

VOLTAGE DETECTOR

■ GENERAL DESCRIPTION

The NJU7704/05 is a low quiescent current voltage detector featuring high precision detection voltage.

The detection voltage is fixed internally with an accuracy of 1.0%. A time delayed reset can be accomplished with the addition of an external capacitor.

NJU7704 is Nch. Open Drain and NJU7705 of output form is a C-MOS output.

■ PACKAGE OUTLINE



NJU7704/05F

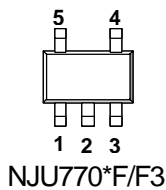


NJU7704/05F3

■ FEATURES

- High Precision Detection Voltage $\pm 1.0\%$
- Low Quiescent Current $1.3\mu\text{A typ.}$
- Detection Voltage Range $1.3\sim 6.0\text{V}(0.1\text{V Step})$
- Adjustable delay time with external capacitor
- Manual Reset Active "L"
- Output Circuit Form
NJU7704: Nch. Open Drain type
NJU7705: C-MOS Output
- Package Outline
SOT-23-5 (MTP5), SC88A

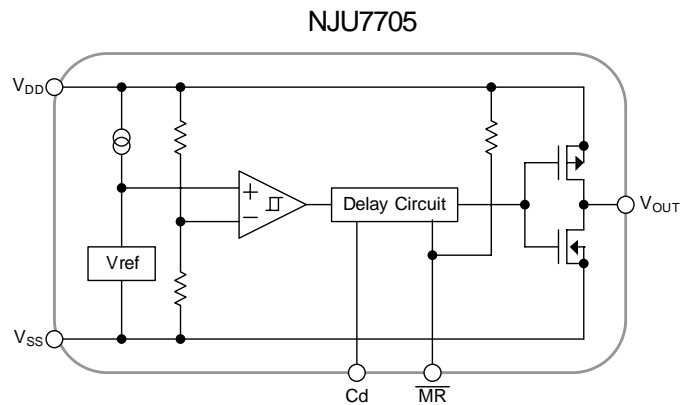
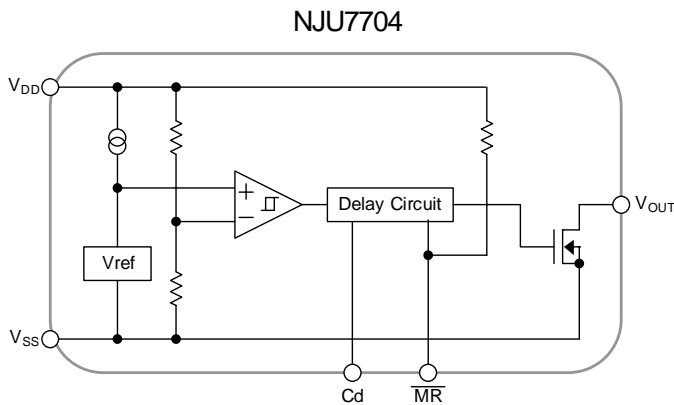
■ PIN CONFIGURATION



PIN FUNCTION

1. Cd
2. V_{SS}
3. MR
4. V_{OUT}
5. V_{DD}

■ EQUIVALENT CIRCUIT



NJU7704/05

■ DETECTION VOLTAGE RANK LIST

Device Name	Package	V _{DET}
NJU7704/05F15	SOT-23-5 (MTP5)	1.5V
NJU7704/05F27		2.7V
NJU7704/05F42		4.2V
NJU7704/05F06		6.0V
NJU7704/05F3-15	SC88A	1.5V
NJU7704/05F3-27		2.7V
NJU7704/05F3-42		4.2V
NJU7704/05F3-06		6.0V

*From 1.5V to 6.0V serialization is possible with 0.1V step

■ NJU7704

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V _{DD}	+10	V
Output Voltage	V _{OUT}	V _{SS} -0.3~+10	V
Output Current	I _{OUT}	50	mA
Power Dissipation	P _D	200	mW
		250(SC88A (*note 1))	
Operating Temperature	T _{opr}	-40 ~ +85	°C
Storage Temperature	T _{stg}	-40 ~ +125	°C

(*note 1): On board, 50mm×50mm×1.6mm glass epoxy baseplate.

