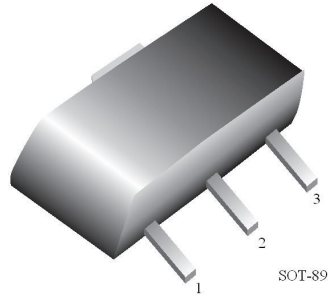


78LXXPRG



1:Output 2:GND 3:Input

3-Terminal Positive Regulators

The 78LXX series of three terminal positive regulators is available with several fixed output voltages (eg. 5V, 6V, 8V, 9V, 12V & 15V) making them useful in a wide range of applications.

Note : "G" in Part Number stands for Lead Free Part.

Absolute Maximum Ratings* $T_A=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
V_I	Input Voltage	30	V
P_D	Power Dissipation	500	mW
T_{OPR}	Operating Temperature Range	-25 to +125	$^\circ\text{C}$
T_J, T_{STG}	Operating & Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

Electrical Characteristics

78L05 (5V Voltage Regulator) ($V_I=10\text{V}, I_O=40\text{mA}, 0^\circ\text{C}<T_J<125^\circ\text{C}, C_I=0.33\mu\text{F}, C_O=0.1\mu\text{F}$, unless otherwise noted)

Symbol	Parameter	Test Conditions	MIN	TYP	MAX	Units
V_O	Output Voltage	$T_J = 25^\circ\text{C}$	4.80	5.00	5.20	v
		$7\text{V} \leq V_I \leq 20\text{V}, 1\text{mA} \leq I_O \leq 40\text{mA}$	4.75	5.00	5.25	V
		$7\text{V} \leq V_I \leq 20\text{V}, 1\text{mA} \leq I_O \leq 70\text{mA}$	4.75	5.00	5.25	V (note)
ΔV_O	Load Regulation	$T_J = 25^\circ\text{C}, 1\text{mA} \leq I_O \leq 100\text{mA}$		11	60	mV
		$T_J = 25^\circ\text{C}, 1\text{mA} \leq I_O \leq 40\text{mA}$		5	30	mV
ΔV_O	Line Regulation	$T_J = 25^\circ\text{C}, 7\text{V} \leq V_I \leq 20\text{V}$		32	150	mV
		$T_J = 25^\circ\text{C}, 8\text{V} \leq V_I \leq 20\text{V}$		26	100	mV
I_q	Quiescent Current	$T_J = 25^\circ\text{C}$		3.8	6.0	mA
ΔI_q	Quiescent Current Change	$8\text{V} \leq V_I \leq 20\text{V}$			1.5	mA
		$1\text{mA} \leq I_O \leq 40\text{mA}$			0.1	mA
V_N	Output Noise Voltage	$10\text{Hz} \leq f \leq 100\text{Hz}$		42		μV
RR	Ripple Rejection	$T_J = 25^\circ\text{C}, 8\text{V} \leq V_I \leq 18\text{V}, f = 120\text{Hz}$	41	80		dB

Vd	Dropout Voltage	$T_J = 25^\circ\text{C}$		1.7		V
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Marking for ML78L05PRG = 8A
78L06 (6V Voltage Regulator) ($V_I=11\text{V}$, $I_O=40\text{mA}$, $0^\circ\text{C}<T_J<125^\circ\text{C}$, $C_I=0.33\mu\text{F}$, $C_O=0.1\mu\text{F}$, unless otherwise noted)

