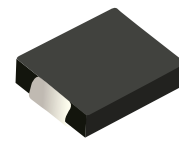
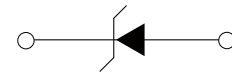


## FEATURES

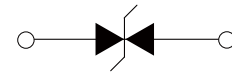
- | Low profile package
- | Ideal for automated placement
- | 5000 Watt peak pulse power capability with a 10/1000 $\mu$ s waveform
- | For surface mounted applications to optimize board space
- | Excellent clamping capability
- | Very fast response time
- | Low incremental surge resistance



DO-214AB(SMC)



Uni-directional



Bi-directional

## APPLICATIONS

- | Power supply protection
- | Automotive application
- | Industrial application
- | Power management

## APPROVALS

|             |                                    |
|-------------|------------------------------------|
| <b>RoHS</b> | Compliance with 2011/65/EU         |
| <b>HF</b>   | Compliance with IEC61249-2-21:2003 |

## MAXIMUM RATINGS ( $T_A=25^{\circ}\text{C}$ )

| Parameter                                                                                       | Symbol    | Value | Unit  |
|-------------------------------------------------------------------------------------------------|-----------|-------|-------|
| Peak Pulse Power Dissipation on 10/1000 $\mu$ s waveform (Note1, Note2).                        | $P_{PPM}$ | 5000  | Watts |
| Steady State Power Dissipation at $T_L=50^{\circ}\text{C}$ , Lead lengths.375" (9.5mm) ( Note2) | $P_D$     | 6.5   | Watts |

**Notes :** 1.Non-repetitive current pulse,  $T_A=25^{\circ}\text{C}$ .  
 2.Mounted on 5.0mm\*5.0mm (0.03mm thick) Copper Pads to each terminal.

## THERMAL CONSIDERATIONS

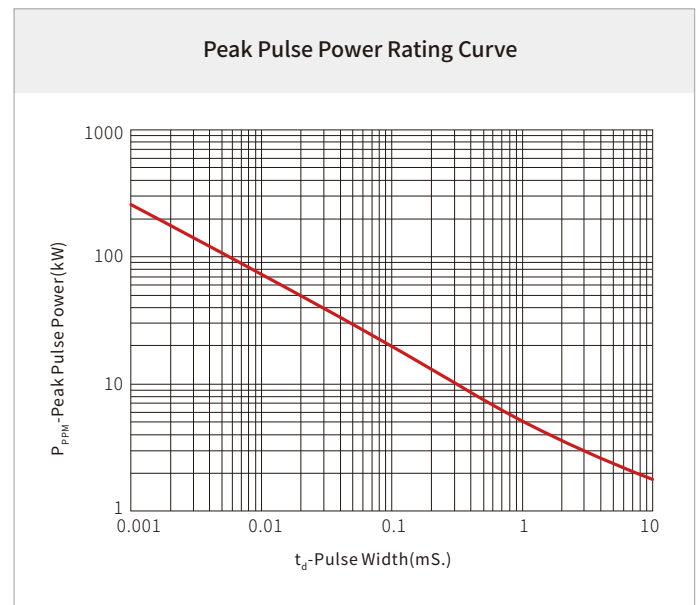
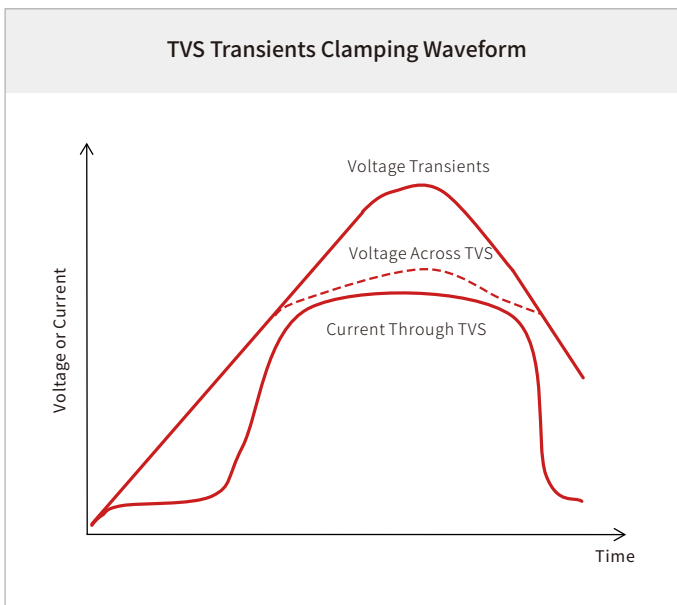
| Parameter                              | Symbol          | Value       | Unit                 |
|----------------------------------------|-----------------|-------------|----------------------|
| Operating Junction Temperature         | $T_J$           | -55 to +150 | $^{\circ}\text{C}$   |
| Storage Temperature Range              | $T_{STG}$       | -55 to +150 | $^{\circ}\text{C}$   |
| Junction to Ambient on printed circuit | $R_{\theta JA}$ | 75          | $^{\circ}\text{C/W}$ |

