DESCRIPTION

The A4766 is a bidirectional 2-channel single-pole single-throw (SPST) analog switch, which is designed to operate from 1.8V to 5.5V.

The A4766 device can handle both analog and digital signals. It features bandwidth(300MHz) and low on-resistance (4.5Ω TYP).

Each switch section has its own enable-input control (SEL). A high-level voltage applied to SEL turns on the associated switch section.

Applications include signal gating, chopping, modulation or demodulation (modem), and signal multiplexing for analog-to-digital and digital-to-analog conversion systems.

The A4766 is available in MSOP8 and DFN8(2x3) package.

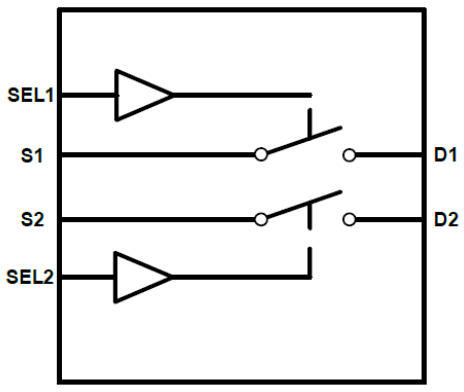
FEATURES

- 4.5Ω Switches connect input to output
- Bandwidth: 300MHz
- High Speed, Typically 30ns
- Supply Range: +1.8V to +5.5V
- Rail-to-Rail Operation
- TTL/CMOS Compatible
- Extended Industrial Temperature
- Range: -40°C to +125°C
- Available in MSOP8 and DFN8(2x3) package

APPLICATION

- Wireless Devices
- Audio and Video Signal Routing
- Portable Computing
- Wearable Devices
- Signal Gating, Chopping, Modulation or Demodulation (Modem)
- Cell Phones

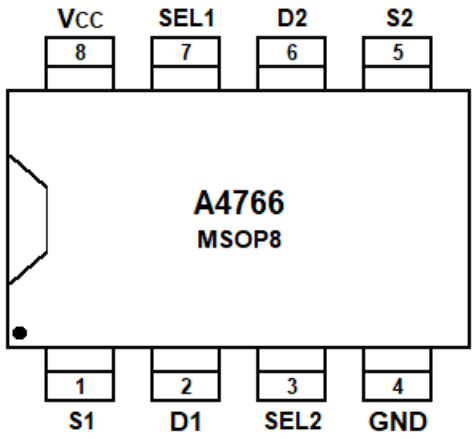
FUNCTION DIAGRAM



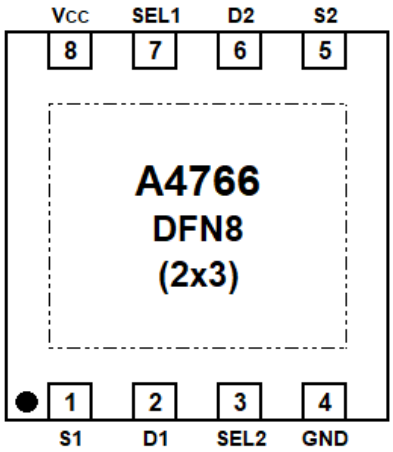
ORDERING INFORMATION

Package Type	Part Number	
MSOP8 SPQ: 4,000pcs/Reel	MS8	A4766MS8R
		A4766MS8VR
DFN8(2x3) SPQ: 3,000pcs/Reel	J8	A4766J8R
		A4766J8VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

PIN DESCRIPTION



Top View



Top View

Pin #		Symbol	I/O	Function
MSOP8	DFN8(2x3)			
1	1	S1	I/O	Bidirectional signal to be switched
2	2	D1	I/O	Bidirectional signal to be switched
3	3	SEL2	I	Controls the switch (L = OFF, H = ON)
4	4	GND	-	Ground
5	5	S2	I/O	Bidirectional signal to be switched
6	6	D2	I/O	Bidirectional signal to be switched
7	7	SEL1	I	Controls the switch (L = OFF, H = ON)
8	8	V_{CC}	-	Power Supply

FUNCTION TABLE

Select Inputs	Switch Status
SEL1/SEL2	
High	All Switches ON
Low	All Switches OFF

NOTE: Input and output pins are identical and interchangeable. Any may be considered an input or output; signals pass equally well in both directions.

