

NJM79M00

The NJM79M00 series of 3-Terminal Medium Current Negative Voltage Regulators are constructed using the New JRC Planar epitaxial process. These regulators employ internal current limiting, thermal shutdown and safe-area compensation making them essentially indestructible. If adequate heat sinking is provided, they can deliver up to 500mA output current. They are intended as fixed voltage regulators in a wide range of applications including local (on-card) regulation for elimination of noise and distribution problems associated with single point regulation. In addition to use a fixed voltage regulators, these devices can be used with external components to obtain adjustable output voltages and currents.

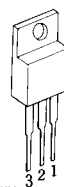
■ Features

- Output Current In Excess of 0.5A
- No External Components
- Internal Thermal Overload protection
- Internal Short Circuit Current Limiting

■ Package Outline

(TO-220)

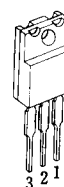
(TO-220F)



1. OUT
2. IN
3. COMMON

NJM79MXXA

The radiation fin is connected to Pin 2.



NJM79MXXFA

■ Absolute Maximum Ratings ($T_a=25^\circ\text{C}$)

Parameter	Symbol	Maximum Rating		Unit
Input Voltage	V_{IN}	79M05 ~ 79M09	-35	V
		79M12 ~ 79M15	-35	
		79M18 ~ 79M24	-40	
Storage Temperature Range	T_{stg}	-40 ~ +125		$^\circ\text{C}$
Operating Temperature Range	Operating Junction Temperature	T_j	-30 ~ +125	$^\circ\text{C}$
	Operating Ambient Temperature	T_{opr}	-30 ~ +75	
Power Dissipation	P_D	7.5 ($T_c \leq 75^\circ\text{C}$)		W

■ Thermal Characteristics

Thermal Resistance	Junction-to-Ambient Temperature	θ_{ja}	$\frac{70(\text{TO-220})}{60(\text{TO-220F})}$	$^\circ\text{C/W}$
	Junction-to-Case	θ_{jc}	5	

■ Electrical Characteristics ($T_i=25^\circ\text{C}$, $C_{IN}=2.2\mu\text{F}$, $C_O=1.0\mu\text{F}$)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
NJM79M05A/FA						
Output Voltage	V_O	$V_{IN} = -10\text{V}$, $I_O = 0.35\text{A}$	-4.8	-5.0	-5.2	V
Quiescent Current	I_Q	$V_{IN} = -10\text{V}$, $I_O = 0\text{mA}$	—	2.2	5.0	mA
Load Regulation	$\Delta V_O - I_O$	$V_{IN} = -10\text{V}$, $I_O = 0.005 \sim 0.5\text{A}$	—	35	50	mV
Line Regulation	$\Delta V_O - V_{IN}$	$V_{IN} = -7 \sim -25\text{V}$, $I_O = 0.35\text{A}$	—	5	50	mV
Ripple Rejection	RR	$V_{IN} = -10\text{V}$, $I_O = 0.35\text{A}$, $e_{in} = 2V_{p-p}$, $f = 120\text{Hz}$	50	58	—	dB
Output Noise Voltage	V_{NO}	$V_{IN} = -10\text{V}$, $I_O = 0.35\text{A}$, $BW = 10\text{Hz} \sim 100\text{kHz}$	—	100	—	μV
Average Temperature Coefficient of Output Voltage	$\Delta V_O / \Delta T$	$V_{IN} = -10\text{V}$, $I_O = 5\text{mA}$	—	-0.4	—	$\text{mV}/^\circ\text{C}$

■ Electrical Characteristics (T_j=25°C, C_{IN}=2.2μF, C_O=1.0μF)

Measurement is to be conducted in pulse testing.

