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MC7905 THRU MC7924

Three-Terminal Negative Voltage Regulators

Features

- Output current in excess of 1.0 Ampere
- No external components required
- Internal thermal overload protection
- Internal short-circuit current limiting
- Output voltage offered in 2% tolerance

Maximum Ratings @ T_A=25°C, Unless Otherwise Noted

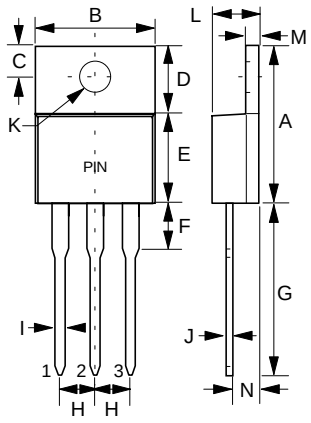
Parameter	Symbol	Value	Unit
Input Voltage	V_1	30	V
Operating Ambient Temperature	P_D	15	W
Operating Junction Temperature	T_{OPR}	-20---+75	°C
Storage Temperature Range	T_{STG}	-55---+125	°C

MC7905

Electrical Characteristics (Vi=10V, Io=500mA, 0°C<Tj<125°C, Ci=2.0uF, Co=1.0uF, Unless Otherwise Specified)

Parameter	Sym	Min	Typ	Max	Test conditions
Output Voltage	V_0	4.9V	5.0V	5.1V	T_j=25°C
		4.85V		5.15V	7V≦V_1≦20V, 5mA≦I_O≦1.0A, P_D=15W
Load Regulation	$\triangle V_o$		10mV	100mV	5mA≦I_O≦1.5A, T_j=25°C,
			3.0mV	50mV	250mA≦I_O≦750mA, T_j=25°C
Line regulation	$\triangle V_o$		3.0mV 1.0mV	100mV 50mV	7V≦V_1≦25V, T_j=25°C 8V≦V_1≦12V, T_j=25°C
Quiescent Current	I_q		2.0mA	4.0mA	T_j=25°C, I_O=0
Quiescent Current Change	$\triangle I_q$			1.3mA 0.5mA	7V≦V_1≦25V 5mA≦I_o≦1.0A
Output Noise Voltage	V_N		40μV		f=120Hz
Ripple Rejection	RR	62dB	74dB		8V≦V_1≦18V f=120Hz, T_j=25°C
Dropout Voltage	V_d		1.1V		I_O=1.0A, T_j=25°C
Peak Output Current	I_{opeak}		2.1A		T_j=25°C
Temperature Coefficient of Output voltage	$\triangle V_O$/ $\triangle Tj$		0.4mV/°C		0°C≦Tj≦125°C, I_O=5mA

TO-220



PIN 1. INPUT
PIN 2. GND
PIN 3. OUTPUT

DIMENSIONS					
DIM	INCHES MIN	INCHES MAX	MM MIN	MM MAX	NOTE
A	.560	.625	14.22	15.88	
B	.380	.420	9.65	10.67	
C	.100	.135	2.54	3.43	
D	.230	.270	5.84	6.86	
E	.380	.420	9.65	10.67	
F	------	.250	------	6.35	
G	.500	.580	12.70	14.73	
H	.090	.110	2.29	2.79	
I	.020	.045	0.51	1.14	
J	.012	.025	0.30	0.64	
K	.139	.161	3.53	4.09	Ø
L	.140	.190	3.56	4.83	
M	.045	.055	1.14	1.40	
N	.080	.115	2.03	2.92	

MC7906

Electrical Characteristics (Vi=11V, Io=500mA, 0°C<Tj<125°C, Ci=2.0uF, Co=1.0uF, Unless Otherwise Specified)

