



Continental Device India Pvt. Limited

An IATF 16949, ISO9001 and ISO 14001 Certified Company

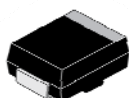


SURFACE MOUNT ULTRA FAST RECTIFIERS

Reverse Voltage - 50 to 1000 Volts, Forward Current - 1.0 Ampere

US1A ~ US1M

DO-214AC (SMA)
Surface Mount
Plastic Package
RoHS compliant



DO-214AC (SMA)

FEATURES:

1. The plastic package carries Underwriters Laboratory Flammability Classification 94V-0
2. For surface mounted applications
3. Ultra fast switching for high efficiency
4. Low reverse leakage
5. Built-in strain relief, ideal for automated placement
6. High forward surge current capability
7. High temperature soldering guaranteed 250°C/10 seconds at terminals
8. This product is available in AEC-Q101 Compliant and PPAP Capable also.

Note: For AEC-Q101 compliant products, please use suffix -AQ in the part number while ordering.

APPLICATIONS: Ultra fast Recovery time for high Efficiency

ABSOLUTE MAXIMUM RATINGS (Ta = 25 °C Unless otherwise specified)

| PARAMETER | SYMBOL | US 1A | US 1B | US 1D | US 1G | US 1J | US 1K | US 1M | UNIT |
|---|-----------------------------------|-------------|----------|----------|----------|----------|----------|----------|------|
| Maximum repetitive peak reverse voltage | V _{RRM} | 50 | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| Maximum RMS voltage | V _{RMS} | 35 | 70 | 140 | 280 | 420 | 560 | 700 | V |
| Maximum DC blocking voltage | V _{DC} | 50 | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| Maximum average forward rectified current at T _J =55°C | I _(AV) | 1.0 | | | | | | | A |
| Peak forward surge current 8.3ms single half sine-wave superimposed on rated load | I _{FSM} | 30 | | | | | | | A |
| Maximum instantaneous forward voltage at I _F =1.0A | V _F | 1.0 | | | 1.3 | 1.7 | | | V |
| Maximum DC reverse current T _A =25°C | I _R | 5 | | | | | | | μA |
| at rated DC blocking voltage T _A =100°C | | 50 | | | | | | | |
| Maximum reverse recovery time ¹ | t _{rr} | 50 | | | | 75 | | | ns |
| Typical junction capacitance ² | C _J | 17 | | | | | | | pF |
| Typical thermal resistance ³ | R _{th(j-L)} | 30 | | | | | | | °C/W |
| Operating junction and storage temperature range | T _J , T _{STG} | -65 to +150 | | | | | | | °C |

Note:

1. Reverse recovery condition $I_F = 0.5\text{A}, I_R = 1.0\text{A}, I_{rr} = 0.25\text{A}$
2. Measured at 1MHz and applied reverse voltage of 4.0V D.C
3. P.C.B. mounted with 0.2x0.2" (5.0x5.0mm) copper pad areas

US1A_1M

Rev04_28052022EEG

Recommended Reflow Solder Profiles

The recommended reflow solder profiles for Pb and Pb-free devices are shown below.

Figure 1 shows the recommended solder profile for devices that have Pb-free terminal plating, and where a Pb-free solder is used.

Figure 2 shows the recommended solder profile for devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with a leaded solder.

