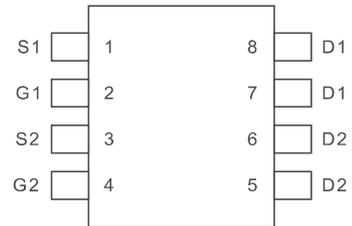


Dual P-Channel Enhancement Mode MOSFET

Description

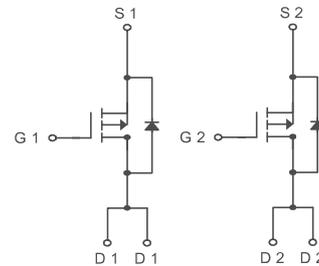
The SM4953 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. The two MOSFETs make a compact and efficient switch and synchronous rectifier combination for use in buck converters.



SOIC-8

General Features

- -30V/-4.9A, $R_{DS(ON)} = 53m\Omega$ (typ.) @ $V_{GS} = -10V$
 $R_{DS(ON)} = 80m\Omega$ (typ.) @ $V_{GS} = -4.5V$
- Super High Density Cell Design
- Reliable and Rugged
- SO-8 Package



P-Channel MOSFET

◆ Ordering Information

| Ordering Number | | Package | Pin Assignment | | | | | | | | Packing |
|--|--------------|---------|--|----|----|----|----|----|----|----|-----------|
| Lead Free | Halogen Free | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| SM4953PRL | SM4953SRG | SOP-8 | S1 | G1 | S2 | G2 | D1 | D1 | D2 | D2 | Tape Reel |
| <p style="text-align: center;">SM4953 X X X</p> <p>(1) Package Type </p> <p>(2) Packing Type </p> <p>(3) Lead Free </p> | | | <p>(1) P: SOP-8</p> <p>(2) R: Tape Reel</p> <p>(3) G: Halogen Free; L: Lead Free</p> | | | | | | | | |



◆ Absolute Maximum Ratings ($T_A=25^\circ\text{C}$, unless otherwise noted)

| Symbol | Parameter | Rating | Unit |
|-----------|---|----------|------|
| V_{DSS} | Drain-Source Voltage | -30 | V |
| V_{GSS} | Gate-Source Voltage | ± 25 | |
| I_D^* | Maximum Drain Current – Continuous $T_A = 25^\circ\text{C}$ | -4.9 | A |
| I_{DM} | Maximum Drain Current – Pulsed | -30 | |

a:Fused current that based on wire numbers and diameter

b:Repetitive Rating: Pulse width limited by the maximum junction temperature

c:1-in² 2oz Cu PCB board

◆ Electrical Characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)

