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Technologies

The Heart of Power and Motion

## Micro Driver

### Miniature DC/BLDC motor controller driver - 12.5A

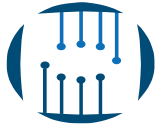
#### Rayon module typical applications:

- Robotics.
- Automotive.
- Avionics.
- Industrial.



#### Specifications:

- Sinusoidal, flux-oriented control and trapezoid drive.
- Hall, Incremental encoder feedback.
- PI closed loop modes: Current
- 12.5A continues current –RMS
- 10 sec 25A over drive
- Rs232 communication.
- Analog and / or digital commands.
- Firmware upgrade via RS232.
- Protections: Temperature, voltage, CPU, encoders, hall, motor stuck more.
- 3 digital input. 3 digital outputs.
- GUI – Load/Read parameters and high-speed live graph monitor.
- Comprehensive Error messages.
- Reliable: rigid construction high current 92A 100V Power MOSFETs,
- Hardware short motor winding protection.
- Operating temperature -40°C to 71°C
- SMD board mount
- Efficiency - 97%



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## Rayon Driver specifications:

Function	Parameter	Remarks
<b>CPU and Memory</b>		
CORE	TI- TMS320F-28035	32bits DSP
Flash	128 Kbytes	
RAM	20 Kbytes	
CORE Speed	60Mhz	
<b>Motor Interface</b>		
BLDC 3 phases Bridge Drivers	6 100V@92A	FOC
Bridge Drivers	DRV8301DCAR	1A turn on 1.2A turn off
Motor Current	12.5A Continues	
Hall angle inputs	60°	Open collector/Drain
Output hall devices power	5VDC	@200mA
Encoder Interface-A	SSI or SPI	SDI SDO SCLK
Encoder Interface-B	Digital RS422	CLK A CLK B Index
Motor Current Sense measurement	2 Channels	0-3V 12bits resolution
Adjustable Motor Current limiter	2 Channels	One Over load Point.
<b>General Purpose Interface</b>		
Digital Input / Output	4 Inputs 2 Output Channels	
Analog input (analog command)	1 Channel	±10V / ±5V /0-10V
<b>Communication Interface</b>		
CAN BUS	Single CAN channel	CAN 2.0B 1Mbit/Sec
UART	1 Channels	RS232 or RS422 comm.
<b>Power Supply</b>		
Operating Voltage	8-48V	
Control Voltage	8V to 48V	
Quiescent Current	45mA @24V	Core @ 60Mhz.
<b>Environment</b>		
Operating Temperature	-40°c +71°c	Optional -55°c to +85°c
Storage Temperature	-65°c - +150°c	
<b>I/O Connection</b>		



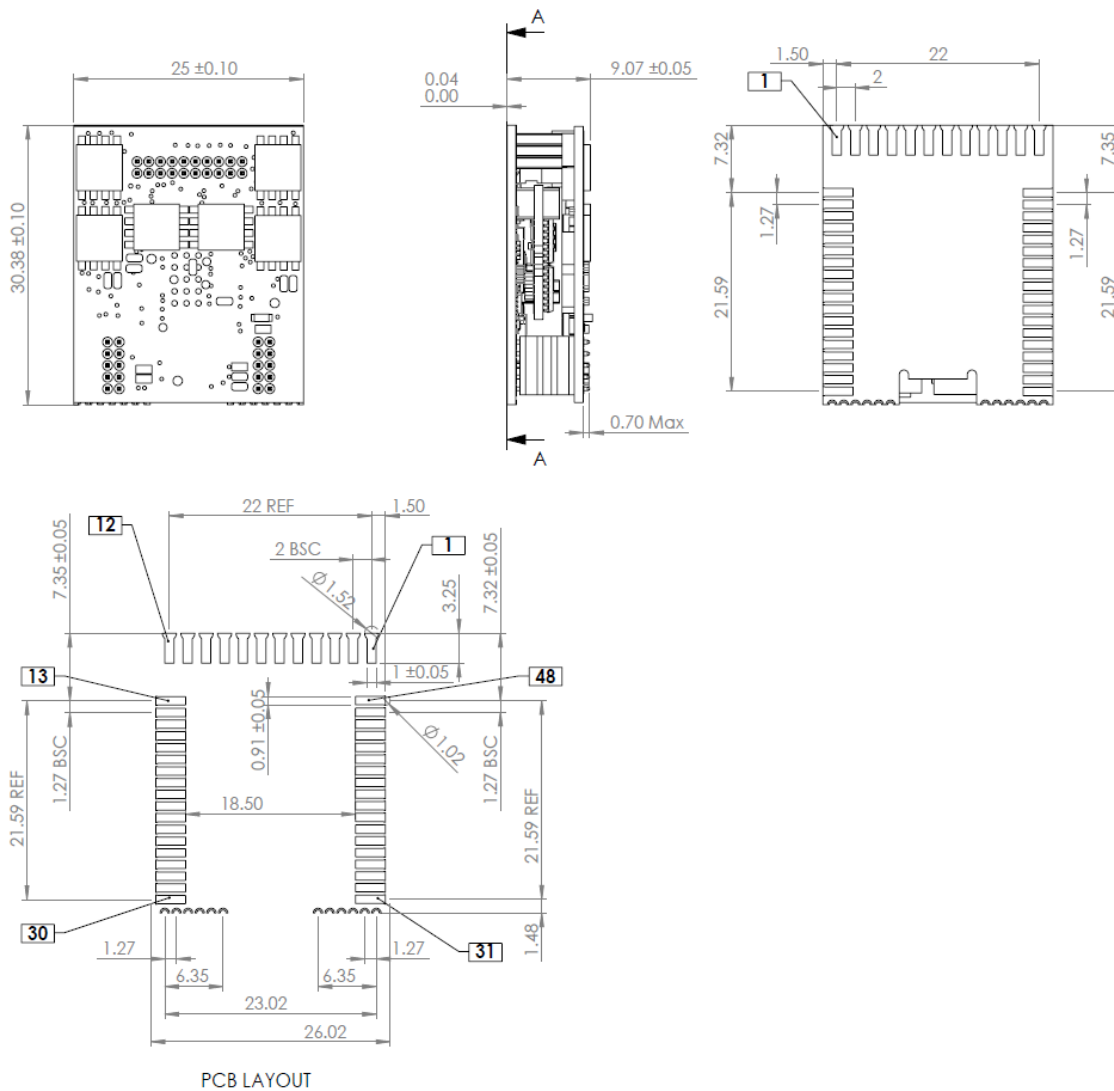
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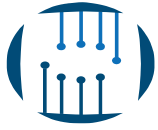
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Power Input and Phase output	SMT layout	
Power Input and Phase output –OEM	SMT layout	
Signals Input and Digital I/O	SMT layout	
Dimension	32mm X 27mm X 9 mm	

