

# Texas Instruments Gen 2 Inlay

## Description

Texas Instruments' Gen 2 Inlay is designed for ease of integration in the smart label conversion process. The inlays feature innovative antenna designs for optimal performance across a wide range of SKU's. The Gen 2 inlay portfolio includes variations in antenna designs and a standard form factor for delivery on reels to enable ease of scalability in high volume conversion and end-user application environments.

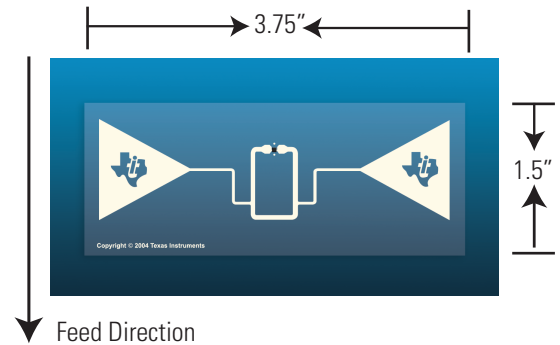
TI Gen 2 products are based on the EPCglobal™ Generation 2 specification with 96 bits of user programmable EPC™ memory field with Read, Write, and Lock capabilities.

## Specifications:

| Part Number                   | RI-UHF-00C02-03                           |
|-------------------------------|---|
| Supported SKU types           | UHF friendly SKU's*                       |
| IC Supported Standard         | EPC UHF Gen 2                             |
| Operating frequency           | 860- 960 MHz                              |
| EPC Memory                    | 96 bits EPC user programmable             |
| TID Memory                    | 32 bits factory pre-programmed            |
| Data retention                | 2 years at + 25°C                         |
| Write/erase cycle             | 1000 at + 25°C                            |
| Operating temperature         | -40°C to + 65°C                           |
| Storage temperature (single)  | -40°C to + 85°C                           |
| Storage temperature (on reel) | -40°C to + 45°C                           |
| Bending radius                | 15 mm (0.59")                             |
| Antenna Size                  | 3.5" X 1" [ 88.90mm X 25.40mm ]           |
| Inlay pitch                   | 1.5" [38.1mm (± 0.5mm)]                   |
| Width of inlay                | 3.75" [95.25mm (± 0.5mm)]                 |
| Die Height                    | ~11 mils (279.4 micron)                   |
| Material/ thickness           | 75 micron (~2.95 mils) PET substrate      |
| Antenna Material              | Printed silver ink                        |
| Reel diameter                 | ID: 3" core (76.2mm); OD: Max 15" (381mm) |
| Delivery                      | Single row inlay wound on cardboard reel  |
| Quantity                      | 10K per reel                              |

### Key features:

- Innovative printed inlay antennas designed for optimal performance on wide ranging SKU's
- 100 % tested inlays
- Fit in most standard label form factors
- EPC Gen 2- read/write and lock
- 96 bits EPC user memory



\* This inlay works with the majority of UHF friendly products. It may also work with some UHF unfriendly (UHF absorbing and reflecting) products.

## Non-volatile (NVM) EPC User Memory Configuration\*:

| Memory Bank     | Memory Bank Name | Memory Bank Bit Address          | Bit Number             |   |   |   |   |   |   |   |   |   |      |          |    |    |    |    |
|-----------------|------------------|----------------------------------|------------------------|---|---|---|---|---|---|---|---|---|------|----------|----|----|----|----|
|                 |                  |                                  | 0                      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10   | 11       | 12 | 13 | 14 | 15 |
| 01 <sub>2</sub> | EPC              | 70 <sub>h</sub> -7F <sub>h</sub> | EPC[15:0]              |   |   |   |   |   |   |   |   |   |      |          |    |    |    |    |
|                 |                  | 60 <sub>h</sub> -6F <sub>h</sub> | EPC[31:16]             |   |   |   |   |   |   |   |   |   |      |          |    |    |    |    |
|                 |                  | 50 <sub>h</sub> -5F <sub>h</sub> | EPC[47:32]             |   |   |   |   |   |   |   |   |   |      |          |    |    |    |    |
|                 |                  | 40 <sub>h</sub> -4F <sub>h</sub> | EPC[63:48]             |   |   |   |   |   |   |   |   |   |      |          |    |    |    |    |
|                 |                  | 30 <sub>h</sub> -3F <sub>h</sub> | EPC[79:64]             |   |   |   |   |   |   |   |   |   |      |          |    |    |    |    |
|                 |                  | 20 <sub>h</sub> -2F <sub>h</sub> | EPC[95:80]             |   |   |   |   |   |   |   |   |   |      |          |    |    |    |    |
|                 |                  | 10 <sub>h</sub> -1F <sub>h</sub> | PROTOCOL CONTROL BITS  |   |   |   |   |   |   |   |   |   |      |          |    |    |    |    |
|                 |                  | 00 <sub>h</sub> -0F <sub>h</sub> | CRC-16                 |   |   |   |   |   |   |   |   |   |      |          |    |    |    |    |
| 00 <sub>2</sub> | RESERVED         | 40 <sub>h</sub> -4F <sub>h</sub> | LOCK_BITS[9:0]         |   |   |   |   |   |   |   |   |   | KILL | Reserved |    |    |    |    |
|                 |                  | 30 <sub>h</sub> -3F <sub>h</sub> | ACCESS PASSWORD[15:0]  |   |   |   |   |   |   |   |   |   |      |          |    |    |    |    |
|                 |                  | 20 <sub>h</sub> -2F <sub>h</sub> | ACCESS PASSWORD[31:16] |   |   |   |   |   |   |   |   |   |      |          |    |    |    |    |
|                 |                  | 10 <sub>h</sub> -1F <sub>h</sub> | KILL PASSWORD[15:0]    |   |   |   |   |   |   |   |   |   |      |          |    |    |    |    |
|                 |                  | 00 <sub>h</sub> -0F <sub>h</sub> | KILL PASSWORD[31:16]   |   |   |   |   |   |   |   |   |   |      |          |    |    |    |    |

\* 96 bit read/write/lock EPC user memory configuration according to EPC Gen 2 (v1.0.9)

## List of Commands\*:

| Command                 | Code     | Length (bits) | Supported? | Protection                        |
|-------------------------|----------|---------------|------------|-----------------------------------|
| QueryRep                | 00       | 4             | Yes        | Unique command length             |
| ACK                     | 01       | 18            | Yes        | Unique command length             |
| Query                   | 1000     | 22            | Yes        | Unique command length and a CRC-5 |
| QueryAdjust             | 1001     | 9             | Yes        | Unique command length             |
| Select                  | 1010     | > 44          | Yes        | CRC-16                            |
| Reserved for future use | 1011     | -             | -          | -                                 |
| NAK                     | 11000000 | 8             | Yes        | Unique command length             |
| Req_RN                  | 11000001 | 40            | Yes        | CRC-16                            |
| Read                    | 11000010 | > 57          | Yes        | CRC-16                            |
| Write                   | 11000011 | > 58          | Yes        | CRC-16                            |
| Kill                    | 11000100 | 59            | Yes        | CRC-16                            |
| Lock                    | 11000101 | 60            | Yes        | CRC-16                            |
| Access                  | 11000110 | 56            | Yes        | CRC-16                            |
| BlockWrite              | 11000111 | > 57          | No         | CRC-16                            |
| BlockErase              | 11001000 | > 57          | No         | CRC-16                            |

\* according to EPC Gen 2 (v1.0.9)

