microFLUX | 2MP

Datasheet

Version 1.0
29/01/26

hargravetechnologies.com

Hargrave Technologies

NDAA Compliant

Contents

01 Safety

We recommend reviewing this datasheet before getting started.

microFLUX 2MP has been designed and tested for reliability, but incorrect installation or operation can cause damage or safety hazards.

Power supplies channel substantial power. Fault currents can exceed 100 A and while extremely rare, major failures can result in fire. Design your vehicle accordingly. Power supplies should be fused from batteries and isolated from flammable components.

Always ensure you are connecting the power supply with the correct polarity.

Never exceed the rated voltage of the power supply, doing so can result in premature failure.

microFLUX 2MP is enclosed to large debris, but not sealed. Direct exposure to water can result in unit failure. Ensure it is mounted in a location with appropriate environmental protection to reflect the UAV's operating conditions.

Do not attempt to disassemble or modify the microFLUX 2MP. Doing so will void your warranty and more importantly, can cause damage that results in a failure.

While there are multiple fail-safes in place, it should be assumed that a powered unit can output to a connected load at any time. Take appropriate precautions.

The microFLUX 2MP enclosure may reach high temperatures during normal operation. Avoid contact with the unit when hot.

microFLUX 2MP is a dual-channel smart power supply in the **FLUX** series, engineered for minimal weight and a compact form factor.

Built for power-hungry platforms, its flexible architecture streamlines integration and delivers the reliability required for flight-critical systems.

02 At a Glance

15 - 60 V

INPUT VOLTAGE

3.3 - 28 V

ADJUSTABLE OUTPUT VOLTAGE

FULL LIST OF SELECTABLE OUTPUTS ON PAGE 6

DroneCAN

TELEMETRY & CONTROL

2 x 20 A

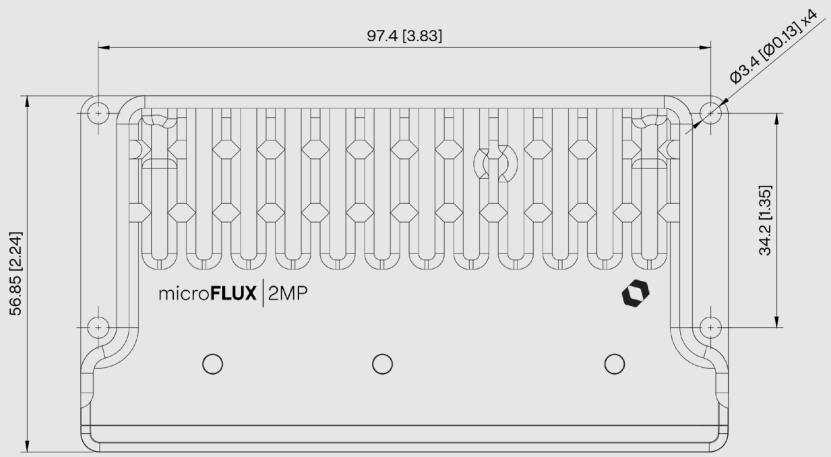
OUTPUT CHANNELS

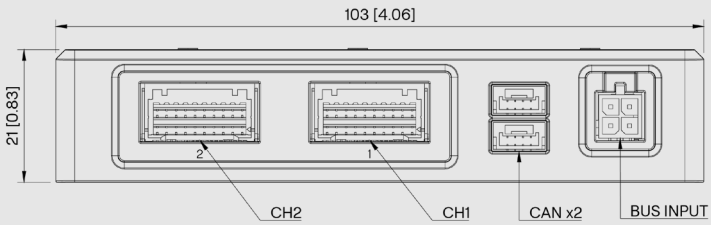
>98%

PEAK EFFICIENCY

118g

BASE WEIGHT

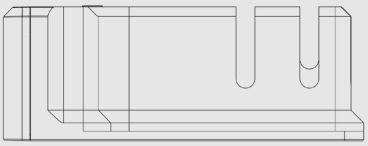




Looking for the CAD?

Click below to find the new microFLUX 2MP CAD:

hrgve.tech/uF-2MP_CAD



All dimensions in mm [inches].

