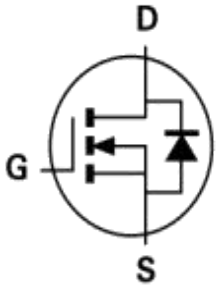
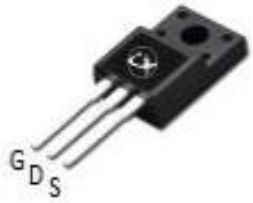
# LSC800M65F

SiC N-Channel MOSFET

## MAIN CHARACTERISTICS

| | |
|---|---|
| $I_D$ | 4A |
| $V_{DS}$ | 800V |
| $R_{DSON}$-Typ （@VGS=18V Tc=25°C） | 840mΩ |




TO-220F

## Features

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

## 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 |
|---|---|---|---|
| LSC800M65F | TO-220F | LSC800M65F | 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 | VGSmax | -18/+22 | V |
| Recommended Operation Value | VGSop | -4/+18 | V |
| Continue Drain Current TC=25℃ | $I_D$ | 4 | A |
| Continue Drain Current TC=100℃ | | 3 | A |
| Pulsed Drain Current (Note1) | $I_{DM}$ | 12 | A |
| Power Dissipation TC=25℃ | $P_D$ | 27 | W |
| Power Dissipation TC=100℃ | | 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,$I_D$ = 100μA | $BV_{DSS}$ | 800 | - | - | V |
| Drain-Source Leakage Current | VDS = 800 V, VGS = 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 TJ=25℃ | $V_{GS(th)}$ | 2 | 2.9 | 4 | V |
| | $V_{DS}$=$V_{GS}$ , $I_D$=1mA TJ=175℃ | | - | 2.1 | - | V |
| Drain-Source On-State Resistance | $V_{GS}$ = 15 V, $I_D$ = 3.3 A | $R_{DS(on)}$ | - | 900 | 1150 | mΩ |
| | $V_{GS}$ = 15 V, $I_D$ =3.3 A, $T_J$ = 175℃ | | - | 980 | - | |
| | $V_{GS}$ = 18 V, $I_D$ = 3.3 A | | - | 840 | 1090 | |
| | $V_{GS}$ = 18 V, $I_D$ =3.3 A, $T_J$ = 175℃ | | - | 900 | - | |
| Forward Transconductance | $V_{DS}$=20V, ID=1A | gfs | | 0.6 | | S |
| Input Capacitance | $V_{GS}$ = 0 V, $V_{DS}$ = 600 V, f = 1MHz | $C_{iss}$ | - | 86 | - | pF |
| Output Capacitance | | $C_{oss}$ | - | 14 | - | pF |
| Reverse Transfer Capacitance | | $C_{rss}$ | - | 2.6 | - | pF |
| Coss Stored Energ | | $E_{OSS}$ | - | 1.9 | - | μJ |
| Internal Gate Resistance | f=1MHz | RG(int) | - | 38 | - | Ω |
| Total Gate Charge(Note2) | $I_D$ = 1A, $V_{DD}$ = 400 V, $V_{GS}$ =4/18 V | $Q_G$ | - | 9.2 | - | 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) | VDS = 400 V, ID = 1A, VGS = -4/18 V, RG = 2.5Ω, L=200μH, Tc=25°C | $t_{d(ON)}$ | - | 2.6 | - | ns |
| Rise Time(Note2) | | $t_r$ | - | 10.2 | - | ns |
| Turn-Off Delay Time(Note2) | | $t_{d(OFF)}$ | - | 7 | - | ns |
| Fall Time(Note2) | | $t_f$ | - | 15 | - | ns |
| Turn-On Energy | | Eon | - | 21 | - | μJ |
| Turn-Off Energy | | Eoff | - | 3.4 | - | 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 = 1A, VGS = -4/18 V, RG = 2.5Ω, L=200μH, Tc=175°C | $t_{d(ON)}$ | - | 2.6 | - | ns |
| Rise Time(Note2) | | $t_r$ | - | 10 | - | ns |
| Turn-Off Delay Time(Note2) | | $t_{d(OFF)}$ | - | 8 | - | ns |
| Fall Time(Note2) | | $t_f$ | - | 16 | - | ns |
| Turn-On Energy | | Eon | - | 20 | - | μJ |
| Turn-Off Energy | | Eoff | - | 3.3 | - | μJ |

