FN980 FAMILY
Product Description

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APPLICABILITY TABLE

PRODUCTS

- FN980 - 3G / 4G / 5G Sub-6 cellular module
- FN980m - 3G / 4G / 5G Sub-6 / 5G mmWave cellular module

Contents

1. INTRODUCTION

1.1. Scope

This document includes high level Technical Specification of the Telit FN980 Family module. All the features and solutions detailed in this document are applicable to all FN980 Family variants, where 'FN980 Family' refers to the variants listed in the applicability table.

If a specific feature is applicable to a specific product only, it will be clearly marked.

Information – FN980 Family refers to all modules listed in the Applicability Table.

The information given should be used as a guide and a starting point for properly developing your product with the Telit FN980 Family module.

Information – The integration of the 3G/4G/5G FN980 Family cellular module within a user application must be done according to the design rules described in the FN980 family official Hardware User Guide.

1.2. Audience

This document is intended for Telit customers, especially system integrators, about to implement their applications using the Telit FN980 Family module.

1.3. Contact Information, Support

For general contact, technical support services, detailed information, guidance on where you can buy the Telit modules, or for recommendations on accessories and components visit:

http://www.telit.com

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

Telit appreciates feedback from the users of our information.

1.4. Text Conventions

Danger – This information MUST be followed or catastrophic equipment failure or bodily injury may occur.

Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.

Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.

1.5. Related Documents

- FN980 Family SW User Guide, 1VV0301615
- FN980 Family AT Commands Reference Guide, 80624ST10996A
- Generic EVB HW User Guide, 1VV0301249
- FN980 Family Interface Board HW User Guide, 1VV0301651

2. GENERAL PRODUCT DESCRIPTION

2.1. Overview

The aim of this document is to present possible and recommended hardware solutions useful for developing a product with the Telit FN980 Family M.2 module.

FN980 Family is Telit's platform for M.2 module for applications, such as M2M applications and industrial IoT device platforms, based on the following technologies:

- 5G mmWave and sub-6/4G/3G networks for data communication
- Designed for industrial grade quality

In its most basic use case, FN980 Family can be applied as a wireless communication front-end for mobile products, offering mobile communication features to an external host CPU through its rich interfaces.

FN980m is available in hardware variants,with designated RF band sets per each variant.

2.2. Frequency Bands and CA combinations

2.2.1. Frequency bands

The operating frequencies in 5G, LTE and WCDMA modes conform to the 3GPP specifications.

The FN980 Family supports CA/MIMO/EN-DC configuration

For specific details about the operating frqeuncies on 5G, LTE and WCDMA mode, please contact Telit team via www.Telit.com.

2.3. Target market

FN980 Family can be used for telematics applications where tamper-resistance, confidentiality, integrity, and authenticity of end-user information are required, for example:

- Industrial equipment
- Home network
- Internet connectivity

2.4. Main features

The FN980 Family of industrial grade cellular modules features 5G mmWave/Sub-6, LTE and multi-RAT module together with an on-chip powerful application processor and a rich set of interfaces.

Main functions and features are listed below:

Main Features

Function	Features
Physical	M.2 Type 3050-D2-B
Cellular technology	5G: FR1(Sub 6G), optional FR2(mmWave) in FN980m, Rel 15 4G: CAT. 20 (2Gbps) on DL, CAT. 18 (211Mbps) on UL, Rel 14 3G: HSPA+ Rel8 up to 42/5.7 Mbps in DL/UL
4x4 MIMO	5G: n1/2/3/66/7/41/77/78/79 4G: B1/25(2)/3/66(4)/7/30/40/41(38)/42/48
Diversity/2nd Rx	4G: all operating bands 3G: all operating bands
GNSS	Dual-Frequency GNSS Upper L-band: GPS/Glonass/Beidou/Galileo Lower L-band: GPS/Galileo
USIM port – dual voltage	Support for SIM Class B and Class C support Clock rates up to 4 MHz
Application processor	Application processor to run customer application code 32 bit ARM Cortex-A7 up to 1.5 GHz running the Linux operating system 4Gbit NAND Flash + 4Gbit LPDDR4 MCP is supported
Main Interfaces	PCIe Gen3 x 1-lane USB 3.1 Gen 2 Peripheral Ports – GPIOs
Antenna connection	4 x MHF-4 type Cellular/GNSS antenna connectors 1 x MHF-4 type Dedicated GNSS antenna connector 4 x mmWave 2 in 1 IF connectors (FN980m only)
Form factor	M.2 Form factor (30 * 50 * 3.4 mm), accommodating the multiple RF bands

Function	Features
Environment and quality requirements	The device is designed and qualified by Telit to satisfy environmental and quality requirements.
Single supply module	The module internally generates all its required internal supply voltages.
RTC	Real-time clock is supported.
Operating temperature	Range -40 °C to +85 °C (conditions as defined in Section **Error! Reference source not found.**, **Error! Reference source not found.**)

2.5. Mechanical specifications

2.5.1. Dimensions

FN980 Family module overall dimensions are:

- Length: 50.00 mm, +/- 0.15 mm tolerance
- Width: 30.00 mm, +/- 0.15 mm tolerance
- Thickness: 3.40 mm, +/- 0.15 mm tolerance

2.5.2. Weight

The nominal weight of the FN980 module is 10.3 grams.
The nominal weight of the FN980m module is 10.5 grams.

