



VERTICALLY INTEGRATED SYSTEMS

DOC.IV-7  
EDITION: 2025-Q3

# PRODUCT CATALOG

FIBER OTICS & PHOTONICS

# 2025

**SCOPE:** Optoelectronic Components & Solutions

**APPLICATIONS:** Optical Communication, Consumer & Automotive

**KEY TECH:** VCSELs, PIN Photodiodes, SiGe BiCMOS



VERTICALLY INTEGRATED SYSTEMS

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INTRODUCTION

TRANSMITTERS RECEIVERS ICS CHIPS

## 01. WELCOME TO VI SYSTEMS

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VI SYSTEMS (VIS) DEVELOPS AND MANUFACTURES CUTTING-EDGE OPTOELECTRONIC COMPONENTS FOR COMMUNICATION, CONSUMER, AND AUTOMOTIVE APPLICATIONS. LOCATED IN THE HEART OF BERLIN, WE ARE A FABLESS COMPANY SPECIALIZING IN ULTRA-FAST SOLUTIONS FOR OPTICAL INTERCONNECTS AND SENSORS.

OUR PORTFOLIO INCLUDES VERTICAL CAVITY SURFACE-EMITTING LASERS (VCSELS) UP TO 246 GB/S AND PIN PHOTODIODES UP TO 400GB/S PER CHANNEL, ALONGSIDE DRIVER AND AMPLIFIER ICS OPERATING UP TO 80GBAUD. OUR COMPONENTS ENABLE ENERGY-EFFICIENT 400 GB/S PAM-4 TRANSMISSION PER 4 WAVELENGTH CHANNELS USING SHORT WAVE DIVISION MULTIPLEXING (SWDM) OVER 300M OF MULTIMODE FIBER. 100GB/S SINGLE MODE FIBER DATA TRANSMISSION OVER KM-LONG DISTANCES IS POSSIBLE.



VERTICALLY INTEGRATED SYSTEMS

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## 03. TECHNOLOGY & SERVICES

### INTEGRATED OPTICAL SOLUTIONS

VIS CUSTOMIZES STATE-OF-THE-ART SIGE BICMOS INTEGRATED CIRCUITS TO MATCH ULTRAHIGH-SPEED VCSEL TRANSMITTER AND PIN RECEIVER COMPONENTS.

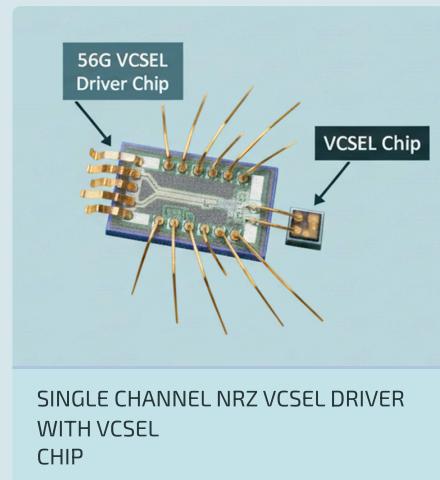
BOTH KEY ELEMENTS ARE ASSEMBLED IN A PROPRIETARY HIGH-FREQUENCY DESIGN DELIVERING OUTSTANDING PERFORMANCE OVER A WIDE TEMPERATURE RANGE.

#### KEY ADVANTAGES:

- HIGH SPEED PERFORMANCE
- LOW POWER CONSUMPTION
- SMALL FOOTPRINT DESIGN
- HIGH RELIABILITY
- LOW COST MANUFACTURING

OUR UNIQUE SELLING POINT IS THE COMBINATION OF MICRO-ASSEMBLY INTEGRATION OF ADVANCED ELECTRO-OPTIC COMPONENTS, DEVELOPMENT OF HIGH-SPEED ICS AND MODULATION APPROACHES.

VIS OPERATES A FABLESS MODEL ENSURING RELIABILITY AND SCALABILITY.



## 04. WAFER MAPPING & HIGH-FREQUENCY TESTING

### WAFER MAPPING SERVICES

VIS'S SEMI-AUTOMATIC PROBER STATION PERFORMS HIGH-SPEED ELECTRICAL AND OPTICAL TESTING EARLY IN THE MANUFACTURING PROCESS, REDUCING COSTS BY ELIMINATING OUT-OF-SPEC WAFERS.

FULL WAFER CHARACTERISATION: 100% CHARACTERISATION OF 2"-8" WAFERS USING AN ALIGNMENT CAMERA WITH PATTERN RECOGNITION; AUTOMATIC ALIGNMENT TO CHIPS; TEMPERATURE RANGE 25°C–150°C.