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C)

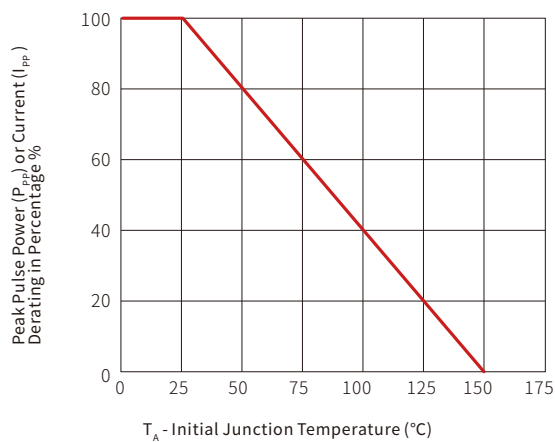
| Part Number |              | Device Marking Code |      | Reverse Stand-off Voltage | Breakdown Voltage Min.@I <sub>T</sub> | Breakdown Voltage Max.@I <sub>T</sub> | Test Current        | Maximum Clamping Voltage @I <sub>PP</sub> | Peak Pulse Current  | Reverse Leakage @V <sub>RWM</sub> |
|-------------|--------------|---------------------|------|---------------------------|---------------------------------------|---------------------------------------|---------------------|-------------------------------------------|---------------------|-----------------------------------|
| Uni-Polar   | Bi-Polar     | Uni                 | Bi   | V <sub>RWM</sub> (V)      | V <sub>BR</sub> (V)                   | V <sub>BR</sub> (V)                   | I <sub>T</sub> (mA) | V <sub>C</sub> (V)                        | I <sub>PP</sub> (A) | I <sub>R</sub> (uA)               |
| 5.0SMDJ11A  | 5.0SMDJ11CA  | 5PEN                | 5BEN | 11.0                      | 12.20                                 | 13.50                                 | 10                  | 18.2                                      | 275.0               | 800                               |
| 5.0SMDJ12A  | 5.0SMDJ12CA  | 5PEP                | 5BEP | 12.0                      | 13.20                                 | 14.70                                 | 10                  | 19.9                                      | 252.0               | 800                               |
| 5.0SMDJ13A  | 5.0SMDJ13CA  | 5PEQ                | 5BEQ | 13.0                      | 14.40                                 | 15.90                                 | 10                  | 21.5                                      | 233.0               | 500                               |
| 5.0SMDJ14A  | 5.0SMDJ14CA  | 5PER                | 5BER | 14.0                      | 15.60                                 | 17.20                                 | 10                  | 23.2                                      | 216.0               | 200                               |
| 5.0SMDJ15A  | 5.0SMDJ15CA  | 5PES                | 5BES | 15.0                      | 16.70                                 | 18.50                                 | 1                   | 24.4                                      | 205.0               | 100                               |
| 5.0SMDJ16A  | 5.0SMDJ16CA  | 5PET                | 5BET | 16.0                      | 17.80                                 | 19.70                                 | 1                   | 26.0                                      | 193.0               | 50                                |
| 5.0SMDJ17A  | 5.0SMDJ17CA  | 5PEU                | 5BEU | 17.0                      | 18.90                                 | 20.90                                 | 1                   | 27.6                                      | 181.0               | 20                                |
| 5.0SMDJ18A  | 5.0SMDJ18CA  | 5PEV                | 5BEV | 18.0                      | 20.00                                 | 22.10                                 | 1                   | 29.2                                      | 172.0               | 10                                |
| 5.0SMDJ20A  | 5.0SMDJ20CA  | 5PEW                | 5BEW | 20.0                      | 22.20                                 | 24.50                                 | 1                   | 32.4                                      | 155.0               | 5                                 |
| 5.0SMDJ22A  | 5.0SMDJ22CA  | 5PEX                | 5BEX | 22.0                      | 24.40                                 | 26.90                                 | 1                   | 35.5                                      | 141.0               | 5                                 |
| 5.0SMDJ24A  | 5.0SMDJ24CA  | 5PEZ                | 5BEZ | 24.0                      | 26.70                                 | 29.50                                 | 1                   | 38.9                                      | 129.0               | 5                                 |
| 5.0SMDJ26A  | 5.0SMDJ26CA  | 5PFE                | 5BFE | 26.0                      | 28.90                                 | 31.90                                 | 1                   | 42.1                                      | 119.0               | 5                                 |
| 5.0SMDJ28A  | 5.0SMDJ28CA  | 5PFG                | 5BFG | 28.0                      | 31.10                                 | 34.40                                 | 1                   | 45.4                                      | 110.0               | 5                                 |
| 5.0SMDJ30A  | 5.0SMDJ30CA  | 5PFK                | 5BFK | 30.0                      | 33.30                                 | 36.80                                 | 1                   | 48.4                                      | 103.0               | 5                                 |
