

GSM0964X

100V 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

- 100V, 25A, $R_{DS(ON)}=50m\Omega@V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS guaranteed
- Green Device Available

Applications

- Networking
- Load Switch
- LED Applications

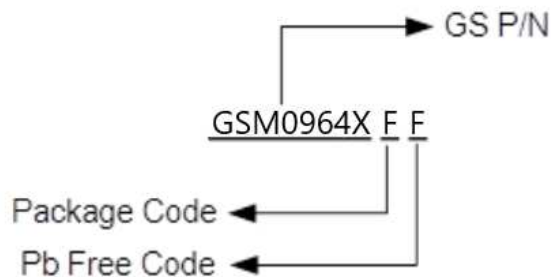
Packages & Pin Assignments

GSM0964XFF (DFN5X6-8L)

Bottom View

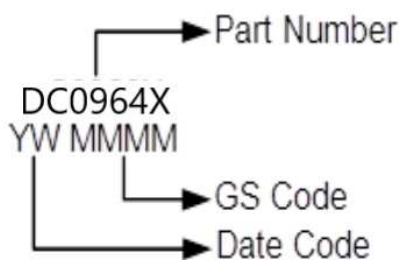
| Pin | Description |
|-----|-------------|
| 1 | Source |
| 2 | Source |
| 3 | Source |
| 4 | Gate |
| 5 | Drain |
| 6 | Drain |
| 7 | Drain |
| 8 | Drain |

Ordering Information



| Part Number | Package | Quantity Reel |
|-------------|-----------|---------------|
| GSM0964XFF | DFN5X6-8L | 3000 PCS |

Marking Information



Absolute Maximum Ratings

$T_C=25^{\circ}\text{C}$ Unless otherwise noted

| Symbol | Parameter | Typical | Unit |
|-----------------|--|---------------------------|-----------------------------|
| V_{DS} | Drain-Source Voltage | 100 | V |
| V_{GS} | Gate –Source Voltage | ± 20 | V |
| I_D | Continuous Drain Current | $T_C=25^{\circ}\text{C}$ | 25 |
| | | $T_C=100^{\circ}\text{C}$ | 15.8 |
| I_{DM} | Pulsed Drain Current ¹ | 100 | A |
| EAS | Single Pulse Avalanche Energy ² | 11.3 | mJ |
| IAS | Single Pulse Avalanche Current ² | 15 | A |
| P_D | Power Dissipation ($T_C=25^{\circ}\text{C}$) | 73.5 | W |
| | Power Dissipation (Derate above 25°C) | 0.59 | W/ $^{\circ}\text{C}$ |
| T_J | Operating Junction Temperature Range | -50 to +150 | $^{\circ}\text{C}$ |
| T_{STG} | Storage Temperature Range | -50 to +150 | $^{\circ}\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance-Junction to Ambient | 62 | $^{\circ}\text{C}/\text{W}$ |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | 1.7 | $^{\circ}\text{C}/\text{W}$ |

Electrical Characteristics

T_J=25°C Unless otherwise noted

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-------------------------------------|---|---|---|------|------|-------|
| Static | | | | | | |
| V _{(BR)DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =250uA | 100 | | | V |
| ΔBV _{DSS} /ΔT _J | BV _{DSS} Temperature Coefficient | Reference to 25°C, I _D =1mA | | 0.09 | | V/°C |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =250uA | 1 | 1.8 | 2.2 | V |
| ΔV _{GS(th)} | V _{GS(th)} Temperature Coefficient | | | -3.7 | | mV/°C |
| I _{GSS} | Gate-Source Leakage Current | V _{DS} =0V, V _{GS} =±20V | | | ±100 | nA |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =100V, V _{GS} =0V | | | 1 | uA |
| | | V _{DS} =80V, V _{GS} =0V, T _J =125°C | | | 10 | |
| I _S | Continuous Source Current | V _G =V _D =0V, Force Current | | | 25 | A |
| I _{SM} | Pulsed Source Current | | | | 50 | |
| R _{DS(on)} | Drain-Source On-Resistance | V _{GS} =10V, I _D =12A | | 42 | 50 | mΩ |
| | | V _{GS} =4.5V, I _D =10A | | 46 | 60 | |
| g _{FS} | Forward Transconductance | V _{DS} =10V, I _D =3A | | 10 | | S |
| V _{SD} | Diode Forward Voltage | V _{GS} =0V, I _S =1A | | | 1 | V |
| Dynamic | | | | | | |
| Q _g | Total Gate Charge ^{3,4} | V _{DS} =80V, V _{GS} =10V, I _D =10A | | 20 | 40 | nC |
| Q _{gs} | Gate-Source Charge ^{3,4} | | | 3.2 | 6.4 | |
| Q _{gd} | Gate-Drain Charge ^{3,4} | | | 5.5 | 11 | |
| C _{iss} | Input Capacitance | V _{DS} =50V, V _{GS} =0V, f=1MHz | | 1290 | 2580 | pF |
| C _{oss} | Output Capacitance | | | 62 | 120 | |
| C _{rss} | Reverse Transfer Capacitance | | | 40 | 80 | |
| t _{d(on)} | Turn-On Time ^{3,4} | V _{DD} =50V, I _D =1A, V _{GS} =10V, R _G =3.3Ω | | 3.1 | 7 | ns |
| t _r | | | | 10.2 | 21 | |
| t _{d(off)} | Turn-Off Time ^{3,4} | | | 18.5 | 38 | |
| t _f | | | | 5.5 | 11 | |
| R _g | Gate Resistance | | V _{DS} =0V, V _{GS} =0V, f=1MHz | | 1.8 | |

