



# 3117 and 3417/3419 RAIN RFID Reader Modules

Single-Port and Four-Port UHF RFID Modules



## Features & 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 Rate ( $\geq 1200$  tags/s)
- Applicable for both mobile and fixed reader installations
- Lightweight and compact form factor
- Low Power Consumption
- MMCX 50  $\Omega$  Mono-Static Ports
- Up to 32 dBm (1.58 W) output power
- USB and Serial UART Port interfaces
- Support for the entire 860 – 960 MHz UHF RFID carrier frequency range to accommodate global regulations

## Applications:

- Mobile Handhelds/Handheld Accessories
- Kiosks / Point of Sale
- Compact Fixed Readers
- Industrial Automation
- Long Range Readers

## Overview

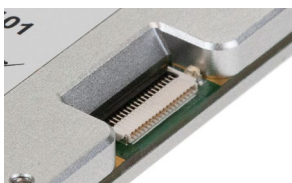
TSL® have drawn upon years of industry leading mobile RFID experience to design and manufacture a family of high performance, energy efficient UHF RFID modules that can be easily integrated into OEM applications such as mobile/battery powered devices or small, fixed reader applications.

The compact and slim form factor of these modules provide flexible mounting options, supported by industry standard USB and serial UART port interfaces combined with four configurable 3.3V I/O lines. The 50  $\Omega$  MMCX Antenna Port(s) provide the freedom to specify an antenna perfectly tuned to your unique application.

These class-leading modules support multiple RF modes including High Speed Tag Acquisition Mode, High Sensitivity Mode and Dense Reader Mode (DRM). Software programmable output power allows the conducted output to be configured in 0.1 dBm steps from 1 – 32 dBm (1mW - 1.58W). The next-generation Impinj E710 reader chip in the 3117 and 3417 sports cutting-edge hardware and the latest anti-collision recognition algorithms, enabling read rates of  $\geq 1200$  tags/s. The 3419 RAIN RFID Reader Module is our ultra high-sensitivity, flagship model, sporting a top-end Impinj E910 reader chip.

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.



Host Interface - 18-Way, 0.5mm Pitch FPC Connector



Four MMCX Antenna Ports (on 3417-01 & 3419-01 variants)



Aluminium chassis provides strength and excellent heat dissipation

# 3117, 3417 & 3419 SPECIFICATIONS

## Physical and Environmental Characteristics

Dimensions:	<b>3117:</b> 42 (W) x 60 (L) x 6.7 (H) mm <b>3417/3419:</b> 42 (W) x 68 (L) x 6.7 (H) mm
Weight:	<b>3117:</b> 30 g (1.06 oz) <b>3417/3419:</b> 34 g (TBC)
Power Supply:	5 - 15V DC
Power Consumption:	1.2A (operating @ 30dBm, 5.0V DC)
Enclosure materials:	Aluminium
Mounting:	<b>3117:</b> 3x M2 pre-threaded holes <b>3417/3419:</b> 4x M2 pre-threaded holes

## Performance Characteristics

RFID Core:	<b>3117/3417:</b> Impinj E710 <b>3419:</b> Impinj E910								
Co-Processor:	ARM Cortex-M4 running TSL STORM Firmware								
Communication protocols:	TSL® STORM Protocol								
TSL® STORM Protocol SDK:	<table border="1"> <thead> <tr> <th>Language</th> <th>Platform</th> </tr> </thead> <tbody> <tr> <td>Java</td> <td>Android, Windows, Linux</td> </tr> <tr> <td>C#</td> <td>.NET 5+ for Windows 10 .NET 4.6 for Windows Linux e.g. Ubuntu, Raspbian</td> </tr> <tr> <td>C</td> <td>Embedded systems supporting ANSI C</td> </tr> </tbody> </table>	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
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## 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:	1 – 32 dBm (1mW – 1.58W) Conducted Output Configurable in 0.1 dBm steps
Receive Sensitivity:	<b>3117/3417:</b> Up to -88 dBm <b>3419:</b> Up to -92 dBm

