

SMD20 *Mézeyrac* – Variable DC-Output Power Supply

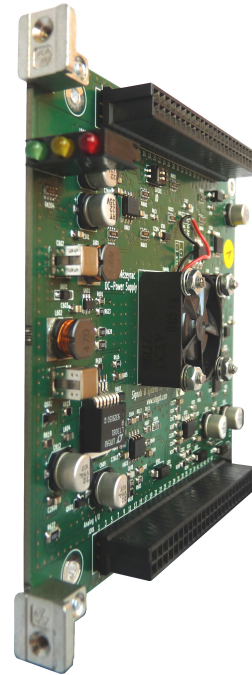
D-Series Modules – Subnanosecond Pulse Generator

FEATURES

- High-efficiency DC/DC converter
- +5 V to +30 V variable DC Output
- 5 W output power
- Fan cooler
- EMI noise immunity
- Ideal for rapid and reliable prototyping

APPLICATIONS

- SMD10 module power source
- SMD10 module cooling



Overview

The modules of the SMD-Series provide the experimentalists a complete line of instruments for the generation of short pulses at high repetition rates. First designed for stroboscopic magnetic imaging TEM (Transmission Electron Microscope), the SMD-Series offers a complete solution to deliver sub-nanosecond pulses into 50- Ω loads at repetition rates ranging from DC to 10 MHz.

The SMD20 *Mézeyrac* module consists in a high efficiency DC/DC converter and a fan cooler. The converter is aimed at providing a variable DC power supply to the SMD10 pulse shaper module. Because the internal pulse generator of the SMD10 operates from this voltage, the amplitude of its output pulses can be controlled *via* the SMD20 module. Thus, with a DC output voltage ranging from +5 V to 30 V, the SMD20 allows the user to control the amplitude of the pulses over the same range.

Since the SMD10 *Pulse Shaper* module has to dissipate 5 W, a fan cooler is mounted on the board of the SMD20 module to force ventilation of the pulse generator amplifier. Of course, to operate the heat-removing properly, the SMD20 module has to be installed on the right side of the pulse shaper module.

The SMD20 allows the user to control the fan cooler and the DC output using serial command through the SPI port. Regulator fault detection and voltage monitoring signals are also available to help the user to ensure a safe operation of the module.

Gathering other modules of the SMD-Series, the SR500 *Pulse Generator* is the ideal reference solution to generate high-voltage sub-nanosecond pulses at high repetition rate (10 MHz) for stroboscopic magnetic imaging TEM. With the additional SMZ320 *Serial Interface* module, the SR500 gives the user a complete control of the pulse generator over USB or optical interfaces.

Important Notice

The specifications provided apply to the SMD20-R20A module. Information in this document is subject to change without notice. Copyright © SISYPH, 2020. All rights reserved.

DC Output Voltage Specifications

Power Supply Input

Terminal	50-pin stack-through connector
Admissible range	$+33\text{ V} \leq +34\text{ V} \leq +35\text{ V}$
Level abs. max. ^a	+35 V
Current	200 mA max.

DC Output

Terminal	50-pin stack-through connector
Range	+5 V to +30 V
Resolution	8-bit
Current ^b	0 mA to 180 mA
Power	5 W max.
Ripple ^c	4 mV max.
Settling time ^d	10 ms max.

^aStresses above these specifications may cause permanent damage.

^bInternal limitation occurs for $I_{\text{out}} > 200\text{ mA}$.

^cRMS value measured at $P_{\text{out}} = 5\text{ W}$.

^dSettling time at 1% for an output step from +5 V to +30 V. Not measured.

Digital Interface Specifications

DC Output Voltage Control

Terminal	50-pin stack-through connector
Interface	3-wire SPI
Range	+5 V to +30 V
Resolution	8-bit digital potentiometer

Fan Operating Voltage Control

Terminal	50-pin stack-through connector
Interface	3-wire SPI
Range	0 V to +5 V
Current ^d	150 mA max.
Resolution	8-bit digital potentiometer

Digital Inputs^b

Terminal	50-pin stack-through connector
Input resistance ^c	100 k Ω
Trigger level	TTL/5-V CMOS compatible

Digital Outputs^a

Terminal	50-pin stack-through connector
Series resistance	1 k Ω
Load resistance	10 k Ω min.
Range	0 V to 5 V

^aSpecifications apply to /FAULT.

^bSpecifications apply to /PRE_EN, /REG_EN, /FAN_EN, MOSI, SCK, /DPOT0, /LED_GB, /LED_YM, /LED_RT.

^cDigital inputs are pulled-up through 100-k Ω resistors (SPI lines excluded).

^dInternal current limitation.

Analog Interface Specifications

Pre-Regulator Voltage Monitoring

Terminal	50-pin stack-through connector
Range	0 V to 3.5 V
Sensitivity	0.1 V/V
Accuracy	±2 %
Offset	±5 mV max.
Load resistance	10 k Ω min.

Regulator Voltage Monitoring

Terminal	50-pin stack-through connector
Range	0 V to 3 V
Sensitivity	0.1 V/V
Accuracy	±2 %
Offset	±5 mV max.
Load resistance	10 k Ω min.

Regulator Current Monitoring

Terminal	50-pin stack-through connector
Range	0 V to 3 V
Sensitivity	10 mV/mA
Accuracy	±5 %
Offset	±1 mV max.
Load resistance	1 M Ω min.

Cooler Fan Voltage Monitoring

Terminal	50-pin stack-through connector
Range	0 V to 5 V
Sensitivity	1 V/V
Accuracy	±5 %
Offset	±5 mV max.
Load resistance	10 k Ω min.

Cooler Fan Voltage Monitoring

Terminal	50-pin stack-through connector
Range	0 V to 5 V
Sensitivity	1 V/V
Accuracy	±5 %
Offset	±5 mV max.
Load resistance	10 k Ω min.

Cooler Fan Current Monitoring

Terminal	50-pin stack-through connector
Range	0 V to 5 V
Sensitivity	10 mV/mA
Accuracy	±5 %
Offset	±5 mV max.
Load resistance	10 k Ω min.

General Specifications

This module is designed to be operated in laboratory environment.

Operating

Temperature +15°C to +30°C

Power Requirements

+15 V $I \leq +100$ mA

-15 V $I \leq +100$ mA

+5 V $I \leq +200$ mA

+24 V Not used

Physical Properties

Height (component side) 17 mm max.

Weight ≤ 80 g

PCB 2-layer FR4, 100 mm \times 100 mm

Warranty

One (1) year parts and labor on defects

Ordering Information

Front Panel Options

SMD20-FP-xx Shielded 3U-4HP front-panel

SMD20-NP-xx none (standard)

Stack-through Header Options

SMD20-xx-SC 50-pin header^a (standard)

SMD20-xx-NC none

Example of Ordering Code

SMD20-NP-SC standard

^aTyco Part Number: 1-173145-4.

Document Identifier

SMD20-SS01-R20A