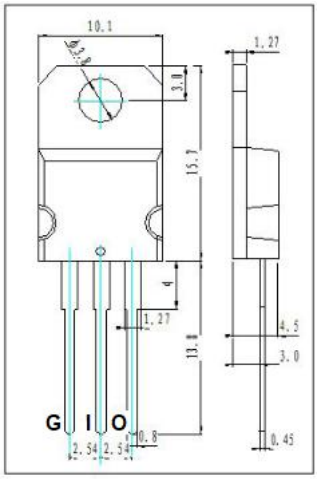
Three-Terminal 1.5A Negative Voltage Regulators

1 Description

The L79XXCV Of three-terminal negative voltage regulators Is available in TO-220M Package making it useful in a wide range of applications.These regulators can provide local on-card regulation,eliminating the distribution problems associated with single point regulation;furthermore,having the same voltage option as the L7800 positive standerd series,they are particularly suited for split power supplies.



2 Feature

- Output current Up To 1.5A
- Output voltage of -5V, -6V,-8V,-12V, -15V, -18V, -20V,-22V, -24V
- Thermal overload protection
- Short circuit protection
- Output transition SOA protection
- Package：TO-220M, Pin configuration: G I O
- Compliant with the RoHS standard

3 Electrical Characteristics

3.1 Absolute Maximum Ratings

Tc=25℃(unless otherwise specified)

Parameter		Symbol	Rating	Units
DC Intput Voltage	V_O=5V to 18V	V_I	-35	V
	V_O=20,24V		-40	
Output Current		I_O	1.5	A
Thermal resistance junction-air		$R_{\theta JA}$	50	℃/W
Thermal resistance junction-cases		$R_{\theta JC}$	6.7	°C/W
Operating junction temperature range		T_{opr}	0～150	℃
Storage temperature range		T_{stg}	-65～150	℃

3.2 Electrical characteristics

L7905CV electrical characteristics

(Refer to test circuits,Tj=0 to 125°C,Io=500mA,Vi=-10V,Ci=2.2μF, Co=1μF, unless otherwise specified)

Parameter	Symbol	Testing conditions		Min	Typ	Max	Units
Output voltage	V_O*	T_j=25℃,V_I=-10V		-4.9	-5.0	-5.1	V
Output voltage	V_O	I_O=-5.0mA to -1.0A,P_O<15W V_I=-8V to -20V		-4.9	-5.0	-5.1	V
Line regulation	△V_O	T_j=25℃, Io=500mA	V_I=-7V to -21V			100	mV
			V_I=-8V to -12V			50	
Load regulation	△V_O	T_j=25℃, V_I=10V	I_O=5mA to 1.5A			100	mV
			I_O=250mA to 750mA			50	
Quiescent current	I_Q	T_j=25℃				3	mA
Quiescent current change	△I_Q	T_j=25℃,V_I=-10V,I_O=5mA to 1.0A				0.5	mA
		T_j=25℃,I_O=0.5A,V_I=-8V to -25V				1.3	
Output voltage drift	△V_O/△T	I_O=5mA, T_j=0 to 125℃			-0.4		mV/℃
Output noise voltage	V_N	f=10Hz to 100KHz, T_j=25℃			100		μV/Vo
Supply voltage rejection	SVR	f=120Hz, ΔVI=10V		54	60		dB
Dropout voltage	V_D	I_O=1.0A, T_j=25℃,ΔV_O=100mV			1.4		V
Short circuit current	I_{SC}				2.1		A

*V_O Grading: ±1%, ±2%

L7906CV electrical characteristics

(Refer to test circuits,Tj=0 to 125°C,Io=500mA,Vi=-11V,Ci=2.2μF, Co=1μF, unless otherwise specified)

