78DXX   LINEAR INTEGRATED CIRCUIT
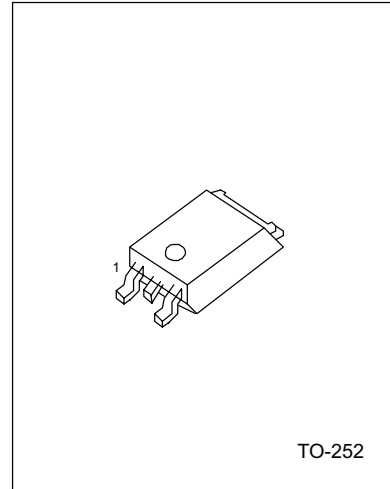
3-TERMINAL 0.5A POSITIVE VOLTAGE REGULATOR

DESCRIPTION

The Contek 78DXX family is monolithic fixed voltage regulator integrated circuit .They are suitable for applications that required supply current up to 0.5 A.
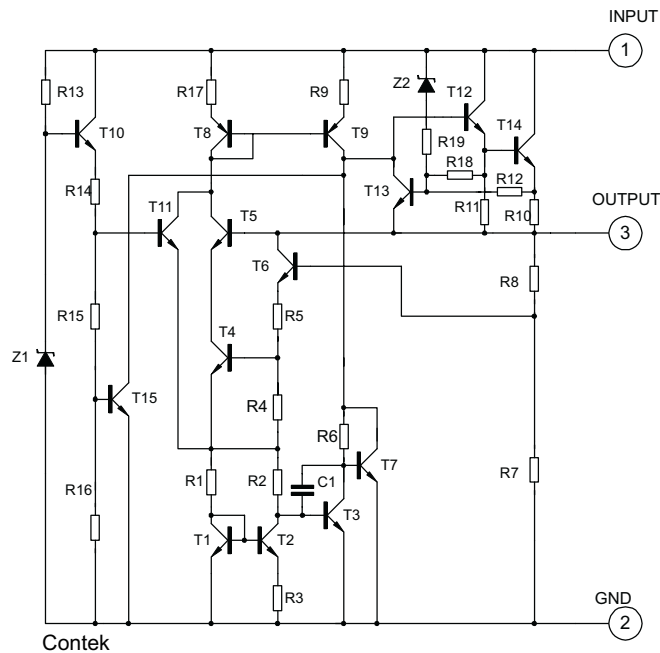
FEATURE

*Output current up to 0.5 A
*Fixed output voltage of 5V, 6V, 8V, 9V, 12V, 15V ,18V and 24V available
*Thermal overload shutdown protection
*Short circuit current limiting
*Output transistor SOA protection

TO-252

1:Input   2:GND   3:Output

EQUIVALENT CIRCUIT

Contek

78DXX   LINEAR INTEGRATED CIRCUIT

ABSOLUTE MAXIMUM RATINGS

(Operating temperature range applies unless otherwise specified)

PARAMETER	SYMBOL	VALUE	UNIT
Input voltage(for Vo=5~18V)	V_I	35	V
(for Vo=20~24V)		40	V
Output Current	I o	0.5	A
Power Dissipation	PD	Internally Limited	W
Operating Junction Temperature Range	T_J	+150	C
Storage Temperature Range	T_{STG}	-65 to+150	C

Contek78D05 ELECTRICAL CHARACTERISTICS

(VI=10V, Io=0.5A, Tj= 0 C - 125 C, C1=0.33uF, Co=0.1uF, unless otherwise specified)(Note 1)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25 C, IO=5mA - 0.5A	4.8	5.0	5.2	V
		V_I =7.5V to 20V, IO=5mA 0.5A,PD<7W	4.75		5.25	V
Load Regulation	ΔVo	Tj=25 C,IO=5mA - 0.5A			50	mV
		Tj=25 C,IO=5mA - 200 mA			25	mV
Line regulation	ΔVo	V_I =7V to 25V,Tj=25 C			50	mV
		V_I =7.5V to 20V,Tj=25 C,Io=0.5A			50	mV
Quiescent Current	Iq	Tj=25 C, IO=0.5A			8.0	mA
Quiescent Current Change	ΔIq	V_I =7.5V to 20V			1.0	mA
	ΔIq	IO=5mA - 0.5A			0.5	mA
Output Noise Voltage	V_N	10Hz<=f<=100kHz		40		uV
Temperature coefficient of Vo	ΔVo/ΔT	Io=5mA		-0.6		mV/ C
Ripple Rejection	RR	V_I =8V -18V,f=120Hz,Tj=25 C	62	80		dB
Peak Output Current	I_{PK}	Tj=25 C		1.2		A
Short-Circuit Current	I_{SC}	VI=35V, Tj=25 C		250		mA
Dropout Voltage	Vd	Tj=25 C		2.0		V

