IP120MA SERIES
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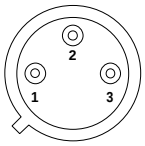
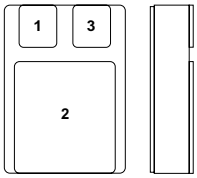
IP79M00A SERIES
IP79M00 SERIES

0.5 AMP NEGATIVE VOLTAGE REGULATOR



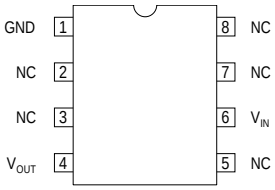
Pin 1 – Ground
Pin 2 – V_{OUT}
Case – V_{IN}

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 ±1% output voltage tolerance at room temperature. Protection features include safe operating area, current limiting and thermal shutdown.

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise stated)

V_I	DC Input Voltage	(for V_O = -5, -12, -15V)		-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.

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Prelim. 9/00

ELECTRICAL CHARACTERISTICS

Parameter		Test Conditions		IP79M05A IP120MA–05 Min.	Typ.	Max.	IP79M05 IP120M–05 Min.	Typ.	Max.	Units
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 $P_D \le P_{MAX}$ 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 V_{IN} = -8V to -18V	I_O = 300mA	65	80		54			dB
			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 0.22µF and a capacitor across the output of 0.1µF.

All characteristics except noise voltage and ripple rejection ratio are measured using pulse techniques ($t_p \le 10$ms, $\delta \le 5\%$). 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 SMD1 Package (SMD1)

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ELECTRICAL CHARACTERISTICS

Parameter		Test Conditions		IP79M12A IP120MA–12 Min.	Typ.	Max.	IP79M12 IP120M–12 Min.	Typ.	Max.	Units
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 $P_D \le P_{MAX}$ T_J = -55 to 150°C	V_{IN} = -14.5V to -30V	-11.64		-12.36	-11.4		-12.6	
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 V_{IN} = -15V to -25V	I_O = 300mA	58	72		54			dB
			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 0.22µF and a capacitor across the output of 0.1µF.

All characteristics except noise voltage and ripple rejection ratio are measured using pulse techniques ($t_p \le$ 10ms, $\delta \le$ 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)

ELECTRICAL CHARACTERISTICS

Parameter		Test Conditions		IP79M15A IP120MA–15 Min.	Typ.	Max.	IP79M15 IP120M–15 Min.	Typ.	Max.	Units
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 $P_D \le P_{MAX}$ T_J = -55 to 150°C	V_{IN} = -17.5V to -30V	-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

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 ($t_p \le$ 10ms, $\delta \le$ 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)