ABSOLUTE MAXIMUM RATINGS

Over operating free-air temperature range, unless otherwise noted

V_{CC}, Supply Voltage[NOTE1]		-0.3V ~ 6.0V
V_{IN}, Input Voltage[NOTE1,2]		-0.3V ~ 6.0V
V_O, Switch I/O Voltage[NOTE1,2,3]		-0.3V ~ V_{CC}+0.3V
I_{IK}, Control Input Clamp Current	V_I<0	-50mA
$I_{I/OK}$, I/O Port Diode Current	$V_{I/O}$ < 0 or $V_{I/O}$ > V_{CC}	-50mA
I_T, On-State Switch Current	V_{IO}=0 to V_{CC}	-50mA ~ 50mA
Continuous Current Through V_{CC} or GND		-100mA ~ 100mA
T_J, Junction Temperature		150℃
T_{STG}, Storage Temperature		-65℃ ~ 150℃
ESD Ratings		
$V_{(ESD)}$, Electrostatic Discharge	Human-body model (HBM)	±2000V
	Machine model (MM)	±300V

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

RECOMMENDED OPERATING CONDITIONS

Over operating free-air temperature range, unless otherwise noted[NOTE2]

Parameter	Symbol	Conditions	Min.	Max.	Unit
Supply Voltage	V_{CC}		1.8	5.5	V
Operating Temperature	T_A		-40	+125	℃

NOTE1: All voltages are with respect to ground, unless otherwise specified.
NOTE2: The input and output negative-voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
NOTE3: This value is limited to 5.5 V maximum.

ELECTRICAL CHARACTERISTICS

V_{CC} = 5.0 V or 3.3V, Typical values are at T_A = +25°C, unless otherwise noted

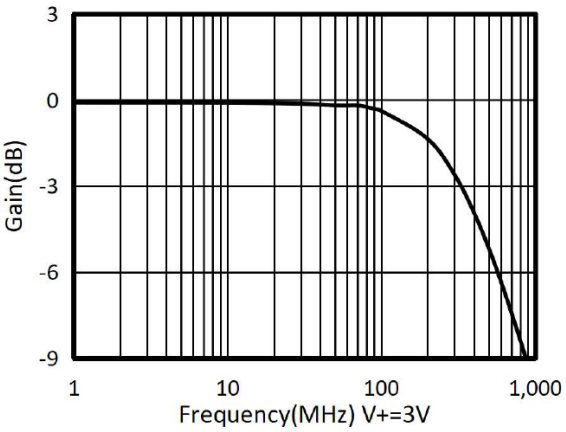
Parameter	Symbol	Conditions	V_{CC}	Temp	Min.	Typ.	Max.	Unit
ANALOG SWITCH								
Analog Signal Range	V_S, V_D			-40°C to +125°C	0	-	V_{CC}	V
On-Resistance	R_{ON}	V_S = V_{CC} /2, I_{SD}= -10mA, Switch ON, See Figure 1	5V	+25°C	-	4.5	8	Ω
				- 40°C to +125°C	-	-	8.5	
			3.3V	+25°C	-	7	10	Ω
				- 40°C to +125°C	-	-	10.5	
On-Resistance Match Between Channels	ΔR_{ON}	V_S = V_{CC} /2, I_{SD} = -10mA, Switch ON, See Figure 1	5V	+25°C	-	0.15	0.3	Ω
				- 40°C to +125°C	-	-	0.4	
			3.3V	+25°C	-	0.15	0.3	Ω
				- 40°C to +125°C	-	-	0.4	
On-Resistance Flatness	$R_{FLAT(ON)}$	0 ≤ (V_S) ≤V_{CC} /2, I_{SD} = -10mA, Switch ON, See Figure 1	5V	+25°C	-	2	3	Ω
				- 40°C to +125°C	-	-	3.3	
			3.3V	+25°C	-	3	4	Ω
				- 40°C to +125°C	-	-	4.3	
Source, Drain OFF Leakage Current	$I_{D(OFF)}$, $I_{S(OFF)}$	V_D = 0.3V, V_{CC} /2, V_S = V_{CC} /2, 0.3V See Figure 2	1.8 to 5.5V	- 40°C to +125°C	-	-	1	µA
Channel ON Leakage Current	$I_{D(ON)}$, $I_{S(ON)}$	V_D = 0.3V, Open V_S = Open, 0.3V See Figure 3	1.8 to 5.5V	- 40°C to +125°C	-	-	1	µA
DIGITAL CONTROL INPUTS								
Input High Voltage	V_{IH}		5V	- 40°C to +125°C	1.5	-	-	V
			3.3V		1.3	-	-	
Input Low Voltage	V_{IL}		5V	- 40°C to +125°C	-	-	0.6	V
			3.3V		-	-	0.5	
Input Leakage Current	I_{IN}	V_{IN} = V_{IO} or 0	1.8 to 5.5V	- 40°C to +125°C	-	-	1	µA

