

G SMBSS139K

60V 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.

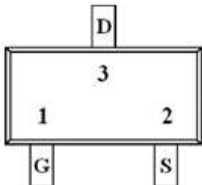
Features

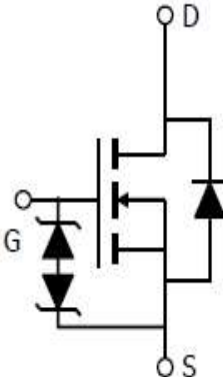
- 60V, 0.2A, $R_{DS(ON)}=2.5\Omega@V_{GS}=4.5V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available
- SOT-523 Package Design
- ESD Protected : 1500V

Applications

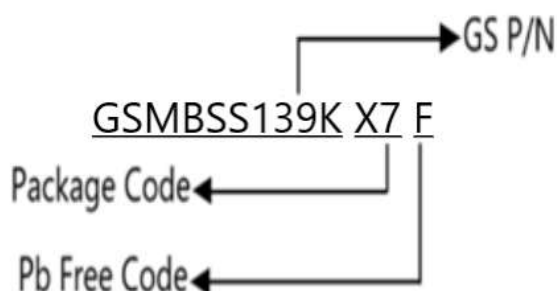
- Notebook
- Load Switch
- LED Applications

Packages & Pin Assignments

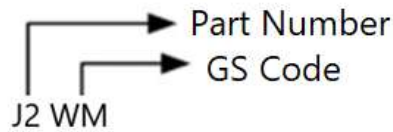
| G SMBSS139KX7F (SOT-523) | |
|--|-------------|
|  <p>Top Views</p> | |
| Pin | Description |
| 1 | Gate |
| 2 | Source |
| 3 | Drain |



Ordering Information



Marking Information



| Part Number | Package | Part Marking | Quantity |
|----------------|---------|--------------|----------|
| G SMBSS139KX7F | SOT-523 | J2WM | 3000pcs |

Absolute Maximum Ratings

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

| Symbol | Parameter | Limits | Unit |
|-----------------|--|-------------|-----------------------------|
| V_{DS} | Drain-Source Voltage | 60 | V |
| V_{GS} | Gate-Source Voltage | ± 20 | V |
| I_D | Continuous Drain Current $T_A=25^{\circ}\text{C}$ | 0.2 | A |
| I_{DM} | Pulsed Drain Current | 0.8 | A |
| P_D | Power Dissipation ($T_A=25^{\circ}\text{C}$) | 0.225 | W |
| | Power Dissipation (Derate above 25°C) | 0.0018 | W/ $^{\circ}\text{C}$ |
| T_J | Operating Junction Temperature Range | -55 to +150 | $^{\circ}\text{C}$ |
| T_{STG} | Storage Temperature Range | -55 to +150 | $^{\circ}\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance-Junction to Ambient | 556 | $^{\circ}\text{C}/\text{W}$ |
| TL | Maximum Lead Temperature for Soldering Purpose, for 10 Seconds | 260 | $^{\circ}\text{C}$ |

