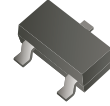


## A2N7002HT-HF

**N-Channel  
RoHS Device  
Halogen Free**



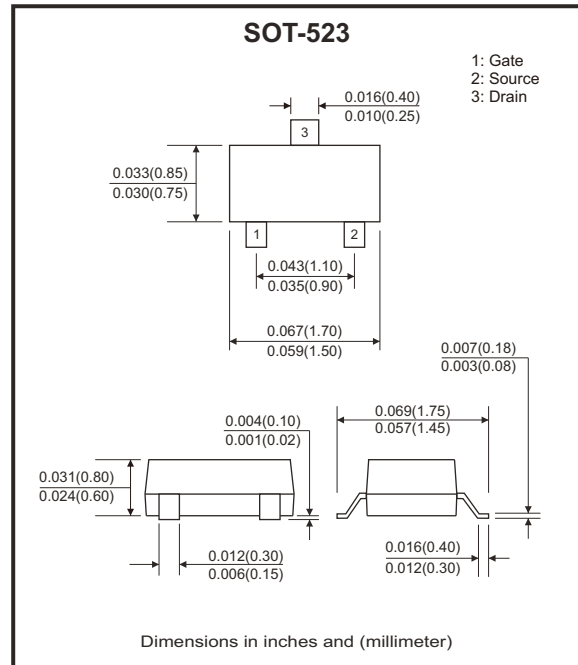
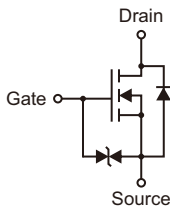
### Features

- Low on-resistance.
- ESD protected gate up to 2KV HBM.
- High-speed switching.
- Drive circuits can be simple.
- Parallel use is easy.
- AEC-Q101 Qualified.

### Mechanical data

- Case: SOT-523, molded plastic.
- Molding compound, UL flammability classification rating 94V-0.
- Terminals: Matte tin plated leads, solderable per MIL-STD-202, method 208.

### Circuit Diagram



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

| Parameter   | Symbol          | Value       | Unit               |
|---|-----------------|-------------|--------------------|
| Drain-source voltage                                | $V_{DSS}$       | 60          | V                  |
| Gate-source voltage                                 | $V_{GSS}$       | $\pm 20$    | V                  |
| Continuous drain current                            | $I_D$           | 300         | mA                 |
| Pulsed drain current (Note 4) $t_p = 10\mu\text{s}$ | $I_{DM}$        | 2000        | mA                 |
| Power dissipation                                   | $P_D$           | 0.15        | W                  |
| Thermal resistance junction to ambient air          | $R_{\theta JA}$ | 833         | $^\circ\text{C/W}$ |
| Thermal resistance junction to lead                 | $R_{\theta JL}$ | 521         | $^\circ\text{C/W}$ |
| Thermal resistance junction to case                 | $R_{\theta JC}$ | 434         | $^\circ\text{C/W}$ |
| Operating junction temperature range                | $T_J$           | -55 to +150 | $^\circ\text{C}$   |
| Storage temperature range                           | $T_{STG}$       | -55 to +150 | $^\circ\text{C}$   |

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**Electrical Characteristics** (at  $T_A=25^{\circ}\text{C}$  unless otherwise noted)

