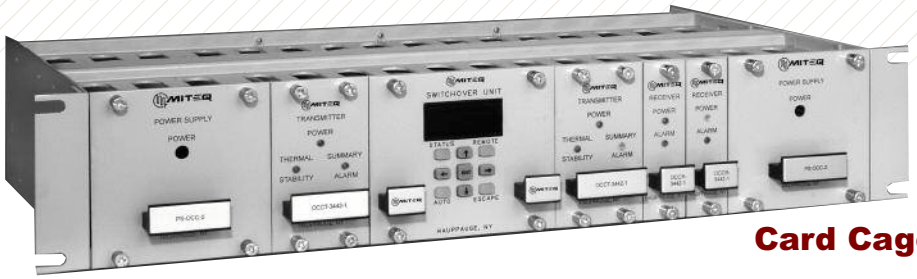
INDOOR APPLICATIONS

PRELIMINARY DATASHEET - CHANGES AND REVISIONS STILL POSSIBLE

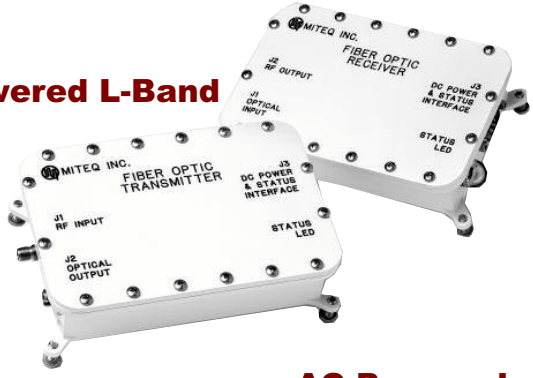
One Third Rack



Card Cage Rack

OUTDOOR APPLICATIONS

DC-Powered L-Band



C-Band LNA

S-Band LNA

AC-Powered

TABLE OF CONTENTS

ADVANTAGE OF FIBER OPTICS

- **Longer transmission paths than coaxial cable**
- **Easy installation, lightweight and flexible**
- **Fiber is unsusceptible to lightning strikes**
- **Provides EMI/RFI insulation**
- **Large bandwidths**

One Third Rack Fiber Optic Links

Features

- High dynamic range
- Low noise figure
- Compact size
- Summary alarm contacts
- Status LEDs
- Front panel removable
- Universal AC input (90-250 VAC)
- Operational to distances over 10 km
- APC optical connectors
- Optional level adjust on Rx

MITEQ'S one third rack fiber optic systems are designed to provide state-of-the-art fiber optic links, while reducing rack space requirements. By creating the framework with front panel access to the fiber optic unit, the end user has the flexibility to interchange transmitters and receivers as needed. One third rack systems can be provided in any combination of up to three individual transmitters or receivers spanning all covered satellite bands.

ONE THIRD RACK MODELS (frame part number: OL-TR3-12)

Transmitter Model Numbers	Receiver Model Numbers	Frequency
ORT-103000-1	ORM-103000-1	10-3000 MHz
ORT-3442-1	ORM-3442-1	3.4-4.2 GHz
ORT-95012750-1	ORM-95012750-1	0.95-12.75 GHz
ORT-9502150-1	ORM-9502150-1	950-2150 MHz
ORT-10701275-1	ORM-10701275-1	10.7-12.75 GHz
ORT-13751450-1	ORM-13751450-1	13.75-14.5 GHz

NOTE: Custom models available upon request.

Specifications

See pages 6 and 7 for additional specifications.

PRIMARY POWER REQUIREMENTS

Voltage ..... 90-250 VAC
Frequency ..... 47-63 Hz
Power ..... 12 W typical

PHYSICAL

Weight
Frame ..... 1.5 pounds nominal
Transmitter
ORT-9502150-1 & ORT-103000-1..... 3 pounds nominal
ORT-10701275-1, ORT-3442-1,
ORT-13751450-1 & ORT-95012750-1... 5 pounds nominal
Receiver
ORM-9502150-1 & ORM-103000-1..... 3 pounds nominal
ORM-10701275-1, ORM-3442-1,
ORT-M3751450-1 & ORM-95012750-1. 5 pounds nominal

PHYSICAL (CONTINUED)

Overall dimension ..... 19" x 1.75" x 12"
(excluding connectors)
Connectors
RF ..... SMA female
Summary alarm DE-9P
(mating connector supplied)

Pin configuration
Pin 1 - summary alarm normally open
Pin 2 - summary alarm common
Pin 3 - summary alarm normally closed
Pins 4, 5 & 6 - N/C
Pin 7 - RSU power enable
Pin 8 - +12 VDC output
Pin 9 - +12 VDC return
AC input IEC-320

Options

See pages 18 and 19 for a list of available options.

One Third Rack Fiber Optic Redundant Switchover Unit

Features

- RF and optical switching
- Local and remote control (RS485/422 10/100Base-T Ethernet
- Automatic/manual control from both local and remote control
- Remote status
- Off line output
- RF switch position indicators
- APC optical connectors
- CE mark

The 1:1 Redundant Switchover Unit is used with two one third rack fiber optic units, one on-line (Unit A) and the second in a standby mode (Unit B). A fault condition in the on-line Unit A, or an operator-generated command, will switch the standby Unit B to the on-line position and remove Unit A from the transmission path. A full feature set of commands is available for both remote and local control.

The 1:1 Redundant Switchover Unit is designed to ensure continuous operation allowing a unit fault to be repaired and/or routine maintenance to be performed without disruption of signal transmission.

The 1:1 Redundant Switchover Unit can be ordered as an RF, fiber or a combination of RF and fiber switching system.

ONE THIRD RACK 1:1 REDUNDANT SWITCHOVER UNIT MODELS

Models*	RF Switching	Fiber Switching	Fiber Connector Type
OSU-S-TR	X		N/A
OSU-FC-TR		X	FC/APC
OSU-E-TR		X	E2000/APC
OSU-SC-TR		X	SC/APC
OSU-S/FC-TR	X	X	FC/APC
OSU-S/E-TR	X	X	E2000/APC
OSU-S/SC-TR	X	X	SC/APC

*See page 2 for available one third rack transmitters and receivers. All transmitter and receiver units ordered prior to June 2006 need to be retrofitted before accommodating switchover system.

Options

See pages 8 and 9 for a list of available options.

For literature describing local control (front panel) and remote control (remote bus), refer to MITEQ Technical Note 25T067 (www.miteq.com/satcomeq/tnindex.htm).

