

**Product Summary**

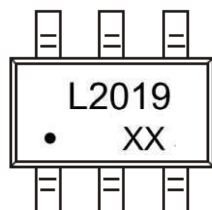
| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---------------|-----------------|-------|
| 20V           | 19mΩ@4.5V       | 5A    |
|               | 24mΩ@2.5V       |       |

**Feature**

- Trench Technology Power MOSFET
- Excellent  $R_{DS(on)}$
- Low Gate Charge
- High Power and Current Handling Capability
- Surface Mount Package

**Application**

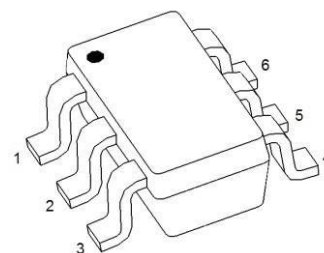
- Battery Protection
- Load Switch
- Power Management

**MARKING:**


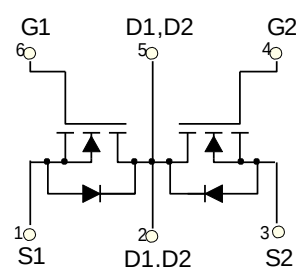
L2019 = Device Code

XX = Date Code

SOT-23-6L



Schematic diagram


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

| Parameter                                                | Symbol          | Value     | Unit                 |
|----------------------------------------------------------|-----------------|-----------|----------------------|
| Drain-Source Voltage                                     | $V_{DS}$        | 20        | V                    |
| Gate-Source Voltage                                      | $V_{GS}$        | ±10       | V                    |
| Continuous Drain Current                                 | $I_D$           | 5         | A                    |
| Pulsed Drain Current <sup>1</sup>                        | $I_{DM}$        | 21        | A                    |
| Power Dissipation                                        | $P_D$           | 1.5       | W                    |
| Thermal Resistance from Junction to Ambient <sup>2</sup> | $R_{\theta JA}$ | 83.3      | $^{\circ}\text{C/W}$ |
| Junction Temperature                                     | $T_J$           | 150       | $^{\circ}\text{C}$   |
| Storage Temperature                                      | $T_{STG}$       | -55~ +150 | $^{\circ}\text{C}$   |

