



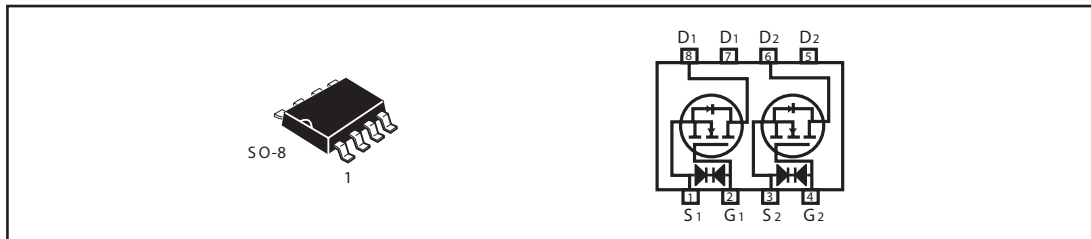
STM6968

Dual N-Channel Enhancement Mode Field Effect Transistor

| PRODUCT SUMMARY | | |
|------------------|----------------|---|
| V _{DSS} | I _D | R _{DS(ON)} (mΩ) Max |
| 60V | 5A | 60 @ V _{GS} = 10V 70 @ V _{GS} = 4.5V |

FEATURES

- Super high dense cell design for low R_{DS(ON)}.
- Rugged and reliable.
- Surface Mount Package.
- ESD Protected.



ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise noted)

| Parameter | Symbol | Limit | Unit | |
|--|-----------------------------------|----------------------|------|---|
| Drain-Source Voltage | V _{DS} | 60 | V | |
| Gate-Source Voltage | V _{GS} | ±20 | V | |
| Drain Current-Continuous ^a @ T _a | I _D | 25°C | 5 | A |
| | | 70°C | 4.3 | A |
| -Pulsed ^b | I _{DM} | 25 | A | |
| Drain-Source Diode Forward Current ^a | I _S | 1.7 | A | |
| Maximum Power Dissipation ^a | P _D | T _a =25°C | 2 | W |
| | | T _a =70°C | 1.44 | |
| Operating Junction and Storage Temperature Range | T _J , T _{STG} | -55 to 150 | °C | |

THERMAL CHARACTERISTICS

| | | | |
|--|------------------|------|------|
| Thermal Resistance, Junction-to-Ambient ^a | R _{θJA} | 62.5 | °C/W |
|--|------------------|------|------|

STM6968

ELECTRICAL CHARACTERISTICS (T_A 25°C unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ ^c | Max | Unit |
|--|---------------------|--|-----|------------------|-----|-------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} = 0V, I _D = 250µA | 60 | | | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 48V, V _{GS} = 0V | | | 1 | µA |
| Gate-Body Leakage | I _{GSS} | V _{GS} = ±20V, V _{DS} = 0V | | | ±10 | µA |
| ON CHARACTERISTICS^b | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250µA | 1.0 | 1.7 | 3 | V |
| Drain-Source On-State Resistance | R _{DS(ON)} | V _{GS} = 10V, I _D = 4.5A | | 49 | 60 | m ohm |
| | | V _{GS} = 4.5V, I _D = 3A | | 55 | 70 | m ohm |
| On-State Drain Current | I _{D(ON)} | V _{DS} = 5V, V _{GS} = 10V | 20 | | | A |
| Forward Transconductance | g _{FS} | V _{DS} = 4.5V, I _D = 4.5A | | 13 | | S |
| DYNAMIC CHARACTERISTICS^c | | | | | | |
| Input Capacitance | C _{ISS} | V _{DS} = 25V, V _{GS} = 0V f = 1.0MHz | | 685 | | pF |
| Output Capacitance | C _{OSS} | | | 85 | | pF |
| Reverse Transfer Capacitance | C _{RSS} | | | 50 | | pF |
| Gate resistance | R _g | V _{GS} = 0V, V _{DS} = 0V, f = 1.0MHz | | 2 | | ohm |
| SWITCHING CHARACTERISTICS^c | | | | | | |
| Turn-On Delay Time | t _{D(ON)} | V _{DD} = 30V I _D = 4.5 A V _{GS} = 10V R _{GEN} = 6 ohm | | 11 | | ns |
| Rise Time | t _r | | | 12 | | ns |
| Turn-Off Delay Time | t _{D(OFF)} | | | 38 | | ns |
| Fall Time | t _f | | | 8 | | ns |
| Total Gate Charge | Q _g | V _{DS} = 48V, I _D = 4.5A, V _{GS} = 10V | | 12.7 | | nC |
| | | V _{DS} = 48V, I _D = 4.5A, V _{GS} = 4.5V | | 6.9 | | nC |
| Gate-Source Charge | Q _{gs} | V _{DS} = 48V, I _D = 4.5 A | | 1.8 | | nC |
| Gate-Drain Charge | Q _{gd} | V _{GS} = 10V | | 3.6 | | nC |

