



# THE DATASHEET OF SF2189A



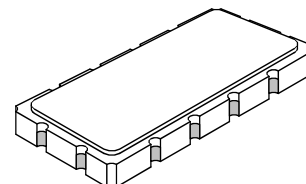
- Precision IF SAW Filter
- Hermetic 13.3 x 6.5 mm Surface-mount Case
- Complies with Directive 2002/95/EC (RoHS)
- Moisture Sensitivity Level: 1

#### Absolute Maximum Ratings

| Rating   | Value          | Units |
|--|----------------|-------|
| Maximum Incident Power in Passband                           | +10            | dBm   |
| Maximum DC Voltage between any Two Terminals                 | 3              | VDC   |
| Storage Temperature Range in Tape and Reel                   | -40 to +85     | °C    |
| Suitable for Lead-free Soldering - Maximum Soldering Profile | 260°C for 30 s |       |

**SF2189A**

**140 MHz  
SAW Filter**



**SM13365-12**

#### Electrical Characteristics

| Characteristic                                     | Sym        | Notes | Min  | Typ  | Max  | Units              |
|--|------------|-------|------|------|------|--------------------|
| Center Frequency                                   | $F_C$      |       |      | 140  |      | MHz                |
| Minimum Insertion Loss                             | $IL_{MIN}$ |       |      | 11.3 | 13.0 | dB                 |
| 1 dB Bandwidth                                     | $BW_1$     |       | 30.0 | 33.0 |      | MHz                |
| 3 dB Bandwidth                                     | $BW_3$     |       | 32.0 | 35.0 |      | MHz                |
| 35 dB Bandwidth                                    | $BW_{35}$  |       |      | 42.4 | 44.0 | MHz                |
| Passband Amplitude Ripple, 80% of 3 dB Bandwidth   |            |       |      | 0.6  | 1.2  | dB <sub>p-p</sub>  |
| Passband Group Delay Ripple, 80% of 3 dB Bandwidth |            |       |      | 50   | 120  | ns <sub>p-p</sub>  |
| Passband Absolute Group Delay                      |            |       |      | 0.55 |      | µs                 |
| Passband Phase Linearity, 80% of 3 dB Bandwidth    |            |       |      | 5    | 14   | deg <sub>p-p</sub> |
| Specification Temperature Range                    |            |       | -20  |      | +80  | °C                 |
| Operable Temperature Range                         |            |       | -45  |      | +125 | °C                 |
| Frequency Temperature Coefficient                  |            |       |      | -94  |      | ppm/°C             |
| Source Impedance                                   |            |       |      | 50   |      | ohm                |
| Load Impedance                                     |            |       |      | 50   |      | ohm                |

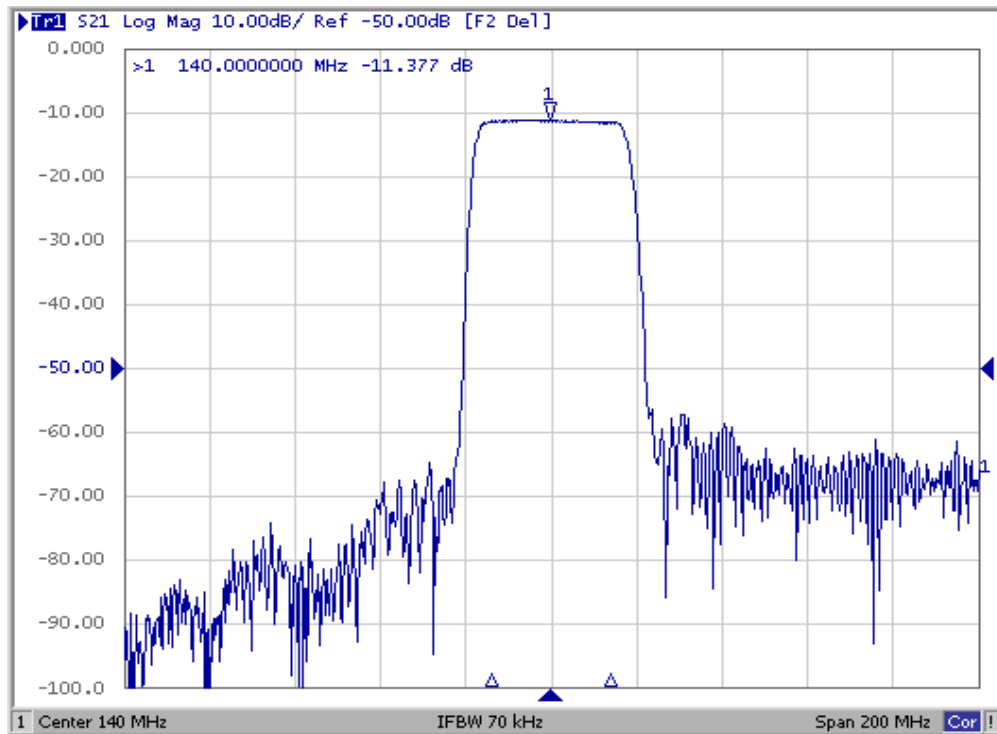
|   |  |
|---|--|
| Case Style  | SM13365-12 13.3 x 6.5 mm Nominal Footprint |
| Lid Symbolization (YY = year, WW = week, S = Shift, ## = Sequence Code) | SF2189A YYWWS##                            |

