

VCS

Laser Current Driver

PRODUCT INTRODUCTION MANUAL

Striving for the Bright Future of Precision Optical Measurement.

Laser Current Driver

01 Product Functions

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



Figure1 VCS100 (left) VCS250/500/1000 (right)

02 Product Features

- Capable of outputting up to 23V, suitable for driving virtually all low-power lasers, including DFB, VCSEL, ICL, QCL, etc.
- Capable of outputting up to 1A current, suitable for driving virtually all low-power lasers, including DFB, VCSEL, ICL, QCL, etc.
- Maximum output current can be limited via a potentiometer, ensuring laser safety.
- Supports remote control of output enablement and monitoring of output current.
- Offers super-stable output current bias and permits current modulation.

03 Product Parameters

Table1 Basic Parameters of VCS

PARAMETERS	MODEL				UNIT
	VCS100	VCS250	VCS500	VCS1000	
Current-to-Voltage Ratio	20	50	100	200	mA/V
Maximum Output Current	100	250	500	1000	mA
Supply Voltage	12~24				V
Output Voltage / Compliance Voltage	Supply Voltage-1				V
Current Noise	<0.9				μA
Temperature Coefficient Impact	<50				ppm/°C
Temperature Coefficient Impact	2				mA
Regulation Rise/Fall Time	800/600				ns
Modulation Depth	90%				@1MHz
Bandwidth (3dB Point)	2				MHz
Modulation Input Voltage Range	0~5				V
Input Pin Impedance	10				MΩ
Remote Enable Voltage Input	Output Enable: High Level (>2V, I>5mA) Output Disable: Low Level (<2V)				
Current Monitoring Factor	50	20	10	2	V/A
Operating Ambient Temperature Range	-20~60			-20~35	°C
Operating Ambient Humidity Range	0~98				%RH
Heat Dissipation Requirements	No additional cooling required within the rated operating range				
Dimensions	47.5*42.8*19.5			47.5*42.8*32.2	mm
Weight	≈50			≈100	g

04 Interface Introduction

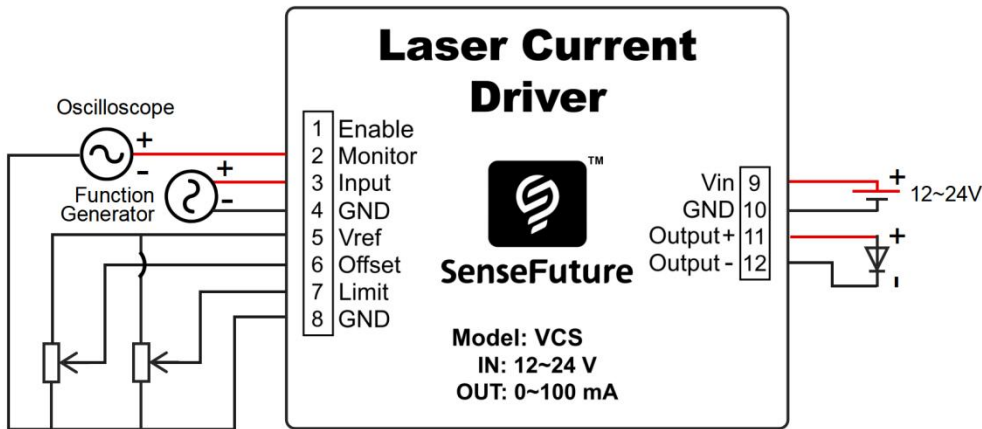


Figure2 Wiring Diagram of VCS
Table2 Pin Definition Table for VCS

Number	Pin Name	Pin Type	Pin Definition
1	Enable	Input	The enable port: when at a low level, the laser current driver does not operate; when at a high level or floating, the laser current driver operates.
2	Monitor	Output	Actual current monitoring pin (0~5V)
3	Input	Input	Modulation Voltage Input Pin (0~5V)
4	GND	Input	Signal Ground Pin
5	Vref	Output	Reference Voltage Output Interface (0~5V)
6	Offset	Input	Current Bias Interface (0~5V)
7	Limit	Input	Current Limiting Interface (0~5V)
8	GND	Input	Signal Ground Pin
9	Vin	Input	Power Supply Positive Input Pin (12~24V)
10	GND	Output	Power Supply Negative Input Pin
11	Output+	Output	Positive Current Output
12	Output-	Output	Negative Current Output

