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

01. WELCOME TO VI SYSTEMS

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) AND PIN PHOTODIODES DELIVERING SPEEDS UP TO 224 GBPS PER CHANNEL, ALONGSIDE DRIVER AND AMPLIFIER ICS OPERATING UP TO 56 GBPS. OUR LATEST GENERATION COMPONENTS ENABLE ENERGY-EFFICIENT 400 GBPS PAM-4 TRANSMISSION USING SHORT WAVE DIVISION MULTIPLEXING (SWDM).

02. TABLE OF CONTENTS

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.

INTEGRATED VCSEL DRIVER WITH VCSEL CHIP PHOTO

KEY ADVANTAGES:

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

CONCEPTUAL GRAPHIC: ICS + OPTICAL COMPONENTS INTEGRATION

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.

SEMI-AUTOMATIC WAFER PROBER AND ALIGNMENT CAMERA PHOTO

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

HIGH-FREQUENCY TEST LABORATORY SETUP PHOTO

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.

STEREO MICROSCOPE WITH TEMPERATURE CHUCK

HIGH-RESOLUTION OPTICAL MICROSCOPE

TEM ANALYSIS PHOTO

OPTICAL PARAMETERS:

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

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

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 GRAPHIC

06. VCSEL TRANSMITTER MODULES

V25-850M

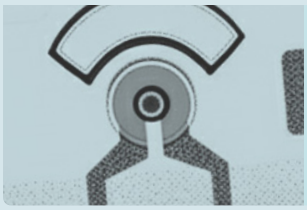
DATA RATE	28 GBPS (NRZ)
WAVELENGTH	850 NM
FIBER TYPE	50/125 MM

DATASHEET

V50-850M

DATA RATE	56 GBPS (PAM-4)
WAVELENGTH	850 NM
FIBER TYPE	50/125 MM

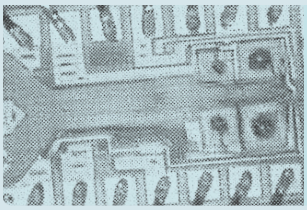
DATASHEET



VM100-850M

DATA RATE	112 GBPS (PAM-4)
WAVELENGTH	850 NM
FIBER TYPE	50/125 MM

DATASHEET



T56-850

DATA RATE	56 GBPS (NRZ)
WAVELENGTH	850 NM
FIBER TYPE	50/125 MM

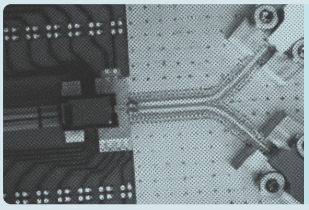
DATASHEET

V25-1550M

WAVELENGTH	1550 NM
DATA RATE	25 GBPS (NRZ)
FIBER TYPE	9/125 MM

DATASHEET

07. OPTICAL RECEIVERS & PHOTODETECTORS



R56-850

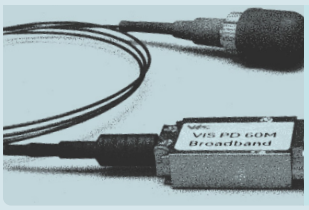
INPUT WAVELENGTH	700–870 NM
DATA RATE (NRZ)	56 GBPS
FIBER TYPE	50/125 MM