Figure 1

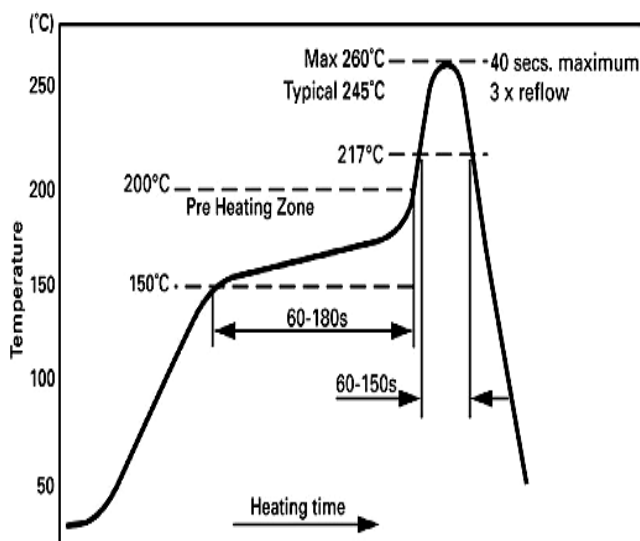
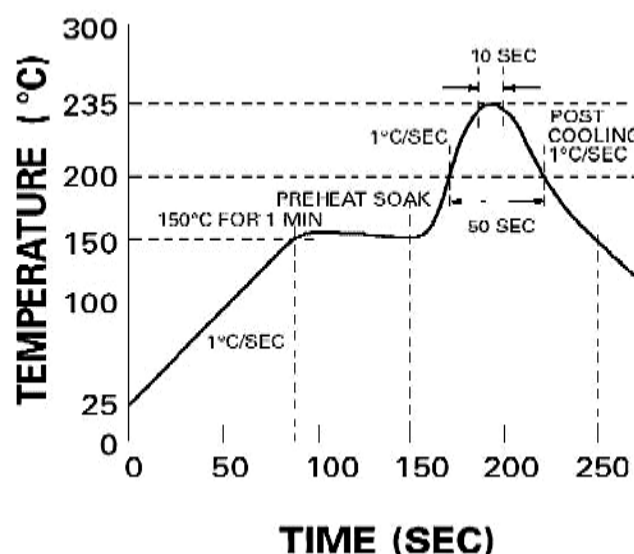


Figure 2

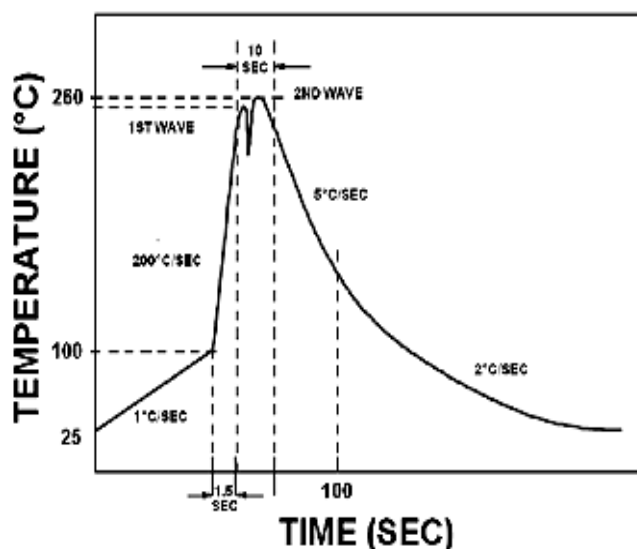


Reflow profiles in tabular form

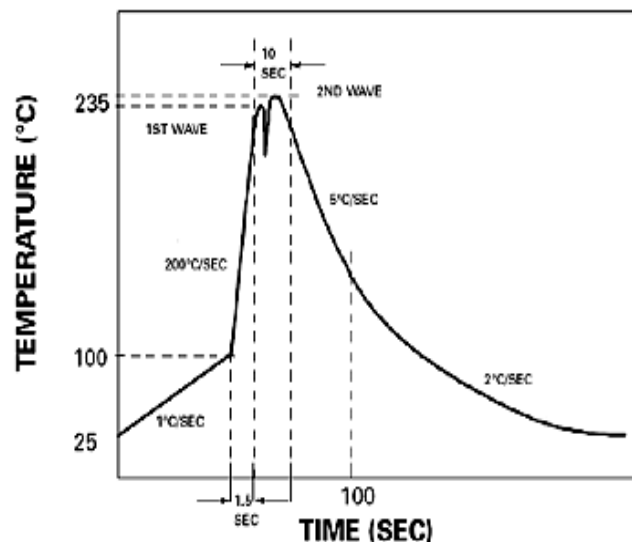
| Profile Feature | Sn-Pb System | Pb-Free System |
|------------------------------------|-----------------|-----------------|
| Average Ramp-Up Rate | ~3°C/second | ~3°C/second |
| Preheat | | |
| – Temperature Range | 150-170°C | 150-200°C |
| – Time | 60-180 seconds | 60-180 seconds |
| Time maintained above: | | |
| – Temperature | 200°C | 217°C |
| – Time | 30-50 seconds | 60-150 seconds |
| Peak Temperature | 235°C | 260°C max. |
| Time within +0 -5°C of actual Peak | 10 seconds | 40 seconds |
| Ramp-Down Rate | 3°C/second max. | 6°C/second max. |

