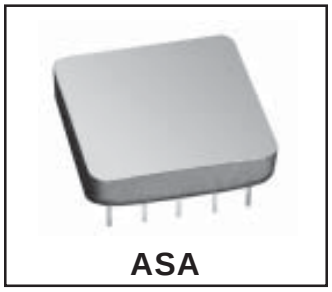
International
IOR Rectifier

PD - 94539

ASA28XXS SERIES

28V Input, Single Output

ADVANCED ANALOG HIGH RELIABILITY HYBRID DC/DC CONVERTERS



ASA

Description

The ASA28XXS Series of DC/DC converters are high reliability thick film hybrid converters that use flyback topology operating at a nominal frequency of 550Khz. High input to output isolation is achieved through the use of transformers in the flyback 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-704D input requirements offering full performance over a 16 to 40 volt input range. Output Power of up to 5 watts is available.

Connecting the inhibit pin (pin 5) to the input common (pin 7) 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 400µA. 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-PRF-38534. All processes used to manufacture these converters have been qualified thereby enabling Advanced Analog to deliver fully compliant devices. Three standard temperature grades are offered with the screening options. Refer to Screening Level section. The CH grade converters are fully compliant to MIL-PRF-38534 for class H. The HB grade converters are processed with the same screening as the CH grade, but do not have class H element evaluation as required by MIL-PRF-38534. These two grades are fully tested and operate over the full military temperature range without derating of output power. A commercial grade is also available. Variations in electrical, mechanical and screening requirements can be accommodated. Extensive computer simulation using complex modeling allows design modifications to be examined. Contact Advanced Analog with specific requirements.

Features

- Up To 5 Watt Output Power
- 5, 12,15 Volt Outputs
- High Reliability
- Wide Input Voltage Range -16 To 40 Volts
- Indefinite Short Circuit and Overload Protection
- Popular Industry Standard Pin-Out
- Military Screening Available
- Parallel Seam Welded Package
- No External Capacitors Required
- Input Voltage Surge Protected to MIL-STD-704A
- Under Voltage Lockout
- Available as Standard Military Drawing

Specifications

ABSOLUTE MAXIMUM RATINGS	
Input Voltage	-0.5 V to 50 V Continuous. 80 V, 100 mSec
Power Output	Internally limited (6.5 W typical)
Soldering	300°C for 10 Sec.
Temperature Range	Operating -55°C to +125°C Case
	Storage -65°C to +150°C

TEST	Conditions -55° ≤ T_C ≤+125°C V_{IN} = 28V dc ±5% C_L = 0 unless otherwise specified	Group A Subgroups	ASA2805S/xx		ASA2812S/xx		ASA2815S/xx		Unit
			Min	Max	Min	Max	Min	Max	
Output voltage	I_{OUT} = 0	1	4.95	5.05	11.88	12.12	14.85	15.15	V
		2, 3	4.90	5.10	11.76	12.24	14.70	15.30	
Output current [1]	V_{IN} = 16, 28, and 40 V dc	1, 2, 3		1000		417		333	mA
Output ripple voltage [2]	V_{IN} = 16, 28 and 40 V dc	1		190		200		200	mV_{PP}
		2, 3		475		290		290	
Line regulation	V_{IN} = 16, 28, and 40 V dc I_{OUT} = 0, 50%, 100% I_{MAX}	1		25		±25		±25	mV
		2, 3		50		±50		±50	
Load regulation	V_{IN} = 16, 28, and 40 V dc I_{OUT} = 0, 50%, 100% I_{MAX}	1		25		±25		±25	mV
		2, 3		50		±50		±50	
Input current	I_{OUT} = 0 Pin 5 to Pin 7	1, 2, 3		18		18		18	mA
	I_{OUT} = 0 Pin5 open			50		50		50	
Input ripple current [2]	I_{OUT} = I_{MAX}	1, 2, 3		100		100		100	mA_{PP}
Efficiency	I_{OUT} = I_{MAX}	1	66		71		71		%
		2, 3			68		68		
Isolation - Input to output or any pin to case	V_{TEST} 500 Vdc, Tc= +25°C	1	100		100		100		MΩ
Capacitive load [3, 4]	No effect on dc performance, Tc = +25°C	4		500		200		200	µf
Power dissipation, load fault	Overload [5]	1, 2, 3		4.0		4.0		4.0	W
	Short circuit			2.0		2.0		2.0	
Switching frequency [4]	I_{OUT} = I_{MAX}	4, 5, 6	500	600	500	600	500	600	KHz
Output response to step transient load changes [6]	½ I_{MAX} ⇔ I_{MAX}	4	-300	+300	-450	+450	-400	+450	mV pk
		5, 6	-450	+450					
	0 mA ⇔ I_{MAX}	4	-500	+500	-750	+750	-800	+750	
		5, 6	-750	+700					
Recovery time, step transient load changes	I_{OUT} = I_{MAX}	4, 5, 6		200		100		100	µS
	0 mA ⇔ ½ I_{MAX}			1		1		1	ms
Output response transient step line changes [4 8]	Input step 16 ⇔ 40 V dc I_{OUT} = I_{MAX}	4, 5, 6		500		1000		1000	mV pk
Recovery time transient step line changes [4, 7, 8]	Input step 16 ⇔ 40 V dc I_{OUT} = I_{MAX}	4, 5, 6		800		800		800	µS
Turn on overshoot	I_{OUT} = 0 mA, I_{MAX}	4, 5, 6		600		600		600	mV pk
Turn on delay [9]	I_{OUT} = 0 or I_{MAX}	4, 5, 6		20		25		25	ms
Load fault recovery [4]		4, 5, 6		20		25		25	ms