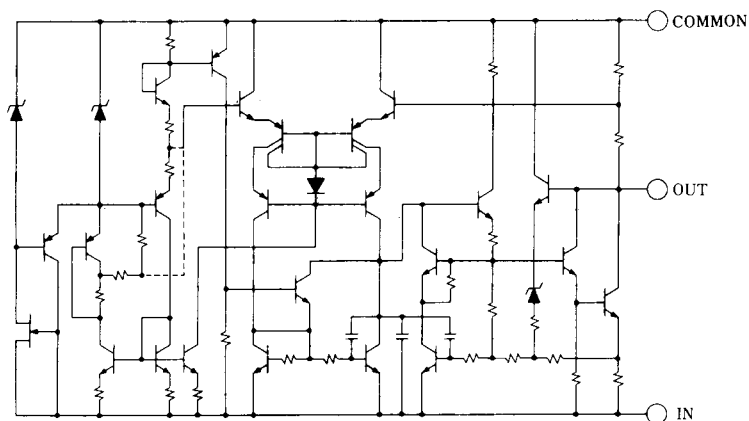
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
NJM79M06A/FA						
Output Voltage	V _O	V _{IN} =-11V, I _O =0.35A	-5.75	-6.0	-6.25	V
Quiescent Current	I _O	V _{IN} =-11V, I _O =0mA	—	2.2	5.0	mA
Load Regulation	ΔV _O -I _O	V _{IN} =-11V, I _O =0.005~0.5A	—	35	60	mV
Line Regulation	ΔV _O -V _{IN}	V _{IN} =-8~-25V, I _O =0.35A	—	5	60	mV
Ripple Rejection	RR	V _{IN} =11V, I _O =0.35A, e _{in} =2V _{p-p} , f=120Hz	50	57	—	dB
Output Noise Voltage	V _{NO}	V _{IN} =-11V, I _O =0.35A BW=10Hz~100kHz	—	130	—	μV
Average Temperature Coefficient of Output Voltage	ΔV _O /ΔT	V _{IN} =-11V, I _O =5mA	—	-0.5	—	mV/°C
NJM79M08A/FA						
Output Voltage	V _O	V _{IN} =-14V, I _O =0.35A	-7.7	-8.0	-8.3	V
Quiescent Current	I _O	V _{IN} =-14V, I _O =0mA	—	2.2	5.0	mA
Load Regulation	ΔV _O -I _O	V _{IN} =-14V, I _O =0.005~0.5A	—	40	80	mV
Line Regulation	ΔV _O -V _{IN}	V _{IN} =-10.5~-25V, I _O =0.35A	—	8	80	mV
Ripple Rejection	RR	V _{IN} =-14V, I _O =0.35A, e _{in} =2V _{p-p} , f=120Hz	50	55	—	dB
Output Noise Voltage	V _{NO}	V _{IN} =-14V, I _O =0.35A, BW=10Hz~100kHz	—	160	—	μV
Average Temperature Coefficient of Output Voltage	ΔV _O /ΔT	V _{IN} =-14V, I _O =5mA	—	-0.7	—	mV/°C
NJM79M09A/FA						
Output Voltage	V _O	V _{IN} =-15V, I _O =0.35A	-8.65	-9.0	-9.35	V
Quiescent Current	I _O	V _{IN} =-15V, I _O =0mA	—	2.2	5.0	mA
Load Regulation	ΔV _O -I _O	V _{IN} =-15V, I _O =0.005~0.5A	—	40	90	mV
Line Regulation	ΔV _O -V _{IN}	V _{IN} =-11.5~-25V, I _O =0.35A	—	8	80	mV
Ripple Rejection	RR	V _{IN} =-15V, I _O =0.35A, e _{in} =2V _{p-p} , f=120Hz	50	54	—	dB
Output Noise Voltage	V _{NO}	V _{IN} =-15V, I _O =0.35A, BW=10Hz~100kHz	—	175	—	μV
Average Temperature Coefficient of Output Voltage	ΔV _O /ΔT	V _{IN} =-15V, I _O =5mA	—	-0.8	—	mV/°C
NJM79M12A/FA						
Output Voltage	V _O	V _{IN} =-19V, I _O =0.35A	-11.5	-12.0	-12.5	V
Quiescent Current	I _O	V _{IN} =-19V, I _O =0mA	—	2.7	6.0	mA
Load Regulation	ΔV _O -I _O	V _{IN} =-19V, I _O =0.005~0.5A	—	30	120	mV
Line Regulation	ΔV _O -V _{IN}	V _{IN} =-14.5~-30V, I _O =0.35A	—	3	80	mV
Ripple Rejection	RR	V _{IN} =-19V, I _O =0.35A, e _{in} =2V _{p-p} , f=120Hz	54	71	—	dB
Output Noise Voltage	V _{NO}	V _{IN} =-19V, I _O =0.35A, BW=10Hz~100kHz	—	210	—	μV
Average Temperature Coefficient of Output Voltage	ΔV _O /ΔT	V _{IN} =-19V, I _O =5mA	—	-0.4	—	mV/°C

■ Electrical Characteristics (T_i=25°C, C_{IN}=2.2μF, C_O=1.0μF)

Measurement is to be conducted in pulse testing.

