

SE100130GA

N-Channel Enhancement-Mode MOSFET

Revision: A

General Description

This type used advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge.

- High density cell design for ultra low $R_{DS(ON)}$
- Excellent package for good heat dissipation

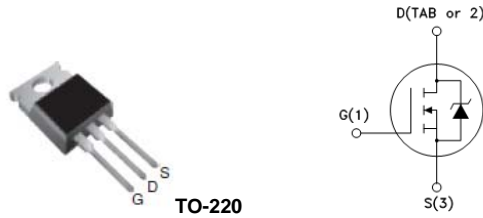
Features

For a single MOSFET

- $V_{DS} = 100V$
- $R_{DS(ON)} = 4m\Omega @ V_{GS}=10V$

Pin configurations

See Diagram below



Absolute Maximum Ratings

| Parameter | | Symbol | Rating | Units |
|--------------------------------------|------------|----------|------------|-------|
| Drain-Source Voltage | | V_{DS} | 100 | V |
| Gate-Source Voltage | | V_{GS} | ± 20 | V |
| Drain Current ¹ | Continuous | I_D | 100 | A |
| | Pulsed | | 390 | |
| Total Power Dissipation | @TA=25°C | P_D | 176 | W |
| Operating Junction Temperature Range | | T_J | -55 to 175 | °C |
| Avalanche Energy, Single Pulsed | | E_{AS} | 400 | mJ |

Thermal Resistance

| Symbol | Parameter | Min | Typ | Units |
|-----------------|------------------|-----|------|-------|
| $R_{\theta JC}$ | Junction to Case | | 0.85 | °C/W |

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| Electrical Characteristics (T _J =25°C unless otherwise noted) | | | | | | |
|--------------------------------------------------------------------------|-----------------------------------|----------------------------------------------------------------------|-----|------|-----|-------|
| Symbol | Parameter | Test Conditions | Min | Typ | Max | Units |
| OFF CHARACTERISTICS (Note 2) | | | | | | |
| B _V DSS | Drain-Source Breakdown Voltage | I _D =250μA, V _{GS} =0 V | 100 | | | V |
| I _{DSS} | Drain to Source Leakage Current | V _{DS} = 100V, V _{GS} =0V | | | 1 | μA |
| I _{GSS} | Gate-Body Leakage Current | V _{GS} =20V | | | 100 | nA |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} = V _{GS} , I _D =250μA | 2 | 2.8 | 4.0 | V |
| R _{DS(ON)} | Static Drain-Source On-Resistance | V _{GS} =10V, I _D =20A | | 4 | 5 | mΩ |
| g _{FS} | Transconductance | V _{DS} =5V, I _D =20A | | 75 | | S |
| DYNAMIC PARAMETERS | | | | | | |
| C _{iss} | Input Capacitance | V _{GS} =0V, V _{DS} =50V, f=1MHz | | 3650 | | pF |
| C _{oss} | Output Capacitance | | | 290 | | pF |
| C _{rss} | Reverse Transfer Capacitance | | | 88 | | pF |
| SWITCHING PARAMETERS | | | | | | |
| Q _g | Total Gate Charge ² | V _{GS} =10V, V _{DS} =50V, I _D =20A | | 56 | | nC |
| Q _{gs} | Gate Source Charge | | | 14 | | nC |
| Q _{gd} | Gate Drain Charge | | | 18 | | nC |
| t _{d(on)} | Turn-On Delay Time | V _{GS} =10V, V _{DS} =50V, R _{GEN} =10Ω | | 17 | | ns |
| t _{d(off)} | Turn-Off Delay Time | | | 57 | | ns |
| t _{d(r)} | Turn-On Rise Time | | | 40 | | ns |
| t _{d(f)} | Turn-Off Fall Time | | | 37 | | ns |
| REVERSE DIODE | | | | | | |
| I _S | Diode Continuous Forward Current | T _C =25°C | | | 20 | A |
| V _{SD} | Diode Forward Voltage | V _{DS} =0V, I _F =20V, | | 0.9 | 1.2 | V |
| T _{rr} | Reverse Recovery Time | V _R =50V, I _F =I _S | | 50 | | ns |
| Q _{rr} | Reverse Recovery Charge | dI/dT=500A/us | | 255 | | nC |