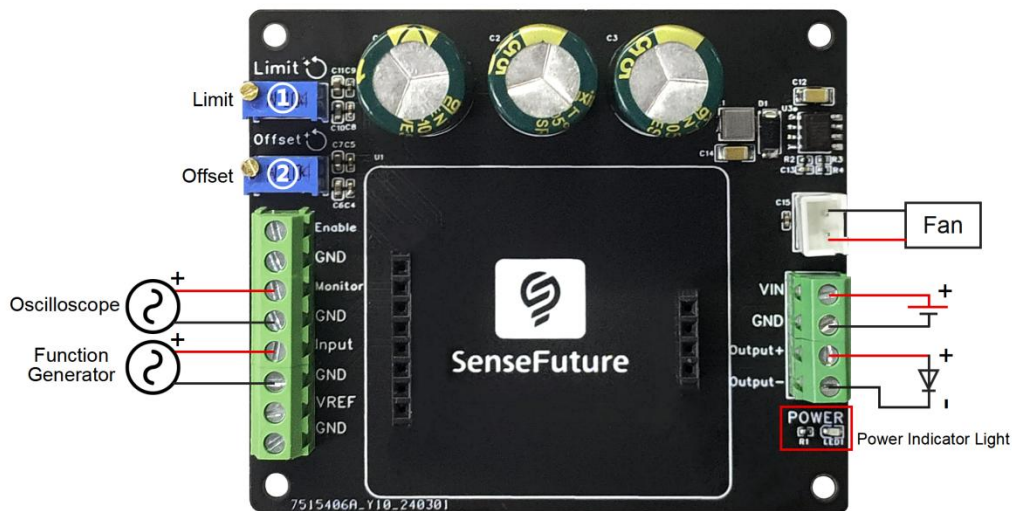


Figure3 Wiring Diagram of VCS Adapter Board

	Knob Name	Function
①	Limit	Maximum Output Current Limit Adjustment Knob, turns clockwise to decrease, counter-clockwise to increase.
②	Offset	Output Bias Current Adjustment Knob, turns clockwise to decrease, counter-clockwise to increase.

