

## »Performance Specification

| Model             | I-hold | I-trip | Vmax  | Imax   | Pd typ | Max. Time to trip |        | R0 min | R1max |
|-------------------|--------|--------|-------|--------|--------|-------------------|--------|--------|-------|
|                   |        |        |       |        |        | Current           | Time   |        |       |
|                   | (A)    | (A)    | (Vdc) | (A)    | (W)    | (A)               | (Sec.) | (Ohm)  | (Ohm) |
| SMD1210-005/30N   | 0.05   | 0.15   | 30.00 | 10.00  | 0.60   | 0.25              | 1.50   | 2.80   | 50.00 |
| SMD1210-005/60N   | 0.05   | 0.15   | 60.00 | 10.00  | 0.60   | 0.25              | 1.50   | 2.80   | 50.00 |
| SMD1210-010/30N   | 0.10   | 0.30   | 30.00 | 10.00  | 0.60   | 0.50              | 1.50   | 1.50   | 15.00 |
| SMD1210-010/60N   | 0.10   | 0.30   | 60.00 | 10.00  | 0.60   | 0.50              | 1.50   | 1.50   | 15.00 |
| SMD1210-020/24N   | 0.20   | 0.40   | 24.00 | 10.00  | 0.60   | 8.00              | 0.02   | 0.80   | 5.00  |
| SMD1210-020/30N   | 0.20   | 0.40   | 30.00 | 10.00  | 0.60   | 8.00              | 0.02   | 0.80   | 5.00  |
| SMD1210-035/6N    | 0.35   | 0.70   | 6.00  | 100.00 | 0.60   | 8.00              | 0.20   | 0.25   | 1.30  |
| SMD1210-035/24N   | 0.35   | 0.70   | 24.00 | 40.00  | 0.60   | 8.00              | 0.20   | 0.25   | 1.30  |
| SMD1210-035/30N   | 0.35   | 0.70   | 30.00 | 40.00  | 0.60   | 8.00              | 0.20   | 0.20   | 1.50  |
| SMD1210-035/30SN  | 0.35   | 0.70   | 30.00 | 40.00  | 0.60   | 8.00              | 0.20   | 0.25   | 1.30  |
| SMD1210-050/13.2N | 0.50   | 1.00   | 13.20 | 100.00 | 0.60   | 8.00              | 0.10   | 0.18   | 0.90  |
| SMD1210-050/16N   | 0.50   | 1.00   | 16.00 | 100.00 | 0.60   | 8.00              | 0.10   | 0.18   | 0.90  |
| SMD1210-050/24N   | 0.50   | 1.00   | 24.00 | 100.00 | 0.60   | 8.00              | 0.10   | 0.18   | 0.90  |
| SMD1210-050/30N   | 0.50   | 1.00   | 30.00 | 40.00  | 0.60   | 8.00              | 0.15   | 0.18   | 1.00  |
| SMD1210-075/6N    | 0.75   | 1.50   | 6.00  | 100.00 | 0.60   | 8.00              | 0.10   | 0.10   | 0.45  |
| SMD1210-075/13.2N | 0.75   | 1.50   | 13.20 | 100.00 | 0.60   | 8.00              | 0.10   | 0.10   | 0.45  |
| SMD1210-075/16N   | 0.75   | 1.50   | 16.00 | 100.00 | 0.60   | 8.00              | 0.10   | 0.10   | 0.45  |
| SMD1210-075/24N   | 0.75   | 1.50   | 24.00 | 100.00 | 0.60   | 8.00              | 0.10   | 0.10   | 0.45  |
| SMD1210-110/8N    | 1.10   | 2.20   | 8.00  | 100.00 | 0.60   | 8.00              | 0.10   | 0.05   | 0.21  |
| SMD1210-110/12N   | 1.10   | 2.20   | 12.00 | 100.00 | 0.60   | 8.00              | 0.10   | 0.05   | 0.21  |
| SMD1210-110/16N   | 1.10   | 2.20   | 16.00 | 100.00 | 0.60   | 8.00              | 0.10   | 0.05   | 0.21  |
| SMD1210-110/16SN  | 1.10   | 2.20   | 16.00 | 100.00 | 0.60   | 8.00              | 0.10   | 0.05   | 0.21  |
| SMD1210-110/24N   | 1.10   | 2.20   | 24.00 | 100.00 | 0.60   | 8.00              | 0.10   | 0.05   | 0.21  |
| SMD1210-150/6N    | 1.50   | 3.00   | 6.00  | 100.00 | 0.80   | 8.00              | 0.30   | 0.03   | 0.11  |
| SMD1210-150/8N    | 1.50   | 3.00   | 8.00  | 100.00 | 0.80   | 8.00              | 0.30   | 0.03   | 0.11  |
| SMD1210-150/12N   | 1.50   | 3.00   | 12.00 | 100.00 | 0.80   | 8.00              | 0.30   | 0.03   | 0.11  |
| SMD1210-150/16N   | 1.50   | 3.00   | 16.00 | 100.00 | 0.80   | 8.00              | 0.30   | 0.03   | 0.11  |
| SMD1210-175/6N    | 1.75   | 3.50   | 6.00  | 100.00 | 0.80   | 8.00              | 0.60   | 0.02   | 0.09  |
| SMD1210-175/12N   | 1.75   | 3.50   | 12.00 | 100.00 | 0.80   | 8.00              | 0.60   | 0.02   | 0.09  |
| SMD1210-175/16N   | 1.75   | 3.50   | 16.00 | 100.00 | 0.80   | 8.00              | 0.60   | 0.02   | 0.09  |
| SMD1210-200/6N    | 2.00   | 4.00   | 6.00  | 100.00 | 0.80   | 8.00              | 1.00   | 0.015  | 0.090 |
| SMD1210-200/12N   | 2.00   | 4.00   | 12.00 | 100.00 | 0.80   | 8.00              | 1.00   | 0.015  | 0.090 |
| SMD1210-200/16N   | 2.00   | 4.00   | 16.00 | 100.00 | 0.80   | 8.00              | 1.00   | 0.015  | 0.090 |