03 Specifications

General

PARAMETER (UNIT)		VALUE	NOTES
Recommended Supply Voltage	(V)	15 – 60 [4S – 14S]	The recommended operating range for the unit.
Absolute Maximum Supply Voltage	(V)	13 - 63	Breaching absolute limits will result in unexpected shutdowns or unit failures.
Maximum Input Current	(A)	22	Depends on crimp selection and wire gauge. See **05 Integration** for details.
Input Overvoltage Protection		Configurable	Configurable warning/disable for overvoltage event.
Input Undervoltage Protection		Configurable	Configurable warning/disable for undervoltage event.
Input Overcurrent Protection		Configurable	Configurable warning/disable for overcurrent event.
Input Voltage Measurement Accuracy	(%)	± 2	Input voltage measurement accuracy across the full-scale range.
Input Current Measurement Accuracy	(%)	± 2	Input current measurement accuracy across the full-scale range.
CAN Bus Support		Isolated DroneCAN	CAN is isolated to prevent ground loops.
Recommended CAN Supply Voltage	(V)	5 - 12	External power required between CAN V+ and CAN GND pins for CAN functionality.
Absolute Maximum CAN Supply Voltage	(V)	-0.3 - 18	Relative to CAN GND pin.

PARAMETER (UNIT)		VALUE	NOTES
CAN Isolation Voltage	(V)	± 63	Isolation for functionality only, not intended for safety.
CAN Signal Common Mode Range	(V)	12	CAN H / CAN L to CAN GND.
Maximum CAN Signal Differential Voltage	(V)	5	CAN H to CAN L, when termination is enabled.
CAN Bus Termination		✓	Software-controlled termination resistor.
Per Channel Power Enable/Disable		✓	Via DroneCAN.
Firmware Updates		✓	Via CAN interface.
Configurator Tool		✓	CAN accessible configuration.
Data Logging		✓	Configurable rate, automatic circular logging.
Self-Correcting Memory		✓	Use of onboard backups and ECC memory.
RGB Indication LED		✓	One indicator per output plus an overall system indicator.
NDAA Compliance		Standard	—
Country of Origin		Australia	—
RoHS/REACH Compliance		✓	—

Channel Specifications

PARAMETER (UNIT)		VALUE	NOTES
Rated Continuous Current	(A)	20	Depends on input voltage, output voltage and ambient temperature. See **06 Performance** for more details.
Rated Peak Current	(A)	24	Depends on input voltage, output voltage and ambient temperature. See **06 Performance** for more details.
Output Voltage	(V)	Refer to Page 6 for full list.	Digitally configurable.
Absolute Maximum Voltage	(V)	-0.3 - 35	Breaching absolute limits will result in unexpected shutdowns or unit failures. It is not recommended to back-feed output channels at any time.
Maximum Output Capacitance	(mF)	Vout ≤ 12 V = 6.0mF Vout > 12 V = 2.0mF	Depends on output voltage. Excess capacitance can cause start-up issues. See **06 Performance** for more details.
Drop Out Voltage	(V)	2	Minimum voltage between input and output to guarantee performance specification.
Voltage Measurement Accuracy	(%)	± 0.3	Voltage measurement accuracy across the full-scale range.
Current Measurement Accuracy	(%)	± 1	Current measurement accuracy across the full-scale range.
Nominal Output Rise Time	(ms)	2.75	—
Auto Power On		Configurable	Configurable automatic power on when input applied.
Output Overvoltage Protection		Configurable	Configurable warning/disable system for overvoltage event.
Output Undervoltage Protection		Configurable	Configurable warning/disable system for undervoltage event.
Output Overcurrent Protection		Configurable	Configurable warning/disable system for overcurrent event.
Over Temperature Protection		Configurable	Configurable warning/disable system for over temperature event.
Short Circuit Protection		✓	Hardware short circuit protection (Constant Current Mode).

Physical

PARAMETER (UNIT)		VALUE	NOTES
Weight	(g)	118 [4.16 oz]	Base weight only, not including cables.
Operating Temperature	(°C)	-20 to 50 [-4 to 122°F]	Continuous operation above 50°C [122°F] may reduce lifetime of unit.
Dimensions	(mm)	21 x 103 x 56.85 [0.83 x 4.05 x 2.24 in]	H x W x D
IP Rating		×	Enclosed, but no dust or water protection rating. Consult **05 Integration** for more information.
Input Connector		Molex Micro-Fit+ 2x2	—
Output Connector		Molex CLIK-Mate 10x2	—
CAN Connectors		2x JST GH 4 Pin	Connected in parallel internally for daisy-chaining.

