

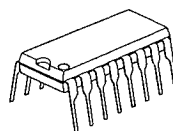
# C-MOS QUAD SPST ANALOG SWITCH

## ■ GENERAL DESCRIPTION

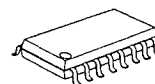
The NJU7301 is a quad break-before-make SPST analog switch protected up to 44V operating voltage.

Each switch is controlled by TTL or C-MOS compatible input.

## ■ PACKAGE OUTLINE



NJU7301D

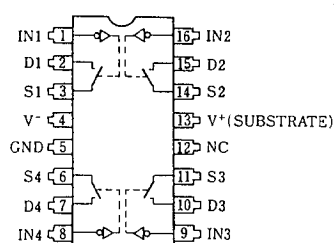


NJU7301M

## ■ FEATURES

- High Break Down Voltage -- 44V
- Package Outline -- DIP/DMP 16
- C-MOS Technology

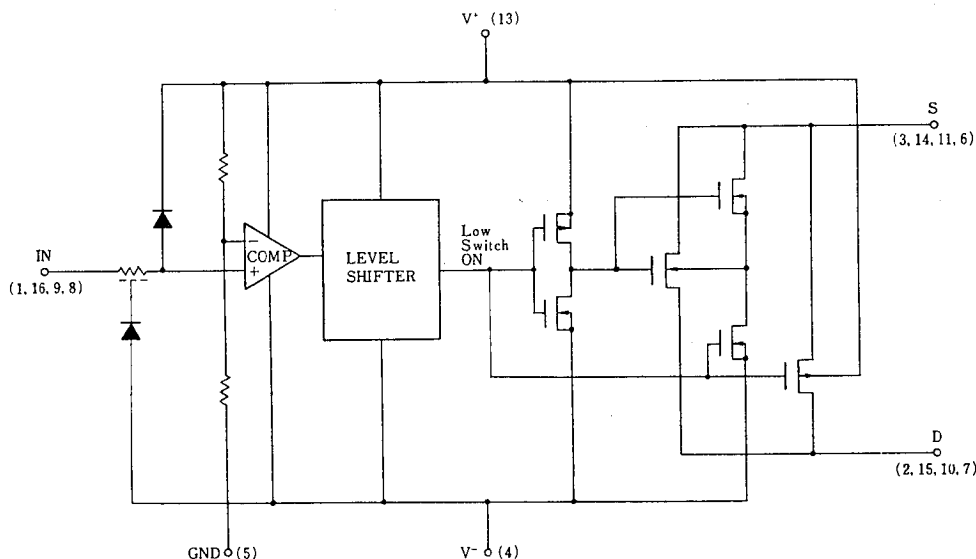
## ■ PIN CONFIGURATION



## ■ TRUTH TABLE

Logic (In)	Switch
0	ON
1	OFF

## ■ EQUIVALENT CIRCUIT



\* Logic input threshold voltage  $V_{TH}$  is about  $V^+ \times 0.128(V)$ .  
When the designing, enough margin is required.

# ■ TERMINAL DESCRIPTION

No.	SYMBOL	F U N C T I O N	No.	SYMBOL	F U N C T I O N
1	IN1	Control Signal Input	9	IN3	Control Signal Input
2	D1	Input/Output 1	10	D3	Input/Output 3
3	S1		11	S3	
4	V <sup>-</sup>	Negative (V <sup>-</sup> ) Power Supply	12	NC	Non Connection
5	GND	Ground	13	V <sup>+</sup>	Positive (V <sup>+</sup> ) Power Supply
6	S4	Input/Output 4	14	S2	Input/Output 2
7	D4		15	D2	
8	IN4	Control Signal Input	16	IN2	Control Signal Input

# ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C )

P A R A M E T E R	SYMBOL	R A T I N G S	UNIT
Supply Voltage	V <sup>+</sup> - V <sup>-</sup>	44	V
	V <sup>+</sup> - GND	19	
	GND - V <sup>-</sup>	25	
Input Voltage	V <sub>I</sub> , V <sub>S</sub> , V <sub>D</sub>	V <sup>-</sup> -0.5 ~ V <sup>+</sup> +0.5 *	V
Input Current	I <sub>I</sub>	30	mA
	I <sub>S</sub> , I <sub>D</sub> Continuous	20	
	Peak Value (PW=1ms, Duty0.1)	70	
Power Dissipation	P <sub>D</sub>	500 (DIP) 200 (DMP)	mW
Operating Temperature Range	T <sub>opr</sub>	0 ~ + 70	°C
Storage Temperature Range	T <sub>stg</sub>	- 65 ~ + 125	°C

\* V<sup>+</sup>+0.5V must be 44V or less.