I-hold: Holding Current: maximum current at which the device will not trip in 25°C still air.

I-trip: Tripping Current: minimum current at which the device will trip in 25°C still air.

Vmax: Maximum voltage device can withstand without damage at rated current(Imax).

I max: Maximum fault current device can withstand without damage at rated voltage(Vmax).

Pd typ: Typical power dissipated from device when in the tripped state at 25°C still air.

R0 min: Minimum resistance of device in initial (un-soldered) state.

R1 max: Maximum resistance of device at 25°C measured one hour after tripping or reflow soldering of 260°C for 20 sec.

## »Environmental Specifications

|   |  |
|---|--|
| Operating Temperature                               | -40 °C to +85 °C   |
| Maximum Device Surface Temperature in Tripped State | 125°C  |
| Passive Aging                                       | +85 °C, 1000 hours ; ±5 % typical resistance change                                    |
| Humidity Aging                                      | +85 °C, 85 % R.H. 1000 hours; ±5 % typical resistance change                           |
| Thermal Shock                                       | MIL-STD-202, Method 107;<br>+85 °C to -40 °C, 20 times;-30 % typical resistance change |
| Solvent Resistance                                  | MIL-STD-202, Method 215 ; No change  |
| Vibration   | MIL-STD-883, Method 2007, Condition A; No change                                       |
| Moisture Sensivity Level                            | Level 1, J-STD-020   |
| Storage Conditions                                  | +40 °C Max. 70% RH Max. Packed in original packaging.                                  |

