Features

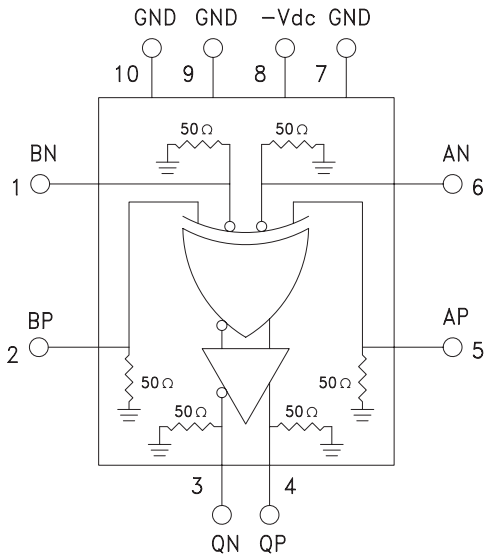
Supports Data Rates up to 50 Gbps
Inputs Terminated Internally in 50 ohms
Supports Single-Ended or Differential Operation
Low Power Consumption: 550mW
Less than 200 fs Additive RMS Jitter
Single -3.3 V Power Supply
Hermetically Sealed Module: 1.85mm Connectors
-40°C to +70°C Operating Temperature

Typical Applications

The HMC-C064 is ideal for:

- OC-768 and SDH STM-256 Equipment
- Serial Data Transmission up to 50 Gbps
- Digital Logic Systems up to 50 Gbps
- Broadband Test and Measurement

Functional Diagram



General Description

The HMC-C064 is a XOR/XNOR gate function designed to support data transmission rates of up to 50 Gbps. All input signals to the HMC-C064 are terminated with 50 Ohms to ground on-chip, and may be either AC or DC coupled. The differential outputs of the HMC-C064 may be either AC or DC coupled. Outputs can be connected directly to a 50 Ohm to ground terminated system, while DC blocking capacitors may be used if the terminating system is 50 Ohms to a non-ground DC voltage. The HMC-C064 operates from a single -3.3V DC supply, and is supplied in a hermetically sealed module with 1.85mm connectors.

Electrical Specifications, T_A = +25°C, -Vdc = Vee = -3.3V

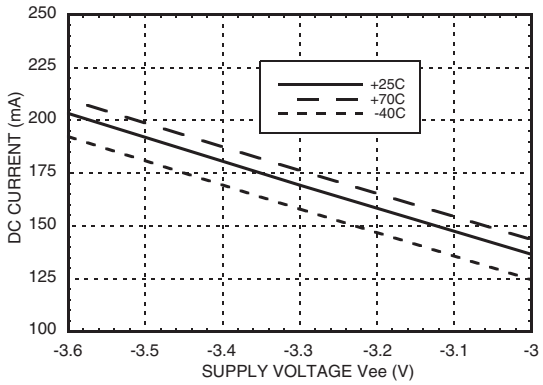
Parameter	Conditions	Min.	Typ.	Max	Units
Power Supply Voltage	±10% Tolerance	-3.6	-3.3	-3	V
Power Supply Current			168	195	mA
Maximum Data Rate	NRZ Format	50			Gbps
Maximum Clock Rate		25			GHz
Deterministic Jitter [1]			2		ps p-p
Additive Random Jitter [2]			0.2		ps rms
Rise Time, tr	20% - 80%		6.5		ps
Fall Time, tf	20% - 80%		10		ps
Data Output Swing	Differential Output Swing	400	480		mV p-p

Electrical Specifications, (continued)

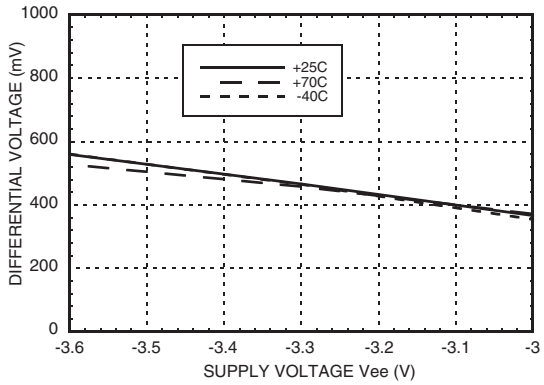
Parameter	Conditions	Min.	Typ.	Max	Units
Input Return Loss	up to 28 GHz		10		dB
Output Return Loss	up to 28 GHz		10		dB
Propagation Delay, td			230		ps
Data Input Amplitude	Single-Ended Amplitude	100		800	mV p-p
	Differential Amplitude	100		2000	mV p-p
Input High Voltage		-0.5		0.5	V
Input Low Voltage		-1		0	V
Output High Voltage			-10		mV
Output Low Voltage			-300		mV

