

### SOT-23



### Pin Definition:

1. Gate
2. Source
3. Drain

### Key Parameter Performance

| Parameter          |                  | Value | Unit |
|--------------------|------------------|-------|------|
| $V_{DS}$           |                  | -30   | V    |
| $R_{DS(on)}$ (max) | $V_{GS} = -10V$  | 95    | mΩ   |
|                    | $V_{GS} = -4.5V$ | 140   |      |
| $Q_g$              |                  | 10    | nC   |

### Features

- Advance Trench Process Technology
- High Density Cell Design for Ultra Low On-resistance

### Application

- Load Switch
- PA Switch

### Ordering Information

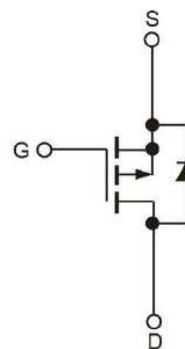
| Part No.      | Package | Packing         |
|---------------|---------|-----------------|
| TSM2307CX RFG | SOT-23  | 3kpcs / 7" Reel |

**Note:** "G" denotes for Halogen- and Antimony-free as those which contain

<900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and

<1000ppm antimony compounds

### Block Diagram



P-Channel MOSFET

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

| Parameter                                    |                          | Symbol    | Limit       | Unit             |
|----------------------------------------------|--------------------------|-----------|-------------|------------------|
| Drain-Source Voltage                         |                          | $V_{DS}$  | -30         | V                |
| Gate-Source Voltage                          |                          | $V_{GS}$  | $\pm 20$    | V                |
| Continuous Drain Current <sup>(Note 1)</sup> |                          | $I_D$     | -3          | A                |
| Pulsed Drain Current <sup>(Note 2)</sup>     |                          | $I_{DM}$  | -20         | A                |
| Continuous Source Current (Diode Conduction) |                          | $I_S$     | -1.7        | A                |
| Power Dissipation                            | $T_a = 25^\circ\text{C}$ | $P_D$     | 1.25        | W                |
|                                              | $T_a = 75^\circ\text{C}$ |           | 0.8         |                  |
| Operating Junction Temperature               |                          | $T_J$     | +150        | $^\circ\text{C}$ |
| Storage Temperature Range                    |                          | $T_{STG}$ | -50 to +150 | $^\circ\text{C}$ |

### Thermal Performance

| Parameter                                | Symbol          | Limit | Unit |
|------------------------------------------|-----------------|-------|------|
| Thermal Resistance - Junction to Case    | $R_{\theta JC}$ | 75    | °C/W |
| Thermal Resistance - Junction to Ambient | $R_{\theta JA}$ | 130   | °C/W |

