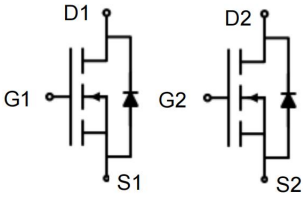
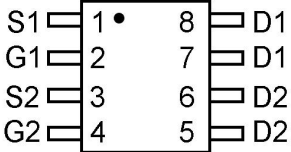



DUAL N-Channel Enhancement Mode Power MOSFET

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Description</p> <p>The G130N06S2 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.</p> <p>General Features</p> <ul style="list-style-type: none"> ● V_{DS} 60V ● I_D (at $V_{GS} = 10V$) 9A ● $R_{DS(ON)}$ (at $V_{GS} = 10V$) < 15mΩ ● $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) < 17mΩ ● 100% Avalanche Tested ● RoHS Compliant <p>Application</p> <ul style="list-style-type: none"> ● Power switch ● DC/DC converters |  <p>Schematic diagram</p>  <p>pin assignment</p>  <p>SOP-8 Dual</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Ordering Information

| Device | Package | Marking | Packaging |
|-----------|------------|----------|--------------|
| G130N06S2 | SOP-8 Dual | G130N06D | 4000pcs/Reel |

Absolute Maximum Ratings $T_C = 25^\circ C$, unless otherwise noted

| Parameter | Symbol | Value | Unit |
|--------------------------------------------------|----------------|------------|------------|
| Drain-Source Voltage | V_{DS} | 60 | V |
| Continuous Drain Current | I_D | 9 | A |
| Pulsed Drain Current (note1) | I_{DM} | 36 | A |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Power Dissipation | P_D | 2.6 | W |
| Single pulse avalanche energy (note2) | E_{AS} | 100 | mJ |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | -55 To 150 | $^\circ C$ |

Thermal Resistance

| Parameter | Symbol | Value | Unit |
|-----------------------------------------|------------|-------|--------------|
| Thermal Resistance, Junction-to-Ambient | R_{thJA} | 48 | $^\circ C/W$ |

| Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted | | | | | | |
|------------------------------------------------------------------|---------------|----------------------------------------------------------|-------|------|-----------|------------|
| Parameter | Symbol | Test Conditions | Value | | | Unit |
| | | | Min. | Typ. | Max. | |
| Static Parameters | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 60 | -- | -- | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 60V, V_{GS} = 0V$ | -- | -- | 1 | μA |
| Gate-Source Leakage | I_{GSS} | $V_{GS} = \pm 20V$ | -- | -- | ± 100 | nA |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 1.0 | 1.7 | 2.5 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 10A$ | -- | 12.5 | 15 | m Ω |
| | | $V_{GS} = 4.5V, I_D = 10A$ | -- | 14 | 17 | |
| Forward Transconductance | g_{FS} | $V_{GS} = 5V, I_D = 10A$ | -- | 17 | -- | S |
| Dynamic Parameters | | | | | | |
| Input Capacitance | C_{iss} | $V_{GS} = 0V,$ $V_{DS} = 30V,$ $f = 1.0\text{MHz}$ | -- | 3021 | -- | pF |
| Output Capacitance | C_{oss} | | -- | 250 | -- | |
| Reverse Transfer Capacitance | C_{rss} | | -- | 193 | -- | |
| Total Gate Charge | Q_g | $V_{DD} = 30V,$ $I_D = 10A,$ $V_{GS} = 10V$ | -- | 67 | -- | nC |
| Gate-Source Charge | Q_{gs} | | -- | 11 | -- | |
| Gate-Drain Charge | Q_{gd} | | -- | 15 | -- | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD} = 30V,$ $I_D = 10A,$ $R_G = 3\Omega$ | -- | 10 | -- | ns |
| Turn-on Rise Time | t_r | | -- | 8 | -- | |
| Turn-off Delay Time | $t_{d(off)}$ | | -- | 36 | -- | |
| Turn-off Fall Time | t_f | | -- | 6 | -- | |
| Drain-Source Body Diode Characteristics | | | | | | |
| Continuous Body Diode Current | I_S | $T_C = 25^\circ\text{C}$ | -- | -- | 9 | A |
| Body Diode Voltage | V_{SD} | $T_J = 25^\circ\text{C}, I_{SD} = 10A, V_{GS} = 0V$ | -- | -- | 1.2 | V |
| Reverse Recovery Charge | Q_{rr} | $I_F = 10A, V_{GS} = 0V$ $di/dt=100A/us$ | -- | 49 | -- | nC |
| Reverse Recovery Time | T_{rr} | | -- | 34 | -- | ns |

