



AiP78M05/06/07/08/09/10/12/ 15/18/20/22/24

Positive-Voltage Regulators

Product Specification

Specification Revision History:

Version	Date	Description
2021-03-A0	2021-03	New
2023-11-A1	2023-11	Parameter modification
2025-01-A2	2025-01	Modify the content



Contents

1、General Description.....	1
2、Block Diagram And Pin Description	5
2.1、Block Diagram	5
2.2、Pin Configurations.....	6
2.3、Pin Description.....	6
3、Electrical Parameter	6
3.1、Absolute Maximum Ratings.....	6
3.2、Recommended Operating Conditions.....	7
3.3、Electrical Characteristics	7
3.3.1、AiP78M05 Electrical Characteristics	7
3.3.2、AiP78M06 Electrical Characteristics	8
3.3.3、AiP78M07 Electrical Characteristics	8
3.3.4、AiP78M08 Electrical Characteristics	9
3.3.5、AiP78M09 Electrical Characteristics	9
3.3.6、AiP78M10 Electrical Characteristics	10
3.3.7、AiP78M12 Electrical Characteristics	10
3.3.8、AiP78M15 Electrical Characteristics	11
3.3.9、AiP78M18 Electrical Characteristics	11
3.3.10、AiP78M20 Electrical Characteristics	12
3.3.11、AiP78M22 Electrical Characteristics.....	12
3.3.12、AiP78M24 Electrical Characteristics	13
4、Testing Circuit	14
5、Typical Application	15
6、Package Information	16
6.1、TO220	16
6.2、TO252	17
7、Statements And Notes	18
7.1、The name and content of Hazardous substances or Elements in the product.....	18
7.2、Notes	18



1、General Description

AiP78M05/06/07/08/09/10/12/15/18/20/22/24 is a three-terminal positive-voltage stabilizing circuit with fixed voltage, which is mainly used as a fixed output voltage source in various electronic devices. The circuit is internally provided with functions such as over-temperature-protection, over-current-protection and compensation for safe operating area. As long as an appropriate external heat dissipation plate and input voltage are added, the output current can be higher than 0.5A. This circuit can not only be used as a fixed output voltage source, but also can output other voltages and currents if the peripheral components are properly configured.

Features:

- The output current can be up to 0.5A;
- Built-in over-temperature-protection and over-current-protection circuit;
- Built-in output transistor safety area compensation;
- Less external elements;
- Fixed output: 5V/6V/7V/8V/9V/10V/12V/15V/18V/20V/22V/24V;
- Packaging information: TO220/TO252

Ordering Information:

Tube packing specifications:

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP78M05JE220.TB	TO220	AiP78M05	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.0mm ×8.7mm Pin spacing: 2.54mm
AiP78M06JE220.TB	TO220	AiP78M06	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.0mm ×8.7mm Pin spacing: 2.54mm
AiP78M07JE220.TB	TO220	AiP78M07	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.0mm ×8.7mm Pin spacing: 2.54mm
AiP78M08JE220.TB	TO220	AiP78M08	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.0mm ×8.7mm Pin spacing: 2.54mm
AiP78M09JE220.TB	TO220	AiP78M09	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.0mm ×8.7mm Pin spacing: 2.54mm



AiP78M10JE220.TB	TO220	AiP78M10	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.0mm×8.7mm Pin spacing: 2.54mm
AiP78M12JE220.TB	TO220	AiP78M12	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.0mm×8.7mm Pin spacing: 2.54mm
AiP78M15JE220.TB	TO220	AiP78M15	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.0mm×8.7mm Pin spacing: 2.54mm
AiP78M18JE220.TB	TO220	AiP78M18	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.0mm×8.7mm Pin spacing: 2.54mm
AiP78M20JE220.TB	TO220	AiP78M20	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.0mm×8.7mm Pin spacing: 2.54mm
AiP78M22JE220.TB	TO220	AiP78M22	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.0mm×8.7mm Pin spacing: 2.54mm
AiP78M24JE220.TB	TO220	AiP78M24	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.0mm×8.7mm Pin spacing: 2.54mm
AiP78M05JG252.TB	TO252	AiP78M05	80 PCS/tube	50 tube/box	4000 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M06JG252.TB	TO252	AiP78M06	80 PCS/tube	50 tube/box	4000 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M07JG252.TB	TO252	AiP78M07	80 PCS/tube	50 tube/box	4000 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M08JG252.TB	TO252	AiP78M08	80 PCS/tube	50 tube/box	4000 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M09JG252.TB	TO252	AiP78M09	80 PCS/tube	50 tube/box	4000 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm



						Pin spacing:2.3mm
AiP78M10JG252.TB	TO252	AiP78M10	80 PCS/tube	50 tube/box	4000 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M12JG252.TB	TO252	AiP78M12	80 PCS/tube	50 tube/box	4000 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M15JG252.TB	TO252	AiP78M15	80 PCS/tube	50 tube/box	4000 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M18JG252.TB	TO252	AiP78M18	80 PCS/tube	50 tube/box	4000 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M20JG252.TB	TO252	AiP78M20	80 PCS/tube	50 tube/box	4000 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M22JG252.TB	TO252	AiP78M22	80 PCS/tube	50 tube/box	4000 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M24JG252.TB	TO252	AiP78M24	80 PCS/tube	50 tube/box	4000 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed quantity	Notes
AiP78M05JG252.TR	TO252	AiP78M05	2500 PCS/reel	2500 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M06JG252.TR	TO252	AiP78M06	2500 PCS/reel	2500 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M07JG252.TR	TO252	AiP78M07	2500 PCS/reel	2500 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M08JG252.TR	TO252	AiP78M08	2500 PCS/reel	2500 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M09JG252.TR	TO252	AiP78M09	2500 PCS/reel	2500 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm



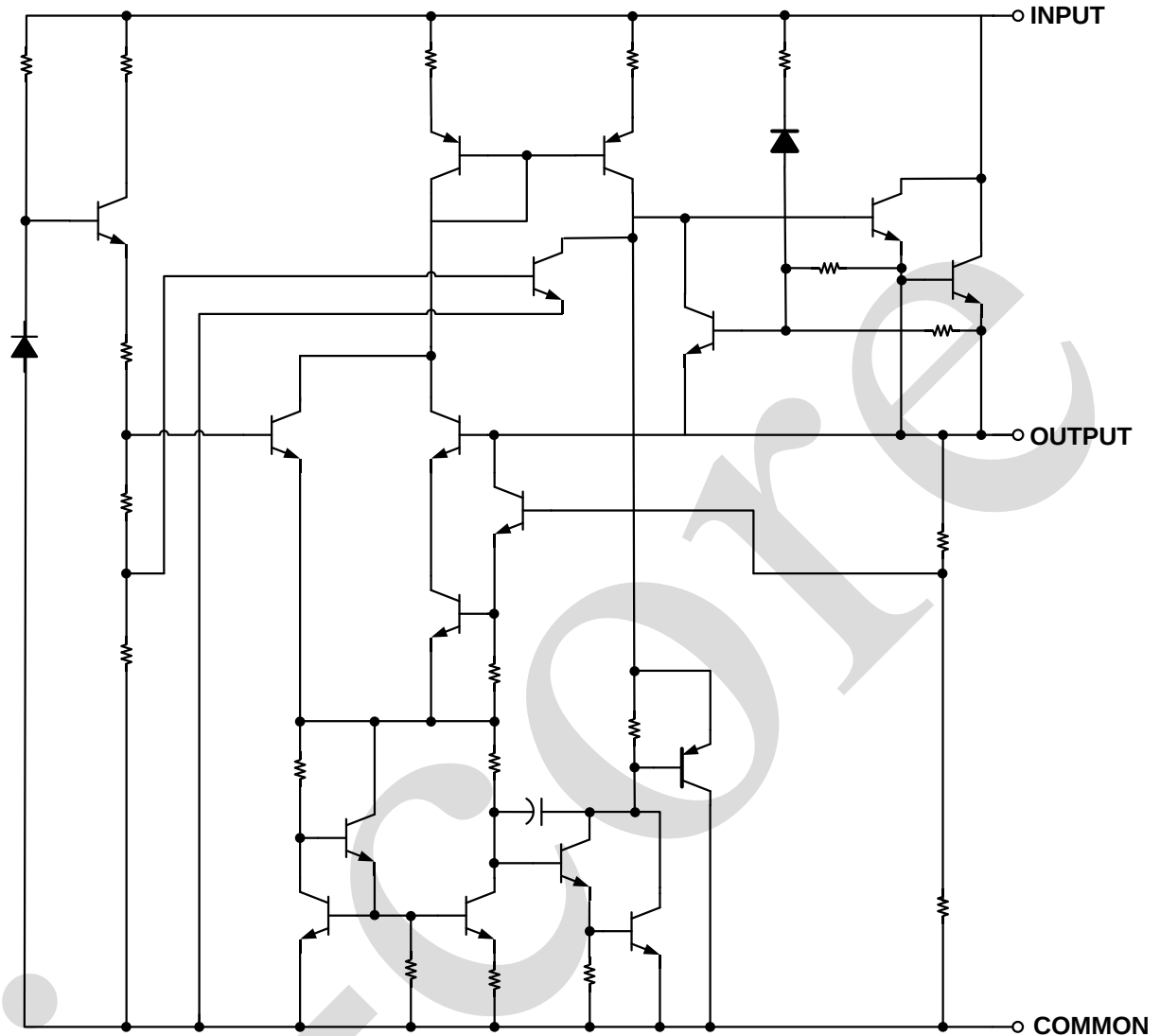
AiP78M10JG252.TR	TO252	AiP78M10	2500 PCS/reel	2500 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M12JG252.TR	TO252	AiP78M12	2500 PCS/reel	2500 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M15JG252.TR	TO252	AiP78M15	2500 PCS/reel	2500 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M18JG252.TR	TO252	AiP78M18	2500 PCS/reel	2500 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M20JG252.TR	TO252	AiP78M20	2500 PCS/reel	2500 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M22JG252.TR	TO252	AiP78M22	2500 PCS/reel	2500 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm
AiP78M24JG252.TR	TO252	AiP78M24	2500 PCS/reel	2500 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing:2.3mm

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



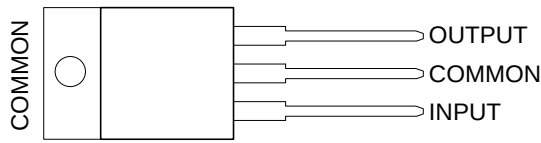
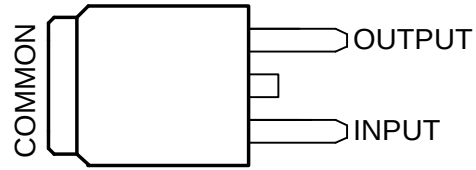
2、Block Diagram And Pin Description

