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New Japan Radio Co.,Ltd.

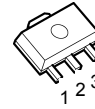
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3-TERMINAL NEGATIVE VOLTAGE REGULATOR

■ GENERAL DESCRIPTION

The NJM79L00 series of 3-Terminal Negative Voltage Regulators is constructed using the New JRC Planar epitaxial process. These regulators employ internal current-limiting, and thermal-shutdown, making them essentially indestructible. If adequate heat sinking is provided, they can deliver up to 100mA output current. They are intended as fixed voltage regulators in a wide range of applications including local or on-card regulation for elimination of noise and distribution problems associated with single-point regulation. In addition, they can be used with power pass elements to make high-current voltage regulators. The NJM79L00 used as a Zener diode/resistor combination replacement, offers an effective output impedance improvement of typically two orders of magnitude, along with lower quiescent current and lower noise.

■ PACKAGE OUTLINE



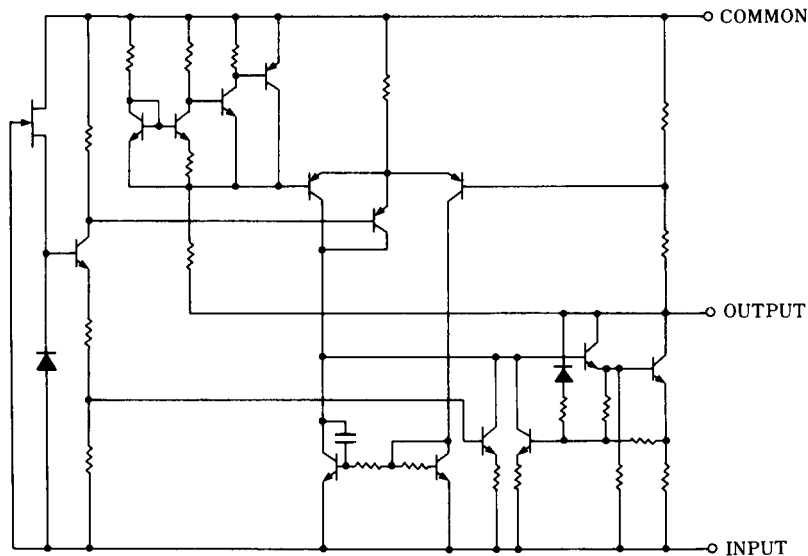
1. COMMON
2. IN
3. OUT

NJM79L00UA (SOT-89)

■ FEATURES

- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Excellent Ripple Rejection
- Guarantee'd 100mA Output Current
- Output Capacitor recommended electrolytic capacitor
- Bipolar Technology
- Package Outline SOT-89

■ EQUIVALENT CIRCUIT



NJM79L00

■ ABSOLUTE MAXIMUM RATINGS

(T_a=25 °C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V _{IN}	(79L03A to 79L09A) - 30 (79L12A to 79L15A) - 35 (79L18A to 79L24A) - 40	V
Operating Temperature Range	T _{opr}	-40 to +85	°C
Storage Temperature Range	T _{stg}	-40 to +125	°C
Power Dissipation	P _D	(SOT89) 350	mW

■ ELECTRICAL CHARACTERISTICS (C_{IN}=0.33μF, C_O=1.0μF, T_J=25 °C)

Measurement is to be conducted in pulse testing.

