



farran

Operational Manual

Radar Front End (FMCW)



QUALITY
ISO 9001:2015
NSAI Certified



1. Introduction

Thank you for choosing a FMCW Radar Front-End. This user manual provides all the information related to installation, operation and troubleshooting of your FMCW. In order to bring out the maximum performance, we advise that you read this user's manual before using this product for the first time and consult it later should such a need arise.

The FMCW is a family of Radar Front-End components used in frequency modulated continuous wave radar systems at frequencies up to 80 GHz with available transmitter output power from +10 to +25 dBm. These devices multiply the frequency of an external swept signal source and share it in both transmitter and receiver sections of the circuit. They offer industry leading noise figure performance and wide bandwidths. Custom FMCW front-ends are available upon request.



General Safety Precautions.

To prevent property damage and personal injury, observe all instructions and warnings given in this manual.



2. List of parts

2.1 What's in the box

1x





6. Installation

Prior to installation of the product please ensure that you applied all recommendations provided in Safety Instructions section of this manual.





6.1 Operating Procedure

To Turn On the product:

1. Connect RF input to the signal sources.
2. Connect DC input(s) to the power supplies ensuring correct polarity.
3. Set power supplies to provide voltage and current as per [Technical Specification](#).
4. Turn on DC power supply.
5. Apply appropriate input power.

To Turn Off the product:

1. Turn off RF input power, small signal first, large signal second.
2. Turn off DC power supply.
3. Disconnect DC power supplies.
4. Disconnect inputs from the signal sources.

-  The FMCW-12-XX radar front end runs from +5V & -5V supplies.
-  The internal circuitry is designed to allow the +5V rail to be applied prior to the -5V rail without any damage or current surge occurring.
-  Typical FMCW-12-XX current consumption is listed in Table 1.
-  FTL suggests using an industry standard 8in/lb torque wrench for tightening SMA and 3.5 mm connectors.

FMCW Architecture

Figure 1 below shows a block diagram of the typical internal architecture of the FMCW-12-XX radar front end.

