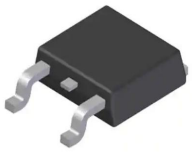
78DXX
3-Terminal Positive Voltage Regulator

General Description

The 78DXX family ismonolithic fixed voltage regulator integrated circuit.

They are suitable for applications that required supply current up to 1A.



TO252-2

Features

- Output Current Up To 1 A
- Fixed Output Voltage Of 5V, 6V, 8V, 9V, 10V,12V, 15V, 18V and 24V Available
- Thermal Overload Shutdown Protection
- Short Circuit Current Limiting Output
- Transistor SOA Protection

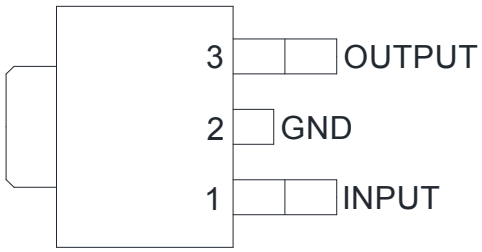
Package Information

Part NO.	Package Description	Package Marking	Package Option
78DXX	TO252-2	CHMC 78DXX SXXXX	70/Tube 2500/Reel

CHMC:Trademark SXXXX:Lot NO. 78DXX:Part NO. (XX: Voltage)

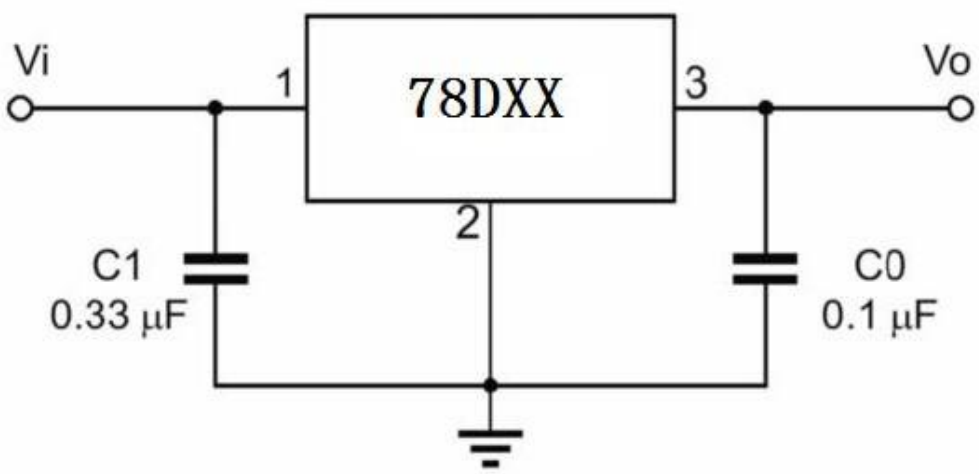
XX(Output Voltage): 05(5.0V)/06(6.0V)/08(8.0V)/09(9.0V)/10(10V)/12(12V)/15(15V)/18(18V)/24(24V)

Pin Connection



78DXX(TO252-2)

Typical Application Circuits



Absolute Maximum Ratings (T_J=25℃, unless otherwise specified)

Characteristic	Value	Value	Unit
Input Voltage	Vi	35	V
Thermal Resistance Junction-Case	$R_{\theta JC}$	10	°C/W
Thermal Resistance Junction-Air	$R_{\theta JA}$	93	°C/W
Operating Temperature Range	T_{OPR}	-40~+125	°C
Storage Temperature Range	T_{STG}	-55~+150	°C

Electrical Characteristics

(Unless otherwise specified, Io=500mA, Vi=10V, Ci=0.33μF, Co=0.1μF)

For 78D05 (V_{IN}=10V, I_{OUT}=0.5A)

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	Vo	T_J=+25°C, Io=5mA~1A	4.8	5.0	5.2	V
		7.5V≤Vi≤20V,Io=5mA～1A	4.75	5.0	5.25	
Line Regulation*	ΔVo	7V≤Vi≤25V T_J=25℃			50	mV
		7.5V≤Vi≤20V,Io=1A,T_J=25℃			50	
Load Regulation*	ΔVo	T_J=25℃,Io=5mA～1A		25	50	mV
		T_J=25℃,Io=0.25A～0.75A		10	25	
Quiescent Current	I_Q	T_J=+25℃,Io≤1.0A		5.0	8.0	mA
Quiescent Current Change	Δ I_Q	7.5V≤Vi≤20V			1.0	mA
		5mA≤Io≤1A			0.5	
Output Noise Voltage	V_N	10Hz≤ f ≤100kHz, T_J=25℃		40	200	μV
Ripple Rejection	RR	8V≤Vi≤18V,f=120Hz	59	80		dB
Dropout Voltage	Vd	T_J=+25°C		2		V
Short Circuit Current	I_{SC}	Vi=30V,Vo=0V,T_J=+25°C		0.25		A
Peak Current	I_{PK}	T_J=+25°C		1.8		A