 **CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.**

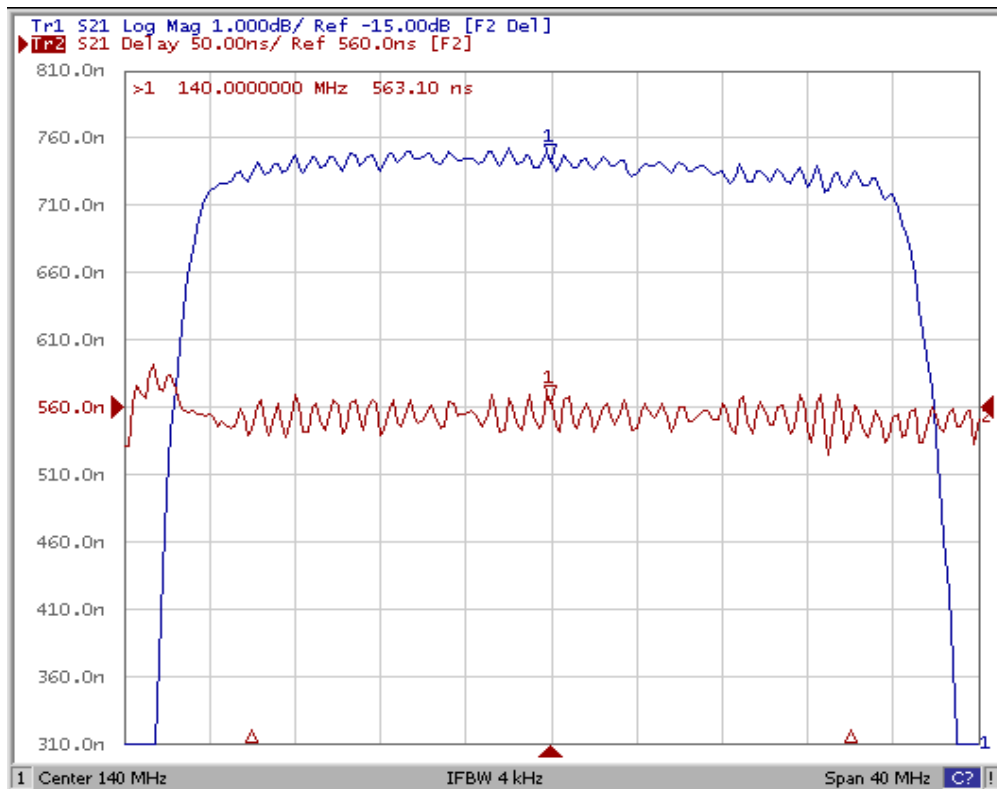
#### NOTES:

1. The design, manufacturing process, and specifications of this device are subject to change.
2. US or International patents may apply.
3. RoHS compliant from the first date of manufacture.