Channel Voltages

PARAMETER (UNIT)		VALUE	NOTES
Output Voltage	(V)	• 3.3 • 5.0 • 5.4 • 6.3 • 7.2 • 8 • 8.2 • 8.4 • 10 • 10.1 • 10.3 • 11.1 • 12 • 12.9 • 13.3 • 15 • 16 • 17.9 • 18.2 • 19 • 20 • 20.8 • 21 • 21.2 • 22.7 • 22.9 • 23 • 24 • 24.9 • 25.7 • 26 • 28	Digitally selectable within the Hargrave Configurator. All voltages are selectable for both outputs.

04 Quick Start

It is important to note that the microFLUX 2MP can never output a voltage higher than the supplied bus voltage.

Communications

- Before use, configure the output voltage and power-on behavior of each output channel using the quick start guide within the **Hargrave Configurator Tool.**
- Enable the CAN terminator on the unit furthest away from flight controller if no other CAN devices are terminating the bus.

Mounting

- Ensure all connected cables are externally strain-relieved for long-term reliability.
- Ensure the microFLUX 2MP is mounted in a location with appropriate environmental protection.

Protection Systems

Activation of protection mechanisms may cause unexpected system responses, including outputs disabling. It is important to understand these behaviors and configure them to its integrated system. More information is available in **07 Protection Systems**.

Configurator

Try our guided Quick Start and configure the microFLUX 2MP with the Hargrave Configurator Tool at:

configurator.hargravetechnologies.com

All settings are accessible over CAN.

Connectors & Cables

Below is the manufacturer part numbers for mating connectors and pre-terminated wires needed to connect to the input and outputs of the microFLUX 2MP. Weight can be minimized by fine tuning the wire size based on system current draw. For details, consult **05 Integration**.

- Bus Input Mating Connector Housing - Molex 2064610400
- Bus Input 16 AWG Pre-terminated Wire - Molex 0367693064 (x4)
- Output Channel Mating Connector Housing - Molex 5031492000
- Output Channel 24 AWG Pre-terminated Wire - Molex 2157111124 (x10 Black) and Molex 2157112124 (x10 Red)

05 Integration

Wiring

A range of wire gauges can be used to connect to the micro**FLUX** 2MP. Wire size and its matching crimp should be chosen to match the expected current at the bus input and channel outputs. To calculate your input current, use the following:

1. $\text{Channel Output Power} = \text{Output Voltage} \times \text{Output Current}$
2. $\text{Channel Input Power} = \text{Channel Output Power} + \text{Loss}$
3. $\text{Total Input Power} = \sum \text{Channel Input Power}$
4. $\text{Max Input Current} = \dfrac{\text{Total Input Power}}{\text{Lowest Battery Voltage}}$

Channel loss can be found using the graphs in **06 Performance**.

Bus Input

Connector Used: Molex Micro-Fit+ 2x2 (2125280401)

Mating Connector Housing: Molex 2064610400 OR 2064610410

Ensure all 4 contacts are equally loaded.

Choose wire gauge and crimp based on calculated input current. All crimps listed below are compatible with the mating connector housing.

CRIMP MPN	WIRE GAUGE	DEVICE INPUT CURRENT LIMIT (A)
2064600012	30	7.6
2064600012	28	9
2064600012	26	11
2064600022	24	12
2064600022	22	15
2064600022	20	17
2064600032	18	19
2064600042	16	22

Pre-terminated wires are available for fast integration such as 0367693064 (16 AWG) or 0367693071 (24 AWG).

Output Channels

Connector Used: Molex 1.5mm CLIK-Mate 10x2 (2132282011)

Mating Connector Housing: Molex 5031492000

Ensure all 20 contacts are equally loaded for full current delivery. Each contact pair delivers 1/10 of the rated current, allowing channels to power multiple loads appropriately.

Choose wire gauge and crimp based on channel output current limit. All crimps listed below are compatible with the mating connector housing.

CRIMP MPN	WIRE GAUGE	CHANNEL OUTPUT CURRENT LIMIT (A)
2130293000	28	10
2130293000 OR 2130283000	26	15
2130283000	24	20

Pre-terminated wires are available for fast bring-up such as 2157111124 (24 AWG, Black) and 2157112124 (24 AWG, Red).

Capacitance

Excessive capacitance on the output of the power supply can result in non-ideal regulator start-up or failure to start entirely due to inrush current. To guarantee controlled start-up, ensure connected devices don't present larger capacitance than shown below:

- **V_{out} ≤ 12 V = 6.0mF**
- **V_{out} > 12 V = 2.0mF**

Inductive Loads

When using with inductive loads, ensure that any voltage spike observed on the micro**FLUX** output when switching does not exceed the rated voltage.

CAN Voltage Supply

To power the CAN isolator, a four-pin CAN cable with a 5 V - 12 V power pin must be used.