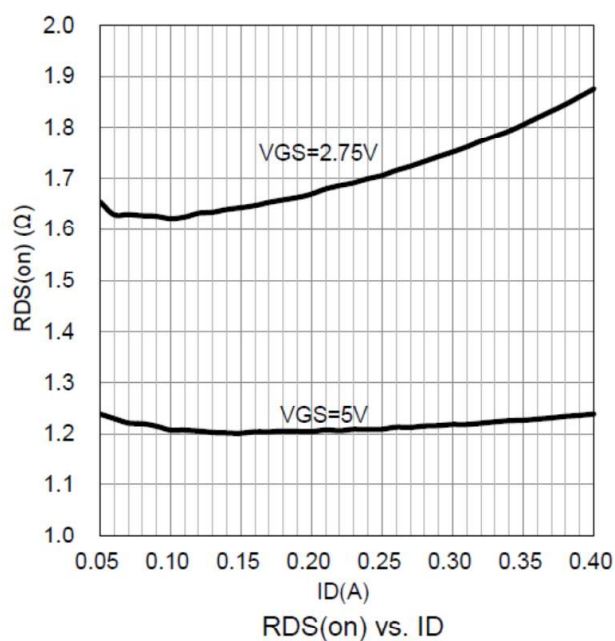
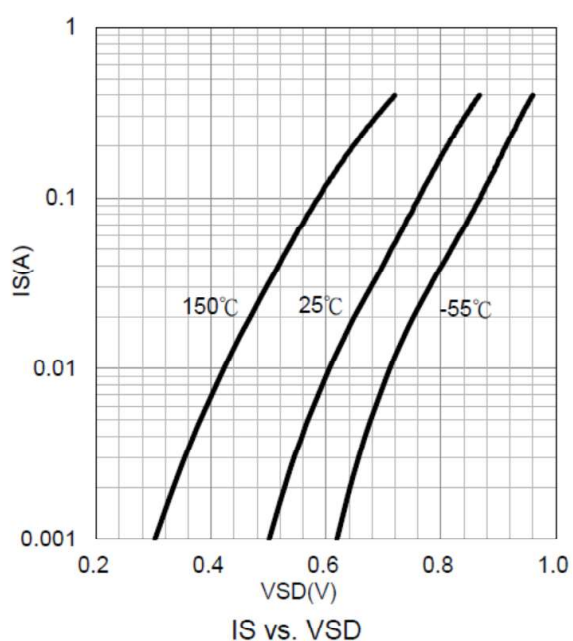
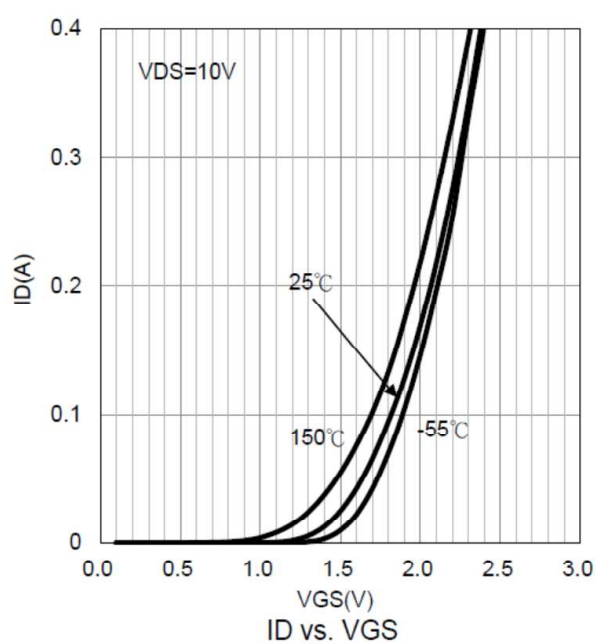
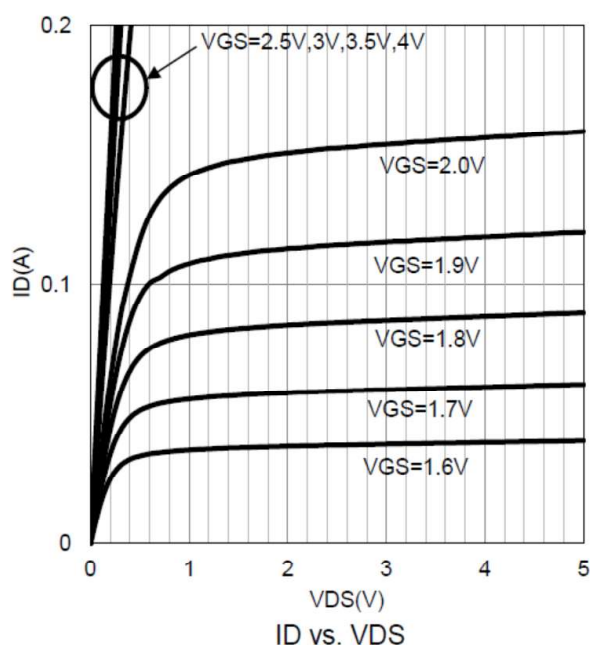
Electrical Characteristics

