

UHF Gen 2 RFID Tag Chip (IPJ-P5003, IPJ-P5005)



Monza[®] 4 Dura Product Brief



Overview

With availability of Monza[®] 4 tag chips in a packaged format (Monza 4 Dura), Impinj extends the advantages of fully EPCglobal-compliant, high-performance, Monza-powered tags to printed circuit board (PCB) applications and enables ruggedized tag designs.

Monza 4 Dura is supported by standard PCB surface mount assembly techniques, meaning easy integration into products designed with PCBs, as well as other electronic applications where soldered connections are preferred. Impinj encased the Monza 4 tag chips in a μ DFN package, making it the industry's smallest and lowest profile tag chip part.

Electronics manufacturers can leverage RFID to monitor work in progress, track inventory, follow board revision history, and prevent counterfeiting. The protection the package offers enables many new opportunities to use UHF RFID in the industrial marketplace.

Monza is supported by a family of innovative antenna designs that not only optimize tag performance for wide-ranging requirements and specific market applications, but also enable whole new categories of use.

Features

- ❖ **True3D antenna technology**—patented, dual-differential antenna ports enable compact omnidirectional tags, improving read reliability
- ❖ Superior read sensitivity of -17.4 dBm (with single port operation, 19.9 dBm with True3D) combined with excellent interference rejection yields a read range of 16 meters (21 meters with True3D)
- ❖ Industry-leading write sensitivity of -14.6 dBm for unparalleled commissioning and bulk encoding reliability.
- ❖ Available memory options to support large user-memory applications
- ❖ **Block permalocking** adds flexibility in memory usage
- ❖ Field-rewritable NVM provides programming flexibility and 100,000-cycle/50-year retention reliability
- ❖ Write rate of 5 ms for 32-bit writes enables 2500 tags/minute programming
- ❖ 8-pin uDFN package accommodates surface-mount assembly
- ❖ Industrial temperature range (-40 °C to $+85$ °C) yields reliable performance under harsh conditions

Applications

- ❖ PCB Tracking
- ❖ Ruggedized tag designs
- ❖ Asset inventory and management, especially those with high reliability requirements
- ❖ Item-level tracking
- ❖ Work-in-progress tracking

Operating Conditions and Electrical Characteristics

| Parameter | Min | Typ | Max | Units | Comments |
|---------------------------------------|-----|------------|-------|--------|---|
| Operating Frequency | 860 | | 960 | MHz | |
| Read Sensitivity Limit (Single Port) | | -17.4 | | dBm | |
| Read Sensitivity Limit (True3D) | | -19.9 | | dBm | |
| Write Sensitivity Limit (Single Port) | | -14.6 | | dBm | |
| Write Sensitivity Limit (True3D) | | -17.1 | | dBm | |
| Operating Temperature | -40 | | 85 | °C | |
| Data Retention | | 50 | | Years | |
| Programming Cycles | | 100,000 | | Cycles | |
| Recommended Source Admittance | | 0.6 – j7.2 | | mS | Single Antenna Port |
| Package Intrinsic Inductance | | 24 | | nH | Parallel RL model of recommended Admittance |
| Package Intrinsic Resistance | | 1650 | | Ω | |
| ESD | | | 2000 | V | Human Body Model |
| DC Input Voltage | | | ± 3.5 | Volts | Applied across two pins |
| DC Input Current | | | ± 0.5 | mA | Into any input pin |

Package Dimensions

| Parameter | Min | Typ | Max | Units | Comments |
|----------------------------------|------|------|------|-------|----------|
| Package Length (P _l) | 1.9 | 2.0 | 2.1 | mm | |
| Package Width (P _w) | 1.9 | 2.0 | 2.1 | mm | |
| Package Height (P _h) | 0.45 | 0.50 | 0.55 | mm | |

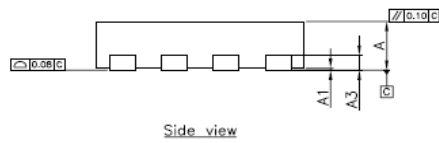
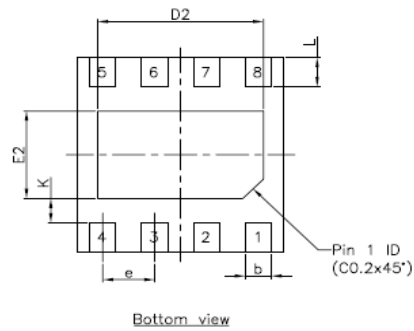
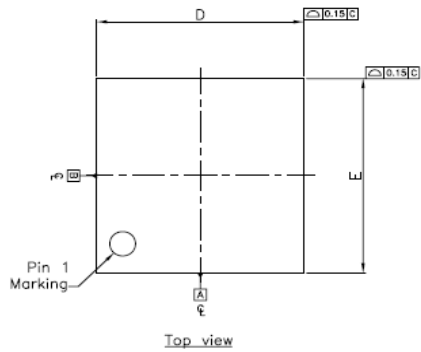
Package Pin Out

| Pin Name | Pin No. | Description |
|----------|---------|--|
| RF1+ | 8 | Differential RF Input Pads for Antenna 1 —isolated from the RF Input Pads for Antenna 2 |
| RF1- | 4 | |
| RF2+ | 1 | Differential RF Input Pads for Antenna 2 —isolated from the RF Input Pads for Antenna 1 |
| RF2- | 5 | |
| — | 2,3,6,7 | No connects (NC) |

Tape and Reel Format

| Parameter | Value | Comments |
|---------------|------------------|---------------------|
| Reel Size | 7 in (17.8 cm) | Outside diameter |
| Hub Size | 2.16 in (5.5 cm) | Inside hub diameter |
| Quantity/reel | 3000 | Units |

