

Inverting Charge Pump IC

■ GENERAL DESCRIPTION

The NJW4191 is the inverting charge pump IC that operates wide 4.7V to 17V input range. With only the external part of an input/output capacitor and a charge pump capacitor, can compose the inverting voltage circuit. It has a high current capability and a corresponding to small-sized capacitor compared with conventional product such as popular 7660/7662.

For usability, it has ON/OFF function, Output Voltage Adjustable function and external synchronous function.

The NJW4191 is suitable for the bias voltage of a liquid crystal panels, CCD, sensors and operational amplifiers.

There is the NJW4190 for doubler voltage output application.

■ PACKAGE OUTLINE



NJW4191R



NJW4191M

■ FEATURES

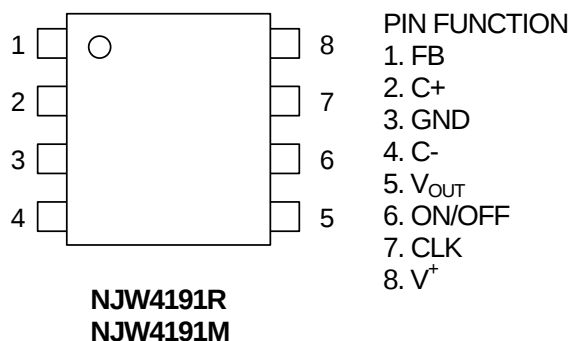
- Inverted Output -17V max.
- Wide Operating Voltage Range 4.7V to 17V
- Maximum Output Current 55mA max.
- Correspond to Ceramic Capacitor (MLCC)
- V_{OUT} Programmable
- ON/OFF Function
- Built-in Oscillation Circuit 300kHz typ.
- External Synchronization Function divide-by-4 counter (A ver.)
- Thermal Shutdown
- Function Compatible to NJU7660/NJU7662 Inverting Circuit*
- Package Outline

NJW4191R	: MSOP8 (VSP8)**
NJW4191M	: DMP8

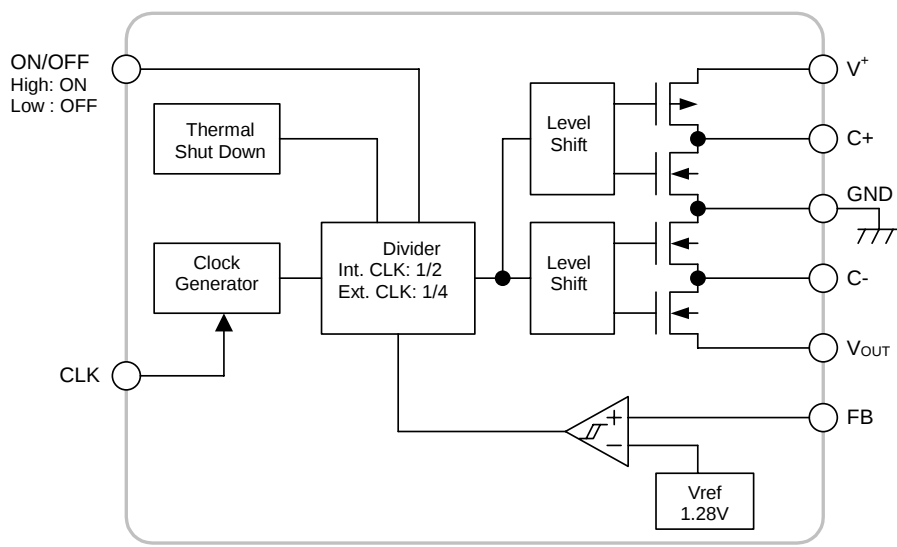
* The NJW4191 is not pin compatible to NJU7660/62.

