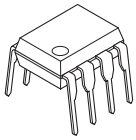
SYSTEM RESET IC WITH WATCHDOG TIMER

■ GENERAL DESCRIPTION

The NJU7291 is a system reset IC with watchdog timer. It can detect an instantaneous voltage drop and break, and generates a reset signal. The NJU7291 provides a fail-safe function with an internal watchdog timer on various microcomputer systems. It is available in 8-lead DIP and MSOP (TVSP) packages.

■ PACKAGE OUTLINE

NJU7291RB1-**
(MSOP8 (TVSP8))

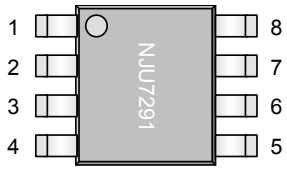


NJU7291D**
(DIP8)

■ FEATURES

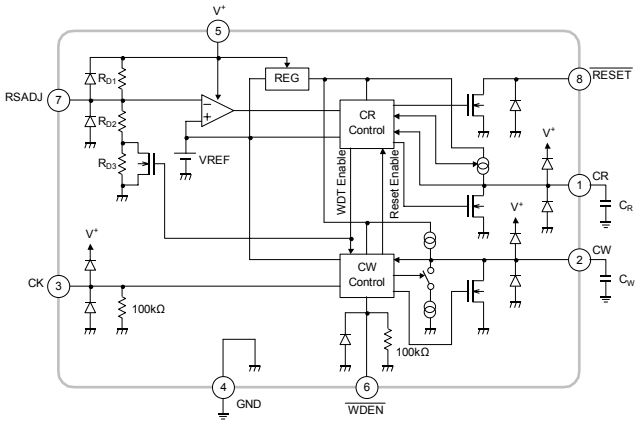
- Supply Voltage Range : V^+ = 2.5 V to 7.0 V
- RESET Detection Voltage : V_{RL} = ± 1.0 % and Adjustable
  * Detection Voltage with External Resistance
- Rising RESET Hold Time and Watchdog Timer RESET Time
  : Setting Ratio = 30 : 1
- Configurable Watchdog Timer Watching Time Independent Setting
- Configurable Stopping Watchdog Timer Function
- Package Outline : MSOP8 (TVSP8)*, DIP8
  *MEET JEDEC MO-187-DA / THIN TYPE

■ PIN CONFIGRATION / PIN FUNCTION



PIN No.	PIN NAME	FUNCTION
1.	CR	External Capacitor Pin for Setting Reset
2.	CW	External Capacitor Pin for Clock
3.	CK	Clock Input
4.	GND	Ground
5.	V^+	Power Supply
6.	WDEN	External Register Pin for Setting Watchdog Timer
7.	RSADJ	External Register Pin for Setting Reset
8.	RESET	Reset Signal Output

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

(T_a = 25 °C)

PARAMETER	SYMBOL	TEST CONDITION	RATINGS	UNIT
Supply Voltage	V^+		8.0	V
Detect Voltage Input voltage	V_{RSADJ}		8.0	V
Clock Input Voltage	V_{CK}	(*1)	8.0	V
$\overline{WDEN}$ Input Voltage	$V_{\overline{WDEN}}$	(*1)	8.0	V
$\overline{RESET}$ Output Voltage	$V_{\overline{RESET}}$		8.0	V
$\overline{RESET}$ Output Sink Current	$I_{\overline{RESET}}$		20	mA
Power Dissipation	P_D	MSOP8(TVSP8) (*2) DIP8	470 500	mW
Operating Temperature	T_{opj}		- 40 to + 85	°C
Storage Temperature	T_{stg}		-40 to +125	°C

(*1) : When input voltage is less than +8V, the absolute maximum control voltage is equal to the input voltage.