STM6968

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ ^c | Max | Unit |
|---|----------|---------------------------|-----|------------------|-----|------|
| DRAIN-SOURCE DIODE CHARACTERISTICS ^b | | | | | | |
| Diode Forward Voltage | V_{SD} | $V_{GS} = 0V, I_s = 1.7A$ | | 0.8 | 1.2 | V |

Notes

- a. Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.
- b. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
- c. Guaranteed by design, not subject to production testing.

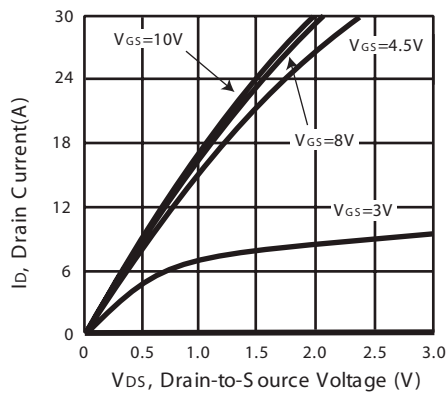


Figure 1. Output Characteristics

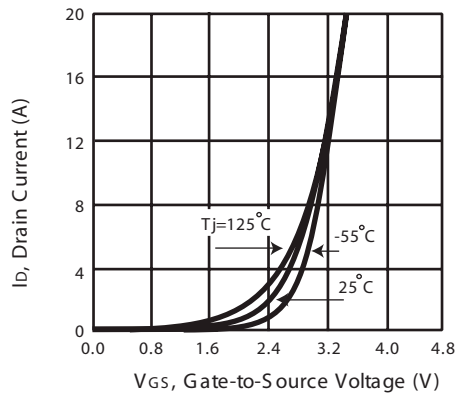


Figure 2. Transfer Characteristics

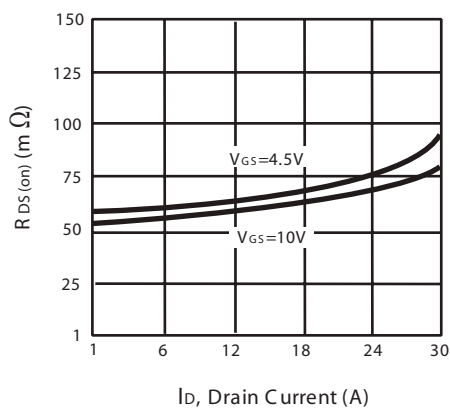


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

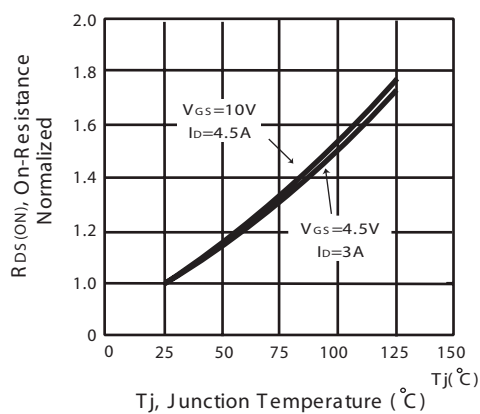


Figure 4. On-Resistance Variation with Drain Current and Temperature

STM6968

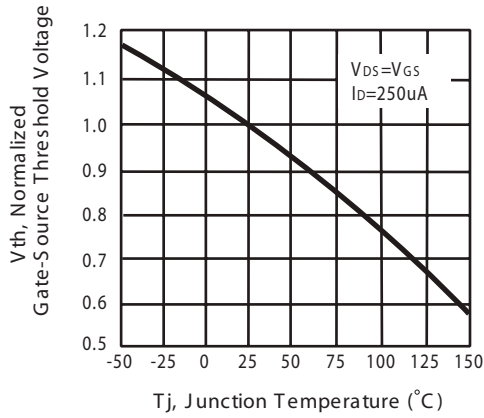


Figure 5. Gate Threshold Variation with Temperature

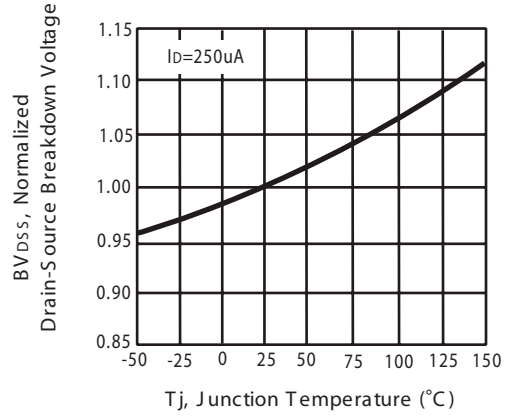


Figure 6. Breakdown Voltage Variation with Temperature