| 5.0SMDJ33A  | 5.0SMDJ33CA  | 5PFM                | 5BFM | 33.0                      | 36.70                                 | 40.60                                 | 1                   | 53.3                                      | 93.9                | 5                                 |
| 5.0SMDJ36A  | 5.0SMDJ36CA  | 5PFP                | 5BFP | 36.0                      | 40.00                                 | 44.20                                 | 1                   | 58.1                                      | 86.1                | 5                                 |
| 5.0SMDJ40A  | 5.0SMDJ40CA  | 5PFR                | 5BFR | 40.0                      | 44.40                                 | 49.10                                 | 1                   | 64.5                                      | 77.6                | 5                                 |
| 5.0SMDJ43A  | 5.0SMDJ43CA  | 5PFT                | 5BFT | 43.0                      | 47.80                                 | 52.80                                 | 1                   | 69.4                                      | 72.1                | 5                                 |
| 5.0SMDJ45A  | 5.0SMDJ45CA  | 5PFV                | 5BFV | 45.0                      | 50.00                                 | 55.30                                 | 1                   | 72.7                                      | 68.8                | 5                                 |
| 5.0SMDJ48A  | 5.0SMDJ48CA  | 5PFX                | 5BFX | 48.0                      | 53.30                                 | 58.90                                 | 1                   | 77.4                                      | 64.7                | 5                                 |
| 5.0SMDJ51A  | 5.0SMDJ51CA  | 5PFZ                | 5BFZ | 51.0                      | 56.70                                 | 62.70                                 | 1                   | 82.4                                      | 60.7                | 5                                 |
| 5.0SMDJ54A  | 5.0SMDJ54CA  | 5PGE                | 5BGE | 54.0                      | 60.00                                 | 66.30                                 | 1                   | 87.1                                      | 57.5                | 5                                 |
| 5.0SMDJ58A  | 5.0SMDJ58CA  | 5PGG                | 5BGG | 58.0                      | 64.40                                 | 71.20                                 | 1                   | 93.6                                      | 53.5                | 5                                 |
| 5.0SMDJ60A  | 5.0SMDJ60CA  | 5PGK                | 5BGK | 60.0                      | 66.70                                 | 73.70                                 | 1                   | 96.8                                      | 51.7                | 5                                 |
| 5.0SMDJ64A  | 5.0SMDJ64CA  | 5PGM                | 5BGM | 64.0                      | 71.10                                 | 78.60                                 | 1                   | 103.0                                     | 48.6                | 5                                 |
| 5.0SMDJ70A  | 5.0SMDJ70CA  | 5PGP                | 5BGP | 70.0                      | 77.80                                 | 86.00                                 | 1                   | 113.0                                     | 44.3                | 5                                 |
| 5.0SMDJ75A  | 5.0SMDJ75CA  | 5PGR                | 5BGR | 75.0                      | 83.30                                 | 92.10                                 | 1                   | 121.0                                     | 41.4                | 5                                 |
| 5.0SMDJ78A  | 5.0SMDJ78CA  | 5PGT                | 5BGT | 78.0                      | 86.70                                 | 95.80                                 | 1                   | 126.0                                     | 39.7                | 5                                 |
| 5.0SMDJ85A  | 5.0SMDJ85CA  | 5PGV                | 5BGV | 85.0                      | 94.40                                 | 104.00                                | 1                   | 137.0                                     | 36.5                | 5                                 |
| 5.0SMDJ90A  | 5.0SMDJ90CA  | 5PGX                | 5BGX | 90.0                      | 100.00                                | 111.00                                | 1                   | 146.0                                     | 34.3                | 5                                 |
| 5.0SMDJ100A | 5.0SMDJ100CA | 5PGZ                | 5BGZ | 100.0                     | 111.00                                | 123.00                                | 1                   | 162.0                                     | 30.9                | 5                                 |
| 5.0SMDJ110A | 5.0SMDJ110CA | 5PHE                | 5BHE | 110.0                     | 122.00                                | 135.00                                | 1                   | 177.0                                     | 28.3                | 5                                 |