Parameter	Symbol	Testing conditions		Min	Typ	Max	Units
Output voltage	V_O*	T_j=25℃,V_I=-11V		-5.88	-6.0	-6.12	V
Output voltage	V_O	I_O=-5.0mA to -1.0A,P_O<15W V_I=-9.5V to -21.5V		-5.88	-6.0	-6.12	V
Line regulation	$\triangle V_O$	T_j=25℃, Io=500mA	V_I=-8.5V to -25V			120	mV
			V_I=-9V to -15V			60	
Load regulation	$\triangle V_O$	T_j=25℃, V_I=-11V	I_O=5mA to 1.5A			120	mV
			I_O=250mA to 750mA			60	
Quiescent current	I_Q	T_j=25℃				3	mA
Quiescent current change	$\triangle I_Q$	T_j=25℃,V_I=-11V,I_O=5mA to 1.0A				0.5	mA
		T_j=25℃,I_O=0.5A,V_I=-9.5V to -25V				1.3	
Output voltage drift	$\triangle V_O/\triangle T$	I_O=5mA, T_j=0 to 125℃			-0.6		mV/℃
Output noise voltage	V_N	f=10Hz to 100KHz, T_j=25℃			144		μV/Vo
Supply voltage rejection	RR	f=120Hz, ΔV_I=10V		54	60		dB
Dropout voltage	V_D	I_O=1.0A, T_j=25℃,ΔV_O=100mV			1.4		V
Short circuit current	I_{SC}				2		A

*V_O Grading: ±1%, ±2%

L7908CV electrical characteristics

(Refer to test circuits,Tj=0 to 125°C,Io=500mA,Vi=-14V,Ci=2.2μF, Co=1μF, unless otherwise specified)

Parameter	Symbol	Testing conditions		Min	Typ	Max	Units
Output Voltage	V_O*	T_j=25℃,V_I=-14V		-7.84	-8.0	-8.16	V
Output Voltage	V_O	I_O=-5.0mA to -1.0A,P_O<15W V_I=-11.5V to -23V		-7.84	-8.0	-8.16	V
Line Regulation	$\triangle V_O$	T_j=25℃, Io=500mA	V_I=-10.5V to -25V			160	mV
			V_I=-11V to -17V			80	
Load Regulation	$\triangle V_O$	T_j=25℃, V_I=-14V	I_O=5mA to 1.5A			160	mV
			I_O=250mA to 750mA			80	
Quiescent Current	I_Q	T_j=25℃				3	mA
Quiescent Current Change	$\triangle I_Q$	T_j=25℃,V_I=-10V,I_O=5mA to 1.0A				0.5	mA
		T_j=25℃,I_O=0.5A,V_I=-11.5V to -25V				1	
Output Voltage Drift	$\triangle V_O/\triangle T$	I_O=5mA, T_j=0 to 125℃			-0.6		mV/℃
Output Noise Voltage	V_N	f=10Hz to 100KHz, T_j=25℃			175		μV
Supply Voltage Rejection	SVR	f=120Hz, ΔV_I=10V		54	60		dB
Dropout Voltage	V_D	I_O=1.0A, T_j=25℃,ΔV_O=100mV			1.1		V
Short Circuit Current	I_{SC}				1.5		A

*V_O Grading: ±1%, ±2%

L7912CV electrical characteristics

(Refer to test circuits,Tj=0 to 125°C,Io=500mA,Vi=-19V,Ci=2.2μF, Co=1μF, unless otherwise specified)