Parallel / Series Channel Connection

Never connect multiple channels in series to increase output voltages. Channel outputs are not isolated and share a common ground.

It is not recommended to connect channels in parallel. Connecting in parallel cannot guarantee increased current rating.

Any Questions?

We're here to help. Reach out directly to our engineering team at:

contact@hargravetechnologies.com

Mounting

The micro**FLUX** 2MP offers 4 mounting holes to secure the unit to your application. These are best suited to M3 socket head bolts. Ensure you use a tightening torque appropriate to the fastener and the mounting material you are using.

The micro**FLUX** 2MP is primarily designed for use in aerial vehicles; vibration isolation of the unit, particularly in land-based applications, will increase its longevity. To reduce the chance of connection joints failing, ensure there is appropriate mechanical strain relief on all cables attached to the unit.

Ingress Protection

The micro**FLUX** 2MP has an integrated enclosure that offers protection against solid objects over 1 mm, like wires and debris. The unit is not sealed against water or dust. Exposure to heavy dust, rain, or submersion can result in unit failure. Ensure that the micro**FLUX** 2MP is mounted in a location with appropriate environmental protection to reflect the UAV's operating conditions.

Thermal Management

The micro**FLUX** 2MP is designed to be cooled passively via natural convection/radiation. In such circumstances, it can achieve the current levels matching 6 W of loss per channel as determined by the graphs in **06 Performance**. The micro**FLUX** 2MP will rise 50°C under such a condition.

For the same temperature rise, providing airflow of 2m/s over the heatsink allows for up to 12W of loss per channel, while an airflow of 8 m/s over the heatsink allows for up to 22.5W per channel. 8 m/s allows continuous full output power for all input and output voltage configurations.

Various configurable temperature protection systems are available to monitor device and channel temperatures, allowing for early warning and over-temperature responses.

06 Performance

Typical performance characteristics measured at 25°C ambient temperature unless otherwise stated.

Output Current Rating

- **20 A / Channel**

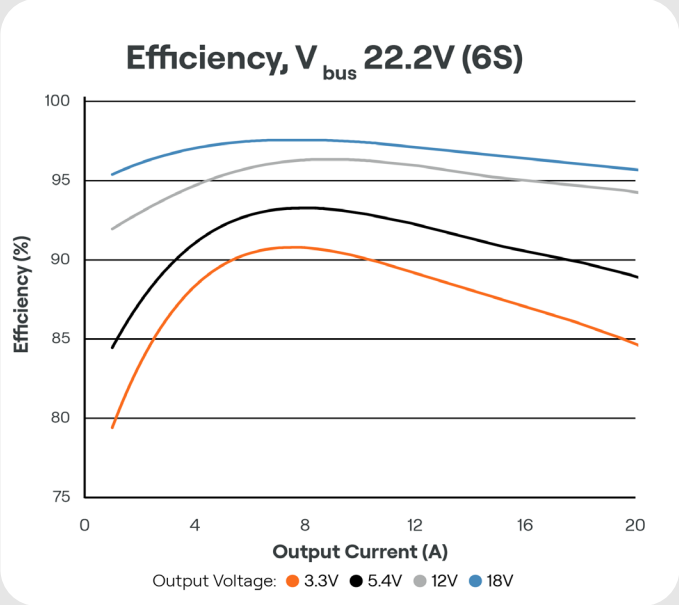
Derating may be required to prevent excess temperature depending on environmental conditions, unit configuration and input voltage. Airflow over the unit of 8 m/s is sufficient to allow any configuration and input voltage with a temperature rise of 50°C or less.

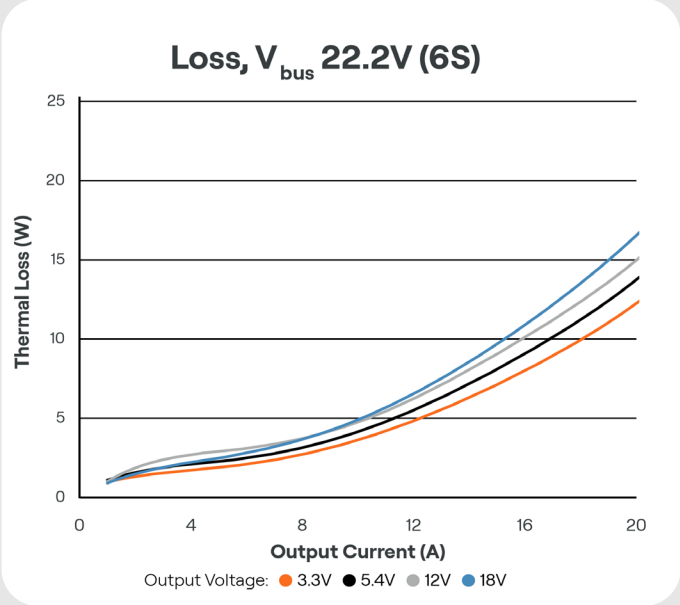
Without airflow, a temperature rise of 50°C will occur with a loss of 6 W per channel. This equates to an output of 7.5 A at 12 V on both channels with an input of 51.8 V.