| Parameter                                 | Symbol       | Conditions  | Min | Typ         | Max      | Unit     |
|---|--------------|---|-----|-------------|----------|----------|
| <b>Off Characteristics</b>                |              |   |     |             |          |          |
| Drain-source breakdown voltage            | $V_{DSS}$    | $V_{GS} = 0V, I_D = 250\mu A$   | 60  |             |          | V        |
| Drain-source leakage current              | $I_{DSS}$    | $V_{DS} = 60V, V_{GS} = 0V$   |     |             | 1        | $\mu A$  |
| Gate-body leakage                         | $I_{GSS}$    | $V_{GS} = \pm 20V, V_{DS} = 0V$   |     |             | $\pm 10$ | $\mu A$  |
| <b>On Characteristics (Note 2)</b>        |              |   |     |             |          |          |
| Static drain-source on resistance         | $R_{DS(ON)}$ | $V_{GS} = 5V, I_D = 0.05A$<br>$V_{GS} = 10V, I_D = 0.5A$                            |     | 1.5<br>1.45 | 3<br>2.5 | $\Omega$ |
| Gate threshold voltage                    | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$   | 1   | 1.5         | 2.5      | V        |
| <b>Dynamic Characteristics (Note 3)</b>   |              |   |     |             |          |          |
| Input capacitance                         | $C_{iss}$    | $V_{GS} = 0V, V_{DS} = 20V, f = 1MHz$   |     | 41          |          | pF       |
| Output capacitance                        | $C_{oss}$    |   |     | 15          |          |          |
| Reverse transfer capacitance              | $C_{rss}$    |   |     | 4           |          |          |
| <b>Switching Characteristics (Note 3)</b> |              |   |     |             |          |          |
| Turn-on delay time                        | $t_{d(on)}$  | $V_{DD} = 30V, I_D = 0.2A,$<br>$V_{GS} = 10V, R_G = 25\Omega,$<br>$R_L = 150\Omega$ |     | 6           |          | nS       |
| Turn-on rise time                         | $t_r$        |   |     | 5           |          |          |
| Turn-off delay time                       | $t_{d(off)}$ |   |     | 25          |          |          |
| Turn-off fall time                        | $t_f$        |   |     | 15          |          |          |
| <b>Drain-Source Diode Characteristics</b> |              |   |     |             |          |          |
| Diode forward voltage (Note 1)            | $V_{SD}$     | $I_S = 0.3A, V_{GS} = 0V$   |     | 0.85        | 1.2      | V        |
| Diode continuous forward current          | $I_S$        | $T_C = 25^{\circ}\text{C}$  |     |             | 0.3      | A        |

Notes: 1. Surface mounted on FR4 board,  $t \leq 10$  sec.

2. Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

3. Guaranteed by design, not subject to production.

4. Pulse width limited by maximum junction temperature.

## Rating and Characteristic Curves (A2N7002HT-HF)

Fig.1 - On-Region Characteristics

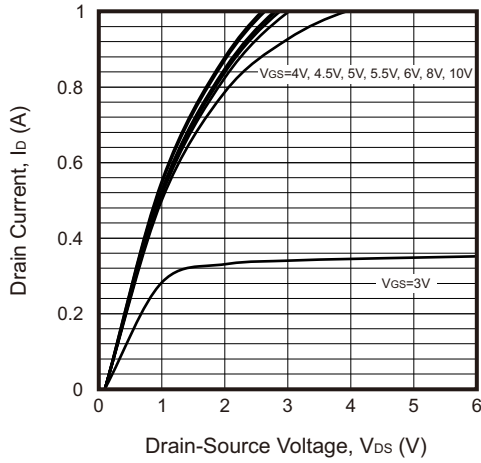


Fig.2 - On-Resistance vs. Drain Current and Gate Voltage

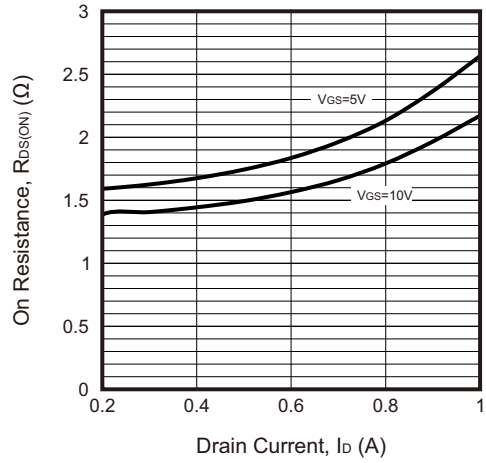


Fig.3 - On-Resistance vs. Gate-Source Voltage

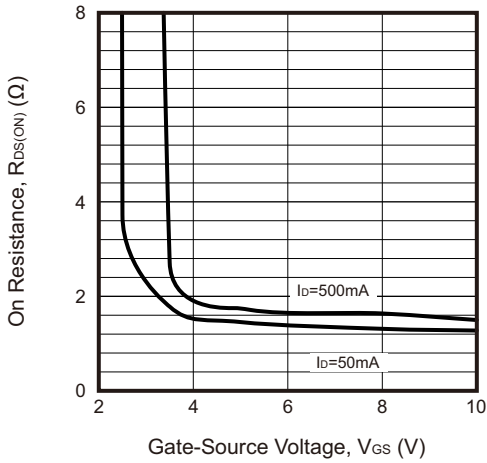


Fig.4 - Gate Voltage vs. Junction Temperature

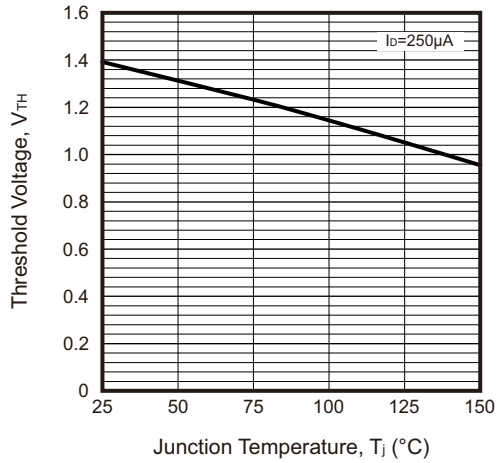


Fig.5 - On Resistance vs. Junction Temperature

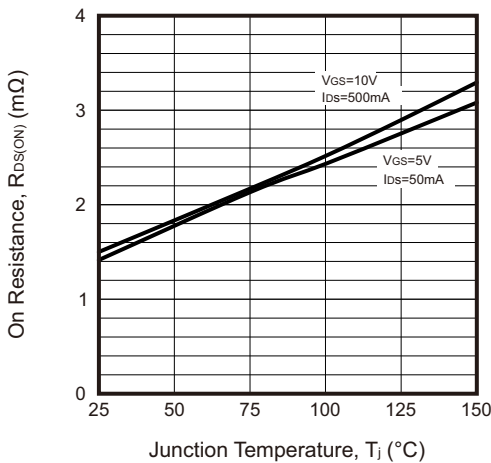
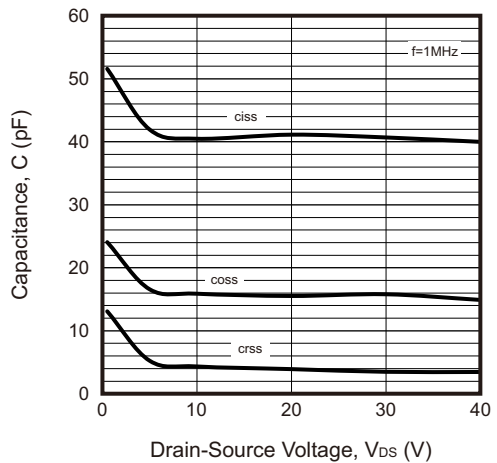
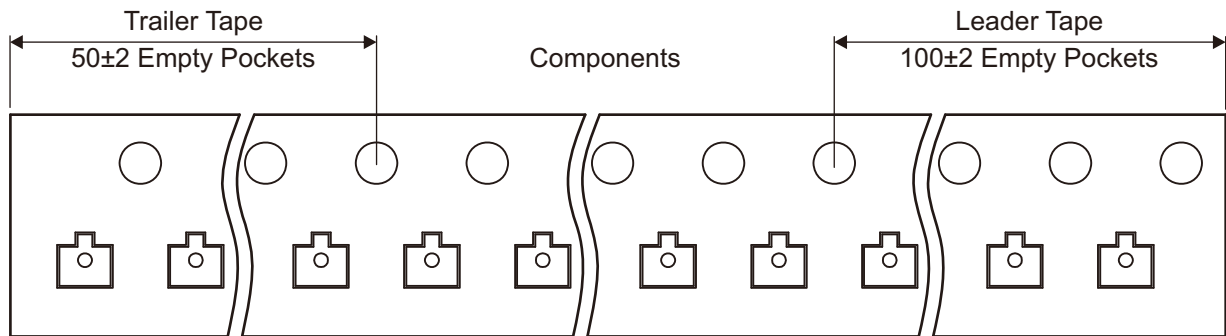
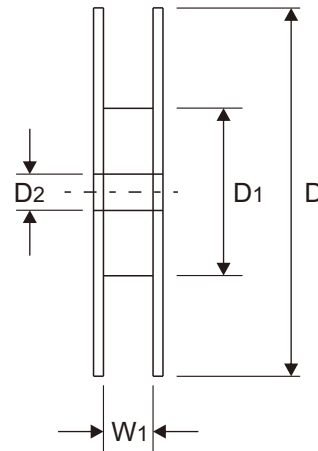
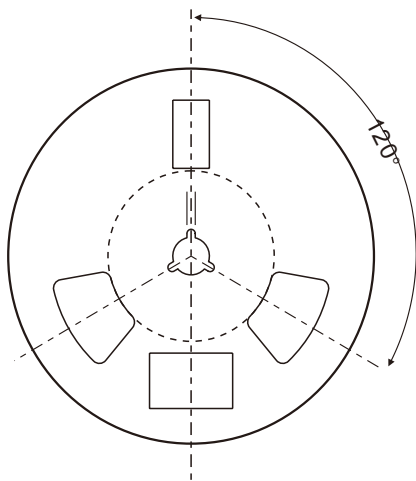
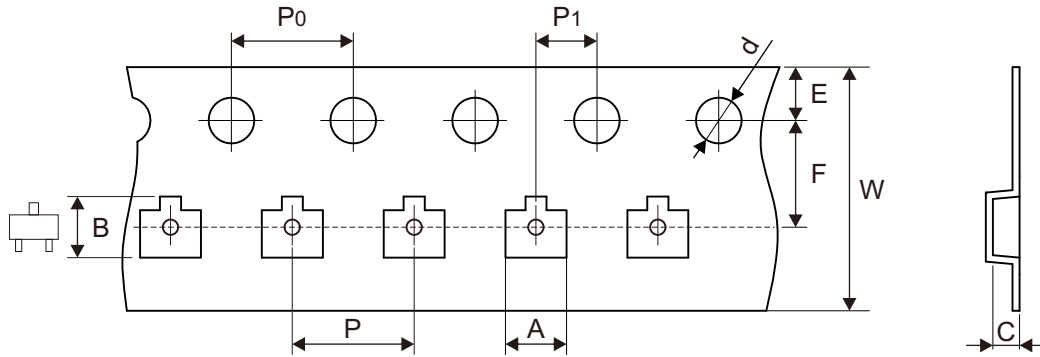