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

| Parameter | Test Condition | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Maximun Body-Diode Continuous Current | Tc=25°C | $I_S$ | - | 5 | - | A |
| Maximun Body-Diode Continuous Current | Tc=100°C | | - | 3.5 | - | A |
| Maximun Body-Diode Pulsed Current(Note2) | | $I_{SM}$ | - | – | 12 | A |
| Drain-Source Diode Forward Voltage | VGS=-4V, ISD=0.5A Tc=25°C | $V_{SD}$ | - | 3.7 | - | V |
| | VGS=-4V, ISD=0.5A Tc=175°C | | - | 3.2 | - | V |
| | VGS=-4V, ISD=1A Tc=25°C | | - | 4.2 | - | V |
| | VGS=-4V, ISD=1A Tc=175°C | | - | 3.8 | - | V |
| Reverse Recovery Time(Note2) | VGS=-4V, ISD=1A, VR=400V, di/dt=1990A/μs, Tj=25°C | trr | - | 36 | - | ns |
| Reverse Recovery Charge(Note2) | | Qrr | - | 23 | - | nC |
| Peak Reverse Recovery Current | | Irrm | - | 1 | - | A |
| Reverse Recovery Time(Note2) | VGS=-4V, ISD=1A, VR=400V, di/dt=1990A/μs, Tj=175°C | trr | - | 34 | - | ns |
| Reverse Recovery Charge(Note2) | | Qrr | - | 30 | - | nC |
| Peak Reverse Recovery Current | | Irrm | - | 1.6 | - | A |