2.1、Block Diagram





2.2、Pin Configurations

**TO220****TO252**

2.3、Pin Description

Pin No.	Pin Name	Description
1	INPUT	Input
2	COMMON	Ground (0V)
3	OUTPUT	Output

3、Electrical Parameter

3.1、Absolute Maximum Ratings

(Voltages are referenced to GND (ground=0V), unless otherwise specified)

Parameter	Symbol	Conditions		Ratings	Unit
Input Voltage	V _{IN}	-		7.0 to 35	V
Thermal Resistor(Jun-Ambient)	R _{θJA}	TO252		84.54	°C/W
		TO220		64.8	
Thermal Resistor(Jun-Case)	R _{θJC}	TO252		3.93	
		TO220		1.6	
Junction Temperature	T _J	-		150	°C
Storage Temperature	T _{stg}	-		-65 to 150	°C
Soldering Temperature	T _L	10s	TO220	245	°C
			TO252	260	°C

Note:

The maximum power dissipation is a function of $T_{J(max)}$, θ_{JA} and T_{amb} , and the maximum allowable power consumption is $P_D = (T_{J(max)} - T_{amb}) / \theta_{JA}$ at any allowable ambient temperature. Operating at the maximum junction temperature $T_J(150^{\circ}\text{C})$ will affect the reliability.



3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Max.	Unit
Input Supply Voltage	V_{IN}	AiP78M05	7	25	V
		AiP78M06	8.5	25	
		AiP78M07	9.5	25	
		AiP78M08	10.5	25	
		AiP78M09	11.5	26	
		AiP78M10	12.5	28	
		AiP78M12	14.5	30	
		AiP78M15	17.5	30	
		AiP78M18	20.5	31	
		AiP78M20	22.5	33	
		AiP78M22	24.5	33	
		AiP78M24	27	35	
Output Current	I_O	—	—	500	mA
Junction Temperature	T_J	—	-40	125	°C
Ambient Temperature	T_{amb}	—	-40	85	°C

3.3、Electrical Characteristics

3.3.1、AiP78M05 Electrical Characteristics

($T_J = -40 \sim 125^\circ\text{C}$, $V_{IN} = 10\text{V}$, $I_O = 350\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J = 25^\circ\text{C}$	4.8	5.0	5.2	V
		$V_{IN} = 7 \sim 20\text{V}$, $I_O = 5 \sim 350\text{mA}$	4.75	5.0	5.25	V
Linear Regulation	REG_V	$V_{IN} = 7 \sim 25\text{V}$, $I_O = 200\text{mA}$	—	—	100	mV
		$V_{IN} = 8 \sim 25\text{V}$, $I_O = 200\text{mA}$	—	—	50	
Load Regulation	$REGL$	$I_O = 5 \sim 500\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	100	mV
		$I_O = 5 \sim 200\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	50	
Bias Current	I_B	$T_J = 25^\circ\text{C}$	—	3	7.5	mA
Bias Current Variation	ΔI_B	$V_{IN} = 8 \sim 25\text{V}$, $I_O = 200\text{mA}$	—	—	0.8	mA
		$I_O = 5 \sim 350\text{mA}$	—	—	0.5	
Output Voltage Offset	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$, $T_J = 0 \sim 125^\circ\text{C}$	—	± 1.1	—	mV/°C
Output Noise Voltage	eN	$B = 10\text{Hz} \sim 100\text{kHz}$	—	40	—	$\mu\text{V}/V_O$
Power Supply Rejection Ratio	SVR	$V_{IN} = 8 \sim 18\text{V}$, $f = 120\text{Hz}$, $I_O = 300\text{mA}$	62	80	—	dB
Dropout	V_d	—	—	2	—	V
Short-Circuit Current	I_{SC}	—	—	0.75	—	A



3.3.2、AiP78M06 Electrical Characteristics

($T_J = -40 \sim 125^\circ\text{C}$, $V_{IN} = 11\text{V}$, $I_O = 350\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J = 25^\circ\text{C}$	5.76	6	6.24	V
		$V_{IN} = 8.5 \sim 19\text{V}$, $I_O = 5 \sim 350\text{mA}$	5.7	6	6.3	V
Linear Regulation	REG_V	$V_{IN} = 8.5 \sim 25\text{V}$, $T_J = 25^\circ\text{C}$	—	—	100	mV
		$V_{IN} = 9 \sim 14\text{V}$, $T_J = 25^\circ\text{C}$	—	—	50	
Load Regulation	REGL	$I_O = 5 \sim 500\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	100	mV
		$I_O = 5 \sim 200\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	50	
Bias Current	I_B	$T_J = 25^\circ\text{C}$	—	3	7.5	mA
Bias Current Variation	ΔI_B	$V_{IN} = 9 \sim 25\text{V}$, $I_O = 200\text{mA}$	—	—	0.8	mA
		$I_O = 5 \sim 350\text{mA}$	—	—	0.5	
Output Voltage Offset	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$	—	± 1.1	—	mV/ $^\circ\text{C}$
Output Noise Voltage	eN	$B = 10\text{Hz} \sim 100\text{kHz}$, $T_J = 25^\circ\text{C}$	—	44	—	$\mu\text{V}/V_O$
Power Supply Rejection Ratio	SVR	$V_{IN} = 9 \sim 19\text{V}$, $f = 120\text{Hz}$ $I_O = 300\text{mA}$	59	76	—	dB
Dropout	V_d	—	—	2	—	V
Short-Circuit Current	I_{SC}	—	—	0.65	—	A