# ELECTRICAL CHARACTERISTICS (DC CHARACTERISTICS)

( $V^+=15V$ ,  $V^-=-15V$ ,  $GND=0V$ )

P A R A M E T E R	S Y M B O L	C O N D I T I O N S		TYP	MAX			UNIT
				25°C	0°C	25°C	70°C	
Analog Signal Range	V <sub>ANALOG</sub>			±15		±15	±15	V
On-state Resistance	R <sub>ON</sub>	V <sub>IN</sub> =0.8V	V <sub>D</sub> =10V	105	200	200	250	Ω
		I <sub>S</sub> =-1mA	V <sub>D</sub> =-10V	115	200	200	250	
Source-off Leakage Current	I <sub>S</sub> (off)	V <sub>I</sub> =2.4V	V <sub>S</sub> =14V, V <sub>D</sub> =-14V	0.01		5	100	nA
			V <sub>S</sub> =-14V, V <sub>D</sub> =14V	-0.02		- 5	-100	
Drain-off Leakage Current	I <sub>D</sub> (off)	V <sub>I</sub> =2.4V	V <sub>D</sub> =14V, V <sub>S</sub> =-14V	0.01		5	100	nA
			V <sub>D</sub> =-14V, V <sub>S</sub> =14V	-0.02		- 5	-100	
Drain-on Leakage Current	I <sub>D</sub> (on)	V <sub>I</sub> =0.8V	V <sub>D</sub> =V <sub>S</sub> =14V	0.1		5	200	nA
			V <sub>D</sub> =V <sub>S</sub> =-14V	-0.15		- 5	-200	
Input Current	I <sub>IH</sub>	V <sub>I</sub> =2.4V		-0.0004		- 1	- 10	μA
		V <sub>I</sub> =15V		0.003		1	10	
	I <sub>IL</sub>	V <sub>I</sub> =0V		-0.0004		- 1	- 10	
Quiescent Current	I <sup>+</sup>	V <sub>I</sub> =0 or 2.4V		0.9		2		mA
	I <sup>-</sup>			-0.3		-1		

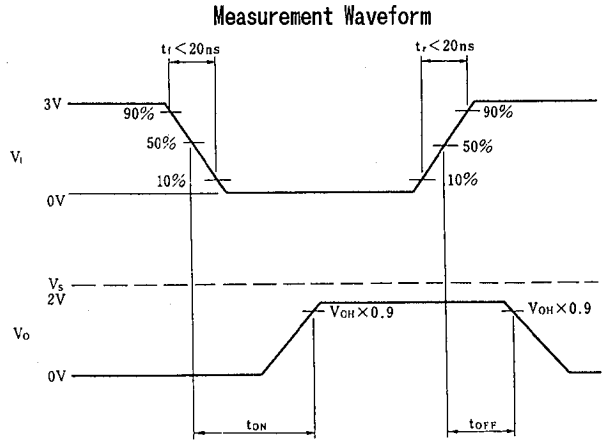
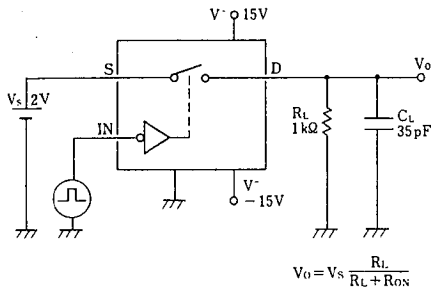
# SWITCHING CHARACTERISTICS

( $V^+=15V$ ,  $V^-=-15V$ ,  $GND=0V$ )

