STG719

LOW VOLTAGE 4Ω SPDT SWITCH

- HIGH SPEED:
  t_{PD} = 0.3ns (TYP.) at V_{CC} = 5V
  t_{PD} = 0.4ns (TYP.) at V_{CC} = 3.3V
- LOW POWER DISSIPATION:
  I_{CC} = 1µA(MAX.) at T_A=25°C
- LOW "ON" RESISTANCE:
  R_{ON} = 4Ω (MAX. T_A=25°C) AT V_{CC} = 5V
  R_{ON} = 6Ω (TYP.) AT V_{CC} = 3V
- WIDE OPERATING VOLTAGE RANGE:
  V_{CC} (OPR) = 1.8V TO 5.5V SINGLE SUPPLY

SOT23-6L

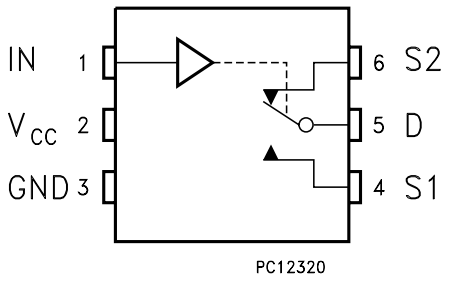
DESCRIPTION

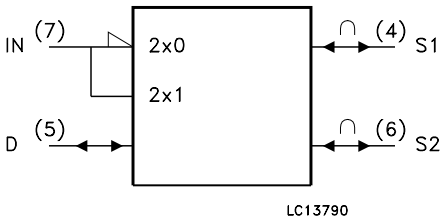
The STG719 is an high-speed spdt CMOS SWITCH fabricated in silicon gate C^2MOS tecnology. It designed to operate from 1.8V to 5.5V, making this device ideal fro prtable applications. It offers 4Ω ON-Resistance Max at 5V 25°C. Additional key faetures are fast switching speed (tON=7ns, tOFF=4.5ns) and Low Power Consumption (<0.001mW typ.). ESD immunity is higher than 1000V per method 3015.7 of MIL-STD-883B. It's available in the commercial temperature range.

ORDER CODES

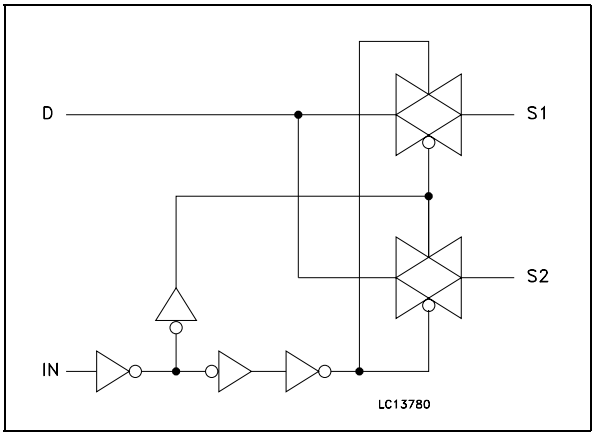
PACKAGE	T & R
SOT23-6L	STG719STR

PIN CONNECTION AND IEC LOGIC SYMBOLS





INPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

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

TRUTH TABLE

CONTROL	SWITCH S1	SWITCH S2
L	ON	OFF
H	OFF	ON

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	-0.5 to +7.0	V
V_I	DC Input Voltage	-0.5 to V_{CC} + 0.5	V
V_{IC}	DC 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 occour. 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	-55 to 125	°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% of V_{CC}