NOTE4: All unused digital inputs of the device must be held at VIO or GND to ensure proper device operation.

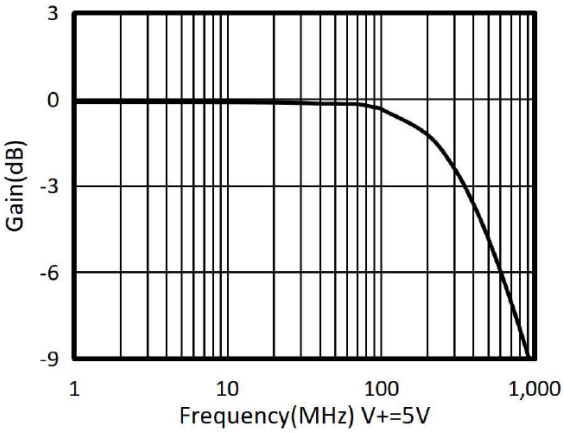
Parameter	Symbol	Conditions		V_{CC}	Temp	Min.	Typ.	Max.	Unit
DYNAMIC CHARACTERISTICS									
Turn-On Time	t_{ON}	V_S = V_{CC}, R_L = 300Ω, C_L = 35pF, See Figure 4		5V	+25°C	-	30	-	ns
				3.3V		-	40	-	
Turn-Off Time	t_{OFF}			5V	+25°C	-	25	-	ns
				3.3V		-	30	-	
Break-Before-Make Time Delay	t_{BBM}	V_S = 3V, R_L = 300Ω, C_L = 35pF, See Figure 5		5V	+25°C	-	5	-	ns
				3.3V		-	8	-	
-3dB Bandwidth	BW	Switch ON, R_L = 50Ω, See Figure 6		5V	+25°C	-	300	-	MHz
Off Isolation	O_{ISO}	R_L = 50Ω, Switch OFF, See Figure 7	f = 10kHz		+25°C	-	-52	-	dB
			f = 1MHz		+25°C	-	-71	-	dB
Source, Drain OFF Capacitance	$C_{S(OFF)}$, $C_{D(OFF)}$	V_S= V_{CC}/2 or GND, Switch OFF			+25°C	-	5	-	pF
Source, Drain ON Capacitance	$C_{S(ON)}$, $C_{D(ON)}$	V_S= V_{CC}/2 or GND, Switch ON			+25°C	-	15	-	pF
POWER REQUIREMENTS									
Power Supply Range	V_{CC}				- 40°C to +125°C	1.8	-	5.5	V
Power Supply Current	I_{CC}	V_{IN} = GND or V_{CC}		5V	- 40°C to +125°C	-	-	1	μA

