

LOW VOLTAGE 4Ω SPDT SWITCH

- HIGH SPEED:
 - $t_{PD} = 0.3 \text{ ns}$ (TYP.) at $V_{CC} = 5V$
 - $t_{PD} = 0.4 \text{ ns}$ (TYP.) at $V_{CC} = 3.0V$
- LOW POWER DISSIPATION:
 - $I_{CC} = 1 \mu A$ (MAX.) at $T_A = 85^\circ C$
- LOW "ON" RESISTANCE:
 - $R_{ON} = 4\Omega$ (MAX. $T_a=25^\circ C$) AT $V_{CC} = 5V$
 - $R_{ON} = 6\Omega$ (TYP.) AT $V_{CC} = 3.0V$
- WIDE OPERATING VOLTAGE RANGE:
 - V_{CC} (OPR) = 1.8V to 5.5V SINGLE SUPPLY



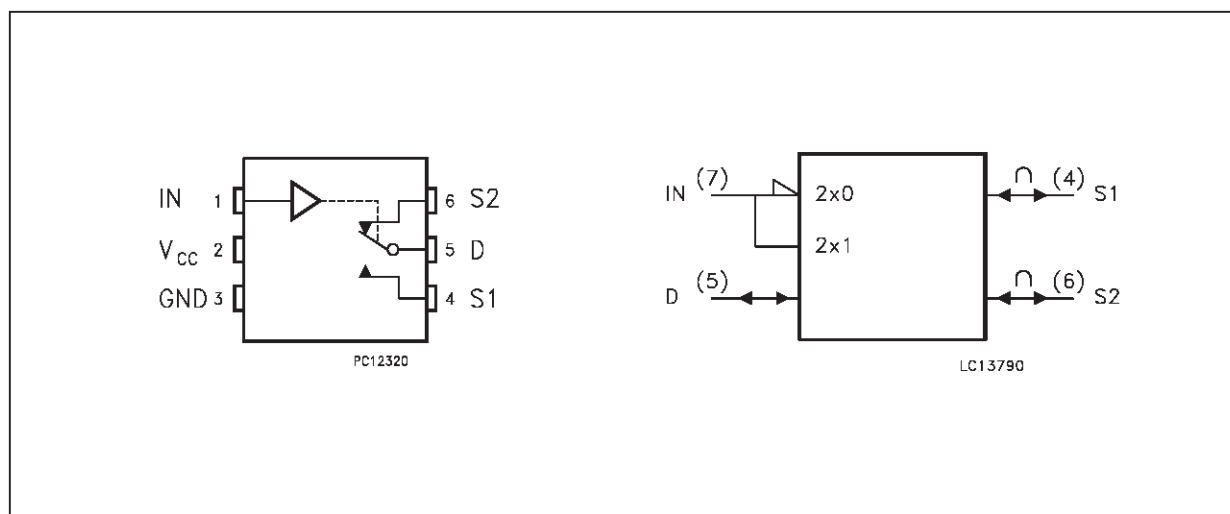
ORDER CODES		
PACKAGE	TUBE	T & R
SOT23-6L		STG719FTR

DESCRIPTION

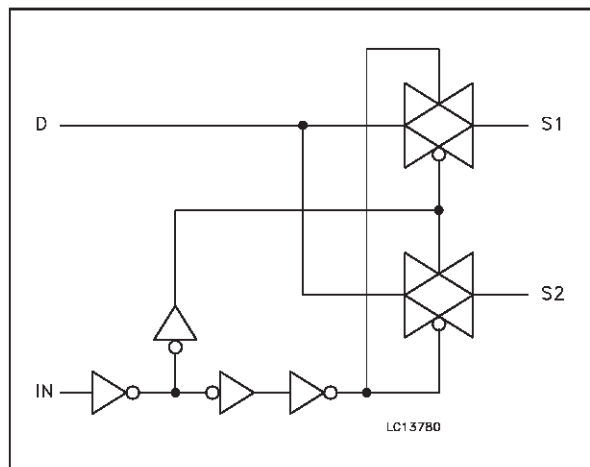
The STG719 is an high speed SPDT CMOS SWITCH fabricated in silicon gate C²MOS technology. It is designed to operate from 1.8V to 5.5V, making this device ideal for portable applications. It offers 4Ω ON-Resistance Max at

5V 25°C. Additional key features are fast switching speed ($t_{ON}=7ns$, $t_{OFF}=4.5ns$) and Low Power Consumption ($<0.01\mu W$ Typ.). ESD immunity is higher than 1000V per Method 3015.7 of MIL-STD-883B. It's available in the commercial temperature range.