### MEASURED PARAMETERS:

- L/I/V CURVES
- THRESHOLD CURRENT
- SLOPE EFFICIENCY
- OPTICAL SPECTRUM
- PHOTODIODE SENSITIVITY
- REVERSE BIAS AND DARK CURRENT

EMISSION ANALYSIS: NEARFIELD AND FARFIELD ANALYSIS FOR EMITTING DIAMETER, MODE CHARACTERISTICS, POLARIZATION AND ANGULAR POWER DISTRIBUTION.

### HIGH-FREQUENCY TEST & CHARACTERISATION

THE HIGH-FREQUENCY LAB ANALYSES ELECTRO-OPTICAL PERFORMANCE USING A SINE-WAVE GENERATOR UP TO 38 GHz WITH A 70 GHz SAMPLING OSCILLOSCOPE.

### LABORATORY CAPABILITIES:

- 32 GHz DETECTOR COVERS 700–1600 NM
- EYE-DIAGRAM AND MODULATION TESTS UP TO 128 GBIT/S
- PRBS7/PRBS31 PATTERN GENERATION
- PHOTODETECTOR MODULES UP TO 112 GBIT/S AT 850 NM



## 06. OPTICAL & MECHANICAL INSPECTION, MODELLING & SIMULATION

### OPTICAL & MECHANICAL INSPECTION

THE LABORATORY'S OPTICAL MICROSCOPES UP TO 1000× MAGNIFICATION AND THICKNESS ANALYSIS TECHNOLOGY RESOLVING 0.1 MM (HORIZONTAL) AND 0.5 MM (VERTICAL).

MICROPROBER STATION: ON-WAFER CHARACTERISATION OVER A WIDE TEMPERATURE RANGE; STATIC TESTS MEASURE FORWARD/REVERSE VOLTAGE, CURRENT AND DIFFERENTIAL RESISTANCE.

#### OPTICAL PARAMETERS:

- POWER
- SPECTRUM
- SENSITIVITY
- EFFICIENCY
- THRESHOLD CURRENT
- SLOPE EFFICIENCY
- AMPLIFICATION

ADVANCED STUDIES: COMPLEX ANALYSES USE FIB, SEM AND TEM WITH EXTERNAL PARTNERS.



STEREO MICROSCOPE WITH TEMPERATURE CHUCK

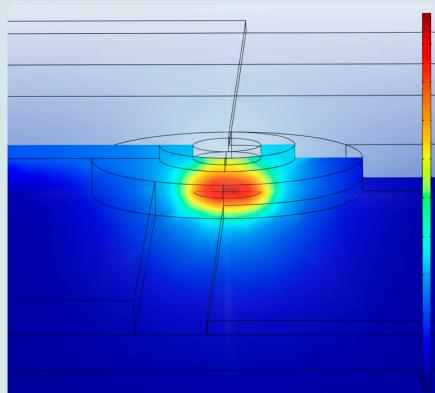


HIGH RESOLUTION OPTICAL MICROSCOPE

### MODELLING & SIMULATION

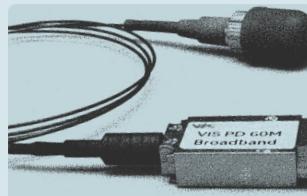
THERMAL MODELLING OF SEMICONDUCTOR PACKAGES USES MODERN FEA/CFD TOOLS INTEGRATED WITH MECHANICAL CAD.

VCSEL SIMULATION: MODELLING OF VCSEL OPTICAL MODES (FUNDAMENTAL AND EXCITED MODES) AND THERMAL DISTRIBUTIONS, WHICH INFORM DESIGN IMPROVEMENTS.