3.3.3、AiP78M07 Electrical Characteristics

($T_J = -40 \sim 125^\circ\text{C}$, $V_{IN} = 13\text{V}$, $I_O = 350\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J = 25^\circ\text{C}$	6.72	7	7.28	V
		$V_{IN} = 9.5 \sim 20\text{V}$, $I_O = 5 \sim 350\text{mA}$	6.65	7	7.35	V
Linear Regulation	REG_V	$V_{IN} = 9.5 \sim 25\text{V}$, $T_J = 25^\circ\text{C}$	—	—	160	mV
		$V_{IN} = 10 \sim 15\text{V}$, $T_J = 25^\circ\text{C}$	—	—	80	
Load Regulation	REGL	$I_O = 5 \sim 500\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	160	mV
		$I_O = 5 \sim 200\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	80	
Bias Current	I_B	$T_J = 25^\circ\text{C}$	—	3	7.5	mA
Bias Current Variation	ΔI_B	$V_{IN} = 9 \sim 25\text{V}$, $I_O = 200\text{mA}$	—	—	0.8	mA
		$I_O = 5 \sim 350\text{mA}$	—	—	0.5	
Output Voltage Offset	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$, $T_J = 0 \sim 125^\circ\text{C}$	—	± 1.1	—	mV/ $^\circ\text{C}$
Output Noise Voltage	eN	$B = 10\text{Hz} \sim 100\text{kHz}$, $T_J = 25^\circ\text{C}$	—	48	—	$\mu\text{V}/V_O$
Power Supply Rejection Ratio	SVR	$V_{IN} = 10 \sim 20\text{V}$, $f = 120\text{Hz}$ $I_O = 300\text{mA}$	56	72	—	dB
Dropout	V_d	—	—	2	—	V
Short-Circuit Current	I_{SC}	—	—	0.55	—	A



3.3.4、AiP78M08 Electrical Characteristics

($T_J = -40 \sim 125^\circ\text{C}$, $V_{IN} = 14\text{V}$, $I_O = 350\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J = 25^\circ\text{C}$	7.7	8	8.3	V
		$V_{IN} = 10.5 \sim 23\text{V}$, $I_O = 5 \sim 350\text{mA}$	7.6	8	8.4	V
Linear Regulation	REG_V	$V_{IN} = 10.5 \sim 25\text{V}$, $I_O = 200\text{mA}$	—	6	100	mV
		$V_{IN} = 11 \sim 25\text{V}$, $I_O = 200\text{mA}$	—	2	50	
Load Regulation	REGL	$I_O = 5 \sim 500\text{mA}$, $T_J = 25^\circ\text{C}$	—	25	160	mV
		$I_O = 5 \sim 200\text{mA}$, $T_J = 25^\circ\text{C}$	—	10	80	
Bias Current	I_B	$T_J = 25^\circ\text{C}$	—	3	7.5	mA
Bias Current Variation	ΔI_B	$V_{IN} = 10.5 \sim 25\text{V}$, $I_O = 200\text{mA}$	—	—	0.8	mA
		$I_O = 5 \sim 350\text{mA}$	—	—	0.5	
Output Voltage Offset	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$, $T_J = 0 \sim 125^\circ\text{C}$	—	-1	—	mV/ $^\circ\text{C}$
Output Noise Voltage	eN	$B = 10\text{Hz} \sim 100\text{kHz}$	—	52	—	μV
Power Supply Rejection Ratio	SVR	$V_{IN} = 11.5 \sim 21.5\text{V}$, $f = 120\text{Hz}$, $I_O = 300\text{mA}$	56	80	—	dB
Dropout	V_d	—	—	2	—	V
Short-Circuit Current	I_{SC}	—	—	0.25	—	A

3.3.5、AiP78M09 Electrical Characteristics

($T_J = -40 \sim 125^\circ\text{C}$, $V_{IN} = 15\text{V}$, $I_O = 350\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J = 25^\circ\text{C}$	8.64	9	9.36	V
		$V_{IN} = 11.5 \sim 24\text{V}$, $I_O = 5 \sim 350\text{mA}$	8.55	9	9.45	V
Linear Regulation	REG_V	$V_{IN} = 11.5 \sim 25\text{V}$, $I_O = 200\text{mA}$	—	6.5	100	mV
		$V_{IN} = 12 \sim 25\text{V}$, $I_O = 200\text{mA}$	—	2	50	
Load Regulation	REGL	$I_O = 5 \sim 500\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	180	mV
		$I_O = 5 \sim 200\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	90	
Bias Current	I_B	$T_J = 25^\circ\text{C}$	—	3	7.5	mA
Bias Current Variation	ΔI_B	$V_{IN} = 11.5 \sim 25\text{V}$, $I_O = 200\text{mA}$	—	—	0.8	mA
		$I_O = 5 \sim 350\text{mA}$	—	—	0.5	
Output Voltage Offset	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$, $T_J = 0 \sim 125^\circ\text{C}$	—	-1	—	mV/ $^\circ\text{C}$
Output Noise Voltage	eN	$B = 10\text{Hz} \sim 100\text{kHz}$, $T_J = 25^\circ\text{C}$	—	58	—	μV
Power Supply Rejection Ratio	SVR	$V_{IN} = 12.5 \sim 23\text{V}$, $f = 120\text{Hz}$, $I_O = 300\text{mA}$	56	72	—	dB
Dropout	V_d	—	—	2	—	V
Short-Circuit Current	I_{SC}	—	—	0.25	—	A



