Data Sheet

(Rev. 1.0)

for S1A0051

FET Driver
For Class-D PWM Amp

Digital & Analog Co., Ltd.

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1. INTRODUCTION

◎ FET (GATE) Driver for CLASS-D Amp

◎ Schmitt Triggered Input

◎ Totem-Pole Structured Output Stage

◎ Four Independent Power MOSFET Gate Drivers

◎ Operating Voltage : 10 ~ 12V (Single Power), ± 5.0V – ± 6.0V(Dual Power)

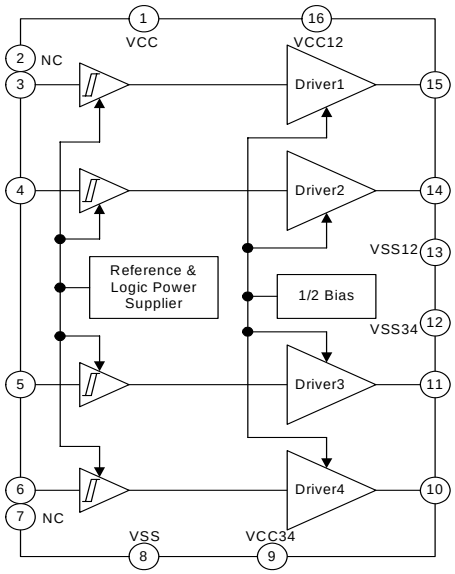
◎ High Performance for Switching Characteristics

○ Typically 15ns for rising/falling time with 1nF load

○ Typically 20ns for propagation delay time with 1nF load

◎ BiCMOS Technology / 16 ETSSOP

2. BLOCK DIAGRAM



3 ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Units
VCC	Driver supply voltage	13.5	V
Tstg	Storage Temperature	-40 – 125	°C
Topr	Operating Temperature	-25 – 75	°C
Electro-Static Discharge	Human Body Model, All pin	2000	V
	Machine Model, All pin	200	V
Pd	Power Dissipation	1000	mW

4. PIN DESCRIPTION

NO.	Name	I/O	Description
1	VCC	P	Positive power supply pin
2	NC	-	No Connected
3	VI1	I	Logic Driver Input 1
4	VI2	I	Logic Driver Input 2
5	VI3	I	Logic Driver Input 3
6	VI4	I	Logic Driver Input 4
7	NC	-	No Connected
8	VSS	P	Negative power supply pin
9	VCC34	P	Positive power supply pin for driver 3, 4
10	VO4	O	Logic Driver Output 4
11	VO3	O	Logic Driver Output 3
12	VSS34	P	Negative power supply pin for driver 3, 4
13	VSS12	P	Negative power supply pin for driver 1, 2
14	VO2	O	Logic Driver Output 2
15	VO1	O	Logic Driver Output 1
16	VCC12	P	Positive power supply pin for driver 1, 2

* I: Input, O: Output, B: Bi-directional, P: Power Supply, -: No Connection.

5. ELECTRIC CHARATERISTICS

With no special mentions, Ta = 25°C, VCC = 10V

Characteristic	Symbol	Condition	Value			Unit
			Min.	Typ.	Max.	
Supply Current	ICC1	VCC = 10V All input pin is Low State	1	3	5	mA
	ICC2	VCC = 12V All input pin is Low State	1.5	3.7	6.0	mA
Switching Characteristics						
Output Rising Time	Tr	CL=1nF	-	15	80	nsec
Output Falling Time	Tf	CL=1nF	-	15	80	nsec
Propagation Delay	Td	CL=1nF	-	20	50	nsec
Driving Characteristics						
Output High Level	VOH	Ipull = 5mA	9.0	9.25	9.5	V
Output Low Level	VOL	Ipush = 5mA	-	-	0.4	V
Input Threshold						
High State Logic 1	VIH	-	3.3	-	-	V
Low State Logic 0	VIL	-	-	-	0.5	V

6. FUCTIONAL DESCRIPTION

Please refer to notes on S1A0071 for more details on the Class-D Amp.

S1A0051 can be used not only in one power supply mode(+10V ~ +12V) but also in dual power supply mode(±5V ~ ±6V). It can receive input signals through the Schmitt Trigger, and has a built-in logic power supply, which makes the logic level independent of the input level when the input signal level is different from the output signal level. S1A0051 drives inputs and outputs that have a non-inverse relation S1A0051 drives each output that have a non-inverse relation about each input and it has superior short propagation delay and fast rising/falling timing characteristics.

Input Interface (Schmitt Trigger)

In S1A0051, the built-in logic power supply sets the internal logic operating voltage, and the power supply voltage range is 5.0V 0.5V for dual power supply mode. By interfacing with the Schmitt Trigger with a hysteresis, the input is unaffected by noise.

Driver & 1/2 BIAS

Configured as CMOS, excluding totem pole output stage, to enhance switching characteristics, the driver generates the center operating voltage (1/2 BIAS) to prevent MOS breakdown when the process CMOS breakdown voltage BVgs is 8V. S1A0051's input/output relationship is non-inverted, which is shown in the timing diagram in Figure. 1.