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. EAS condition : $T_J=25^\circ\text{C}$, $V_{DD}=50V, V_{GS}=10V, L=0.5\text{mH}, R_g=25\Omega$
3. Identical low side and high side switch with identical R_G

Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



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

Figure 1. Output Characteristics

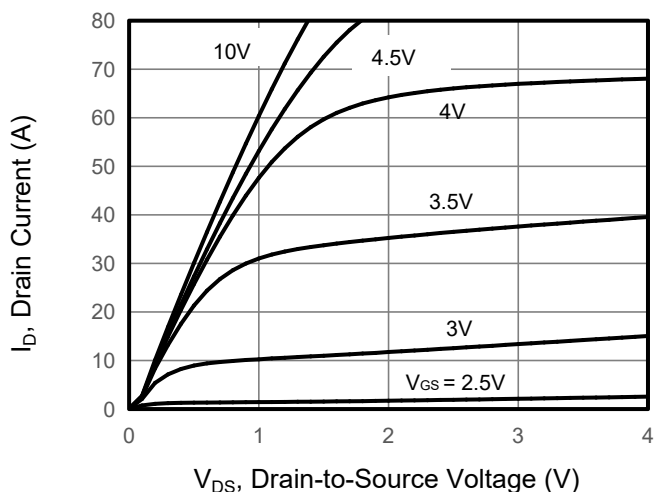


Figure 2. Transfer Characteristics

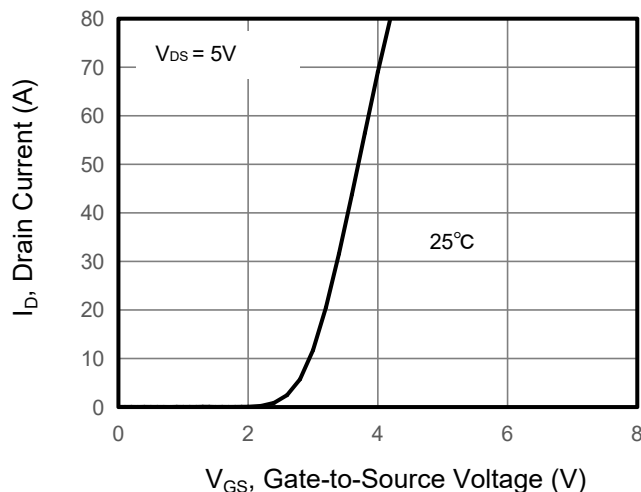


Figure 3. Drain Source On Resistance

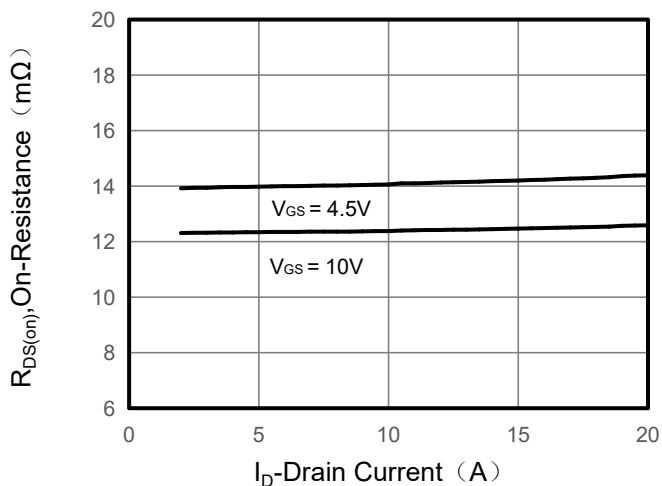


Figure 4. Gate Charge

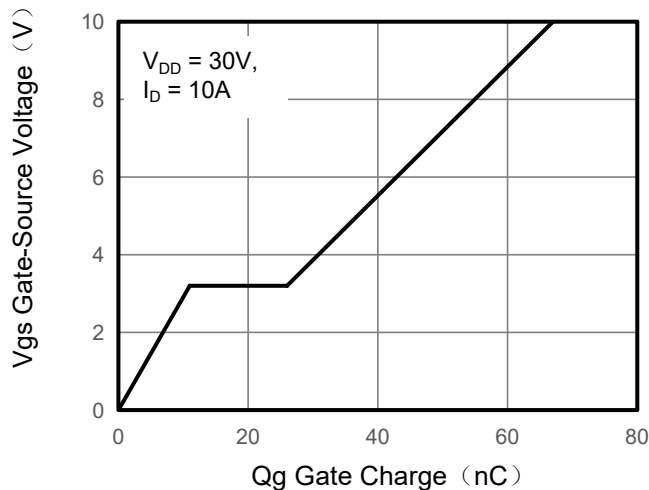


Figure 5. Capacitance

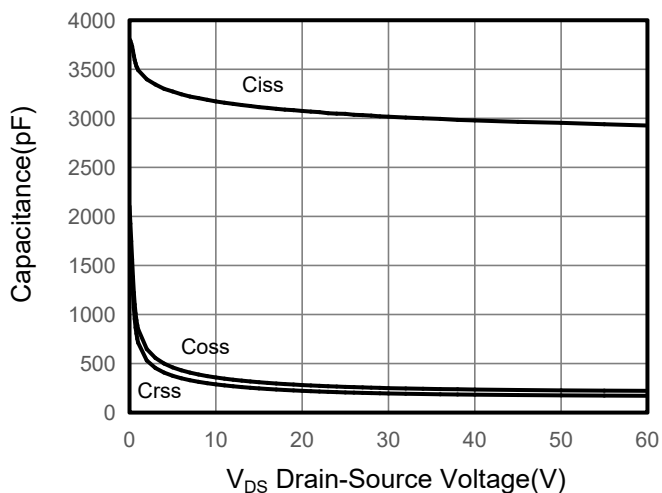
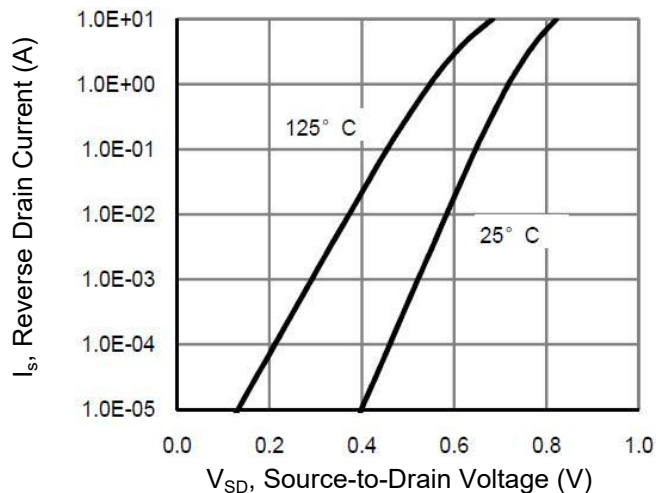