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=15A., R_G=25Ω, Starting T_J=25°C.
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

Typical Performance Characteristics

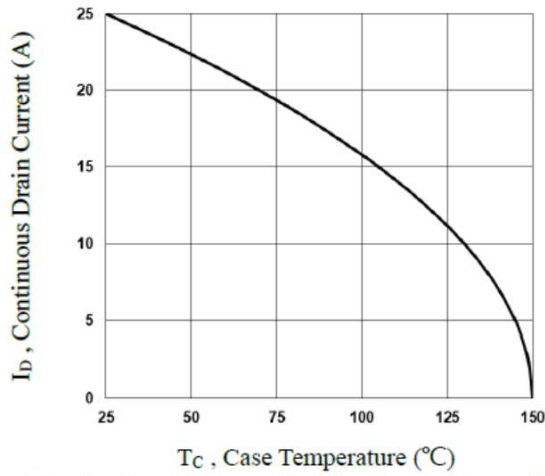


Fig.1 Continuous Drain Current vs. TC

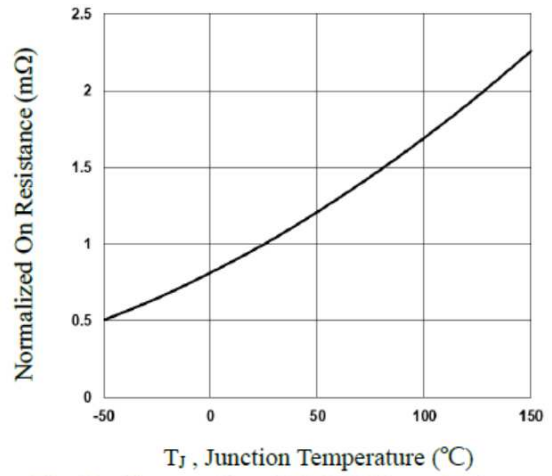


Fig.2 Normalized RDS(on) vs. TJ

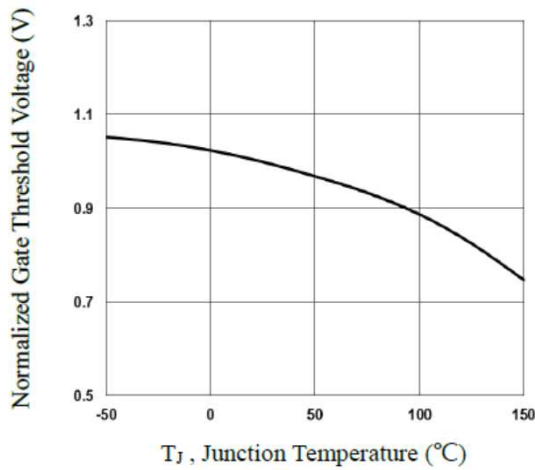


Fig.3 Normalized V_{th} vs. T_J

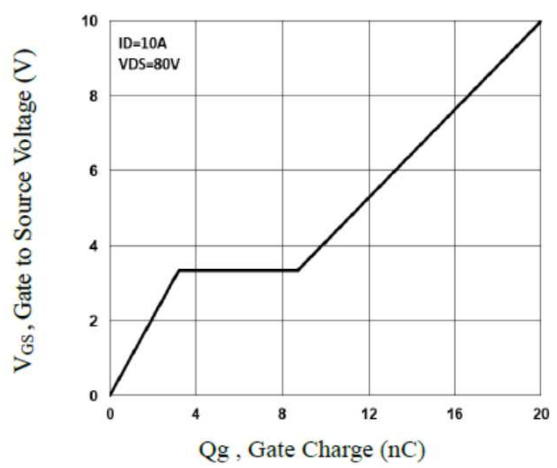


Fig.4 Gate Charge Characteristics

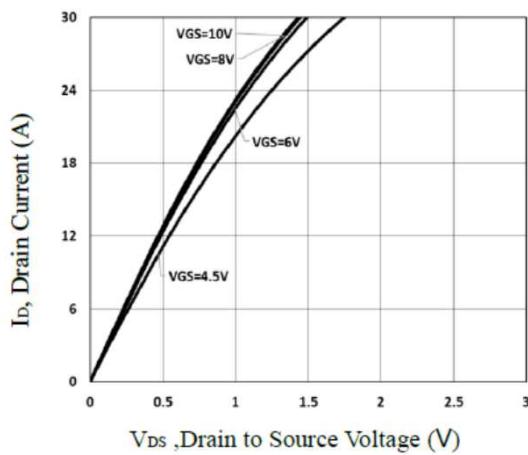


Fig.5 Typical Output Characteristics

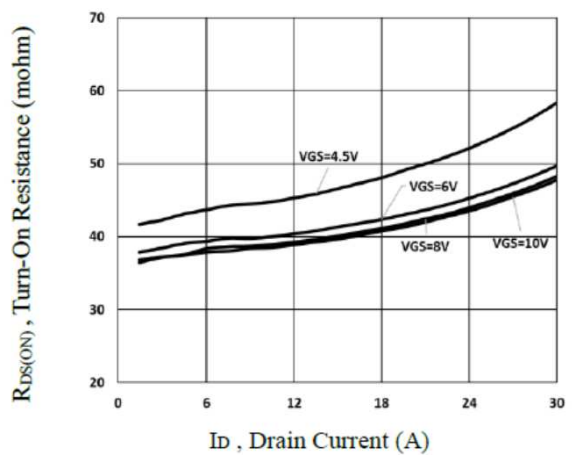


Fig.6 Turn-On Resistance vs. I_D

Typical Performance Characteristics (Continue)

