AX78XX Series

3-Terminal Positive Voltage Regulators

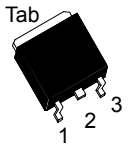
Description

The AX78XX series can provide local on-card regulation, eliminating the distribution problems associated with single point regulation. Each employs internal current limiting, thermal shut-down and safe operating area protection, making it essen-tially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.

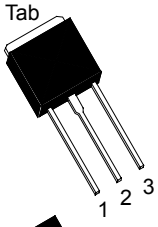
Features

- Output Current In Excess of 1A
- Output Voltages of 5V, 6V, 8V, 9V, 12V
- Internal Short-Circuit Current Limiting & Thermal Overload Protection
- Guaranteed In Extended Temperature Range

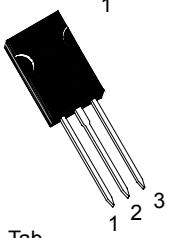
AX78XX Series Pin Assignment



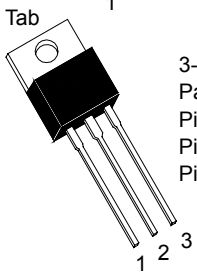
3-Lead Plastic **TO-252**
Package Code: J
Pin 1: V_{IN}
Pin 2 & Tab: GND
Pin 3: V_{OUT}



3-Lead Plastic **TO-251**
Package Code: I
Pin 1: V_{IN}
Pin 2 & Tab: GND
Pin 3: V_{OUT}



3-Lead Plastic **SOT-82**
Package Code: NE
Pin 1: V_{IN}
Pin 2: GND
Pin 3: V_{OUT}



3-Lead Plastic **TO-220AB**
Package Code: E
Pin 1: V_{IN}
Pin 2 & Tab: GND
Pin 3: V_{OUT}

Absolute Maximum Ratings (T_A=25°C)

Characteristic	Symbol	Rating	Unit
Input Voltage	V_{IN}	40	V
Power Dissipation	P_D	Internally limited (Note)	
Operating Temperature	T_{opr}	-30 to 85	°C
Storage Temperature	T_{stg}	-55 to 150	°C
Junction Temperature	T_j	150	°C

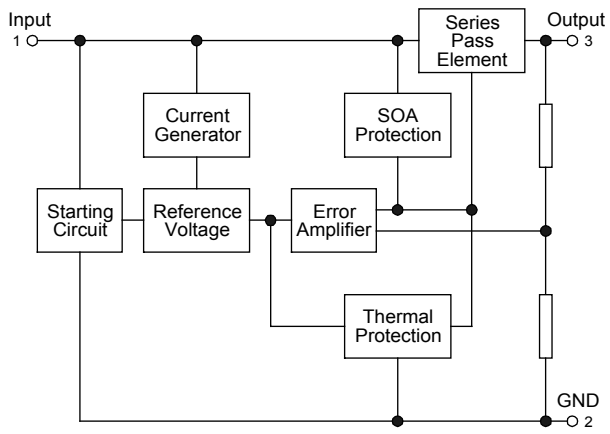
Note: (1)T_A=25°C, TO-251: 1W, TO-252: 1W, SOT-82: 2.1W, TO-220AB: 2.7W
(2)T_C=25°C, All package: 10W

Thermal Data

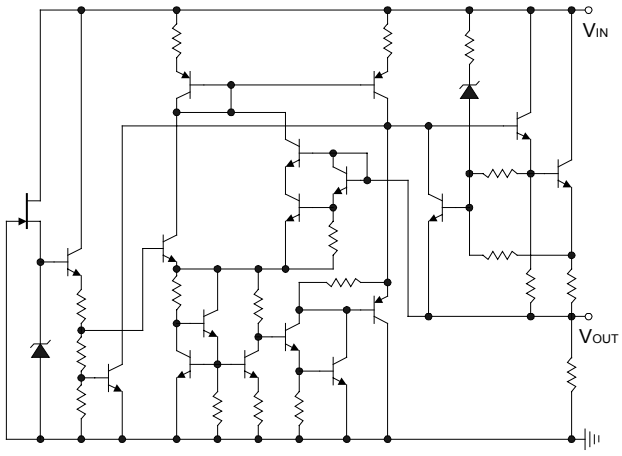
Characteristic	Symbol	TO-252	TO-251	SOT-82	TO-220AB	Unit
Thermal Resistance Junction-Case	$R_{th(j-c)}$	12.5	12.5	12.5	12.5	°C/W
Thermal Resistance Junction-Ambient	$R_{th(j-a)}$	125	125	60	47	°C/W

Schematic Diagram & Equivalent Circuit

Schematic Diagram



Equivalent Circuit



AX7805 Series Electrical Characteristics

V_{IN}=10V, I_{OUT}=500mA, C_{IN}=0.33uF, C_{OUT}=0.1uF, 0°C≤T_J≤125°C (unless otherwise specified)

Symbol	Parameter	Conditions	AX7805AJ/AI/ANE/AE			Units
			Min	Typ	Max	
V_O	Output Voltage	T_J=25°C, I_{OUT}=500mA	4.85	5	5.15	V
		5mA≤I_{OUT}≤1A	4.85	5	5.15	
		7V≤V_{IN}≤25V, P_{OUT}≤15W				
ΔV_O	Line Regulation	T_J=25°C, 7V≤V_{IN}≤25V	-	3	50	mV
		T_J=25°C, 8V≤V_{IN}≤12V	-	1	25	
ΔV_O	Load Regulation	T_J=25°C, 5mA≤I_{OUT}≤1A	-	15	100	mV
		T_J=25°C, 250mA≤I_{OUT}≤750mA	-	5	50	
I_B	Quiescent Current	I_{OUT}=5mA, T_J=25°C	-	3.9	8	mA
ΔI_B	Quiescent Current Change	I_{OUT}=500mA, 7V≤V_{IN}≤25V, T_J=25°C	-	-	1.3	mA
		5mA≤I_{OUT}≤1A, V_{IN}=10V, T_J=25°C	-	-	0.5	
eN	Output Noise Voltage	B=10Hz~100KHz, I_{OUT}=50mA, T_J=25°C	-	50	-	uV/V_O
RR	Ripple Rejection	10V≤V_{IN}≤18V, f=120Hz, I_{OUT}=50mA, T_J=25°C	57	73	-	dB
V_D	Dropout Voltage	T_J=25°C, I_{OUT}=1A	-	2	2.5	V
R_O	Output Resistance	f=1KHz	-	17	-	mΩ
I_{SC}	Short Circuit Current	T_J=25°C	-	2.3	2.8	A
$\Delta V_O/\Delta T$	Output Voltage Drift	0°C≤T_J≤125°C	-	-	0.6	mV/°C

