



# FRONTGRADE

## ADVANCED DATASHEET

### SPSM-PS

SpaceVPX System Power Supply Module

12/24/2024

Version 1.0



## Introduction

The Frontgrade™ System Power Module™ (SPSM-SM) uses Space GaN devices to implement a 28V (or 100V) to 12V DC-DC converter to power SpaceVPX chassis. The 28V module accepts an unregulated input range of 22V to 36V and outputs a peak of 24As at 12V with a +/-5% tolerance. The module provides Pulse On and Pulse Off discretes, analog thermistor interface and a RS-422 current and status voltage interface. The module includes Frontgrade's UT32M0R500 ARM Cortex M0+ microcontroller, which handles enabling the 12V output switches and provides module health status. The Compact 3U SpaceVPX based design is a compatible power supply for use in Frontgrade's Reconfigurable Processing System (RPS-PS) and supports parallel operation for additional power demand.

## System Power Supply Module: SPSM-PS

### Features

#### Primary Input Power

- 22V to 36V Input range, 28V Nominal
- 42V for 2 seconds Survival Limit
- 150uF Max Input Capacitance
- Isolated from secondary > 1 Meg ohm at 50V
- Pulse Discretes for ON and OFF
- MIL-STD-461 Revision G capable
- 15 pin D-sub Connector

#### Secondary Output Power

- 12V at 288W (peak)
- 12V at 125W (thermal/reliability nominal)
- Seven 12V outputs groups
  - Sharable
  - Six Switchable
  - One non-switchable
  - 9A max per group

#### Telemetry

- Analog Thermistor Interface
- Current and Voltage via RS-422

#### Mass / Volume / Thermal

- Mass: less than 600 grams (estimated), standard 3U 160mm SpaceVPX form factor
- Maximum operating temperature mounted on a regulated thermal interface: 52°C

#### Operational Life / Reliability And Performance

- System reliability over 0.98
- System SEU rate: No more than one ground intervention per year for typical LEO Missions
- TID of 25 krad (Si) or 100 krad (Si) optional assuming 100 mils of shielding with 6061-T6 Aluminum
- NASA PEM-INST-001 Level-2 parts pedigree available

Distribution Statement A: Approved for public release. Distribution is unlimited.