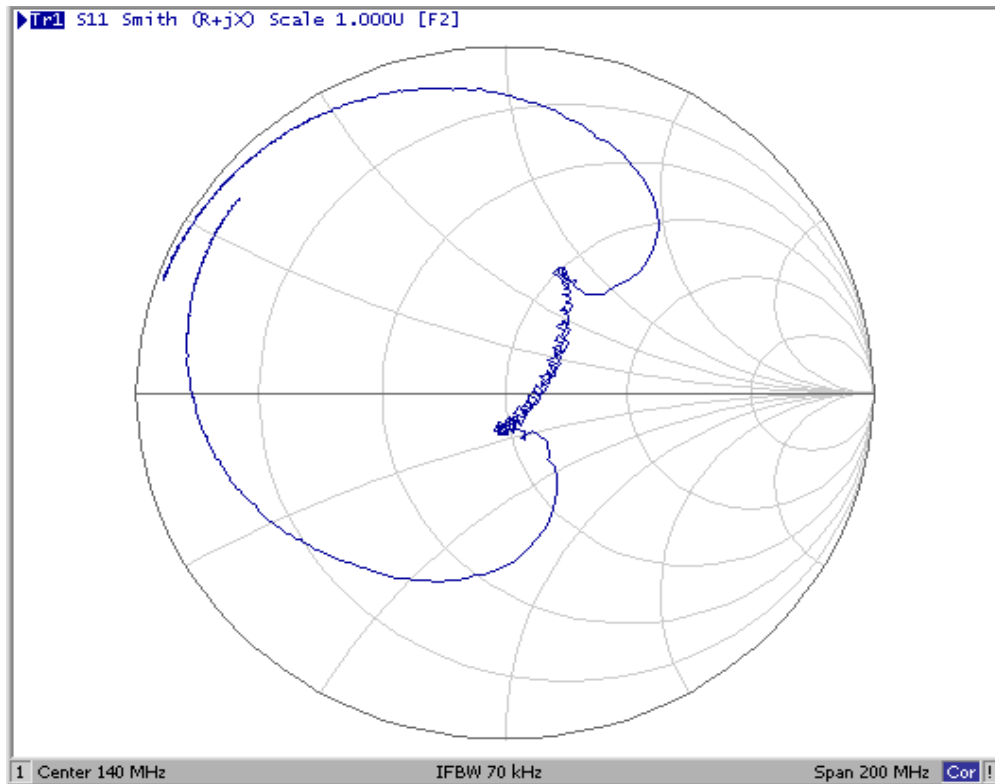
## SF2189A Filter Response



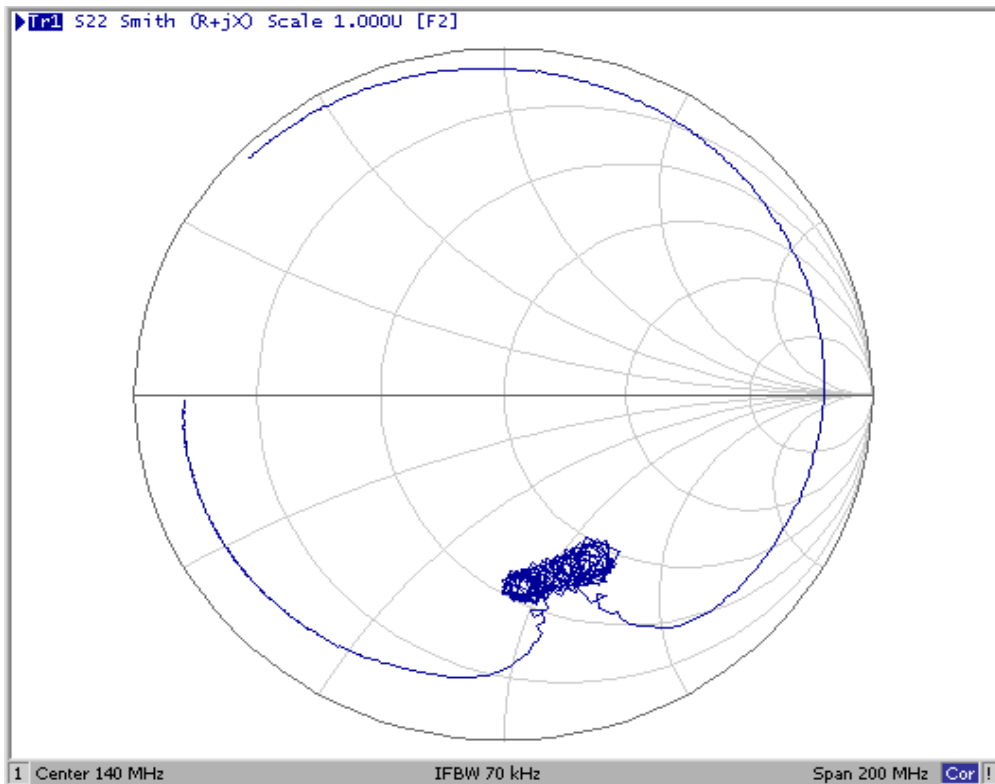
## SF2189A Passband Amplitude and Group Delay Ripple