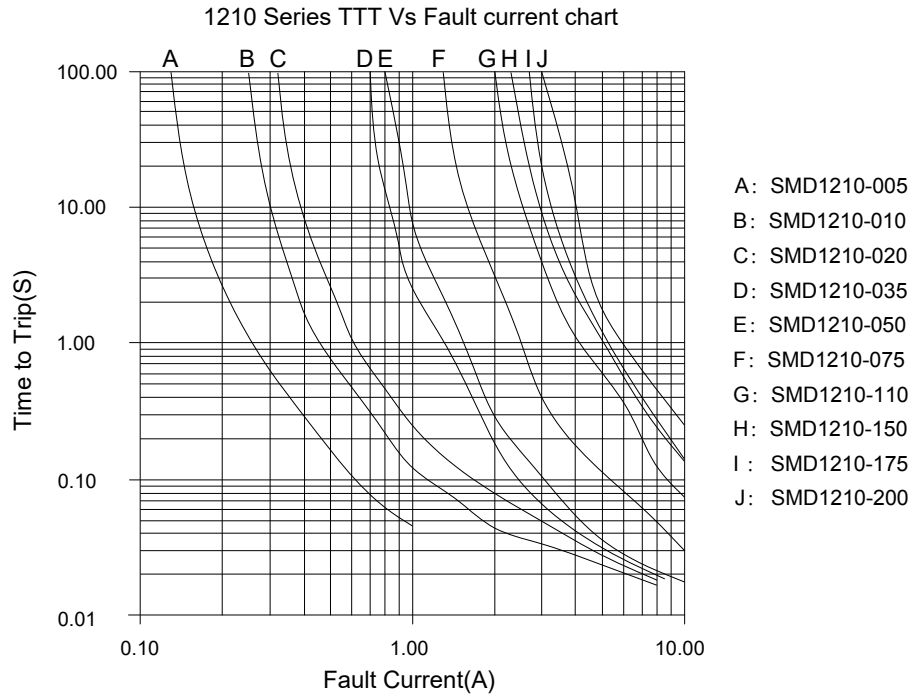
## »Test Procedures And Requirements

| No. | Test              | Test Conditions   | Accept/Reject Criteria                      |
|-----|-------------------|---|---|
| 1   | R0 min            | Resistance measurement at 25°C                                | $R0min \leq R \leq R1max$                   |
| 2   | R1 max            | Resistance measurement one hour after post trip               | $R0min \leq R \leq R1max$                   |
| 3   | I-hold            | Hold rated current 1800 second without trip, @ 25°C           | No trip                                     |
| 4   | I-trip            | Device must trip within 900 second under rated current, @25°C | Trip  |
| 5   | Max. time to trip | At specified current, 25°C                                    | $T \leq \text{max. time to trip (seconds)}$ |
| 6   | Trip Cycle Life   | $V_{max}$ , $I_{max}$ , 100 cycles                            | No arcing or burning                        |
| 7   | Trip Endurance    | $V_{max}$ , $I_{max}$ 24 hours                                | No arcing or burning                        |
| 8   | Solderability     | ANSI/J-STD-002  | 95 % min. coverage                          |

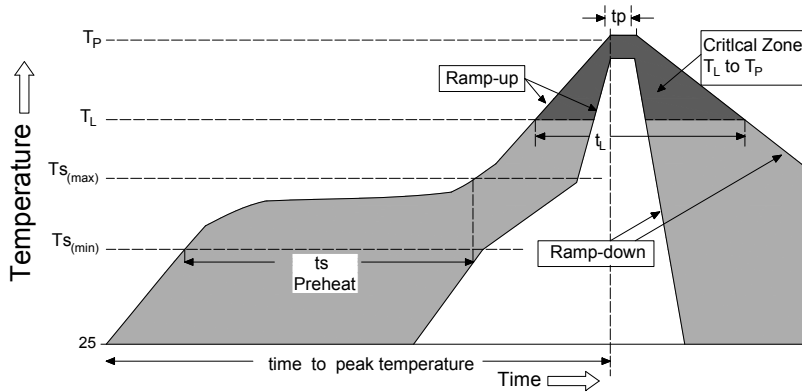
**»Thermal Derating Chart** Recommended Hold Current(A) at Ambient Temperature(°C)

