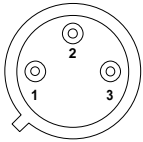
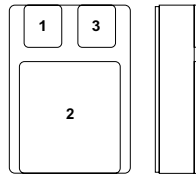


0.5 AMP NEGATIVE VOLTAGE REGULATOR



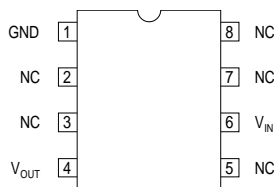
Pin 1 – Ground
 Pin 2 – V_{OUT}
 Case – V_{IN}

H Package – TO-39



Pin 1 – Ground
 Pin 2 – V_{IN}
 Case – V_{OUT}

**SMD Package - SMD1
CERAMIC SURFACE MOUNT**



8 Pin J Package

FEATURES

- **OUTPUT CURRENT UP TO 0.5A**
- **OUTPUT VOLTAGES OF -5, -12, -15V**
- **0.01% / V LINE REGULATION**
- **0.3% / A LOAD REGULATION**
- **THERMAL OVERLOAD PROTECTION**
- **SHORT CIRCUIT PROTECTION**
- **OUTPUT TRANSISTOR SOA PROTECTION**
- **1% VOLTAGE TOLERANCE (-A VERSIONS)**

Order Information

Part Number	H-Pack (TO-39)	J-Pack CERDIP	SMD-Pack SMD1	Temp. Range
IP79MxxAzz	✓	✓	✓	-55 to +150°C
IP79Mxxzz	✓	✓	✓	"
IP120MAzz-xx	✓		✓	"
IP120Mzz-xx	✓		✓	"

Note:

xx = Voltage Code (05, 12, 15) zz = Package Code (H, J)
 eg. IP79M05J IP120MAH-12

DESCRIPTION

The IP120MA and IP79M00A series of voltage regulators are fixed output regulators intended for local, on-card voltage regulation. These devices are available in -5, -12, and -15 volt options and are capable of delivering in excess of 500mA over temperature.

The A suffix devices are fully specified at 0.5A, provide 0.01% / V line regulation, 0.3% / A load regulation, and $\pm 1\%$ output voltage tolerance at room temperature. Protection features include safe operating area, current limiting and thermal shutdown.

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise stated)

V_I	DC Input Voltage (for $V_O = -5, -12, -15\text{V}$)	-35V
P_D	Power Dissipation	Internally limited
$R_{\theta JC}$	Thermal Resistance Junction to Case	20°C / W
	– H Package	
	– SMD Package	TBA°C / W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	120°C / W
	– H Package	
	– J Package	119°C / W
T_J	Operating Junction Temperature Range	-55 to 150°C
T_{stg}	Storage Temperature	-65 to 150°C

Note 1. Although power dissipation is internally limited, these specifications are applicable for maximum power dissipation P_{MAX} of 2W for the H-Package, 1.05W for the J-Package and 15W for the SG-Package.