3.3.6、AiP78M10 Electrical Characteristics

($T_J = -40 \sim 125^\circ\text{C}$, $V_{IN} = 17\text{V}$, $I_O = 350\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J = 25^\circ\text{C}$	9.6	10	10.4	V
		$V_{IN} = 12.5 \sim 25\text{V}$, $I_O = 5 \sim 350\text{mA}$	9.5	10	10.5	V
Linear Regulation	REG_V	$V_{IN} = 12.5 \sim 28\text{V}$, $I_O = 200\text{mA}$	—	—	240	mV
		$V_{IN} = 14 \sim 20\text{V}$, $I_O = 200\text{mA}$	—	—	120	
Load Regulation	REGL	$I_O = 5 \sim 500\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	240	mV
		$I_O = 5 \sim 200\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	120	
Bias Current	I_B	$T_J = 25^\circ\text{C}$	—	3	7.5	mA
Bias Current Variation	ΔI_B	$V_{IN} = 12.5 \sim 28\text{V}$, $I_O = 200\text{mA}$	—	—	1	mA
		$I_O = 5 \sim 350\text{mA}$	—	—	0.5	
Output Voltage Offset	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$, $T_J = 0 \sim 125^\circ\text{C}$	—	± 1	—	mV/ $^\circ\text{C}$
Output Noise Voltage	eN	$B = 10\text{Hz} \sim 100\text{kHz}$, $T_J = 25^\circ\text{C}$	—	70	—	$\mu\text{V}/V_O$
Power Supply Rejection Ratio	SVR	$V_{IN} = 12 \sim 23\text{V}$, $f = 120\text{Hz}$ $I_O = 300\text{mA}$	55	72	—	dB
Dropout	V_d	—	—	2	—	V
Short-Circuit Current	I_{SC}	—	—	0.25	—	A

3.3.7、AiP78M12 Electrical Characteristics

($T_J = -40 \sim 125^\circ\text{C}$, $V_{IN} = 19\text{V}$, $I_O = 350\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J = 25^\circ\text{C}$	11.5	12	12.5	V
		$V_{IN} = 14.5 \sim 27\text{V}$, $I_O = 5 \sim 350\text{mA}$	11.4	12	12.6	V
Linear Regulation	REG_V	$V_{IN} = 14.5 \sim 30\text{V}$, $I_O = 200\text{mA}$	—	—	240	mV
		$V_{IN} = 16 \sim 30\text{V}$, $I_O = 200\text{mA}$	—	—	120	
Load Regulation	REGL	$I_O = 5 \sim 500\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	240	mV
		$I_O = 5 \sim 200\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	120	
Bias Current	I_B	$T_J = 25^\circ\text{C}$	—	3	7.5	mA
Bias Current Variation	ΔI_B	$V_{IN} = 14.5 \sim 30\text{V}$, $I_O = 200\text{mA}$	—	—	0.8	mA
		$I_O = 5 \sim 350\text{mA}$	—	—	0.5	
Output Voltage Offset	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$, $T_J = 0 \sim 125^\circ\text{C}$	—	-1	—	mV/ $^\circ\text{C}$
Output Noise Voltage	eN	$B = 10\text{Hz} \sim 100\text{kHz}$	—	75	—	μV
Power Supply Rejection Ratio	SVR	$V_{IN} = 15 \sim 25\text{V}$, $f = 120\text{Hz}$, $I_O = 300\text{mA}$	55	71	—	dB
Dropout	V_d	—	—	2	—	V
Short-Circuit Current	I_{SC}	—	—	0.25	—	A



3.3.8、AiP78M15 Electrical Characteristics

($T_J = -40 \sim 125^\circ\text{C}$, $V_{IN} = 23\text{V}$, $I_O = 350\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J = 25^\circ\text{C}$	14.4	15	15.6	V
		$V_{IN} = 17.5 \sim 30\text{V}$, $I_O = 5 \sim 350\text{mA}$	14.2 5	15	15.7 5	V
Linear Regulation	REG_V	$V_{IN} = 17.5 \sim 30\text{V}$, $I_O = 200\text{mA}$	—	—	300	mV
		$V_{IN} = 20 \sim 30\text{V}$, $I_O = 200\text{mA}$	—	—	150	
Load Regulation	REGL	$I_O = 5 \sim 500\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	300	mV
		$I_O = 5 \sim 200\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	150	
Bias Current	I_B	$T_J = 25^\circ\text{C}$	—	3	7.5	mA
Bias Current Variation	ΔI_B	$V_{IN} = 17.5 \sim 30\text{V}$, $I_O = 200\text{mA}$	—	—	0.8	mA
		$I_O = 5 \sim 350\text{mA}$	—	—	0.5	
Output Voltage Offset	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$, $T_J = 0 \sim 125^\circ\text{C}$	—	-1	—	mV/ $^\circ\text{C}$
Output Noise Voltage	eN	$B = 10\text{Hz} \sim 100\text{kHz}$	—	90	—	μV
Power Supply Rejection Ratio	SVR	$V_{IN} = 18.5 \sim 28.5\text{V}$, $f = 120\text{Hz}$, $I_O = 300\text{mA}$	54	70	—	dB
Dropout	V_d	—	—	2	—	V
Short-Circuit Current	I_{SC}	—	—	0.25	—	A

