



# THE DATASHEET OF SMBJ30A-QH





## Features

- Surface Mount SMB package
- Standoff Voltage: 5 to 220 volts
- Power Dissipation: 600 watts
- RoHS compliant\*
- AEC-Q101 compliant\*\*

## Applications

- Protection of power buses
- Protection of I/O interfaces
- Overvoltage transient protection
- Entertainment applications
- Comfort applications
- Telecom, computer, industrial and consumer electronics applications

# SMBJ-Q Transient Voltage Suppressor Diode Series

### General Information

Bourns offers Transient Voltage Suppressor Diodes for surge and ESD protection applications, in compact chip package DO-214AA (SMB) size format. The Transient Voltage Suppressor series offers a choice of Working Peak Reverse Voltage from 5 V up to 220 V. Typical fast response times are less than 1.0 picosecond from 0 V to Breakdown Voltage.

Bourns® Chip Diodes conform to JEDEC standards, are easy to handle with standard pick and place equipment and the flat configuration minimizes roll away.

### Additional Information

Click these links for more information:



### Agency Recognition

| Description |                                      |
|-------------|--------------------------------------|
| UL          | File Number: <a href="#">E153537</a> |

### Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

| Parameter                                                                                                        | Symbol           | Value       | Unit  |
|------------------------------------------------------------------------------------------------------------------|------------------|-------------|-------|
| Minimum Peak Pulse Power Dissipation (T <sub>P</sub> = 1 ms) (Note 1,2)                                          | P <sub>PK</sub>  | 600         | Watts |
| Peak Forward Surge Current<br>8.3 ms Single Half Sine Wave Superimposed on Rated Load<br>(JEDEC Method) (Note 3) | I <sub>FSM</sub> | 100         | Amps  |
| Operating Temperature Range                                                                                      | T <sub>J</sub>   | -55 to +150 | °C    |
| Storage Temperature Range                                                                                        | T <sub>STG</sub> | -55 to +150 | °C    |

1. Non-repetitive current pulse, per Pulse Waveform graph and derated above T<sub>A</sub> = 25 °C per Pulse Derating Curve.
2. Mounted on 5.0 mm<sup>2</sup> (0.03 mm thick) copper pads to each terminal.
3. 8.3 ms Single Half-Sine Wave duty cycle = 4 pulses maximum per minute (unidirectional units only).



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\*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

\*\*Q" part number suffix indicates AEC-Q101 compliance.

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# SMBJ-Q Transient Voltage Suppressor Diode Series

## Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

| Unidirectional Device |         | Bidirectional Device |         | Breakdown Voltage V <sub>BR</sub> (Volts) |      |                       | Working Peak Reverse Voltage | Maximum Reverse Leakage @ V <sub>RWM</sub> | Maximum Clamping Voltage @ I <sub>pp</sub> (10/1000 μs) | Maximum Peak Pulse Current (10/1000 μs) | Maximum Clamping Voltage @ I <sub>pp</sub> (8/20 μs) | Maximum Peak Pulse Current (8/20 μs) |
|-----------------------|---------|----------------------|---------|-------------------------------------------|------|-----------------------|------------------------------|--------------------------------------------|---------------------------------------------------------|-----------------------------------------|------------------------------------------------------|--------------------------------------|
| Part No.              | Marking | Part No.             | Marking | Min.                                      | Max. | @ I <sub>T</sub> (mA) | V <sub>RWM</sub> (V)         | I <sub>R</sub> (μA)                        | V <sub>C</sub> (V)                                      | I <sub>pp</sub> (A)                     | V <sub>C</sub> (V)                                   | I <sub>pp</sub> (A)                  |
| SMBJ5.0A-Q            | KEQ     | SMBJ5.0CA-Q          | AEQ     | 6.40                                      | 7.00 | 10                    | 5.0                          | 800                                        | 9.2                                                     | 65.3                                    | 12.0                                                 | 326.5                                |
| SMBJ6.0A-Q            | KGQ     | SMBJ6.0CA-Q          | AGQ     | 6.67                                      | 7.37 | 10                    | 6.0                          | 800                                        | 10.3                                                    | 58.3                                    | 13.4                                                 | 291.5                                |
| SMBJ6.5A-Q            | KKQ     | SMBJ6.5CA-Q          | AKQ     | 7.22                                      | 7.98 | 10                    | 6.5                          | 500                                        | 11.2                                                    | 53.6                                    | 14.6                                                 | 268.0                                |
| SMBJ7.0A-Q            | KMQ     | SMBJ7.0CA-Q          | AMQ     | 7.78                                      | 8.60 | 10                    | 7.0                          | 200                                        | 12.0                                                    | 50.0                                    | 15.6                                                 | 250.0                                |
| SMBJ7.5A-Q            | KPQ     | SMBJ7.5CA-Q          | APQ     | 8.33                                      | 9.21 | 1.0                   | 7.5                          | 100                                        | 12.9                                                    | 46.6                                    | 16.8                                                 | 233.0                                |
| SMBJ8.0A-Q            | KRQ     | SMBJ8.0CA-Q          | ARQ     | 8.89                                      | 9.83 | 1.0                   | 8.0                          | 50                                         | 13.6                                                    | 44.2                                    | 17.7                                                 | 221.0                                |
| SMBJ8.5A-Q            | KTQ     | SMBJ8.5CA-Q          | ATQ     | 9.44                                      | 10.4 | 1.0                   | 8.5                          | 20                                         | 14.4                                                    | 41.7                                    | 18.7                                                 | 208.5                                |
| SMBJ9.0A-Q            | KVQ     | SMBJ9.0CA-Q          | AVQ     | 10.0                                      | 11.1 | 1.0                   | 9.0                          | 10                                         | 15.4                                                    | 39.0                                    | 20.0                                                 | 195.0                                |
| SMBJ10A-Q             | KXQ     | SMBJ10CA-Q           | AXQ     | 11.1                                      | 12.3 | 1.0                   | 10                           | 5.0                                        | 17.0                                                    | 35.3                                    | 22.1                                                 | 176.5                                |
| SMBJ11A-Q             | KZQ     | SMBJ11CA-Q           | AZQ     | 12.2                                      | 13.5 | 1.0                   | 11                           | 1.0                                        | 18.2                                                    | 33.0                                    | 23.7                                                 | 165.0                                |
| SMBJ12A-Q             | LEQ     | SMBJ12CA-Q           | BEQ     | 13.3                                      | 14.7 | 1.0                   | 12                           | 1.0                                        | 19.9                                                    | 30.2                                    | 25.9                                                 | 151.0                                |
| SMBJ13A-Q             | LGQ     | SMBJ13CA-Q           | BGQ     | 14.4                                      | 15.9 | 1.0                   | 13                           | 1.0                                        | 21.5                                                    | 28.0                                    | 28.0                                                 | 140.0                                |
| SMBJ14A-Q             | LKQ     | SMBJ14CA-Q           | BKQ     | 15.6                                      | 17.2 | 1.0                   | 14                           | 1.0                                        | 23.2                                                    | 25.9                                    | 30.2                                                 | 129.5                                |
| SMBJ15A-Q             | LMQ     | SMBJ15CA-Q           | BMQ     | 16.7                                      | 18.5 | 1.0                   | 15                           | 1.0                                        | 24.4                                                    | 24.6                                    | 31.7                                                 | 123.0                                |