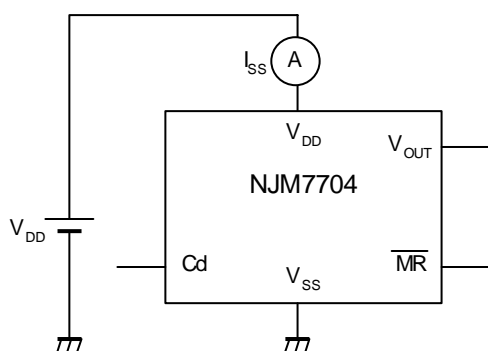
■ ELECTRICAL CHARACTERISTICS (Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Detection Voltage	V _{DET}		-1.0%	—	+1.0%	V	
Hysteresis Voltage	V _{HYS}		70	90	130	mV	
Quiescent Current	I _{SS}	V _{DD} =V _{DET} +1V	V _{DET} =1.5V~2.5V Version	—	1.2	3.0	μA
			V _{DET} =2.6V~6.0V Version	—	1.3	3.3	
Output Current	I _{OUT}	Nch, V _{DS} =0.5V	V _{DD} =1.2V	0.75	1.5	—	mA
			V _{DD} =2.4V (≥2.7V Version)	3.0	6.0	—	
Output Leak Current	I _{LEAK}	V _{DD} =V _{OUT} =9V	—	—	0.1	μA	
Detection Voltage Temperature Coefficient	ΔV _{DET} /ΔTa	Ta=0~+85°C	—	±100	—	ppm/°C	
Delay Time	t _d	V _{DD} =V _{DET} +1V, Cd=4.7nF	8	10	12	ms	
Input Voltage of MR pin	V _{MR_H}		1.5	—	V _{DD}	V	
	V _{MR_L}		0	—	0.3	V	
Impedance of MR pin	R _{MR}		1.0	2.0	3.0	MΩ	
Operating Voltage (*note 2)	V _{DD}	R _L =100kΩ	0.8	—	9	V	

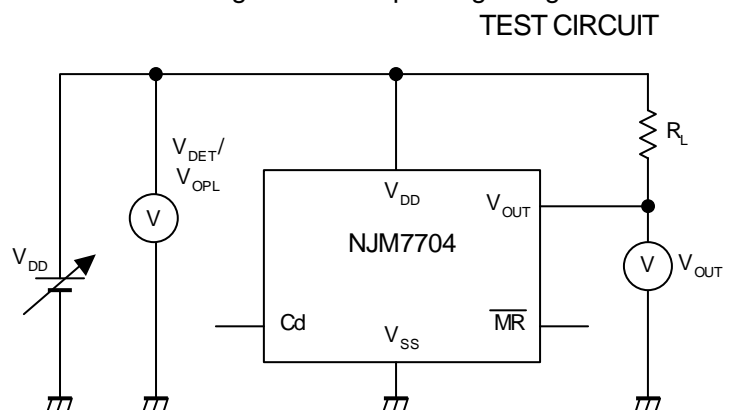
(*note 2): The minimum Operating Voltage(V_{OPL}) indicates the same value of the output voltage(V_{OUT}) on condition that V_{OUT} becomes 10% or less of the input voltage(V_{DD}).