Contek78D06 ELECTRICAL CHARACTERISTICS

(VI=11V, Io=0.5A, Tj= 0 C - 125 C, C1=0.33uF, Co=0.1uF, unless otherwise specified)(Note 1)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25 C, IO=5mA - 0.5A	5.75	6.0	6.26.2	V
		V_I =8.5V to 21V, IO=5mA 0.5A, PD<7W	5.7		6.3	V
Load Regulation	ΔVo	Tj=25 C,IO=5mA - 0.5A			60	mV
		Tj=25 C,IO=5mA - 200mA			30	mV
Line regulation	ΔVo	V_I =8V to 25V,Tj=25 C			60	mV
		V_I =8.5V to 21V,Tj=25 C,Io=0.5A			60	mV
Quiescent Current	Iq	Tj=25 C, IO=0.5A			8.0	mA
Quiescent Current Change	ΔIq	V_I =8.5V to 21V			1.0	mA
	ΔIq	IO=5mA 0.5A			0.5	mA
Output Noise Voltage	V_N	10Hz<=f<=100kHz		45		uV
Temperature coefficient of Vo	ΔVo/ΔT	Io=5mA		-0.7		mV/ C
Ripple Rejection	RR	V_I =9V - 19V,f=120Hz,Tj=25 C	59	75		dB

78DXX LINEAR INTEGRATED CIRCUIT

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Peak Output Current	I_{PK}	Tj=25 C		1.2		A
Short-Circuit Current	I_{SC}	VI=35V, Tj=25 C		250		mA
Dropout Voltage	Vd	Tj=25 C		2.0		V

Contek78D08 ELECTRICAL CHARACTERISTICS

(VI=14V, Io=0.5A, Tj= 0 C - 125 C, C1=0.33uF, Co=0.1uF, unless otherwise specified)(Note 1)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25 C, Io=5mA - 0.5A	7.7	8.0	8.3	V
		VI =10.5V to 23V, Io=5mA 0.5A, PD<7W	7.6		8.4	V
Load Regulation	ΔVo	Tj=25 C,Io=5mA - 0.5A			80	mV
		Tj=25 C,Io=5mA - 200mA			40	mV
Line regulation	ΔVo	VI =10.5V to 25V,Tj=25 C			80	mV
		VI =10.5V to 3V,Tj=25 C,Io=0.5A			80	mV
Quiescent Current	Iq	Tj=25 C, Io=0.5A			8.0	mA
Quiescent Current Change	ΔIq	VI =10.5V to 23V			1.0	mA
	ΔIq	Io=5mA - 0.5A			0.5	mA
Output Noise Voltage	V_N	10Hz<=f<=100kHz		58		uV
Temperature coefficient of Vo	ΔVo/ΔT	Io=5mA		-0.9		mV/ C
Ripple Rejection	RR	VI =11.5V to 21.5V, f=120Hz,Tj=25 C	56	72		dB
Peak Output Current	I_{PK}	Tj=25 C		1.2		A
Short-Circuit Current	I_{SC}	VI=35V, Tj=25 C		250		mA
Dropout Voltage	Vd	Tj=25 C		2.0		V

