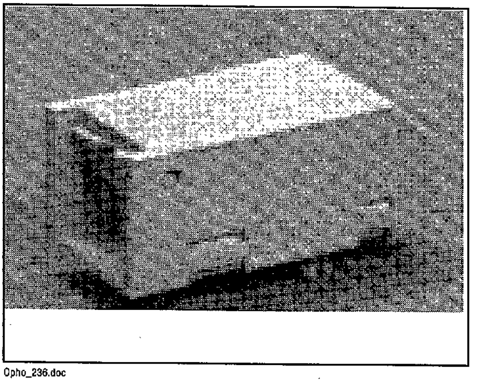
HFM2600-001

VF45 Transceiver

FEATURES

- Compatible with Ethernet and Token Ring protocols
- Innovative NEW style interconnect is competitive with UTP solutions for Fiber-To-The-Desktop
- Small footprint allows high density port spacing



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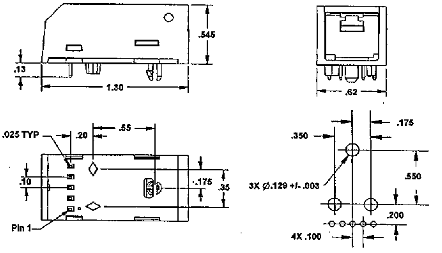
DESCRIPTION

The VF45 Fiber Optic transceiver is intended to provide a low cost solution to the requirements of 10 Mbit Ethernet and 4/16 Mbit Token Ring LAN applications. The HFM2600 combines a fiber optic transmitter and receiver with an innovative new connection scheme. The HFM2600 lends itself to high density applications by significantly reducing the board space required for a fiber optic transceiver. The inexpensive VF45 connection scheme enables cost effective fiber-to-the-desktop in the horizontal LAN cabling environment, while maintaining high standards of performance. The HFM2600 is completely interoperable with existing short wavelength fiber optic solutions for Ethernet and Token Ring.

The HFM2600 utilizes existing Honeywell optoelectronic components and IC's with proven capabilities in the Ethernet and Token Ring LAN environment. The new style interconnect allows the HFM2600 to look and feel similar to existing UTP copper interconnects with the added benefits of fiber optic performance.

The transmitter consists of a high reliability GaAlAs 850nm LED coupled to a multimode fiber through a VF45 style connector. The LED uses a glass microlens over the Caprock junction to collimate the light, increasing the intensity, which provides for consistent power launch into fiber optic cables.

OUTLINE DIMENSIONS in inches (mm)



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Pinout

1. RX Vcc
2. RX Output
3. RX Gnd
4. LED Anode
5. LED Cathode

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DESCRIPTION (continued)

The hybrid bipolar fiber optic receiver consists of a silicon PIN photodiode for high speed operation and a transimpedance preamplifier IC for excellent noise immunity. The device is designed to operate on the ECL standard of -5.2 volts and has very good Power Supply Rejection Ratio (20 db @ 10 MHz typical). It can also be operated with a +5 volts supply although some PSRR performance will be sacrificed at data rates below 1 MHz.

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TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS

(T_A=25°C unless otherwise stated)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Fiber Coupled Power [1] [2]	P_{OC} Avg.	-21.8	-17.8	-15.8	dBm	I_F=32mA Peak; 50% duty cycle; 50 µm fiber
	P_{OC} Avg.	-22.3		-15.3	dBm	NA=0.20 (Over Temp)
Fiber Coupled Power [1] [2]	P_{OC} Avg.	-18.0	-14.0	-12.0	dBm	I_F=32mA Peak; 50% duty cycle; 62.5 µm fiber
	P_{OC} Avg.	-18.5		-11.5	dBm	NA=0.275 (Over Temp)
Forward Voltage	V_F		1.60		V	I_F = 32 mA
	V_F	1.48	1.70	2.09	V	I_F = 60 mA
Forward Voltage Temperature	$\Delta V_F/\Delta T$		-0.25		mV/°C	I_F = 32 mA
Coefficient	$\Delta V_F/\Delta T$		-0.22		mV/°C	I_F = 60 mA
Reverse Voltage	B_{VR}	1.8	3.8		V	I_R = 10 µA
Peak Wavelength	λ_P				nm	I_F = 32 mA DC
	λ_P	810	850	885	nm	I_F = 60 mA DC
Response Time	t_R/t_F		4.0	6.0	ns	I_F = 32 mA peak, No Prebias
Po Temperature Coefficient	$\Delta P_O/\Delta T$		-0.019		dB/°C	I_F = 100 mA
	$\Delta P_O/\Delta T$		-0.024		dB/°C	I_F = 60 mA
Series Resistance	r_S		4.0		Ω	DC
Device Capacitance	C		55		pF	V_R = 0 V, f = 1 MHz
Thermal Resistance			260		°C/W	Heat sinked

Notes

1. Maximum degradation at end of life = 2 dB.
2. P_{OC} is measured using a 10 meter mode stripped cable which is intended to accurately represent a working system.