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

## RATINGS AND CHARACTERISTIC CURVES

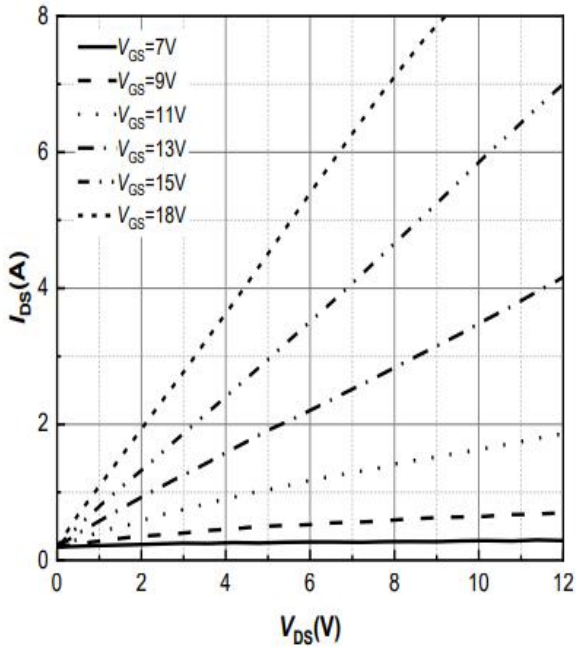



Figure 1. **Output Characteristics $T_j$=-55°C**

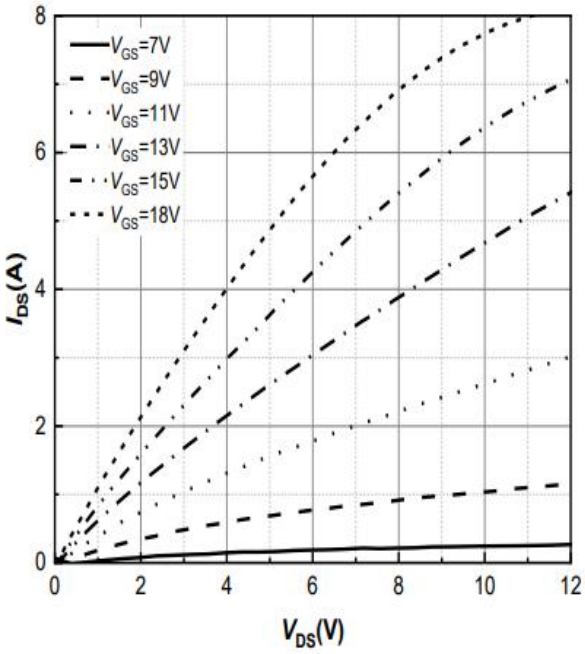



Figure 2. **Output Characteristics $T_j$=25°C**

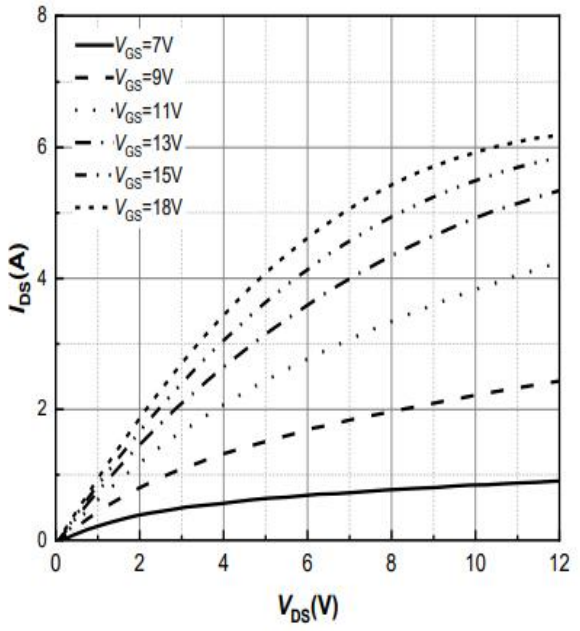



Figure 3. **Output Characteristics $T_j$=175°C**

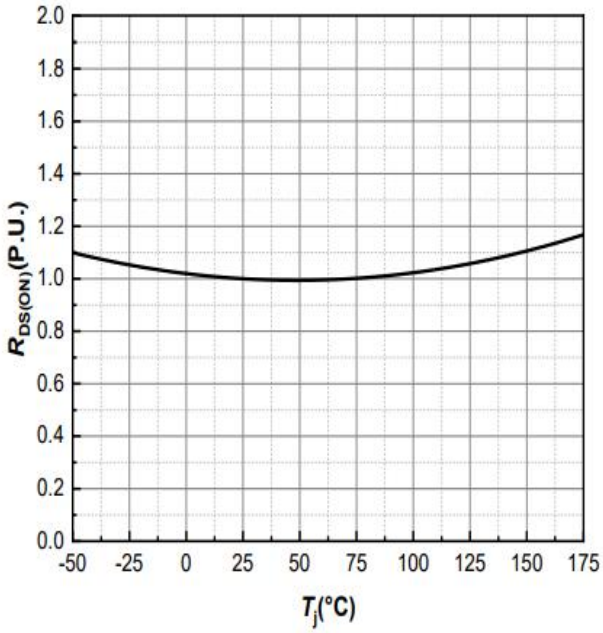



Figure 4. **Normalized On-Resistance vs. Temperature**

## RATINGS AND CHARACTERISTIC CURVES

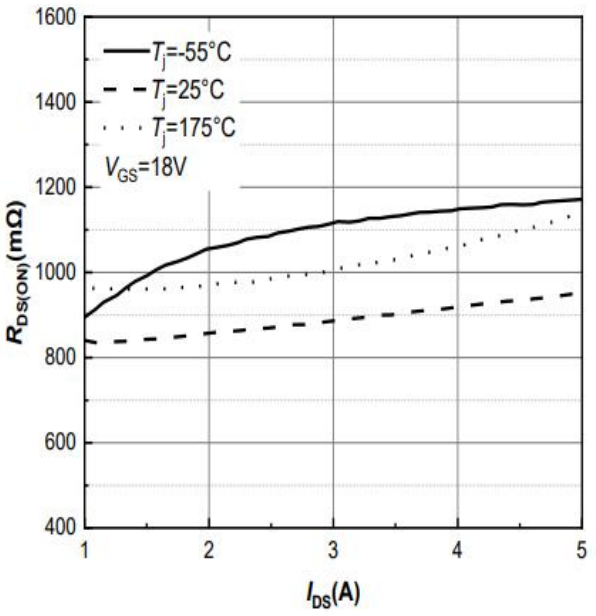



