

500mA Low Dropout Voltage Regulator

■ GENERAL DESCRIPTION

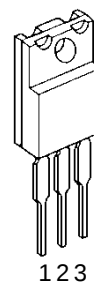
The NJU7223 series is a high precision output voltage, low drop output, low current consumption and high output current 3-terminal positive voltage regulator with a over current protection and a thermal shutdown.

Low dropout voltage is realized at high current output.

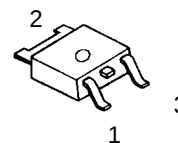
■ FEATURES

- High Precision Output $\pm 2.0\%$
- Output Current $I_o(\text{max.})=500\text{mA}$
- Low Current Consumption $I_q=30\mu\text{A}$
- Low Dropout Voltage $0.4\text{V typ. } (I_o=500\text{mA}, V_o=5.0\text{V})$
- Internal Over Current Protection
- Internal Thermal Shutdown Protection
- CMOS Technology
- Package Outline TO-220F, TO-252

■ PACKAGE OUTLINE



NJU7223F

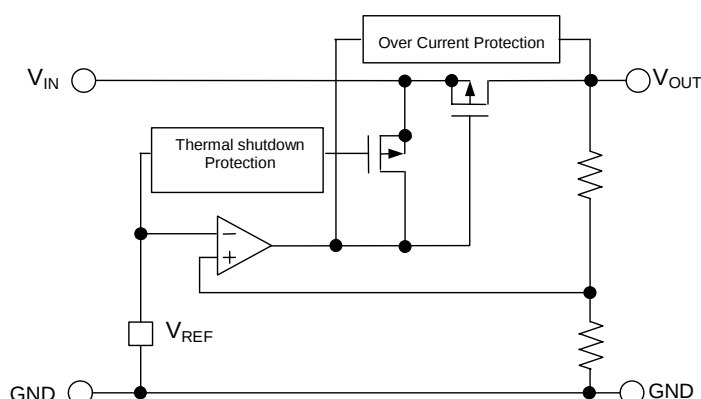


NJU7223DL1

■ PIN CONFIGURATION

1. V_{OUT}
2. V_{IN}
3. GND

■ EQUIVALENT CIRCUIT



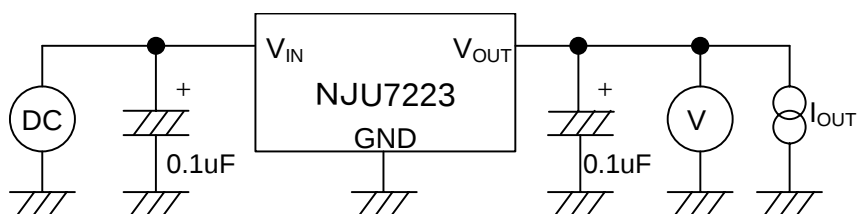
■ OUTPUT VOLTAGE RANK LIST

V_{OUT}	TO-220F	TO-252
+1.8V	NJU7223F18	NJU7223DL1-18
+2.5V	NJU7223F25	NJU7223DL1-25
+3.0V	NJU7223F30	NJU7223DL1-30
+3.3V	NJU7223F33	NJU7223DL1-33
+5.0V	NJU7223F50	NJU7223DL1-50

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	+18	V
Output Voltage	V_{OUT}	GND-0.3 ~ $V_{IN} + 0.3$	V
Output Current	I_{OUT}	700	mA
Power Dissipation	P_D	TO-220F 7.5(Tc≤85°C) TO-252 7.5(Tc≤56°C) 1.0(Ta=25°C)	W
Operating Temperature Range	Topr	-40 ~ 85	°C
Storage Temperature Range	Tstg	-55 ~ 150	°C

■ TEST CIRCUIT



■ ELECTRICAL CHARACTERISTICS ($C_{IN}=C_O=0.1\mu F$, $T_j=25^\circ C$)

Measurement is to be conducted in pulse testing.