HFM2600-001

VF45 Transceiver

RECEIVER ELECTRO-OPTICAL CHARACTERISTICS

(T_A = 0 °C < T < 70 °C, V_{EE} = -5.2V, unless otherwise specified)

PARAMETER	SYMBOL	MIN	TYP (1)	MAX	UNITS	TEST CONDITIONS
Response Time (2) @ 25 °C	t_R/t_F	5.3	7.0	9.6	ns	I_F = 32 mA peak, No Prebias; P_{IN} = 100 µW Peak
Over Temperature 0 to +70 °C	R	4.5		11.5	mV/µW	λ = 850 nm; 62.5µm core fiber
Input Power @ 25 °C	P_{IN} (Avg.)	-34 0.4		-10.6 87.5	dBm µW	f = 10 MHz; 50% duty cycle λ = 850 nm
Over Temperature 0 to 70 °C	P_{IN} (Avg.)			-11.2 75	dBm µW	PWD = 2.5 nS
DC Output Voltage (3)	V_{ODC}	-4.0	-3.65	-3.3	V	P_{IN} ≤ 0.1 µW
Power Supply Current @ 25 °C	I_{CC}		9	15	mA	R_{LOAD} = 0
Rise/Fall Time @ 25 °C	t_R / t_F		3.6	4.5	ns	f = 10 MHz; 50% duty cycle; P_{IN} = 50 µW avg.
Over Temperature 0 to +70 °C	t_R / t_F		3.6	6.3	ns	λ = 850 nm
Pulse Width Distortion (4)	PWD		0.2	2.5	ns	f = 10MHz; 50% duty cycle P_{IN} = 75 µW avg.; λ = 850 nm
Bandwidth	BW		125		MHz	λ = 850 nm; R = .707R Max.
RMS Noise Output Voltage @ 25 °C	V_{NO}		0.52	0.58	mV	P_{IN} = 0 µW; 75 MHz 3 pole Bessel filter on output
	V_{NO}			0.70	mV	No filter on output
Output PSRR (5)			20		dB	f = 10MHz
Output Overshoot @ 25 °C			10	13	%	P_{IN} = 10 µW
Output resistance			20		Ω	f = 50MHz
RMS Input Noise Power @ 25 °C (6) (7)	P_{IN}		-41.3 0.074	-41.0 0.079	dBm µW	P_{IN} = 0 µW 75 MHz, 3 pole Bessel filter on output

Notes

1. Typical specifications are for operations at T_A= 25°C.
2. Photodiode has 600mm (0.24 in.) diameter microlens for optical coupling.
3. Quiescent output voltage V_{ODC} = V_{CC} - 3.65 Volts typical. Dynamic output voltage swing is above the quiescent output voltage (V_O= V_{ODC}+ R x P_{IN}).
4. Measured at the 50% amplitude point on the output waveform.
5. Output PSRR is defined as 20 log (Vsupply Ripple/Vout Ripple).
6. Input referred noise is calculated as P_{HI} = V_{NO} / R
7. Output pinh should be AC coupled to a 511 ohm load. Load capacitance <50pf (see circuit diagram).

ABSOLUTE MAXIMUM RATINGS

RECEIVER

Storage temperature	-40 to +85 °C
Operating temperature	0 to +70 °C
Lead solder temperature	260 °C for 10 sec.
Supply voltage (V_{CC} - V_{EE})	-0.5 to 6.0 Volts

TRANSMITTER

Storage temperature	-40 to +85 °C
Operating temperature	0 to +70 °C
Lead solder temperature	260 °C for 10 sec.
Reverse input voltage	1.8 Volts
Continuous forward current (heat sinked)	100 mA

RECOMMENDED OPERATING CONDITIONS

Supply voltage (V_{CC} - V_{EE})	5.0 to 5.5 Volts
Optical signal input	1.0 to 100 µW

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 operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

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ORDER GUIDE

Description	Catalog Listing
Fiber Optic VF45 Transceiver	HFM2600-001

To order the Patch Cords please call 3M at 1-800/426-8688
Patch Cord Part number
VOL-V6R3 (62.5um, VF45-to-VF45 , 3m long)
VOL-T6R3 (62.5um, VF45-to-ST, 3m long)
VOL-C6R3 (62.5um, VF45-to-SC, 3m long)

This package is also available in special interface receptacles for interfacing to standard fiber optic cables.