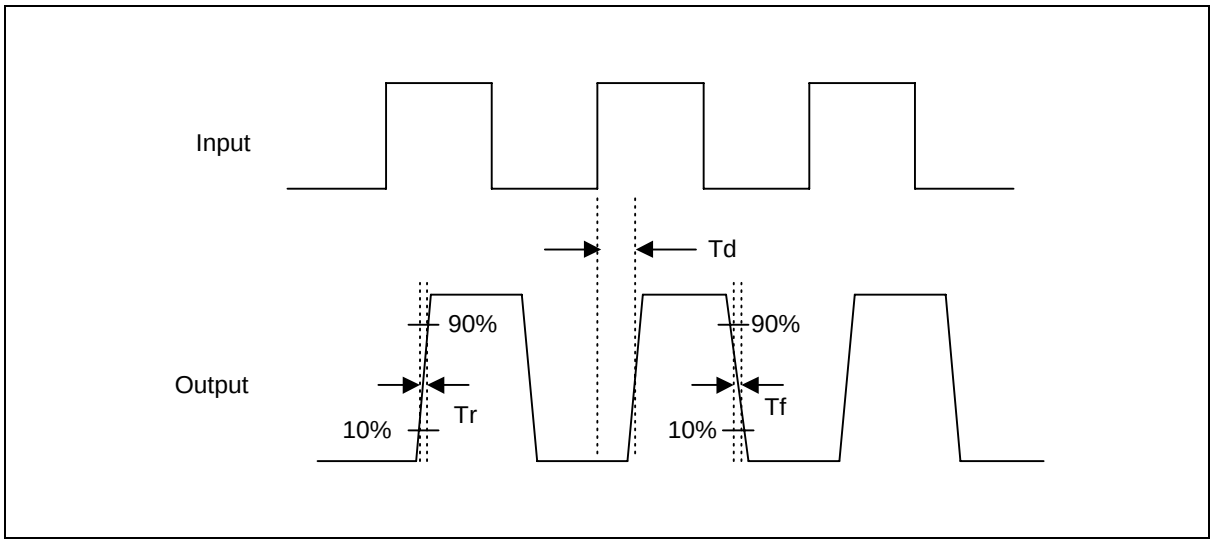
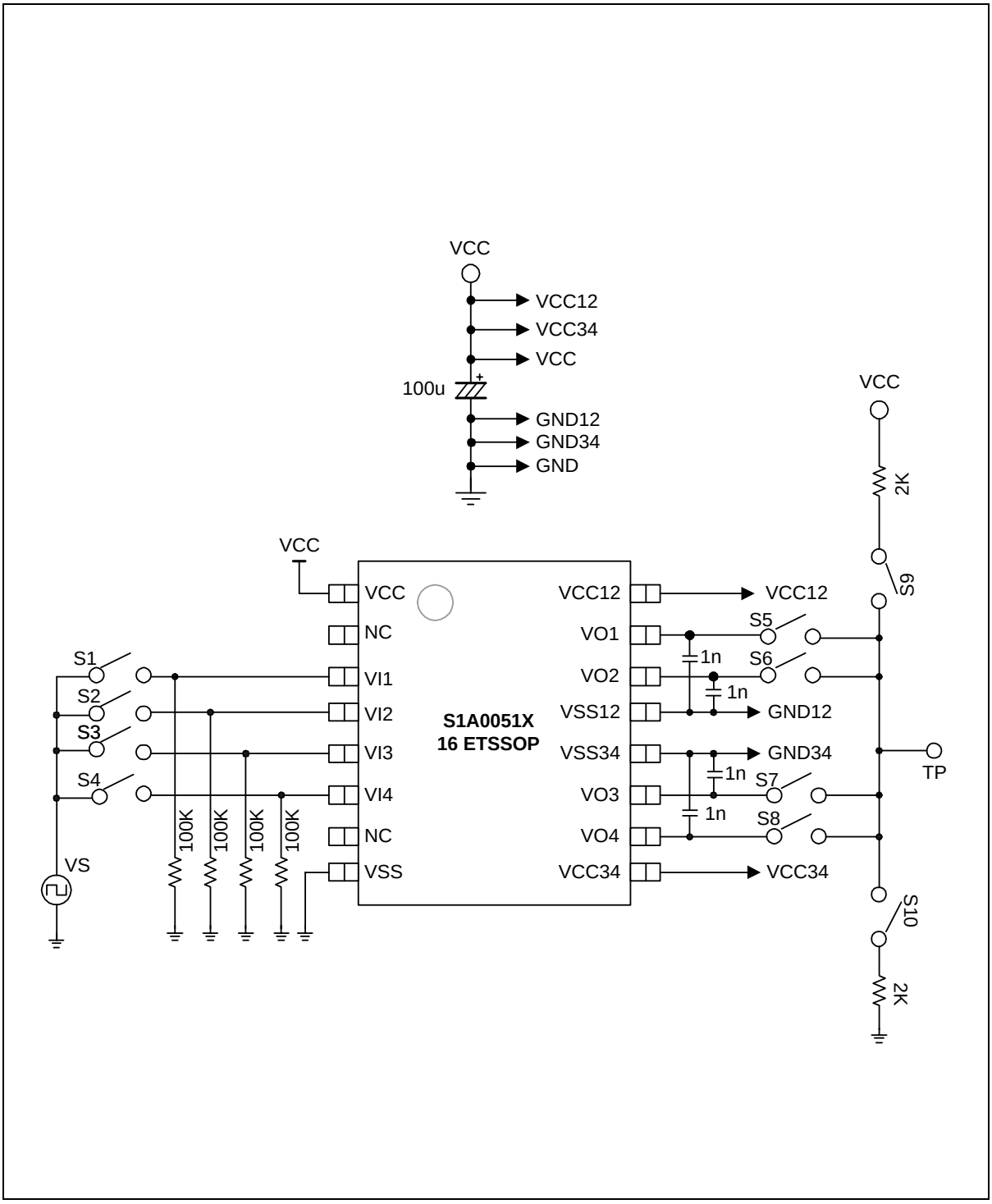
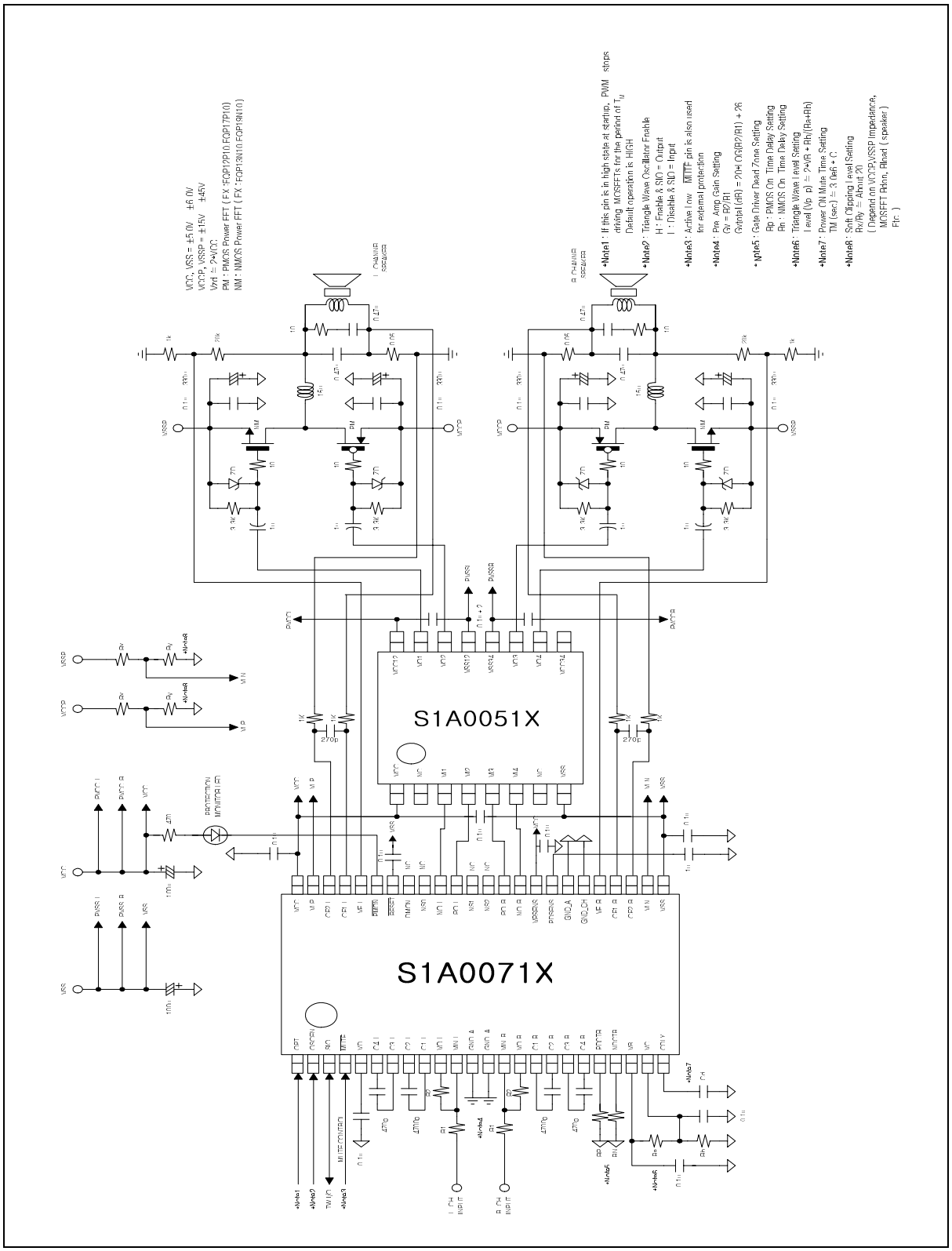


Figure 1. Input vs. Output Timing Diagram

7. TEST CIRCUIT



8. APPLICATION CIRCUIT (refer to S1A0071 datasheet)



9. PACKAGE DIMENSIONS