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Vo=1.8V Version Output Voltage	V_O	$V_{IN}=3.8V$, $I_O=300mA$	1.764	1.80	1.836	V
Input Voltage	V_{IN}		-	-	14	V
Dropout Voltage	ΔV_{IO}	$I_O=150mA$	-	0.4	0.6	V
Line Regulation	$\Delta V_O/\Delta V_{IN} \cdot V_O$	$V_{IN}=2.8V \sim 12.0V$	-	0.10	-	%/V
Load Regulation	$\Delta V_O/\Delta I_O$	$V_{IN}=3.8V$, $I_O=1 \sim 500mA$	-	120	160	mV
Quiescent Current	I_{DD}	$V_{IN}=3.8V$	-	30	60	μA
Ripple Rejection	RR	$V_{IN}=3.8V$, $e_{in}=1V_{P-P}$ $f=120Hz$, $I_O=300mA$	-	57	-	dB
Output Noise Voltage	V_{NO}	$V_{IN}=3.8V$, $I_O=300mA$ $BW=10Hz \sim 100kHz$	-	65	-	μV
Vo=2.5V Version Output Voltage	V_O	$V_{IN}=4.5V$, $I_O=300mA$	2.45	2.50	2.55	V
Input Voltage	V_{IN}		-	-	14	V
Dropout Voltage	ΔV_{IO}	$I_O=300mA$	-	0.4	0.6	V
Line Regulation	$\Delta V_O/\Delta V_{IN} \cdot V_O$	$V_{IN}=3.5V \sim 12.0V$	-	0.10	-	%/V
Load Regulation	$\Delta V_O/\Delta I_O$	$V_{IN}=4.5V$, $I_O=1 \sim 500mA$	-	120	160	mV
Quiescent Current	I_{DD}	$V_{IN}=4.5V$	-	30	60	μA
Ripple Rejection	RR	$V_{IN}=4.5V$, $e_{in}=1V_{P-P}$ $f=120Hz$, $I_O=300mA$	-	57	-	dB
Output Noise Voltage	V_{NO}	$V_{IN}=4.5V$, $I_O=300mA$ $BW=10Hz \sim 100kHz$	-	110	-	μV
Vo=3.0V Version Output Voltage	V_O	$V_{IN}=5.0V$, $I_O=300mA$	2.94	3.00	3.06	V
Input Voltage	V_{IN}		-	-	14	V
Dropout Voltage	ΔV_{IO}	$I_O=300mA$	-	0.4	0.6	V
Line Regulation	$\Delta V_O/\Delta V_{IN} \cdot V_O$	$V_{IN}=4.0V \sim 12.0V$	-	0.10	-	%/V
Load Regulation	$\Delta V_O/\Delta I_O$	$V_{IN}=5.0V$, $I_O=1 \sim 500mA$	-	120	160	mV
Quiescent Current	I_{DD}	$V_{IN}=5.0V$	-	30	60	μA
Ripple Rejection	RR	$V_{IN}=5.0V$, $e_{in}=1V_{P-P}$ $f=120Hz$, $I_O=300mA$	-	57	-	dB
Output Noise Voltage	V_{NO}	$V_{IN}=5.0V$, $I_O=300mA$ $BW=10Hz \sim 100kHz$	-	115	-	μV