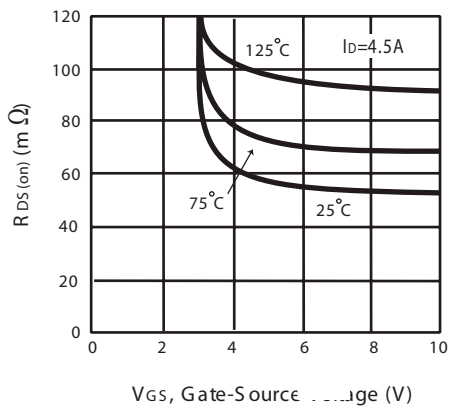


Figure 7. On-Resistance vs. Gate-Source Voltage

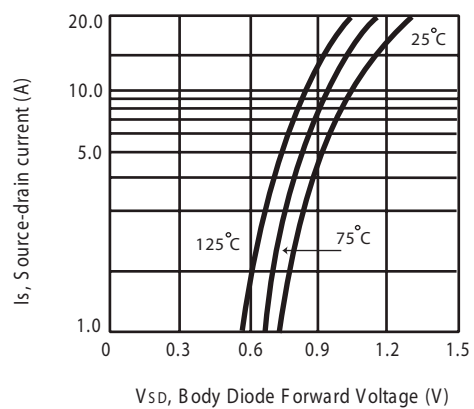


Figure 8. Body Diode Forward Voltage Variation with Source Current

STM6968

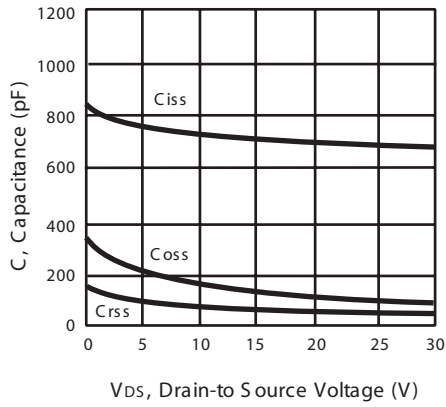


Figure 9. Capacitance

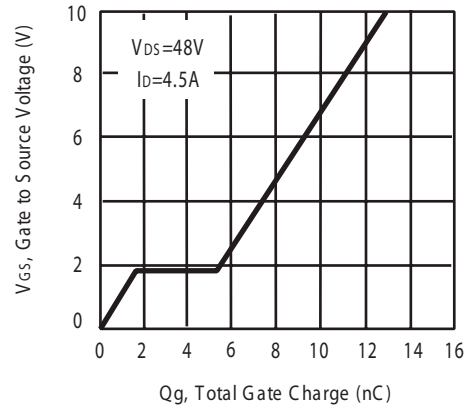


Figure 10. Gate Charge

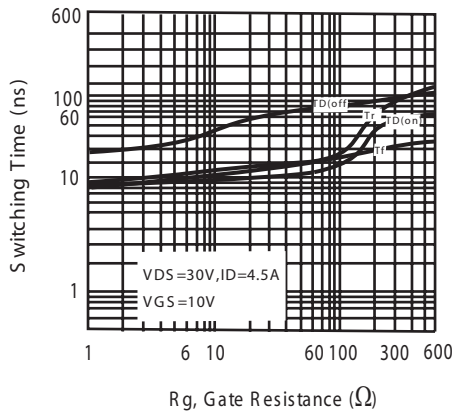


Figure 11. switching characteristics

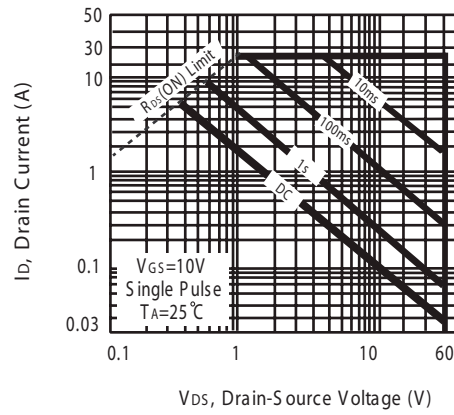
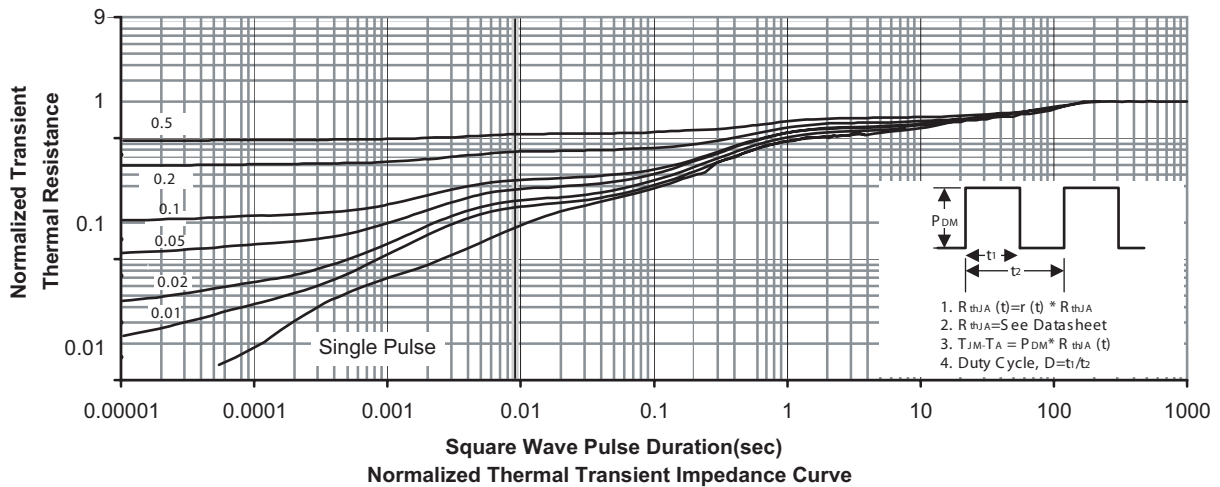