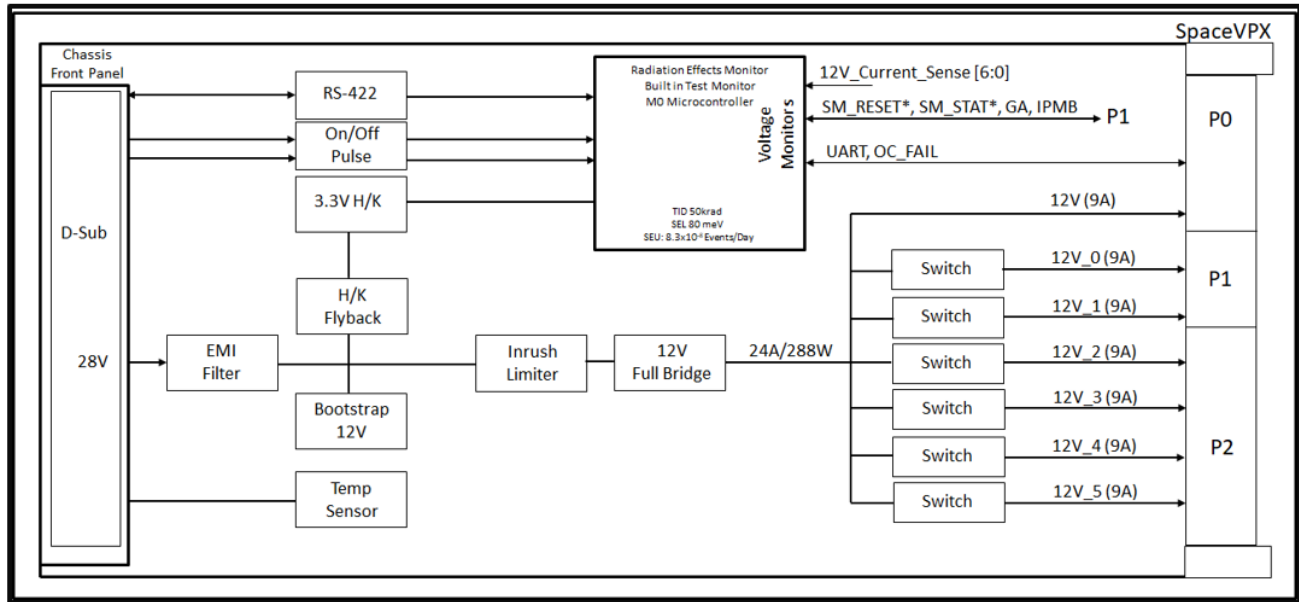
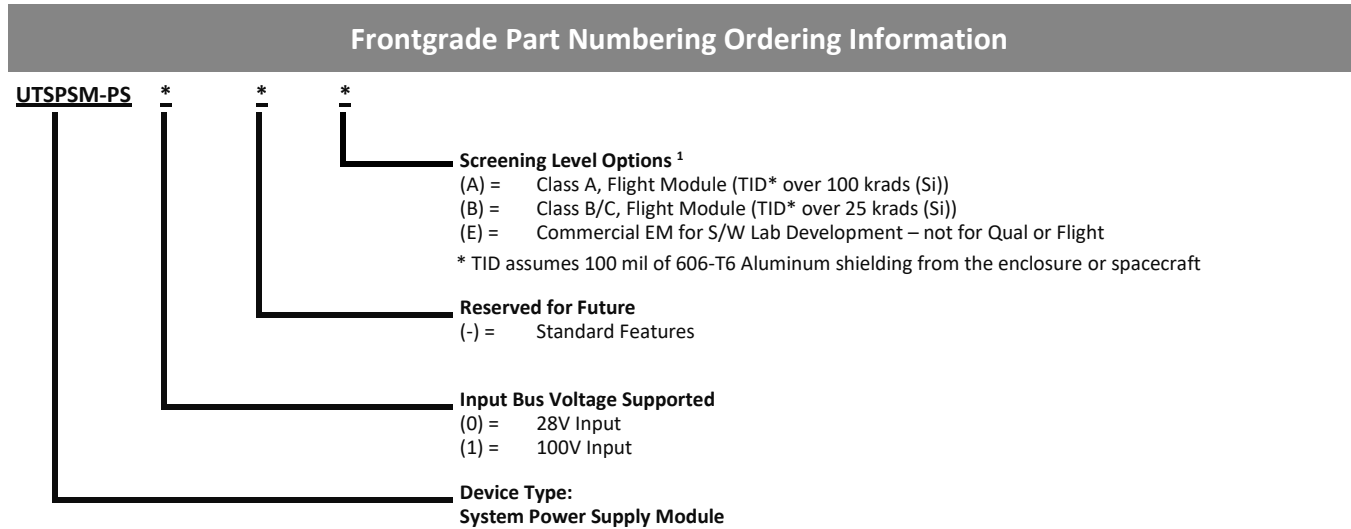


Figure 1. SPSM-PS Block Diagram

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## Ordering Information



**Notes:**

1. Screening Level Options (A, B, or E) must be specified.

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## Revision History

Date	Revision #	Author	Change Description	Page #
12/24/24	1.0	TLM	Initial release of Advanced Datasheet.	All

## Datasheet Definitions

	Definition
Advanced Datasheet	Frontgrade reserves the right to make changes to any products and services described herein at any time without notice. The product is still in the development stage and the <b>datasheet is subject to change</b> . Specifications can be <b>TBD</b> and the part package and pinout are <b>not final</b> .
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