



78NXX

LINEAR INTEGRATED CIRCUIT

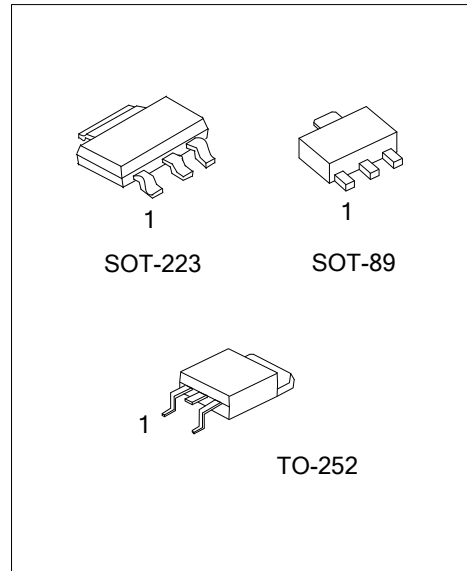
3-TERMINAL 300mA POSITIVE VOLTAGE REGULATOR

DESCRIPTION

The UTC **78NXX** family is monolithic fixed voltage regulator integrated circuit. They are suitable for applications requiring supply current up to 300mA.

FEATURES

- * Output Current up to 300mA
- * Fixed Output Voltage of 5V, 6V, 8V
- * Thermal Overload Shutdown Protection
- * Short Circuit Current Limiting



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
-	78NXXG-AB3-R	SOT-89	O	G	I	Tape Reel
-	78NXXG-AA3-R	SOT-223	O	G	I	Tape Reel
78NXXL-TN3-R	78NXXG-TN3-R	TO-252	I	G	O	Tape Reel

Note: XX: Output Voltage, refer to Marking Information

<p>78NXXG-AB3-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package (4) Output Voltage Code</p>	<p>(1) R: Tape Reel (2) AB3: SOT-89, AA3: SOT-223, TN3: TO-252 (3) G: Halogen Free and Lead Free, L: Lead Free (4) xx: Refer to Marking Information</p>
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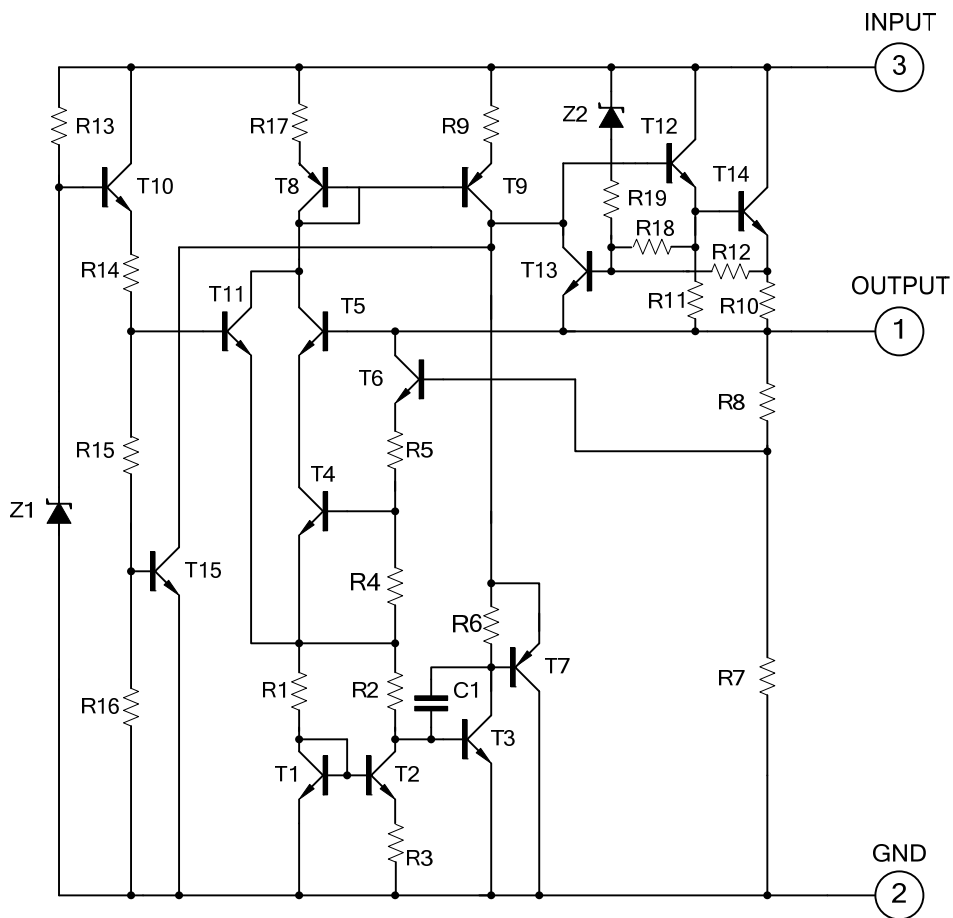
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MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-89	05: 5.0V 06: 6.0V 08: 8.0V	
SOT-223		
TO-252		