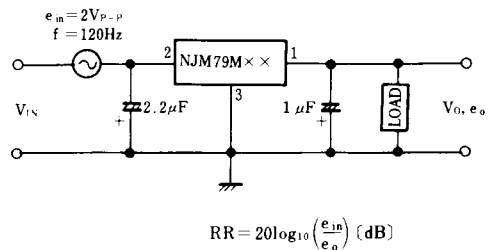
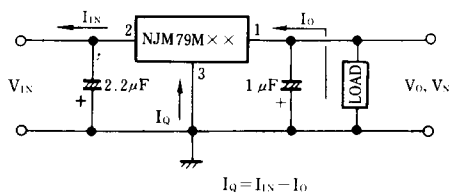
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
NJM79M15A/FA						
Output Voltage	V _O	V _{IN} =−23V, I _O =0.35A	−14.4	−15.0	−15.6	V
Quiescent Current	I _O	V _{IN} =−23V, I _O =0mA	—	2.7	6.0	mA
Load Regulation	ΔV _O -I _O	V _{IN} =23V, I _O =0.005~0.5A	—	30	150	mV
Line Regulation	ΔV _O -V _{IN}	V _{IN} =−17.5~−30V, I _O =0.35A	—	3	80	mV
Ripple Rejection	RR	V _{IN} =−23V, I _O =0.35A, e _{in} =2V _{p-p} , f=120Hz	54	70	—	dB
Output Noise Voltage	V _{NO}	V _{IN} =−23V, I _O =0.35A, BW=10Hz~100kHz	—	230	—	μV
Average Temperature Coefficient of Output Voltage	ΔV _O /ΔT	V _{IN} =−23V, I _O =5mA	—	−0.5	—	mV/°C
NJM79M18A/FA						
Output Voltage	V _O	V _{IN} =−27V, I _O =0.35A	−17.3	−18.0	−18.7	V
Quiescent Current	I _O	V _{IN} =−27V, I _O =0mA	—	2.7	6.0	mA
Load Regulation	ΔV _O -I _O	V _{IN} =−27V, I _O =0.005~0.5A	—	35	180	mV
Line Regulation	ΔV _O -V _{IN}	V _{IN} =−21~−30V, I _O =0.35A	—	4	80	mV
Ripple Rejection	RR	V _{IN} =−27V, I _O =0.35A, e _{in} =2V _{p-p} , f=120Hz	54	69	—	dB
Output Noise Voltage	V _{NO}	V _{IN} =−27V, I _O =0.35A, BW=10Hz~100kHz	—	270	—	μV
Average Temperature Coefficient of Output Voltage	ΔV _O /ΔT	V _{IN} =−27V, I _O =5mA	—	−0.6	—	mV/°C
NJM79M24A/FA						
Output Voltage	V _O	V _{IN} =−33V, I _O =0.35A	−23.0	−24.0	−25.0	V
Quiescent Current	I _O	V _{IN} =−33V, I _O =0mA	—	2.7	6.0	mA
Load Regulation	ΔV _O -I _O	V _{IN} =−33V, I _O =0.005~0.5A	—	40	240	mV
Line Regulation	ΔV _O -V _{IN}	V _{IN} =−27~−38V, I _O =0.35A	—	5	80	mV
Ripple Rejection	RR	V _{IN} =−33V, I _O =0.35A, e _{in} =2V _{p-p} , f=120Hz	54	66	—	dB
Output Noise Voltage	V _{NO}	V _{IN} =−33V, I _O =0.35A, BW=10Hz~100kHz	—	330	—	μV
Average Temperature Coefficient of Output Voltage	ΔV _O /ΔT	V _{IN} =−33V, I _O =5mA	—	−0.8	—	mV/°C

■ Equivalent Circuit

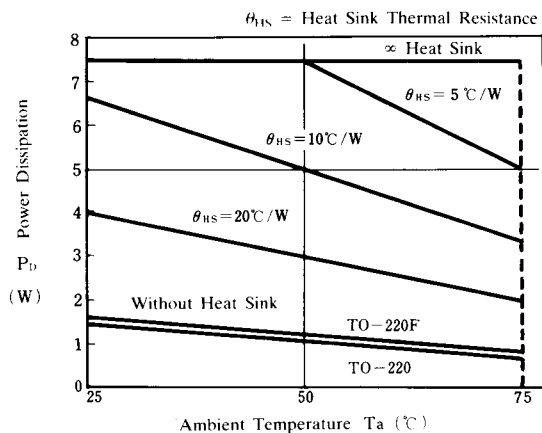


■ Test Circuit

1. Output Voltage, Line Regulation, Load Regulation, Quiescent Current, Average Temperature Coefficient of Output Voltage, Output Noise Voltage
2. Ripple Rejection



■ Power Dissipation vs. Ambient Temperature



■ Typical Characteristics