| SMBJ16A-Q             | LPQ     | SMBJ16CA-Q           | BPQ     | 17.8                                      | 19.7 | 1.0                   | 16                           | 1.0                                        | 26.0                                                    | 23.1                                    | 33.8                                                 | 115.5                                |
| SMBJ17A-Q             | LRQ     | SMBJ17CA-Q           | BRQ     | 18.9                                      | 20.9 | 1.0                   | 17                           | 1.0                                        | 27.6                                                    | 21.8                                    | 35.9                                                 | 109.0                                |
| SMBJ18A-Q             | LTQ     | SMBJ18CA-Q           | BTQ     | 20.0                                      | 22.1 | 1.0                   | 18                           | 1.0                                        | 29.2                                                    | 20.6                                    | 38.0                                                 | 103.0                                |
| SMBJ20A-Q             | LVQ     | SMBJ20CA-Q           | BVQ     | 22.2                                      | 24.5 | 1.0                   | 20                           | 1.0                                        | 32.4                                                    | 18.6                                    | 42.1                                                 | 93.0                                 |
| SMBJ22A-Q             | LXQ     | SMBJ22CA-Q           | BXQ     | 24.4                                      | 26.9 | 1.0                   | 22                           | 1.0                                        | 35.5                                                    | 16.9                                    | 46.2                                                 | 84.5                                 |
| SMBJ24A-Q             | LZQ     | SMBJ24CA-Q           | BZQ     | 26.7                                      | 29.5 | 1.0                   | 24                           | 1.0                                        | 38.9                                                    | 15.5                                    | 50.6                                                 | 77.5                                 |
| SMBJ26A-Q             | MEQ     | SMBJ26CA-Q           | CEQ     | 28.9                                      | 31.9 | 1.0                   | 26                           | 1.0                                        | 42.1                                                    | 14.3                                    | 54.7                                                 | 71.5                                 |
| SMBJ28A-Q             | MGQ     | SMBJ28CA-Q           | CGQ     | 31.1                                      | 34.4 | 1.0                   | 28                           | 1.0                                        | 45.4                                                    | 13.3                                    | 59.0                                                 | 66.5                                 |
| SMBJ30A-Q             | MKQ     | SMBJ30CA-Q           | CKQ     | 33.3                                      | 36.8 | 1.0                   | 30                           | 1.0                                        | 48.4                                                    | 12.4                                    | 62.9                                                 | 62.0                                 |
| SMBJ33A-Q             | MMQ     | SMBJ33CA-Q           | CMQ     | 36.7                                      | 40.6 | 1.0                   | 33                           | 1.0                                        | 53.3                                                    | 11.3                                    | 69.3                                                 | 56.5                                 |
| SMBJ36A-Q             | MPQ     | SMBJ36CA-Q           | CPQ     | 40                                        | 44.2 | 1.0                   | 36                           | 1.0                                        | 58.1                                                    | 10.4                                    | 75.5                                                 | 52.0                                 |
| SMBJ40A-Q             | MRQ     | SMBJ40CA-Q           | CRQ     | 44.4                                      | 49.1 | 1.0                   | 40                           | 1.0                                        | 64.5                                                    | 9.3                                     | 83.9                                                 | 46.5                                 |
| SMBJ43A-Q             | MTQ     | SMBJ43CA-Q           | CTQ     | 47.8                                      | 52.8 | 1.0                   | 43                           | 1.0                                        | 69.4                                                    | 8.7                                     | 90.2                                                 | 43.5                                 |
| SMBJ45A-Q             | MVQ     | SMBJ45CA-Q           | CVQ     | 50                                        | 55.3 | 1.0                   | 45                           | 1.0                                        | 72.7                                                    | 8.3                                     | 94.5                                                 | 41.5                                 |
| SMBJ48A-Q             | MXQ     | SMBJ48CA-Q           | CXQ     | 53.3                                      | 58.9 | 1.0                   | 48                           | 1.0                                        | 77.4                                                    | 7.8                                     | 100.6                                                | 39.0                                 |
| SMBJ51A-Q             | MZQ     | SMBJ51CA-Q           | CZQ     | 56.7                                      | 62.7 | 1.0                   | 51                           | 1.0                                        | 82.4                                                    | 7.3                                     | 107.1                                                | 36.5                                 |
| SMBJ54A-Q             | NEQ     | SMBJ54CA-Q           | DEQ     | 60                                        | 66.3 | 1.0                   | 54                           | 1.0                                        | 87.1                                                    | 6.9                                     | 113.2                                                | 34.5                                 |
| SMBJ58A-Q             | NGQ     | SMBJ58CA-Q           | DGQ     | 64.4                                      | 71.2 | 1.0                   | 58                           | 1.0                                        | 93.6                                                    | 6.5                                     | 121.7                                                | 32.5                                 |
