3117 Board Mount UHF RFID RAIN Reader Module

Embed high performance UHF RFID technology within your own products

Key Specs:

- Impinj E710 chipset
- Max sensitivity: -88 dBm
- Max read rate: ≥ 1200 tags/s*
- Max output power: 32 dBm (1.58w)
- 1x antenna connection
- Form Factor: Board Mount

Features and Benefits:

- High Performance UHF RFID
- RAIN RFID (EPC Class 1 Gen 2, ISO 18000-63) compliant
- Single SKU for global use
- All worldwide regions supported
- Fast Read Rates
- Applicable for both mobile and fixed reader installations
- Board Mount form factor with castellated edges
- Low Power Consumption
- Support for the entire 860 – 960 MHz UHF RFID carrier frequency range to accommodate global regulations

Overview

TSL® have used decades of industry leading mobile RFID experience to design and manufacture a family of high performance, energy efficient UHF RFID modules that can be easily integrated into OEM applications such as mobile/ battery powered devices or small, fixed reader applications.

The compact and slim form factor of the 3117 module provides flexible mounting options, supported by industry standard USB and serial UART port interfaces combined with four configurable 3.3V I/O lines. A 50 Ω antenna connection provides the freedom to specify an external antenna perfectly tuned to your unique application.

This class-leading module supports multiple RF modes including High Sensitivity Mode and Dense Reader Mode (DRM), plus High Speed Tag Acquisition Mode and the latest anti-collision recognition algorithms, enabling read rates of ≥ 1200 tags/s. Software programmable output power allows the conducted output to be configured in 0.1 dBm steps from 1 up to the regulatory maximum.

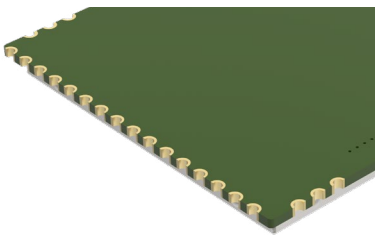
TSL's STORM RFID protocol (a sophisticated, parameterised set of commands that carry out multiple actions locally within the RFID module) makes embedded integration a breeze, reducing time-to-market and development costs. Multiple complex tag operations can be executed using simple pre-configured commands.

TSL provides the free, comprehensive STORM Protocol SDK, allowing development in C, C# and Java languages on platforms including .NET, Android, Windows and Linux.

Applications:

- Handheld readers
- Lockers
- Smart shelfs
- Mid/Long range readers with integrated antenna

Ultra slim and lightweight



Castellated edges for direct soldering to parent board

* Maximum tag read rate measured over the air with a large tag population in a quiet RF environment

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3117 UHF RFID MODULE (BOARD MOUNT) SPECIFICATIONS

Physical and Environmental Characteristics

Dimensions:	42 (W) x 60 (L) x 4.3 (H) mm
Weight:	29 g (1.02 oz)
Power Supply:	5 - 15V DC
Power Consumption:	1.2A (operating @ 30dBm, 5.0V DC)
Enclosure materials:	Tin Plate (Steel with Tin coat)
Mounting:	Castellated edges (for soldering)

Performance Characteristics

RFID Core:	Impinj E710
Co-Processor:	ARM Cortex-M4 running TSL STORM Firmware
Communication protocols:	TSL STORM Protocol
TSL STORM Protocol SDK:	

Language	Platform
Java	Android, Windows, Linux
C#	.NET 5+ for Windows 10 .NET 4.6 for Windows Linux e.g. Ubuntu, Raspbian
C	Embedded systems supporting ANSI C

RFID Performance

Standards supported:	EPC Class 1 Gen 2
Frequency Range(s):	865 – 868 MHz (ETSI) 915 - 921 MHz (ETSI Upper Band) 902 – 928 MHz (FCC)
RF Power:	FCC: 1-30 dBm (1W) Conducted Output ETSI: 1-32 dBm (1.58W) Conducted Output Configurable in 0.1 dBm steps
Receive Sensitivity:	Up to -88 dBm

Environmental

Operating Temp.:	-20°C to 60°C (-4°F to 140°F)
Storage Temp.:	-40°C to +85°C (-40°F to 185°F)
Electrostatic Discharge (ESD):	TBC