■ TEST CIRCUIT

● Circuit Operating Current TEST CIRCUIT

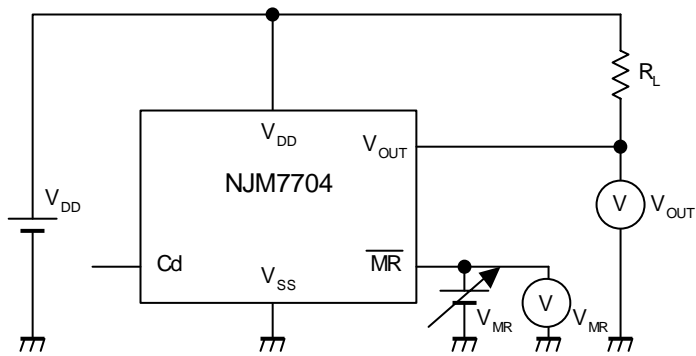


● Detection voltage/Minimum operating voltage TEST CIRCUIT

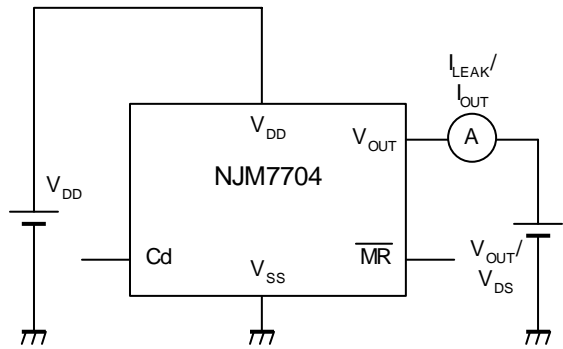


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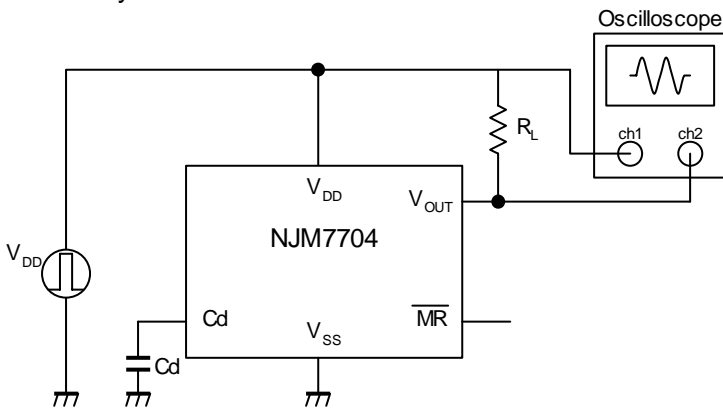
● MR pin Input voltage TEST CIRCUIT



● Leak current / Output current TEST CIRCUIT

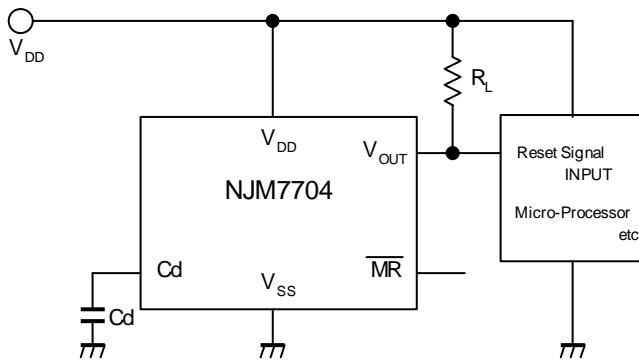


● Delay time TEST CIRCUIT

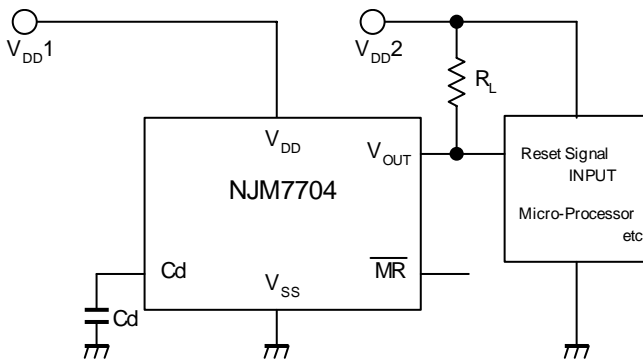


■ TYPICAL APPLICATION

① Power Supply Monitor Circuit (VDD line COMMON)



② Power Supply Monitor Circuit (VDD line SEPARATE)



NJU7704/05

■ NJU7705

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V _{DD}	+10	V
Output Voltage	V _{OUT}	V _{SS} -0.3~+10	V
Output Current	I _{OUT}	50	mA
Power Dissipation	P _D	200	mW
		250(SC88A(*note 1))	
Operating Temperature	T _{opr}	-40 ~ +85	°C
Storage Temperature	T _{stg}	-40 ~ +125	°C

(*note 1): On board, 50mm×50mm×1.6mm glass epoxy baseplate.

