DESCRIPTION

The A4711 is a Single Wide-Bandwidth, fast single-pole double-throw (SPDT) CMOS switch featuring an On-Resistance of 2.7 ohm at V_{CC}=5.0V and wide power supply range from 1.8V to 5.5V. It can be used as an analog switch or as a low-delay bus switch.

The 350MHz high bandwidth performance supports the high frequency application.

Break-before-make function for both parts eliminates signal disruption during switching from preventing both switches being enabled simultaneously.

The A4711 is available in SC70-6 package.

ORDERING INFORMATION

Package Type	Part Number	
SC70-6	C6	A4711C6R
		A4711C6VR
Note	R: Tape & Reel V:Halogen free Package	
AiT provides all RoHS products Suffix "V" means Halogen free Package		

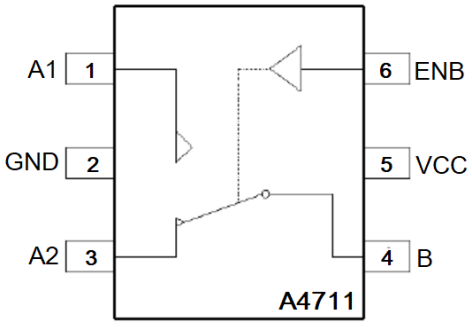
FEATURES

- Wide Power Supply Range: 1.8V to 5.5V
- High Bandwidth: 350MHz
- High Off-Isolation:
  84dB at 1MHz
  51dB at 10MHz
- On-Resistance: 2.7Ω(TYP) at 5.0V
- Fast Switching Time
  T_{ON} = 25ns; T_{OFF} = 17ns
- TTL/CMOS Compatible
- Break-Before-Make Switching
- Rail-to-Rail Signal Range
- Operation Temperature: -40℃ to 125℃
- Available in SC70-6 Package

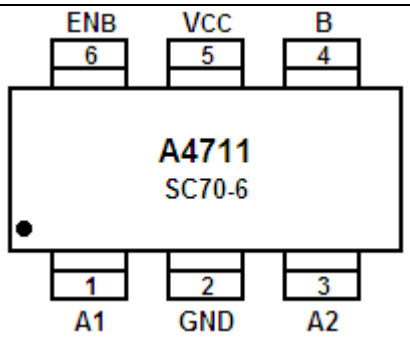
APPLICATION

- Wireless Handsets
- MP3 Players
- Portable Electronic Devices
- Relay Replacement
- PDAs
- Audio & Video Signal Routing
- PCMCIA Cards
- Computer Peripherals
- Modems

TYPICAL APPLICATION



PIN DESCRIPTION



Top View

Pin #	Symbol	Function	Description
1	A1	Input/Output	Data Port
2	GND	Ground	Ground
3	A2	Input/Output	Data Port
4	B	Input/Output	Data Port
5	V_{CC}	PWR	Power Supply
6	ENB	Input	Logic Control Signal

FUNCTION TABLE

ENB	Function
1	A1 Connected to B
0	A2 Connected to B

ABSOLUTE MAXIMUM RATINGS

V_{CC}, DC Supply Voltage	-0.3V ~ 6.0V
V_{A1}/ V_{A2}/ V_B, DC Switch Voltage	-0.3V ~ V_{SUP} + 0.3 (V)
V_{ENB}, DC Input Voltage	-0.3V ~ V_{SUP} + 0.3 (V)
$I_{(A1/A2/B)}$, Continuous Current	±200mA
$I_{PEAK(A1/A2/B)}$, Peak Current[NOTE1]	±300mA
T_A, Operating Temperature Range	-40℃~ +125℃

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.
NOTE1: Pulsed at 1ms, 50% duty circle

RECOMMENDED OPERATING CONDITIONS

DC Supply Voltage (V_{CC})	1.8V to 5.5V
Switch Input Voltage (V_S)	0V to V_{CC}
Control Input Voltage (V_{ENB})	0V to V_{CC}
Operation Temperature (T_A)	-40℃ to +125℃

ELECTRICAL CHARACTERISTICS[NOTE3]