TYPICAL PERFORMANCE CHARACTERISTICS

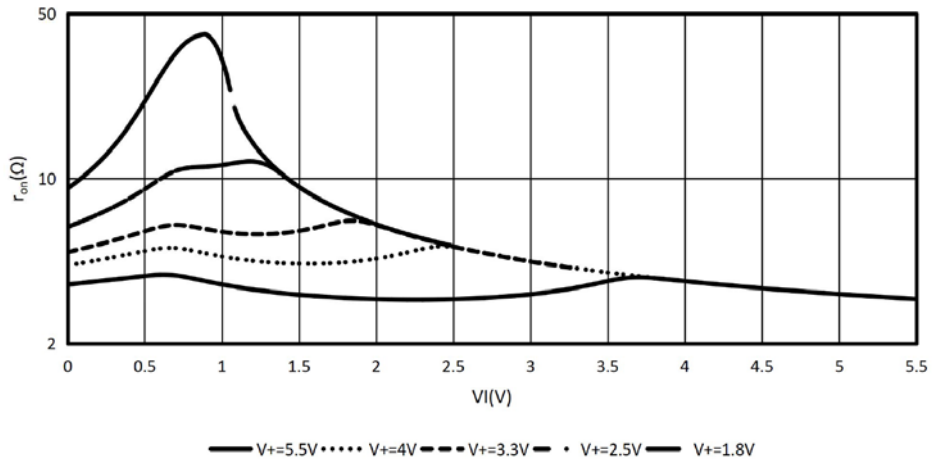
1. Bandwidth



2. Bandwidth



3. Typical R_{ON} as a Function of Input Voltage (V_I) for V_I = 0 to V+



Parameter Measurement Information

Figure 1. ON-State Resistance (R_{ON})

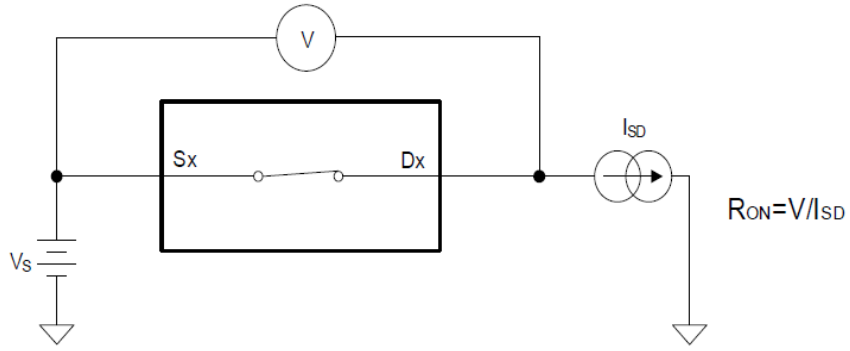


Figure 2.OFF-State Leakage Current ($I_{D(OFF)}$, $I_{S(OFF)}$)

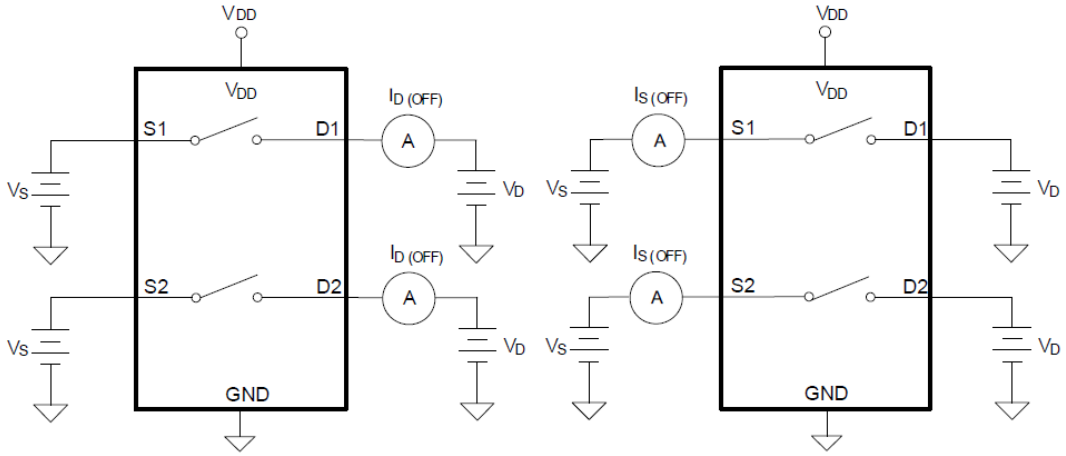


Figure 3. ON-State Leakage Current ($I_{D(ON)}$, $I_{S(ON)}$)

