

GSM1413

20V P-Channel Enhancement Mode MOSFET

Product Description

GSM1413, P-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

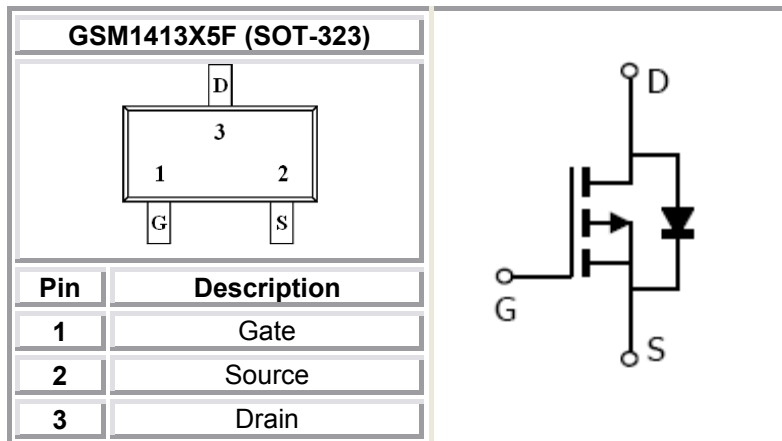
Features

- -20V/-3.0A , $R_{DS(ON)}= 125m\Omega@V_{GS}=-4.5V$
- -20V/-2.4A , $R_{DS(ON)}= 160m\Omega@V_{GS}=-2.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-323(SC-70) package design

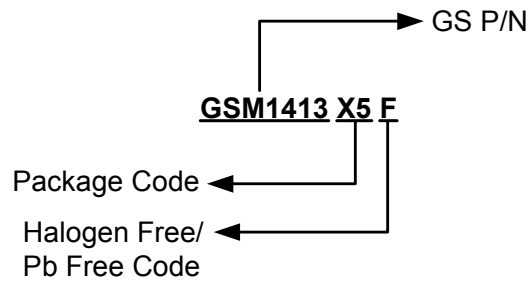
Applications

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- Net Working System

Packages & Pin Assignments

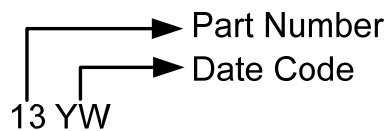


Ordering Information



| Part Number | Package | Quantity |
|-------------|---------|----------|
| GSM1413X5F | SOT-323 | 3000 PCS |