[1] Deterministic jitter measured at 45 Gbps with PRBS 2^{13}-1 pattern. It is the peak to peak deviation from the ideal time crossing
[2] Random jitter is measured with 45 Gbps 10101… pattern

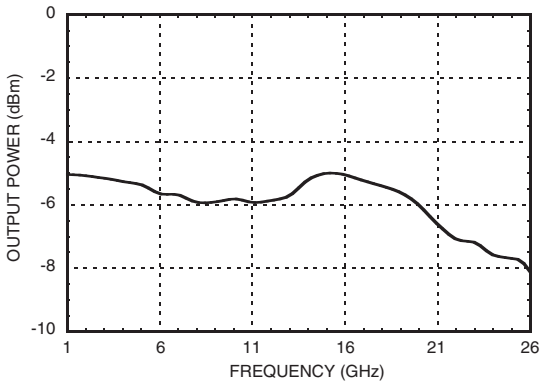
DC Current vs. Supply Voltage



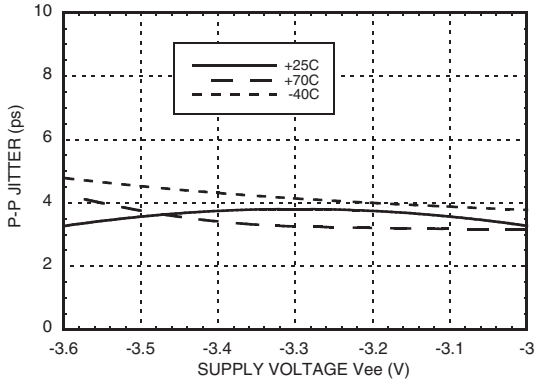
Differential Output vs. Supply Voltage



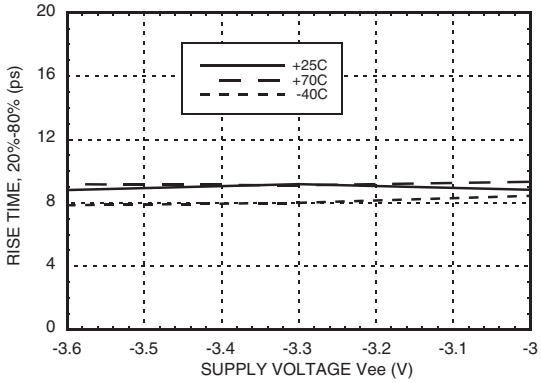
Output Power vs. Frequency



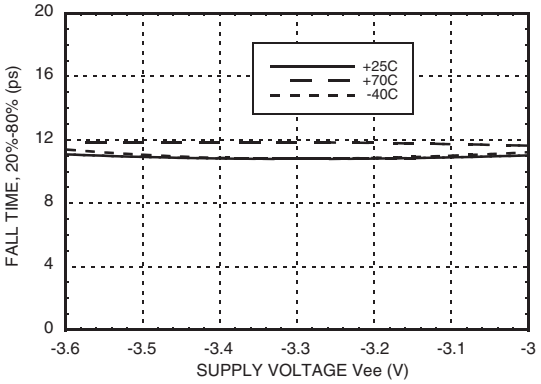
Peak-to-Peak Jitter vs. Supply Voltage [1] [2]



Rise Time vs. Supply Voltage [1]



Fall Time vs. Supply Voltage [1]



[1] Data input = 45Gbps PRBS 2^23-1 [2] Source jitter was not deembedded.

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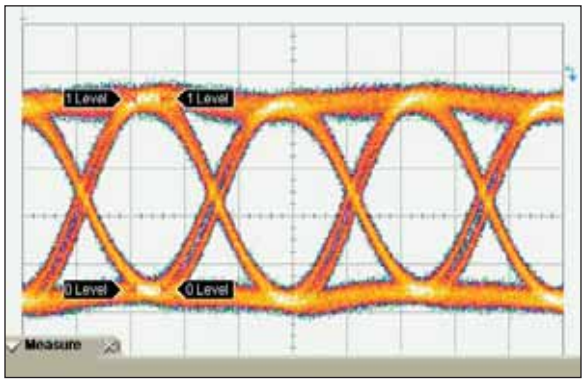
20 Alpha Road Chelmsford, MA 01824 Phone: 978-250-3343 Fax: 978-250-3373
Order Online at www.hittite.com

