Fiber Optic LAN Components
High Speed VCSEL Component

Preliminary
SV3641

FEATURES

- Designed for low drive currents between 2 and 7mA
- Flat Window TO-46 style package
- High speed ≥1 Ghz
- Advanced Technology VCSEL Chip
- 780nm wavelength
- Single Mode Lasing Operation

This is a new and advanced class of VCSELs from Honeywell having dramatically reduced electrical power consumption, reduced variation with temperature and excellent reliability. The 780nm single mode VCSELs are available in all of the current Honeywell VCSEL packaging configurations such as the TO46, fiber connectorized, and surface mount components. They will also be available in plastic encapsulated (Side Looker) package and a plastic surface mount package. Custom packaging designs are also available. The different packages are for different applications both in the datacom market as well as in the sensor market .

The SV3641 combines many of the desired features of an LED and the advantages of a laser diode operating in a single longitudinal mode and a single transverse mode. The VCSEL provides increased power output at low drive currents. As the current increases above its threshold, the light intensity increases proportionally.

ABSOLUTE MAXIMUM RATINGS

Parameter	Rating
Storage Temperature	-40 to +85°C
Case Operating Temperature	0 to +70°C
Lead Solder Temperature	260°C, 10 sec.
Power Supply Voltage	3 V

NOTICE

Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operations section for extended periods of time may affect reliability.

ELECTRO-OPTICAL CHARACTERISTICS (Vcc=5V, 0°C<T<70°C unless otherwise specified)

Parameter	Symbol	Units	Min	Typ	Max	Notes
Forward Voltage	V_F	V		2	2.5	T_A=25°C, I_F=4mA
Series Resistance	R_S	Ω	75	110	150	T_A=25°C
Series Resistance Temperature Coefficient	dR_S/dT	PPM/°C		-2000		I_F=3mA, 0-70°C
VCSEL reverse voltage	V_R	V		-10		I_R=1μA
Threshold Current	I_{TH}	mA		2		T_A=25°C
Threshold Current Temperature Coefficient	ΔI_{TH}	mA	-0.1		0.1	0-70°C 1
Slope Efficiency	η	mW/mA	0.25	0.35	0.6	T_A=25°C
Slope Efficiency Temperature Coefficient	dη/dT	PPM/°C		-6000		3-4mA, T_A=0-70°C
Power	P	mW	0.7			I_F=5mA
Beam Divergence	Θ_{FWHM}	deg		11	20	T_A=25°C, I_F=3mA
Rise/Fall Time	T_R,T_F	ps		150		1
Peak Wavelength	λ	nm	760	780	790	T=25C, I_F=4mA
Side mode suppression Ratio	SMSR	dB	15	30		T_A=25°C, I_F=4mA
Wavelength temperature coefficient	dλ/dT	nm/°C		0.06		0-70°C
Relative Intensity Noise	RIN	dB/Hz				

Notes:

1. Minimum threshold occurs above room temperature. This helps in reducing power variation over temperture at a constant current.
2. Rise and fall times are sensitive to drive electronics. All Honeywell single mode VCSELs can be made to have rise and fall times less than 100ps.

NOTICE

The inherent design of this component causes it to be sensitive to electrostatic discharge (ESD). To prevent ESD-induced damage and/or degradation to equipment, take normal ESD precautions when handling this product

These single-mode parts have very small active volumes, leading to several notable properties.

- They are even more sensitive to ESD than are multi-mode VCSELs or CD lasers.
- They operate at currents typically below 5 mA and should never be driven at much higher currents.
- The spectral peak shifts significantly with current—as much as several nanometers per mA, but shifts only slowly with ambient temperature (at 0.06 nm/°C). Operation at a particular wavelength can be achieved by first setting the current at an appropriate level, then adjusting the temperature.
- While they are designed to stay single mode over the whole operating current range, at very high currents they may become multi-mode, increasing the spectral width and the beam divergence.
- As samples of a yet-to-be-released product, these parts have not been subjected to all of Honeywell's normal rigorous parametric and reliability screening. They have been tested sufficiently to assure acceptable operation, and the reliability of parts produced with this general process has been established. These parts are supplied as-is, with no warranty express or implied, to allow users to begin preliminary evaluations of this type of VCSEL
- Despite their low operating currents, these VCSELs can emit sufficient power to be categorized as Class 3 lasers, and should be treated with the usual precautions.
- The approximate distance from the window to the emitting surface is about 0.072 inches

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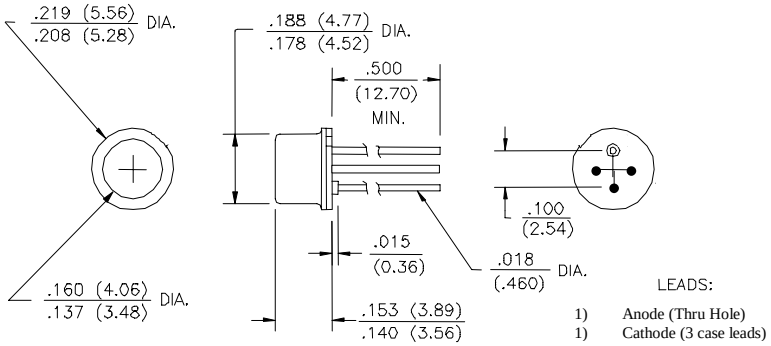
ORDER GUIDE

Catalog Listing	Description
SV3641	High Speed Advanced Technology VCSEL Component

MOUNTING DIMENSIONS (for reference only) in./(mm)



WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and is **in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose**.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact a nearby sales office.

SALES AND SERVICE

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