LAMBDA ADVANCED ANALOG INC.

ASR2815T

Hybrid - High Reliability DC/DC Converter

DESCRIPTION

The ASR2815T DC/DC converter is a very reliable thick film hybrid converter that uses flyback topology operating at a nominal frequency of 300 kHz. High input to output isolation is achieved through the use of transformers in the forward power and feedback circuits.

The advanced feedback design provides fast loop response for superior line and load transient characteristics and offers greater reliability than devices incorporating optical feedback circuits.

This device is designed to meet Mil-Std-704A input requirements offering full performance over a 16 to 50 volt input range and capable of operation at 100 volt input for up to 5 milliseconds. Output power of up to 3.2 watts is available for either balanced or unbalanced loads, however, a minimum load of 40ma on the +5V output is required to maintain full performance on the +/-15 volt outputs.

Connecting the inhibit pin (pin 15) to the input common (pin 17/18) 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.

These converters are manufactured in a facility fully qualified to Mil-Std-1772. All processes used to manufacture these converters have been qualified to enable Advanced Analog to deliver compliant devices. Two screening grades are available to satisfy a wide range of requirements. The CH grade converters are fully compliant to Mil-Std-1772 class B. The HB grade converters are processed to full class B screening but do not have class B element evaluation as required by Mil-Std-1772. Both grades are fully tested and operate over the full military temperature range without derating of output power. Variations in electrical, mechanical and screening can be accommodated. Extensive computer simulation using complex modeling enables rapid design modification to be provided. Contact Advanced Analog with specific requirements.

CAUTION: An external capacitor is required on the positive output. Operating the unit without an external capacitor will result in damage to the internal circuitry. Minimum recommended capacitor value is 220uf. A low ESR tantalum capacitor is required for optimal performance. All specifications on this data sheet are based on the use of a high quality solid tantalum on the +5 volt output with 1.0uf capacitors on the +/-15 volt outputs. Operation with different types of capacitors will seriously affect performance.

FEATURES

- **Up to 3.2 watt output power**
- **High Reliability**
- **Wide Input Voltage - 16 to 50 volts (100v absolute max)**
- **Indefinite short circuit protection**
- **Popular industry standard pin-out**
- **Military Screening**
- **Resistance seam welded package**

SPECIFICATIONS

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

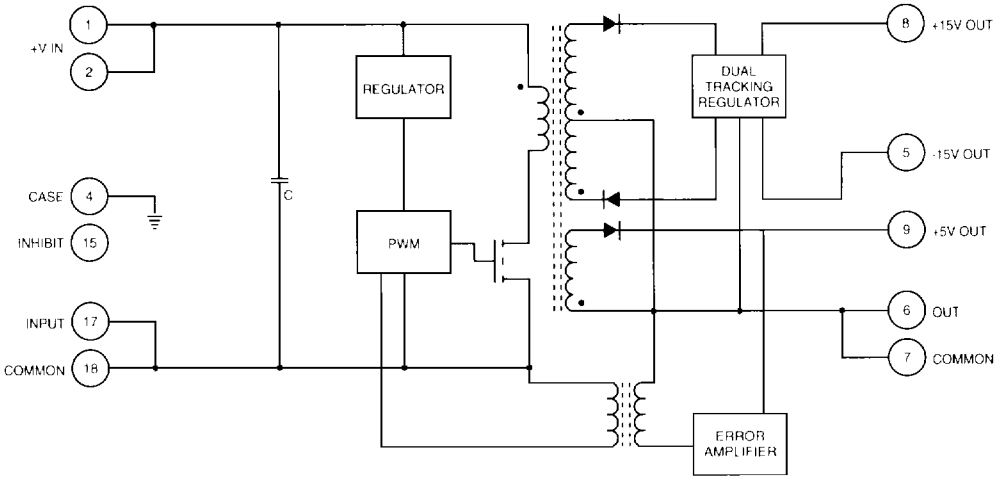
ABSOLUTE MAXIMUM RATING		
Supply voltage (5 ms)	100 Vdc	
Supply voltage (steady state)	50 Vdc	
DC output current	+5V output -	400mA
	±15V output -	±40mA
Power dissapation @ Po=3.2 watts	3.5 w	
Derate above Tc = 125°C to Po = 0 w @ Tc = +135°C		
Power dissipation (short circuit)	4.0 w	
Thermal rise - junction to case	20°C	
Storage temperature	-55°C to +135°C	

