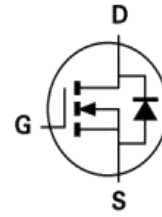


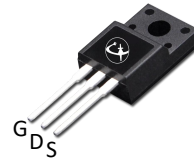
MAIN CHARACTERISTICS

| | |
|--|-------|
| I_D | 7A |
| V_{DS} | 800V |
| $R_{DS(on)-typ}$ (@VGS=18V Tc=25°C) | 490mΩ |



Features

- High Speed Switching
- High Blocking Voltage with Low RDS(on)
- Easy to Parallel
- Simple to Drive
- RoHS Compliant



TO-220F

Benefits

- Increased Power Density
- Faster Operating Frequency
- Reduction of Heat Sink Requirement
- Higher Efficiency
- Reduced EMI

Application

- Power Factor Correction Modules
- Switch Mode Power Supplies
- DC-AC Inverters
- High Voltage DC/DC Converters

Package parameters

| Part Number | Package | Mode Name | Pack |
|-------------|---------|------------|------|
| LSC500M65F | TO-220F | LSC500M65F | Tube |

Maximum Ratings at Tc=25°C unless otherwise specified

| Parameter | Symbol | Value | Unit |
|--|-----------------|-------------|------|
| Drain-Source Voltage | V_{DS} | 800 | V |
| Gate-Source Voltage | V_{GS} | -18/+22 | V |
| Gate-Source Voltage,max.Transient Voltage tp≤0.5μs,D<0.001 | V_{GSmax} | -18/+22 | V |
| Recommended Operation Value | VGSop | -4/+18 | V |
| Continue Drain Current TC=25°C | I_D | 7 | A |
| Continue Drain Current TC=100°C | | 5 | A |
| Pulsed Drain Current (Note1) | I_{DM} | 13 | A |
| Power Dissipation TC=25°C | P_D | 35 | W |
| Power Dissipation TC=100°C | | 13 | W |
| Operating Temperature Range | T_J | -40 to +175 | °C |
| Storage Temperature Range | T_{STG} | -40 to +150 | °C |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 5.5 | °C/W |
| Thermal Resistance, Junction to | $R_{\theta JA}$ | 40 | °C/W |

Note1:Pulse test: 300 μs pulse width, 2 % duty cycle

Electrical Characteristics at Tc=25°C unless otherwise specified

| Parameter | Test Condition | Symbol | Min | Typ | Max | Unit |
|----------------------------------|---|--------------|--------------|-----|-----|------|
| Drain-Source Breakdown Voltage | $V_{GS} = 0 V, I_D = 100\mu A$ | BV_{DSS} | 800 | - | - | V |
| Drain-Source Leakage Current | $V_{DS} = 800 V, V_{GS} = 0 V$ | I_{DSS} | - | 1 | 10 | μA |
| Gate Leakage Current | $V_{GS} = 18 V, V_{DS} = 0 V$ | I_{GSS} | - | - | 250 | nA |
| Gate-Source Threshold Voltage | $V_{DS}=V_{GS}, I_D=1mA, T_J=25^\circ C$ | $V_{GS(th)}$ | 2 | 2.9 | 4 | V |
| | $V_{DS}=V_{GS}, I_D=1mA, T_J=175^\circ C$ | | - | 2.1 | - | V |
| Drain-Source On-State Resistance | $V_{GS} = 15 V, I_D = 3.3 A$ | $R_{DS(on)}$ | - | 640 | 864 | mΩ |
| | $V_{GS} = 15 V, I_D = 3.3 A, T_J = 175^\circ C$ | | - | 670 | - | |
| | $V_{GS} = 18 V, I_D = 3.3 A$ | | - | 490 | 637 | |
| | $V_{GS} = 18 V, I_D = 3.3 A, T_J = 175^\circ C$ | | - | 610 | - | |
| Forward Transconductance | $V_{DS}=20V, I_D=3.3A$ | gfs | | 2.1 | | S |
| Input Capacitance | $V_{GS} = 0 V, V_{DS} = 600 V, f = 1MHz$ | C_{iss} | - | 116 | - | pF |
| Output Capacitance | | C_{oss} | - | 18 | - | pF |
| Reverse Transfer Capacitance | | C_{rss} | - | 2.8 | - | pF |
| Coss Stored Energy | | E_{oss} | - | 2.4 | - | μJ |
| Internal Gate Resistance | | f=1MHz | $R_{G(int)}$ | - | 8.6 | - |
| Total Gate Charge(Note2) | $I_D = 3.3A, V_{DD} = 400 V, V_{GS} = 4/18 V$ | Q_G | - | 7 | - | nC |
| Gate to Source Charge(Note2) | | Q_{GS} | - | 1.3 | - | nC |
| Gate to Drain Charge(Note2) | | Q_{GD} | - | 4.2 | - | nC |
| Turn-on Delay Time(Note2) | $V_{DS} = 400 V, I_D = 3.3A, V_{GS} = -4/18 V, R_G = 2.5\Omega, L=200\mu H, T_C=25^\circ C$ | $t_{d(ON)}$ | - | 3 | - | ns |
| Rise Time(Note2) | | t_r | - | 12 | - | ns |
| Turn-Off Delay Time(Note2) | | $t_{d(OFF)}$ | - | 9 | - | ns |
| Fall Time(Note2) | | t_f | - | 18 | - | ns |
| Turn-On Energy | | E_{on} | - | 24 | - | μJ |
| Turn-Off Energy | E_{off} | - | 4 | - | μJ | |

Electrical Characteristics at Tc=25°C unless otherwise specified

| Parameter | Test Condition | Symbol | Min | Typ | Max | Unit |
|----------------------------|---|---------------------|-----|-----|-----|------|
| Turn-on Delay Time(Note2) | VDS = 400 V, ID = 3.3A, VGS = -4/18 V, RG = 2.5Ω, L=200μH, Tc=175°C | t _{d(ON)} | - | 3 | - | ns |
| Rise Time(Note2) | | t _r | - | 11 | - | ns |
| Turn-Off Delay Time(Note2) | | t _{d(OFF)} | - | 10 | - | ns |
| Fall Time(Note2) | | t _f | - | 19 | - | ns |
| Turn-On Energy | | Eon | - | 22 | - | μJ |
| Turn-Off Energy | | Eoff | - | 4 | - | μJ |

Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

| Parameter | Test Condition | Symbol | Min. | Typ. | Max. | Unit |
|--|-------------------------------|-----------------|------|------|------|------|
| Maximum Body-Diode Continuous Current | Tc=25°C | I _S | - | 7 | - | A |
| Maximum Body-Diode Continuous Current | Tc=175°C | | - | 3 | - | A |
| Maximum Body-Diode Pulsed Current(Note2) | | I _{SM} | - | - | 13 | A |
| Drain-Source Diode Forward Voltage | VGS=-4V, ISD=1.7A Tc=25°C | V _{SD} | - | 4 | - | V |
| | VGS=-4V, ISD=1.7A Tc=175°C | | - | 3.6 | - | V |
| | VGS=-4V, ISD=3.3A Tc=25°C | V _{SD} | - | 4.5 | - | V |
| | VGS=-4V, ISD=3.3A Tc=175°C | | - | 4 | - | V |
| Reverse Recovery Time(Note2) | VGS=-4V, ISD=3.3A, | trr | - | 45 | - | ns |
| Reverse Recovery Charge(Note2) | VR=400V, di/dt=1990A/μs, | Qrr | - | 54 | - | nC |
| Peak Reverse Recovery Current | Tj=25°C | Irrm | - | 2 | - | A |
| Reverse Recovery Time(Note2) | VGS=-4V, ISD=1.7A, | trr | - | 48 | - | ns |
| Reverse Recovery Charge(Note2) | VR=400V, di/dt=1990A/μs, | Qrr | - | 52 | - | nC |
| Peak Reverse Recovery Current | Tj=175°C | Irrm | - | 2.3 | - | A |

Note2:Pulse test: 300 μs pulse width, 2 % duty cycle

RATINGS AND CHARACTERISTIC CURVES

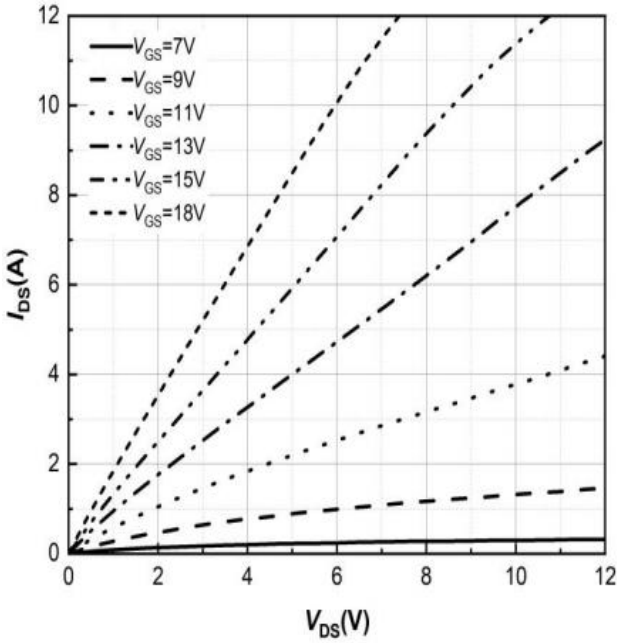


Figure 1. Output Characteristics
 $T_j = -40^\circ\text{C}$

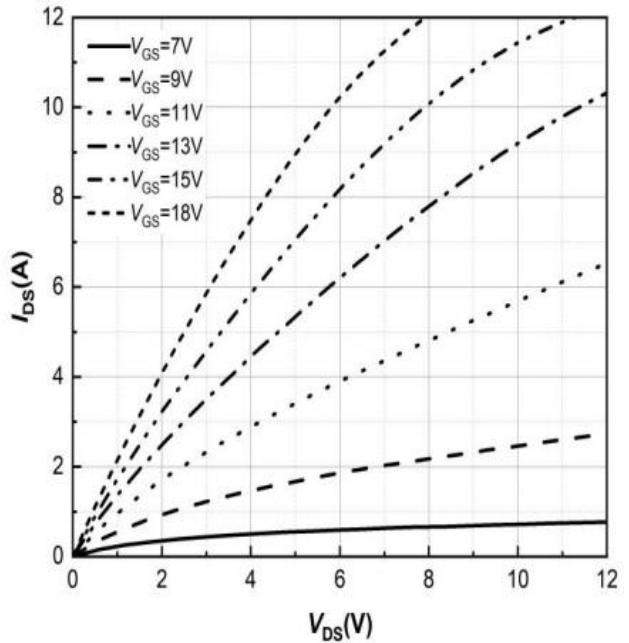


Figure 2. Output Characteristics
 $T_j = 25^\circ\text{C}$

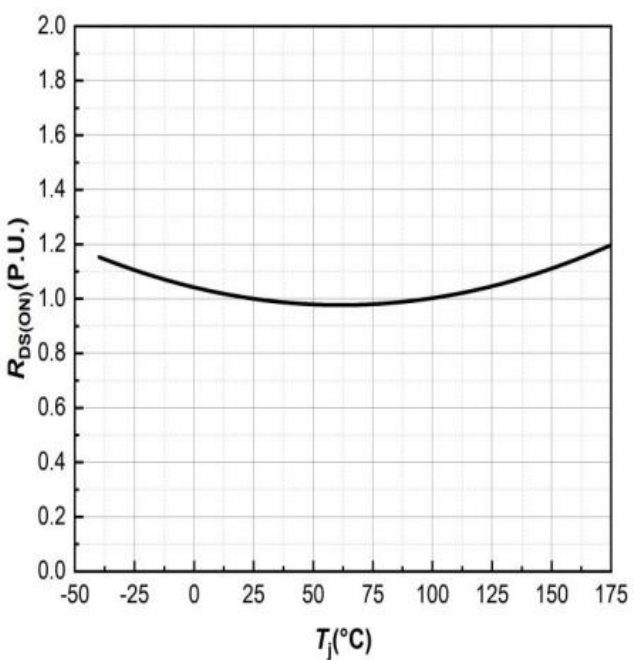
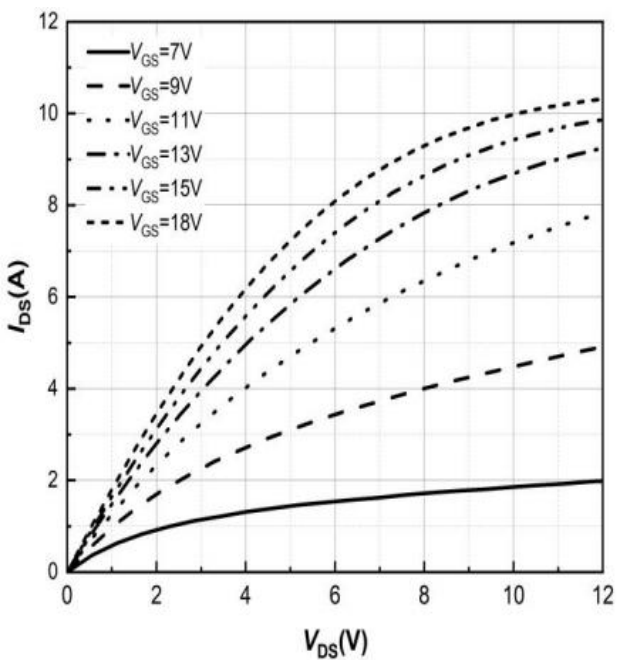


