

VCS

Laser Current Driver

PRODUCT MANUAL

Striving for the Bright Future of Precision Optoelectronic Measurement.

01 Product Functions

VCS Laser Current Driver is primarily used for low-noise current driving of lasers, allowing adjustment of laser driving current by varying the input voltage.



VCS Laser Current Driver Product Image (product functions may be iterated)

02 Product Features

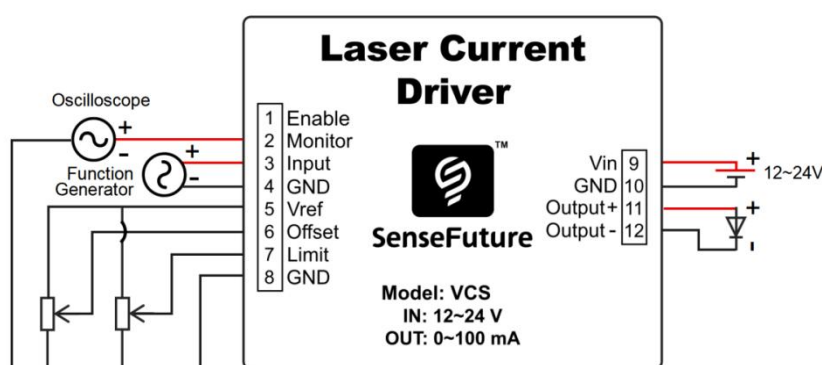
- Low current noise: **RMS < 0.4 μ A**
- Output voltage: Up to 23 V; output current: Up to 1 A – capable of driving almost all low-power laser diodes, such as DFB, VCSEL, ICL, QCL, etc.
- Current limit protection: The maximum output current can be limited by a potentiometer to 60% of the nominal maximum value, ensuring laser safety.
- Remote control: Supports remote output enable/disable and output current monitoring.
- Output performance: Ultra-stable output current bias, with positive current modulation capability.

03 Specifications

Parameter	Model				
	VCS20	VCS100	VCS250	VCS500	VCS1000
Current-to-Voltage Ratio	4mA/V	20mA/V	50mA/V	100mA/V	200mA/V
Maximum Output Current	20mA	100mA	250mA	500mA	1000mA
Supply Voltage	12~24V				
Output Voltage / Compliance Voltage	Supply Voltage-1 V				
RMS Current Noise	< 0.4 μ A	< 2 μ A	< 5 μ A	< 20 μ A	< 40 μ A
Temperature Coefficient	<50ppm/°C				

Leakage Current	2mA				
Modulation Rise/Fall Time	800/600ns				
Modulation Depth	90%@1MHz				
Bandwidth (3 dB)	2MHz				
Modulation Input Voltage Range	0~5V				
Input Pin Impedance	10MΩ				
Remote Enable Voltage Input	Output Enable: High Level (>2V, I>5mA) Output Disable: Low Level (<2V)				
Current Monitor Coefficient	250V/A	50V/A	20V/A	10V/A	5V/A
Operating Ambient Temperature Range	-20~60℃				-20~35℃
Operating Ambient Humidity Range	0~98%RH				
Cooling Requirements	No additional cooling required within the rated operating range				
Dimensions	47.5*42.8*19.5mm(±0.1mm)		47.5*42.8*32.2mm(±0.1mm)		
Weight	≈47g		≈72g		

