



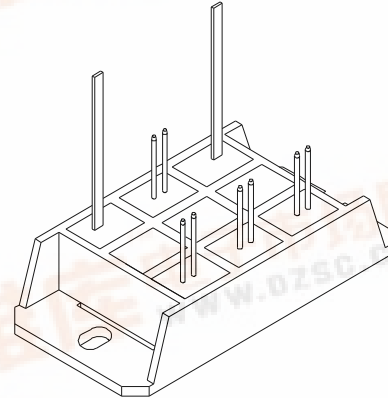
AXC-102

ACTIVE FILTER FOR RIPPLE ATTENUATION 20A

PRELIMINARY

Features :

- ? High Efficiency.
- ? Superior Performance at Low Frequencies.
- ? Output Impedance Less Than $5m\Omega$.
- ? Retriggerable / Non-retriggerable Circuit Breaker.
- ? Shut Down.
- ? Sense Input Control.
- ? Status Output.
- ? Wide Operation Range 0-28V.
- ? Programmable Voltage Drop.
- ? Compact Size.



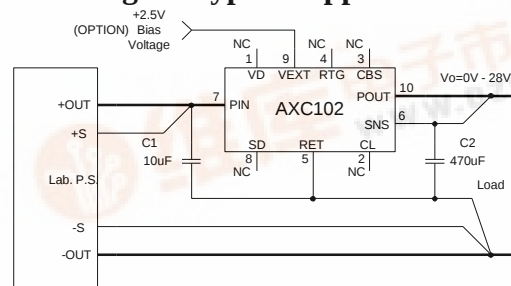
Product Description

The **AXC-102** is a power filter which provide high attenuation starting at extremely low frequencies (30dB@20Hz). The device is designed for positive supply of 0 to 28 Volts and up to 20Amp load. The output voltage tracks the DC input voltage with 0.6V drop (adjustable). Full performance is kept for input ripple of up to 0.8 Volts p-p. Exceptional effort has been made to maintain low output impedance (less than $5m\Omega$ at audio frequencies). The **AXC** filters are designed to meet the most stringent noise requirements in electronic equipment, laboratory power supplies, audio equipment, etc. Sense input provides a constant DC voltage drop across the AXC102. A programmable current circuit breaker shuts down the device when the current through the module exceeds the rated current (programmable). The circuit breaker has two modes of operation: Retriggerable and Non-retriggerable mode. A CBS (Circuit Breaker Status) indicates when the device is in disconnected mode. A low level voltage (less than 1V), at SD (Shut Down) input, shuts down the output voltage and the quiescent current drops below 2.5mA. This feature fits power management, as well as battery power saving applications.

Applications

- ? **Laboratory Power Supply.**
- ? **Mixed Signal Power Splitter.**
- ? **Automotive Power Filter.**
- ? **Professional Audio Systems.**
- ? **Power Management.**

Fig.1 - Typical Application



Ultra Low Noise, Lab. Power Supply



AXC-102

PRELIMINARY

Absolute Maximum Ratings

Parameter	Conditions	Min	Max	Units
Supply Voltage		0	30	Vdc
Maximum Output Current	Less than 100uSec	0	100	A
SD Current		0	10	mA
SD Voltage		-2	5	V
CL Current		-1	1	mA
CL Voltage		-10	10	V
VEXT Current		-15	25	mA
VEXT Voltage		2.3	2.7	V
CBS,RTG Current			1	mA
CBS,RTG Voltage		-10	30	V
VD Current			1	mA
VD Voltage		PIN-1	PIN+1	V
SNS Current			10	mA
SNS Voltage		POUT-1	POUT+1	V
Storage Temperature		-30	110	°C
Operating Temperature		-30	85	°C

DC Electrical Specification (-30°C ≤ T_A ≤ +85°C)