Connectivity

Interface

Pin Description

PIN	Name	Type
1-3	+VDCIN	Power
4	ENABLE	Input
5	I/O 1_SCL (GPIO1)	I/O
6	I/O 2_SDA (GPIO2)	I/O
7	USART1_TX	Output
8	USART1_RX	Input
9	USB DM	I/O
10	USB DP	I/O
11	Inventory Stop (GPIO4)	Input
12	Inventory Start (GPIO3)	Input
13	Internal Use Only	Input
14-40	GND	Power
41	RFOUT	Output
42-64	GND	Power

Antenna interface	1x 50 Ω Mono-Static antenna connection
Connectivity Options	USB CDC Virtual COM Port UART - Serial Port • 9600 to 921600 bps (921600 bps default) • 8-N-1, Flow Control: None • 3.3V TTL Logic Levels (5.0V Tolerant) I²C Master for optional accessories • Uses I/O 1 & 2 • Requires external pull-ups to 3.3V
I/O	4 x GPIO lines

Regulatory

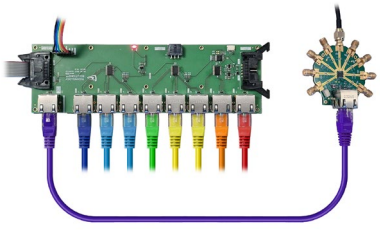
Supported Regions	Pre-configured for the following regions: • US, Canada and other regions following US FCC 47 CFR Ch. 1 Part 15 • Europe and other regions following ETSI EN 302 208-1 (V 2.1.1) • Australia, Brazil, China, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, New Zealand, Peru, Philippines, Singapore, South Africa, Taiwan, Thailand, Uruguay and Vietnam • For other regions please Contact TSL

Part Numbers

Please note that initially a Developer Kit (page 4) should be purchased as a single, one-off purchase. Thereafter, the required number of RFID modules can be purchased separately.

3117-BM-01	3117 UHF RFID RAIN Reader Module (Board Mount version), Impinj E710

Module Developer Kits - see page 4



Expand capabilities with our range of accessories - see page 5

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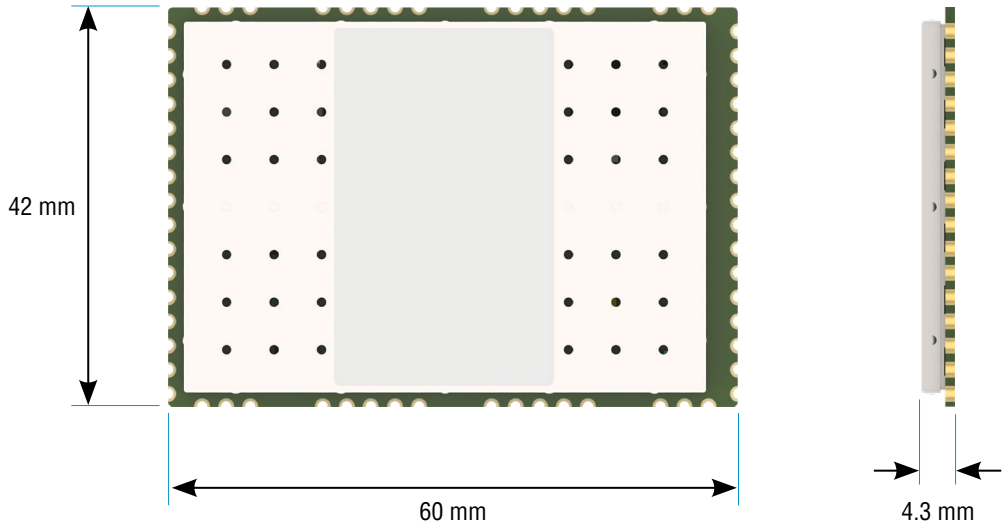
3117 UHF RFID MODULE (BOARD MOUNT) SPECIFICATIONS

3117-BM-01 Dimensions



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DEVELOPER KIT

Key Features:

- Provides connectors for Power, USB, High-Speed Serial and GPIO pins
- Push buttons to start/stop commands stored in the memory banks
- The Developer Kit can be set up in minutes.
- The Developer Kit can be powered by DC (recommended) or USB (provided the USB-C data connection is capable of supplying up to 2A)
- The only additional equipment required is a Windows 10/11 PC and some UHF RFID tags.
- Dedicated supporting software & documentation:
  - Developer Kit User Guide
  - STORM Protocol Explorer app
  - STORM Protocol User Guide
  - STORM command bank examples

