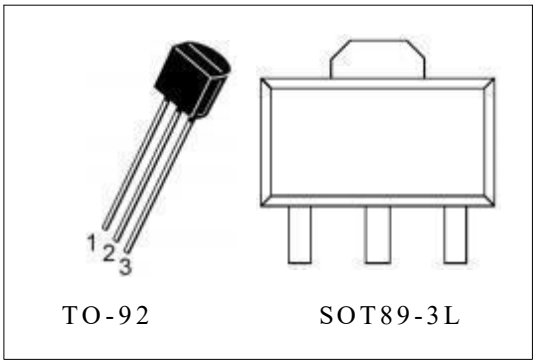
78Lxx

DESCR IPTION

The XJS78Lxx series of fixed voltage monolithic integrated circuit voltage regulators are suitable for applications that required supply up to 100mA.

Out line Drawing

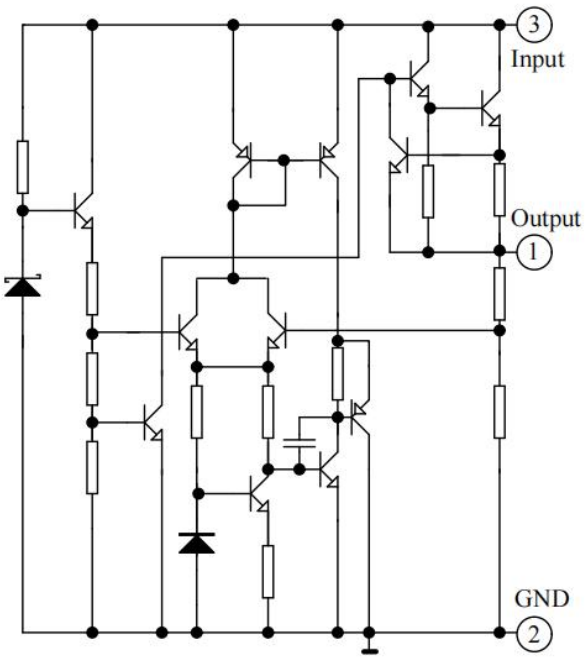


TO-92 SOT89-3L

FEATURE

- Maximum output current of 100mA
- Output voltage of 5V, 6V, 8V, 9V, 10V, 12V, 15V and 24V
- Thermal overload protection
- Short circuit current limiting

EQUIVALENT CIRCUIT



PIN CONNECTION

管脚定义	TO92	SOT89-3L
PIN1	Output	Output
PIN2	GND	GND
PIN3	Input	Input

ABSOLUTE MAXIMUM RATINGS

(Operating temperature range applies unless otherwise specified)

Characteristic		Symbol	Value	Unit
Input Voltage	Vo=5V~8V	Vi	25	V
	Vo=9V~15V		40	
Operating Junction Temperature Range		Topr	-20~120	°C
Storage Temperature Range		Tstg	-55~150	°C

XJS78L05 ELECTRICAL CHARACTERISTICS

(Unless otherwise specified: Vi=10V; Io=40mA; C1=0.33μF; Co=0.1μF, 0<Tj<125°C) (Note 1)

Characteristics	Test conditions	Symbol	Min.	Typ.	Max.	Unit
Output Voltage	Tj=25°C	Vo	4.9	5.0	5.1	V
	7V≤Vi≤20V; Io=1mA~40mA		4.85		5.15	V
	7V≤Vi≤Vmax; Io=1mA~70mA		4.85		5.15	V (note2)
Load Regulation	Tj=25°C; Io=1mA~100mA	ΔVo		11	60	mV
	Tj=25°C; Io=1mA~40mA			5.0	30	mV
Line Regulation	Tj=25°C; 7V≤Vi≤20V	ΔVo		8	150	mV
	Tj=25°C; 8V≤Vi≤20V			6	100	mV
Quiescent Current		Iq		2.0	5.5	mA
Quiescent Current Change	8V≤Vi≤20V	ΔIq			1.5	mA
	1mA≤Io≤40mA				0.1	mA
Output Noise Voltage	10Hz≤f≤100kHz	VN		40		μV
Temperature Coefficient of Vo	Io=5mA	ΔVo/ΔT		-0.65		mV/°C
Ripple Rejection	10V≤Vi≤20V; f=120Hz; Tj=25°C	RR	41	80		dB
Dropout Voltage	Tj=25°C	Vd		1.7		V

