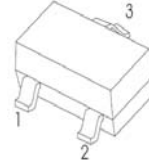


**N-Channel 30-V (D-S) MOSFET**

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$          | $I_D$ |
|---------------|--------------------------|-------|
| 30V           | 2.5Ω @ $V_{GS(th)}$ 1.2V | 100mA |
|               | 2.0Ω @ $V_{GS(th)}$ 1.5V | 200mA |
|               | 2Ω @ $V_{GS(th)}$ 1.8V   | 200mA |
|               | 1.6Ω @ $V_{GS(th)}$ 2.5V | 200mA |
|               | 1.2Ω @ $V_{GS(th)}$ 4.5V | 500mA |

**SOT-23**

1. GATE
2. SOURCE
3. DRAIN


**FEATURE**

- Low on-resistance
- Fast switching speed
- Low voltage drive makes this device ideal for Portable equipment
- Easily designed drive circuits
- Easy to parallel

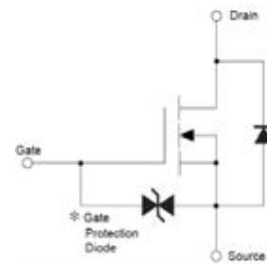
**APPLICATION**

- Interfacing , Switching

**MARKING**

3N2K.

Marking: 3N2K.

**Equivalent Circuit**

**MOSFET MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$  unless otherwise noted)**

| Symbol          | Parameter                                        | Value    | Unit  |
|-----------------|--------------------------------------------------|----------|-------|
| $V_{DS}$        | Drain-Source Voltage                             | 30       | V     |
| $V_{GS}$        | Gate-Source Voltage                              | ±12      | V     |
| $I_D$           | Continuous Drain Current                         | 0.3      | A     |
| $P_D$           | Power Dissipation                                | 0.35     | W     |
| $T_J, T_{stg}$  | Operation Junction and Storage Temperature Range | -55~+150 | °C    |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient          | 357      | °C /W |