Card Cage Fiber Optic Links

Features

- High dynamic range
- Low noise figure
- Hot-swappable modules
- Diode-summed power supplies
- Ten module capacity in a two rack unit high chassis
- Summary alarm contacts for each module
- Status LEDs
- Front panel removable
- Universal AC input (90-250 VAC)
- Operational to distances over 10 km
- APC optical connectors

MITEQ'S fiber optic card cage system provides support for multiple transmitter and receiver modules spanning all covered satellite bands. The card cage design allows for the availability of multiple fiber optic links in a two rack unit high chassis, feature hot-swappable connections, diode-summed redundant power supplies and summary alarm contacts. The card cage can be configured with up to ten receiver modules, five transmitter modules, or any combination of up to ten L-Band transmitter and/or receiver modules

CARD CAGE COMPONENTS

Model Numbers	Description
OCC-1	Card Cage Rack
PS-OCC-1*	Power Supply
PS-OCC-2*	Power Supply

* Card cage can operate from single power supply, however, two power supplies needed for redundancy

CARD CAGE TRANSMITTERS AND RECEIVERS

Transmitter Model Numbers	Receiver Model Numbers	Frequency
OCCT-103000-1	OCCR-103000-1	10-3000 MHz
OCCT-3442-1*	OCCR-3442-1	3.4-4.2 GHz
OCCT-95012750-1*	OCCR-95012750-1	0.95-12.75 GHz
OCCT-9502150-1	OCCR-9502150-1	950-2150 MHz
OCCT-10701275-1*	OCCR-10701275-1	10.7-12.75 GHz
OCCT-13751450-1*	OCCR-13751450-1	13.75-14.5 GHz

NOTE: Custom models available upon request.

Specifications

See pages 6 and 7 for additional specifications.

PRIMARY POWER REQUIREMENTS

Voltage ..... 90-250 VAC
Frequency ..... 47-63 Hz
Power
PS-OCC-1 ..... 45 W maximum
PS-OCC-2 ..... 150 W maximum

PHYSICAL

Weight
Transmitter ..... 3 pounds nominal
Receiver ..... 2 pounds nominal
Card cage ..... 4 pounds nominal
Power supply ..... 3 pounds nominal

PHYSICAL (CONTINUED)

Overall dimension ..... 19" x 3.5" x 10" (excluding connectors)

Connectors
RF ..... SMA female
Summary alarm DB-25S
Remote ..... DE-9S (for switchover units only)
AC input IEC-320
Optical ..... See page 7

Options

See pages 18 and 19 for a list of available options.

One Third Rack Fiber Optic Redundant Switchover Unit

Features

- RF and optical switching
- Local and remote control (RS485/422 10/100Base-T Ethernet
- Automatic/manual control from both local and remote control
- Remote status
- Off line output
- RF switch position indicators
- APC optical connectors
- CE mark

The MITEQ 1:1 Fiber Optic Switchover Modules were designed to work with MITEQ optical card cage rack (OCC-1) and two fiber optic receiver or transmitter modules, one on-line (Unit A) and one is standby mode (Unit B). A fault condition in the on-line Unit A, or an operator-generated command, will switch the standby Unit B to the faulted on-line position and remove Unit A from the transmission path.

The MITEQ 1:2 Fiber Optic Switchover Modules were designed to work with MITEQ optical card cage rack (OCC-1) and three fiber optic receiver or transmitter modules, two on-line (Units A&B) and the third in standby mode (Unit C). A fault condition in either of the on-line Units A or B, or an operator-generated command, will switch the standby Unit C to the faulted on-line position and remove Units A or B from the transmission path.

The 1:1 Switchover Unit can be an RF, fiber or a combination of RF and fiber switching. The 1:2 Switchover Unit can on be RF or fiber.

The 1:1 and 1:2 Redundant Switchover Units are designed to ensure continuous operation allowing a unit to be repaired an/or routine maintenance to be performed without disruption of signal transmission.

1:1 FIBER OPTIC SWITCHOVER MODULE MODLE NUMBERS

Models*	RF Switching	Fiber Switching	Fiber Connector Type
OCCS-S	X		N/A
OCCS-FC		X	FC/APC
OCCS-E2		X	E2000/APC
OCCS-SC		X	SC/APC
OCCS-S-FC	X	X	FC/APC
OCCS-S-E2	X	X	E2000/APC
OCCS-S-SC	X	X	SC/APC

1:2 FIBER OPTIC SWITCHOVER MODULE MODLE NUMBERS

Models*	RF Switching	Fiber Switching	Fiber Connector Type
OCCS2-S	X		SMA Female
OCCS2-FC		X	FC/APC
OCCS2-E2		X	E2000/APC
OCCS2-SC		X	SC/APC

*See page 4 for available card cage transmitters and receivers.

Options

See pages 8 and 9 for a list of available options.

For literature describing local control (front panel) and remote control (remote bus), refer to MITEQ Technical Note 25T067 (www.miteq.com/satcomeq/tnindex.htm).

Specifications for Indoor Fiber Optic Links

The following specifications are based on link data, with 1 meter of fiber and -30 dBm input level.

ELECTRICAL SPECIFICATIONS			
Band	**L-Band**	**L- and S-Band**	**C-Band**
Third rack model numbers Card cage model numbers	ORT-9502150-1, ORM-9502150-1 OCCT-9502150-1, OCCR-9502150-1	ORT-103000-1, ORM-103000-1 OCCT-103000-1, OCCR-103000-1	ORT-3442-1, ORM-3442-1 OCCT-3442-1, OCCR-3442-1
Frequency Range	950 – 2150 MHz	10 – 3000 MHz	3.4 – 4.2 GHz
Gain	5 dB typical	10 dB minimum	10 dB typical
Amplitude response	1.5 dB p-p maximum		±1 dB p-p maximum
Noise figure	20 dB typical	10 dB typical, 15 dB maximum (above 10 MHz)	20 dB maximum
Group delay	±0.1 ns p-p		
Input power (1 dB compression point)	-14 dBm minimum		-15 dBm minimum
Third order intermodulation with two -25 dBm inputs	-42 dBc		-40 dBc
Gain stability	±0.25 dB/24 hours at constant temperature		
VSWR (RF only)	2.0:1 maximum		1.2:1 maximum
RF impedance	50 ohms		
Phase noise*	-100 dBc/Hz typical at 100 Hz offset		
Spurious free dynamic range	100 dB minimum at 1 Hz bandwidth		
Non-damage input	+10 dBm		+5 dBm