Parameter	Conditions	Min	Typ	Max	Units
Operating Voltage	VEXT not connected	4		28	V
	VEXT connected to external 2.5V	0		28	V
Operation Current		0		20	A
Quiescent Current	Normal Operation		22	26	mA
	Shut Down Mode			2.25	mA
VEXT Voltage		2.5		2.6	V
VEXT Current	2.50<VEXT<2.60V	10		26	mA
Voltage Drop	No Load	0		0.62	V
	Full Load	0.2		0.68	V
	R1* Not Connected	0.60		0.62	V
SD OFF Position Voltage		0		1	V
SD OFF Position Current			2	2.5	mA
Retriggerable Time	RTG Not Connected	50		100	mSec
CBS Output Voltage ON Position		1.5		2.5	V
CBS Output Voltage Off Position		0		1	V
CBS Output Current ON Position				20	uA
CBS Output Current Off Position				20	uA
Circuit Breaker Off Current	R1* Not Connected	20		22	A
	R1*=0	4		5	A

* R1 See Fig.2

AC Electrical Specification (-30°C ≤ T_A ≤ +85°C)

Operating Voltage 4-28V ; Output Current I_{LOAD}=(0÷20)A

Parameter	Conditions	Min	Typ	Max	Units
Insertion Loss	20Hz ÷ 10KHz @ 50Ω	40	50	60	dB
Attenuation*	At 1Khz	55	61		dB
	10Hz-10Khz	27	30		dB
Output Impedance	10Hz ÷ 10KHz		4	6	mΩ
Line Transient Attenuation	Transient voltage less than 0.5V R2** does not exist	26	30		dB
Transient Output Impedance	Idc=2A; ΔI=5A			6	mΩ

*C1 = 10uF ,C2=470uF Electrolytic Capacitor ,R2 not exist; Maximum Input Noise Level = 0.8Vptp

** See Fig2.

Circuit Breaker Current Setting:

$$I_{\text{CIRCUIT BREAKER}} [A] = \frac{720 + 240R_1 [K\Omega]}{150 + 11R_1 [K\Omega]} \pm 10\%$$

Voltage Drop Setting:

$$V_{\text{DROP}} [V] = \frac{1.2R_2 [K\Omega]}{100 + 2R_2 [K\Omega]} \pm 5\%$$

*R1,R2 See Fig2.