Symbol	Parameter	Conditions	AX7805BJ/BI/BNE/BE			Units
			Min	Typ	Max	
V_O	Output Voltage	T_J=25°C, I_{OUT}=500mA	4.75	5	5.25	V
		5mA≤I_{OUT}≤1A	4.75	5	5.25	
		7V≤V_{IN}≤25V, P_{OUT}≤15W				
ΔV_O	Line Regulation	T_J=25°C, 7V≤V_{IN}≤25V	-	3	100	mV
		T_J=25°C, 8V≤V_{IN}≤12V	-	1	50	
ΔV_O	Load Regulation	T_J=25°C, 5mA≤I_{OUT}≤1A	-	15	100	mV
		T_J=25°C, 250mA≤I_{OUT}≤750mA	-	5	50	
I_B	Quiescent Current	I_{OUT}=5mA, T_J=25°C	-	3.9	8	mA
ΔI_B	Quiescent Current Change	I_{OUT}=500mA, 7V≤V_{IN}≤25V, T_J=25°C	-	-	1.3	mA
		5mA≤I_{OUT}≤1A, V_{IN}=10V, T_J=25°C	-	-	0.5	
eN	Output Noise Voltage	B=10Hz~100KHz, I_{OUT}=50mA, T_J=25°C	-	50	-	uV/V_O
RR	Ripple Rejection	10V≤V_{IN}≤18V, f=120Hz, I_{OUT}=50mA, T_J=25°C	57	73	-	dB
V_D	Dropout Voltage	T_J=25°C, I_{OUT}=1A	-	2	2.5	V
R_O	Output Resistance	f=1KHz	-	17	-	mΩ
I_{SC}	Short Circuit Current	T_J=25°C	-	2.3	2.8	A
$\Delta V_O/\Delta T$	Output Voltage Drift	0°C≤T_J≤125°C	-	-	0.6	mV/°C

AX7806 Series Electrical Characteristics

V_{IN}=11V, I_{OUT}=500mA, C_{IN}=0.33uF, C_{OUT}=0.1uF, 0°C≤T_J≤125°C (unless otherwise specified)

Symbol	Parameter	Conditions	AX7806AJ/AI/ANE/AE			Units
			Min	Typ	Max	
V_O	Output Voltage	T_J=25°C, I_{OUT}=500mA	5.82	6	6.18	V
		5mA≤I_{OUT}≤1A	5.82	6	6.18	
		8V≤V_{IN}≤25V, P_{OUT}≤15W				
ΔV_O	Line Regulation	T_J=25°C, 8V≤V_{IN}≤25V	-	3	60	mV
		T_J=25°C, 9V≤V_{IN}≤13V	-	1	25	
ΔV_O	Load Regulation	T_J=25°C, 5mA≤I_{OUT}≤1A	-	15	100	mV
		T_J=25°C, 250mA≤I_{OUT}≤750mA	-	5	50	
I_B	Quiescent Current	I_{OUT}=5mA, T_J=25°C	-	3.9	8	mA
ΔI_B	Quiescent Current Change	I_{OUT}=500mA, 9V≤V_{IN}≤25V, T_J=25°C	-	-	1.3	mA
		5mA≤I_{OUT}≤1A, V_{IN}=11V, T_J=25°C	-	-	0.5	
eN	Output Noise Voltage	B=10Hz~100KHz, I_{OUT}=50mA, T_J=25°C	-	-	55	uV/V_O
RR	Ripple Rejection	11V≤V_{IN}≤19V, f=120Hz, I_{OUT}=50mA, T_J=25°C	56	72	-	dB
V_D	Dropout Voltage	T_J=25°C, I_{OUT}=1A	-	2	2.5	V
R_O	Output Resistance	f=1KHz	-	17	-	mΩ
I_{SC}	Short Circuit Current	V_{IN}=45V, T_J=25°C	-	2.3	2.8	A
$\Delta V_O/\Delta T$	Output Voltage Drift	0°C≤T_J≤125°C	-	-	0.7	mV/°C

Symbol	Parameter	Conditions	AX7806BJ/BI/BNE/BE			Units
			Min	Typ	Max	
V_O	Output Voltage	T_J=25°C, I_{OUT}=500mA	5.7	6	6.3	V
		5mA≤I_{OUT}≤1A	5.7	6	6.3	
		8V≤V_{IN}≤25V, P_{OUT}≤15W				
ΔV_O	Line Regulation	T_J=25°C, 8V≤V_{IN}≤25V	-	3	120	mV
		T_J=25°C, 9V≤V_{IN}≤13V	-	1	60	
ΔV_O	Load Regulation	T_J=25°C, 5mA≤I_{OUT}≤1A	-	15	120	mV
		T_J=25°C, 250mA≤I_{OUT}≤750mA	-	5	60	
I_B	Quiescent Current	I_{OUT}=5mA, T_J=25°C	-	3.9	8	mA
ΔI_B	Quiescent Current Change	I_{OUT}=500mA, 9V≤V_{IN}≤25V, T_J=25°C	-	-	1.3	mA
		5mA≤I_{OUT}≤1A, V_{IN}=11V, T_J=25°C	-	-	0.5	
eN	Output Noise Voltage	B=10Hz~100KHz, I_{OUT}=50mA, T_J=25°C	-	-	55	uV/V_O
RR	Ripple Rejection	11V≤V_{IN}≤19V, f=120Hz, I_{OUT}=50mA, T_J=25°C	56	72	-	dB
V_D	Dropout Voltage	T_J=25°C, I_{OUT}=1A	-	2	2.5	V
R_O	Output Resistance	f=1KHz	-	17	-	mΩ
I_{SC}	Short Circuit Current	V_{IN}=45V, T_J=25°C	-	2.3	2.8	A
$\Delta V_O/\Delta T$	Output Voltage Drift	0°C≤T_J≤125°C	-	-	0.7	mV/°C