Symbol	Parameter	Test Conditions	MIN	TYP	MAX	Units
V _O	Output Voltage	$T_J = 25^\circ\text{C}$	5.75	6.00	6.25	V
		$8\text{V} \leq V_I \leq 20\text{V}$, $1\text{mA} \leq I_O \leq 40\text{mA}$	5.70	6.00	6.30	V
		$8\text{V} \leq V_I \leq 20\text{V}$, $1\text{mA} \leq I_O \leq 70\text{mA}$	5.70	6.00	6.30	V (note)
ΔV_O	Load Regulation	$T_J = 25^\circ\text{C}$, $1\text{mA} \leq I_O \leq 100\text{mA}$		16	80	mV
		$T_J = 25^\circ\text{C}$, $1\text{mA} \leq I_O \leq 40\text{mA}$		9	40	mV
ΔV_O	Line Regulation	$T_J = 25^\circ\text{C}$, $8.5\text{V} \leq V_I \leq 20\text{V}$		35	175	mV
		$T_J = 25^\circ\text{C}$, $9\text{V} \leq V_I \leq 20\text{V}$		29	125	mV
I _q	Quiescent Current	$T_J = 25^\circ\text{C}$		3.9	6.0	mA
ΔI_q	Quiescent Current Change	$9\text{V} \leq V_I \leq 20\text{V}$			1.5	mA
		$1\text{mA} \leq I_O \leq 40\text{mA}$			0.1	mA
V _N	Output Noise Voltage	$10\text{Hz} \leq f \leq 100\text{Hz}$		46		μV
RR	Ripple Rejection	$T_J = 25^\circ\text{C}$, $9\text{V} \leq V_I \leq 19\text{V}$, $f = 120\text{Hz}$	40	48		dB
Vd	Dropout Voltage	$T_J = 25^\circ\text{C}$		1.7		V

78L08 (8V Voltage Regulator) ($V_I=14\text{V}$, $I_O=40\text{mA}$, $0^\circ\text{C}<T_J<125^\circ\text{C}$, $C_I=0.33\mu\text{F}$, $C_O=0.1\mu\text{F}$, unless otherwise noted)

Symbol	Parameter	Test Conditions	MIN	TYP	MAX	Units
V _O	Output Voltage	$T_J = 25^\circ\text{C}$	7.70	8.00	8.30	V
		$10.5\text{V} \leq V_I \leq 23\text{V}$, $1\text{mA} \leq I_O \leq 40\text{mA}$	7.60	8.00	8.40	V
		$10.5\text{V} \leq V_I \leq 23\text{V}$, $1\text{mA} \leq I_O \leq 70\text{mA}$	7.60	8.00	8.40	V (note)
ΔV_O	Load Regulation	$T_J = 25^\circ\text{C}$, $1\text{mA} \leq I_O \leq 100\text{mA}$		18	80	mV
		$T_J = 25^\circ\text{C}$, $1\text{mA} \leq I_O \leq 40\text{mA}$		10	40	mV
ΔV_O	Line Regulation	$T_J = 25^\circ\text{C}$, $10.5\text{V} \leq V_I \leq 23\text{V}$		42	175	mV
		$T_J = 25^\circ\text{C}$, $11\text{V} \leq V_I \leq 23\text{V}$		36	125	mV
I _q	Quiescent Current	$T_J = 25^\circ\text{C}$		4.0	6.0	mA
ΔI_q	Quiescent Current Change	$11\text{V} \leq V_I \leq 23\text{V}$			1.5	mA
		$1\text{mA} \leq I_O \leq 40\text{mA}$			0.1	mA
V _N	Output Noise Voltage	$10\text{Hz} \leq f \leq 100\text{Hz}$		54		μV
RR	Ripple Rejection	$T_J = 25^\circ\text{C}$, $13\text{V} \leq V_I \leq 23\text{V}$, $f = 120\text{Hz}$	37	46		dB
Vd	Dropout Voltage	$T_J = 25^\circ\text{C}$		1.7		V

Marking for ML78L08PRG = 8D



MiniLogic Device Corporation



78L09 (9V Voltage Regulator) ($V_I=15V$, $I_O=40mA$, $0^\circ C < T_J < 125^\circ C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise noted)