ELECTRICAL CHARACTERISTICS

Parameter	Test Conditions	IP79M05A IP120MA-05			IP79M05 IP120M-05			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	
V_O Output Voltage	$I_O = 100\text{mA}$ $V_{IN} = -10\text{V}$	-4.95	-5	-5.05	-4.8	-5	-5.2	V
	$I_O = 5\text{mA to } 350\text{mA}$ $P_D \leq P_{MAX}$ $V_{IN} = -7\text{V to } -25\text{V}$ $T_J = -55 \text{ to } 150^\circ\text{C}$	-4.85		-5.15	-4.75		-5.25	
ΔV_O Line Regulation	$I_O = 350\text{mA}$	$V_{IN} = -7\text{V to } -25\text{V}$	3	10			50	mV
		$V_{IN} = -8\text{V to } -18\text{V}$ $T_J = -55 \text{ to } 150^\circ\text{C}$	3	10			30	
ΔV_O Load Regulation	$I_O = 5\text{mA to } 500\text{mA}$ $V_{IN} = -10\text{V}$ $T_J = -55 \text{ to } 150^\circ\text{C}$		5	50			100	mV
I_Q Quiescent Current	$V_{IN} = -10\text{V}$ $I_O = 350\text{mA}$ $T_J = -55 \text{ to } 150^\circ\text{C}$		1	2		1	2	mA
ΔI_Q Quiescent Current Change	$I_O = 5\text{mA to } 500\text{mA}$ $V_{IN} = -10\text{V}$ $T_J = -55 \text{ to } 150^\circ\text{C}$		0.1	0.4			0.4	mA
	$I_O = 200\text{mA}$ $V_{IN} = -8\text{V to } -25\text{V}$ $T_J = -55 \text{ to } 150^\circ\text{C}$		0.1	0.4			0.4	
V_N Output Noise Voltage	$f = 10\text{Hz to } 100\text{kHz}$		40	400			400	μV
$\frac{\Delta V_{IN}}{\Delta V_O}$ Ripple Rejection	$f = 120\text{Hz}$ $V_{IN} = -8\text{V to } -18\text{V}$	$I_O = 300\text{mA}$	65	80	54			dB
		$I_O = 100\text{mA}$ $T_J = -55 \text{ to } 150^\circ\text{C}$	65	80	54			
Dropout Voltage	$I_O = 350\text{mA}$		1.1	2.3			2.3	V
I_{sc} Short Circuit Current	$V_{IN} = -35\text{V}$		300	600		300	600	mA
I_{pk} Peak Output Current	$V_{IN} = -10\text{V}$	0.5	1.0	1.4	0.5	1.0	1.6	A
Average Temperature Coefficient of V_O	$I_O = 5\text{mA}$		0.5	2.0		0.5		$\frac{\text{mV}}{^\circ\text{C}}$

1) All characteristics are measured with a capacitor across the input of $0.22\mu\text{F}$ and a capacitor across the output of $0.1\mu\text{F}$.

All characteristics except noise voltage and ripple rejection ratio are measured using pulse techniques ($t_p \leq 10\text{ms}$, $\delta \leq 5\%$). Output voltage changes due to changes in internal temperature must be taken into account separately.

2) Test Conditions unless otherwise stated: $T_J = 25^\circ\text{C}$

$P_{MAX} = 2\text{W}$ for H Package (TO-39)

$P_{MAX} = 1.05\text{W}$ for J Package (CERDIP)

$P_{MAX} = 15\text{W}$ for SMD1 Package (SMD1)

ELECTRICAL CHARACTERISTICS

Parameter	Test Conditions	IP79M12A IP120MA-12			IP79M12 IP120M-12			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	
V_O Output Voltage	$I_O = 100\text{mA}$ $V_{IN} = -19\text{V}$	-11.88	-12	-12.12	-11.5	-12	-12.5	V
	$I_O = 5\text{mA to } 350\text{mA}$ $P_D \leq P_{MAX}$ $V_{IN} = -14.5\text{V to } -30\text{V}$ $T_J = -55 \text{ to } 150^\circ\text{C}$	-11.64		-12.36	-11.4		-12.6	
ΔV_O Line Regulation	$I_O = 350\text{mA}$ $V_{IN} = -14.5\text{V to } -30\text{V}$ $T_J = -55 \text{ to } 150^\circ\text{C}$		4	18			80	mV
			4	18			50	
ΔV_O Load Regulation	$I_O = 5\text{mA to } 500\text{mA}$ $V_{IN} = -19\text{V}$ $T_J = -55 \text{ to } 150^\circ\text{C}$		10	60			240	mV
I_Q Quiescent Current	$V_{IN} = -19\text{V}$ $I_O = 350\text{mA}$ $T_J = -55 \text{ to } 150^\circ\text{C}$		1.5	3		1.5	3	mA
ΔI_Q Quiescent Current Change	$I_O = 5\text{mA to } 500\text{mA}$ $V_{IN} = -19\text{V}$ $T_J = -55 \text{ to } 150^\circ\text{C}$		0.1	0.4			0.4	mA
	$I_O = 200\text{mA}$ $V_{IN} = -14.5\text{V to } -30\text{V}$ $T_J = -55 \text{ to } 150^\circ\text{C}$		0.1	0.4			0.4	
V_N Output Noise Voltage	$f = 10\text{Hz to } 100\text{kHz}$		96	960			960	μV
$\frac{\Delta V_{IN}}{\Delta V_O}$ Ripple Rejection	$f = 120\text{Hz}$ $I_O = 300\text{mA}$	58	72		54			dB
	$V_{IN} = -15\text{V to } -25\text{V}$ $I_O = 100\text{mA}$ $T_J = -55 \text{ to } 150^\circ\text{C}$	58	72		54			
Dropout Voltage	$I_O = 350\text{mA}$		1.1	2.3			2.3	V
I_{sc} Short Circuit Current	$V_{IN} = -35\text{V}$		300	600		300	600	mA
I_{pk} Peak Output Current	$V_{IN} = -19\text{V}$	0.5	1.0	1.4	0.5	1.0	1.6	A
Average Temperature Coefficient of V_O	$I_O = 5\text{mA}$		1.2	4.8		1.2		$\text{mV}/^\circ\text{C}$