Contek78D09 ELECTRICAL CHARACTERISTICS

(VI=15V, Io=0.5A, Tj= 0 C - 125 C, C1=0.33uF, Co=0.1uF, unless otherwise specified)(Note 1)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25 C, Io=5mA - 0.5A	8.65	9.00	9.35	V
		VI =11.5V to 24V, Io=5mA - 0.5A,PD<7W	8.6		9.4	V
Load Regulation	ΔVo	Tj=25 C,Io=5mA - 0.5A			90	mV
		Tj=25 C,Io=5mA - 200mA			45	mV
Line regulation	ΔVo	VI =11.5V to 25 V,Tj=25 C			90	mV
		VI =11.5V to 24V,Tj=25 C, Io=0.5A			90	mV
Quiescent Current	Iq	Tj=25 C, Io=0.5A			8.0	mA
Quiescent Current Change	ΔIq	VI =11.5V to 24V			1.0	mA
	ΔIq	Io=5mA 0.5A			0.5	mA
Output Noise Voltage	V_N	10Hz<=f<=100kHz		58		uV
Temperature coefficient of Vo	ΔVo/ΔT	Io=5mA		-1.1		mV/ C
Ripple Rejection	RR	VI =12.5V to 22.5V, f=120Hz,Tj=25 C	56	72		dB
Peak Output Current	I_{PK}	Tj=25 C		1.2		A
Short-Circuit Current	I_{SC}	VI=35V, Tj=25 C		250		mA
Dropout Voltage	Vd	Tj=25 C		2.0		V

78DXX   LINEAR INTEGRATED CIRCUIT

Contek78D12 ELECTRICAL CHARACTERISTICS

(VI=19V, Io=0.5A, Tj= 0 C - 125 C, C1=0.33uF, Co=0.1uF, unless otherwise specified)(Note 1)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25 C, Io=5mA - 0.5A	11.5	12.0	12.5	V
		VI =14.5V to 27V, Io=5mA 0.5A,PD<7W	11.4		12.6	V
Load Regulation	ΔVo	Tj=25 C,Io=5mA - 0.5A			120	mV
		Tj=25 C,Io=5mA - 200mA			60	mV
Line regulation	ΔVo	VI =14.5V to 30V,Tj=25 C			120	mV
		VI =14.6V to 27V,Tj=25 C, Io=0.5A			120	mV
Quiescent Current	Iq	Tj=25 C, Io=0.5A			8.0	mA
Quiescent Current Change	ΔIq	VI =14.5V to 30V			1.0	mA
	ΔIq	Io=5mA 0.5A			0.5	mA
Output Noise Voltage	VN	10Hz<=f<=100kHz		75		uV
Temperature coefficient of Vo	ΔVo/ΔT	Io=5mA		-1.5		mV/ C
Ripple Rejection	RR	VI =15V - 25V,f=120Hz,Tj=25 C	55	72		dB
Peak Output Current	IPK	Tj=25 C		1.2		A
Short-Circuit Current	ISC	VI=35V, Tj=25 C		250		mA
Dropout Voltage	Vd	Tj=25 C		2.0		V

Contek78D15 ELECTRICAL CHARACTERISTICS

(VI=23V, Io=0.5A, Tj= 0 C - 125 C, C1=0.33uF, Co=0.1uF, unless otherwise specified)(Note 1)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25 C, Io=5mA - 0.5A	14.4	15.0	15.6	V
		VI =17.5V to 30V, Io=5mA - 0.5A,PD<7W	14.25		15.75	V
Load Regulation	ΔVo	Tj=25 C,Io=5mA - 0.5A			150	mV
		Tj=25 C,Io=5mA - 200mA			75	mV
Line regulation	ΔVo	VI =18.5V to 30V,Tj=25 C			150	mV
		VI =17.7V to 30V, Tj=25 C, Io =0.5A			150	mV
Quiescent Current	Iq	Tj=25 C, Io=0.5A			8.0	mA
Quiescent Current Change	ΔIq	VI =17.5V to 30V			1.0	mA
	ΔIq	Io=5mA 0.5A			0.5	mA
Output Noise Voltage	VN	10Hz<=f<=100kHz		90		uV
Temperature coefficient of Vo	ΔVo/ΔT	Io=5mA		-1.8		mV/ C
Ripple Rejection	RR	VI =18.5V to 28.5V f=120Hz,Tj=25 C	54	70		dB
Peak Output Current	IPK	Tj=25 C		1.2		A
Short-Circuit Current	ISC	VI=35V, Tj=25 C		250		mA
Dropout Voltage	Vd	Tj=25 C		2.0		V

