# GSM3911P

## 30V P-Channel MOSFETs

### Product Description

These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

These devices are well suited for high efficiency fast switching applications.

### Features

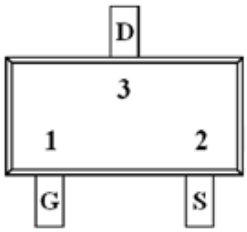
- -30V, -4.1A, $R_{DS(ON)}$=55mΩ@$V_{GS}$=-10V
- Fast switching
- Suit for -4.5V Gate Drive Applications
- Green Device Available
- SOT-23 package design

### Applications

- Notebook
- Load Switch
- Battery Protection
- Hand-held Instruments

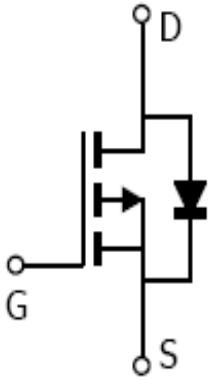
### Packages & Pin Assignments

**GSM3911PJZF (SOT-23)**

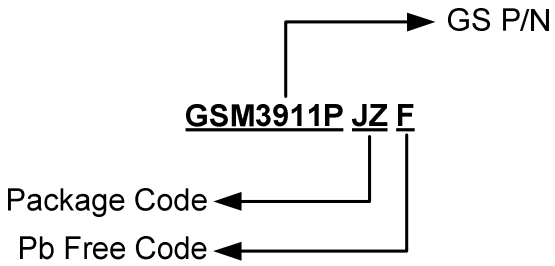



Top Views

| Pin | Description |
|---|---|
| 1 | Gate |
| 2 | Source |
| 3 | Drain |



## Ordering Information




| Part Number | Package | Quantity |
|---|---|---|
| GSM3911PJZF | SOT-23 | 3000pcs |

## Marking Information


## Absolute Maximum Ratings

$T_A$=25ºC Unless otherwise noted

| Symbol | Parameter | | Typical | Unit |
|---|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | | -30 | V |
| $V_{GS}$ | Gate-Source Voltage | | ±20 | V |
| $I_D$ | Continuous Drain Current | $T_A$=25℃ | -4.1 | A |
| | | $T_A$=100℃ | -2.6 | |
| $I_{DM}$ | Pulsed Drain Current | | -16.4 | A |
| $P_D$ | Power Dissipation ($T_A$=25℃) | | 1.56 | W |
| | Power Dissipation (Derate above 25℃) | | 0.012 | W/℃ |
| $T_J$ | Operating Junction Temperature Range | | -55 to +150 | ℃ |
| $T_{STG}$ | Storage Temperature Range | | -55 to +150 | ℃ |
| $R_{\theta JA}$ | Thermal Resistance-Junction to Ambient | | 80 | ℃/W |

## Electrical Characteristics

$T_A$=25℃ Unless otherwise noted

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V,$I_D$=-250uA | -30 | | | V |
| $\triangle BV_{DSS}/\triangle T_J$ | $BV_{DSS}$ Temperature Coefficient | Reference to 25℃, $I_D$=-1mA | | -0.03 | | V/℃ |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$,$I_D$=-250uA | -1.2 | -1.6 | -2.2 | V |
| $\triangle V_{GS(th)}$ | $V_{GS(th)}$ Temperature Coefficient | | | 4 | | mV/℃ |
| $I_{GSS}$ | Gate Leakage Current | $V_{DS}$=0V,$V_{GS}$=±20V | | | ±100 | nA |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=-30V,$V_{GS}$=0V | | | -1 | uA |
| | | $V_{DS}$=-24V,$V_{GS}$=0V, $T_J$=125℃ | | | -10 | |
| $I_S$ | Continuous Source Current | $V_G$=$V_D$=0V, Force Current | | | -4.1 | A |
| $I_{SM}$ | Pulsed Source Current | | | | -16.4 | |
| $R_{DS(on)}$ | Drain-Source On-Resistance | $V_{GS}$=-10V,$I_D$=-3A | | 45 | 55 | mΩ |
| | | $V_{GS}$=-4.5V,$I_D$=-2A | | 67 | 85 | |
| $g_{FS}$ | Forward Transconductance | $V_{DS}$=-10V,$I_D$=-3A | | 3.5 | | S |
| $V_{SD}$ | Diode Forward Voltage | $V_{GS}$=0V,$I_S$=-1A | | | -1 | V |
| **Dynamic** | | | | | | |
| $Q_g$ | Total Gate Charge | $V_{DS}$=-15V,$V_{GS}$=-4.5V, $I_D$=-3A | | 5.1 | 7 | nC |
| $Q_{gs}$ | Gate-Source Charge | | | 2 | 3 | |
| $Q_{gd}$ | Gate-Drain Charge | | | 2.2 | 4 | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=-15V,$V_{GS}$=0V, f=1MHz | | 560 | 810 | pF |
| $C_{oss}$ | Output Capacitance | | | 55 | 80 | |
| $C_{rss}$ | Reverse Transfer Capacitance | | | 40 | 60 | |
| $t_{d(on)}$ | Turn-On Time | $V_{DD}$=-15V,$I_D$=-1A, $V_{GS}$=-10V,$R_G$=6Ω | | 3.4 | 6 | ns |
| $t_r$ | | | | 10.8 | 21 | |
| $t_{d(off)}$ | Turn-Off Time | | | 26.9 | 51 | |
| $t_f$ | | | | 6.9 | 13 | |