Speak to us

For any questions about performance in specific applications, reach out to our engineering team at:

contact@hargravetechnologies.com

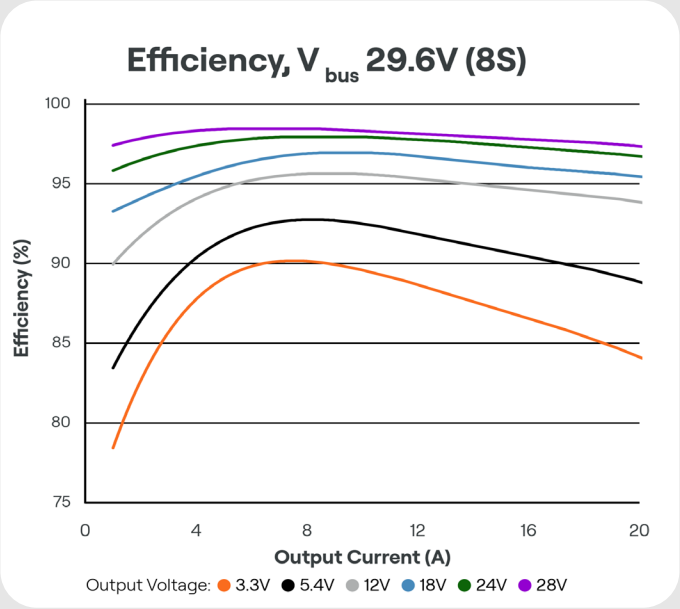


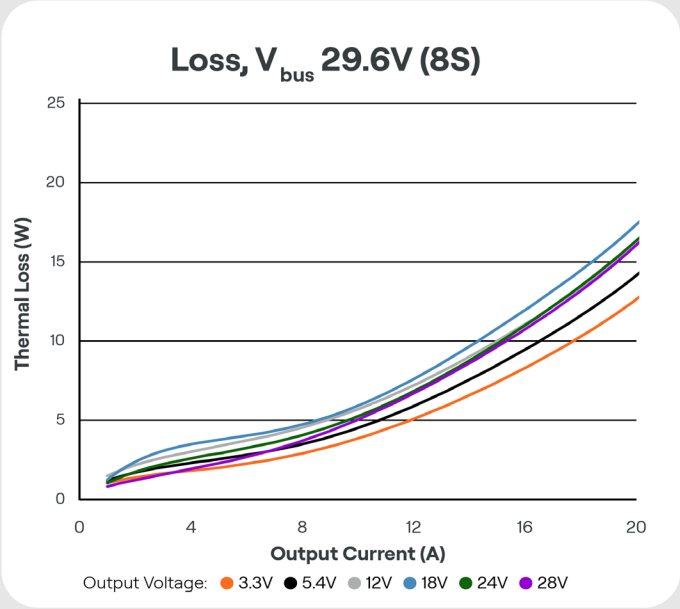


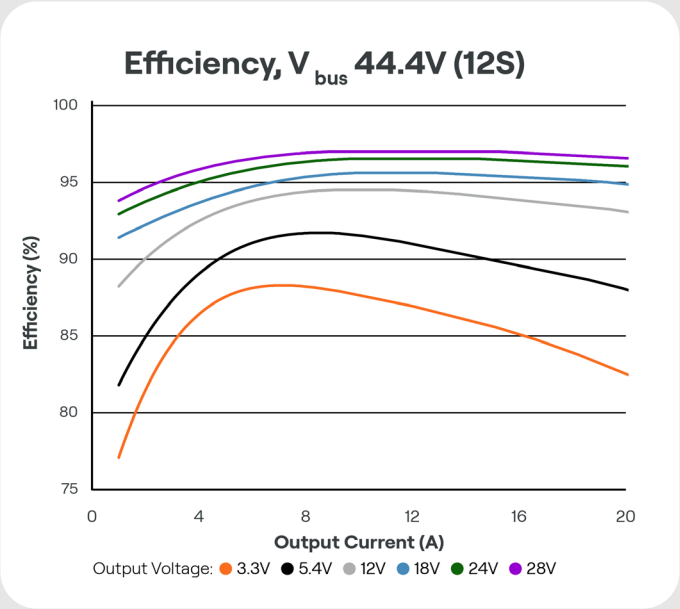
The secret is in the source

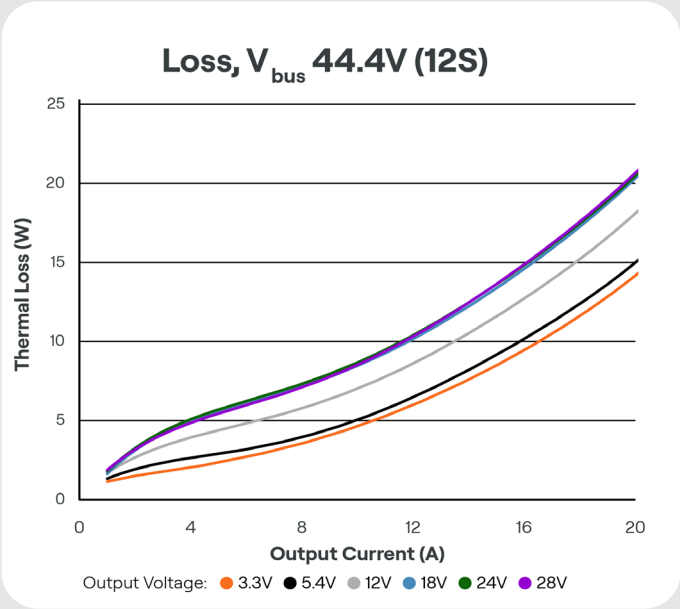
All Hargrave Technologies products are engineered, manufactured and tested in Australia from first class components. Australia is classed as a domestic source under Title III of the United States Defense Production Act.