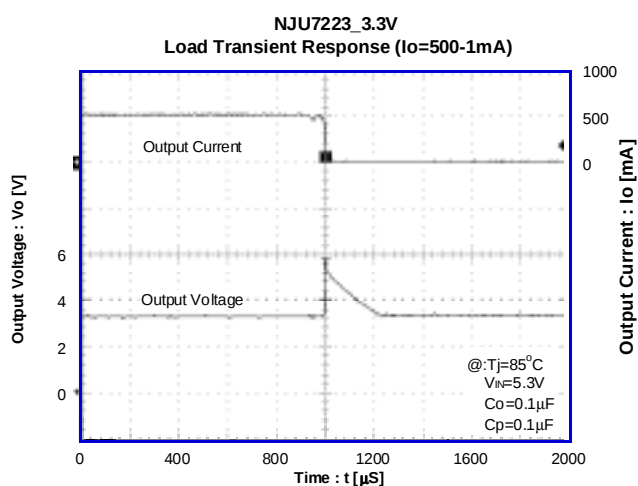
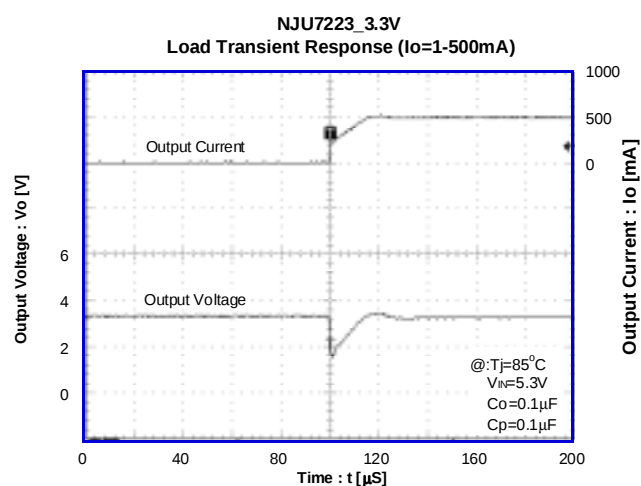
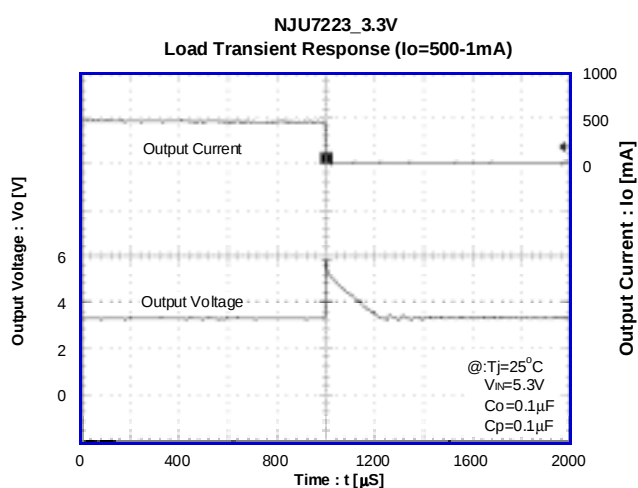
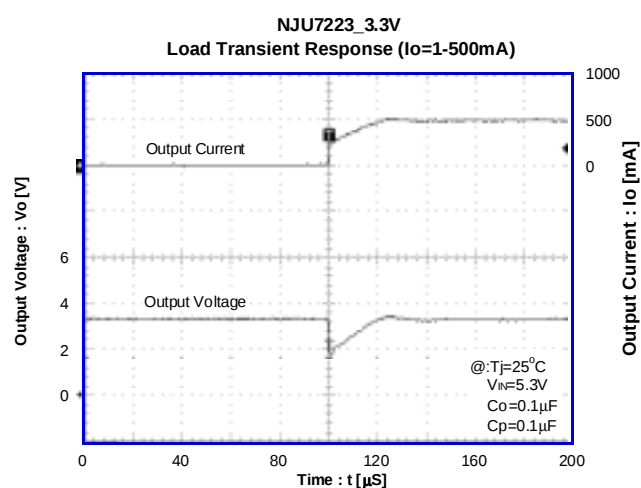
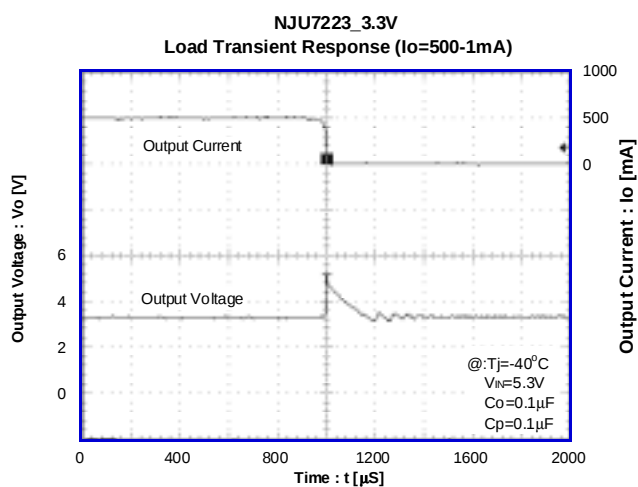
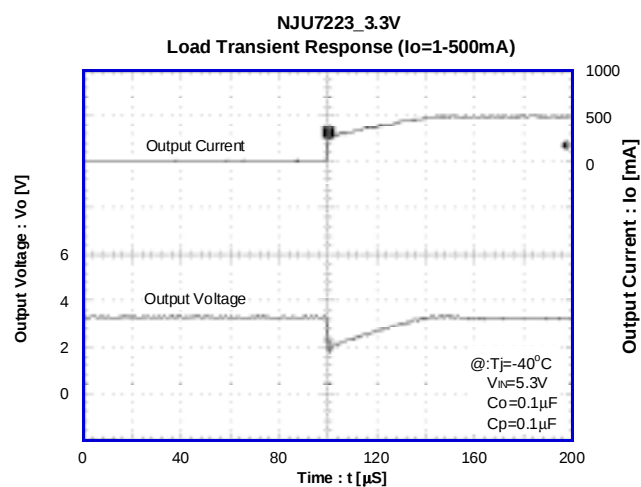
■ ELECTRICAL CHARACTERISTICS ($C_{IN}=C_O=0.1\mu F$, $T_j=25^\circ C$)

Measurement is to be conducted in pulse testing.