CAUTION

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.

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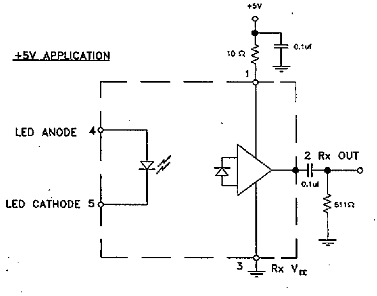

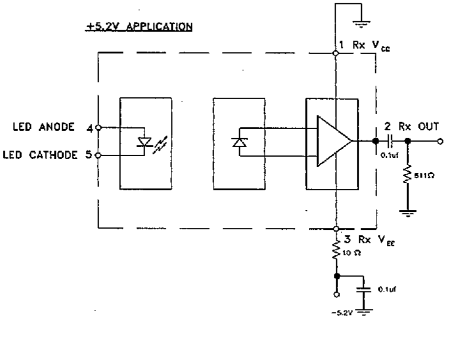

Fig. 1 Typical Optical Power Output vs Forward Current

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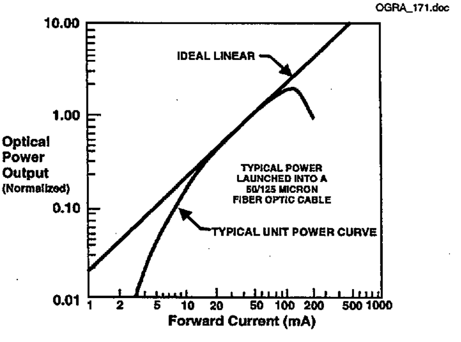

HFM2600-001

VF45 Transceiver

Fig. 2 Typical Spectral Output vs Wavelength

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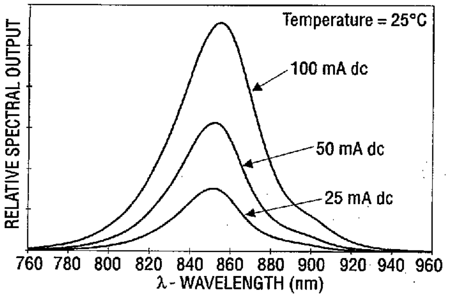

Fig. 3 Typical Optical Power Output vs Case Temperature

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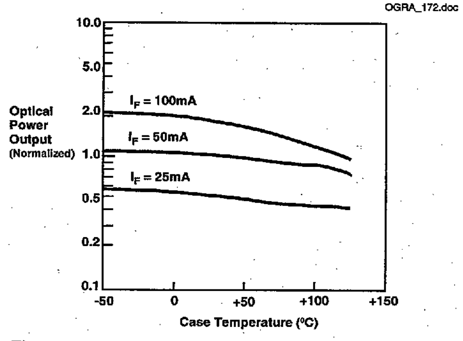

Fig. 4 Spectral Response

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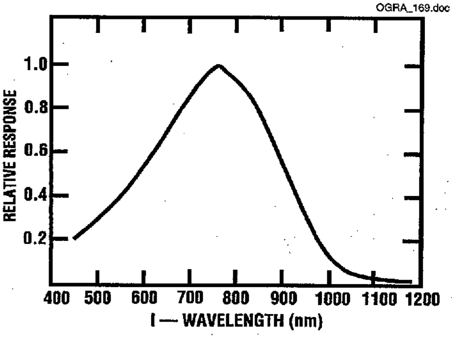

Fig. 5 Pulse Width Distortion vs Optical Input Power

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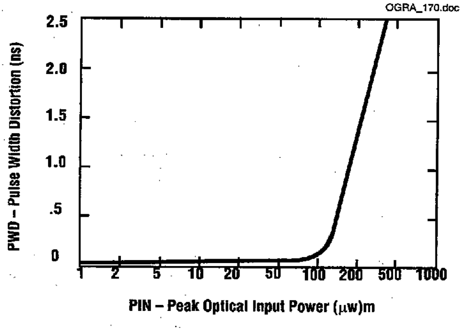

Fig. 6 Switching Waveform

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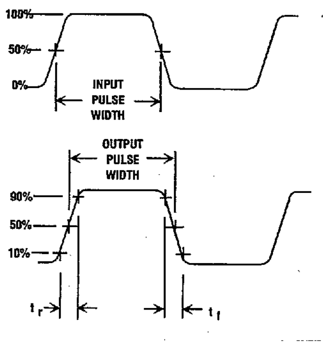

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