

Description

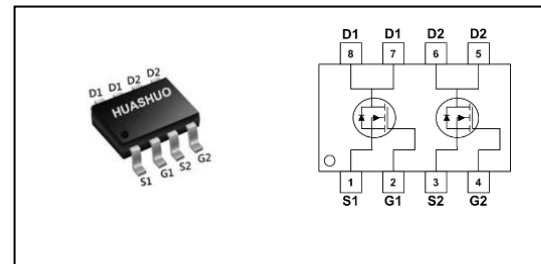
The HSM0228 is the high cell density trenched N-ch MOSFETs, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The HSM0228 meet the RoHS and Green Product requirement with full function reliability approved.

- Green Device Available
- Super Low Gate Charge
- Excellent $C_{dv/dt}$ effect decline
- Advanced high cell density Trench technology

Product Summary

| | | |
|------------------|-----|------------|
| V_{DS} | 100 | V |
| $R_{DS(ON),max}$ | 68 | m Ω |
| I_D | 4 | A |

SOP8 Pin Configuration

Absolute Maximum Ratings

| Symbol | Parameter | Rating | Units |
|------------------------|--|------------|------------|
| V_{DS} | Drain-Source Voltage | 100 | V |
| V_{GS} | Gate-Source Voltage | ± 20 | V |
| $I_D @ T_A=25^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V_1$ | 4 | A |
| $I_D @ T_A=70^\circ C$ | Continuous Drain Current, $V_{GS} @ 10V_1$ | 3 | A |
| I_{DM} | Pulsed Drain Current ₂ | 25 | A |
| $P_D @ T_A=25^\circ C$ | Total Power Dissipation ₃ | 1.5 | W |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ C$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^\circ C$ |

Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|-----------------|--|------|------|--------------|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient ₁ | --- | 90 | $^\circ C/W$ |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case ₁ | --- | 40 | $^\circ C/W$ |



Dual N-Ch 100V Fast Switching MOSFETs

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------------|--|--|------|-------|------|-------|
| BV _{DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =250uA | 100 | --- | --- | V |
| ΔBV _{DSS} /ΔT _J | BVDSS Temperature Coefficient | Reference to 25°C, I _D =1mA | --- | 0.122 | --- | V/°C |
| R _{DS(ON)} | Static Drain-Source On-Resistance ₂ | V _{GS} =10V, I _D =4A | --- | --- | 68 | mΩ |
| | | V _{GS} =4.5V, I _D =3A | --- | --- | 94 | mΩ |
| V _{GS(th)} | Gate Threshold Voltage | V _{GS} =V _{DS} , I _D =250uA | 1.2 | --- | 2.5 | V |
| ΔV _{GS(th)} | V _{GS(th)} Temperature Coefficient | | --- | -4.84 | --- | mV/°C |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =80V, V _{GS} =0V, T _J =25°C | --- | --- | 10 | uA |
| | | V _{DS} =80V, V _{GS} =0V, T _J =55°C | --- | --- | 100 | |
| I _{GSS} | Gate-Source Leakage Current | V _{GS} =±20V, V _{DS} =0V | --- | --- | ±100 | nA |
| g _{fs} | Forward Transconductance | V _{DS} =5V, I _D =4A | --- | 14 | --- | S |
| R _g | Gate Resistance | V _{DS} =0V, V _{GS} =0V, f=1MHz | --- | 2.1 | --- | Ω |
| Q _g | Total Gate Charge (10V) | V _{DS} =50V, V _{GS} =10V, I _D =4A | --- | 12 | --- | nC |
| Q _{gs} | Gate-Source Charge | | --- | 2.7 | --- | |
| Q _{gd} | Gate-Drain Charge | | --- | 1.7 | --- | |
| T _{d(on)} | Turn-On Delay Time | V _{DD} =50V, V _{GS} =10V, R _G =3Ω I _D =4A | --- | 3.8 | --- | ns |
| T _r | Rise Time | | --- | 26 | --- | |
| T _{d(off)} | Turn-Off Delay Time | | --- | 16 | --- | |
| T _f | Fall Time | | --- | 8.8 | --- | |
| C _{iss} | Input Capacitance | V _{DS} =25V, V _{GS} =0V, f=1MHz | --- | 620 | --- | pF |
| C _{oss} | Output Capacitance | | --- | 105 | --- | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 63 | --- | |

Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-----------------|--|---|------|------|------|------|
| I _S | Continuous Source Current _{1,4} | V _G =V _D =0V, Force Current | --- | --- | 2.5 | A |
| I _{SM} | Pulsed Source Current _{2,4} | | --- | --- | 25 | A |
| V _{SD} | Diode Forward Voltage ₂ | V _{GS} =0V, I _S =1A, T _J =25°C | --- | --- | 1.2 | V |

Note :

- 1.The data tested by surface mounted on a 1 inch₂ FR-4 board with 2OZ copper.
- 2.The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.