| SMBJ60A-Q             | NKQ     | SMBJ60CA-Q           | DKQ     | 66.7                                      | 73.7 | 1.0                   | 60                           | 1.0                                        | 96.8                                                    | 6.2                                     | 125.8                                                | 31.0                                 |
| SMBJ64A-Q             | NMQ     | SMBJ64CA-Q           | DMQ     | 71.1                                      | 78.6 | 1.0                   | 64                           | 1.0                                        | 103                                                     | 5.9                                     | 133.9                                                | 29.5                                 |
| SMBJ70A-Q             | NPQ     | SMBJ70CA-Q           | DPQ     | 77.8                                      | 86.0 | 1.0                   | 70                           | 1.0                                        | 113                                                     | 5.3                                     | 146.9                                                | 26.5                                 |
| SMBJ75A-Q             | NRQ     | SMBJ75CA-Q           | DRQ     | 83.3                                      | 92.1 | 1.0                   | 75                           | 1.0                                        | 121                                                     | 5.0                                     | 157.3                                                | 25.0                                 |
| SMBJ78A-Q             | NTQ     | SMBJ78CA-Q           | DTQ     | 86.7                                      | 95.8 | 1.0                   | 78                           | 1.0                                        | 126                                                     | 4.8                                     | 163.8                                                | 24.0                                 |
| SMBJ85A-Q             | NVQ     | SMBJ85CA-Q           | DVQ     | 94.4                                      | 104  | 1.0                   | 85                           | 1.0                                        | 137                                                     | 4.4                                     | 178.1                                                | 22.0                                 |
| SMBJ90A-Q             | NXQ     | SMBJ90CA-Q           | DXQ     | 100                                       | 111  | 1.0                   | 90                           | 1.0                                        | 146                                                     | 4.1                                     | 189.8                                                | 20.5                                 |
| SMBJ100A-Q            | NZQ     | SMBJ100CA-Q          | DZQ     | 111                                       | 123  | 1.0                   | 100                          | 1.0                                        | 162                                                     | 3.7                                     | 210.6                                                | 18.5                                 |
| SMBJ110A-Q            | PEQ     | SMBJ110CA-Q          | EEQ     | 122                                       | 135  | 1.0                   | 110                          | 1.0                                        | 177                                                     | 3.4                                     | 230.1                                                | 17.0                                 |
| SMBJ120A-Q            | PGQ     | SMBJ120CA-Q          | EGQ     | 133                                       | 147  | 1.0                   | 120                          | 1.0                                        | 193                                                     | 3.1                                     | 250.9                                                | 15.5                                 |
| SMBJ130A-Q            | PKQ     | SMBJ130CA-Q          | EKQ     | 144                                       | 159  | 1.0                   | 130                          | 1.0                                        | 209                                                     | 2.9                                     | 271.7                                                | 14.5                                 |
| SMBJ150A-Q            | PMQ     | SMBJ150CA-Q          | EMQ     | 167                                       | 185  | 1.0                   | 150                          | 1.0                                        | 243                                                     | 2.5                                     | 315.9                                                | 12.5                                 |
| SMBJ160A-Q            | PPQ     | SMBJ160CA-Q          | EPQ     | 178                                       | 197  | 1.0                   | 160                          | 1.0                                        | 259                                                     | 2.3                                     | 336.7                                                | 11.5                                 |
| SMBJ170A-Q            | PRQ     | SMBJ170CA-Q          | ERQ     | 189                                       | 209  | 1.0                   | 170                          | 1.0                                        | 275                                                     | 2.2                                     | 357.5                                                | 11.0                                 |
| SMBJ180A-Q            | PTQ     | SMBJ180CA-Q          | ETQ     | 201                                       | 222  | 1.0                   | 180                          | 1.0                                        | 292                                                     | 2.1                                     | 379.6                                                | 10.5                                 |
| SMBJ200A-Q            | PVQ     | SMBJ200CA-Q          | EVQ     | 224                                       | 247  | 1.0                   | 200                          | 1.0                                        | 324                                                     | 1.9                                     | 421.2                                                | 9.5                                  |
| SMBJ220A-Q            | PXQ     | SMBJ220CA-Q          | EXQ     | 246                                       | 272  | 1.0                   | 220                          | 1.0                                        | 356                                                     | 1.7                                     | 462.8                                                | 8.5                                  |

