

3-TERMINAL NEGATIVE VOLTAGE REGULATOR

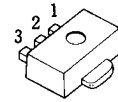
■ GENERAL DESCRIPTION

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

(TO-92)

(SOT-89)



NJM79L00A

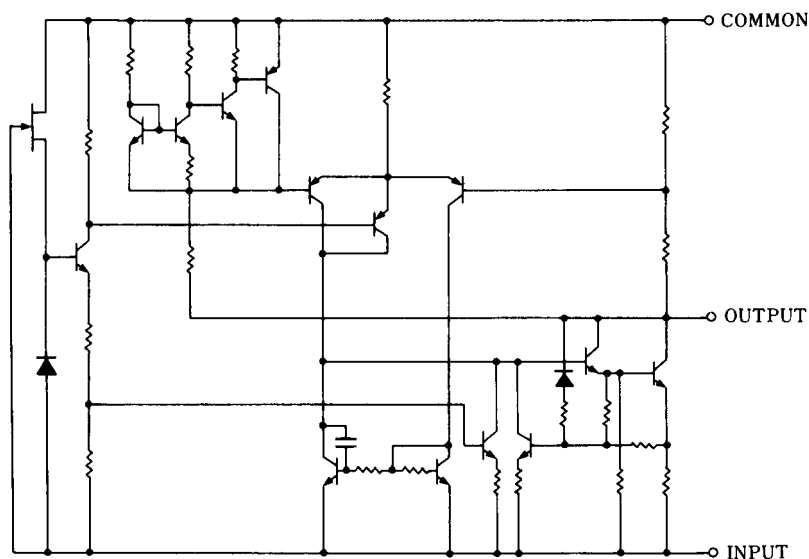
NJM79L00UA

1. COMMON
2. IN
3. OUT

■ FEATURES

- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Excellent Ripple Rejection
- Guarantee'd 100mA Output Current
- Package Outline TO-92, SOT-89
- Bipolar Technology

■ EQUIVALENT CIRCUIT



NJM79L00

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	(79L03A to 79L09A) - 30 (79L12A to 79L15A) - 35 (79L18A to 79L24A) - 40	V V V
Operating Temperature Range	T_{opr}	-40 to +85	°C
Storage Temperature Range	T_{stg}	-40 to +125	°C
Power Dissipation	P_D	(TO92) 500 (SOT89) 350	mW mW

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

Measurement is to be conducted in pulse testing.

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
NJM79L03A						
Output Voltage	V_O	$V_{IN}=-10V$, $I_O=40mA$	-2.88	-3.0	-3.12	V
Line Regulation	$\Delta V_O - V_{IN}$	$V_{IN}=-7$ to $-20V$, $I_O=40mA$	-	10	60	mV
Load Regulation	$\Delta V_O - I_O$	$V_{IN}=-10V$, $I_O=1$ 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
NJM79L05A						
Output Voltage	V_O	$V_{IN}=-10V$, $I_O=40mA$	-4.8	-5.0	-5.2	V
Line Regulation	$\Delta V_O - V_{IN}$	$V_{IN}=-7$ to $-20V$, $I_O=40mA$	-	15	150	mV
Load Regulation	$\Delta V_O - I_O$	$V_{IN}=-10V$, $I_O=1$ 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

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

Measurement is to be conducted in pulse testing.

