

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.

■ 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

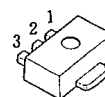
■ PACKAGE OUTLINE

(TO-92)



NJM79L00A

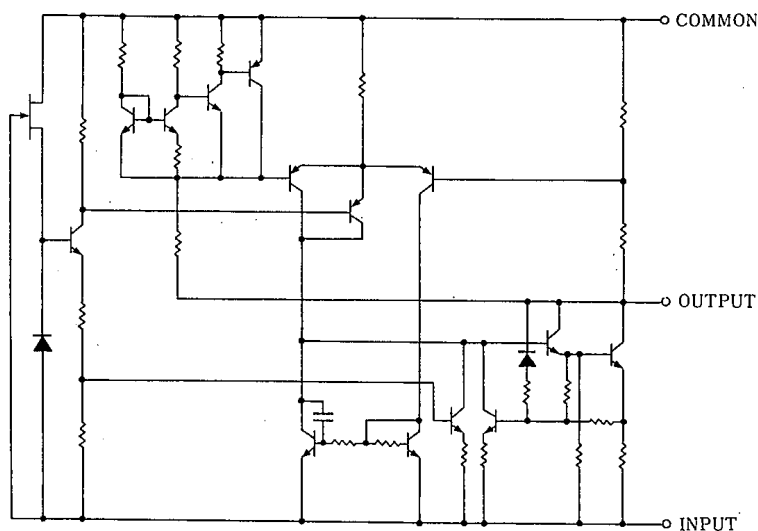
(SOT-89)



NJM79L00UA

1. COMMON
2. IN
3. OUT

■ EQUIVALENT CIRCUIT



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	(79L03A~79L09A) -30	V
		(79L12A~79L15A) -35	V
		(79L18A~79L24A) -40	V
Operating Temperature Range	T_{opr}	-40 ~ +85	°C
Storage Temperature Range	T_{stg}	-40 ~ +125	°C
Power Dissipation	P_D	(TO92) 500	mW
		(SOT89) 350	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	$\Delta V_O/V_{IN}$	$V_{IN}=-7\sim-20V$, $I_O=40mA$	—	10	60	mV
Load Regulation	$\Delta V_O/I_O$	$V_{IN}=-10V$, $I_O=1\sim100mA$	—	4	72	mV
Quiescent Current	I_Q	$V_{IN}=-10V$, $I_O=0mA$	—	3.5	6.0	mA
Ripple Rejection	RR	$V_{IN}=-8\sim-18V$, $I_O=40mA$, $e_{in}=1V_{P-P}$, $f=120Hz$	45	72	—	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-10V$, $BW=10Hz\sim100kHz$, $I_O=40mA$	—	70	—	μV
NJM79L05A						
Output Voltage	V_O	$V_{IN}=-10V$, $I_O=40mA$	-4.8	-5.0	-5.2	V
Line Regulation	$\Delta V_O/V_{IN}$	$V_{IN}=-7\sim-20V$, $I_O=40mA$	—	15	150	mV
Load Regulation	$\Delta V_O/I_O$	$V_{IN}=-10V$, $I_O=1\sim100mA$	—	7	60	mV
Quiescent Current	I_Q	$V_{IN}=-10V$, $I_O=0mA$	—	3.5	6.0	mA
Ripple Rejection	RR	$V_{IN}=-8\sim-18V$, $I_O=40mA$, $e_{in}=1V_{P-P}$, $f=120Hz$	41	71	—	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-10V$, $BW=10Hz\sim100kHz$, $I_O=40mA$	—	120	—	μV

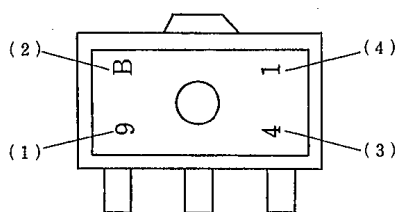
■ ELECTRICAL CHARACTERISTICS ($C_{IN}=0.33\ \mu F$, $C_O=1.0\ \mu F$, $T_J=25^\circ C$) Measurement is to be conducted in pulse testing.