## Typical Performance Characteristics

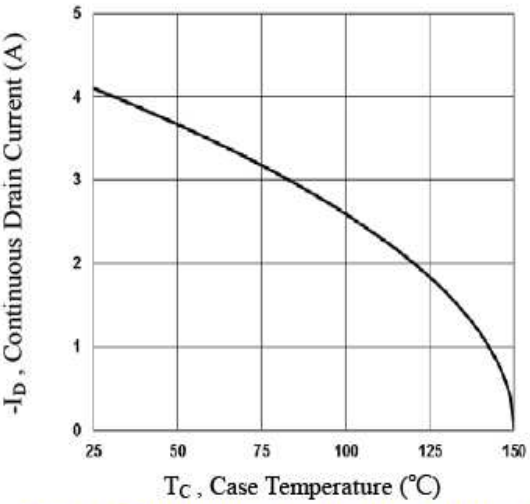



**Fig.1 Continuous Drain Current vs. $T_c$**

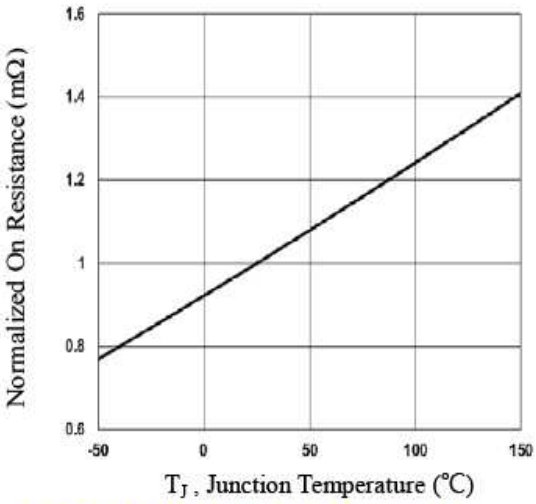



**Fig.2 Normalized RDSON vs. $T_J$**

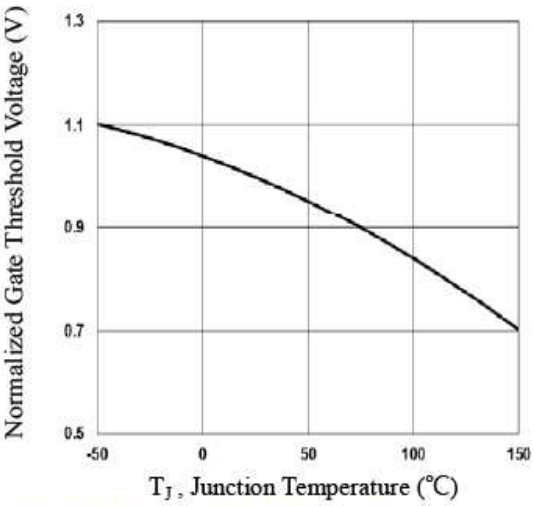



**Fig.3 Normalized $V_{th}$ vs. $T_J$**

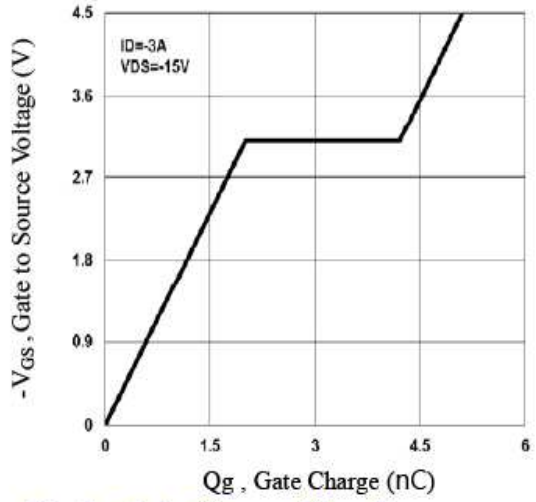