PIN CONNECTION AND IEC LOGIC SYMBOLS



LOGIC DIAGRAM



PIN DESCRIPTION

PIN No	SYMBOL	NAME AND FUNCTION
1	IN	Control
4, 6	S1, S2	Independent Channel
5	D	Common Channel
3	GND	Ground (0V)
2	V _{CC}	Positive Supply Voltage

TRUTH TABLE

IN	SWITCH S1	SWITCH S2
L	ON	OFF
H	OFF	ON

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CC}	Supply Voltage	-0.5 to +7	V
V _I	DC Input Voltage	-0.5 to V _{CC} + 0.5	V
V _{IC}	Control Input Voltage	-0.5 to V _{CC} + 0.5	V
V _O	DC Output Voltage	-0.5 to V _{CC} + 0.5	V
I _{IK}	DC Input Diode Current	± 20	mA
I _{OK}	DC Output Diode Current	± 20	mA
I _O	DC Output Current	± 50	mA
I _{CC} or I _{GND}	DC V _{CC} or Ground Current	± 50	mA
T _{stg}	Storage Temperature	-65 to +150	°C
T _L	Lead Temperature (10 sec)	300	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V _{CC}	Supply Voltage (note 1)	1.8 to 5.5	V
V _I	Input Voltage	0 to V _{CC}	V
V _{IC}	Control Input Voltage	0 to V _{CC}	V
V _O	Output Voltage	0 to V _{CC}	V
T _{op}	Operating Temperature:	-40 to +85	°C
dt/dv	Input Rise and Fall Time (note 2)	0 to 10	ns/V

1) Truth Table guaranteed: 1.2V to 6V

2) V_{IN} from 30% to 70% V_{CC}

DC SPECIFICATIONS

Symbol	Parameter	Test Conditions		Value					Unit	
				V _{CC} (V)	T _A = 25 °C			-40 to 85 °C		
					Min.	Typ.	Max.	Min.		Max.
V _{IHC}	High Level Control Input Voltage	3.0 ^(*)		2.0			2.0		V	
		5.0 ^(**)		2.4			2.4			
V _{ILC}	Low Level Control Input Voltage	3.0 ^(*)				0.4		0.4	V	
		5.0 ^(**)				0.8		0.8		
R _{ON}	ON Resistance	3.0 ^(*)	V _S = 0 to V _{CC} I _S = 10 mA		6	7		10	Ω	
		5.0 ^(**)				4		5		
ΔR _{ON}	ON Resistance Match Between Channels	3.0 ^(*)	V _S = 0 to V _{CC} I _S = 10 mA		0.1			0.4	Ω	
		5.0 ^(**)			0.1			0.4		
R _{FLATON}	ON Resistance Flatness	3.0 ^(*)	V _S = 0 to V _{CC} I _S = 10 mA		2.5				Ω	
		5.0 ^(**)			0.75					
I _{SOFF}	Source OFF Leakage	3.0 ^(*)	V _S = 1V or V _{CC} V _D = V _{CC} or 1V V _{IN} = V _{CC} or GND		±0.01	±0.25		±0.35	nA	
		5.0 ^(**)			±0.01	±0.25		±0.35		
I _{SON}	Channel ON Leakage Current	3.0 ^(*)	V _S =V _D =1V to V _{CC} -2.5V V _{IN} = V _{IHC}		±0.01	±0.25		±0.35	nA	
		5.0 ^(**)			±0.01	±0.25		±0.35		
I _{IN}	Control Input Leakage Current	3.0 ^(*)	V _I = V _{IH} or V _{IL}		0.005			±0.1	μA	
		5.0 ^(**)			0.005			±0.1		
I _{CC}	Quiescent Supply Current	3.0 ^(*)	V _I = V _{CC} or GND		0.001			1	μA	
		5.0 ^(**)			0.001			1		