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
NJM79L03UA						
Output Voltage	V _O	V _{IN} =-10V, I _O =40mA	-2.88	-3.0	-3.12	V
Line Regulation	ΔV _O - V _{IN}	V _{IN} =-7 to -20V, I _O =40mA	-	10	60	mV
Load Regulation	ΔV _O - I _O	V _{IN} =-10V, I _O =1 to 100mA	-	4	72	mV
Quiescent Current	I _Q	V _{IN} =-10V, I _O =0mA	-	3.5	6.0	mA
Ripple Rejection	RR	V _{IN} =-8 to -18V, I _O =40mA, e _{in} =1V _{P-P} , f=120Hz	45	72	-	dB
Output Noise Voltage	V _{NO}	V _{IN} =-10V, BW=10Hz to 100kHz, I _O =40mA	-	70	-	μV
NJM79L05UA						
Output Voltage	V _O	V _{IN} =-10V, I _O =40mA	-4.8	-5.0	-5.2	V
Line Regulation	ΔV _O - V _{IN}	V _{IN} =-7 to -20V, I _O =40mA	-	15	150	mV
Load Regulation	ΔV _O - I _O	V _{IN} =-10V, I _O =1 to 100mA	-	7	60	mV
Quiescent Current	I _Q	V _{IN} =-10V, I _O =0mA	-	3.5	6.0	mA
Ripple Rejection	RR	V _{IN} =-8 to -18V, I _O =40mA, e _{in} =1V _{P-P} , f=120Hz	41	71	-	dB
Output Noise Voltage	V _{NO}	V _{IN} =-10V, BW=10Hz to 100kHz, I _O =40mA	-	120	-	μV
NJM79L06UA						
Output Voltage	V _O	V _{IN} =-12V, I _O =40mA	-5.76	-6.0	-6.24	V
Line Regulation	ΔV _O - V _{IN}	V _{IN} =-8.5 to -20V, I _O =40mA	-	18	150	mV
Load Regulation	ΔV _O - I _O	V _{IN} =-12V, I _O =1 to 100mA	-	8	70	mV
Quiescent Current	I _Q	V _{IN} =-12V, I _O =0mA	-	3.5	6.0	mA
Ripple Rejection	RR	V _{IN} =-9 to -19V, I _O =40mA, e _{in} =1V _{P-P} , f=120Hz	40	68	-	dB
Output Noise Voltage	V _{NO}	V _{IN} =-12V, BW=10Hz to 100kHz, I _O =40mA	-	140	-	μV

■ **ELECTRICAL CHARACTERISTICS** ($C_{IN}=0.33\mu F$, $C_O=1.0\mu F$, $T_J=25\text{ }^\circ\text{C}$)

Measurement is to be conducted in pulse testing.

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
NJM79L07UA						
Output Voltage	V_O	$V_{IN}=-13V, I_O=40mA$	-6.72	-7.0	-7.28	V
Line Regulation	$\Delta V_O - V_{IN}$	$V_{IN}=-9.5\sim-22V, I_O=40mA$	-	21	160	mV
Load Regulation	$\Delta V_O - I_O$	$V_{IN}=-13V, I_O=1\sim 100mA$	-	9	75	mV
Quiescent Current	I_Q	$V_{IN}=-13V, I_O=0mA$	-	3.5	6.0	mA
Ripple Rejection	RR	$V_{IN}=-10\sim-20V, I_O=40mA, e_{in}=1V_{P-P}, f=120Hz$	40	68	-	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-13V, BW=10Hz\sim 100kHz, I_O=40mA$	-	170	-	μV
NJM79L08UA						
Output Voltage	V_O	$V_{IN}=-14V, I_O=40mA$	-7.68	-8.0	-8.32	V
Line Regulation	$\Delta V_O - V_{IN}$	$V_{IN}=-10.5\text{ to }-23V, I_O=40mA$	-	24	175	mV
Load Regulation	$\Delta V_O - I_O$	$V_{IN}=-14V, I_O=1\text{ to }100mA$	-	10	80	mV
Quiescent Current	I_Q	$V_{IN}=-14V, I_O=0mA$	-	3.5	6.0	mA
Ripple Rejection	RR	$V_{IN}=-11\text{ to }-21V, I_O=40mA, e_{in}=1V_{P-P}, f=120Hz$	39	68	-	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-14V, BW=10Hz\text{ to }100kHz, I_O=40mA$	-	190	-	μV
NJM79L09UA						
Output Voltage	V_O	$V_{IN}=-15V, I_O=40mA$	-8.64	-9.0	-9.36	V
Line Regulation	$\Delta V_O - V_{IN}$	$V_{IN}=-11.5\text{ to }-24V, I_O=40mA$	-	27	200	mV
Load Regulation	$\Delta V_O - I_O$	$V_{IN}=-15V, I_O=1\text{ to }100mA$	-	12	90	mV
Quiescent Current	I_Q	$V_{IN}=-15V, I_O=0mA$	-	3.5	6.0	mA
Ripple Rejection	RR	$V_{IN}=-12\text{ to }-22V, I_O=40mA, e_{in}=1V_{P-P}, f=120Hz$	38	67	-	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-15V, BW=10Hz\text{ to }100kHz, I_O=40mA$	-	210	-	μV
NJM79L12UA						
Output Voltage	V_O	$V_{IN}=-19V, I_O=40mA$	-11.5	-12.0	-12.5	V
Line Regulation	$\Delta V_O - V_{IN}$	$V_{IN}=-14.5\text{ to }-27V, I_O=40mA$	-	36	250	mV
Load Regulation	$\Delta V_O - I_O$	$V_{IN}=-19V, I_O=1\text{ to }100mA$	-	16	100	mV
Quiescent Current	I_Q	$V_{IN}=-19V, I_O=0mA$	-	3.5	6.5	mA
Ripple Rejection	RR	$V_{IN}=-15\text{ to }-25V, I_O=40mA, e_{in}=1V_{P-P}, f=120Hz$	37	64	-	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-19V, BW=10Hz\text{ to }100kHz, I_O=40mA$	-	210	-	μV

