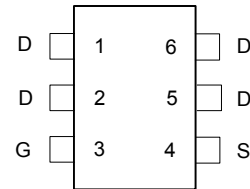


## P-Channel Enhancement Mode MOSFET

### Features

- 30V/-3A ,  $R_{DS(ON)} = 100m\Omega(\text{typ.}) @ V_{GS} = -10V$   
 $R_{DS(ON)} = 140m\Omega(\text{typ.}) @ V_{GS} = -4.5V$
- Super High Dense Cell Design for Extremely Low  $R_{DS(ON)}$
- Reliable and Rugged
- SOT-23-6 Package

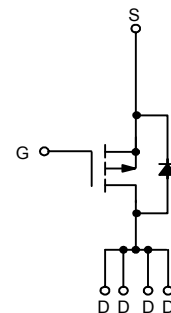
### Pin Description



Top View of SOT-23-6

### Applications

- Power Management in Notebook Computer , Portable Equipment and Battery Powered Systems.



P-Channel MOSFET

### Ordering and Marking Information

|   |   |
|---|---|
| <p>APM2607 <span style="border: 1px solid black; padding: 2px;">□□-□□</span></p> <div style="margin-left: 20px;"> <p>└─── Handling Code</p> <p>└─── Temp. Range</p> <p>└─── Package Code</p> </div> | <p>Package Code<br/>C : SOT-23-6</p> <p>Operation Junction Temp. Range<br/>C : -55 to 150°C</p> <p>Handling Code<br/>TR : Tape &amp; Reel</p> |
| <p>APM2607 C : <span style="border: 1px solid black; padding: 2px 5px;">M07X</span></p>   | <p>X - Date Code</p>  |

### Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Symbol    | Parameter                          | Rating   | Unit |
|-----------|------------------------------------|----------|------|
| $V_{DSS}$ | Drain-Source Voltage               | -30      | V    |
| $V_{GSS}$ | Gate-Source Voltage                | $\pm 20$ |      |
| $I_D^*$   | Maximum Drain Current – Continuous | -3       | A    |
| $I_{DM}$  | Maximum Drain Current – Pulsed     | -12      |      |

\* Surface Mounted on FR4 Board,  $t \leq 10$  sec.

ANPEC reserves the right to make changes to improve reliability or manufacturability without notice, and advise customers to obtain the latest version of relevant information to verify before placing orders.

## Absolute Maximum Ratings (Cont.) (T<sub>A</sub> = 25°C unless otherwise noted)

| Symbol           | Parameter                                | Rating                | Unit |
|------------------|--|-----------------------|------|
| P <sub>D</sub>   | Maximum Power Dissipation                | T <sub>A</sub> =25°C  | 1.25 |
|                  |  | T <sub>A</sub> =100°C | 0.5  |
| T <sub>J</sub>   | Maximum Junction Temperature             | 150                   | °C   |
| T <sub>STG</sub> | Storage Temperature Range                | -55 to 150            | °C   |
| R <sub>θJA</sub> | Thermal Resistance – Junction to Ambient | 100                   | °C/W |

## Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

| Symbol                           | Parameter                        | Test Condition   | APM2607 |      |      | Unit |
|----------------------------------|----------------------------------|--|---------|------|------|------|
|                                  |                                  |  | Min.    | Typ. | Max. |      |
| <b>Static</b>                    |                                  |  |         |      |      |      |
| BV <sub>DSS</sub>                | Drain-Source Breakdown Voltage   | V <sub>GS</sub> =0V, I <sub>DS</sub> =-250μA               | -30     |      |      | V    |
| I <sub>DSS</sub>                 | Zero Gate Voltage Drain Current  | V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V                 |         |      | -1   | μA   |
| V <sub>GS(th)</sub>              | Gate Threshold Voltage           | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =-250μA | -1      | -1.5 | -2   | V    |
| I <sub>GSS</sub>                 | Gate Leakage Current             | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                 |         |      | ±100 | nA   |
| R <sub>DS(ON)</sub> <sup>a</sup> | Drain-Source On-state Resistance | V <sub>GS</sub> =-10V, I <sub>DS</sub> =-3A                |         | 100  | 120  | mΩ   |
|                                  |                                  | V <sub>GS</sub> =-4.5V, I <sub>DS</sub> =-2.5A             |         | 140  | 170  |      |
| V <sub>SD</sub> <sup>a</sup>     | Diode Forward Voltage            | I <sub>SD</sub> =-1.25A, V <sub>GS</sub> =0V               |         | -0.7 | -1.3 | V    |
| <b>Dynamic<sup>b</sup></b>       |                                  |  |         |      |      |      |
| Q <sub>g</sub>                   | Total Gate Charge                | V <sub>DS</sub> =-15V, I <sub>DS</sub> =-3A                |         | 8    | 13   | nC   |
| Q <sub>gs</sub>                  | Gate-Source Charge               | V <sub>GS</sub> =-10V                                      |         | 1.9  |      |      |
| Q <sub>gd</sub>                  | Gate-Drain Charge                |  |         | 1.1  |      |      |
| t <sub>d(ON)</sub>               | Turn-on Delay Time               | V <sub>DD</sub> =-15V, I <sub>DS</sub> =-1A,               |         | 10   | 20   | ns   |
| T <sub>r</sub>                   | Turn-on Rise Time                | V <sub>GEN</sub> =-10V, R <sub>G</sub> =6Ω                 |         | 8    | 20   |      |
| t <sub>d(OFF)</sub>              | Turn-off Delay Time              | R <sub>L</sub> =15Ω  |         | 25   | 50   |      |
| T <sub>f</sub>                   | Turn-off Fall Time               |  |         | 5    | 15   |      |
| C <sub>iSS</sub>                 | Input Capacitance                | V <sub>GS</sub> =0V  |         | 550  |      | pF   |
| C <sub>oSS</sub>                 | Output Capacitance               | V <sub>DS</sub> =-25V                                      |         | 120  |      |      |
| C <sub>rSS</sub>                 | Reverse Transfer Capacitance     | Frequency=1.0MHz   |         | 75   |      |      |

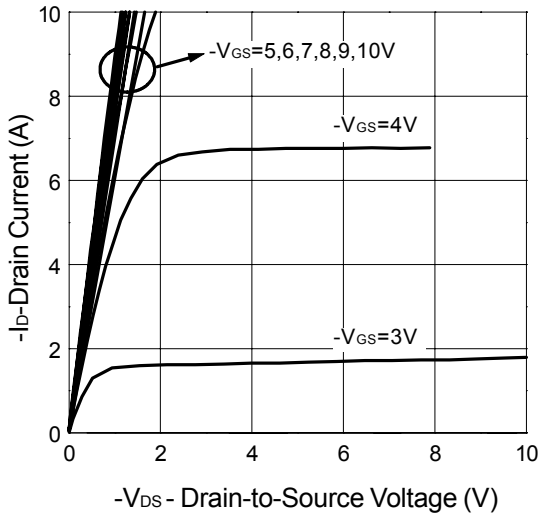
### Notes

<sup>a</sup> : Pulse test ; pulse width ≤300μs, duty cycle ≤ 2%

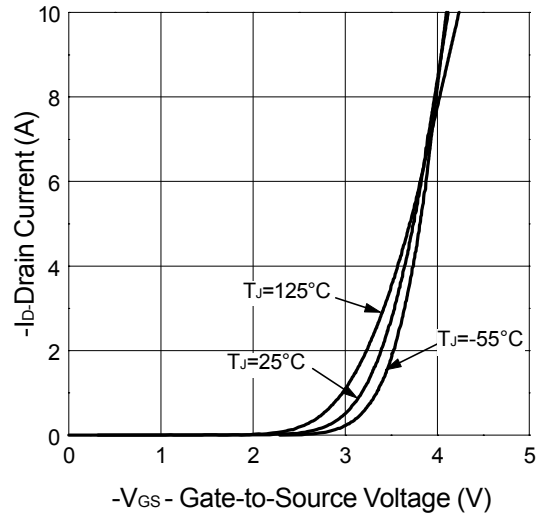
<sup>b</sup> : Guaranteed by design, not subject to production testing