XJS78L06 ELECTRICAL CHARACTERISTICS

(Unless otherwise specified: Vi=12V; Io=40mA; C1=0.33μF; Co=0.1μF, 0<Tj<125°C) (Note 1)

Characteristics	Test conditions	Symbol	Min.	Typ.	Max	Unit
Output Voltage	Tj=25°C	Vo	5.75	6.0	6.25	V
	8.5V≤Vi≤20V; Io=1mA~40mA		5.7		6.3	V
	8.5V≤Vi≤Vmax; Io=1mA~70mA		5.7		6.3	V (note2)
Load Regulation	Tj=25°C; Io=1mA~100mA	ΔVo		12.8	80	mV
	Tj=25°C; Io=1mA~40mA			5.8	40	mV
Line Regulation	Tj=25°C; 8.5V≤Vi≤20V	ΔVo		64	175	mV
	Tj=25°C; 9V≤Vi≤20V			54	125	mV
Quiescent Current		Iq		3.9	6.0	mA
Quiescent Current Change	9V≤Vi≤20V	ΔIq			1.5	mA
	1mA≤Io≤40mA				0.1	mA
Output Noise Voltage	10Hz≤f≤100kHz	VN		49		μV
Temperature Coefficient of Vo	Io=5mA	ΔVo/ΔT		-0.75		mV/°C
Ripple Rejection	10V≤Vi≤20V; f=120Hz; Tj=25°C	RR	40	46		dB
Dropout Voltage	Tj=25°C	Vd		1.7		V

XJS78L08 ELECTRICAL CHARACTERISTICS

(Unless otherwise specified: Vi=14V; Io=40mA; C1=0.33μF; Co=0.1μF, 0<Tj<125°C) (Note 1)

Characteristics	Test conditions	Symbol	Min.	Typ.	Max.	Unit
Output Voltage	Tj=25°C	Vo	7.7	8.0	8.3	V
	10.5V≤Vi≤23V; Io=1mA~40mA		7.6		8.4	V
	10.5V≤Vi≤Vmax; Io=1mA~70mA		7.6		8.4	V (note2)
Load Regulation	Tj=25°C; Io=1mA~100mA	ΔVo		15	80	mV
	Tj=25°C; Io=1mA~40mA			8.0	40	mV
Line Regulation	Tj=25°C; 10.5V≤Vi≤23V	ΔVo		10	175	mV
	Tj=25°C; 11V≤Vi≤23V			8	125	mV
Quiescent Current		Iq		2.0	5.5	mA
Quiescent Current Change	11V≤Vi≤23V	ΔIq			1.5	mA
	1mA≤Io≤40mA				0.1	mA
Output Noise Voltage	10Hz≤f≤100kHz	VN		49		μV
Temperature Coefficient of Vo	Io=5mA	ΔVo/ΔT		-0.75		mV/°C
Ripple Rejection	11V≤Vi≤23V; f=120Hz; Tj=25°C	RR	39	70		dB
Dropout Voltage	Tj=25°C	Vd		1.7		V

XJS78L09 ELECTRICAL CHARACTERISTICS

(Unless otherwise specified: Vi=15V; Io=40mA; C1=0.33μF; Co=0.1μF, 0<Tj<125°C) (Note 1)

Characteristics	Test conditions	Symbol	Min.	Typ.	Max.	Unit
Output Voltage	Tj=25°C	Vo	8.64	9.0	9.36	V
	11.5V≤Vi≤24V; Io=1mA~40mA		8.55		9.45	V
	11.5V≤Vi≤Vmax; Io=1mA~70mA		8.55		9.45	V (note2)
Load Regulation	Tj=25°C; Io=1mA~100mA	ΔVo		20	90	mV
	Tj=25°C; Io=1mA~40mA			10	45	mV
Line Regulation	Tj=25°C; 11.5V≤Vi≤24V	ΔVo		90	200	mV
	Tj=25°C; 13V≤Vi≤24V			100	150	mV
Quiescent Current		Iq		2.0	6.0	mA
Quiescent Current Change	13V≤Vi≤24V	ΔIq			1.5	mA
	1mA≤Io≤40mA				0.1	mA
Output Noise Voltage	10Hz≤f≤100kHz	VN		49		μV
Temperature Coefficient of Vo	Io=5mA	ΔVo/ΔT		-0.75		mV/°C
Ripple Rejection	12V≤Vi≤23V; f=120Hz; Tj=25°C	RR	38	44		dB
Dropout Voltage	Tj=25°C	Vd		1.7		V