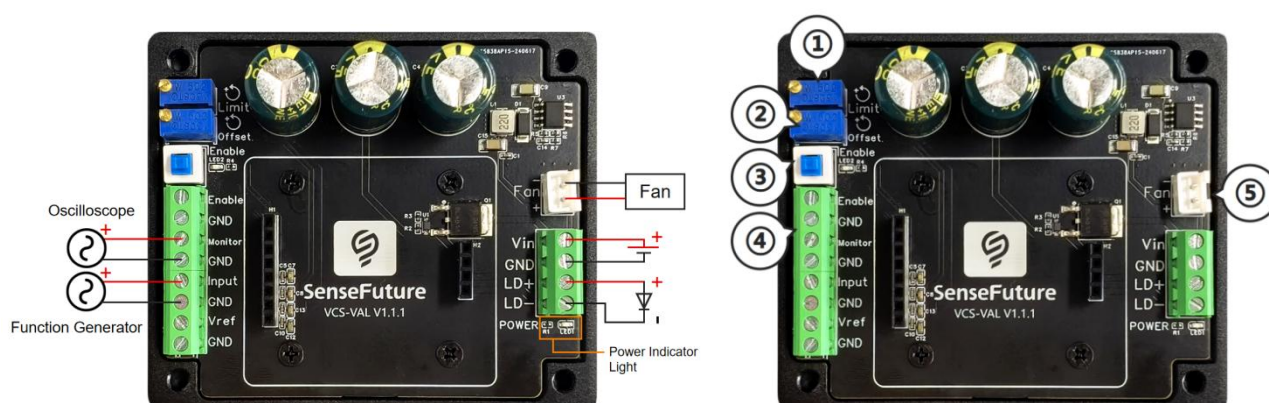
04 Interface Description



VCS Wiring Diagram & Pin Definition Table

	Pin name	Pin type	Pin description
1	Enable	Input	Enable input: Low level disables the driver; high level (3~6 V) or floating enables normal operation.
2	Monitor	Output	Actual current monitor pin: Output voltage range 0~5 V.
3	Input	Input	Modulation voltage input pin: Input voltage range 0~5 V.

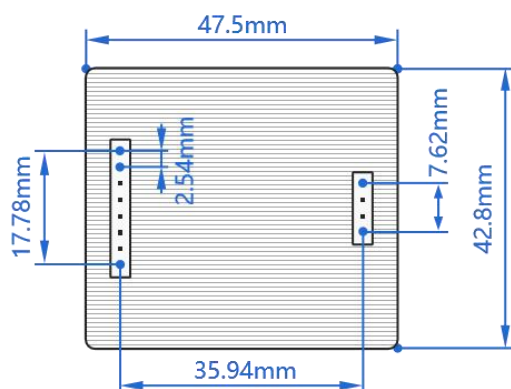
4	GND	Input	Low-current ground pin.
5	Vref	Output	Internal supply output pin: 8.5 V output.
6	Offset	Input	Current bias set pin: Input voltage range 0–5 V.
7	Limit	Input	Current limit set pin: Input voltage range 0–6 V.
8	GND	Input	Low-current ground pin.
9	Vin	Input	Power supply positive input pin: Range 12–24 V.
10	GND	Input	Power supply negative input pin.
11	Output+	Output	Current positive output pin.
12	Output-	Output	Current negative output pin.



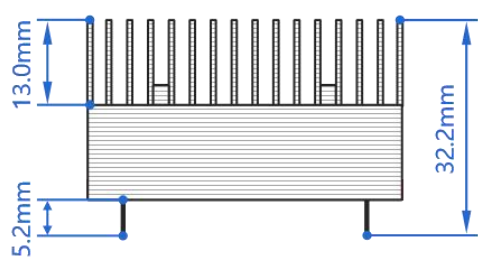
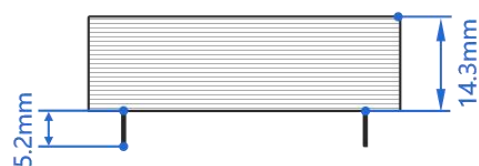
VCS Adapter Board Wiring Diagram & Pin Definition Table

	Name	Function
①	Limit Knob	Maximum output current limit adjustment. Clockwise rotation decreases the limit; counterclockwise increases. The minimum limit can be set to 60% of the full scale.
②	Offset Knob	Output bias current adjustment. Clockwise decreases the current; counterclockwise increases. Maximum adjustment up to 100% of the rated output.
③	Enable Button	When the Enable terminal is at high level or floating, pressing the button turns the laser output ON, and releasing it turns the output OFF.
④	Enable Terminal	Enable port. Low level disables the driver; high level (3–6 V) or floating enables normal operation.
⑤	Fan Terminal	12 V output for a cooling fan. When using VCS250 / 500 / 1000 models, connect a fan to ensure proper heat dissipation.
-	Other Terminals	Refer to the pin definition table for the VCS.

