



电子元器件系列 (中国.厦门)

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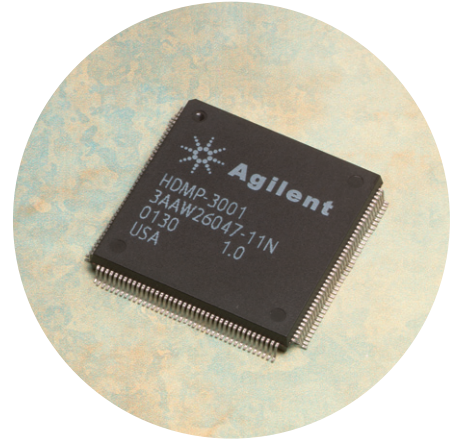
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## Multi-Protocol IC

Network operators and telecommunications customers are trying to get maximum value from installed equipment. In order to extract maximum value in the Metro Access area, where Ethernet-based Enterprise networks meet SONET-based Metro networks, equipment must support multiple protocols in the same equipment.

Agilent's Multi-Protocol IC (MPIC) provides full-duplex mapping of Ethernet frames encapsulated into SONET/SDH payloads. The HDMP-3001 simplifies and reduces the cost of maintaining corporate networks spanning several geographic sites. It enables network equipment manufacturers to design equipment that corporate customers can use to create direct LAN to LAN connections over existing SONET/SDH networks.



**Agilent's multi-protocol IC allow Ethernet-based data to travel over SONET/SDH-based METRO networks**

### Ethernet to SONET/SDH Framer/Mapper Selection Guide

Data Rate	SONET/SDH Data Rate	Ethernet Data	Protocol	Vcat	Part Number
155 Mb/s	Line Side Parallel STS-3c/STM-1	Full Duplex Fast Ethernet	GFP, (G.7041) and LAPS, X.86	No	HDMP-3001

### G-Link Selection Guide

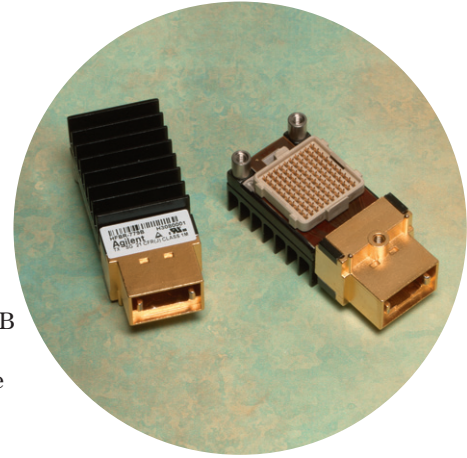
Data Rates	Parallel Data Bits	Package Type	Parallel I/O	Tx/Rx	Part Number
260-1400	16,17	64 pin PQFP	LVTTTL	Tx	HDMP-1032A
				Rx	HDMP-1034A
150-1500	16,17,20,21	80 pin MQUAD	TTL	Tx	HDMP-1022
				Rx	HDMP-1024

## Parallel Optics Modules

Today's scaleable networking equipment allows network operators to increase capacity simply by adding one or more chassis to the original configuration. Pluggable parallel fiber optics modules offer a cost-effective and reliable method of optical interconnection in multi-chassis equipment, offering the speed, density and reach that designers demand. The devices are aimed at applications such as proprietary system interconnects (optical backplanes), OC-192 very short reach (VSR), InfiniBand systems and large multiprocessor system interconnects.

Agilent's 12-channel parallel optics modules operate at 2.7 gigabits per second (Gb/s) per channel. The modules combine with industry-standard fiber optic cables and connectors to deliver an aggregate throughput of 32 Gb/s. The HFBR-772B transmitter and HFBR-782B receiver pair occupies approximately the same area as two 1 Gb/s small form factor (SFF) transceivers, but provides performance 15 times greater. The products comply with the SNAP12 multi-source agreement (MSA).

Agilent also offers a parallel optics module with 4 transmit and 4 receive channels in one package, each operating at 1 to 2.7 Gb/s, for an aggregate bandwidth of 4 to 10.8 Gb/s in each direction. The Agilent transceiver conforms to the POP4 MSA standard.