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
NJM79L06A						
Output Voltage	V_O	$V_{IN}=-12\text{V}$, $I_O=40\text{mA}$	-5.76	-6.0	-6.24	V
Line Regulation	$\Delta V_O - V_{IN}$	$V_{IN}=-8.5$ to -20V , $I_O=40\text{mA}$	-	18	150	mV
Load Regulation	$\Delta V_O - I_O$	$V_{IN}=-12\text{V}$, $I_O=1$ to 100mA	-	8	70	mV
Quiescent Current	I_Q	$V_{IN}=-12\text{V}$, $I_O=0\text{mA}$	-	3.5	6.0	mA
Ripple Rejection	RR	$V_{IN}=-9$ to -19V , $I_O=40\text{mA}$, $e_{in}=1V_{P-P}$, $f=120\text{Hz}$	40	68	-	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-12\text{V}$, $BW=10\text{Hz}$ to 100kHz , $I_O=40\text{mA}$	-	140	-	μV
NJM79L08A						
Output Voltage	V_O	$V_{IN}=-14\text{V}$, $I_O=40\text{mA}$	-7.68	-8.0	-8.32	V
Line Regulation	$\Delta V_O - V_{IN}$	$V_{IN}=-10.5$ to -23V , $I_O=40\text{mA}$	-	24	175	mV
Load Regulation	$\Delta V_O - I_O$	$V_{IN}=-14\text{V}$, $I_O=1$ to 100mA	-	10	80	mV
Quiescent Current	I_Q	$V_{IN}=-14\text{V}$, $I_O=0\text{mA}$	-	3.5	6.0	mA
Ripple Rejection	RR	$V_{IN}=-11$ to -21V , $I_O=40\text{mA}$, $e_{in}=1V_{P-P}$, $f=120\text{Hz}$	39	68	-	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-14\text{V}$, $BW=10\text{Hz}$ to 100kHz , $I_O=40\text{mA}$	-	190	-	μV
NJM79L09A						
Output Voltage	V_O	$V_{IN}=-15\text{V}$, $I_O=40\text{mA}$	-8.64	-9.0	-9.36	V
Line Regulation	$\Delta V_O - V_{IN}$	$V_{IN}=-11.5$ to -24V , $I_O=40\text{mA}$	-	27	200	mV
Load Regulation	$\Delta V_O - I_O$	$V_{IN}=-15\text{V}$, $I_O=1$ to 100mA	-	12	90	mV
Quiescent Current	I_Q	$V_{IN}=-15\text{V}$, $I_O=0\text{mA}$	-	3.5	6.0	mA
Ripple Rejection	RR	$V_{IN}=-12$ to -22V , $I_O=40\text{mA}$, $e_{in}=1V_{P-P}$, $f=120\text{Hz}$	38	67	-	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-15\text{V}$, $BW=10\text{Hz}$ to 100kHz , $I_O=40\text{mA}$	-	210	-	μV
NJM79L12A						
Output Voltage	V_O	$V_{IN}=-19\text{V}$, $I_O=40\text{mA}$	-11.5	-12.0	-12.5	V
Line Regulation	$\Delta V_O - V_{IN}$	$V_{IN}=-14.5$ to -27V , $I_O=40\text{mA}$	-	36	250	mV
Load Regulation	$\Delta V_O - I_O$	$V_{IN}=-19\text{V}$, $I_O=1$ to 100mA	-	16	100	mV
Quiescent Current	I_Q	$V_{IN}=-19\text{V}$, $I_O=0\text{mA}$	-	3.5	6.5	mA
Ripple Rejection	RR	$V_{IN}=-15$ to -25V , $I_O=40\text{mA}$, $e_{in}=1V_{P-P}$, $f=120\text{Hz}$	37	64	-	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-19\text{V}$, $BW=10\text{Hz}$ to 100kHz , $I_O=40\text{mA}$	-	210	-	μV

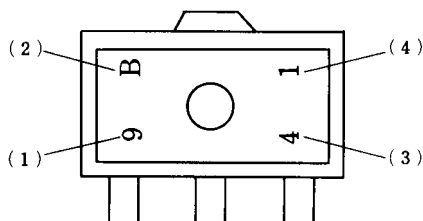
NJM79L00

■ 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
NJM79L15A						
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
NJM79L18A						
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
NJM79L24A						
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

■ SOT-89 MARK



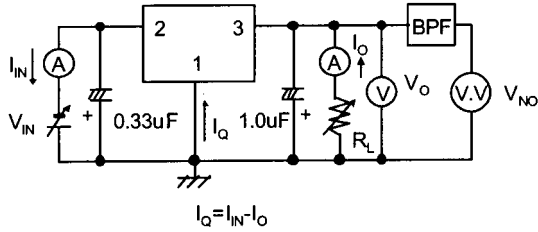
- (1) 9: Negative Output
- (2) Vo Rank
- (3) The end of A. D.
- (4) Production Month

Oct. ...X
Nov. ...Y
Dec. ...Z

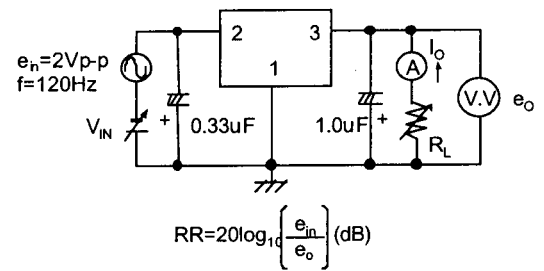
	(1)	(2)
NJM79L03UA	9	B
NJM79L05UA	9	C
NJM79L06UA	9	E
NJM79L08UA	9	G
NJM79L09UA	9	H
NJM79L12UA	9	K
NJM79L15UA	9	L
NJM79L18UA	9	M
NJM79L24UA	9	P