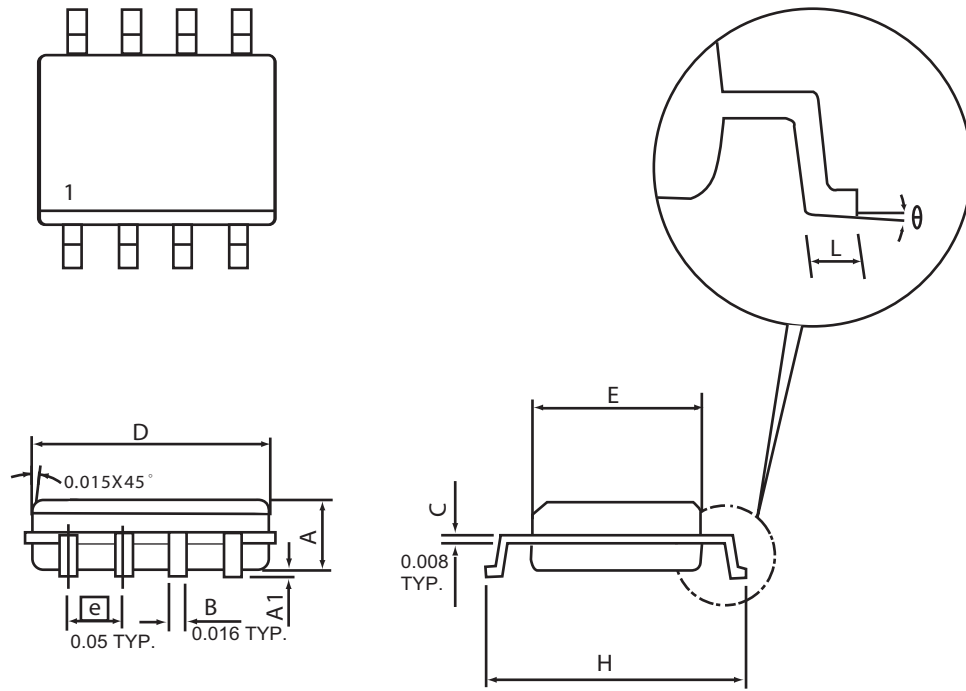
Figure 12. Maximum Safe Operating Area



STM6968

PACKAGE OUTLINE DIMENSIONS

SO-8

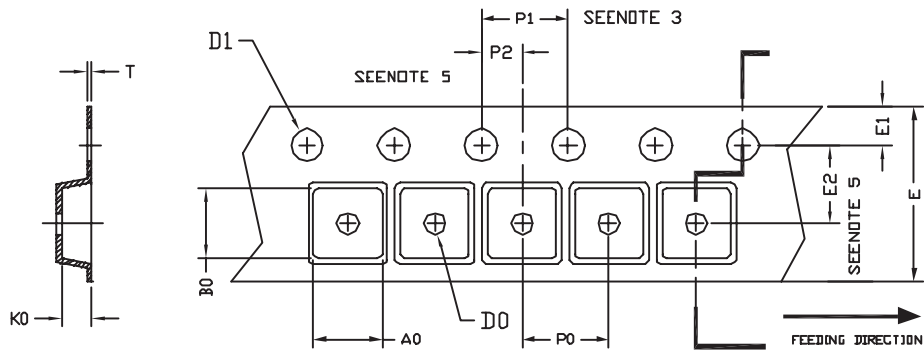


| SYMBOLS | MILLIMETERS | | INCHES | |
|----------|-------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.35 | 1.75 | 0.053 | 0.069 |
| A1 | 0.10 | 0.25 | 0.004 | 0.010 |
| D | 4.80 | 4.98 | 0.189 | 0.196 |
| E | 3.81 | 3.99 | 0.150 | 0.157 |
| H | 5.79 | 6.20 | 0.228 | 0.244 |
| L | 0.41 | 1.27 | 0.016 | 0.050 |
| θ | 0° | 8° | 0° | 8° |

STM6968

SO-8 Tape and Reel Data

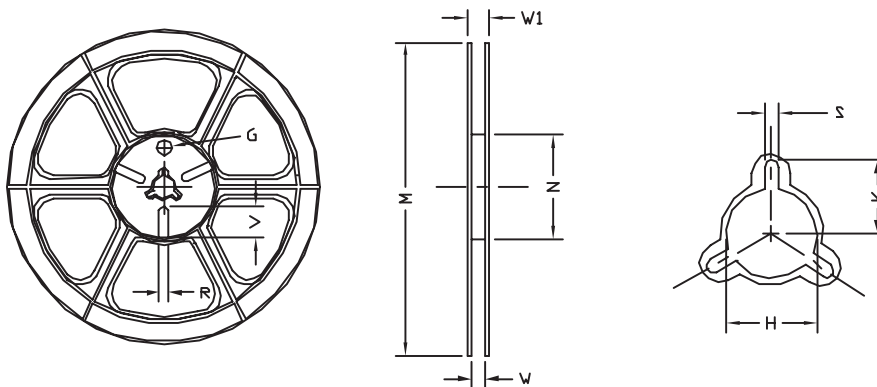
SO-8 Carrier Tape



unit: mm

| PACKAGE | A0 | B0 | K0 | D0 | D1 | E | E1 | E2 | P0 | P1 | P2 | T |
|------------------|------|------|------|---------------------|------------------------------|-------------------|------|-------------------|-----|-----|-------------------|-------------------|
| SOP 8N 150mil | 6.40 | 5.20 | 2.10 | $\phi 1.5$ (MIN) | $\phi 1.5$ + 0.1 - 0.0 | 12.0 ± 0.3 | 1.75 | 5.5 ± 0.05 | 8.0 | 4.0 | 2.0 ± 0.05 | 0.3 ± 0.05 |

SO-8 Reel



UNIT: mm

| TAPE SIZE | REEL SIZE | M | N | W | W1 | H | K | S | G | R | V |
|-----------|------------|----------------|-----------------|---------------|---------------|------------------------|-----|-------------------|-----|-----|-----|
| 12 mm | $\phi 330$ | 330 ± 1 | 62 ± 1.5 | 12.4 + 0.2 | 16.8 - 0.4 | $\phi 12.75$ + 0.15 | --- | 2.0 ± 0.15 | --- | --- | --- |