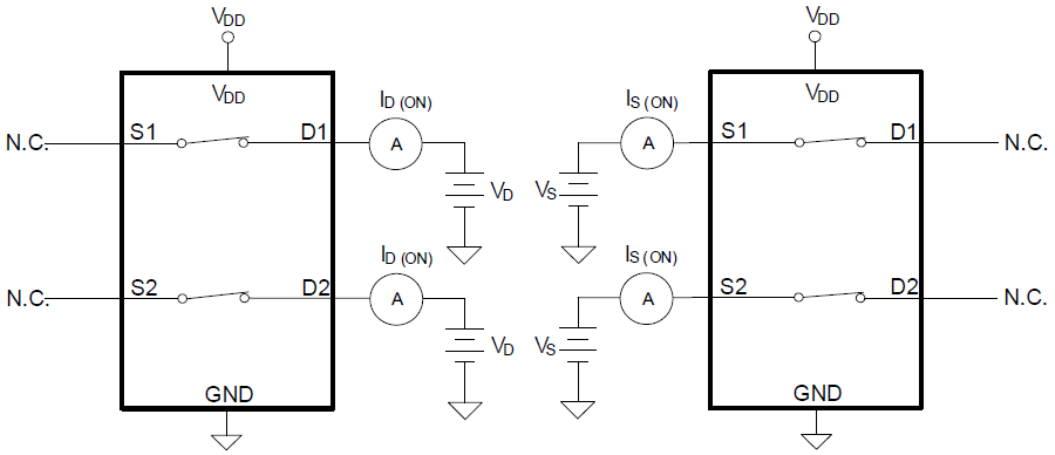


Figure 4. Turn-On (t_{ON}) and Turn-Off Time (t_{OFF})

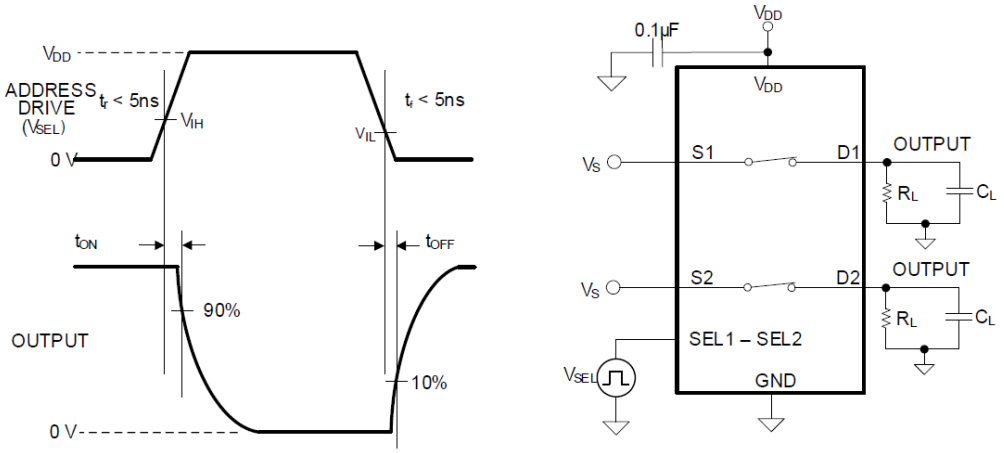


Figure 5. Break-Before-Make Time (t_{BBM})

