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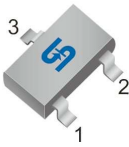
Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: [info@chipsmall.com](mailto:info@chipsmall.com) Web: [www.chipsmall.com](http://www.chipsmall.com)

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



### SOT-23



### Pin Definition:

1. Gate
2. Source
3. Drain

### PRODUCT SUMMARY

| $V_{DS}$ (V) | $R_{DS(on)}$ ( $\Omega$ )(max) | $I_D$ (A) |
|--------------|--------------------------------|-----------|
| 600          | 700 @ $V_{GS} = 0V$            | 0.03      |

### Features

- Depletion Mode
- Low Gate Charge

### Application

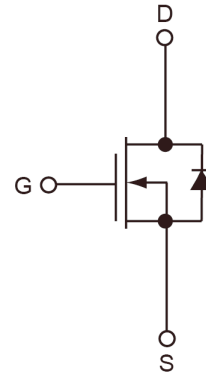
- Converters
- Telecom

### Ordering Information

| Part No.     | Package | Packing         |
|--------------|---------|-----------------|
| TSM126CX RFG | SOT-23  | 3kpcs / 7" Reel |

**Note:** "G" denotes Halogen Free Product.

### Block Diagram



N-Channel MOSFET

### Absolute Maximum Ratings (Ta = 25°C unless otherwise noted)

| Parameter  | Symbol         | Limit       | Unit |
|--|----------------|-------------|------|
| Drain-Source Voltage                             | $V_{DS}$       | 600         | V    |
| Gate-Source Voltage                              | $V_{GS}$       | $\pm 20$    | V    |
| Continuous Drain Current                         | $I_D$          | 0.030       | A    |
| Continuous Drain Current                         |                | 0.024       | A    |
| Pulsed Drain Current <sup>a</sup>                | $I_{DM}$       | 0.120       | A    |
| Maximum Power Dissipation                        | $P_D$          | 0.5         | W    |
| Soldering Temperature <sup>b</sup>               | $T_L$          | 300         | °C   |
| Operating Junction Temperature                   | $T_J$          | +150        | °C   |
| Operating Junction and Storage Temperature Range | $T_J, T_{STG}$ | -55 to +150 | °C   |

### Thermal Performance

| Parameter                               | Symbol         | Limit | Unit |
|---|----------------|-------|------|
| Thermal Resistance, Junction to Ambient | $R\theta_{JA}$ | 250   | °C/W |

### Notes:

- a. Pulse width limited by the Maximum junction temperature
- b. Distance of 1.6mm from case for 10 seconds.

