

GSMDC4903Z

40V 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.

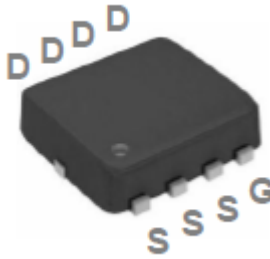
Features

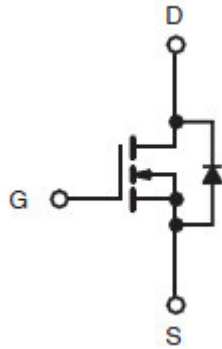
- -40V, -38 A, $R_{DS(ON)}=14\text{ m}\Omega@V_{GS}=-10\text{V}$
- Improved dv/dt capability
- Fast switching
- 100% EAS guaranteed
- Green Device Available
- DFN3X3-8L package design

Applications

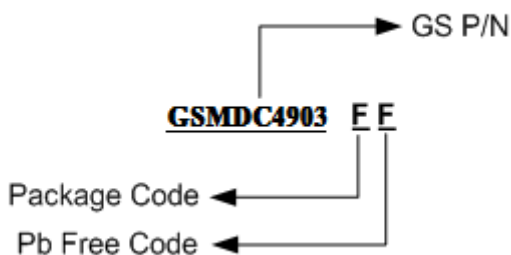
- MB / VGA / Vcore
- Load Switch
- LED applications
- POL Applications

Packages & Pin Assignments

| GSMDC4903ZFF (DFN3X3-8L) | |
|--|-------------|
|  <p>Bottom View</p> | |
| Pin | Description |
| 1 | Source |
| 2 | Source |
| 3 | Source |
| 4 | Gate |
| 5 | Drain |
| 6 | Drain |
| 7 | Drain |
| 8 | Drain |

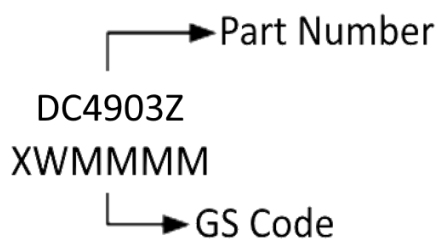


Ordering Information



| Part Number | Package | Quantity |
|--------------|-----------|----------|
| GSMDC4903ZFF | DFN3X3-8L | 3000 PCS |

Marking Information



Absolute Maximum Ratings

T_C=25°C Unless otherwise noted

| Symbol | Parameter | Typical | Unit |
|------------------|--|-----------------------|------|
| V _{DS} | Drain-Source Voltage | -40 | V |
| V _{GS} | Gate –Source Voltage | ±20 | V |
| I _D | Continuous Drain Current | T _C =25°C | -38 |
| | | T _C =100°C | -24 |
| I _{DM} | Pulsed Drain Current (Note 1) | -152 | A |
| EAS | Single Pulse Avalanche Energy (Note 2) | 130 | mJ |
| IAS | Single Pulse Avalanche Current (Note 2) | 51 | A |
| P _D | Power Dissipation (T _C =25°C) | 52 | W |
| | Power Dissipation (Derate above 25°C) | 0.42 | W/°C |
| T _J | Operating Junction Temperature Range | -55 to +150 | °C |
| T _{STG} | Storage Temperature Range | -55 to +150 | °C |
| R _{θJA} | Thermal Resistance-Junction to Ambient | 62 | °C/W |
| R _{θJC} | Thermal Resistance-Junction to Case | 2.4 | °C/W |

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=51A., R_G=25Ω, Starting T_J=25°C