DATASHEET

D30-850M

3 DB BANDWIDTH	> 30 GHZ
WAVELENGTH	840-1650 NM
FIBER TYPE	50/125 MM

DATASHEET



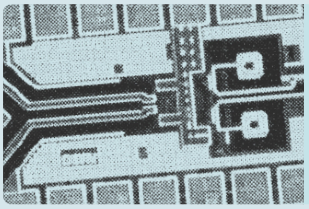
D60M FC

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

DATASHEET

08. INTEGRATED CIRCUITS (ICS)

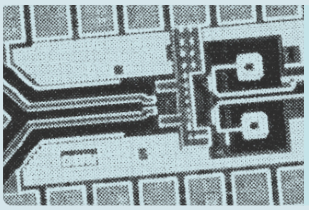
HIGH SPEED VCSEL DRIVERS



A56-230C

DATA RATE	UP TO 100 GBPS
SUPPLY VOLTAGE	3.3 V
POWER DISSIPATION	200 MW

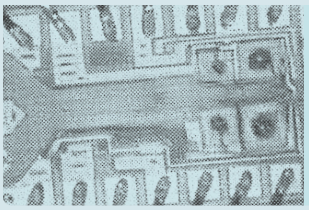
DATASHEET



A56-105C

DATA RATE	UP TO 56 GBPS
SUPPLY VOLTAGE	3.3 V
POWER DISSIPATION	105 MW

DATASHEET



T56-250C

DATA RATE	UP TO 56 GBPS (NRZ)
DIFFERENTIAL GAIN	3.0 KΩ
POWER	150 MW

DATASHEET

09. ULTRA HIGH-SPEED VCSEL CHIPS

SERIES: VM100

VM100 850

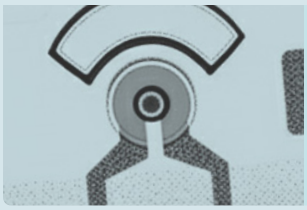
CHIP TYPE	MULTI-MODE
WAVELENGTH	840–860 NM
CONTACT	GSG

DATASHEET

VM100 880

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

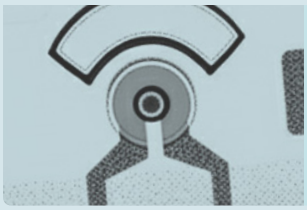
DATASHEET



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

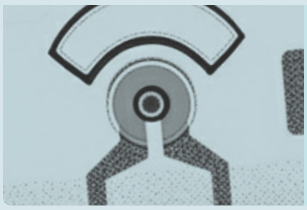
CHIP TYPE	MA-SM
WAVELENGTH	840–860 NM
CONTACT	GSG

DATASHEET

VM100 880 MA-SM

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

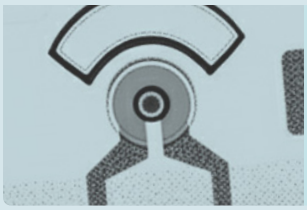
DATASHEET



VM100 910 MA-SM

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

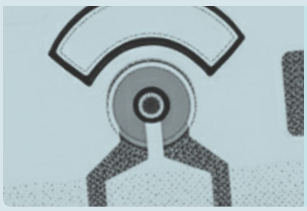
DATASHEET



VM100 940 MA-SM

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

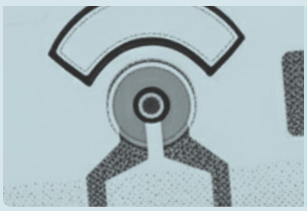
DATASHEET



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 MM
BANDWIDTH	~40 GHZ

DATASHEET

D35 SWDM

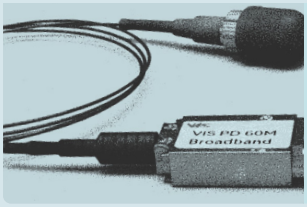
CONTACT TYPE	GSG
DIAMETER	25 MM
BANDWIDTH	~35 GHZ

DATASHEET

D30 SWDM

CONTACT TYPE	GSG
DIAMETER	~23 MM
BANDWIDTH	~30 GHZ

DATASHEET



D70 SWDM

CONTACT TYPE	GSG
DIAMETER	~25 MM
BANDWIDTH	~70 GHZ

DATASHEET

D400G

CONTACT TYPE	GSG
DIAMETER	~16 MM
BANDWIDTH	~60 GHZ (25Ω)

DATASHEET

13. CONTACT INFORMATION

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

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