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

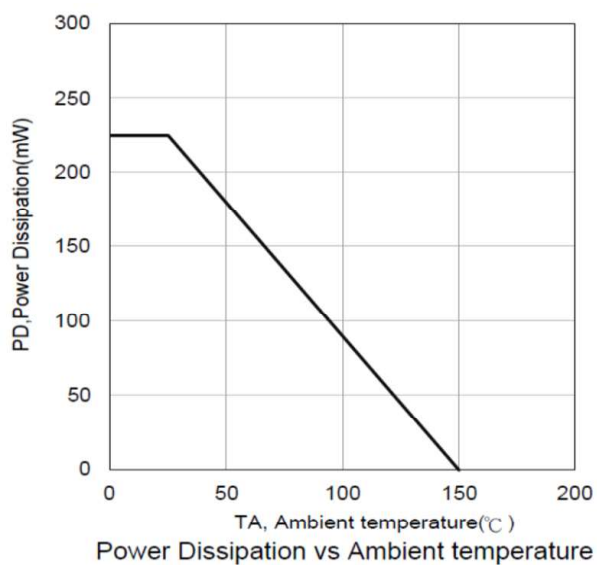
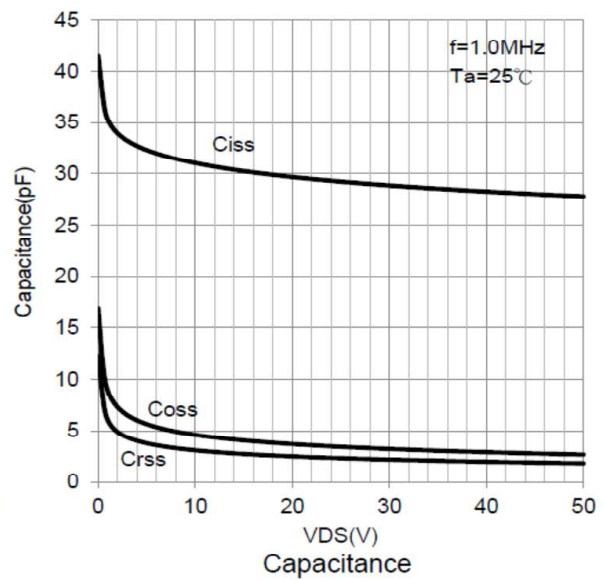
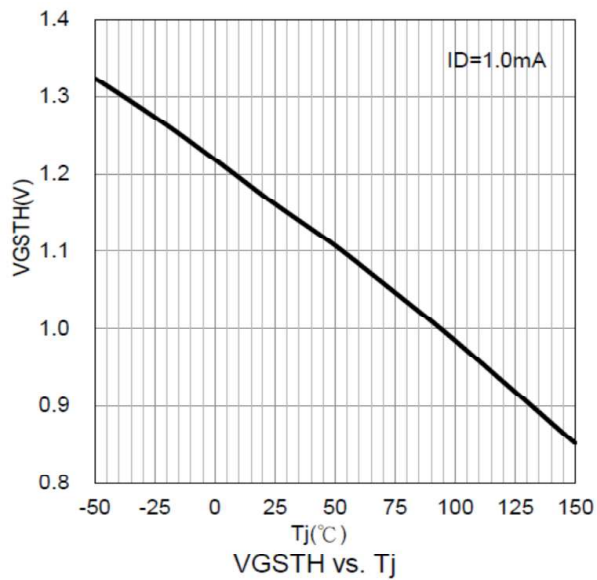
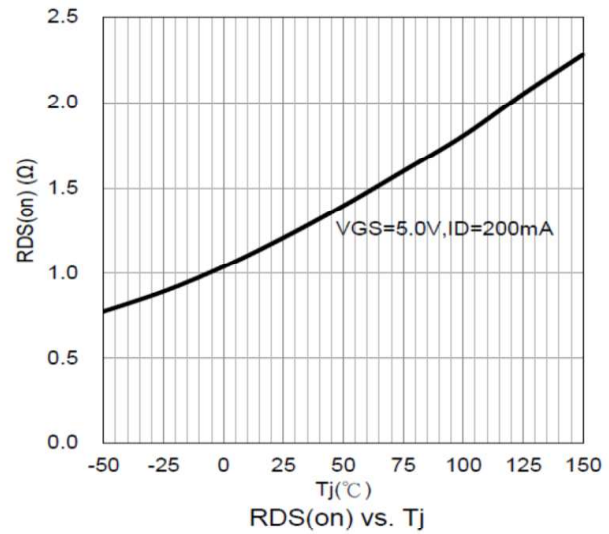
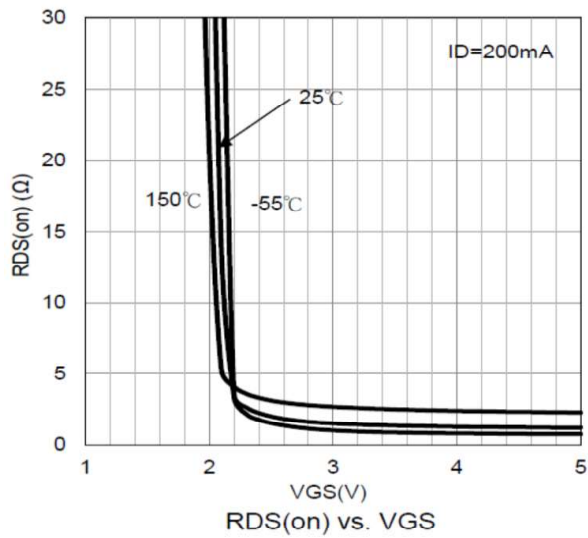
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---------------|---------------------------------|-------------------------------|------|-----|------|----------|
| Static | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 60 | - | - | V |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.85 | - | 1.45 | V |
| I_{GSSF} | Gate Leakage Current , Forward | $V_{DS}=0V, V_{GS}=20V$ | | | 10 | μA |
| I_{GSSR} | Gate Leakage Current , Reverse | $V_{DS}=0V, V_{GS}=-20V$ | | | -10 | μA |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=25V, V_{GS}=0V$ | | | 0.1 | μA |
| | | $V_{DS}=50V, V_{GS}=0V,$ | | | 0.5 | |
| $R_{DS(on)}$ | Drain-Source On-Resistance | $V_{GS}=4.5V, I_D=0.2A$ | | - | 2.25 | Ω |
| | | $V_{GS}=2.5V, I_D=0.1A$ | - | - | 4.05 | |
| g_{FS} | Forward Transconductance | $V_{DS}=25V, I_D=0.2A$ | 100 | - | - | mS |