| Model             | Ambient Operating Temperature |       |      |      |      |      |      |      |      |
|-------------------|-------------------------------|-------|------|------|------|------|------|------|------|
|                   | -40°C                         | -20°C | 0°C  | 25°C | 40°C | 50°C | 60°C | 70°C | 85°C |
| SMD1210-005/30N   | 0.08                          | 0.07  | 0.06 | 0.05 | 0.04 | 0.04 | 0.03 | 0.03 | 0.02 |
| SMD1210-005/60N   | 0.08                          | 0.07  | 0.06 | 0.05 | 0.04 | 0.04 | 0.03 | 0.03 | 0.02 |
| SMD1210-010/30N   | 0.16                          | 0.14  | 0.12 | 0.10 | 0.08 | 0.07 | 0.06 | 0.05 | 0.04 |
| SMD1210-010/60N   | 0.16                          | 0.14  | 0.12 | 0.10 | 0.08 | 0.07 | 0.06 | 0.05 | 0.04 |
| SMD1210-020/24N   | 0.29                          | 0.26  | 0.22 | 0.20 | 0.16 | 0.14 | 0.13 | 0.11 | 0.08 |
| SMD1210-020/30N   | 0.29                          | 0.26  | 0.22 | 0.20 | 0.16 | 0.14 | 0.13 | 0.11 | 0.08 |
| SMD1210-035/6N    | 0.47                          | 0.45  | 0.40 | 0.35 | 0.33 | 0.28 | 0.24 | 0.21 | 0.18 |
| SMD1210-035/24N   | 0.47                          | 0.45  | 0.40 | 0.35 | 0.33 | 0.28 | 0.24 | 0.21 | 0.18 |
| SMD1210-035/30N   | 0.47                          | 0.45  | 0.40 | 0.35 | 0.33 | 0.28 | 0.24 | 0.21 | 0.18 |
| SMD1210-035/30SN  | 0.47                          | 0.45  | 0.40 | 0.35 | 0.33 | 0.28 | 0.24 | 0.21 | 0.18 |
| SMD1210-050/13.2N | 0.76                          | 0.67  | 0.58 | 0.50 | 0.43 | 0.40 | 0.36 | 0.32 | 0.28 |
| SMD1210-050/16N   | 0.76                          | 0.67  | 0.58 | 0.50 | 0.43 | 0.40 | 0.36 | 0.32 | 0.28 |
| SMD1210-050/24N   | 0.76                          | 0.67  | 0.58 | 0.50 | 0.43 | 0.40 | 0.36 | 0.32 | 0.28 |
| SMD1210-050/30N   | 0.76                          | 0.67  | 0.58 | 0.50 | 0.43 | 0.40 | 0.36 | 0.32 | 0.28 |
| SMD1210-075/6N    | 1.00                          | 0.97  | 0.86 | 0.75 | 0.64 | 0.59 | 0.54 | 0.48 | 0.40 |
| SMD1210-075/13.2N | 1.00                          | 0.97  | 0.86 | 0.75 | 0.64 | 0.59 | 0.54 | 0.48 | 0.40 |
| SMD1210-075/16N   | 1.00                          | 0.97  | 0.86 | 0.75 | 0.64 | 0.59 | 0.54 | 0.48 | 0.40 |
| SMD1210-075/24N   | 1.00                          | 0.97  | 0.86 | 0.75 | 0.64 | 0.59 | 0.54 | 0.48 | 0.40 |
| SMD1210-110/8N    | 1.60                          | 1.42  | 1.26 | 1.10 | 0.94 | 0.86 | 0.80 | 0.70 | 0.58 |
| SMD1210-110/12N   | 1.60                          | 1.42  | 1.26 | 1.10 | 0.94 | 0.86 | 0.80 | 0.70 | 0.58 |
| SMD1210-110/16N   | 1.60                          | 1.42  | 1.26 | 1.10 | 0.94 | 0.86 | 0.80 | 0.70 | 0.58 |
| SMD1210-110/16SN  | 1.60                          | 1.42  | 1.26 | 1.10 | 0.94 | 0.86 | 0.80 | 0.70 | 0.58 |
| SMD1210-110/24N   | 1.60                          | 1.42  | 1.26 | 1.10 | 0.94 | 0.86 | 0.80 | 0.70 | 0.58 |
| SMD1210-150/6N    | 2.30                          | 2.02  | 1.76 | 1.50 | 1.24 | 1.11 | 1.00 | 0.85 | 0.65 |
| SMD1210-150/8N    | 2.30                          | 2.02  | 1.76 | 1.50 | 1.24 | 1.11 | 1.00 | 0.85 | 0.65 |
| SMD1210-150/12N   | 2.30                          | 2.02  | 1.76 | 1.50 | 1.24 | 1.11 | 1.00 | 0.85 | 0.65 |
| SMD1210-150/16N   | 2.30                          | 2.02  | 1.76 | 1.50 | 1.24 | 1.11 | 1.00 | 0.85 | 0.65 |
| SMD1210-175/6N    | 2.45                          | 2.22  | 2.01 | 1.75 | 1.45 | 1.26 | 1.10 | 0.98 | 0.80 |
| SMD1210-175/12N   | 2.45                          | 2.22  | 2.01 | 1.75 | 1.45 | 1.26 | 1.10 | 0.98 | 0.80 |
| SMD1210-175/16N   | 2.45                          | 2.22  | 2.01 | 1.75 | 1.45 | 1.26 | 1.10 | 0.98 | 0.80 |
| SMD1210-200/6N    | 2.60                          | 2.44  | 2.35 | 2.00 | 1.78 | 1.67 | 1.50 | 1.45 | 1.10 |
| SMD1210-200/12N   | 2.60                          | 2.44  | 2.35 | 2.00 | 1.78 | 1.67 | 1.50 | 1.45 | 1.10 |
| SMD1210-200/16N   | 2.60                          | 2.44  | 2.35 | 2.00 | 1.78 | 1.67 | 1.50 | 1.45 | 1.10 |