NJM79L00

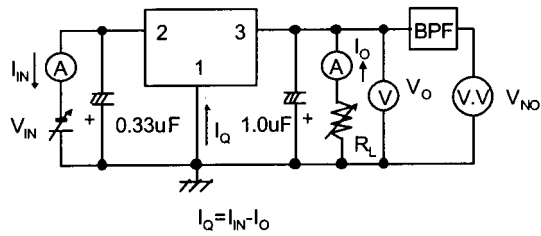
■ ELECTRICAL CHARACTERISTICS (C_{IN}=0.33μF, C_O=1.0μF, T_J=25°C)

Measurement is to be conducted in pulse testing.

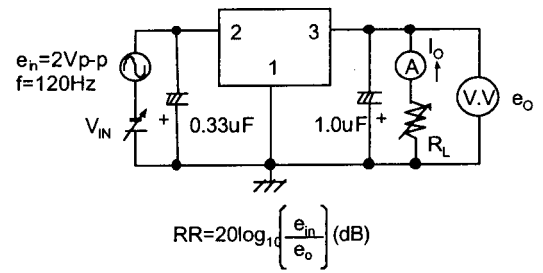
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
NJM79L15UA						
Output Voltage	V _O	V _{IN} =-23V, I _O =40mA	-14.4	-15.0	-15.6	V
Line Regulation	ΔV _O - V _{IN}	V _{IN} =-17.5 to -30V, I _O =40mA	-	45	300	mV
Load Regulation	ΔV _O - I _O	V _{IN} =-23V, I _O =1 to 100mA	-	20	150	mV
Quiescent Current	I _Q	V _{IN} =-23V, I _O =0mA	-	3.5	6.5	mA
Ripple Rejection	RR	V _{IN} =-18.5 to -28.5V, I _O =40mA, e _{in} =1V _{P-P} , f=120Hz	34	63	-	dB
Output Noise Voltage	V _{NO}	V _{IN} =-23V, BW=10Hz to 100kHz, I _O =40mA	-	340	-	μV
NJM79L18UA						
Output Voltage	V _O	V _{IN} =-27V, I _O =40mA	-17.3	-18.0	-18.7	V
Line Regulation	ΔV _O - V _{IN}	V _{IN} =-20.7 to -33V, I _O =40mA	-	54	325	mV
Load Regulation	ΔV _O - I _O	V _{IN} =-27V, I _O =1 to 100mA	-	23	170	mV
Quiescent Current	I _Q	V _{IN} =-27V, I _O =0mA	-	3.5	6.5	mA
Ripple Rejection	RR	V _{IN} =-23 to -33V, I _O =40mA, e _{in} =1V _{P-P} , f=120Hz	33	60	-	dB
Output Noise Voltage	V _{NO}	V _{IN} =-27V, BW=10Hz to 100kHz, I _O =40mA	-	410	-	μV
NJM79L24UA						
Output Voltage	V _O	V _{IN} =-33V, I _O =40mA	-23.0	-24.0	-25.0	V
Line Regulation	ΔV _O - V _{IN}	V _{IN} =-27 to -38V, I _O =40mA	-	72	350	mV
Load Regulation	ΔV _O - I _O	V _{IN} =-33V, I _O =1 to 100mA	-	30	200	mV
Quiescent Current	I _Q	V _{IN} =-33V, I _O =0mA	-	3.5	6.5	mA
Ripple Rejection	RR	V _{IN} =-29 to -35V, I _O =40mA, e _{in} =1V _{P-P} , f=120Hz	31	55	-	dB
Output Noise Voltage	V _{NO}	V _{IN} =-33V, BW=10Hz to 100kHz, I _O =40mA	-	550	-	μV