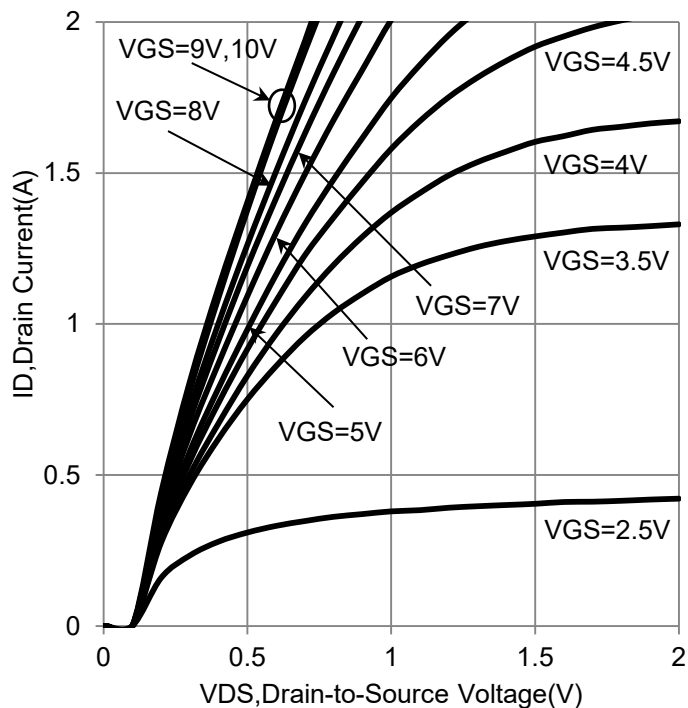
**N-Channel 30-V (D-S) MOSFET**

**T<sub>a</sub>=25 °C unless otherwise specified**

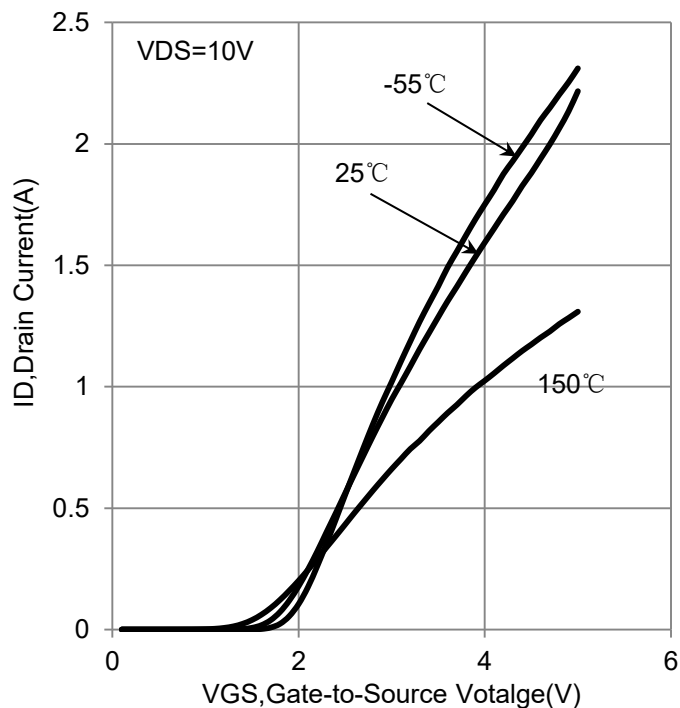
| Parameter                       | Symbol              | Test Condition                                                                                                | Min | Typ  | Max | Units |
|---------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------|-----|------|-----|-------|
| Off Characteristics             |                     |                                                                                                               |     |      |     |       |
| Drain-Source Breakdown Voltage  | V <sub>DS</sub>     | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA                                                                  | 30  |      |     | V     |
| Zero Gate Voltage Drain Current | I <sub>DSS</sub>    | V <sub>DS</sub> =28V, V <sub>GS</sub> = 0V                                                                    |     |      | 1   | μA    |
| Gate –Source leakage current    | I <sub>GSS</sub>    | V <sub>GS</sub> =±8V, V <sub>DS</sub> = 0V                                                                    |     |      | ±10 | μA    |
| Gate Threshold Voltage          | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA                                                     | 0.6 |      | 1.0 | V     |
| Drain-Source On-Resistance      | R <sub>DS(on)</sub> | V <sub>GS</sub> = 1.2V, I <sub>D</sub> =100mA                                                                 |     | -    | 3   | Ω     |
|                                 |                     | V <sub>GS</sub> =1.5V,I <sub>D</sub> =200mA                                                                   |     | -    | 2   | Ω     |
|                                 |                     | V <sub>GS</sub> =1.8V,I <sub>D</sub> =200mA                                                                   |     | 1.1  | 2   | Ω     |
|                                 |                     | V <sub>GS</sub> =2.5V,I <sub>D</sub> =200mA                                                                   |     | 0.85 | 1.6 | Ω     |
|                                 |                     | V <sub>GS</sub> =4.5V,I <sub>D</sub> =500mA                                                                   |     | 0.75 | 1.2 | Ω     |
| Forward Transconductance        | g <sub>FS</sub>     | V <sub>DS</sub> =3V, I <sub>D</sub> = 10mA                                                                    |     | 0.33 |     | mS    |
| Dynamic Characteristics*        |                     |                                                                                                               |     |      |     |       |
| Input Capacitance               | C <sub>iss</sub>    | V <sub>DS</sub> =5V, V <sub>GS</sub> =0V, f =1MHz                                                             |     | 42   |     | pF    |
| Output Capacitance              | C <sub>oss</sub>    |                                                                                                               |     | 12.2 |     | pF    |
| Reverse Transfer Capacitance    | C <sub>rss</sub>    |                                                                                                               |     | 8    |     | pF    |
| Switching Characteristics*      |                     |                                                                                                               |     |      |     |       |
| Turn-On Delay Time              | t <sub>d(on)</sub>  | V <sub>GS</sub> =5V, V <sub>bd</sub> =5V,<br>I <sub>D</sub> =10mA, R <sub>g</sub> =10Ω, R <sub>L</sub> =500Ω, |     | 15   |     | ns    |
| Rise Time                       | t <sub>r</sub>      |                                                                                                               |     | 35   |     | ns    |
| Turn-Off Delay Time             | t <sub>d(off)</sub> |                                                                                                               |     | 70   |     | ns    |
| Fall Time                       | t <sub>f</sub>      |                                                                                                               |     | 70   |     | ns    |

1. Surface-mounted on FR4 board using 1 in sq pad size  
(Cu area = 1.27 in sq [2 oz] including traces).
2. Pulse Test: Pulse Width ≤ 100 μs, Duty Cycle ≤ 2.0%.
3. If the IGSS is application in Video signal you must notice the Value .