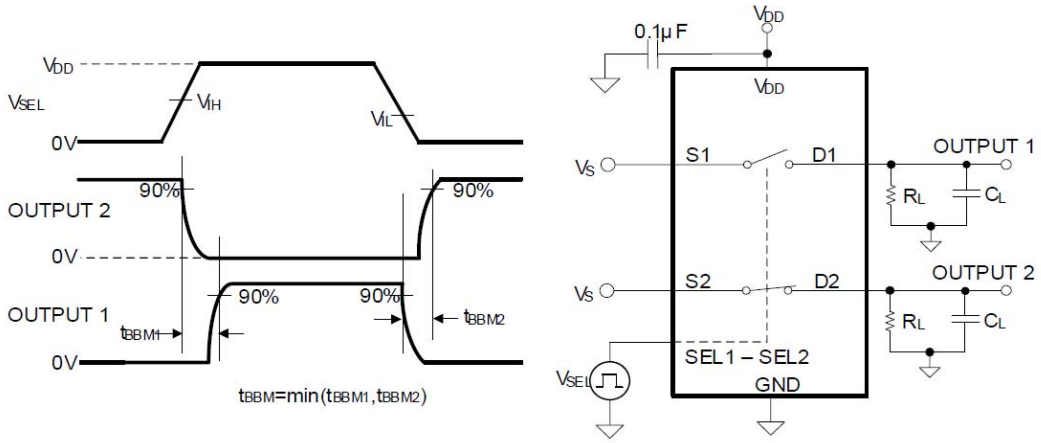


Figure 6. Bandwidth (BW)

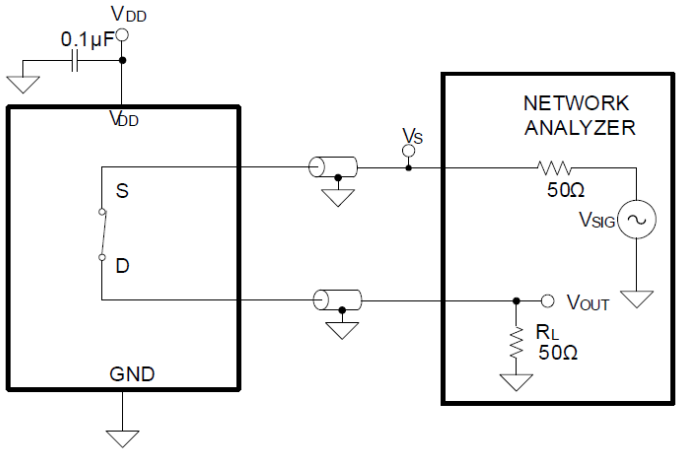


Figure 7.OFF Isolation (O_{ISO})

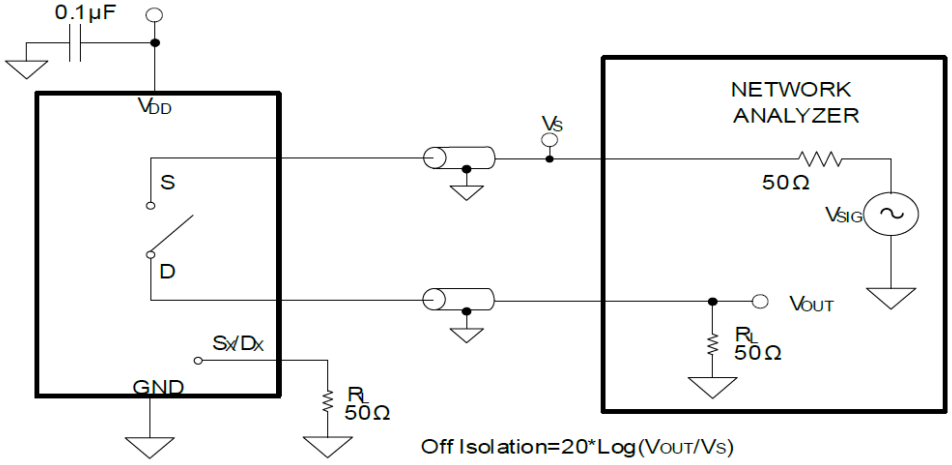


Figure 8. Crosstalk (X_{TALK})

