SMALL PACKAGE VOLTAGE INVERTER

■ GENERAL DESCRIPTION

The **NJU7665** series is a voltage inverter incorporated RC oscillator, pre-buffer and power-MOS, which generates a polarity-converted negative voltage from +1.5V to +5.5V.

The switching frequency is fixed by internal RC oscillator and the following line-up of 3 version are available to select.

The **NJU7665** series is in MTP-5 package and it is suitable for battery use items and other portable items.

■ PACKAGE OUTLINE

NJU7665XF

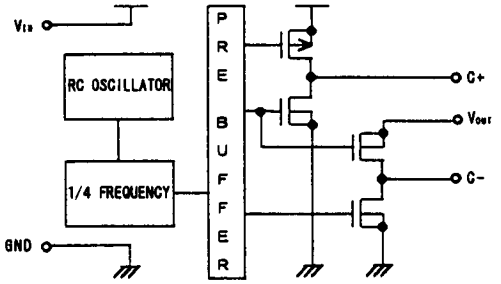
■ FEATURES

- Input Voltage : 1.5 to 5.5V
- Switching Frequency : fsw = 7.5k, 75k, 150kHz
- Low Output Resistance : 75Ω MAX. (C version, C = 1μF, V_{IN} = 3V)
- Low Operating Current : 100μA MAX. (A version)
- C-MOS Technology
- Package Outline : MTP-5

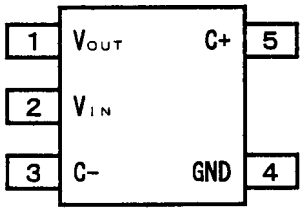
■ LINE-UP TABLE

TYPE NO.	Switching Frequency	Supply Current	Output Resistance
NJU7665A	7.5kHz (typ.)	100μA (max.)	1kΩ (max.)
NJU7665B	75kHz (typ.)	0.65mA (max.)	100Ω (max.)
NJU7665C	150kHz (typ.)	1.4mA (max.)	75Ω (max.)

■ BLOCK DIAGRAM



■ PIN CONFIGURATION



■ TERMINAL DESCRIPTION

Terminal No.	Symbol	Function
1	V_{OUT}	Output Voltage
2	V_{IN}	Power Supply Terminal
3	C^-	Charge Pump Capacitor (-) Connecting Terminal
4	GND	Ground Terminal
5	C^+	Charge Pump Capacitor (+) Connecting Terminal

■ ABSOLUTE MAXIMUM RATINGS

(T_a = 25ºC)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Supply Voltage	V_{IN}	-0.3 to 6.0	V
Power Dissipation	P_D	200	mW
Operating Temperature	T_{opr}	-40 to + 85	ºC
Storage Temperature	T_{stg}	-55 to +125	ºC

Note1) Decoupling capacitor should be connected between V_{IN} and GND due to the stabilized operation for the IC.

■ ELECTRICAL CHARACTERISTICS

A version (V_{IN} = 3.0V, C1 = C2 = 1µF, T_a = 25°C)

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current	I_{IN}	RL = ∞	–	–	100	µA
Input Supply Voltage	V_{IN}	-40 °C ≤ Ta ≤ 85°C	1.5	–	5.5	V
Output Resistance	R_{OUT}	I_{OUT} = 500µA	–	–	1.0	kΩ
Switching Frequency	F_{SW}		4.5	7.5	10.5	kHz
Voltage Conversion Rate	V_{EF}	RL = ∞	90	99.3	–	%

B version (V_{IN} = 3.0V, C1 = C2 = 1µF, T_a = 25°C)

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current	I_{IN}	RL = ∞	–	–	0.65	mA
Input Supply Voltage	V_{IN}	-40 °C ≤ Ta ≤ 85°C	1.5	–	5.5	V
Output Resistance	R_{OUT}	I_{OUT} = 5mA	–	–	100	Ω
Switching Frequency	F_{SW}		40	75	100	kHz
Voltage Conversion Rate	V_{EF}	RL = ∞	90	99.3	–	%