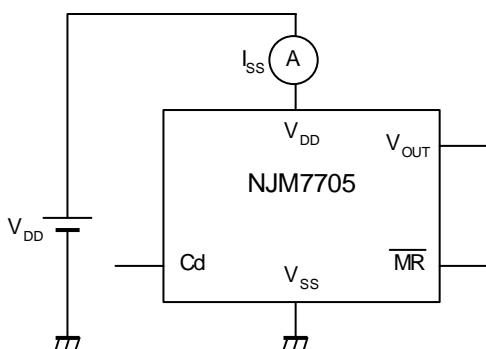
■ ELECTRICAL CHARACTERISTICS (Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Detection Voltage	V _{DET}		-1.0%	—	+1.0%	V	
Hysteresis Voltage	V _{HYS}		70	90	130	mV	
Quiescent Current	I _{SS}	V _{DD} =V _{DET} +1V	V _{DET} =1.5V~2.5V Version	—	1.2	3.0	μA
			V _{DET} =2.6V~6.0V Version	—	1.3	3.3	
Output Current	I _{OUT}	Nch, V _{DS} =0.5V	V _{DD} =1.2V	0.75	1.5	—	mA
			V _{DD} =2.4V (≥2.7V Version)	3.0	6.0	—	
		Pch, V _{DS} =0.5V	V _{DD} =4.8V (≤3.9V Version)	1.0	2.0	—	
			V _{DD} =6.0V (4.0V~5.6V Version)	1.25	2.5	—	
		V _{DD} =8.4V (≥5.7V Version)	1.5	3.0	—		
Detection Voltage Temperature Coefficient	ΔV _{DET} /ΔTa	Ta=0~+85°C	—	±100	—	ppm/°C	
Delay Time	t _d	V _{DD} =V _{DET} +1V, Cd=4.7nF	8	10	12	ms	
Input Voltage of MR pin	V _{MR_H}		1.5	—	V _{DD}	V	
	V _{MR_L}		0	—	0.3	V	
Impedance of MR pin	R _{MR}		1.0	2.0	3.0	MΩ	
Operating Voltage (*note 2)	V _{DD}	R _L =100kΩ	0.8	—	9	V	

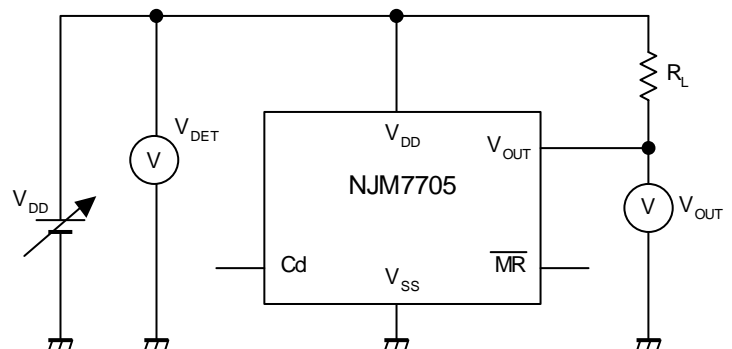
(*note 2): The minimum Operating Voltage(V_{OPL}) indicates the same value of the output voltage(V_{OUT}) on condition that V_{OUT} becomes 10% or less of the input voltage(V_{DD}).

■ TEST CIRCUIT

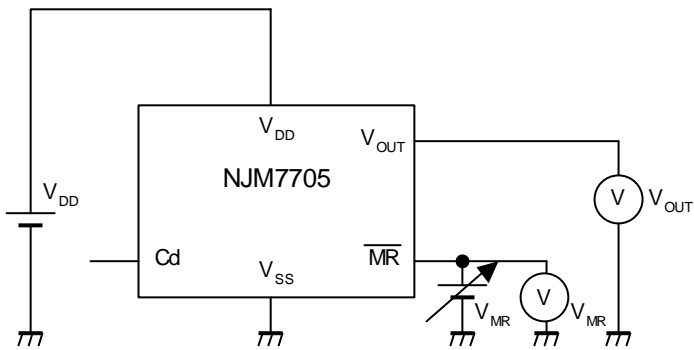
● Circuit Operating Current TEST CIRCUIT