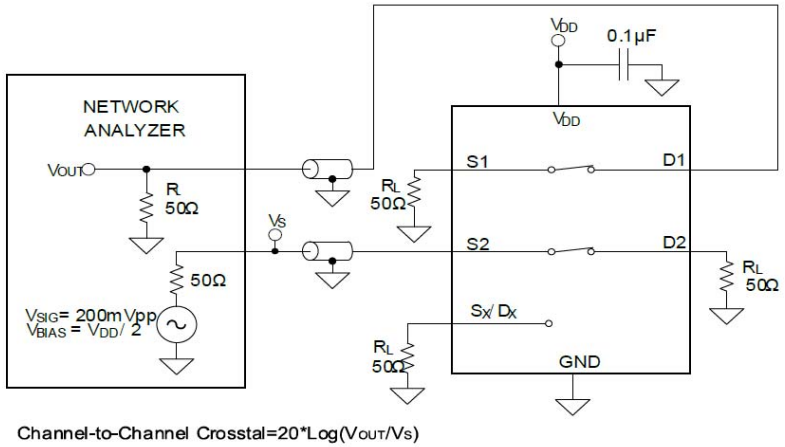
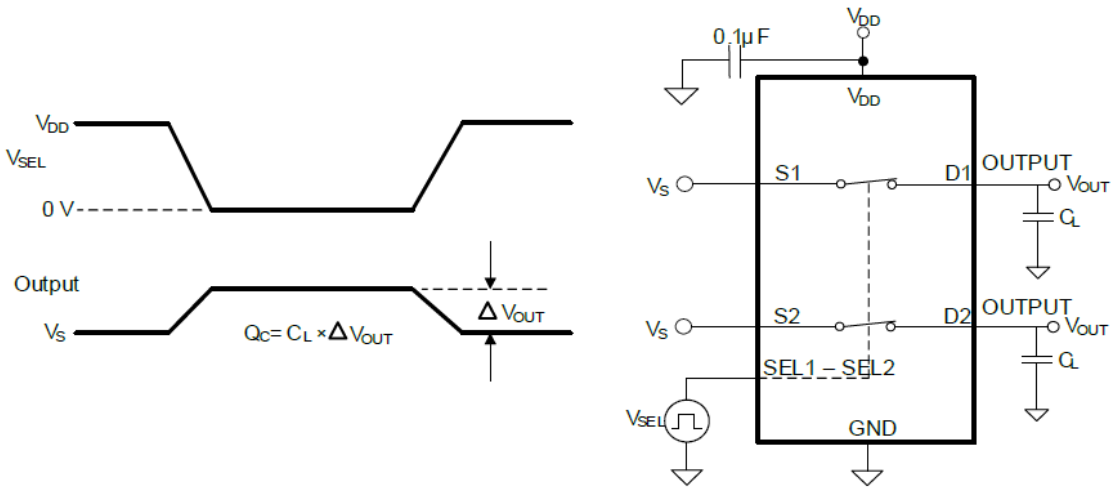


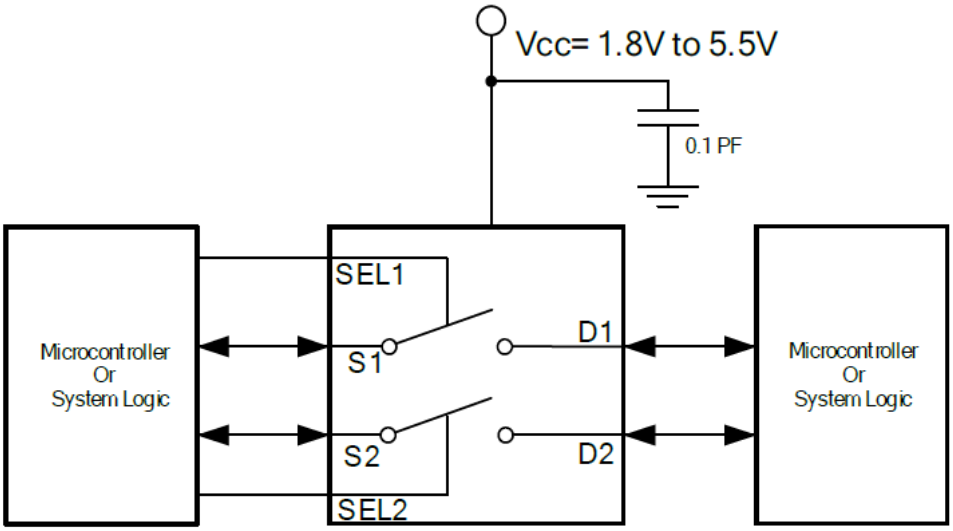
Figure 9. Charge Injection (Q_C)



TYPICAL APPLICATION

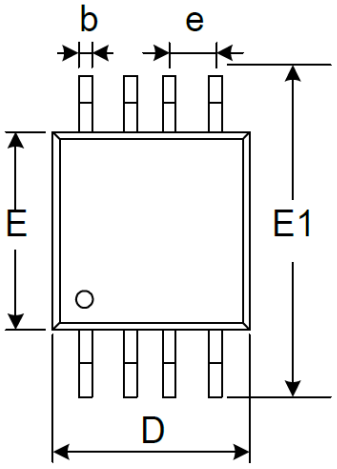
The A4766 can be used in any situation where a Dual SPST switch would be used and a solid-state, voltage-controlled version is preferred. The A4766 allows on/off control of analog and digital signals with a digital control signal. All input signals should remain between 0V and V_{CC} for optimal operation.