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 | -40 | | | V |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =-250uA | -1.0 | -1.6 | -2.5 | V |
| I _{GSS} | Gate Leakage Current | V _{DS} =0V, V _{GS} =±20V | | | ±100 | nA |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =-40V, V _{GS} =0V | | | -1 | uA |
| | | V _{DS} =-32V, V _{GS} =0V, T _J =125°C | | | -10 | |
| I _S | Continuous Source Current | V _G =V _D =0V, Force Current | | | -38 | A |
| I _{SM} | Pulsed Source Current | | | | -76 | |
| R _{DS(on)} | Drain-Source On-Resistance | V _{GS} =-10V, I _D =-15A | | 11.3 | 14 | mΩ |
| | | V _{GS} =-4.5V, I _D =-8A | | 15.6 | 21 | |
| g _{Fs} | Forward Transconductance | V _{DS} =-10V, I _D =-4A | | 11 | | S |
| V _{SD} | Diode Forward Voltage | V _{GS} =0V, I _S =-1A | | | -1 | V |
| Dynamic | | | | | | |
| Q _g | Total Gate Charge (Note 3,4) | V _{DS} =-32V, V _{GS} =-4.5V, I _D =-10A | | 22.2 | 40 | nC |
| Q _{gs} | Gate-Source Charge (Note 3,4) | | | 8.2 | 16 | |
| Q _{gd} | Gate-Drain Charge (Note 3,4) | | | 8.8 | 16 | |
| C _{iss} | Input Capacitance | V _{DS} =-25V, V _{GS} =0V, f=1MHz | | 2757 | 4000 | pF |
| C _{oss} | Output Capacitance | | | 240 | 360 | |
| C _{rss} | Reverse Transfer Capacitance | | | 46 | 90 | |
| t _{d(on)} | Turn-On Time (Note 3,4) | V _{DD} =-20V, I _D =-1A, V _{GS} =-10V, R _G =6Ω | | 23 | 40 | ns |
| t _r | | | | 10 | 20 | |
| t _{d(off)} | Turn-Off Time (Note 3,4) | | | 135 | 250 | |
| t _f | | | | 46 | 90 | |

Note 3: The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%

Note 4: Essentially independent of operating temperature.