### Rayon Driver Lay out



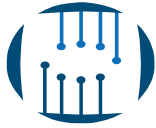


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## Rayon Driver connection

<b>PIN</b>	<b>Function</b>	<b>Remarks</b>
<b>1,2,3</b>	<b>+V Motor</b>	<b>Motor Power 8 - 48VDC</b>
<b>10,11,12</b>	<b>V Motor Return</b>	<b>Motor Power return 0V</b>
<b>4,5</b>	<b>Phase A</b>	<b>BLDC Motor Phase A or DC Motor +</b>
<b>6,7</b>	<b>Phase B</b>	<b>BLDC Motor Phase B or DC Motor -</b>
<b>8,9</b>	<b>Phase C</b>	<b>BLDC Motor Phase C</b>
<b>13</b>	<b>Ground</b>	<b>0V -Digital Ground Hall supply</b>
14	VCC_3.3V	Do not use
15	Reserved	Do not use
16	Reserved	Do not use
17	Reserved	Do not use
18	Reserved	Do not use
19	Reserved	Do not use
20	Reserved	Do not use
21	Reserved	Do not use
22	Reserved	Do not use
23	Reserved	Do not use
24	Reserved	Do not use
<b>35</b>	<b>RS232_RX</b>	<b>RS232 RX (Data in to Rayon)</b>
<b>26</b>	<b>RS232_TX</b>	<b>RS232 TX (Data out from Rayon)</b>
<b>27</b>	<b>Ground</b>	<b>0V -Digital Ground Encoder supply</b>
<b>28</b>	<b>Ain -</b>	<b>±10V input Analog command negative side</b>
<b>29</b>	<b>Ain +</b>	<b>±10V input Analog command positive side</b>
30	Reserved	Do not use



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31	Ground	0V -Digital Ground Encoder supply
32	VCC_5V	Hall and Encoder Voltage
33	HALL 1	Open collector Hall 3 Sensor input
34	HALL 2	Open collector Hall 3 Sensor input
35	HALL 3	Open collector Hall 3 Sensor input
36	ENC1 CLK A NOT	Incremental Encoder1 Clock A not
37	ENC1 CLK A	Incremental Encoder1 Clock A
38	ENC1 CLK B NOT	Incremental Encoder1 Clock B not
39	ENC1 CLK B	Incremental Encoder1 Clock B
40	ENC1 IDX NOT	Incremental Encoder1 Index not
41	ENC1 IDX	Incremental Encoder1 Index
42	Digital Output 1	Open collector limit to 24V
43	Digital Output 2	Open collector limit to 24V
44	Digital Output 3	Open collector limit to 24V
45	Digital Input 1	Open collector or switch input
46	Digital Input 2	Open collector or switch input
47	Digital Input 3	Open collector or switch input
48	Digital Input 4	Open collector or switch input



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## Rayon 12.5A block diagram