## Typical Characteristics

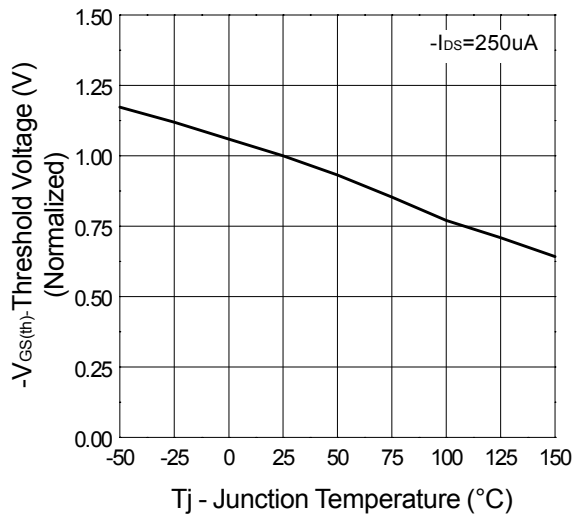
Output Characteristics



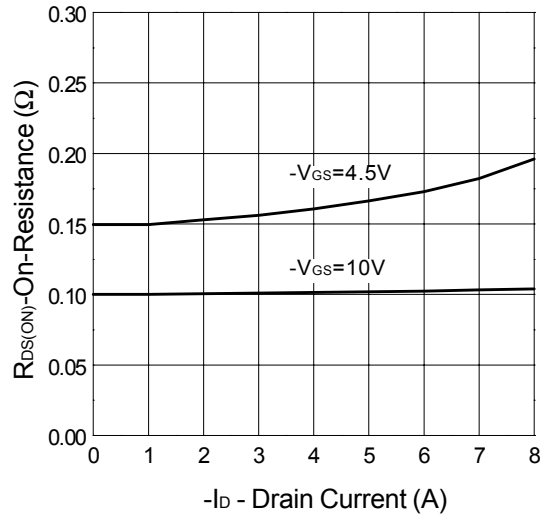
Transfer Characteristics



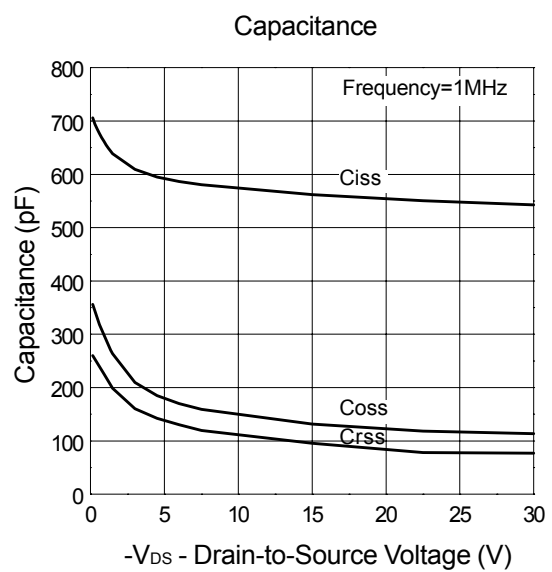
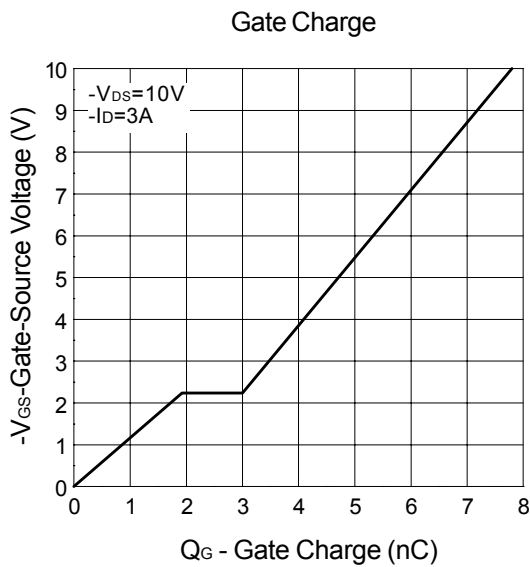
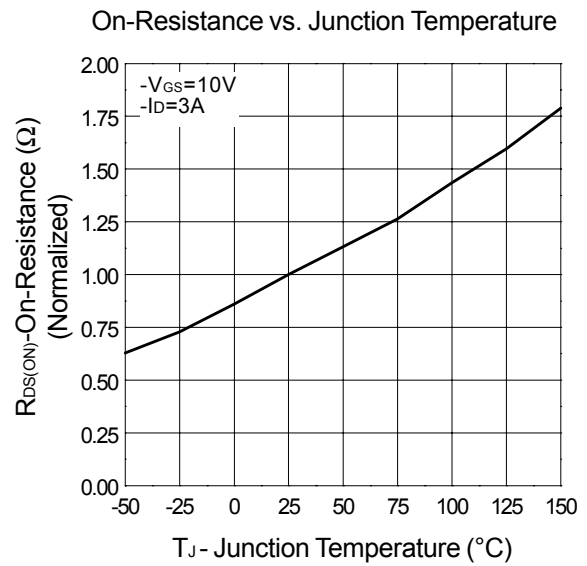
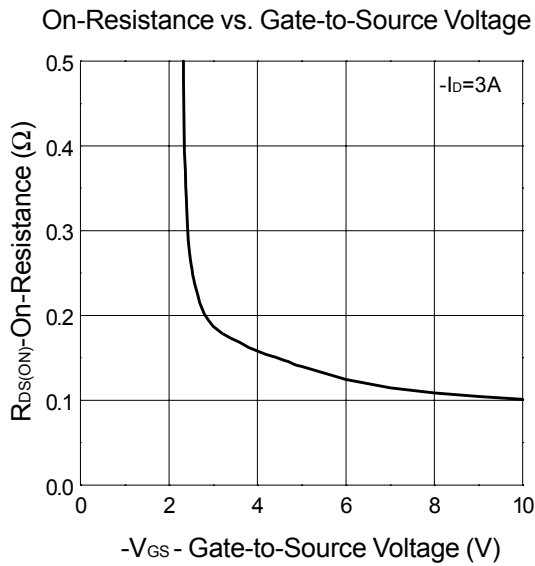
Threshold Voltage vs. Junction Temperature



