup

6. Off isolation

Off isolation is defined as the ratio of the signal at the drain pin (Dx) of the device when a signal is applied to the source pin (Sx) of an off-channel. The characteristic impedance, Z0, for the measurement is 50Ω. Figure 6 shows the setup used to measure off isolation. Use off isolation equation to compute off isolation.

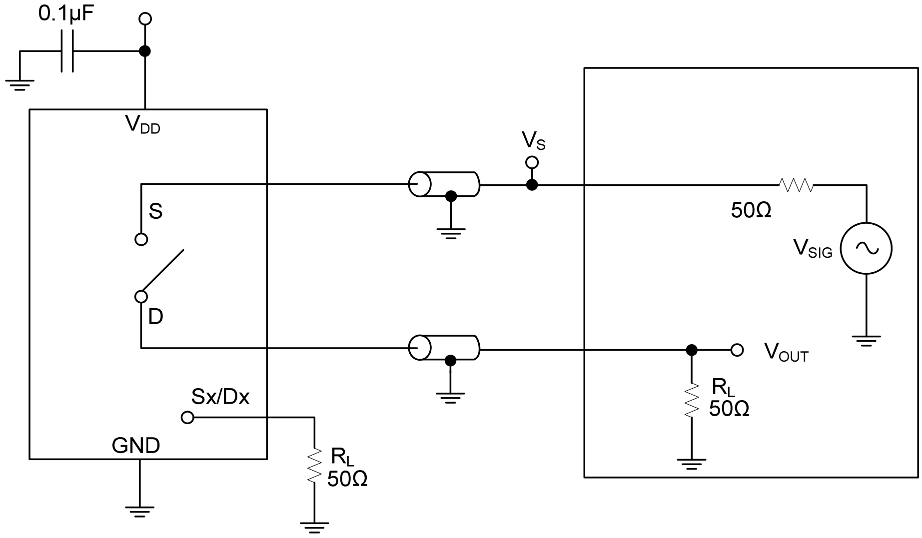


Figure 6. Off isolation measurement setup

$$\text{Off Isolation} = 20 \cdot \text{Log}\left(\frac{V_{OUT}}{V_S}\right)$$

■ PARAMETER MEASUREMENT INFORMATION (Cont.)

7. Channel-to-Channel Crosstalk

Crosstalk is defined as the ratio of the signal at the drain pin (Dx) of a different channel, when a signal is applied at the source pin (Sx) of an on-channel. The characteristic impedance, Z0, for the measurement is 50Ω. Figure 7 shows the setup used to measure, and the equation used to compute crosstalk.

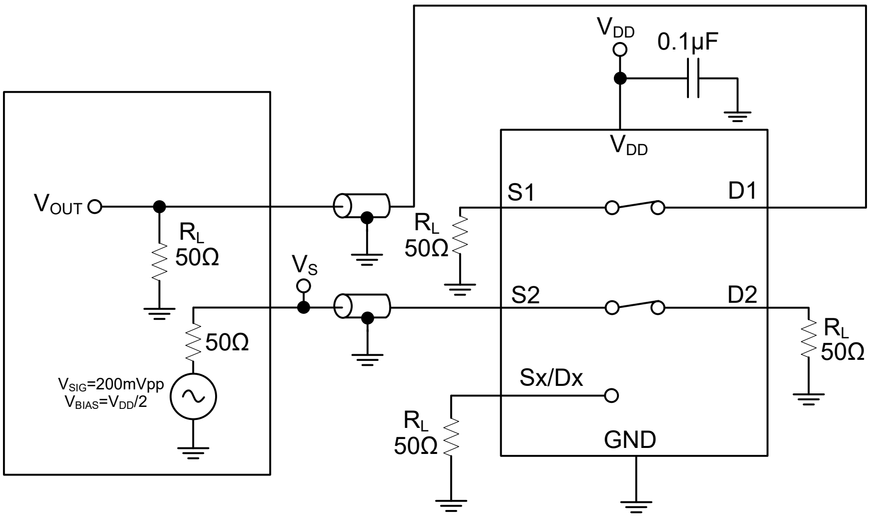


Figure 7. Channel-to-Channel Crosstalk Measurement Setup

Channel-to-Channel Crosstalk = $20 \cdot \text{Log}\left(\frac{V_{OUT}}{V_S}\right)$

8. Bandwidth

Bandwidth is defined as the range of frequencies that are attenuated by less than 3 dB when the input is applied to the source pin (Sx) of an on-channel, and the output is measured at the drain pin (Dx) of the device. The characteristic impedance, Z0, for the measurement is 50 Ω. Figure 8 shows the setup used to measure bandwidth.

