

# 10G XFP DWDM Transceiver (KW8940-Dxx)

## Duplex LC,DWDM, EML, PIN Receiver, Single Mode, 40km



- ✧ DWDM EML laser transmitter
- ✧ 100GHz ITU Grid, C Band
- ✧ Duplex LC connector
- ✧ 2-wire interface for management and diagnostic monitor
- ✧ XFI electrical interface with AC coupling
- ✧ Power supply voltages : +3.3V, +5V
- ✧ Temperature range: 0°C to 70°C
- ✧ Power dissipation: <3.5W
- ✧ RoHS Compliant

### Features:

- ✧ Support multi protocol from 9.95Gb/s to 11.3Gb/s
- ✧ Hot pluggable 30 pin connector
- ✧ Compliant with XFP MSA
- ✧ Transmission distance of 40km over single mode fiber

### Applications:

- ✧ DWDM Networks
- ✧ SONET OC-192/SDH STM-64
- ✧ 10GBASE-ER/EW Ethernet
- ✧ 40km 10G Fiber Channel

### Description:

Kewei fiber' K W 8940-Dxx Small Form Factor 10Gb/s (XFP) transceivers are compliant with the current XFP Multi-Source Agreement (MSA) Specification. The high performance cooled DWDM EML transmitter and high sensitivity PIN receiver provide superior performance for SONET/SDH and Ethernet applications up to 40km optical links.

### Specification:

#### ● Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature	T <sub>ST</sub>	-40	+85	°C
Operating Temperature	T <sub>IP</sub>	-5	+70	°C
Supply Voltage 1	V <sub>CC3</sub>	-0.5	+4.0	V
Supply Voltage 2	V <sub>CC5</sub>	-0.5	+6.0	V

#### ● Electrical Characteristics (Condition: T<sub>a</sub>=T<sub>OP</sub>)

Parameter	Symbol	Min	Typ	Max	Unit	Note
Supply Voltage 1	V <sub>CC5</sub>	4.75		5.25	V	
Supply Voltage 2	V <sub>CC3</sub>	3.13		3.45	V	
Supply Current – V <sub>CC5</sub> supply	I <sub>CC5</sub>			200	mA	
Supply Current – V <sub>CC3</sub> supply	I <sub>CC3</sub>			550	mA	
Module total power	P			3.5	W	

**10G XFP DWDM Transceiver (KW8940-Dxx)**  
**Duplex LC,DWDM, EML, PIN Receiver, Single Mode, 40km**

<b>Transmitter</b>							
Input differential impedance	R <sub>in</sub>		100		Ω	1	
Differential data input swing	V <sub>in,pp</sub>	150		820	mV		
Transmit Disable Voltage	VD	2.0		V <sub>cc</sub>	V		
Transmit Enable Voltage	VEN	GND		GND+0.8	V		
Transmit Disable Assert Time	T <sub>off</sub>			100	ms		
Tx Enable Assert Time	T <sub>on</sub>			100	ms		
<b>Receiver</b>							
Differential data output swing	V <sub>out,pp</sub>	300	500	850	mV		
Data output rise time	t <sub>r</sub>		-	35	ps	2	
Data output fall time	t <sub>f</sub>		-	35	ps	2	
LOS Fault	VLOS fault	V <sub>cc</sub> – 0.5		V <sub>cc</sub> HOST	V	3	
LOS Normal	VLOS norm	GND		GND+0.5	V	3	
Power Supply Rejection	PSR	See Note 4 below					4

**Notes:**

1. After internal AC coupling.
2. 20 – 80 %
3. Loss Of Signal is open collector to be pulled up with a 4.7k – 10kohm resistor to 3.15 – 3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
4. Per Section 2.7.1. in the XFP MSA Specification.

