# GSM3106ZF

## 30V N-Channel MOSFETs

### Product Description

These N-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

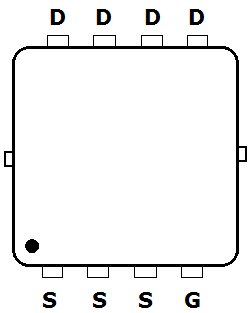
- 30V, 54A, $R_{DS(ON)}$<6mΩ@$V_{GS}$=10V
- High Power and current handing capability
- Lead Free and Green Devices Available
- DFN3x3-8L package design

### Applications

- MB / VGA / Vcore
- POL Applications
- SMPS 2nd SR

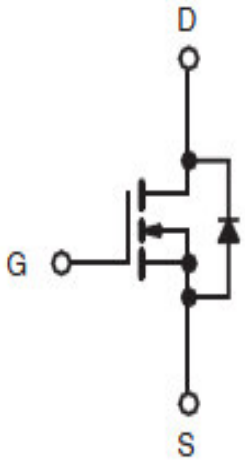
### Packages & Pin Assignments

**GSM3106ZF (DFN3x3-8L)**

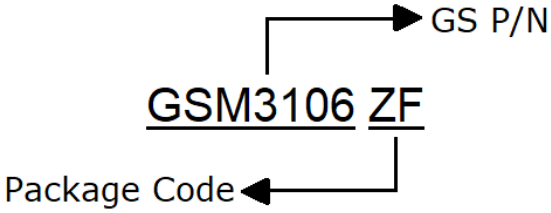



Top View

| Pin | Description |
|---|---|
| 1 | Source |
| 2 | Source |
| 3 | Source |
| 4 | Gate |
| 5 | Drain |
| 6 | Drain |
| 7 | Drain |
| 8 | Drain |

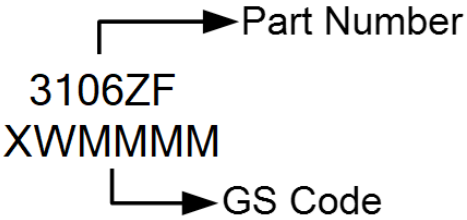


## Ordering Information




| Part Number | Package | Quantity |
|---|---|---|
| GSM3106ZF | DFN3x3-8L | 5000pcs |

## 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 | $T_C$=25℃[1] | 54 | A |
| | | $T_C$=70℃ | 43 | |
| $I_{DM}$ | Pulsed Drain Current[2] | | 80 | A |
| $E_{AS}$ | Single Pulse Avalanche Energy[3] | | 25 | mJ |
| $P_D$ | Power Dissipation $T_C$=25℃ | | 26.6 | W |
| | Power Dissipation $T_C$=70℃ | | 17.1 | W |
| $T_J$ | Operating Junction Temperature Range | | -55 to +150 | ℃ |
| $T_{STG}$ | Storage Temperature Range | | -55 to +150 | ℃ |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | | 4.7 | ℃/W |

Note :
1.The maximum current rating is package limited..
2.Repetitive Rating: Pulse width limited by maximum junctiontemperature.
3.$E_{AS}$ condition: $T_J$=25℃,$V_{DS}$=30V,$V_{GS}$=10V,$R_G$=25Ω, L=0.5mH, Ipeak=24A.