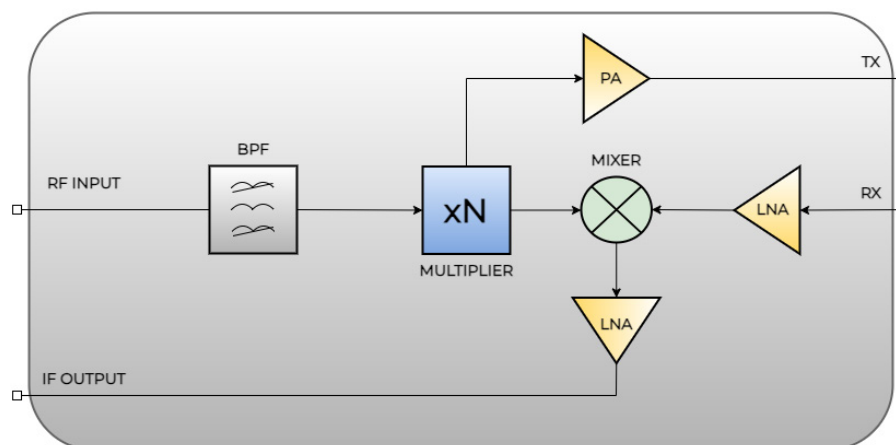


Figure 1: Typical FMCW architecture



7. Technical Specifications

7.1 FMCW-12-XX Specifications

Table 1. FMCW-12-XX Specifications

Model	Parameters												
	Centre Frequency	Bandwidth	Receiver Gain	Receiver Noise Figure @ 2 MHz IF	IF Output Frequency		LO Input Power	Transmit Output Power	RF Connections Tx & Rx	LO Connector	IF Connector	Power Requirements	Dimensions (LxWxH)
	(GHz)	(GHz)	(dB)	(dB)	min	max	(dBm)	(dBm)					(mm)
	typ	typ	typ	max			typ	typ	typ	typ	typ	typ	typ
FMCW-12-0006 (Low Power)	76.5	1	30	10	0.05	10	+10	+12	WR-12 UG-387/U	SMA 3.5 mm (f)	SMA 3.5 mm (f)	+5V @ 700 mA -5V @ 40 mA	67 x 28 x 19
FMCW-12-MP01 (Medium Power)	76.5	1	30	10	0.05	10	+10	+20	WR-12 UG-387/U	SMA 3.5 mm (f)	SMA 3.5 mm (f)	+5V @ 700 mA -5V @ 40 mA	67 x 28 x 19
FMCW-12-HP01 (High Power)	76.5	1	30	10	0.05	10	+10	+25	WR-12 UG-387/U	SMA 3.5 mm (f)	SMA 3.5 mm (f)	+5V @ 1300 mA -5V @ 40 mA	67 x 28 x 19

Specification Definitions

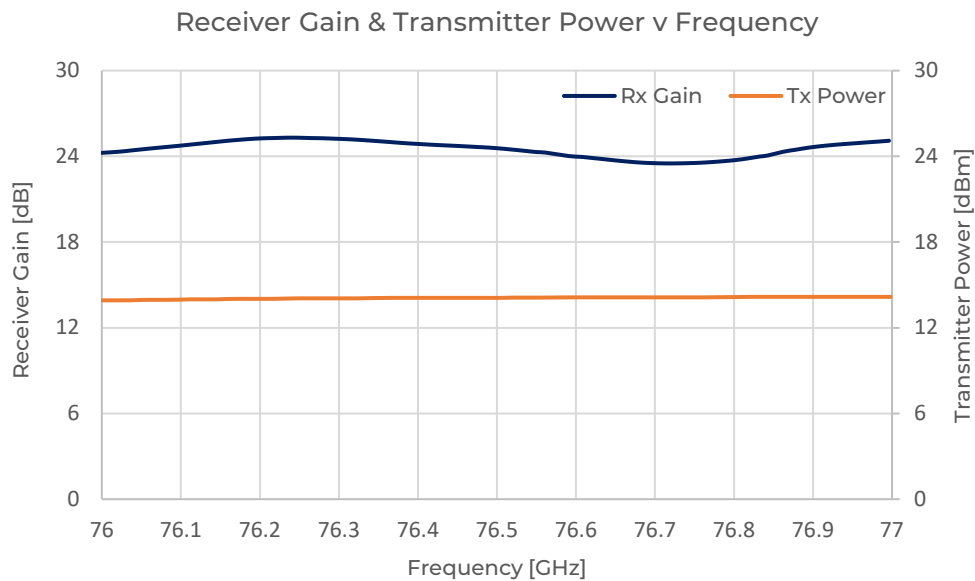
Nominal value (nom.) – ensured by design, not tested. **Measured value (min, max)** – expected and warranted product performance obtained from the actual measurements of product sample. **Non-traceable measured value (n. trc. meas.)** – expected product performance obtained from the actual measurements of a product sample by means of using Farran's own equipment and methods. Traceable only to Farran laboratory equipment. **Typical data (typ.)** – value that represents the product specification met over 90% of bandwidth or a mean value. **Specifications without limits** – represent the warranted product performance; with values of no or a negligible deviation from the given value and as such have a secondary impact on the product performance.