Recommended Wave Solder Profiles

The Recommended solder Profile For Devices with Pb-free terminal plating where a Pb-free solder is used



The Recommended solder Profile For Devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with leaded solder



Wave Profiles in Tabular Form

| Profile Feature | Sn-Pb System | Pb-free System |
|------------------------------------|-----------------------------|-----------------------------|
| Average Ramp-Up Rate | ~200°C/second | ~200°C/second |
| Heating rate during preheat | Typical 1-2, Max 4°C/sec | Typical 1-2, Max 4°C/Sec |
| Final preheat Temperature | Within 125°C of Solder Temp | Within 125°C of Solder Temp |
| Peak Temperature | 235°C | 260°C max. |
| Time within +0 -5°C of actual Peak | 10 seconds | 10 seconds |
| Ramp-Down Rate | 5°C/second max. | 5°C/second max. |

TYPICAL CHARACTERISTICS CURVES

Fig 1: FORWARD CURRENT DERATING CURVE

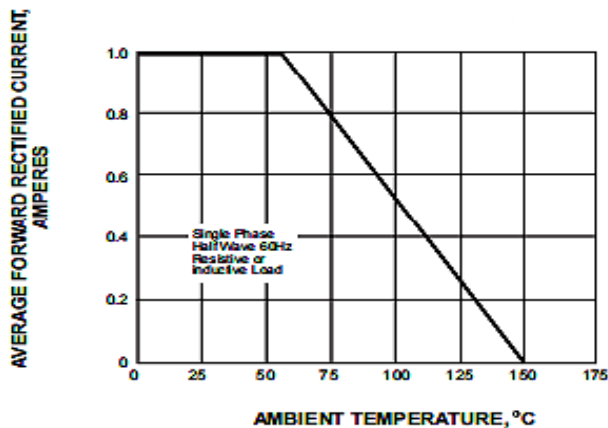


Fig 2: TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

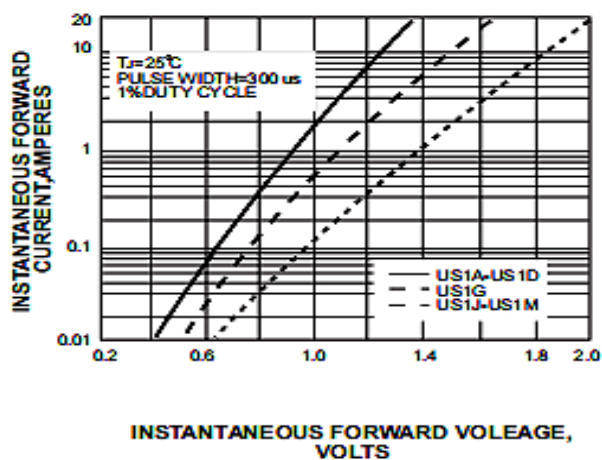


Fig 3: TYPICAL JUNCTION CAPACITANCE

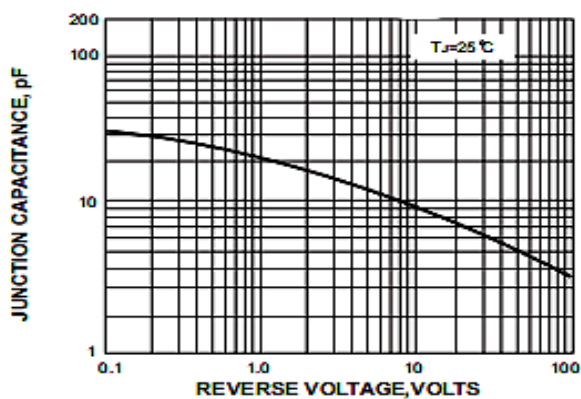


Fig 4: MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

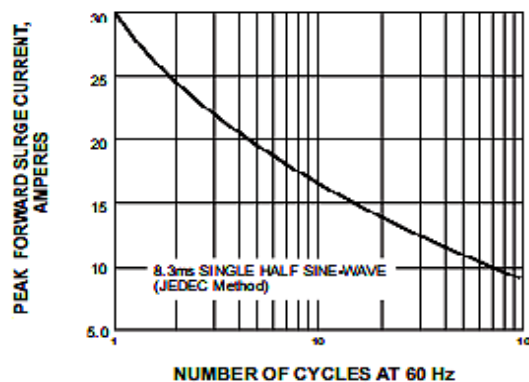


Fig 5: TYPICAL REVERSE CHARACTERISTICS

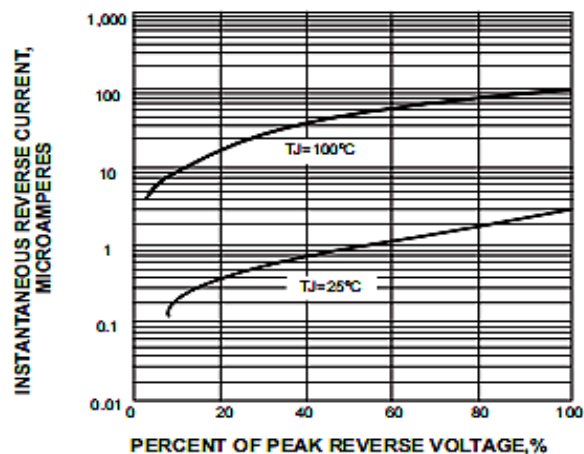
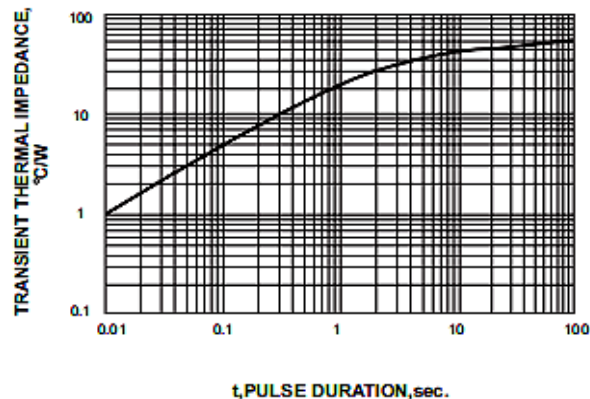