Marking Information



Absolute Maximum Ratings

T_A=25°C Unless otherwise noted

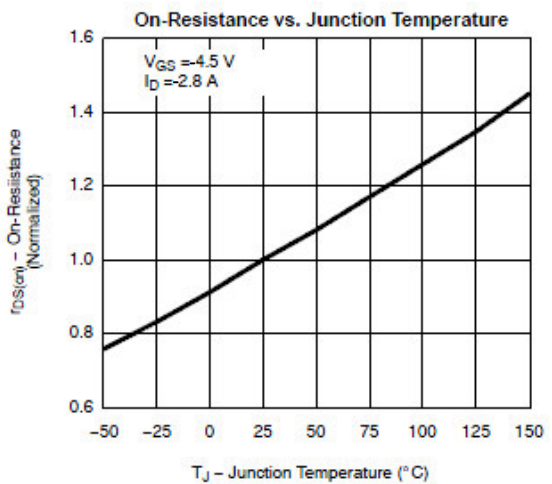
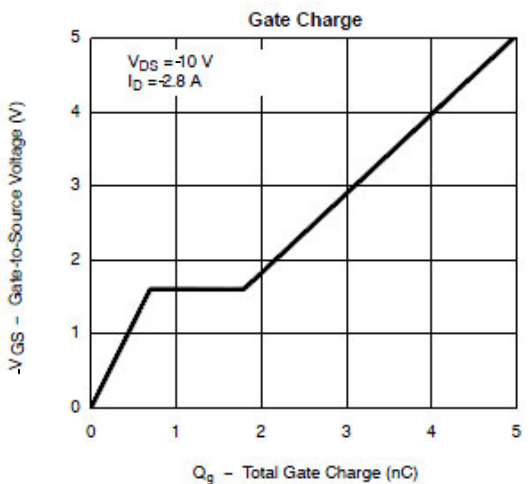
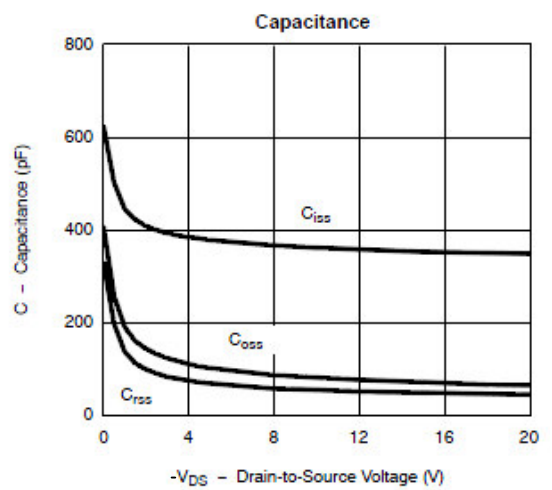
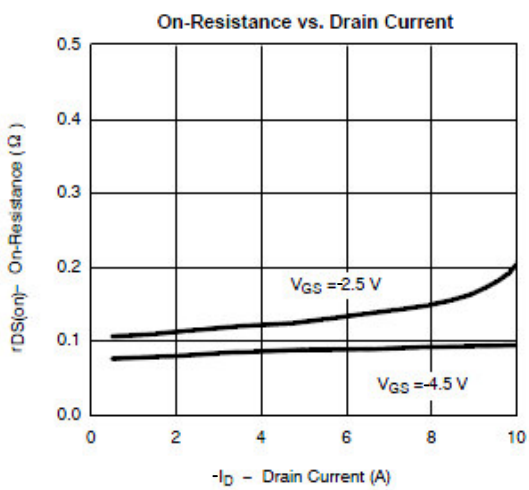
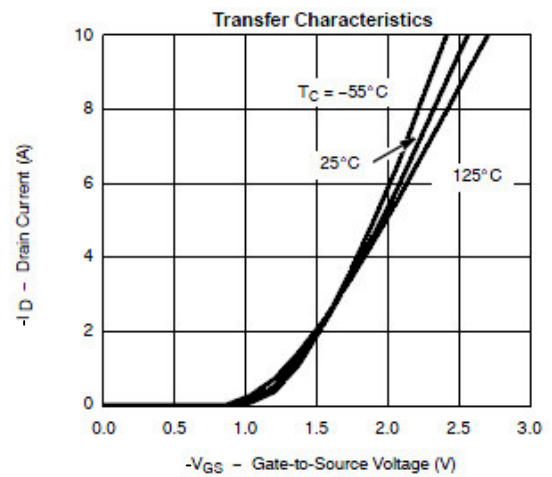
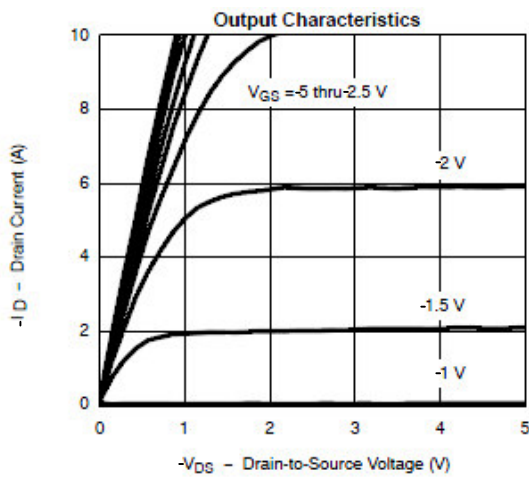
| Symbol | Parameter | Typical | Unit |
|------------------|---|----------------------|-------|
| V _{DSS} | Drain-Source Voltage | -20 | V |
| V _{GSS} | Gate-Source Voltage | ±12 | V |
| I _D | Continuous Drain Current(T _J =150°C) | T _A =25°C | -3.0 |
| | | T _A =70°C | -2.4 |
| I _{DM} | Pulsed Drain Current | -10 | A |
| I _S | Continuous Source Current(Diode Conduction) | -1.6 | A |
| P _D | Power Dissipation | T _A =25°C | 0.35 |
| | | T _A =70°C | 0.22 |
| T _J | Operating Junction Temperature | 150 | °C |
| T _{STG} | Storage Temperature Range | -55/150 | °C |
| R _{θJA} | Thermal Resistance-Junction to Ambient | 120 | °C/ W |

