



QUESTTEL

Broadcast Systems

User Manual

CATV Optical Receiver

L-RF-MN-RX



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Chapter 1. Introduction

1.1 Overview

L-RF-MN-RX, the operating bandwidth of 47~862MHz, is a low power, high performance, cost-effective triple play, FTTH CATV optical receiver. Products with high sensitivity optical receiver tube and special low noise matching circuit.

L-RF-MN-RX for Analog TV, in $P_{in} = -10\text{dBm}$ when, $V_o \geq 69\text{dB}\mu\text{V}$, $\text{CNR} \geq 45\text{dB}$.

L-RF-MN-RX for Digital TV, in $P_{in} = -15\text{dBm}$ when, $V_o \geq 62.7\text{dB}\mu\text{V}$, $\text{MER} \geq 36.8\text{dB}$.

L-RF-MN-RX for Digital TV, in $P_{in} = -20\text{dBm}$ when, $V_o \geq 53.1\text{dB}\mu\text{V}$, $\text{MER} \geq 29.4\text{dB}$.

Triple play, fiber to the home, using the L-RF-MN-RX can save a lot of optical fiber amplifier power resources. For operators, can greatly reduce the cost of building the network.

1.2 Feature

1. Extra-low noise(3.8% modulate, -10dBm receive, $\text{CNR} \geq 45\text{dB}$)
2. Wide dynamic receiving optical power range: within $P_{in} = -15$,
 $\text{MER} \geq 36.8\text{dB}$
3. Can save a large number of optical power resource, greatly reduce the
Network configuration cost
4. In the range of 40~862MHz, all have good flatness ($\text{FL} \leq \pm 0.75\text{dB}$)
5. Metal shell, supply safeguards to opto-electrical sensing device
6. High output level can supply for many users
7. Low power consumption, high cost performance

1.3 Application

1. CATV FTTH
2. Integration of three network
3. FTTH PON

Chapter 2. Details

2.1 Status Indication

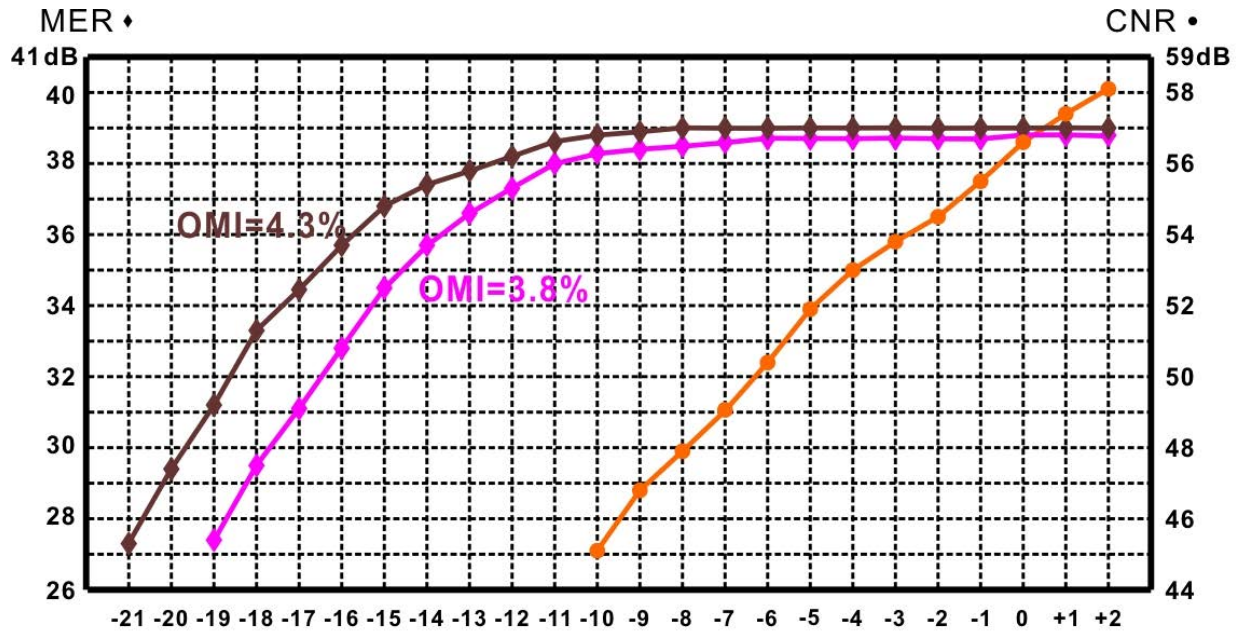
1. RED: >+2dBm
2. GREEN: +2~-16dBm
3. ORANGE: -16~-20dBm
4. RED: <-20dBm