ELECTRICAL SPECIFICATIONS			
Band	**Broadband**	**Ku-Band (Rx-Band)**	**Ku-Band (Tx-Band)**
Third rack model numbers Card cage model numbers	ORT-95012750-1, ORM-95012750-1 OCCT-95012750-1, OCCR-95012750-1	ORT-10701275-1, ORM-10701275-1 OCCT-10701275-1, OCCR-10701275-1	ORT-13751450-1, ORM-13751450-1 OCCT-13751450-1, OCCR-13751450-1
Frequency Range	0.950 – 12.750 GHz	10.70 – 12.75 GHz	13.75 – 14.5 GHz
Gain	13 dB typical	10 dB typical	
Amplitude response	±4 dB p-p maximum	±1 dB p-p maximum	
Noise figure	20 dB typical, 25 dB maximum		
Group delay	±0.1 ns p-p		
Input power (1 dB compression point)	-15 dBm minimum		
Third order intermodulation with two -25 dBm inputs	-40 dBc		
Gain stability	±0.25 dB/24 hours at constant temperature		
VSWR (RF only)	2.0:1 maximum	1.3:1 maximum	
RF impedance	50 ohms		
Phase noise*	-100 dBc/Hz typical at 100 Hz offset		
Spurious free dynamic range	100 dB minimum at 1 Hz bandwidth		
Non-damage input	+5 dBm		

* Phase noise is residual phase noise not single sideband. Specification is guaranteed not measured.

Specifications for Indoor Fiber Optic Links (Continued)

OPTICAL SPECIFICATIONS	
Fiber	9/125 (single mode fiber)
Optical connector*	
L- and S-band units	FC/APC
C- and Ku-band units	E2000/APC
Wavelength**	
Minimum	1300 nm (receivers), 1540 nm (transmitters)
Typical	1550 nm
Maximum	1560 nm
Spectral width	1.0 nm (transmitter only)
Optical power in fiber	4 mW typical
Single side-mode suppression ratio	30 dB minimum, 40 dB typical

* Optical connectors are standard connectors for listed bands. Other connectors are available as an option.

** Wavelengths listed are MITEQ's standard. For cases where a CWDM (Coarse Wavelength Division Multiplexing) system is needed, MITEQ can supply up to 10 different transmitter wavelengths with 20 nm channel spacing.

COMMON ENVIRONMENTAL SPECIFICATIONS

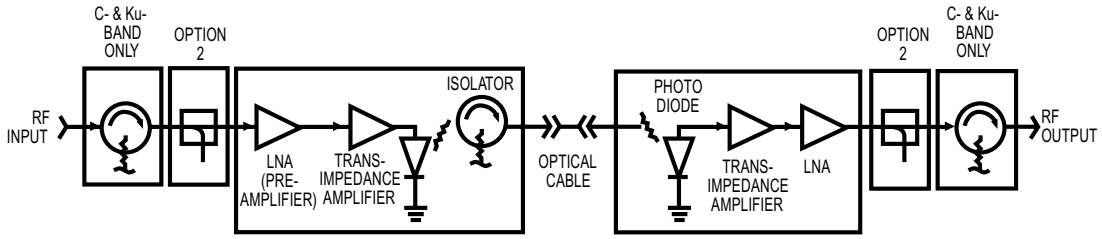
Operating

Ambient temperature ..... 0 to +50°C
Relative humidity ..... Up to 95% at 30°C
Atmospheric pressure ..... Up to 10,000 feet

Non-operating

Ambient temperature ..... -30 to +60°C
Relative humidity ..... Up to 95% at 40°C
Atmospheric pressure ..... Up to 40,000 feet
Shock and vibration ..... Normal handling by commercial carriers

Block Diagram



Specifications for Indoor Fiber Optic Links

MODES OF OPERATION

Local mode ..... Commands are received from the keys on the front panel.
Remote mode ..... Command are received from a remote system controller via the remote interface connector. All front panel keys are disabled, with the exception of local/remote mode selection.
Automatic mode ..... Switchover occurs if a fault is detected in an on-line unit.
Manual mode ..... Switchover may be executed either via the front panel keys (local mode) or the remote interface (remote mode)

RF SPECIFICATIONS

Frequency	VSWR (Max.)	Isolation (Min.)	Insertion Loss (Typ.)
DC – 1 GHz	1.10:1	85 dB	0.40 dB
1 – 4 GHz	1.20:1	80 dB	0.45 dB
4 – 8 GHz	1.30:1	70 dB	0.55 dB
8 – 14.5 GHz	1.40:1	65 dB	0.65 dB

OPTICAL SPECIFICATIONS

Frequency	VSWR (Max.)	Isolation (Min.)	Insertion Loss (Typ.)
DC – 14.5 GHz	1.01:1	60 dB	1.0 dB

RF SWITCH SPECIFICATIONS

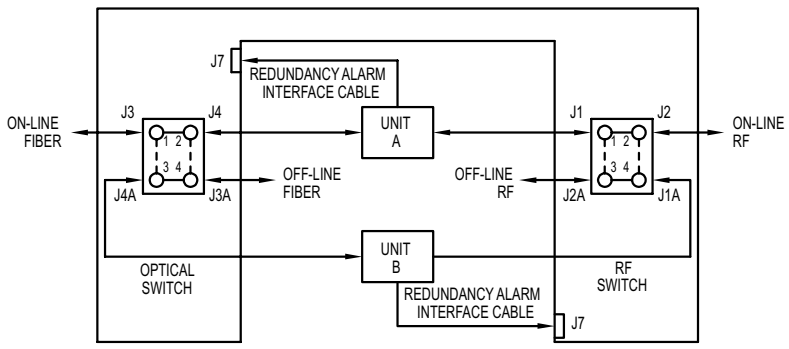
Switch type ..... Coaxial, four-port transfer
Switch contacts ..... Break-before-make, wiping
Switch drive ..... Latching
Switching speed ..... 150 ms maximum

OPTICAL SWITCH SPECIFICATIONS

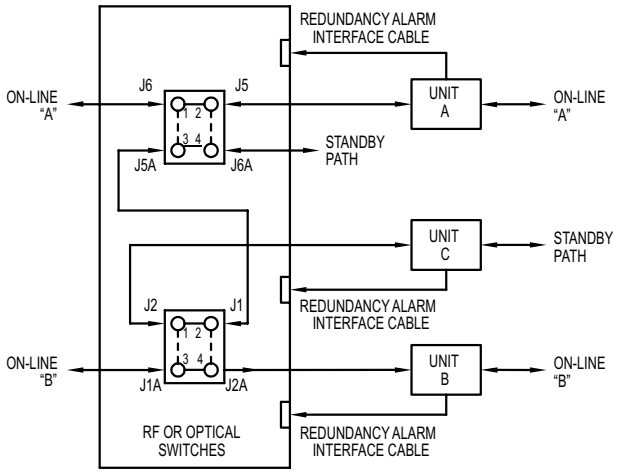
Switch type ..... Optical, 2 x 2
Switch drive ..... Latching
Switching speed ..... 10 ms maximum

Functional Block Diagrams

1:1



1:2



Specifications for 1:1 and 1:2 Switchover Units

ONE THIRD RACK SPECIFICATIONS

PRIMARY POWER REQUIREMENTS

Voltage ..... DC power from MITEQ
1/3 rack fiber optic Tx and Rx

PHYSICAL

Dimensions (excluding connectors)
- Module ..... 5.70” x 1.48” x 12”
- Frame ..... 19” x 1.75” panel height x 12”

Weight
- Module ..... 4.5 pounds [2 Kg] nominal
- Frame ..... 1.5 pounds [0.68 Kg] nominal

Connectors
- RF ..... SMA female
- Fiber optic ..... FC/APC, E2000/APC or SC/APC
- Redundancy alarm* DE-15P
- Remote interface* ..... DE-9S for RS422/485
- Ethernet interface RJ-45

* Mating connectors supplied.