■ TEST CIRCUIT

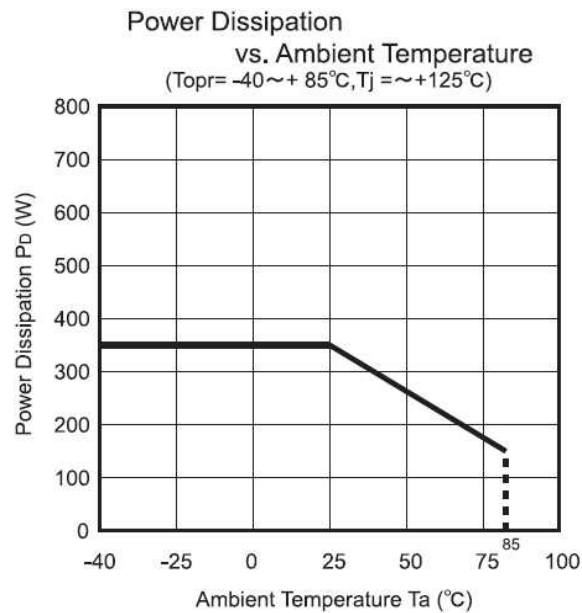
1. Output Voltage, Output Current, Line Regulation, Load Regulation, Quiescent Current, Output Noise Voltage



2. Ripple Rejection



■ POWER DISSIPATION VS. AMBIENT TEMPERATURE

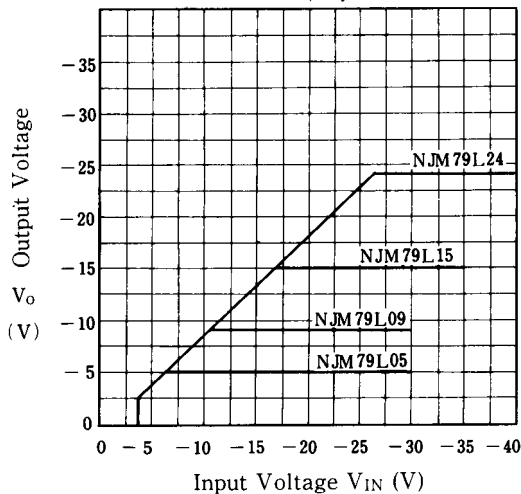


NJM79L00

■ TYPICAL CHARACTERISTICS

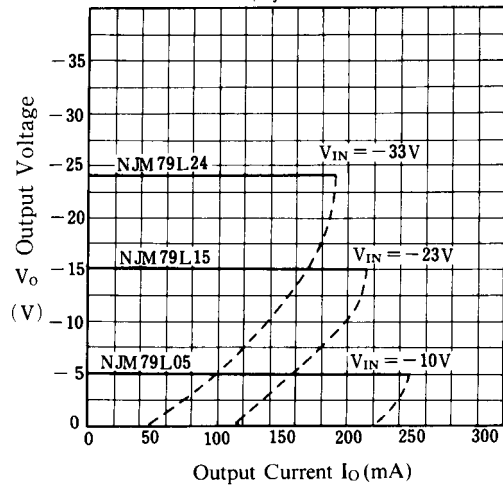
NJM79L00 Input Voltage vs. Output Voltage