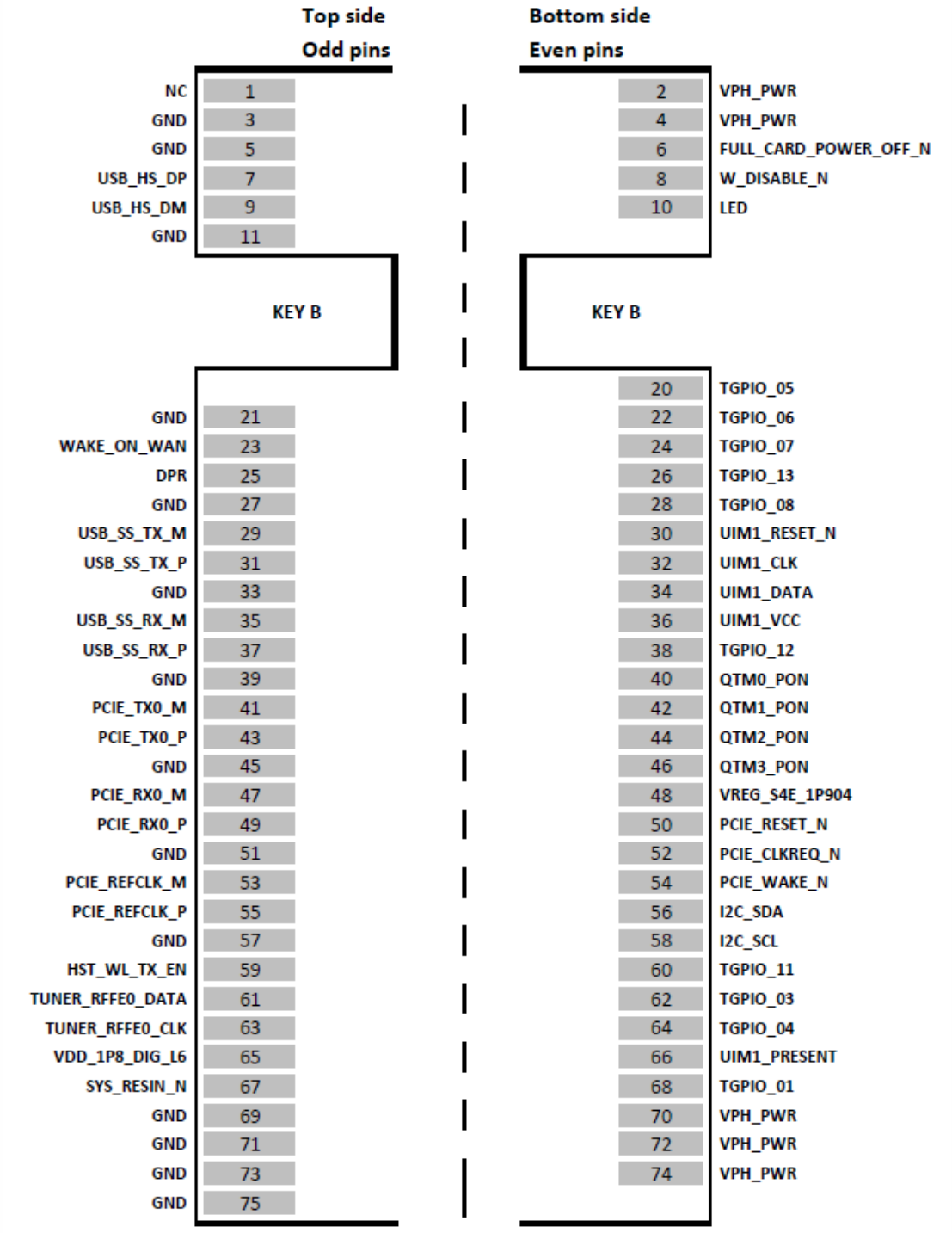
2.6. Environmental Requirements

2.6.1. RoHS Compliance

As a part of the Telit corporate policy of environmental protection, the FN980 Family complies with the RoHS (Restriction of Hazardous Substances) directive of the European Union (EU directive 2011/65/EU).