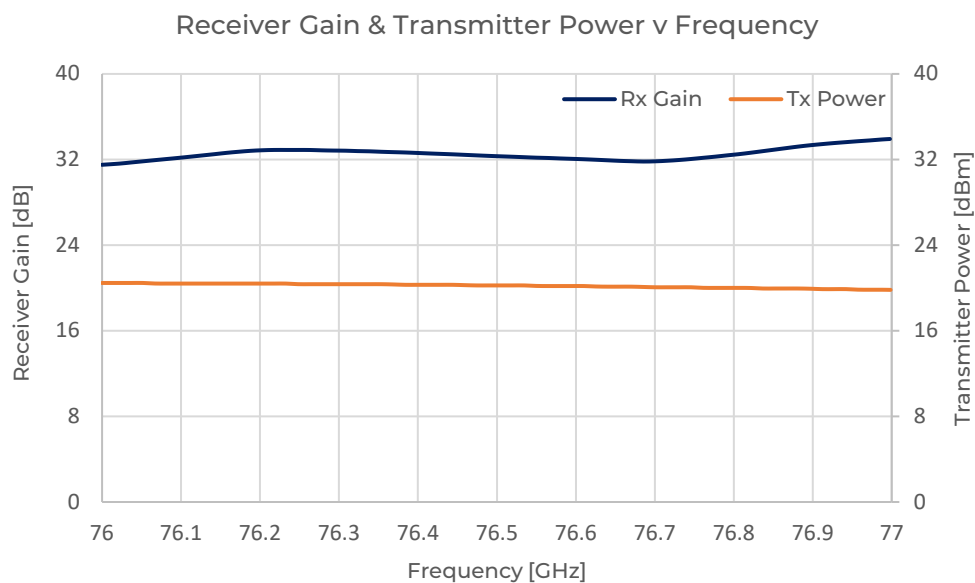
8. Typical Performance

Farran's FMCW Radar Front End performance plots are provided in this section, for all models. Unless otherwise stated, all performance data furnished here has been obtained from in-house measurements, at room temperature.