Typical Characteristics

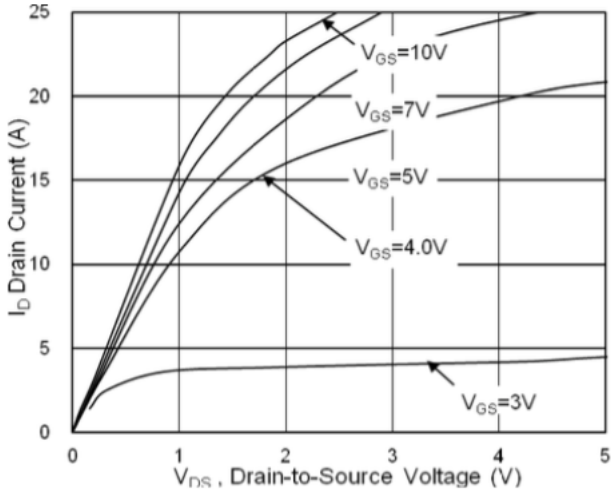


Fig.1 Typical Output Characteristics

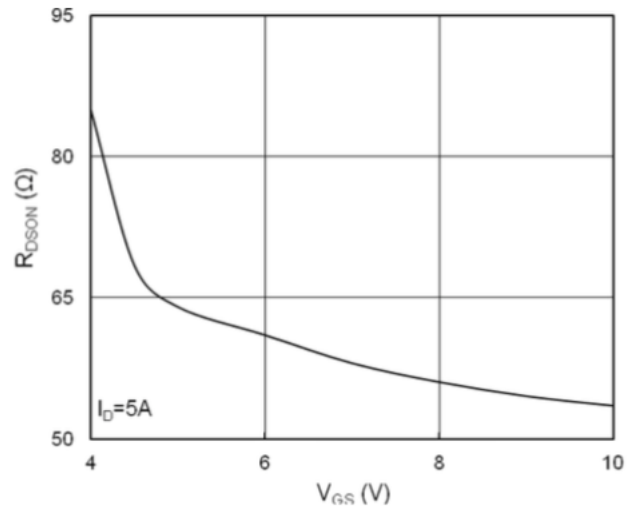


Fig.2 On-Resistance vs. Gate-Source

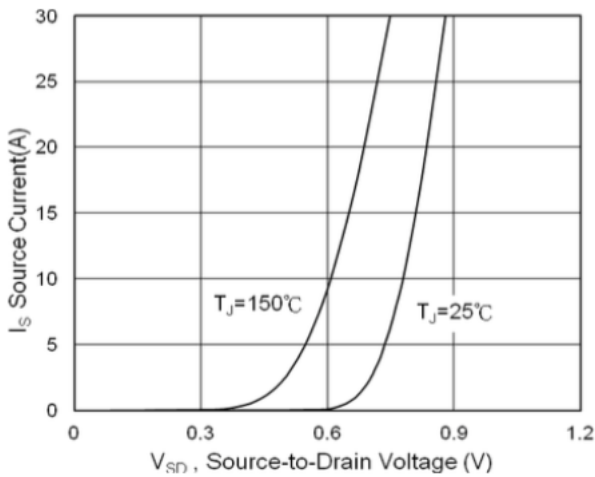


Fig.3 Forward Characteristics Of Reverse

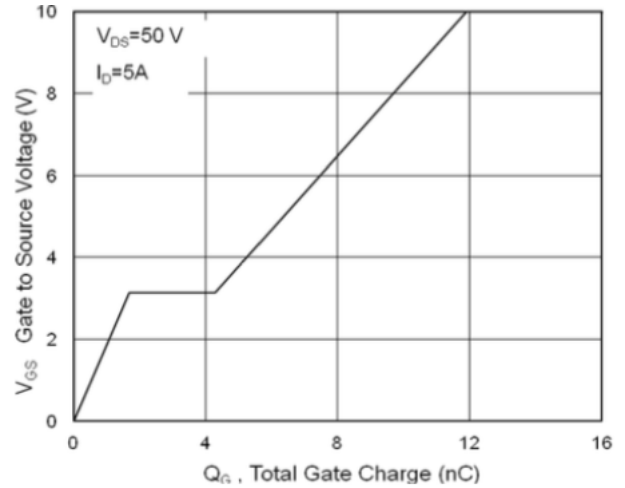