Typical Characteristics

Fig 1. Typical Output Characteristics

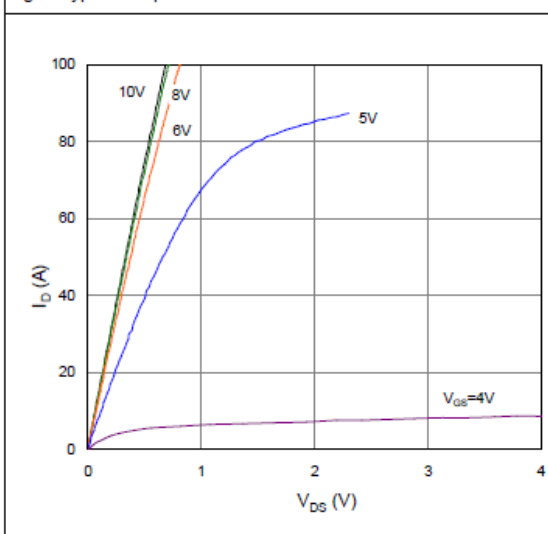


Figure 2. On-Resistance vs. Gate-Source Voltage

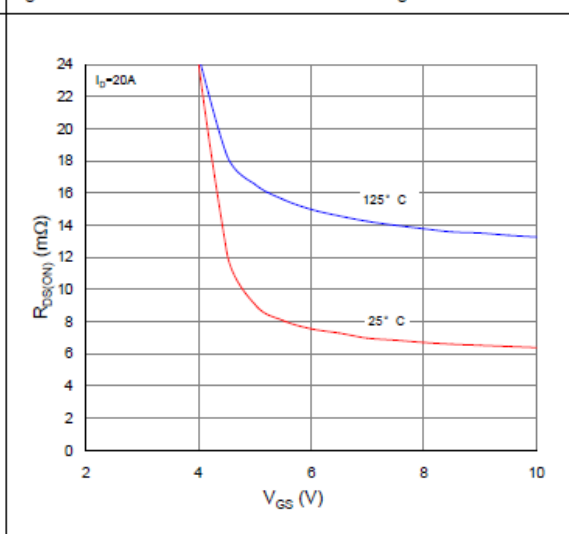


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