3.3.9、AiP78M18 Electrical Characteristics

($T_J = -40 \sim 125^\circ\text{C}$, $V_{IN} = 25\text{V}$, $I_O = 350\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J = 25^\circ\text{C}$	17.2 8	18	18.7 2	V
		$V_{IN} = 20.5 \sim 31\text{V}$, $I_O = 5 \sim 350\text{mA}$	17.1	18	18.9	V
Linear Regulation	REG_V	$V_{IN} = 20.5 \sim 31\text{V}$, $I_O = 200\text{mA}$	—	—	360	mV
		$V_{IN} = 24 \sim 30\text{V}$, $I_O = 200\text{mA}$	—	—	180	
Load Regulation	REGL	$I_O = 5 \sim 500\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	360	mV
		$I_O = 5 \sim 200\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	180	
Bias Current	I_B	$T_J = 25^\circ\text{C}$	—	3	7.5	mA
Bias Current Variation	ΔI_B	$V_{IN} = 20.5 \sim 31\text{V}$, $I_O = 200\text{mA}$	—	—	1	mA
		$I_O = 5 \sim 350\text{mA}$	—	—	0.5	
Output Voltage Offset	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$, $T_J = 0 \sim 125^\circ\text{C}$	—	± 1	—	mV/ $^\circ\text{C}$
Output Noise Voltage	eN	$B = 10\text{Hz} \sim 100\text{kHz}$	—	110	—	$\mu\text{V}/V_O$
Power Supply Rejection Ratio	SVR	$V_{IN} = 21 \sim 31\text{V}$, $f = 120\text{Hz}$, $I_O = 300\text{mA}$	53	69	—	dB
Dropout	V_d	—	—	2	—	V
Short-Circuit Current	I_{SC}	—	—	0.21	—	A



3.3.10、AiP78M20 Electrical Characteristics

($T_J = -40 \sim 125^\circ\text{C}$, $V_{IN} = 27\text{V}$, $I_O = 350\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J = 25^\circ\text{C}$	19.2	20	20.8	V
		$V_{IN} = 22.5 \sim 33\text{V}$, $I_O = 5 \sim 350\text{mA}$	19	20	21	V
Linear Regulation	REG_V	$V_{IN} = 22.5 \sim 33\text{V}$, $I_O = 200\text{mA}$	—	—	420	mV
		$V_{IN} = 27 \sim 33\text{V}$, $I_O = 200\text{mA}$	—	—	210	
Load Regulation	REGL	$I_O = 5 \sim 500\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	420	mV
		$I_O = 5 \sim 200\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	210	
Bias Current	I_B	$T_J = 25^\circ\text{C}$	—	3	7.5	mA
Bias Current Variation	ΔI_B	$V_{IN} = 22.5 \sim 33\text{V}$, $I_O = 200\text{mA}$	—	—	1	mA
		$I_O = 5 \sim 350\text{mA}$	—	—	0.5	
Output Voltage Offset	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$, $T_J = 0 \sim 125^\circ\text{C}$	—	± 1	—	mV/ $^\circ\text{C}$
Output Noise Voltage	eN	$B = 10\text{Hz} \sim 100\text{kHz}$	—	130	—	$\mu\text{V}/V_O$
Power Supply Rejection Ratio	SVR	$V_{IN} = 23 \sim 33\text{V}$, $f = 120\text{Hz}$ $I_O = 300\text{mA}$	52	68	—	dB
Dropout	V_d	—	—	2	—	V
Short-Circuit Current	I_{SC}	—	—	0.19	—	A

3.3.11、AiP78M22 Electrical Characteristics

($T_J = -40 \sim 125^\circ\text{C}$, $V_{IN} = 30\text{V}$, $I_O = 350\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J = 25^\circ\text{C}$	21.1 2	22	22.8 8	V
		$V_{IN} = 24.5 \sim 33\text{V}$, $I_O = 5 \sim 350\text{mA}$	20.9	22	23.1	V
Linear Regulation	REG_V	$V_{IN} = 24.5 \sim 33\text{V}$, $I_O = 200\text{mA}$	—	—	450	mV
		$V_{IN} = 29 \sim 33\text{V}$, $I_O = 200\text{mA}$	—	—	225	
Load Regulation	REGL	$I_O = 5 \sim 500\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	450	mV
		$I_O = 5 \sim 200\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	225	
Bias Current	I_B	$T_J = 25^\circ\text{C}$	—	3	7.5	mA
Bias Current Variation	ΔI_B	$V_{IN} = 24.5 \sim 33\text{V}$, $I_O = 200\text{mA}$	—	—	1	mA
		$I_O = 5 \sim 350\text{mA}$	—	—	0.5	
Output Voltage Offset	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$, $T_J = 0 \sim 125^\circ\text{C}$	—	± 1	—	mV/ $^\circ\text{C}$
Output Noise Voltage	eN	$B = 10\text{Hz} \sim 100\text{kHz}$	—	150	—	$\mu\text{V}/V_O$
Power Supply Rejection Ratio	SVR	$V_{IN} = 26 \sim 33\text{V}$, $f = 120\text{Hz}$ $I_O = 300\text{mA}$	51	67	—	dB
Dropout	V_d	—	—	2	—	V
Short-Circuit Current	I_{SC}	—	—	0.17	—	A