AX7808 Series Electrical Characteristics

V_{IN}=14V, I_{OUT}=500mA, C_{IN}=0.33uF, C_{OUT}=0.1uF, 0°C≤T_J≤125°C (unless otherwise specified)

Symbol	Parameter	Conditions	AX7808AJ/AI/ANE/AE			Units
			Min	Typ	Max	
V_O	Output Voltage	T_J=25°C, I_{OUT}=500mA	7.76	8	8.24	V
		5mA≤I_{OUT}≤1A	7.76	8	8.24	
		10V≤V_{IN}≤25V, P_{OUT}≤15W				
ΔV_O	Line Regulation	T_J=25°C, 10.5V≤V_{IN}≤25V	-	3	80	mV
		T_J=25°C, 11V≤V_{IN}≤17V	-	1	40	
ΔV_O	Load Regulation	T_J=25°C, 5mA≤I_{OUT}≤1A	-	15	100	mV
		T_J=25°C, 250mA≤I_{OUT}≤750mA	-	5	50	
I_B	Quiescent Current	I_{OUT}=5mA, T_j=25°C	-	3.9	8	mA
ΔI_B	Quiescent Current Change	I_{OUT}=500mA, 10.5V≤V_{IN}≤25V, T_J=25°C	-	-	1.3	mA
		5mA≤I_{OUT}≤1A, V_{IN}=14V, T_J=25°C	-	-	0.5	
eN	Output Noise Voltage	B=10Hz~100KHz, I_{OUT}=50mA, T_J=25°C	-	-	70	uV/V_O
RR	Ripple Rejection	14V≤V_{IN}≤21.5V, f=120Hz, I_{OUT}=50mA, T_J=25°C	53	69	-	dB
V_D	Dropout Voltage	T_J=25°C, I_{OUT}=1A	-	2	2.5	V
R_O	Output Resistance	f=1KHz	-	17	-	mΩ
I_{SC}	Short Circuit Current	T_J=25°C	-	2.3	2.8	A
$\Delta V_O/\Delta T$	Output Voltage Drift	0°C≤T_J≤125°C	-	-	1	mV/°C

Symbol	Parameter	Conditions	AX7808BJ/BI/BNE/BE			Units
			Min	Typ	Max	
V_O	Output Voltage	T_J=25°C, I_{OUT}=500mA	7.6	8	8.4	V
		5mA≤I_{OUT}≤1A	7.6	8	8.4	
		10V≤V_{IN}≤25V, P_{OUT}≤15W				
ΔV_O	Line Regulation	T_J=25°C, 10.5V≤V_{IN}≤25V	-	3	160	mV
		T_J=25°C, 11V≤V_{IN}≤17V	-	1	80	
ΔV_O	Load Regulation	T_J=25°C, 5mA≤I_{OUT}≤1A	-	15	160	mV
		T_J=25°C, 250mA≤I_{OUT}≤750mA	-	5	80	
I_B	Quiescent Current	I_{OUT}=5mA, T_J=25°C	-	3.9	8	mA
ΔI_B	Quiescent Current Change	I_{OUT}=500mA, 10.5V≤V_{IN}≤25V, T_J=25°C	-	-	1.3	mA
		5mA≤I_{OUT}≤1A, V_{IN}=14V, T_J=25°C	-	-	0.5	
eN	Output Noise Voltage	B=10Hz~100KHz, I_{OUT}=50mA, T_J=25°C	-	-	70	uV/V_O
RR	Ripple Rejection	14V≤V_{IN}≤21.5V, f=120Hz, I_{OUT}=50mA, T_J=25°C	53	69	-	dB
V_D	Dropout Voltage	T_J=25°C, I_{OUT}=1A	-	2	2.5	V
R_O	Output Resistance	f=1KHz	-	17	-	mΩ
I_{SC}	Short Circuit Current	T_J=25°C	-	2.3	2.8	A
$\Delta V_O/\Delta T$	Output Voltage Drift	0°C≤T_J≤125°C	-	-	1	mV/°C

AX7809 Series Electrical Characteristics

V_{IN}=15V, I_{OUT}=500mA, C_{IN}=0.33uF, C_{OUT}=0.1uF, 0°C≤T_J≤125°C (unless otherwise specified)