For 78D06 (V_{IN}=11V, I_{OUT}=0.5A)

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	Vo	T_J=+25°C, Io=5mA~1A	5.76	6.0	6.24	V
		8.5V≤Vi≤21V,Io=5mA～1A	5.7	6.0	6.3	
Line Regulation*	ΔVo	8V≤Vi≤25V Tj=25℃			60	mV
		8.5V≤Vi≤21V,Io=1A,Tj=25℃			60	
Load Regulation*	ΔVo	Tj=25℃,Io=5mA～1A			60	mV
		Tj=25℃,Io=0.25A～0.75A			30	
Quiescent Current	I_Q	Io≤1.0A			8.0	mA
Quiescent Current Change	Δ I_Q	8.5V≤Vi≤21V			1.0	mA
		5mA≤Io≤1A			0.5	
Output Noise Voltage	V_N	10Hz≤ f ≤100kHz, Tj=25℃		45		μV
Ripple Rejection	RR	9V≤Vi≤19V,f=120Hz, Io=500mA, Tj=25℃	56	75		dB
Dropout Voltage	Vd	T_J=+25°C		2		V
Short Circuit Current	I_{SC}	Vi=35V,Vo=0V,T_J=+25°C		0.25		A
Peak Current	I_{PK}	Vi=10V,Vo=0V,T_J=+25°C		1.8		A

For 78D08 (V_{IN}=14V, I_{OUT}=0.5A)

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	Vo	T_J=+25°C, Io=5mA~1A	7.68	8.0	8.32	V
		10.5V≤Vi≤23V,Io=5mA～1A	7.6	8.0	8.4	
Line Regulation*	ΔVo	10.5V≤Vi≤25V Tj=25℃			80	mV
		10.5V≤Vi≤23V,Io=1A,Tj=25℃			80	
Load Regulation*	ΔVo	Tj=25℃,Io=5mA～1A			80	mV
		Tj=25℃,Io=0.25A～0.75A			40	
Quiescent Current	I_Q	T_J=+25°C, Io≤1.0A			8.0	mA
Quiescent Current Change	Δ I_Q	10.5V≤Vi≤23V			1.0	mA
		5mA≤Io≤1A			0.5	
Output Noise Voltage	V_N	10Hz≤ f ≤100kHz, Tj=25℃		58	200	μV
Ripple Rejection	RR	11.5V≤Vi≤21.5V,f=120Hz, Io=500mA, Tj=25℃	53	72		dB
Dropout Voltage	Vd	T_J=+25°C		2		V
Short Circuit Current	I_{SC}	Vi=35V,Vo=0V,T_J=+25°C		0.25		A
Peak Current	I_{PK}	T_J=+25°C		1.8		A

For 78D09 (V_{IN}=15V, I_{OUT}=0.5A)

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	Vo	T_J=+25°C, Io=5mA~1A	8.64	9	9.36	V
		11.5V≤Vi≤24V,Io=5mA～1A	8.55		9.45	
Line Regulation*	ΔVo	11.5V≤Vi≤25V Tj=25℃			90	mV
		11.5V≤Vi≤24V,Io=1A,Tj=25℃			90	
Load Regulation*	ΔVo	Tj=25℃,Io=5mA～1A			90	mV
		Tj=25℃,Io=0.25A～0.75A			45	
Quiescent Current	I_Q	T_J=+25°C, Io≤1.0A			8.0	mA
Quiescent Current Change	Δ I_Q	11.5V≤Vi≤24V			1.0	mA
		5mA≤Io≤1A			0.5	
Output Noise Voltage	V_N	10Hz≤ f ≤100kHz, Tj=25℃		58		μV
Ripple Rejection	RR	12.5V≤Vi≤22.5V,f=120Hz, Io=500mA, Tj=25℃	53	72		dB
Dropout Voltage	Vd	T_J=+25°C		2		V
Short Circuit Current	I_{SC}	Vi=35V,Vo=0V,T_J=+25°C		0.25		A
Peak Current	I_{PK}	T_J=+25°C		1.8		A

For 78D10 (V_{IN}=16V, I_{OUT}=0.5A)

