



**OTOT-300C**

**OLSON TECHNOLOGY, INC.**

**GENERAL PURPOSE  
RETURN PATH TRANSMITTER**

**INSTRUCTION MANUAL**



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## SAFETY WARNINGS



### LASER RADIATION



A laser transmitter emits invisible radiation that can cause permanent eye damage. ***AVOID DIRECT EXPOSURE TO BEAM.*** Operate the transmitter only with the proper optical fiber installed in the transmitter optical connector. Power to the OTOT-300C should be turned-off or preferably, disconnected whenever the optical connector cover is opened and there is no installed fiber (as when the fiber connector is being installed or removed from the transmitter connector).

**NEVER** USE ANY OPTICAL INSTRUMENT TO VIEW THE OUTPUT OF THE LASER TRANSMITTER. "OPTICAL INSTRUMENT" INCLUDES MAGNIFYING GLASSES, ETC.

**NEVER** LOOK INTO THE OUTPUT OF THE LASER TRANSMITTER

**NEVER** LOOK INTO THE OUTPUT OF A FIBER CONNECTED TO A LASER TRANSMITTER.

**NEVER** LOOK INTO OR USE ANY OPTICAL INSTRUMENT TO VIEW THE DISTANT END OF A FIBER THAT MAY BE CONNECTED DIRECTLY OR VIA AN OPTICAL SPLITTER, TO A TRANSMITTER THAT MAY BE OPERATING. THIS SPECIFICALLY APPLIES TO FIBERS THAT ARE TO BE CONNECTED TO RECEIVERS OR OTHER DEVICES AT ANY DISTANCE FROM THE LASER TRANSMITTER.

### ***SHOCK HAZARD***

The OTOT-300C is designed for indoor use only. Direct exposure to moisture must be avoided. Connect the AC Adapter into the OTOT-300C before plugging the adapter into the wall.

## **INTRODUCTION**

The Olson Technology, Inc. Model OTOT-300C is a General Purpose CATV Return Path Transmitter. It offers wide analog RF bandwidth of 5-300MHz. It is available with a variety of laser options including 1310nm DFB, 1550nm DFB and CWDM wavelengths at optical output powers ranging from 1mW (0dBm) to 3mW (+5dBm). The OTOT-300C offers a low-cost alternative to digital return path hardware. It is compatible with most analog RF return path optical receivers. The Olson Technology, Inc. OTOR-300 Triple Return Path Receiver is an ideal mate to the OTOT-300C. The OTOT-300C is built in a rugged cast Aluminum housing and is powered from +12 Volts to +16 Volts DC. (Power supply ordered separately.)

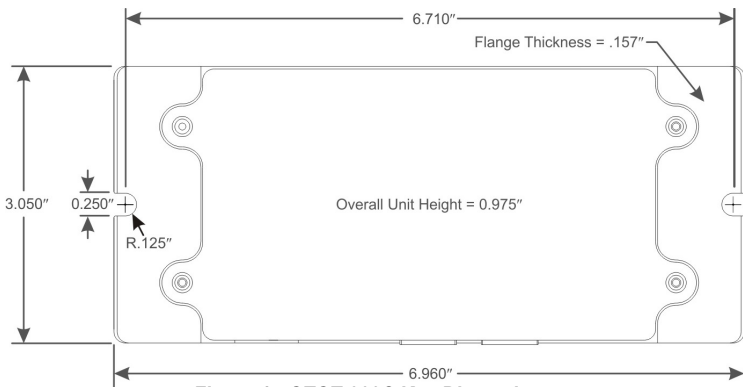
The OTOT-300C features an RF Drive test point that will yield +10dBmV per channel with a standard 5-42MHz CATV return load. The unit also has a 20dB RF gain adjustment, which allows the unit to deal with non-standard CATV return loads. The unit has a green LED to provide a positive indication that the unit is powered and a DC test point that indicates the optical output power (1Volt/mW).