Parameter	Symbol	Testing conditions		Min	Typ	Max	Units
Output voltage	V_O*	T_j=25℃,V_I=-19V		-11.76	-12.0	-12.24	V
Output voltage	V_O	I_O=-5.0mA to -1.0A,P_O<15W V_I=-15.5V to -27V		-11.76	-12.0	-12.24	V
Line regulation	△V_O	T_j=25℃, Io=500mA	V_I=-14.5V to -30V			240	mV
			V_I=-16V to -22V			120	
Load regulation	△V_O	T_j=25℃, V_I=-19V	I_O=5mA to 1.5A			240	mV
			I_O=250mA to 750mA			120	
Quiescent current	I_Q	T_j=25℃				3	mA
Quiescent current change	△I_Q	T_j=25℃,V_I=-19V,I_O=5mA to 1.0A				0.5	mA
		T_j=25℃,I_O=0.5A,V_I=-15V to -30V				1	
Output voltage drift	△V_O/△T	I_O=5mA, T_j=0 to 125℃			-0.8		mV/℃
Output noise voltage	V_N	f=10Hz to 100KHz, T_j=25℃			200		μV/Vo
Supply voltage rejection	SVR	f=120Hz, ΔV_I=10V		54	60		dB
Dropout voltage	V_D	I_O=1.0A, T_j=25℃,ΔV_O=100mV			1.1		V
Short circuit current	I_{SC}				1.5		A

*V_O Grading: ±1%, ±2%

L7915CV electrical characteristics

(Refer to test circuits,Tj=0 to 125°C,Io=500mA,Vi=-23V,Ci=2.2μF, Co=1μF, unless otherwise specified)

Parameter	Symbol	Testing Conditions		Min	Typ	Max	Units
Output voltage	V_O*	T_j=25℃,V_I=-23V		-14.7	-15.0	-15.30	V
Output voltage	V_O	I_O=-5.0mA to -1.0A,P_O<15W V_I=-18.5V to -30V		-14.7	-15.0	-15.30	V
Line regulation	△V_O	T_j=25℃, Io=500mA	V_I=-17.5V to -30V			300	mV
			V_I=-20V to -26V			150	
Load regulation	△V_O	T_j=25℃, V_I=-23V	I_O=5mA to 1.5A			300	mV
			I_O=250mA to 750mA			150	
Quiescent current	I_Q	T_j=25℃				3	mA
Quiescent current change	△I_Q	T_j=25℃,V_I=-23V,I_O=5mA to 1.0A				0.5	mA
		T_j=25℃,I_O=0.5A,V_I=-18.5V to -30V				1	
Output voltage drift	△V_O/△T	I_O=5mA, T_j=0 to 125℃			-0.9		mV/℃
Output noise voltage	V_N	f=10Hz to 100KHz, T_j=25℃			250		μV/Vo
Supply voltage rejection	SVR	f=120Hz, ΔV_I=10V		54	60		dB
Dropout voltage	V_D	I_O=1.0A, T_j=25℃,ΔV_O=100mV			1.1		V
Short circuit current	I_{SC}				1.3		A

*V_O Grading: ±1%, ±2%

L7918CV electrical characteristics

(Refer to test circuits,Tj=0 to 125°C,Io=500mA,Vi=-27V,Ci=2.2μF, Co=1μF, unless otherwise specified)

Parameter	Symbol	Testing conditions		Min	Typ	Max	Units
Output voltage	V_O*	T_j=25℃,V_I=-27V		-17.64	-18	-18.36	V
Output voltage	V_O	I_O=-5.0mA to -1.0A,P_O<15W V_I=-22V to -33V		-17.64	-18	-18.36	V
Line regulation	△V_O	T_j=25℃, Io=500mA	V_I=-21V to -33V			360	mV
			V_I=-24V to -30V			180	
Load regulation	△V_O	T_j=25℃, V_I=-27V	I_O=5mA to 1.5A			360	mV
			I_O=250mA to 750mA			180	
Quiescent current	I_Q	T_j=25℃				3	mA
Quiescent current change	△I_Q	T_j=25℃,V_I=-27V,I_O=5mA to 1.0A				0.5	mA
		T_j=25℃,I_O=0.5A,V_I=-22V to -33V				1	
Output voltage drift	△V_O/△T	I_O=5mA, T_j=0 to 125℃			-1		mV/℃
Output noise voltage	V_N	f=10Hz to 100KHz, T_j=25℃			300		μV/Vo
Supply voltage rejection	SVR	f=120Hz, ΔV_I=10V		54	60		dB
Dropout voltage	V_D	I_O=1.0A, T_j=25℃,ΔV_O=100mV			1.1		V
Short circuit current	I_{SC}				1.1		A