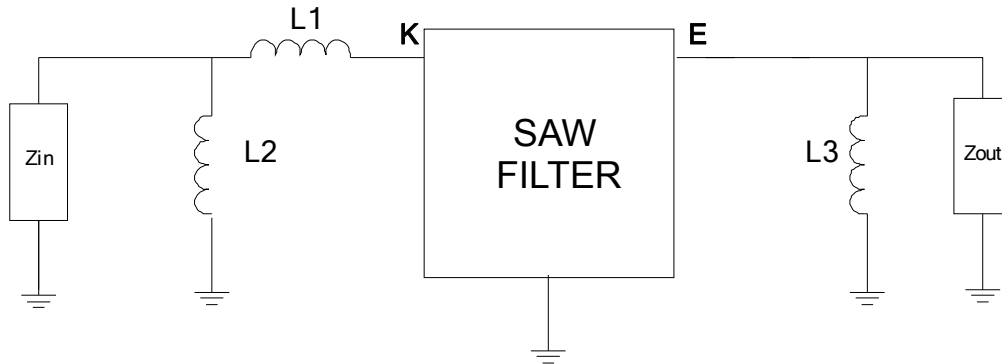
## SF2189A Input Impedance (K Port)



## SF2189A Output Impedance (E Port)

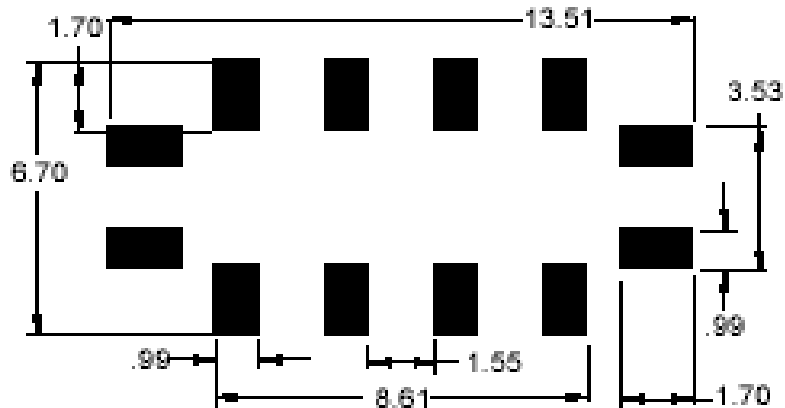


## SF2189A 50 ohm Matching Network



$$L1 = 10 \text{ nH}, L2 = 27 \text{ nH}, L3 = 68 \text{ nH}$$

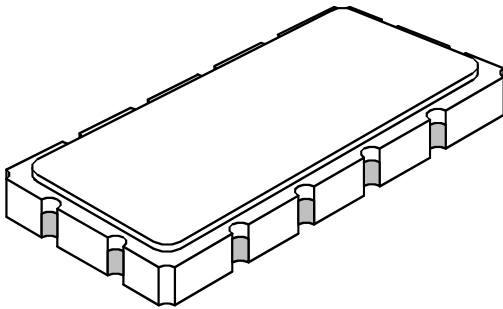
## SF2189A PCB Pad Layout



# SM13365-12 Case

## 12-Terminal Ceramic Surface-Mount Case

13.3 x 6.5 mm Nominal Footprint



### Case Dimensions

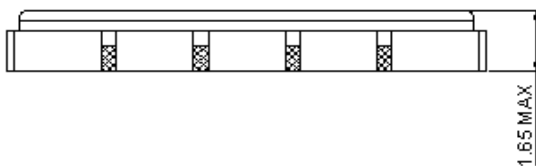
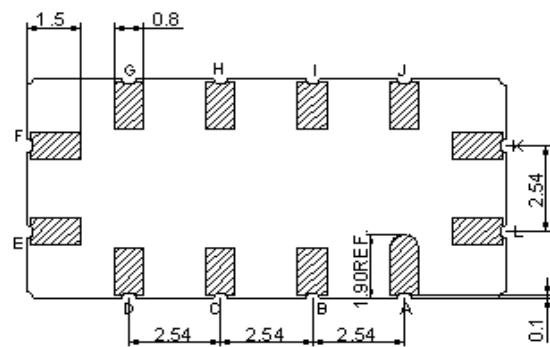
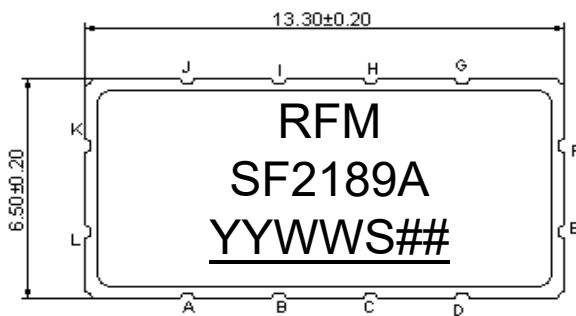
| Dimension | mm    |       |       | Inches |       |       |
|-----------|-------|-------|-------|--------|-------|-------|
|           | Min   | Nom   | Max   | Min    | Nom   | Max   |
| A         | 13.08 | 13.31 | 13.60 | 0.515  | 0.524 | 0.535 |
| B         | 6.27  | 6.50  | 6.80  | 0.247  | 0.256 | 0.268 |
| C         |       | 1.91  | 2.00  |        | 0.075 | 0.079 |