## **INSTALLATION / ENVIRONMENTAL CONSIDERATIONS**

The OTOT-300C is specified to operate from -10°C to +55°C. It usually will not require an air-conditioned environment. It should be mounted in an adequately ventilated area. Like any other electronic equipment, it will probably have a longer life span if it is not operated at the upper limit of the temperature range. Installation in wet areas or areas of extremely high humidity should be avoided. Dirty or dusty areas should be avoided if possible. The OTOT-300C should not be installed in areas that are accessible to children.

The OTOT-300C may be installed and operated in any position on a flat surface. The unit has two slots in the bottom flange to accommodate mounting hardware. The unit should be mounted by sliding under one screw and then installing and tightening the other screw. If mounting requires a wood screw, use #6 or #8 (maximum) pan-head sheet metal screws. These are commonly available at hardware stores. If mounting with a machine screw (to tapped holes), use 6-32 pan-head screws.

Figure 1 shows the key dimensions of the OTOT-300C.



**Figure 1 - OTOT-300C Key Dimensions**

## OPTICAL CONNECTORS AND CLEANING

The standard optical connector is an SC/APC. In order to use an FC/APC connectors, you must order a conversion kit, OTLL-SCFCKIT. The standard optical connector location is on the same side as the RF connector. The fiber ends can be damaged by the insertion of contaminated connectors. Some types of customer damage to connectors are not covered under warranty. Fiber connectors should never be left uncovered. Pre-packaged alcohol wipes are a convenient means of cleaning optical connectors. Clean alcohol and lint free wipes, such as Kim-Wipe type 34155, or swabs may also be used.

More sophisticated fiber optic connector cleaners, such as the Senko SmartCleaner (SCK-SC-250) are very effective for cleaning external and internal fiber optic connectors.



**Figure 2 - Senko SmartCleaner**

## **OPERATIONAL SETUP – RETURN PATH TRANSMITTER**

First mount the OTOT-300C in a suitable location.

Next, be certain that electrical power is NOT applied to the transmitter. The green Power LED should be dark. Then clean and attach the optical fiber. Electrical power may now be applied.

The OTOT-300C transmitter is a key component in a CATV Return Path optical link. Proper RF input level to the OTOT-300C is critical to good performance. The RF input level to any optical transmitter is dependent on the number of channels being transmitted. As the number of carried channels is lowered, the RF input level to the transmitter can be raised. This results in increased RF levels at the receiver and improves NPR. Links should be designed and transmitters should be set up using values that represent the maximum number of channels likely to be carried.

For a normal 5-42MHz return path load, the RF Input Level should be adjusted so that the signal at the RF Test Point is +10dBmV per channel.

## Noise Power Ratio Test

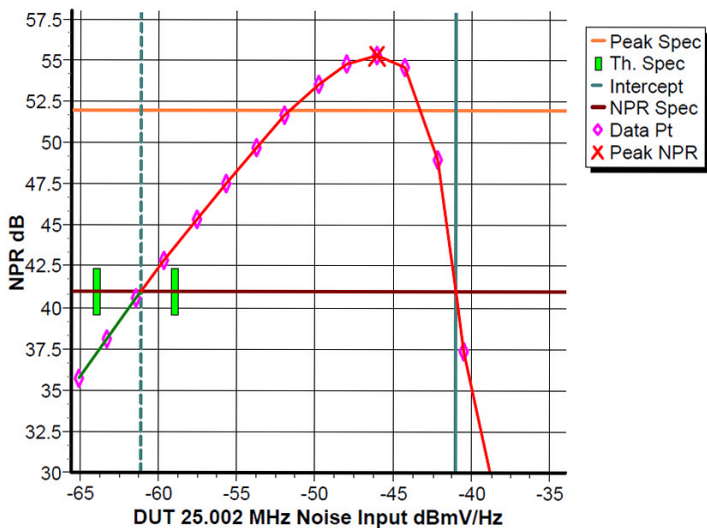


Figure 3 - Typical NPR Performance

### TEST POINTS and ADJUSTMENTS

The OTOT-300C features an RF Drive test point that will yield +10dBmV per channel when the RF input level is optimum with a standard 5-42MHz CATV return load. Connect the RF input to the transmitter and adjust the level until +10dBmV per channel is measured on the test point. Figure 2 shows typical NPR performance with greater than 18dB of usable dynamic range above 41dB NPR.