Symbol	Parameter	Conditions	AX7809AJ/AI/ANE/AE			Units
			Min	Typ	Max	
V_O	Output Voltage	T_J=25°C, I_{OUT}=500mA	8.73	9	9.27	V
		5mA≤I_{OUT}≤1A	8.73	9	9.27	
		11V≤V_{IN}≤25V, P_{OUT}≤15W				
ΔV_O	Line Regulation	T_J=25°C, 11.5V≤V_{IN}≤25V	-	3	90	mV
		T_J=25°C, 13V≤V_{IN}≤19V	-	1	45	
ΔV_O	Load Regulation	T_J=25°C, 5mA≤I_{OUT}≤1A	-	15	100	mV
		T_J=25°C, 250mA≤I_{OUT}≤750mA	-	5	50	
I_B	Quiescent Current	I_{OUT}=5mA, T_j=25°C	-	3.9	8	mA
ΔI_B	Quiescent Current Change	I_{OUT}=500mA, 11.5V≤V_{IN}≤26V, T_J=25°C	-	-	1.3	mA
		5mA≤I_{OUT}≤1A, V_{IN}=15V, T_J=25°C	-	-	0.5	
eN	Output Noise Voltage	B=10Hz~100KHz, I_{OUT}=50mA, T_J=25°C	-	-	75	uV/V_O
RR	Ripple Rejection	15V≤V_{IN}≤22.5V, f=120Hz, I_{OUT}=50mA, T_J=25°C	51	67	-	dB
V_D	Dropout Voltage	T_J=25°C, I_{OUT}=1A	-	2	2.5	V
R_O	Output Resistance	f=1KHz	-	17	-	mΩ
I_{SC}	Short Circuit Current	T_J=25°C	-	2.3	2.8	A
$\Delta V_O/\Delta T$	Output Voltage Drift	0°C≤T_J≤125°C	-	-	1.1	mV/°C

Symbol	Parameter	Conditions	AX7809BJ/BI/BNE/BE			Units
			Min	Typ	Max	
V_O	Output Voltage	T_J=25°C, I_{OUT}=500mA	8.55	9	9.45	V
		5mA≤I_{OUT}≤1A	8.55	9	9.45	
		11V≤V_{IN}≤25V, P_{OUT}≤15W				
ΔV_O	Line Regulation	T_J=25°C, 11.5V≤V_{IN}≤25V	-	3	180	mV
		T_J=25°C, 13V≤V_{IN}≤19V	-	1	90	
ΔV_O	Load Regulation	T_J=25°C, 5mA≤I_{OUT}≤1A	-	15	180	mV
		T_J=25°C, 250mA≤I_{OUT}≤750mA	-	5	90	
I_B	Quiescent Current	I_{OUT}=5mA, T_J=25°C	-	3.9	8	mA
ΔI_B	Quiescent Current Change	I_{OUT}=500mA, 11.5V≤V_{IN}≤26V, T_J=25°C	-	-	1.3	mA
		5mA≤I_{OUT}≤1A, V_{IN}=15V, T_J=25°C	-	-	0.5	
eN	Output Noise Voltage	B=10Hz~100KHz, I_{OUT}=50mA, T_J=25°C	-	-	75	uV/V_O
RR	Ripple Rejection	15V≤V_{IN}≤22.5V, f=120Hz, I_{OUT}=50mA, T_J=25°C	51	67	-	dB
V_D	Dropout Voltage	T_J=25°C, I_{OUT}=1A	-	2	2.5	V
R_O	Output Resistance	f=1KHz	-	17	-	mΩ
I_{SC}	Short Circuit Current	T_J=25°C	-	2.3	2.8	A
$\Delta V_O/\Delta T$	Output Voltage Drift	0°C≤T_J≤125°C	-	-	1.1	mV/°C

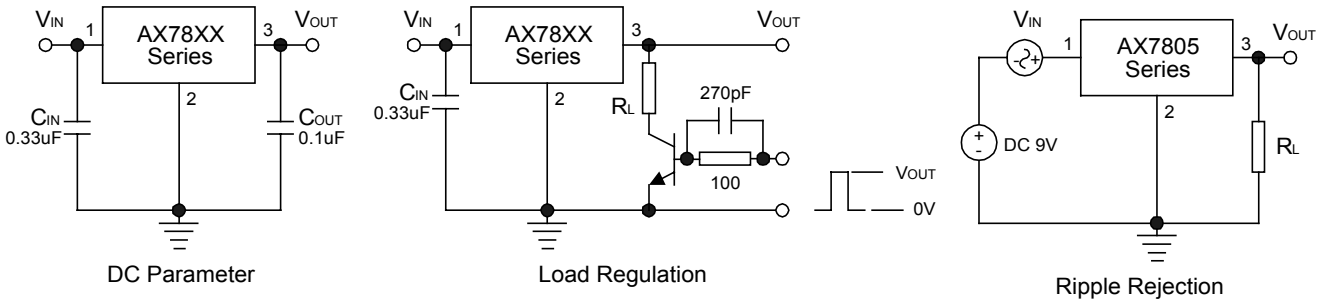
AX7812 Series Electrical Characteristics

V_{IN}=19V, I_{OUT}=500mA, C_{IN}=0.33uF, C_{OUT}=0.1uF, 0°C≤T_J≤125°C (unless otherwise specified)

Symbol	Parameter	Conditions	AX7812AJ/AI/ANE/AE			Units
			Min	Typ	Max	
V_O	Output Voltage	T_J=25°C, I_{OUT}=500mA	11.64	12	12.36	V
		5mA≤I_{OUT}≤1A	11.64	12	12.36	
		14V≤V_{IN}≤30V, P_{OUT}≤15W				
ΔV_O	Line Regulation	T_J=25°C, 14.5V≤V_{IN}≤30V	-	10	120	mV
		T_J=25°C, 16V≤V_{IN}≤22V	-	3	60	
ΔV_O	Load Regulation	T_J=25°C, 5mA≤I_{OUT}≤1A	-	12	100	mV
		T_J=25°C, 250mA≤I_{OUT}≤750mA	-	4	60	
I_B	Quiescent Current	I_{OUT}=5mA, T_j=25°C	-	3.9	8	mA
ΔI_B	Quiescent Current Change	I_{OUT}=500mA, 14.5V≤V_{IN}≤30V, T_J=25°C	-	-	1.3	mA
		5mA≤I_{OUT}≤1A, V_{IN}=19V, T_J=25°C	-	-	0.5	
eN	Output Noise Voltage	B=10Hz~100KHz, I_{OUT}=50mA, T_J=25°C	-	-	90	uV/V_O
RR	Ripple Rejection	19V≤V_{IN}≤25V, f=120Hz, I_{OUT}=50mA, T_J=25°C	50	66	-	dB
V_D	Dropout Voltage	T_J=25°C, I_{OUT}=1A	-	2	2.5	V
R_O	Output Resistance	f=1KHz	-	18	-	mΩ
I_{SC}	Short Circuit Current	T_J=25°C	-	2.3	2.8	A
$\Delta V_O/\Delta T$	Output Voltage Drift	0°C≤T_J≤125°C	-	-	1.6	mV/°C