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Vo=3.3V Version Output Voltage	V_O	$V_{IN}=5.3V$, $I_O=300mA$	3.234	3.30	3.366	V
Input Voltage	V_{IN}		-	-	14	V
Dropout Voltage	ΔV_{IO}	$I_O=300mA$	-	0.4	0.6	V
Line Regulation	$\Delta V_O/\Delta V_{IN} \cdot V_O$	$V_{IN}=4.3V \sim 12.0V$	-	0.10	-	%/V
Load Regulation	$\Delta V_O/\Delta I_O$	$V_{IN}=5.3V$, $I_O=1 \sim 500mA$	-	120	160	mV
Quiescent Current	I_{DD}	$V_{IN}=5.3V$	-	30	60	μA
Ripple Rejection	RR	$V_{IN}=5.3V$, $e_{in}=1V_{P-P}$ $f=120Hz$, $I_O=300mA$	-	56	-	dB
Output Noise Voltage	V_{NO}	$V_{IN}=5.3V$, $I_O=300mA$ $BW=10Hz \sim 100kHz$	-	117	-	μV
Vo=5.0V Version Output Voltage	V_O	$V_{IN}=7.0V$, $I_O=500mA$	4.90	5.00	5.10	V
Input Voltage	V_{IN}		-	-	14	V
Dropout Voltage	ΔV_{IO}	$I_O=500mA$	-	0.4	0.6	V
Line Regulation	$\Delta V_O/\Delta V_{IN} \cdot V_O$	$V_{IN}=6.0V \sim 12.0V$	-	0.10	-	%/V
Load Regulation	$\Delta V_O/\Delta I_O$	$V_{IN}=7.0V$, $I_O=1 \sim 500mA$	-	120	160	mV
Quiescent Current	I_{DD}	$V_{IN}=7.0V$	-	30	60	μA
Ripple Rejection	RR	$V_{IN}=7.0V$, $e_{in}=1V_{P-P}$ $f=120Hz$, $I_O=300mA$	-	55	-	dB
Output Noise Voltage	V_{NO}	$V_{IN}=7.0V$, $I_O=300mA$ $BW=10Hz \sim 100kHz$	-	122	-	μV