Typical Performance Characteristics

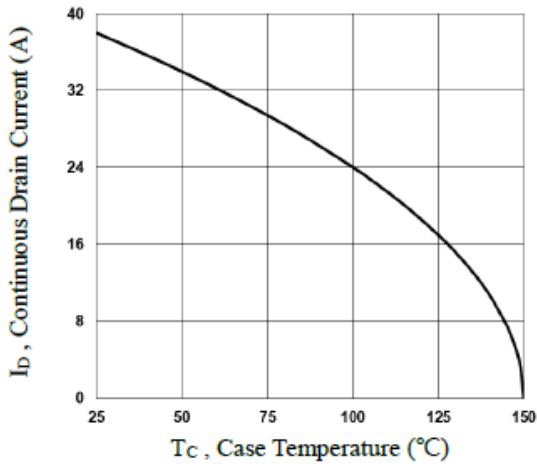


Fig.1 Continuous Drain Current vs. T_c

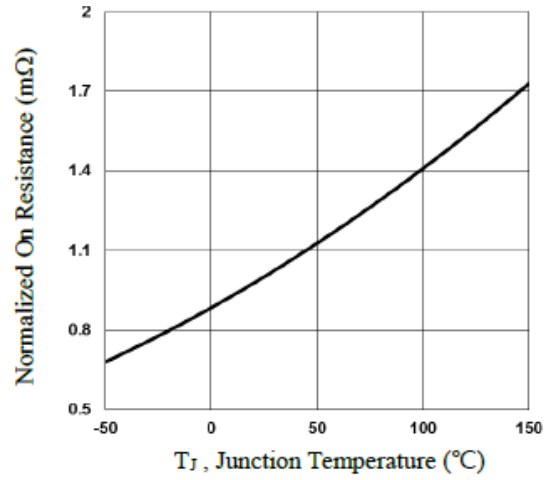


Fig.2 Normalized RD_{SON} vs. T_j

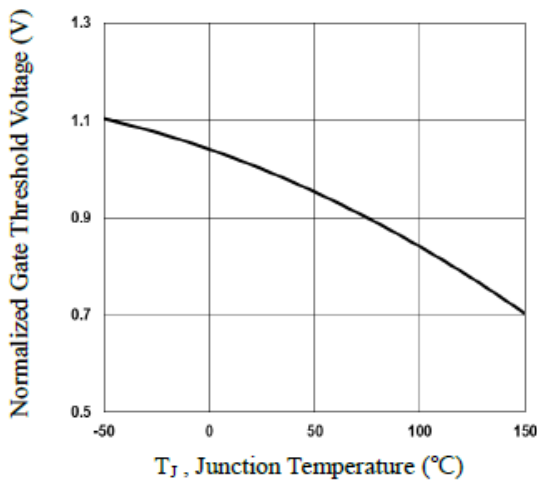


Fig.3 Normalized V_{th} vs. T_j

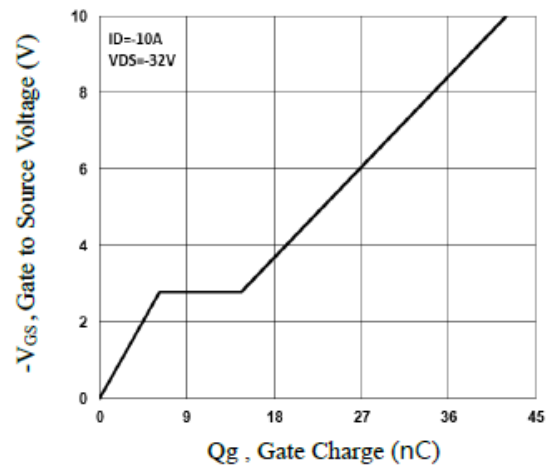


Fig.4 Gate Charge Waveform

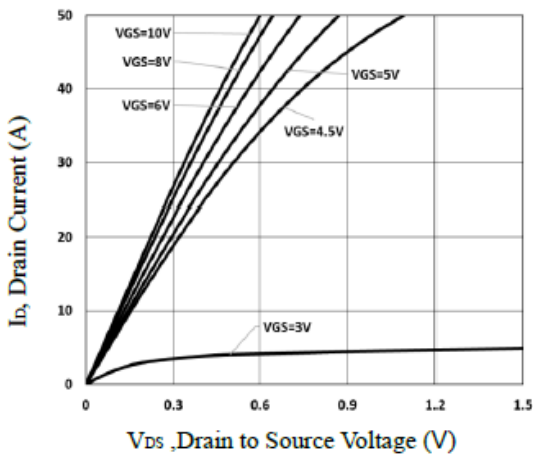


Fig.5 Typical Output Characteristics

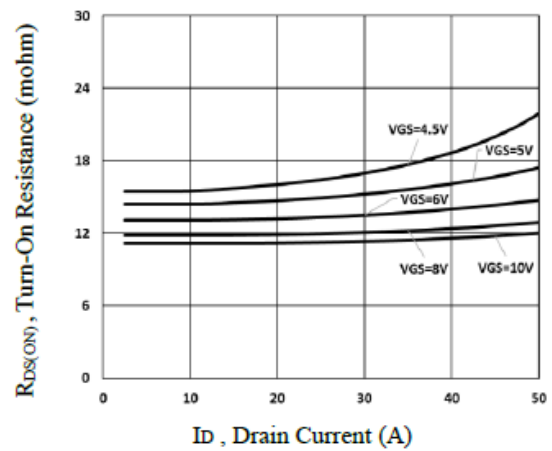


Fig.6 Turn-On Resistance vs. I_D

Typical Performance Characteristics(continue)