DC SPECIFICATION

Symbol	Parameter	Test Condition		Value							Unit
		V_{CC} (V)		T_A = 25°C			-40 to 85°C		-55 to 125°C		
				Min.	Typ.	Max.	Min.	Max.	Min.	Max.	
V_{IHC}	High Level Control Input Voltage	3.3(*)		2.0			2.0		2.0		V
		5.0(**)		2.4			2.4		2.4		
V_{ILC}	Low Level Control Input Voltage	3.3(*)				0.4		0.4		0.4	V
		5.0(**)				0.8		0.8		0.8	
R_{ON}	ON Resistance	3.3(*)	V_S = 0 to V_{CC} I_S = 10mA		6	7		10			Ω
		5.0(**)				4		5			
ΔR_{ON}	ON Resistance	3.3(*)	V_S = 0 to V_{CC} I_S = 10mA		0.1			0.4			Ω
		5.0(**)			0.1			0.4			
R_{FLATON}	ON Resistance fLATNESS	3.3(*)	V_S = 0 to V_{CC} I_S = 10mA		2.5						Ω
		5.0(**)			0.75						
I_{SOFF}	Source OFF Leakage	3.3(*)	V_S =1V or V_{CC} V_{DD} = V_{CC} or 1V V_{IN} = V_{CC} or GND		±0.01	±0.25		± 0.35		± 0.35	µA
		5.0(**)			±0.01	±0.25		± 0.35		± 0.35	
I_{SON}	Channel ON Leakage	3.3(*)	V_S=V_D=1V to V_{CC}-2.5V V_{IN} = V_{IHC}		±0.01	±0.25		± 0.35		± 0.35	µA
		5.0(**)			±0.01	±0.25		± 0.35		± 0.35	
I_{IN}	Control Input Leakage Current	3.3(*)	V_I = V_{IH} or V_{IL}		0.005			±0.1			µA
		5.0(**)			0.005			±0.1			
I_{CC}	Quiescent Supply Current	3.3(*)	V_I = V_{CC} or GND		0.001	1		1			µA
		5.0(**)			0.001			1			

(*) Voltage range is 3.3V ± 0.3V
(**) Voltage range is 5V ± 0.5V

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

Symbol	Parameter	Test Condition		Value							Unit
		V_{CC} (V)		T_A = 25°C			-40 to 85°C		-55 to 125°C		
				Min.	Typ.	Max.	Min.	Max.	Min.	Max.	
t_{PD}	Delay Time	3.3(*)	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	3.3(*)	V_S = 2V		10			16			ns
		5.0(**)	V_S = 3V		7			11			
t_{OFF}	OFF Channel Time	3.3(*)	V_S = 2V		5.5			7			ns
		5.0(**)	V_S = 3V		4.5			6			
t_D	Break Before Make Time Delay	3.3(*)	V_S = 2V	1	4						ns
		5.0(**)	V_S = 3V	1	4						
C_{SOFF}	OFF Channel Capacitance										pF
C_{SON}	ON Channel Capacitance										pF

(*) Voltage range is 3.3V ± 0.3V
(**) Voltage range is 5.0V ± 0.5V

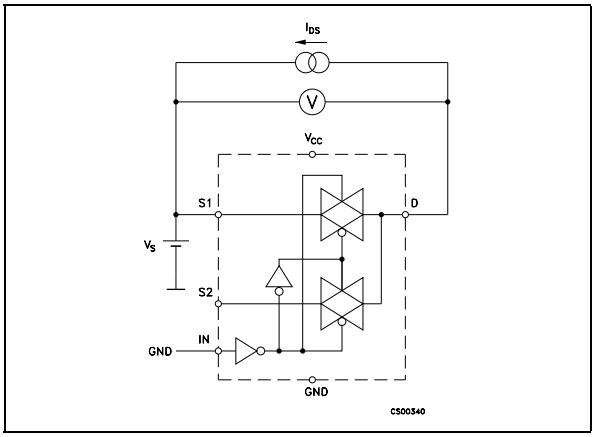
ANALOG SWITCH CHARACTERISTICS (GND = 0V; T_A = 25°C)

Symbol	Parameter	Test Condition		Value	Unit
		V_{CC} (V)		Typ.	
f_{MAX}	Frequency Response (Switch ON)	3.3(*)	Bandwidth at -3dB	200	MHz
		5.0(**)		200	
	Feedthrough Attenuation (Switch OFF)	3.3(*)	f_{IN} = 10MHz sine wave	-40	dB
		3.3(*)	f_{IN} = 1MHz sine wave	-74	
		5.0(**)	f_{IN} = 10MHz sine wave	-40	
		5.0(**)	f_{IN} = 1MHz sine wave	-74	
	Crosstalk (Channel to Chabbel)	3.3(*)	f_{IN} = 10MHz sine wave	-39	dB
		3.3(*)	f_{IN} = 1MHz sine wave	-52	
		5.0(**)	f_{IN} = 10MHz sine wave	-39	
		5.0(**)	f_{IN} = 1MHz sine wave	-52	