Fig.2 - Test Circuit

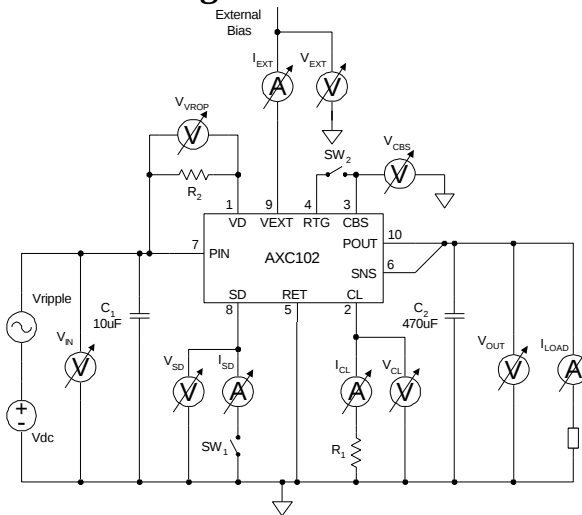


Fig.3 - Circuit Breaker Current Setting

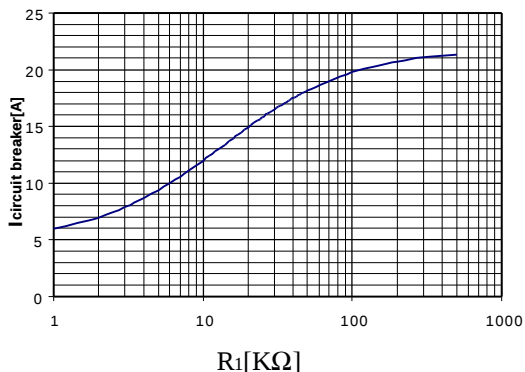
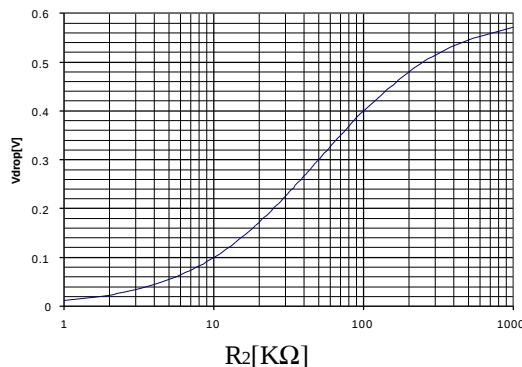


Fig.4 - Voltage Drop Setting



Load Transient Response

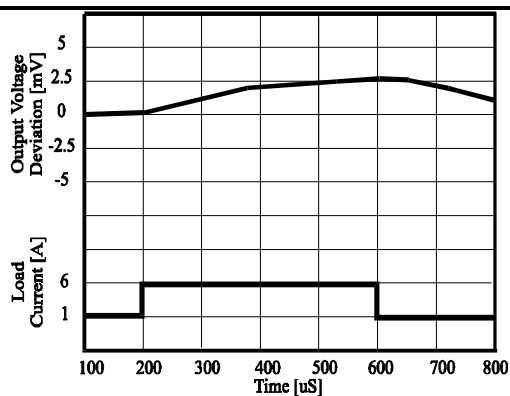


Fig.5A

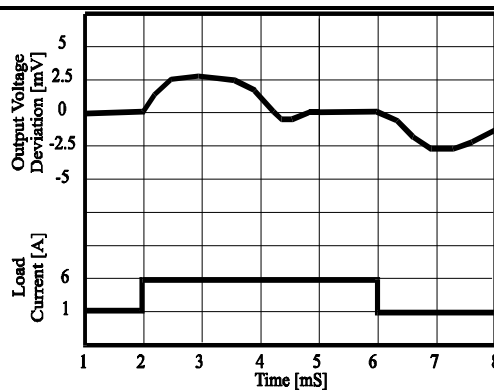


Fig.5B

Thermal Resistance

Parameter	Typ	Max	Units
Junction-to-Sink [R_{qJS}]	1.4	1.6	°C/W

General Specifications

Parameter		Units
Weight	34±2	gr.

Attenuation (Vout[ac]/Vripple)

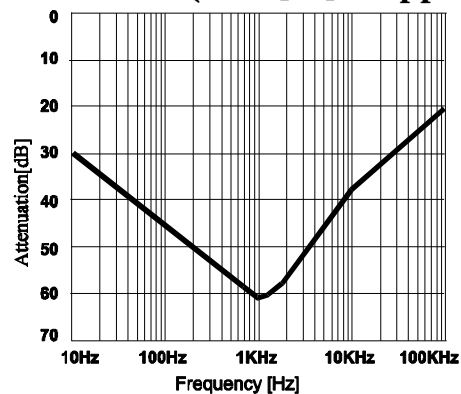


Fig.6

Pin Description

No	Name	Short Description	No	Name	Short Description
1	VD	Voltage Drop	6	SNS	Sense Input
2	CL	Current Limit	7	PIN	Positive Input
3	CBS	Circuit Breaker Status	8	SD	Shut Down
4	RTG	Retriggerable Mode	9	VEXT	External Bias
5	RET	Ground	10	POUT	Positive Output