Detailed Package Drawing

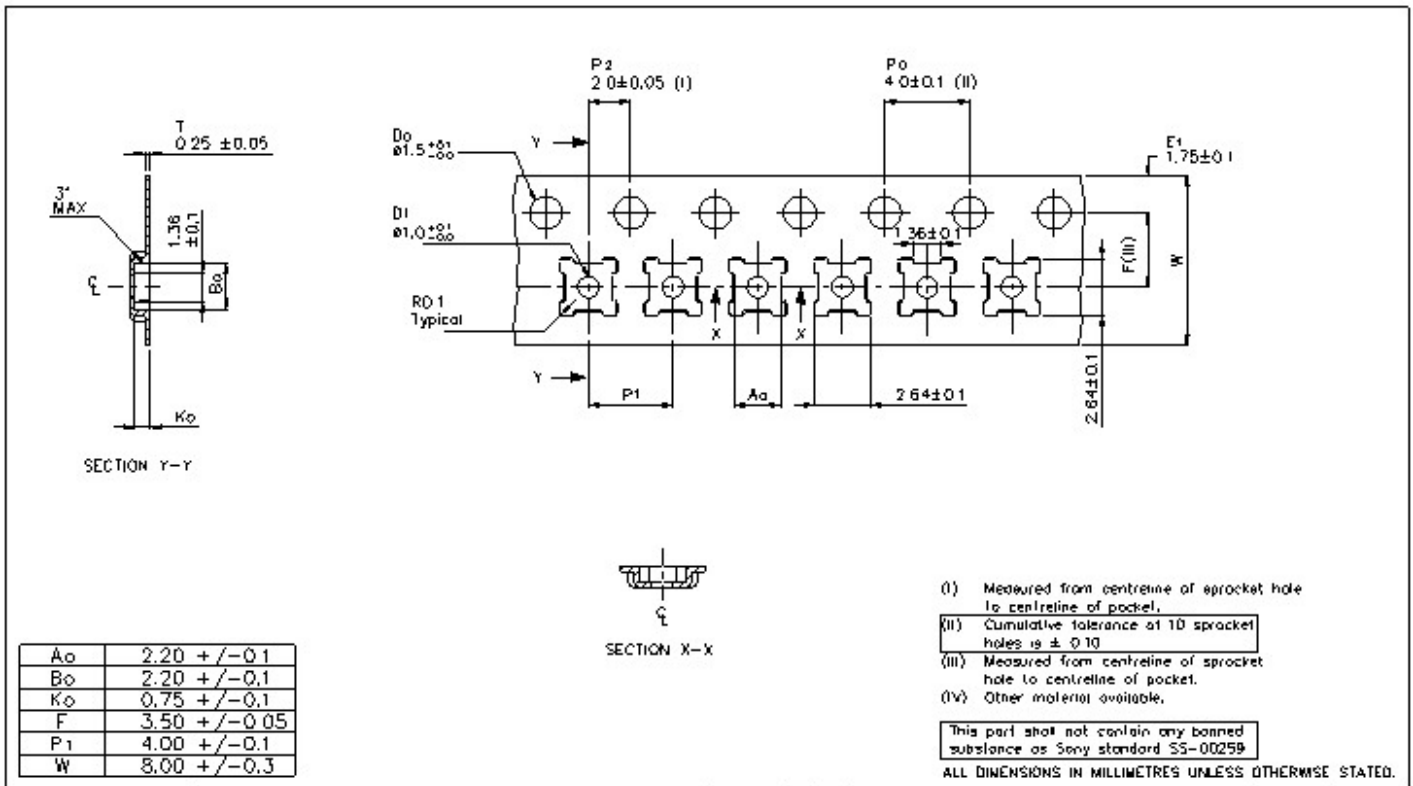


| SYMBOL | MIN. | NOM. | MAX. |
|--------|-----------|------|------|
| A | 0.45 | 0.50 | 0.55 |
| A1 | 0.00 | 0.02 | 0.05 |
| A3 | 0.152 REF | | |
| b | 0.18 | 0.25 | 0.30 |
| D | 1.90 | 2.00 | 2.10 |
| D2 | 1.50 | 1.60 | 1.70 |
| E | 1.90 | 2.00 | 2.10 |
| E2 | 0.80 | 0.90 | 1.00 |
| e | 0.50 BSC | | |
| K | 0.20 | | |
| L | 0.20 | 0.30 | 0.45 |

NOTES:

1. ALL DIMENSIONS IN MILLIMETER, ANGLES IN DEGREE.
2. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS. COPLANARITY SHALL NOT EXCEED 0.08 MM.
3. WARPAGE SHALL NOT EXCEED 0.10 MM.
4. PACKAGE LENGTH/PACKAGE WIDTH ARE NOT CONSIDERED AS SPECIAL CHARACTERISTIC.
5. REFER JEDEC MO-229.
6. MARKING IS FOR PACKAGE ORIENTATION REFERENCE ONLY.

Tape And Reel Drawing



Ordering Information

| Part | Description |
|-----------|---|
| IPJ-P5003 | Monza 4QT Dura (packaged silicon), industrial temperature range |
| IPJ-P5005 | Monza 4E Dura (packaged silicon), industrial temperature range |

Notices:

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This product is covered by one or more of the following U.S. patents. Other patents pending. 7283037, 7026935, 7049964, 7501953, 7030786, 7246751, 7245213, 7408466, 7187290, 7215251, 7116240, 7183926, 7312622, 7307528, 7388468, 7394324, 7120550, 7253719, 7380190, 7403122, 7307529, 7472835, 7561866, 7405659, 7307534, 7528728, 7423539, 7123171, 7420469, 7541843, 7448547, 7525438, 7482251