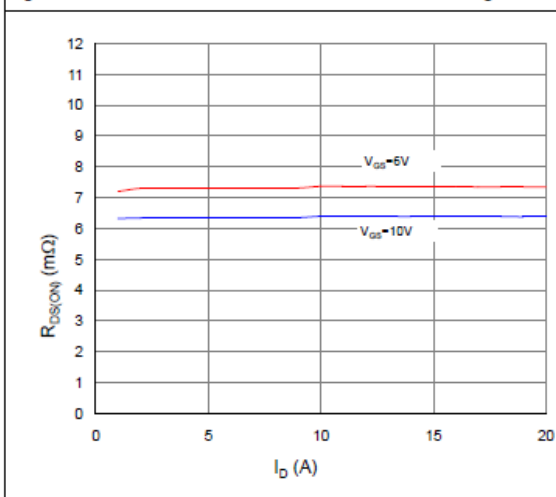


Figure 4. Normalized On-Resistance vs. Junction Temperature

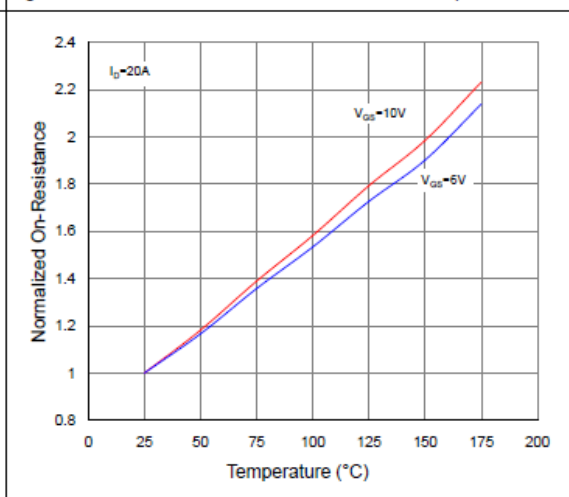


Figure 5. Typical Transfer Characteristics

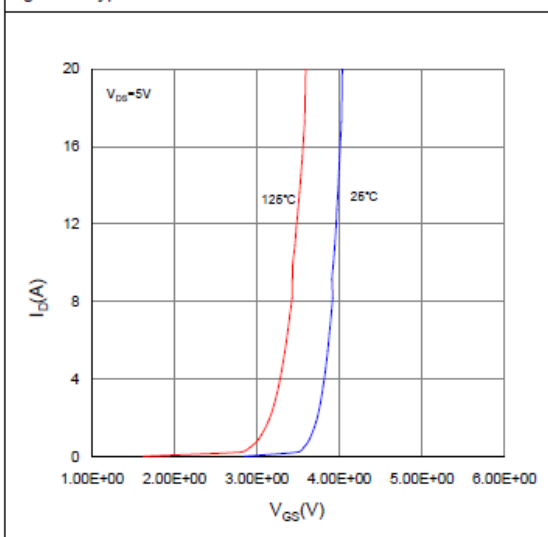
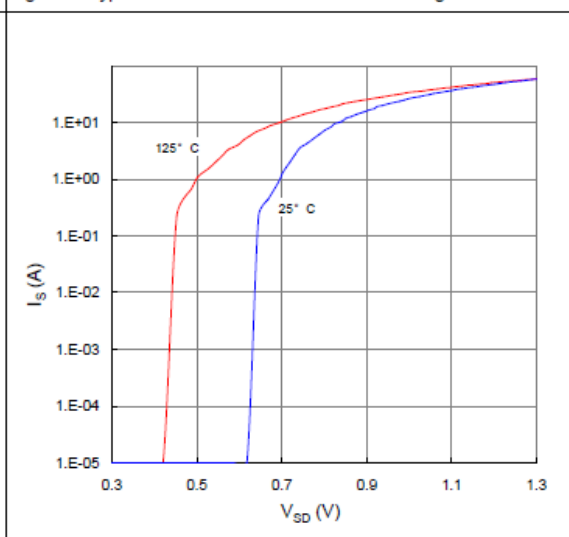