**Fig.4 Gate Charge Waveform**

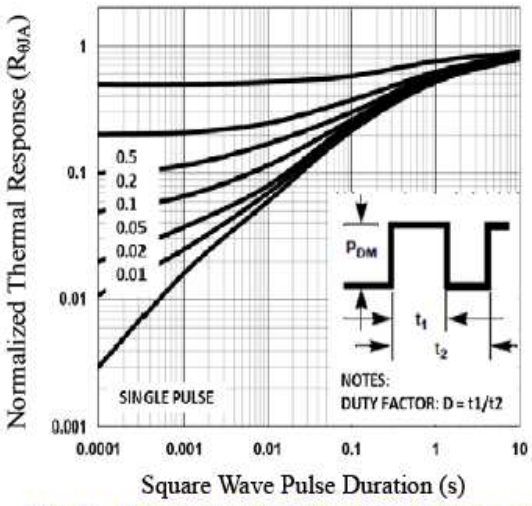



**Fig.5 Normalized Transient Impedance**

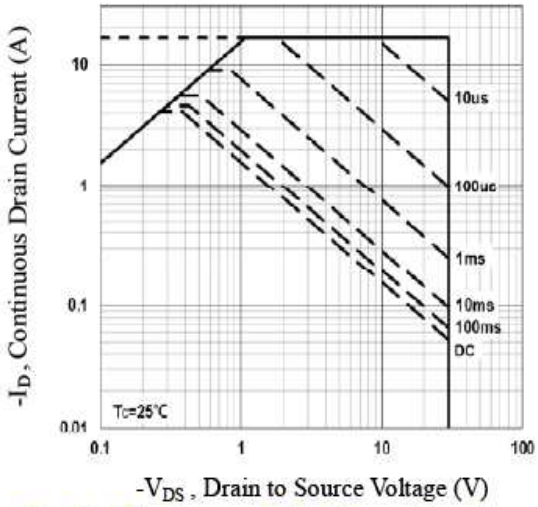
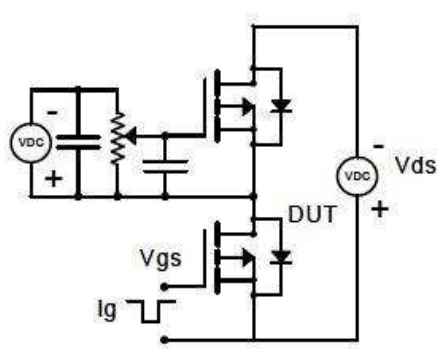
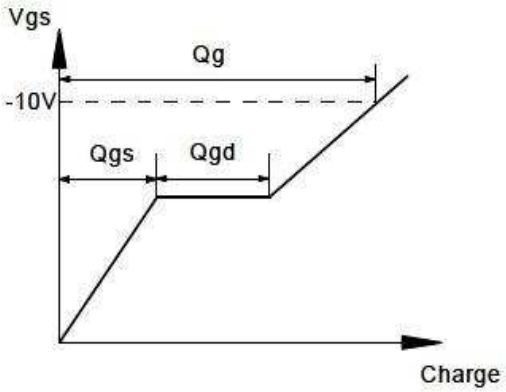



**Fig.6 Maximum Safe Operation Area**

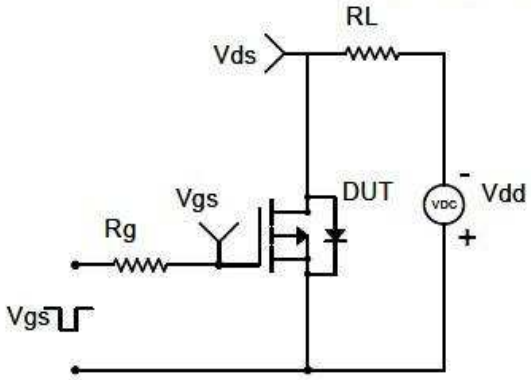
## Typical Performance Characteristics (Continue)