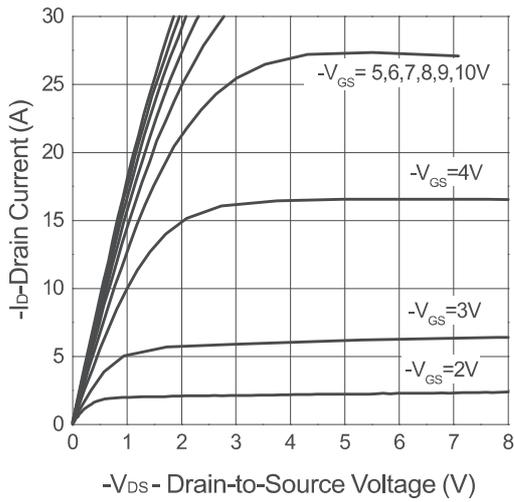
| Symbol | Parameter | Test Condition | SM4953 | | | Unit |
|----------------------------|---|---|--------|--------------------|-----------|------------|
| | | | Min. | Typ ^a . | Max. | |
| Static | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_{DS}=-250\mu A$ | -30 | | | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=-24V, V_{GS}=0V$ | | | -1 | μA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_{DS}=-250\mu A$ | -1 | -1.5 | -2 | V |
| I_{GSS} | Gate Leakage Current | $V_{GS}=\pm 25V, V_{DS}=0V$ | | | ± 100 | nA |
| $R_{DS(ON)}$ | Drain-Source On-state Resistance ^b | $V_{GS}=-10V, I_{DS}=-4.9A$ | | 53 | 60 | m Ω |
| | | $V_{GS}=-4.5V, I_{DS}=-3.6A$ | | 80 | 95 | |
| V_{SD} | Diode Forward Voltage ^b | $I_{SD}=-1.7A, V_{GS}=0V$ | | -0.7 | -1.3 | V |
| Dynamic^a | | | | | | |
| Q_g | Total Gate Charge | $V_{DS}=-15V, I_{GS}=-10V$ | | 22.3 | 29 | nC |
| Q_{gs} | Gate-Source Charge | $I_D=-4.6A$ | | 4.65 | | |
| Q_{gd} | Gate-Drain Charge | | | 2 | | |
| $t_{d(ON)}$ | Turn-on Delay Time | $V_{DD}=-15V, I_D=-2A,$ $V_{GEN}=-10V, R_G=6\Omega$ $R_L=7.5\Omega$ | | 10 | 18 | ns |
| T_r | Turn-on Rise Time | | | 15 | 20 | |
| $t_{d(OFF)}$ | Turn-off Delay Time | | | 22 | 38 | |
| T_f | Turn-off Fall Time | | | 15 | 25 | |
| C_{iss} | Input Capacitance | $V_{GS}=0V$ | | 1260 | | pF |
| C_{oss} | Output Capacitance | $V_{DS}=-25V$ | | 340 | | |
| C_{rss} | Reverse Transfer Capacitance | Frequency=1.0MHz | | 220 | | |

Note: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycles $\leq 2\%$

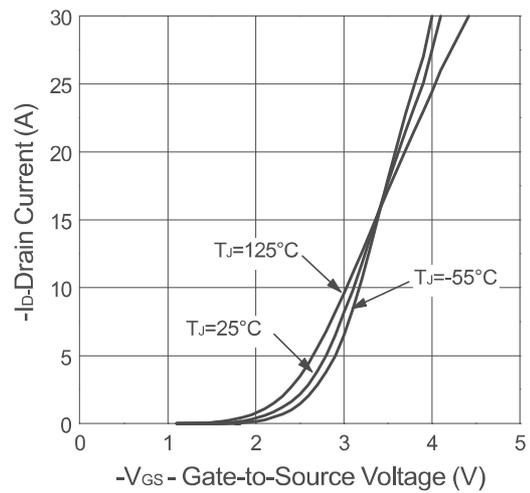
d: Guaranteed by design: not subject to production testing