Fig 6: TYPICAL TRANSIENT THERMAL IMPEDANCE





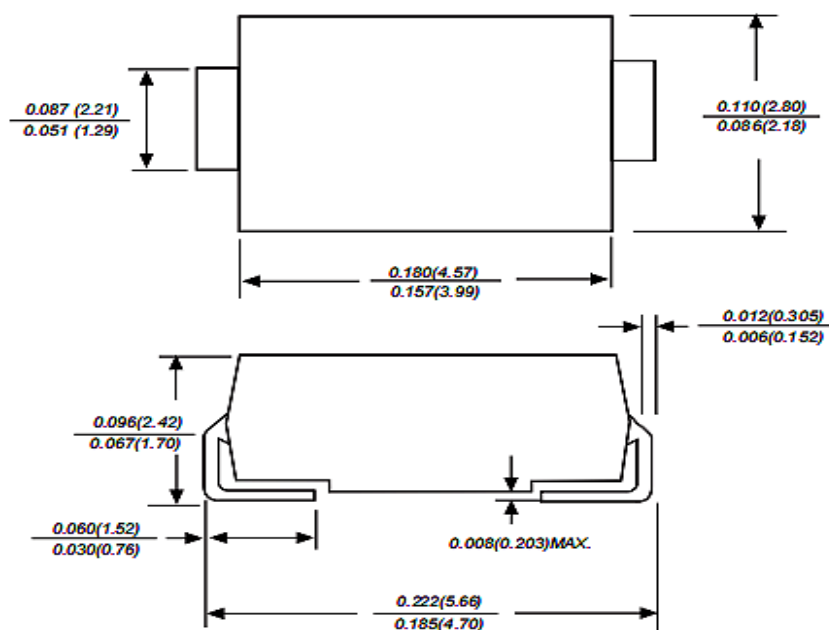
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Package Detail

DO-214AC (SMA) Plastic Package



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC DO-214AC molded plastic body

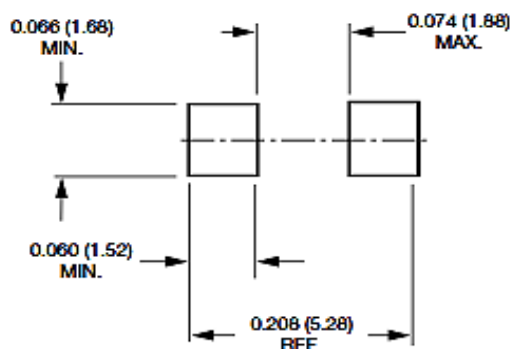
Terminals: Plated axial leads, solder able per MIL-STD-750, Method 2026

Polarity: Color band denotes cathode end

Mounting Position: Any

Weight: 0.058 grams

SOLDER PAD LAYOUT



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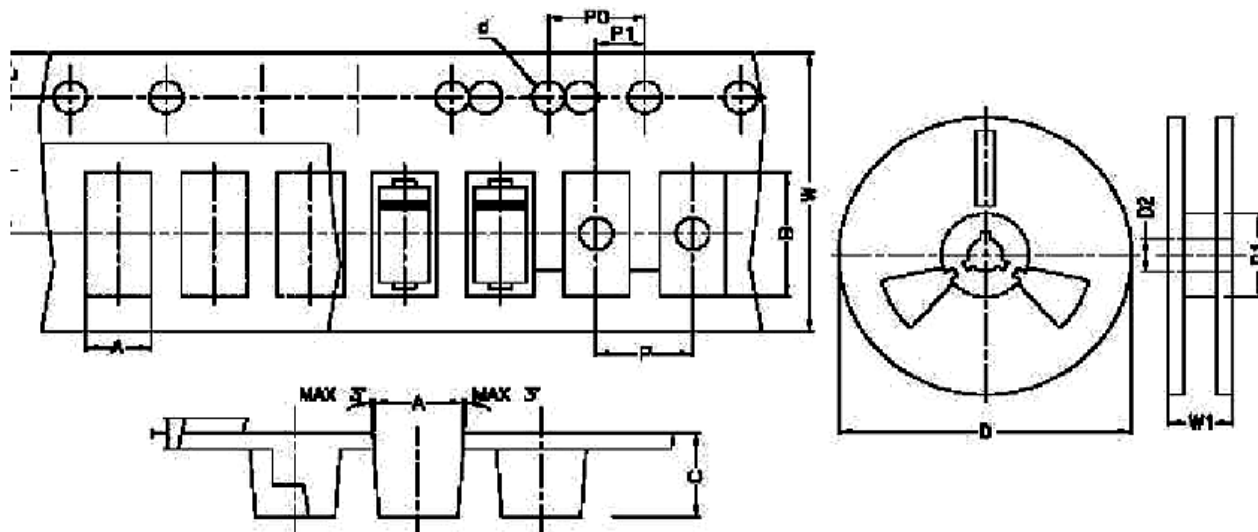