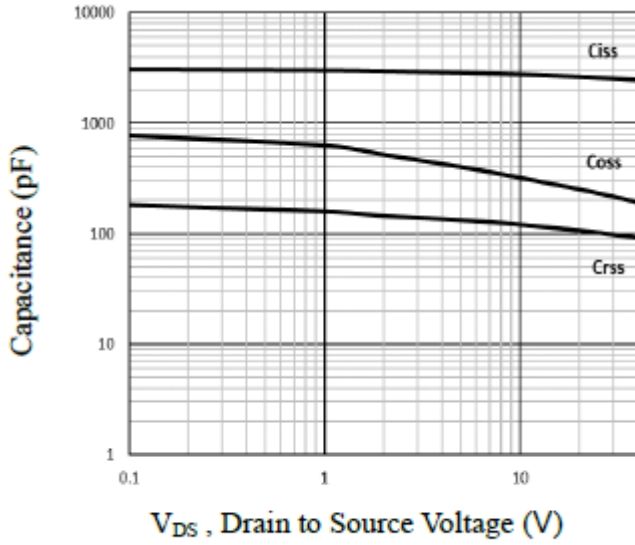


Fig.7 Capacitance Characteristics

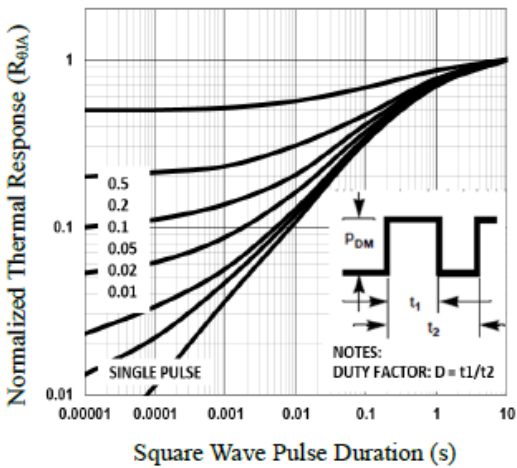


Fig.8 Normalized Transient Impedance

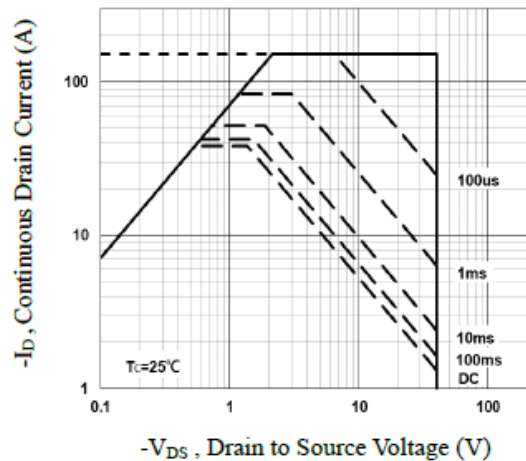


Fig.9 Maximum Safe Operation Area

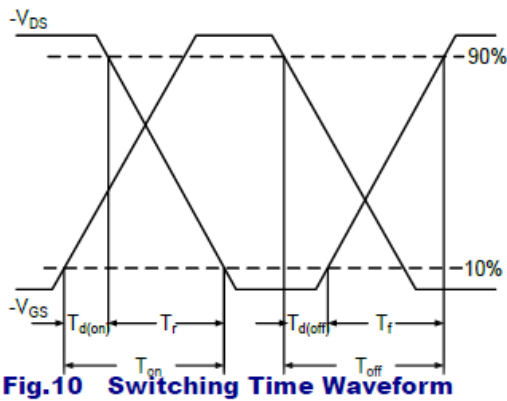


Fig.10 Switching Time Waveform

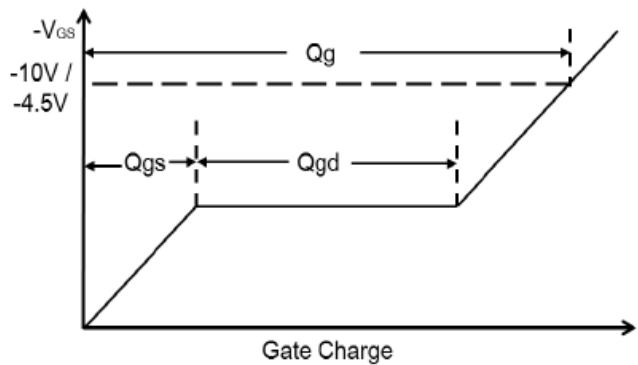
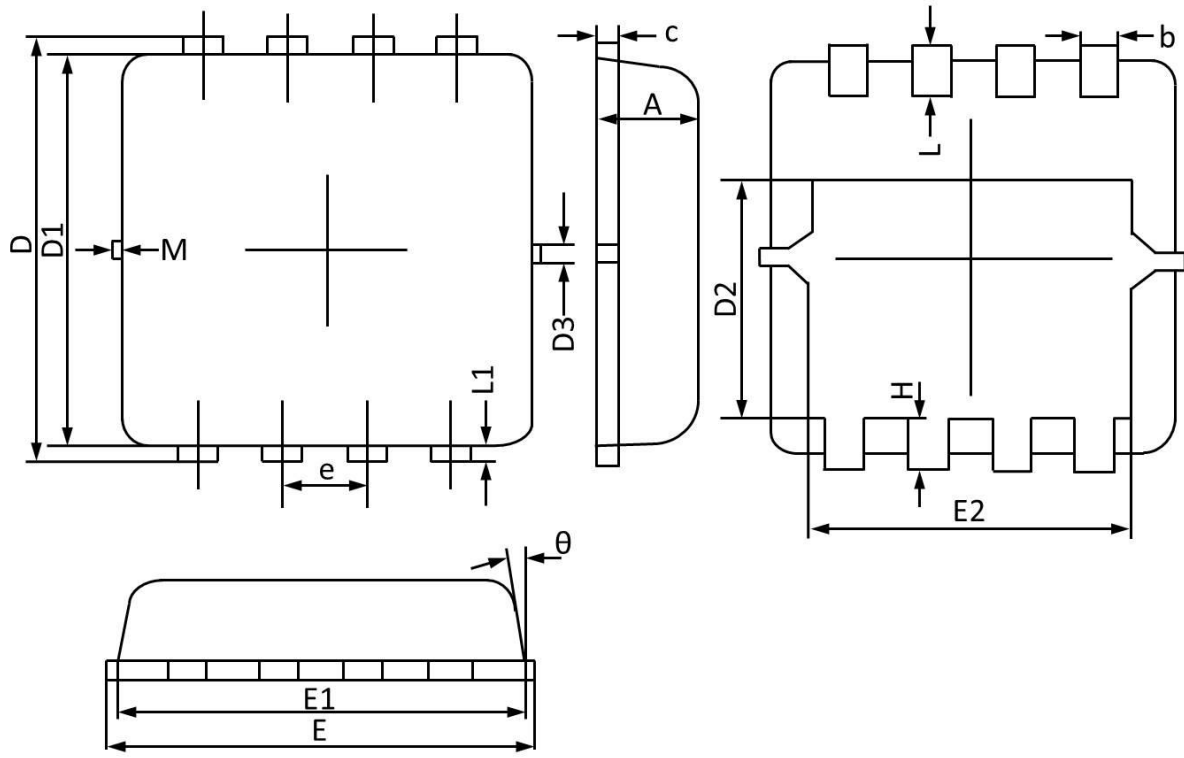


Fig.11 Gate Charge Waveform

Package Dimension

DFN3X3-8L









| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|----------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.700 | 0.800 | 0.028 | 0.031 |
| b | 0.250 | 0.350 | 0.010 | 0.013 |
| c | 0.100 | 0.250 | 0.004 | 0.009 |
| D | 3.250 | 3.450 | 0.128 | 0.135 |
| D1 | 3.000 | 3.200 | 0.119 | 0.125 |
| D2 | 1.780 | 1.980 | 0.070 | 0.077 |
| D3 | 0.130 REF | | 0.005 REF | |
| E | 3.200 | 3.400 | 0.126 | 0.133 |
| E1 | 3.000 | 3.200 | 0.119 | 0.125 |
| E2 | 2.390 | 2.590 | 0.094 | 0.102 |
| e | 0.650 BSC | | 0.026 BSC | |
| H | 0.300 | 0.500 | 0.011 | 0.019 |
| L | 0.300 | 0.500 | 0.011 | 0.019 |
| L1 | 0.130 REF | | 0.005 REF | |
| θ | 0° | 12° | 0° | 12° |
| M | 0.150 REF | | 0.006 REF | |

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