DC ELECTRICAL CHARACTERISTICS @ +2.7V Supply

Parameter	Symbol	Conditions	Min.	Typ.(1)	Max.	Unit
Analog Signal Range	$V_{A1}/V_{A2}/V_B$		0	-	V_{CC}	V
A1 On-Resistance	$R_{ON(A1)}$	V_{CC} = 2.7V; I_B =-10mA ; V_{A1} =1.5V	-	5.5	-	Ω
A2 On-Resistance	$R_{ON(A2)}$	V_{CC} = 2.7V; I_B =-10mA ; V_{A2} =1.5V	-	5.5	-	Ω
A1 On-Resistance Flatness[NOTE2]	$R_{FLAT(A1)}$	V_{CC} = 2.7V; I_B =-10mA ; V_{A1} =1.5V	-	2.3	-	Ω
A2 On-Resistance Flatness[NOTE2]	$R_{FLAT(A2)}$	V_{CC} = 2.7V; I_B =-10mA ; V_{A2} =1.5V	-	2.3	-	Ω
On-Resistance Match Between Channels[NOTE3]	ΔR_{ON}	V_{CC} = 2.7V; I_B =-10mA ; V_{A2} /V_{A1}=1.5	-	0.15	1	Ω
A_1 or A_2 Off Leakage Current	$I_{OFF(A1)}$ or $I_{OFF(A2)}$	V_{CC} = 3.6V; V_{A1} or V_{A2} = 3V, 0.3V; V_B = 0.3V, 3 V	-	0.01	1	μA
A_1 or A_2. B On Leakage Current	$I_{OFF(A1)}$ $I_{OFF(A2)}$ $I_{ON(B)}$	V_{CC}= 3.6V; V_{A1} or V_{A2} = 3.3V, 0.3V; V_B = 0.3V, 3.3 V or floating	-	0.01	1	μA
Input Voltage High	V_{IH}	Minimum High Level Input Voltage	1.2	-	-	V
Input Voltage Low	V_{IL}	Maximum Low Level Input Voltage	-	-	0.5	V
Input Leakage Current	I_{ENB}	V_{ENB} = 0 or V_{CC}	-	0.01	1	μA

DYNAMIC CHARACTERISTICS @ +2.7V Supply

Parameter	Symbol	Conditions		Min.	Typ.(3)	Max.	Unit
AC ELECTRICAL CHARACTERISTICS							
Turn-On Time	T_{ON}	V_{CC} = 2.7V; V_{A1} or V_{A2} = 1.5V, R_L =300Ω; C_L = 35pF, V_{IH}=1.5V,V_{IL}=0V		-	30	-	ns
Turn-Off Time	T_{OFF}	V_{CC} = 2.7V; V_{A1} or V_{A2} = 1.5V, R_L =300Ω; CL = 35pF, V_{IH}=1.5V,V_{IL}=0V		-	20	-	ns
Break-Before-Make Time	T_{BBM}	V_{CC} = 2.7V; V_{A1} or V_{A2} = 1.5V, R_L = 300Ω; C_L = 35pF		-	15	-	ns
NC OFF Capacitance	$C_{OFF(A1)}$	f = 1MHz		-	5.5	-	pF
NO OFF Capacitance	$C_{OFF(A2)}$	f = 1MHz		-	5.5	-	pF
NC ON Capacitance	$C_{ON(A1)}$	f = 1MHz		-	15.5	-	pF
NO ON Capacitance	$C_{ON(A2)}$	f = 1MHz		-	15.5	-	pF
ADDITIONAL APPLICATION CHARACTERISTICS							
3dB Bandwidth	f_{3dB}	Signal = 0dBm, R_L = 50Ω, C_L = 5pF		-	350	-	MHz
Off Isolation[NOTE6]	V_{ISO}	R_L = 50Ω, C_L = 5pF, Signal = 0dBm	f = 1MHz	-	-84	-	dB
			f =10MHz	-	-51	-	dB
Power Supply Range	V_{CC}			1.8	-	5.5	V