**Agilent's Parallel Optics solutions offer very high throughput in a small footprint.**

### Parallel Optics Transceivers Selection Guide

	Temp	Voltage	Package	Connector	Pin-Out	Part Number
10 Gbps Short Reach 500 m 850 nm (Multi-Mode)	0 to 70°C	3.3 V	Pluggable	MTP™/MPO	10x10 MegArray	HFBR-7924 (4+4 x 2.7 Gbd, Pluggable MSA Compliant)

### Parallel Optics Transmitters and Receivers Selection Guide

Proprietary System Interconnect (PSI) Short Reach 500 m 850 nm (Multi Mode)	0 to 70°C	3.3 V	Pluggable	MTP™/MPO	10x10 MegArray	HFBR-772B (Transmitter, 12 x 2.5-2.72 Gbd Pluggable MSA Compliant, 50/125 μm)
				MTP™/MPO	10x10 MegArray	HFBR-782B (Receiver, 12 x 2.5-2.72 Gbd Pluggable MSA Compliant, 50/125 μm)
				MTP™/MPO	10x10 MegArray	HFBR-7793 (Transmitter, 12 x 2.5-2.72 Gbd Pluggable MSA Compliant, 62.5/125 μm)
				MTP™/MPO	10x10 MegArray	HFBR-789B (Receiver, 12 x 2.5-2.72 Gbd Pluggable MSA Compliant, 62.5/125 μm)

## Pluggable DWDM Transceivers

Agilent designed and developed the industry's first hot-pluggable dense wavelength division multiplex (DWDM) transceivers which are used to send multiple channels of data, voice or video over a single fiber optic link.

The Agilent AFKC-xxxx devices allow network service providers to plug in a DWDM transceiver exactly when and where it's needed, and at any wavelength, reducing inventory costs. The transceivers also eliminate system downtime during upgrades and service calls. And multi-rate operation (from 155 Mb/s to 2.7 Gb/s) allows operators to offer flexible service.

Network equipment manufacturers will also benefit from the transceivers' pluggability as it eliminates cumbersome fiber "pigtailed" and pin through-hole devices that are difficult to assemble in high-volume systems. Additionally, Agilent's hot-pluggable transceivers feature integrated control of the laser to reduce equipment design cycles and shorten time to market. Their integrated wavelength locker saves space and equips the platform for future high-density DWDM applications.

Agilent has spearheaded a hot-pluggable DWDM transceiver MSA to ensure multiple sources for customers.

### DWDM Transceiver Selection Guide

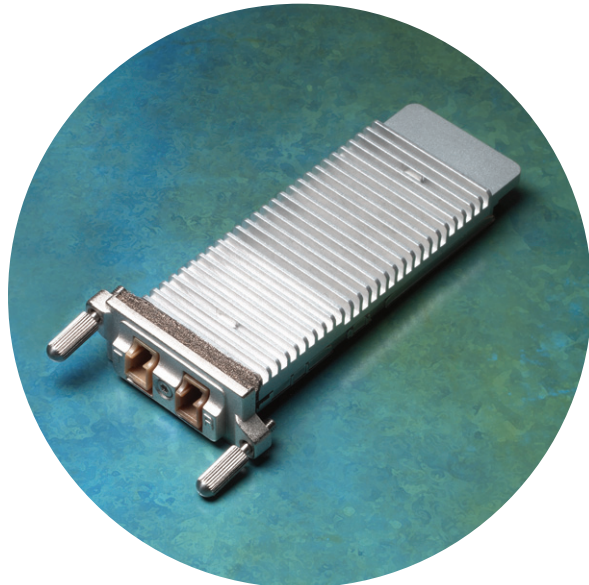
	Temp	Voltage	Package	Connector	Pin-Out	Part Number
OC-48 100 km reach DWDM (single mode)	-5 to 70°C	3.3 V	MSA (1)	LC	70 pin	AFKC-xxxxD (xxxx specifies wavelength - note 2 AFKC-1000D (unspecified wavelength)
OC-48 160 km reach DWDM (single mode)	-5 to 70°C	3.3 V	MSA (1)	LC	70 pin	AFKC-xxxxE (xxxx specifies wavelength - note 2 AFKC-1000E (unspecified wavelength)

#### Notes

1. MSA package can be found at [www.hotplugdwdm.org/msa.htm](http://www.hotplugdwdm.org/msa.htm)
2. See page 11 of datasheet

#### Accessories

- AFKA-0001 Rail mechanism for AFKC series  
 AFKA-0002 EMI kennel for AFKC series



Agilent Technologies  
Pluggable DWDM  
transceiver.