Typical Characteristics

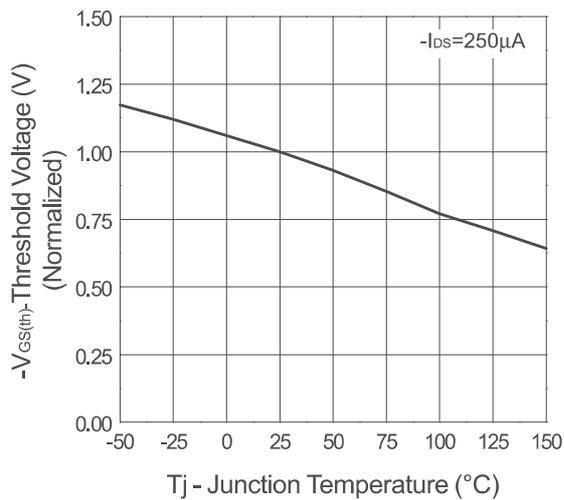
Output Characteristics



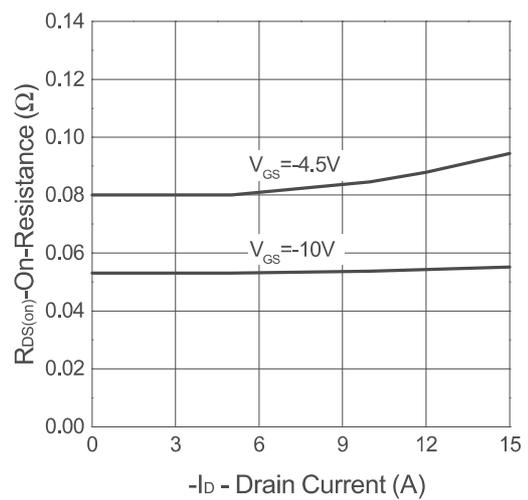
Transfer Characteristics



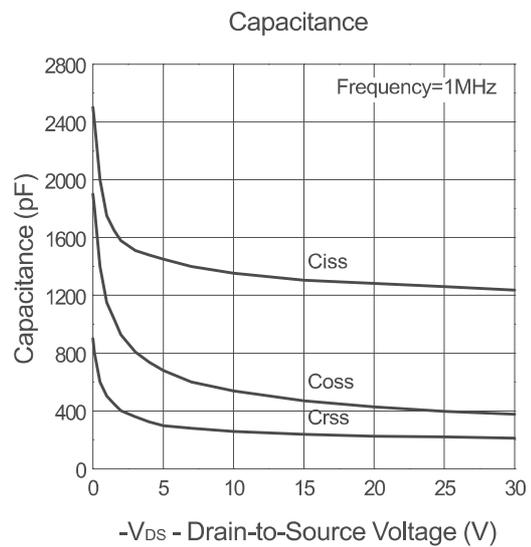
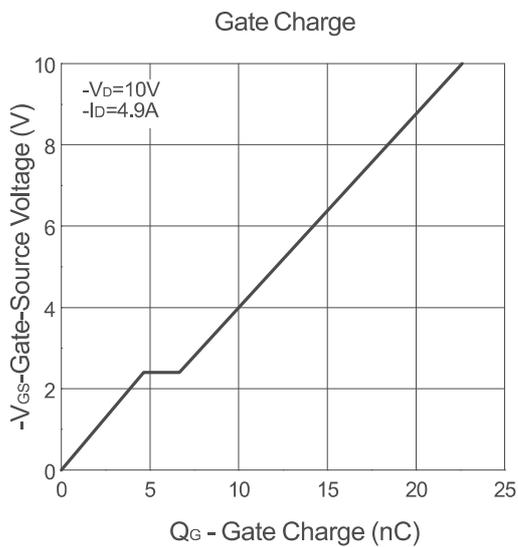
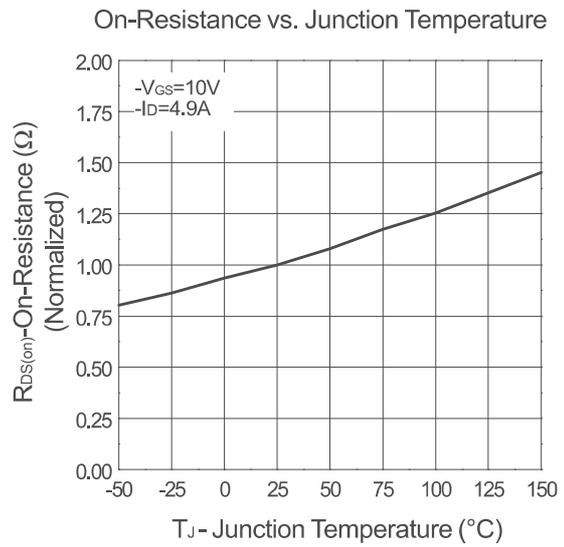
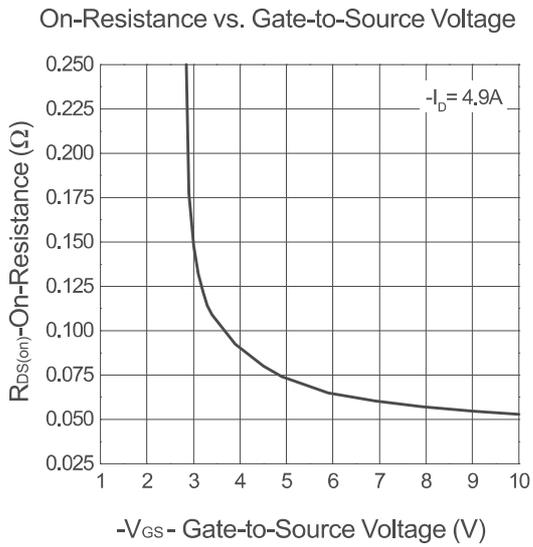
Threshold Voltage vs. Junction Temperature