Figure 6. Typical Source-Drain Diode Forward Voltage



Typical Characteristics

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

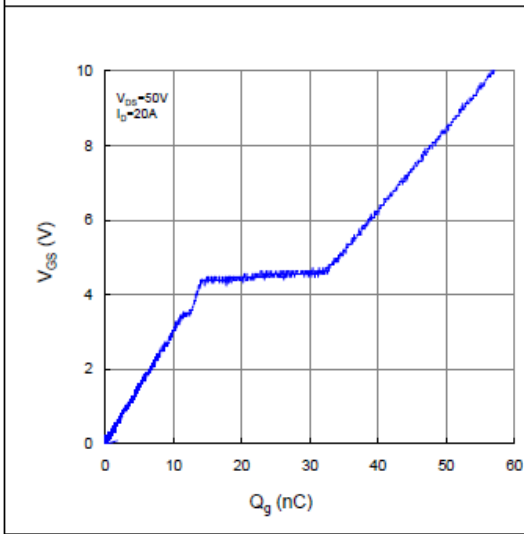


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

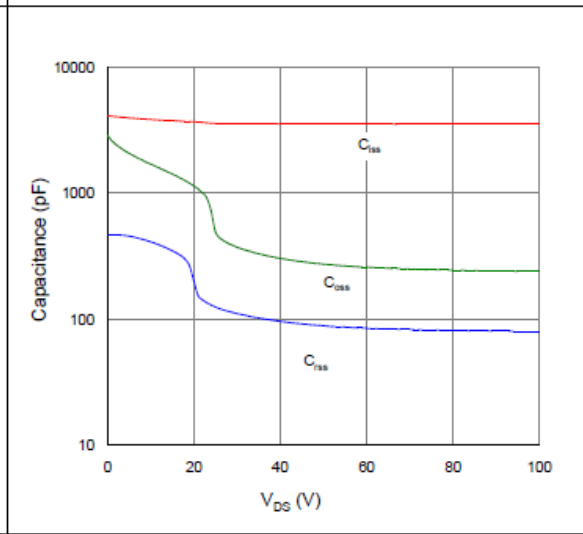


Figure 9. Maximum Safe Operating Area

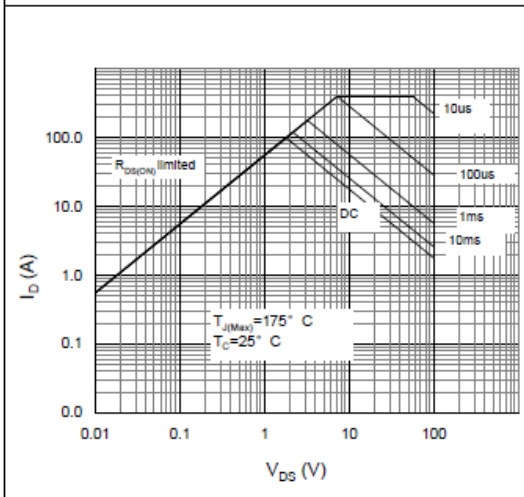


Figure 10. Maximum Drain Current vs. Case Temperature

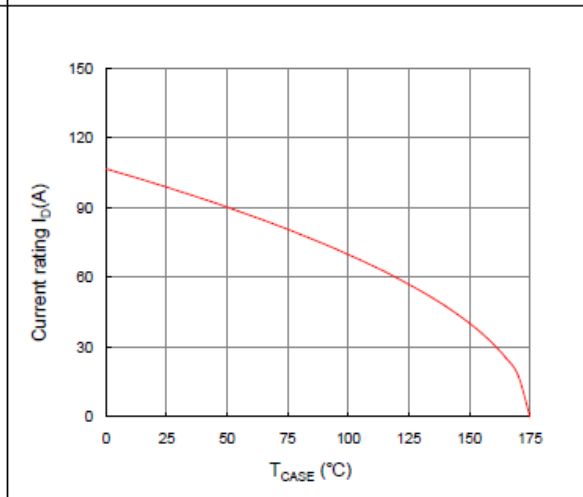
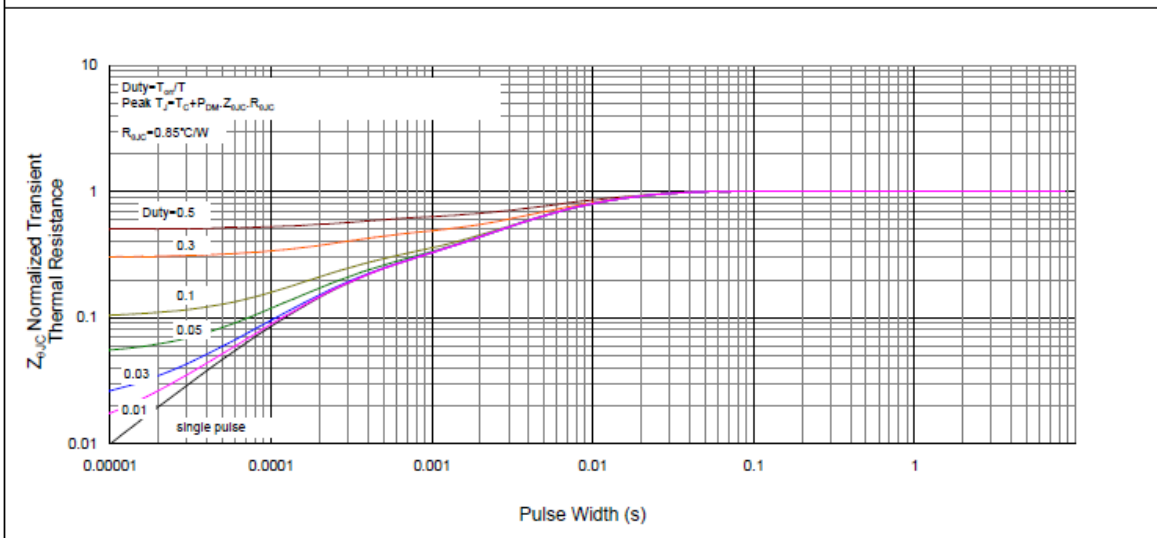