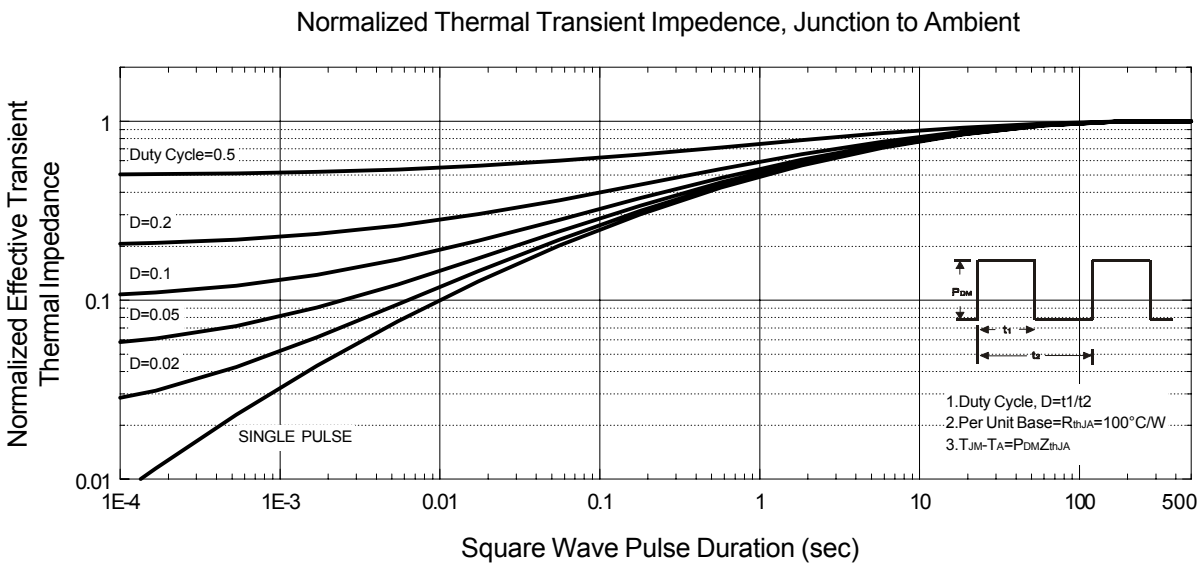
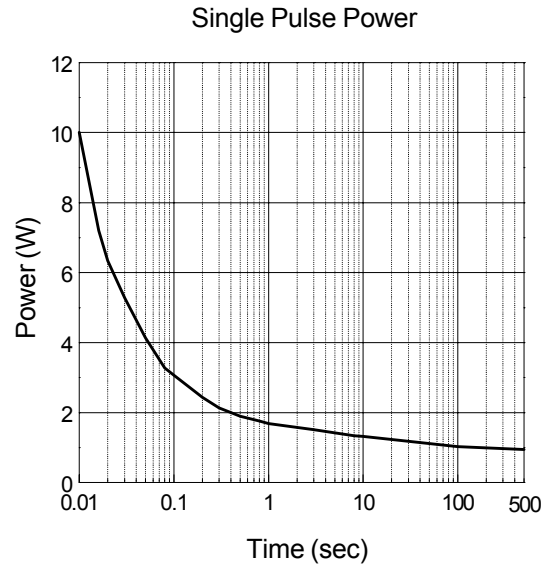
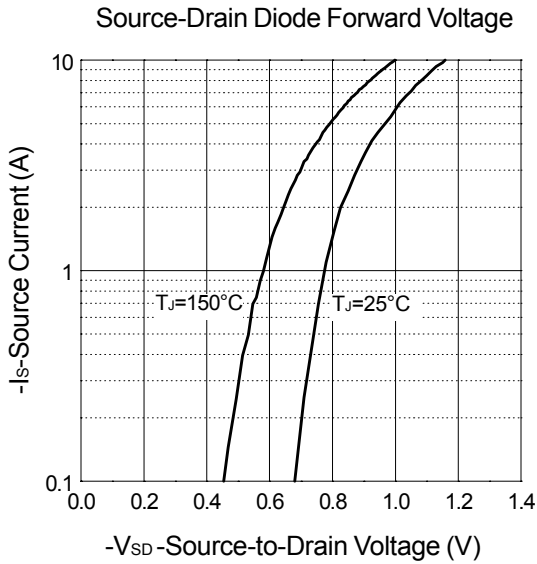
On-Resistance vs. Drain Current