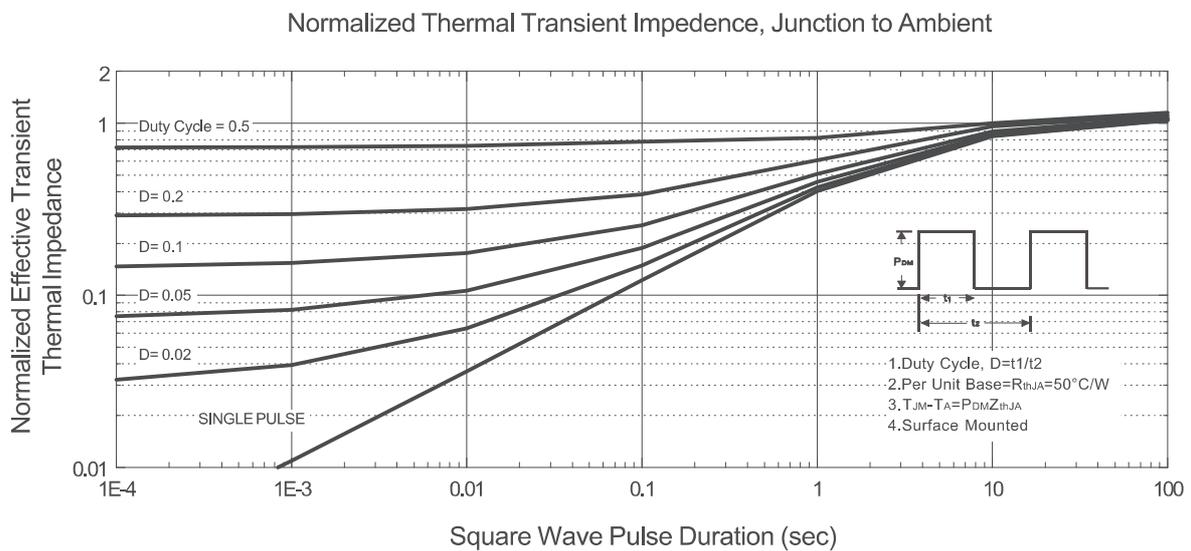
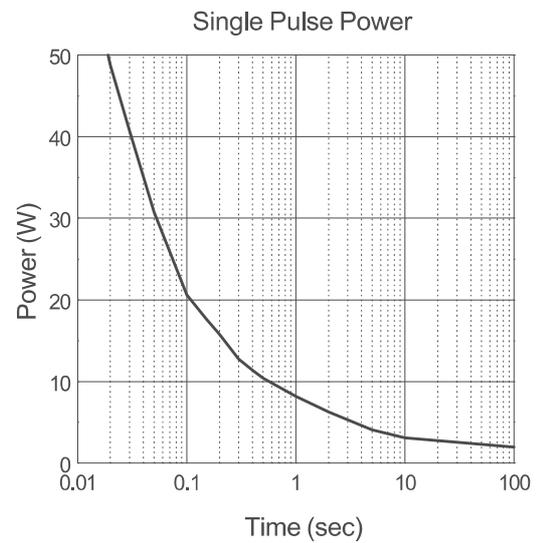
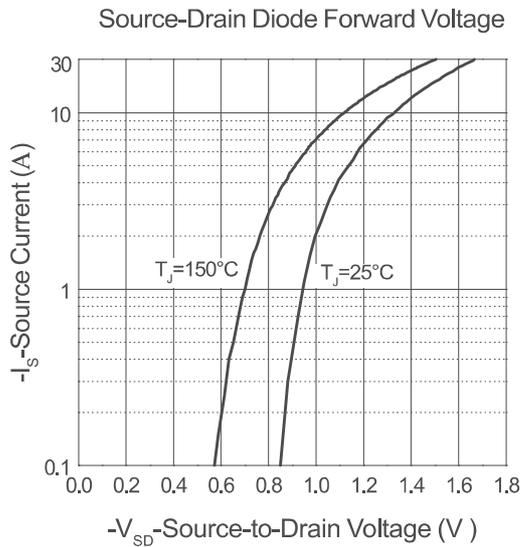
On-Resistance vs. Drain Current