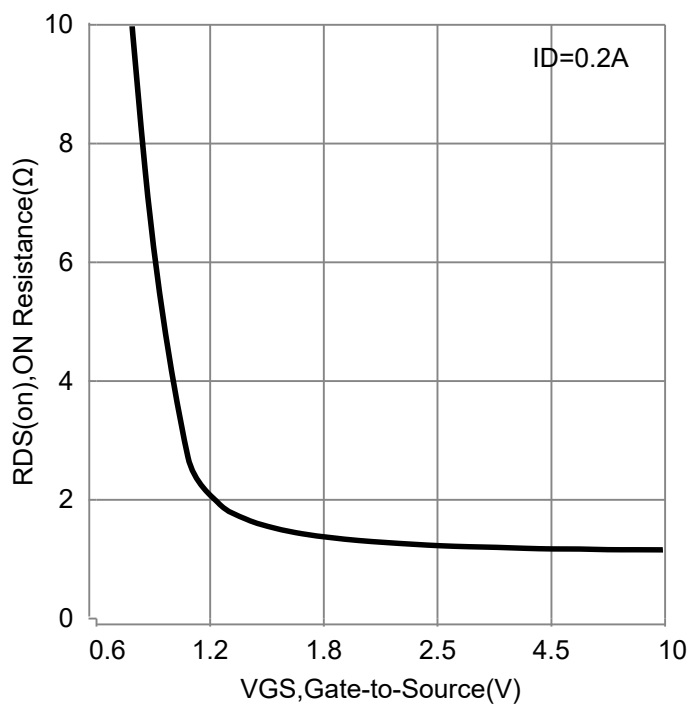
### N-Channel 30-V (D-S) MOSFET



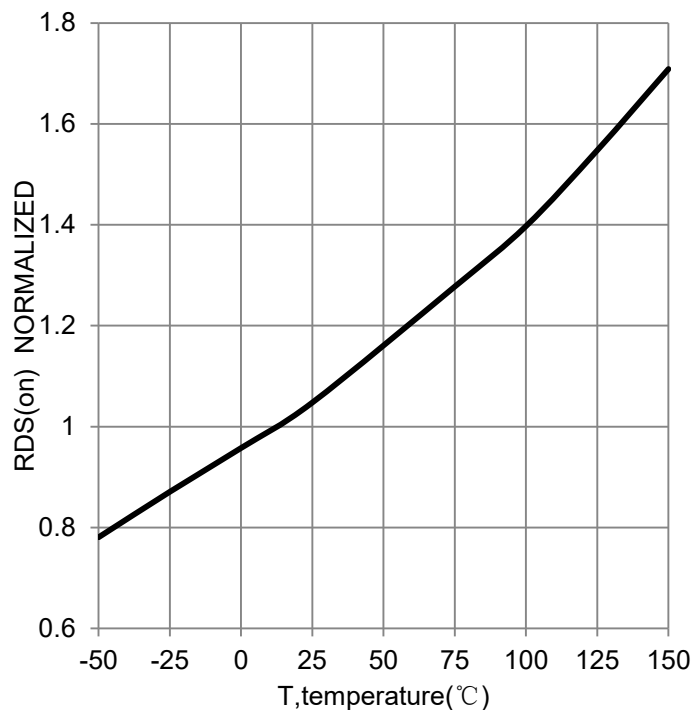
On-Region Characteristics



Transfer Characteristics



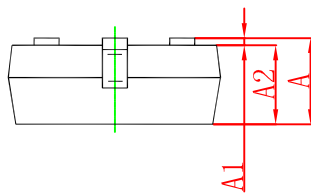
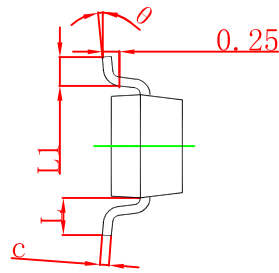
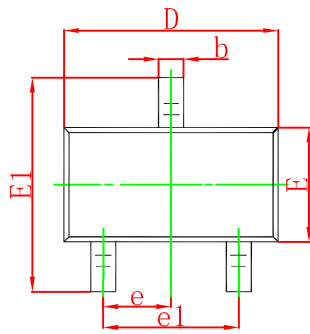
$R_{DS(on)}$  vs.  $V_{GS}$



$R_{DS(on)}$  vs. Temperature

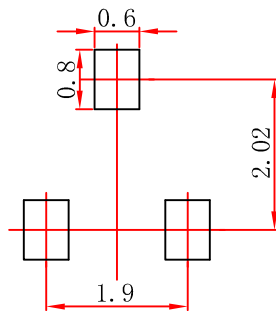
**Note:** 此曲线仅供参考，如 $V_{GS(th)}$ 应用电压在1.2V以下时需与我司联系且 $V_{th}=1.2\text{V}$ 时 $I_D$ 值最大100mA需注意应用场合

### N-Channel 30-V (D-S) MOSFET



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.050 | 0.035                | 0.041 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| e      | 0.950 TYP                 |       | 0.037 TYP            |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.550 REF                 |       | 0.022 REF            |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