| Dynamic | | | | | |
|--------------|------------------------------|---|--|------|----|
| C_{iss} | Input Capacitance | $V_{DS}=25V, V_{GS}=0V,$ $f=1MHz$ | | 22.8 | pF |
| C_{oss} | Output Capacitance | | | 3.5 | |
| C_{rss} | Reverse Transfer Capacitance | | | 2.9 | |
| $t_{d(on)}$ | Turn-On Time | $V_{DD}=30V, I_D=1A,$ $V_{GS}=10V, R_G=25\Omega$ | | 3.8 | ns |
| $t_{d(off)}$ | Turn-Off Time | | | 19 | |

Typical Performance Characteristics

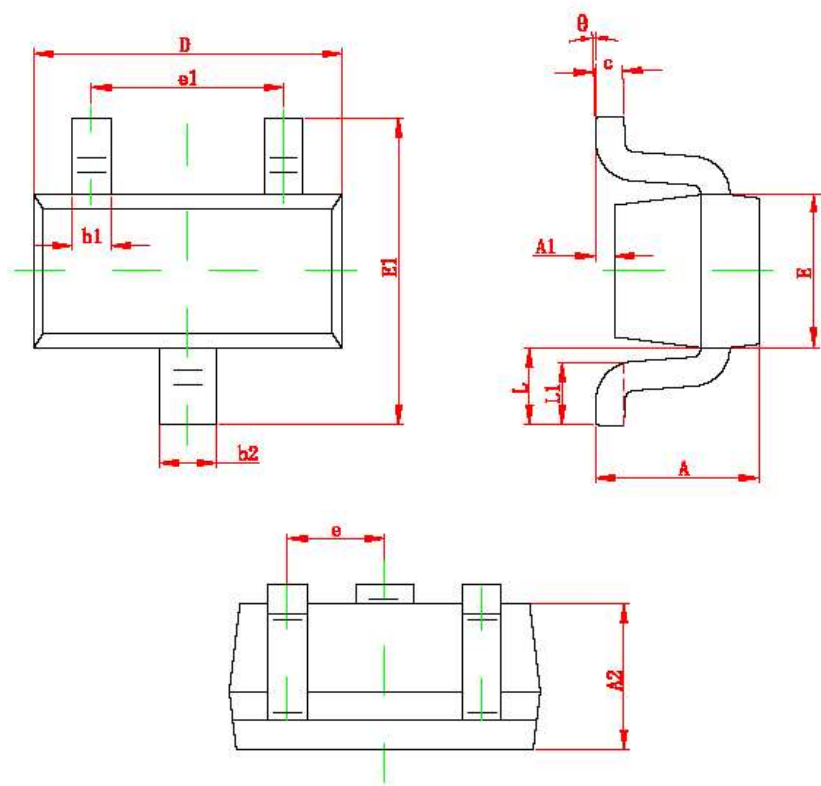


Typical Performance Characteristics (Continue)



Package Dimension

SOT-523









| Dimensions | | | | |
|------------|-------------|-------|------------|-------|
| Symbol | Millimeters | | Inches | |
| | Min | Max | Min | Max |
| A | 0.700 | 0.900 | 0.028 | 0.035 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.700 | 0.800 | 0.028 | 0.031 |
| b1 | 0.150 | 0.250 | 0.006 | 0.010 |
| b2 | 0.250 | 0.350 | 0.010 | 0.013 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 1.500 | 1.700 | 0.059 | 0.067 |
| E | 0.700 | 0.900 | 0.028 | 0.035 |
| E1 | 1.450 | 1.750 | 0.057 | 0.069 |
| e | 0.500(TYP) | | 0.020(TYP) | |
| e1 | 0.900 | 1.100 | 0.035 | 0.043 |
| L | 0.550(REF) | | 0.022(REF) | |
| L1 | 0.280 | 0.440 | 0.011 | 0.017 |
| θ | 0° | 8° | 0° | 8° |

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CONTACT US

| GS Headquarter | |
|---|--|
|  | 4F.,No.43-1,Lane11,Sec.6,Minquan E.Rd NeiHu District Taipei City 114, Taiwan (R.O.C) |
|  | 886-2-2657-9980 |
|  | 886-2-2657-3630 |
|  | sales_twn@gs-power.com |

| RD Division | |
|---|--------------------------------------|
|  | 824 Bolton Drive Milpitas. CA. 95035 |
|  | 1-408-457-0587 |