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	Vo	T_J=+25°C, Io=5mA~1A	9.6	10	10.40	V
		12.5V≤Vi≤25V,Io=5mA～1A	9.5		10.5	
Line Regulation*	ΔVo	12.5V≤Vi≤25V Tj=25℃			100	mV
		12.5V≤Vi≤25V,Io=1A,Tj=25℃			100	
Load Regulation*	ΔVo	Tj=25℃,Io=5mA～1A			100	mV
		Tj=25℃,Io=0.25A～0.75A			50	
Quiescent Current	I_Q	T_J=+25°C, Io≤1.0A			8.0	mA
Quiescent Current Change	Δ I_Q	12.5V≤Vi≤25V			1.0	mA
		5mA≤Io≤1A			0.5	
Output Noise Voltage	V_N	10Hz≤ f ≤100kHz, Tj=25℃		58		μV
Ripple Rejection	RR	12.5V≤Vi≤22.5V,f=120Hz, Io=500mA, Tj=25℃	53	72		dB
Dropout Voltage	Vd	T_J=+25°C		2		V
Short Circuit Current	I_{SC}	Vi=35V,Vo=0V,T_J=+25°C		0.25		A
Peak Current	I_{PK}	T_J=+25°C		1.8		A

For 78D12 (V_{IN}=19V, I_{OUT}=0.5A)

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	Vo	T_J=+25°C, Io=5mA~1A	11.52	12	12.48	V
		14.5V≤Vi≤27V,Io=5mA～1A	11.4		12.6	
Line Regulation*	ΔVo	14.5V≤Vi≤30V Tj=25℃			120	mV
		14.6V≤Vi≤27V,Io=1A,Tj=25℃			120	
Load Regulation*	ΔVo	Tj=25℃,Io=5mA～1A			120	mV
		Tj=25℃,Io=0.25A～0.75A			60	
Quiescent Current	I_Q	T_J=+25°C, Io≤1.0A			8.0	mA
Quiescent Current Change	Δ I_Q	14.5V≤Vi≤30V			1.0	mA
		5mA≤Io≤1A			0.5	
Output Noise Voltage	V_N	10Hz≤ f ≤100kHz, Tj=25℃		75		μV
Ripple Rejection	RR	15V≤Vi≤25V,f=120Hz,Tj=25℃	52	72		dB
Dropout Voltage	Vd	T_J=+25°C		2		V
Short Circuit Current	I_{SC}	Vi=35V,Vo=0V,T_J=+25°C		0.25		A
Peak Current	I_{PK}	T_J=+25°C		1.8		A

For 78D15 (V_{IN}=23V, I_{OUT}=0.5A)

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	Vo	T_J=+25°C, Io=5mA~1A	14.4	15	15.6	V
		17.5V≤Vi≤30V,Io=5mA～1A	14.25		15.75	
Line Regulation*	ΔVo	18.5V≤Vi≤30V Tj=25℃			150	mV
		17.5V≤Vi≤30V,Io=1A,Tj=25℃			150	
Load Regulation*	ΔVo	Tj=25℃,Io=5mA～1A			150	mV
		Tj=25℃,Io=0.25A～0.75A			75	
Quiescent Current	I_Q	T_J=+25°C, Io≤1.0A			8.0	mA
Quiescent Current Change	Δ I_Q	17.5V≤Vi≤30V			1.0	mA
		5mA≤Io≤1A			0.5	
Output Noise Voltage	V_N	10Hz≤ f ≤100kHz, Tj=25℃		90		μV
Ripple Rejection	RR	18.5V≤Vi≤28.5V,f=120Hz,Tj=25℃	51	72		dB
Dropout Voltage	Vd	T_J=+25°C		2		V
Short Circuit Current	I_{SC}	Vi=35V,Vo=0V,T_J=+25°C		0.25		A
Peak Current	I_{PK}	T_J=+25°C		1.8		A

For 78D18 (V_{IN}=27V, I_{OUT}=0.5A)