Symbol	Parameter	Test Conditions	MIN	TYP	MAX	Units
V_O	Output Voltage	$T_J = 25^\circ C$	8.64	9.00	9.36	V
		$12V \leq V_I \leq 24V$, $1mA \leq I_O \leq 40mA$	8.55	9.00	9.45	V
		$12V \leq V_I \leq 24V$, $1mA \leq I_O \leq 70mA$	8.55	9.00	9.45	V (note)
ΔV_O	Load Regulation	$T_J = 25^\circ C$, $1mA \leq I_O \leq 100mA$		19	90	mV
		$T_J = 25^\circ C$, $1mA \leq I_O \leq 40mA$		11	40	mV
ΔV_O	Line Regulation	$T_J = 25^\circ C$, $12V \leq V_I \leq 24V$		45	175	mV
		$T_J = 25^\circ C$, $13V \leq V_I \leq 24V$		40	125	mV
I_q	Quiescent Current	$T_J = 25^\circ C$		4.1	6.0	mA
ΔI_q	Quiescent Current Change	$12V \leq V_I \leq 24V$			1.5	mA
		$1mA \leq I_O \leq 40mA$			0.1	mA
V_N	Output Noise Voltage	$10Hz \leq f \leq 100Hz$		58		μV
RR	Ripple Rejection	$T_J = 25^\circ C$, $15V \leq V_I \leq 25V$, $f = 120Hz$		45		dB
Vd	Dropout Voltage	$T_J = 25^\circ C$		1.7		V

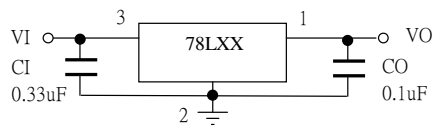
Marking for ML78L09PRG = 8E

78L12 (12V Voltage Regulator) ($V_I=19V$, $I_O=40mA$, $0^\circ C < T_J < 125^\circ C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise noted)

Symbol	Parameter	Test Conditions	MIN	TYP	MAX	Units
V_O	Output Voltage	$T_J = 25^\circ C$	11.50	12.00	12.25	V
		$14.5V \leq V_I \leq 27V$, $1mA \leq I_O \leq 40mA$	11.40	12.00	12.60	V
		$14.5V \leq V_I \leq 27V$, $1mA \leq I_O \leq 70mA$	11.40	12.00	12.60	V (note)
ΔV_O	Load Regulation	$T_J = 25^\circ C$, $1mA \leq I_O \leq 100mA$		22	100	mV
		$T_J = 25^\circ C$, $1mA \leq I_O \leq 40mA$		13	50	mV
ΔV_O	Line Regulation	$T_J = 25^\circ C$, $14.5V \leq V_I \leq 27V$		55	250	mV
		$T_J = 25^\circ C$, $16V \leq V_I \leq 27V$		49	200	mV
I_q	Quiescent Current	$T_J = 25^\circ C$		4.3	6.5	mA
ΔI_q	Quiescent Current Change	$16V \leq V_I \leq 27V$			1.5	mA
		$1mA \leq I_O \leq 40mA$			0.1	mA
V_N	Output Noise Voltage	$10Hz \leq f \leq 100Hz$		70		μV
RR	Ripple Rejection	$T_J = 25^\circ C$, $15V \leq V_I \leq 25V$, $f = 120Hz$	37	42		dB
Vd	Dropout Voltage	$T_J = 25^\circ C$		1.7		V

78L15 (15V Voltage Regulator) ($V_I=23V$, $I_O=40mA$, $0^\circ C < T_J < 125^\circ C$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, unless otherwise noted)