| Part Number |              | Device Marking Code |      | Reverse Stand-off Voltage | Breakdown Voltage Min.@ $I_T$ | Breakdown Voltage Max.@ $I_T$ | Test Current | Maximum Clamping Voltage @ $I_{PP}$ | Peak Pulse Current | Reverse Leakage @ $V_{RWM}$ |
|-------------|--------------|---------------------|------|---------------------------|-------------------------------|-------------------------------|--------------|-------------------------------------|--------------------|-----------------------------|
| Uni-Polar   | Bi-Polar     | Uni                 | Bi   | $V_{RWM}(V)$              | $V_{BR}(V)$                   | $V_{BR}(V)$                   | $I_T(mA)$    | $V_C(V)$                            | $I_{PP}(A)$        | $I_R(\mu A)$                |
| 5.0SMDJ120A | 5.0SMDJ120CA | 5PHG                | 5BHG | 120.0                     | 133.00                        | 147.00                        | 1            | 193.0                               | 26.0               | 5                           |
| 5.0SMDJ130A | 5.0SMDJ130CA | 5PHK                | 5BHK | 130.0                     | 144.00                        | 159.00                        | 1            | 209.0                               | 24.0               | 5                           |
| 5.0SMDJ150A | 5.0SMDJ150CA | 5PHM                | 5BHM | 150.0                     | 155.00                        | 171.00                        | 1            | 226.8                               | 22.3               | 5                           |
| 5.0SMDJ160A | 5.0SMDJ160CA | 5PHP                | 5BHP | 160.0                     | 167.00                        | 185.00                        | 1            | 243.0                               | 20.8               | 5                           |
| 5.0SMDJ170A | 5.0SMDJ170CA | 5PHR                | 5BHR | 170.0                     | 178.00                        | 197.00                        | 1            | 259.0                               | 19.5               | 5                           |
| 5.0SMDJ180A | 5.0SMDJ180CA | 5PHT                | 5BHT | 180.0                     | 189.00                        | 209.00                        | 1            | 275.0                               | 18.4               | 5                           |
| 5.0SMDJ190A | 5.0SMDJ190CA | 5PHV                | 5DHV | 190.0                     | 200.00                        | 220.00                        | 1            | 291.6                               | 17.3               | 5                           |
| 5.0SMDJ200A | 5.0SMDJ200CA | 5PHX                | 5DHX | 200.0                     | 211.00                        | 232.00                        | 1            | 307.8                               | 16.4               | 5                           |
| 5.0SMDJ210A | 5.0SMDJ210CA | 5PHZ                | 5DHZ | 210.0                     | 224.00                        | 247.00                        | 1            | 324.0                               | 15.6               | 5                           |
| 5.0SMDJ220A | 5.0SMDJ220CA | 5PIE                | 5DIE | 220.0                     | 246.00                        | 272.00                        | 1            | 356.0                               | 14.2               | 5                           |
| 5.0SMDJ250A | 5.0SMDJ250CA | 5PIG                | 5DIG | 250.0                     | 279.00                        | 309.00                        | 1            | 405.0                               | 12.5               | 5                           |
| 5.0SMDJ300A | 5.0SMDJ300CA | 5PIK                | 5DIK | 300.0                     | 335.00                        | 371.00                        | 1            | 486.0                               | 10.4               | 5                           |
| 5.0SMDJ350A | 5.0SMDJ350CA | 5PIM                | 5DIM | 350.0                     | 391.00                        | 432.00                        | 1            | 567.0                               | 8.9                | 5                           |
| 5.0SMDJ400A | 5.0SMDJ400CA | 5PIP                | 5DIP | 400.0                     | 447.00                        | 494.00                        | 1            | 648.0                               | 7.8                | 5                           |