Figure 3. Output Characteristics
 $T_j=175^\circ\text{C}$

Figure 4. Normalized On-Resistance vs. Temperature

RATINGS AND CHARACTERISTIC CURVES

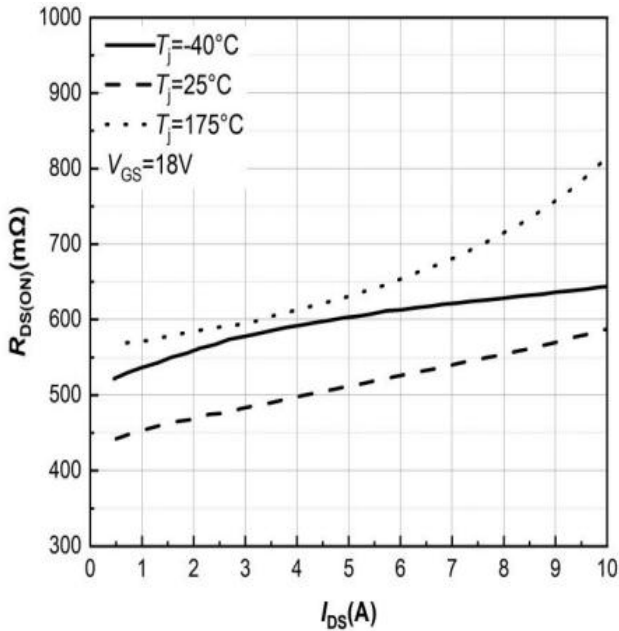


Figure 5. On-Resistance vs. Drain Current For Various Temperatures

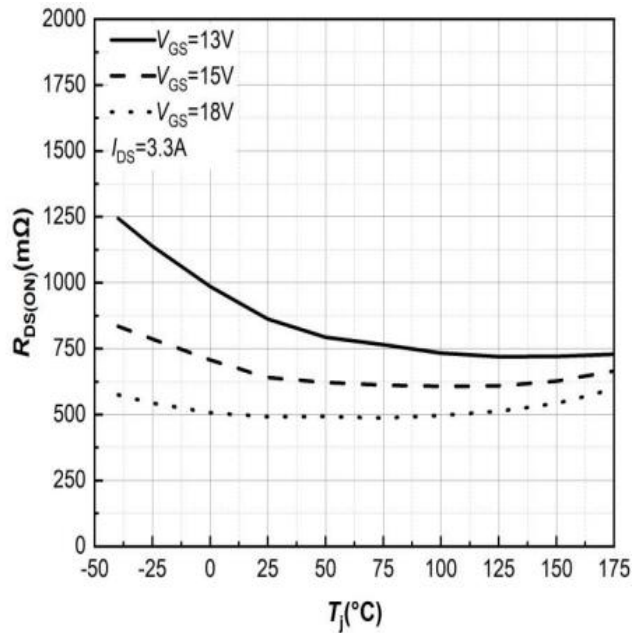


Figure 6. On-Resistance vs. Temperature For Various Gate Voltage

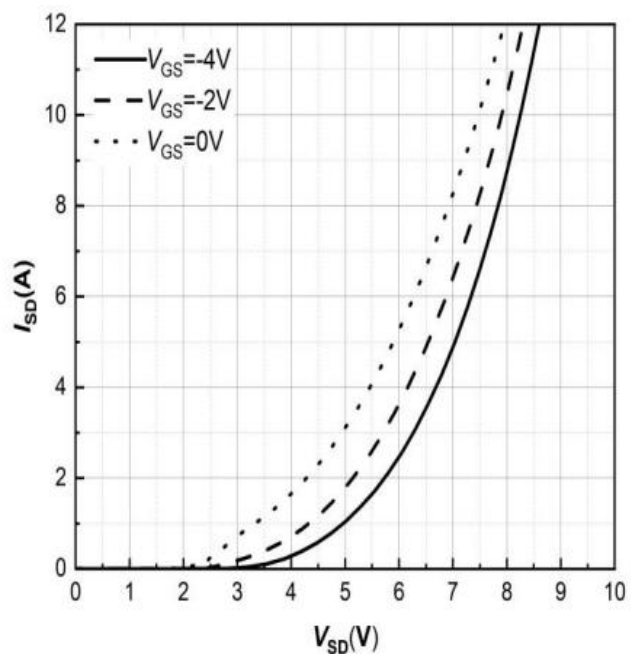
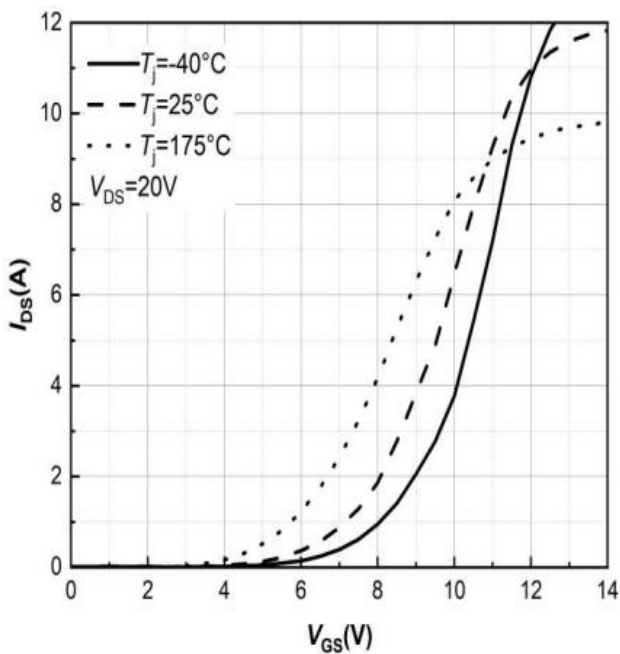