For Notes to Specifications, refer to page 3

Notes to Specifications

1. Parameter guaranteed and measured during line and load regulation tests.
2. Bandwidth guaranteed by design. Tested for 20 kHz to 2 MHz.
3. Capacitive load may be any value from 0 to the maximum limit without compromising dc performance. A capacitive load in excess of the maximum limit will not disturb loop stability but may interfere with the operation of the load fault detection circuitry, appearing as a short circuit during turn-on.
4. Parameter shall be tested as part of design characterization and after design or process changes.
5. An overload is that condition of load in excess of rated load but less than that necessary to trigger the short circuit protection and is the condition of maximum power dissipation.
6. Load step transition time between 2 and 10 microseconds.
7. Recovery time is measured from the initiation of the transient to where V_{OUT} has returned to within ±1 percent of V_{OUT} at 50 percent load.
8. Input step transition time between 2 and 10 microseconds.
9. Turn-on delay time measurement is for either a step application of power at the input or the removal of a ground signal from the inhibit pin (pin 2) while power is applied to the input.

Available Screening Levels and Process Variations for ASA28XXS Series

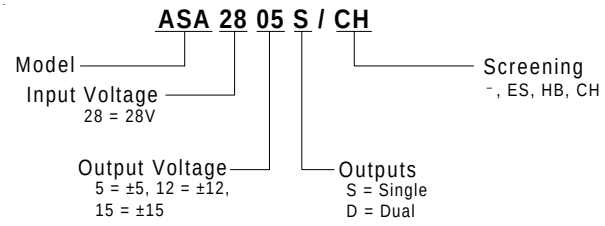
Requirement	MIL-STD-883 Method	No Suffix	ES Suffix	HB Suffix	CH Suffix
Temperature Range		-20°C to +85°C	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C
Element Evaluation					MIL-PRF-38534
Internal Visual	2017	*	✓	✓	✓
Temperature Cycle	1010		Cond B	Cond C	Cond C
Constant Acceleration	2001,		500g	Cond A	Cond A
Burn-in	1015	48hrs @ 85°C	48hrs @ 125°C	160hrs @ 125°C	160hrs @ 125°C
Final Electrical (Group A)	MIL-PRF-38534	25°C	25°C	-55, +25, +125°C	-55, +25, +125°C
Seal, Fine & Gross	1014	Cond C	Cond A, C	Cond A, C	Cond A, C
External Visual	2009	*	✓	✓	✓

* per Commercial Standards

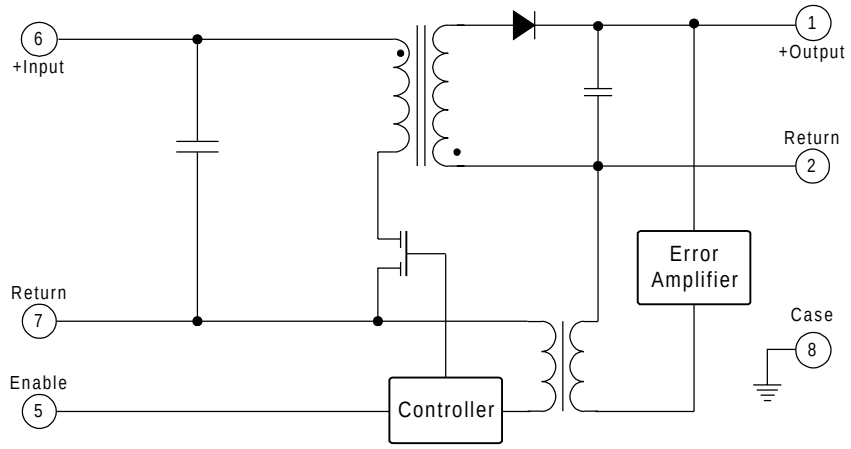
Available Standard Military Drawing (SMD) Cross Reference

ASA2805S/CH	5962-9462901
ASA2812S/CH	5962-9463101
ASA2815S/CH	5962-9463001

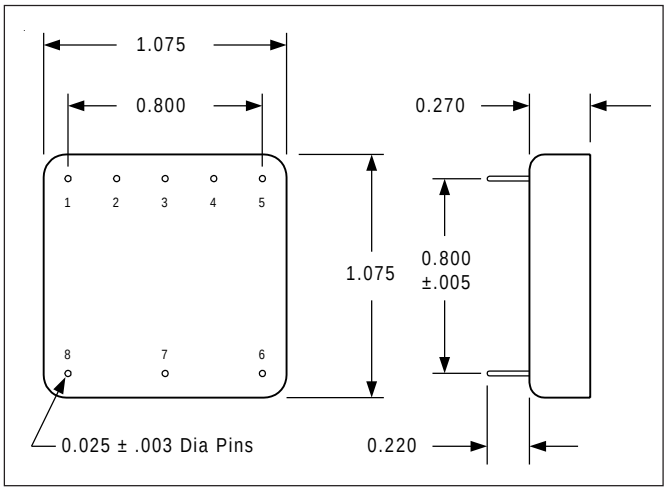
Part Numbering



ASA28XXS Block Diagram



ASA28XXS Case Outline



ASA28XXS Pin Designation

Pin No.	Designation
1	Positive Output
2	Output Return
3	N/C
4	N/C
5	Enable
6	Positive Input
7	Input Return
8	Case

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Data and specifications subject to change without notice. 09/02