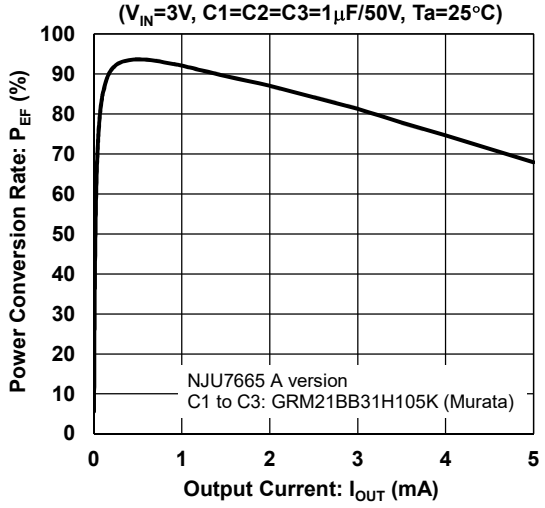
C version (V_{IN} = 3.0V, C1 = C2 = 1µF, T_a = 25°C)

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current	I_{IN}	RL = ∞	–	–	1.4	mA
Input Supply Voltage	V_{IN}	-40 °C ≤ Ta ≤ 85°C	1.5	–	5.5	V
Output Resistance	R_{OUT}	I_{OUT} = 10mA	–	–	75	Ω
Switching Frequency	F_{SW}		80	150	200	kHz
Voltage Conversion Rate	V_{EF}	RL = ∞	90	99.3	–	%

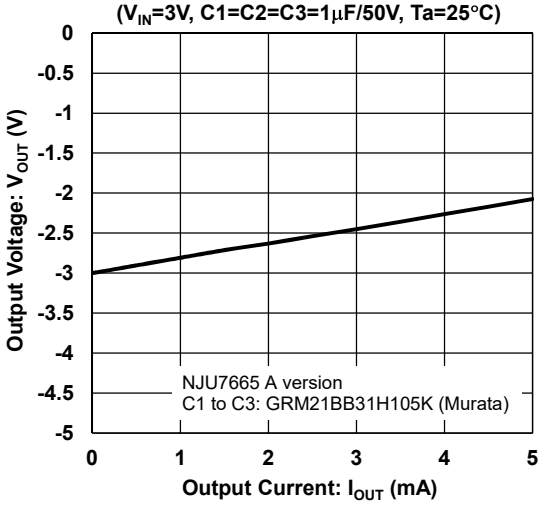
NOTE2) Please minimize the wiring impedance of C+, C- terminals due to the power conversion rate.

■CHARACTERISTICS

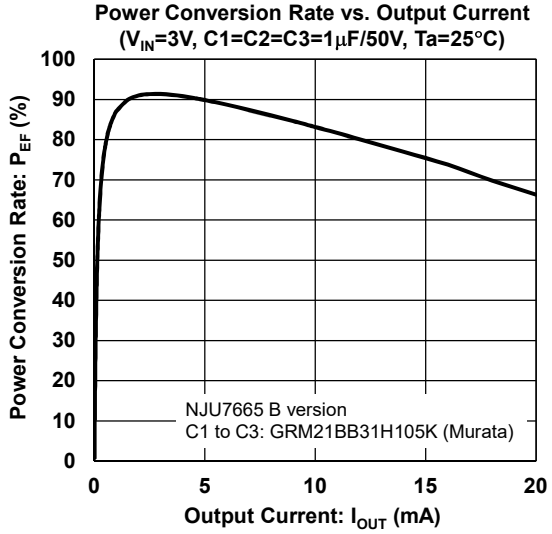
Power Conversion Rate vs. Output Current
(V_{IN}=3V, C1=C2=C3=1μF/50V, Ta=25°C)