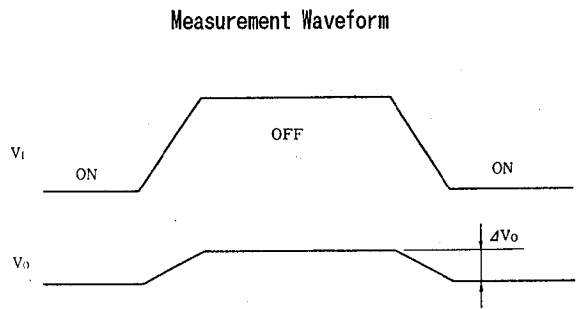
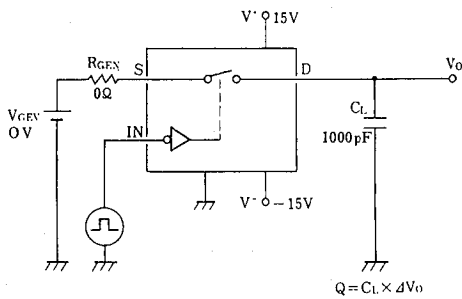
PARAMETER	SYMBOL	CONDITIONS		TYP	MAX			UNIT
				25°C	0°C	25°C	70°C	
Turn-on Time	t <sub>on</sub>	R <sub>L</sub> =1kΩ, C <sub>L</sub> =35pF		480		600		ns
Turn-off Time	t <sub>off</sub>			370		450		
Charge Injection	Q	C <sub>L</sub> =1000pF, V <sub>GEN</sub> =0V, R <sub>GEN</sub> =0Ω		20				pC
Source-Off Capacit.	C <sub>S</sub> (off)	f=100kHz	V <sub>S</sub> =0V, V <sub>I</sub> =5V	5				pF
Drain-Off Capacit.	C <sub>D</sub> (off)		V <sub>D</sub> =0V, V <sub>I</sub> =5V	5				
Channel-On Capacitance	C <sub>D</sub> (on) +C <sub>S</sub> (on)		V <sub>D</sub> =V <sub>S</sub> =0V, V <sub>I</sub> =0V	16				
Off Isolation	OIRR		V <sub>S</sub> =2V <sub>P-P</sub> , R <sub>L</sub> =75Ω	70				dB
Channel-to-channel Crosstalk	CCRR			90				

■ MEASUREMENT CIRCUITS

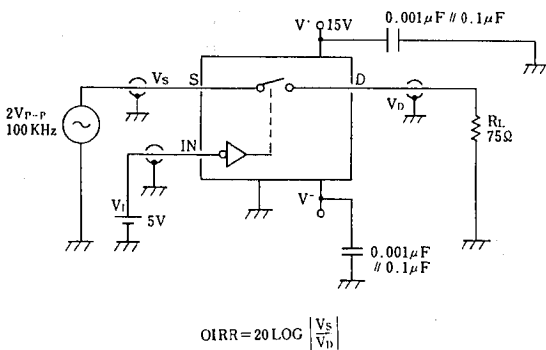
(1) Turn-on/Turn-off Time



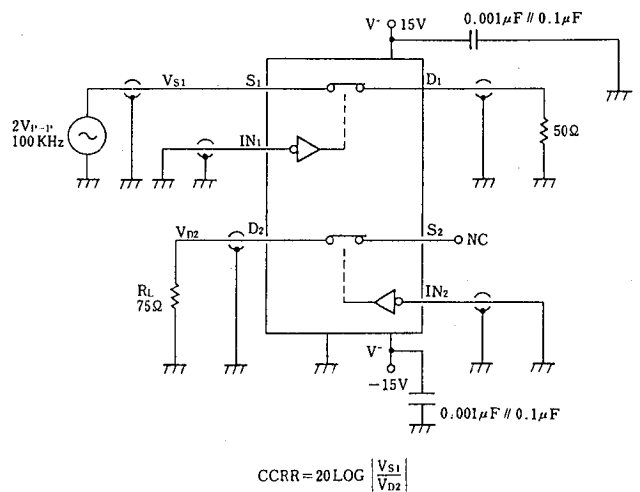
(2) Charge Injection



(3) Off Isolation



(4) Channel-To-Channel Crosstalk



## MEMO

**[CAUTION]**

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