XJS78L10 ELECTRICAL CHARACTERISTICS

(Unless otherwise specified: Vi=16V; Io=40mA; C1=0.33μF; Co=0.1μF, 0<Tj<125°C) (Note 1)

Characteristics	Test conditions	Symbol	Min.	Typ.	Max.	Unit
Output Voltage	Tj=25°C	Vo	9.6	10	10.4	V
	12.5V≤Vi≤23V; Io=1mA~40mA		9.5		10.5	V
	12.5V≤Vi≤Vmax; Io=1mA~70mA		9.5		10.5	V (note2)
Load Regulation	Tj=25°C; Io=1mA~100mA	ΔVo		20	94	mV
	Tj=25°C; Io=1mA~40mA			10	47	mV
Line Regulation	Tj=25°C; 12.5V≤Vi≤23V	ΔVo		100	220	mV
	Tj=25°C; 14V≤Vi≤23V			200	170	mV
Quiescent Current		Iq		4.2	6.5	mA
Quiescent Current Change	12.5V≤Vi≤23V	ΔIq			1.5	mA
	1mA≤Io≤40mA				0.1	mA
Output Noise Voltage	10Hz≤f≤100kHz	VN		74		μV
Temperature Coefficient of Vo	Io=5mA	ΔVo/ΔT		-0.95		mV/°C
Ripple Rejection	15V≤Vi≤23V; f=120Hz; Tj=25°C	RR	38	43.		dB
Dropout Voltage	Tj=25°C	Vd		1.7		V

XJS78L12 ELECTRICAL CHARACTERISTICS

(Unless otherwise specified: Vi=19V; Io=40mA; C1=0.33μF; Co=0.1μF, 0<Tj<125°C) (Note 1)

Characteristics	Test conditions	Symbol	Min.	Typ.	Max	Unit
Output Voltage	Tj=25°C	Vo	11.5	15	15.6	V
	14.5V≤Vi≤27V; Io=1mA~40mA		11.4		12.6	V
	14.5V≤Vi≤Vmax; Io=1mA~70mA		11.4		12.6	V (note2)
Load Regulation	Tj=25°C; Io=1mA~100mA	ΔVo		25	150	mV
	Tj=25°C; Io=1mA~40mA			12	75	mV
Line Regulation	Tj=25°C; 14.5V≤Vi≤27V	ΔVo		25	300	mV
	Tj=25°C; 16V≤Vi≤27V			20	250	mV
Quiescent Current		Iq		2.0	6.0	mA
Quiescent Current Change	16V≤Vi≤27V	ΔIq			1.5	mA
	1mA≤Io≤40mA				0.1	mA
Output Noise Voltage	10Hz≤f≤100kHz	VN		80		μV
Temperature Coefficient of Vo	Io=5mA	ΔVo/ΔT		-1.0		mV/°C
Ripple Rejection	15V≤Vi≤25V; f=120Hz; Tj=25°C	RR	37	65		dB
Dropout Voltage	Tj=25°C	Vd		1.7		V

XJS78L15 ELECTRICAL CHARACTERISTICS

(Unless otherwise specified: Vi=23V; Io=40mA; C1=0.33μF; Co=0.1μF, 0<Tj<125°C) (Note 1)

Characteristics	Test conditions	Symbol	Min.	Typ.	Max	Unit
Output Voltage	Tj=25°C	Vo	14.4	15	15.6	V
	17.5V≤Vi≤30V; Io=1mA~40mA		14.25		15.75	V
	17.5V≤Vi≤Vmax; Io=1mA~70mA		14.25		15.75	V (note2)
Load Regulation	Tj=25°C; Io=1mA~100mA	ΔVo		20	150	mV
	Tj=25°C; Io=1mA~40mA			25	150	mV
Line Regulation	Tj=25°C; 17.5V≤Vi≤30V	ΔVo		25	150	mV
	Tj=25°C; 20V≤Vi≤30V			15	75	mV
Quiescent Current		Iq		2.2	6.5	mA
Quiescent Current Change	20V≤Vi≤30V	ΔIq			1.5	mA
	1mA≤Io≤40mA				0.1	mA
Output Noise Voltage	10Hz≤f≤100kHz	VN		90		μV
Temperature Coefficient of Vo	Io=5mA	ΔVo/ΔT		-1.3		mV/°C
Ripple Rejection	18.5V≤Vi≤28.5V; f=120Hz; Tj=25°C	RR	34	63		dB
Dropout Voltage	Tj=25°C	Vd		1.7		V