(*) Voltage range is 3.0V ± 0.3V

(**) Voltage range is 5V ± 0.5V

AC ELECTRICAL CHARACTERISTICS (C_L = 35 pF, R_L = 300Ω)

Symbol	Parameter	Test Condition		Value					Unit	
				V _{CC} (V)	T _A = 25 °C			-40 to 85 °C		
					Min.	Typ.	Max.	Min.		Max.
t _{PD}	Delay Time	3.0 ^(*)	V _S = 3V square wave f=1MHz t _r =t _f =6ns		0.4	0.8		1.2	ns	
		5.0 ^(**)			0.3	0.6		1.0		
t _{ON}	ON Channel Time	3.0 ^(*)	V _S = 2V		10			16	ns	
		5.0 ^(**)	V _S = 3V		7			11		
t _{OFF}	OFF Channel Time	3.0 ^(*)	V _S = 2V		5.5			7	ns	
		5.0 ^(**)	V _S = 3V		4.5			6		
t _D	Break Before Make Time Delay	3.0 ^(*)	V _S = 2V	1	4				ns	
		5.0 ^(**)	V _S = 3V	1	4					
C _{SOFF}	OFF Channel Capacitance				19				pF	
C _{SON}	ON Channel Capacitance				33				pF	

(*) Voltage range is 3.0V ± 0.3V

(**) Voltage range is 5V ± 0.5V

ANALOG SWITCH CHARACTERISTICS ($C_L = 5 \text{ pF}$, $R_L = 50\Omega$, $GND = 0 \text{ V}$, $T_A = 25^\circ\text{C}$)

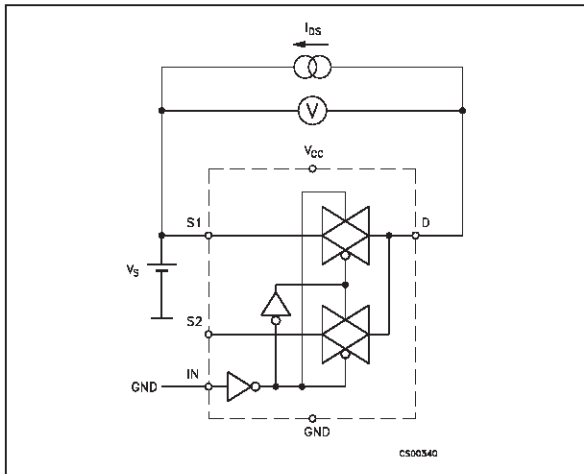
Symbol	Parameter	Test Condition		Value	Unit
		V_{CC} (V)			
f_{MAX}	Frequency Response (Switch ON)	3.0 ^(*)	Bandwidth at -3dB	200	MHz
		5.0 ^(**)		200	
OIRR	OFF Isolation (Switch OFF)	3.0 ^(*)	$f_{IN} = 10\text{MHz}$ sine wave	-40	dB
		3.0 ^(*)	$f_{IN} = 1\text{MHz}$ sine wave	-74	
		5.0 ^(**)	$f_{IN} = 10\text{MHz}$ sine wave	-40	
		5.0 ^(**)	$f_{IN} = 1\text{MHz}$ sine wave	-74	
	Crosstalk (Between Channels)	3.0 ^(*)	$f_{IN} = 10\text{MHz}$ sine wave	-39	dB
		3.0 ^(*)	$f_{IN} = 1\text{MHz}$ sine wave	-52	
		5.0 ^(**)	$f_{IN} = 10\text{MHz}$ sine wave	-39	
		5.0 ^(**)	$f_{IN} = 1\text{MHz}$ sine wave	-52	