8.1 FMCW-12-0006



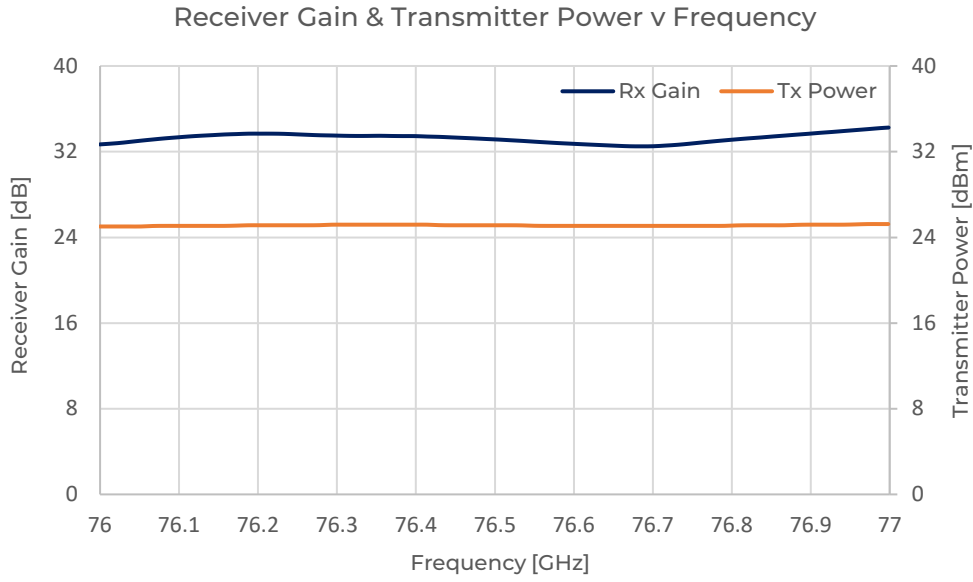
8.2 FMCW-12-MP01





8. Typical Performance

8.3 FMCW-12-HP01



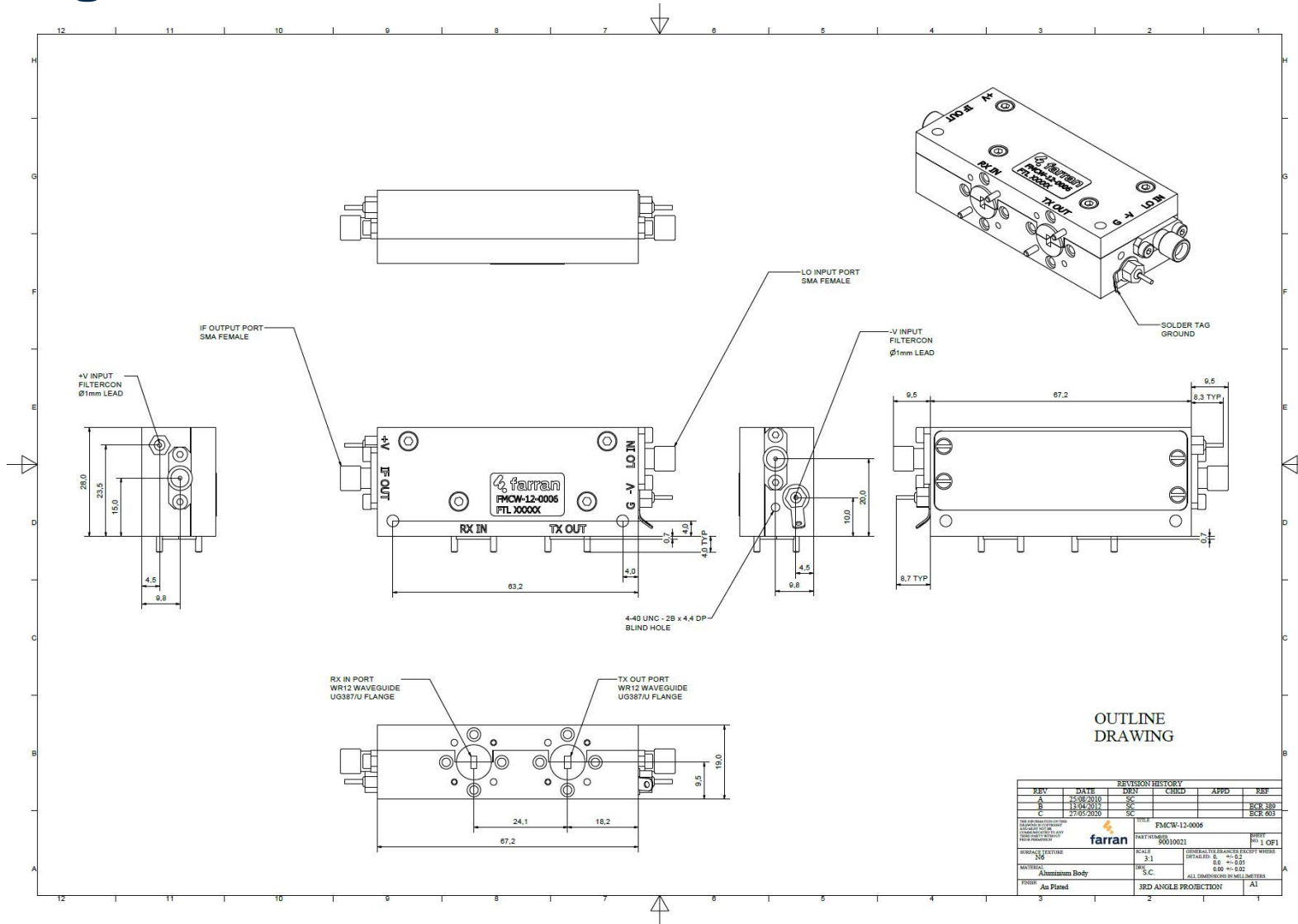


12. Appendices

12.1 Drawings



FMCW-12-XX



REVISION HISTORY					
REV	DATE	BY	CHKD	APPR	REF
A	23/06/2010	SC			BCR 382
B	17/04/2011	SC			BCR 603
C	27/07/2016	SC			

TITLE FMCW-12-0006	PART NUMBER 80010021	SHEET 1 OF 1
SCALE 3:1	GENERAL TOLERANCES UNLESS OTHERWISE SPECIFIED DECIMALS: 0.0 ±0.05 FRACTIONS: 0.00 ±0.02	FINISH Au Plated
MATERIAL Aluminium Body	DIMENSIONS IN MILLIMETERS ALL DIMENSIONS IN MILLIMETERS	PROJECTION FIRST ANGLE PROJECTION

