Advanced Analog

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ALO2800S Series

Hybrid - High Reliability DC/DC Converters

DESCRIPTION

The ALO2800S DC/DC converters feature high power density and full military temperature range operation without output power derating.

The advanced patented feedback design provides fast loop response for superior line and load transient characteristics as well as high audio rejection and offers greater reliability than devices incorporating optical feedback circuits. The basic circuit topology is a push-pull configuration operating at a nominal switching frequency of 275Khz. A non-linear PWM modulating signal is used to maintain constant control loop gain with changes in input voltage. A unique input voltage compensation circuit optimizes load fault detection to provide low and constant load fault power dissipation with varying input line voltage.

This device is designed to meet Mil-Std-704A input requirements offering full performance over a 16 to 50 volt continuous input range as well as full performance during the 80 volt surge. An input surge of 100 volts for up to 5 milliseconds will not adversely affect performance specifications. The series protection portion of these converters limits the actual converter input voltage to 50 volts under these abnormal surge conditions and incorporates thermal protection to turn off power to the converter in the event the input surge duration exceeds the requirements of Mil-Std-704A. Recovery from thermal shutdown is automatic when the input voltage returns to within the 16 to 50 volt range. Output power of up to 50 watts is available.

The ALO2800S is packaged in a 3.050" x 2.705" x .500" rugged parallel seam welded steel case with four 0.138-32 threaded inserts allowing convenient mounting to a thermal plane. Input and output pins are configured in a single row on one side of the package. Ceramic feedthrough 0.040" copper core alloy 52 pins assure true longterm hermiticity.

Connecting the inhibit pin (pin 4) to the input common (pin 3) will cause the converter to shut down. It is recommended that the inhibit pin be driven by an open collector device capable of sinking at least 400ua. The open circuit voltage of the inhibit pin is 11.5+/- 0.5 volts.

FEATURES

- **50 watt output power - no temperature derating**
- **High reliability**
- **Wide input voltage range - 16 to 50 volts (100v absolute max)**
- **Indefinite short circuit and overload protection**
- **Side exit input and output pins**
- **Military screening**
- **Resistance seam welded package**
- **High efficiency - 75%**
- **Remote sense**

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SPECIFICATIONS

T_{CASE} = -55°C to +125°C, V_{IN} = +28 V ±5% (unless otherwise specified).

ABSOLUTE MAXIMUM RATINGS

Supply Voltage (5ms)	100 V_{DC}
Supply Voltage (100ms)	80 V_{DC}
Supply Voltage (steady state)	50 V_{DC}
Power Dissipation @ Po=50 watts	15 w
Derate above Tc=125°C to Po=0 w @ Tc=	+135°C
Power Dissipation (short circuit)	15w
Thermal Rise-junction to case	20°C
Storage Temperature	-55 to +135°C

Parameter	Conditions	ALO2805S Min	ALO2805S Typ	ALO2805S Max	ALO2808S Min	ALO2808S Typ	ALO2808S Max	Units
STATIC CHARACTERISTICS								
OUTPUT	V_{IN} = 16 to 50 V_{DC}, Po=0							
Voltage	T_{CASE} = +25°C	4.95	5.00	5.05	7.95	8.00	8.05	V_{DC}
	Over Temp	4.90	5.00	5.10	7.90	8.00	8.10	V_{DC}
Current	V_{IN} = 16 to 50 V	0		8.0	0		6.25	A_{DC}
Ripple	Full Load DC to 2 MHz			50			50	mV p-p
REGULATION								
Line	V_{IN} = 16 to 50 V							
	I_O = 10% to Full Load		1.0	10		1.0	10	mV
Load	V_{IN} = 16 to 50 V							
	10%, 50%, 100% load		1.0	10		1.0	10	mV
INPUT								
Voltage Range		16	28	50	16	28	50	V_{DC}
Current	No Load			50			50	mA
	Inhibited			25			25	mA
Ripple Current	Full Load, BW=20 MHz			50			50	mA p-p
EFFICIENCY	Full Load T_{CASE} = +25°C	75			77			%
LOAD FAULT POWER DISSIPATION	Short Circuit T_{CASE} = +25°C			15			15	W
ISOLATION	Input to Output @ 500 V_{DC}							
	T_{CASE} = +25°C	100			100			meg Ω
DYNAMIC CHARACTERISTICS								
STEP LOAD CHANGES (T_{CASE} = +25°C)								
Output Transient	Po=25W to from 50W			250			300	mVpk
Recovery	T_R, T_F ≥ 20µs			100			100	µs
STEP LINE CHANGES (T_{CASE} = +25°C)								
Output Transient	Input step 28 to 100V_{DC}							
	100 to 28V T=5ms		100			100		mVpk
Recovery	T_R, T_F ≥ 20µs		1			1		ms
TURN-ON	V_{IN} = 16 to 50 V_{DC}							
	T_{CASE} = +25°C							
Overshoot				250			250	mV
Delay				12			12	ms
Weight				200			200	gm