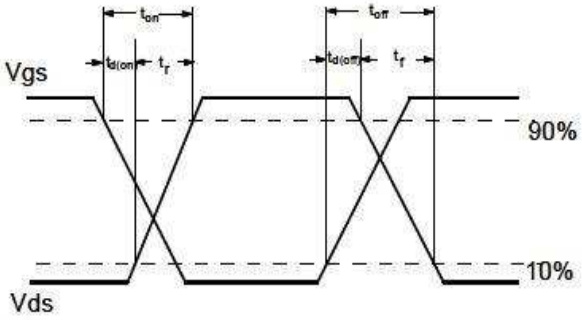
Gate Charge Test Circuit & Waveform



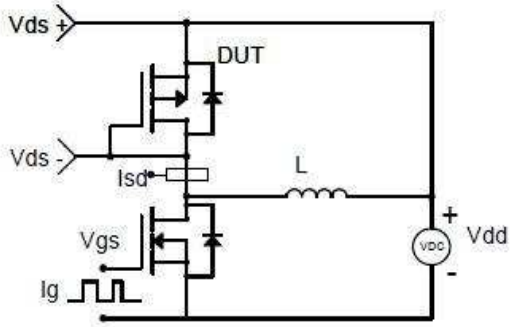



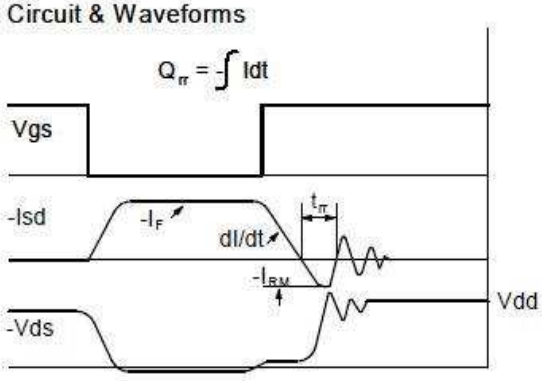

Resistive Switching Test Circuit & Waveforms



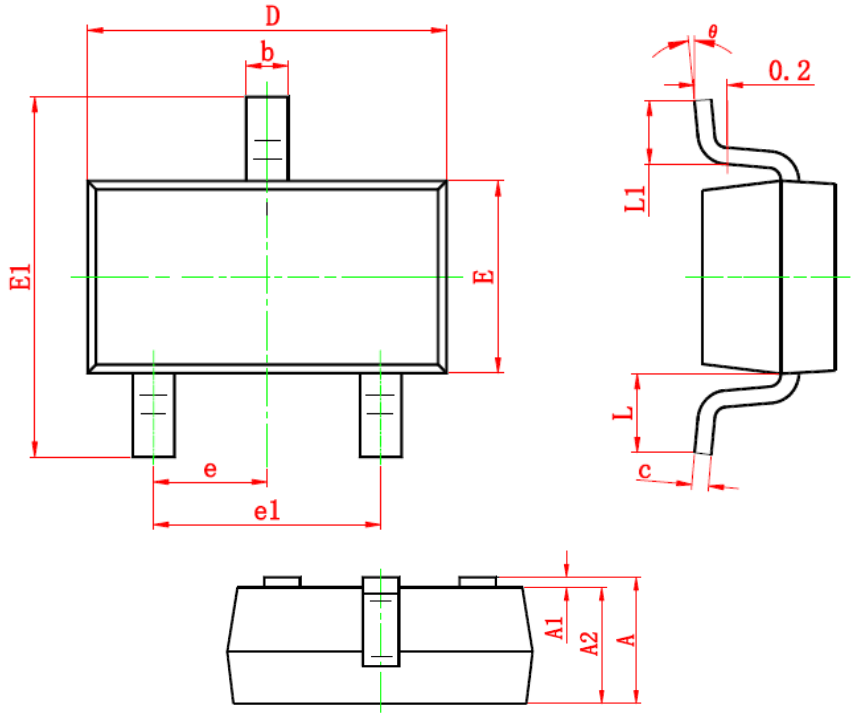

Diode Recovery Test Circuit & Waveforms



## Package Dimension

# SOT-23




| Dimensions | | | | |
|---|---|---|---|---|
| Symbol | Millimeters | | Inches | |
| | Min | Max | Min | Max |
| A | 0.900 | 1.200 | 0.035 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.100 | 0.035 | 0.039 |
| 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 | 0º | 8º | 0º | 6º |

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