Figure 6. Source-Drain Diode Forward



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

Figure 7. Drain-Source On-Resistance

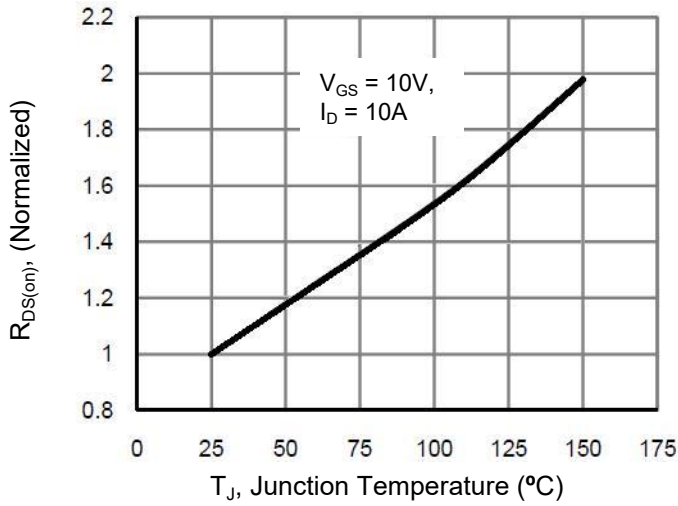


Figure 8. Safe Operation Area

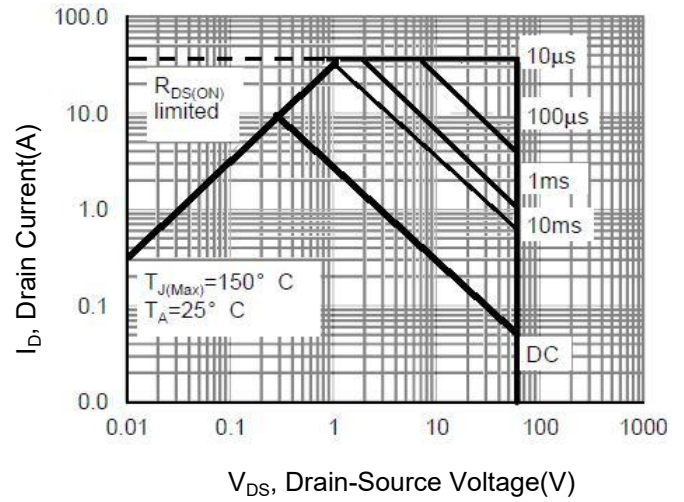
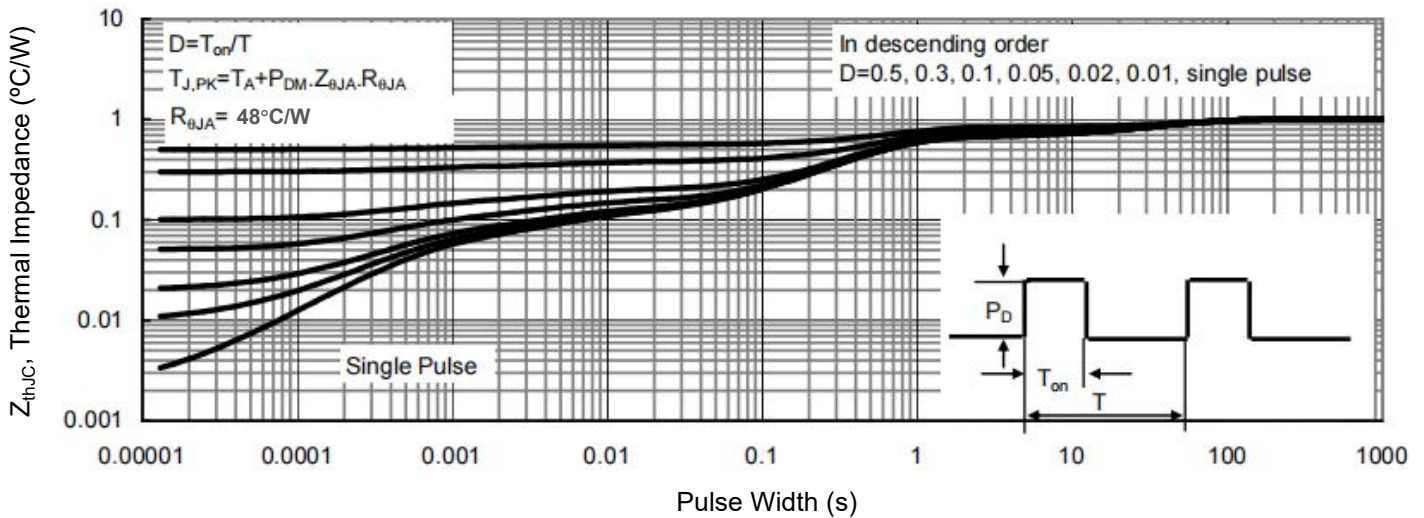
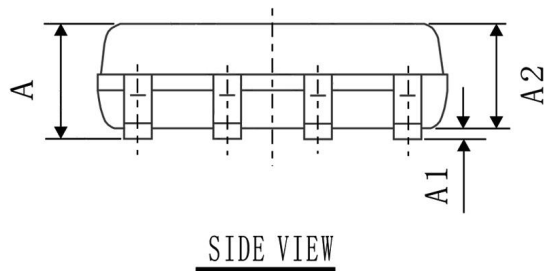
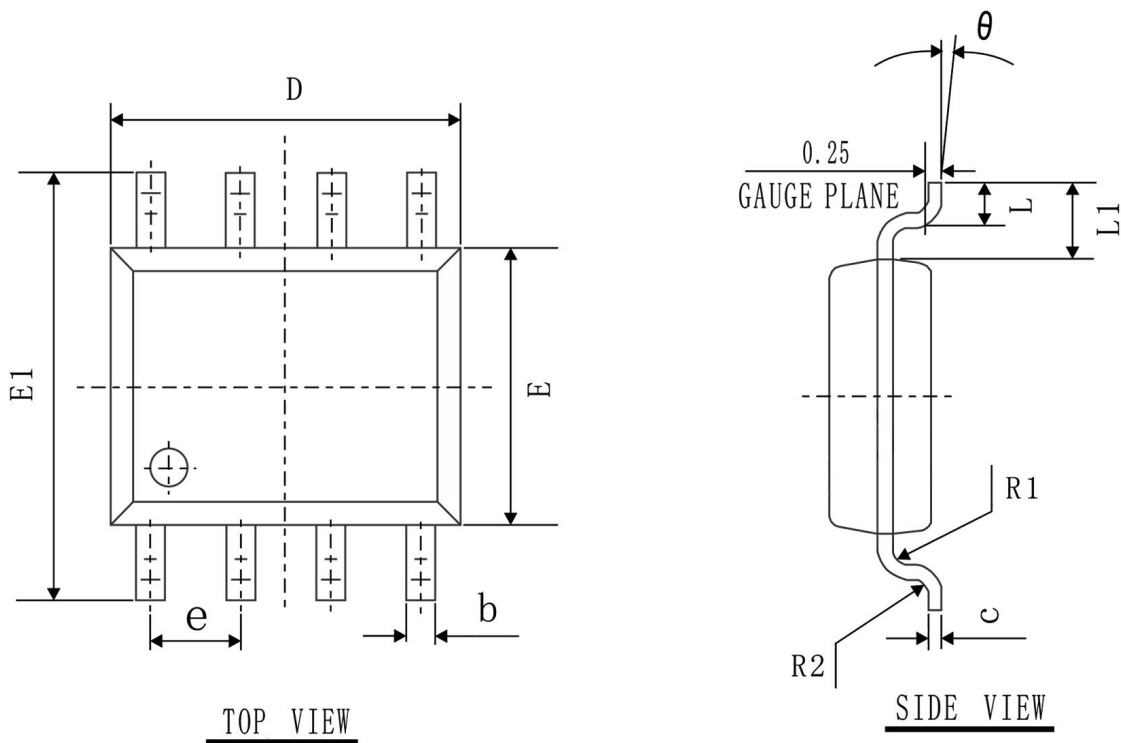


Figure 9. Normalized Maximum Transient Thermal Impedance



SOP-8 Dual Package Information



| SYMBOL | MIN | NOM | MAX |
|----------|----------|-------|-------|
| A | 1.40 | 1.60 | 1.80 |
| A1 | 0.05 | 0.15 | 0.25 |
| A2 | 1.35 | 1.45 | 1.55 |
| b | 0.30 | 0.40 | 0.50 |
| c | 0.153 | 0.203 | 0.253 |
| D | 4.80 | 4.90 | 5.00 |
| E | 3.80 | 3.90 | 4.00 |
| E1 | 5.80 | 6.00 | 6.20 |
| L | 0.45 | 0.70 | 1.00 |
| θ | 2° | 4° | 6° |
| L 1 | 1.04 REF | | |
| e | 1.27 BSC | | |
| R1 | 0.07 TYP | | |
| R2 | 0.07 TYP | | |