The unit also has a 20dB RF gain adjustment, which allows the unit to deal with non-standard CATV return loads. The unit has a green LED to provide a positive indication that the unit is powered and a DC test point that indicates the optical output power (1Volt/mW).

## RF Output & Performance Characteristics

	Min	Typ	Max	Units
Frequency Range	5		300	MHz
Pass Band Flatness	-1		+1	dB
RF Test Point (35MHz Load)		+10		dBmV/Ch
RF Test Point Flatness	-1		+1	dB
Impedance (F Connector)		75		Ohms
RF Adjustment Range		20		dB
Return Loss	15			dB
DFB 41dB NPR Threshold *		-60		dBmV/Hz
DFB & CWDM NPR Range	15	18		dB

\* RF Adjustment is centered.

## Physical Characteristics

Weight

Min	Typ	Max	Units
	12		oz.
	340		g
3.05 x 6.96 x 0.975			in.
7.75 x 17.7 x 2.48			cm

Dimensions (H x W x L)

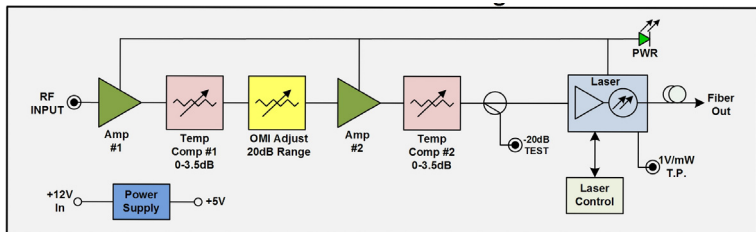


Figure 4 - OTOT-300C Block Diagram

## Optical Characteristics (with SM 9/125 $\mu$ m SM Fiber)

	Min	Typ	Max	Units
Operating Wavelength (1310)	1290	1310	1330	nm
Operating Wavelength (1550)	1530	1550	1570	nm
Operating Wavelength (CWDM)	-3	ITU	+3	nm
Optical Power	-0.5	Rated	+0.5	mW
Optical Return Loss	55			dB
Optical Connector (Std.)		SC/APC		
Optical Connector (Option)		FC/APC		

*Notes: All measurements at +25°C*

## Ordering Information

### Transmitter Options

Model OTOT-304C-SA/1	Tx, 1310nm DFB, 1mW, SC/APC
Model OTOT-304C-SA/2	Tx, 1310nm DFB, 2mW, SC/APC
Model OTOT-304C-SA/3	Tx, 1310nm DFB, 3mW, SC/APC
Model OTOT-305C-SA	Tx, 1550nm DFB, 2mW, SC/APC
Model OTOT-347C-SA	Tx, CWDM, 1470nm, 2mW, SC/APC
Model OTOT-349C-SA	Tx, CWDM, 1490nm, 2mW, SC/APC
Model OTOT-351C-SA	Tx, CWDM, 1510nm, 2mW, SC/APC
Model OTOT-353C-SA	Tx, CWDM, 1530nm, 2mW, SC/APC
Model OTOT-355C-SA	Tx, CWDM, 1550nm, 2mW, SC/APC
Model OTOT-357C-SA	Tx, CWDM, 1570nm, 2mW, SC/APC
Model OTOT-359C-SA	Tx, CWDM, 1590nm, 2mW, SC/APC
Model OTOT-361C-SA	Tx, CWDM, 1610nm, 2mW, SC/APC

### Power Supply

Model OTPS-12A	Universal AC, +12V, 1.5A, 2.1mm/5.5mm DC plug
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### Accessories

Model OTLL-SCFCKIT	Optical Connector Adapter Kit, SC/APC to FC/APC
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