**Electrical Specifications** ( $T_j = 25^\circ\text{C}$  unless otherwise noted)

| Parameter                        | Conditions   | Symbol               | Min   | Typ   | Max   | Unit |
|----------------------------------|--|----------------------|-------|-------|-------|------|
| Static <sup>a</sup>              |  |                      |       |       |       |      |
| Drain-Source Breakdown Voltage   | V <sub>GS</sub> = -5V, I <sub>D</sub> = 250μA  | BV <sub>DSS</sub>    | 600   | --    | --    | V    |
| Gate Threshold Voltage           | V <sub>DS</sub> = 3V, I <sub>D</sub> = 8μA   | V <sub>GS(TH)</sub>  | -2.7  | -1.8  | -1.0  | V    |
| Drain-Source cutoff current      | V <sub>DS</sub> = 600V, V <sub>GS</sub> = -5V, Ta = 25°C   | I <sub>DS(OFF)</sub> | --    | --    | 0.1   | μA   |
| Drain-Source cutoff current      | V <sub>DS</sub> = 480V, V <sub>GS</sub> = -5V, Ta = 125°C  |                      |       |       | 10    | μA   |
| Gate-Source Leakage Current      | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V   | I <sub>GSS</sub>     | --    | --    | ±10   | μA   |
| On-state Drain Current           | V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V  | I <sub>DSS</sub>     | 12    | --    | --    | mA   |
| Drain-Source On-State Resistance | V <sub>GS</sub> = 0V, I <sub>D</sub> = 3mA   | R <sub>DS(ON)</sub>  | --    | 350   | 700   | Ω    |
|                                  | V <sub>GS</sub> = 10V, I <sub>D</sub> = 16mA   |                      |       | 400   | 800   | Ω    |
| Forward Transconductance         | V <sub>DS</sub>   >2 I <sub>D</sub> *R <sub>DS(ON)</sub> max, I <sub>D</sub> = 0.01A             | g <sub>fs</sub>      | 0.008 | 0.017 | --    | S    |
| Dynamic                          |  |                      |       |       |       |      |
| Input Capacitance                | V <sub>DS</sub> = 25V, V <sub>GS</sub> = -5V, f = 1.0MHz   | C <sub>iss</sub>     | --    | 51.42 | --    | pF   |
| Output Capacitance               |  | C <sub>oss</sub>     | --    | 4.48  | --    |      |
| Reverse Transfer Capacitance     |  | C <sub>rss</sub>     | --    | 1.12  | --    |      |
| Total Gate Charge                | V <sub>DS</sub> = 400V, I <sub>D</sub> = 0.01A, V <sub>GS</sub> = -5V to 5V                      | Q <sub>g</sub>       | --    | 1.18  | --    | nC   |
| Gate-Source Charge               |  | Q <sub>gs</sub>      | --    | 0.49  | --    |      |
| Gate-Drain Charge                |  | Q <sub>gd</sub>      | --    | 0.365 | --    |      |
| Switching                        |  |                      |       |       |       |      |
| Turn-On Delay Time               | V <sub>DD</sub> = 300V, I <sub>D</sub> = 0.01A, V <sub>GS</sub> = -5V to 7V, R <sub>G</sub> = 6Ω | t <sub>d(on)</sub>   | --    | 10.01 | --    | ns   |
| Turn-On Rise Time                |  | t <sub>r</sub>       | --    | 55.7  | --    |      |
| Turn-Off Delay Time              |  | t <sub>d(off)</sub>  | --    | 57.2  | --    |      |
| Turn-Off Fall Time               |  | t <sub>f</sub>       | --    | 135.5 | --    |      |
| Source-Drain Diode               |  |                      |       |       |       |      |
| Diode forward Current            | Continuous   | I <sub>S</sub>       | --    | --    | 0.025 | A    |
| Diode Pulse Current              |  | I <sub>SM</sub>      | --    | --    | 0.100 | A    |
| Diode Forward Voltage            | I <sub>SD</sub> = 16mA, V <sub>GS</sub> = -5V  | V <sub>SD</sub>      | --    | --    | 1.2   | V    |
| Reverse Recovery Time            | I <sub>F</sub> =0.01A, V <sub>GS</sub> =-10V   | t <sub>rr</sub>      | --    | 243.1 | --    | ns   |
| Reverse Recovery Charge          | dI <sub>F</sub> /dt=100A/μs, V <sub>R</sub> =30V   | Q <sub>rr</sub>      | --    | 639   | --    | nC   |