($I_o = 40\text{mA}$, $T_j = 25^\circ\text{C}$)



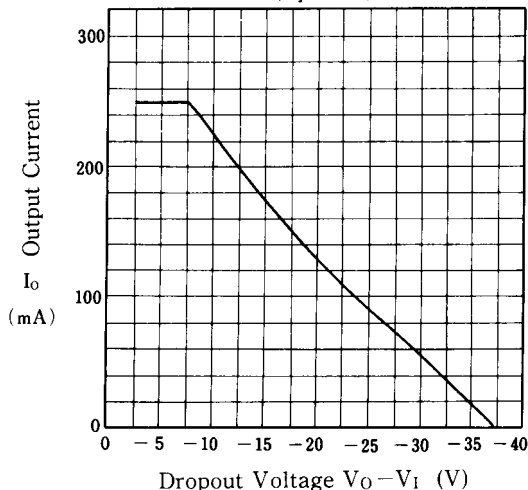
NJM79L05/15/24 Load Characteristics

($T_j = 25^\circ\text{C}$)

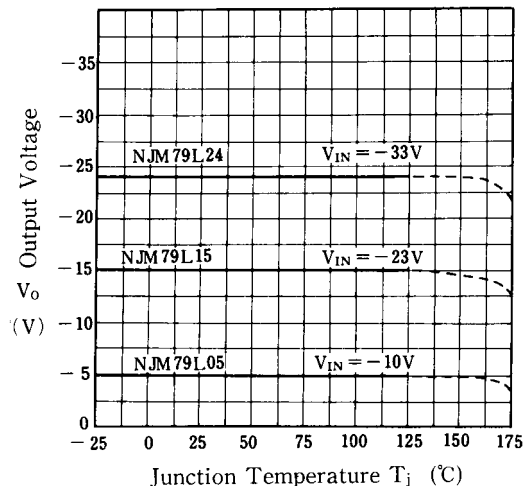


NJM79L00 Series Short Circuit Current

($T_j = 25^\circ\text{C}$)

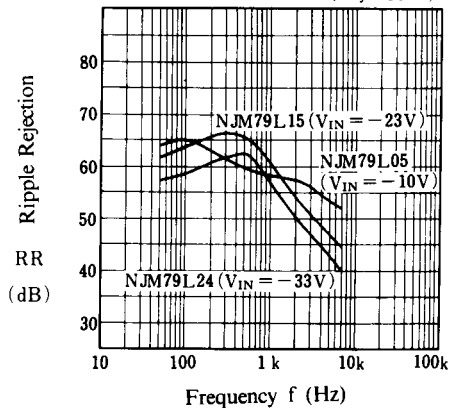


NJM79L05/12/24 Output Voltage vs. Junction Temperature



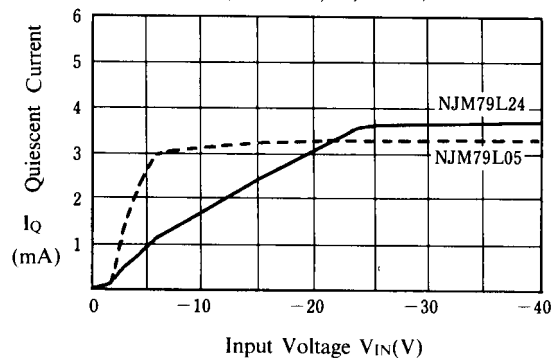
NJM79L05/15/24 Ripple Rejection vs. Frequency

($I_o = 40\text{mA}$, $e_{in} = 2\text{V}_{p-p}$, $T_j = 25^\circ\text{C}$)