** MEET JEDEC MO-187-DA

■ PIN CONFIGURATION



■ BLOCK DIAGRAM



■ PRODUCT CLASSIFICATION

PART NUMBER	Divider
NJW4191R-A	External CLK: 1/4
NJW4191M-A	

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	MAXIMUM RATINGS	UNIT
Input Voltage	V ⁺	+20	V
FB pin Voltage	V _{FB}	+6 - V _{OUT}	V
ON/OFF pin Voltage	V _{ON/OFF}	-0.3 to +6	V
CLK pin Voltage	V _{CLK}	-0.3 to +6	V
Maximum Output Current	I _{OUT}	55	mA
Power Dissipation	P _D	MSOP8 (VSP8) : 595 (*1) DMP8 : 530 (*1)	mW
Operating Temperature	T _{opr}	-40 to +85	°C
Storage Temperature	T _{stg}	-40 to +150	°C

(*1): Mounted on glass epoxy board. (76.2×114.3×1.6mm:EIA/JDEC standard size, 2Layers)

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V ⁺	4.7	—	17	V
External CLK Input Range A version (*2)	f _{CLK}	300	—	2,000	kHz
External CLK Duty Input Range	DUTY	45	—	80	%

(*2): The oscillation frequency is output from the V_{OUT} pin that external clock input frequency divided by four (4).

■ ELECTRICAL CHARACTERISTICS

(Unless otherwise noted, $V^+ = 10V$, $V_{ON/OFF} = 5V$, $V_{FB} = V_{OUT}$, $V_{CLK} = GND$, $C1 = C2 = C3 = 1\mu F$, $T_a = 25^\circ C$)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
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General Characteristics

Supply Current	I_{DD1}	$V_{ON/OFF} = 5V$, $R_L = \text{no Load}$	—	940	1,220	μA
	I_{DD2}	$V_{ON/OFF} = GND$	—	330	450	μA
Output Resistance	R_O	$I_{OUT} = 20mA$	—	25	34	Ω
Oscillation Frequency	f_{OSC}		—	300	—	kHz
Power Efficiency	P_{EF}	$R_L = 500\Omega$	87	91	—	%
Voltage Conversion Efficiency	V_{EF}	$R_L = \text{no Load}$	97	99.9	—	%

ON/OFF Block

ON Control Voltage	V_{ON}	$V_{ON/OFF} = L \rightarrow H$	1.7	—	5.5	V
OFF Control Voltage	V_{OFF}	$V_{ON/OFF} = H \rightarrow L$	0	—	0.3	V
ON/OFF pin Current	$I_{ON/OFF}$	$V_{ON/OFF} = 1.7V$	—	3.5	7	μA

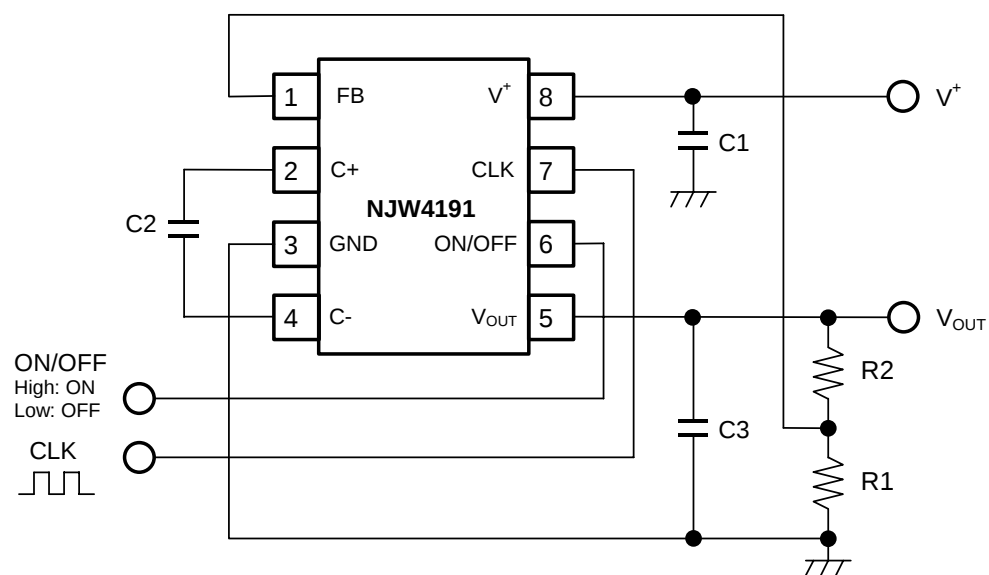
FB Block

Detection Voltage	V_T	$V_{FB} = L \rightarrow H$	-10%	1.28	+10%	V
FB pin Sink Current	I_{FB}	$V_{FB} = 5.5 - V_{OUT} $	—	0.01	1	μA