- 1) All characteristics are measured with a capacitor across the input of $0.22\mu\text{F}$ and a capacitor across the output of $0.1\mu\text{F}$.
 All characteristics except noise voltage and ripple rejection ratio are measured using pulse techniques ($t_p \leq 10\text{ms}$, $\delta \leq 5\%$). Output voltage changes due to changes in internal temperature must be taken into account separately.
- 2) Test Conditions unless otherwise stated: $T_J = 25^\circ\text{C}$
 $P_{MAX} = 2\text{W}$ for H Package (TO-39)
 $P_{MAX} = 1.05\text{W}$ for J Package (CERDIP)
 $P_{MAX} = 15\text{W}$ for SMD Package (SMD1)

ELECTRICAL CHARACTERISTICS

Parameter	Test Conditions	IP79M15A IP120MA-15			IP79M15 IP120M-15			Units	
		Min.	Typ.	Max.	Min.	Typ.	Max.		
V _O Output Voltage	I _O = 100mA V _{IN} = -23V	-14.85	-15	-15.15	-14.4	-15	-15.6	V	
	I _O = 5mA to 350mA P _D ≤ P _{MAX} V _{IN} = -17.5V to -30V T _J = -55 to 150°C	-14.55		-15.45	-14.25		-15.75		
ΔV _O Line Regulation	I _O = 350mA V _{IN} = -17.5V to -30V T _J = -55 to 150°C		4	22			80	mV	
			4	22			50		
ΔV _O Load Regulation	I _O = 5mA to 500mA V _{IN} = -23V T _J = -55 to 150°C		12	75			240	mV	
I _Q Quiescent Current	V _{IN} = -23V I _O = 350mA T _J = -55 to 150°C		1.5	3		1.5	3	mA	
ΔI _Q Quiescent Current Change	I _O = 5mA to 500mA V _{IN} = -23V T _J = -55 to 150°C		0.1	0.4			0.4	mA	
	I _O = 200mA V _{IN} = -17.5V to -30V T _J = -55 to 150°C		0.1	0.4			0.4		
V _N Output Noise Voltage	f = 10Hz to 100kHz		120	1200			1200	μV	
$\frac{\Delta V_{IN}}{\Delta V_O}$ Ripple Rejection	f = 120Hz V _{IN} = -18.5V to -28.5V	I _O = 300mA	57	70		54		dB	
		I _O = 100mA T _J = -55 to 150°C	57	70		54			
Dropout Voltage	I _O = 350mA		1.1	2.3			2.3	V	
I _{sc} Short Circuit Current	V _{IN} = -35V		300	600		300	600	mA	
I _{pk} Peak Output Current	V _{IN} = -23V		0.5	1.0	1.4	0.5	1.0	1.6	A
Average Temperature Coefficient of V _O	I _O = 5mA		1.5	6.0		1.5		mV/°C	

1) All characteristics are measured with a capacitor across the input of 0.22μF and a capacitor across the output of 0.1μF.

All characteristics except noise voltage and ripple rejection ratio are measured using pulse techniques ($t_p \leq 10\text{ms}$, $\delta \leq 5\%$). Output voltage changes due to changes in internal temperature must be taken into account separately.

2) Test Conditions unless otherwise stated: T_J = 25°C

P_{MAX} = 2W for H Package (TO-39)

P_{MAX} = 1.05W for J Package (CERDIP)

P_{MAX} = 15W for SMD Package (SMD1)