Typical Characteristics (Cont.)

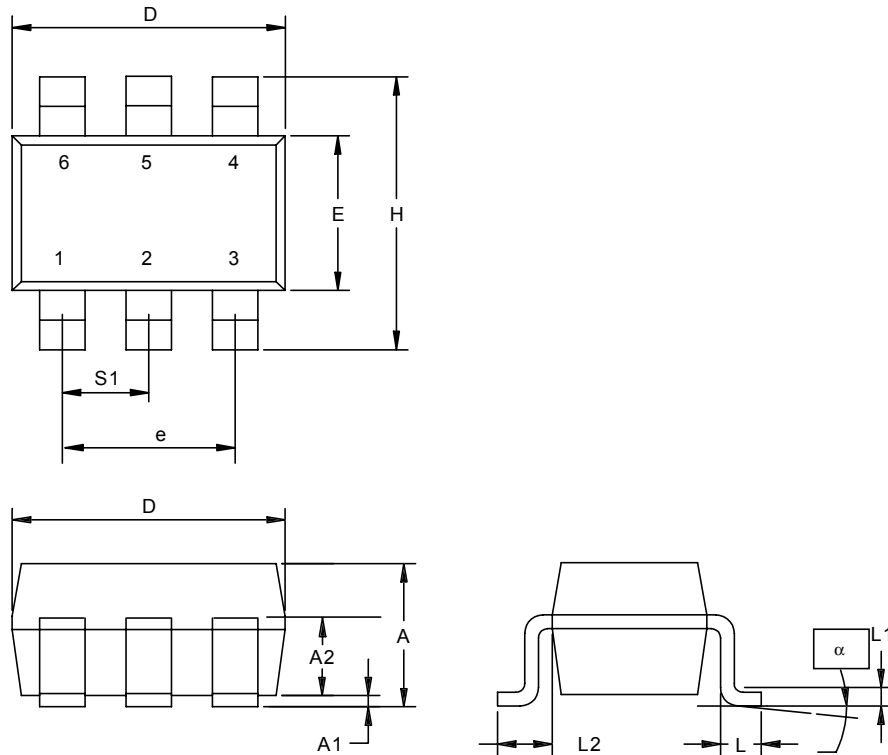


Typical Characteristics (Cont.)



