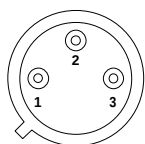
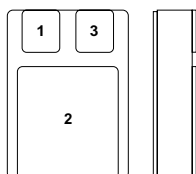


0.5 AMP NEGATIVE VOLTAGE REGULATOR



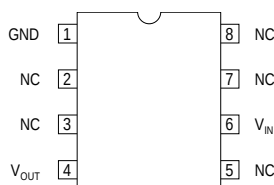
Pin 1 – Ground
 Pin 2 – V_{OUT}
 Case – V_{IN}

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 CERP	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	– H Package 20°C / W – SMD Package TBA°C / W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	– H Package 120°C / W – 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 = 100mA V _{IN} = -10V		-4.95	-5	-5.05	-4.8	-5	-5.2	V				
		I _O = 5mA to 350mA P _D ≤ P _{MAX} V _{IN} = -7V to -25V T _J = -55 to 150°C		-4.85			-5.15				-4.75		-5.25	
ΔV _O	Line Regulation	I _O = 350mA	V _{IN} = -7V to -25V	3		10	50			mV				
			V _{IN} = -8V to -18V T _J = -55 to 150°C	3		10	30							
ΔV _O	Load Regulation	I _O = 5mA to 500mA V _{IN} = -10V T _J = -55 to 150°C		5		50	100			mV				
I _Q	Quiescent Current	V _{IN} = -10V I _O = 350mA T _J = -55 to 150°C	1		2	1		2	mA					
ΔI _Q	Quiescent Current Change	I _O = 5mA to 500mA V _{IN} = -10V T _J = -55 to 150°C		0.1		0.4	0.4			mA				
		I _O = 200mA V _{IN} = -8V to -25V T _J = -55 to 150°C		0.1		0.4	0.4							
V _N	Output Noise Voltage	f = 10Hz to 100kHz		40		400	400			μV				
$\frac{\Delta V_{IN}}{\Delta V_O}$	Ripple Rejection	f = 120Hz	I _O = 300mA	65	80	54			dB					
		V _{IN} = -8V to -18V	I _O = 100mA T _J = -55 to 150°C	65	80	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} = -10V		0.5	1.0	1.4	0.5	1.0	1.6	A				
Average Temperature Coefficient of V _O		I _O = 5mA		0.5		2.0	0.5		mV/°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 = 100mA V _{IN} = -19V		-11.88	-12	-12.12	-11.5	-12	-12.5	V
		I _O = 5mA to 350mA		-11.64		-12.36	-11.4		-12.6	
		P _D ≤ P _{MAX} V _{IN} = -14.5V to -30V								
		T _J = -55 to 150°C								
ΔV _O	Line Regulation	I _O = 350mA	V _{IN} = -14.5V to -30V	4	18			80	mV	
			V _{IN} = -15V to -25V T _J = -55 to 150°C	4	18			50		
ΔV _O	Load Regulation	I _O = 5mA to 500mA V _{IN} = -19V T _J = -55 to 150°C		10	60			240	mV	
I _Q	Quiescent Current	V _{IN} = -19V	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} = -19V T _J = -55 to 150°C		0.1	0.4			0.4	mA	
		I _O = 200mA V _{IN} = -14.5V to -30V T _J = -55 to 150°C		0.1	0.4			0.4		
V _N	Output Noise Voltage	f = 10Hz to 100kHz		96	960			960	μV	
$\frac{\Delta V_{IN}}{\Delta V_O}$	Ripple Rejection	f = 120Hz	I _O = 300mA	58	72		54		dB	
		V _{IN} = -15V to -25V	I _O = 100mA T _J = -55 to 150°C	58	72		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} = -19V		0.5	1.0	1.4	0.5	1.0	1.6	A
Average Temperature Coefficient of V _O		I _O = 5mA		1.2	4.8		1.2		mV/°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		4	22			80	mV
			V _{IN} = -18V to -28V T _J = -55 to 150°C		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	I _O = 300mA	57	70		54			dB
		V _{IN} = -18.5V to -28.5V	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

- 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 ≤ 10ms, δ ≤ 5%). Output voltage changes due to changes in internal temperature must be taken into account separately.
- 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)