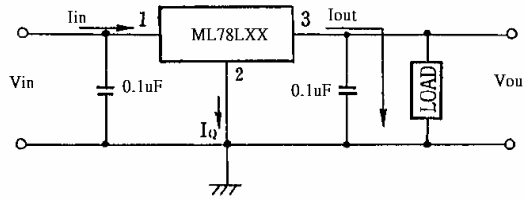
Symbol	Parameter	Test Conditions	MIN	TYP	MAX	Units
V_O	Output Voltage	$T_J = 25^\circ C$	14.40	15.00	15.60	v
		$17.5V \leq V_I \leq 30V$, $1mA \leq I_O \leq 40mA$	14.25	15.00	15.75	V
		$V_I = 23V$, $1mA \leq I_O \leq 70mA$	14.25	15.00	15.75	V (note)
ΔV_O	Load Regulation	$T_J = 25^\circ C$, $V_I = 23V$, $1mA \leq I_O \leq 100mA$		25	150	mV
		$T_J = 25^\circ C$, $V_I = 23V$, $1mA \leq I_O \leq 40mA$		15	75	mV
ΔV_O	Line Regulation	$T_J = 25^\circ C$, $17.5V \leq V_I \leq 30V$, $I_O = 40mA$		65	300	mV
		$T_J = 25^\circ C$, $19V \leq V_I \leq 30V$, $I_O = 40mA$		58	250	mV
I_q	Quiescent Current	$T_J = 25^\circ C$		4.6	6.5	mA