**Agilent's SONET/SDH transceivers offer a variety of data rates, distance, temperature ranges and package configurations.**

### **SONET/SDH –Compliant Fiber Optic Transceivers**

Agilent is the world's leading provider of fiber optic transceivers and the METRAK family of high performance transceivers for SONET/SDH applications showcases the Agilent advantage. The new small form factor (SFF) PTH (pin-through-hole), and small form factor pluggable (SFP) transceiver devices feature an LC connector and are available for long reach, intermediate reach and short reach applications. Agilent has focused its legendary manufacturing capabilities to deliver OC-3, OC-12, and OC-48 devices to meet the expanding demands of the MAN.

Using Fabry-Perot (FP) and Distributed Feedback (DFB) laser technologies, Agilent delivers the industry's broadest line of Metro SFF transceivers, providing a variety of data rates, distance, temperature ranges, and package configuration. The transceivers demonstrate superior jitter performance and low EMI emissions for increased design flexibility in meeting regulatory standards. Each METRAK product is tested for Bellcore Standard compliance, and has passed rigorous tests for mechanical and thermal shock, vibration, moisture, and high temperature endurance. The devices also comply with all regulations for eye safety and flammability.

#### **Jitter performance**

	<b>SONET Specification</b>	<b>Agilent OC-48 Transceiver</b>
Peak to Peak	100 mUI	30 mUI (typical)
RMS	10 mUI	3 mUI (typical)

**OC-3/SONET/SDH SFF/SFP Fiber Optic Transceivers Selection Guide**

	Temp	Voltage	Package	Connector	Pin-Out	Part Number
OC-3 Short Reach <2 km 1300 nm (Multi-Mode)	0 to 70°C	5 V	Duplex	SC	1x9	HFBR-5204 (500 m)
				SC	1x9	HFBR-5204P (Mezzanine height)
				SC	1x9	HFBR-5205
				SC	1x9	HFBR-5205P (Mezzanine height)
				SC	1x9	HFBR-5205PE (Mezzanine height w/extended shield)
				ST	1x9	HFBR-5204T
		ST	1x9	HFBR-5205T		
		3.3 V	Duplex	SC	1x9	HFBR-5805
	ST			1x9	HFBR-5805T	
	SFF PTH	MTRJ	2x5	HFBR-5905 (No nose shield)		
	-40 to +85°C	5 V	Duplex	SC	1x9	HFBR-5205A
				ST	1x9	HFBR-5205AT
	-10 to +85°C	3.3 V	Duplex	SC	1x9	HFBR-5805A
				ST	1x9	HFBR-5805AT
	-40 to +85°C		SFF PTH	MTRJ	2x5	HFBR-5905 (No nose shield)
OC-3 Intermediate Reach 15 km 1300 nm (Single Mode)	0 to 70°C	5 V	Duplex	SC	1x9	HFCT-5205B (Black Case)
				SC	1x9	HFCT-5205D (Blue Case)
				SC	2x9	HFCT-5201B (Black Case)
				SC	2X9	HFCT-5201D (Blue Case)
		3.3 V	Duplex	SC	1x9	HFCT-5805B (Black Case)
				SC	1x9	HFCT-5805D (Blue Case)
				SC	2x9	HFCT-5801B (Black Case)
				SC	2x9	HFCT-5801D (Blue Case)
			SFF PTH	LC	2x10	HFCT-5962TG (No nose shield)
				LC	2x10	HFCT-5962TL
				LC	2x10	HFCT-5964TG (SD LV TTL, no nose shield)
				LC	2x10	HFCT-5964TL (Signal Detect LV TTL)
		LC		2x5	HFCT-5961TG (No nose shield)	
		LC		2x5	HFCT-5961TL	
		LC		2x5	HFCT-5963TG (SD LV TTL, no nose shield)	
		LC		2x5	HFCT-5963TL (Signal Detect LV TTL)	
	SFP	LC	Pluggable	HFCT-5760TL (w/o diagnostic monitoring interface "DMI"), std de-latch		
		LC	Pluggable	HFCT-5760TP (w/o diagnostic monitoring interface "DMI"), bail de-latch		
	-40 to +85°C	5 V	Duplex	SC	1x9	HFCT-5205A (Black Case)
				SC	1x9	HFCT-5205C (Blue Case)
				SC	2x9	HFCT-5201A (Black Case)
				SC	2x9	HFCT-5201C (Blue Case)
			Duplex	SC	1x9	HFCT-5805A (Black Case)
				SC	1x9	HFCT-5805C (Blue Case)
				SC	2x9	HFCT-5801A (Black Case)
				SC	2x9	HFCT-5801C (Blue Case)
		3.3 V	SFF PTH	LC	2x10	HFCT-5962ATG (no nose shield)
				LC	2x10	HFCT-5962ATL
				LC	2x10	HFCT-5964ATG (SD LV TTL, no nose shield)
				LC	2x10	HFCT-5964ATL (Signal Detect LV TTL)
LC				2x5	HFCT-5961ATG (No nose shield)	
LC				2x5	HFCT-5961ATL	
LC				2x5	HFCT-5963ATG (SD LV TTL, no nose shield)	
LC				2x5	HFCT-5963ATL (Signal Detect LV TTL)	
SFP	LC	Pluggable	HFCT-5760ATL (w/o diagnostic monitoring interface "DMI"), std de-latch			
	LC	Pluggable	HFCT-5760ATP (w/o diagnostic monitoring interface "DMI"), bail de-latch			

