



# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

The LTV1305 is a low power consumption CFP4 transceiver with high performance up to 111.8Gb/s high speed telecom and data communications over single mode fiber. It is compliant with the CFP4 MSA, IEEE802.3ba 100GBase LR4 specifications. It operates from a 3.3V DC power supply and is offered in the commercial temperature range. The module has an aggregate link bandwidth in excess of 100Gb/s by using 4 electrical lanes, each capable of transmitting 25.78Gb/s, 4 optical lanes, each capable of 25.78 Gb/s over 10km single mode fiber. It is fabricated with a rugged metal housing. The device is Class I laser safety compliant and meets the EU Directive 2002/95/EC for RoHS compliance.

### Applications

- 100GBASE-LR4
- OTN OTU4

### Features

- 4 electrical, 4 optical lanes
- Aggregate data rate in excess of 111.8Gb/s
- Hot Pluggable CFP4 form factor
- 10km link on SMF
- Cooled 4x25G LAN-WDM transmitter
- +3.3V power supply
- Case Operating Temperature:-5 to 70°C
- CFP4 MSA Compliance
- CFP MSA MIS Version 2.2 Compliance
- IEEE 802.3ba Compliance
- ITU-T G.959.1 2012
- ITU-T G.709 Compliance

Ordering Information	
Part Number	Case Operating Temperature
LTV1305-BC+	-5 to 70 °C

Absolute Maximum Ratings					
Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	T <sub>st</sub>	-40	+85	°C	Exceeding the Absolute Maximum Ratings may cause irreversible damage to the device. The device is not intended to be operated under the condition of simultaneous Absolute Maximum Ratings, a condition which may cause irreversible damage to the device.
Relative Humidity	RH	5	85	%	
Supply Voltage	V <sub>CC</sub>	0	3.6	V	
Receiver Input Optical Power per channel	P <sub>imax</sub>	+5.5	-	dBm	



# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

Recommended Operating Conditions						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Operating Case Temperature	$T_{case}$	-5	+25	+70	°C	
Relative Humidity	RH	5	-	85	%	
Supply Voltage	$V_{CC}$	3.2	3.3	3.4	V	
Supply Current	$I_{CC}$			1.875	A	
Power Supply Noise	$V_{rip}$			2 3	% %	DC-1MHz 1-10MHz
Module Power Dissipation	$P_w$	-	-	6	W	
Low Power Mode Dissipation	$P_{low}$	-	-	1	W	

Transmitter Electrical Characteristics ( With Recommended Operating Conditions )						
Parameter	Symbol	Min	Typ	Max	Units	Conditions / Notes
Tx_Data Differential Input Voltage	$V_{IN}$	200		900	mV	Tx_DATA Electrical Signal
Tx_Data Differential Input Impedance	$Z_{IN}$	-	100	-	$\Omega$	

Receiver Electrical Characteristics (With Recommended Operating Conditions )						
Parameter	Symbol	Min	Typ	Max	Units	Conditions / Notes
Rx_Data Differential Output Voltage	$V_{OUT}$	200	-	900	mV	Rx_DATA Electrical Signal
Rx_Data Differential Output Impedance	$Z_{OUT}$	-	100	-	$\Omega$	



# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

### Optical Specifications for 100GBASE-LR4

Transmitter Optical Characteristics						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Transmitter Type		LAN WDM EML				
Date Rate Per Lane		25.78125			Gbps	
Data rate variation		-100		+100	ppm	
Total Average Launch Power	$P_{OUT}$	-	-	10.5	dBm	
Lane Average Launch Power (Each Lane)	$P_{AVE}$	-4.3	-	4.5	dBm	
Transmitter OMA, Each	$P_{OMA}$	-1.3	-	4.5	dBm	
Difference in Launch power between any two lanes(OMA)				5	dB	
Launch power in OMA minus TDP		-2.3			dBm	
Transmitter and Dispersion penalty	TDP			2.2	dBm	
Optical Output with Tx OFF	$P_{OFF}$		-	-30	dBm	
Center Wavelength, Each Lane	$\lambda$	1294.53 - 1296.59 1299.02 - 1301.09 1303.54 - 1305.63 1308.09 - 1310.19			nm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio	ER	4	-	-	dB	
Transmitter Reflectance	TFL	-	-	-12	dB	
Optical Return loss Tolerance	ORL	-	-	20	dB	
Transmitter Eye Mask {X1,X2,X3,Y1,Y2,Y3}		NRZ 25G RATIO {x1:0.25,x2:0.4,x3:0.45, y1:0.25,y2:0.28,y3:0.4}; 5% Margin, hit ratio, 5^E-5 with 1000 samples, IEEE 802.3ba Compliance				

Receiver Optical Characteristics						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Date Rate Per Lane		25.78125			Gbps	
Data rate variation		-100		+100	ppm	
Average receive power each lane (max)		4.5			dBm	
Receive power each lane (OMA) (max)		4.5			dBm	
Receiver Sensitivity , Each Lane	$P_{AVE}$	-	-	-8.6	dBm	OMA
Center Wavelength, Each Lane	$\lambda$	1294.53 - 1296.59 1299.02 - 1301.09 1303.54 - 1305.63 1308.09 - 1310.19			nm	
Receiver Reflectance	ORL	-	-	-26	dB	
Signal Loss Assert	$P_a$	-25	-	-	dBm	
Signal Loss Deassert	$P_d$	-	-	-13	dBm	
Signal Loss Hysteresis	$P_{hy}$	0.5	-	6	dBm	



# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

### Optical Specifications for OTU4

Transmitter Optical Characteristics						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Transmitter Type		LAN WDM EML				
Date Rate Per Lane		27.95			Gbps	
Date Rate Variation		-20		+20	ppm	
Total Average Launch Power	P <sub>OUT</sub>	-	-	8.9	dBm	
Lane Average Launch Power (Each Lane)	P <sub>AVE</sub>	-2.5	-	2.9	dBm	
Difference in Launch power between any two lanes(OMA)				5	dB	
Optical Output with Tx OFF	P <sub>OFF</sub>		-	-30	dBm	
Center Wavelength, Each Lane	λ	1294.53 - 1296.59 1299.02 - 1301.09 1303.54 - 1305.63 1308.09 - 1310.19			nm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio	ER	7	-	-	dB	
Transmitter Reflectance	TFL	-	-	-12	dB	
Optical Return loss Tolerance	ORL	-	-	20	dB	
Transmitter Eye Mask {X1,X2,X3,Y1,Y2,Y3}		NRZ 25G RATIO {x1:0.25,x2:0.4,x3:0.45, y1:0.25,y2:0.28,y3:0.4}; 5% Margin, hit ratio, 5 <sup>E</sup> -5 with 1000 samples, ITU-T 959.1 Compliance				

Receiver Optical Characteristics						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Date Rate Per Lane		27.95			Gbps	
Date Rate Variation		-20		+20	ppm	
Average receive power each lane	R <sub>pow</sub>	-8.8		2.9	dBm	
Input channel power difference				5.5	dBm	
Mean total input power				8.9	dBm	
Optical path penalty				1.5	dBm	
Receiver Sensitivity , Each Lane	P <sub>AVE</sub>	-	-	-10.3	dBm	Equivalent ensitivity
Center Wavelength, Each Lane	λ	1294.53 - 1296.59 1299.02 - 1301.09 1303.54 - 1305.63 1308.09 - 1310.19			nm	
Receiver Reflectance	ORL	-	-	-26	dB	
Signal Loss Assert	P <sub>a</sub>	-25	-	-	dBm	
Signal Loss Deassert	P <sub>d</sub>	-	-	-13	dBm	
Signal Loss Hysteresis	P <sub>hy</sub>	0.5	-	6	dBm	



# LTV1305 CFP4 Optical Transceiver

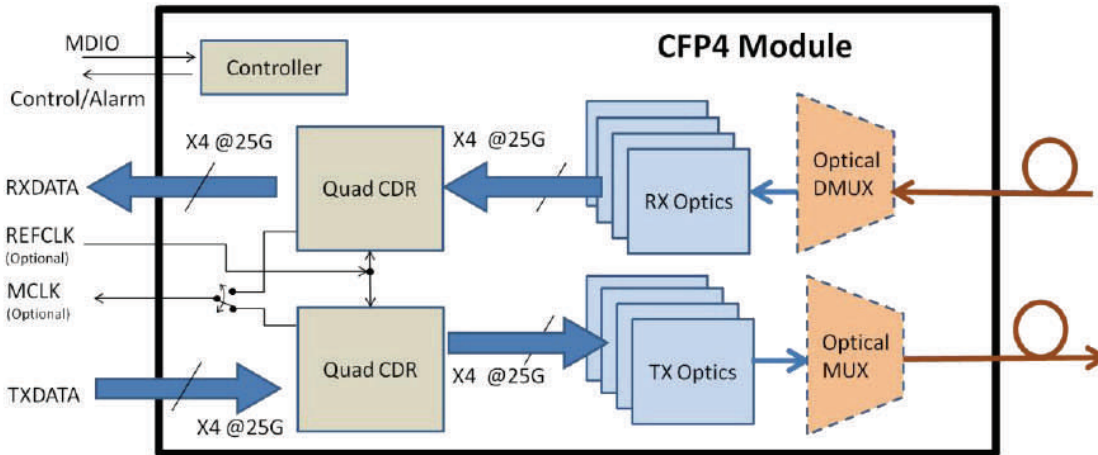
## 100Gb/s 10km

3.3V LVCMOS Electrical Characteristics Refer to CFP MSA						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Supply Voltage	VCC	3.2	3.3	3.4	V	
Input High Voltage	VIH	2	-	VCC+0.3	V	
Input Low Voltage	VIL	-0.3	-	0.8	V	
Input Leakage Current	IIN	-10	-	+10	uA	
Output High Voltage (IOH=-100uA)	VOH	VCC-0.2	-	-	V	
Output Low Voltage (IOL=100uA)	VOL	-	-	0.2	V	

1.2V LVCMOS Electrical Characteristics Refer to CFP MSA						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Input High Voltage	VIH	0.84		1.5	V	
Input Low Voltage	VIL	-0.3		0.36	V	
Input Leakage Current	IIN	-100		+100	uA	
Output High Voltage (IOH=-100uA)	VOH	1.0	-	1.5	V	
Output Low Voltage (IOL=100uA)	VOL	-0.3	-	0.2	V	
Output High Current	IOH			-4	mA	
Output LOW Current	IOL	+4		-	mA	
Input capacitance	Ci			10	pF	

Monitor Information			
Parameter	Spec	Units	Notes
Temperature	+/-3	°C	
Voltage	+/-5%	V	
Ibias	+/-10%	mA	
Rx power	+/-3.0	dB	
Tx power	+/-2.0	dB	

#### LTV1305 Block Diagram

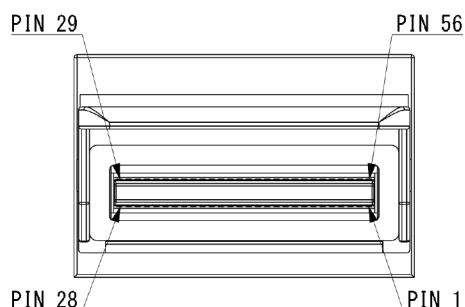


#### Pin Assignment

Pin view from top ==> Host

	CFP4 Bottom
1	3.3V_GND
2	3.3V_GND
3	3.3V
4	3.3V
5	3.3V
6	3.3V
7	3.3V_GND
8	3.3V_GND
9	VND_IO_A
10	VND_IO_B
11	TX_DIS (PRG_CNTL1)
12	RX_LOS (PRG_ALRM1)
13	GLB_ALRMn
14	MOD_LOPWR
15	MOD_ABS
16	MOD_RSTn
17	MDC
18	MDIO
19	PRTADR0
20	PRTADR1
21	PRTADR2
22	VND_IO_C
23	VND_IO_D
24	VND_IO_E
25	GND
26	(MCLKn)
27	(MCLKp)
28	GND