THERMAL DISTRIBUTION IN A VCSEL

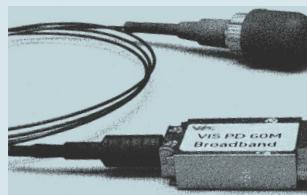
## 06. VCSEL TRANSMITTER MODULES



### V25-850M

DATA RATE 28 GBPS (NRZ)  
WAVELENGTH 850 NM  
FIBER TYPE 50/125  $\mu$ M

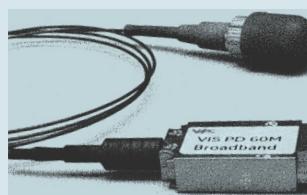
DATASHEET 



### V50-850M

DATA RATE 56 GBPS (PAM-4)  
WAVELENGTH 850 NM  
FIBER TYPE 50/125  $\mu$ M

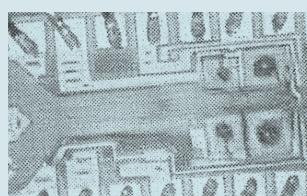
DATASHEET 



### VM100-850M

DATA RATE 112 GBPS (PAM-4)  
WAVELENGTH 850 NM  
FIBER TYPE 50/125  $\mu$ M

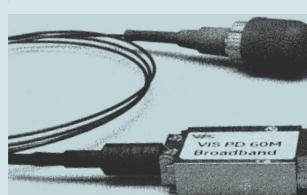
DATASHEET 



### T56-850

DATA RATE 56 GBPS (NRZ)  
WAVELENGTH 850 NM  
FIBER TYPE 50/125  $\mu$ M

DATASHEET 

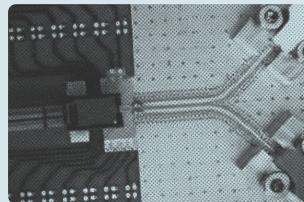


### V25-1550M

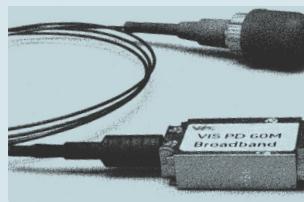
WAVELENGTH 1550 NM  
DATA RATE 25 GBPS (NRZ)  
FIBER TYPE 9/125  $\mu$ M

DATASHEET 

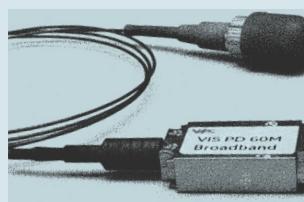
## 07. OPTICAL RECEIVERS & PHOTODETECTORS

**R56-850**

INPUT 700–870 NM  
WAVELENGTH  
DATA RATE (NRZ) 56 GBPS  
FIBER TYPE 50/125  $\mu$ M

DATASHEET **D30-850M**

3 DB BANDWIDTH > 30 GHz  
WAVELENGTH 840–1650 NM  
FIBER TYPE 50/125  $\mu$ M

DATASHEET **D60M FC**

INPUT 400–1650 NM  
WAVELENGTH  
3 DB BANDWIDTH > 60 GHz  
FIBER TYPE MMF/SMF

DATASHEET 



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PRODUCT-GROUP: ICS

TRANSMITTERS

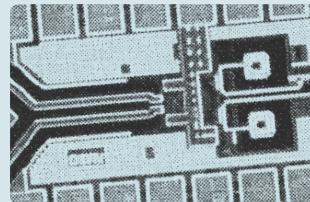
RECEIVERS

ICS

CHIPS

## 08. INTEGRATED CIRCUITS (ICS)

### HIGH SPEED VCSEL DRIVERS



#### A56-230C

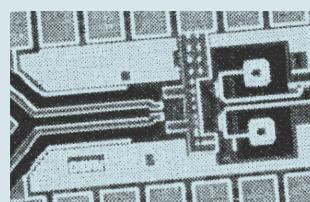
DATA RATE UP TO 100 GBAUD

SUPPLY VOLTAGE 3.3 V

POWER 200 MW

DISSIPATION

DATASHEET



#### A56-105C

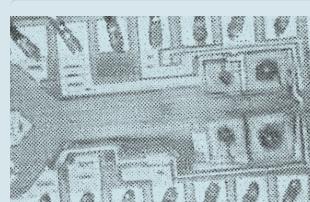
DATA RATE UP TO 100 GBAUD

SUPPLY VOLTAGE 3.3 V

POWER 105 MW

DISSIPATION

DATASHEET



#### T56-250C

DATA RATE UP TO 100 GBAUD

DIFFERENTIAL 3.0 kΩ

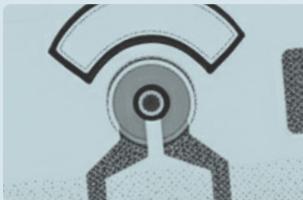
GAIN

POWER 150 MW

DATASHEET

## 09. ULTRA HIGH-SPEED VCSEL CHIPS

SERIES: VM100

**VM100 850**

CHIP TYPE      MULTI-MODE  
WAVELENGTH    840–860 NM  
CONTACT        GSG

DATASHEET **VM100 880**

CHIP TYPE      MULTI-MODE  
WAVELENGTH    870–890 NM  
CONTACT        GSG

DATASHEET **VM100 910**

CHIP TYPE      MULTI-MODE  
WAVELENGTH    900–920 NM  
CONTACT        GSG

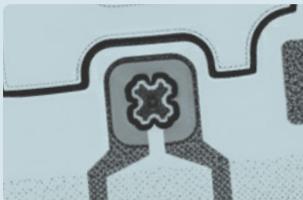
DATASHEET **VM100 940**

CHIP TYPE      MULTI-MODE  
WAVELENGTH    930–950 NM  
CONTACT        GSG

DATASHEET 

## 10. ULTRA HIGH-SPEED VCSEL CHIPS

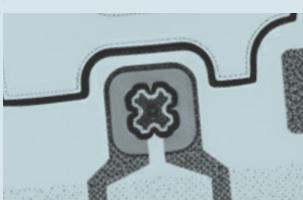
SERIES: VM100 (MA-SM / QSM)



