

Dual N-Ch 20V Fast Switching MOSFETs

Description

The HSM9926 is the high cell density trench N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

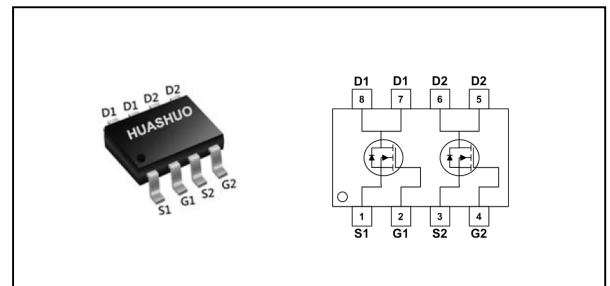
The HSM9926 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

- 100% EAS Guaranteed
- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

Product Summary

| | | |
|------------------|----|------------|
| V_{DS} | 20 | V |
| $R_{DS(ON),max}$ | 28 | m Ω |
| I_D | 6 | A |

Dual SOP8 Pin Configuration



Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|----------------------------|--|------------|------------------|
| V_{DS} | Drain-Source Voltage | 20 | V |
| V_{GS} | Gate-Source Voltage | ± 12 | V |
| $I_D@T_A=25^\circ\text{C}$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 6 | A |
| $I_D@T_A=70^\circ\text{C}$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 4 | A |
| I_{DM} | Pulsed Drain Current ² | 24 | A |
| $P_D@T_A=25^\circ\text{C}$ | Total Power Dissipation ⁴ | 1.3 | W |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^\circ\text{C}$ |

Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|-----------------|--|------|------|--------------------|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient ¹ | --- | 62.5 | $^\circ\text{C/W}$ |



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

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|--------------|--|---|------|------|-----------|------------|
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 20 | --- | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance ² | $V_{GS}=4.5V, I_D=6A$ | --- | 22 | 28 | m Ω |
| | | $V_{GS}=2.5V, I_D=5.2A$ | --- | 34 | 44 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}=V_{DS}, I_D=250\mu A$ | 0.6 | 0.9 | 1.5 | V |
| I_{DSS} | Drain-Source Leakage Current | $V_{DS}=20V, V_{GS}=0V, T_J=25^\circ C$ | --- | --- | 1 | uA |
| | | $V_{DS}=20V, V_{GS}=0V, T_J=55^\circ C$ | --- | --- | 5 | |
| I_{GSS} | Gate-Source Leakage Current | $V_{GS}=\pm 12V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| g_{fs} | Forward Transconductance | $V_{DS}=5V, I_D=6A$ | --- | 47 | --- | S |
| Q_g | Total Gate Charge (4.5V) | $V_{DS}=10V, V_{GS}=4.5V, I_D=3A$ | --- | 6.2 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 1.6 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 1.5 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DD}=10V, V_{GEN}=4.5V, R_{GEN}=6\Omega$ $I_D=1A; R_L=10\Omega$ | --- | 9.6 | --- | ns |
| T_r | Rise Time | | --- | 6.3 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 30 | --- | |
| T_f | Fall Time | | --- | 6.5 | --- | |
| C_{iss} | Input Capacitance | $V_{DS}=8V, V_{GS}=0V, f=1MHz$ | --- | 553 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 144 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 120 | --- | |

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=46A$
- 4.The power dissipation is limited by 150 $^\circ\text{C}$ junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.