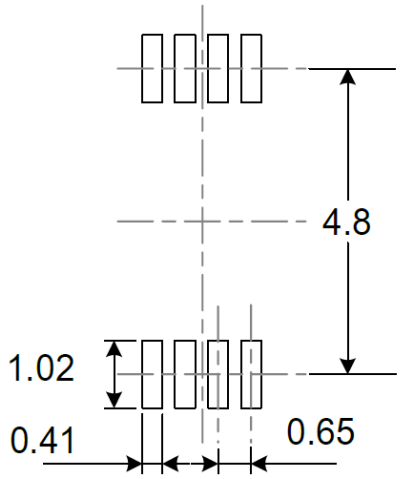
Figure 10. Typical Application Schematic



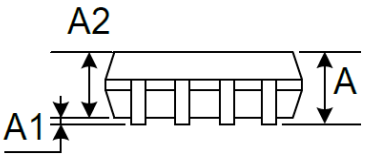
PACKAGE INFORMATION

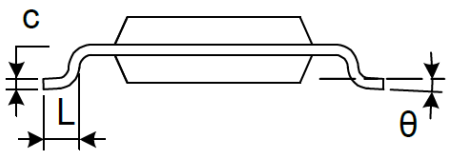
Dimension in MSOP8 (Unit: mm)





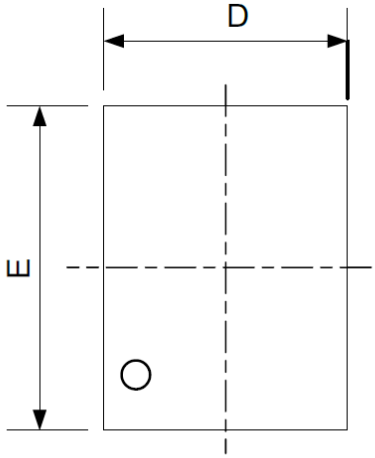
RECOMMENDED LAND PATTERN (Unit: mm)



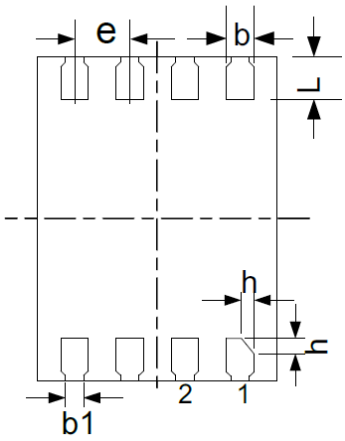


Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.820	1.100	0.030	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.250	0.380	0.010	0.015
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
e	0.650 BSC		0.026 BSC	
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187	0.199
L	0.400	0.800	0.016	0.031
θ	0°	6°	0°	6°

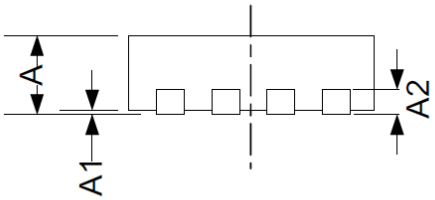
Dimension in DFN8(2x3) (Unit: mm)



TOP VIEW



BOTTOM VIEW



SIDE VIEW

Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.180	0.250	0.007	0.010
b	0.180	0.300	0.007	0.012
b1	0.16 REF		0.006 REF	
D	1.900	2.100	0.075	0.083
E	2.900	3.100	0.114	0.122
e	0.500 TYP		0.019 TYP	
L	0.350	0.450	0.014	0.018
h	0.075	0.175	0.003	0.007

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