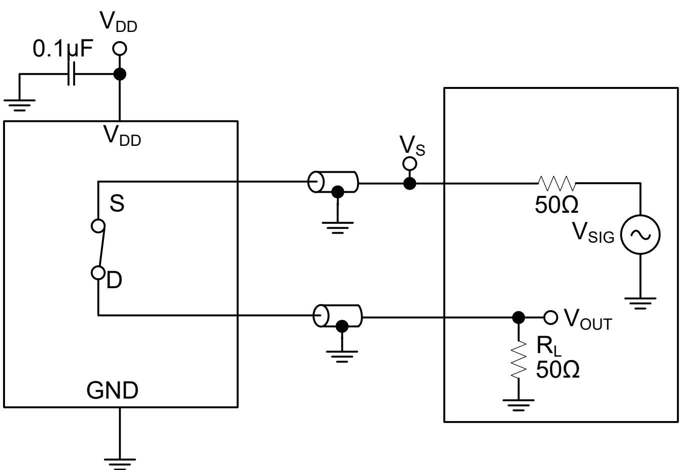


Figure 8. Bandwidth measurement setup

■ TYPICAL APPLICATION CIRCUIT

Switches and multiplexers are commonly used in the feedback path of amplifier circuits to provide configurable gain control. By using various resistor values on each switch path the UTC **UMUX1111** allows the system to have multiple gain settings. An external resistor, or utilizing 1 channel always being closed, ensures the amplifier isn't operating in an open loop configuration. A transimpedance amplifier (TIA) for photodiode inputs is a common circuit that requires gain control using a multi-channel switch to convert the output current of the photodiode into a voltage for the MCU or processor. The leakage current, capacitance, and charge injection performance of the UTC **UMUX1111** are key specifications to evaluate when selecting a device for gain control.

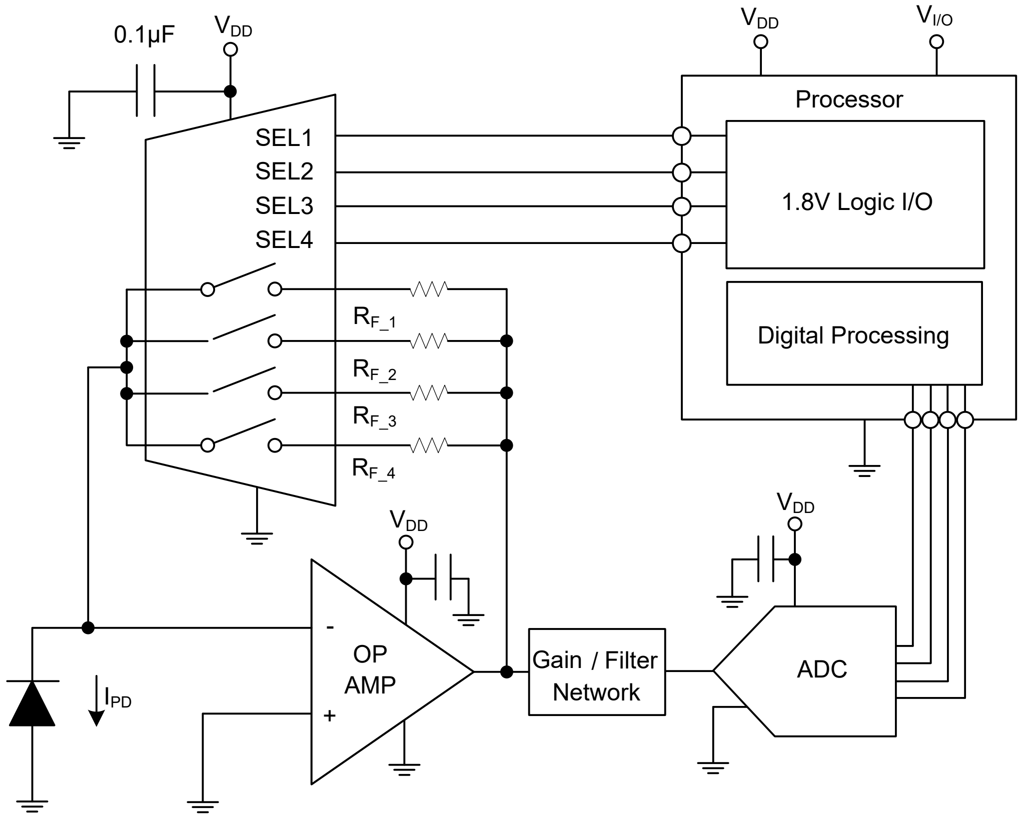


Figure 12. Switching Gain Settings of a TIA circuit

■ TYPICAL CHARACTERISTICS