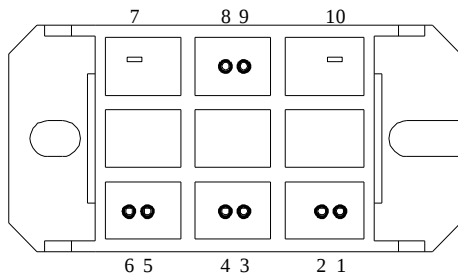
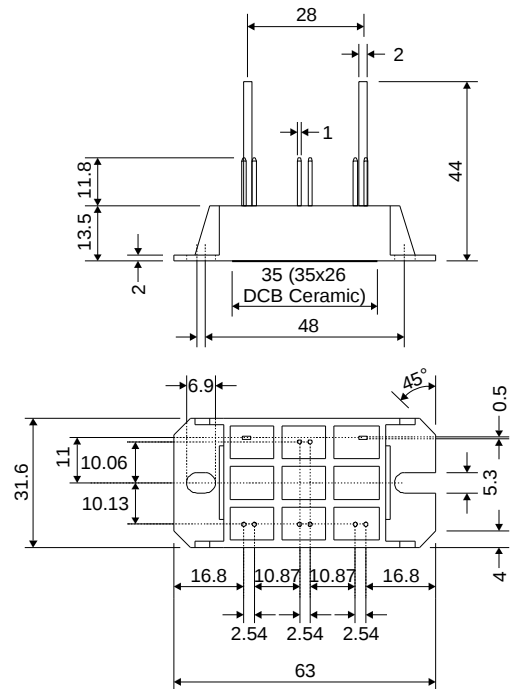