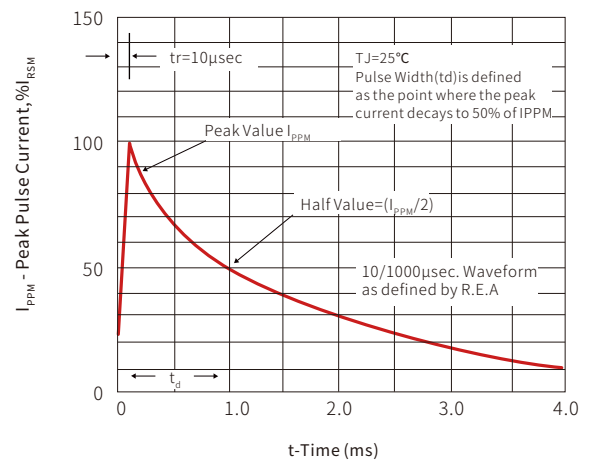
## CHARACTERISTIC CURVES



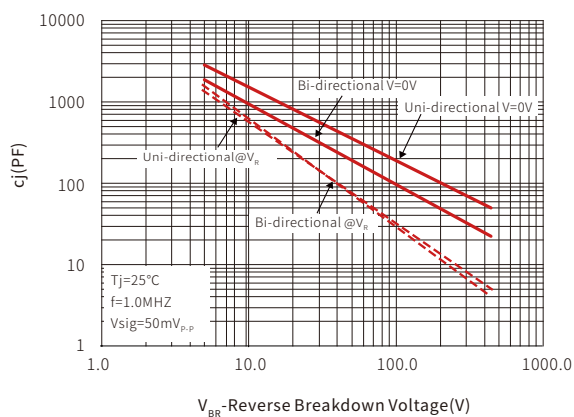
### Pulse Derating Curve



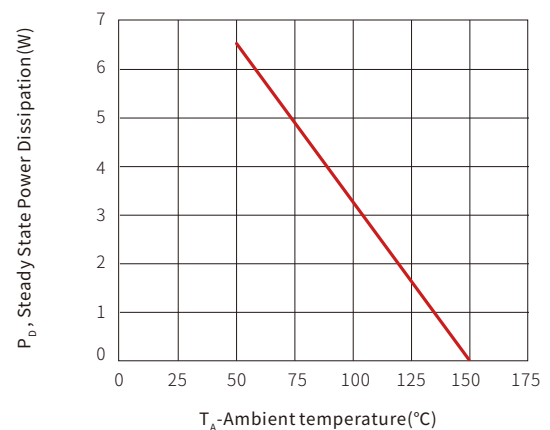
### Pulse Waveform



### Typical Junction Capacitance

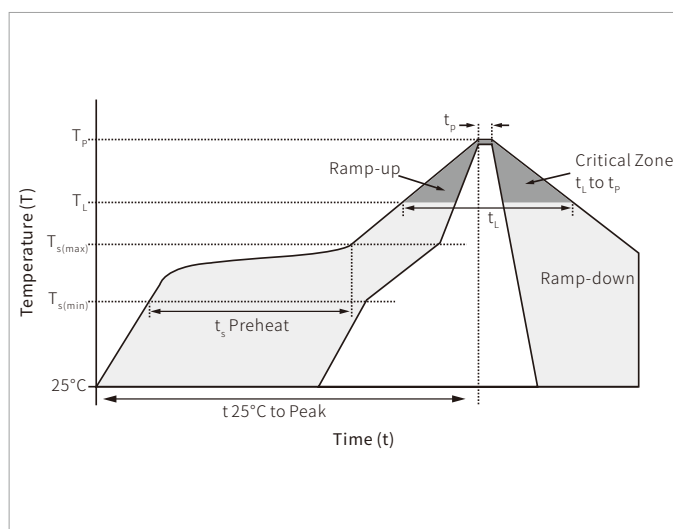


### Steady State Power Dissipation Derating Curve

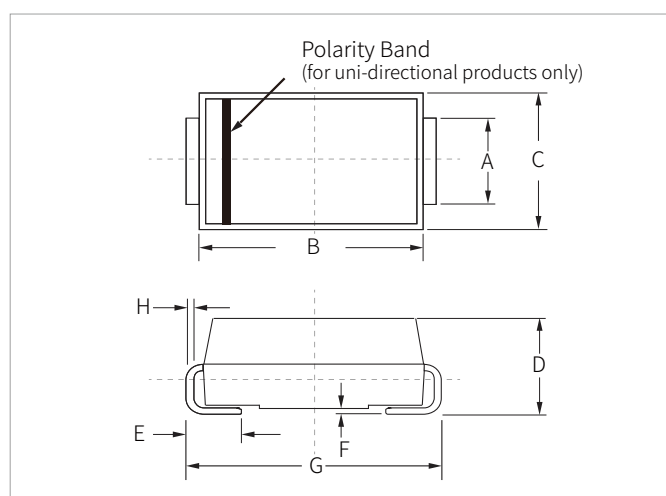


## SOLDERING PARAMETERS

| Reflow Condition                                      |                                  | Lead-free assembly |
|-------------------------------------------------------|----------------------------------|--------------------|
| Pre Heat                                              | Temperature Max ( $T_{s(min)}$ ) | 150°C              |
|                                                       | Temperature Max ( $T_{s(max)}$ ) | 200°C              |
|                                                       | Time (min to max) ( $t_s$ )      | 60 – 180 secs      |
| Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak |                                  | 3°C/second max     |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                  |                                  | 3°C/second max     |
| Reflow                                                | Temperature ( $T_L$ ) (Liquidus) | 217°C              |
|                                                       | Time (min to max) ( $t_L$ )      | 60 – 150 seconds   |
| Peak Temperature ( $T_p$ )                            |                                  | 260°C              |
| Time within 5°C of actual peak Temperature ( $t_p$ )  |                                  | 20 – 40 seconds    |