● **Optical Characteristics (Condition: T<sub>a</sub>=T<sub>OP</sub>)**

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
<b>Transmitter</b>						
Operating Data Rate	BR	9.95		11.3	Gb/s	
Bit Error Rate	BER			10 <sup>-12</sup>		
Maximum Launch Power	P <sub>MAX</sub>	-1		+4	dBm	1
Optical Wavelength-End Of Life	λ	X-100	X	X+100	pm	
Optical Wavelength-Beginning Of Life	λ	X-25	X	X+25	pm	
Optical Extinction Ratio	ER	8.2			dB	
Spectral Width@-20dB	Δλ			1	nm	
Side mode Suppression ratio	SMSR <sub>min</sub>	30			dB	
Rise/Fall Time (20%~80%)	T <sub>r</sub> /T <sub>f</sub>			35	ps	
Average Launch power of OFF Transmitter	P <sub>OFF</sub>			-30	dBm	
Tx Jitter	T <sub>xj</sub>	Compliant with each standard requirements				
Optical Eye Mask		IEEE802.3ae				2
<b>Receiver</b>						
Operating Data Rate	BR	9.95		11.3	Gb/s	
Receiver Sensitivity	Sen			-16	dBm	2
Maximum Input Power	P <sub>MAX</sub>	0			dBm	2
Optical Center Wavelength	λ <sub>c</sub>	1260		1600	nm	
Receiver Reflectance	R <sub>rx</sub>			-27	dB	

# 10G XFP DWDM Transceiver (KW8940-Dxx)

## Duplex LC,DWDM, EML, PIN Receiver, Single Mode, 40km

LOS De-Assert	LOS <sub>D</sub>			-17	dBm	
LOS Assert	LOS <sub>A</sub>	-27			dBm	
LOS Hysteresis	LOS <sub>H</sub>	0.5		5	dB	

### Notes:

- The optical power is launched into SMF.
- Measured with a PRBS 2<sup>31</sup>-1 test pattern @ 10.3125Gbps BER<10<sup>-12</sup>.

### Pin Assignment:

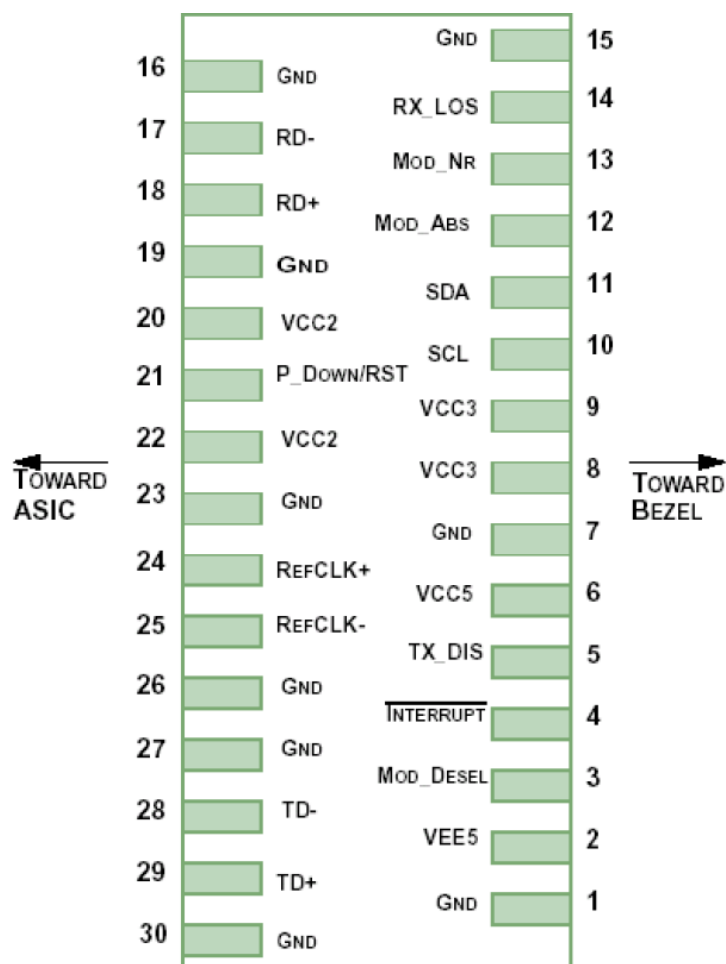


Diagram of Host Board Connector Block Pin Numbers and Name

### Pin Description:

Pin	Logic	Symbol	Name/Description	Ref.
1		GND	Module Ground	1
2		VEE5	Optional -5.2 Power Supply – Not required	
3	LVTTL-I	Mod-Desel	Module De-select; When held low allows the module to respond to 2-wire serial interface commands	
4	LVTTL-O	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Transmitter laser source turned off	
6		VCC5	+5 Power Supply	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	