CARD CAGE SPECIFICATIONS

PRIMARY POWER REQUIREMENTS

Voltage ..... DC power from
card cage (OCC-1)

PHYSICAL

Dimensions (excluding connectors)
- Module ..... 4 card cage slots (3-6)
- Frame ..... 19” x 35” panel height x 10”

Weight
- Module ..... 3 pounds [2 Kg] nominal
- Frame ..... 4 pounds [0.68 Kg] nominal

Connectors
- RF ..... SMA female
- Fiber optic ..... FC/APC, E2000/APC or SC/APC
- Summary alarm* DE-25S
- Remote interface* DE-9S
- Ethernet interface RJ-45

* Located on card cage (OCC-1). Mating connectors supplied.

REDUNDANCY CONNECTOR J7

PIN	Description
1	Unit A’ summary alarm normally open
2	Unit A’ summary alarm common
3	Unit A’ summary alarm normally closed
5	Unit ‘A’ + 12 VDC
7	Unit A’ + 12 VDC return
9	Unit ‘B’ summary alarm normally open
10	Unit ‘B’ summary alarm common
11	Unit ‘B’ summary alarm normally closed
13	Unit ‘B’ + 12 VDC
15	Unit ‘B’ + 12 VDC return

REMOTE CONNECTOR J6

PIN	Description
1	Ground
2	‘OSU’ summary alarm common
3	Data out-
4	‘OSU’ summary alarm open
5	Data in-
6	‘OSU’ summary alarm closed
7	Data out+
8	N/C
9	Data in+

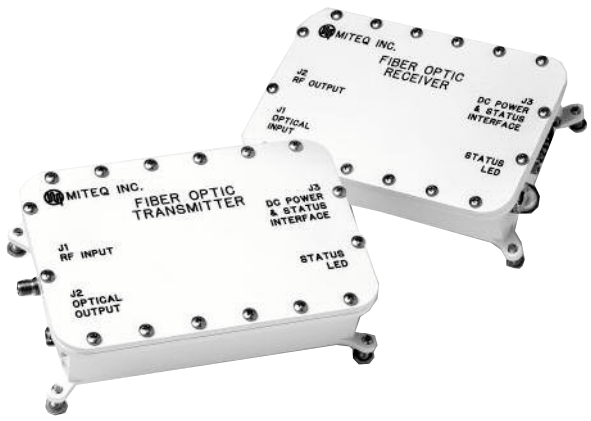
REMOTE CONNECTOR J14

PIN	Description
1	Ground
2	N/C
3	Data out-
4	N/C
5	Data in-
6	N/C
7	Data out+
8	N/C
9	Data in+

DC-Powered Outdoor L-Band Fiber Optic Links

Features

- High dynamic range
- Low noise figure
- Operational to distances up to 60 km
- Compact size
- Weather-tight enclosure
- Summary alarm contacts
- Status LEDs



MITEQ'S outdoor L-Band fiber optic links are designed for antenna mounting. With a high dynamic range and low noise figure these units provide a low cost alternative to coaxial cable. Their compact size provide an ideal solution for L-Band antenna based fiber optic applications.

TRANSMITTER AND RECEIVER MODELS

Transmitter Model Numbers	Receiver Model Numbers	Frequency
OWT-103000-1*	OWR-103000-1*	10-3000 MHz
OWT-9502150-1	OWR-9502150-1	950-2150 MHz

* Extended frequency range available, see options.

Specifications

See pages 12 and 13 for additional specifications.

PRIMARY POWER REQUIREMENTS

Voltage ..... +15 ±0.5 VDC
Noise ripple ..... <100 mV p-p
Power
Transmitter ..... 7.5 W typical
Receiver ..... 4.5 W typical

Available paint colors:
Furniture white (standard) .. FED-STD-595B color 27875
Monarch Black ..... FED-STD-595B color 27038
Green 383 ..... FED-STD-595B color 34094
Desert Tan ..... FED-STD-595B color 33303

PHYSICAL

Weight ..... 2 pounds nominal
Overall dimension ... 5.0" x 3.25" x 1.3"
Connectors
RF ..... SMA female
Optical ..... FC/APC (ST/APC optional)
Alarm/power ..... DE-9P (mating connector supplied)

Pin configuration
Pin 1 - ground
Pin 2 - +15 VDC input
Pins 3, 7, 8, 9 - N/C
Pin 4 - summary alarm normally open
Pin 5 - summary alarm common
Pin 6 - summary alarm normally closed

Options

See pages 18 and 19 for a list of available options.

AC-Powered Outdoor L-Band Fiber Optic Links

Features

- High dynamic range
- Low noise figure
- Operational to distances over 60 km
- Compact size
- Weather-tight enclosure
- Summary alarm contacts
- Status LEDs
- Universal AC input (90-250 VAC)
- Optional DC output to LNA
- CE mark

MITEQ'S outdoor AC-powered fiber optic links are designed for antenna mounting. With a high dynamic range and low noise figure these units provide a low cost alternative to coaxial cable. These units are an alternative to MITEQ's DC-powered units. These units are available in all covered satellite bands and are an ideal solution for all antenna based fiber optic applications.

TRANSMITTER AND RECEIVER MODELS

Transmitter Model Numbers	Receiver Model Numbers	Frequency
OWT-103000-2	OWR-103000-2	10-3000 MHz
OWT-3442-2	OWR-3442-2	3.4-4.2 GHz
OWT-95012750-2	OWR-95012750-2	0.95-12.75 GHz
OWT-9502150-2	OWR-9502150-2	950-2150 MHz
OWT-10701275-2	OWR-10701275-2	10.7-12.75 GHz
OWT-13751450-2	OWR-13751450-2	13.75-14.5 GHz

Specifications

See pages 12 and 13 for additional specifications.

PRIMARY POWER REQUIREMENTS

Voltage ..... 90-250 VAC
Frequency ..... 47-63 Hz
Power*
  Transmitter ..... 12 W typical
  Receiver ..... 8 W typical
* Without LNA option.