**MOSFET ELECTRICAL CHARACTERISTICS**( $T_A = 25^\circ\text{C}$  unless otherwise noted)

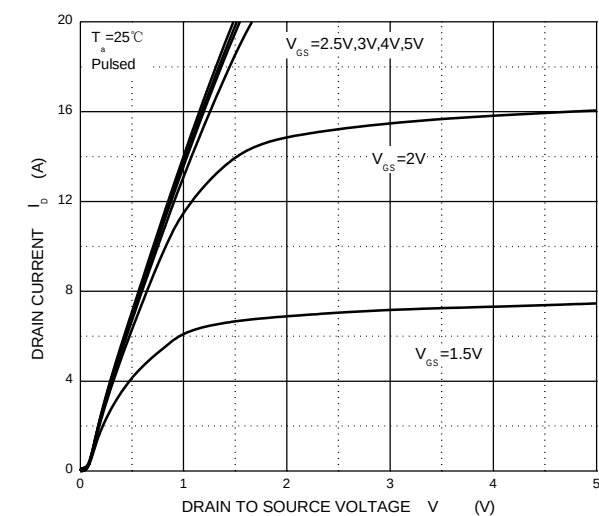
| Parameter                               | Symbol        | Test Condition                                            | Min  | Type | Max       | Unit       |
|-----------------------------------------|---------------|-----------------------------------------------------------|------|------|-----------|------------|
| Static Characteristics                  |               |                                                           |      |      |           |            |
| Drain - source Breakdown Voltage        | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$                             | 20   |      |           | V          |
| Zero Gate Voltage Drain Current         | $I_{DSS}$     | $V_{DS} = 18V, V_{GS} = 0V$                               |      |      | 1         | $\mu A$    |
| Gate - body Leakage Current             | $I_{GSS}$     | $V_{GS} = \pm 10V, V_{DS} = 0V$                           |      |      | $\pm 100$ | nA         |
| Gate Threshold Voltage <sup>3</sup>     | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = 250\mu A$                         | 0.45 | 0.7  | 1.2       | V          |
| Drain-source On-resistance <sup>3</sup> | $R_{DS(on)}$  | $V_{GS} = 4.5V, I_D = 3A$                                 |      | 19   | 27        | m $\Omega$ |
|                                         |               | $V_{GS} = 2.5V, I_D = 3A$                                 |      | 24   | 35        |            |
| Forward Transconductance <sup>3</sup>   | $g_{fs}$      | $V_{DS} = 5V, I_D = 4.5A$                                 | 5    |      |           | S          |
| Diode Forward Voltage                   | $V_{SD}$      | $V_{GS} = 0V, I_S = 1.25A$                                |      |      | 1.2       | V          |
| Dynamic characteristics <sup>4</sup>    |               |                                                           |      |      |           |            |
| Input Capacitance                       | $C_{iss}$     | $V_{DS} = 8V, V_{GS} = 0V, f = 1MHz$                      |      | 755  |           | pF         |
| Output Capacitance                      | $C_{oss}$     |                                                           |      | 130  |           |            |
| Reverse Transfer Capacitance            | $C_{rss}$     |                                                           |      | 112  |           |            |
| Switching Characteristics <sup>4</sup>  |               |                                                           |      |      |           |            |
| Total Gate Charge                       | $Q_g$         | $V_{DS} = 10V, V_{GS} = 4.5V, I_D = 4A$                   |      | 9    |           | nC         |
| Gate-source Charge                      | $Q_{gs}$      |                                                           |      | 1.8  |           |            |
| Gate-drain Charge                       | $Q_{gd}$      |                                                           |      | 2.2  |           |            |
| Turn-on Delay Time                      | $t_{d(on)}$   | $V_{DD} = 10V, V_{GS} = 4V, I_D = 1A$<br>$R_G = 10\Omega$ |      | 15   |           | ns         |
| Turn-on Rise Time                       | $t_r$         |                                                           |      | 4    |           |            |
| Turn-off Delay Time                     | $t_{d(off)}$  |                                                           |      | 36   |           |            |
| Turn-off Fall Time                      | $t_f$         |                                                           |      | 15   |           |            |

Note :