78DXX   LINEAR INTEGRATED CIRCUIT

Contek78D18 ELECTRICAL CHARACTERISTICS

(VI=27V, Io=0.5A, Tj= 0 C - 125 C, C1=0.33uF, Co=0.1uF, unless otherwise specified)(Note 1)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25 C, Io=5mA - 0.5A	17.3	18.0	18.7	V
		VI =21V to 33V, Io=5mA - 0.5A,PD<7W	17.1		18.9	V
Load Regulation	∆Vo	Tj=25 C,Io=5mA - 0.5A			180	mV
		Tj=25 C,Io=5mA - 200mA			90	mV
Line regulation	∆Vo	VI =21V to 33V,Tj=25 C			180	mV
		VI =21V to 33V, Tj=25 C, Io 0.5A			180	mV
Quiescent Current	Iq	Tj=25 C, Io=0.5A			8.0	mA
Quiescent Current Change	∆Iq	VI =21.5V to 33V			1.0	mA
	∆Iq	Io=5mA - 0.5A			0.5	mA
Output Noise Voltage	VN	10Hz<=f<=100kHz		110		uV
Temperature coefficient of Vo	∆Vo/∆T	Io=5mA		-2.2		mV/ C
Ripple Rejection	RR	VI =22V - 32V,f=120Hz,Tj=25 C	53	69		dB
Peak Output Current	IPK	Tj=25 C		1.2		A
Short-Circuit Current	ISC	VI=35V, Tj=25 C		250		mA
Dropout Voltage	Vd	Tj=25 C		2.0		V

Contek78D24 ELECTRICAL CHARACTERISTICS

(VI=33V, Io=0.5A, Tj= 0 C - 125 C, C1=0.33uF, Co=0.1uF, unless otherwise specified)(Note 1)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25 C, Io=5mA - 0.5A	23.0	24.0	25.0	V
		VI =27V to 38V, Io=5mA - 0.5A, PD<7W	22.8		25.2	V
Load Regulation	∆Vo	Tj=25 C,Io=5mA - 0.5A			240	mV
		Tj=25 C,Io=5mA - 200mA			120	mV
Line regulation	∆Vo	VI =27V to 38V,Tj=25 C			240	mV
		VI =27V to 38V,Tj=25 C,Io=0.5A			240	mV
Quiescent Current	Iq	Tj=25 C, Io=0.5A			8.0	mA
Quiescent Current Change	∆Iq	VI =28V to 38V			1.0	mA
	∆Iq	Io=5mA - 0.5A			0.5	mA
Output Noise Voltage	VN	10Hz<=f<=100kHz		170		uV
Temperature coefficient of Vo	∆Vo/∆T	Io=5mA		-2.8		mV/ C
Ripple Rejection	RR	VI =28V - 38V,f=120Hz,Tj=25 C	50	66		dB
Peak Output Current	IPK	Tj=25 C		1.2		A
Short-Circuit Current	ISC	VI=35V, Tj=25 C		250		mA
Dropout Voltage	Vd	Tj=25 C		2.0		V

Note 1: The Maximum steady state usable output current are dependent on input voltage, heat   sinking , lead
length of the package and copper pattern of PCB. The data above represents pulse test conditions with
junction temperatures specified at the initiation of test.
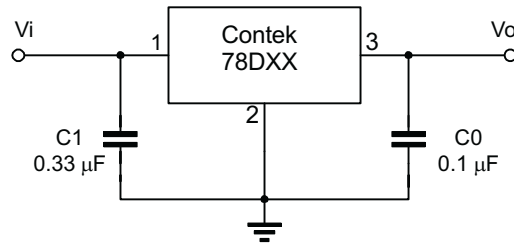Note 2: Power dissipation<0.5W

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CONTEK

78DXX   LINEAR INTEGRATED CIRCUIT

TYPICAL APPLICATION CIRCUIT

Vi ──○───┬────┤ 1 Contek 3 ├────┬───○ Vo
         │   │   78DXX   │   │
         │   │   2   │   │
       C1 ┤   │   ┤ C0
     0.33 μF   │   0.1 μF
         └──────────┴────────┘
                    │
                   ⏚

Note 1: To specify an output voltage, substitute voltage value for " DXX".
Note 2: Bypass capacitors are recommended for optimum stability and transient response and should be located
        as close as possible to the regulators.