Figure 7. Transfer Characteristic for Various Junction Temperatures

Figure 8. Body Diode Characteristic $T_J = -40^\circ\text{C}$

RATINGS AND CHARACTERISTIC CURVES

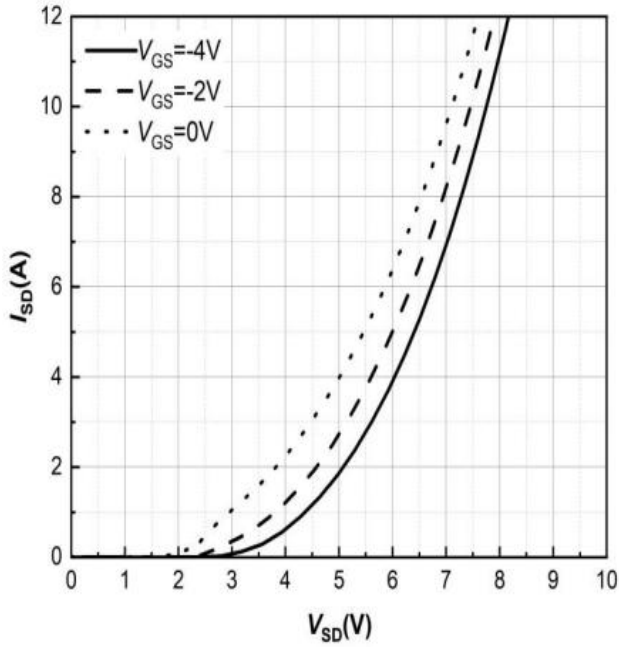


Figure 9. Body Diode Characteristic $T_J = 25^\circ\text{C}$

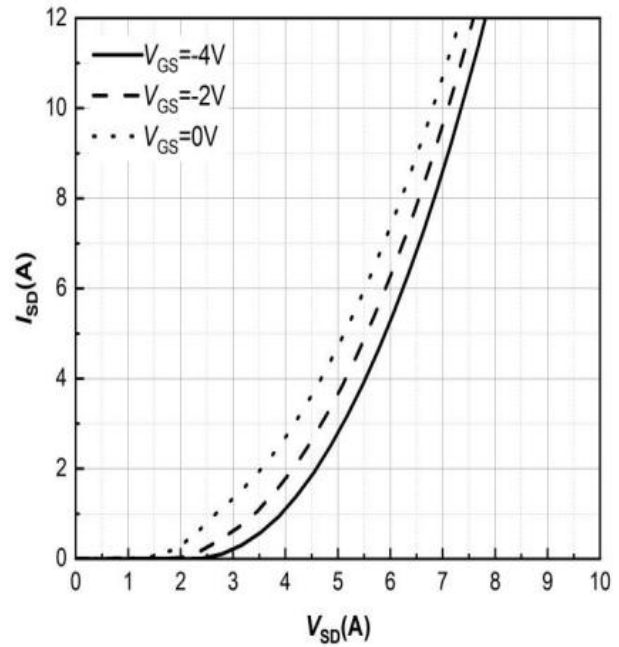


Figure 10. Body Diode Characteristic $T_J = 175^\circ\text{C}$

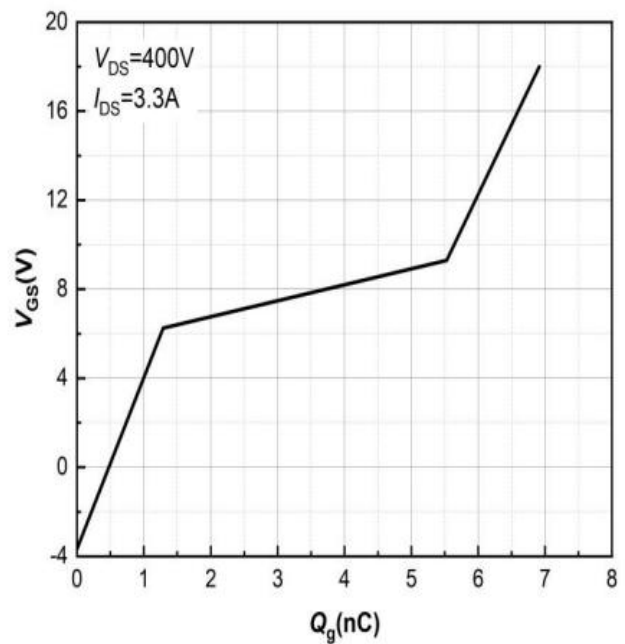
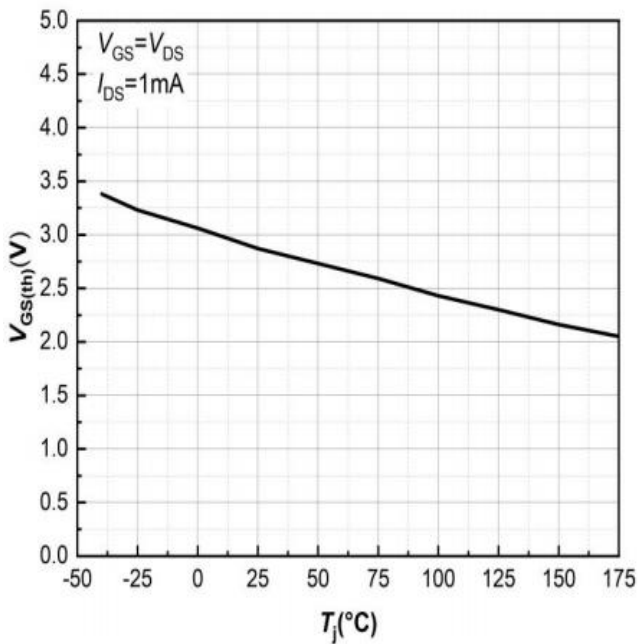


