



AiP78M05/08/09/12/15

Positive-Voltage Linear Regulators

Product Specification

Specification Revision History:

Version	Date	Description
2022-11-A1	2022-11	New



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1、General Description

AiP78M05/08/09/12/15 is a three-terminal regulating circuit, which is widely used as a fixed output source in various electronic instruments and equipment. Its main features are as follows:

- The maximum output current is 0.5A;
- Built-in overheating and overflow protection circuit;
- Built-in output transistor safe area compensation;
- Less external elements, strong applicability;
- 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: 10.2mm×8.9mm Pin spacing: 2.54mm
AiP78M08JE220.TB	TO220	AiP78M08	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.2mm×8.9mm Pin spacing: 2.54mm
AiP78M09JE220.TB	TO220	AiP78M09	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.2mm×8.9mm Pin spacing: 2.54mm
AiP78M12JE220.TB	TO220	AiP78M12	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.2mm×8.9mm Pin spacing: 2.54mm
AiP78M15JE220.TB	TO220	AiP78M15	50 PCS/tube	20 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 10.2mm×8.9mm 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
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
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

Reel packing specifications:

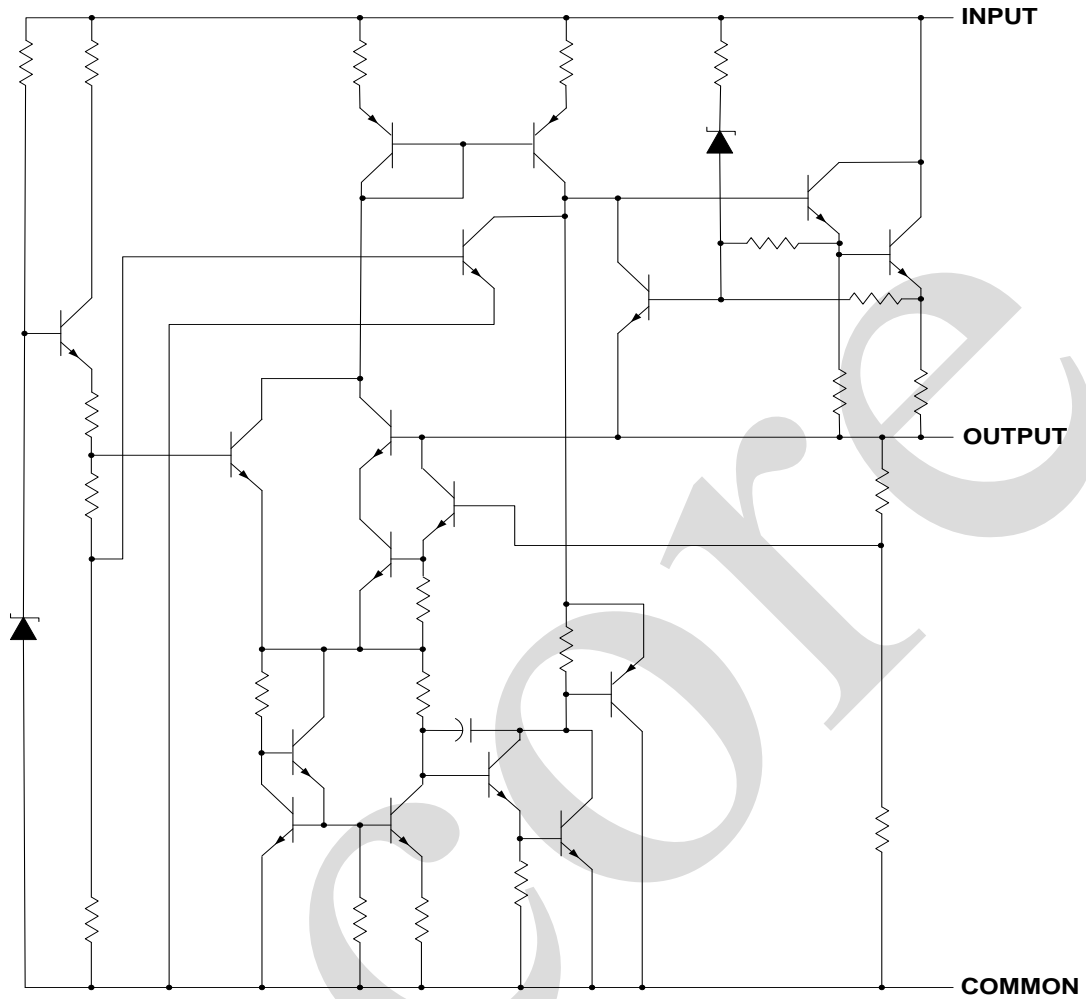
Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP78M05JG252.TR	TO252	AiP78M05	2500 PCS/reel	2500 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm Pin spacing: 2.3mm
AiP78M08JG252.TR	TO252	AiP78M08	2500 PCS/reel	2500 PCS/box	Dimensions of plastic enclosure: 6.6mm×6.1mm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

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

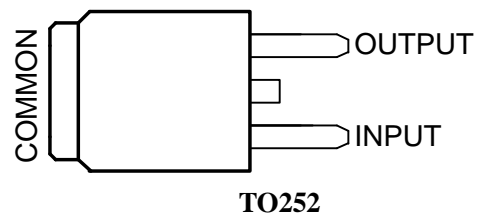
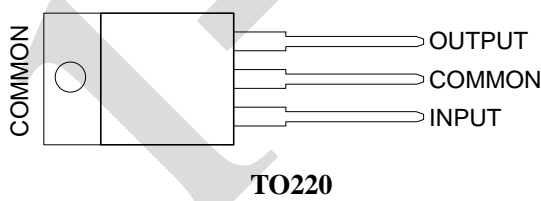


2、Block Diagram And Pin Description

2.1、Block Diagram



2.2、Pin Configurations



2.3、Pin Description

Pin No.	Pin Name	Description
1	INPUT	Input Voltage
2	COMMON	Common Port
3	OUTPUT	Output Voltage



3、Electrical Parameter

3.1、Absolute Maximum Ratings

Parameter	Symbol	Conditions	Ratings	Unit
Input Supply Voltage	V_{IN}	-	7.0 to 35	V
Thermal Resistance(Junction-Environment)	$R_{\theta JA}$	TO252	28	°C/W
		TO220	19	
Junction Temperature	T_J	-	150	°C
Storage Temperature	T_{stg}	-	-65 to 150	°C

3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Max.	Unit
Input Supply Voltage	V_{IN}	AiP78M05	7	25	V
		AiP78M08	10.5	25	V
		AiP78M09	11.5	26	V
		AiP78M12	14.5	30	V
		AiP78M15	17.5	32	V
Output Current	I_O	-	-	500	mA
Junction Temperature	T_J	-	-40	125	°C
Ambient Temperature	T_A	-	-40	85	°C

3.3、Electrical Characteristics

3.3.1、AiP78M05 Electrical Characteristics

($T_J=25^\circ\text{C}$, $V_{IN}=10\text{V}$, $I_O=350\text{mA}$, $C_I=0.33\mu\text{F}$, $C_O=0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions and Test Methods	Min.	Typ.	Max.	Unit
Output Voltage	V_O	-	4.8	5	5.2	V
		$V_{IN}=7\sim 20\text{V}$, $I_O=5\sim 350\text{mA}$	4.75	5	5.25	V
Linear Regulation Ratio	ΔV_O	$V_{IN}=7\sim 25\text{V}$, $I_O=200\text{mA}$	-	-	100	mV
		$V_{IN}=8\sim 25\text{V}$, $I_O=200\text{mA}$	-	-	50	
Load Regulation Ratio	ΔV_O	$I_O=5\sim 500\text{mA}$, $T_J=25^\circ\text{C}$	-	-	100	mV
		$I_O=5\sim 200\text{mA}$, $T_J=25^\circ\text{C}$	-	-	50	
Quiescent Current	I_d	-	-	-	6	mA
Quiescent Current Variation	ΔI_d	$V_{IN}=8\sim 25\text{V}$, $I_O=200\text{mA}$	-	-	0.8	mA
		$I_O=5\sim 350\text{mA}$	-	-	0.5	
Output Voltage Drift	$\Delta V_O/\Delta T$	$I_O=5\text{mA}$, $T_J=0\sim 125^\circ\text{C}$	-	-0.5	-	mV/°C
Output Noise Voltage	eN	B=10Hz~100kHz	-	40	-	μV
Power Supply Rejection Ratio	SVR	$V_{IN}=8\sim 18\text{V}$, f=120Hz, $I_O=300\text{mA}$	62	-	-	dB
Dropout	V_d	-	-	2	-	V
Short-Circuit Current	I_{SC}	$V_{IN}=35\text{V}$	-	0.3	-	A



3.3.2、AiP78M08 Electrical Characteristics

($T_J=25^\circ\text{C}$, $V_{IN}=14\text{V}$, $I_O=350\text{mA}$, $C_I=0.33\mu\text{F}$, $C_O=0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions and Test Methods	Min.	Typ.	Max.	Unit
Output Voltage	V_O	-	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 Ratio	ΔV_O	$V_{IN}=10.5\sim 25\text{V}$, $I_O=200\text{mA}$	-	-	100	mV
		$V_{IN}=11\sim 25\text{V}$, $I_O=200\text{mA}$	-	-	50	
Load Regulation Ratio	ΔV_O	$I_O=5\sim 500\text{mA}$, $T_J=25^\circ\text{C}$	-	-	160	mV
		$I_O=5\sim 200\text{mA}$, $T_J=25^\circ\text{C}$	-	-	80	
Quiescent Current	I_d	-	-	-	6	mA
Quiescent Current Variation	ΔI_d	$V_{IN}=10.5\sim 25\text{V}$, $I_O=200\text{mA}$	-	-	0.8	mA
		$I_O=5\sim 350\text{mA}$	-	-	0.5	
Output Voltage Drift	$\Delta V_O/\Delta T$	$I_O=5\text{mA}$, $T_J=0\sim 125^\circ\text{C}$	-	-0.5	-	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	-	-	dB
Dropout	V_d	-	-	2	-	V
Short-Circuit Current	I_{SC}	$V_{IN}=35\text{V}$	-	0.25	-	A

3.3.3、AiP78M09 Electrical Characteristics

($T_J=25^\circ\text{C}$, $V_{IN}=15\text{V}$, $I_O=350\text{mA}$, $C_I=0.33\mu\text{F}$, $C_O=0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions and Test Methods	Min.	Typ.	Max.	Unit
Output Voltage	V_O	-	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 Ratio	ΔV_O	$V_{IN}=11.5\sim 25\text{V}$, $I_O=200\text{mA}$	-	-	100	mV
		$V_{IN}=12\sim 25\text{V}$, $I_O=200\text{mA}$	-	-	50	
Load Regulation Ratio	ΔV_O	$I_O=5\sim 500\text{mA}$, $T_J=25^\circ\text{C}$	-	-	180	mV
		$I_O=5\sim 200\text{mA}$, $T_J=25^\circ\text{C}$	-	-	90	
Quiescent Current	I_d	-	-	-	6	mA
Quiescent Current Variation	ΔI_d	$V_{IN}=11.5\sim 25\text{V}$, $I_O=200\text{mA}$	-	-	0.8	mA
		$I_O=5\sim 350\text{mA}$	-	-	0.5	
Output Voltage Drift	$\Delta V_O/\Delta T$	$I_O=5\text{mA}$, $T_J=0\sim 125^\circ\text{C}$	-	-0.5	-	mV/ $^\circ\text{C}$
Output Noise Voltage	eN	$B=10\text{Hz}\sim 100\text{kHz}$	-	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	-	-	dB
Dropout	V_d	-	-	2	-	V
Short-Circuit Current	I_{SC}	$V_{IN}=35\text{V}$	-	0.25	-	A



3.3.4、AiP78M12 Electrical Characteristics

($T_J=25^{\circ}\text{C}$, $V_{IN}=19\text{V}$, $I_O=350\text{mA}$, $C_I=0.33\mu\text{F}$, $C_O=0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions and Test Methods	Min.	Typ.	Max.	Unit
Output Voltage	V_O	-	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 Ratio	ΔV_O	$V_{IN}=14.5\sim 30\text{V}$, $I_O=200\text{mA}$	-	-	100	mV
		$V_{IN}=16\sim 30\text{V}$, $I_O=200\text{mA}$	-	-	50	
Load Regulation Ratio	ΔV_O	$I_O=5\sim 500\text{mA}$, $T_J=25^{\circ}\text{C}$	-	-	240	mV
		$I_O=5\sim 200\text{mA}$, $T_J=25^{\circ}\text{C}$	-	-	120	
Quiescent Current	I_d	-	-	-	6	mA
Quiescent Current Variation	ΔI_d	$V_{IN}=14.5\sim 30\text{V}$, $I_O=200\text{mA}$	-	-	0.8	mA
		$I_O=5\sim 350\text{mA}$	-	-	0.5	
Output Voltage Drift	$\Delta V_O/\Delta T$	$I_O=5\text{mA}$, $T_J=0\sim 125^{\circ}\text{C}$	-	-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	-	-	dB
Dropout	V_d	-	-	2	-	V
Short-Circuit Current	I_{SC}	$V_{IN}=35\text{V}$	-	0.24	-	A

3.3.5、AiP78M15 Electrical Characteristics

($T_J=25^{\circ}\text{C}$, $V_{IN}=23\text{V}$, $I_O=350\text{mA}$, $C_I=0.33\mu\text{F}$, $C_O=0.1\mu\text{F}$, unless otherwise specified)

Parameter	Symbol	Conditions and Test Methods	Min.	Typ.	Max.	Unit
Output Voltage	V_O	-	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 Ratio	ΔV_O	$V_{IN}=17.5\sim 30\text{V}$, $I_O=200\text{mA}$	-	-	100	mV
		$V_{IN}=20\sim 30\text{V}$, $I_O=200\text{mA}$	-	-	50	
Load Regulation Ratio	ΔV_O	$I_O=5\sim 500\text{mA}$, $T_J=25^{\circ}\text{C}$	-	-	300	mV
		$I_O=5\sim 200\text{mA}$, $T_J=25^{\circ}\text{C}$	-	-	150	
Quiescent Current	I_d	-	-	-	6	mA
Quiescent Current Variation	ΔI_d	$V_{IN}=17.5\sim 30\text{V}$, $I_O=200\text{mA}$	-	-	0.8	mA
		$I_O=5\sim 350\text{mA}$	-	-	0.5	
Output Voltage Drift	$\Delta V_O/\Delta T$	$I_O=5\text{mA}$, $T_J=0\sim 125^{\circ}\text{C}$	-	-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	-	-	dB
Dropout	V_d	-	-	2	-	V
Short-Circuit Current	I_{SC}	$V_{IN}=35\text{V}$	-	0.24	-	A



4、Testing Circuit

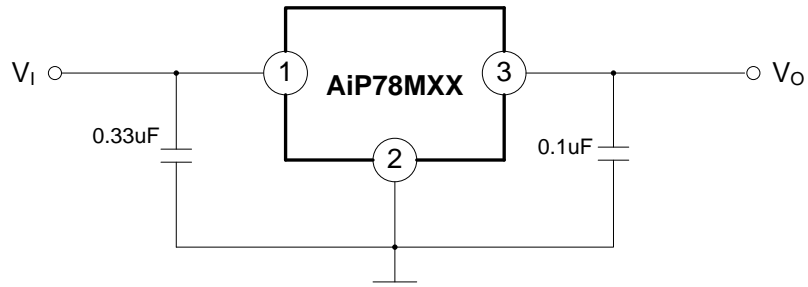


Figure 1: DC Testing Circuit

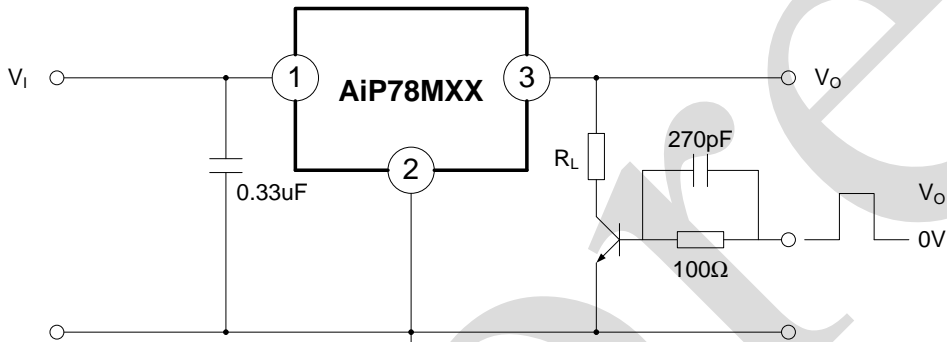


Figure 2: Load Regulation Ratio Circuit

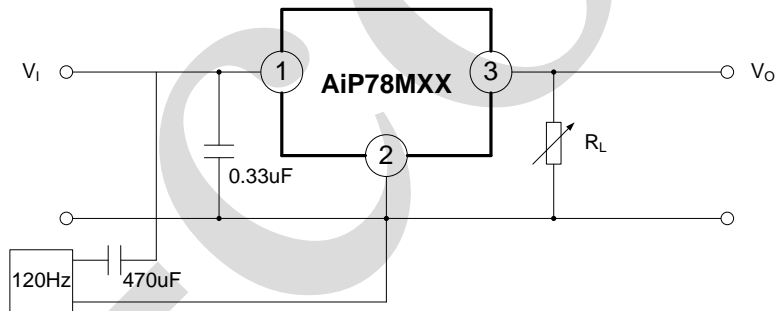
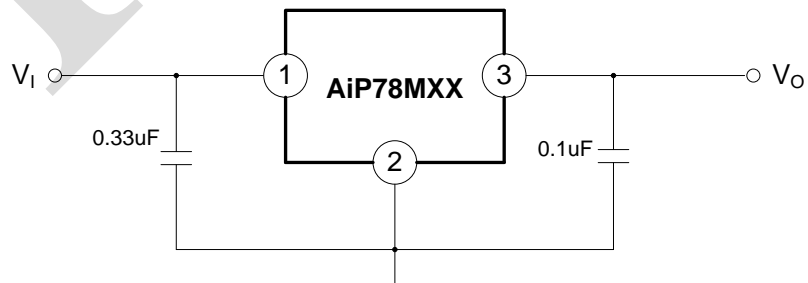


Figure 3: Waveform Rejection Ratio Test Circuit

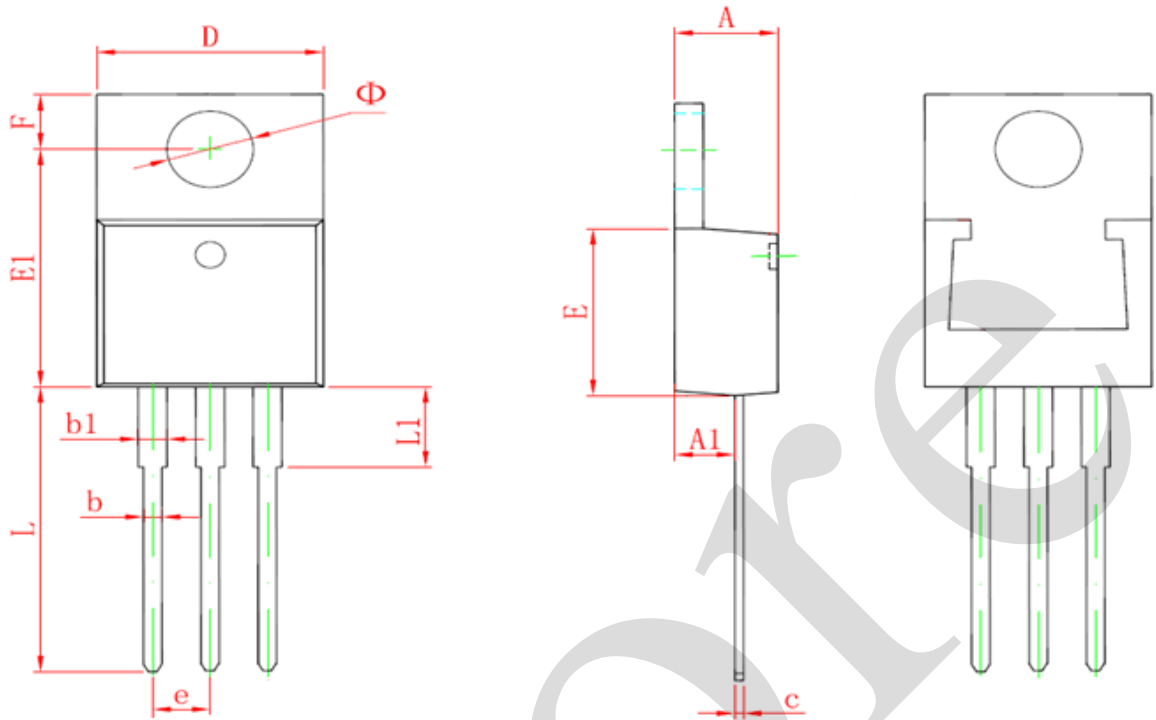
5、Typical Application Circuit





6、Package Information

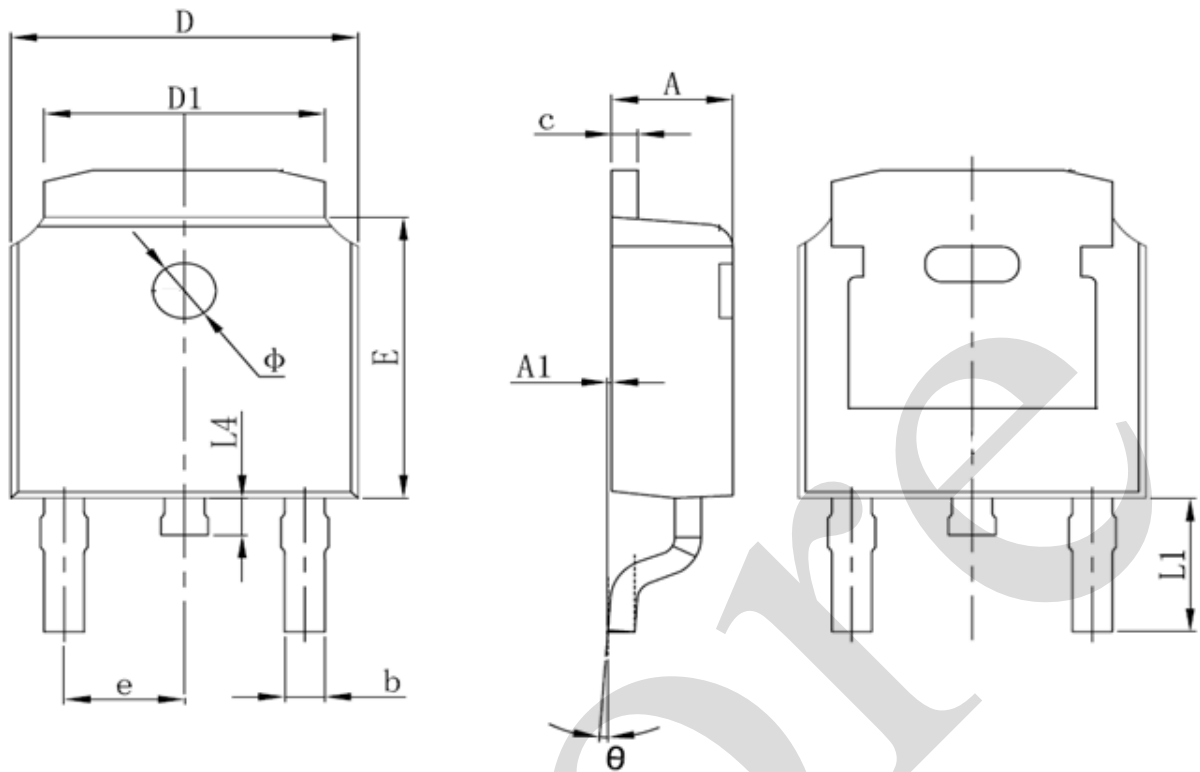
6.1、TO220



Symbol	Dimensions (mm)	
	Min.	Max.
A	4.40	4.80
A1	2.15	2.82
b	0.70	0.91
b1	1.12	1.42
c	0.31	0.60
D	9.70	10.31
E	8.50	9.39
E1	12.06	12.55
e	2.54	
F	2.59	3.55
L	12.60	13.80
L1	3.40	3.96
φ	3.00	3.93



6.2、TO252



Symbol	Dimensions (mm)	
	Min.	Max.
A	2.20	2.40
A1	0.00	0.13
b	0.58	0.87
c	0.45	0.61
D	6.50	6.70
D1	5.10	5.46
E	6.00	6.23
e	2.186	2.386
L1	2.60	3.05
L4	0.60	1.00
ϕ	0.90	1.30
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

We recommend you to read this chapter carefully before using this product.

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