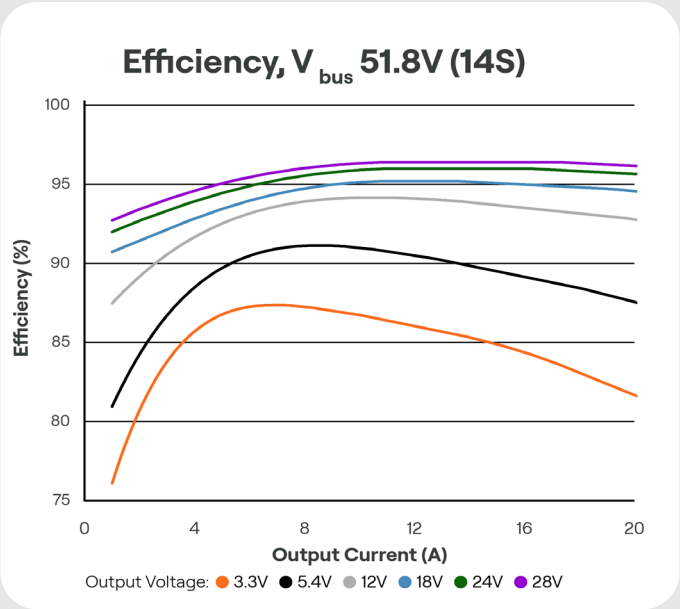
Because of this, we can produce units that are compliant with the United States National Defense Authorization Act 2023 - generally required for suppliers to United States Government agencies. All variations of the micro**FLUX** 2MP are NDAA compliant, with all legislated components sourced outside of the NDAA "countries of concern", including the People's Republic of China. It is also EO13981-compliant.