Figure 11. Threshold Voltage vs. Temperature

Figure 12. Gate Charge Characteristics

RATINGS AND CHARACTERISTIC CURVES

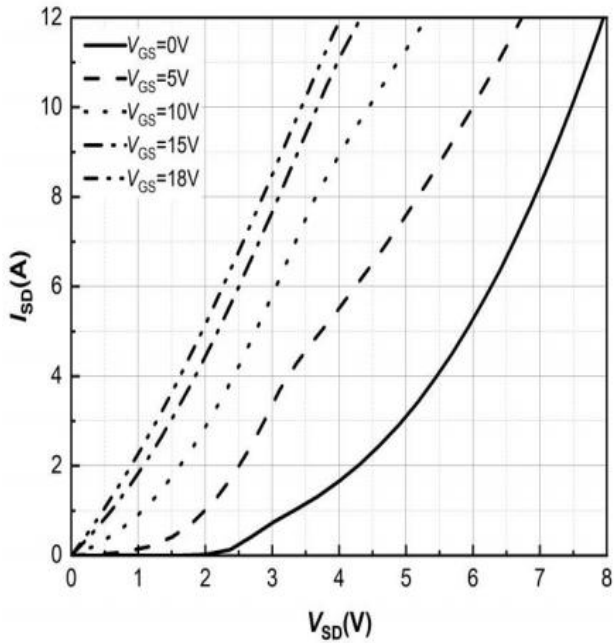


Figure 13. 3rd Quadrant Characteristic
 $T_j = -40^\circ\text{C}$

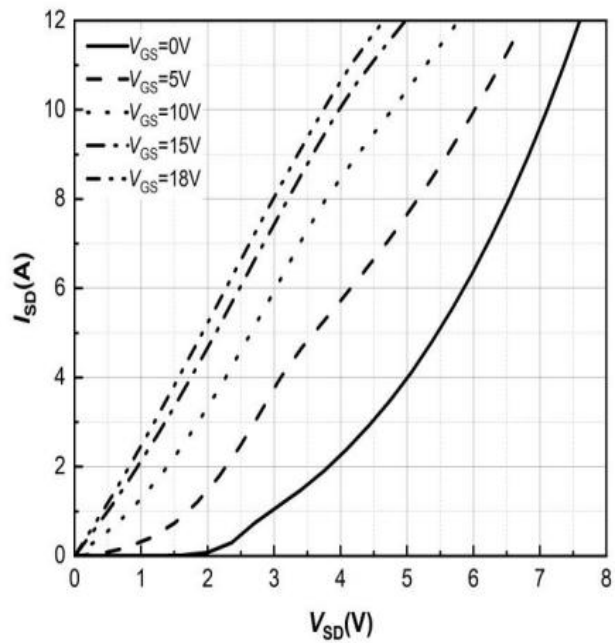


Figure 14. 3rd Quadrant Characteristic
 $T_j = 25^\circ\text{C}$

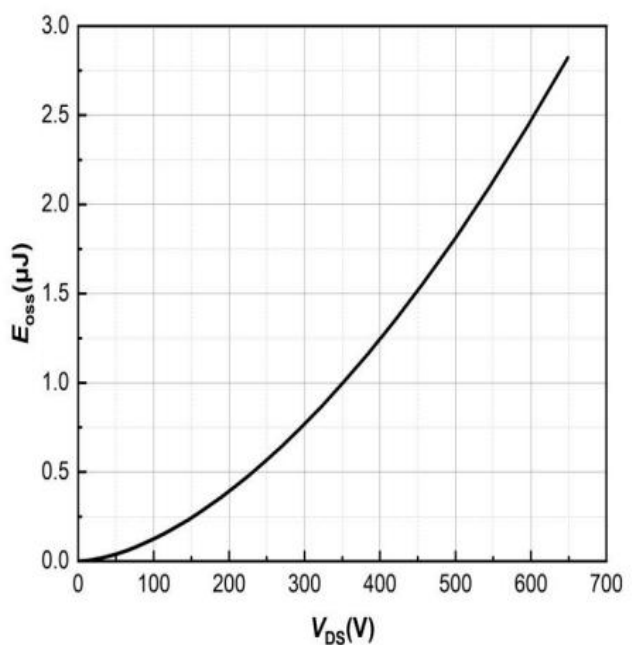
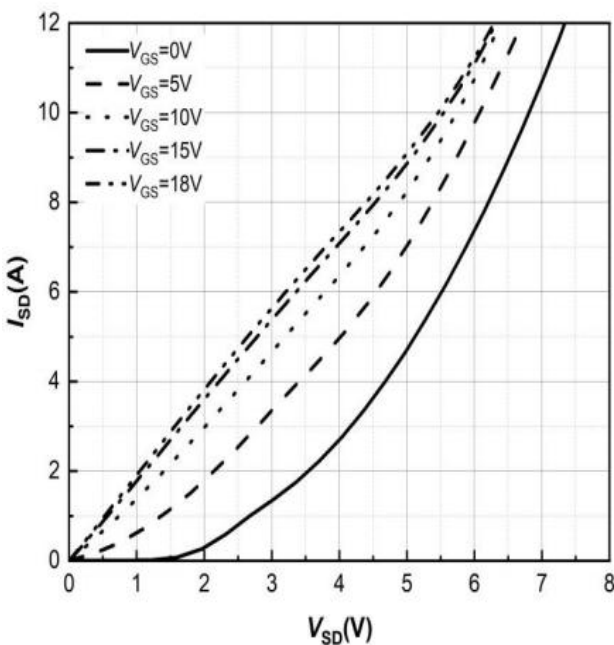