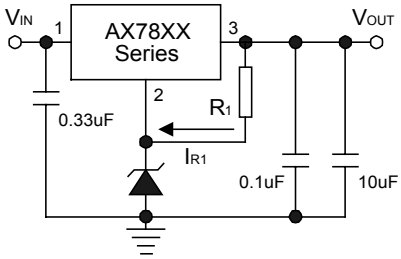
Symbol	Parameter	Conditions	AX7812BJ/BI/BNE/BE			Units
			Min	Typ	Max	
V_O	Output Voltage	T_J=25°C, I_{OUT}=500mA	11.4	12	12.6	V
		5mA≤I_{OUT}≤1A	11.4	12	12.6	
		14V≤V_{IN}≤30V, P_{OUT}≤15W				
ΔV_O	Line Regulation	T_J=25°C, 14.5V≤V_{IN}≤30V	-	10	240	mV
		T_J=25°C, 16V≤V_{IN}≤22V	-	3	120	
ΔV_O	Load Regulation	T_J=25°C, 5mA≤I_{OUT}≤1A	-	12	240	mV
		T_J=25°C, 250mA≤I_{OUT}≤750mA	-	4	120	
I_B	Quiescent Current	I_{OUT}=5mA, T_J=25°C	-	3.9	8	mA
ΔI_B	Quiescent Current Change	I_{OUT}=500mA, 14.5V≤V_{IN}≤30V, T_J=25°C	-	-	1.3	mA
		5mA≤I_{OUT}≤1A, V_{IN}=19V, T_J=25°C	-	-	0.5	
eN	Output Noise Voltage	B=10Hz~100KHz, I_{OUT}=50mA, T_J=25°C	-	-	90	uV/V_O
RR	Ripple Rejection	19V≤V_{IN}≤25V, f=120Hz, I_{OUT}=50mA, T_J=25°C	50	66	-	dB
V_D	Dropout Voltage	T_J=25°C, I_{OUT}=1A	-	2	2.5	V
R_O	Output Resistance	f=1KHz	-	18	-	mΩ
I_{SC}	Short Circuit Current	T_j=25°C	-	2.3	2.8	A
$\Delta V_O/\Delta T$	Output Voltage Drift	0°C≤T_J≤125°C	-	-	1.6	mV/°C

Test Circuits



Application Circuits

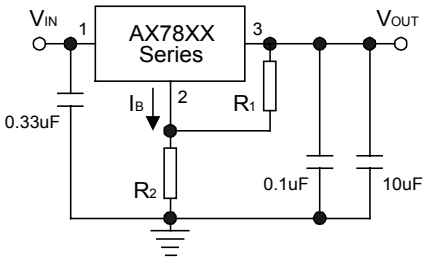
Constant Current Regulator



$V_{OUT}=V_{OUT(IC)}+V_Z$

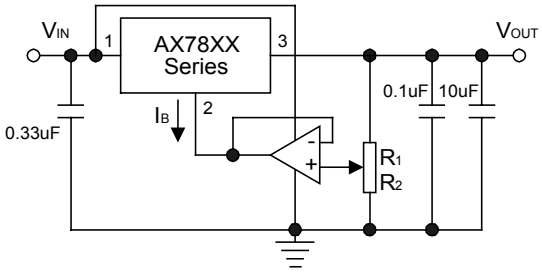
$I_1=V_{OUT(IC)}/R_1$

Circuit for Increasing Output Voltage



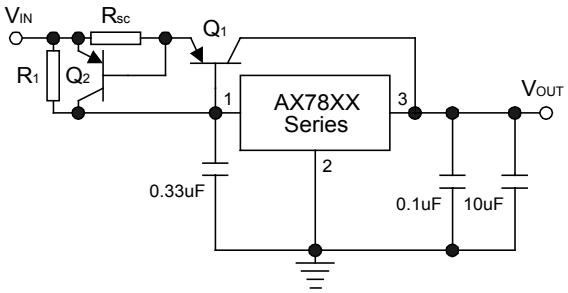
$V_{OUT}=V_{OUT(IC)}(1+R_2/R_1)+R_2*I_B$

Adjustable Output Regulator



$V_{OUT}=V_{OUT(IC)}(1+R_2/R_1)$

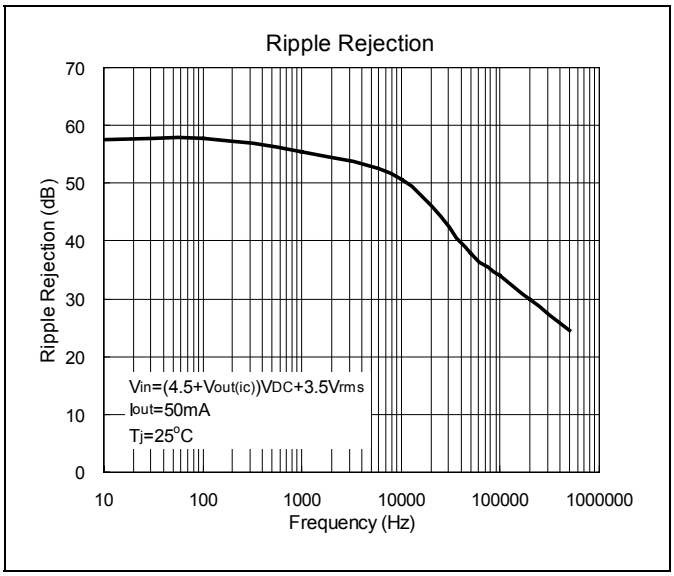
High Output Current with Short-circuit Protection