## Environmental

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

## Connectivity

Interface	18-Way 0.5mm Pitch FPC <table border="1"> <thead> <tr> <th>Pin</th> <th>Near</th> </tr> </thead> <tbody> <tr> <td>1 – 4</td> <td>VCC (5 – 15V DC)</td> </tr> <tr> <td>5</td> <td>ENABLE</td> </tr> <tr> <td>6</td> <td>I/O 1 (I<sup>2</sup>C Master SCL)</td> </tr> <tr> <td>7</td> <td>I/O 2 (I<sup>2</sup>C Master SDA)</td> </tr> <tr> <td>8</td> <td>UART TX</td> </tr> <tr> <td>9</td> <td>UART RX</td> </tr> <tr> <td>10</td> <td>USB DM</td> </tr> <tr> <td>11</td> <td>USB DP</td> </tr> <tr> <td>12</td> <td>I/O 4</td> </tr> <tr> <td>13</td> <td>I/O 3</td> </tr> <tr> <td>14</td> <td>DNU (Connect to GND or leave floating)</td> </tr> <tr> <td>15 – 18</td> <td>GND</td> </tr> </tbody> </table>	Pin	Near	1 – 4	VCC (5 – 15V DC)	5	ENABLE	6	I/O 1 (I <sup>2</sup> C Master SCL)	7	I/O 2 (I <sup>2</sup> C Master SDA)	8	UART TX	9	UART RX	10	USB DM	11	USB DP	12	I/O 4	13	I/O 3	14	DNU (Connect to GND or leave floating)	15 – 18	GND
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Antenna Interface	<b>3117:</b> 1x MMCX 50 Ω Mono-Static Port <b>3417/3419:</b> 4x MMCX 50 Ω Mono-Static Ports																										
Connectivity Options	USB CDC Virtual COM Port UART - Serial Port <ul style="list-style-type: none"> <li>9600 to 921600 bps (921600 bps default)</li> <li>8-N-1, Flow Control: None</li> <li>3.3V TTL Logic Levels (5.0V Tolerant)</li> </ul> I <sup>2</sup> C Master for optional accessories <ul style="list-style-type: none"> <li>Uses I/O 1 &amp; 2</li> <li>Requires external pull-ups to 3.3V</li> </ul>																										
I/O	4 x GPIO lines																										

## Regulatory

Supported Regions	Pre-configured for the following regions: <ul style="list-style-type: none"> <li>US, Canada and other regions following US FCC 47 CFR Ch. 1 Part 15</li> <li>Europe and other regions following ETSI EN 302 208-1 (V 2.1.1)</li> <li>Australia, Brazil, China, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, New Zealand, Peru, Philippines, Singapore, South Africa, Taiwan, Thailand, Uruguay and Vietnam</li> <li>For other regions please <a href="#">Contact TSL®</a></li> </ul>
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## Warranty

The TSL® 3117 and 3417/3419 modules are 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](http://www.tsl.com/warranty).