ΔI_q	Quiescent Current Change	$19V \leq V_I \leq 30V$, $I_O = 40mA$			1.5	mA
		$V_I = 23V$, $1mA \leq I_O \leq 40mA$			0.1	mA
V_N	Output Noise Voltage	$10Hz \leq f \leq 100Hz$		82		μV
RR	Ripple Rejection	$T_J = 25^\circ C$, $18.5V \leq V_I \leq 28.5V$, $f = 120Hz$	34	39		dB
Vd	Dropout Voltage	$T_J = 25^\circ C$		1.7		V

Marking for ML78L015PRG = 8I
Typical Application


Note : Bypass capacitors are recommended for optimum stability and transient response and should be located as close as possible to the regulator.

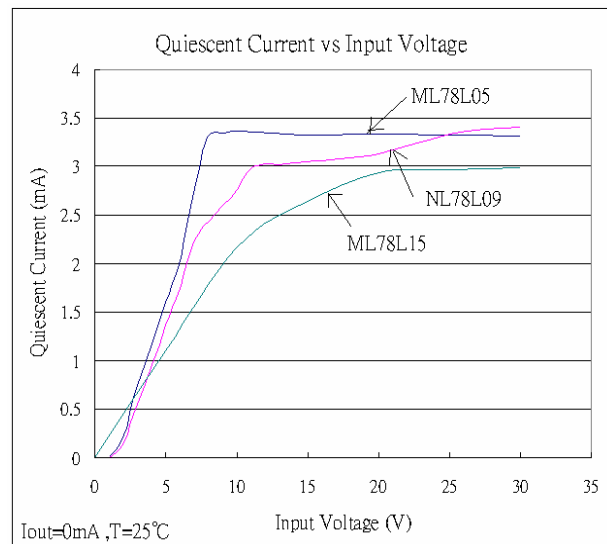
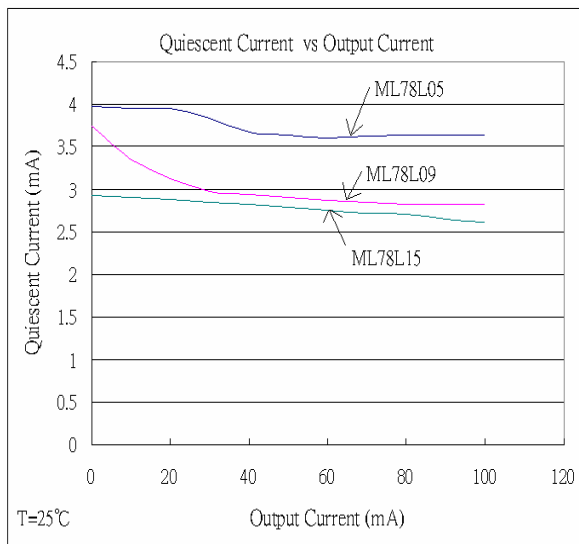
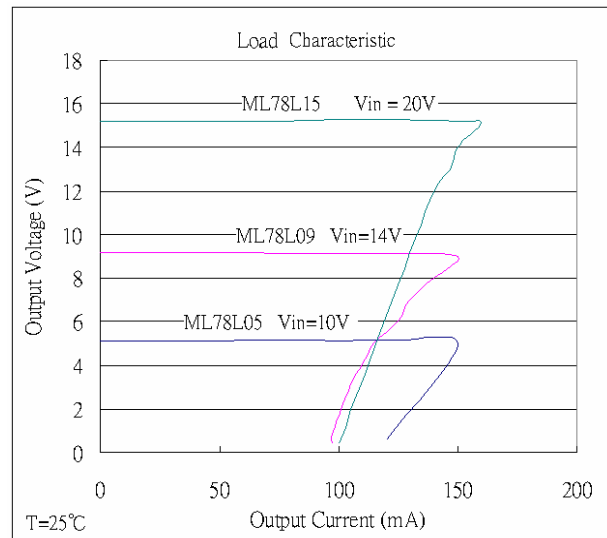
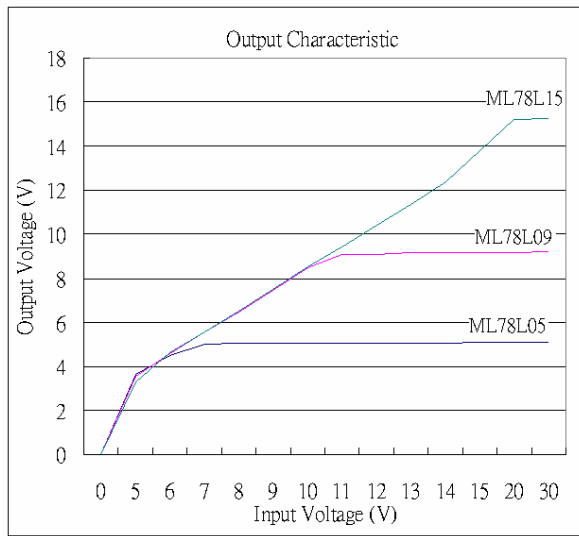
■ Test Circuit