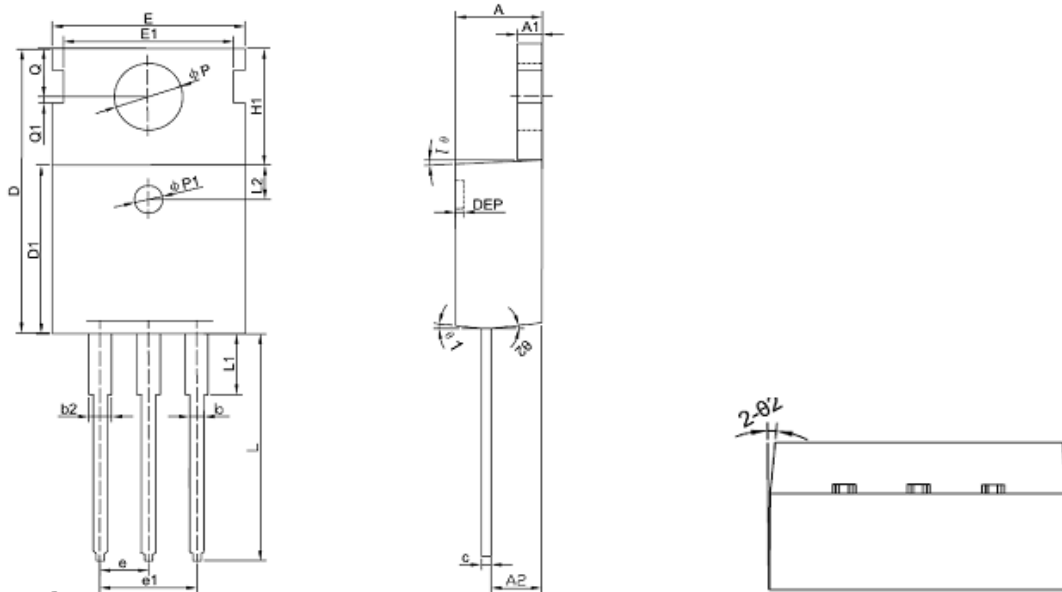
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case



SE100130GA

Package Outline Dimension

TO-220



| Symbol | Dimension In Millimeters | | | Dimension In Inches | | |
|------------|--------------------------|-----------|-----------|---------------------|-----------|-----------|
| | Min | Nom | Max | Min | Nom | Max |
| A | 4.400 | 4.550 | 4.700 | 0.173 | 0.179 | 0.185 |
| A1 | 1.270 | 1.300 | 1.330 | 0.050 | 0.051 | 0.052 |
| A2 | 2.590 | 2.690 | 2.790 | 0.102 | 0.106 | 0.110 |
| b | 0.770 | - | 0.900 | 0.030 | - | 0.035 |
| b2 | 1.230 | - | 1.360 | 0.048 | - | 0.054 |
| c | 0.480 | 0.500 | 0.520 | 0.019 | 0.020 | 0.020 |
| D | 15.100 | 15.400 | 15.700 | - | 0.606 | - |
| D1 | 9.000 | 9.100 | 9.200 | 0.354 | 0.358 | 0.362 |
| DEP | 0.050 | 0.285 | 0.520 | 0.002 | 0.011 | 0.020 |
| E | 10.060 | 10.160 | 10.260 | 0.396 | 0.400 | 0.404 |
| E1 | - | 8.700 | - | - | 0.343 | - |
| $\Phi P1$ | 1.400 | 1.500 | 1.600 | 0.055 | 0.059 | 0.063 |
| e | 2.54BSC | | | 0.1BSC | | |
| e1 | 5.08BSC | | | 0.2BSC | | |
| H1 | 6.100 | 6.300 | 6.500 | 0.240 | 0.248 | 0.256 |
| L | 12.750 | 12.960 | 13.170 | 0.502 | 0.510 | 0.519 |
| L1 | - | - | 3.950 | - | - | 0.156 |
| L2 | 1.85REF | | | 0.073REF | | |
| ΦP | 3.570 | 3.600 | 3.630 | 0.141 | 0.142 | 0.143 |
| Q | 2.730 | 2.800 | 2.870 | 0.107 | 0.110 | 0.113 |
| Q1 | - | 0.200 | - | - | 0.008 | - |
| θ_1 | 5° | 7° | 9° | 5° | 7° | 9° |
| θ_2 | 1° | 3° | 5° | 1° | 3° | 5° |

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