| D         |       | 1.50  |       |        | 0.059 |       |
| E         |       | 0.79  |       |        | 0.031 |       |
| H         |       | 1.0   |       |        | 0.039 |       |
| P         |       | 2.54  |       |        | 0.100 |       |

### Electrical Connections

| Connection  | Terminals  |
|-------------|------------|
| Input       | K          |
| Output      | E          |
| Case Ground | All others |

### Materials

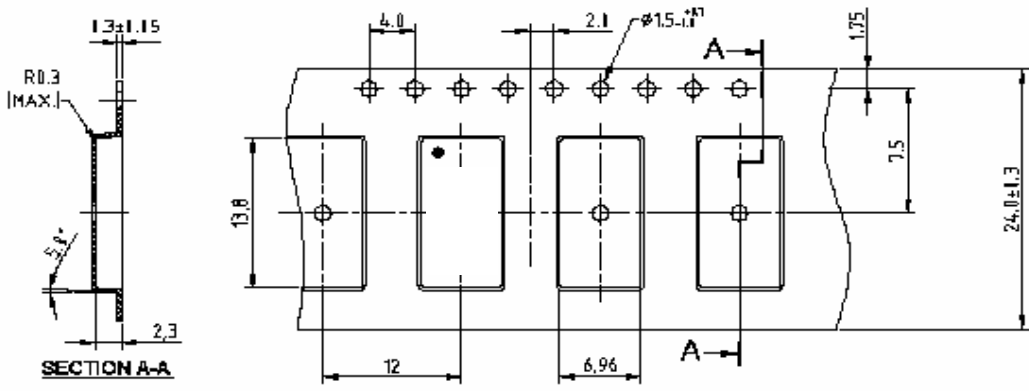
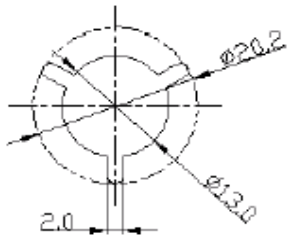
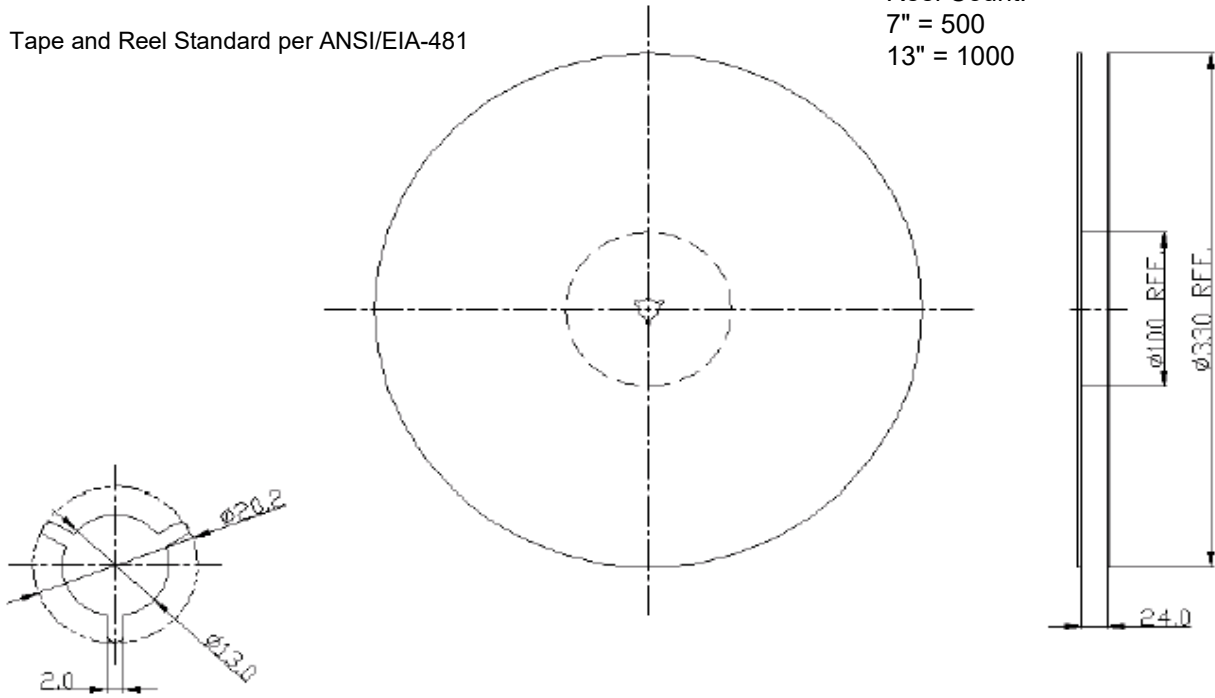
|                    |  |
|--------------------|--|
| Solder Pad Plating | 0.3 to 1.0 $\mu\text{m}$ Gold over 1.27 to 8.89 $\mu\text{m}$ Nickel |
| Lid Plating        | 2.0 to 3.0 $\mu\text{m}$ Nickel                                      |
| Body               | $\text{Al}_2\text{O}_3$ Ceramic                                      |