■ TEST CIRCUIT

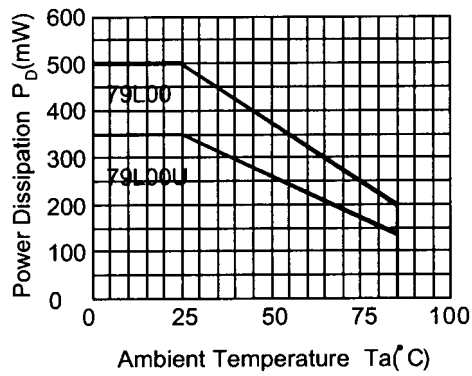
1. Output Voltage, Output Current, Line Regulation, Load Regulation, Quiescent Current, Output Noise Voltage



2. Ripple Rejection



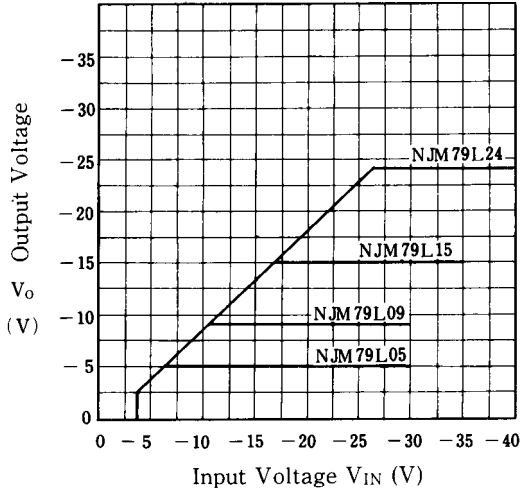
■ POWER DISSIPATION VS. AMBIENT TEMPERATURE



■ TYPICAL CHARACTERISTICS

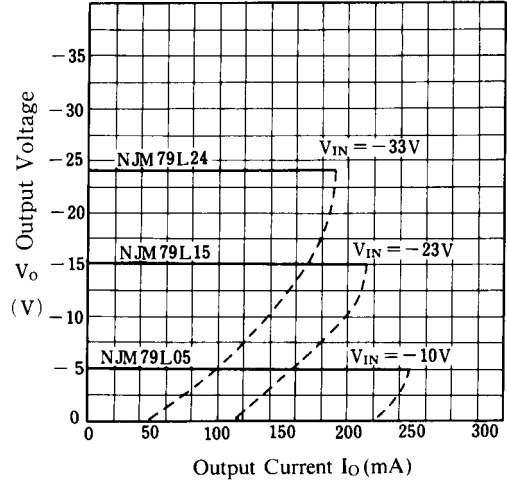
NJM79L00 Input Voltage vs. Output Voltage