Packaging Information

SOT-23-6



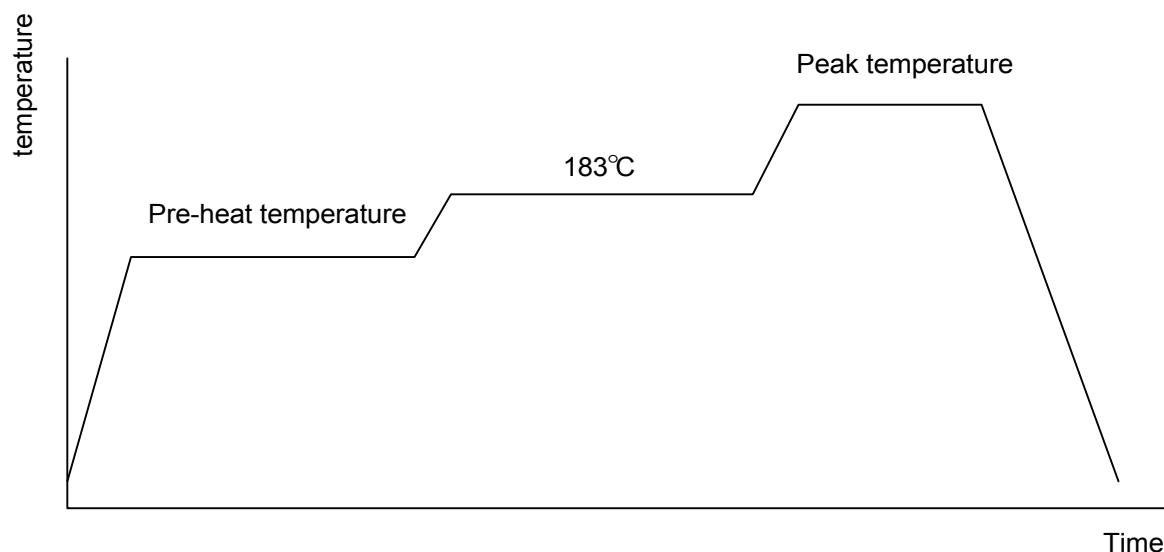
| Dim      | Millimeters |      | Inches      |        |
|----------|-------------|------|-------------|--------|
|          | Min.        | Max. | Min.        | Max.   |
| A        | 1.00        | 1.45 | 0.0394      | 0.0571 |
| A1       | 0.00        | 0.15 | 0.0000      | 0.0591 |
| A2       | 0.70        | 1.25 | 0.0276      | 0.0492 |
| b        | 0.35        | 0.55 | 0.0138      | 0.0217 |
| D        | 2.70        | 3.10 | 0.1063      | 0.1220 |
| E        | 1.40        | 1.80 | 0.50551     | 0.0709 |
| e        | 1.90 BSC    |      | 0.07480 BSC |        |
| H        | 2.60        | 3.00 | 0.1024      | 0.1181 |
| L        | 0.30        | -    | 0.00118     | -      |
| L1       | 0.08        | 0.25 | 0.0031      | 0.0098 |
| L2       | 0.60 REF    |      | 0.024 REF   |        |
| $\alpha$ | 0°          | 10°  | 0°          | 10°    |
| S1       | 0.85        | 1.05 | 0.0335      | 0.0413 |

## Physical Specifications

|                    |  |
|--------------------|--|
| Terminal Material  | Solder-Plated Copper (Solder Material : 90/10 or 63/37 SnPb) |
| Lead Solderability | Meets EIA Specification RSI86-91, ANSI/J-STD-002 Category 3. |

### Reflow Condition (IR/Convection or VPR Reflow)

Reference JEDEC Standard J-STD-020A APRIL 1999



### Classification Reflow Profiles

|  | Convection or IR/ Convection | VPR                       |
|--|------------------------------|---------------------------|
| Average ramp-up rate(183°C to Peak)        | 3°C/second max.              | 10 °C /second max.        |
| Preheat temperature 125 ± 25°C)            | 120 seconds max.             |                           |
| Temperature maintained above 183°C         | 60 ~ 150 seconds             |                           |
| Time within 5°C of actual peak temperature | 10 ~ 20 seconds              | 60 seconds                |
| Peak temperature range                     | 220 +5/-0°C or 235 +5/-0°C   | 215~ 219°C or 235 +5/-0°C |
| Ramp-down rate                             | 6 °C /second max.            | 10 °C /second max.        |
| Time 25°C to peak temperature              | 6 minutes max.               |                           |