Notes: 1. Suffix 'A' denotes a 5 % tolerance unidirectional device.  
 2. Suffix 'CA' denotes a 5 % tolerance bidirectional device.

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Users should verify actual device performance in their specific applications.

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# SMBJ-Q Transient Voltage Suppressor Diode Series



## Performance Graphs

### Peak Pulse Power Derating Curve



### Maximum Non-Repetitive Surge Current



### Pulse Waveform



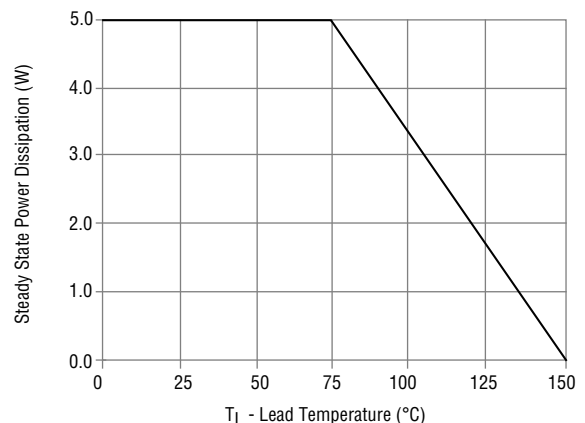
### Typical Junction Capacitance



### Pulse Rating Curve



### Steady State Power Derating Curve



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# SMBJ-Q Transient Voltage Suppressor Diode Series



## Product Dimensions



| Dimension | SMB (DO-214AA)                 |
|-----------|--------------------------------|
| A         | 4.06 - 4.57<br>(0.160 - 0.180) |
| B         | 3.30 - 3.94<br>(0.130 - 0.155) |
| C         | 1.95 - 2.20<br>(0.077 - 0.087) |
| D         | 0.15 - 0.31<br>(0.006 - 0.012) |
| E         | 5.21 - 5.59<br>(0.205 - 0.220) |
| F         | 0.203 MAX.<br>(0.008)          |
| G         | 2.13 - 2.44<br>(0.084 - 0.096) |
| H         | 0.76 - 1.52<br>(0.030 - 0.060) |

DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

## Typical Part Marking



## Recommended Footprint



| Dimension | SMB (DO-214AA)  |
|-----------|-----------------|
| A (Max.)  | 2.69<br>(0.106) |
| B (Min.)  | 2.10<br>(0.083) |
| C (Min.)  | 1.27<br>(0.050) |

DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

## Physical Specifications

Case ..... Molded plastic per UL Class 94V-0  
 Polarity.....Cathode band indicates unidirectional device  
 No cathode band indicates bidirectional device

## How to Order

Package **SMBJ 12 CA - Q**  
 SMBJ = SMB/DO-214AA  
 Working Peak Reverse Voltage .....  
 5 ~ 220 = 5 ~ 220 V<sub>RWM</sub> (Volts)  
 Suffix .....  
 A = 5 % Tolerance Unidirectional Device  
 CA = 5 % Tolerance Bidirectional Device  
 AEC-Q101 Suffix .....  
 Q = AEC-Q101 Compliant, 13-inch Reel  
 QH = AEC-Q101 Compliant, 7-inch Reel