Fig.4 Gate-Charge Characteristics

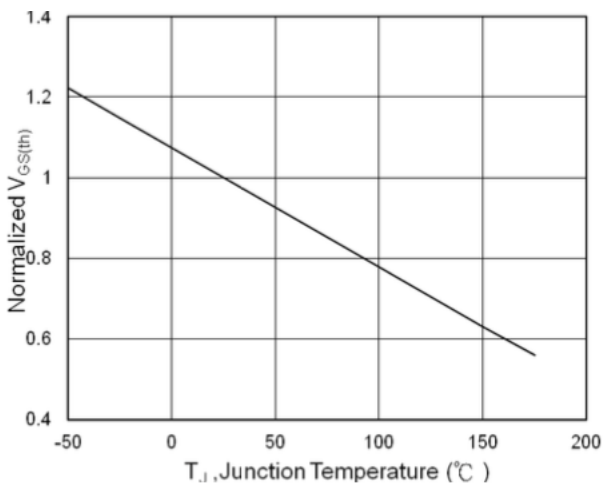


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

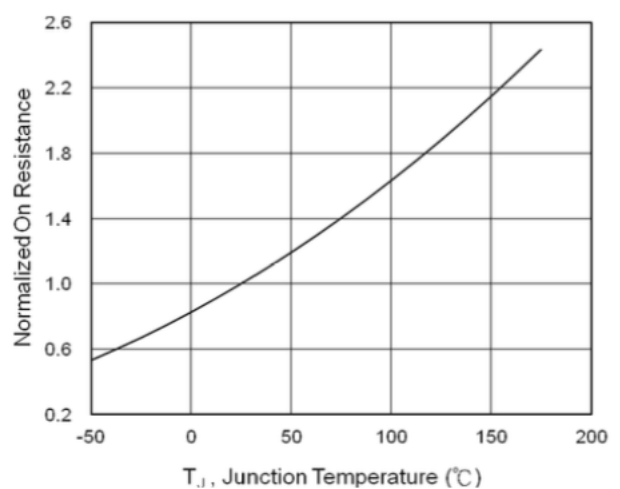


Fig.6 Normalized $R_{DS(on)}$ vs. T_J



Dual N-Ch 100V Fast Switching MOSFETs

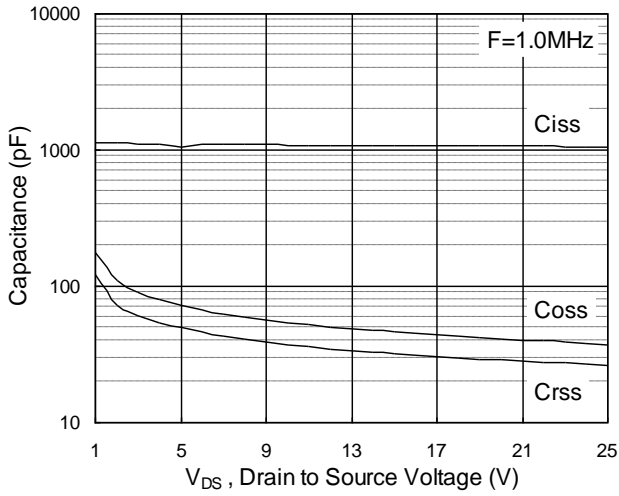