DC ELECTRICAL CHARACTERISTICS @ +5.0V Supply

Parameter	Symbol	Conditions	Min	Typ.(1)	Max	Unit
Analog Signal Range	$V_{A1}/V_{A2}/V_B$		0		V_{CC}	V
A_1 On-Resistance	$R_{ON(A1)}$	V_{CC} = 5.0V; I_B =-10mA ; V_{A1}=3.5V	-	2.7	-	Ω
A_2 On-Resistance	$R_{ON(A2)}$	V_{CC} = 5.0V; I_B =-10mA ; V_{A2} =3.5V	-	2.7	-	Ω
A_1 On-Resistance Flatness NOTE2	$R_{FLAT(A1)}$	V_{CC} = 5.0V; I_B =-10mA ; V_{A1}=3.5V	-	0.8	-	Ω
A_2 On-Resistance Flatness NOTE2	$R_{FLAT(A2)}$	V_{CC} = 5.0V; I_B =-10mA ; V_{A2} =3.5V	-	0.8	-	Ω
On-Resistance Match Between Channels NOTE3	ΔR_{ON}	V_{CC} = 5.0V; I_B =-10mA ; V_{A2} /V_{A1}=3.5	-	0.15	-	Ω
A_1 or A_2 Off Leakage Current	$I_{OFF(A1)}$ or $I_{OFF(A2)}$	V_{CC} = 5.5V; V_{A1} or V_{A2} = 4.5V, 1.0V; V_B = 1.0V, 4.5 V	-	0.01	1	μA
A_1 or A_2 On Leakage Current	$I_{ON(A1)}$ $I_{ON(A2)}$, $I_{ON(B)}$	V_{CC} = 5.5V; V_{A1} or V_{A2} = 4.5V, 1.0V; V_B = 1.0V, 4.5 V or floating	-	0.01	1	μA
Input Voltage High	V_{IH}	Minimum High Level Input Voltage	1.5	-	-	V
Input Voltage Low	V_{IL}	Maximum Low Level Input Voltage	-	-	0.6	V
Input Leakage Current	I_{ENB}	V_{ENB} = 0 or V_{CC}	-	0.01	1	μA

DAYNAMIC CHARACTERISTICS @ +5.0V Supply

Parameter	Symbol	Conditions		Min	Typ.(1)	Max	Unit
Turn-On Time	T_{ON}	V_{CC} = 5.0V; V_{A1} or V_{A2} = 3.0V, R_L =300Ω; C_L = 35pF, V_{IH}=1.5V,V_{IL}=0V		-	25	-	ns
Turn-Off Time	T_{OFF}	V_{CC} = 5.0V; V_{A1} or V_{A2} = 3.5V, R_L =300Ω; C_L = 35pF, V_{IH}=1.5V,V_{IL}=0V		-	17	-	ns
Break-Before-Make Time	T_{BBM}	V_{CC} = 5.0V; V_{A1} or V_{A2} = 3.5V, R_L = 300Ω; C_L = 35pF		-	8.5	-	ns
NC OFF Capacitance	$C_{OFF(A1)}$	f = 1MHz		-	5.5	-	pF
NO OFF Capacitance	$C_{OFF(A2)}$	f = 1MHz		-	5.5	-	pF
NC ON Capacitance	$C_{ON(A1)}$	f = 1MHz		-	15.5	-	pF
NO ON Capacitance	$C_{ON(A2)}$	f = 1MHz		-	15.5	-	pF
3dB Bandwidth	f_{3dB}	Signal = 0dBm, R_L = 50Ω, C_L = 5pF		-	350	-	MHz
Off Isolation NOTE4	V_{ISO}	R_L = 50Ω, C_L = 5pF, Signal = 0dBm	f = 1MHz	-	-84	-	dB
			f =10MHz	-	-51	-	dB
Power Supply Range	V_{CC}			1.8	-	5.5	V