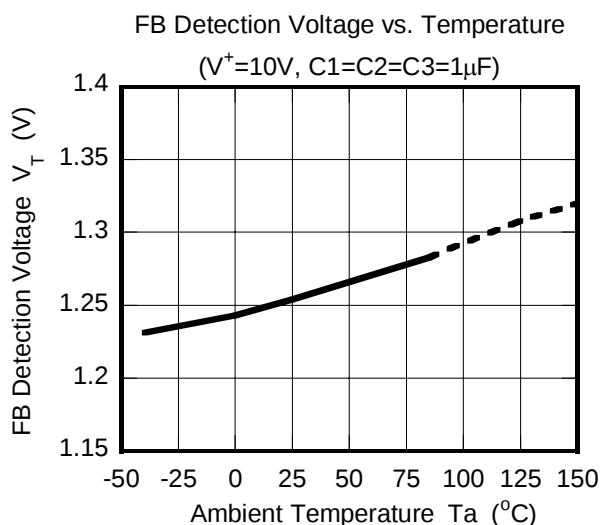
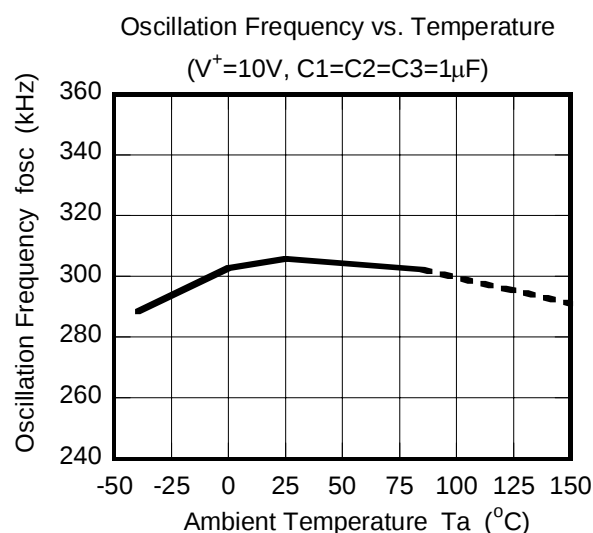
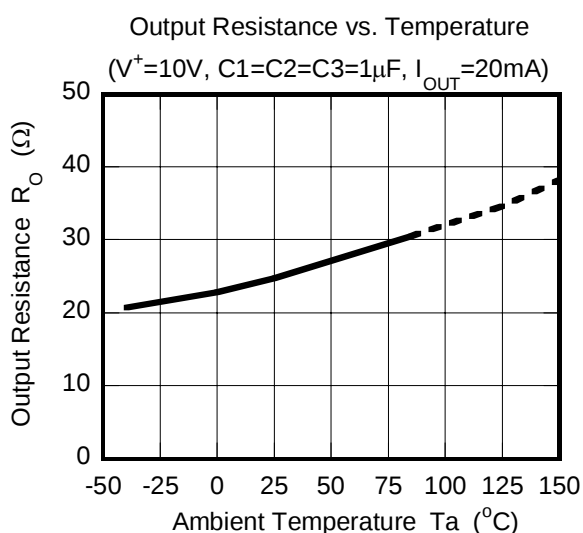
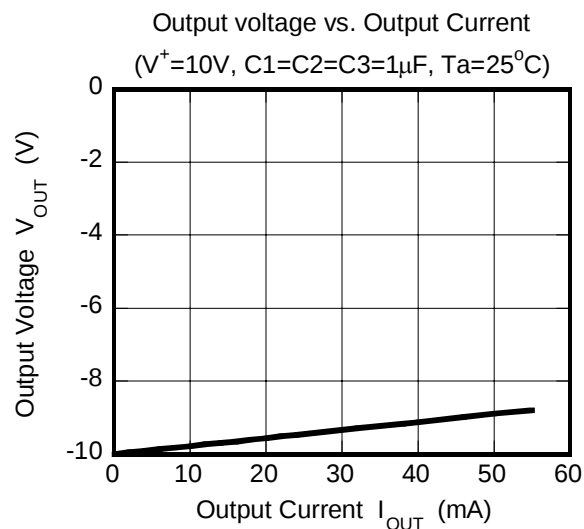
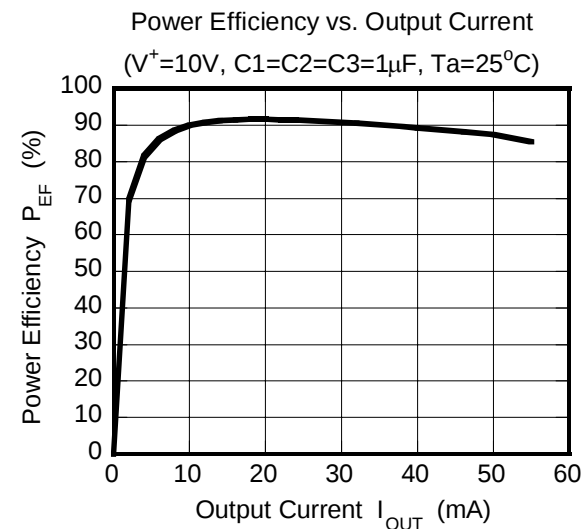
CLK Block