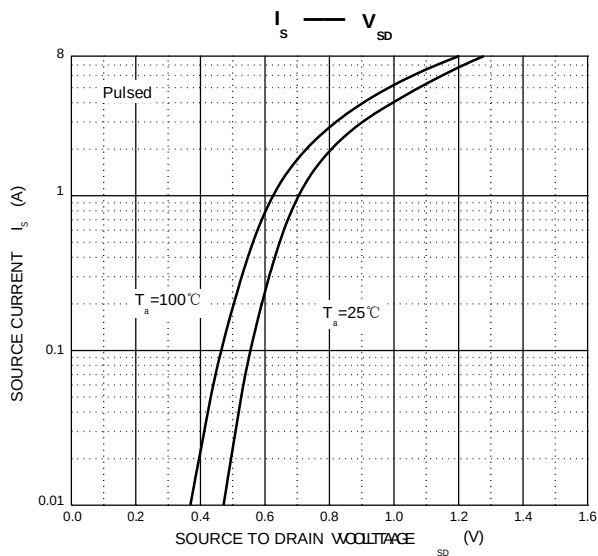
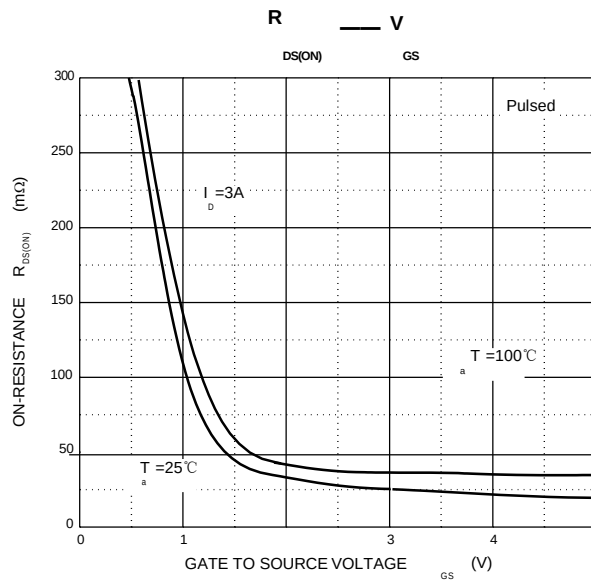
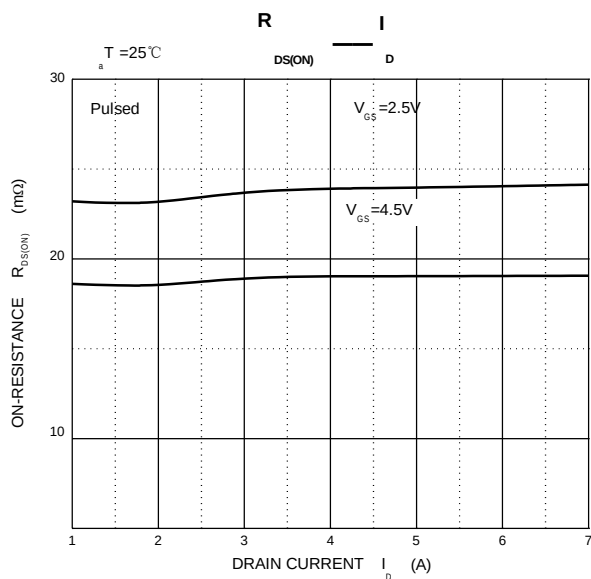
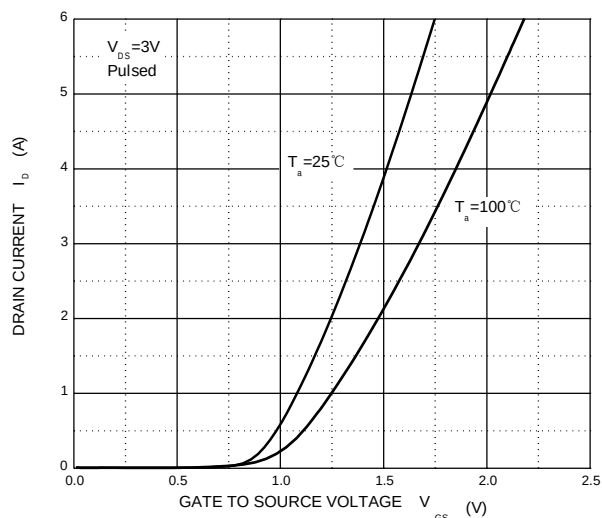
- 1.Repetitive rating: Pluse width limited by maximum junction temperature
- 2.Surface mounted on FR4 board using 1 square inch pad size,1oz single-side copper.
- 3.Pulse test : Pulse width $\leq 300\mu s$ , duty cycle $\leq 2\%$ .
- 4.Guaranteed by design, not subject to production.