*V_O Grading: ±1%, ±2%

L7920CV electrical characteristics

(Refer to test circuits,Tj=0 to 125°C,Io=500mA,Vi=-29V,Ci=2.2μF, Co=1μF, unless otherwise specified)

Parameter	Symbol	Testing Conditions		Min	Typ	Max	Units
Output voltage	V_O*	T_j=25℃,V_I=-29V		-19.6	-20	-20.4	V
Output voltage	V_O	I_O=-5.0mA to -1.0A,P_O<15W V_I=-24V to -35V		-19.6	-20	-20.4	V
Line regulation	△V_O	T_j=25℃, Io=500mA	V_I=-23V to -35V			400	mV
			V_I=-26V to -32V			200	
Load regulation	△V_O	T_j=25℃, V_I=-29V	I_O=5mA to 1.5A			400	mV
			I_O=250mA to 750mA			200	
Quiescent current	I_Q	T_j=25℃				3	mA
Quiescent current change	△I_Q	T_j=25℃,V_I=-29V,I_O=5mA to 1.0A				0.5	mA
		T_j=25℃,I_O=0.5A,V_I=-24V to -35V				1	
Output voltage drift	△V_O/△T	I_O=5mA, T_j=0 to 125℃			-1.1		mV/℃
Output noise voltage	V_N	f=10Hz to 100KHz, T_j=25℃			350		μV/Vo
Supply voltage rejection	SVR	f=120Hz, ΔV_I=10V		54	60		dB
Dropout voltage	V_D	I_O=1.0A, T_j=25℃,ΔV_O=100mV			1.1		V
Short circuit current	I_{SC}				0.9		A

*V_O Grading: ±1%, ±2%

L7922CV electrical characteristics

(Refer to test circuits,Tj=0 to 125°C,Io=500mA,Vi=-31V,Ci=2.2μF, Co=1μF, unless otherwise specified)

Parameter	Symbol	Testing conditions		Min	Typ	Max	Units
Output voltage	V_O*	T_j=25℃,V_I=-31V		-21.56	-22	-22.44	V
Output voltage	V_O	I_O=-5.0mA to -1.0A,P_O<15W V_I=-26V to -37V		-21.56	-22	-22.44	V
Line regulation	$\triangle V_O$	T_j=25℃, Io=500mA	V_I=-25V to -37V			440	mV
			V_I=-28V to -34V			220	
Load regulation	$\triangle V_O$	T_j=25℃, V_I=-31V	I_O=5mA to 1.5A			440	mV
			I_O=250mA to 750mA			220	
Quiescent current	I_Q	T_j=25℃				3	mA
Quiescent current change	$\triangle I_Q$	T_j=25℃,V_I=-31V,I_O=5mA to 1.0A				0.5	mA
		T_j=25℃,I_O=0.5A,V_I=-26V to -37V				1	
Output voltage drift	$\triangle V_O/\triangle T$	I_O=5mA, T_j=0 to 125℃			-1.1		mV/℃
Output noise voltage	V_N	f=10Hz to 100KHz, T_j=25℃			375		μV/Vo
Supply voltage rejection	SVR	f=120Hz, ΔV_I=10V		54	60		dB
Dropout voltage	V_D	I_O=1.0A, T_j=25℃,ΔV_O=100mV			1.1		V
Short circuit current	I_{SC}				1.1		A

*V_O Grading: ±1%, ±2%

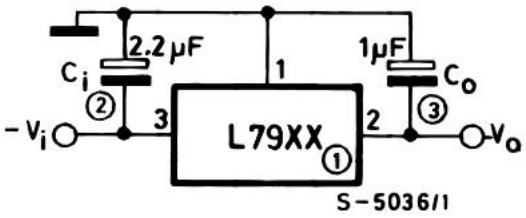
L7924CV electrical characteristics

(Refer to test circuits,Tj=0 to 125°C,Io=500mA,Vi=-33V,Ci=2.2μF, Co=1μF, unless otherwise specified)