# Tape and Reel Specifications

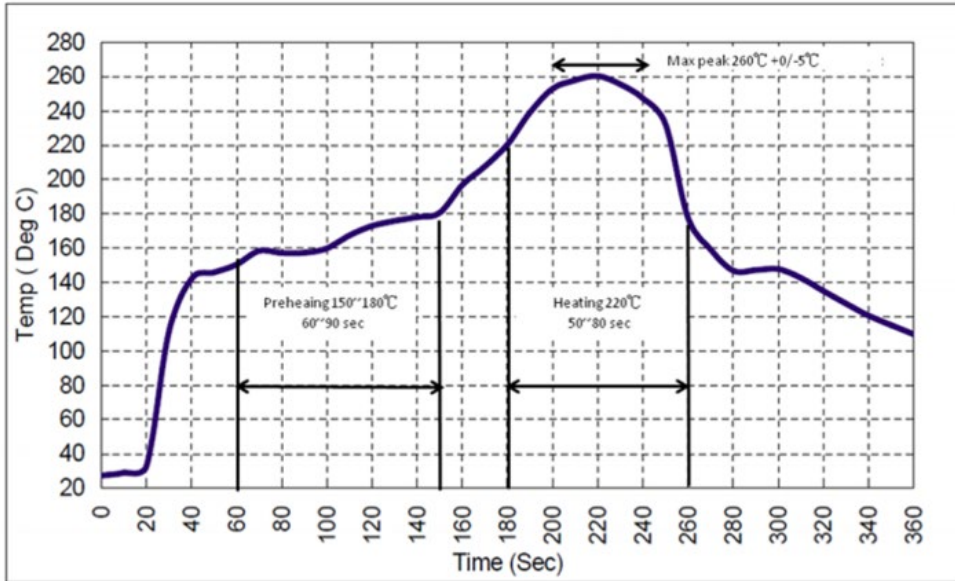
Tape and Reel Standard per ANSI/EIA-481

Reel Count:  
7" = 500  
13" = 1000





## Recommended Reflow Profile

1. Preheating shall be fixed at 150~180°C for 60~90 seconds.
2. Ascending time to preheating temperature 150°C shall be 30 seconds min.
3. Heating shall be fixed at 220°C for 50~80 seconds and at 260°C +0/-5°C peak (10 seconds).
4. Time: 5 times maximum.



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