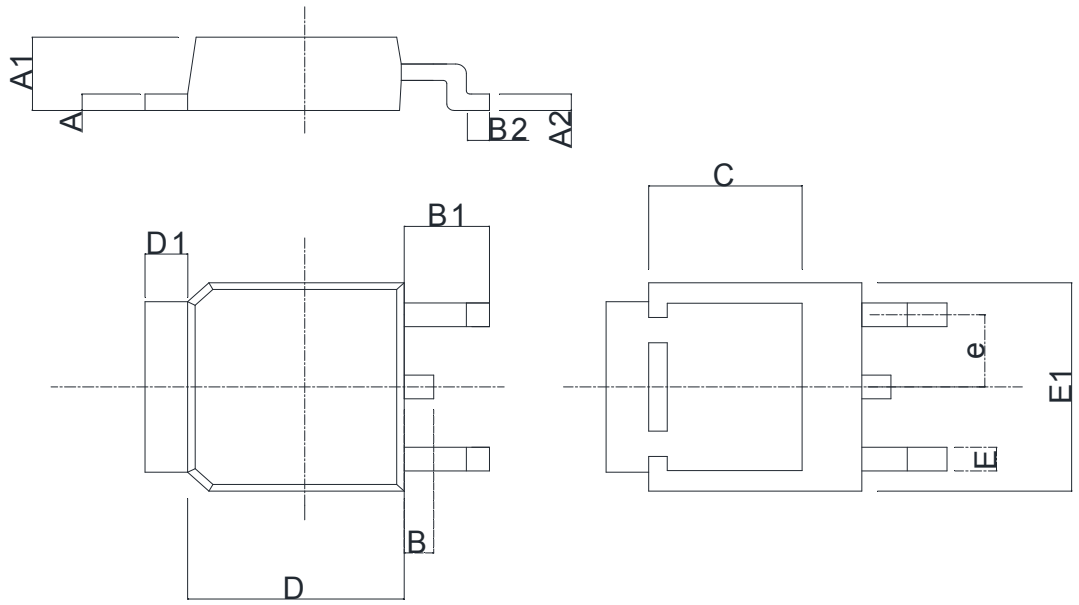
Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	Vo	T_J=+25°C, Io=5mA~1A	17.28	18	18.72	V
		21V≤Vi≤33V,Io=5mA～1A	17.1		18.9	
Line Regulation*	ΔVo	21V≤Vi≤33V Tj=25℃			180	mV
		21V≤Vi≤33V,Io=1A,Tj=25℃			180	
Load Regulation*	ΔVo	Tj=25℃,Io=5mA～1A			180	mV
		Tj=25℃,Io=0.25A～0.75A			90	
Quiescent Current	I_Q	T_J=+25°C, Io≤1.0A			8.0	mA
Quiescent Current Change	Δ I_Q	21.5V≤Vi≤33V			1.0	mA
		5mA≤Io≤1A			0.5	
Output Noise Voltage	V_N	10Hz≤ f ≤100kHz, Tj=25℃		110		μV
Ripple Rejection	RR	22V≤Vi≤32V,f=120Hz, Io=500mA, Tj=25℃	50	67		dB
Dropout Voltage	Vd	T_J=+25°C		2		V
Short Circuit Current	I_{SC}	Vi=35V,Vo=0V,T_J=+25°C		0.25		A
Peak Current	I_{PK}	T_J=+25°C		1.8		A

For 78D24 (V_{IN}=33V, I_{OUT}=0.5A)

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	Vo	T_J=+25°C, Io=5mA~1A	23.04	24	24.96	V
		27V≤Vi≤38V,Io=5mA～1A	22.8		25.2	
Line Regulation*	ΔVo	27V≤Vi≤38V Tj=25℃			240	mV
		27V≤Vi≤38V,Io=1A,Tj=25℃			240	
Load Regulation*	ΔVo	Tj=25℃,Io=5mA～1A			240	mV
		Tj=25℃,Io=0.25A～0.75A			120	
Quiescent Current	I_Q	T_J=+25°C, Io≤1.0A			8.0	mA
Quiescent Current Change	Δ I_Q	28V≤Vi≤38V			1.0	mA
		5mA≤Io≤1A			0.5	
Output Noise Voltage	V_N	10Hz≤ f ≤100kHz, Tj=25℃		170		μV
Ripple Rejection	RR	28V≤Vi≤38V,f=120Hz, Io=500mA, Tj=25℃	47	66		dB
Dropout Voltage	Vd	T_J=+25°C		2		V
Short Circuit Current	I_{SC}	Vi=35V,Vo=0V,T_J=+25°C		0.25		A
Peak Current	I_{PK}	T_J=+25°C		1.8		A

Outline Dimensions

TO252-2 Unit: mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.470	0.570	0.018	0.023
A1	2.220	2.380	0.087	0.094
A2	0.470	0.570	0.018	0.023
B	0.820	0.840	0.032	0.033
B1	2.380	2.480	0.093	0.098
B2	0.500	0.520	0.019	0.021
C	4.250	4.450	0.167	0.176
D	6.000	6.200	0.236	0.245
D1	1.150	1.250	0.045	0.050
E	0.650	0.850	0.025	0.034
E1	6.450	6.750	0.253	0.266
e	2.285（BSC）		0.090（BSC）	

Statements

- Silicore Technology reserves the right to make changes without further notice to any products or specifications herein. Before customers place an order, customers need to confirm whether datasheet obtained is the latest version, and to verify the integrity of the relevant information.

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- The product upgrades without end, Silicore Technology will wholeheartedly provide customers integrated circuits that have better performance and better quality.