2.2 Test Data(Pin=+2.0dBm~-20dBm)

Pin (dBm)	Vo (dBμV)	MER	BER		Pin (dBm)	Vo (dBμV)	MER	BER	
			POST	PER				POST	PER
+2.0	97	39.0	<1.0E-9	<1.0E-9	-10.0	72.9	38.8	<1.0E-9	<1.0E-9
+1.0	94.9	39.0	<1.0E-9	<1.0E-9	-11.0	70.5	38.7	<1.0E-9	<1.0E-9
+0.0	92.7	39.0	<1.0E-9	<1.0E-9	-12.0	68.4	38.2	<1.0E-9	<1.0E-9
-1.0	90.1	39.0	<1.0E-9	<1.0E-9	-13.0	67.2	37.6	<1.0E-9	<1.0E-9
-2.0	88.8	39.0	<1.0E-9	<1.0E-9	-14.0	64.9	37.4	<1.0E-9	<1.0E-9
-3.0	86.8	39.0	<1.0E-9	<1.0E-9	-15.0	62.7	36.8	<1.0E-9	<1.0E-9
-4.0	84.6	39.0	<1.0E-9	<1.0E-9	-16.0	60.7	35.7	<1.0E-9	<1.0E-9
-5.0	82.2	39.0	<1.0E-9	<1.0E-9	-17.0	59.1	34.5	<1.0E-9	<1.0E-9
-6.0	80.2	39.0	<1.0E-9	<1.0E-9	-18.0	57.1	33.3	<1.0E-9	<1.0E-9
-7.0	78.9	39.0	<1.0E-9	<1.0E-9	-19.0	55.1	31.2	<1.0E-9	<1.0E-9
-8.0	76.0	39.0	<1.0E-9	<1.0E-9	-20.0	53.1	29.4	<1.0E-9	<1.0E-9
-9.0	75.1	38.9	<1.0E-9	<1.0E-9					

Remark: 1. Teat Signal: MER: 39.0 (dB)、BER : <1.0E-9,QAM64 4CH;
 2. Tx input level: 87dBμV;3. The Test Frequency: 47 ~ 862MHz

2.3 CNR, MER Degradation Table



Note: 1. CNR Test conditions: 59CH PAL-D, OMI = 3.8%

2. MER test conditions: The Original Signal : MER = 39.0dB, BER < 1.0E-9,

Test Frequency : 47 ~ 862MHz Full Channel, (The Curve is: 858.00MHz) .

Red curve: OMI=3.8%

Brown curve: OMI=4.3%

3. Digital television Receiving Low Light, appropriate to increase the system modulation (OMI), can greatly improve the MER degradation.

Chapter 3. Technical Specification

	Performance		Index	Supplement
Optic feature	CATV Work wavelength	(nm)	1260~1620	
	Channel Isolation	(dB)	≥40	1550nm & 1490nm
	Responsibility	(A/W)	≥0.85	1310nm
			≥0.9	1550nm
	Receiving power	(dBm)	+2~-10	Analog TV(CNR>45dB)
			+2~-20	Digital TV(MER>29dB)
	Optical return loss	(dB)	≥55	
Optical fiber connector		SC/APC		
RF Feature	Work bandwidth	(MHz)	40~862	
	Flatness	(dB)	≤+0.75	40~862MHz
	Output level	(dBμV)	>92	Analog TV (Pin=+3dBm)
			>82	Analog TV (Pin=-2dBm)
			>82	Digital TV (Pin=-5dBm)
	Output level adjust	(dB)	0~18	MGC
	Return loss	(dB)	≥14	40 ~ 862MHz
	Output impedance	(Ω)	75	
	Output port number		1	
RF tie-in		F-Female		
Analog TV Link Feature	Test channel	(CH)	59CH(PAL-D)	
	OMI	(%)	3.8	
	CNR1	(dB)	56.6	Pin=-2dBm
	CNR2	(dB)	48.5	Pin=-8dBm
	CTB	(dB)	≤-70	
	CSO	(dB)	≤-66	
Digital TV Link	OMI	(%)	4.3	
	MER	(dB)	≥38	Pin=-15dBm
			≥30	Pin=-19dBm
BER	(dB)	<1.0E-9	Pin:+2~-20dBm	
General feature	Power supply	(V)	DC+12V	±1.0V
	Power Consume	(W)	≤3	+12VDC.210mA
	Work temp	(°C)	-20 ~ 55	
	Storage temp	(°C)	-40 ~ 85	
	Work relative temp	(%)	5 ~ 95	
	Size	(mm)	38×80×20	A -Type
			50×88×22	B -Type
59.5×98×23			C -Type	

Appendix 1 Use Attention

1. The power adapter for this equipment: Input 220V, output DC 12V(0.6A)
2. Keep the optical connector clean, the bad link will cause too low RF output level
3. The built-in RF adjustable attenuator(PAD) of equipment can debug suitable level for system users .User Should not adjust by themselves, to avoid the device damage.

Read before operating equipment.

1. **Cleaning** - Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
2. **Power Sources** - Use supplied or equivalent UL/CSA approved low voltage DC plug-in transformer.
3. **Outdoor Antenna Grounding** - If you connect an outside antenna or cable system to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.
4. **Lightning** - Avoid installation or reconfiguration of wiring during lightning activity.
5. **Power Lines** - Do not locate an outside antenna system near overhead power lines or other electric light or power circuits or where it can fall into such power lines or circuits. When installing an outside antenna system, refrain from touching such power lines or circuits, as contact with them might be fatal.
6. **Overloading** - Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.
7. **Object and Liquid Entry** - Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short out parts, resulting in a fire or electric shock. Never spill liquid of any kind on the product.
8. **Servicing** - Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
9. **Damage Requiring Service** - Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - When the power supply cord or plug is damaged.
 - If liquid spills or objects fall into the product.
 - If the product is exposed to rain or water.
 - If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions. An improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
 - If the video product is dropped or the cabinet is damaged.
 - When the video product exhibits a distinct change in performance, this indicates a need for service.