CLK Threshold (High)	V_{CLK_H}		2.4	—	5.5	V
CLK Threshold (Low)	V_{CLK_L}		0	—	0.7	V
CLK pin Sink Current	I_{CLK}	$V_{CLK} = 5.5V$	—	6	10	μA

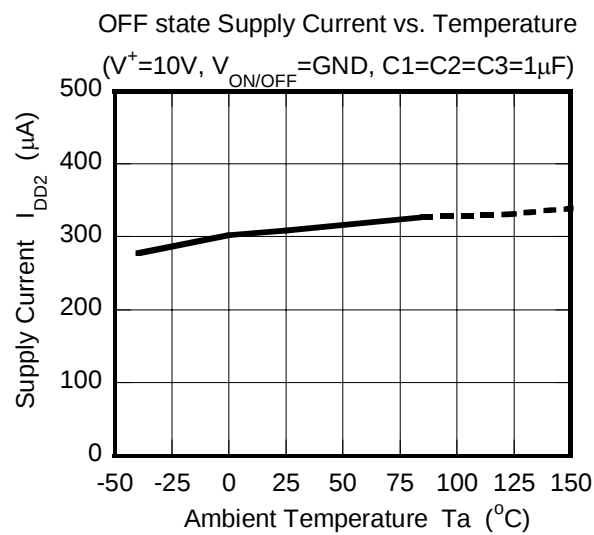
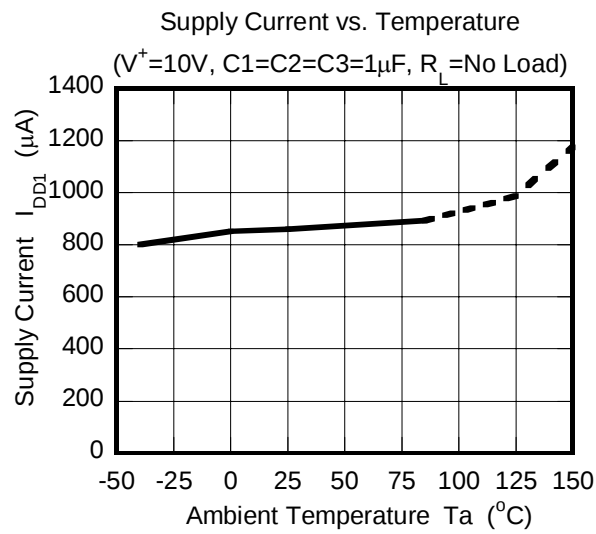
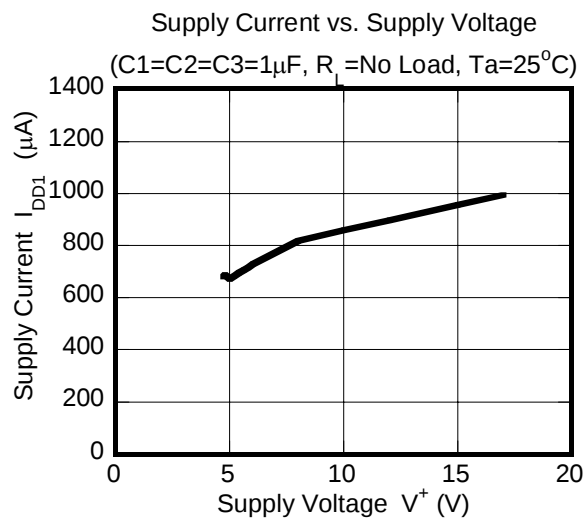
■ TYPICAL APPLICATION



■ CHARACTERISTICS



CHARACTERISTICS



MEMO

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