	CFP4 Top
56	GND
55	TX3n
54	TX3p
53	GND
52	TX2n
51	TX2p
50	GND
49	TX1n
48	TX1p
47	GND
46	TX0n
45	TX0p
44	GND
43	(REFCLKn)
42	(REFCLKp)
41	GND
40	RX3n
39	RX3p
38	GND
37	RX2n
36	RX2p
35	GND
34	RX1n
33	RX1p
32	GND
31	RX0n
30	RX0p
29	GND



Pin Description (Bottom)			
Pin	Symbol	Description	Notes
1	3.3V_GND	Module Ground	
2	3.3V_GND	Module Ground	
3	3.3V	3.3V Module Supply Voltage	
4	3.3V	3.3V Module Supply Voltage	
5	3.3V	3.3V Module Supply Voltage	
6	3.3V	3.3V Module Supply Voltage	
7	3.3V_GND	Module Ground	
8	3.3V_GND	Module Ground	
9	VND_IO_A	Module Vendor I/O. Must No Connect on host board	
10	VND_IO_B	Module Vendor I/O. Must No Connect on host board	
11	TX_DIS	Transmitter Disable for all lanes, "1" or NC = transmitter disabled, "0" = transmitter enabled	1
12	RX_LOS	Receiver Loss of Optical Signal, "1": low optical signal, "0": normal condition	
13	GLB_ALRMn	Global Alarm. "0": alarm condition in any MDIO Alarm register, "1": no alarm condition	
14	MOD_LOPWR	Module Low Power Mode. "1" or NC: module in low power (safe) mode, "0": power-on enabled	1
15	MOD_ABS	Module Absent. "1" or NC: module absent, "0": module present.	2
16	MOD_RSTn	Module Reset. "0" resets the module, "1" or NC = module enabled.	3
17	MDC	Management Data Clock	
18	MDIO	Management Data I/O bi-directional data	
19	PRTADR0	MDIO port address bit 0	
20	PRTADR1	MDIO port address bit 1	
21	PRTADR2	MDIO port address bit 2	
22	VND_IO_C	Module Vendor I/O. Must No Connect on host board	
23	VND_IO_D	Module Vendor I/O. Must No Connect on host board	
24	VND_IO_E	Module Vendor I/O. Must No Connect on host board	
25	GND	Module Ground	



# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

Pin Description (Bottom)			
Pin	Symbol	Description	Notes
26	MCLKn	For optical waveform testing. Not for normal use.	
27	MCLKp	For optical waveform testing. Not for normal use.	
28	GND	Module Ground	
Pin Description (Top)			
29	GND	Module Ground	
30	RX0p	Lane 0 Receiver Output (Positive)	
31	RX0n	Lane 0 Receiver Output (Negative)	
32	GND	Module Ground	
33	RX1p	Lane 1 Receiver Output (Positive)	
34	RX1n	Lane 1 Receiver Output (Negative)	
35	GND	Module Ground	
36	RX2p	Lane 2 Receiver Output (Positive)	
37	RX2n	Lane 2 Receiver Output (Negative)	
38	GND	Module Ground	
39	RX3p	Lane 3 Receiver Output (Positive)	
40	RX3n	Lane 3 Receiver Output (Negative)	
41	GND	Module Ground	
42	REFCLKp	For optical waveform testing. Not for normal use.	
43	REFCLKn	For optical waveform testing. Not for normal use.	
44	GND	Module Ground	
45	TX0p	Lane 0 Transmitter Input (Positive)	
46	TX0n	Lane 0 Transmitter Input (Negative)	
47	GND	Module Ground	
48	TX1p	Lane 1 Transmitter Input (Positive)	
49	TX1n	Lane 1 Transmitter Input (Negative)	
50	GND	Module Ground	
51	TX2p	Lane 2 Transmitter Input (Positive)	
52	TX2n	Lane 2 Transmitter Input (Negative)	
53	GND	Module Ground	
54	TX3p	Lane 3 Transmitter Input (Positive)	
55	TX3n	Lane 3 Transmitter Input (Negative)	
56	GND	Module Ground	

**Notes:**

1. Pull-up with 4.7K to 10K resistor in the module
2. Pull-down with <100ohm resistor in the module
3. Pull-down with 4.7K to 10K resistor in the module