05 Outline Dimensions

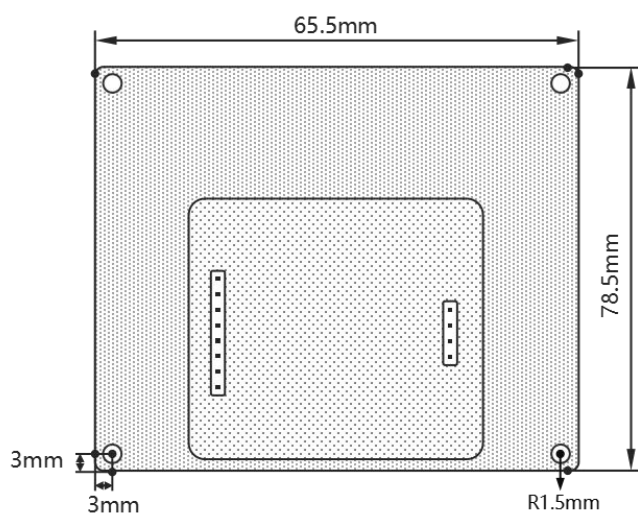
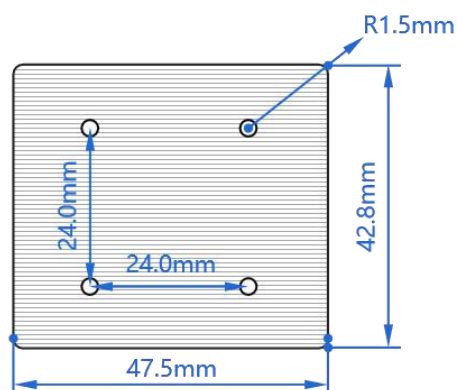
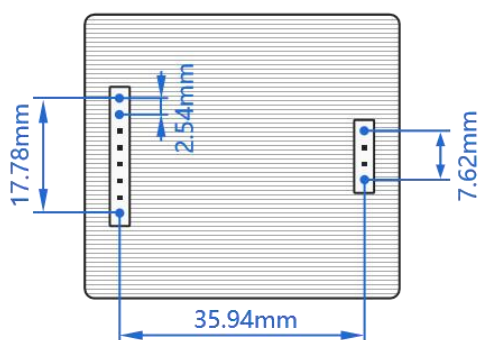


VCS20/100



VCS250/500/1000

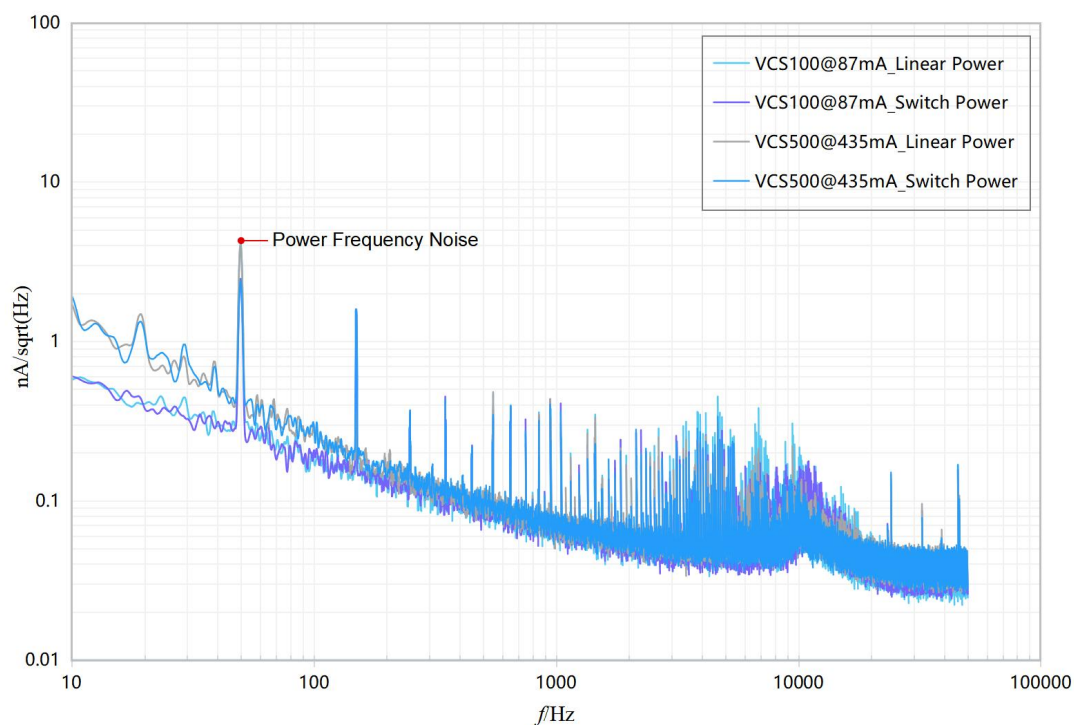
(正视图)



