3-Terminal 0.1A Negative Voltage Regulator

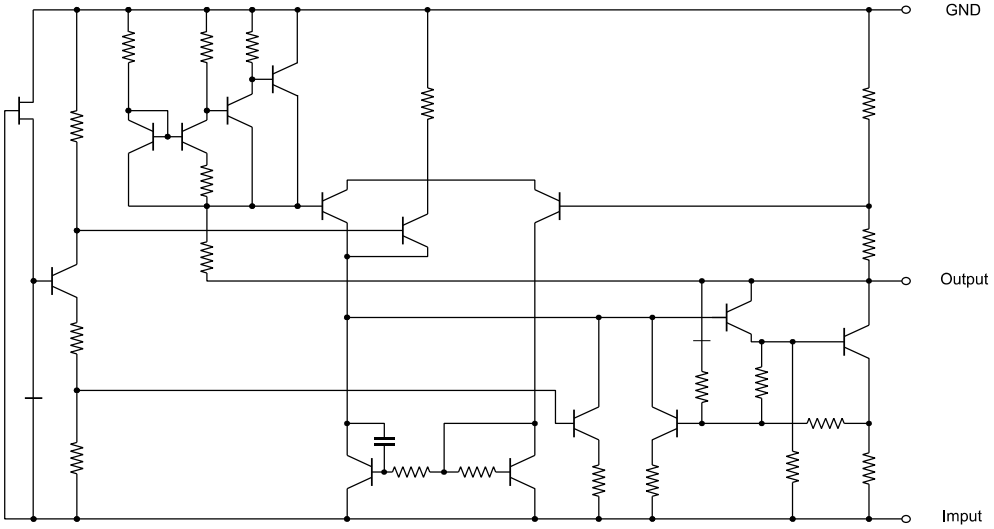
1. Description

The FLH L79LXX family is monolithic fixed voltage regulator integrated circuit. They are suitable for applications that required supply current up to 100mA.

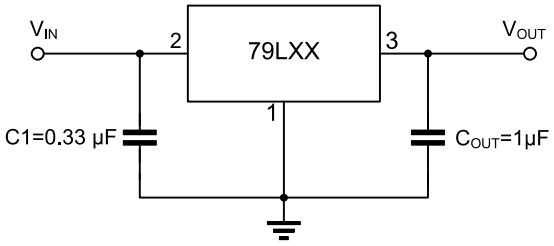
2. Features

- Output current up to 100mA.
- Fixed output voltage of -5V, -6V, -8V, -9V, -10V, -12V, -15V, -18V and -24V available.
- Thermal overload shutdown protection.
- Short circuit current limiting.

3. Functional Block Diagram



4. Application circuit



5. Ordering Information

Type Number	Package Type	Packing
L79L05ABD	SOP-8	Tape & Reel
L79L06ABD	SOP-8	Tape & Reel
L79L08ABD	SOP-8	Tape & Reel
L79L09ABD	SOP-8	Tape & Reel
L79L10ABD	SOP-8	Tape & Reel
L79L12ABD	SOP-8	Tape & Reel
L79L15ABD	SOP-8	Tape & Reel
L79L18ABD	SOP-8	Tape & Reel
L79L24ABD	SOP-8	Tape & Reel
L79L05ABU	SOT-89	Tape & Reel
L79L06ABU	SOT-89	Tape & Reel
L79L08ABU	SOT-89	Tape & Reel
L79L09ABU	SOT-89	Tape & Reel
L79L10ABU	SOT-89	Tape & Reel
L79L12ABU	SOT-89	Tape & Reel
L79L15ABU	SOT-89	Tape & Reel
L79L18ABU	SOT-89	Tape & Reel
L79L24ABU	SOT-89	Tape & Reel
L79L05ABZ	TO-92	Bulk
L79L06ABZ	TO-92	Bulk
L79L08ABZ	TO-92	Bulk
L79L09ABZ	TO-92	Bulk
L79L10ABZ	TO-92	Bulk
L79L12ABZ	TO-92	Bulk
L79L15ABZ	TO-92	Bulk
L79L18ABZ	TO-92	Bulk
L79L24ABZ	TO-92	Bulk

Note: If the physical information is inconsistent with the ordering information, please refer to the actual product.

6. ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	VALUE	UNIT
Input Voltage	V_{OUT} = -5~ -9V	V_{IN}	-30	V
	V_{OUT} = -12~ -15V		-35	V
	V_{OUT} = -18~ -24V		-35	V
Power Dissipation	TO-92	P_D	350	mW
	SOP-8		300	mW
	TO-92		625	mW
Operating Temperature		T_{OPR}	-40 ~ +85	°C
Storage Temperature		T_{STG}	-40 ~ +125	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

7. ELECTRICAL CHARACTERISTICS

79L05

(T_J=25°C, C1=0.33μF, C_{OUT}=1μF, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=-10V, I_{OUT}=40mA	-4.8	-5.0	-5.2	V
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	V_{IN}=-7~-20V, I_{OUT} =40mA		15	150	mV
Load Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{OUT} \times V_{OUT}}$	V_{IN}=-10V, I_{OUT} =1~100mA		7	60	mV
Quiescent current	I_Q	V_{IN}=-10V, I_{OUT} =40mA		3.5	6.0	mA
Ripple Rejection	RR	V_{IN}=-8~-18V, I_{OUT} =40mA, e_{IN}=1V_{P-P}, f=120Hz	41	71		dB
Output Voltage Noise	eN	V_{IN}=-10V, I_{OUT} =40Ma, BW=10Hz~100kH		120		μV

79L06

(T_J=25°C, C1=0.33μF, C_{OUT}=1μF, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=-12V, I_{OUT} =40mA	-5.76	-6.0	-6.24	V
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	V_{IN}=-8.5~-20V, I_{OUT} =40mA		15	150	mV
Load Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{OUT} \times V_{OUT}}$	V_{IN}=-12V, I_{OUT} =1~100mA		7	60	mV
Quiescent current	I_Q	V_{IN}=-12V, I_{OUT} =40mA		3.5	6.0	mA
Ripple Rejection	RR	V_{IN}=-9~ -19V, I_{OUT} =40Ma, e_{IN}=1V_{P-P}, f=120Hz	41	71		dB
Output Voltage Noise	eN	V_{IN}=-12V, I_{OUT} =40mA, BW=10Hz~100kH		120		μV

79L08

(T_J=25°C, C1=0.33μF, C_{OUT}=1μF, unless otherwise specified)

PARAMETER	SYMBOL	Test conditions	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=-14V, I_{OUT} =40mA	-7.68	-8.0	-8.32	V
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	V_{IN}=-10.5~-23V, I_{OUT} =40mA		24	175	mV
Load Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{OUT} \times V_{OUT}}$	V_{IN}=-14V, I_{OUT} =1~100mA		10	80	mV
Quiescent current	I_Q	V_{IN}=-14V, I_{OUT} =40mA		3.5	6.0	mA
Ripple Rejection	RR	V_{IN}=-11~ -21V, I_{OUT} =40mA, e_{IN}=1V_{P-P}, f=140Hz	39	68		dB
Output Voltage Noise	eN	V_{IN}=-14V, I_{OUT} =40mA, BW=10Hz~100kH		190		μV

79L09

(T_J=25°C, C1=0.33μF, C_{OUT}=1μF, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=-15V, I_{OUT} =40mA	-8.64	-9.0	-9.36	V
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	V_{IN}=-12.5~-24V, I_{OUT} =40mA		27	200	mV
Load Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{OUT} \times V_{OUT}}$	V_{IN}=-15V, I_{OUT} =1~100mA		12	90	mV
Quiescent current	I_Q	V_{IN}=-15V, I_{OUT} =40mA		3.5	6.0	mA
Ripple Rejection	RR	V_{IN}=-12~ -22V, I_{OUT} =40 mA, e_{IN}=1V_{P-P}, f=150Hz	37	64		dB
Output Voltage Noise	eN	V_{IN}=-15V, I_{OUT} =40mA, BW=10Hz~100kH		210		μV

79L10

(T_J=25°C, C1=0.33μF, C_{OUT}=1μF, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=-16V, I_{OUT} =40mA	-9.6	-10	-10.4	V
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	V_{IN}=-13~-24V, I_{OUT} =40mA		30	220	mV
Load Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{OUT} \times V_{OUT}}$	V_{IN}=-16V, I_{OUT} =1~100mA		15	95	mV
Quiescent current	I_Q	V_{IN}=-16V, I_{OUT} =40mA		3.5	6.0	mA
Ripple Rejection	RR	V_{IN}=-13~ -23V, I_{OUT} =40mA, e_{IN}=1V_{P-P}, f=150Hz	37	64		dB
Output Voltage Noise	eN	V_{IN}=-16V, I_{OUT} =40mA, BW=10Hz~100kH		210		μV