## Electrical Characteristics

$T_A$=25℃ Unless otherwise noted

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static characteristics** | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$=250uA | 30 | | | V |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=250uA | 1.0 | | 2.5 | V |
| $I_{GSS}$ | Gate Leakage Current | $V_{DS}$=0V, $V_{GS}$=±20V | | | ±100 | nA |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=30V, $V_{GS}$=0V | | | 1 | uA |
| $V_{SD}$ | Diode Forward Voltage[3] | $V_{GS}$=0V, $I_S$=2A | | | 1 | V |
| $R_{DS(on)}$ | Drain-Source On-Resistance[3] | $V_{GS}$=10V, $I_D$=20A | | 4.8 | 6 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=10A | | 6.9 | 9 | |
| **Gate charge characteristics** | | | | | | |
| $Q_g$ | Total Gate Charge[3,4] | $V_{DD}$=15V, $I_D$=9A | | 16.7 | | nC |
| $Q_{gs}$ | Gate-Source Charge[3,4] | | | 2.2 | | |
| $Q_{gd}$ | Gate-Drain Charge[3,4] | | | 3.5 | | |
| **Dynamic characteristics** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=15V,$V_{GS}$=0V, f=1.0MHz | | 1155 | | pF |
| $C_{oss}$ | Output Capacitance | | | 456 | | |
| $C_{rss}$ | Reverse Transfer Capacitance | | | 72 | | |
| $t_{d(on)}$ | Turn-On Time | $V_{DD}$=15V, $V_{GS}$=10V, Rg=3Ω, $I_D$=9A | | 3.5 | | ns |
| $t_r$ | Rise Time | | | 5.5 | | |
| $t_{d(off)}$ | Turn-Off Time | | | 13.5 | | |
| $t_f$ | Fall Time | | | 4.6 | | |