NOTE1: Typical characteristics are at +25°C

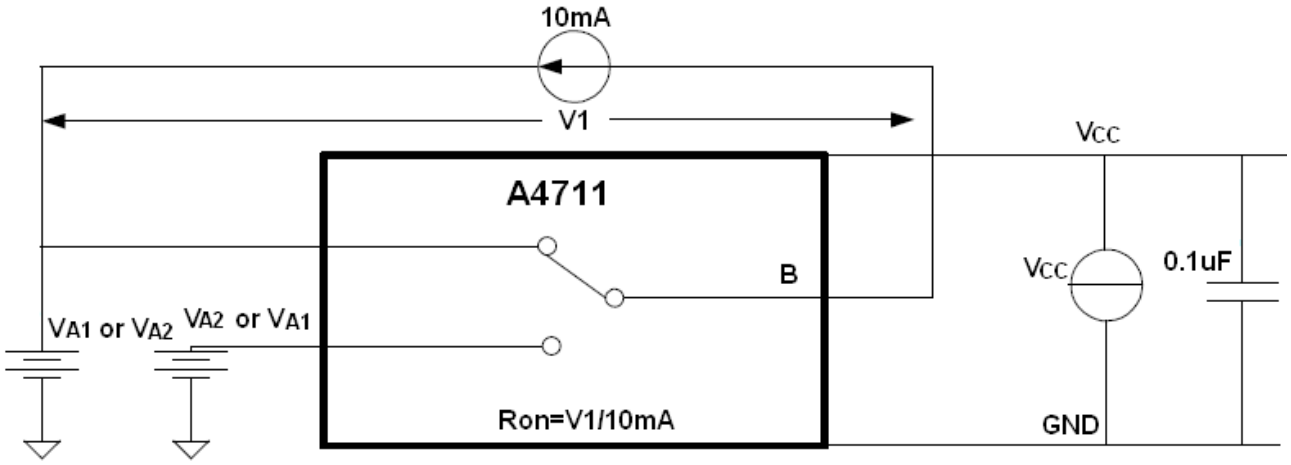
NOTE2: Flatness is defined as the difference between the maximum and minimum value of on resistance as measured over the specified analog signal ranges.

NOTE3: $\triangle R_{ON} = R_{ON(MAX)} - R_{ON(MIN)}$, between A_1 and A_2 .

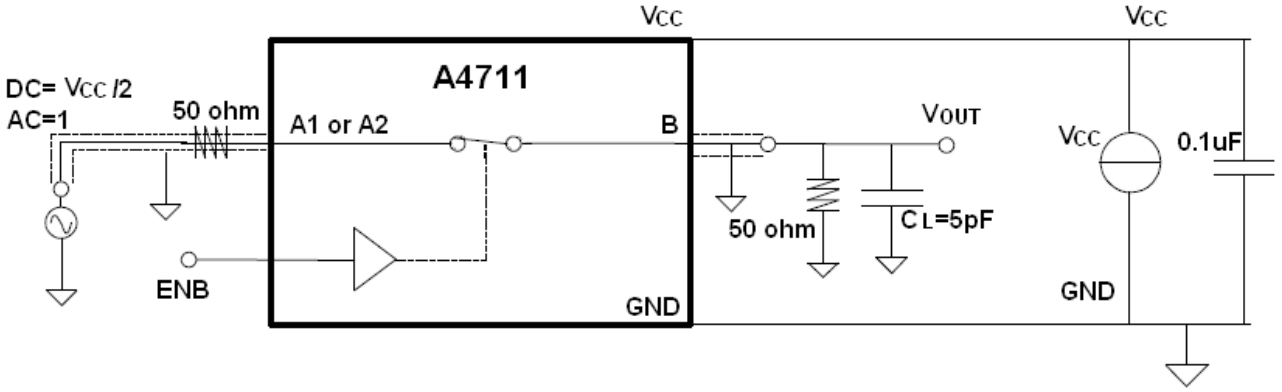
NOTE4: Off Channel Isolation = $20\log_{10}[(V_{A1\backslash A2})/V_B]$