### VM100 850 MA-SM

CHIP TYPE MA-SM  
WAVELENGTH 840–860 NM  
CONTACT GSG

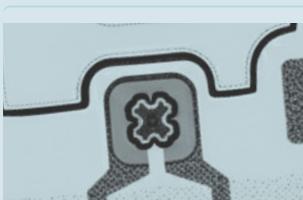
DATASHEET 



### VM100 880 MA-SM

CHIP TYPE MA-SM  
WAVELENGTH 870–890 NM  
CONTACT GSG

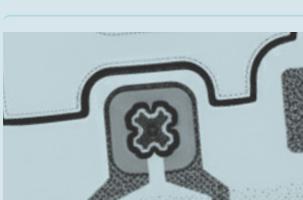
DATASHEET 



### VM100 910 MA-SM

CHIP TYPE MA-SM  
WAVELENGTH 900–920 NM  
CONTACT GSG

DATASHEET 



### VM100 940 MA-SM

CHIP TYPE MA-SM  
WAVELENGTH 930–950 NM  
CONTACT GSG

DATASHEET 



### VM100 850 QSM

CHIP TYPE QSM  
WAVELENGTH 840–860 NM  
CONTACT GSG

DATASHEET 



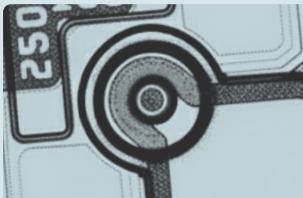
### VM100 910 QSM

CHIP TYPE QSM  
WAVELENGTH 900–920 NM  
CONTACT GSG

DATASHEET 

## 11. HIGH-SPEED VCSEL CHIPS

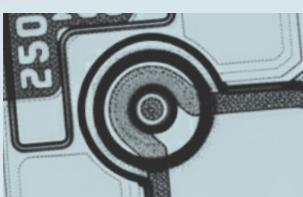
SERIES: V50 / VM50 / V25



### V50 850

CHIP TYPE	MULTI-MODE
WAVELENGTH	840–860 NM
CONTACT	SG / GS

DATASHEET 



### VM50 940

CHIP TYPE	MULTI-MODE
WAVELENGTH	930–950 NM
CONTACT	GSG

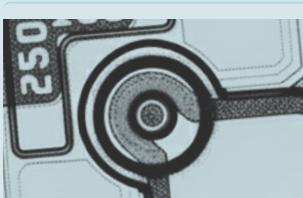
DATASHEET 



### V25 940 HP MA

FEATURE	HIGH POWER (LIFI)
WAVELENGTH	930–950 NM
CONTACT	SG / GS

DATASHEET 



### VM50 850

CHIP TYPE	MULTI-MODE
WAVELENGTH	840–860 NM
CONTACT	GSG

DATASHEET 



### V25 850 HT

FEATURE	HIGH TEMP (125°C)
WAVELENGTH	840–860 NM
CONTACT	SG / GS

DATASHEET 

## 12. HIGH-SPEED PHOTODIODES (PDS)

SWDM-OPTIMIZED



### D40 SWDM

CONTACT TYPE GSG  
DIAMETER 20 µM  
BANDWIDTH ~40 GHz

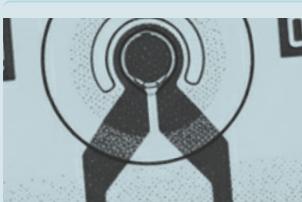
DATASHEET 



### D35 SWDM

CONTACT TYPE GSG  
DIAMETER 25 µM  
BANDWIDTH ~35 GHz

DATASHEET 



### D30 SWDM

CONTACT TYPE GSG  
DIAMETER ~23 µM  
BANDWIDTH ~30 GHz

DATASHEET 



### D70 SWDM

CONTACT TYPE GSG  
DIAMETER ~25 µM  
BANDWIDTH ~70 GHz

DATASHEET 



### D400G

CONTACT TYPE GSG  
DIAMETER ~16 µM  
BANDWIDTH ~60 GHz (25Ω)

DATASHEET 



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CONTACT & INFORMATION

TRANSMITTERS

RECEIVERS

ICS

CHIPS

## 13. CONTACT INFORMATION

FOR ADDITIONAL INFORMATION OR TO RECEIVE A QUOTATION, PLEASE CONTACT OUR SALES DEPARTMENT.

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