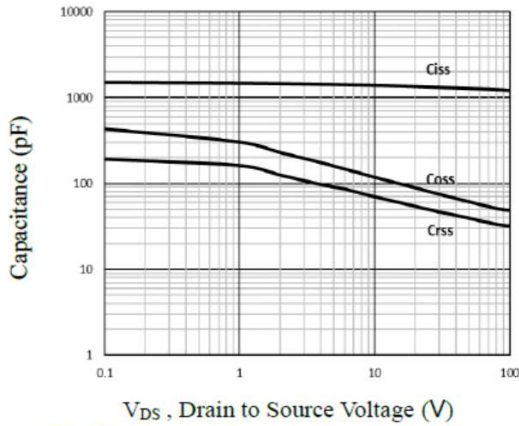


Fig.7 Capacitance Characteristics

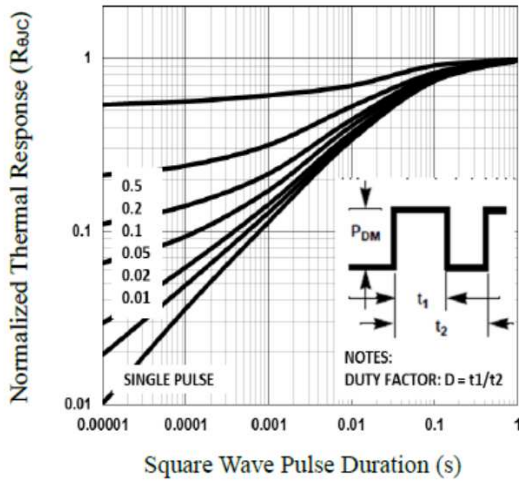


Fig.8 Normalized Transient Impedance

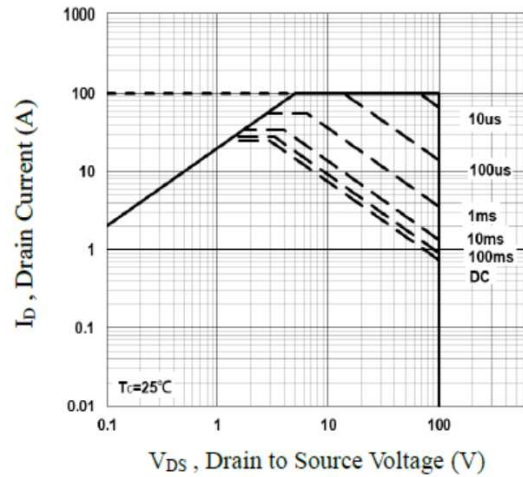


Fig.9 Maximum Safe Operation Area

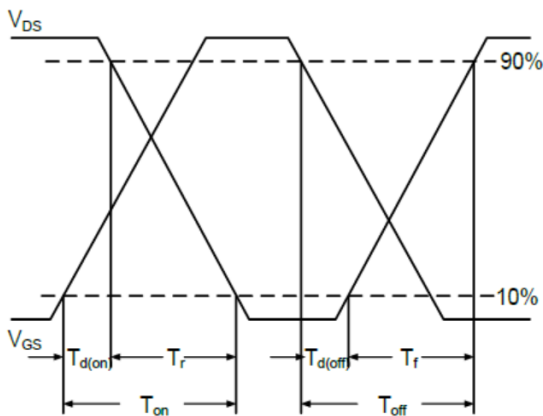


Fig.10 Switching Time Waveform

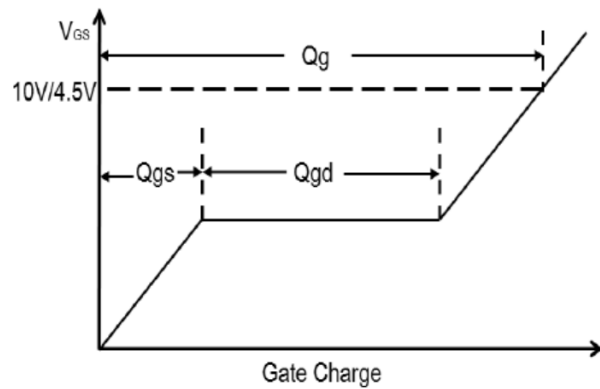
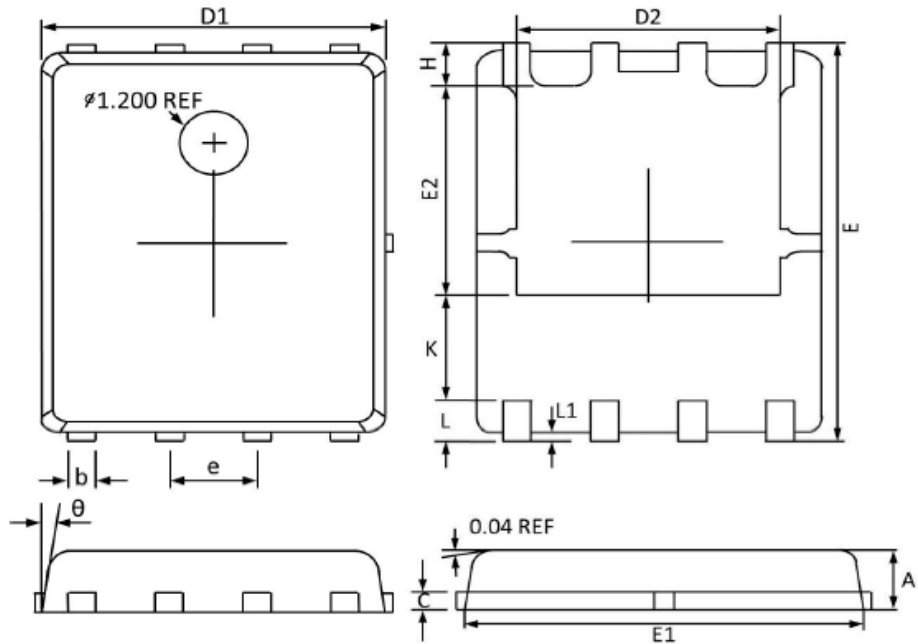


Fig.11 Gate Charge Waveform

Package Dimension

DFN5X6-8L







Dimensions



| Symbol | Millimeters | | Inches | |
|----------------------------|-------------|-------|-------------|-------|
| | Min | Max | Min | Max |
| A | 0.900 | 1.100 | 0.036 | 0.043 |
| b | 0.330 | 0.510 | 0.013 | 0.020 |
| c | 0.200 | 0.300 | 0.008 | 0.011 |
| D1 | 4.800 | 5.100 | 0.189 | 0.201 |
| D2 | 3.610 | 4.100 | 0.142 | 0.161 |
| E | 5.900 | 6.200 | 0.232 | 0.244 |
| E1 | 5.700 | 5.900 | 0.224 | 0.232 |
| E2 | 3.350 | 3.780 | 0.132 | 0.149 |
| e | 1.270 (BSC) | | 0.050 (BSC) | |
| H | 0.410 | 0.700 | 0.016 | 0.028 |
| K | 1.100 | 1.500 | 0.043 | 0.059 |
| L | 0.510 | 0.710 | 0.020 | 0.028 |
| L1 | 0.060 | 0.200 | 0.002 | 0.008 |
| θ | 0° | 12° | 0° | 12° |

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