3.3.12、AiP78M24 Electrical Characteristics

($T_J = -40 \sim 125^\circ\text{C}$, $V_{IN} = 33\text{V}$, $I_O = 350\text{mA}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_O	$T_J = 25^\circ\text{C}$	23	24	25	V
		$V_{IN} = 27 \sim 35\text{V}$, $I_O = 5 \sim 350\text{mA}$	22.8	24	25.2	V
Linear Regulation	REG_V	$V_{IN} = 27 \sim 35\text{V}$, $I_O = 200\text{mA}$	—	—	480	mV
		$V_{IN} = 30 \sim 36\text{V}$, $I_O = 200\text{mA}$	—	—	240	
Load Regulation	REGL	$I_O = 5 \sim 500\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	480	mV
		$I_O = 5 \sim 200\text{mA}$, $T_J = 25^\circ\text{C}$	—	—	240	
Bias Current	I_B	$T_J = 25^\circ\text{C}$	—	3	7.5	mA
Bias Current Variation	ΔI_B	$V_{IN} = 27 \sim 38\text{V}$, $I_O = 200\text{mA}$	—	—	1	mA
		$I_O = 5 \sim 350\text{mA}$	—	—	0.5	
Output Voltage Offset	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$, $T_J = 0 \sim 125^\circ\text{C}$	—	± 1.5	—	mV/ $^\circ\text{C}$
Output Noise Voltage	eN	$B = 10\text{Hz} \sim 100\text{kHz}$	—	170	—	$\mu\text{V}/V_O$
Power Supply Rejection Ratio	SVR	$V_{IN} = 28 \sim 35\text{V}$, $f = 120\text{Hz}$ $I_O = 300\text{mA}$	50	66	—	dB
Dropout	V_d	—	—	2	—	V
Short-Circuit Current	I_{SC}	—	—	0.15	—	A



4、Testing Circuit

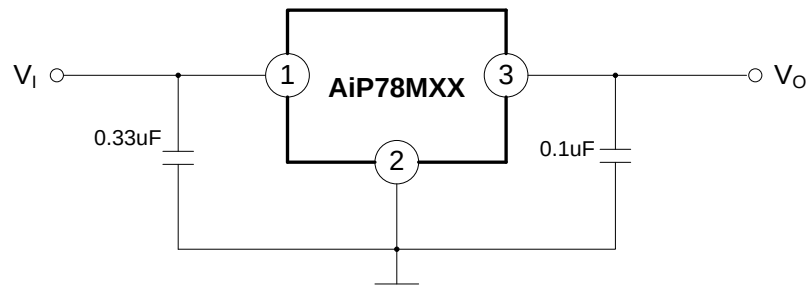


Figure 1. Standard Test Circuit

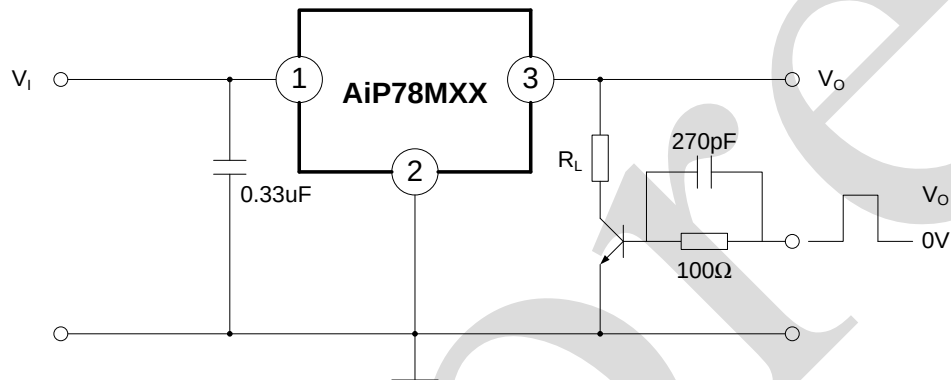


Figure 2. Noise Test Circuit

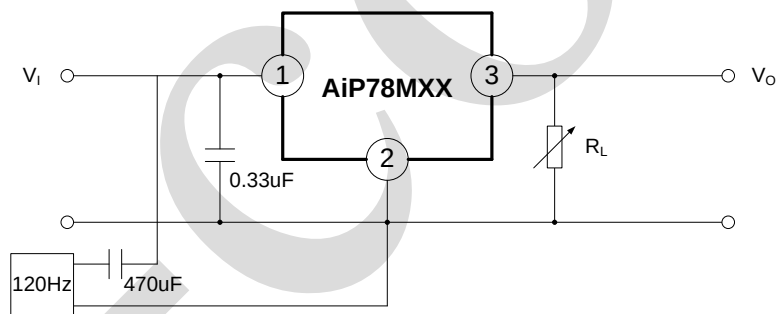
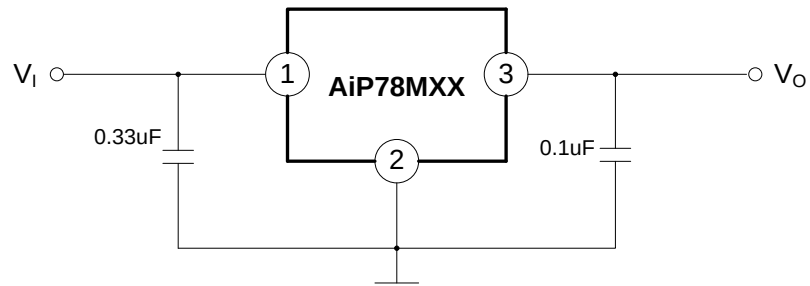