## Environmental Specifications

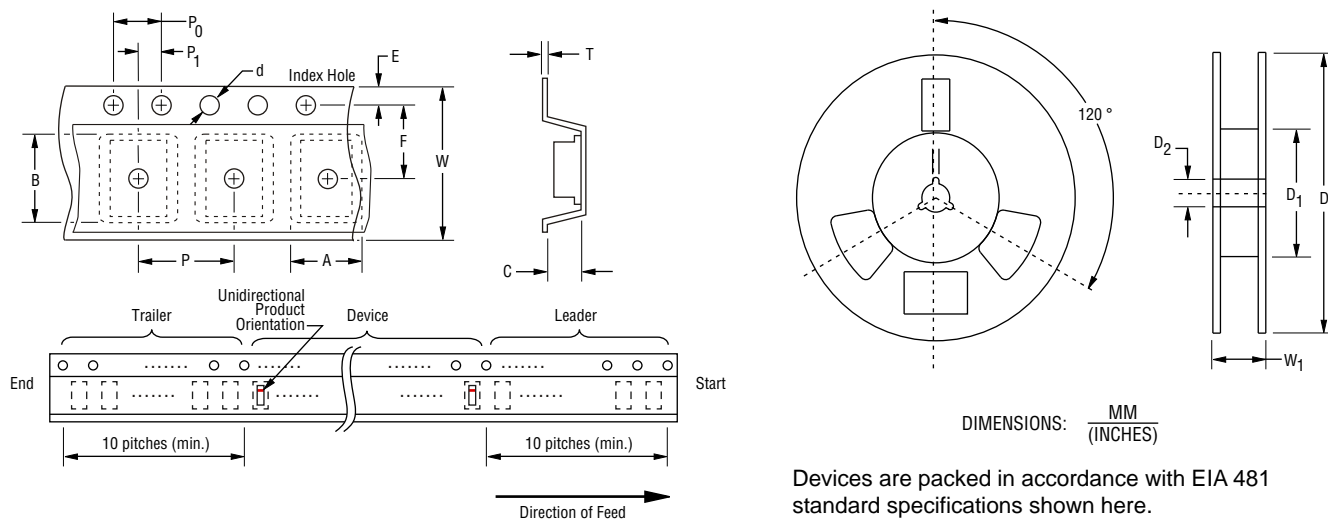
Moisture Sensitivity Level..... 1  
 ESD Classification (HBM).....3B

# SMBJ-Q Transient Voltage Suppressor Diode Series

# BOURNS®

## Packaging Information

The product will be dispensed in tape and reel format (see diagram below).



| Item                   | Symbol         | SMB (DO-214AA)                             |                        |
|------------------------|----------------|--------------------------------------------|------------------------|
|                        |                | 7-Inch Reel                                | 13-Inch Reel           |
| Carrier Width          | A              | $\frac{3.67 \pm 0.20}{(0.144 \pm 0.008)}$  |                        |
| Carrier Length         | B              | $\frac{5.60 \pm 0.20}{(0.220 \pm 0.008)}$  |                        |
| Carrier Depth          | C              | $\frac{2.57 \pm 0.20}{(0.101 \pm 0.008)}$  |                        |
| Sprocket Hole          | d              | $\frac{1.50 \pm 0.10}{(0.059 \pm 0.004)}$  |                        |
| Reel Outside Diameter  | D              | $\frac{178}{(7.008)}$                      | $\frac{330}{(12.992)}$ |
| Reel Inner Diameter    | D <sub>1</sub> | $\frac{50.0}{(1.969)}$ MIN.                |                        |
| Feed Hole Diameter     | D <sub>2</sub> | $\frac{13.0 \pm 0.20}{(0.512 \pm 0.008)}$  |                        |
| Sprocket Hole Position | E              | $\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$  |                        |
| Punch Hole Position    | F              | $\frac{5.50 \pm 0.05}{(0.217 \pm 0.002)}$  |                        |
| Punch Hole Pitch       | P              | $\frac{8.00 \pm 0.10}{(0.315 \pm 0.004)}$  |                        |
| Sprocket Hole Pitch    | P <sub>0</sub> | $\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$  |                        |
| Embossment Center      | P <sub>1</sub> | $\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$  |                        |
| Overall Tape Thickness | T              | $\frac{0.30 \pm 0.10}{(0.012 \pm 0.004)}$  |                        |
| Tape Width             | W              | $\frac{12.00 \pm 0.30}{(0.472 \pm 0.012)}$ |                        |
| Reel Width             | W <sub>1</sub> | $\frac{18.4}{(0.724)}$ MAX.                |                        |
| Quantity per Reel      | --             | 500                                        | 3,000                  |

REV. 10/20

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-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management