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Package & Reel Taping Specification



| ITEM | SYMBOL | SPECIFICATION (mm) | SPECIFICATION (Inch) |
|------------------------|--------|--------------------|----------------------|
| CARRIER WIDTH | A | 3.2 MAX | 0.125 MAX |
| CARRIER LENGTH | B | 7.8 MAX | 0.307 MAX |
| CARRIER DEPTH | C | 4.5 MAX | 0.177 MAX |
| SPROCKET HOLE | d | 1.5 ±1.00 | 0.58 ±0.004 |
| REEL OUTSIDE DIAMETER | D | 178.0 ±2.00 | 7.00 ±0.079 |
| REEL INNER DIAMETER | D1 | 50.0 MIN | 1.989 MIN |
| FEED HOLE DIAMETER | D2 | 13.0 ±0.50 | 0.512 ±0.020 |
| SPROCKET HOLE POSITION | E | 1.75 ±0.10 | 0.88 ±0.004 |
| PUNCH HOLE POSITION | F | 5.5 ±0.10 | 0.217 ±0.004 |
| PUNCH HOLE PITCH | P | 4.0 ±0.10 | 0.157 ±0.004 |
| SPROCKET HOLE PITCH | PC | 4.0 ±0.10 | 0.157 ±0.004 |
| EMBOSSMENT CENTER | P1 | 2.0 ±0.05 | 0.078 ±0.002 |
| OVERALL TAPE THICKNESS | T | 1.1 MAX | 0.043 MAX |
| TAPE WIDTH | W | 12.0 ±0.30 | 0.472 ±0.12 |
| REEL WIDTH | W1 | 10.4 MAX | 0.724 MAX |

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Recommended Product Storage Environment for Discrete Semiconductor Devices

This storage environment assumes that the Diodes and transistors are packed properly inside the original packing supplied by CDIL.

- Temperature 5 °C to 30 °C
- Humidity between 40 to 70 %RH
- Air should be clean.
- Avoid harmful gas or dust.
- Avoid outdoor exposure or storage in areas subject to rain or water spraying .
- Avoid storage in areas subject to corrosive gas or dust. Product shall not be stored in areas exposed to direct sunlight.
- Avoid rapid change of temperature.
- Avoid condensation.
- Mechanical stress such as vibration and impact shall be avoided.
- The product shall not be placed directly on the floor.
- The product shall be stored on a plane area. They should not be turned upside down.
- They should not be placed against the wall.

Shelf Life of CDIL Products

The shelf life of products is the period from product manufacture to shipment to customers. The product can be unconditionally shipped within this period. The period is defined as 2 years.

If products are stored longer than the shelf life of 2 years the products shall be subjected to quality check as per CDIL quality procedure.

The products are further warranted for another one year after the date of shipment subject to the above conditions in CDIL original packing.

Floor Life of CDIL Products and MSL Level

When the products are opened from the original packing, the floor life will start.

For this, the following JEDEC table may be referred:

| JEDEC MSL Level | | |
|-----------------|--------------------|-----------------|
| Level | Time | Condition |
| 1 | Unlimited | ≤30 °C / 85% RH |
| 2 | 1 Year | ≤30 °C / 60% RH |
| 2a | 4 Weeks | ≤30 °C / 60% RH |
| 3 | 168 Hours | ≤30 °C / 60% RH |
| 4 | 72 Hours | ≤30 °C / 60% RH |
| 5 | 48 Hours | ≤30 °C / 60% RH |
| 5a | 24 Hours | ≤30 °C / 60% RH |
| 6 | Time on Label(TOL) | ≤30 °C / 60% RH |



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Customer Notes

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.



CDIL is a registered trademark of

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CIN No. U32109DL1964PTC004291

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