**10G XFP DWDM Transceiver (KW8940-Dxx)**  
**Duplex LC,DWDM, EML, PIN Receiver, Single Mode, 40km**

9		VCC3	+3.3V Power Supply	
10	LVTTL-I	SCL	Serial 2-wire interface clock	2
11	LVTTL- I/O	SDA	Serial 2-wire interface data line	2
12	LVTTL-O	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module.	2
13	LVTTL-O	Mod_NR	Module Not Ready;	2
14	LVTTL-O	RX_LOS	Receiver Loss of Signal indicator	2
15		GND	Module Ground	1
16		GND	Module Ground	1
17	CML-O	RD-	Receiver inverted data output	
18	CML-O	RD+	Receiver non-inverted data output	
19		GND	Module Ground	1
20		VCC2	+1.8V Power Supply – Not required	
21	LVTTL-I	P_Down/RST	Power Down; When high, places the module in the low power stand-by mode and on the falling edge of P_Down initiates a module reset	
			Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle.	
22		VCC2	+1.8V Power Supply – Not required	
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board – Not required	3
25	PECL-I	RefCLK-	Reference Clock inverted input, AC coupled on the host board – Not required	3
26		GND	Module Ground	1
27		GND	Module Ground	1
28	CML-I	TD-	Transmitter inverted data input	
29	CML-I	TD+	Transmitter non-inverted data input	
30		GND	Module Ground	1

**Note**

1. Module circuit ground is isolated from module chassis ground within the module.
2. Open collector; should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.
3. A Reference Clock input is not required .

**Digital Diagnostic Functions:**

As defined by the XFP MSA 1 , Kwei fiber’s XFP transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

- ✓ Transceiver temperature
- ✓ Laser bias current
- ✓ Transmitted optical power
- ✓ Received optical power
- ✓ Transceiver supply voltage

It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-users when particular operating parameters are outside of a factory-set normal range.

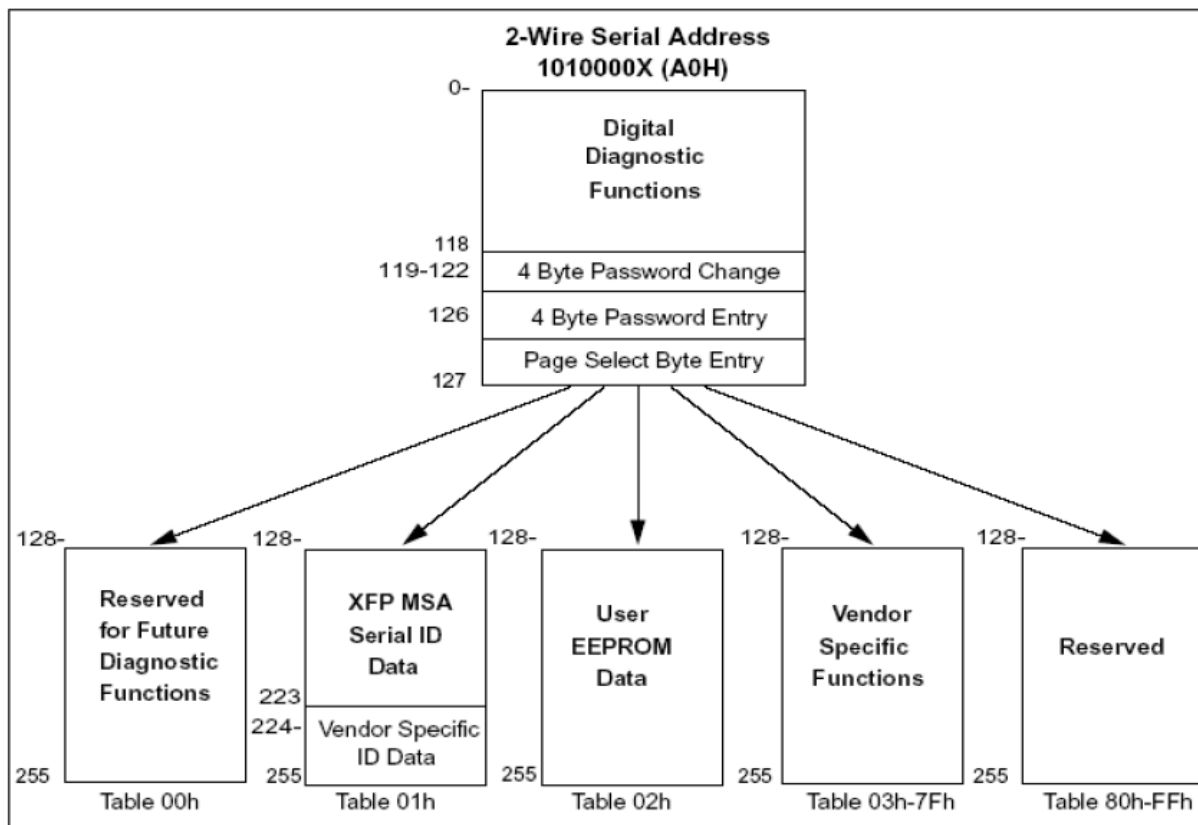
The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through the 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL pin) is generated by the