Electrical Characteristics

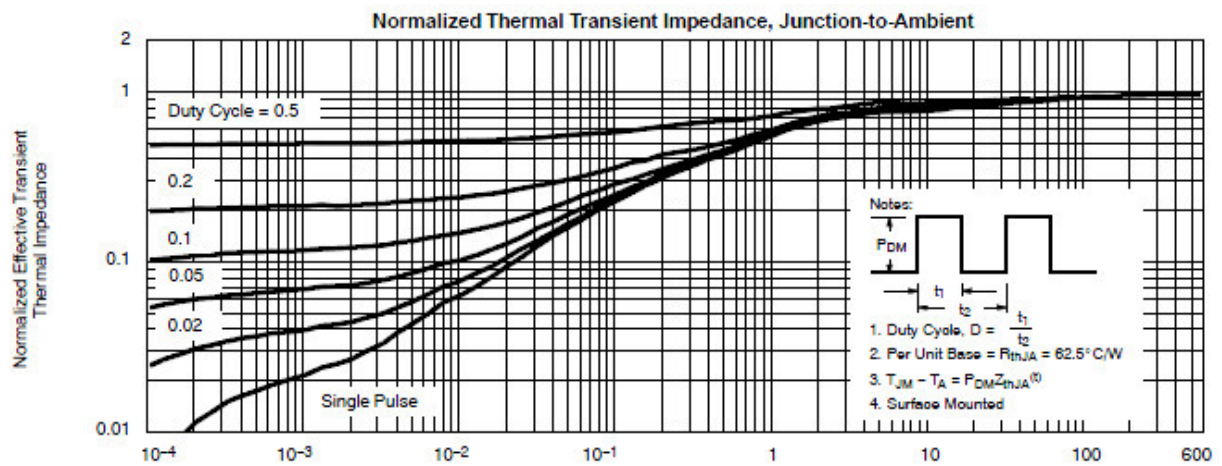
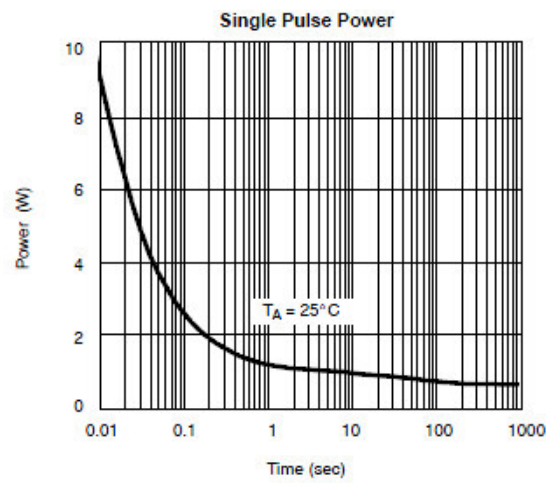
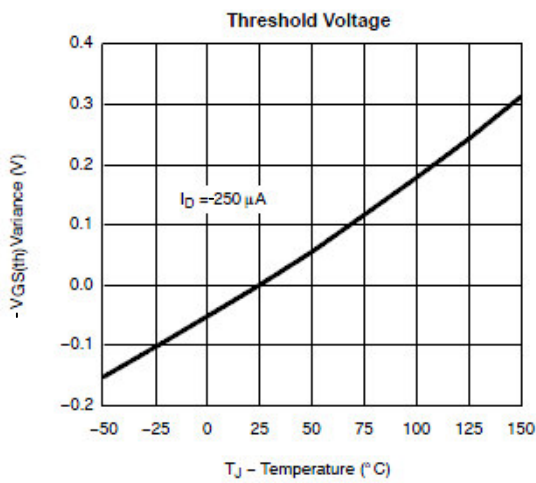
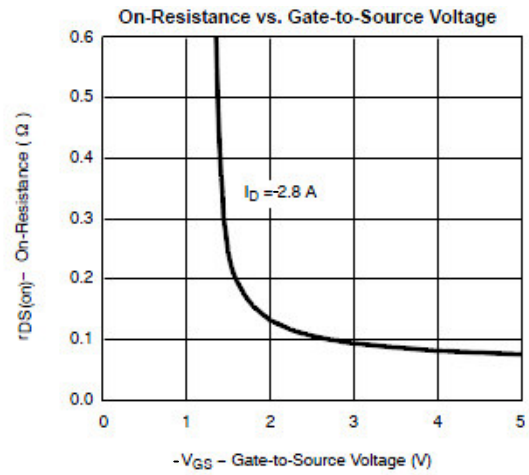
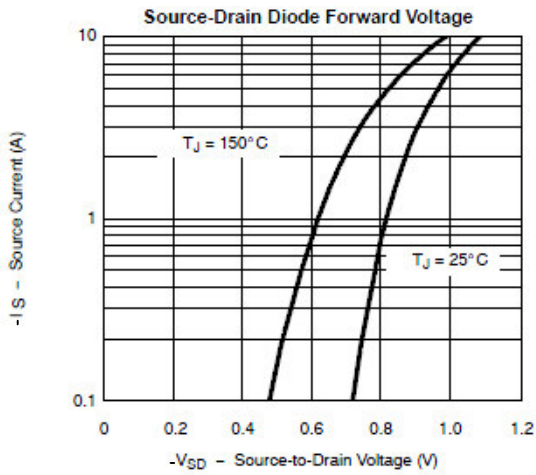
T_A=25°C unless otherwise noted