BLOCK CIRCUIT



■ ABSOLUTE MAXIMUM RATING (Operating temperature range applies, unless otherwise specified.)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	30	V
Output Current	I_{OUT}	300	mA
Power Dissipation	SOT-89	550	mW
	SOT-223	750	
	TO-252	1000	
Operating Temperature (Note 2)	T_{OPR}	-40~+150	°C
Storage Temperature	T_{STG}	-55~+150	°C

Notes: 1. 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.

2. It is guarantee by design, not 100% be tested.

■ ELECTRICAL CHARACTERISTICS

(0°C < T_J < 125°C, $C_1=0.33\mu\text{F}$, $C_0=0.1\mu\text{F}$, unless otherwise specified) (Note 1)

For 78N05 ($V_{IN}=10\text{V}$, $I_{OUT}=40\text{mA}$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^\circ\text{C}$	4.80	5.0	5.20	V
		$7\text{V} \leq V_{IN} \leq V_{MAX}$ $I_{OUT}=1\text{mA} \sim 300\text{mA}$ (Note 2)	4.75		5.25	V
Load Regulation	ΔV_{OUT}	$T_J=25^\circ\text{C}$, $I_{OUT}=1\text{mA} \sim 300\text{mA}$		11	60	mV
		$T_J=25^\circ\text{C}$, $I_{OUT}=1\text{mA} \sim 40\text{mA}$		5.0	30	mV
Line Regulation	ΔV_{OUT}	$7\text{V} \leq V_{IN} \leq 20\text{V}$, $T_J=25^\circ\text{C}$		8	150	mV
		$8\text{V} \leq V_{IN} \leq 20\text{V}$, $T_J=25^\circ\text{C}$		6	100	mV
Quiescent Current	I_Q			2.0	5.5	mA
Quiescent Current Change	ΔI_Q	$8\text{V} \leq V_{IN} \leq 20\text{V}$			1.5	mA
		$1\text{mA} \leq V_{IN} \leq 40\text{mA}$			0.1	mA
Output Noise Voltage	e_N	$10\text{Hz} \leq f \leq 100\text{kHz}$		40		μV
Temperature Coefficient of V_{OUT}	$\Delta V_O/\Delta T$	$I_{OUT}=5\text{mA}$		-0.65		$\text{mV}/^\circ\text{C}$
Ripple Rejection	RR	$8\text{V} \leq V_{IN} \leq 20\text{V}$, $f=120\text{Hz}$, $T_J=25^\circ\text{C}$	41	80		dB
Dropout Voltage	V_D	$T_J=25^\circ\text{C}$		1.7		V

For 78N06 ($V_{IN}=12\text{V}$, $I_{OUT}=40\text{mA}$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^\circ\text{C}$	5.76	6.0	6.24	V
		$8.5\text{V} \leq V_{IN} \leq V_{MAX}$, $I_{OUT}=1\text{mA} \sim 300\text{mA}$ (Note 2)	5.7		6.3	V
Load Regulation	ΔV_{OUT}	$T_J=25^\circ\text{C}$, $I_{OUT}=1\text{mA} \sim 300\text{mA}$		12.8	80	mV
		$T_J=25^\circ\text{C}$, $I_{OUT}=1\text{mA} \sim 40\text{mA}$		5.8	40	mV
Line Regulation	ΔV_{OUT}	$8.5\text{V} \leq V_{IN} \leq 20\text{V}$, $T_J=25^\circ\text{C}$		64	175	mV
		$9\text{V} \leq V_{IN} \leq 20\text{V}$, $T_J=25^\circ\text{C}$		54	125	mV
Quiescent Current	I_Q			2.0	5.5	mA
Quiescent Current Change	ΔI_Q	$9\text{V} \leq V_{IN} \leq 20\text{V}$			1.5	mA
		$1\text{mA} \leq V_{IN} \leq 40\text{mA}$			0.1	mA
Output Noise Voltage	e_N	$10\text{Hz} \leq f \leq 100\text{kHz}$		49		μV
Temperature Coefficient of V_{OUT}	$\Delta V_O/\Delta T$	$I_{OUT}=5\text{mA}$		0.75		$\text{mV}/^\circ\text{C}$
Ripple Rejection	RR	$10\text{V} \leq V_{IN} \leq 20\text{V}$, $f=120\text{Hz}$, $T_J=25^\circ\text{C}$	40	46		dB
Dropout Voltage	V_D	$T_J=25^\circ\text{C}$		1.7		V

■ ELECTRICAL CHARACTERISTICS (Cont.)