### SOT-23 Suggested Pad Layout

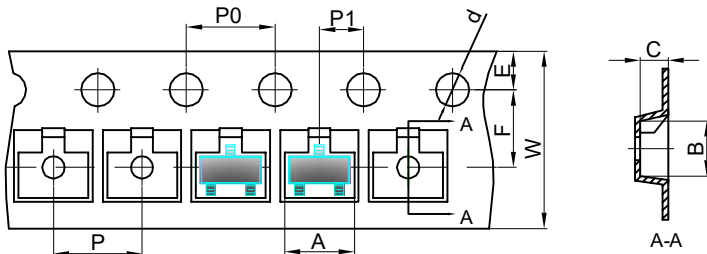


**Note:**

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

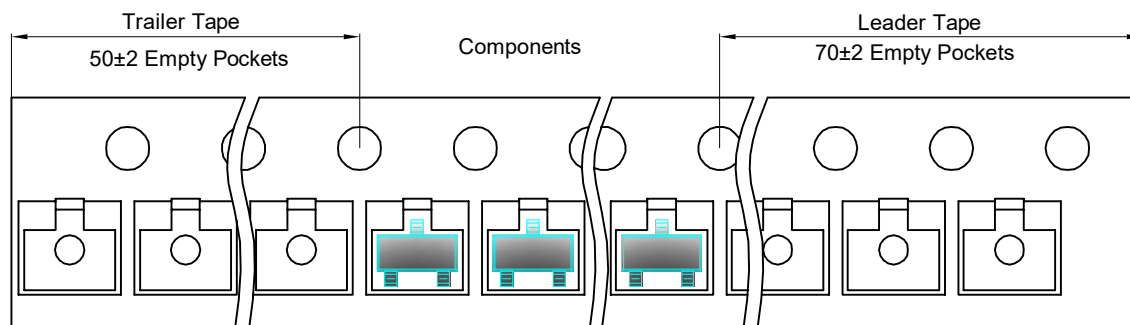
## SOT-23 Tape and reel

SOT-23 Embossed Carrier Tape

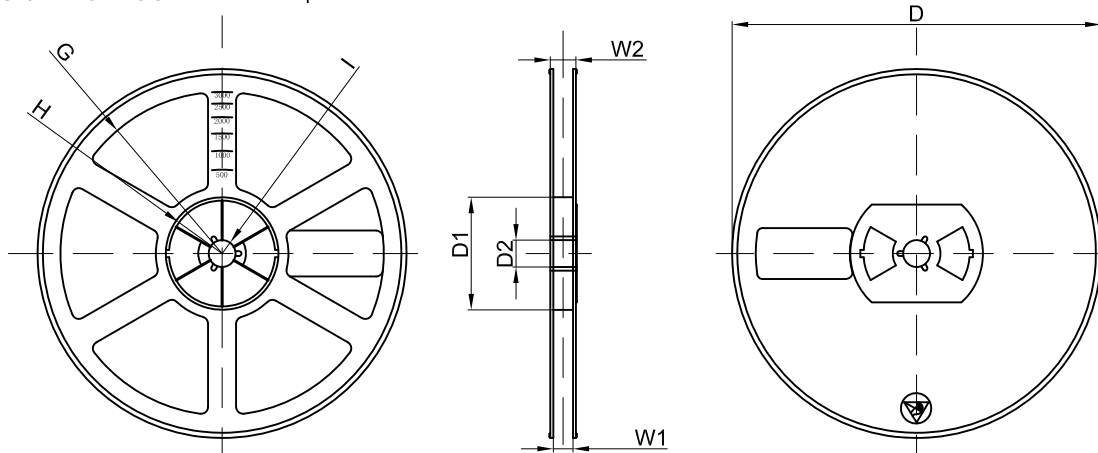


| Dimensions are in millimeter |      |      |      |       |      |      |      |      |      |      |
|------------------------------|------|------|------|-------|------|------|------|------|------|------|
| Pkg type                     | A    | B    | C    | d     | E    | F    | P0   | P    | P1   | W    |
| SOT23                        | 3.15 | 2.77 | 1.22 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |

## SOT-23 Tape Leader and Trailer



## SOT-23 Reel



| Dimensions are in millimeter |         |       |       |        |        |       |      |       |
|------------------------------|---------|-------|-------|--------|--------|-------|------|-------|
| Reel Option                  | D       | D1    | D2    | G      | H      | I     | W1   | W2    |
| 7"Dia                        | Ø178.00 | 54.40 | 13.00 | R78.00 | R25.60 | R6.50 | 9.50 | 12.30 |