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP.	MAX.	UNIT
NJM79L06A						
Output Voltage	V_O	$V_{IN}=-12V$, $I_O=40mA$	-5.76	-6.0	-6.24	V
Line Regulation	ΔV_O-V_{IN}	$V_{IN}=-8.5\sim-20V$, $I_O=40mA$	—	18	150	mV
Load Regulation	ΔV_O-I_O	$V_{IN}=-12V$, $I_O=1\sim 100mA$	—	8	70	mV
Quiescent Current	I_Q	$V_{IN}=-12V$, $I_O=0mA$	—	3.5	6.0	mA
Ripple Rejection	RR	$V_{IN}=-9\sim-19V$, $I_O=40mA$, $e_{in}=1V_{P-P}$ $f=120Hz$	40	68	—	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-12V$, $BW=10Hz\sim 100kHz$, $I_O=40mA$	—	140	—	μV
NJM79L08A						
Output Voltage	V_O	$V_{IN}=-14V$, $I_O=40mA$	-7.68	-8.0	-8.32	V
Line Regulation	ΔV_O-V_{IN}	$V_{IN}=-10.5\sim-23V$, $I_O=40mA$	—	24	175	mV
Load Regulation	ΔV_O-I_O	$V_{IN}=-14V$, $I_O=1\sim 100mA$	—	10	80	mV
Quiescent Current	I_Q	$V_{IN}=-14V$, $I_O=0mA$	—	3.5	6.0	mA
Ripple Rejection	RR	$V_{IN}=-11\sim-21V$, $I_O=40mA$, $e_{in}=1V_{P-P}$ $f=120Hz$	39	68	—	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-14V$, $BW=10Hz\sim 100kHz$, $I_O=40mA$	—	190	—	μV
NJM79L09A						
Output Voltage	V_O	$V_{IN}=-15V$, $I_O=40mA$	-8.64	-9.0	-9.36	V
Line Regulation	ΔV_O-V_{IN}	$V_{IN}=-11.5\sim-24V$, $I_O=40mA$	—	27	200	mV
Load Regulation	ΔV_O-I_O	$V_{IN}=-15V$, $I_O=1\sim 100mA$	—	12	90	mV
Quiescent Current	I_Q	$V_{IN}=-15V$, $I_O=0mA$	—	3.5	6.0	mA
Ripple Rejection	RR	$V_{IN}=-12\sim-22V$, $I_O=40mA$, $e_{in}=1V_{P-P}$ $f=120Hz$	38	67	—	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-15V$, $BW=10Hz\sim 100kHz$, $I_O=40mA$	—	210	—	μV
NJM79L12A						
Output Voltage	V_O	$V_{IN}=-19V$, $I_O=40mA$	-11.5	-12.0	-12.5	V
Line Regulation	ΔV_O-V_{IN}	$V_{IN}=-14.5\sim-27V$, $I_O=40mA$	—	36	250	mV
Load Regulation	ΔV_O-I_O	$V_{IN}=-19V$, $I_O=1\sim 100mA$	—	16	100	mV
Quiescent Current	I_Q	$V_{IN}=-19V$, $I_O=0mA$	—	3.5	6.5	mA
Ripple Rejection	RR	$V_{IN}=-15\sim-25V$, $I_O=40mA$, $e_{in}=1V_{P-P}$ $f=120Hz$	37	64	—	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-19V$, $BW=10Hz\sim 100kHz$, $I_O=40mA$	—	210	—	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
NJM79L15A						
Output Voltage	V_O	$V_{IN}=-23\text{V}$, $I_O=40\text{mA}$	-14.4	-15.0	-15.6	V
Line Regulation	$\Delta V_O/V_{IN}$	$V_{IN}=-17.5\sim-30\text{V}$, $I_O=40\text{mA}$	—	45	300	mV
Load Regulation	$\Delta V_O/I_O$	$V_{IN}=-23\text{V}$, $I_O=1\sim100\text{mA}$	—	20	150	mV
Quiescent Current	I_Q	$V_{IN}=-23\text{V}$, $I_O=0\text{mA}$	—	3.5	6.5	mA
Ripple Rejection	RR	$V_{IN}=-18.5\sim-28.5\text{V}$, $I_O=40\text{mA}$, $e_{in}=1\text{V}_{\text{p-p}}$ $f=120\text{Hz}$	34	63	—	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-23\text{V}$, $BW=10\text{Hz}\sim100\text{kHz}$, $I_O=40\text{mA}$	—	340	—	μV
NJM79L18A						
Output Voltage	V_O	$V_{IN}=-27\text{V}$, $I_O=40\text{mA}$	-17.3	-18.0	-18.7	V
Line Regulation	$\Delta V_O/V_{IN}$	$V_{IN}=-20.7\sim-33\text{V}$, $I_O=40\text{mA}$	—	54	325	mV
Load Regulation	$\Delta V_O/I_O$	$V_{IN}=-27\text{V}$, $I_O=1\sim100\text{mA}$	—	23	170	mV
Quiescent Current	I_Q	$V_{IN}=-27\text{V}$, $I_O=0\text{mA}$	—	3.5	6.5	mA
Ripple Rejection	RR	$V_{IN}=-23\sim-33\text{V}$, $I_O=40\text{mA}$, $e_{in}=1\text{V}_{\text{p-p}}$, $f=120\text{Hz}$	33	60	—	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-27\text{V}$, $BW=10\text{Hz}\sim100\text{Kz}$, $I_O=40\text{mA}$	—	410	—	μV
NJM79L24A						
Output Voltage	V_O	$V_{IN}=-33\text{V}$, $I_O=40\text{mA}$	-23.0	-24.0	-25.0	V
Line Regulation	$\Delta V_O/V_{IN}$	$V_{IN}=-27\sim-38\text{V}$, $I_O=40\text{mA}$	—	72	350	mV
Load Regulation	$\Delta V_O/I_O$	$V_{IN}=-33\text{V}$, $I_O=1\sim100\text{mA}$	—	30	200	mV
Quiescent Current	I_Q	$V_{IN}=-33\text{V}$, $I_O=0\text{mA}$	—	3.5	6.5	mA
Ripple Rejection	RR	$V_{IN}=-29\sim-35\text{V}$, $I_O=40\text{mA}$, $e_{in}=1\text{V}_{\text{p-p}}$, $f=120\text{Hz}$	31	55	—	dB
Output Noise Voltage	V_{NO}	$V_{IN}=-33\text{V}$, $BW=10\text{Hz}\sim100\text{kHz}$, $I_O=40\text{mA}$	—	550	—	μV