Fig.6 - Capacitance Characteristics



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## Reel Taping Specification



| SOT-523 | SYMBOL | A             | B             | C             | d             | D             | D1            | D2            |
|---------|--------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|         | (mm)   | 1.85 ± 0.05   | 1.85 ± 0.05   | 0.875 ± 0.05  | 1.50 ± 0.10   | 178.00 ± 1.00 | 54.00 ± 0.50  | 13.00 ± 0.50  |
|         | (inch) | 0.073 ± 0.002 | 0.073 ± 0.002 | 0.034 ± 0.002 | 0.059 ± 0.004 | 7.008 ± 0.039 | 2.126 ± 0.020 | 0.512 ± 0.020 |

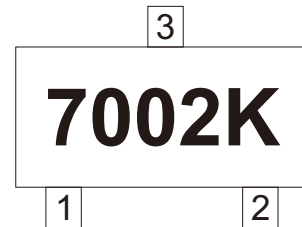
| SOT-523 | SYMBOL | E             | F             | P             | P0            | P1            | W                        | W1            |
|---------|--------|---------------|---------------|---------------|---------------|---------------|--------------------------|---------------|
|         | (mm)   | 1.75 ± 0.10   | 3.50 ± 0.05   | 4.00 ± 0.10   | 4.00 ± 0.10   | 2.00 ± 0.05   | 8.00 + 0.20<br>- 0.10    | 9.50 ± 1.00   |
|         | (inch) | 0.069 ± 0.004 | 0.138 ± 0.002 | 0.157 ± 0.004 | 0.157 ± 0.004 | 0.079 ± 0.002 | 0.315 + 0.008<br>- 0.004 | 0.374 ± 0.039 |

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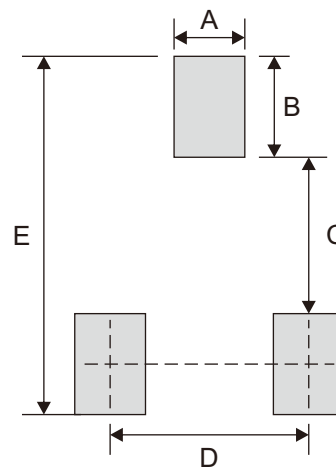
## Marking Code

| Part Number  | Marking Code |
|--------------|--------------|
| A2N7002HT-HF | 7002K        |



## Suggested PAD Layout

| SIZE | SOT-523 |        |
|------|---------|--------|
|      | (mm)    | (inch) |
| A    | 0.356   | 0.014  |
| B    | 0.508   | 0.020  |
| C    | 0.787   | 0.031  |
| D    | 1.00    | 0.039  |
| E    | 1.803   | 0.071  |



Note: 1. The pad layout is for reference purposes only.

## Standard Packaging

| Case Type | REEL PACK  |                  |
|-----------|------------|------------------|
|           | REEL (pcs) | Reel Size (inch) |
| SOT-523   | 3,000      | 7                |