»Typical time to trip at 25°C



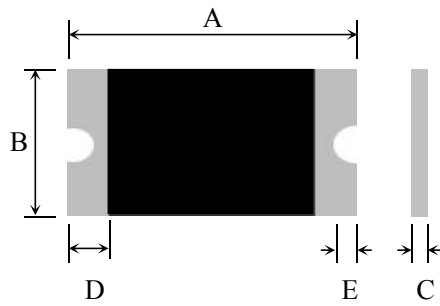
»Soldering Parameters



| Profile Feature                                 |                           | Pb-Free Assembly        |
|---|---------------------------|-------------------------|
| Average Ramp-Up Rate (Ts(max) to Tp)            |                           | 3°C/second max          |
| Pre Heat:                                       | Temperature Min (Ts(min)) | 150°C                   |
|   | Temperature Max (Ts(max)) | 200°C                   |
|   | Time (Min to Max) (ts)    | 60 – 180 secs           |
| Time Maintained Above:                          | Temperature (Tl)          | 217°C                   |
|   | Temperature (tL)          | 60 – 150 seconds        |
| Peak / Classification Temperature (Tp)          |                           | 260 <sup>+0/-5</sup> °C |
| Time within 5°C of actual peak Temperature (tp) |                           | 20 – 40 seconds         |
| Ramp-down Rate                                  |                           | 6°C/second max          |
| Time 25°C to peak Temperature (Tp)              |                           | 8 minutes Max.          |

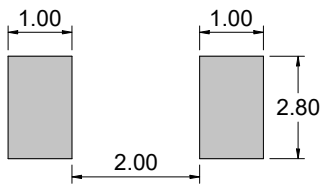
- ◆All temperature refer to topside of the package, measured on the package body surface
- ◆If reflow temperature exceeds the recommended profile, devices may not meet the performance requirements
- ◆Recommended reflow methods: IR, vapor phase oven, hot air oven, N2 environment for lead
- ◆Recommended maximum paste thickness is 0.25mm (0.010inch)
- ◆Devices can be cleaned using standard industry methods and solvents

»Physical Dimensions(mm)