XJS78L18 ELECTRICAL CHARACTERISTICS

(Unless otherwise specified: Vi=27V; Io=40mA; C1=0.33μF; Co=0.1μF, 0<Tj<125°C) (Note 1)

Characteristics	Test conditions	Symbol	Min.	Typ.	Max	Unit
Output Voltage	Tj=25°C	Vo	17.3	18	18.7	V
	21V≤Vi≤33V; Io=1mA~40mA		17.1		18.9	V
	21V≤Vi≤Vmax; Io=1mA~70mA		17.1		18.9	V (note2)
Load Regulation	Tj=25°C; Io=1mA~100mA	ΔVo		30	170	mV
	Tj=25°C; Io=1mA~40mA			15	85	mV
Line Regulation	Tj=25°C; 21V≤Vi≤33V	ΔVo		145	300	mV
	Tj=25°C; 22V≤Vi≤33V			135	250	mV
Quiescent Current		Iq		2.0	6.0	mA
Quiescent Current Change	21V≤Vi≤33V	ΔIq			1.5	mA
	1mA≤Io≤40mA				0.1	mA
Output Noise Voltage	10Hz≤f≤100kHz	VN		150		μV
Temperature Coefficient of Vo	Io=5mA	ΔVo/ΔT		-1.8		mV/°C
Ripple Rejection	23V≤Vi≤33V; f=120Hz; Tj=25°C	RR	34	48		dB
Dropout Voltage	Tj=25°C	Vd		1.7		V

XJS78L24 ELECTRICAL CHARACTERISTICS

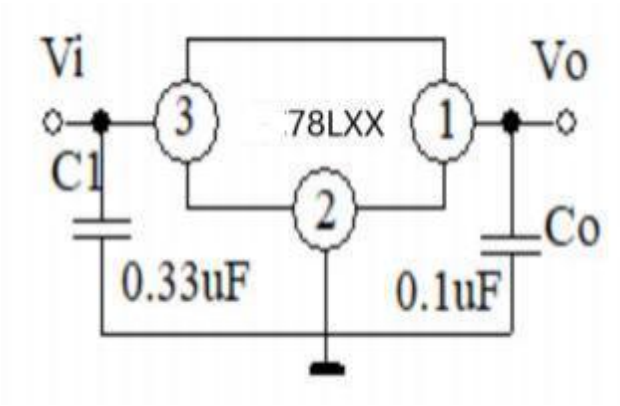
(Unless otherwise specified: Vi=33V; Io=40mA; C1=0.33μF; Co=0.1μF, 0<Tj<125°C) (Note 1)

Characteristics	Test conditions	Symbol	Min.	Typ.	Max.	Unit
Output Voltage	Tj=25°C	Vo	23	24	25	V
	27V≤Vi≤38V; Io=1mA~40mA		22.8		25.2	V
	27V≤Vi≤Vmax; Io=1mA~70mA		22.8		25.2	V (note2)
Load Regulation	Tj=25°C; Io=1mA~100mA	ΔVo		40	200	mV
	Tj=25°C; Io=1mA~40mA			20	100	mV
Line Regulation	Tj=25°C; 27V≤Vi≤38V	ΔVo		160	300	mV
	Tj=25°C; 28V≤Vi≤38V			150	250	mV
Quiescent Current		Iq		2.2	6.0	mA
Quiescent Current Change	27V≤Vi≤38V	ΔIq			1.5	mA
	1mA≤Io≤40mA				0.1	mA
Output Noise Voltage	10Hz≤f≤100kHz	VN		200		μV
Temperature Coefficient of Vo	Io=5mA	ΔVo/ΔT		-2.0		mV/°C
Ripple Rejection	27V≤Vi≤38V; f=120Hz; Tj=25°C	RR	34	45		dB
Dropout Voltage	Tj=25°C	Vd		1.7		V

Note1:TheMaximumsteadystateusableoutputcurrentandinputvoltageareverydependenton theheatingsinkingand/orleadtemperaturelengthofthepackage.Thedateaboverespresent pulsetestconditionswithjunctiontemperaturesasindicatedattheinitiationoftest.

Note2:Powerdissipation<0.75W

TYPICAL APPLICATION CIRCUIT



Note 1:To specify an output voltage,substitue voltage value for "xx".

Note2:Bypass capacitors are recommended for optimum stability and transient responseandshouldbelocatedascloseaspossibletotheregulators.