Output Eye Diagram



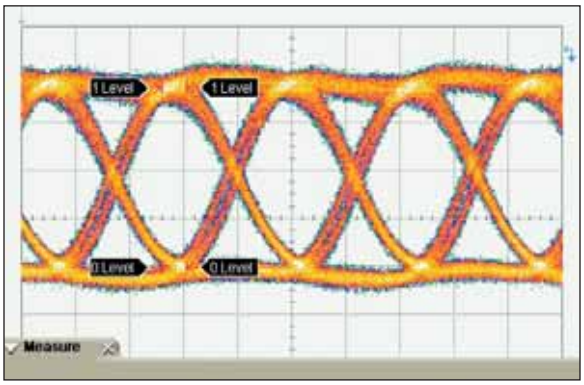
	Current	Minimum	Maximum	Total Meas
Jitter p-p (3)	3.333 ps	3.111 ps	3.333 ps	30
Rise Time (3)	8.67 ps	7.78 ps	8.89 ps	30
Fall Time (3)	10.67 ps	10.67 ps	10.89 ps	30
Single-Ended Eye Amplitude (3)	239 mV	239 mV	239 mV	30

Vertical Scale	60.2 mV / div
Horizontal Scale	10.0 ps / div

Test Conditions

Eye diagram data presented on an Infinium DCA 86100A
AP = 40 GB/s PRBS 2^{23} -1
BP = 40 GB/s 10101 ... data stream
Pseudo Random Code = 2^{23} -1
Vin = 250 mVpp differential

Output Eye Diagram



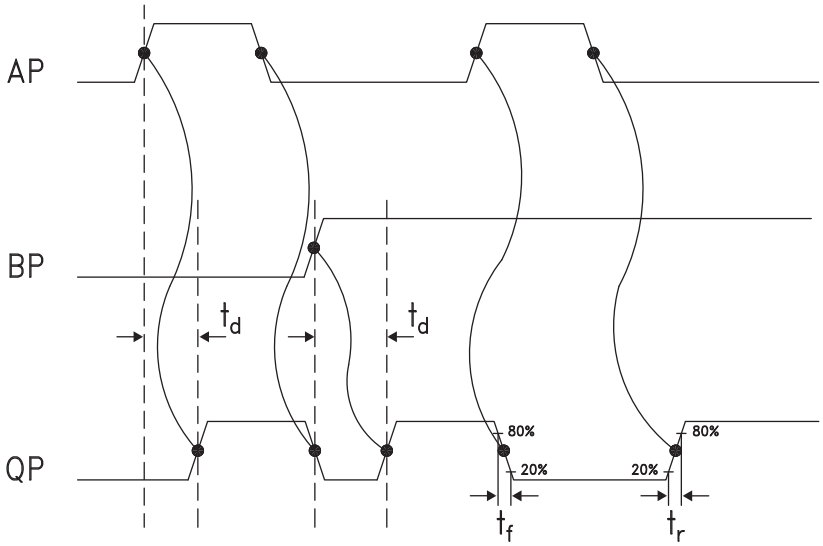
	Current	Minimum	Maximum	Total Meas
Jitter p-p (3)	4.444 ps	3.778 ps	4.444 ps	20
Rise Time (3)	9.11 ps	9.00 ps	9.33 ps	20
Fall Time (3)	10.22 ps	10.22 ps	10.67 ps	20
Single-Ended Eye Amplitude (3)	227 mV	227 mV	227 mV	20

Vertical Scale	60.2 mV / div
Horizontal Scale	10.0 ps / div

Test Conditions

Eye diagram data presented on an Infinium DCA 86100A
AP = 45 GB/s PRBS 2^{23} -1
BP = 45 GB/s 10101 ... data stream
Pseudo Random Code = 2^{23} -1
Vin = 250 mVpp differential