3. PINS ALLOCATION

3.1. Pin Layout



4. POWER SUPPLY

The power supply circuitry and board layout are very important parts of the full product design, with critical impact on the overall product performance.

4.1. Power Supply Requirements

The FN980 Family power requirements are as follows:

Power Supply Requirements

Nominal supply voltage	3.3V
Supply voltage range	3.135V – 3.465V
Maximum ripple on module input supply	30 mV
Peak current consumption without mmWave antenna module	3.3V @ 4 A

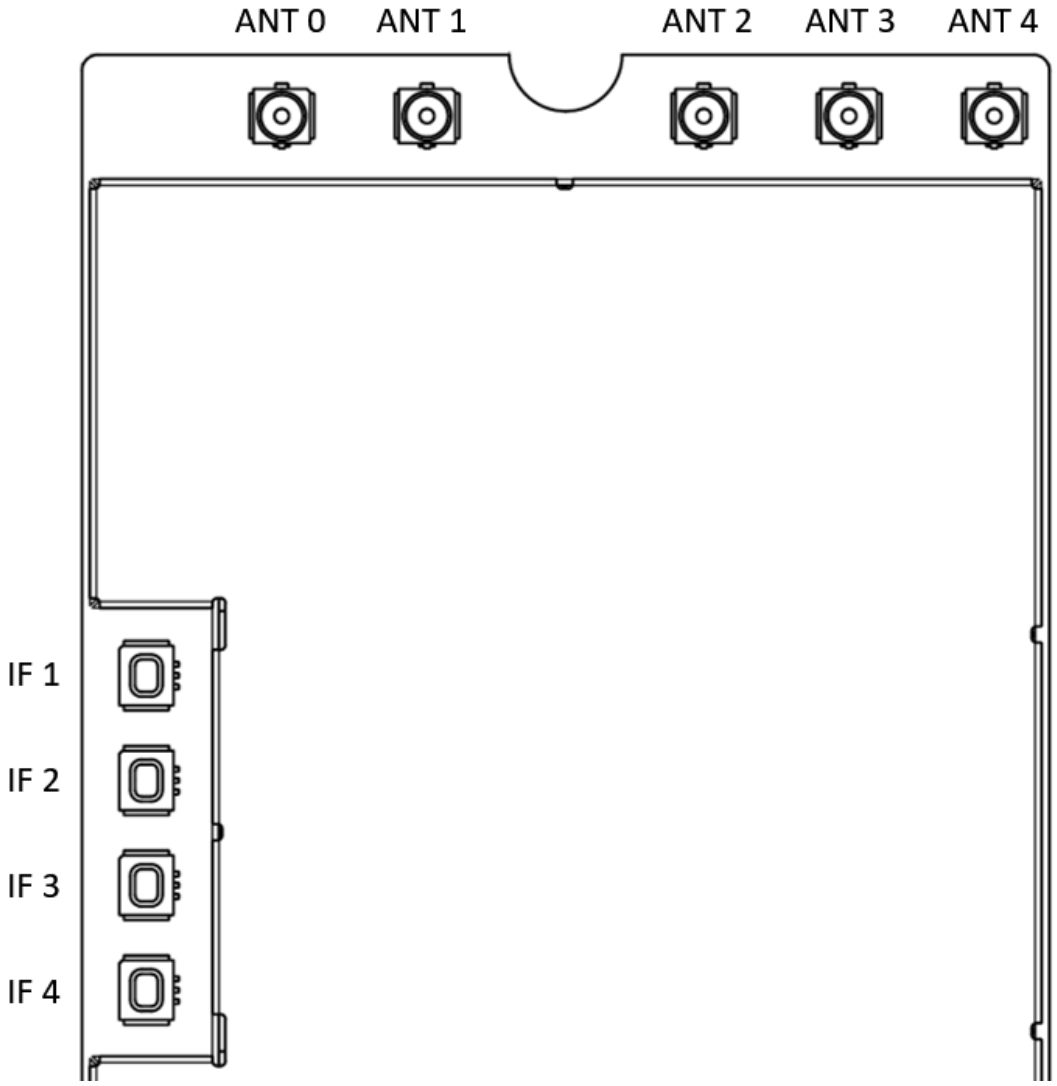
5. RF SECTION

5.1. Antenna Interface

FN980 Family provides four MHF-4 type RF connectors covering the 5G FR1/LTE/WCDMA bands including GNSS, one MHF-4 type RF connector for dedicated GNSS and four 2in1mmWave IF connectors for 5G FR2 (FN980m only).

5.1.1. Antenna configration

See the picture on the below for their position on the interface.



6. MECHANICAL DESIGN

6.1. General

The FN980 Family module was designed to be compliant with a standard lead-free SMT process.