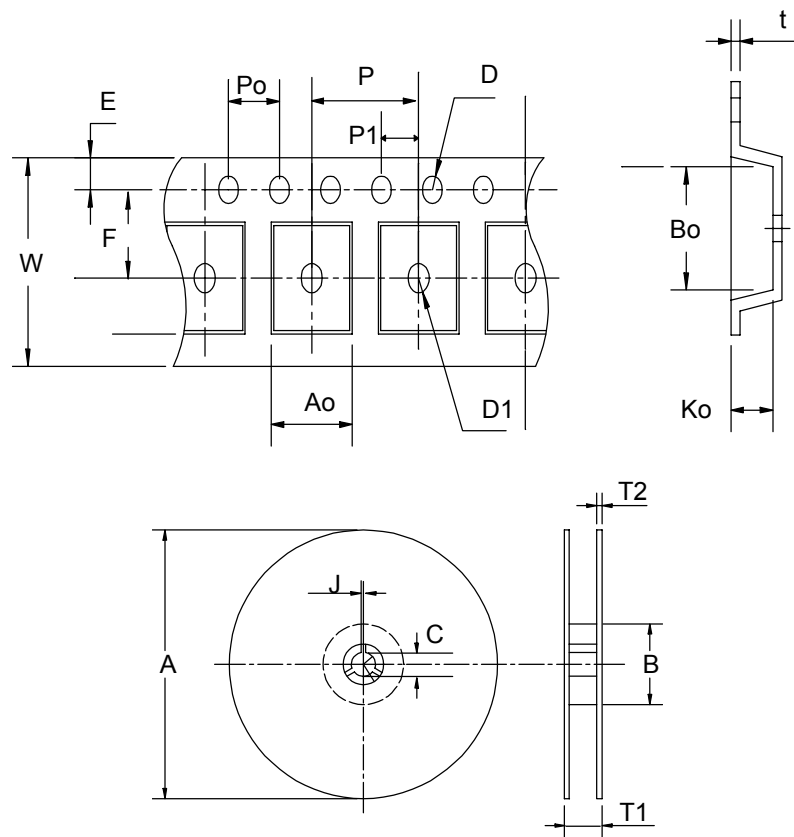
### Package Reflow Conditions

| pkg. thickness ≥ 2.5mm and all bags | pkg. thickness < 2.5mm and pkg. volume ≥ 350 mm <sup>3</sup> | pkg. thickness < 2.5mm and pkg. volume < 350mm <sup>3</sup> |
|-------------------------------------|--|---|
| Convection 220 +5/-0 °C             |  | Convection 235 +5/-0 °C                                     |
| VPR 215-219 °C                      |  | VPR 235 +5/-0 °C  |
| IR/Convection 220 +5/-0 °C          |  | IR/Convection 235 +5/-0 °C                                  |

## Reliability test program

| Test item     | Method              | Description               |
|---------------|---------------------|---------------------------|
| SOLDERABILITY | MIL-STD-883D-2003   | 245°C, 5 SEC              |
| HOLT          | MIL-STD 883D-1005.7 | 1000 Hrs Bias @ 125°C     |
| PCT           | JESD-22-B, A102     | 168 Hrs, 100% RH, 121°C   |
| TST           | MIL-STD 883D-1011.9 | -65°C ~ 150°C, 200 Cycles |

## Carrier Tape & Reel Dimensions



| Application | A          | B        | C          | J          | T1        | T2         | W                | P        | E         |
|-------------|------------|----------|------------|------------|-----------|------------|------------------|----------|-----------|
| SOT-23-6    | 178±1      | 72 ± 1.0 | 13.0 + 0.2 | 2.5 ± 0.15 | 8.4 ± 2   | 1.5± 0.3   | 8.0+ 0.3<br>-0.3 | 4 ± 0.1  | 1.75± 0.1 |
|             | F          | D        | D1         | Po         | P1        | Ao         | Bo               | Ko       | t         |
|             | 3.5 ± 0.05 | 1.5 +0.1 | 1.5 +0.1   | 4.0 ± 0.1  | 2.0 ± 0.1 | 3.15 ± 0.1 | 3.2± 0.1         | 1.4± 0.1 | 0.2±0.03  |



## Cover Tape Dimensions

| Application | Carrier Width | Cover Tape Width | Devices Per Reel |
|-------------|---------------|------------------|------------------|
| SOT-23-6    | 8             | 5.3              | 3000             |

## Customer Service

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