LNA OPTIONAL POWER

Voltage ..... +12 VDC
Current ..... 500 mA maximum

Available paint colors:
  Furniture white (standard) .. FED-STD-595B color 27875
  Monarch Black ..... FED-STD-595B color 27038
  Green 383 ..... FED-STD-595B color 34094
  Desert Tan ..... FED-STD-595B color 33303

PHYSICAL

Weight ..... 6 pounds nominal
Overall dimension ... 7.34" x 5.0" x 2.78"
Connectors
  RF ..... SMA female
  Optical ..... FC/APC (ST/APC optional)
  AC input ..... MS3102R10SL-3P (mating connector supplied)
  Alarm/power ..... DE-9P (mating connector supplied)

Pin configuration
  Pin 1 - ground
  Pins 2, 7, 5, 9 - N/C
  Pin 3 - summary alarm normally closed
  Pin 4 - summary alarm normally open
  Pin 6 - +15 VDC
  Pin 8 - summary alarm common

Options

See pages 18 and 19 for a list of available options.

Specifications for Outdoor Fiber Optic Links

The following specifications are based on link data, with 1 meter of fiber and -30 dBm input level.

ELECTRICAL SPECIFICATIONS			
Band	**L-Band**	**L- and S-Band**	**C-Band**
Model numbers	OWT-9502150-1, OWR-9502150-1 OWT-9502150-2, OWR-9502150-2	OWT-103000-1, OWR-103000-1 OWT-103000-2, OWR-103000-2	OWT-3442-2, OWR-3442-2
Frequency Range	950 – 2150 MHz	10 – 3000 MHz	3.4 – 4.2 GHz
Gain	5 dB nominal	10 dB nominal	10 dB nominal
Amplitude response	1.5 dB p-p maximum		±1 dB p-p maximum
Noise figure	20 dB maximum	15 dB maximum (above 10 MHz)	20 dB maximum
Group delay	±0.1 ns p-p		
Input power (1 dB compression point)	-14 dBm minimum		-15 dBm minimum
Third order intermodulation with two -25 dBm inputs	-42 dBc		-40 dBc
Gain stability	±0.25 dB/24 hours at constant temperature ±5 dB/temperature range		
VSWR (RF only)	2.0:1 maximum		1.2:1 maximum
RF impedance	50 ohms		
Phase noise*	-100 dBc/Hz typical at 100 Hz offset		
Spurious free dynamic range	100 dB minimum at 1 Hz bandwidth		
Non-damage input	+10 dBm		+5 dBm

ELECTRICAL SPECIFICATIONS			
Band	**Broadband**	**Ku-Band (Rx-Band)**	**Ku-Band (Tx-Band)**
Model numbers	OWT-95012750-2, OWT OWR-95012750-2	-10701275-2, OWR-10701275-2	OWT-13751450-2, OWR-13751450-2
Frequency Range	0.950 – 12.750 GHz	10.70 – 12.75 GHz	13.75 – 14.5 GHz
Gain	13 dB typical	10 dB typical	
Amplitude response	±4 dB p-p maximum	±1 dB p-p maximum	
Noise figure	25 dB maximum		
Group delay	±0.1 ns p-p		
Input power (1 dB compression point)	-15 dBm minimum		
Third order intermodulation with two -25 dBm inputs	-40 dBc		
Gain stability	±0.25 dB/24 hours at constant temperature ±5 dB/temperature range		
VSWR (RF only)	2.0:1 maximum	1.3:1 maximum	
RF impedance	50 ohms		
Phase noise	-100 dBc/Hz typical at 100 Hz offset		
Spurious free dynamic range	100 dB minimum at 1 Hz bandwidth		
Non-damage input	+5 dBm		

* Phase noise is residual phase noise not single sideband. Specification is guaranteed not measured.

Options

OPTION 4: DC OUTPUT TO LNA FOR AC POWERED UNITS

4A. DC output on J3 connector to power LNA.
+12 VDC available at 500 mA maximum.

4B. DC output on RF center pin to power LNA.
+12 VDC available at 300 mA maximum.

See pages 18 and 19 for a list of available options.

Specifications for Outdoor Fiber Optic Links (Continued)

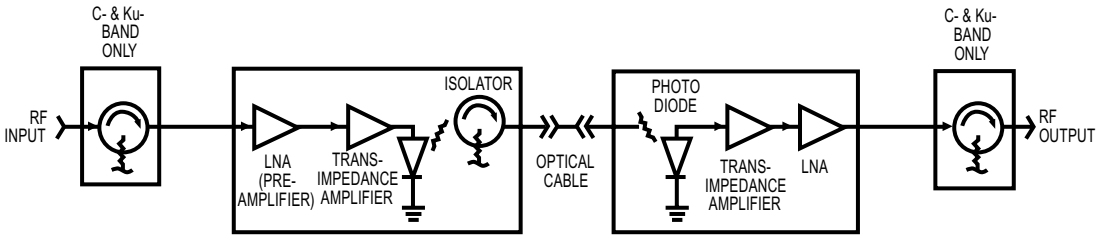
OPTICAL SPECIFICATIONS	
Fiber	9/125 (single mode fiber)
Optical connector	FC/APC (standard) ST/APC (optional)
Wavelength	
Minimum	1300 nm (receivers), 1540 nm (transmitters)
Typical	1550 nm
Maximum	1560 nm
Spectral width	1.0 nm (transmitter only)
Optical power in fiber	4 mW typical
Single side-mode suppression ratio	30 dB minimum, 40 dB typical

COMMON ENVIRONMENTAL SPECIFICATIONS

Operating
- Ambient temperature ..... -30 to +60°C
- Relative humidity ..... Up to 100% at 30°C
- Atmospheric pressure ..... Up to 10,000 feet

Non-operating
- Ambient temperature ..... -40 to +70°C
- Relative humidity ..... Up to 100% at 40°C
- Atmospheric pressure ..... Up to 40,000 feet
- Shock and vibration ..... Normal handling by commercial carriers