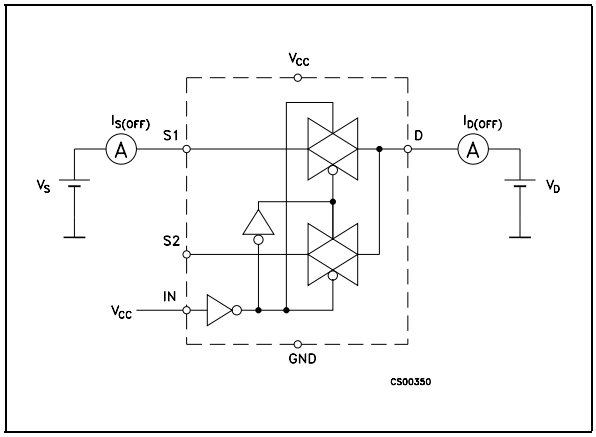
(*)Voltage range is 3.3V ± 0.3V
(**) Voltage range is 5.0V ± 0.5V

TEST CIRCUITS

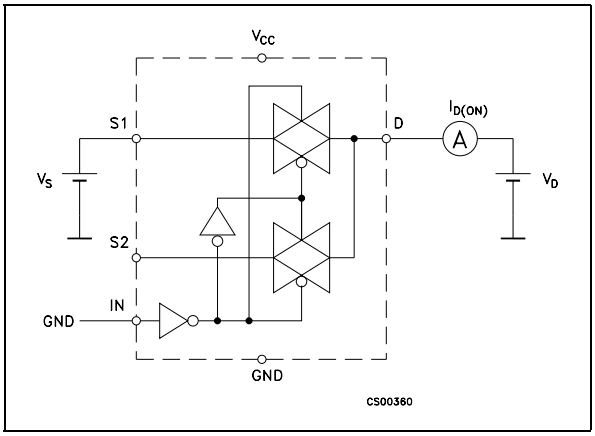
ON RESISTANCE



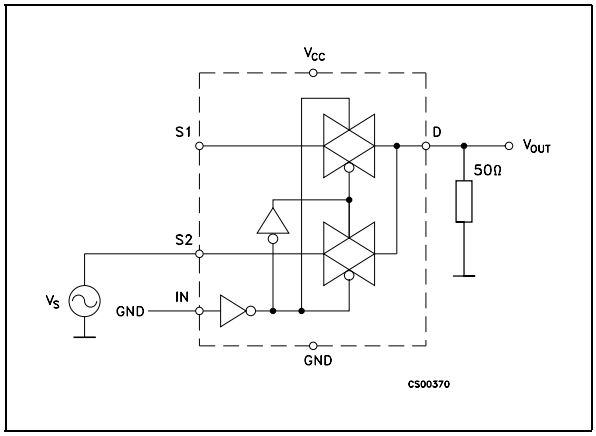
OFF LEAKAGE



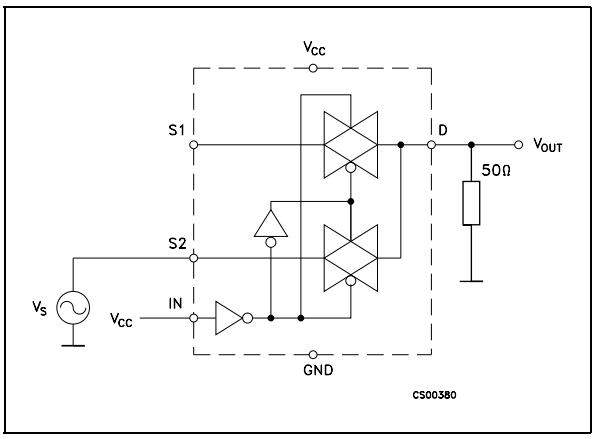
ON LEAKAGE



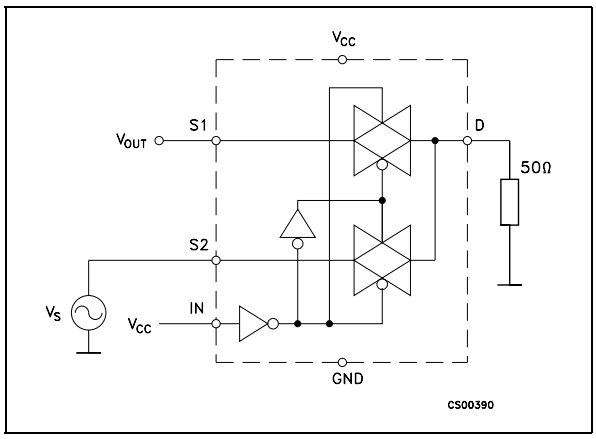
OFF ISOLATION



