

ARC-SGHFC100

DC/DC Converter Controller

based on **SPACE IC** □

SPPWM120RH

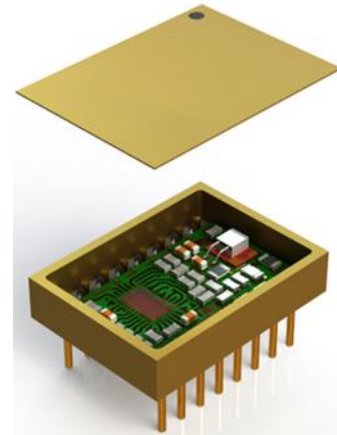
FEATURES

- Wide input power bus range:
18V to 105V within derating rules ECSS-Q-ST30-11C
- Integrated start-up circuitry
- Integrated power switch
- 100kHz to 1MHz switching frequency
- Synchronization capability to external clock
- Up to 15W output power DC/DC converter implementation
- Output over-current protection
- Under-voltage protection
- Over-voltage protection
- Over-temperature protection
- ON-OFF capability
- Operating temperature range -55°C to 90°C within derating rules ECSS-Q-ST30-11C
- Radiation tolerant: TID 100krad, SEL 60 MeV'cm²/mg
- Export restriction free

APPLICATIONS

- Isolated DC/DC converters
- Non-isolated DC/DC converters
- Flyback topology
- Satellite systems
- Launch vehicles

TYPICAL APPLICATION



DESCRIPTION

The DC/DC converter controller ARC-SGHFC100 simplifies the design of isolated and non-isolated DC/DC converters which are based on a primary low-side power transistor (e.g. flyback topology).

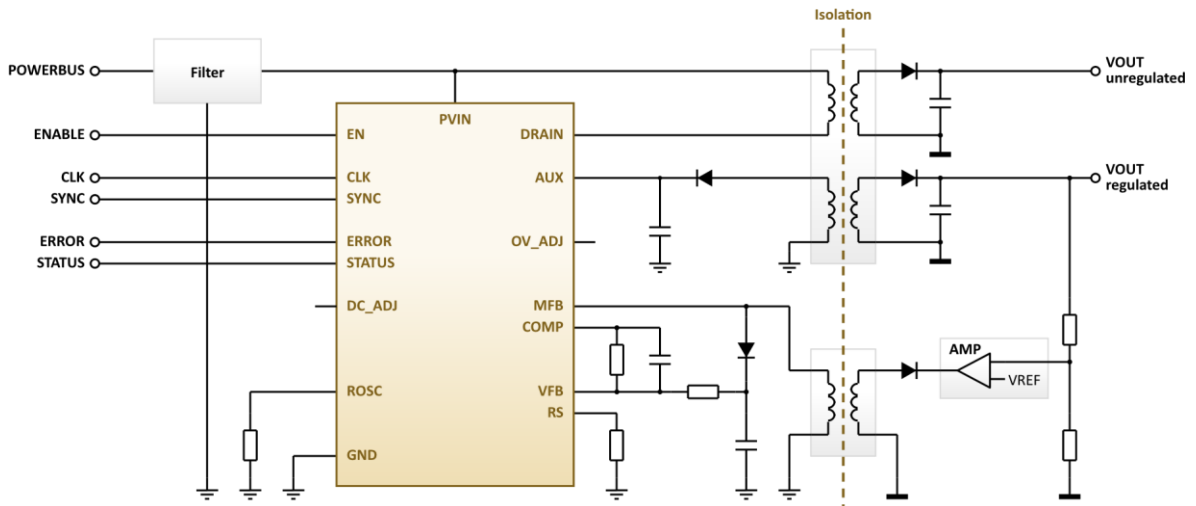
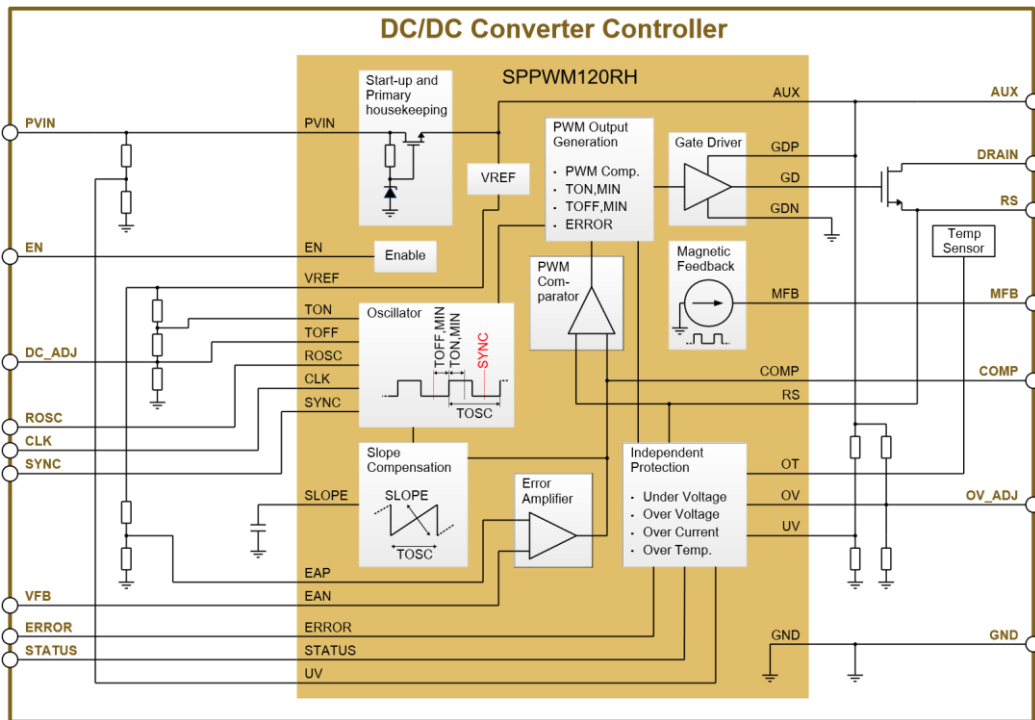
The ARC-SGHFC100 can directly interface the input power bus in a wide voltage range (18V-105V) without need of additional components.