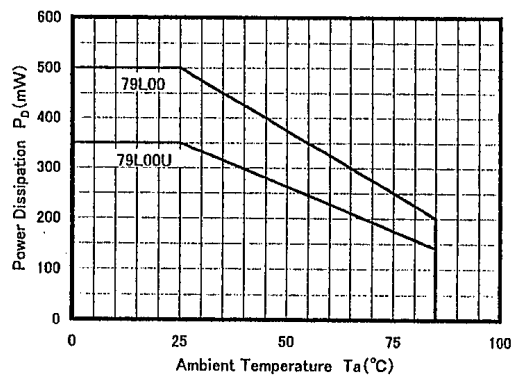
■ SOT-89 MARK



(1)9: Negative Output
 (2)Vo Rank
 (3)The end of A.D.
 (4)Production Month
 Oct. ...X
 Nov. ...Y
 Dec. ...Z

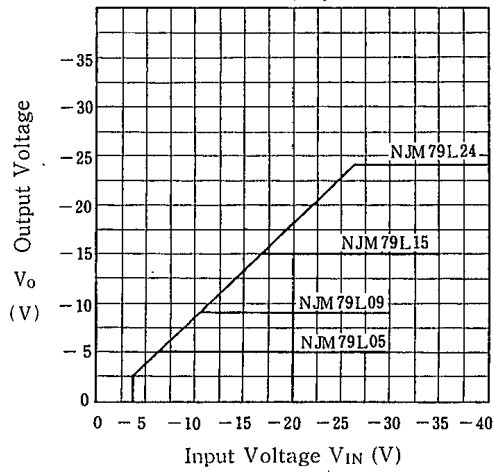
	(1)	(2)
NJM79L03UA	9	B
NJM79L05UA	9	C
NJM79L06UA	9	E
NJM79L08UA	9	G
NJM79L09UA	9	H
NJM79L12UA	9	K
NJM79L15UA	9	L
NJM79L18UA	9	M
NJM79L24UA	9	P

■ POWER DISSIPATION VS. AMBIENT TEMPERATURE

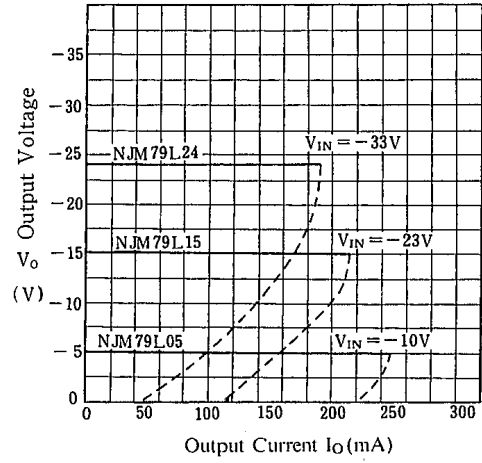


■ TYPICAL CHARACTERISTICS

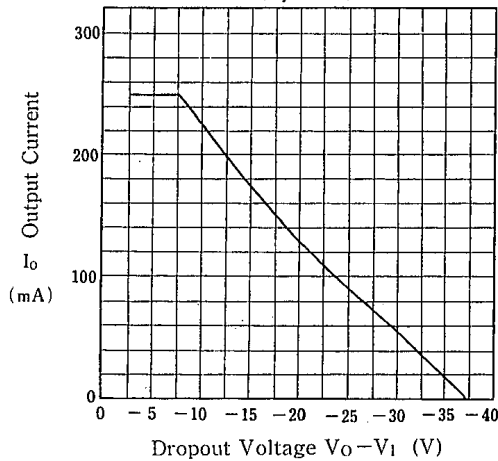
NJM79L00 Input Voltage vs. Output Voltage
($I_o = 40\text{mA}$, $T_j = 25^\circ\text{C}$)