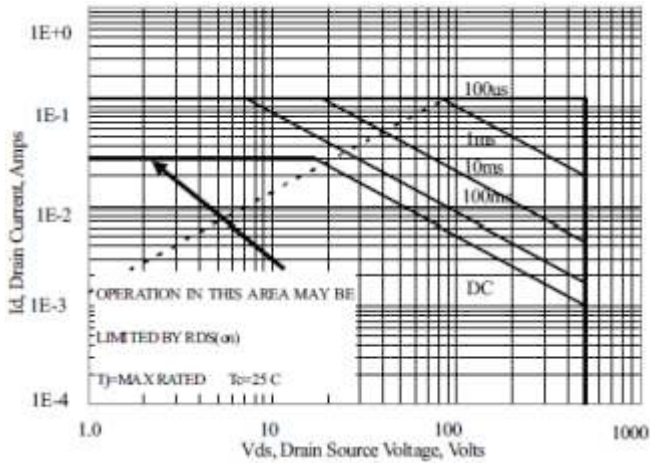
**Notes:**

a. pulse test:  $PW \leq 380\mu s$ , duty cycle  $\leq 2\%$

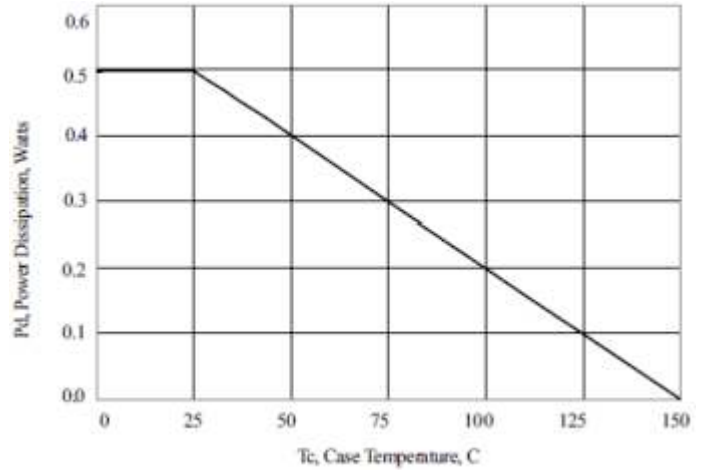


**Electrical Characteristics Curves** ( $T_a = 25^\circ\text{C}$ , unless otherwise noted)

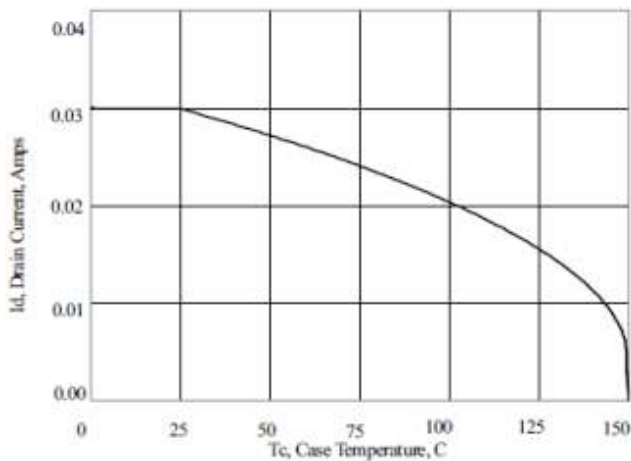
**Maximum Forward Bias Safe Operation Area**



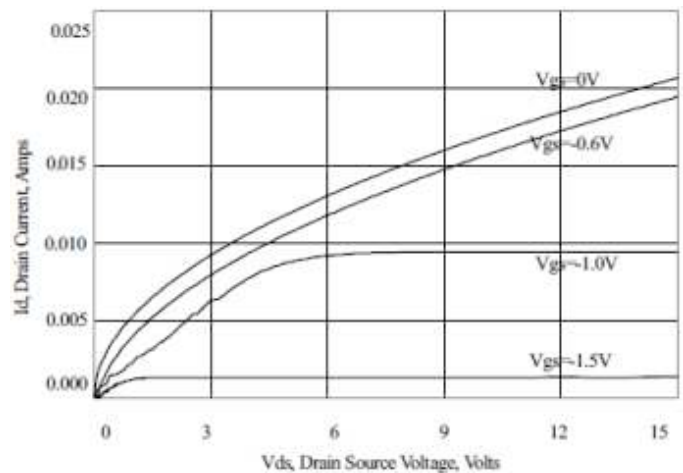
**Maximum Power Dissipation vs. Case Temperature**



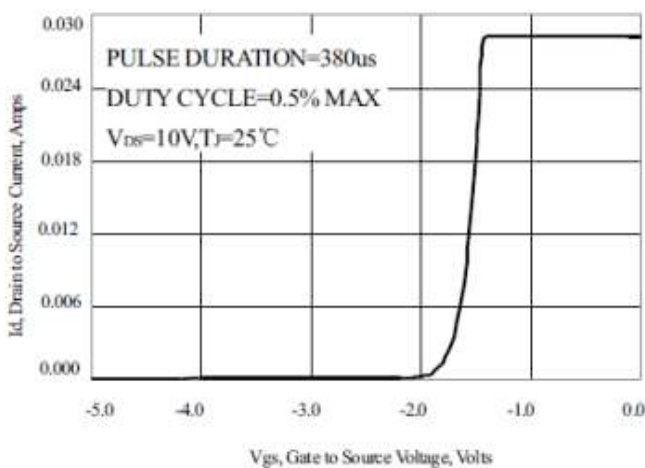
**Maximum Continuous Drain Current vs. Case Temperature**