## Typical Performance Characteristics

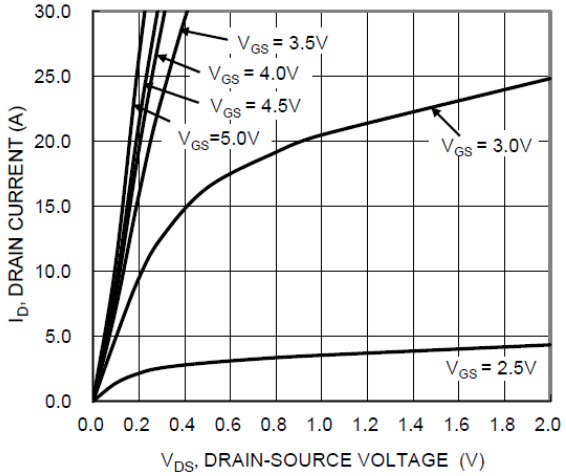



**Figure 1. Output Characteristics**

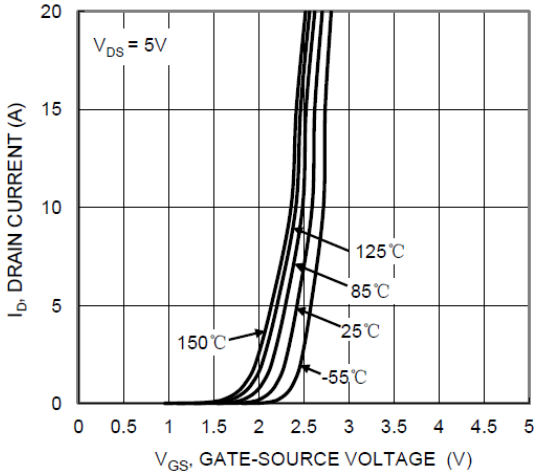



**Figure 2. Transfer Characteristics**

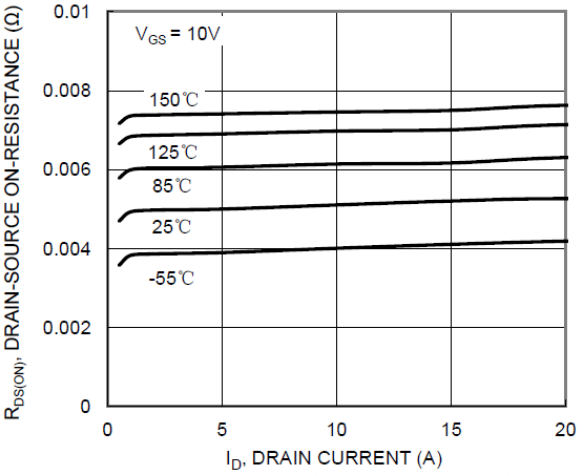



**Figure 3. On-Resistance vs. Drain Current**

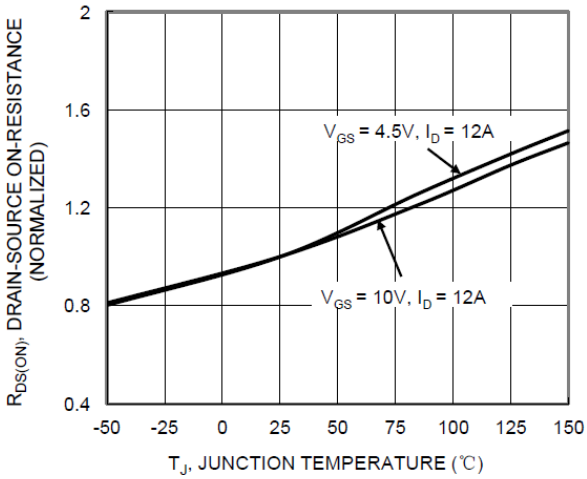



**Figure 4. Normalized $R_{DSON}$ vs. $T_J$**

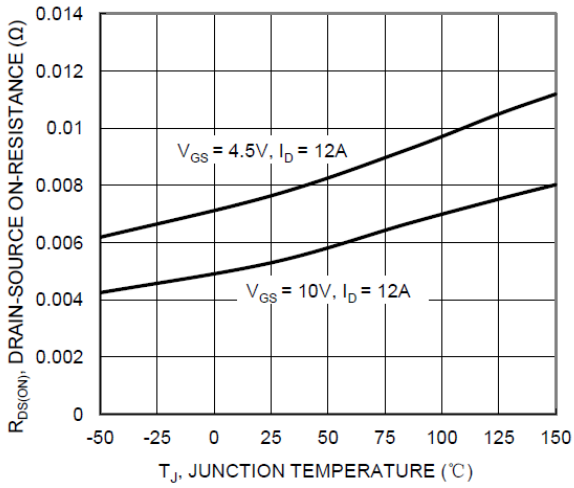



**Figure 5. On-Resistance Variation with Temperature**

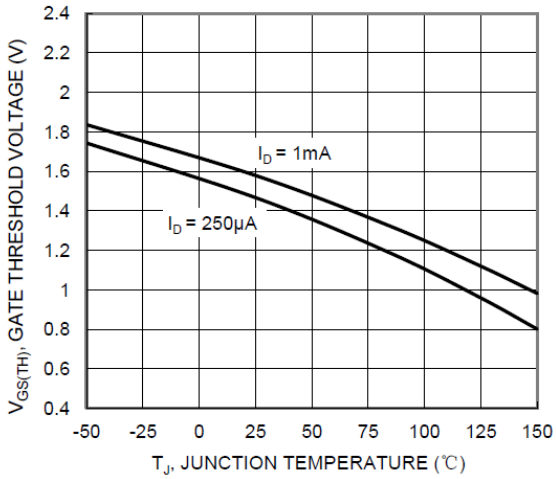



**Figure 6. Gate Threshold Variation vs. $T_J$**

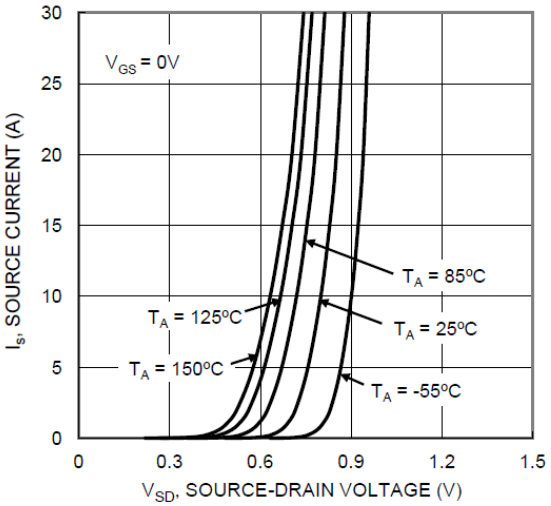