Fig.7 Capacitance

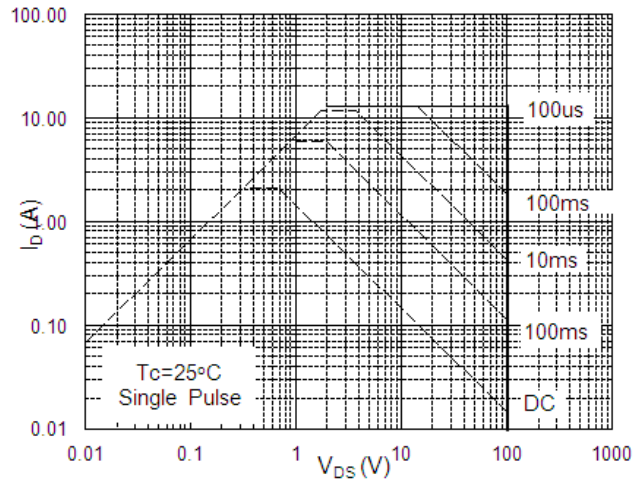


Fig.8 Safe Operating Area

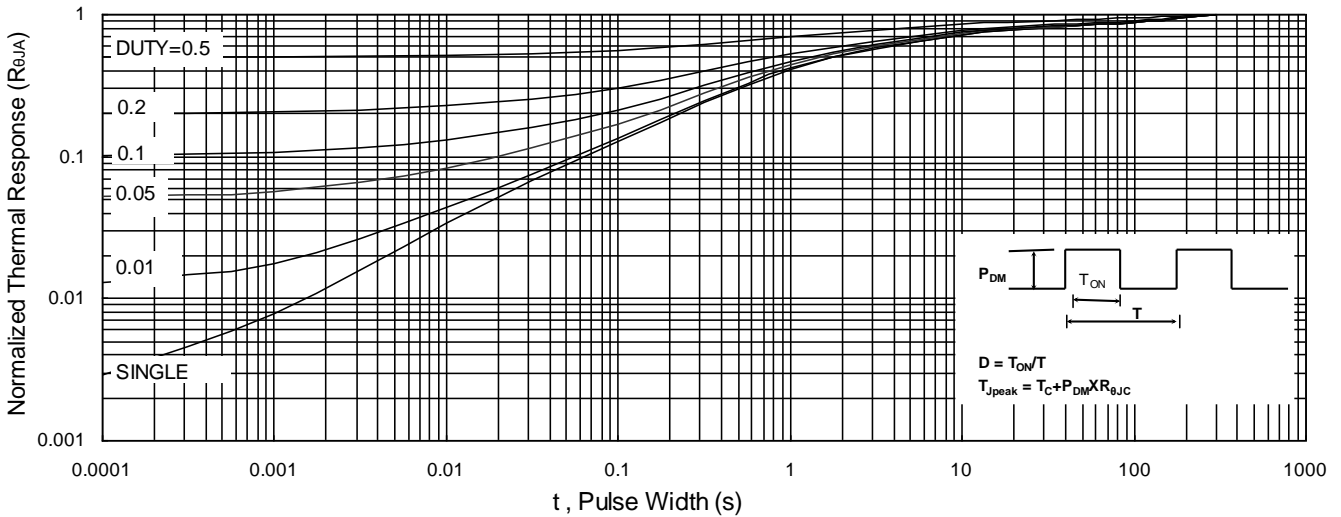


Fig.9 Normalized Maximum Transient Thermal Impedance

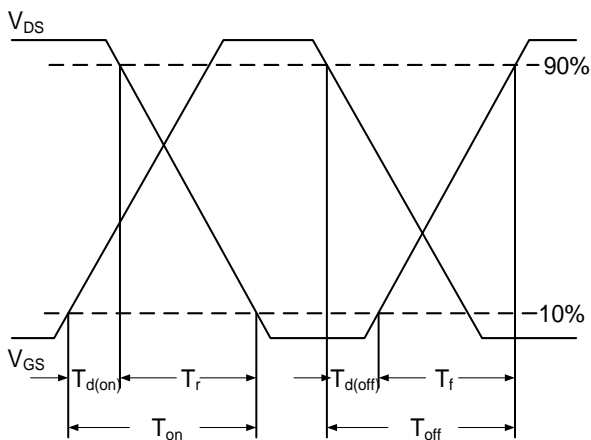


Fig.10 Switching Time Waveform

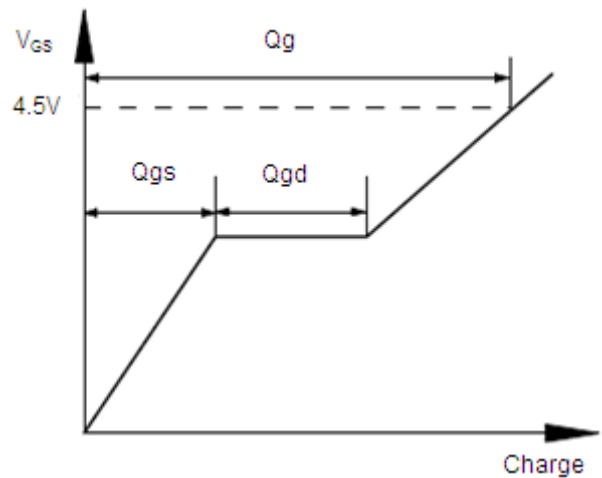