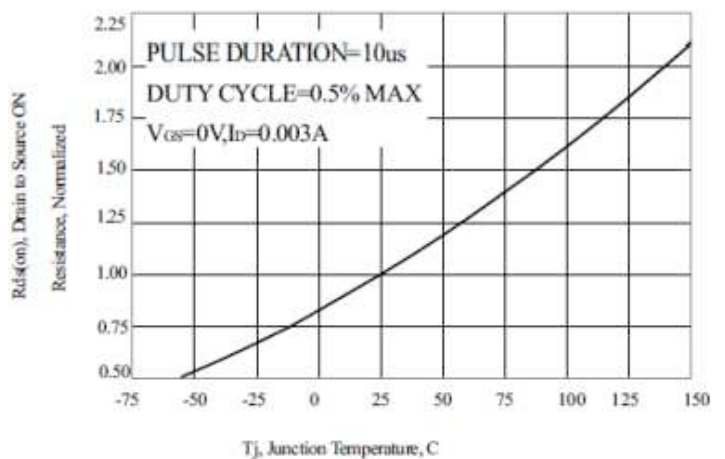
**Typical Output Characteristics**



**Typical Transfer Characteristics**

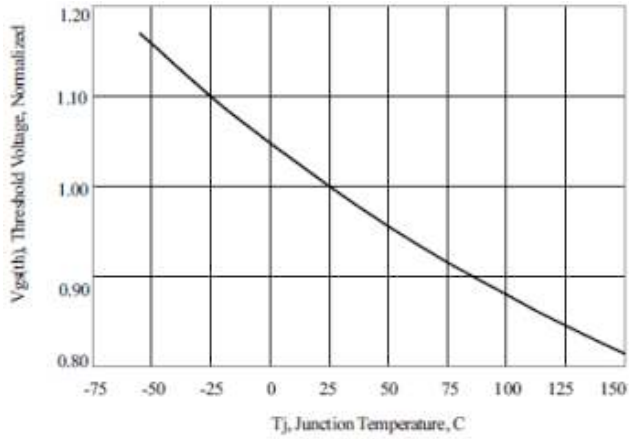


**Drain to Source ON Resistance vs. Junction Temperature**

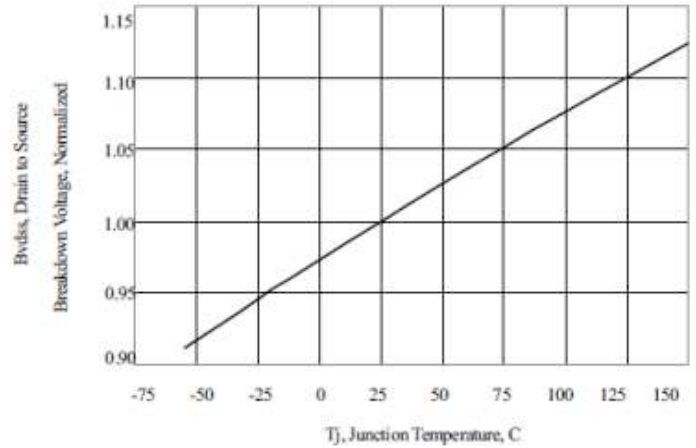


**Electrical Characteristics Curves** ( $T_a = 25^\circ\text{C}$ , unless otherwise noted)

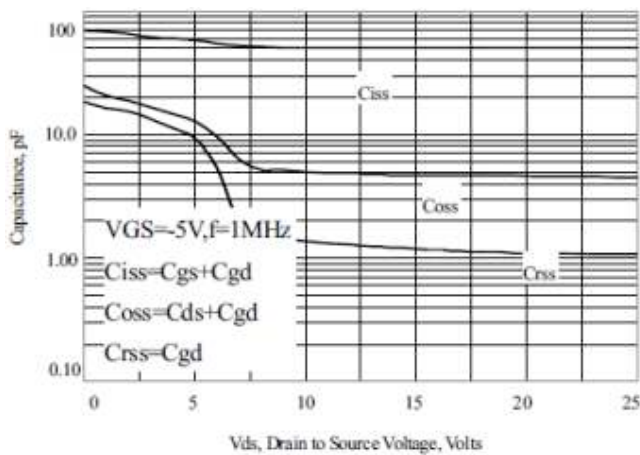
**Threshold Voltage vs. Junction Temperature**



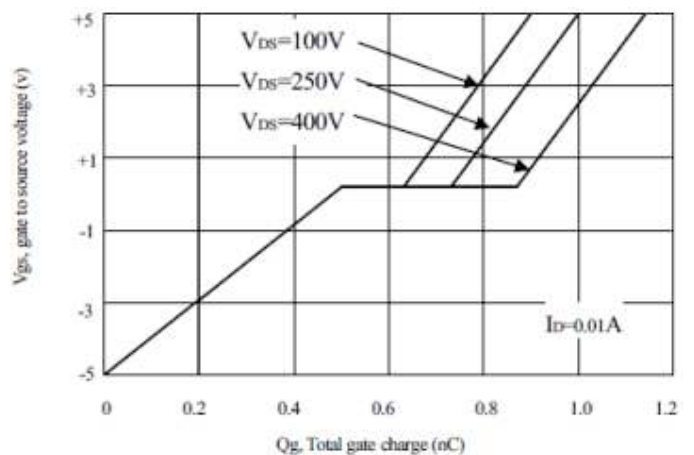
**Breakdown Voltage vs. Junction Temperature**