05 Dimensional Drawing

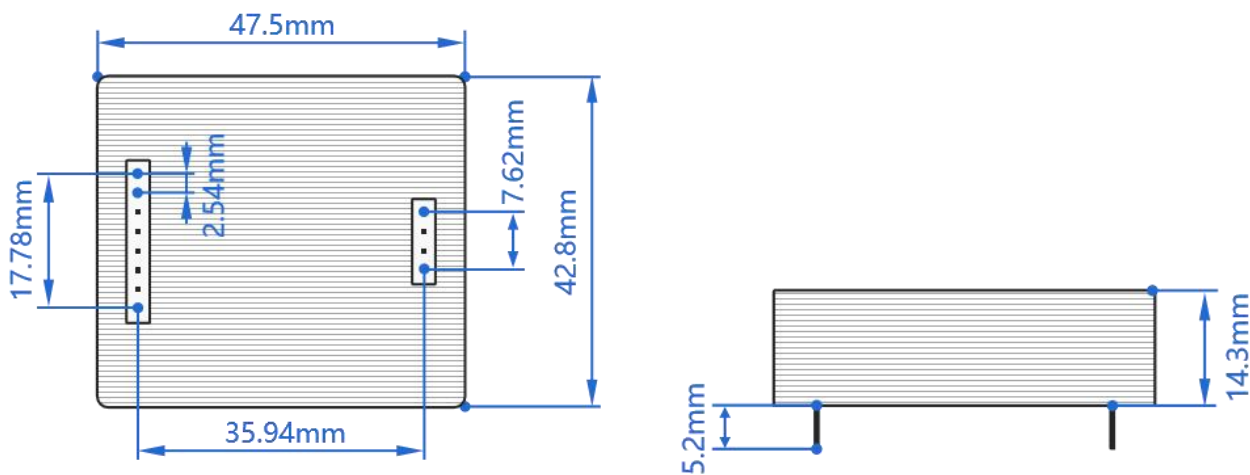


Figure4 Dimensional drawing of VCS100

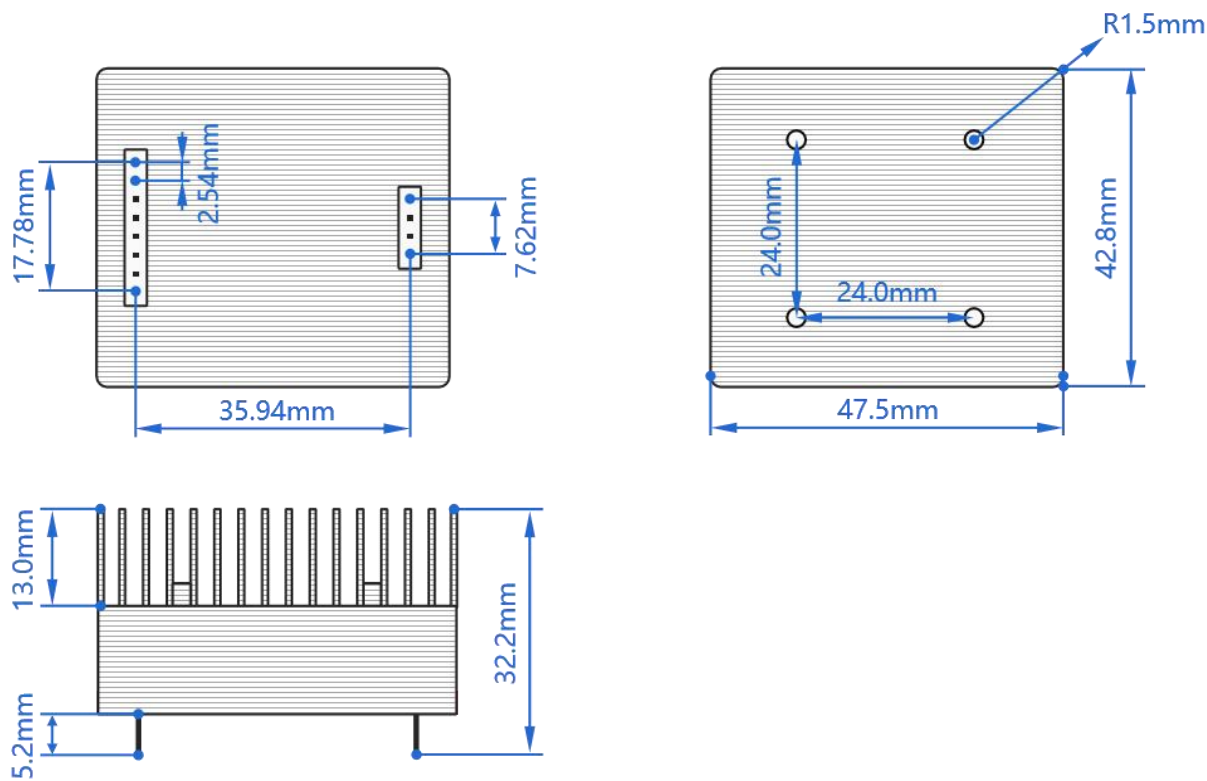


Figure5 Dimensional drawing of VCS250/500/1000

06 Test Data (Partial)

6.1 Current Noise Spectral Density

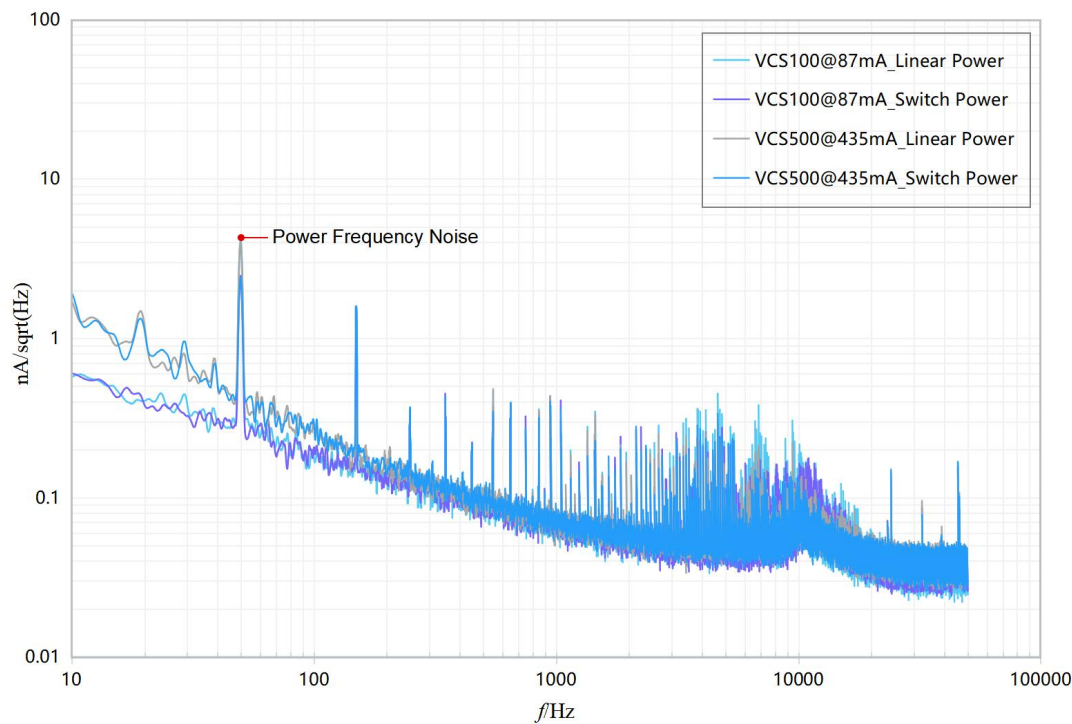


Figure6 Current Noise Spectral Density Plot of VCS