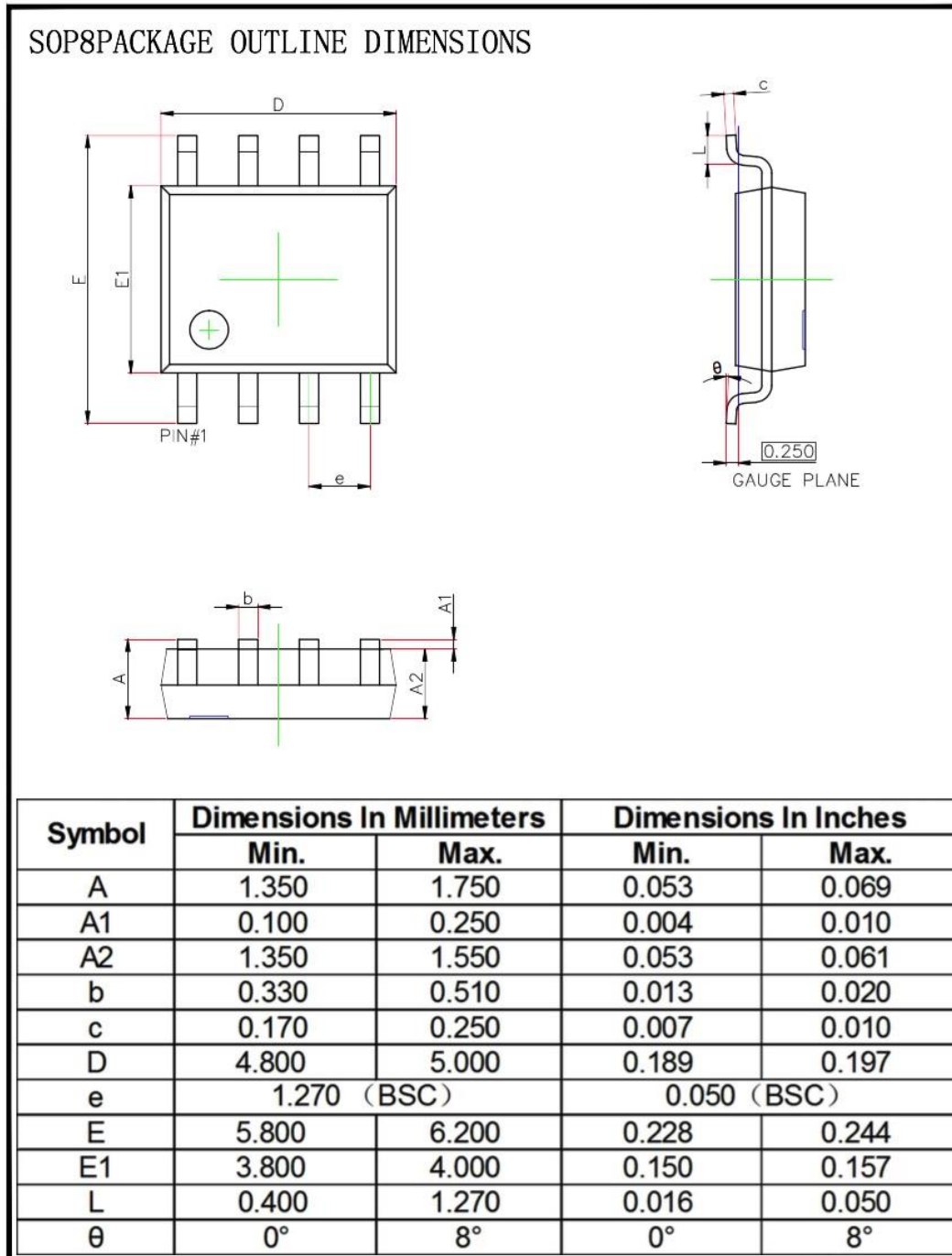


Fig.11 Gate Charge Waveform



Ordering Information

| Part Number | Package code | Packaging |
|-------------|--------------|----------------|
| HSM0228 | SOP-8 | 2500/Tape&Reel |



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