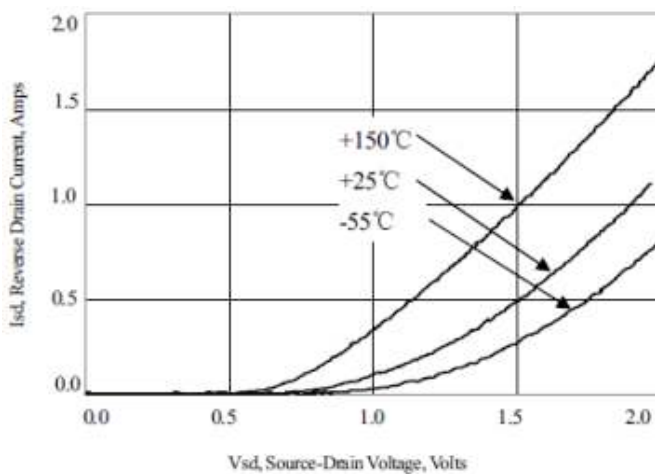
**Typical Capacitance vs. Drain to source Voltage**



**Typical Gate Charge vs. Gate to Source Voltage**

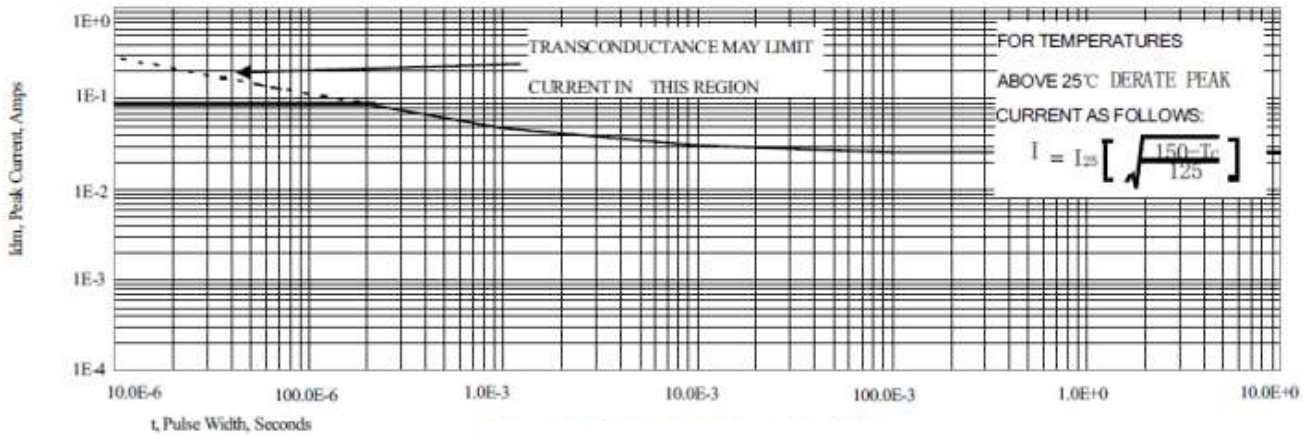


**Typical Body Diode Transfer Characteristics**

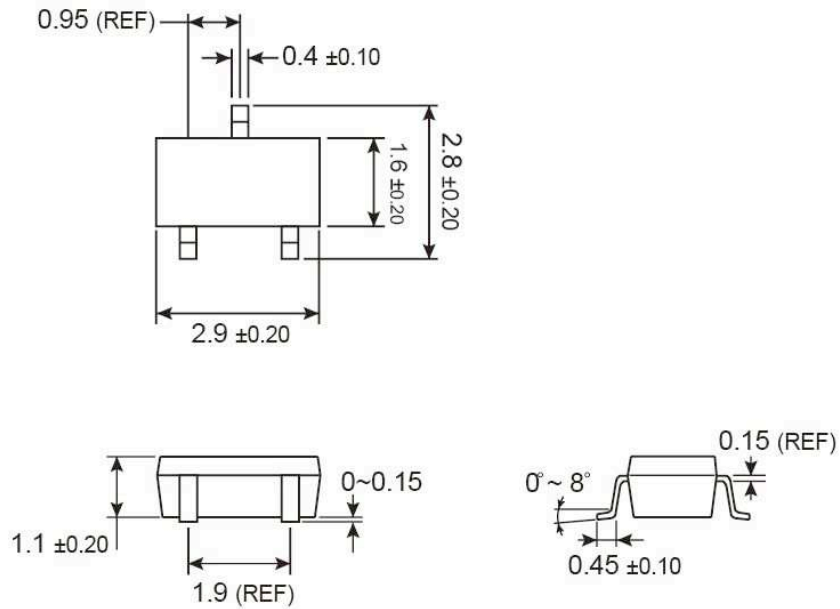


**Electrical Characteristics Curves** (Ta = 25°C, unless otherwise noted)

**Maximum Peak Current Capability**



**SOT-23 Mechanical Drawing**



Unit: Millimeters

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