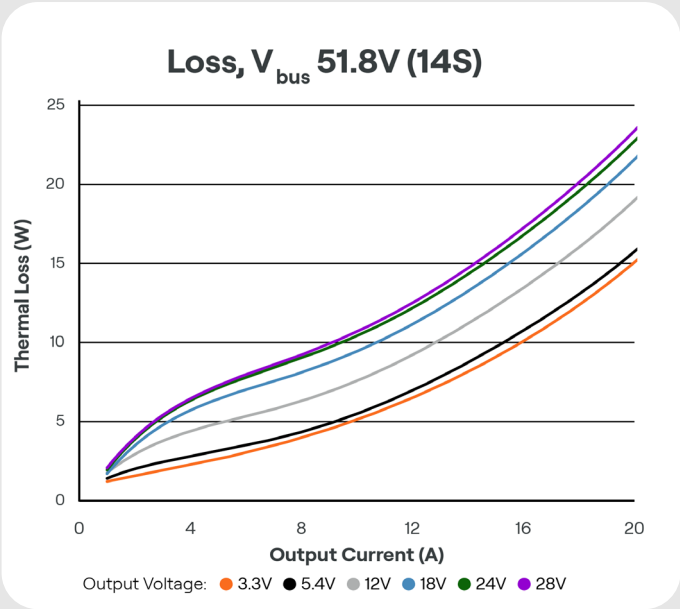

Efficiency, V bus 29.6V (8S)
Efficiency (%)
100
95
90
85
80
75
0
4
8
12
16
20
Output Current (A)
Output Voltage: 3.3V 5.4V 12V 18V 24V 28V


Loss, V bus 29.6V (8S)
Thermal Loss (W)
25
20
15
10
5
0
0
4
8
12
16
20
Output Current (A)
Output Voltage: 3.3V 5.4V 12V 18V 24V 28V


Efficiency, V bus 44.4V (12S)
Efficiency (%)
100
95
90
85
80
75
0
4
8
12
16
20
Output Current (A)
Output Voltage: 3.3V 5.4V 12V 18V 24V 28V


Loss, V bus 44.4V (12S)
Thermal Loss (W)
25
20
15
10
5
0
0
4
8
12
16
20
Output Current (A)
Output Voltage: 3.3V 5.4V 12V 18V 24V 28V


Efficiency, V bus 51.8V (14S)
Efficiency (%)
100
95
90
85
80
75
0
4
8
12
16
20
Output Current (A)
Output Voltage: 3.3V 5.4V 12V 18V 24V 28V


Loss, V bus 51.8V (14S)
Thermal Loss (W)
25
20
15
10
5
0
0
4
8
12
16
20
Output Current (A)
Output Voltage: 3.3V 5.4V 12V 18V 24V 28V

07 Protection Systems

TYPE	PROTECTION	RESPONSE	USE	HARDWARE (HW) FALLBACK
Per Channel	Undervoltage Response	Adjustable warning & error limits. If the voltage drops below the error limit the channel can be shut off (Optional).	Detects a decrease in the output voltage due to an excessive load current, insufficient input voltage or internal hardware failure.	No.
Per Channel	Overvoltage Response	Adjustable warning & error limits. If the voltage rises above the error limit the channel can be shut off (Optional).	Detects an increase in the output voltage due to back-feeding, voltage spikes from switching inductive loads or internal hardware failure.	No.
Per Channel	Over Temperature Response	Adjustable warning & error limits. If temperature exceeds the error limit the channel can be shut off (Optional).	Prevents the unit from reaching unsafe temperatures as defined by the application.	No.
Per Channel	Undercurrent Response	Adjustable warning limit. Exceeding it sends a warning message.	Detects lower than expected load current draw, indicative of a downstream problem.	No.
Per Channel	Overcurrent Response	Adjustable warning & error limits. If current exceeds the error limit the channel can be shut off (Optional).	Prevents downstream devices from drawing power exceeding their allocated power budget and flags downstream problems causing excessive current draw.	Yes, channel will enter a constant current mode at the maximum current limit, resulting in output voltage reducing.
System	Bus Undervoltage Response	When the bus voltage falls below the error limit all channels can be turned off, or only non-priority channels are turned off (Configurable).	Provides an early-warning of low battery or supply sag and prevents over-discharge of batteries	No.
System	Bus Overvoltage Response	Adjustable warning & error limits. When the bus voltage rises above the error limit all channels can be turned off, or only non-priority channels are turned off (Configurable).	Detects voltage spikes at the bus and minimizes effect on downstream components or damage to the unit.	No.
System	Bus Overcurrent Response	Adjustable warning & error limits. When the bus current exceeds the error limit all channels can be turned off, or only non-priority channels are turned off (Configurable).	Detects situations where the current limit of the unit input exceed their ratings and prevents damage to the device.	No.
System	Bus Over Temperature Response	Adjustable warning & error limits. When the bus temperature exceeds the error limit all channels can be turned off, or only non-priority channels are turned off (Configurable).	Prevents the unit from reaching unsafe temperatures as defined by the application.	No.