Figure 15. 3rd Quadrant Characteristic
 $T_j=175^{\circ}\text{C}$

Figure 16. Output Capacitor Stored Energy

RATINGS AND CHARACTERISTIC CURVES

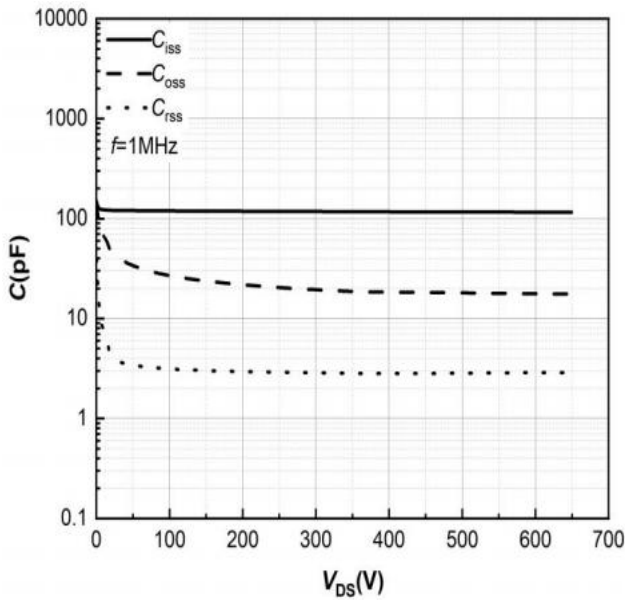


Figure 17. Capacitances vs. Drain-Source

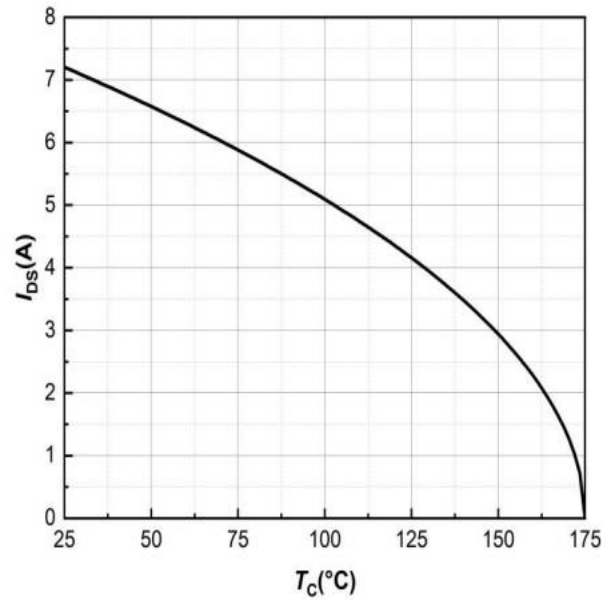


Figure 18. Continuous Drain Current Derating vs. Case Temperature

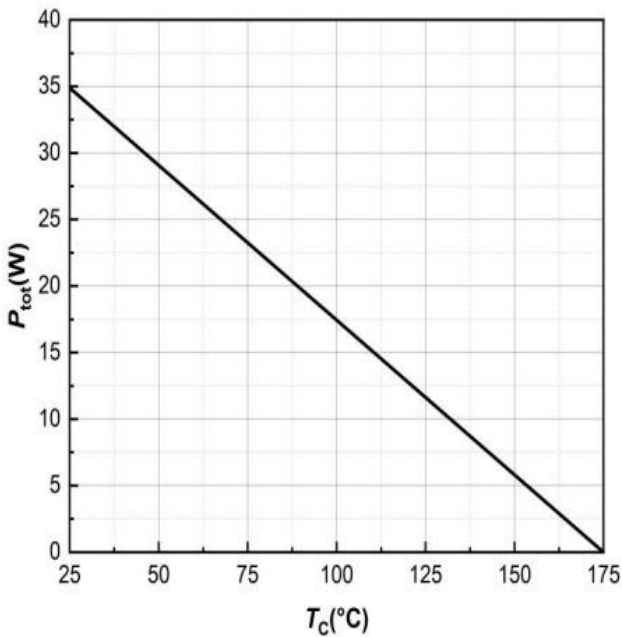


Figure 19. Maximum Power Dissipation Derating vs. Case Temperature

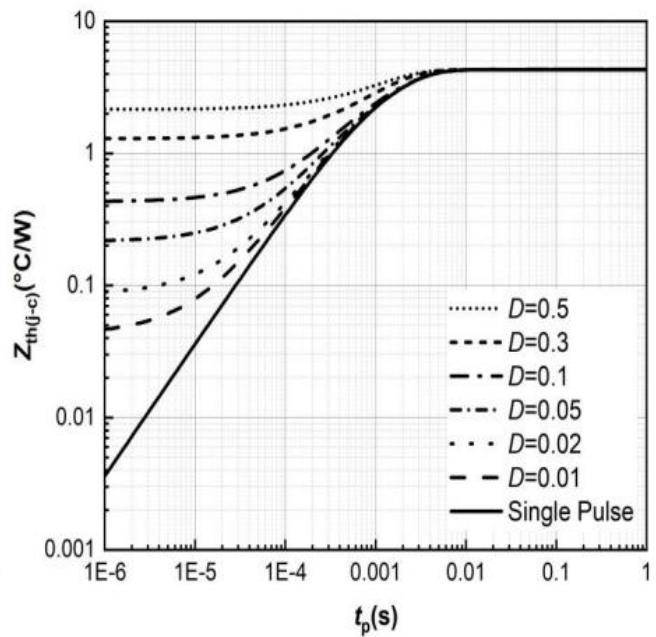


Figure 20. Transient Thermal Impedance

Derating vs. Case Temperature

RATINGS AND CHARACTERISTIC CURVES

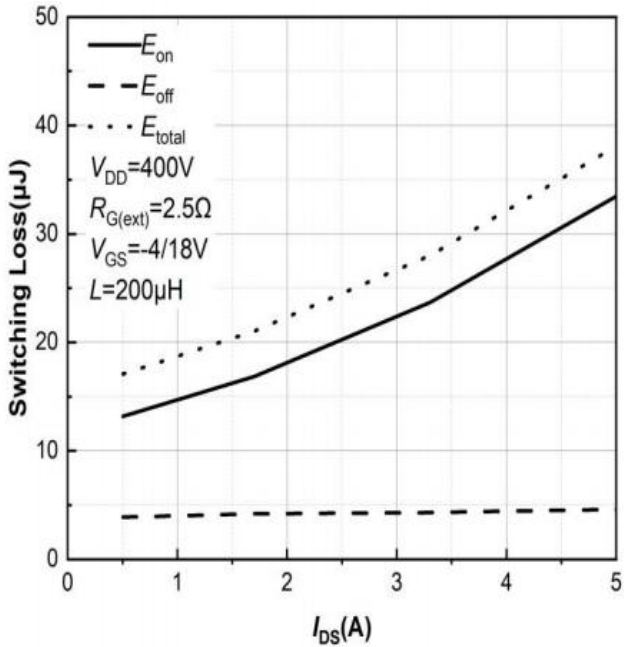


Figure 21. Clamped Inductive Switching Energy vs. Drain Current
 $T_j=25^\circ\text{C}$