TEST CIRCUIT

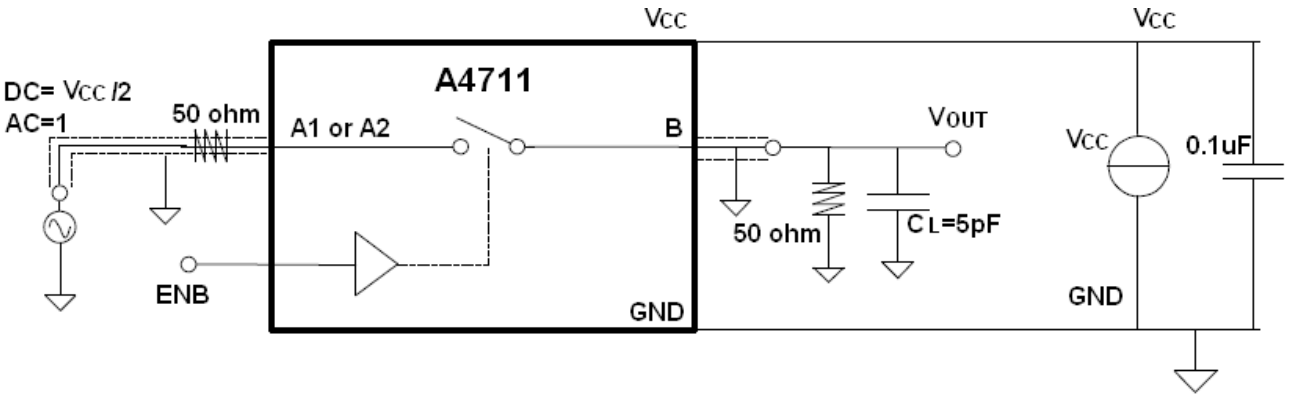
1. Test Circuit for On Resister



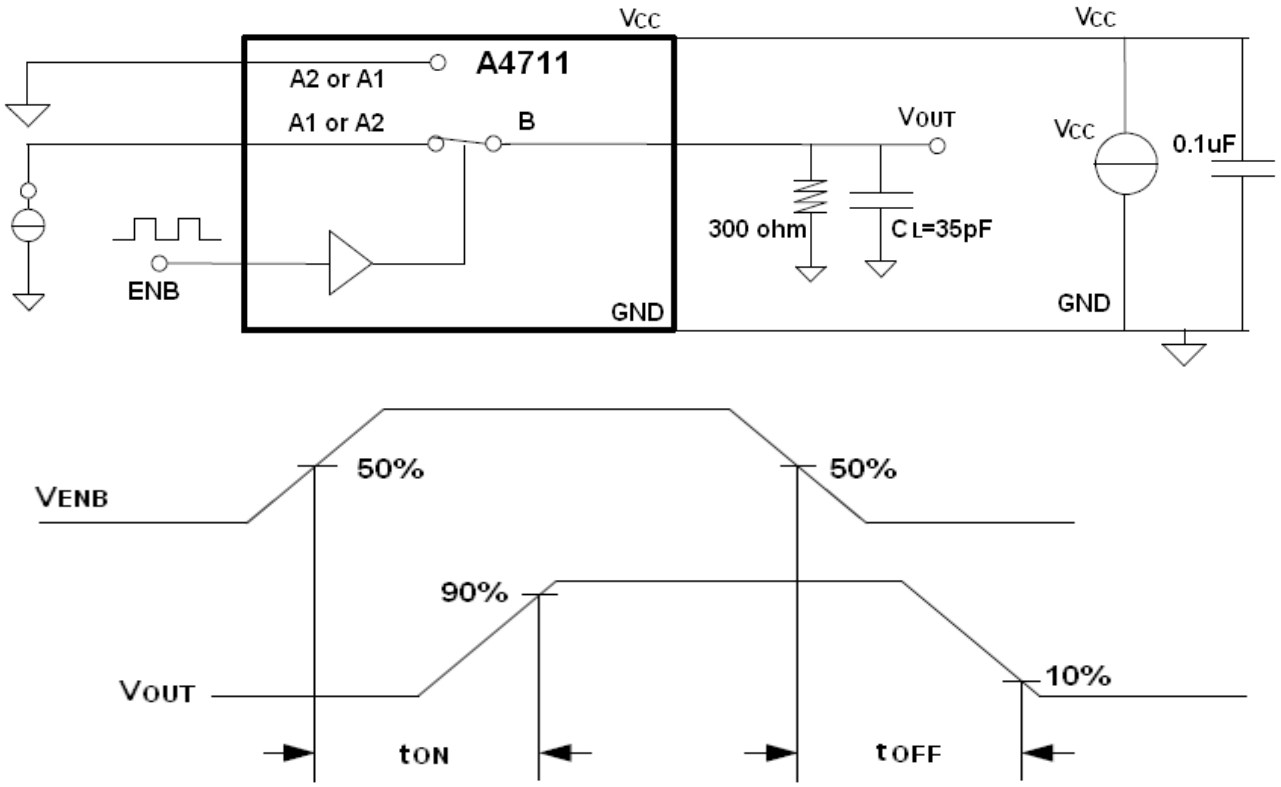
2. Test Circuit for Bandwidth



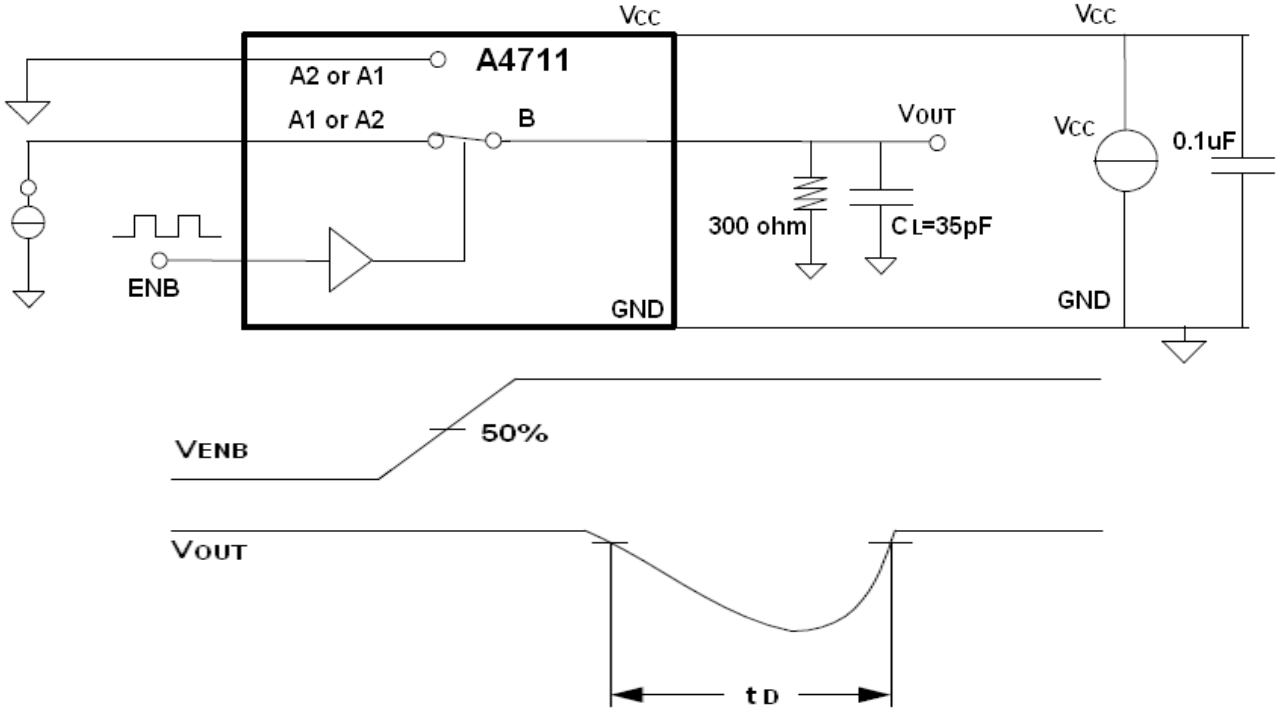
3. Test Circuit for Off Isolation