(*2) : Mounted on glass epoxy board (76.2 × 114.3 × 1.6mm: 2Layers FR-4)

■ RECOMMENDED OPERATING CONDITION

(T_a = 25 °C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.
Supply Voltage	V^+		2.5 to 7.0	V
Detect Voltage Input voltage	V_{RSADJ}		0 to V^+	V
Clock Input Voltage	V_{CK}		0 to V^+	V
$\overline{WDEN}$ Input Voltage	$V_{\overline{WDEN}}$		0 to V^+	V

■ ELECTRICAL CHARACTERISTICS

< Voltage Detector Block > (V^+ = 3.3V, T_a = 25 °C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Reset Voltage	V_{RL}		- 1.0 %	-	+1.0 %	V
Hysteresis Voltage	$V_{HYS\ RS}$	$V_{HYS\ RS} = V_{RH}$ (*3) - V_{RL}	63	90	117	mV
Reference Voltage	V_{TRS}		0.95	1.00	1.05	V
Average temperature coefficient of Reference Voltage	$\Delta V_{TRS}/\Delta T_a$	T_a = - 40 °C to + 85°C	-	±200	-	ppm/°C
Output Delay Hold time	T_{PR}	C_R = 0.01µF	1.9	2.5	3.5	ms
CR Pin Charge Current at Detect Voltage	I_{CRD}	V_{CR} = 0.05V	3	4	5	µA
CR Pin Threshold Voltage at Reset Release	V_{TCRD}	V_{CW} = 0.05V	0.95	1.00	1.05	V

(*3) : V_{RH} : Return Voltage

< Output Block > (V^+ = 3.3V, T_a = 25 °C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
$\overline{RESET}$ Output Voltage at " L " Output	V_{RSTL}	$I_{\overline{RESET}}$ = 0.5mA, V_{RSADJ} = 0V	-	0.2	0.4	V
$\overline{RESET}$ Output Sink Current at " L " Output	I_{RST}	$V_{\overline{RESET}}$ = 0.5V, V_{RSADJ} = 0V	5	10	-	mA
$\overline{RESET}$ Minimum Operating Voltage	V_{OPL}	$V_{\overline{RESET}}$ = 0.4V, R_{pu} (*4) = 330kΩ	-	0.8	1.2	V

(*4) : R_{pu} : Pull up Resistance

< General Characteristics > (V^+ = 3.3V, T_a = 25 °C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I_{SS}	WDT	-	170	250	µA

< Watch Dog Timer Block > (V^+ = 3.3V, T_a = 25 °C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Clock Input Threshold Voltage	V_{TCK}		0.6	0.9	1.2	V
Clock Input Pulse With	T_{CKW}		0.05	-	-	ms
Clock Input Cycle	T_{CK}		0.1	-	-	ms
WDT Monitor Time	T_{WD}	C_W = 0.01µF	1.5	2.0	2.8	ms
CW Pin Charge Current	I_{CK}	V_{CW} = 0.05V	3	4	5	µA
CW Pin Threshold Voltage at WDT Reset	V_{TCWH}	V_{CR} = 0.05V	0.95	1.00	1.05	V
CW Pin Discharge Current at Clock Detect	I_{CWL}	V_{CW} = 0.05V	30	40	50	µA
CW Pin Threshold Voltage at Changing Charge	V_{TCWL}	V_{CR} = 0.05V	0.18	0.20	0.22	V
WDT Reset Time	T_{WR}	C_R = 0.01µA	0.063	0.083	0.117	ms
CR Pin Charge Current at Timer Reset	I_{CRW}	V_{CR} = 0.05V	45	60	75	µA
CR Pin Threshold Voltage at Release Timer Reset	V_{TCRW}	V_{CW} = 0.05V	0.48	0.50	0.53	V
$\overline{WDEN}$Pin Threshold Voltage at Stop WDT	V_{TWDIS}		1.6	-	V^+	V
$\overline{WDEN}$Pin Threshold Voltage at Release Stop WDT	V_{TWEN}		0	-	0.3	V

■ DETECT VOLTAGE LINE UP

DEVICE NAME	VDET	STATUS
NJU7291RB1-03	3.0V	MP

DEVICE NAME	VDET	STATUS
NJU7291D46	4.6V	MP

■ TIMING CHART