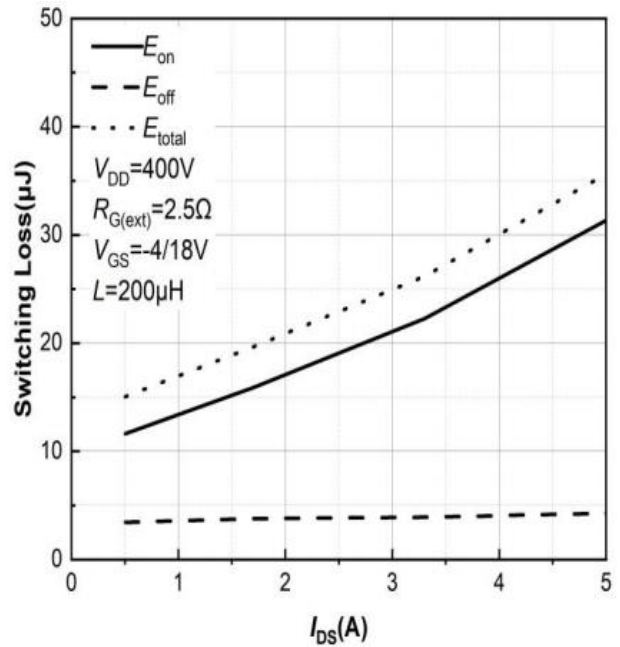


Figure 22. Clamped Inductive Switching Energy vs. Drain Current
 $T_j=175^\circ\text{C}$

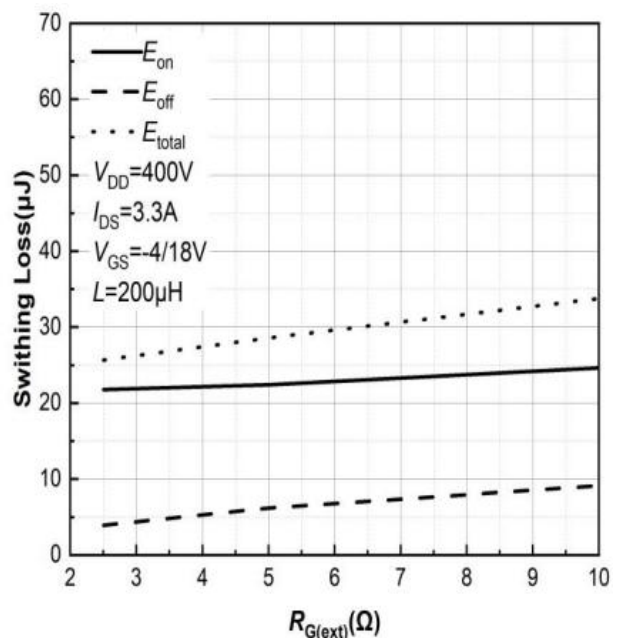
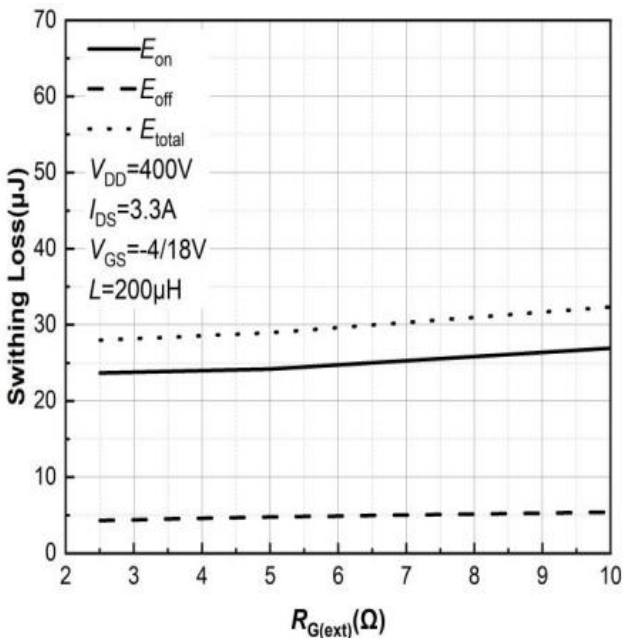


Figure 23. Clamped Inductive Switching
Energy vs. $R_{G(ext)}$
 $T_j=25^\circ\text{C}$

Figure 24. Clamped Inductive Switching
Energy vs. $R_{G(ext)}$
 $T_j=175^\circ\text{C}$