Parameter	Sym	Min	Typ	Max	Test conditions
Output Voltage	V_0	5.88V	6.0V	6.12V	T_j=25°C
		5.83V		6.17V	8V≦V_1≦21V, 5mA≦I_O≦1.0A, P_D=15W
Load Regulation	$\triangle V_o$		10mV	120mV	5mA≦I_O≦1.5A, T_j=25°C,
			3.0mV	60mV	250mA≦I_O≦750mA, T_j=25°C
Line regulation	$\triangle V_o$		4.0mV 1.5mV	120mV 60mV	8V≦V_1≦25V, T_j=25°C 9V≦V_1≦13V, T_j=25°C
Quiescent Current	I_q		2.0mA	4.0mA	T_j=25°C, I_O=0
Quiescent Current Change	$\triangle I_q$			1.3mA 0.5mA	8V≦V_1≦25V 5mA≦I_o≦1.0A
Output Noise Voltage	V_N		44μV		10Hz≦f≦100KHz T_j=25°C
Ripple Rejection	RR	60dB	73dB		f=120Hz
Dropout Voltage	V_d		1.1V		I_O=1.0A, T_j=25°C
Peak Output Current	I_{opeak}		2.1A		T_j=25°C
Temperature Coefficient of Output voltage	$\triangle V_O/\triangle Tj$		0.5mV/°C		0°C≦Tj≦125°C, I_O=5mA

MC7908

Electrical Characteristics (Vi=14V, Io=500mA, 0°C<Tj<125°C, Ci=2.0uF, Co=1.0uF, Unless Otherwise Specified)

Parameter	Sym	Min	Typ	Max	Test conditions
Output Voltage	V_0	7.84V	8.0V	8.16V	T_j=25°C
		7.74V		8.26V	10.5V≦V_1≦23V, 5mA≦I_O≦1.0A, P_D=15W
Load Regulation	$\triangle V_o$		12mV	160mV	5mA≦I_O≦1.5A, T_j=25°C,
			4.0mV	80mV	250mA≦I_O≦750mA, T_j=25°C
Line regulation	$\triangle V_o$		6.0mV 2.0mV	160mV 80mV	10.5V≦V_1≦25V, T_j=25°C 11V≦V_1≦17V, T_j=25°C
Quiescent Current	I_q		2.2mA	4.5mA	T_j=25°C, I_O=0
Quiescent Current Change	$\triangle I_q$			1.0mA 0.5mA	10.5V≦V_1≦25V 5mA≦I_o≦1.0A
Output Noise Voltage	V_N		52μV		10Hz≦f≦100KHz T_j=25°C
Ripple Rejection	RR	56dB	71dB		f=120Hz
Dropout Voltage	V_d		2.0V		I_O=1.0A, T_j=25°C
Peak Output Current	I_{opeak}		2.1A		T_j=25°C
Temperature Coefficient of Output voltage	$\triangle V_O/\triangle Tj$		0.6mV/°C		0°C≦Tj≦125°C, I_O=5mA

MC7909

Electrical Characteristics (Vi=15V, Io=500mA, 0°C<Tj<125°C, Ci=2.0uF, Co=1.0uF, Unless Otherwise Specified)

Parameter	Sym	Min	Typ	Max	Test conditions
Output Voltage	V_0	8.82V	9.0V	9.18V	T_j=25°C
		8.72V		9.28V	11.5V≦V_1≦24V, 5mA≦I_O≦1.0A, P_D=15W
Load Regulation	$\triangle V_o$		12mV	180mV	5mA≦I_O≦1.5A, T_j=25°C,
			4.0mV	90mV	250mA≦I_O≦750mA, T_j=25°C
Line regulation	$\triangle V_o$		7.0mV 2.0mV	180mV 90mV	11.5V≦V_1≦26V, T_j=25°C 12V≦V_1≦18V, T_j=25°C
Quiescent Current	I_q		2.2mA	4.5mA	T_j=25°C, I_O=0
Quiescent Current Change	$\triangle I_q$			1.0mA 0.5mA	11.5V≦V_1≦26V 5mA≦I_o≦1.0A
Output Noise Voltage	V_N		58μV		10Hz≦f≦100KHz T_j=25°C
Ripple Rejection	RR	56dB	71dB		f=120Hz
Dropout Voltage	V_d		1.1V		I_O=1.0A, T_j=25°C
Peak Output Current	I_{opeak}		2.1A		T_j=25°C
Temperature Coefficient of Output voltage	$\triangle V_O/\triangle Tj$		0.6mV/°C		0°C≦Tj≦125°C, I_O=5mA