VCS Adapter Board

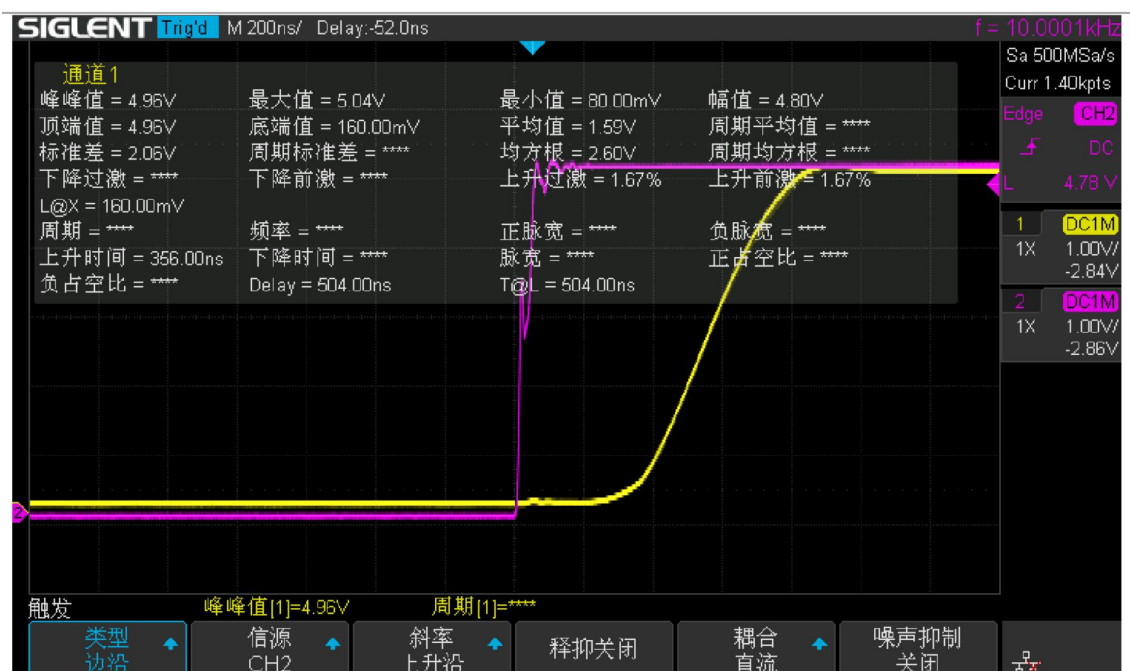
06 Test Data (Partial)