Quiescent Current vs. Input Voltage

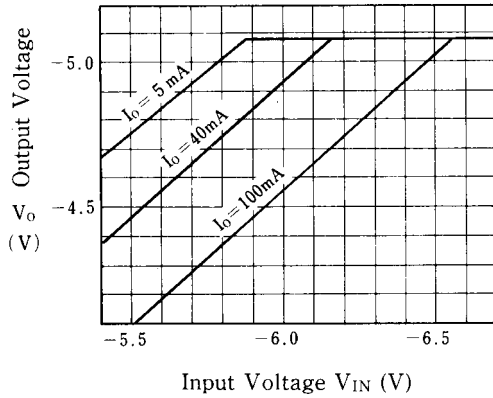
($I_o = 0\text{mA}$, $T_j = 25^\circ\text{C}$)



■ TYPICAL CHARACTERISTICS

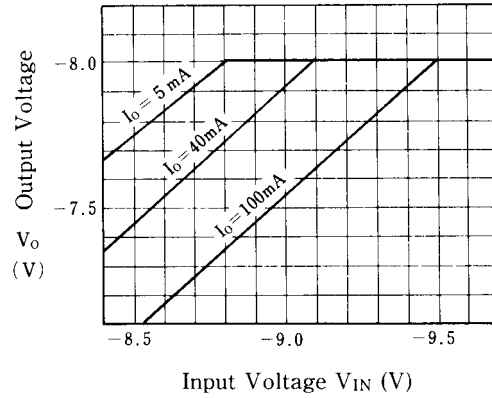
NJM79L05 Dropout Characteristics

($T_j = 25^\circ\text{C}$)

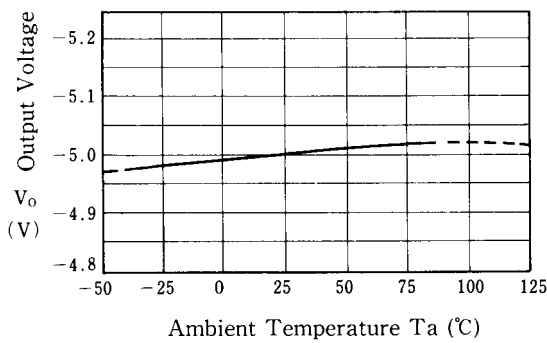


NJM79L08 Dropout Characteristics

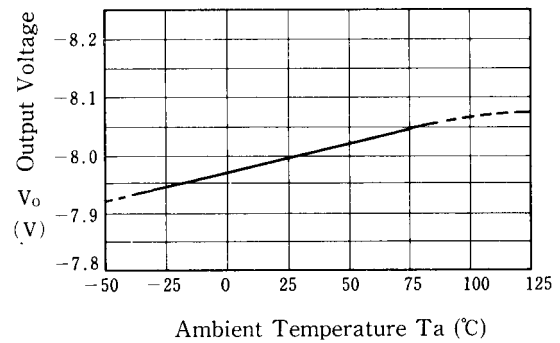
($T_j = 25^\circ\text{C}$)



NJM79L05 Output Voltage vs. Temperature

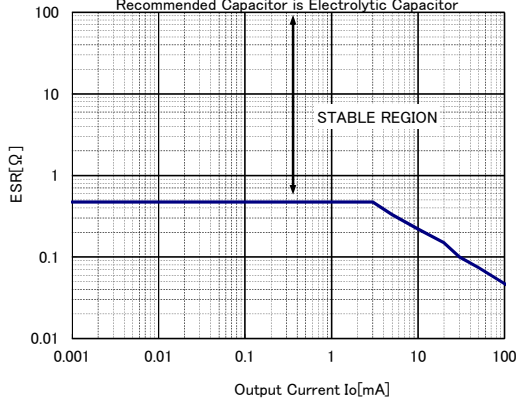


NJM79L08 Output Voltage vs. Temperature



NJM79L00 Equivalent Series Resistance vs. Output Current

V_{in} = Output voltage of the conditions described in the ELECTRICAL CHARACTERISTICS
 $T_a = 25^\circ\text{C}$, $C_{in} = 0.33\mu\text{F}$, $C_o = 1.0\mu\text{F}$ (Ceramic capacitor)
 Recommended Capacitor is Electrolytic Capacitor



[CAUTION]

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