

## C-MOS QUAD SPST ANALOG SWITCH

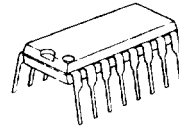
### ■ GENERAL DESCRIPTION

The NJU211 is a quad break-before-make SPST analog switch protected up to 40V operating voltage.

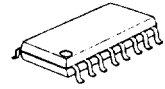
Each switch is controlled by TTL or C-MOS compatible input, and the input threshold level can be adjusted by external voltage supply control.

The NJU211 is functionally and pin-to-pin compatible with SILICONIX DG211A.

### ■ PACKAGE OUTLINE



NJU211D

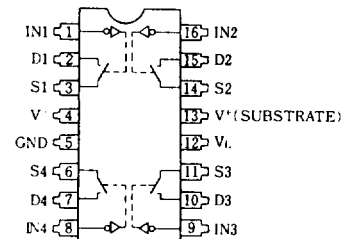


NJU211M

### ■ FEATURES

- High Break Down Voltage -- 40V
- Input Threshold Voltage Adjustable
- Package Outline -- DIP/DMP 16
- C-MOS Technology

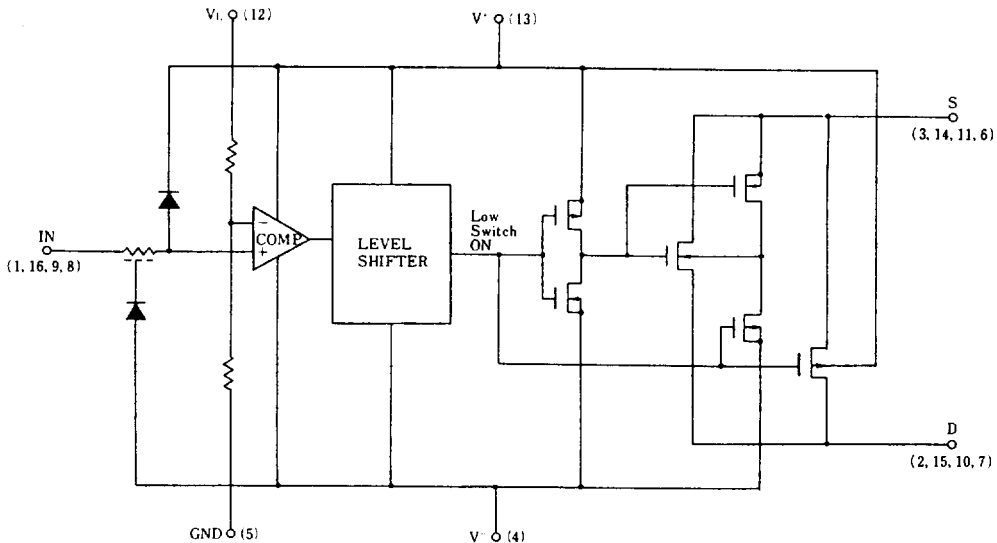
### ■ PIN CONFIGURATION



### ■ TRUTH TABLE

Logic (In)	Switch
0	ON
1	OFF

### ■ EQUIVALENT CIRCUIT



\* Logic input threshold voltage  $V_{TH}$  is about  $V_L \times 0.384(V)$ .  
When the designing, enough margin is required.


**■ TERMINAL DESCRIPTION**

No.	SYMBOL	FUNCTION	No.	SYMBOL	FUNCTION
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	V <sub>L</sub>	Threshold Level Control Voltage Supply
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

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**■ ABSOLUTE MAXIMUM RATINGS**

( Ta=25°C )

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup> - V <sup>-</sup>	40	V
	V <sup>+</sup> - GND	19	
	GND - V <sup>-</sup>	25	
Threshold Control Voltage	V <sub>L</sub> - GND	-0.5 ~ V <sup>+</sup> +0.5 *	
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 40V or less.


**ELECTRICAL CHARACTERISTICS (DC CHARACTERISTICS)**

 (  $V^+=15V$  ,  $V^-=-15V$  ,  $GND=0V$  ,  $V_L=5V$  )

PARAMETER	SYMBOL	CONDITIONS	TYP	MAX			UNIT
			25°C	0°C	25°C	70°C	
Analog Signal Range	$V_{ANALOG}$		$\pm 15$		$\pm 15$	$\pm 15$	V
On-state Resistance	$R_{ON}$	$V_{IN}=0.8V$	$V_D=10V$	105		175	$\Omega$
		$I_S=-1mA$	$V_D=-10V$	115		175	
Source-off Leakage Current	$I_S(off)$	$V_I=2.4V$	$V_S=14V, V_D=-14V$	0.01		5	nA
			$V_S=-14V, V_D=14V$	-0.02		- 5	
Drain-off Leakage Current	$I_D(off)$	$V_I=2.4V$	$V_D=14V, V_S=-14V$	0.01		5	nA
			$V_D=-14V, V_S=14V$	-0.02		- 5	
Drain-on Leakage Current	$I_D(on)$	$V_I=0.8V$	$V_D=V_S=14V$	0.1		5	nA
			$V_D=V_S=-14V$	-0.15		- 5	
Input Current	$I_{IH}$	$V_I=2.4V$		-0.0004		- 1	$\mu A$
		$V_I=15V$		0.003		1	
	$I_{IL}$	$V_I=0V$		-0.0004		- 1	
Quiescent Current	$I^+$	$V_I=0$ or $2.4V$		0.35		0.68	mA
	$I^-$			0.30		0.68	
	$I_L$			0.5		1.2	

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**SWITCHING CHARACTERISTICS**

 (  $V^+=15V$  ,  $V^-=-15V$  ,  $GND=0V$  ,  $V_L=5V$  )

PARAMETER	SYMBOL	CONDITIONS	TYP	MAX			UNIT	
			25°C	0°C	25°C	70°C		
Turn-on Time	$t_{on}$	$R_L=1k\Omega$ , $C_L=35pF$	460		1000		ns	
Turn-off Time	$t_{off}$		360		500			
Charge Injection	Q	$C_L=1000pF$ , $V_{GEN}=0V$ , $R_{GEN}=0\Omega$	20				pC	
Source-Off Capacit.	$C_S(off)$	$f=100kHz$	$V_S=0V$ , $V_I=5V$	5			pF	
Drain-Off Capacit.	$C_D(off)$		$V_D=0V$ , $V_I=5V$	5				
Channel-On Capacitance	$C_D(on)$ $+C_S(on)$		$V_D=V_S=0V$ , $V_I=0V$	16				
Off Isolation	OIRR			70				dB
Channel-to-channel Crosstalk	CCRR		$V_S=2V_{P-P}$ , $R_L=75\Omega$	90				