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------------------|---------------------------------|--|------|-------|------|------|
| Static | | | | | | |
| V _{(BR)DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =-250uA | -20 | | | V |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =-250uA | -0.4 | | -0.9 | V |
| I _{GSS} | Gate Leakage Current | V _{DS} =0V, V _{GS} =±12V | | | ±100 | nA |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} = -16V, V _{GS} =0V | | | -1 | uA |
| | | V _{DS} = -16V, V _{GS} =0V, T _J =85°C | | | -30 | |
| I _{D(on)} | On-State Drain Current | V _{DS} ≤ -5V, V _{GS} =-4.5V | -6 | | | A |
| | | V _{DS} ≤ -5V, V _{GS} =-2.5V | -3 | | | |
| R _{DS(on)} | Drain-Source On-Resistance | V _{GS} =-4.5V, I _D =-3.0A | | 115 | 125 | mΩ |
| | | V _{GS} =-2.5V, I _D =-2.4A | | 140 | 160 | |
| g _{fs} | Forward Transconductance | V _{DS} =-5V, I _D =-2.8A | | 6.5 | | S |
| V _{SD} | Diode Forward Voltage | I _S =-1.25A, V _{GS} =0V | | -0.75 | -1.3 | V |
| Dynamic | | | | | | |
| C _{iSS} | Input Capacitance | V _{DS} =-6V, V _{GS} =0V, f=1MHz | | 415 | | pF |
| C _{oss} | Output Capacitance | | | 223 | | |
| C _{rSS} | Reverse Transfer Capacitance | | | 87 | | |
| Q _g | Total Gate Charge | V _{DS} =-6V, V _{GS} =-4.5V, I _D =-2.8A | | 5.8 | 10 | nC |
| Q _{gs} | Gate-Source Charge | | | 0.85 | | |
| Q _{gd} | Gate-Drain Charge | | | 1.7 | | |
| t _{d(on)} | Turn-On Time | V _{DD} =-6V, R _L =6Ω, I _D =-1.0A, V _{GEN} =-4.5V, R _G =6Ω | | 13 | 25 | ns |
| t _r | | | | 36 | 60 | |
| t _{d(off)} | Turn-Off Time | | | 42 | 70 | |
| t _f | | | | 34 | 60 | |

Typical Performance Characteristics

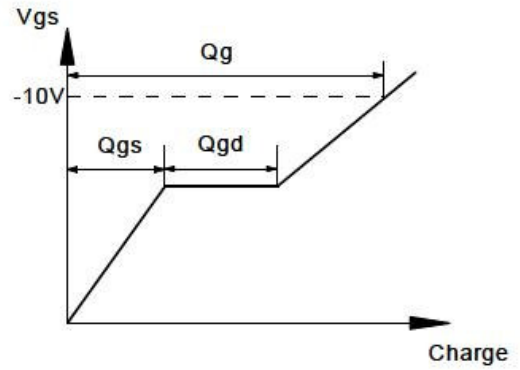
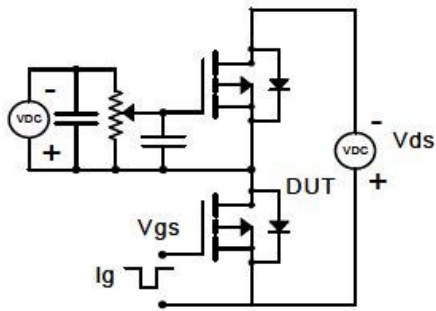