(*) Voltage range is $3.0\text{V} \pm 0.3\text{V}$

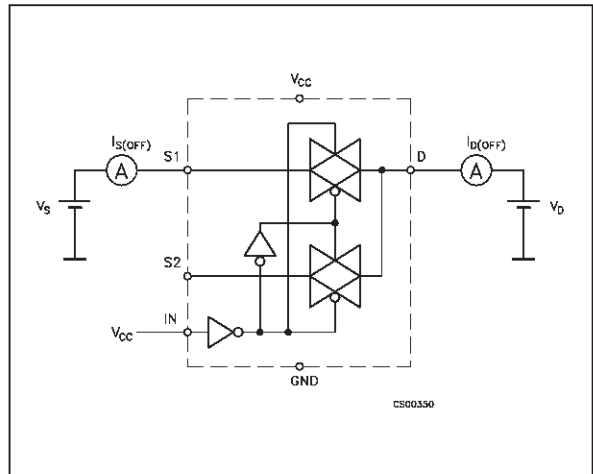
(**) Voltage range is $5\text{V} \pm 0.5\text{V}$

TEST CIRCUITS

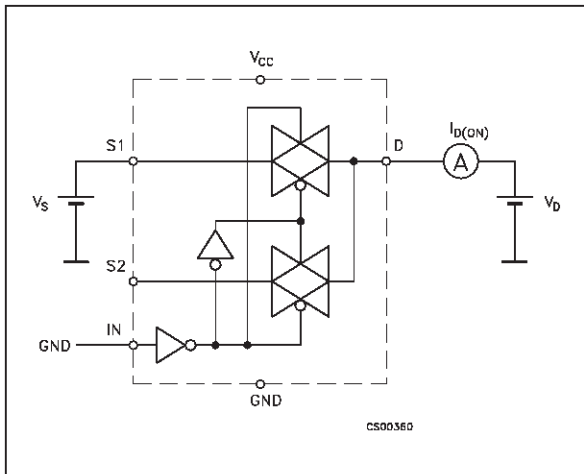
ON RESISTANCE



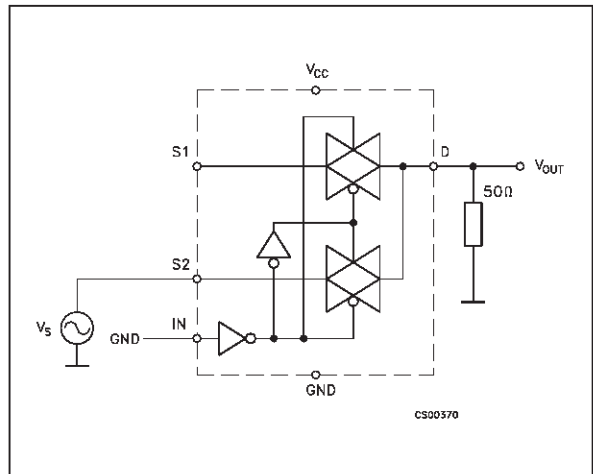
OFF LEAKAGE



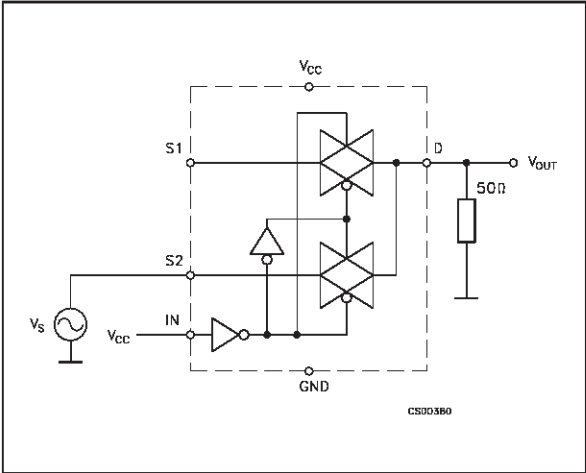
ON LEAKAGE