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Typical Characteristics

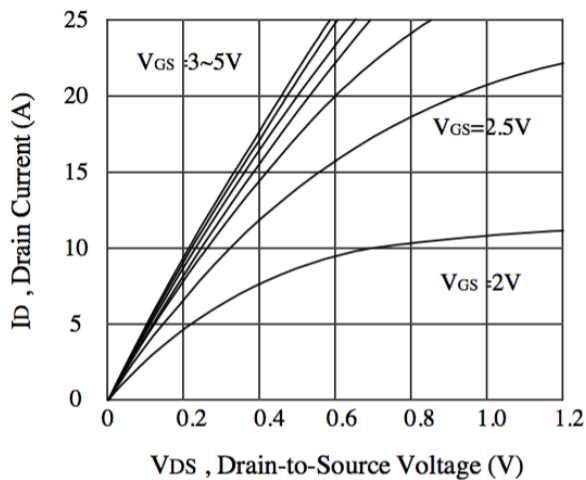


Figure 1. Output Characteristics

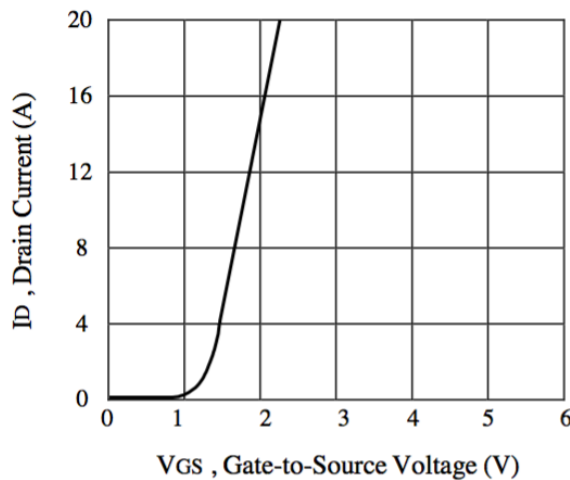


Figure 2. Transfer Characteristics

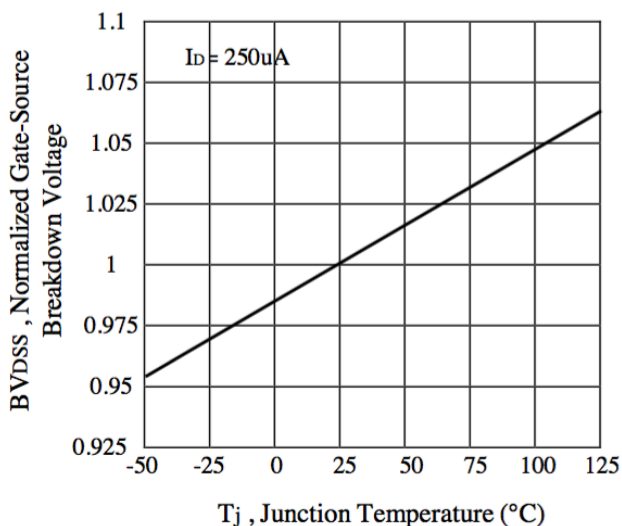


Figure 3. Breakdown Voltage Variation with Temperature

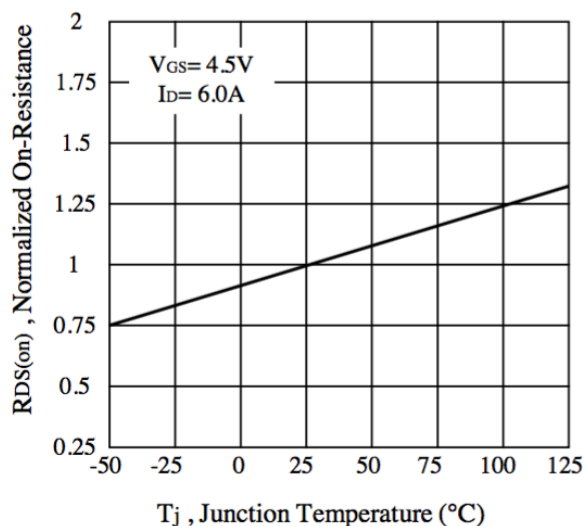


Figure 4. On-Resistance Variation with Temperature

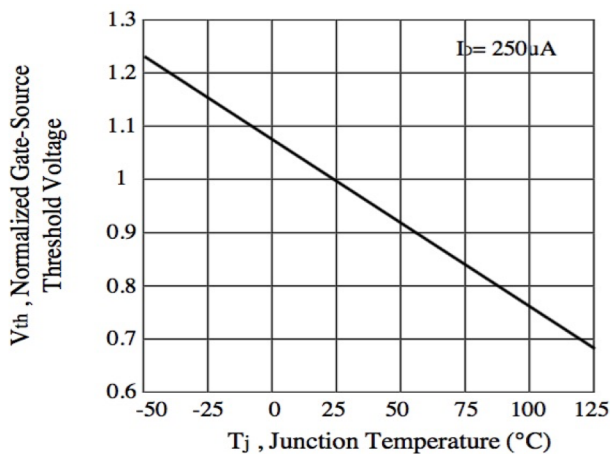


Figure 5. Gate Threshold Variation with Temperature

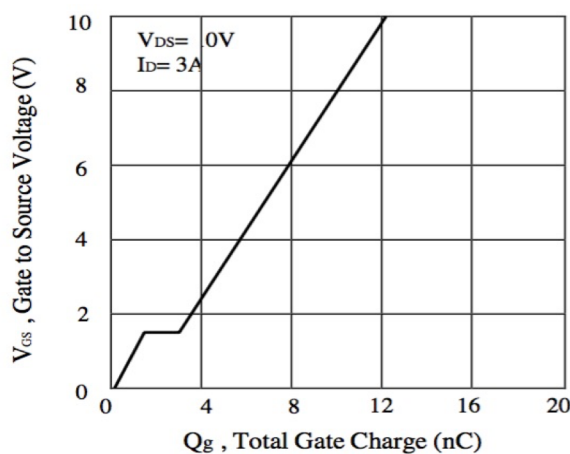
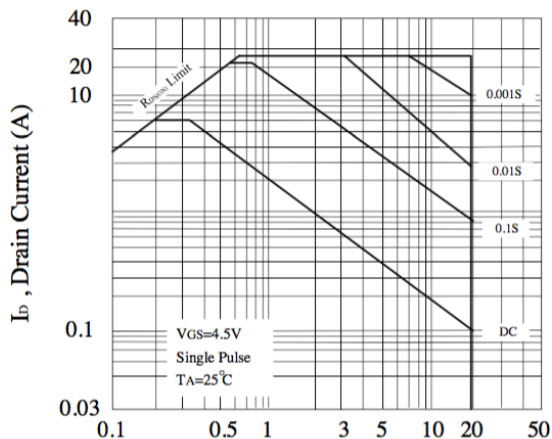