RATINGS AND CHARACTERISTIC CURVES

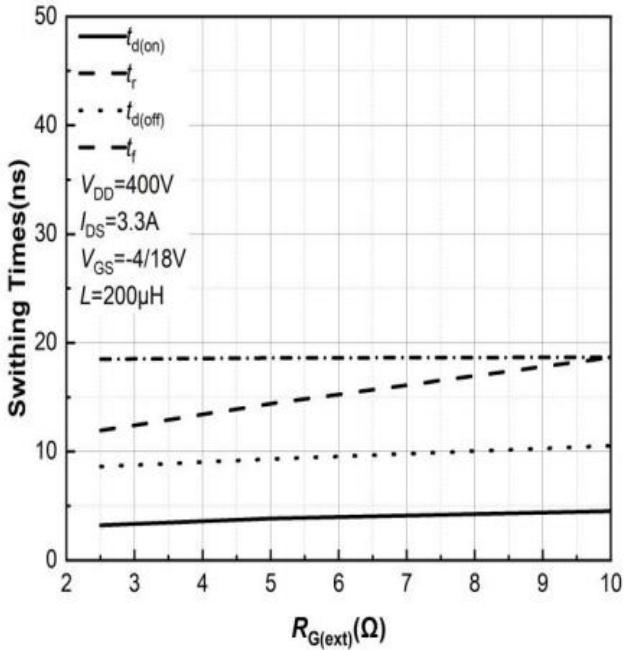


Figure 25. Switching Times vs. $R_{G(ext)}$
 $T_j=25^\circ\text{C}$

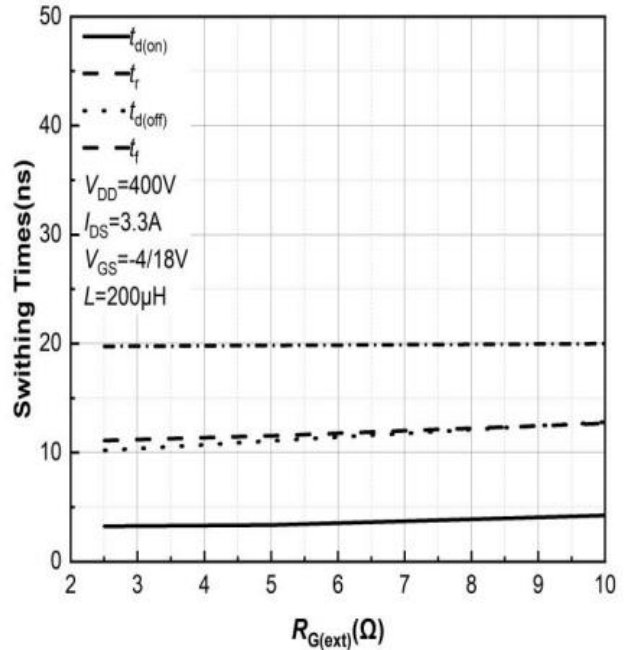


Figure 26. Switching Times vs. $R_{G(ext)}$
 $T_j=175^\circ\text{C}$

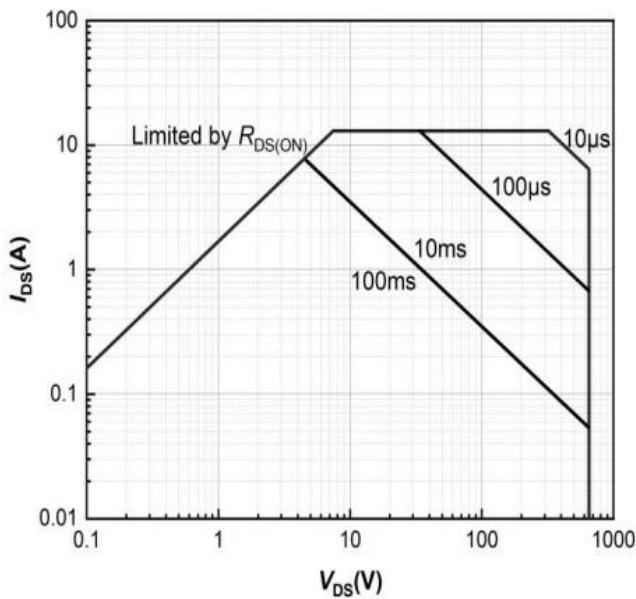
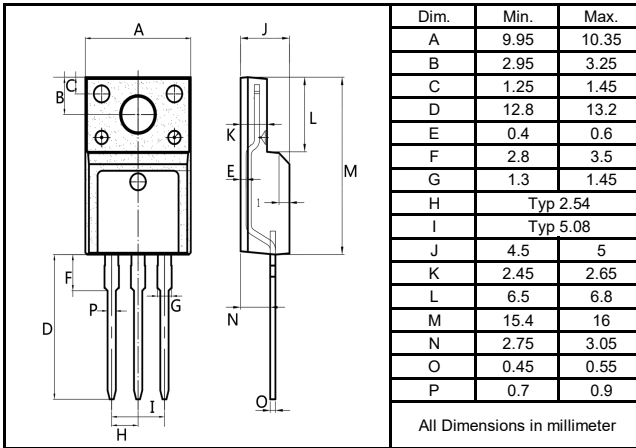


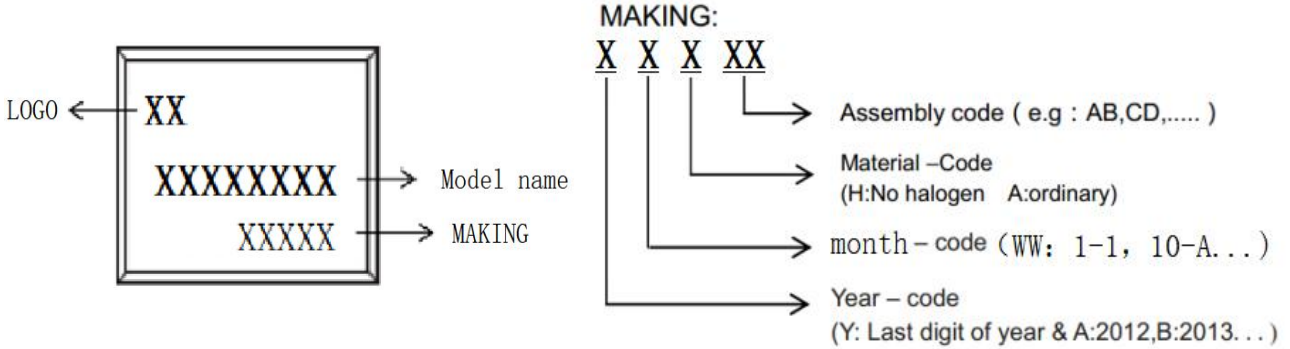
Figure 27. Safe Operating Area

Package Outline Dimensions millimeters


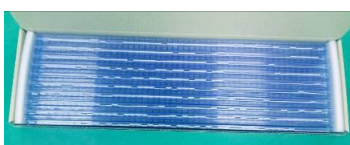

TO-220F



Marking on the body



packing instruction

| PKG | Minimal Package | Mini Box | Box |
|---------|---|--|---|
| TO-220F |  |  |  |
| | 50pcs/pdpe | 1000pcs/box | 5000pcs/box |

Notice

All product, product specifications and data are subject to change without notice to improve. The right to explain is owned by LINGXUN electronics company.

Confirm that operation temperature is within the specified range described in the product specification. Avoid applying power exceeding normal rated

power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.

LINGXUN electronics shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

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LSC500M65F

SiC N-Channel MOSFET

| Revision History | | |
|------------------|---------------|----------|
| Rev | Changes | Date |
| 1.0 | First version | 2025/9/8 |