



# FRONTGRADE

## ADV PRODUCT BRIEF

### SPSM

System Power Supply Module

8/27/2024  
Version 1.0.1

## Introduction

The Frontgrade™ System Power Module™ (SPSM) uses Space GaN devices to implement a 28V to 12V DC-DC converter. The module accepts a wide 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 discrettes, 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) and supports parallel operation for additional power demand.

## System Power Supply Module: SPSM

### 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 Discrettes 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

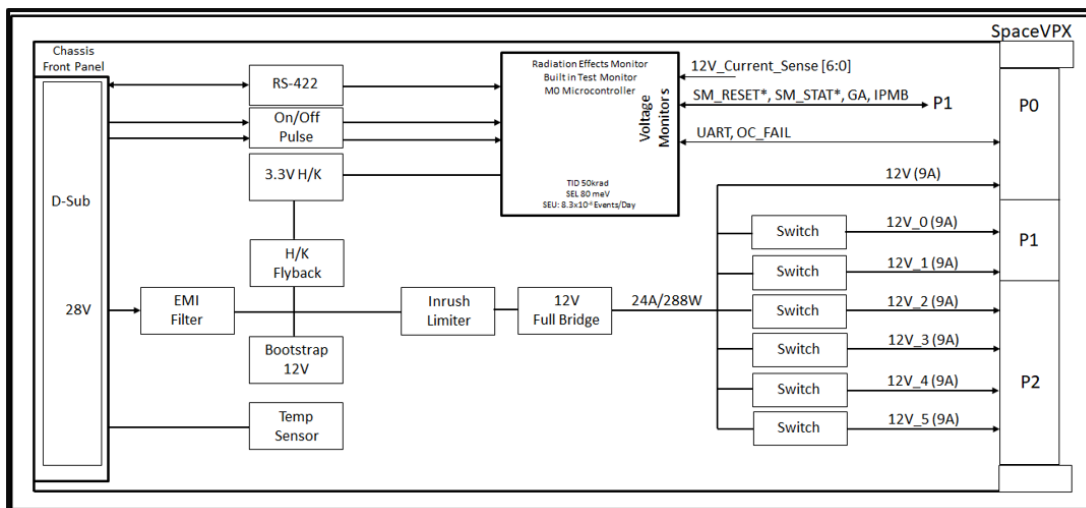
- Analog Thermistor Interface
- Current and Voltage via RS-422

#### 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

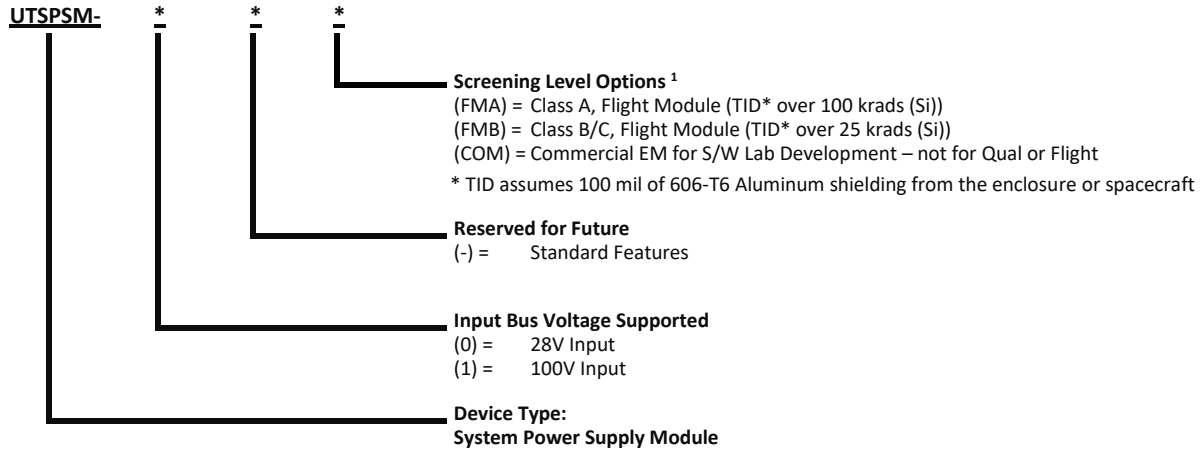
#### Operational Life / Reliability And Performance

- 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



## Ordering Information

### Frontgrade Part Numbering Ordering Information



**Notes:**

1. Screening Level Options (FMA, FMB, or COM) must be specified.

## Revision History

Date	Revision #	Author	Change Description	Page #
4/28/2024	1.0.0	Kevin.Caster@Frontgrade.com	Advanced Product Brief – initial release and data is subject to change	All
8/27/2024	1.0.1	TLM	Editorial updates and formatting changes throughout. Sheet 4: Replaced export-controlled note with unlimited distribution statement.	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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Datasheet	Product is in production and any changes to the product and services described herein will follow a formal customer notification process for form, fit or function changes.

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