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

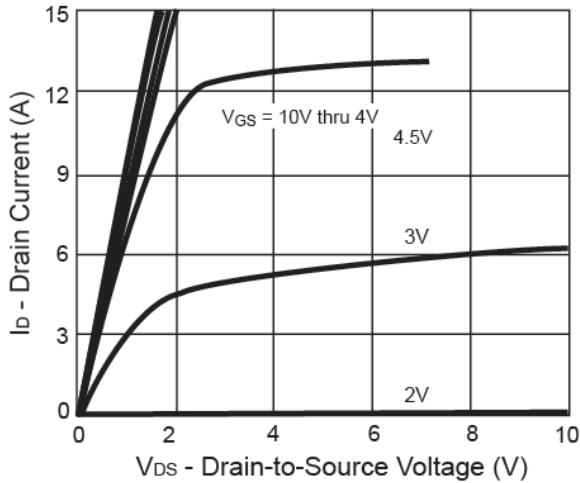
| Parameter                         | Conditions                                                                          | Symbol       | Min | Typ | Max  | Unit |
|-----------------------------------|-------------------------------------------------------------------------------------|--------------|-----|-----|------|------|
| Static                            |                                                                                     |              |     |     |      |      |
| Drain-Source Breakdown Voltage    | $V_{GS} = 0V, I_D = -250\mu A$                                                      | $BV_{DSS}$   | -30 | --  | --   | V    |
| Drain-Source On-State Resistance  | $V_{GS} = -10V, I_D = -3A$                                                          | $R_{DS(ON)}$ | --  | 76  | 95   | mΩ   |
|                                   | $V_{GS} = -4.5V, I_D = -2A$                                                         |              | --  | 103 | 140  | mΩ   |
| Gate Threshold Voltage            | $V_{DS} = V_{GS}, I_D = -250\mu A$                                                  | $V_{GS(TH)}$ | -1  | --  | -3   | V    |
| Zero Gate Voltage Drain Current   | $V_{DS} = -30V, V_{GS} = 0V$                                                        | $I_{DSS}$    | --  | --  | -1.0 | μA   |
| Gate Body Leakage                 | $V_{GS} = \pm 20V, V_{DS} = 0V$                                                     | $I_{GSS}$    | --  | --  | ±100 | nA   |
| Forward Transconductance (Note 4) | $V_{DS} = -10V, I_D = -6A$                                                          | $g_{fs}$     | --  | 5   | --   | S    |
| Diode Forward Voltage             | $I_S = -1.7V, V_{GS} = 0V$                                                          | $V_{SD}$     |     |     | -1.2 | V    |
| Dynamic                           |                                                                                     |              |     |     |      |      |
| Total Gate Charge (Note 3,4)      | $V_{DS} = -15V, I_D = -3A,$<br>$V_{GS} = -10V$                                      | $Q_g$        | --  | 10  | 15   | nC   |
| Gate-Source Charge (Note 3,4)     |                                                                                     | $Q_{gs}$     | --  | 1.9 | --   |      |
| Gate-Drain Charge (Note 3,4)      |                                                                                     | $Q_{gd}$     | --  | 2   | --   |      |
| Input Capacitance                 | $V_{DS} = -30V, V_{GS} = 0V,$<br>$f = 1.0MHz$                                       | $C_{iss}$    | --  | 565 | --   | pF   |
| Output Capacitance                |                                                                                     | $C_{oss}$    | --  | 126 | --   |      |
| Reverse Transfer Capacitance      |                                                                                     | $C_{rss}$    | --  | 75  | --   |      |
| Switching                         |                                                                                     |              |     |     |      |      |
| Turn-On Delay Time (Note 3,4)     | $V_{DD} = -15V, R_L = 15\Omega,$<br>$I_D = -1A, V_{GEN} = -10V,$<br>$R_G = 6\Omega$ | $t_{d(on)}$  | --  | 10  | 20   | ns   |
| Turn-On Rise Time (Note 3,4)      |                                                                                     | $t_r$        | --  | 9   | 20   |      |
| Turn-Off Delay Time (Note 3,4)    |                                                                                     | $t_{d(off)}$ | --  | 27  | 50   |      |
| Turn-Off Fall Time (Note 3,4)     |                                                                                     | $t_f$        | --  | 7   | 16   |      |

#### Note:

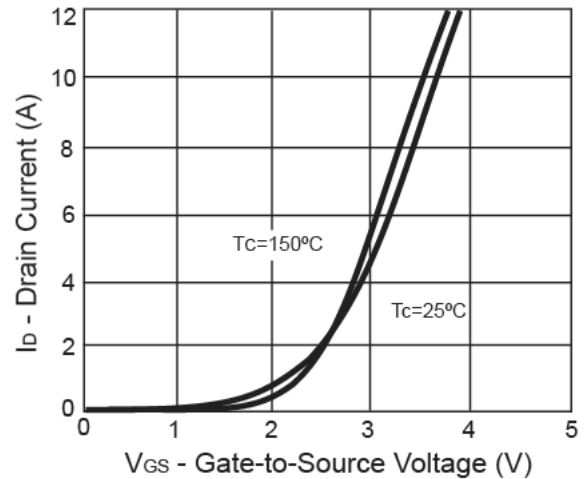
- Limited by maximum junction temperature
- Pulse width limited by safe operating area
- Pulse test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
- Switching time is essentially independent of operating temperature.