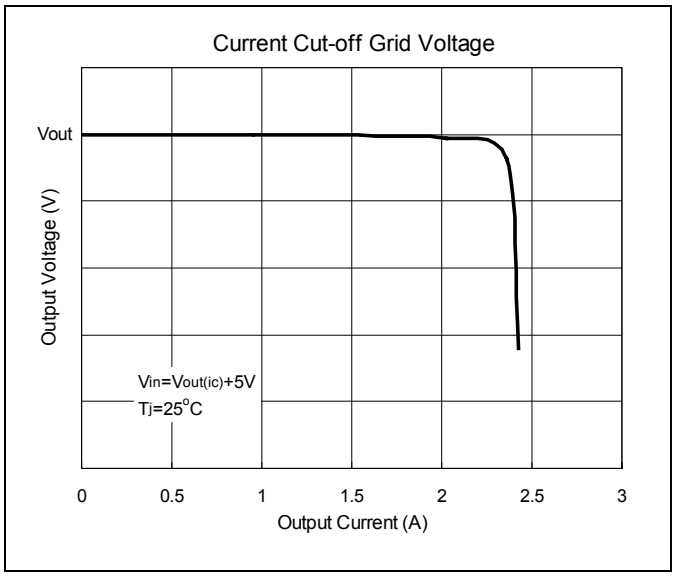


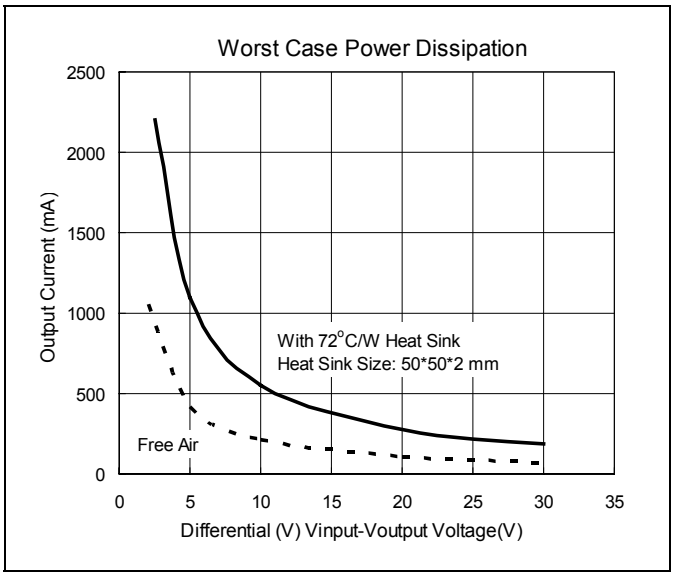
$R_1 \le V_{BE1}/I_{B(max)}$

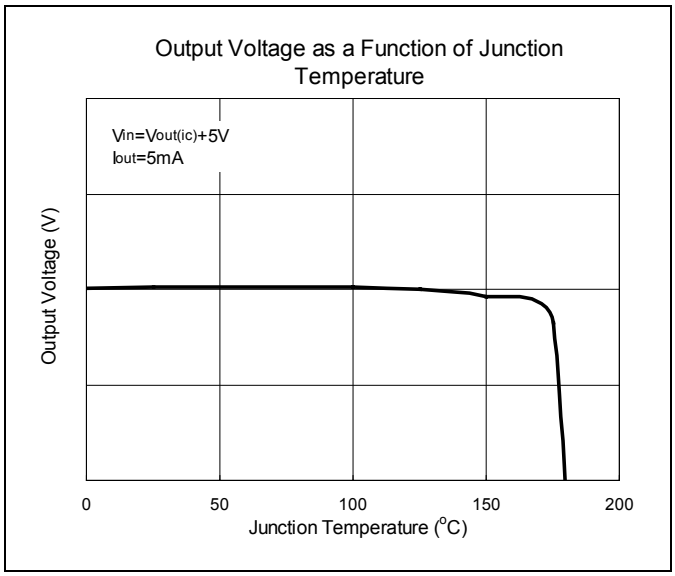
$R_{SC}=V_{BE2}/I_{SC}$, I_{SC}: Short-Circuit Current