Parameter	Symbol	Testing Conditions		Min	Typ	Max	Units
Output voltage	V_O*	T_j=25℃,V_I=-33V		-23.52	-24	-24.48	V
Output voltage	V_O	I_O=-5.0mA to -1.0A,P_O<15W V_I=-27V to -38V		-23.52	-24	-24.48	V
Line regulation	$\triangle V_O$	T_j=25℃, Io=500mA	V_I=-27V to -38V			480	mV
			V_I=-30V to -36V			240	
Load regulation	$\triangle V_O$	T_j=25℃, V_I=-33V	I_O=5mA to 1.5A			480	mV
			I_O=250mA to 750mA			240	
Quiescent current	I_Q	T_j=25℃				3	mA
Quiescent current change	$\triangle I_Q$	T_j=25℃,V_I=-33V,I_O=5mA to 1.0A				0.5	mA
		T_j=25℃,I_O=0.5A,V_I=-27V to -38V				1	
Output voltage drift	$\triangle V_O/\triangle T$	I_O=5mA,T_j=0 to 125℃			-1		mV/℃
Output noise voltage	V_N	f=10Hz to 100KHz, T_j=25℃			400		μV/Vo
Supply voltage rejection	SVR	f=120Hz, ΔV_I=10V		54	60		dB
Dropout voltage	V_D	I_O=1.0A, T_j=25℃,ΔV_O=100mV			1.1		V
Short circuit current	I_{SC}				1.1		A

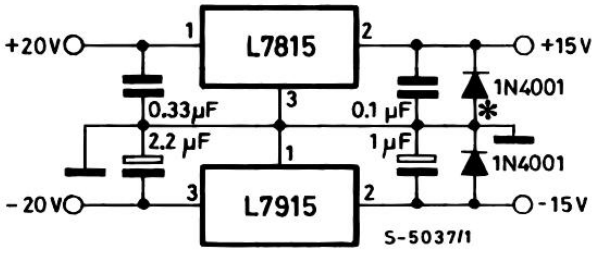
*V_O Grading: ±1%, ±2%

4 Test Circuits

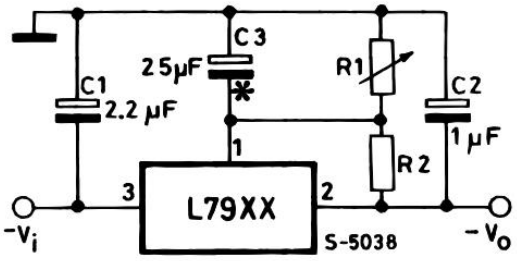


Fixed Output Regulator

5 Application Circuits

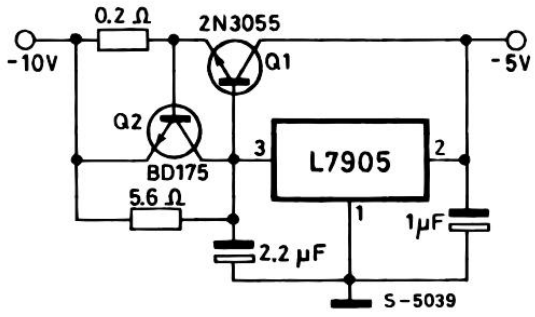


Split Power Supply (± 15V/1A)