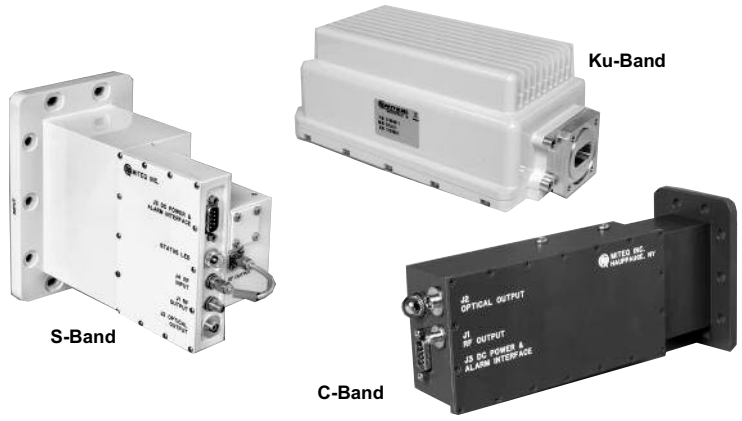
Block Diagram



Integrated LNA with Fiber Optic Transmitter

Features

- SATCOM LNA
- Fiber optic transmitter
- High dynamic range
- Low noise figure
- Operational to distances over 10 km
- Compact size
- Status LEDs



MITEQ'S outdoor DC-powered low noise amplifiers with integrated fiber optic transmitters are designed for antenna mounting. These units combine two state-of-the-art technologies. The end user gets all of the performance advantages of MITEQ's SATCOM LNAs plus a fiber optic transmitter all in one package. The transmitter features a high dynamic range and low noise figure, while the LNA features a very low noise temperature. The units eliminate the need for multiple housings and are an ideal solution for all antenna-based fiber optic applications.

Noise Temperature (°K)	LNA Gain (dB)	Model Number
C-BAND (3.4-4.2 GHz)		
30	50	OTA-C1
40	50	OTA-C2
30	60	OTA-C3
40	60	OTA-C4
S-BAND (2.2-2.3 GHz)		
30	50	OTA-S1
40	50	OTA-S2
30	60	OTA-S3
40	60	OTA-S4
Ku-BAND (10.7-12.75 GHz)		
70	60	OTA-K1
70	50	OTA-K2

Specifications

See page 15 for additional specifications.

PRIMARY POWER REQUIREMENTS

Voltage ..... +15 ±0.5 VDC
Noise ripple ..... <100 mV p-p
Power ..... 12 W typical (C, S-Band)
22.5 W typical (Ku-Band)

PHYSICAL

Weight ..... 5 pounds nominal
Connectors
RF output ..... SMA female
RF input ..... CPR229G, grooved flange (C-Band)
CPR430, flat flange (S-Band)
WR75, flat flange (Ku-Band)
Optical ..... FC/APC (ST/APC optional)
Alarm ..... DE-9P (mating connector supplied - C, S-Band)

PHYSICAL (continued)

Alarm ..... MS3112E10-6P (mating connector supplied - Ku-Band)
Pin configuration (DE-9P)
Pin 1 - ground
Pin 2 - +15 VDC input
Pins 3, 7, 8, 9 - N/C
Pin 4 - summary alarm normally open
Pin 5 - summary alarm common
Pin 6 - summary alarm normally closed
Pin configuration (MS3112E10-6P))
Pin A - +15 VDC input
Pin B - Return
Pin C - summary alarm normally closed
Pin D - summary alarm common
Pin E - summary alarm normally open

Specifications for Integrated LNA with Fiber Optic Transmitter

Electrical Specifications for LNA

Model numbers	OTA-C1 OTA-S1 OTA-K2	OTA-C2 OTA-S2	OTA-C3 OTA-S3 OTA-K1	OTA-C4 OTA-S4
Gain	50 dB minimum	50 dB minimum	60 dB minimum	60 dB minimum
Gain flatness	±0.5 dB maximum			
Pout	+10 dBm maximum			
IP^3	+20 dBm maximum			
VSWR Input Output	 1.25:1 maximum 2.0:1 maximum			
Gain variation over temperature	5 dB			

Electrical Specifications for Transmitter

Gain	LNA Gain -10 dB typical
Amplitude response	±1 dB p-p maximum (C-, S-Band), ±2 dB p-p maximum (Ku-Band)
Noise figure	20 dB maximum (C-, S-Band), 25 dB maximum (Ku-Band)
Group delay	±1 ns p-p maximum

*All specification for RF performance of the transmitter imply mating to a receiver. Transmitter will work with any available MITEQ receiver covering the same band

Optical Specifications for Transmitter

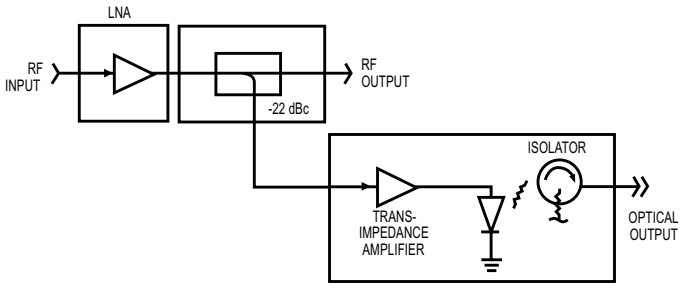
Fiber	9/125 (single mode)
Optical connector	FC/APC
Wavelength Minimum Typical Maximum	 1540 nm 1550 nm 1560 nm
Spectral width	1.0 nm
Optical power in fiber	4 mW typical (C-, S-Band), 6 mW typical (Ku-Band)
Single side-mode suppression ratio	30 dB minimum, 40 dB typical

COMMON ENVIRONMENTAL SPECIFICATIONS

Operating
- Ambient temperature ..... -30 to +60°C
- Relative humidity ..... Up to 100% at 30°C
- Atmospheric pressure ..... Up to 10,000 feet