**OC-3/SONET/SDH SFF/SFP Fiber Optic Transceivers Selection Guide**

	Temp	Voltage	Package	Connector	Pin-Out	Part Number
OC-3 Long Reach 40 km 1300 nm (Single Mode)	0 to 70°C	5 V	Duplex	SC	1x9	HFCT-5215B (Black Case)
				SC	1x9	HFCT-5215D (Blue Case)
		3.3 V	SFF PTH	LC	2x10	HFCT-5962NG (No nose shield)
				LC	2x10	HFCT-5962NL
				LC	2x10	HFCT-5964NG (SD LV TTL, no nose shield)
				LC	2x10	HFCT-5964NL (Signal Detect LV TTL)
				LC	2x5	HFCT-5961NG (No nose shield)
				LC	2x5	HFCT-5961NL
				LC	2x5	HFCT-5963NG (SD LV TTL, no nose shield)
				LC	2x5	HFCT-5963NL (Signal Detect LV TTL)
				MTRJ	2x5	HFCT-5915E
				SFP	LC	Pluggable
			LC		Pluggable	HFCT-5760NP (w/o diagnostic monitoring interface "DMI") , bail de-latch
			LC		Pluggable	HFCT-5760ANL (w/o diagnostic monitoring interface "DMI") , std de-latch
		LC	Pluggable		HFCT-5760ANP (w/o diagnostic monitoring interface "DMI") , bail de-latch	