Timing Diagram



Truth Table

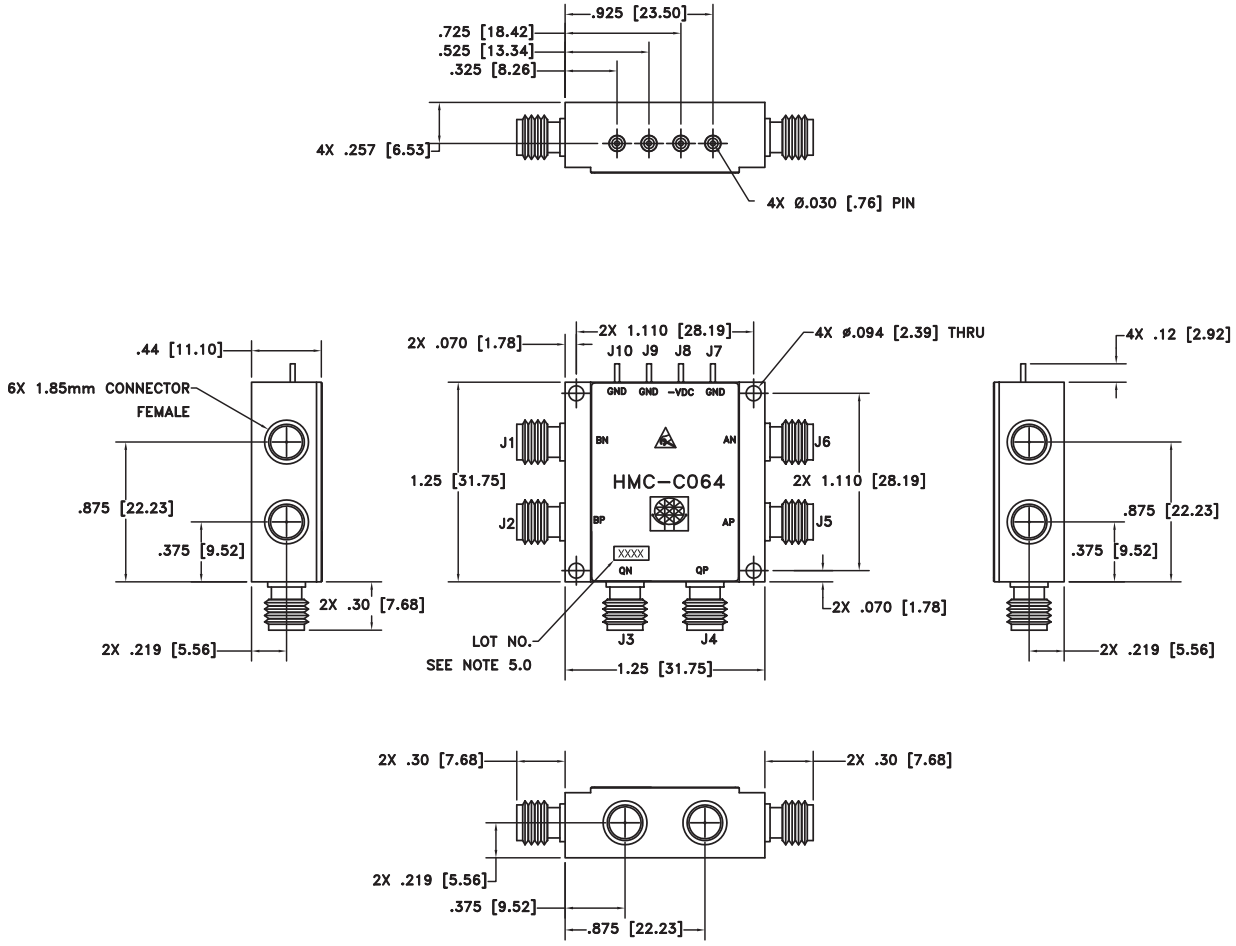
Input		Outputs
A	B	Q
L	L	L
L	H	H
H	L	H
H	H	L
Notes: A = AP - AN B = BP - BN Q = QP - QN	H - Negative voltage level L - Positive voltage level	

Absolute Maximum Ratings

Power Supply Voltage (Vee)	-3.6 to +0.5V
Input Signals (Vpp)	-1.5V to +0.5V
Output Signals (Vpp)	-1.5V to +0.5V
Junction Temperature	125°C
Storage Temperature	-65°C to +125°C
Operating Temperature	-40°C to 70°C

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



NOTES:
1 PACKAGE, LEADS, COVER MATERIAL: KOVAR
2 FINISH: GOLD PLATE OVER NICKEL PLATE.
3 ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]
4 TOLERANCES:
4.1 .XX = ± .02
4.2 XXX = ±.010
5 MARK LOT NUMBER ON 0.080 X 0.250 LABEL WHERE SHOWN, WITH 0.030" MIN. TEXT HEIGHT.

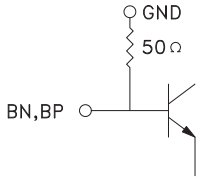
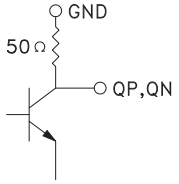
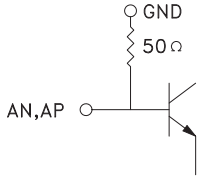
Package Information

Package Type	C-13
Package Weight [1]	59.5 gms

[1] Includes the connectors

[2] ±1 gms Tolerance

Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 2	BN, BP	Differential Data Input B	
3, 4	QN, QP	Differential data outputs.	
5, 6	AP, AN	Differential Data Input A	
7, 9, 10	GND	Signal and supply ground.	
8	-Vdc	Negative Supply	