6.1 Current Noise Spectral Density

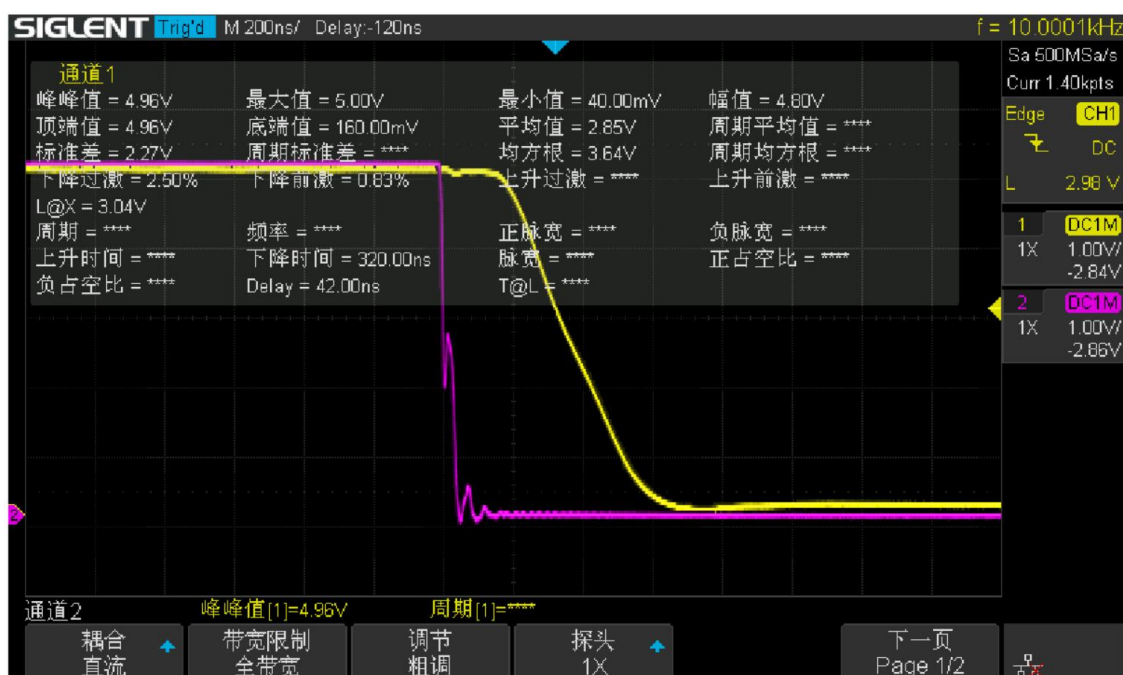


Current Noise Spectral Density Plot of VCS

6.2 Rise/Fall Time

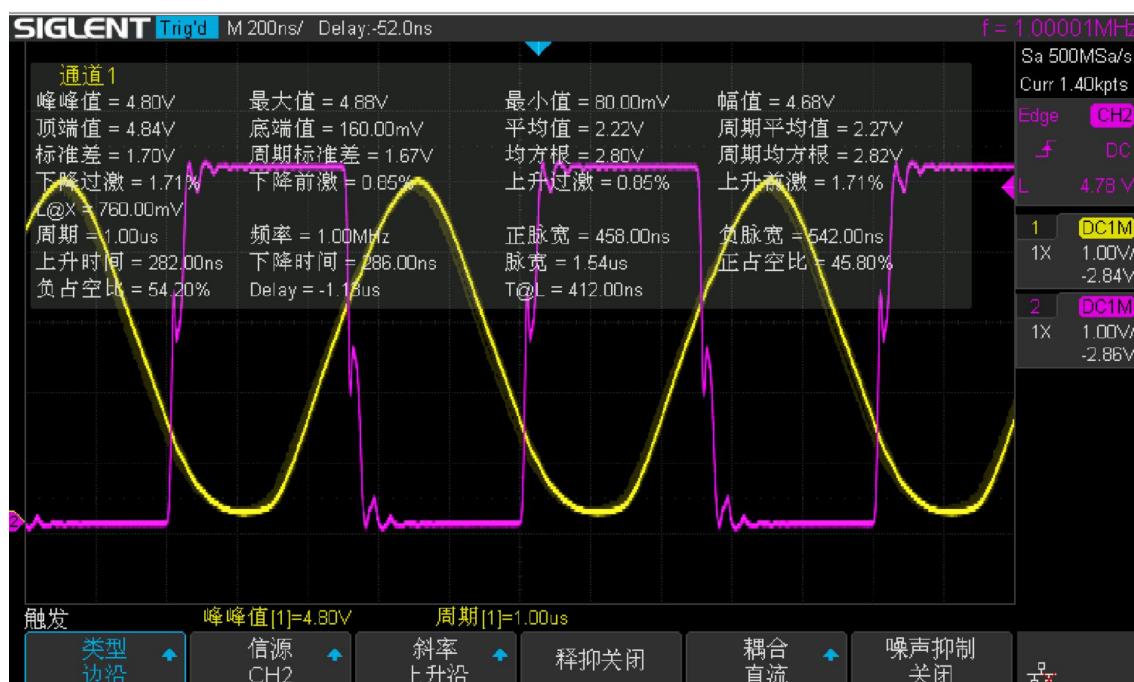


Rise Time Test Graph(Purple: Rising edge signal input from 0V to 5V, tested with a 10 Ohm load; Yellow: Actual curve of the current rise)



Fall Time Test Graph(Purple: Falling edge input from 5V to 0V, tested with a 10 Ohm load; Yellow: Actual curve of the current decay)

6.3 Modulation Depth



Modulation Depth Test Graph(Purple: A 1 MHz square wave signal input ranging from 0V to 5V, tested with a 10 Ohm load; Yellow: The curve representing the actual current decay to 90% of its initial value)

6.4 Modulation Bandwidth (3dB)



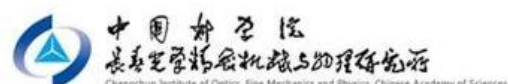
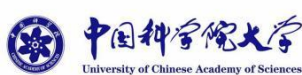
Modulation Bandwidth Test Diagram(Purple: A 2 MHz sinusoidal signal input ranging from 0V to 5V, tested with a 10 Ohm load;Yellow: The curve representing the actual current response after a 3dB drop)

6.5 Temperature Drift Test (VCS100)

Load Resistance (Ω)	Temperature ($^{\circ}\text{C}$)	Current(A)
10	-20	0.0415605
10	-10	0.0415805
10	10	0.0416017
10	20	0.0416302
10	30	0.0416501
10	40	0.0416751
10	50	0.0417005
Temperature Coefficient (ppm/ $^{\circ}\text{C}$)		47.08

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Version Change Log

Version	Change description	Change date	Reviewed by
1.0.0	Initial version	2026/7/30	YL、WYR

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**Original Aspiration Shapes the Future;
Innovation Creates Value;
Sharing Brings People Together;**

**We look forward to win-win
cooperation with you!**