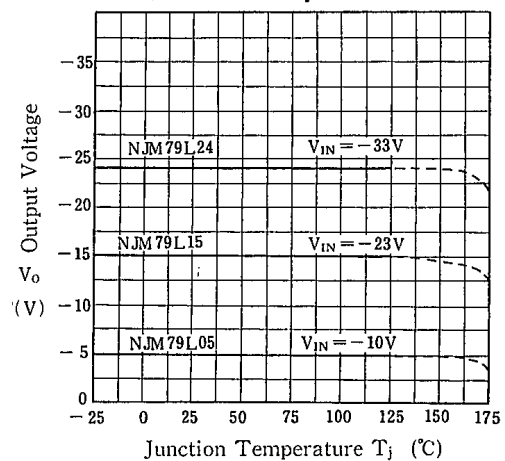
NJM79L05/15/24 Load Characteristics
($T_j = 25^\circ\text{C}$)



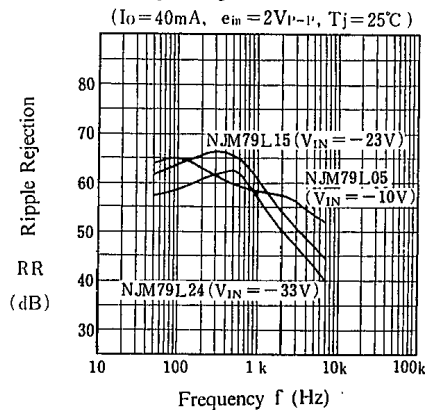
NJM79L00 Series Short Circuit Current
($T_j = 25^\circ\text{C}$)



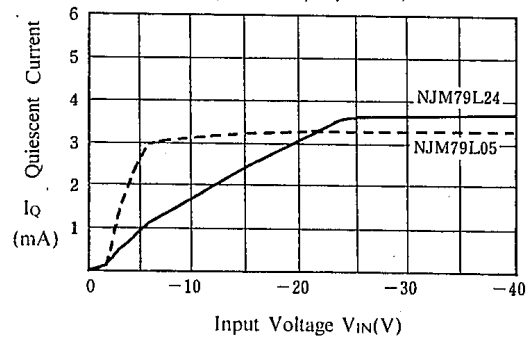
NJM79L05/12/24 Output Voltage vs. Junction Temperature



NJM79L05/15/24 Ripple Rejection vs. Frequency
($I_o = 40\text{mA}$, $e_{in} = 2\text{V}_{p-p}$, $T_j = 25^\circ\text{C}$)



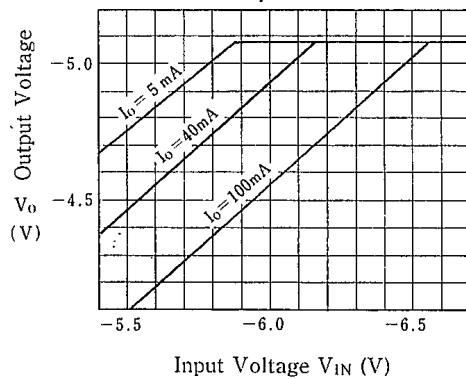
Quiescent Current vs. Input Voltage
($I_o = 0\text{mA}$, $T_j = 25^\circ\text{C}$)



■ TYPICAL CHARACTERISTICS

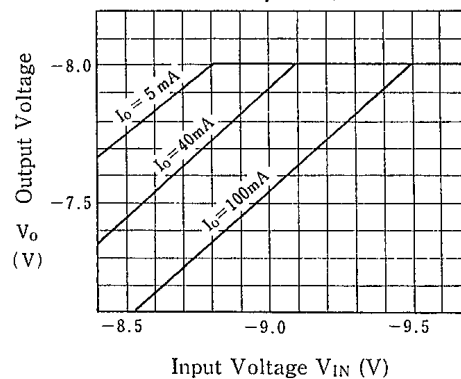
NJM79L05 Dropout Characteristics

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

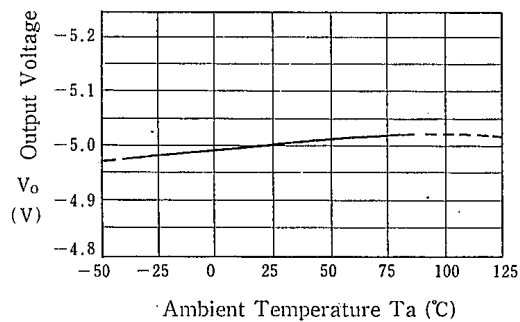


NJM79L08 Dropout Characteristics

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



NJM79L05 Output Voltage vs. Temperature



NJM79L08 Output Voltage vs. Temperature