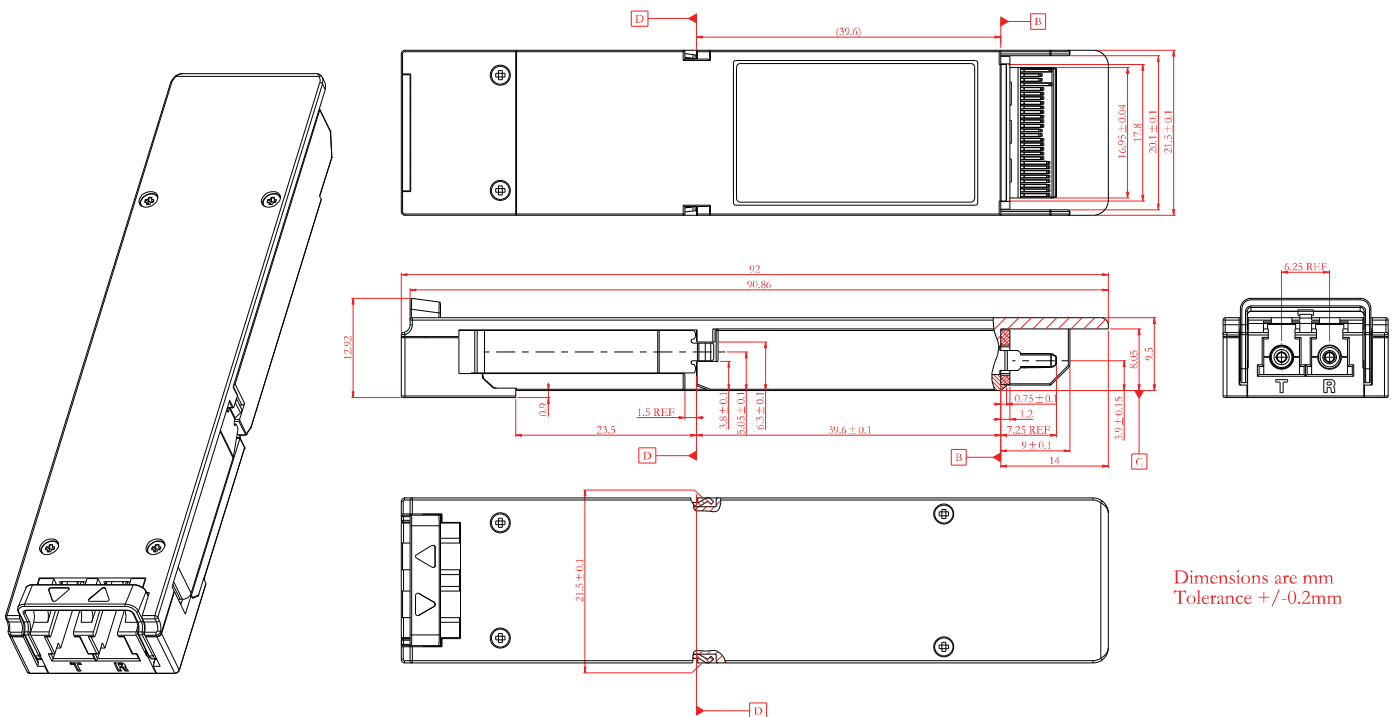




# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

### Mechanical Dimensions





# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

### Warnings

#### Handling Precautions:

This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

#### Laser Safety:

Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

#### Notice:

The information provided on this page contains the product target specifications which are subject to change without notice.

Check with your Hisense Sales Office for product updates, changes in specifications, sample availability and production release dates.

### Global Sales Offices

#### Asia

##### China Headquarter

Hisense Broadband Multimedia Technology

Add: 204, Yan An 3 Road, Qingdao, China

Tel: 86-532-55751950

Fax: 86-532-55751977

Post: 266071

WS: hbmt.hisense.com

#### North America

##### USA Headquarter

Hisense Broadband, Inc.

800 West Fifth Avenue, Suite 201A, Naperville, Illinois 60563

Tel: 1 (630) 995-3951

Fax: 1 (630) 995-3713

EM: Sales@hisensebroadband.com

WS: www.hisensebroadband.com

CFP NVR1					
Base ID					
内地址	长度	Bit	字段名称	描述	值
8000	1	7~0	Module Identifier	00h: Unknown or unspecified, 01h: GBIC, 02h: Module/connector soldered to motherboard, 03h: SFP, 04h: 300 pin XSBI, 05h: XENPAK, 06h: XFP, 07h: XFF, 08h: XFP-E, 09h: XPAK, 0Ah: X2, 0Bh: DWDM-SFP, 0Ch: QSFP, 0Dh: QSFP+, 0Eh: CFP, 0Fh: CXP (TBD), 10h: 168-pin 5"x7" MSA-100GLH, 11h: CFP2 12h: CFP4 13h ~ FFh : Reserved.	12h
8001	1		Extended Identifier		
		7~6	Power Class	00b: Power Class 1 Module, 01b: Power Class 2 Module, 10b: Power Class 3 Module, 11b: Power Class >3 Module.	11b
		5~4	Lane Ratio Type	00b: Network lane : Host lane = 1 : n (Mux type), 01b: Network lane : Host lane = n : m (Gear Box type), 10b: Network lane : Host lane = n : n (Parallel type), 11b: Reserved.	10b
		3~1	WDM Type	000b: Non-WDM, 001b: CWDM, 010b: LAN WDM, 011b: DWDM on 200G-grid, 100b: DWDM on 100G-grid, 101b: DWDM on 50G-grid, 110b: DWDM on 25G-grid, 111b: Other type WDM.	010b
	0	CLEI Presence	0: No CLEI code present, 1: CLEI code present.	0	
8002	1	7~0	Connector Type Code	00h: Undefined, 01h : SC, 07h : LC, 08h : MT-RJ, 09h : MPO, Other Codes : Reserved	07h



# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

8003	1	7~0	Ethernet Application Code	<p>Ethernet Application Code.            00h: Undefined type,            01h: 100GE SMF 10km, 100GE-LR4,            02h: 100GE SMF 40km, 100GE-ER4,            03h: 100GE MMF 100m OM3, 100GESR10,            04h: For future use,            05h: 40GE SMF 10km, 40GE-LR4,            07h: 40GE MMF 100m OM3, 40GE-SR4,            0Dh: 40GE-CR4 Copper</p> <p>For future use:            100G G.959.1 OTU4            40G G.693 SDH            40G G.693 OTU3            40G G.695 SDH            40G G.695 OTU3,            0Eh: 100GE-CR10 Copper,            0Fh: 40G BASE-FR,            10h~FFh: Reserved.</p>	01h
8004	1	7~0	Ethernet Application Code	00h: Undefined type.	00h
8005	1	7~0	Copper Link Application Code	00h: Undefined type.	00h
8006	1	7~0	SONET/SDH Application Code	00h: Undefined type, 01h: VSR2000-3R2, 02h: VSR2000-3R3, 03h: VSR2000-3R5, 04h ~ 0FFh: Reserved.	00h
8007	1	7~0	OTN Application Code	00h: Undefined type, 01h: VSR2000-3R2F, 02h: VSR2000-3R3F, 03h: VSR2000-3R5F, 04h: VSR2000-3L2F, 05h: VSR2000-3L3F, 06h: VSR2000-3L5F, 07h: C4S1-2D1 (OTL3.4), 08h: 4I1-9D1F (OTL4.4), 09h: P111-3D1 (NRZ 40G 1300nm, 10km) 0Ah ~ 0FFh: Reserved.	08h
8008	1		<b>Additional Capable Rates Supported</b>	<b>Additional application rates module supporting.</b>	
		7~5	Reserved	0: Not supported, 1: Supported.	000b
		4	111.8 Gbps	0: Not supported, 1: Supported.	1
		3	103.125Gbps	0: Not supported, 1: Supported.	1
		2	41.25 Gbps	0: Not supported, 1: Supported.	0
		1	43Gbps	0: Not supported, 1: Supported.	0
0	39.8Gbps	0: Not supported, 1: Supported.	0		
8009	1		<b>Number of Lanes Supported</b>	<b>Number of Network Lane supported and number of Host Lane supported in this particular module.</b>	
		7~4	Number of Network Lanes	The value of 0 represents 16 network lanes supported. The values of 1 through 15 represent the actual number of networklanes supported.	0100b
		3~0	Number of Host Lanes	The value of 0 represents 16 host lanes supported. The values of 1 through 15 represent the actual number of host lanes supported.	0100b



# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

		<b>Media Properties</b>			
800A	1	7~6	Media Type	00b: SMF , 01b: MMF (OM3), 10b: Reserved, 11b: Copper.	00b
		5	Directionality	0: Normal, 1: BiDi.	0
		4	Optical Multiplexing and De-multiplexing	0: Without optical MUX/DEMUX, 1: With optical MUX/DEMUX.	1
		3~0	Active Fiber per Connector	A 4-bit unsigned number representing number of active fibers for TX and RX per connector. 0: 16 TX Lanes and 16 RX Lanes, 1: 1 TX Lane and 1 RX Lane, 4: 4 TX Lanes and 4 RX Lanes, 10: 10 TX Lanes and 10 RX Lanes, 12: 12 TX Lanes and 12 RX Lanes.	0001b
800B	1	7~0	Maximum Network Lane Bit Rate	8-bit value x 0.2 Gbps. Max. 28Gbps	8Ch
800C	1	7~0	Maximum Host Lane Bit Rate	8-bit value x 0.2 Gbps. Max. 28Gbps	8Ch
800D	1	7~0	Maximum SingleMode Optical Fiber Length	8-bit value x 1 km for single mode fiberlength. 10km	0Ah
800E	1	7~0	Maximum Multi-Mode Optical Fiber Length	8-bit value x 10 m for multi-mode fiber length.	00h
800F	1	7~0	Maximum Copper Cable Length	8-bit value x 1 m for copper cable length.	00h
8010	1		<b>Transmitter Spectral Characteristics 1</b>		
		7~5	Reserved		000b
		4~0	Number of ActiveTransmit Fibers	0: Undefined.	00001b
8011	1		<b>Transmitter Spectral Characteristics 2</b>		
		7~5	Reserved		000b
		4~0	Number of Wavelengths per activeTransmit Fiber	0: Undefined	00100b
8012 8013	2	7~0	Minimum Wavelength per Active Fiber	16-bit unsigned value x 0.025 nm. (MSB is at 8012h, LSB is at 8013h).	CA45h
8014 8015	2	7~0	Maximum Wavelength per Active Fiber	16-bit unsigned value x 0.025 nm. (MSB is at 8014h, LSB is at 8015h).	CCB8h
8016 8017	2	7~0	Maximum per Lane Optical Width	Guaranteed range of laser wavelength. 16-bit unsigned value x 1 pm. MSB is at 8016h, LSB is at 8017h. max. 2.1nm	0834h



# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

8018	1		<b>Device Technology 1</b>		
		7~4	Laser Source Technology	0000b: VCSEL, 0001b: FP, 0010b: DFB, 0011b: DBR, 0100b: Copper, 0101b ~ 1111b:Reserved	0010b
		3~0	Transmitter modulation technology	0000b: DML, 0001b: EML, 0010b: InP-MZ, 0011b: LN-MZ 0100b: Copper, 0101b ~ 1111b: Reserved	0001b
8019	1		<b>Device Technology 2</b>		
		7	Wavelength control	0: No wavelength control, 1: Active wavelength control.	0
		6	Cooled transmitter	0: Un-cooled transmitter device, 1: Cooled or Semi-cooled transmitter.	1
		5	Tunability	0: Transmitter not Tunable, 1: Transmitter Tunable.	0
		4	VOA implemented	0: Detector side VOA not implemented, 1: Detector side VOA implemented.	0
		3~2	Detector Type	00b: Undefined, 01b: PIN detector, 10b: APD detector, 11b: Optical Amplifier + PIN detector.	01b
		1	CDR with EDC	0: CDR without EDC, 1: CDR with EDC.	0
		0	Reserved		0
801A	1		<b>Signal Code</b>		
		7~6	Modulation	00b: Undefined, 01b: NRZ, 10b: RZ, 11b: Reserved.	01b
		5~2	Signal coding	0000b: Non-PSK, 0001b: ODB, 0010b: DPSK, 0011b: QPSK, 0100b: DQPSK, 0101b: DPQPSK, 0110~1010b: Reserved, 1011b: 16QAM, 1100b: 64QAM, 1101b: 256QAM, 1110~1111b: Reserved.	0000b
		1~0		Reserved	00b



# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

801B	1	7~0	Maximum Total Optical Output Power per Connector	Unsigned 8 bit value * 100 uW. (10.5dBm)	70h
801C	1	7~0	Maximum Optical Input Power per Network Lane	Unsigned 8 bit value * 100 uW. (4.5dBm)	1Ch
801D	1	7~0	Maximum Power Consumption	Unsigned 8 bit value * 200 mW. (6W)	1Eh
801E	1	7~0	Maximum Power Consumption in Low Power Mode	Unsigned 8 bit value * 20 mW. 1000mW	32h
801F	1	7~0	Maximum Operating Case Temp Range	Signed 8 bit value of * 1 degC with valid range of 0 ~ 100 degC. Use 2's complement representation. 70C	46h
8020	1	7~0	Minimum Operating Case Temp Range	Signed 8 bit value. Increments of * 1degC with valid range of -40 ~ +40degC. Use 2's complement representation. -5C.	FBh
8021 to 8030	16	7~0	Vendor Name	Vendor (manufacturer) name in in ASCII code.	"Hisense"
8031 to 8033	3	7~0	Vendor OUI	The vendor organizationally unique identifier (vendor OUI). A 3-byte field that contains the IEEE Company Identifier for the vendor.	AC4AFEh
8034 to 8043	16	7~0	Vendor Part Number	Vendor (manufacturer) part number in any combination of letters and/or digits in ASCII code.	"LTV1305-BC+"
8044 to 8053	16	7~0	Vendor Serial Number	Vendor (manufacturer) serial number in any combination of letters and/or digits in ASCII code.	生产写入
8054 to 805B	8	7~0	Date Code	Vendor (manufacturer) date code in ASCII characters, in the format YYYYMMDD (e.g., 20090310 for March 10, 2009). One character at each MDIO address.	YYYYMMDD 生产写入
805C 805D	2	7~0	Lot Code	Lot code in any combination of letters and/or digits in ASCII code.	20h
805E to 8067	10	7~0	CLEI Code	CLEI Code in any combination of letters and/or digits in ASCII code.	20h
8068	1	7~0	CFP MSA Hardware Specification Revision Number	This register indicates the CFP MSA Hardware Specification version number supported by the transceiver. The 8 bits are used to represent the version number times 10. This yields a max of 25.5 revisions. HW Spec Rev 1.4	01h

8069	1	7~0	CFP MSA Management Interface Specification Revision Number	This register indicates the CFP MSA Management Interface Specification version number supported by the transceiver. The 8 bits are used to represent the version number times 10. This yields a max of 25.5 revisions. MI spec Rev 2.2 R06a	16h
806A 806B	2	7~0	Module Hardware Version Number	A two-register number in the format of x.y with x at lower address and y at higher address.	0100h
806C 806D	2	7~0	Module Firmware Version Number	A two-register number in the format of x.y with x at lower address and y at higher address.	0100h
806E	1		<b>Digital Diagnostic Monitoring Type</b>		
		7~4	Reserved		0000b
		3	Received power measurement type	0: OMA, 1: Average Power.	1
		2	Transmitted power measurement type	0: OMA, 1: Average Power.	1
		1~0	Reserved		00b
806F	1		<b>Digital Diagnostic Monitoring Capability 1</b>	Module level DDM capability.	
		7~6	Transceiver auxiliary monitor 2	00b: Not supported, 01b ~ 11b: TBD.	00b
		5~4	Transceiver auxiliary monitor 1	00b: Not supported, 01b ~ 11b: TBD.	00b
		3	Reserved		0
		2	Transceiver SOA bias current monitor	0: Not supported, 1: supported.	0
		1	Transceiver power supply voltage monitor	0: Not supported, 1: supported.	1
		0	Transceiver temperature monitor	0: Not supported, 1: supported.	1
8070	1		<b>Digital Diagnostic Monitoring Capability 2</b>	Per lane DDM capability.	
		7~4	Reserved		0000b
		3	Network Lane received power monitor	0: Not supported, 1: supported.	1
		2	Network Lane laser output power monitor	0: Not supported, 1: supported.	1
		1	Network Lane laser bias current monitor	0: Not supported, 1: supported.	1
		0	Network Lane laser temperature monitor	0: Not supported, 1: supported.	1





# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

8071	1		<b>Module Enhanced Options</b>		
		7	Host Lane Loop-back	0: Not supported, 1: Supported.	0
		6	Host Lane PRBS Supported	0: Not supported, 1: Supported.	0
		5	Host Lane emphasis control	0: Not supported, 1: Supported.	1
		4	Network Lane Loop-back	0: Not supported, 1: Supported.	0
		3	Network Lane PRBS	0: Not supported, 1: Supported.	0
		2	Decision Threshold Voltage control function of FEC	This bit indicates whether bit 2 of A012h is supported. 0: Not supported, 1: Supported.	0
		1	Decision Phase control function of FEC	This bit indicates whether bit 1 of A012 is supported. 0: Not supported, 1: Supported.	0
	0	Unidirectional TX/RX only Operation Modes	0: Not supported, 1: Supported.	0	
8072	1	7~0	Maximum High-Power-up Time	Fully power up time required by module. Unsigned 8-bit value * 1 sec. Use 1 sec if the actual time is less than 1 sec. 15 sec	0Fh
8073	1	7~0	Maximum TX-Turn-on Time	Maximum time required to turn on all TX lanes and to let them reach stability. Unsigned 8-bit value * 1 sec. Use 1 sec if it is less than 1 sec.	05h
8074	1	7~0	Host Lane Signal Spec	0: Unspecified, 1: CAUI, 2: XLAUI, 3: SFI5.2, 4~255: Reserved.	0Ch
8075	1		<b>Heat Sink Type</b>		
		7~1	Reserved		0000000b
		0	Heat Sink Type	0: Flat top, 1: Integrated heat sink.	0
8076	1	7~0	Maximum TX-Turn-off Time	Maximum time required to turn off all transmitters. Unsigned 8-bit value * 1ms. 100ms	64h
8077	1	7~0	Maximum High-Power-down Time	Maximum time required from entering the High-Power-down state to exit from this state. Unsigned 8-bit value * 1 sec. Use 1 sec if it is less than 1 second.	01h



# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

8078	1		<b>Module Enhanced Options 2</b>		
		7~5	Reserved	0: Not supported, 1: Supported.	0
		4	Active Decision Voltage and Phase function	0: Not supported, 1: Supported.	0
		3	RX FIFO Reset	0: Not supported, 1: Supported.	0
		2	RX FIFO Auto Reset	0: Not supported, 1: Supported.	0
		1	TX FIFO Reset	0: Not supported, 1: Supported.	0
		0	TX FIFO Auto Reset	0: Not supported, 1: Supported.	0
8079	1		<b>Transmitter Monitor Clock Options</b>	This clock is intended to be used as a reference for measurements of the optical output. If provided, the clock shall operate at a rate relative to the optical lane rate of 1/16 rate for 40Gbit/s applications and a 1/8 rate of 25Gbit/s for 100Gbit/s applications. Another option is a clock at 1/16 or 1/64 the rate of transmitter electrical input data.	
		7	1/16 of Host Lane Rate	0: Not supported, 1: Supported.	0
		6	1/16 of Network Lane Rate	0: Not supported, 1: Supported.	0
		5	1/64 of Host Lane Rate	0: Not supported, 1: Supported.	0
		4	1/64 of Network Lane Rate	0: Not supported, 1: Supported.	0
		3	Reserved	0: Not supported, 1: Supported.	0
		2	1/8 of Network Lane Rate	0: Not supported, 1: Supported.	0
		1	Reserved	0: Not supported, 1: Supported.	0
		0	Monitor Clock Option	0: Not supported, 1: Supported.	0



# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

807A	1		<b>Receiver Monitor Clock Options</b>	The CFP module may supply an optional receiver monitor clock. This clock is intended to be used as a reference for measurements of the optical input. If provided, the clock shall operate at a rate relative to the optical lane rate of 1/16 rate for 40Gbit/s applications and 1/8 rate of 25Gbit/s for 100Gbit/s applications. Another option is a clock at 1/16 or 1/64 rate of the receiver electrical output data.	
		7	1/16 of Host Lane Rate	0: Not supported, 1: Supported.	0
		6	1/16 of Network Lane Rate	0: Not supported, 1: Supported.	0
		5	1/64 of Host Lane Rate	0: Not supported, 1: Supported.	0
		4	1/64 of Network Lane Rate	0: Not supported, 1: Supported.	0
		3	Reserved	0: Not supported, 1: Supported.	0
		2	1/8 of Network Lane Rate	0: Not supported, 1: Supported.	0
		1	Reserved	0: Not supported, 1: Supported.	0
	0	Monitor Clock Option	0: Not supported, 1: Supported.	0	
807B 807C [2.0]	2	7~0	Module Firmware B Version Number	A two-register number in the format of x.y with x at lower address and y at higher address.	0000h
807D [2.2]	1	7~0	Maximum MDIO Ready Time	An 8-bit unsigned number representing Maximum MDIO Ready Time due to module software upgrade introduced MDIO down time in seconds.	00h
807E [2.2]	1		CFP and CFP2/4 Extended Identifier		
		7~6	Extended Power Class	This field defines coding extended power classes for CFP, CFP2, CFP4, used together with register 8001h. 00b: Power Class 4 Module, 01b: Power Class 5 Module, 10b: Power Class 6 Module, 11b: N/A.	00b
		5	MDIO Port Address Scheme Configuration	1-bit field specifies two MDIO Port Address modes (See Section 2.1.1 for additional information). 0: CFP2 only multi-device Type functionality scheme is used; 1: CFP/CFP2/CFP4 Common MDIO Port Address scheme with effective port address range from 0 to 31.	1b
		4~0	Reserved		00000b
807F	1	7~0	CFP NVR 1 Checksum	The 8-bit unsigned sum of all CFP NVR 1 contents from address 8000h through 807Eh inclusive.	程序写入



# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

CFP NVR 2					
Alarm/Warning Threshold					
内地址	长度	Bit	字段名称	描述	值 (十进制)
8080	2	7~0	Transceiver Temp High Alarm Threshold	These thresholds are a signed 16-bit integer with LSB = 1/256 of a degree Celsius representing a range from -128 to + 127 255/256 degree C. MSA valid range is between -40 and +125C." MSB stored at low address, LSB stored at high address.	80°C
8082	2	7~0	Transceiver Temp High Warning Threshold		70°C
8084	2	7~0	Transceiver Temp Low Warning Threshold		-5°C
8086	2	7~0	Transceiver Temp Low Alarm Threshold		-15°C
8088	2	7~0	VCC High Alarm Threshold	These thresholds are an unsigned 16- bit integer with LSB = 0.1 mV,representing a range of voltage from 0 to 6.5535 V. MSB stored at low address, LSB stored at high address.	943E (3.6V)
808A	2	7~0	VCC High Warning Threshold		8DCC (3.4V)
808C	2	7~0	VCC Low Warning Threshold		7404 (3.2V)
808E	2	7~0	VCC Low AlarmThreshold		6D92 (3.0 V)
8090	2	7~0	SOA Bias Current High Alarm Threshold	These threshold values are an unsigned 16-bit integer with LSB = 2uA, representing a range of current from 0 to 131.072 mA. MSB stored at low address, LSB stored at high address.	
8092	2	7~0	SOA Bias Current High WarningThreshold		
8094	2	7~0	SOA Bias Current Low WarningThreshold		
8096	2	7~0	SOA Bias Current Low Alarm Threshold		
8098	2	7~0	Auxiliary 1 Monitor High AlarmThreshold	TBD	
809A	2	7~0	Auxiliary 1 Monitor High-WarningThreshold	TBD	
809C	2	7~0	Auxiliary 1 Monitor Low WarningThreshold	TBD	
809E	2	7~0	Auxiliary 1 Monitor Low AlarmThreshold	TBD	
80A0	2	7~0	Auxiliary 2 Monitor High AlarmThreshold	TBD	
80A2	2	7~0	Auxiliary 2 Monitor High-WarningThreshold	TBD	
80A4	2	7~0	Auxiliary 2 Monitor Low WarningThreshold	TBD	
80A6	2	7~0	Auxiliary 2 Monitor Low AlarmThreshold	TBD	
80A8	2	7~0	Laser Bias Current High Alarm Threshold		120 mA
80AA	2	7~0	Laser Bias Current High WarningThreshold		110 mA
80AC	2	7~0	Laser Bias Current Low WarningThreshold		20mA
80AE	2	7~0	Laser Bias Current Low Alarm Threshold		10 mA



# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

80B0	2	7~0	Laser Output Power High Alarm Threshold	Reference A2B0h Description for additional information. MSB stored at low address, LSB stored at high address.	7B86 (6.5 dBm)
80B2	2	7~0	Laser Output Power High Warning Threshold		6E17 (4.5 dBm)
80B4	2	7~0	Laser Output Power Low Warning Threshold		1393 (-4.3 dBm)
80B6	2	7~0	Laser Output Power Low Alarm Threshold		0E83 (-6.3 dBm)
80B8	2	7~0	Laser Temperature High Alarm Threshold	Alarm and warning thresholds for measured received input power. Reference A2C0h Description for additional information. MSB stored at low address, LSB stored at high address.	70 C
80BA	2	7~0	Laser Temperature High Warning Threshold		65 C
80BC	2	7~0	Laser Temperature Low Warning Threshold		35 C
80BE	2	7~0	Laser Temperature Low Alarm Threshold		30 C
80C0	2	7~0	Receive Optical Power High Alarm Threshold	Alarm and warning thresholds for measured received input power. Reference A2D0h Description for additional information. MSB stored at low address, LSB stored at high address.	7B86 (6.5 dBm)
80C2	2	7~0	Receive Optical Power High Warning Threshold		6E17 (4.5 dBm)
80C4	2	7~0	Receive Optical Power Low Warning Threshold		0366 (-10.6 dBm)
80C6	2	7~0	Receive Optical Power Low Alarm Threshold		0232 (-12.6 dBm)
80C8	55	7~0	Reserved		00h
80FF	2	7~0	CFP NVR 2 Checksum	The 8-bit unsigned sum of all CFP NVR 2 contents from address 8080h through 80FEh inclusive.	程序写入

CFP NVR 3					
内地址	长度	Bit	字段名称	描述	值(十进制)
8100 to 8101	2	7~0	RX Sensitivity Spec for network lanes 0	RX Sensitivity measured in dBm @ BER=1e-12 at Typical condition. The value is a signed 16-bit integer with LSB = 0.01dBm. It uses two register addresses each for a total 32 register addresses for total 16 lanes.	measured
8102 to 8103	2	7~0	RX Sensitivity Spec for network lanes 1		measured
8104 to 8105	2	7~0	RX Sensitivity Spec for network lanes 2		measured
8106 to 8107	2	7~0	RX Sensitivity Spec for network lanes 3		measured
8120 to 8121	2	7~0	TX Power Spec for network lanes 0	TX Power measured in dBm at typical condition. The value is a signed 16-bit integer with LSB = 0.01dBm. It uses two register addresses each for a total 32 register addresses for total 16 lanes.	measured
8122 to 8123	2	7~0	TX Power Spec for network lanes 1		measured
8124 to 8125	2	7~0	TX Power Spec for network lanes 2		measured
8126 to 8127	2	7~0	TX Power Spec for network lanes 3		measured
8140 to 8141	2	7~0	Measured ER for network lanes 0	Measured Extinction ratio at Typical condition in dB. The value is an unsigned 16-bit integer with LSB = 0.01dB. It uses two register addresses each for a total 32 register addresses for total 16 lanes.	measured
8142 to 8143	2	7~0	Measured ER for network lanes 1.		measured
8144 to 8145	2	7~0	Measured ER for network lanes 2.		measured
8146 to 8147	2	7~0	Measured ER for network lanes 3.		measured
8160 to 8161	2	7~0	Path Penalty for network lanes 0 .	Path penalty @worst CD at Typical condition. The value is an unsigned 16-bit integer with LSB = 0.01dB. It uses two register addresses each for a total 32 register addresses for total 16 lanes.	measured



# LTV1305 CFP4 Optical Transceiver

## 100Gb/s 10km

8162 to 8163	2	7~0	Path Penalty for network lanes 1 .		measured
8164 to 8165	2	7~0	Path Penalty for network lanes 2 .		measured
8166 to 8167	2	7~0	Path Penalty for network lanes 3 .		measured

CFP NVR 4					
内地 址	长度	Bit	字段名称	描述	值
8180	1	7~0	CFP NVR 3 Checksum	The 8-bit unsigned sum of all CFP NVR 3 contents from address 8100h through 817Fh inclusive.	程序写入
8181	127	7~0	Reserved		00h