| Model             | A    |      | B    |      | C    |      | D    |      | E    |
|-------------------|------|------|------|------|------|------|------|------|------|
|                   | Min  | Max  | Min  | Max  | Min  | Max  | Min  | Max  | Min  |
| SMD1210-005/30N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-005/60N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-010/30N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-010/60N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-020/24N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-020/30N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-035/6N    | 3.00 | 3.43 | 2.35 | 2.80 | 0.35 | 0.85 | 0.25 | 0.75 | 0.10 |
| SMD1210-035/24N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.35 | 0.85 | 0.25 | 0.75 | 0.10 |
| SMD1210-035/30N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-035/30SN  | 3.00 | 3.43 | 2.35 | 2.80 | 0.35 | 0.85 | 0.25 | 0.75 | 0.10 |
| SMD1210-050/13.2N | 3.00 | 3.43 | 2.35 | 2.80 | 0.35 | 0.85 | 0.25 | 0.75 | 0.10 |
| SMD1210-050/16N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.35 | 0.85 | 0.25 | 0.75 | 0.10 |
| SMD1210-050/24N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.35 | 0.85 | 0.25 | 0.75 | 0.10 |
| SMD1210-050/30N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-075/6N    | 3.00 | 3.43 | 2.35 | 2.80 | 0.35 | 0.85 | 0.25 | 0.75 | 0.10 |
| SMD1210-075/13.2N | 3.00 | 3.43 | 2.35 | 2.80 | 0.35 | 0.85 | 0.25 | 0.75 | 0.10 |
| SMD1210-075/16N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.35 | 0.85 | 0.25 | 0.75 | 0.10 |
| SMD1210-075/24N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-110/8N    | 3.00 | 3.43 | 2.35 | 2.80 | 0.35 | 0.85 | 0.25 | 0.75 | 0.10 |
| SMD1210-110/12N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.35 | 0.85 | 0.25 | 0.75 | 0.10 |
| SMD1210-110/16N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-110/16SN  | 3.00 | 3.43 | 2.35 | 2.80 | 0.35 | 0.85 | 0.25 | 0.75 | 0.10 |
| SMD1210-110/24N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-150/6N    | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-150/8N    | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-150/12N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-150/16N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-175/6N    | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-175/12N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.85 | 1.25 | 0.25 | 0.75 | 0.10 |
| SMD1210-175/16N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.85 | 1.25 | 0.25 | 0.75 | 0.10 |
| SMD1210-200/6N    | 3.00 | 3.43 | 2.35 | 2.80 | 0.65 | 1.15 | 0.25 | 0.75 | 0.10 |
| SMD1210-200/12N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.85 | 1.25 | 0.25 | 0.75 | 0.10 |
| SMD1210-200/16N   | 3.00 | 3.43 | 2.35 | 2.80 | 0.85 | 1.25 | 0.25 | 0.75 | 0.10 |

»Recommended Pad Layout (mm)&Physical Specifications



|                    |  |
|--------------------|--|
| Terminal Material  | Tin-Plated Nickel-Copper (Solder Material: Matte Tin (Sn))   |
| Lead Solderability | Meets EIA Specification RS186-9E, ANSI/J-STD-002 Category 3. |

»Tape And Reel Specifications (mm)&Packaging quantity

| TAPE SPECIFICATIONS: EIA-481-1 (mm) |  |
|-------------------------------------|--|
| Item                                | SMD1210-035/6N SMD1210-035/24N SMD1210-005/30N SMD1210-005/60N     |
|                                     | SMD1210-035/30SN SMD1210-050/13.2N SMD1210-010/30N SMD1210-010/60N |
|                                     | SMD1210-050/16N SMD1210-050/24N SMD1210-020/24N SMD1210-020/30N    |
|                                     | SMD1210-075/6N SMD1210-075/13.2N SMD1210-035/30N SMD1210-050/30N   |
|                                     | SMD1210-075/16N SMD1210-110/8N SMD1210-075/24N SMD1210-110/16N     |
|                                     | SMD1210-110/12N SMD1210-110/16SN SMD1210-110/24N SMD1210-150/6N    |
|                                     | SMD1210-150/8N SMD1210-150/12N                                     |
|                                     | SMD1210-150/16N SMD1210-175/6N                                     |
|                                     | SMD1210-175/12N SMD1210-175/16N                                    |
|                                     | SMD1210-200/6N SMD1210-200/12N                                     |
|                                     | SMD1210-200/16N  |
|                                     | W  |
| F                                   | 3.50±0.05  |
| E1                                  | 1.75±0.10  |
| D0                                  | 1.55±0.05  |
| D1                                  | 1.00 min   |
| P0                                  | 4.0±0.10   |
| P1                                  | 4.0±0.10   |
| P2                                  | 2.0±0.05   |
| A0                                  | 3.00±0.10  |
| B0                                  | 3.50±0.10  |
| T                                   | 0.25±0.05  |
| K0                                  | 0.85±0.10  |
| Leader                              | 390mm  |
| Trailer                             | 160mm  |
| Q'ty                                | 4,000pcs/Reel  |

| REEL DIMENSIONS: EIA-481-1 (mm) |           |
|---------------------------------|-----------|
| C                               | Ø178±1.0  |
| D                               | Ø60.2±0.5 |
| W                               | 9.0±1.5   |
| H                               | 11.0±0.5  |