Typical Characteristics

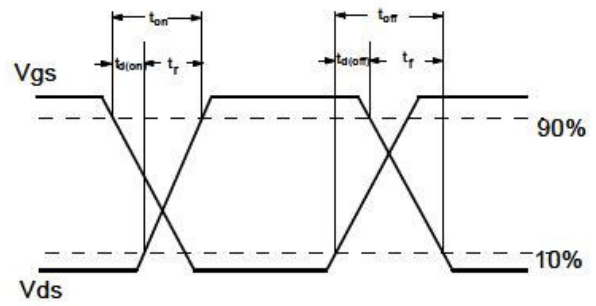
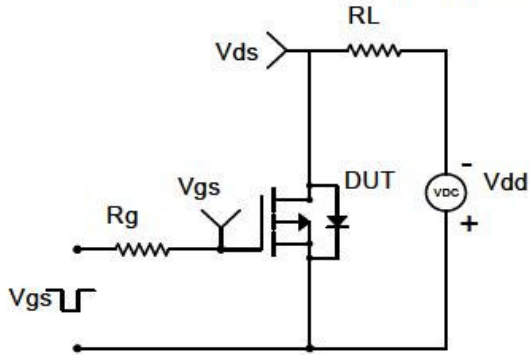


Typical Characteristics

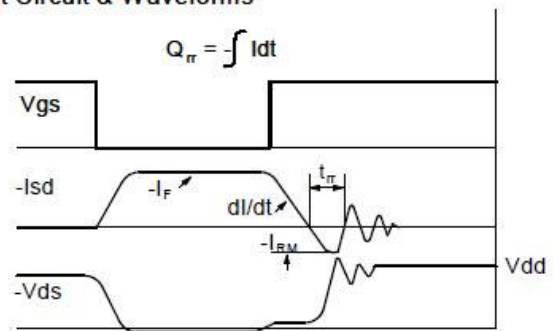
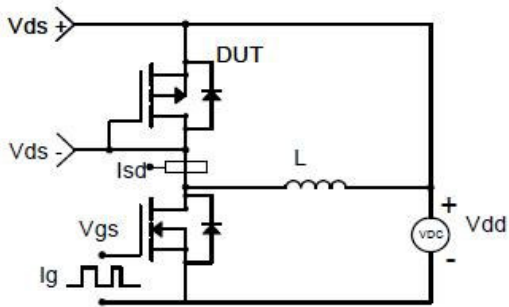
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

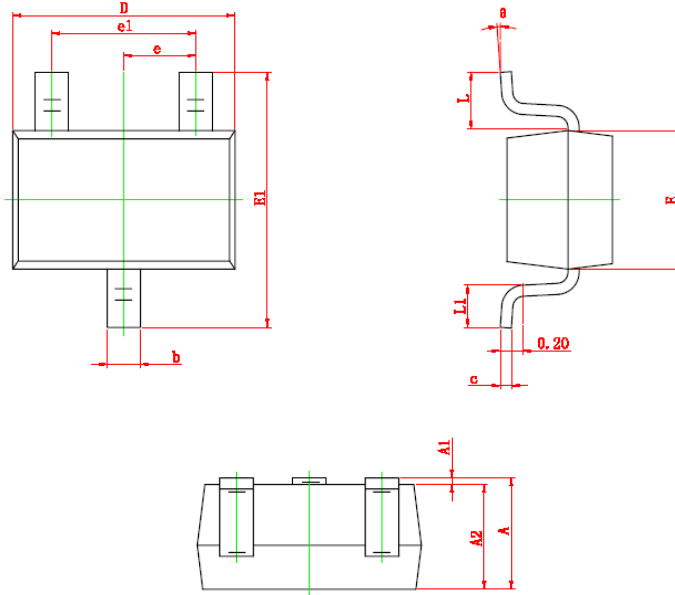


Diode Recovery Test Circuit & Waveforms



Package Dimension

SOT-323 PLASTIC PACKAGE







| Dimensions | | | | |
|------------|-------------|-------|-----------|-------|
| Symbol | Millimeters | | Inches | |
| | Min | Max | Min | Max |
| A | 0.900 | 1.100 | 0.035 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.000 | 0.035 | 0.039 |
| b | 0.200 | 0.400 | 0.008 | 0.016 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.000 | 2.200 | 0.079 | 0.087 |
| E | 1.150 | 1.350 | 0.045 | 0.053 |
| E1 | 2.150 | 2.450 | 0.085 | 0.096 |
| e | 0.650 TYP | | 0.026 TYP | |
| e1 | 1.200 | 1.400 | 0.047 | 0.055 |
| L | 0.525 REF | | 0.021 REF | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| θ | 0° | 8° | 0° | 8° |



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