Typical Characteristics (Cont.)

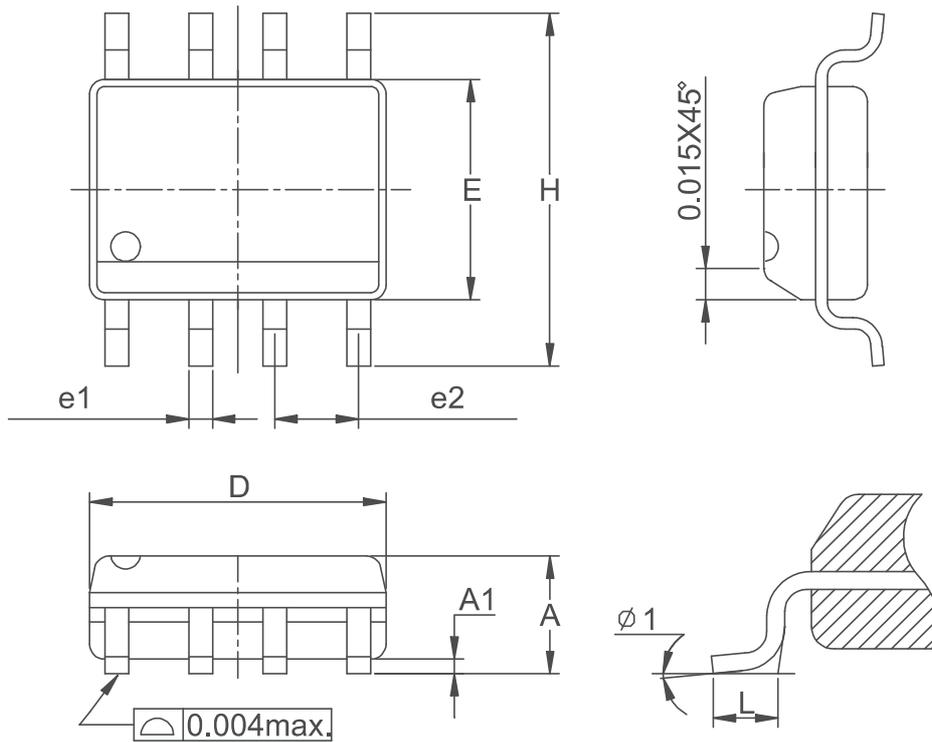


Typical Characteristics (Cont.)



Packaging Information

SOP-8 pin (Reference JEDEC Registration MS-012)



| Dim | Millimeters | | Inches | |
|-----|-------------|------|---------|-------|
| | Min. | Max. | Min. | Max. |
| A | 1.35 | 1.75 | 0.053 | 0.069 |
| A1 | 0.10 | 0.25 | 0.004 | 0.010 |
| D | 4.80 | 5.00 | 0.189 | 0.197 |
| E | 3.80 | 4.00 | 0.150 | 0.157 |
| H | 5.80 | 6.20 | 0.228 | 0.244 |
| L | 0.40 | 1.27 | 0.016 | 0.050 |
| e1 | 0.33 | 0.51 | 0.013 | 0.020 |
| e2 | 1.27BSC | | 0.50BSC | |
| φ 1 | 8° | | 8° | |