**Figure 7. Diode Forward Voltage vs. Current**

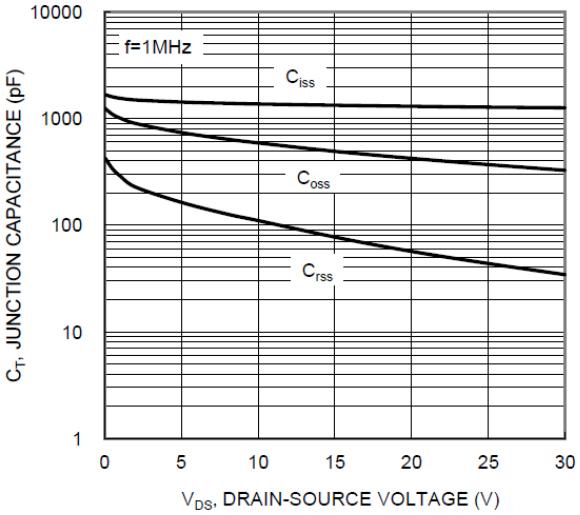



**Figure 8. Capacitance**

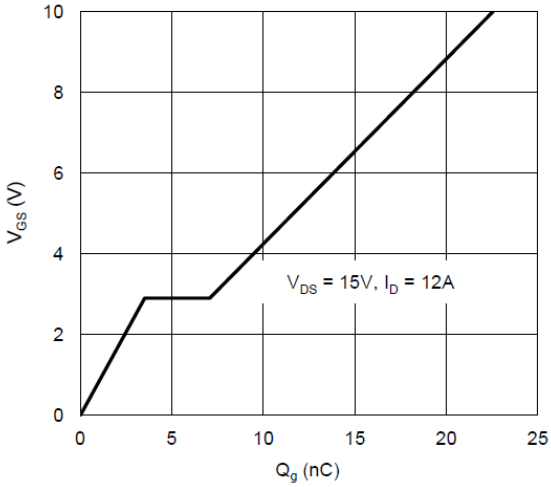



**Figure 9. Gate Charge Waveform**

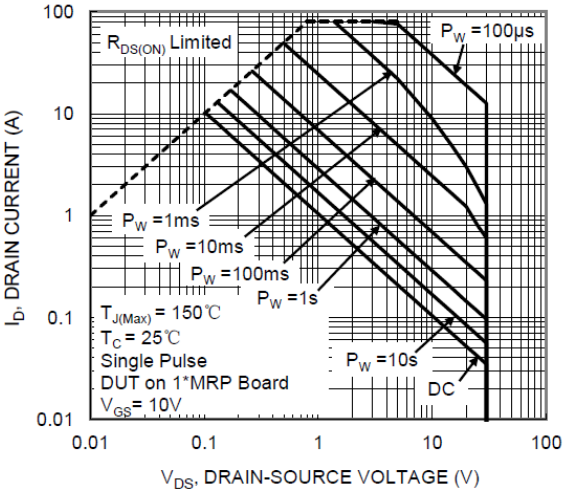



**Figure 10. Maximum Safe Operating Area**

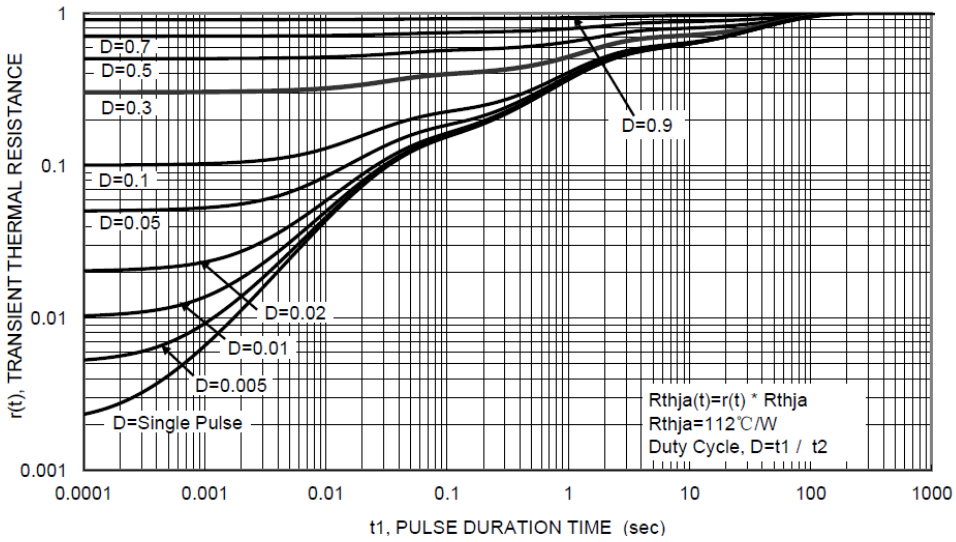
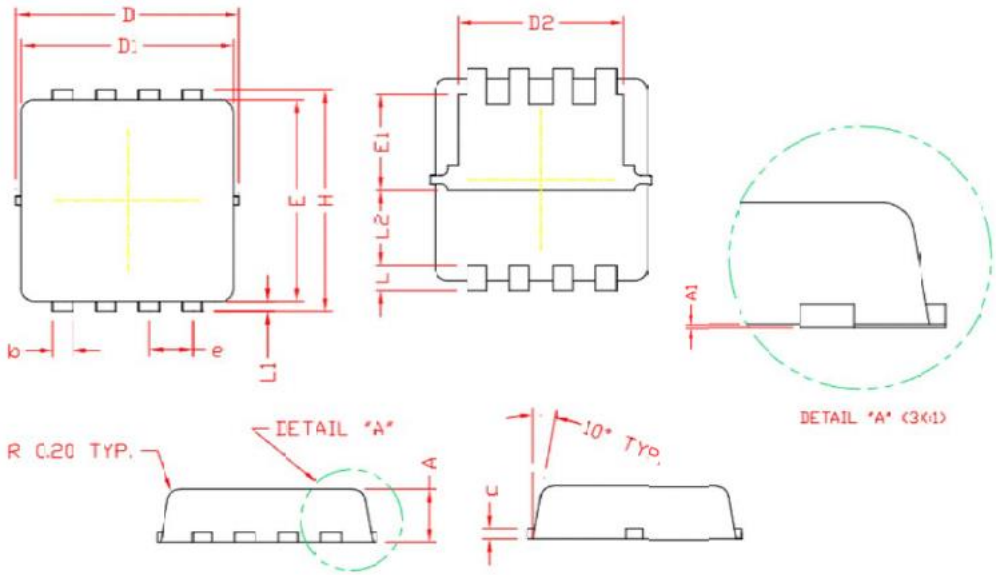



**Figure 11. Normalized Transient Thermal Resistance**

## Package Dimension

# DFN3x3-8L




| Dimensions | | | | |
|---|---|---|---|---|
| SYMBOL | Millimeters | | Inches | |
| | MIN | MAX | MIN | MAX |
| A | 0.700 | 0.900 | 0.028 | 0.035 |
| A1 | 0.000 | 0.050 | 0.000 | 0.002 |
| b | 0.240 | 0.350 | 0.010 | 0.014 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 3.250 | 3.400 | 0.128 | 0.134 |
| D1 | 3.050 | 3.250 | 0.120 | 0.020 |
| D2 | 2.400 | 2.600 | 0.095 | 0.102 |
| E | 3.000 | 3.200 | 0.118 | 0.126 |
| E1 | 1.350 | 1.550 | 0.053 | 0.061 |
| e | 0.650 BSC | | 0.026 BSC | |
| H | 3.200 | 3.400 | 0.126 | 0.134 |
| L | 0.300 | 0.500 | 0.012 | 0.020 |
| L1 | 0.100 | 0.200 | 0.004 | 0.008 |
| L2 | 1.130 REF | | 0.045 REF | |

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