MC7910

Electrical Characteristics (Vi=15V, Io=500mA, 0°C<Tj<125°C, Ci=2.0uF, Co=1.0uF, Unless Otherwise Specified)

Parameter	Sym	Min	Typ	Max	Test conditions
Output Voltage	V_0	8.82V	9.0V	9.18V	T_j=25°C
		8.72V		9.28V	11.5V≦V_1≦24V, 5mA≦I_O≦1.0A, P_D=15W
Load Regulation	$\triangle V_o$		12mV	180mV	5mA≦I_O≦1.5A, T_j=25°C,
			4.0mV	90mV	250mA≦I_O≦750mA, T_j=25°C
Line regulation	$\triangle V_o$		7.0mV 2.0mV	180mV 90mV	11.5V≦V_1≦26V, T_j=25°C 12V≦V_1≦18V, T_j=25°C
Quiescent Current	I_q		2.2mA	4.5mA	T_j=25°C, I_O=0
Quiescent Current Change	$\triangle I_q$			1.0mA 0.5mA	11.5V≦V_1≦26V 5mA≦I_o≦1.0A
Output Noise Voltage	V_N		58μV		10Hz≦f≦100KHz T_j=25°C
Ripple Rejection	RR	56dB	71dB		f=120Hz
Dropout Voltage	V_d		1.1V		I_O=1.0A, T_j=25°C
Peak Output Current	I_{opeak}		2.1A		T_j=25°C
Temperature Coefficient of Output voltage	$\triangle V_O/\triangle Tj$		0.6mV/°C		0°C≦Tj≦125°C, I_O=5mA

MC7912

Electrical Characteristics (Vi=19V, Io=500mA, 0°C<Tj<125°C, Ci=2.0uF, Co=1.0uF, Unless Otherwise Specified)

Parameter	Sym	Min	Typ	Max	Test conditions
Output Voltage	V_0	11.76V	12V	12.24V	T_j=25°C
		11.66V		12.34V	14.5V≦V_1≦27V, 5mA≦I_O≦1.0A, P_D=15W
Load Regulation	$\triangle V_o$		12mV	240mV	5.0mA≦I_O≦1.5A, T_j=25°C,
			4.0mV	120mV	250mA≦I_O≦750mA, T_j=25°C
Line regulation	$\triangle V_o$		10mV 3.0mV	240mV 120mV	14.5V≦V_1≦30V, T_j=25°C 16V≦V_1≦22V, T_j=25°C
Quiescent Current	I_q		2.5mA	5.0mA	T_j=25°C, I_O=0
Quiescent Current Change	$\triangle I_q$			1.0mA 0.5mA	14.5V≦V_1≦30V 5mA≦I_o≦1.0A
Output Noise Voltage	V_N		75μV		10Hz≦f≦100KHz T_j=25°C
Ripple Rejection	RR	55dB	70dB		f=120Hz
Dropout Voltage	V_d		1.1V		I_O=1.0A, T_j=25°C
Peak Output Current	I_{opeak}		2.1A		T_j=25°C
Temperature Coefficient of Output voltage	$\triangle V_O/\triangle Tj$		0.8mV/°C		0°C≦Tj≦125°C, I_O=5mA

MC7915

Electrical Characteristics (Vi=23V, Io=500mA, 0°C<Tj<125°C, Ci=2.0uF, Co=1.0uF, Unless Otherwise Specified)

Parameter	Sym	Min	Typ	Max	Test conditions
Output Voltage	V_0	14.7V	15.0V	15.3V	T_j=25°C
		14.55V		15.45V	17.5V≦V_1≦30V, 5mA≦I_O≦1.0A, P_D=15W
Load Regulation	$\triangle V_o$		12mV	300mV	5mA≦I_O≦1.5A, T_j=25°C,
			4.0mV	150mV	250mA≦I_O≦750mA, T_j=25°C
Line regulation	$\triangle V_o$		11mV 3.0mV	300mV 150mV	17.5V≦V_1≦30V, T_j=25°C 16V≦V_1≦22V, T_j=25°C
Quiescent Current	I_q		2.5mA	5.0mA	T_j=25°C, I_O=0
Quiescent Current Change	$\triangle I_q$			1.0mA 0.5mA	17.5V≦V_1≦30V 5mA≦I_o≦1.0A
Output Noise Voltage	V_N		90μV		10Hz≦f≦100KHz T_j=25°C
Ripple Rejection	RR	54dB	69dB		f=120Hz
Dropout Voltage	V_d		1.1V		I_O=1.0A, T_j=25°C
Peak Output Current	I_{opeak}		2.1A		T_j=25°C
Temperature Coefficient of Output voltage	$\triangle V_O/\triangle Tj$		0.9mV/°C		0°C≦Tj≦125°C, I_O=5mA

MC7918

Electrical Characteristics (Vi=27V, Io=500mA, 0°C<Tj<125°C, Ci=2.0uF, Co=1.0uF, Unless Otherwise Specified)

Parameter	Sym	Min	Typ	Max	Test conditions
Output Voltage	V_0	17.64V	18.0V	18.36V	T_j=25°C
		17.54V		18.46V	21.0V≦V_1≦33V, 5mA≦I_O≦1.0A, P_D=15W
Load Regulation	$\triangle V_o$		12mV	360mV	5mA≦I_O≦1.5A, T_j=25°C,
			4.0mV	180mV	250mA≦I_O≦750mA, T_j=25°C
Line regulation	$\triangle V_o$		15mV 5.0mV	360mV 180mV	21.0V≦V_1≦33V, T_j=25°C 24V≦V_1≦30V, T_j=25°C
Quiescent Current	I_q		2.5mA	5.0mA	T_j=25°C, I_O=0
Quiescent Current Change	$\triangle I_q$			1.0mA 0.5mA	21V≦V_1≦33V 5mA≦I_o≦1.0A
Output Noise Voltage	V_N		110μV		10Hz≦f≦100KHz T_j=25°C
Ripple Rejection	RR	53dB	68dB		f=120Hz
Dropout Voltage	V_d		1.1V		I_O=1.0A, T_j=25°C
Peak Output Current	I_{opeak}		2.1A		T_j=25°C
Temperature Coefficient of Output voltage	$\triangle V_O/\triangle Tj$		1.0mV/°C		0°C≦Tj≦125°C, I_O=5mA

MC7924

Electrical Characteristics (Vi=33V, Io=500mA, 0°C<Tj<125°C, Ci=2.0uF, Co=1.0uF, Unless Otherwise Specified)

Parameter	Sym	Min	Typ	Max	Test conditions
Output Voltage	V_0	23.52V	24.0V	24.48V	T_j=25°C
		23.42V		24.58V	27V≦V_1≦38V, 5mA≦I_O≦1.0A, P_D=15W
Load Regulation	$\triangle V_o$		12mV	480mV	5mA≦I_O≦1.5A, T_j=25°C,
			4.0mV	240mV	250mA≦I_O≦750mA, T_j=25°C
Line regulation	$\triangle V_o$		18mV 6.0mV	480mV 240mV	27V≦V_1≦38V, T_j=25°C 30V≦V_1≦36V, T_j=25°C
Quiescent Current	I_q		3.0mA	5.0mA	T_j=25°C, I_O=0
Quiescent Current Change	$\triangle I_q$			1.0mA 0.5mA	27V≦V_1≦38V 5mA≦I_o≦1.0A
Output Noise Voltage	V_N		170μV		10Hz≦f≦100KHz T_j=25°C
Ripple Rejection	RR	50dB	65dB		f=120Hz
Dropout Voltage	V_d		1.1V		I_O=1.0A, T_j=25°C
Peak Output Current	I_{opeak}		2.1A		T_j=25°C
Temperature Coefficient of Output voltage	$\triangle V_O/\triangle Tj$		1.0mV/°C		0°C≦Tj≦125°C, I_O=5mA

MC7905 thru MC7924

Representation Schematic Diagram