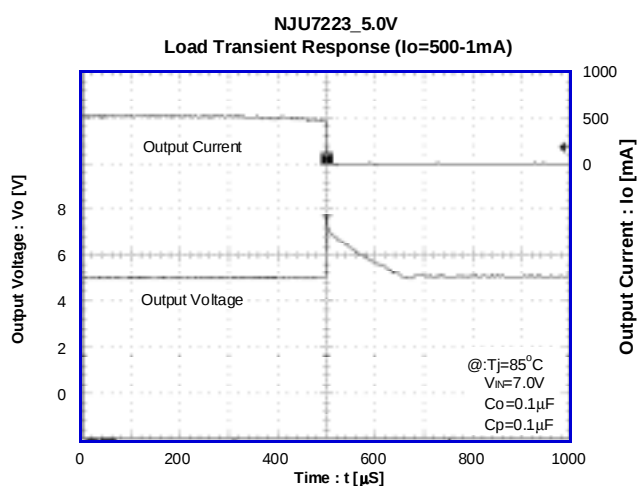
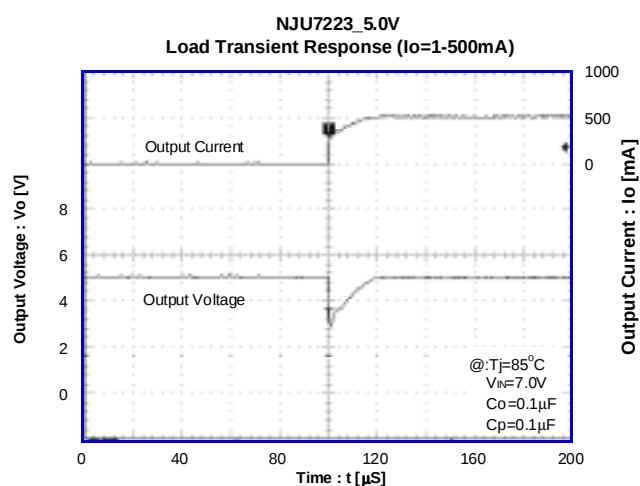
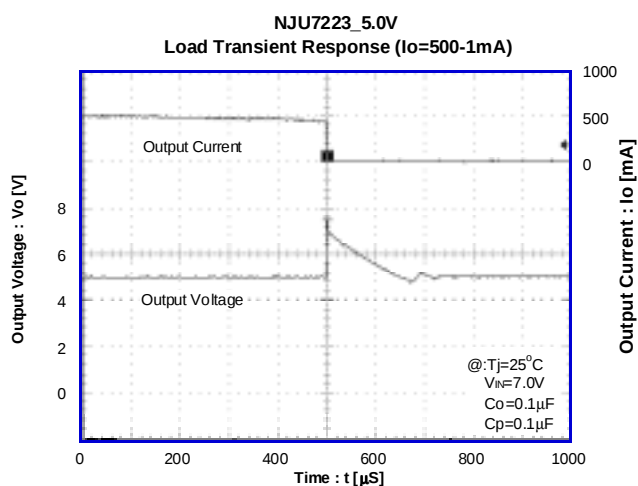
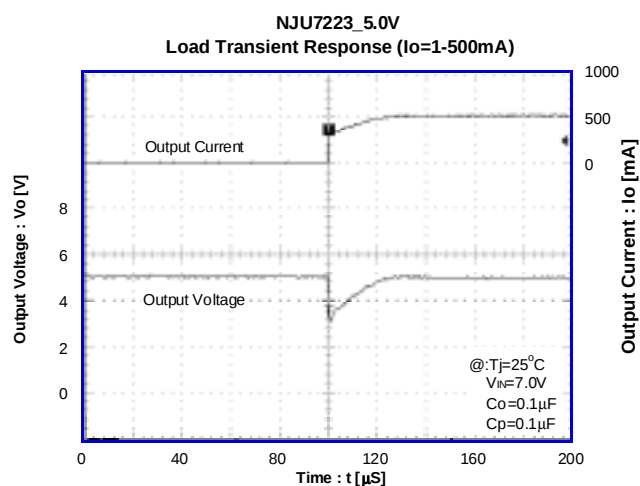
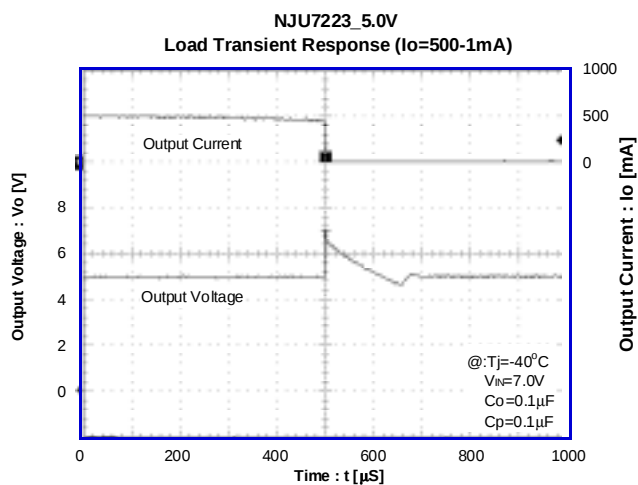
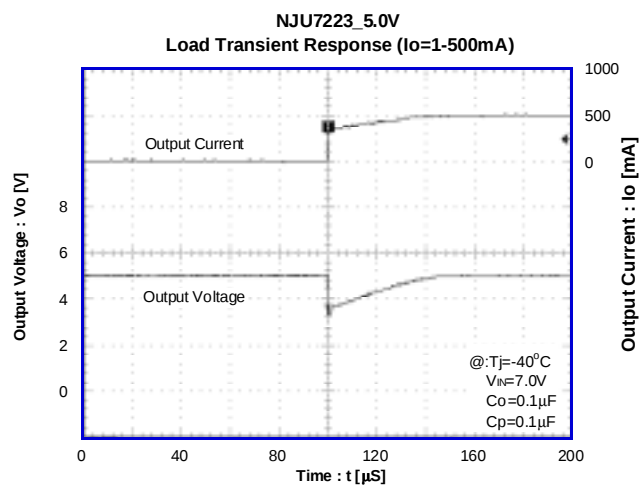
TYPICAL CHARACTERISTICS

Load Transient Response (Vo=3.3V version)



■ TYPICAL CHARACTERISTICS

Load Transient Response (Vo=5.0V version)



[CAUTION]

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