# 10G XFP DWDM Transceiver (KW8940-Dxx)

## Duplex LC,DWDM, EML, PIN Receiver, Single Mode, 40km

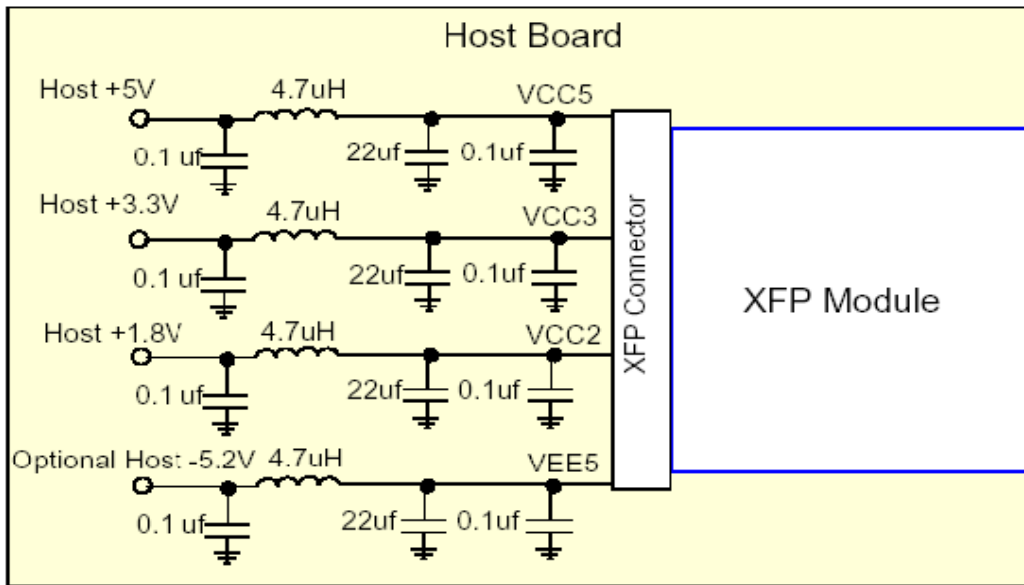
host. The positive edge clocks data into the XFP transceiver into those segments of its memory map that are not write-protected. The negative edge clocks data from the XFP transceiver. The serial data signal (SDA pin) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially. The 2-wire serial interface provides sequential or random access to the 8 bit parameters, addressed from 000h to the maximum address of the memory.

For more detailed information including memory map definitions, please see the XFP MSA Specification.