Fig.7

Fig.8 – Mechanical Drawing



Typical Applications

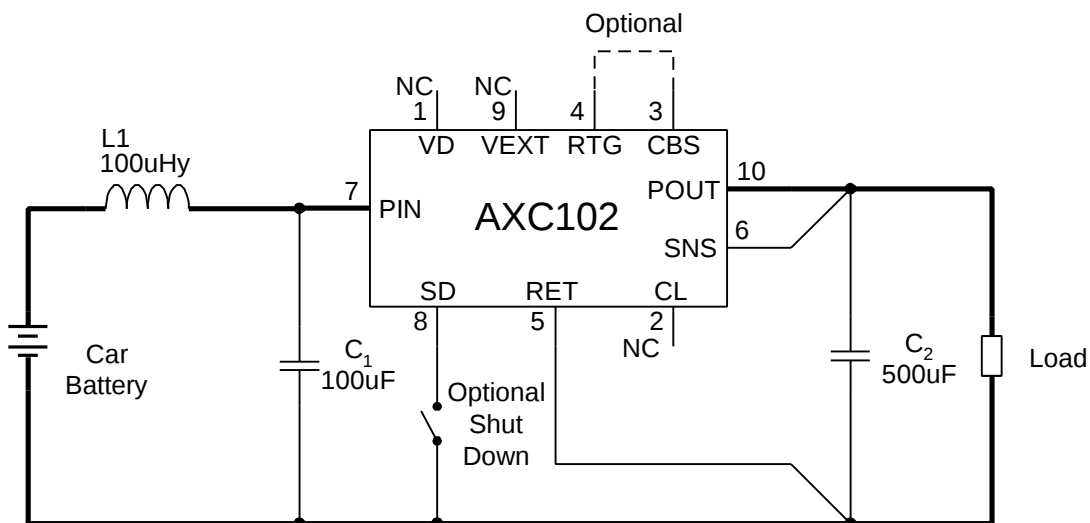


Fig.9A - Input Power Filter For Sensitive Vehicle Electronic Equipment

Typical Applications

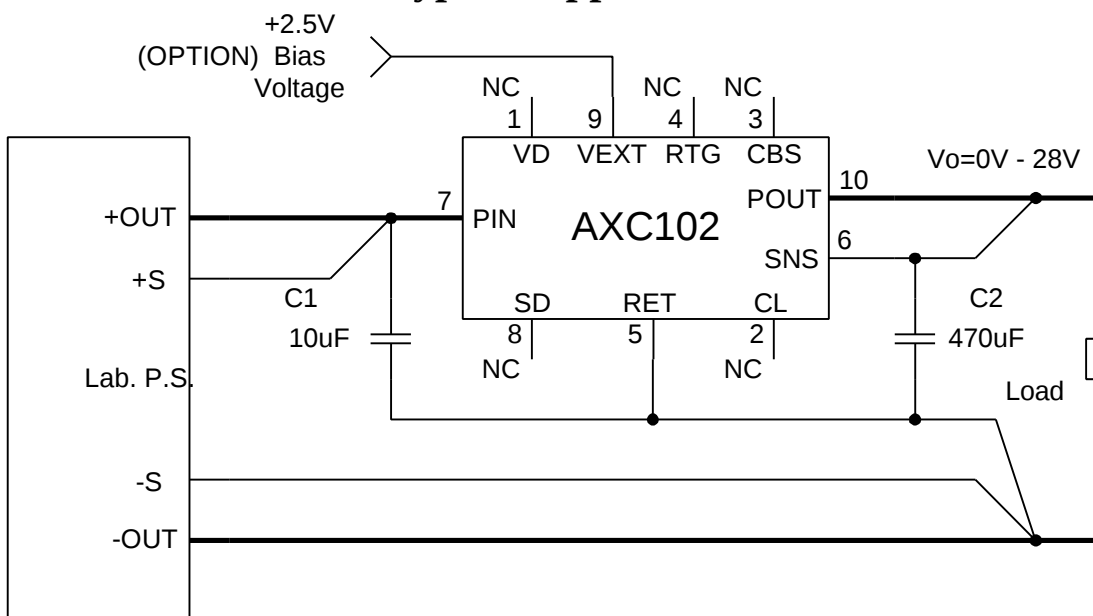


Fig.9B – Ultra Low Noise, High Efficiency Laboratory Switch-Mode Power Supply

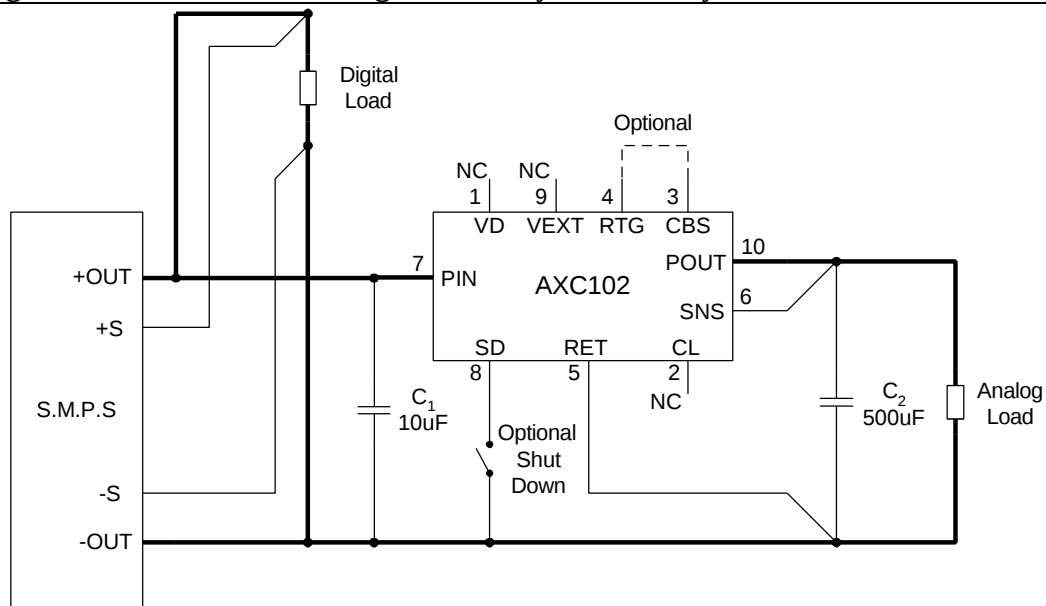


Fig.9C - Analog Digital Power Supply Decoupler (Sensitive Analog Load).