79L12

(T_J=25°C, C1=0.33μF, C_{OUT}=1μF, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=-19V, I_{OUT} =40mA	-11.52	-12.0	-12.48	V
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	V_{IN}=-14.5~-27V, I_{OUT} =40mA		36	250	mV
Load Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{OUT} \times V_{OUT}}$	V_{IN}=-19V, I_{OUT} =1~100mA		16	100	mV
Quiescent current	I_Q	V_{IN}=-19V, I_{OUT} =40mA		3.5	6.0	mA
Ripple Rejection	RR	V_{IN}=-15~-25V, I_{OUT} =40mA, e_{IN}=1V_{P-P}, f=190Hz	37	64		dB
Output Voltage Noise	eN	V_{IN}=-19V, I_{OUT} =40mA, BW=10Hz~100kH		210		μV

79L15

(T_J=25°C, C1=0.33μF, C_{OUT}=1μF, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=-23V, I_{OUT} =40mA	-14.4	-15.0	-15.6	V
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	V_{IN}=-17.5~-30V, I_{OUT} =40mA		45	300	mV
Load Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{OUT} \times V_{OUT}}$	V_{IN}=-23V, I_{OUT} =1~100mA		20	150	mV
Quiescent current	I_Q	V_{IN}=-23V, I_{OUT} =40mA		3.5	6.0	mA
Ripple Rejection	RR	V_{IN}=-18.5~ -28.5V, I_{OUT} =40mA e_{IN}=1V_{P-P}, f=230Hz	34	63		dB
Output Voltage Noise	eN	V_{IN}=-23V, I_{OUT} =40mA BW=10Hz~100kH		340		μV

79L18

(T_J=25°C, C1=0.33μF, C_{OUT}=1μF, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=-27V, I_{OUT} =40mA	-17.28	-18.0	-18.72	V
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	V_{IN}=-20.5~-33V, I_{OUT} =40mA		54	300	mV
Load Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{OUT} \times V_{OUT}}$	V_{IN}=-27V, I_{OUT} =1~100mA		23	170	mV
Quiescent current	I_Q	V_{IN}=-27V, I_{OUT} =40mA		3.5	6.0	mA
Ripple Rejection	RR	V_{IN}=-23~ -33V, I_{OUT} =40mA e_{IN}=1V_{P-P}, f=270Hz	33	60		dB
Output Voltage Noise	eN	V_{IN}=-27V, I_{OUT} =40mA BW=10Hz~100kH		410		μV

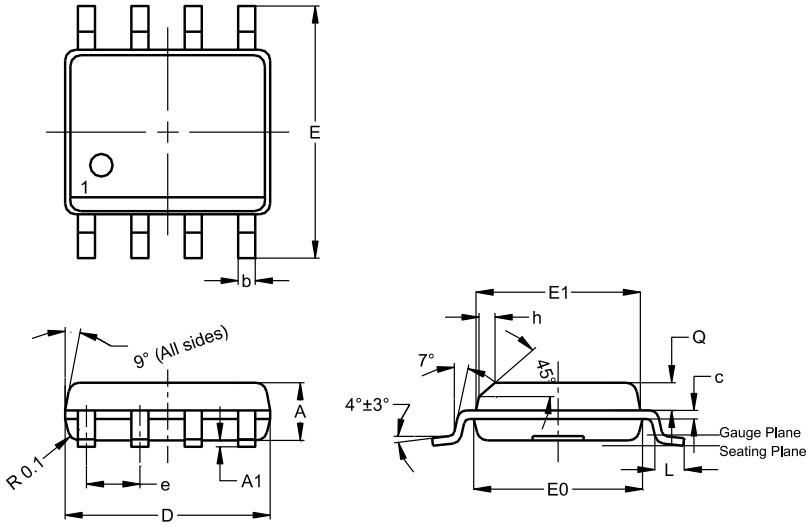
79L24

(T_J=25°C, C1=0.33μF, C_{OUT}=1μF, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=-33V, I_{OUT} =40mA	-23.04	-24.0	-24.96	V
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	V_{IN}=-27~-38V, I_{OUT}=40mA		72	350	mV
Load Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{OUT} \times V_{OUT}}$	V_{IN}=-33V, I_{OUT} =1~100mA		30	200	mV
Quiescent current	I_Q	V_{IN}=-33V, I_{OUT} =40mA		3.5	6.0	mA
Ripple Rejection	RR	V_{IN}=-29~ -35V, I_{OUT} =40mA e_{IN}=1V_{P-P}, f=330Hz	31	55		dB
Output Voltage Noise	eN	V_{IN}=-33V, I_{OUT} =40mA BW=10Hz~100kH		550		μV