Physical and Environmental Characteristics

Power Supply:	5 – 15 VDC, 2.0A
Compatible with:	3117, 3417 or 3419 RAIN Reader Modules
Data Connections	• USB-C • High Speed Serial (UART)

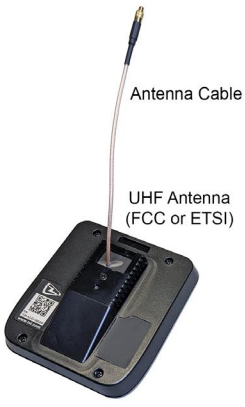
Part Numbers

Please note that initially a Developer Kit should be purchased as a single, one-off purchase. Thereafter, the required number of RFID modules can be purchased separately.

3117-DEV-KIT-ETSI-01	Includes 3117-01 Module (Enclosed version), ETSI Antenna, RAIN Development Board, Power Supply, Antenna Cable, USB-C and USB FTDI Cables
3117-DEV-KIT-FCC-01	Includes 3117-01 Module (Enclosed version), FCC Antenna, RAIN Development Board, Power Supply, Antenna Cable, USB-C and USB FTDI Cables

Contents

Each Developer Kit includes:



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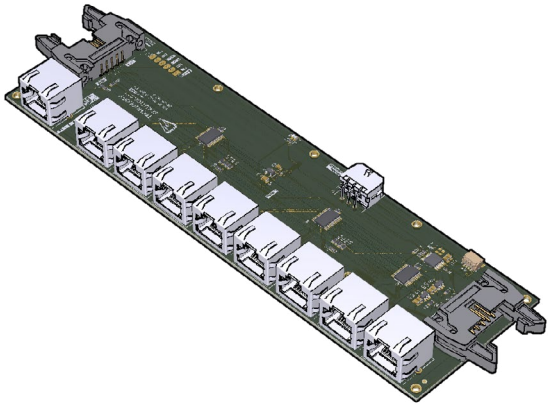
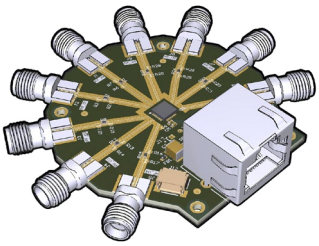
ACCESSORIES



GPIO Expander Board

Use in combination with the 8-port UHF Multiplexer to map out logical antennas to physical environments. Each ethernet port can be connected to one Multiplexer.



8-port UHF Multiplexer

Use in combination with the GPIO Expander Board to map out logical antennas to physical environments. Daisy-chaining Multiplexers and GPIO Expander Boards can allow up to 256 Logical Antennas to be connected to a four-port module.

Part Numbers	
Modules	
GPIO-01	GPIO Expander for TSL Modules
MUX-01	8 Port UHF Multiplexer for TSL Modules

WARRANTY

Warranty Information

The 3117 module is warranted against manufacturing defects for a period of one year (12 months) from date of shipment, provided the product remains unmodified and is operated under normal and proper conditions.

Full warranty information can be downloaded from the TSL website at www.tsl.com/warranty.

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ABOUT

About TSL

Technology Solutions UK Ltd (TSL), part of HID, is a leading manufacturer of high performance mobile RFID readers used to identify and track products, assets, data or personnel.

For over two decades, TSL has delivered innovative data capture solutions to Fortune 500 companies around the world using a global network of distributors and system integrators. Specialist in-house teams design all aspects of the finished products and software ecosystems, including electronics, firmware, application development tools, RF design and injection mould tooling.

TSL is an ISO 9001:2015 certified company.

ISO 9001: 2015

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About HID

HID powers the trusted identities of the world's people, places and things. We make it possible for people to transact safely, work productively and travel freely. Our trusted identity solutions give **people** convenient access to physical and digital **places** and connect **things** that can be identified, verified and tracked digitally. Millions of people around the world use HID products and services to navigate their everyday lives, and billions of things are connected through HID technology. We work with governments, educational institutions, hospitals, financial institutions, industrial businesses and some of the most innovative companies on the planet. Headquartered in Austin, Texas, HID has over 4,000 employees worldwide and operates international offices that support more than 100 countries. HID is an ASSA ABLOY Group brand.

For more information, visit www.hidglobal.com.

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