Figure 3. Waveform Rejection Ration Test Circuit



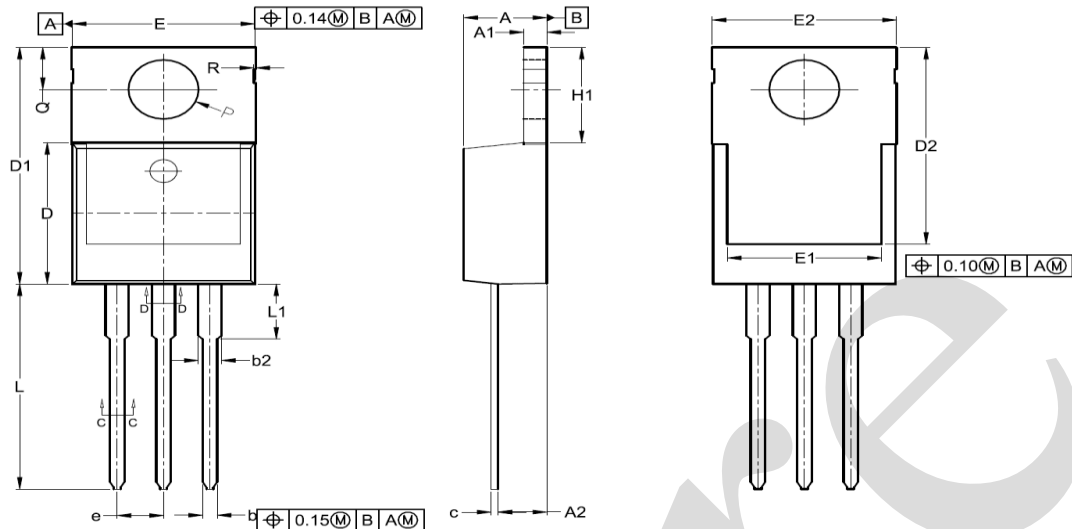
5、Typical Application





6、Package Information

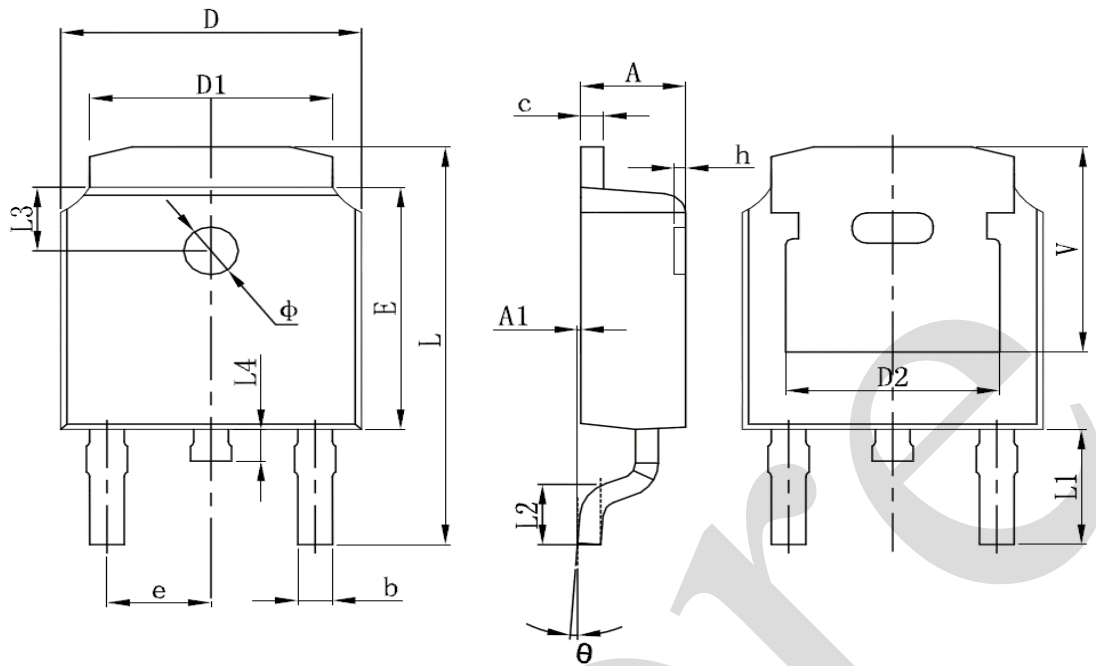
6.1、TO220



2024/02/B	Dimensions In Millimeters	
Symbol	Min	Max
A	4.45	4.67
A1	1.17	1.41
A2	2.28	2.88
b	0.70	0.94
b2	1.17	1.47
c	0.31	0.60
E	9.90	10.40
D	8.50	9.60
D1	14.65	15.60
D2	8.76	13.01
E1	8.24	8.64
E2	9.90	10.40
e	2.54	
Q	2.44	3.04
L	12.95	13.80
L1	3.20	3.96
P	3.73	3.94



6.2、TO252



2024/06/B	Dimensions In Millimeters	
Symbol	Min	Max
A	2.2	2.4
A1	0	0.13
b	0.58	0.9
c	0.45	0.65
D	6.4	6.7
D1	5.1	5.53
D2	4.8	5.3
V	5.2	5.8
E	6	6.23
e	2.186	2.386
L	9.7	10.4
L1	2.5	3.05
L2	0.7	1.73
L3	1.6	1.8
L4	0.6	1
ϕ	0.9	1.3
θ	0°	8°



7、Statements And Notes

7.1、The name and content of Hazardous substances or Elements in the product

Part name	Hazardous substances or Elements									
	Lead and lead compounds	Mercury and mercury compounds	Cadmium and cadmium compounds	Hexavalent chromium compounds	Polybrominated biphenyls	Polybrominated biphenyl ethers	Dibutyl phthalate	Butylbenzyl phthalate	Di-2-ethylhexyl phthalate	Diisobutyl phthalate
Lead frame	○	○	○	○	○	○	○	○	○	○
Plastic resin	○	○	○	○	○	○	○	○	○	○
Chip	○	○	○	○	○	○	○	○	○	○
The lead	○	○	○	○	○	○	○	○	○	○
Plastic sheet installed	○	○	○	○	○	○	○	○	○	○
explanation	○: Indicates that the content of hazardous substances or elements in the detection limit of the following the SJ/T11363-2006 standard. ×: Indicates that the content of hazardous substances or elements exceeding the SJ/T11363-2006 Standard limit requirements.									

7.2、Notes

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