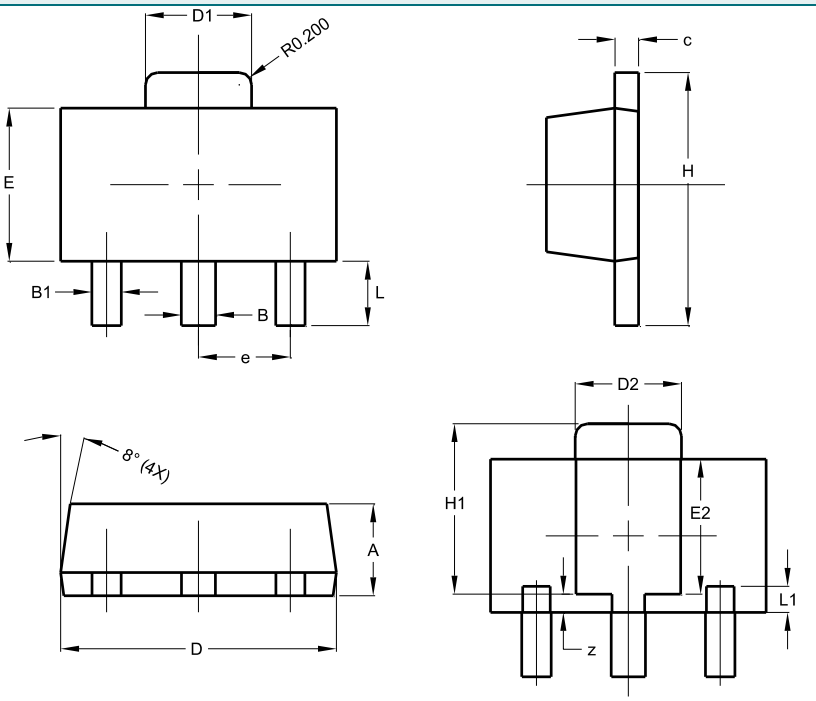
8. Package Outlines

SOP-8



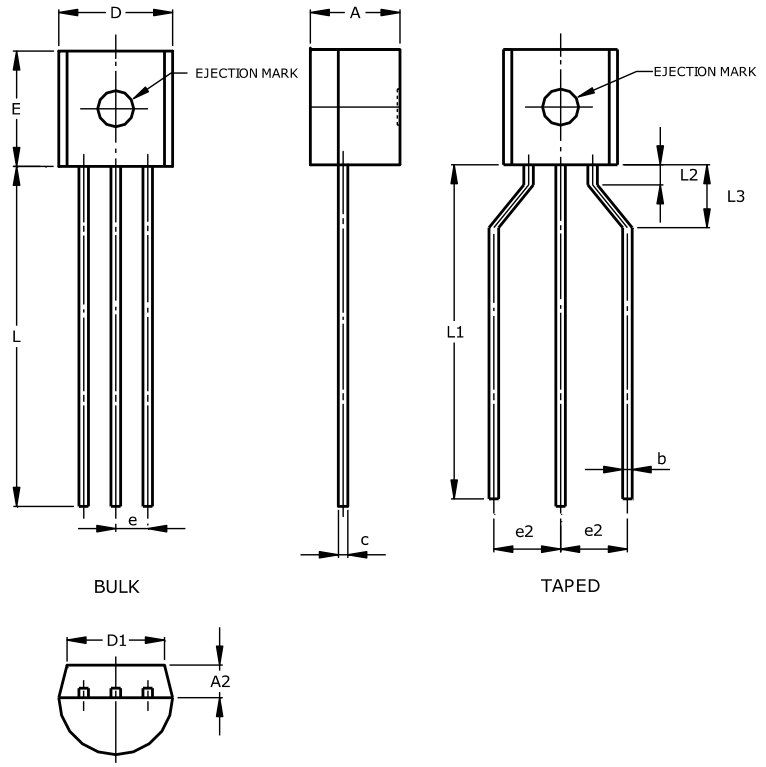
SOP-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	-	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

TO-92



SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in mm			

TO-92



TO92			
Dim	**Min**	**Max**	**Typ**
A	3.45	3.66	-
A2	1.22	1.37	-
b	-	-	0.38
c	-	-	0.38
D	4.27	4.78	-
D1	-	-	3.87
E	4.32	4.83	-
e	-	-	1.27
e2	2.40	2.90	-
L	12.98	15.00	-
L1	12.80	15.00	-
L2	0.80	-	-
L3	2.00	3.00	-
All Dimensions in mm			

9. Disclaimers

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