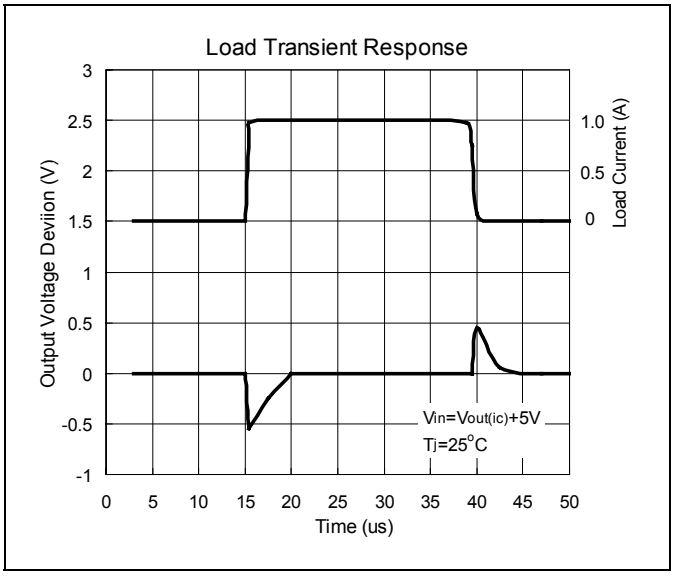
Characteristics Curve

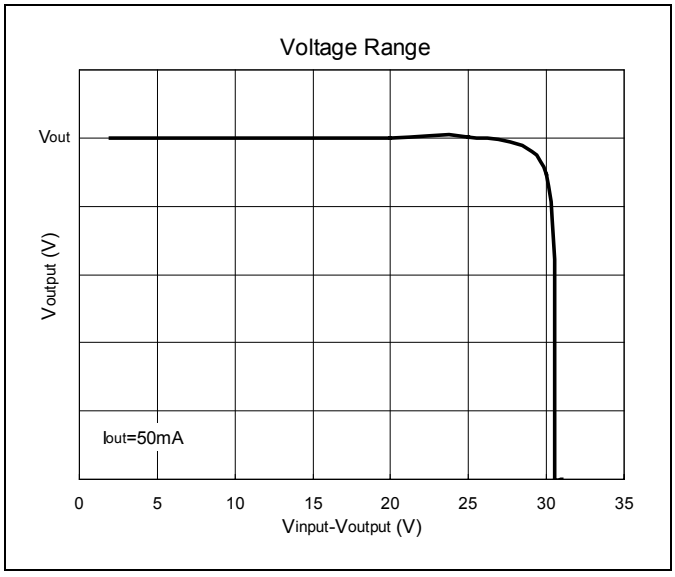




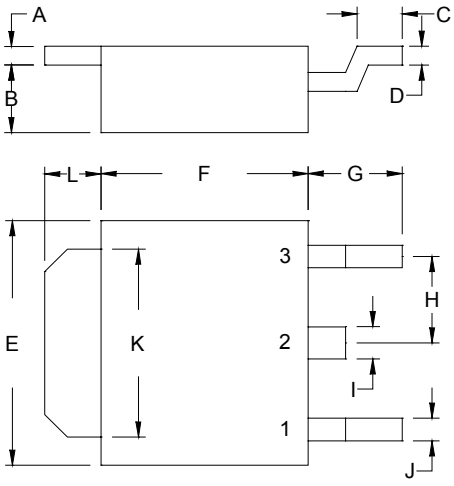






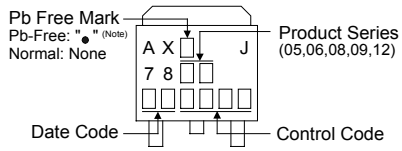


TO-252 Dimension



3-Lead TO-252 Plastic
Surface Mount Package
AVANTICS Package Code: J

Marking:



Note: Green label is used for pb-free packing

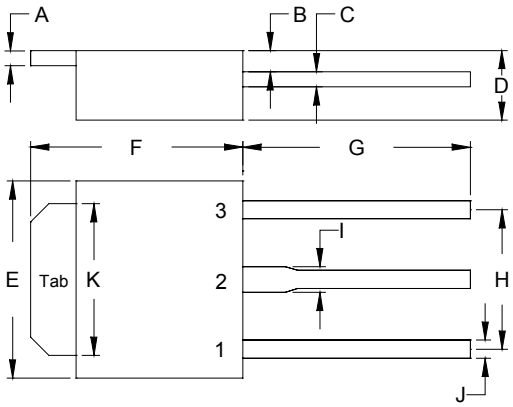
Pin Style: 1.Input 2.Ground 3.Output

Material:
- Lead solder plating: Sn60/Pb40 (Normal), Sn/3.0Ag/0.5Cu or Pure-Tin (Pb-free)
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

DIM	Min.	Max.
A	0.45	0.55
B	1.70	1.90
C	0.90	1.50
D	0.45	0.60
E	6.40	6.80
F	5.40	5.80
G	2.20	2.80
H	-	*2.30
I	0.70	0.90
J	-	0.90
K	5.20	5.50
L	1.40	1.60

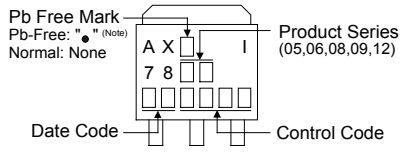
*: Typical, Unit: mm

TO-251 Dimension



3-Lead TO-251 Plastic
Surface Mount Package
AVANTICS Package Code: I

Marking:



Note: Green label is used for pb-free packing

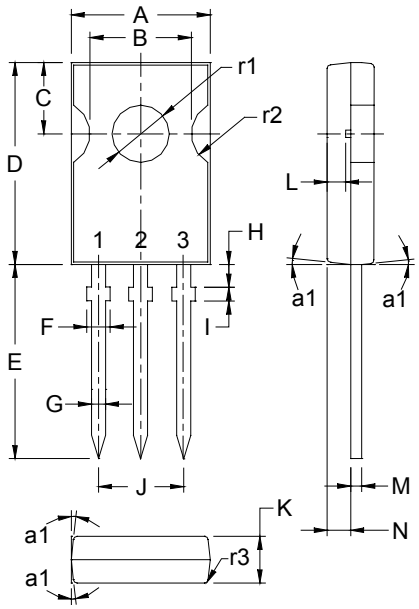
Pin Style: 1.Input 2.Ground 3.Output

Material:
- Lead solder plating: Sn60/Pb40 (Normal), Sn/3.0Ag/0.5Cu or Pure-Tin (Pb-free)
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

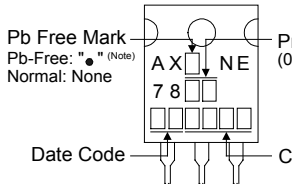
DIM	Min.	Max.
A	0.45	0.55
B	0.90	1.50
C	0.45	0.60
D	2.20	2.40
E	6.40	6.80
F	6.80	7.40
G	7.20	7.80
H	-	*4.60
I	-	0.90
J	-	0.80
K	5.20	5.50

*: Typical, Unit: mm

SOT-82 Dimension



Marking:



Note: Green label is used for pb-free packing

Pin Style: 1.Input 2.Ground 3.Output

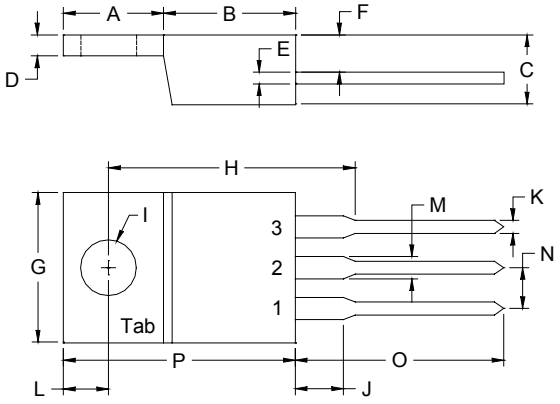
Material:
- Lead solder plating: Sn60/Pb40 (Normal), Sn/3.0Ag/0.5Cu or Pure-Tin (Pb-free)
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

3-Lead SOT-82
Plastic Package
AVANTICS Package Code: NE

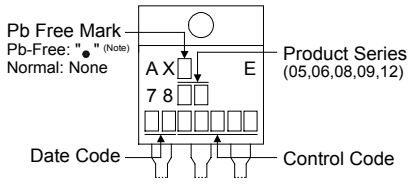
DIM	Min.	Max.
A	7.57	7.67
B	5.44	5.54
C	3.78	3.98
D	10.88	10.98
E	10.25	10.75
F	-	*1.27
G	-	*0.76
H	1.16	1.26
I	-	*0.76
J	4.52	4.62
K	2.49	2.59
L	1.10	1.20
M	-	*0.60
N	1.22	1.32
a1	-	*3°
r1	-	ϕ3.10
r2	-	R1.70
r3	-	R0.20

*: Typical, Unit: mm

TO-220AB Dimension



Marking:



Note: Green label is used for pb-free packing

Pin Style: 1.Input 2.Ground 3.Output

Material:
- Lead solder plating: Sn60/Pb40 (Normal), Sn/3.0Ag/0.5Cu or Pure-Tin (Pb-free)
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

3-Lead TO-220AB
Plastic Package
AVANTICS Package Code: E

DIM	Min.	Max.
A	5.58	7.49
B	8.38	8.90
C	4.40	4.70
D	1.15	1.39
E	0.35	0.60
F	2.03	2.92
G	9.66	10.28
H	-	*16.25
I	-	*3.83
J	3.00	4.00
K	0.75	0.95
L	2.54	3.42
M	1.14	1.40
N	-	*2.54
O	12.70	14.27
P	14.48	15.87

*: Typical, Unit: mm

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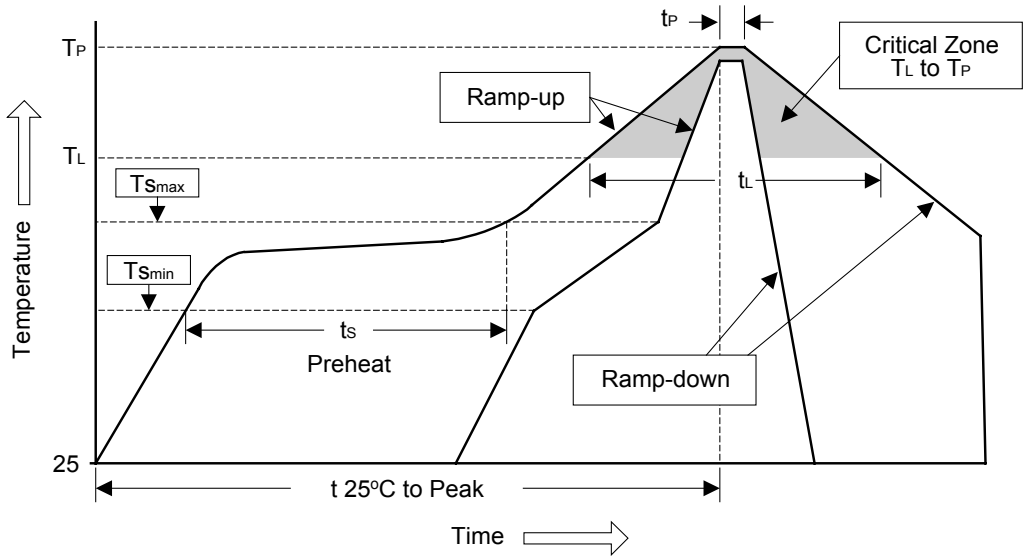
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- AVANTICS Microelectronics Corp: No. 255, Cai Lun Rd. Zhangjiang Technology Industrial Park Pudong, Shanghai, China
  Tel: 86-021-58955599 Fax: 86-021-58558038

Soldering Methods for AVANTICS's Products

1. Storage environment: Temperature=10°C~35°C Humidity=65%±15%

2. Reflow soldering of surface-mount devices

Figure 1: Temperature profile



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	<3°C/sec	<3°C/sec
Preheat - Temperature Min (Ts_{min}) - Temperature Max (Ts_{max}) - Time (min to max) (ts)	 100°C 150°C 60~120 sec	 150°C 200°C 60~180 sec
Tsmax to T_L - Ramp-up Rate	 <3°C/sec	 <3°C/sec
Time maintained above: - Temperature (T_L) - Time (t_L)	 183°C 60~150 sec	 217°C 60~150 sec
Peak Temperature (T_P)	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (t_P)	10~30 sec	20~40 sec
Ramp-down Rate	<6°C/sec	<6°C/sec
Time 25°C to Peak Temperature	<6 minutes	<8 minutes

3. Flow (wave) soldering (solder dipping)

Products	Peak temperature	Dipping time
Pb devices.	245°C ±5°C	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec