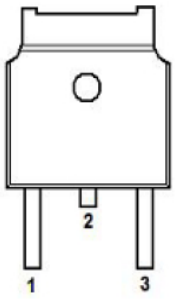
DESCRIPTION

The WD78MXX series of three-terminal positive regulators are available in TO-252 packages.Each type employs internal current limiting, thermal shut-down and safe area protection, making it essentially indestructible.If adequate heat sinking is provided ,they can deliver over 0.5A output current, Although designed as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltage and currents.

TO-252



1. Input
2. GND
3. Output

1:Input 2:GND 3:Output

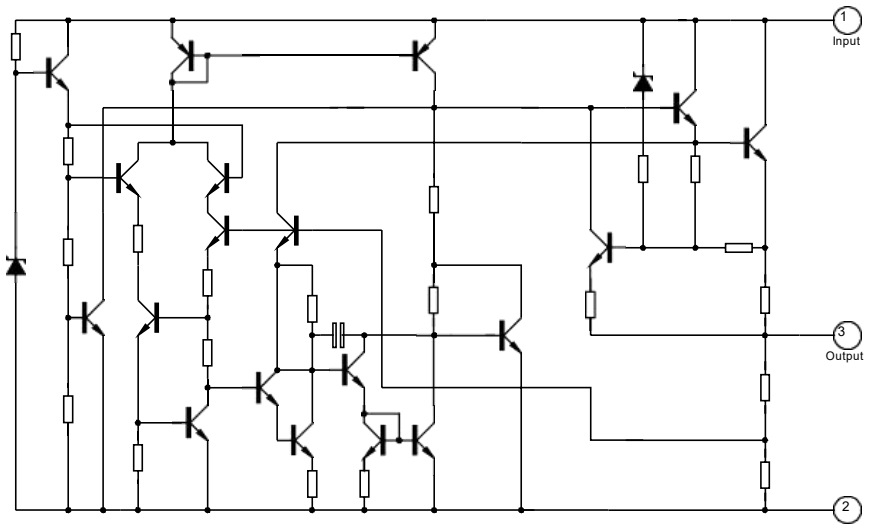
FEATURES

- Output current up to 0.5A
- Short circuit protection
- Thermal overload protection
- Output transistor SOA protection

ORDERING INFORMATION

Device	Marking	PARAMETERS
WD78M05	WD78M05 ******	Vin(max)=35V,Vout=5V,0.5A,TO-252
WD78M06	WD78M06 ******	Vin(max)=35V,Vout=6V,0.5A,TO-252
WD78M08	WD78M08******	Vin(max)=35V,Vout=8V,0.5A,TO-252
WD78M09	WD78M09 ******	Vin(max)=35V,Vout=9V,0.5A,TO-252
WD78M12	WD78M12 ******	Vin(max)=35V,Vout=12V,0.5A,TO-252
WD78M15	WD78M15 ******	Vin(max)=35V,Vout=15V,0.5A,TO-252

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS(Tc=25℃ unless otherwise noted)

Characteristic	Symbol	Value	Unit
Input voltage	Vi	35	V
Output current	Io	Internally Limited	mA
Power dissipation	Pd	Internally Limited	mW
Operating Temperature	Topr	-40~+125	℃
Storage Temperature	Tstg	-65~+150	℃

WD78M05 ELECTRICAL CHARACTERISTIC

(Refer to test circuits, Tj=25°C,Io=300mA,Vi=10V,Ci=0.33μF, Co=0.1μF, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Output voltage			4.8	5.0	5.2	V
Output voltage	Vo	Io=5 to 350mA, Vi=7 to 20V	4.75	5.0	5.25	V
Line regulation	ΔVo	Vi=7 to 25V,Io=200mA			100	mV
		Vi=8 to 25V,Io=200mA			50	
Load regulation	ΔVo	Io=5 to 500mA, Tj=25°C			100	mV
		Io=5 to 200mA, Tj=25°C			50	mV
Quiescent current	IQ				6	mA
Quiescent current change	ΔIQ	Io=5 to350mA			0.5	mA
		Vi=8V to 25V,Io=200mA			0.8	mA
Output voltage drift	ΔVo/ΔT	Io=5mA,Tj=0 to 125°C		-0.5		mV/°C
Supply voltage rejection	SVR	Vi=8to 18V, f=120Hz,Io=300mA	62			dB
Output noise voltage	VN	f=10Hz to 100kHz		40		μV
Dropout voltage	VD			2		V
Short circuit current	Isc	Vi=35V		50		mA

WD78M06 ELECTRICAL CHARACTERISTIC

(Refer to test circuits, Tj=25°C,Io=350mA,Vi=11V,Ci=0.33μF, Co=0.1μF, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Output voltage			5.75	6	6.25	V
Output voltage	Vo	Io=5 to 350mA, Vi=8 to 21V	5.7	6	6.3	V
Line regulation	ΔVo	Vi=8 to 25V,Io=200mA			120	mV
		Vi=9 to 25V,Io=200mA			60	
Load regulation	ΔVo	Io=5 to 500mA, Tj=25°C			120	mV
		Io=5 to 200mA, Tj=25°C			60	mV
Quiescent current	IQ				6	mA
Quiescent current change	ΔIQ	Io=5 to350mA			0.5	mA
		Vi=9V to 25V,Io=200mA			0.8	mA
Output voltage drift	ΔVo/ΔT	Io=5mA,Tj=0 to 125°C		-0.6		mV/°C
Supply voltage rejection	SVR	Vi=9to 19V, f=120Hz,Io=300mA	59			dB
Output noise voltage	VN	f=10Hz to 100kHz		45		μV
Dropout voltage	VD			2		V
Short circuit current	Isc	Vi=35V		50		mA

WD78M08 ELECTRICAL CHARACTERISTIC

(Refer to test circuits, Tj=25°C,Io=300mA,Vi=14V,Ci=0.33μF, Co=0.1μF, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Output voltage			7.7	8.0	8.3	V
Output voltage	Vo	Io=5 to 350mA, Vi=10.5 to 23V	7.6	8.0	8.4	V
Line regulation	ΔVo	Vi=10.5 to 25V,Io=200mA			160	mV
		Vi=11 to25V, Io=200mA			80	mV
Load regulation	ΔVo	Io=5 to 500mA, Tj=25°C			160	mV
		Io=5 to 200mA, Tj=25°C			80	mV
Quiescent current	IQ				6	mA
Quiescent current change	ΔIQ	Io=5 to350mA			0.5	mA
		Vi=10.5V to 25V,Io=200mA			0.8	mA
Output voltage drift	ΔVo/ΔT	Io=5mA,Tj=0 to 125°C		-0.8		mV/°C
Supply voltage rejection	SVR	Vi=11.5 to 21.5V, f=120Hz,Io=300mA	56			dB
Output noise voltage	VN	f=10Hz to 100kHz		52		μV
Dropout voltage	VD			2		V
Short circuit current	Isc	Vi=35V		50		mA

WD78M08 ELECTRICAL CHARACTERISTIC

(Refer to test circuits, Tj=25°C,Io=300mA,Vi=14V,Ci=0.33μF, Co=0.1μF, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Output voltage			7.7	8.0	8.3	V
Output voltage	Vo	Io=5 to 350mA, Vi=10.5 to 23V	7.6	8.0	8.4	V
Line regulation	ΔVo	Vi=10.5 to 25V,Io=200mA			160	mV
		Vi=11 to25V, Io=200mA			80	mV
Load regulation	ΔVo	Io=5 to 500mA, Tj=25°C			160	mV
		Io=5 to 200mA, Tj=25°C			80	mV
Quiescent current	IQ				6	mA
Quiescent current change	ΔIQ	Io=5 to350mA			0.5	mA
		Vi=10.5V to 25V,Io=200mA			0.8	mA
Output voltage drift	ΔVo/ΔT	Io=5mA,Tj=0 to 125°C		-0.8		mV/°C
Supply voltage rejection	SVR	Vi=11.5 to 21.5V, f=120Hz,Io=300mA	56			dB
Output noise voltage	VN	f=10Hz to 100kHz		52		μV
Dropout voltage	VD			2		V
Short circuit current	Isc	Vi=35V		50		mA

WD78M12 ELECTRICAL CHARACTERISTIC

Refer to test circuits T =25°C Io=350mA Vi=19V Ci=0.33 F Co=0.1 F unless otherwise s ecified

(, j , , , μ , μ , p)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Output voltage			11.5	12	12.5	V
Output voltage	Vo	Io=5 to 350mA, Vi=14.5 to 27V	11.4	12	12.6	V
Line regulation	ΔVo	Vi=14.5 to 30V,Io=200mA			240	mV
		Vi=16 to30V, Io=200mA			120	mV
Load regulation	ΔVo	Io=5 to 500mA, Tj=25°C			240	mV
		Io=5 to 200mA, Tj=25°C			120	mV
Quiescent current	IQ				6	mA
Quiescent current change	ΔIQ	Io=5 to350mA			0.5	mA
		Vi=14.5V to 30V,Io=200mA			0.8	mA
Output voltage drift	ΔVo/ΔT	Io=5mA,Tj=0 to 125°C		-1		mV/°C
Supply voltage rejection	SVR	Vi=15 to 25V, f=120Hz,Io=300mA	55			dB
Output noise voltage	VN	f=10Hz to 100kHz		75		μV
Dropout voltage	VD			2		V
Short circuit current	Isc	Vi=35V		50		mA

WD78M15 ELECTRICAL CHARACTERISTIC

(Refer to test circuits, Tj=25°C,Io=350mA,Vi=23V,Ci=0.33μF, Co=0.1μF, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Output voltage			14.4	15	15.6	V
Output voltage	Vo	Io=5 to 350mA, Vi=17.5V to 30V	14.25	15	15.75	V
Line regulation	ΔVo	Vi=17.5 Vto 30V,Io=200mA			300	mV
		Vi=20V to 30V, Io=200mA			150	mV
Load regulation	ΔVo	Io=5 to 500mA, Tj=25°C			300	mV
		Io=5 to 200mA, Tj=25°C			150	mV
Quiescent current	IQ				6	mA
Quiescent current change	ΔIQ	Io=5 to350mA			0.5	mA
		Vi=17.5V to 30V,Io=200mA			0.8	mA
Output voltage drift	ΔVo/ΔT	Io=5mA,Tj=0 to 125°C		-1.1		mV/°C
Supply voltage rejection	SVR	Vi=18.5V to 28.5V, f=120Hz,Io=300mA	53			dB
Output noise voltage	VN	f=10Hz to 100kHz		100		μV
Dropout voltage	VD			2		V
Short circuit current	Isc	Vi=35V		50		mA

TEST CIRCUITS

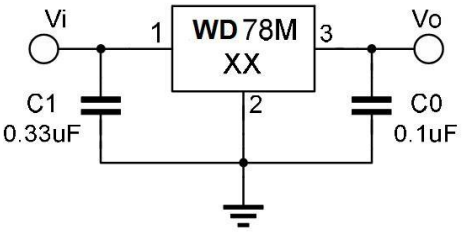


Fig.1 DC PARAMETERS

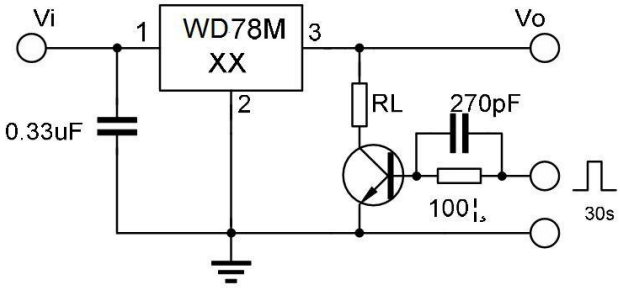


Fig.2 LOAD REGULATION

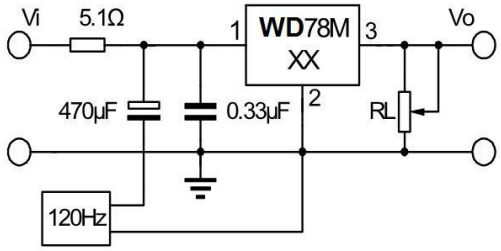


Fig.3 RIPPLE REJECTION

APPLICATION CIRCUIT

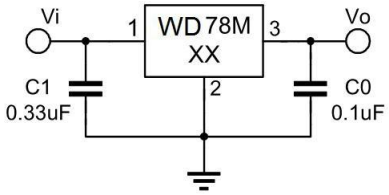


Fig.4 Fixed output regulator

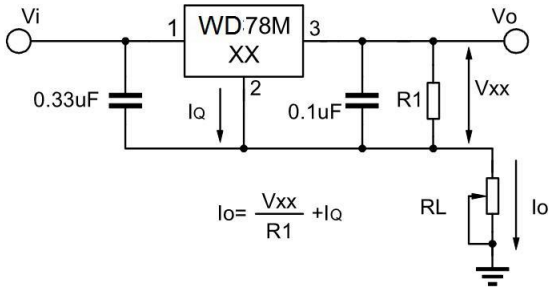


Fig.5 Constant current regulator

APPLICATION CIRCUIT

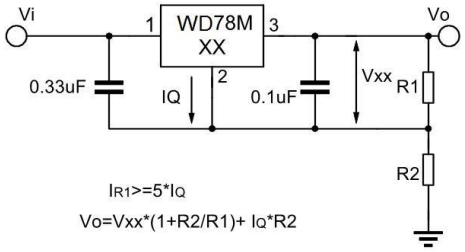


Fig.6 Circuit for increasing Regulator output voltage

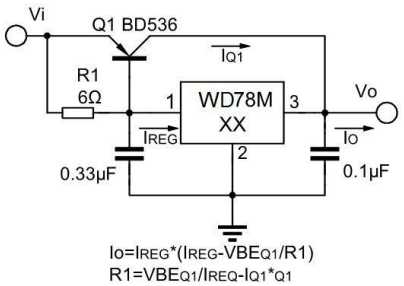


Fig.7 High current with voltage regulator

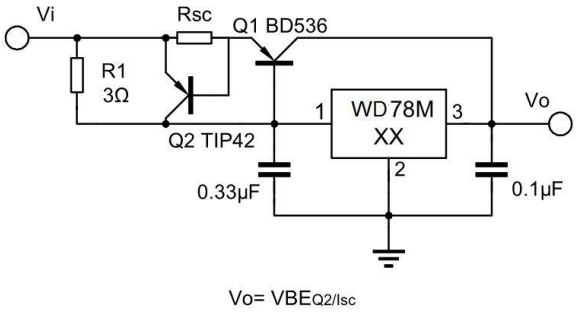


Fig.8 High output curent short circuit protection

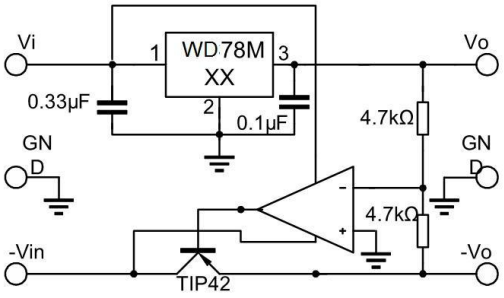


Fig.9 Tracking voltage regulator

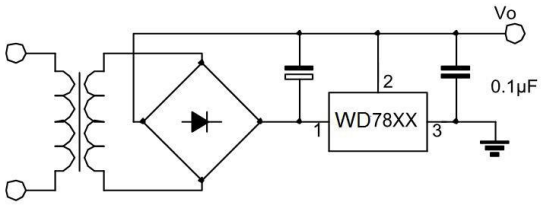


Fig.10 Negative output voltage ciruit

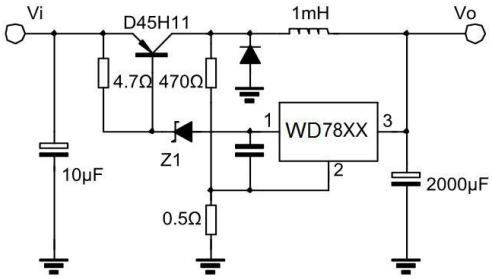


Fig.11 switching regulator

PACKAGE DIMENSIONS

TO-252