

# MC79XX/MC79XXA/LM79XX

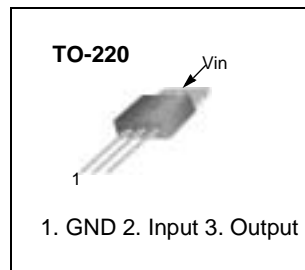
## 3-Terminal 1A Negative Voltage Regulator

### Features

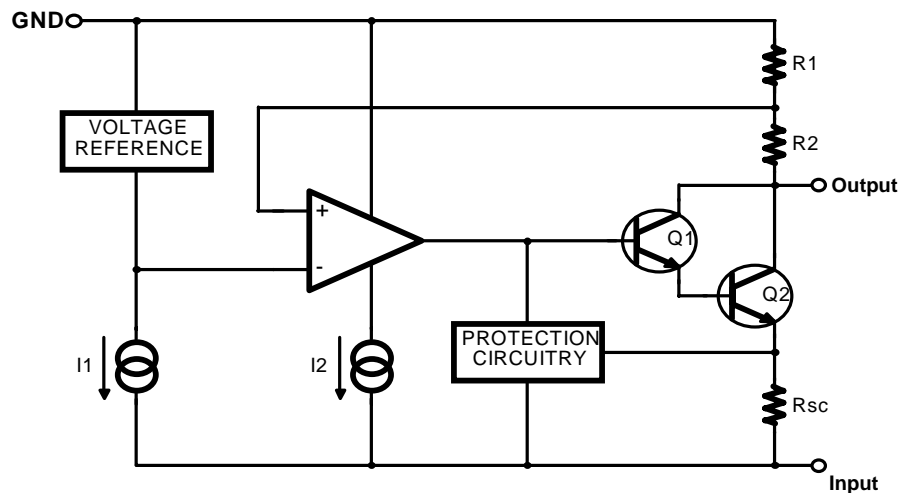
- Output Current in Excess of 1A
- Output Voltages of -5, -6, -8, -9, -10, -12, -15, -18 and -24V
- Internal Thermal Overload Protection
- Short Circuit Protection
- Output Transistor Safe Operating Area Compensation

### Description

The MC79XX / MC79XXA / LM79XX series of three terminal negative regulators are available in TO-220 package and with several fixed output voltages, making them useful in a wide range of applications. Each type employs internal current limiting, thermal shut down and safe operating area protection, making it essentially indestructible.



### Internal Block Diagram



## Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input Voltage	$V_I$	-35	V
Thermal Resistance Junction-Case (Note1)	$R_{\theta JC}$	5	°C/W
Thermal Resistance Junction-Air (Note1, 2)	$R_{\theta JA}$	65	
Operating Temperature Range	$T_{OPR}$	0 ~ +125	°C
Storage Temperature Range	$T_{STG}$	-65 ~ +150	°C

### Note:

- Thermal resistance test board  
Size: 76.2mm \* 114.3mm \* 1.6mm(1S0P)  
JEDEC standard: JESD51-3, JESD51-7
- Assume no ambient airflow

## Electrical Characteristics (MC7905/LM7905)

( $V_I = -10V$ ,  $I_O = 500mA$ ,  $0^\circ C \leq T_J \leq +125^\circ C$ ,  $C_I = 2.2\mu F$ ,  $C_O = 1\mu F$ , unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25^\circ C$	-4.8	-5.0	-5.2	V	
		$I_O = 5mA$ to 1A, $P_O \leq 15W$ $V_I = -7V$ to -20V	-4.75	-5.0	-5.25		
Line Regulation (Note3)	$\Delta V_O$	$T_J = +25^\circ C$	$V_I = -7V$ to -25V	-	35	100	mV
			$V_I = -8V$ to -12V	-	8	50	
Load Regulation (Note3)	$\Delta V_O$	$T_J = +25^\circ C$ $I_O = 5mA$ to 1.5A	-	10	100	mV	
		$T_J = +25^\circ C$ $I_O = 250mA$ to 750mA	-	3	50		
Quiescent Current	$I_Q$	$T_J = +25^\circ C$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5mA$ to 1A	-	0.05	0.5	mA	
		$V_I = -8V$ to -25V	-	0.1	0.8		
Temperature Coefficient of $V_D$	$\Delta V_O / \Delta T$	$I_O = 5mA$	-	-0.4	-	mV/°C	
Output Noise Voltage	$V_N$	$f = 10Hz$ to 100kHz $T_A = +25^\circ C$	-	40	-	$\mu V$	
Ripple Rejection	RR	$f = 120Hz$ $\Delta V_I = 10V$	54	60	-	dB	
Dropout Voltage	$V_D$	$T_J = +25^\circ C$ $I_O = 1A$	-	2	-	V	
Short Circuit Current	$I_{SC}$	$T_J = +25^\circ C$ , $V_I = -35V$	-	300	-	mA	
Peak Current	$I_{PK}$	$T_J = +25^\circ C$	-	2.2	-	A	

### Note

- Load and line regulation are specified at constant junction temperature. Changes in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**Electrical Characteristics (MC7906)** (Continued)(V<sub>I</sub> = -11V, I<sub>O</sub> = 500mA, 0°C ≤ T<sub>J</sub> ≤ +125°C, C<sub>I</sub> = 2.2μF, C<sub>O</sub> = 1μF, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	V <sub>O</sub>	T <sub>J</sub> = +25°C	-5.75	-6	-6.25	V	
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = -9V to -21V	-5.7	-6	-6.3		
Line Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C	V <sub>I</sub> = -8V to -25V	-	10	120	mV
			V <sub>I</sub> = -9V to -13V	-	5	60	
Load Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 5mA to 1.5A	-	10	120	mV	
		T <sub>J</sub> = +25°C I <sub>O</sub> = 250mA to 750mA	-	3	60		
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> = +25°C	-	3	6	mA	
Quiescent Current Change	ΔI <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A	-	0.05	0.5	mA	
		V <sub>I</sub> = -8V to -25V	-	0.1	1.3		
Temperature Coefficient of V <sub>D</sub>	ΔV <sub>O</sub> /ΔT	I <sub>O</sub> = 5mA	-	-0.5	-	mV/°C	
Output Noise Voltage	V <sub>N</sub>	f = 10Hz to 100kHz T <sub>A</sub> = +25°C	-	130	-	μV	
Ripple Rejection	RR	f = 120Hz ΔV <sub>I</sub> = 10V	54	60	-	dB	
Dropout Voltage	V <sub>D</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 1A	-	2	-	V	
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> = +25°C, V <sub>I</sub> = -35V	-	300	-	mA	
Peak Current	I <sub>PK</sub>	T <sub>J</sub> = +25°C	-	2.2	-	A	

**Note**

1. Load and line regulation are specified at constant junction temperature. Changes in V<sub>O</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**Electrical Characteristics (MC7908)** (Continued)(V<sub>I</sub> = -14V, I<sub>O</sub> = 500mA, 0°C ≤ T<sub>J</sub> ≤ +125°C, C<sub>I</sub> = 2.2μF, C<sub>O</sub> = 1μF, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	V <sub>O</sub>	T <sub>J</sub> = +25°C	-7.7	-8	-8.3	V	
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = -10V to -23V	-7.6	-8	-8.4		
Line Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C	V <sub>I</sub> = -10.5V to -25V	-	10	160	mV
			V <sub>I</sub> = -11V to -17V	-	5	80	
Load Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 5mA to 1.5A	-	12	160	mV	
		T <sub>J</sub> = +25°C I <sub>O</sub> = 250mA to 750mA	-	4	80		
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> = +25°C	-	3	6	mA	
Quiescent Current Change	ΔI <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A	-	0.05	0.5	mA	
		V <sub>I</sub> = -10.5V to -25V	-	0.1	1		
Temperature Coefficient of V <sub>D</sub>	ΔV <sub>O</sub> /ΔT	I <sub>O</sub> = 5mA	-	-0.6	-	mV/°C	
Output Noise Voltage	V <sub>N</sub>	f = 10Hz to 100kHz T <sub>A</sub> = +25°C	-	175	-	μV	
Ripple Rejection	RR	f = 120Hz ΔV <sub>I</sub> = 10V	54	60	-	dB	
Dropout Voltage	V <sub>D</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 1A	-	2	-	V	
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> = +25°C, V <sub>I</sub> = -35V	-	300	-	mA	
Peak Current	I <sub>PK</sub>	T <sub>J</sub> = +25°C	-	2.2	-	A	

**Note**

1. Load and line regulation are specified at constant junction temperature. Changes in V<sub>O</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**Electrical Characteristics (MC7909)** (Continued)(V<sub>I</sub> = -15V, I<sub>O</sub> = 500mA, 0°C ≤ T<sub>J</sub> ≤ +125°C, C<sub>I</sub> = 2.2μF, C<sub>O</sub> = 1μF, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	V <sub>O</sub>	T <sub>J</sub> = +25°C	-8.7	-9.0	-9.3	V	
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = -1.5V to -23V	-8.6	-9.0	-9.4		
Line Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C	V <sub>I</sub> = -11.5V to -26V	-	10	180	mV
			V <sub>I</sub> = -12V to -18V	-	5	90	
Load Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 5mA to 1.5A	-	12	180	mV	
		T <sub>J</sub> = +25°C I <sub>O</sub> = 250mA to 750mA	-	4	90		
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> = +25°C	-	3	6	mA	
Quiescent Current Change	ΔI <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A	-	0.05	0.5	mA	
		V <sub>I</sub> = -11.5V to -26V	-	0.1	1		
Temperature Coefficient of V <sub>D</sub>	ΔV <sub>O</sub> /ΔT	I <sub>O</sub> = 5mA	-	-0.6	-	mV/°C	
Output Noise Voltage	V <sub>N</sub>	f = 10Hz to 100kHz T <sub>A</sub> = +25°C	-	175	-	μV	
Ripple Rejection	RR	f = 120Hz ΔV <sub>I</sub> = 10V	54	60	-	dB	
Dropout Voltage	V <sub>D</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 1A	-	2	-	V	
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> = +25°C, V <sub>I</sub> = -35V	-	300	-	mA	
Peak Current	I <sub>PK</sub>	T <sub>J</sub> = +25°C	-	2.2	-	A	

**Note:**

1. Load and line regulation are specified at constant junction temperature. Changes in V<sub>O</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**Electrical Characteristics (MC7910)** (Continued)(V<sub>I</sub> = -17V, I<sub>O</sub> = 500mA, 0°C ≤ T<sub>J</sub> ≤ +125°C, C<sub>I</sub> = 2.2μF, C<sub>O</sub> = 1μF, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	V <sub>O</sub>	T <sub>J</sub> = +25°C	-9.6	-10	-10.4	V	
		I <sub>O</sub> = 5mA to 1A, P <sub>d</sub> ≤ 15W V <sub>I</sub> = -12V to -28	-9.5	-10	-10.5		
Line Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C	V <sub>I</sub> = -12.5V to -28V	-	12	200	mV
			V <sub>I</sub> = -14V to -20V	-	6	100	
Load Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 5mA to 1.5A	-	12	200	mV	
		T <sub>J</sub> = +25°C I <sub>O</sub> = 250mA to 750mA	-	4	100		
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> = +25°C	-	3	6	mA	
Quiescent Current Change	ΔI <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A	-	0.05	0.5	mA	
		V <sub>I</sub> = -12.5V to -28V	-	0.1	1		
Temperature Coefficient of V <sub>O</sub>	ΔV <sub>O</sub> /ΔT	I <sub>O</sub> = 5mA	-	-1	-	mV/°C	
Output Noise Voltage	V <sub>N</sub>	10Hz ≤ f ≤ 100kHz T <sub>A</sub> = +25°C	-	280	-	μV	
Ripple Rejection	RR	f = 120Hz ΔV <sub>I</sub> = 10V	54	60	-	dB	
Dropout Voltage	V <sub>D</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 1A	-	2	-	V	
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> = +25°C, V <sub>I</sub> = -35V	-	300	-	mA	
Peak Current	I <sub>PK</sub>	T <sub>J</sub> = +25°C	-	2.2	-	A	

**Note:**

1. Load and line regulation are specified at constant junction temperature. Changes in V<sub>O</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**Electrical Characteristics (MC7912)** (Continued)(V<sub>I</sub> = -19V, I<sub>O</sub> = 500mA, 0°C ≤ T<sub>J</sub> ≤ +125°C, C<sub>I</sub> = 2.2μF, C<sub>O</sub> = 1μF, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	V <sub>O</sub>	T <sub>J</sub> = +25°C	-11.5	-12	-12.5	V	
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = -15.5V to -27V	-11.4	-12	-12.6		
Line Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C	V <sub>I</sub> = -14.5V to -30V	-	12	240	mV
			V <sub>I</sub> = -16V to -22V	-	6	120	
Load Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 5mA to 1.5A	-	12	240	mV	
		T <sub>J</sub> = +25°C I <sub>O</sub> = 250mA to 750mA	-	4	120		
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> = +25°C	-	3	6	mA	
Quiescent Current Change	ΔI <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A	-	0.05	0.5	mA	
		V <sub>I</sub> = -14.5V to -30V	-	0.1	1		
Temperature Coefficient of V <sub>D</sub>	ΔV <sub>O</sub> /ΔT	I <sub>O</sub> = 5mA	-	-0.8	-	mV/°C	
Output Noise Voltage	V <sub>N</sub>	f = 10Hz to 100kHz T <sub>A</sub> = +25°C	-	200	-	μV	
Ripple Rejection	RR	f = 120Hz ΔV <sub>I</sub> = 10V	54	60	-	dB	
Dropout Voltage	V <sub>D</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 1A	-	2	-	V	
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> = +25°C, V <sub>I</sub> = -35V	-	300	-	mA	
Peak Current	I <sub>PK</sub>	T <sub>J</sub> = +25°C	-	2.2	-	A	

**Note:**

1. Load and line regulation are specified at constant junction temperature. Changes in V<sub>O</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**Electrical Characteristics (MC7915)** (Continued)(V<sub>I</sub> = -23V, I<sub>O</sub> = 500mA, 0°C ≤ T<sub>J</sub> ≤ +125°C, C<sub>I</sub> = 2.2μF, C<sub>O</sub> = 1μF, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	V <sub>O</sub>	T <sub>J</sub> = +25°C	-14.4	-15	-15.6	V	
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = -18V to -30V	-14.25	-15	-15.75		
Line Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C	V <sub>I</sub> = -17.5V to -30V	-	12	300	mV
			V <sub>I</sub> = -20V to -26V	-	6	150	
Load Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 5mA to 1.5A	-	12	300	mV	
		T <sub>J</sub> = +25°C I <sub>O</sub> = 250mA to 750mA	-	4	150		
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> = +25°C	-	3	6	mA	
Quiescent Current Change	ΔI <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A	-	0.05	0.5	mA	
		V <sub>I</sub> = -17.5V to -30V	-	0.1	1		
Temperature Coefficient of V <sub>D</sub>	ΔV <sub>O</sub> /ΔT	I <sub>O</sub> = 5mA	-	-0.9	-	mV/°C	
Output Noise Voltage	V <sub>N</sub>	f = 10Hz to 100kHz T <sub>A</sub> = +25°C	-	250	-	μV	
Ripple Rejection	RR	f = 120Hz ΔV <sub>I</sub> = 10V	54	60	-	dB	
Dropout Voltage	V <sub>D</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 1A	-	2	-	V	
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> = +25°C, V <sub>I</sub> = -35V	-	300	-	mA	
Peak Current	I <sub>PK</sub>	T <sub>J</sub> = +25°C	-	2.2	-	A	

**Note:**

1. Load and line regulation are specified at constant junction temperature. Changes in V<sub>O</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used.



**Electrical Characteristics (MC7918)** (Continued)(V<sub>I</sub> = -27V, I<sub>O</sub> = 500mA, 0°C ≤ T<sub>J</sub> ≤ +125°C, C<sub>I</sub> = 2.2μF, C<sub>O</sub> = 1μF, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	V <sub>O</sub>	T <sub>J</sub> = +25°C	-17.3	-18	-18.7	V	
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = -22.5V to -33V	-17.1	-18	-18.9		
Line Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C	V <sub>I</sub> = -21V to -33V	-	15	360	mV
			V <sub>I</sub> = -24V to -30V	-	8	180	
Load Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 5mA to 1.5A	-	15	360	mV	
		T <sub>J</sub> = +25°C I <sub>O</sub> = 250mA to 750mA	-	5	180		
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> = +25°C	-	3	6	mA	
Quiescent Current Change	ΔI <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A	-	0.05	0.5	mA	
		V <sub>I</sub> = -21V to -33V	-	0.1	1		
Temperature Coefficient of V <sub>D</sub>	ΔV <sub>O</sub> /ΔT	I <sub>O</sub> = 5mA	-	-1	-	mV/°C	
Output Noise Voltage	V <sub>N</sub>	f = 10Hz to 100kHz T <sub>A</sub> = +25°C	-	300	-	μV	
Ripple Rejection	RR	f = 120Hz ΔV <sub>I</sub> = 10V	54	60	-	dB	
Dropout Voltage	V <sub>D</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 1A	-	2	-	V	
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> = +25°C, V <sub>I</sub> = -35V	-	300	-	mA	
Peak Current	I <sub>PK</sub>	T <sub>J</sub> = +25°C	-	2.2	-	A	

**Note:**

1. Load and line regulation are specified at constant junction temperature. Changes in V<sub>O</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**Electrical Characteristics (MC7924)** (Continued)(V<sub>I</sub> = -33V, I<sub>O</sub> = 500mA, 0°C ≤ T<sub>J</sub> ≤ +125°C, C<sub>I</sub> = 2.2μF, C<sub>O</sub> = 1μF, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	V <sub>O</sub>	T <sub>J</sub> = +25°C	-23	-24	-25	V	
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = -27V to -38V	-22.8	-24	-25.2		
Line Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C	V <sub>I</sub> = -27V to -38V	-	15	480	mV
			V <sub>I</sub> = -30V to -36V	-	8	180	
Load Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 5mA to 1.5A	-	15	480	mV	
		T <sub>J</sub> = +25°C I <sub>O</sub> = 250mA to 750mA	-	5	240		
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> = +25°C	-	3	6	mA	
Quiescent Current Change	ΔI <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A	-	0.05	0.5	mA	
		V <sub>I</sub> = -27V to -38V	-	0.1	1		
Temperature Coefficient of V <sub>D</sub>	ΔV <sub>O</sub> /ΔT	I <sub>O</sub> = 5mA	-	-1	-	mV/°C	
Output Noise Voltage	V <sub>N</sub>	f = 10Hz to 100kHz T <sub>A</sub> = +25°C	-	400	-	μV	
Ripple Rejection	RR	f = 120Hz ΔV <sub>I</sub> = 10V	54	60	-	dB	
Dropout Voltage	V <sub>D</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 1A	-	2	-	V	
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> = +25°C, V <sub>I</sub> = -35V	-	300	-	mA	
Peak Current	I <sub>PK</sub>	T <sub>J</sub> = +25°C	-	2.2	-	A	

**Note:**

1. Load and line regulation are specified at constant junction temperature. Changes in V<sub>O</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**Electrical Characteristics (MC7905A)** (Continued)(V<sub>I</sub> = -10V, I<sub>O</sub> = 500mA, 0°C ≤ T<sub>J</sub> ≤ +125°C, C<sub>I</sub> = 2.2μF, C<sub>O</sub> = 1μF, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	V <sub>O</sub>	T <sub>J</sub> = +25°C	-4.9	-5.0	-5.1	V	
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = -7V to -20V	-4.8	-5.0	-5.2		
Line Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C	V <sub>I</sub> = -7V to -20V I <sub>O</sub> =1A	-	5	50	mV
			V <sub>I</sub> = -8V to -12V I <sub>O</sub> =1A	-	2	25	
		V <sub>I</sub> = -7.5V to -25V	-	7	50		
		V <sub>I</sub> = -8V to -12V, I <sub>O</sub> =1A	-	7	50		
Load Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C, I <sub>O</sub> = 5mA to 1.5A	-	10	100	mV	
		T <sub>J</sub> = +25°C I <sub>O</sub> = 250mA to 750mA	-	3	50		
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> = +25°C	-	3	6	mA	
Quiescent Current Change	ΔI <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A	-	0.05	0.5	mA	
		V <sub>I</sub> = -8V to -25V	-	0.1	0.8		
Temperature Coefficient of V <sub>D</sub>	ΔV <sub>O</sub> /ΔT	I <sub>O</sub> = 5mA	-	-0.4	-	mV/°C	
Output Noise Voltage	V <sub>N</sub>	f = 10Hz to 100kHz T <sub>A</sub> = +25°C	-	40	-	μV	
Ripple Rejection	RR	f = 120Hz ΔV <sub>I</sub> = 10V	54	60	-	dB	
Dropout Voltage	V <sub>D</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 1A	-	2	-	V	
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> = +25°C, V <sub>I</sub> = -35V	-	300	-	mA	
Peak Current	I <sub>PK</sub>	T <sub>J</sub> = +25°C	-	2.2	-	A	

**Note:**

1. Load and line regulation are specified at constant junction temperature. Changes in V<sub>O</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**Electrical Characteristics (MC7912A)** (Continued)(V<sub>I</sub> = -19V, I<sub>O</sub> = 500mA, 0°C ≤ T<sub>J</sub> ≤ +125°C, C<sub>I</sub> = 2.2μF, C<sub>O</sub> = 1μF, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	V <sub>O</sub>	T <sub>J</sub> = +25°C	-11.75	-12	-12.25	V	
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = -15.5V to -27V	-11.5	-12	-12.5		
Line Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C	V <sub>I</sub> = -14.5V to -27V I <sub>O</sub> = 1A	-	12	120	mV
			V <sub>I</sub> = -16V to -22V I <sub>O</sub> = 1A	-	6	60	
		V <sub>I</sub> = -14.8V to -30V	-	12	120		
		V <sub>I</sub> = -16V to -22V, I <sub>O</sub> = 1A	-	12	120		
Load Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 5mA to 1.5A	-	12	150	mV	
		T <sub>J</sub> = +25°C I <sub>O</sub> = 250mA to 750mA	-	4	75		
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> = +25°C	-	3	6	mA	
Quiescent Current Change	ΔI <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A	-	0.05	0.5	mA	
		V <sub>I</sub> = -15V to -30V	-	0.1	1		
Temperature Coefficient of V <sub>D</sub>	ΔV <sub>O</sub> /ΔT	I <sub>O</sub> = 5mA	-	-0.8	-	mV/°C	
Output Noise Voltage	V <sub>N</sub>	f = 10Hz to 100kHz T <sub>A</sub> = +25°C	-	200	-	μV	
Ripple Rejection	RR	f = 120Hz ΔV <sub>I</sub> = 10V	54	60	-	dB	
Dropout Voltage	V <sub>D</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 1A	-	2	-	V	
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> = +25°C, V <sub>I</sub> = -35V	-	300	-	mA	
Peak Current	I <sub>PK</sub>	T <sub>J</sub> = +25°C	-	2.2	-	A	

**Note:**

1. Load and line regulation are specified at constant junction temperature. Changes in V<sub>O</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used.

**Electrical Characteristics (MC7915A)** (Continued)(V<sub>I</sub> = -23V, I<sub>O</sub> = 500mA, 0°C ≤ T<sub>J</sub> ≤ +125°C, C<sub>I</sub> = 2.2μF, C<sub>O</sub> = 1μF, unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	V <sub>O</sub>	T <sub>J</sub> = +25°C	-14.7	-15	-15.3	V	
		I <sub>O</sub> = 5mA to 1A, P <sub>O</sub> ≤ 15W V <sub>I</sub> = -18V to -30V	-14.4	-15	-15.6		
Line Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C	V <sub>I</sub> = -17.5V to -30V I <sub>O</sub> = 1A	-	12	150	mV
			V <sub>I</sub> = -20V to -26V I <sub>O</sub> = 1A	-	6	75	
		V <sub>I</sub> = -17.9V to -30V	-	12	150		
		V <sub>I</sub> = -20V to -26V, I <sub>O</sub> = 1A	-	6	150		
Load Regulation (Note1)	ΔV <sub>O</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 5mA to 1.5A	-	12	150	mV	
		T <sub>J</sub> = +25°C I <sub>O</sub> = 250mA to 750mA	-	4	75		
Quiescent Current	I <sub>Q</sub>	T <sub>J</sub> = +25°C	-	3	6	mA	
Quiescent Current Change	ΔI <sub>Q</sub>	I <sub>O</sub> = 5mA to 1A	-	0.05	0.5	mA	
		V <sub>I</sub> = -18.5V to -30V	-	0.1	1		
Temperature Coefficient of V <sub>D</sub>	ΔV <sub>O</sub> /ΔT	I <sub>O</sub> = 5mA	-	-0.9	-	mV/°C	
Output Noise Voltage	V <sub>N</sub>	f = 10Hz to 100kHz T <sub>A</sub> = +25°C	-	250	-	μV	
Ripple Rejection	RR	f = 120Hz ΔV <sub>I</sub> = 10V	54	60	-	dB	
Dropout Voltage	V <sub>D</sub>	T <sub>J</sub> = +25°C I <sub>O</sub> = 1A	-	2	-	V	
Short Circuit Current	I <sub>SC</sub>	T <sub>J</sub> = +25°C, V <sub>I</sub> = -35V	-	300	-	mA	
Peak Current	I <sub>PK</sub>	T <sub>J</sub> = +25°C	-	2.2	-	A	

**Note:**

1. Load and line regulation are specified at constant junction temperature. Changes in V<sub>O</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used.

# Typical Performance Characteristics

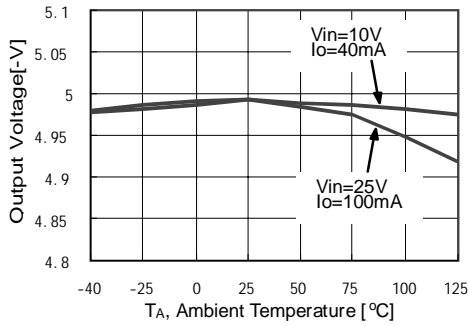


Figure 1. Output Voltage

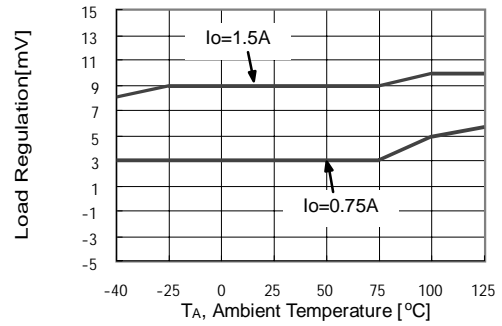


Figure 2. Load Regulation

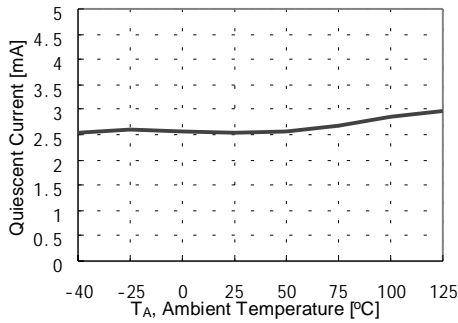


Figure 3. Quiescent Current

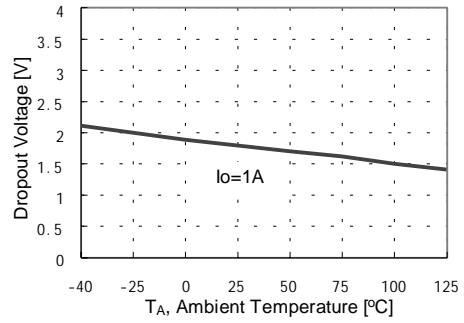


Figure 4. Dropout Voltage



Figure 5. Short Circuit Current

## Typical Applications

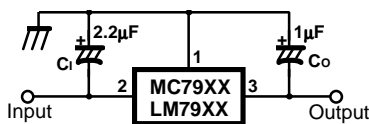


Figure 6. Negative Fixed output regulator

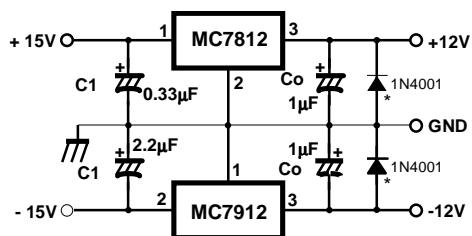


Figure 7. Split power supply ( ± 12V/1A)

### Notes:

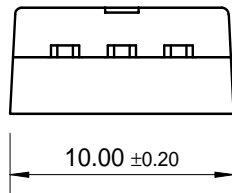
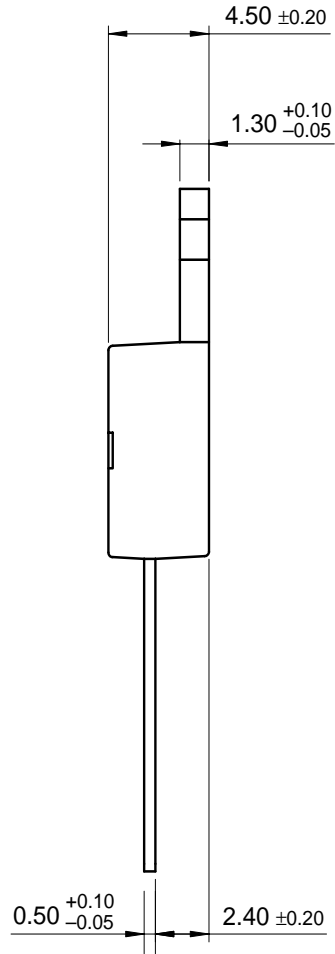
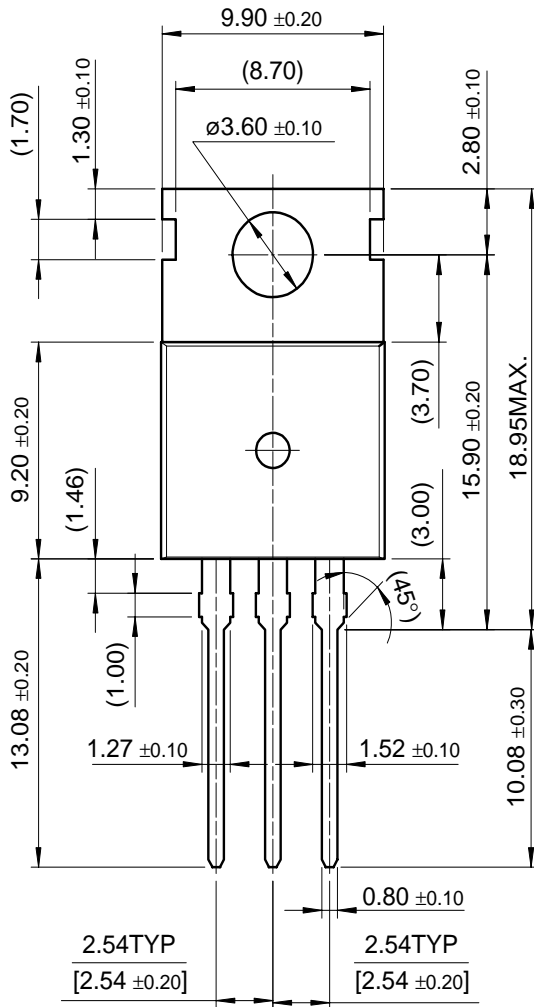
- (1) To specify an output voltage, substitute voltage value for "XX "
- (2) Required for stability. For value given, capacitor must be solid tantalum. If aluminium electronics are used, at least ten times value shown should be selected. C<sub>1</sub> is required if regulator is located an appreciable distance from power supply filter.
- (3) To improve transient response. If large capacitors are used, a high current diode from input to output (1N4001 or similar) should be introduced to protect the device from momentary input short circuit.

# Mechanical Dimensions

## Package

Dimensions in millimeters

### TO-220





## Ordering Information

Product Number	Output Voltage Tolerance	Package	Operating Temperature
LM7905CT	±4%	TO-220	0 ~ +125°C
Product Number	Output Voltage Tolerance	Package	Operating Temperature
MC7905CT	±4%	TO-220	0 ~ +125°C
MC7906CT			
MC7908CT			
MC7909CT			
MC7910CT			
MC7912CT			
MC7915CT			
MC7918CT			
MC7924CT			
MC7905ACT			
MC7912ACT			
MC7915ACT			

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