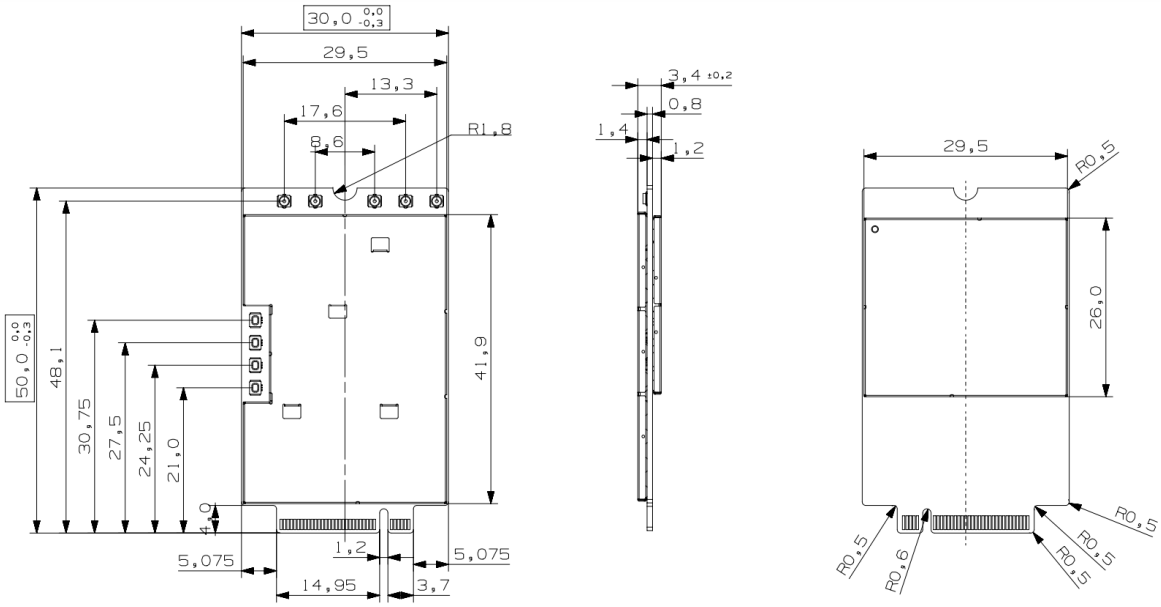
6.2. Finishing & Dimensions

The FN980 Family module's overall dimensions are:

- Length: 50.00 mm
- Width: 30.00 mm
- Thickness: 3.40 mm

6.3. Drawing

This figure shows the mechanical dimensions of the FN980 Family module.



7. ACRONYMS

USB	Universal Serial Bus
HS	High Speed
DTE	Data Terminal Equipment
UMTS	Universal Mobile Telecommunication System
WCDMA	Wideband Code Division Multiple Access
HSDPA	High Speed Downlink Packet Access
HSUPA	High Speed Uplink Packet Access
LTE	Long term evolution
NR	New Radio
CA	Carrier aggregation
EN-DC	E-UTRA-NR Dual Connectivity
E-UTRA	Evolved UMTS Terrestrial Radio Access
UART	Universal Asynchronous Receiver Transmitter
PCIE	Peripheral Component Interconnect Express
SIM	Subscriber Identification Module
I2S	Inter-IC Sound
I/O	Input Output
GPIO	General Purpose Input Output
CMOS	Complementary Metal – Oxide Semiconductor
CLK	Clock
RTC	Real Time Clock

PCB	Printed Circuit Board
ESR	Equivalent Series Resistance
VSWR	Voltage Standing Wave Radio
VNA	Vector Network Analyzer
FDD	Frequency division duplex
TDD	Time division duplex
I2C	Inter-integrated circuit
SOC	System-on-Chip

8. DOCUMENT HISTORY

Revision	Date	Changes
0	2020-10-26	First draft
1	xxxx-xx-xx	
2	xxxx-xx-xx	

SUPPORT INQUIRIES

Link to **www.telit.com** and contact our technical support team for any questions related to technical issues.

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Telit Communications S.p.A.
Via Stazione di Prosecco, 5/B
I-34010 Sgonico (Trieste), Italy

Telit IoT Platforms LLC
5300 Broken Sound Blvd, Suite 150
Boca Raton, FL 33487, USA

Telit Wireless Solutions Inc.
3131 RDU Center Drive, Suite 135
Morrisville, NC 27560, USA

Telit Wireless Solutions Co., Ltd.
8th Fl., Shinyoung Securities Bld.
6, Gukjegeumyung-ro8-gil, Yeongdeungpo-gu
Seoul, 150-884, Korea

Telit Wireless Solutions Ltd.
10 Habarzel St.
Tel Aviv 69710, Israel

Telit Wireless Solutions
Technologia e Servicos Ltda
Avenida Paulista, 1776, Room 10.C
01310-921 São Paulo, Brazil

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