# 3117, 3417 & 3419 SPECIFICATIONS

## 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.

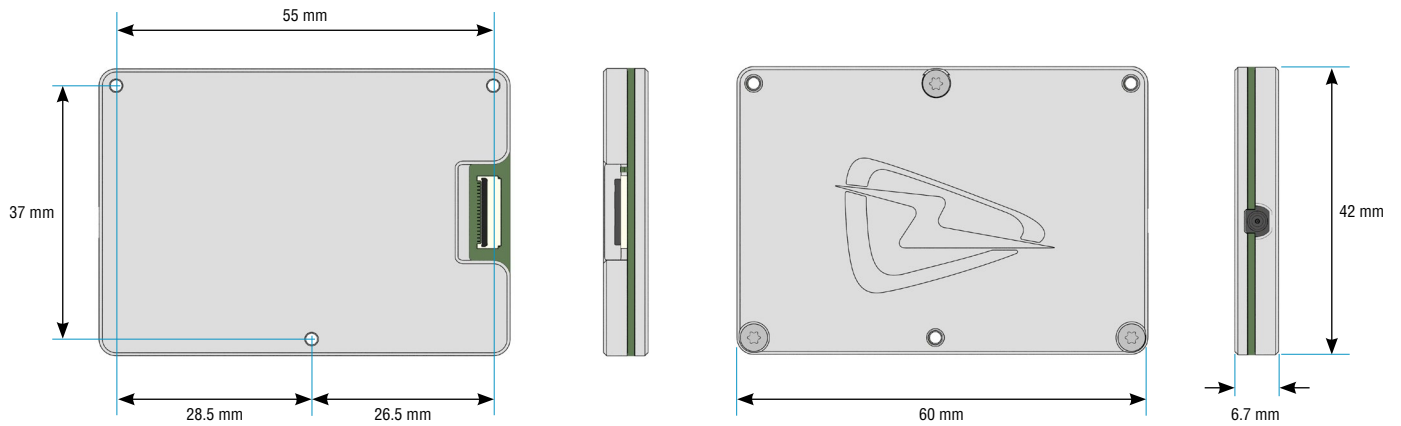
### Developer Kits

<b>3117-DEV-KIT-ETSI-01</b>	Includes 3117-01 Module, ETSI Antenna, RAIN Development Board, Power Supply, Antenna Cable, USB-C and USB FTDI Cables
<b>3117-DEV-KIT-FCC-01</b>	Includes 3117-01 Module, FCC Antenna, RAIN Development Board, Power Supply, Antenna Cable, USB-C and USB FTDI Cables
<b>3417-DEV-KIT-ETSI-01</b>	Includes 3417-01 Module, ETSI Antenna, RAIN Development Board, Power Supply, Antenna Cable, USB-C and USB FTDI Cables
<b>3417-DEV-KIT-FCC-01</b>	Includes 3417-01 Module, FCC Antenna, RAIN Development Board, Power Supply, Antenna Cable, USB-C and USB FTDI Cables
<b>3419-DEV-KIT-ETSI-01</b>	Includes 3419-01 Module, ETSI Antenna, RAIN Development Board, Power Supply, Antenna Cable, USB-C and USB FTDI Cables
<b>3419-DEV-KIT-FCC-01</b>	Includes 3419-01 Module, FCC Antenna, RAIN Development Board, Power Supply, Antenna Cable, USB-C and USB FTDI Cables

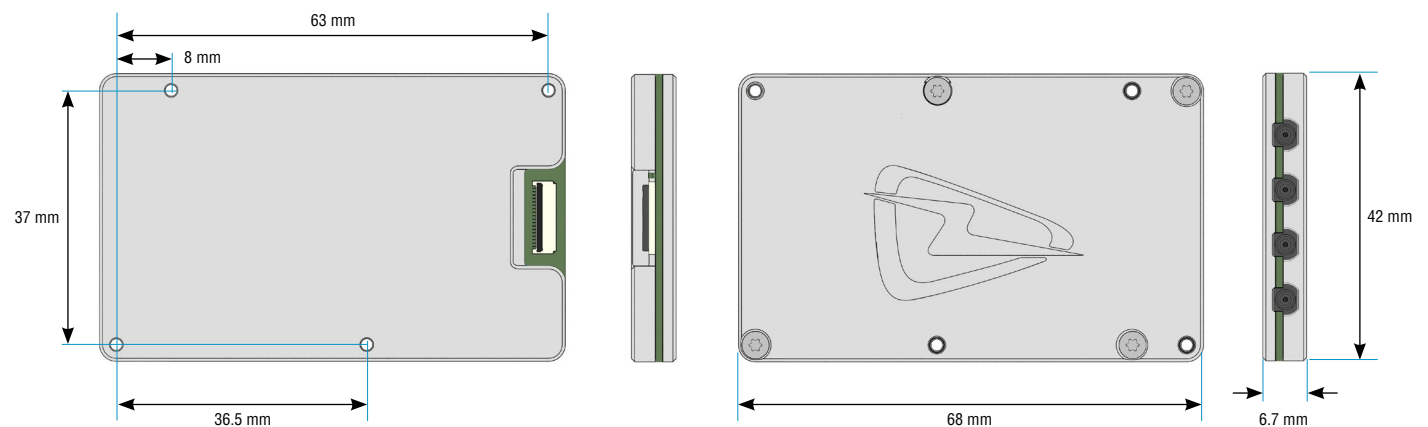
### Modules

<b>3117-01</b>	3117 RAIN RFID Reader Module with one MMCX Antenna Port, Impinj E710
<b>3117-BM-01</b>	3117 RAIN RFID Reader Module (Board Mount version), Impinj E710
<b>3417-01</b>	3417 RAIN RFID Reader Module with four MMCX Antenna Ports, Impinj E710
<b>3417-BM-01</b>	3417 RAIN RFID Reader Module (Board Mount version), Impinj E710
<b>3419-01</b>	3419 RAIN RFID Reader Module with four MMCX Antenna Ports, Impinj E910

## 3117-01 (Single Antenna Port) Dimensions



## 3417-01 & 3419-01 (Four Antenna Port) Dimensions



# ABOUT

## About TSL®



**TECHNOLOGY  
SOLUTIONS** UK LTD  
part of **HID**

Technology Solutions UK Ltd (TSL®), part of HID Global, 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

## Contact

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<b>Website:</b>	<a href="http://www.tsl.com">www.tsl.com</a>

## About HID Global



**HID Global 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 Global has over 4,000 employees worldwide and operates international offices that support more than 100 countries. HID Global is an ASSA ABLOY Group brand.

For more information, visit [www.hidglobal.com](http://www.hidglobal.com).

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