Product Information Notification: Impinj E Family Reader Chip Specification Updates

May 16, 2024

Dear Impinj Customer,

This notification informs you of several updates to the specifications of the Impinj E Family RAIN RFID reader chips. Impinj is now using an ISO standard and RAIN Alliance recommended methodology for testing and reporting reader chip receive sensitivity, which results in a change to the previously published receive sensitivity. This provides consistency with how Impinj reader receive sensitivity specifications are reported.

This notification also updates other parameters such as ESD, spurious emissions, harmonic spurs, and transmit synthesizer. These changes are based on the completion of internal characterization.

A summary of key changes is shown in the specification updates table below, and changes are reflected in product brief and datasheet collateral on the Impinj website and support portal. There are no design, manufacturing, or performance changes for Impinj E family reader chips associated with this notification.

Affected Products

Impinj Product Name	Impinj Ordering Part Number
Impinj E910 reader chip	IPJ-E910-XXX
Impinj E710 reader chip	IPJ-E710-XXX
Impinj E510 reader chip	IPJ-E510-XXX
Impinj E310 reader chip	IPJ-E310-XXX

Specification Updates

The changes below are reflected in the Impinj E910, E710, E510, and E310 RAIN RFID Reader Chip Datasheet v2.

Parameter	Datasheet v1.4 (previous)	Datasheet v2 (new)
ESD Rating: ESD, Power supply and IO pins	CDM Class C2	CDM Class C0b
ESD Rating: RF Pins	HBM Class 3A CDM Class C2	HBM Class 2 CDM Class C0b
Maximum Chip Idle Power Consumption	55 mW (3.3 V single supply)	75 mW (3.3 V single supply)
	44 mW (2.5 V single supply)	60 mW (2.5 V single supply)

	34 mW (3.3 / 1.6 V dual supply)	46 mW (3.3 / 1.6 V dual supply)
	33 mW (2.5 / 1.6 V dual supply)	44 mW (2.5 / 1.6 V dual supply)
Receive Sensitivity Measurement Methodology	1% packet error rate, with +7 dBm self-jammer at Impinj E910 RX pin or +10 dBm self-jammer at Impinj E710, E510, or E310 RX pin, DC blocking baseband filter (not DRM), typical Gen2 parameters	Measured by a CISC Xplorer RAIN RFID sensitivity tester using a 90% success rate. Described at the chip RX pin assuming 11 dB path loss to the antenna. Described under four antenna conditions. More details in section 2.4.4.
Receive Sensitivity Values	Example (Mode 285): -99 dBm (E910) -93 dBm (E710) -87 dBm (E510) -80 dBm (E310)	Example (Mode 285, ideal antenna): -103 dBm (E910) -98 dBm (E710) -93 dBm (E510) -84.5 dBm (E310) See Tables 14-17 for complete data
Chip Receiver Specifications RSSI Measurement Accuracy	3 dB	± 1 dB (see conditions)
TX In-band Spurious Emissions	-77 dBc (RBW = 3 kHz)	-82 dBc (RBW = 3 kHz)
TX Out-of-band Spurious Emissions	-42 dBm (RBW = 120 kHz, ETSI LB) -39 dBm (RBW = 120 kHz, ETSI UB) -6 dBm (RBW = 1 MHz, FCC)	-80 dBm across frequency range 0.047 to 2 GHz, RBW = 100 kHz, average detector
TX Clock Harmonic Spurs	-87.6 dBc (at 864 MHz) -83.6 dBc (at 960 MHz)	-70 dBm/100 Hz (at 864 MHz) -73 dBm/100 Hz (at 960 MHz)
TX Output Power Regulatory Compliant Range		See revised conditions in Table 19

For questions or additional information, please contact your Impinj account manager or the Impinj technical support team at support@impinj.com.

For a downloadable version of this notification, please view the customer notification on the Impinj Support Portal.