### Electrical Characteristics Curve

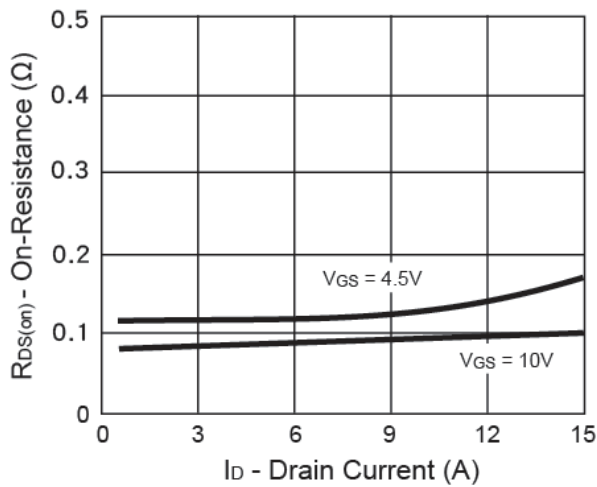
**Output Characteristics**



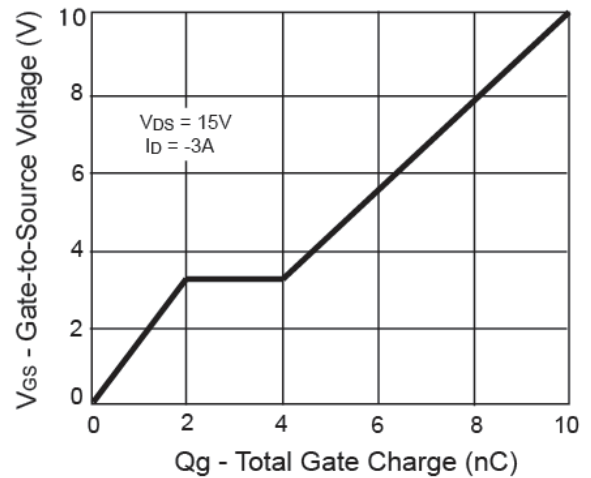
**Transfer Characteristics**



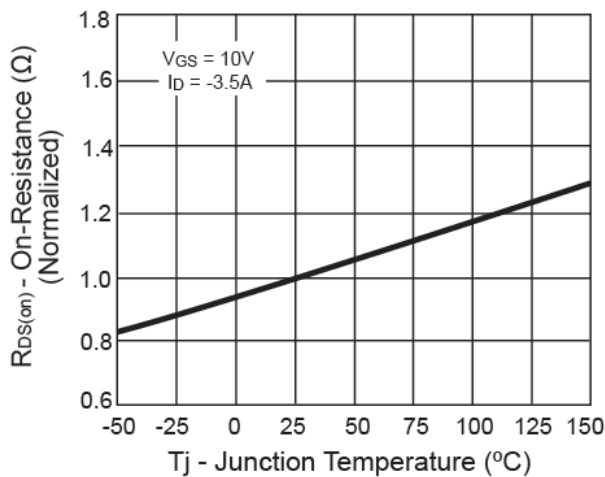
**On-Resistance vs. Drain Current**



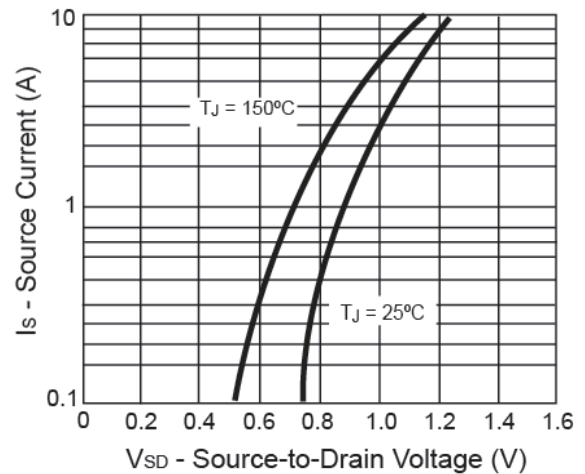