The design effort of single- and multi-output DC/DC converters will be reduced to designing the main transformer, the output rectifier stage and input and output filters while all the other functionalities, including over-current, under-voltage, over-voltage and over-temperature protection are implemented within the DC/DC converter controller.

The switching frequency of the converter is settable from 100kHz to 1MHz with an external resistor. Lead edge blanking and maximum duty cycle are set as minimum on-time ($t_{ON,MIN}$) and minimum off-time ($t_{OFF,MIN}$) internally. The slope compensation is also set internally.

A pulsed current is provided for magnetic feedback applications at pin MFB. Optical feedback provided by an optocoupler can be connected to the COMP pin. For non-isolated topologies the internal error amplifier is accessible via VFB.

The ARC-SGHFC100 is designed, manufactured and tested according to ECSS-Q-ST-30-11C and ECSS-ST-60-05C.


FUNCTIONAL BLOCK DIAGRAM


PIN DESCRIPTIONS

Pin Name	Pin Number	Pin Description
PVIN	1	Power bus input to supply the device.
DRAIN	2	Low side power MOSFET drain to be connected to transformer primary winding.
RS	3	Source of the MOSFET to be connected to current sense resistor to obtain a voltage proportional to the switch current. This signal is used by the PWM to terminate the switch conduction.
AUX	4	Voltage for the primary housekeeping and the driver supply.
OV_ADJ	5	Connection point for the adjustment resistor for fine tuning of the overvoltage threshold. This pin can be used as monitor signal for the auxiliary voltage value.
ERROR	6	Error signal, open drain output. Will pull the pin to GND in case a critical error occurred.
STATUS	7	Status signal, open drain output. Will pull the pin to GND in case the status is „not-ready“.
GND	8	Power bus return, ground reference.
MFB	9	Magnetic feedback: Pulsed current will be applied to this pin to transfer the feedback from the secondary side via an external transformer to the primary. Connect this pin to GND if not used.
COMP	10	This pin is the error amplifier output and is made available for loop compensation and optical feedback applications.
VFB	11	This is the inverting input of the error amplifier. It is normally connected to the switching power supply output through a resistor divider. Connect this pin to GND if the error amplifier is not used (e.g. isolated topology with magnetic feedback).
DC_ADJ	12	Duty cycle adjust pin. Connect a resistor between this pin and GND to increase the maximum duty cycle.
ROSC	13	Timing resistor connection pin for oscillator frequency programming.
EN	14	Enable input pin: The EN pin is a digital input pin that enables or disables the regulator. Set the EN pin high to turn the regulator on; set it to GND, to turn the regulator off. An OFF/ON sequence will reset the latching protections.
SYNC	15	Synchronization input pin. Apply an external clock signal for synchronization. Connect this pin to GND if external synchronization is not used. A synchronization after startup is possible.
CLK	16	This is the oscillator clock output pin. It provides a clock signal which can be used to synchronize external circuitry.