08 Ordering Options

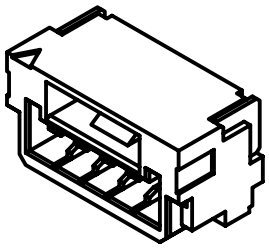
SKU	Channels	NDAA Compliant
105446	2 x 20 A Output Channels	✓

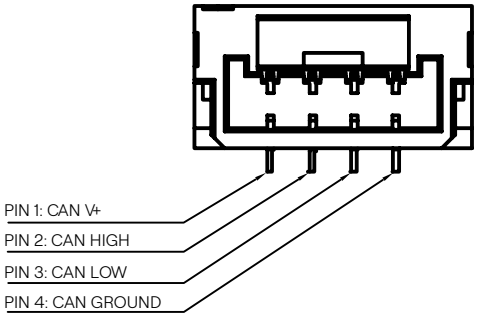
09 Pinouts

Control Signal - CAN

JST BM04B-GHS-TBT (LF)(SN)

Mates to:
JST GHR-04V-S

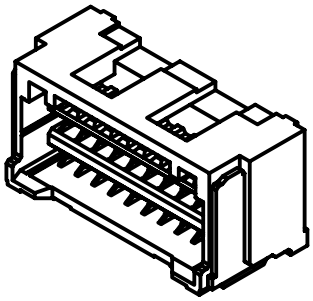


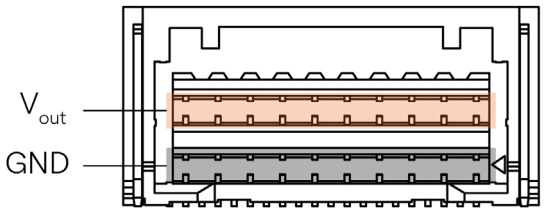


Power - Output

Molex 2132282011

Mates to:
Molex 5031492000

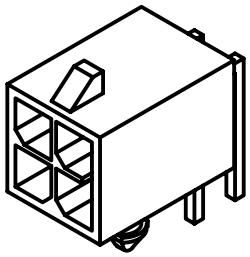


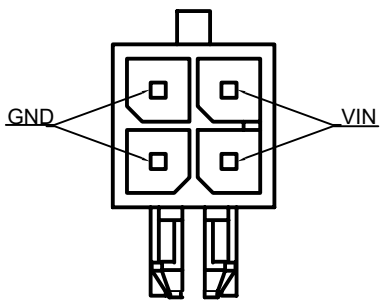


Power - Input

Molex 2125280401

Mates to:
Molex 2064610400 OR 2064610410





10 Powered by GateKEEPER

GateKEEPER is the unified technology core that underpins the next generation of Hargrave Technologies' power electronics. It encompasses everything we've learnt through over a million flight hours with our development partners and extends it with CAN, advanced data-logging and class leading protection systems.

Using GateKEEPER, we can share a common hardware and firmware foundation across our range of power electronics, so they can all benefit from the diversity and longevity of applications demanded by modern UAS. Shared architecture allows us to collect a wider range of flight data, allowing us to minimize long term reliability risks across a broad range of products.

We can use GateKEEPER to rapidly develop bespoke electronics specific to your application, with the reliability of an extensively flight-validated core shared with our COTS products.

Response Ready.

Contact us.

Sales

To find out more about how to take off with microFLUX 2MP, get in touch with our sales engineers at:

sales@hargravetechnologies.com

Documentation

For a detailed technical overview and operations manual, visit:

docs.hargravetechnologies.com

Technical

For any technical questions, please reach out to a technical contact at Hargrave or email us at:

contact@hargravetechnologies.com

11 Revisions

Revision	Date	Description
1.0	29/01/2026	Datasheet Release

12 Disclaimer

This power supply datasheet is provided for informational purposes only. This power supply is designed and intended solely for use in uncrewed aerial vehicles (UAVs) and drones. It is not intended for any other applications in which a malfunction or failure may cause loss of life, injury or property damage, including but not limited to crewed aviation.

Hargrave Technologies Pty Ltd (ABN 45 670 453 120) and its Related Bodies Corporate are collectively referred to as "Hargrave". Hardware, software and related technologies described in this document are collectively referred to as "Product".

By using Product, you agree that:

1. Product is specifically designed only for use in UAVs. Any other use is not supported or recommended without consultation with Hargrave.
2. Hargrave Technologies reserve the right to change the data provided in this datasheet at any time without prior notice. It is the responsibility of the user to ensure that they have the most up-to-date information.
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5. Reverse engineering of Product, including but not limited to disassembly, decompilation, or any other attempt to derive the source code or underlying technology, is strictly prohibited.
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9. Any modifications or alterations made to Product are strictly prohibited and may result in unsafe operation, voiding of warranty, and legal consequences.
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