**Gate Charge**



**On-Resistance vs. Junction Temperature**

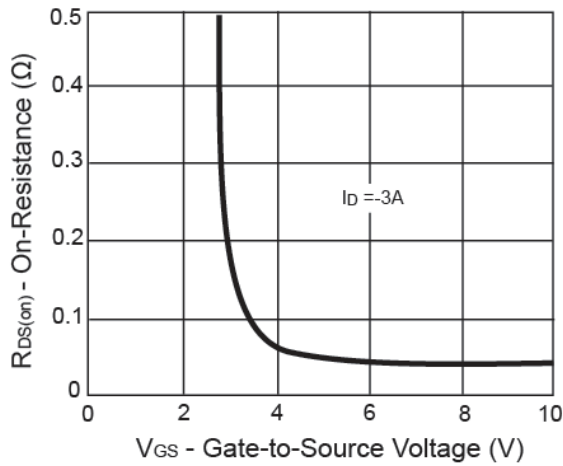


**Source-Drain Diode Forward Voltage**

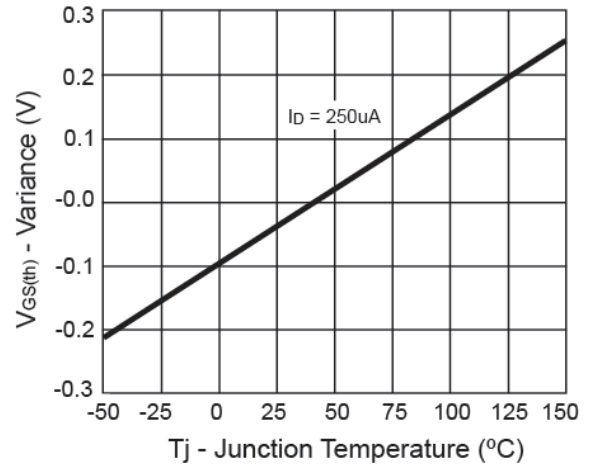


### Electrical Characteristics Curve

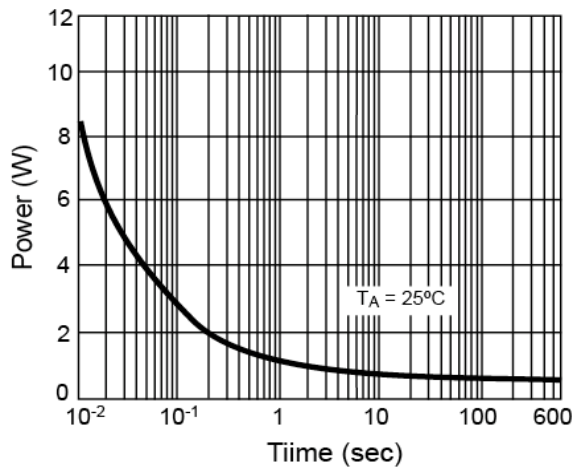
**On-Resistance vs. Gate-Source Voltage**