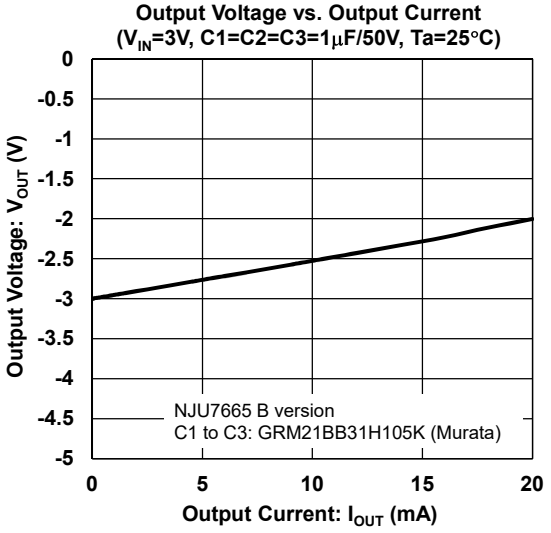
Output Voltage vs. Output Current
(V_{IN}=3V, C1=C2=C3=1μF/50V, Ta=25°C)



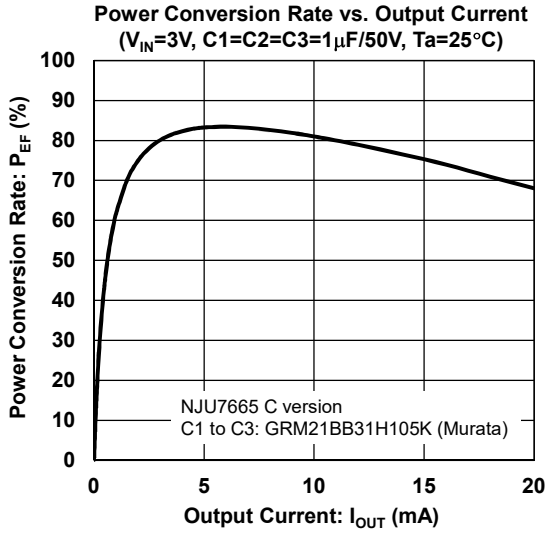
Power Conversion Rate vs. Output Current
(V_{IN}=3V, C1=C2=C3=1μF/50V, Ta=25°C)



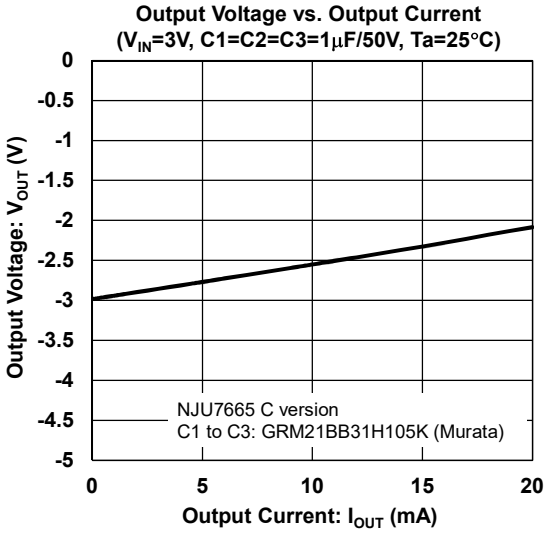
Output Voltage vs. Output Current
(V_{IN}=3V, C1=C2=C3=1μF/50V, Ta=25°C)



Power Conversion Rate vs. Output Current
(V_{IN}=3V, C1=C2=C3=1μF/50V, Ta=25°C)

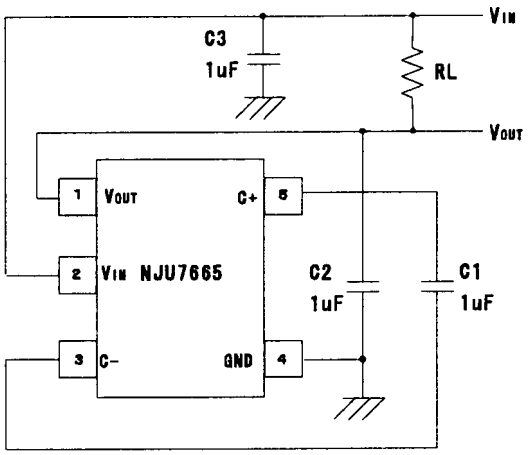


Output Voltage vs. Output Current
(V_{IN}=3V, C1=C2=C3=1μF/50V, Ta=25°C)



■ APPLICATION CIRCUIT

1. Negative Voltage Output Circuit



2. Parallel Connection Circuit

The following circuit reduce the output impedance.