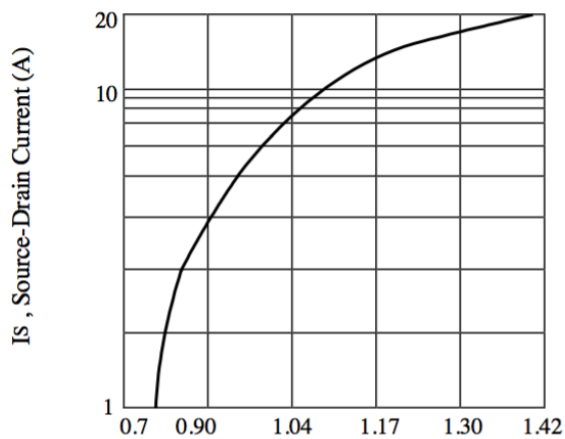


Figure 6. Gate Charge



VDS , Drain-Source Voltage (V)
Figure 7. Maximum Safe Operating Area



VSD , Body Diode Forward Voltage (V)
Figure 8. Body Diode Forward Voltage Variation with Source Current

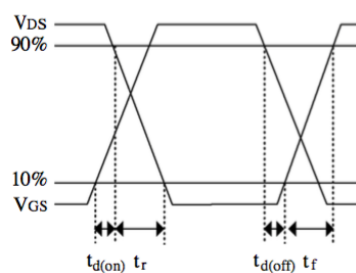
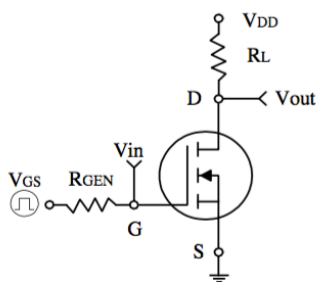


Figure 9. Switching Test Circuit and Switching Waveforms

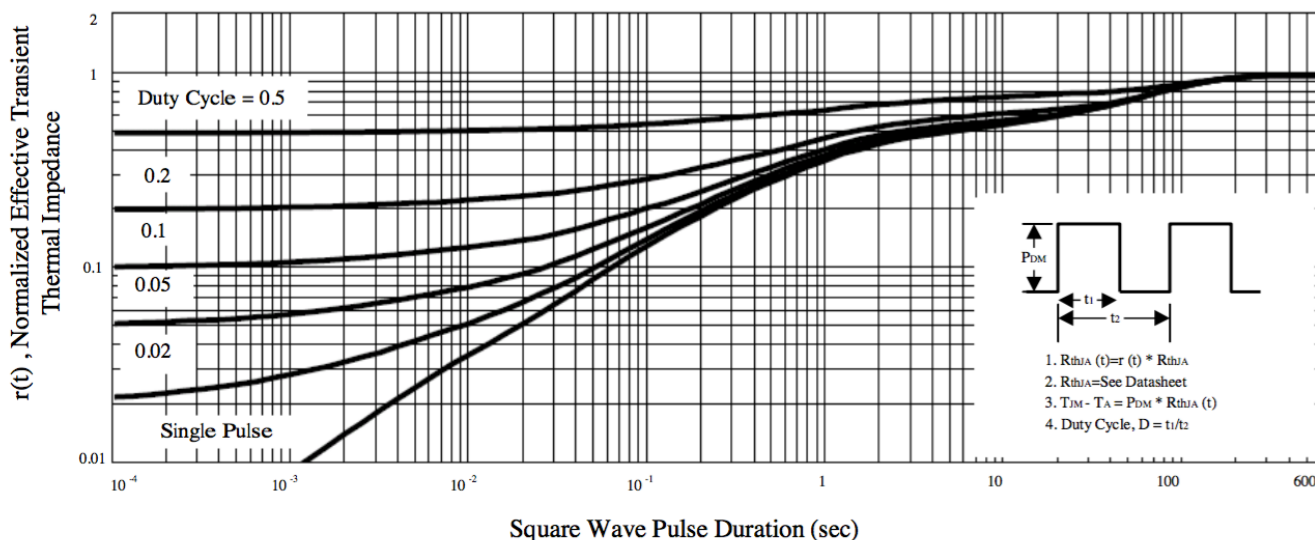


Figure 10. Normalized Thermal Transient Impedance Curve



Ordering Information

| Part Number | Package code | Packaging |
|-------------|--------------|----------------|
| HSM9926 | SOP-8 | 4000/Tape&Reel |