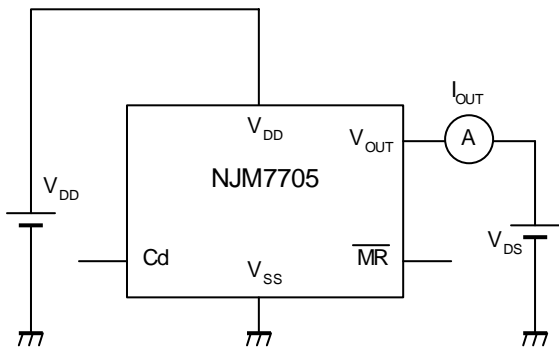
● Detection voltage TEST CIRCUIT



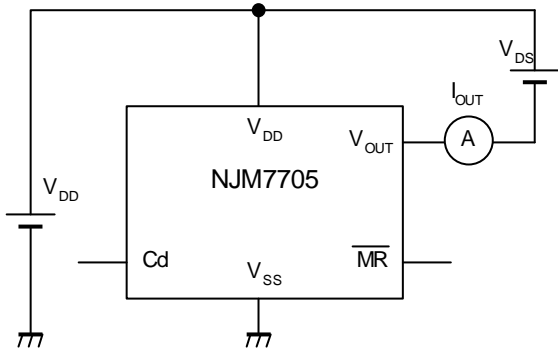
● MR pin Input voltage TEST CIRCUIT



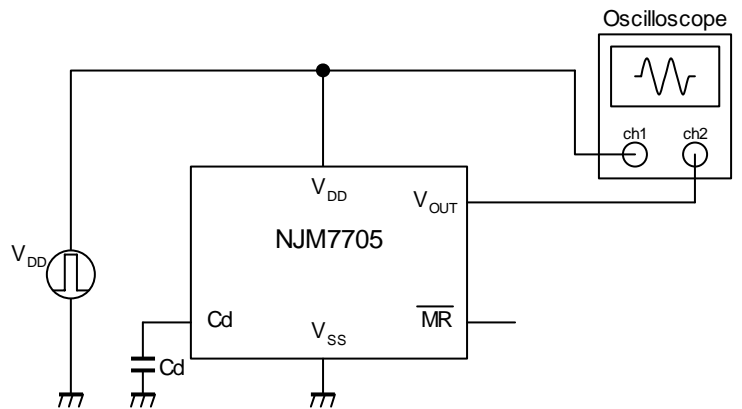
● Nch Output current TEST CIRCUIT



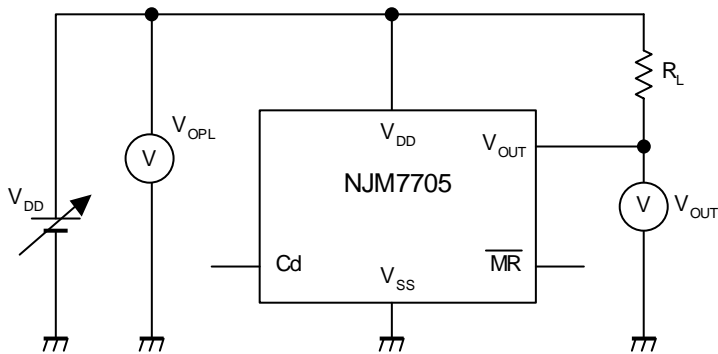
● Pch Output current TEST CIRCUIT



● Delay time TEST CIRCUIT



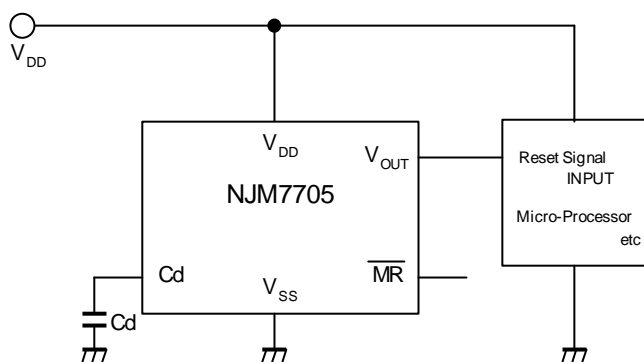
● Minimum operating voltage TEST CIRCUIT



NJU7704/05

■ TYPICAL APPLICATION

① Power Supply Monitor Circuit (VDD line COMMON)



[CAUTION]

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