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



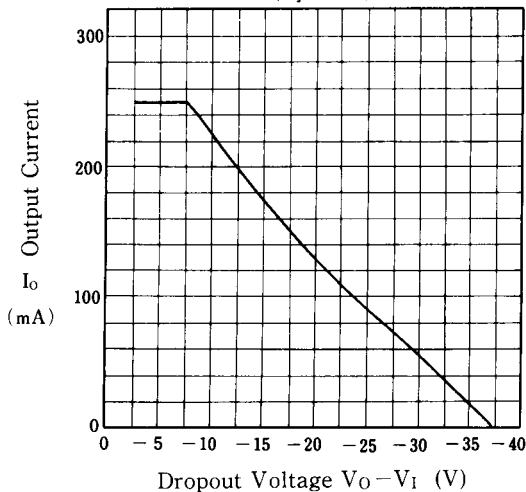
NJM79L05/15/24 Load Characteristics

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

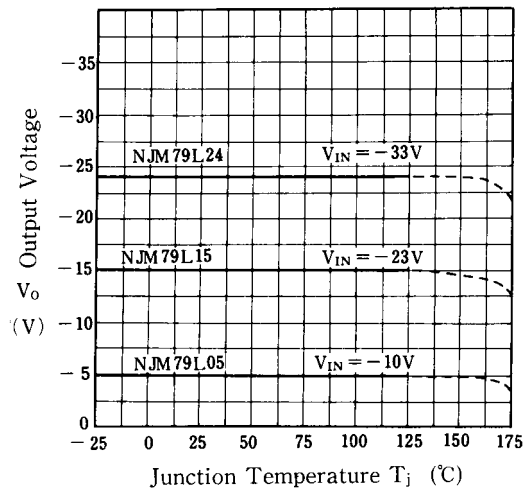


NJM79L00 Series Short Circuit Current

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

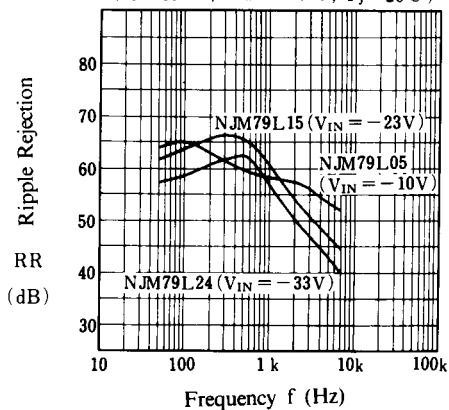


NJM79L05/12/24 Output Voltage vs. Junction Temperature



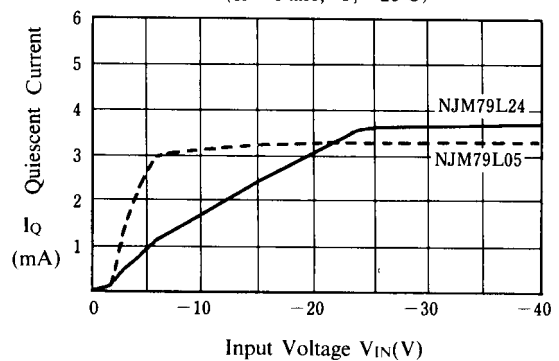
NJM79L05/15/24 Ripple Rejection vs. Frequency

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



Quiescent Current vs. Input Voltage

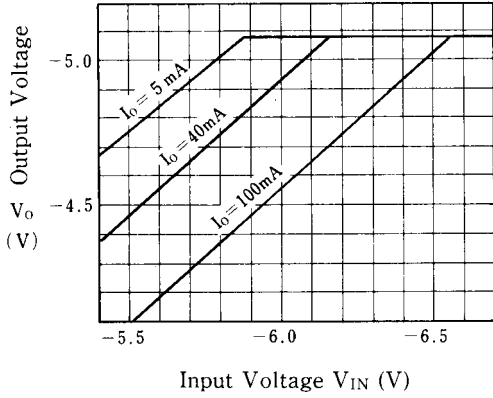
($I_o = 0\text{mA}$, $T_j = 25^\circ\text{C}$)



■ TYPICAL CHARACTERISTICS

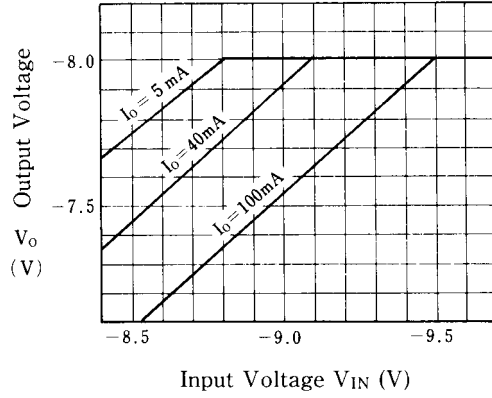
NJM79L05 Dropout Characteristics

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

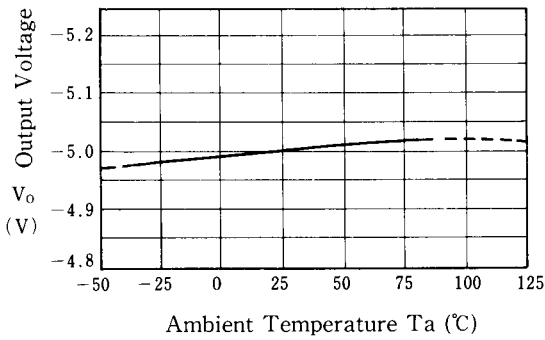


NJM79L08 Dropout Characteristics

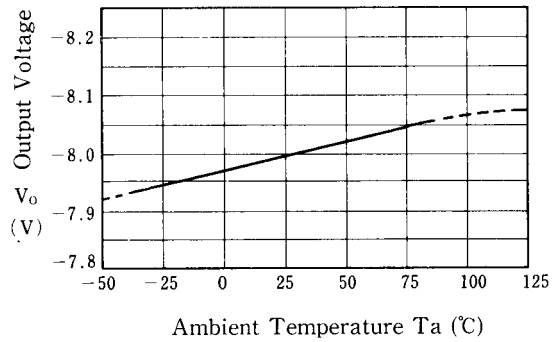
($T_j = 25^\circ\text{C}$)



NJM79L05 Output Voltage vs. Temperature



NJM79L08 Output Voltage vs. Temperature



[CAUTION]

The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.