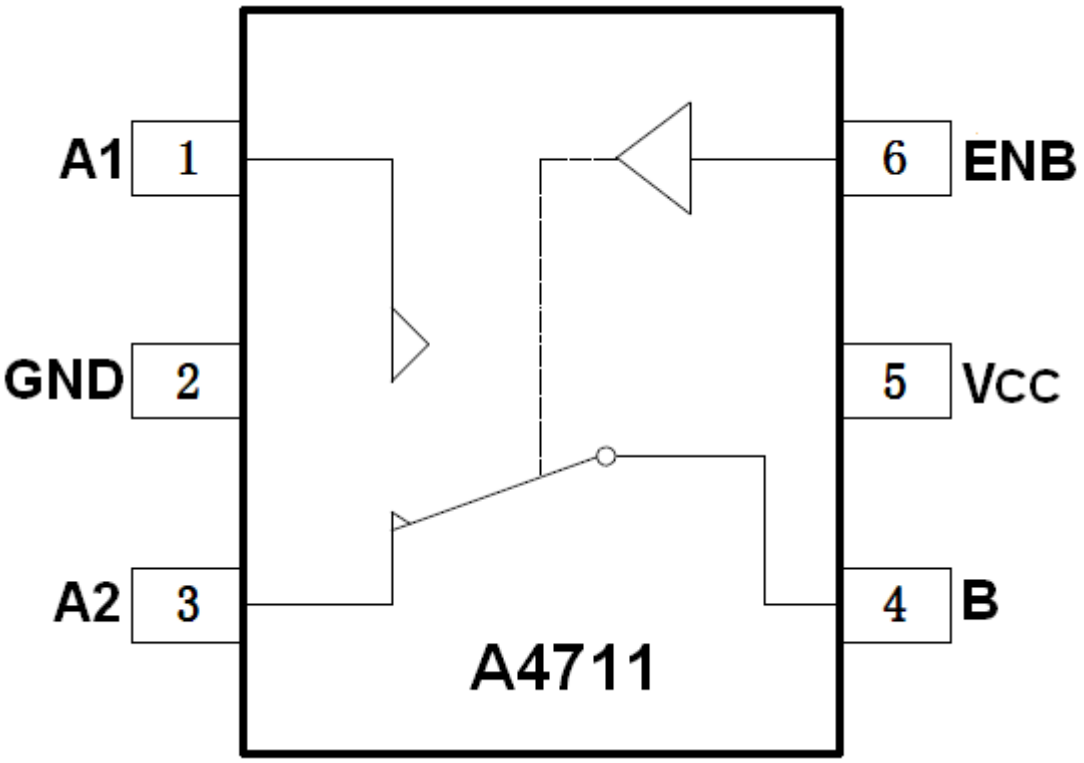
4. Test Circuit for Switch Times



5. Test Circuit for Break-Before-Make Time Delay, t_D

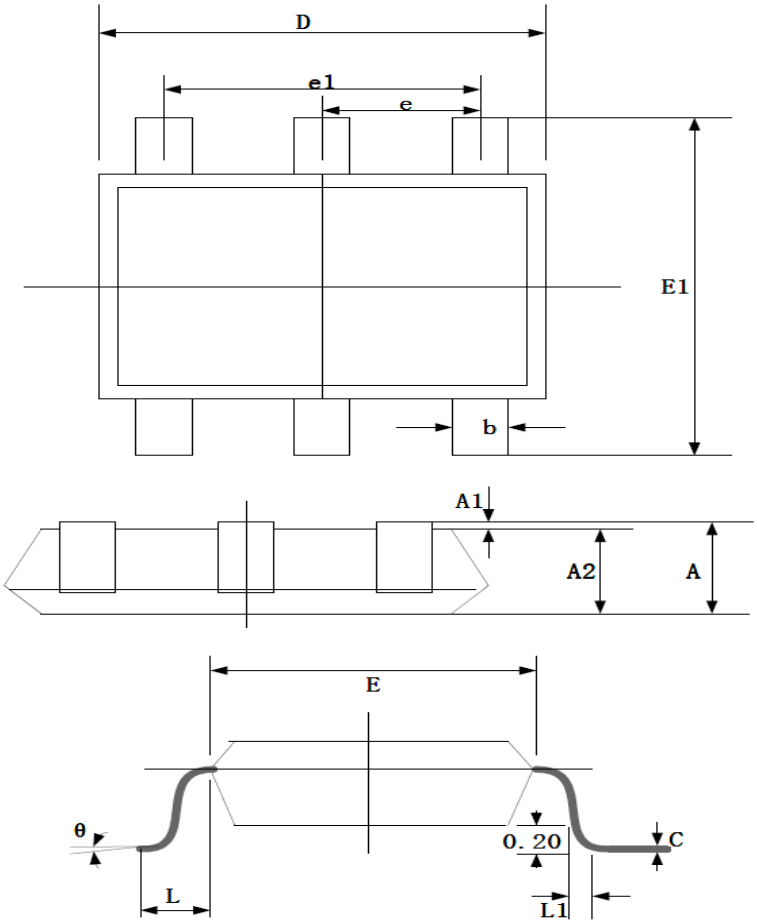


BLOCK DIAGRAM



PACKAGE INFORMATION

Dimension in SC70-6 Package (Unit: mm)



Symbol	Min	Max
A	0.900	1.100
A1	0.000	0.100
A2	0.900	1.000
b	0.150	0.350
c	0.080	0.150
D	2.000	2.200
E	1.150	1.350
E1	2.150	2.450
e	0.065 TYP	
e1	1.200	1.400
L	0.525 REF	
L1	0.260	0.460
θ	0°	8°

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