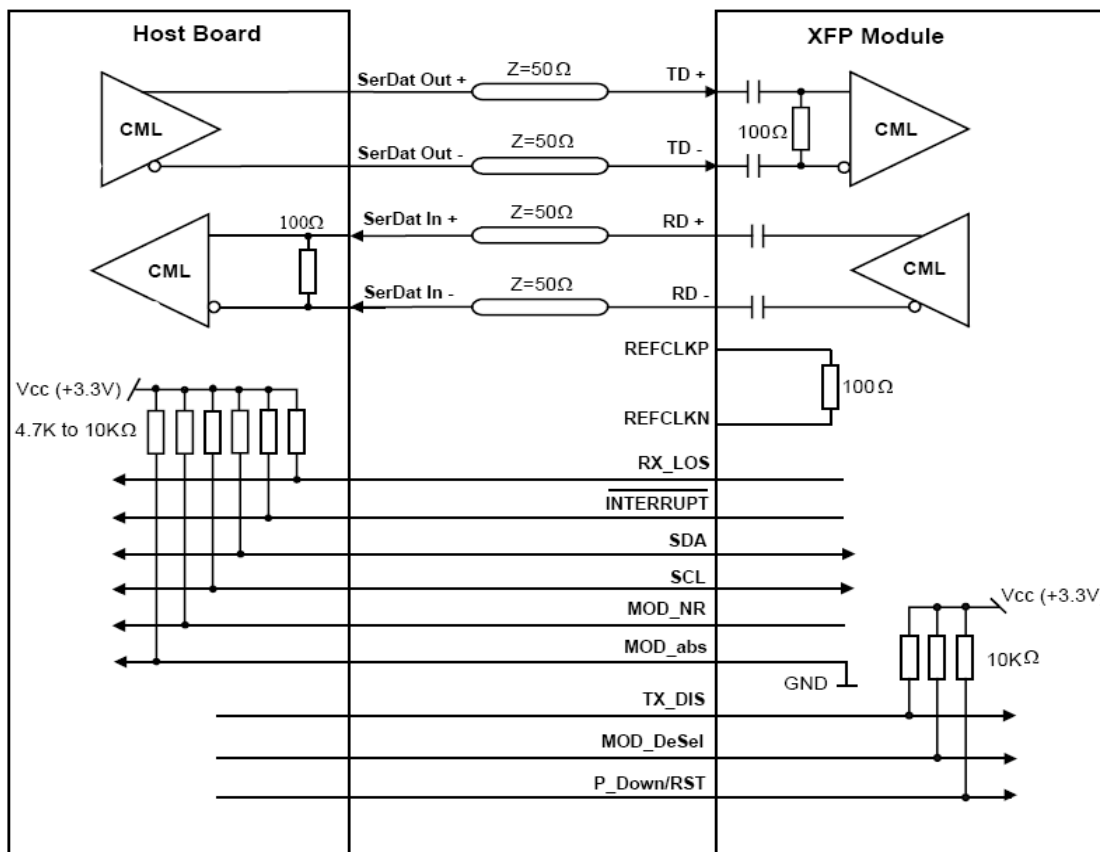


**10G XFP DWDM Transceiver (KW8940-Dxx)**  
**Duplex LC,DWDM, EML, PIN Receiver, Single Mode, 40km**

**Recommended Circuit:**



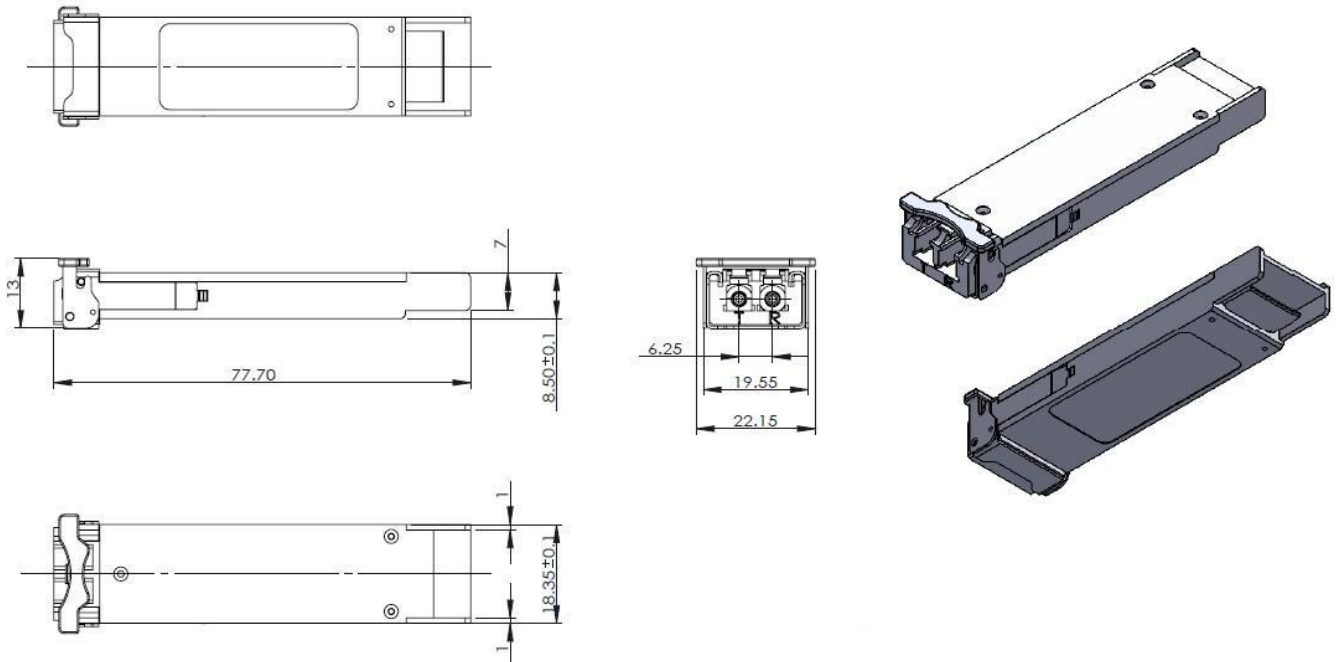
**Recommended Host Board Power Supply Circuit**



**Recommended High-speed Interface Circuit**

**10G XFP DWDM Transceiver (KW8940-Dxx)**  
**Duplex LC,DWDM, EML, PIN Receiver, Single Mode, 40km**

**Mechanical Dimensions:**



● **Order Information:**

**KW8940-DXX**

**XX: 100GHZ ITU Grid Wavelength**

Part No.	Central Wavelength(nm)	Frequency (THZ)
KW8940-D61	1528.77	196.1
KW8940-D60	1529.55	196.0
KW8940-D59	1530.33	195.9
KW8940-D58	1531.12	195.8
KW8940-D57	1531.90	195.7
KW8940-D56	1532.68	195.6
KW8940-D55	1533.47	195.5
KW8940-D54	1534.25	195.4
KW8940-D53	1535.04	195.3
KW8940-D52	1535.82	195.2
KW8940-D51	1536.61	195.1
KW8940-D50	1537.40	195.0
KW8940-D49	1538.19	194.9
KW8940-D48	1538.98	194.8
KW8940-D47	1539.77	194.7
KW8940-D46	1540.56	194.6
KW8940-D45	1541.35	194.5
KW8940-D44	1542.14	194.4