1. Output Voltage, Line Regulation, Load Regulation, Quiescent Current, Average Temperature Coefficient of Output Voltage, Output Noise Voltage

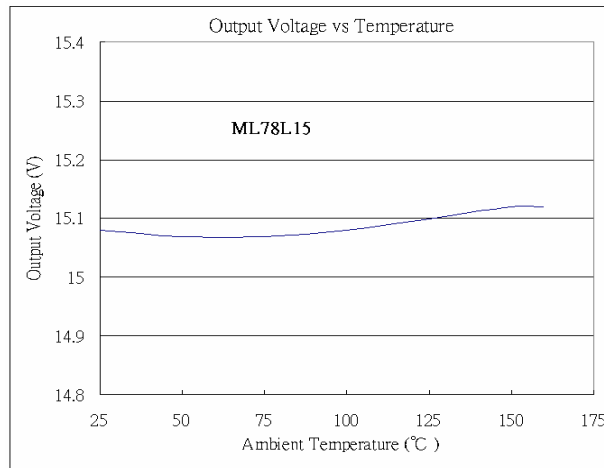
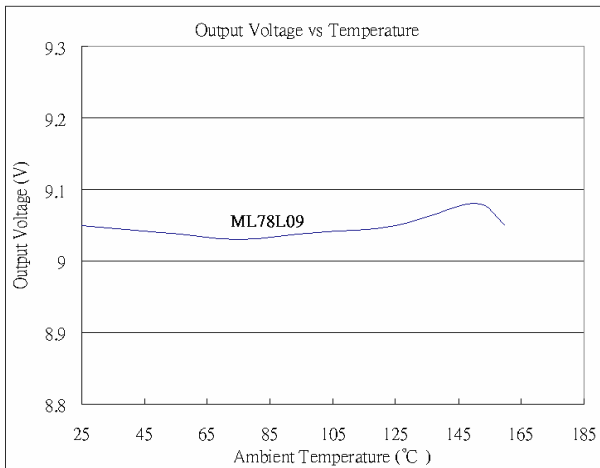
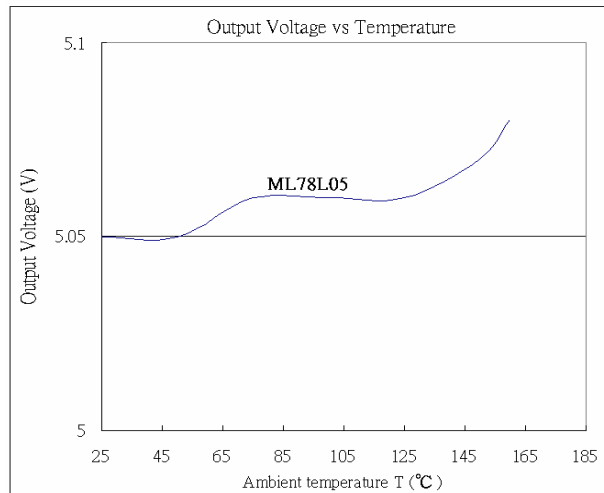
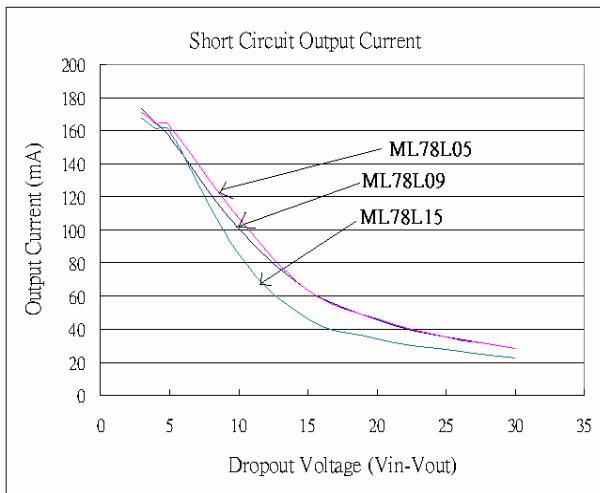
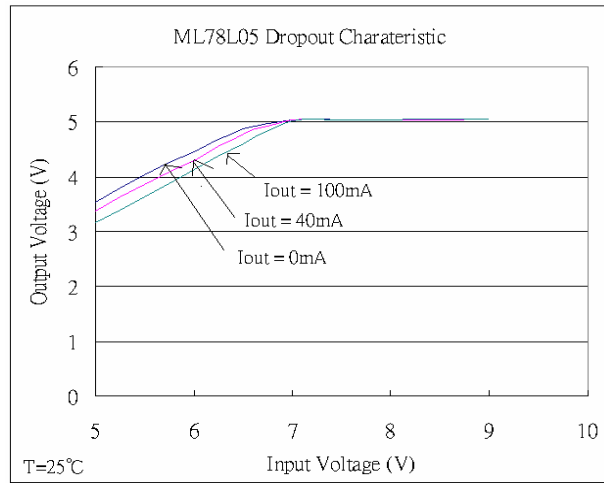
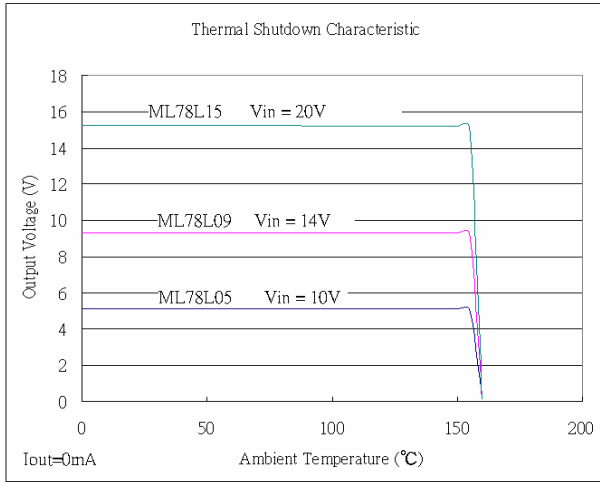


$$I_q = I_{IN} - I_o$$

■ Typical Characteristic



■ Typical Characteristic



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