Test	Conditions -55°C < Tc < +125°C, V_{IN} = 28 VDC ±5%, CL=0, unless otherwise specified	ASR2815T Min	Typ	Max	Unit
STATIC CHARACTERISTICS					
OUTPUT					
Voltage	V_{IN} = 16 to 50v, Po = 0, Tc = 25°C	4.95	5.00	5.05	VDC
		14.75	15.00	15.25	VDC
		-14.75	-15.00	-15.25	VDC
	Over Temp	4.85	5.00	5.15	VDC
		14.35	15.00	15.65	VDC
		-14.35	-15.00	-15.65	VDC
Current	V_{IN} = 16 - 50v +5v OUT	40		+400	mA
	±15v OUT	±4		±40	mA
Ripple Voltage	Full Load DC to 2MHz			80	mVrms
REGULATION					
Line	Io = Min to Full Load	+5v out		50	mV
		±15v OUT		150	mV
Load	V_{IN} = 16 to 50v	+5v out		50	mV
		-15v OUT		150	mV
INPUT					
Voltage Range		16	28	50	VDC
Current	No Load			35	mA
	Inhibited			12	mA
Ripple Current	Full Load			300	mA
EFFICIENCY	Full Load Tc = 25°C	50			%
ISOLATION	Input to output @ 500V, Tc = 25°C	100			meg
LOAD FAULT POWER DISSIPATION	Short Circuit, Tc = 25°C			4.0	W
DYNAMIC CHARACTERISTICS					
TURN ON	V_{IN} = 16 to 50v, Tc = 25°C				
Delay				14	ms
WEIGHT				26	grams

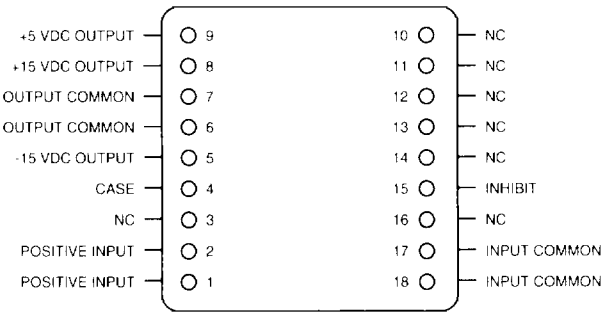
Notes:

1. A minimum load of 40ma on the +5 volt is required for proper regulation. All tests are performed with a 200 uf capacitor on the +5 volt output and 1.0 uf on the ±15 volt outputs.

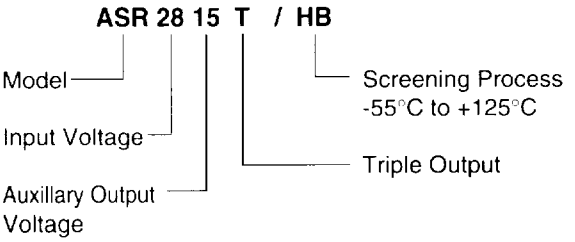
BLOCK DIAGRAM



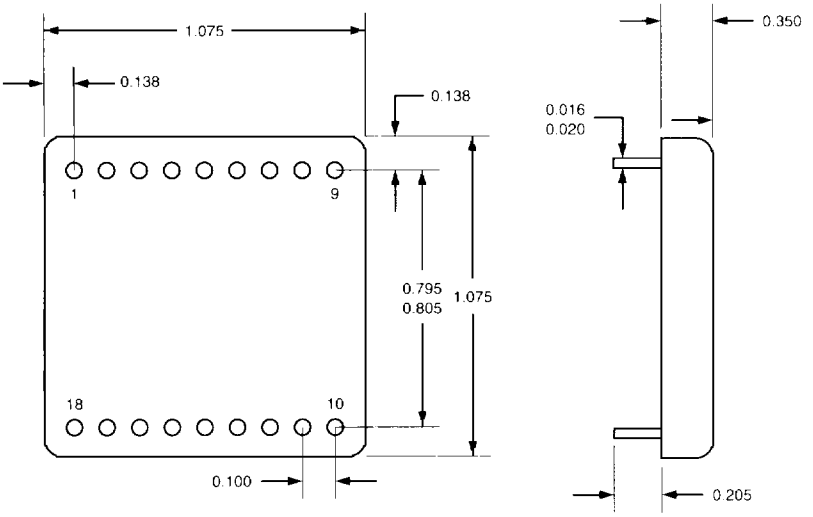
PIN DESIGNATION



PART NUMBER



MECHANICAL OUTLINE



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
Burn-in	1015	TC = +125°C
Final Electrical Test		TC = -55, +25, +125°C
External Visual	2009	
Gross Leak	1014	C
Fine Leak	1014	A1

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MIL-STD-1772 Qualified

2270 Martin Avenue
Santa Clara CA 95050-2781
(408) 988-4930 FAX (408) 988-2702