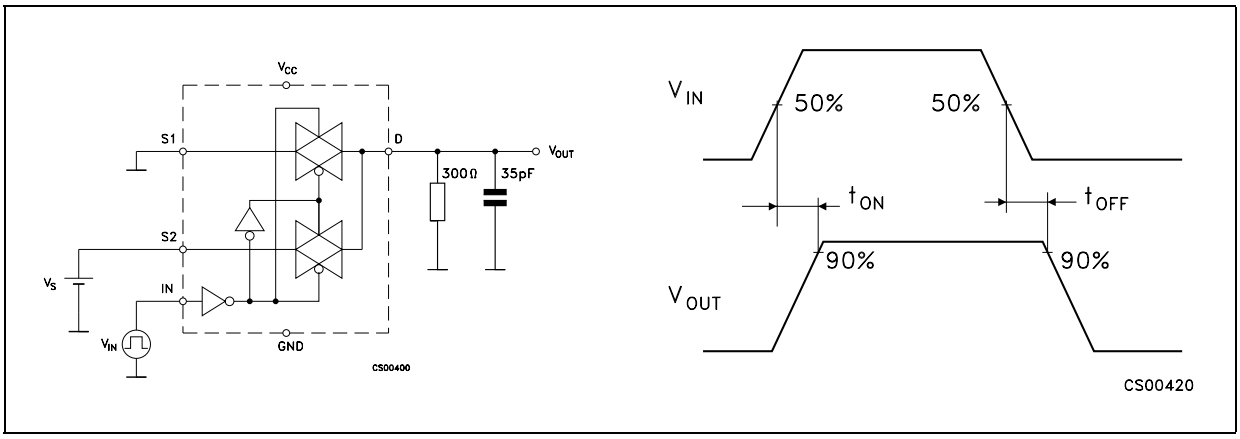
BANDWIDTH



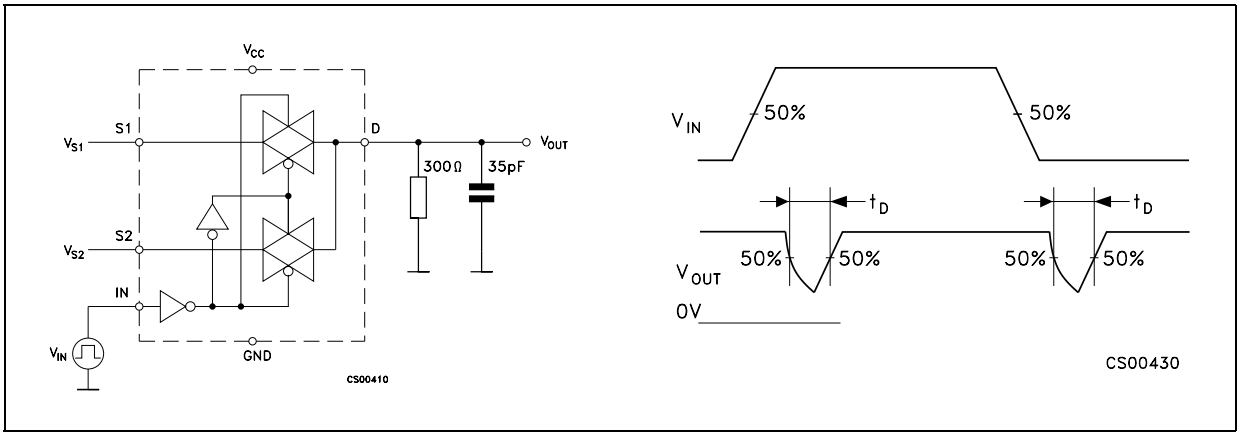
CHANNEL TO CHANNEL CROSSTALK



SWITCHING TIMES

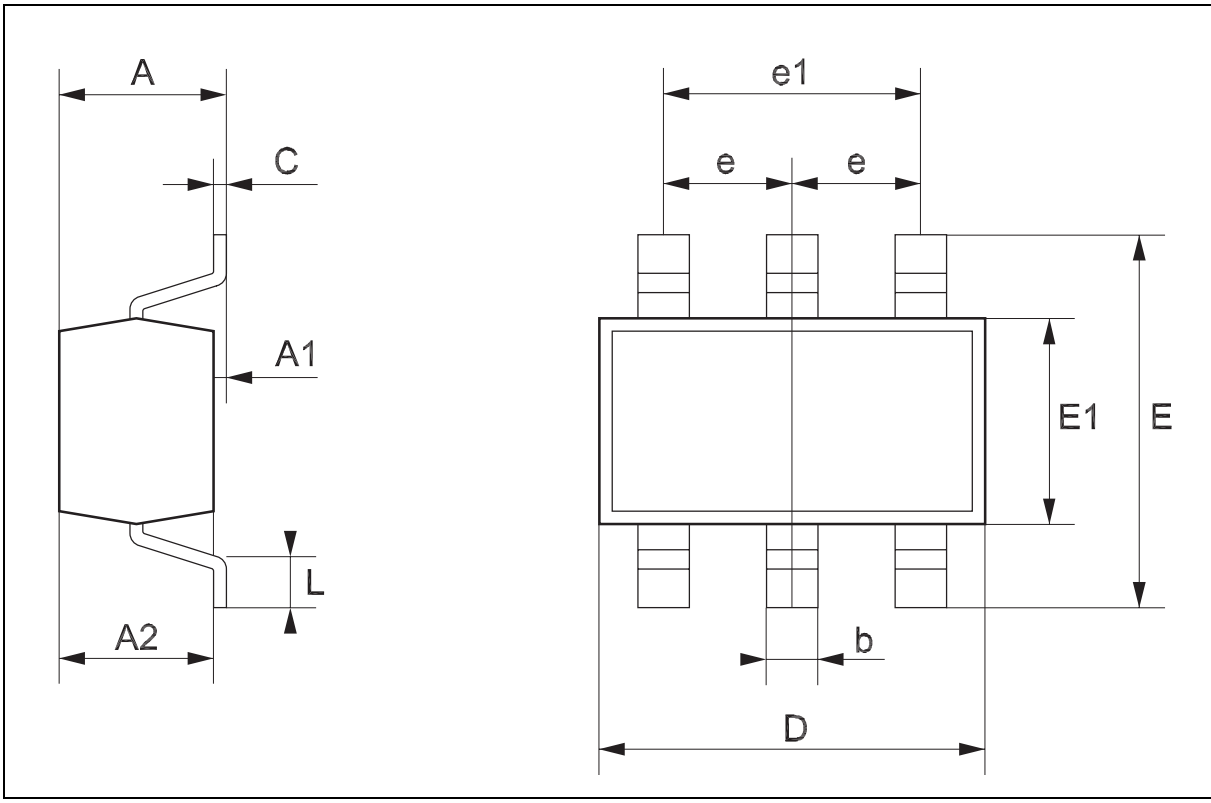


BREAK BEFORE MAKE TIME DLEAY



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
e		0.95			37.4	
e1		1.9			74.8	
L	0.35		0.55	13.7		21.6



Tape & Reel SOT23-xL MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			180			7.086
C	12.8	13.0	13.2	0.504	0.512	0.519
D	20.2			0.795		
N	60			2.362		
T			14.4			0.567
Ao	3.13	3.23	3.33	0.123	0.127	0.131
Bo	3.07	3.17	3.27	0.120	0.124	0.128
Ko	1.27	1.37	1.47	0.050	0.054	0.0.58
Po	3.9	4.0	4.1	0.153	0.157	0.161
P	3.9	4.0	4.1	0.153	0.157	0.161