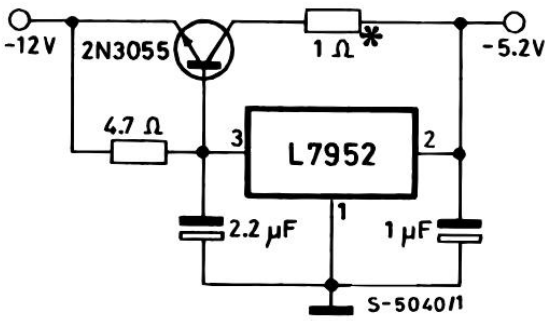


$V_O = V_{xx}\frac{R_1 + R_2}{R_2}$ $\frac{V_{xx}}{R_2} > 3I_d$

Circuit for Increasing Output Voltage

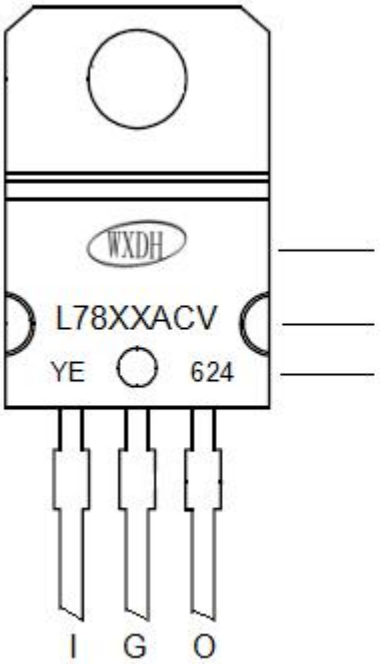


High Current Negative Regulator (-5V/4A with 5A current limiting)



Typical ECL System Power Supply (-5.2V/4A)

6 Marking



NO.1: LOGO WXDH

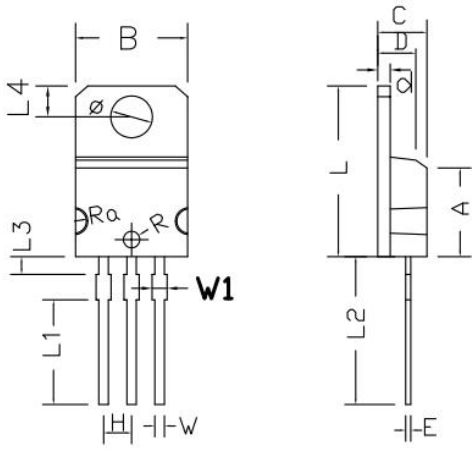
NO.2: Part Number L78XXACV

NO.3 Left: YE Production identification code

NO.3 Right: Assemblly Week Code, 624 On behalf of 24th natural week 2016 year

7 Dimension

TO-220M PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
	MIN	MAX	MIN	MAX
A	8.03	8.05	0.316	0.317
B	10.13	10.23	0.399	0.403
C	4.42	4.52	0.174	0.178
D	3.42	3.52	0.135	0.139
E	0.44	0.46	0.017	0.018
L	15.25	15.45	0.601	0.609
H	2.52	2.56	0.099	0.101
W	0.85	0.87	0.033	0.034
Φ	3.78	3.82	0.149	0.151
R	0.74	0.76	0.029	0.030
Ra	9.44	9.48	0.372	0.374
d	1.28	1.32	0.050	0.052
L1	9.4	9.6	0.370	0.378
L2	13.22	13.62	0.521	0.537
L3	1.52	1.72	0.060	0.068
L4	2.7	2.9	0.106	0.114
W1	1.32	1.42	0.052	0.056

8 Attentions

- Jiangsu Donghai Semiconductor Technology CO.,LTD. reserves the right to change the specification without prior notice! The customer should obtain the latest version of the information before making the order and verify that the information is complete and up to date.
- It is the responsibility of the purchaser for any failure or failure of any semiconductor product under certain conditions. It is the responsibility of the purchaser to comply with safety standards and to take safety measures in the system design and machine manufacturing of Donghai products in order to avoid potential risk of failure. Injury or property damage.
- Product promotion is endless, our company will be dedicated to provide customers with better products.

9 Appendix

Revision history:

Date	REV.	Description	Page
2017.05.15	1.0	Original	