6.2 Rise/Fall Time

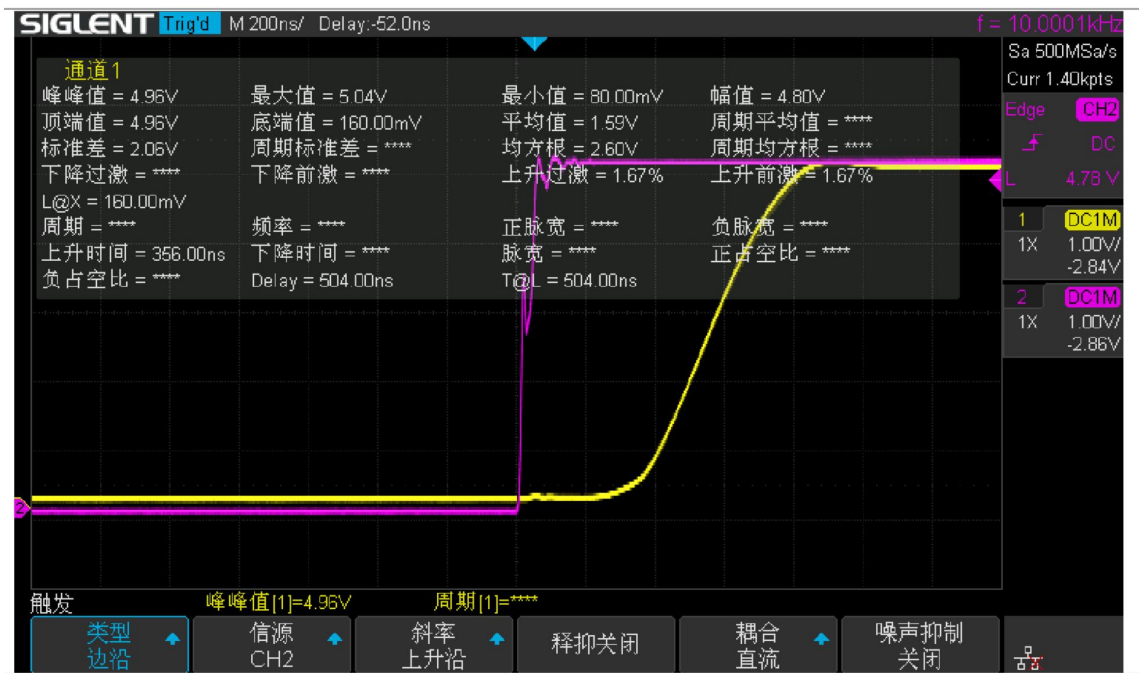


Figure7 Rise Time Test Graph

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

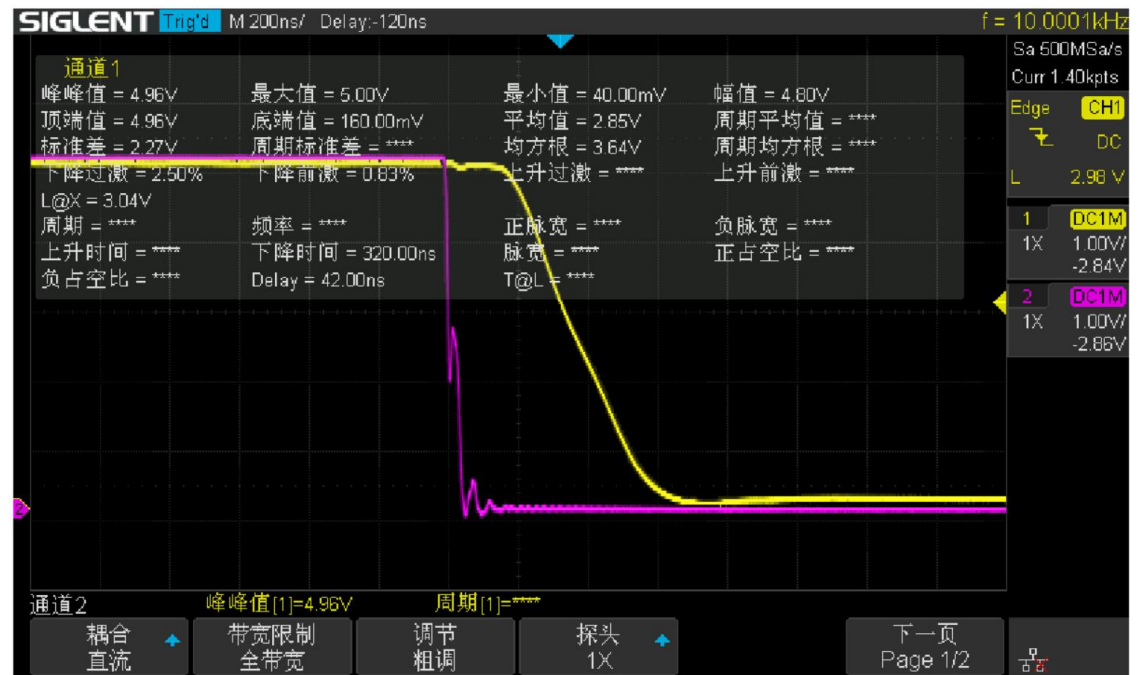


Figure8 Fall Time Test Graph

(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

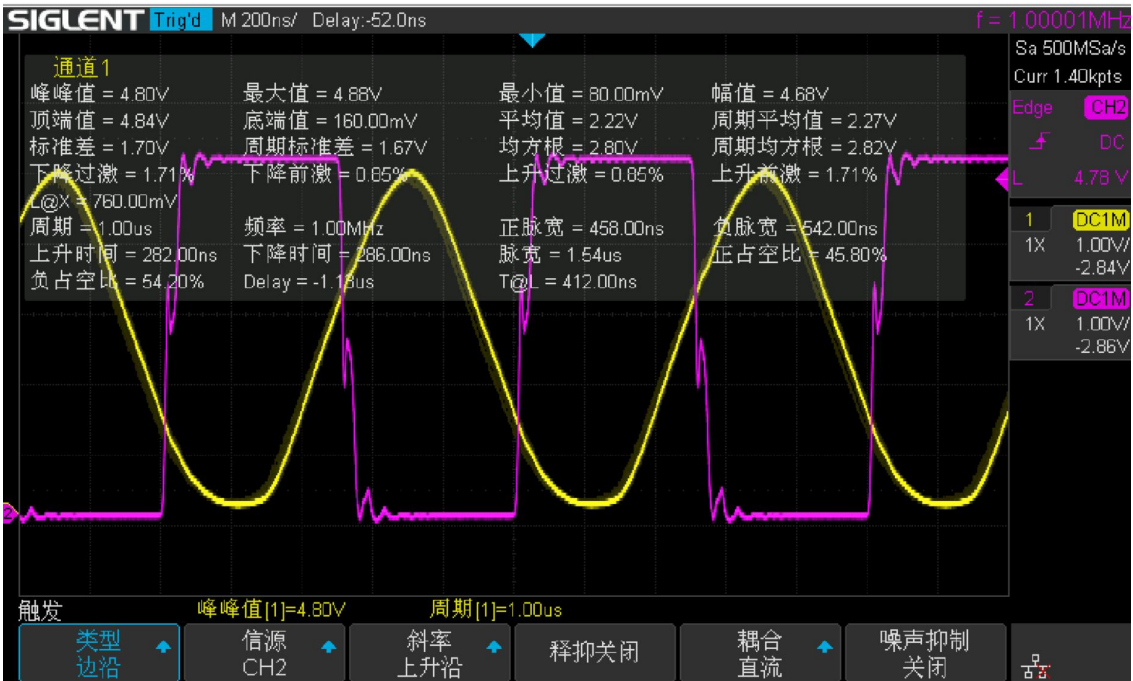


Figure9 Modulation Depth Test Graph

(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)



Figure10 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

07 Instructional Video

YouTube

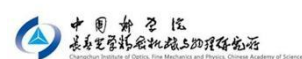


【SenseFuture】Laser Current Driver (VCS Series) Instructions for Use

<https://www.youtube.com/watch?v=oxOiF9q8Rxl&t=34s>

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