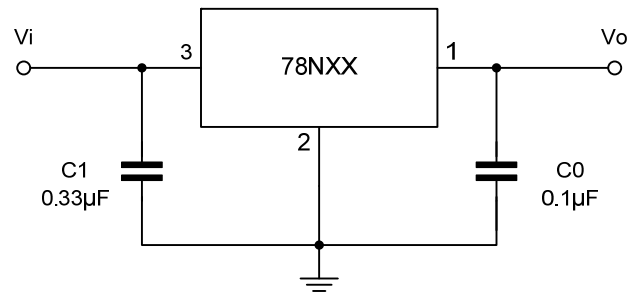
For 78N08 ($V_{IN}=14V$, $I_{OUT}=40mA$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^{\circ}C$	7.68	8.0	8.32	V
		$10.5V \leq V_{IN} \leq V_{MAX}$, $I_{OUT}=1mA \sim 300mA$ (Note 2)	7.60		8.40	V
Load Regulation	ΔV_{OUT}	$T_J=25^{\circ}C, I_{OUT}=1mA \sim 300mA$		15	80	mV
		$T_J=25^{\circ}C, I_{OUT}=1mA \sim 40mA$		8.0	40	mV
Line Regulation	ΔV_{OUT}	$10.5V \leq V_{IN} \leq 23V, T_J=25^{\circ}C$		10	175	mV
		$11V \leq V_{IN} \leq 23V, T_J=25^{\circ}C$		8	125	mV
Quiescent Current	I_Q			2.0	5.5	mA
Quiescent Current Change	ΔI_Q	$11V \leq V_{IN} \leq 23V$			1.5	mA
		$1mA \leq V_{IN} \leq 40mA$			0.1	mA
Output Noise Voltage	e_N	$10Hz \leq f \leq 100kHz$		49		μV
Temperature Coefficient of V_{OUT}	$\Delta V_O/\Delta T$	$I_{OUT}=5mA$		0.75		$mV/^{\circ}C$
Ripple Rejection	RR	$11V \leq V_{IN} \leq 23V, f=120Hz, T_J=25^{\circ}C$	39	70		dB
Dropout Voltage	V_D	$T_J=25^{\circ}C$		1.7		V

Notes: 1. The Maximum steady state usable output current are dependent on input voltage, heat sinking, lead length of the package and copper pattern of PCB. The data above represent pulse test conditions with junction temperatures specified at the initiation of test.

2. Power dissipation < 0.5W

■ TYPICAL APPLICATION CIRCUIT



- Notes:
1. To specify an output voltage, substitute voltage value for "XX".
 2. Bypass capacitors are recommended for optimum stability and transient response and should be located as close as possible to the regulators.