**10G XFP DWDM Transceiver (KW8940-Dxx)**  
**Duplex LC,DWDM, EML, PIN Receiver, Single Mode, 40km**

---

KW8940-D43	1542.94	194.3
KW8940-D42	1543.73	194.2
KW8940-D41	1544.53	194.1
KW8940-D40	1545.32	194.0
KW8940-D39	1546.12	193.9
KW8940-D38	1546.92	193.8
KW8940-D37	1547.72	193.7
KW8940-D36	1548.51	193.6
KW8940-D35	1549.32	193.5
KW8940-D34	1550.12	193.4
KW8940-D33	1550.92	193.3
KW8940-D32	1551.72	193.2
KW8940-D31	1552.52	193.1
KW8940-D30	1553.33	193.0
KW8940-D29	1554.13	192.9
KW8940-D28	1554.94	192.8
KW8940-D27	1555.75	192.7
KW8940-D26	1556.55	192.6
KW8940-D25	1557.36	192.5
KW8940-D24	1558.17	192.4
KW8940-D23	1558.98	192.3
KW8940-D22	1559.79	192.2
KW8940-D21	1560.61	192.1
KW8940-D20	1561.42	192.0
KW8940-D19	1562.23	191.9
KW8940-D18	1563.05	191.8
KW8940-D17	1563.86	191.7

Kewei fiber reserves the right to make changes to the products or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such products or information.

Published by Kunshan Kewei Fiber Communications Equipment Co.,Ltd

Copyright © KEWEI FIBER

All Rights Reserved