**Typical Characteristics**

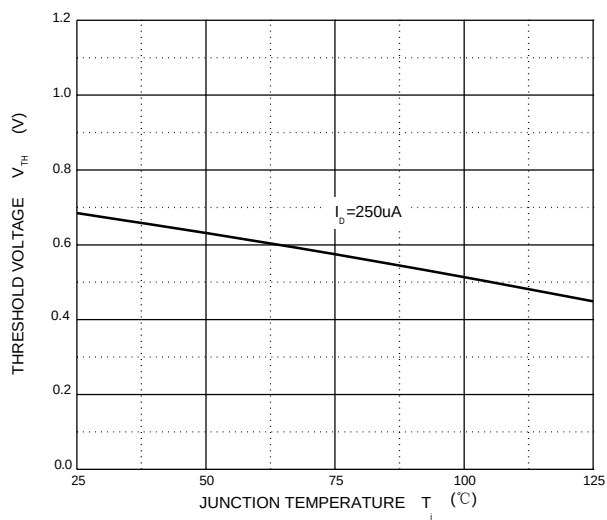
**Output Characteristics**

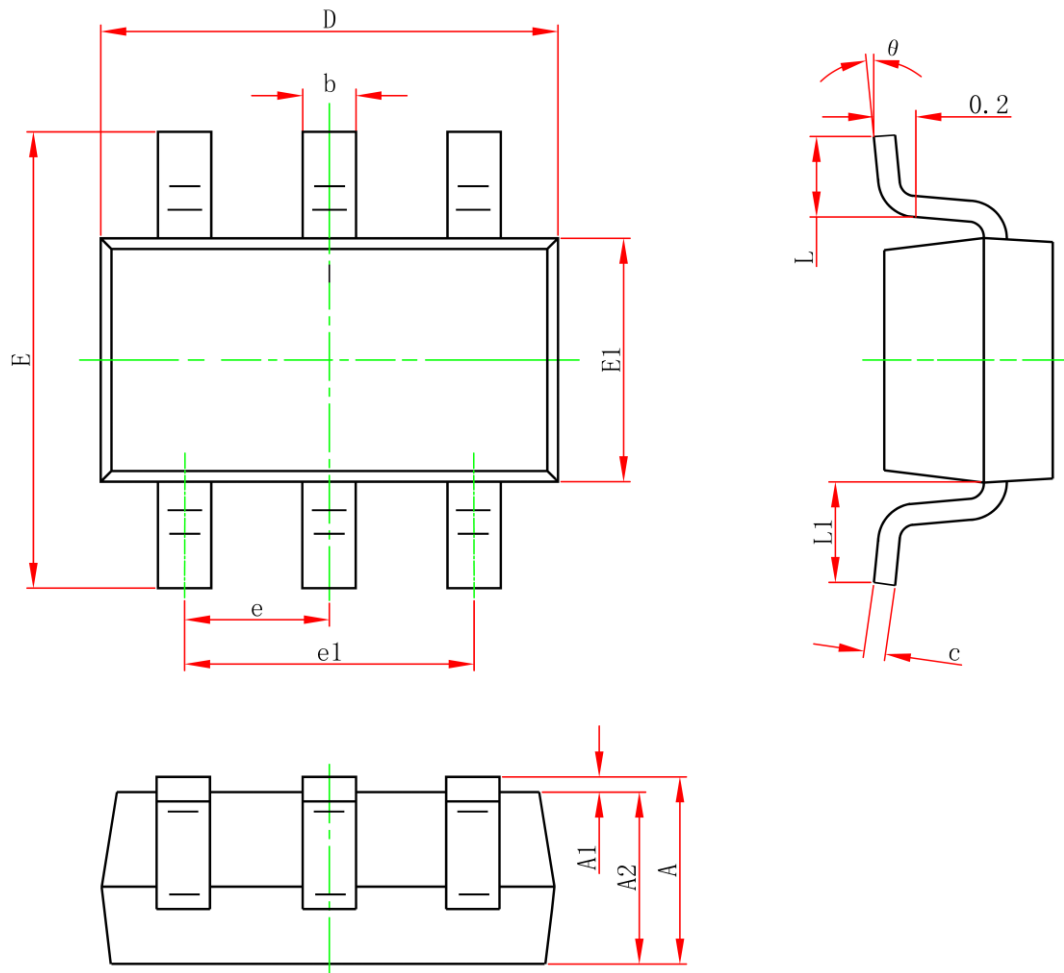


**Transfer Characteristics**



**Threshold Voltage**





| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1     | 0                         | 0.150 | 0.000                | 0.006 |
| A2     | 1.050                     | 1.250 | 0.041                | 0.049 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.100                     | 0.200 | 0.004                | 0.008 |
| D      | 2.820                     | 3.020 | 0.111                | 0.119 |
| E      | 2.650                     | 2.950 | 0.104                | 0.116 |
| E1     | 1.500                     | 1.700 | 0.059                | 0.067 |
| e      | 0.950TYP                  |       | 0.037TYP             |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.300                     | 0.600 | 0.012                | 0.024 |
| L1     | 0.600REF                  |       | 0.024REF             |       |
| θ      | 0°                        | 8°    | 0°                   | 8°    |