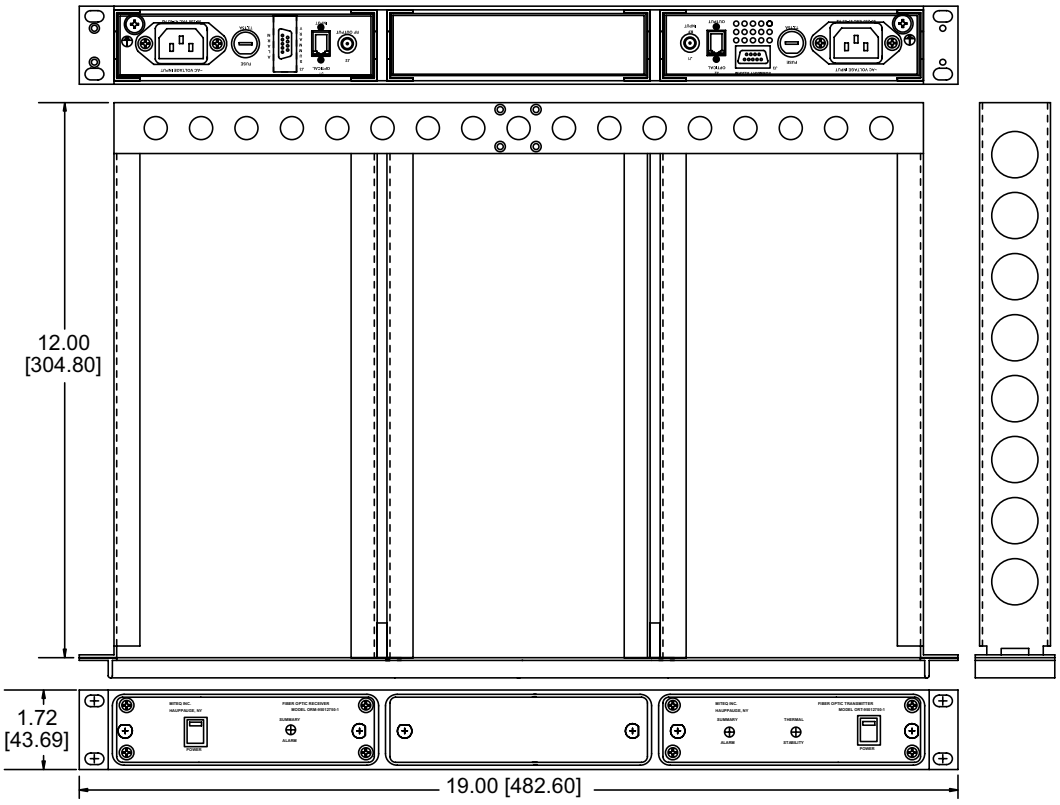
Non-operating
- Ambient temperature ..... -50 to +70°C
- Relative humidity ..... Up to 100% at 40°C
- Atmospheric pressure ..... Up to 40,000 feet
- Shock and vibration ..... Normal handling by commercial carriers

Block Diagram

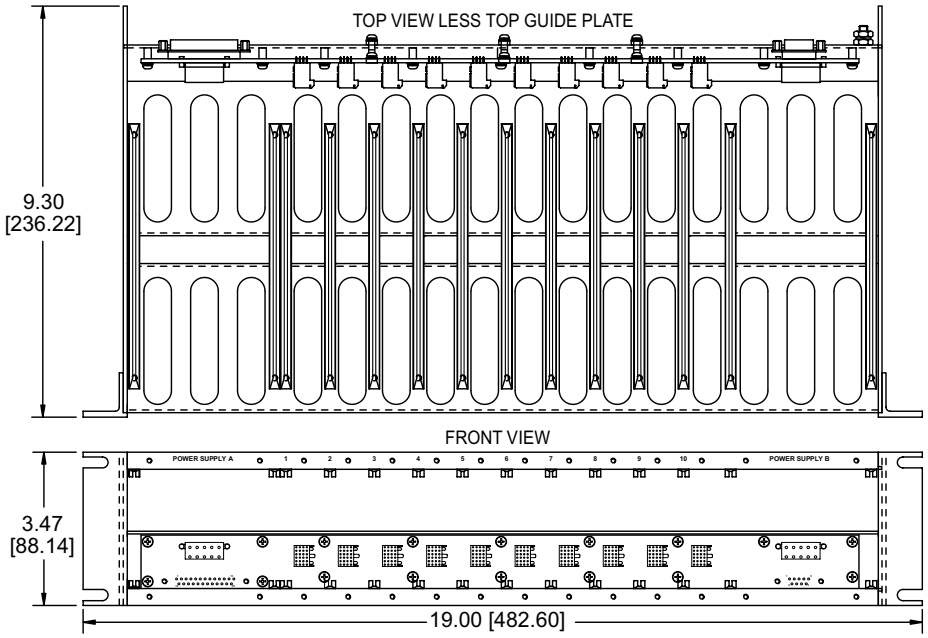


Outline Drawings

One-Third Rack Links



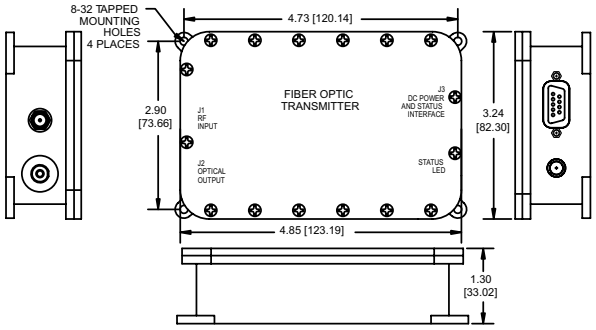
Card Cage Links



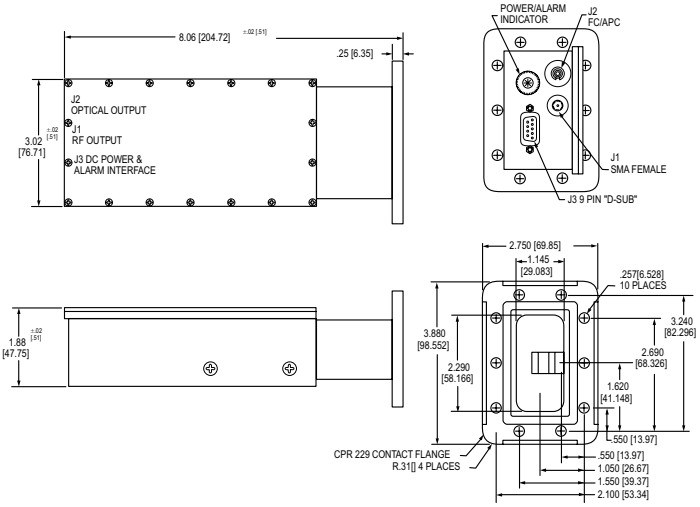
NOTE: DIMENSIONS SHOWN IN BRACKETS [ ] ARE IN MILLIMETERS.

Outline Drawings (continued)