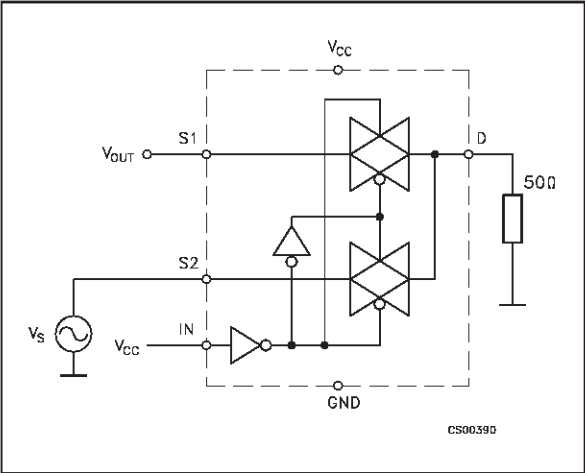
OFF ISOLATION



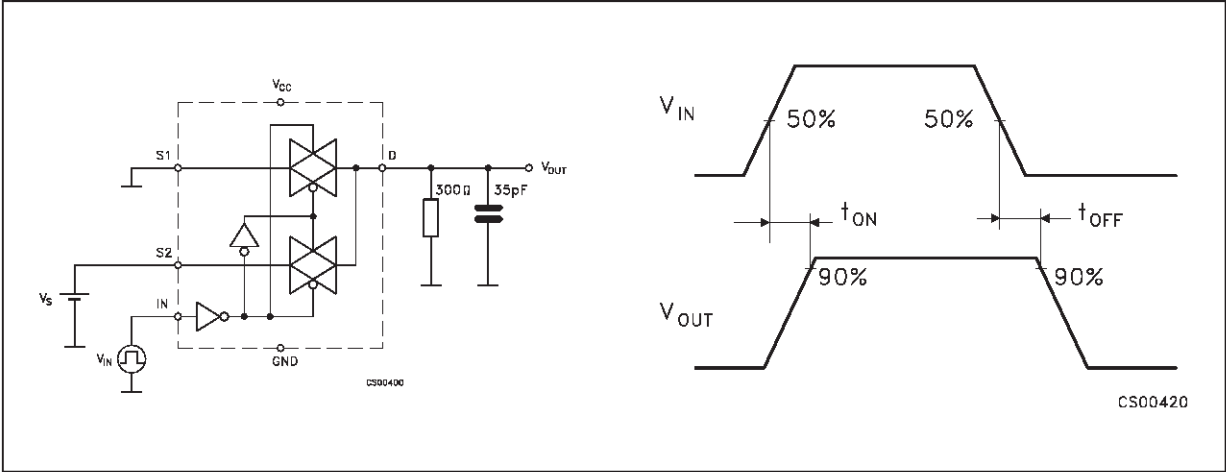
BANDWIDTH



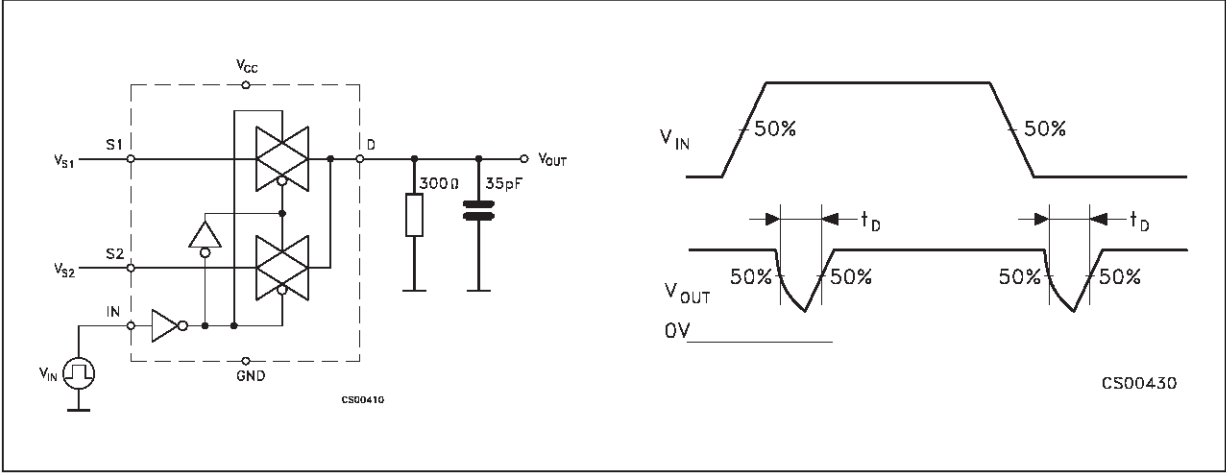
CHANNEL TO CHANNEL CROSSTALK



SWITCHING TIMES

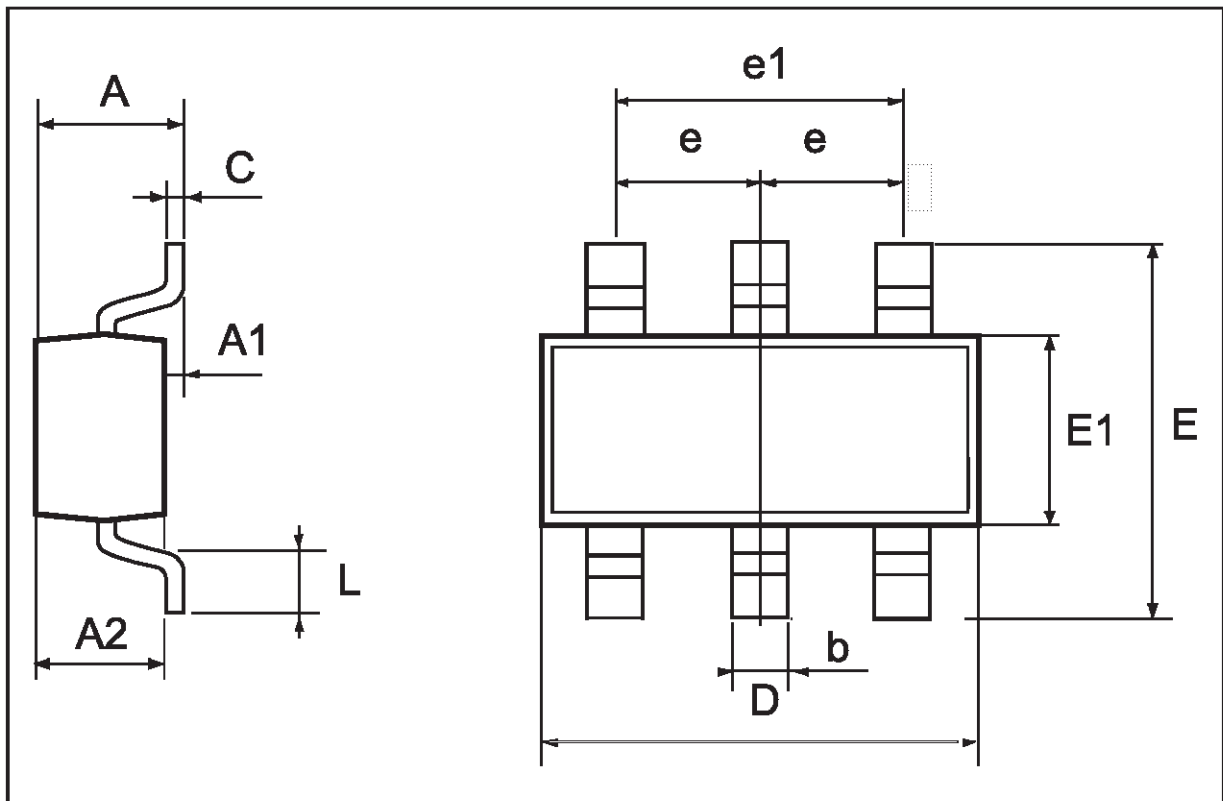


BREAK BEFORE MAKE TIME DELAY



SOT23-6L MECHANICAL DATA

DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	0.90		1.45	35.4		57.1
A1	0.00		0.15	0.0		5.9
A2	0.90		1.30	35.4		51.2
b	0.35		0.50	13.7		19.7
C	0.09		0.20	3.5		7.8
D	2.80		3.00	110.2		118.1
E	2.60		3.00	102.3		118.1
E1	1.50		1.75	59.0		68.8
L	0.35		0.55	13.7		21.6
e		0.95			37.4	
e1		1.9			74.8	



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