**OC-12/SONET/SDH SFF/SFP Fiber Optic Transceivers Selection Guide**

	Temp	Voltage	Package	Connector	Pin-Out	Part Number	
OC-12 Short Reach 500 m 1300 nm (Multi-Mode)	0 to 70°C	5 V	Duplex	SC	1x9	HFBR-5208EM (Extended shield)	
				SC	1x9	HFBR-5208FM (Flush shield)	
				SC	1x9	HFBR-5208M (No shield, metallized housing)	
	-40 to +85°C	5 V	Duplex	SFF PTH	MTRJ	2x5	HFBR-5908E (With nose shield)
				SC	1x9	HFBR-5208AEM (Extended shield)	
					1x9	HFBR-5208AFM (Flush shield)	
1x9	HFBR-5208AM (No shield, metallized housing)						
OC-12 Intermediate Reach 15 km 1300 nm (Single Mode)	0 to 70°C	5 V	Duplex	SC	1x9	HFCT-5208EM (Extended shield)	
				SC	1x9	HFCT-5208FM (Flush shield)	
				SC	1x9	HFCT-5208M (No shield, metallized housing)	
		3.3 V	SFF PTH	LC	2x10	HFCT-5952TG (No nose shield)	
				LC	2x10	HFCT-5952TL	
				LC	2x5	HFCT-5951TG (No nose shield)	
				LC	2x5	HFCT-5951TL	
				LC	2x5	HFCT-5954TG (No nose shield, multi-rate)	
				LC	2x5	HFCT-5954TL (Multi-rate)	
				LC	2x5	HFCT-5953TG (No nose shield, multi-rate)	
	SFP	LC	Pluggable	HFCT-5750TL (w/o diagnostic monitoring interface "DMI"), std de-latch			
		LC	Pluggable	HFCT-5750TP (w/o diagnostic monitoring interface "DMI"), bail de-latch			
	-40 to +85°C	5 V	Duplex	SC	1x9	HFCT-5208AEM (Extended shield)	
				SC	1x9	HFCT-5208AFM (Flush shield)	
				SC	1x9	HFCT-5208AM (No shield, metallized housing)	
		3.3 V	SFF PTH	LC	2x10	HFCT-5952ATG (No nose shield)	
				LC	2x10	HFCT-5952ATL	
				LC	2x5	HFCT-5951ATG (No nose shield)	
				LC	2x5	HFCT-5951ATL	
LC				2x10	HFCT-5954ATG (No nose shield, multi-rate)		
LC				2x10	HFCT-5954ATL (Multi-rate)		
LC				2x5	HFCT-5953ATG (No nose shield, multi-rate)		
SFP	LC	Pluggable	HFCT-5750ATL (w/o diagnostic monitoring interface "DMI"), std de-latch				
	LC	Pluggable	HFCT-5750ATP (w/o diagnostic monitoring interface "DMI"), bail de-latch				
OC-12 Long Reach 40 km 1300 nm (Single Mode)	0 to 70°C	5 V	Duplex	SC	1x9	HFCT-5218M (No shield, metallized housing)	
				SC	1x9	HFCT-5218EM (Extended shield)	
				SC	1x9	HFCT-5218FM (Flush shield)	
	3.3 V	SFF PTH	LC	2x10	HFCT-5952NG (No nose shield)		
			LC	2x10	HFCT-5952NL		
			LC	2x5	HFCT-5951NG (No nose shield)		
LC	2x5	HFCT-5951NL					



**OC-48/SONET/SDH SFF/SFP Fiber Optic Transceivers Selection Guide**

	Temp	Voltage	Package	Connector	Pin-Out	Part Number
OC-48 Short Reach 2 km 1300 nm (Single-Mode)	0 to 70°C	3.3 V	SFF PTH	LC	2x10	HFCT-5942G (no nose shield)
				LC	2x10	HFCT-5942L
				LC	2x5	HFCT-5941G (no nose shield)
				LC	2x5	HFCT-5941L
				LC	2x10	HFCT-5944L (Multi-rate)
				LC	2x10	HFCT-5944G (No nose shield, multi-rate)
				LC	2x5	HFCT-5943L (Multi-rate)
				LC	2x5	HFCT-5943G (No nose shield, multi-rate)
	-40 to +85°C	3.3 V	SFF PTH	LC	2x10	HFCT-5942AG (no nose shield)
				LC	2x10	HFCT-5942AL
				LC	2x5	HFCT-5941AG (no nose shield)
				LC	2x5	HFCT-5941AL
				LC	2x10	HFCT-5944AL (Multi-rate)
				LC	2x10	HFCT-5944AG (No nose shield, multi-rate)
				LC	2x5	HFCT-5943AL (Multi-rate)
				LC	2x5	HFCT-5943AG (No nose shield, multi-rate)
OC-48 Intermediate Reach 15 km 1300 nm (Single Mode)	0 to 70°C	3.3 V	SFF PTH	LC	2x10	HFCT-5942TG (no nose shield)
				LC	2x10	HFCT-5942TL
				LC	2x5	HFCT-5941TG (no nose shield)
				LC	2x5	HFCT-5941TL
				LC	2x10	HFCT-5944TL (Multi-rate)
				LC	2x10	HFCT-5944TG (No nose shield, multi-rate)
				LC	2x5	HFCT-5943TL (Multi-rate)
				LC	2x5	HFCT-5943TG (No nose shield, multi-rate)
	-20 to +85°C	3.3 V	SFF PTH	LC	2x10	HFCT-5942ATG (no nose shield)
				LC	2x10	HFCT-5942ATL
				LC	2x5	HFCT-5941ATG (no nose shield)
				LC	2x5	HFCT-5941ATL
				LC	2x10	HFCT-5944ATL (Multi-rate)
				LC	2x10	HFCT-5944ATG (No nose shield, multi-rate)
				LC	2x5	HFCT-5943ATL (Multi-rate)
				LC	2x5	HFCT-5943ATG (No nose shield, multi-rate)