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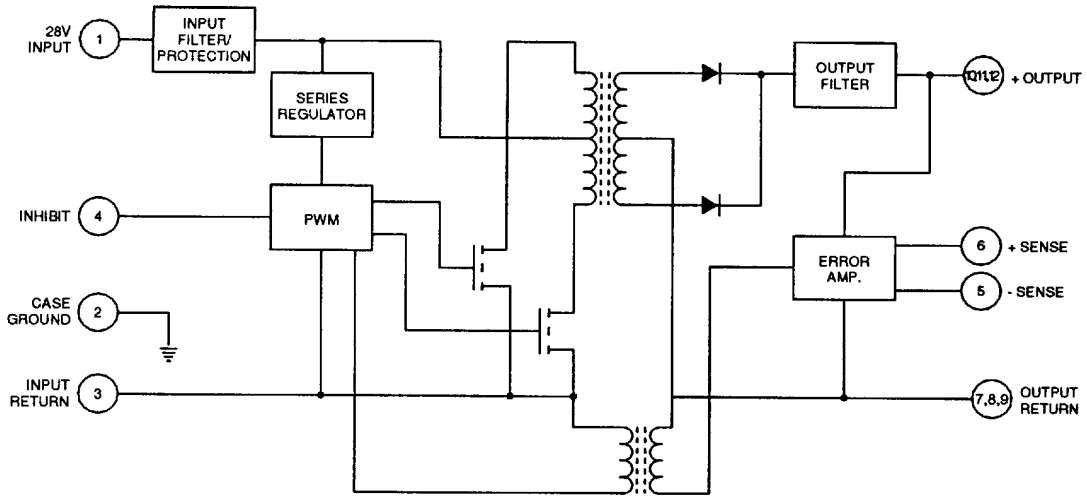
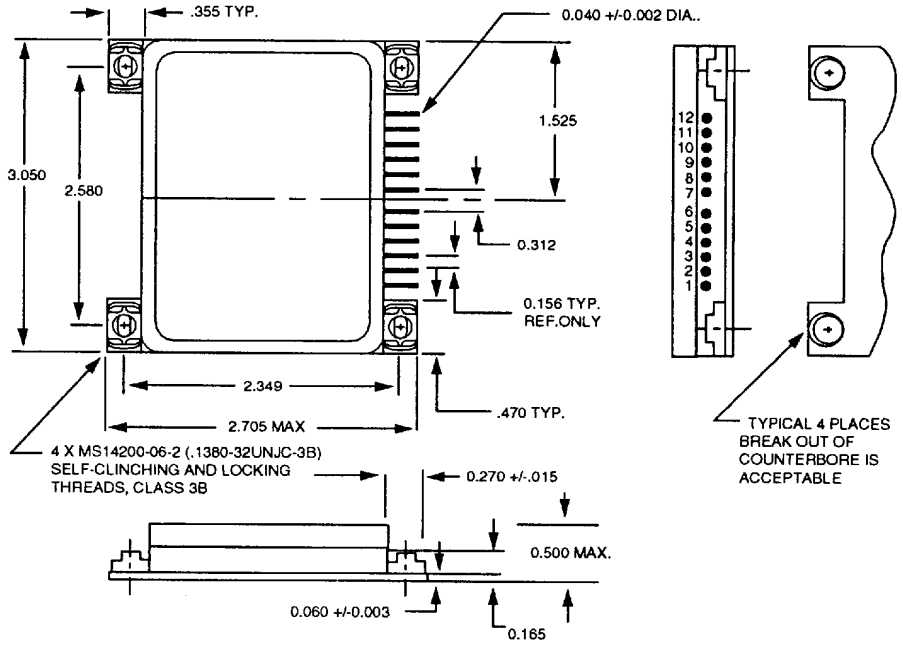
BLOCK DIAGRAM



MECHANICAL OUTLINE



PIN DESIGNATION

ALO2805S
ALO2808S

Pin 1	+28V input	Pin 5	-Sense
Pin 2	Case Ground	Pin 6	+Sense
Pin 3	+28V return	Pin 7,8,9	Output return
Pin 4	Inhibit	Pin 10,11,12	+5V/+8V output

PART NUMBER

ALO 28 05 S / HB

- Model
- Input Voltage
- Output Voltage
  - 05 – +5 VDC
  - 08 – +8 VDC
- Single Output
- Screening -55°C to 125°C

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HB Screening Process

Test Inspection	Method	Condition
Pre-Seal Internal Visual	2017	
Stabilization Bake	1008	C
Temperature Cycling	1010	C
Constant Acceleration	2001	A, Y1 direction, 1000g
Burn-in	1015	Tc = +125°C
Final Electrical Test		Tc = -55,+25,+125°C
Gross Leak	1014	C
Fine Leak	1014	A
External Visual	2009	

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MIL-STD-1772
Qualified

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