TYPICAL CHARACTERISTICS

Fig.1 Ambient Temperature vs. Power Dissipation

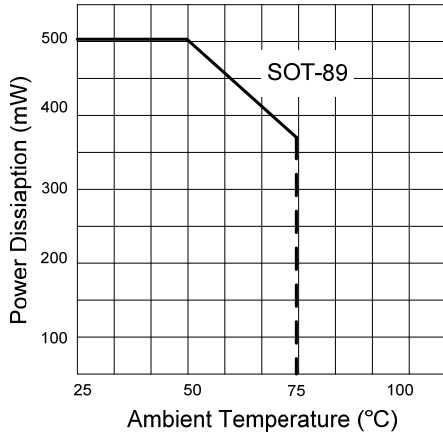


Fig.2 78N05 Output Voltage vs. Ambient Temperature

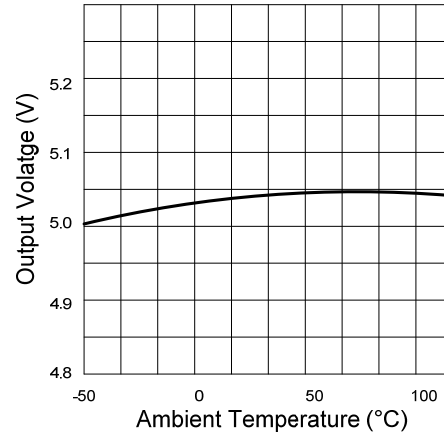


Fig.3 78N08 Output Voltage vs. Ambient Temperature

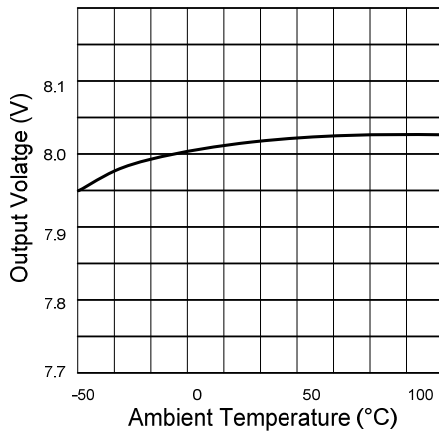


Fig.4 Output Characteristics (I_{OUT}=0mA, T_J=25°C)

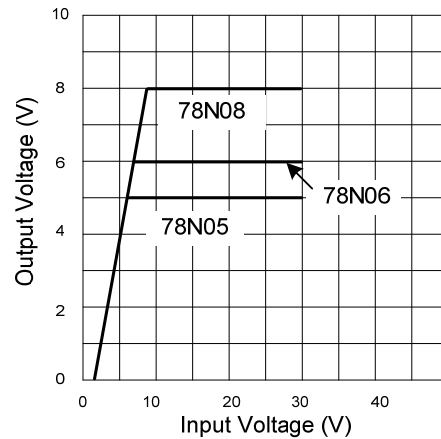


Fig.5 78N05 Dropout Characteristics (T_J=25°C)

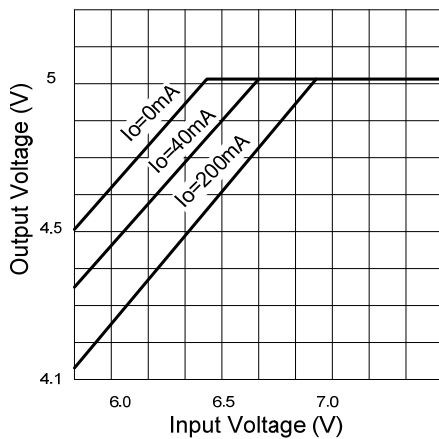
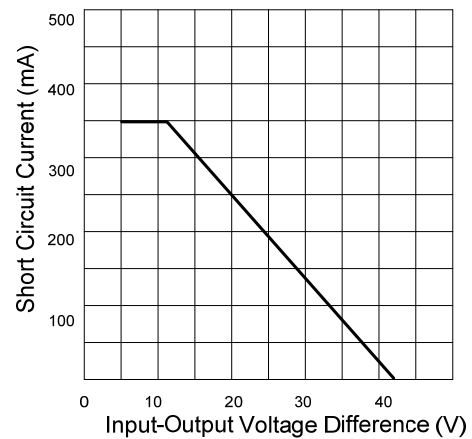


Fig.6 Short Circuit Output Current (T_J=25°C)



■ TYPICAL CHARACTERISTICS(Cont.)

Fig.7 78N05 Quiescent Current vs. Input Voltage ($I_{out}=0mA, T_J=25^{\circ}C$)

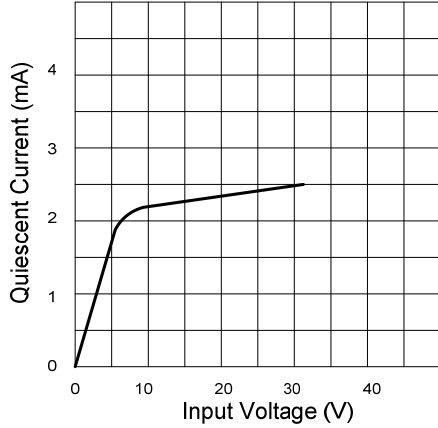
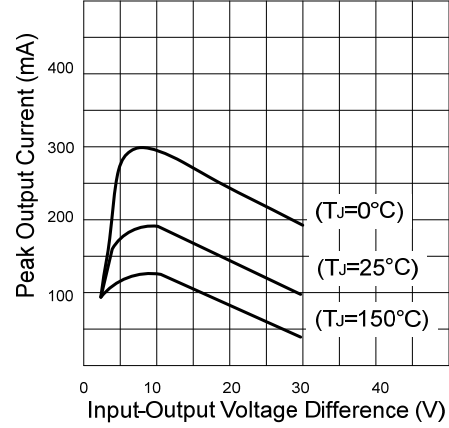


Fig.8 Peak Output Current vs Dropout Voltage Difference



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