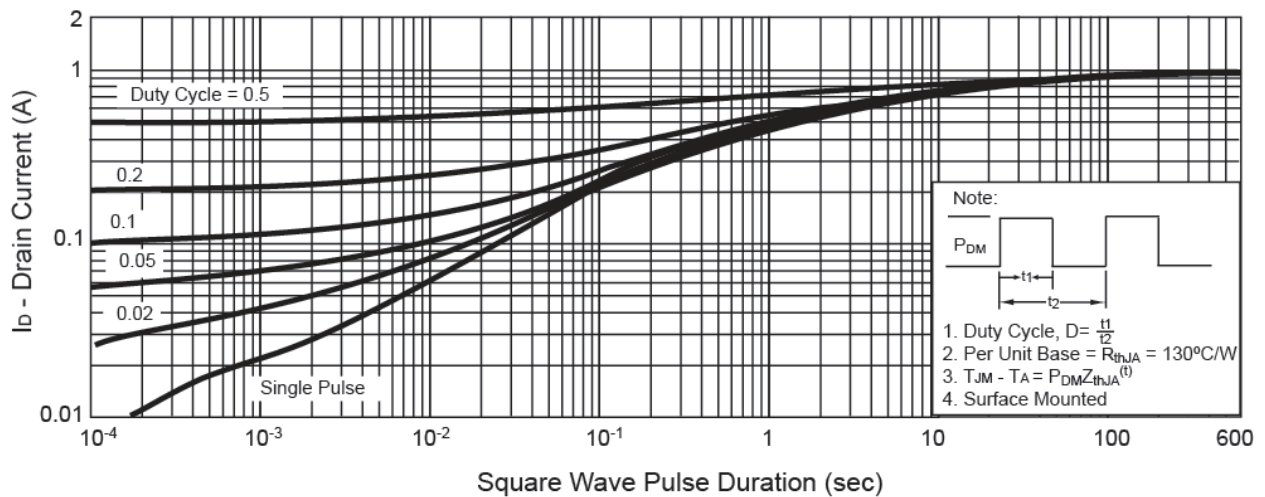
**Threshold Voltage**



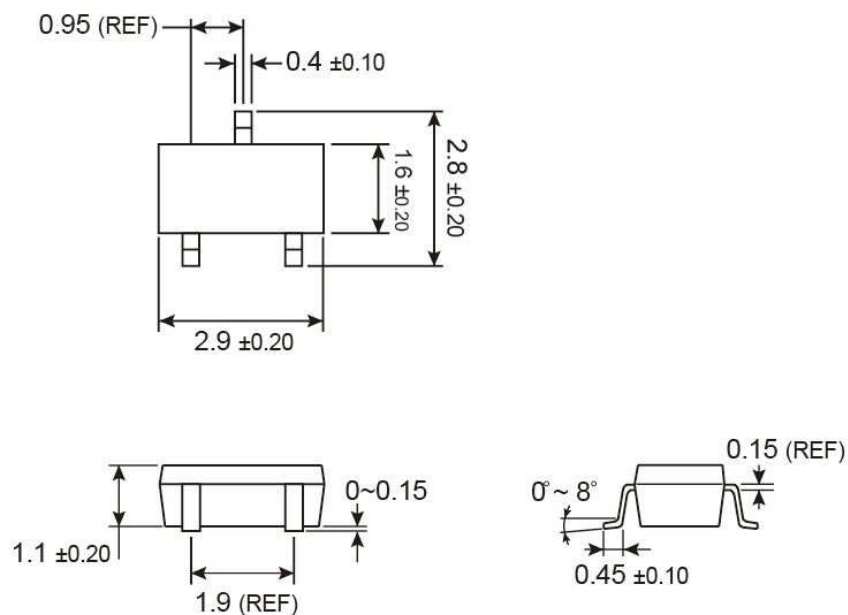
**Single Pulse Power**



**Normalized Thermal Transient Impedance, Junction-to-Ambient**

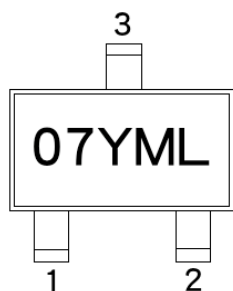


## SOT-23 Mechanical Drawing



Unit: Millimeters

## Marking Diagram



**07** = Device Code

**Y** = Year Code

**M** = Month Code for Halogen Free Product

**O** =Jan **P** =Feb **Q** =Mar **R** =Apr

**S** =May **T** =Jun **U** =Jul **V** =Aug

**W** =Sep **X** =Oct **Y** =Nov **Z** =Dec

**L** = Lot Code

## Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9