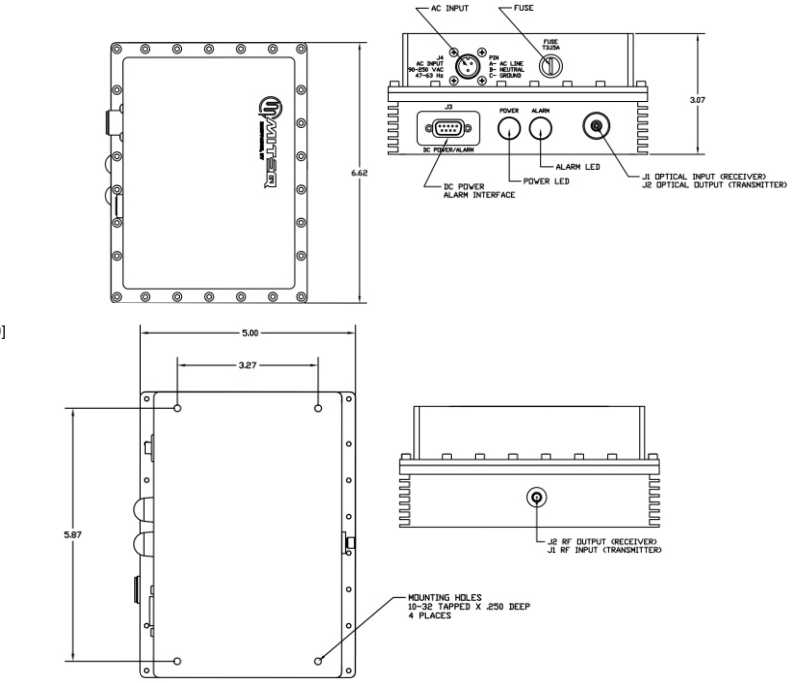
DC-Powered L-Band Links



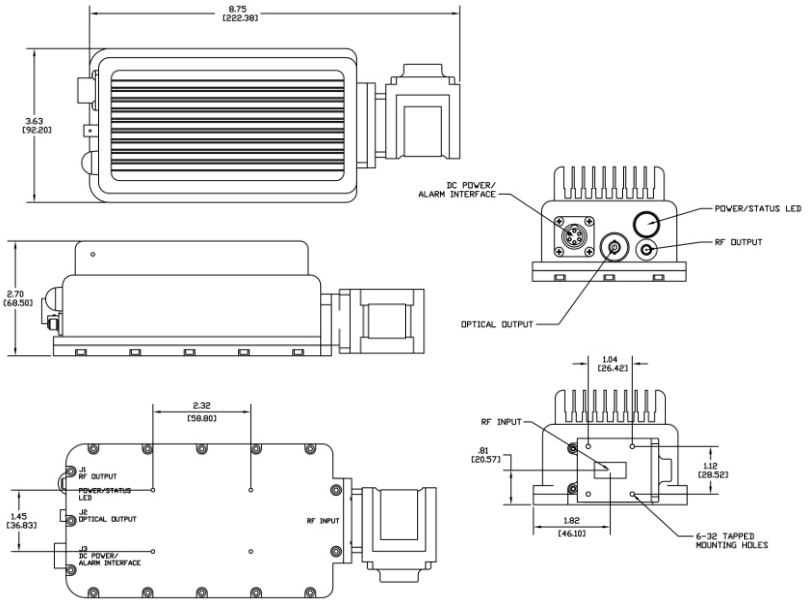
C-Band LNA with Fiber



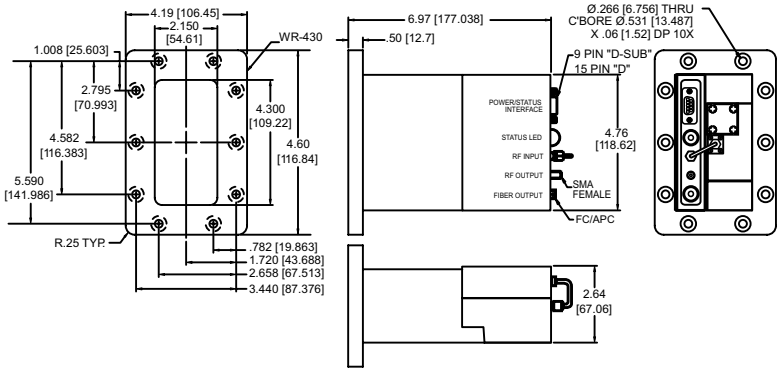
AC-Powered Links



Ku-Band LNA with Fiber



S-Band LNA with Fiber



NOTE: DIMENSIONS SHOWN IN BRACKETS [ ] ARE IN MILLIMETERS.

Options

1. Extended frequency range (10-4200 MHz).

2. RF signal monitor.
RF connector (SMA female) provided on front panel with -20 dBc nominal level.

5. Reference diplexer.
A reference diplexer can be added to the RF side of both the transmitter and receiver. The transmitter side will attenuate the reference signal (10 or 100 MHz) by 25 dB and pass the L-band signal. The receiver side will then amplify the reference signal and pass the L-band signal. This prevents saturation of the link due to the prescence of the reference signal. Some clipping of the L-band signal may occur at the low end.
A. 10 MHz reference diplexer.
B. 100 MHz reference diplexer.

10. Level adjust.
10 dB minimum, continuous adjustment from front panel knob.

11. Higher input signal power.
The input intercept point can be increased for applications where a higher input power is needed.
Input 1 dB compression: 0 dBm minimum
Input IP^3: +10 dBm minimum
Gain: 0 dB nominal
Noise figure: 23 dB nominal

FC. FC/APC optical connector.
SC. SC/APC optical connector.
E2. E2000/APC optical connector.
ST. ST/APC optical connector.

Options (continued)

Available Options Per Unit Model Number

Model Numbers	Option Number										
	FC	E2	SC	ST	1	2	4	5A	5B	10	11
ORT-9502150-1		X	X					X	X		X
ORM-9502150-1		X	X					X	X	X	X
ORT-103000-1		X	X		X			X	X		X
ORM-103000-1		X	X		X			X		X	X
ORT-3442-1	X		X			X					
ORM-3442-1	X		X			X				X	
ORT-95012750-1	X		X			X					
ORM-95012750-1	X		X			X				X	
ORT-10701275-1	X		X			X					
ORM-10701275-1	X		X			X				X	
ORT-13751450-1	X		X			X					
ORM-13751450-1	X		X			X				X	
OCCT-9502150-1		X	X					X	X		X
OCCR-9502150-1		X	X					X	X		X
OCCT-103000-1		X	X		X			X	X		X
OCCR-103000-1		X	X		X			X	X		X
OCCT-3442-1	X		X			X					
OCCR-3442-1	X		X			X					
OCCT-95012750-1	X		X			X					
OCCR-95012750-1	X		X			X					
OCCT-10701275-1	X		X			X					
OCCR-10701275-1	X		X			X					
OCCT-13751450-1	X		X			X					
OCCR-13751450-1	X		X			X					
OWT-9502150-1				X							X
OWR-9502150-1				X							X
OWT-103000-1				X	X						X
OWR-103000-1				X	X						X
OWT-103000-2				X	X		X	X	X		X
OWR-103000-2				X	X		X	X	X		X
OWT-3442-2				X			X				
OWR-3442-2				X			X				
OWT-95012750-2				X							
OWR-95012750-2				X			X				
OWT-10701275-2				X			X				
OWR-10701275-2				X							
OWT-13751450-2				X			X				
OWR-13751450-2				X			X				
OWT-9502150-2				X			X	X	X		
OWR-9502150-2				X			X	X	X		

100 Davids Drive, Hauppauge, NY 11788
TEL.: +1-631-436-7400 • FAX: +1-631-436-7431
www.miteq.com