| Ramp-down Rate                                        |                                  | 6°C/second max     |
| Time 25°C to peak Temperature ( $T_p$ )               |                                  | 8 minutes max.     |
| Do not exceed                                         |                                  | 260°C              |

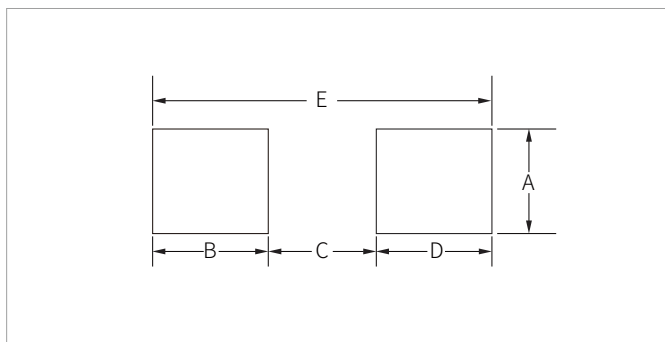


## DO-214AB(SMC) PACKAGE INFORMATION



| Ref. | Millimeters |      | Inches |       |
|------|-------------|------|--------|-------|
|      | Min.        | Max. | Min.   | Max.  |
| A    | 2.80        | 3.20 | 0.110  | 0.126 |
| B    | 6.60        | 7.20 | 0.260  | 0.283 |
| C    | 5.70        | 6.10 | 0.224  | 0.240 |
| D    | 2.15        | 2.75 | 0.085  | 0.108 |
| E    | 1.00        | 1.60 | 0.039  | 0.063 |
| F    | 0.02        | 0.20 | 0.000  | 0.008 |
| G    | 7.60        | 8.00 | 0.299  | 0.315 |
| H    | 0.15        | 0.30 | 0.006  | 0.012 |

## RECOMMENDED PAD LAYOUT DIMENSIONS



| Ref. | Millimeters |      | Inches   |       |
|------|-------------|------|----------|-------|
|      | Min.        | Max. | Min.     | Max.  |
| A    | 3.30        | -    | 0.129    | -     |
| B    | 2.40        | -    | 0.094    | -     |
| C    | -           | 4.20 | -        | 0.165 |
| D    | 2.40        | -    | 0.094    | -     |
| E    | 8.20REF     |      | 0.323REF |       |

## ORDERING INFORMATION

| Part Number   | Component Package | QTY/Reel | Reel Size |
|---------------|-------------------|----------|-----------|
| 5.0SMDJxx(C)A | DO-214AB(SMC)     | 3000PCS  | 13"       |

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