Figure 5. **On-Resistance vs. Drain Current For Various Temperatures**

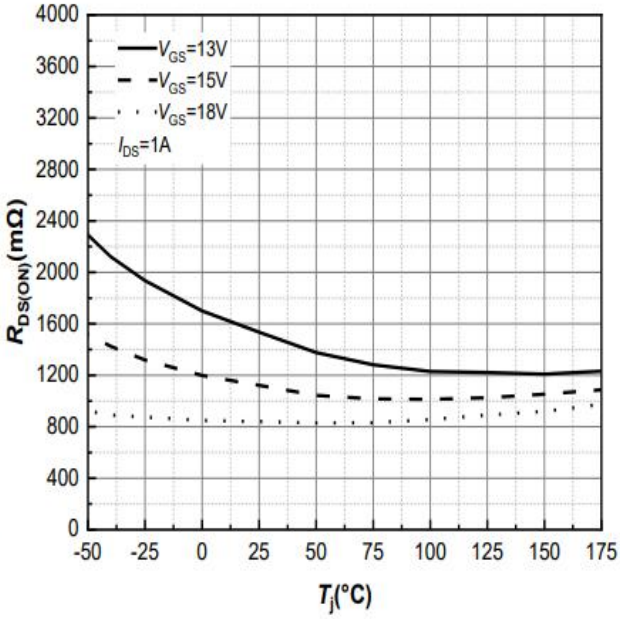



Figure 6. **On-Resistance vs. Temperature For Various Gate Voltage**

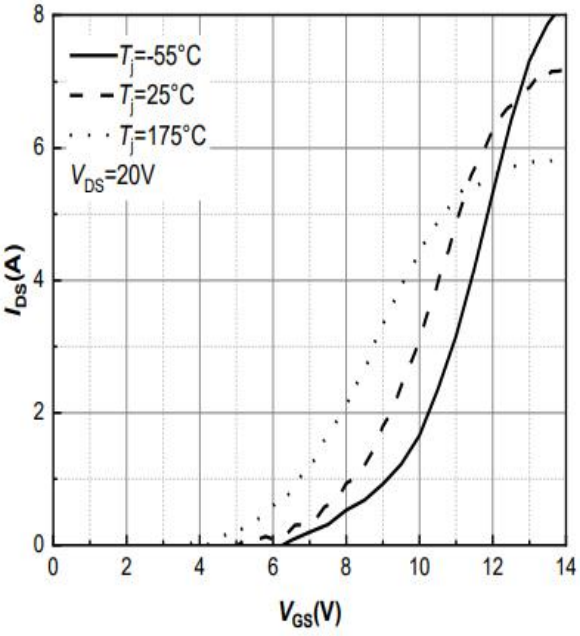



Figure 7. **Transfer Characteristic for Various Junction Temperatures**

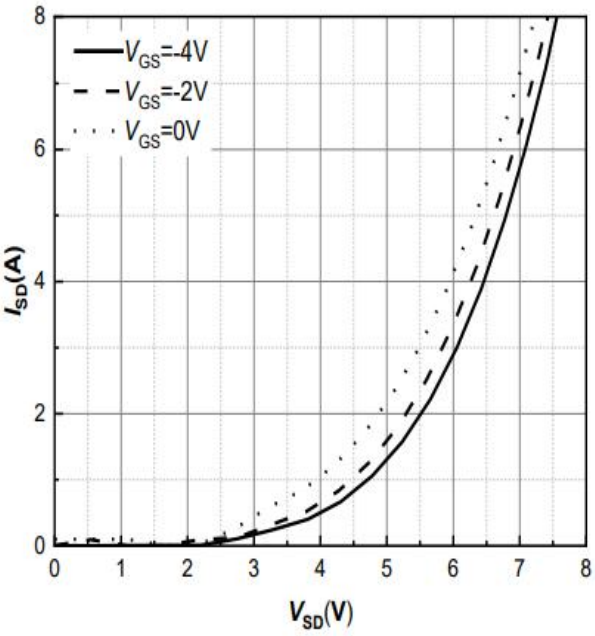



Figure 8. **Body Diode Characteristic $T_j$=-55°C**

## RATINGS AND CHARACTERISTIC CURVES

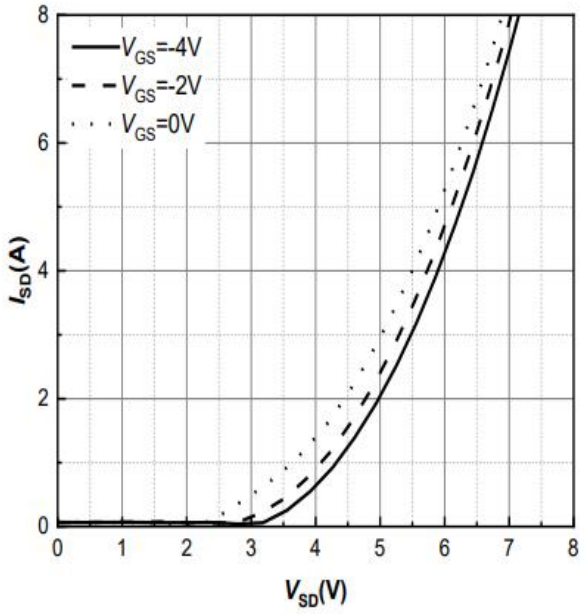



Figure 9. **Body Diode Characteristic $T_j$=25°C**

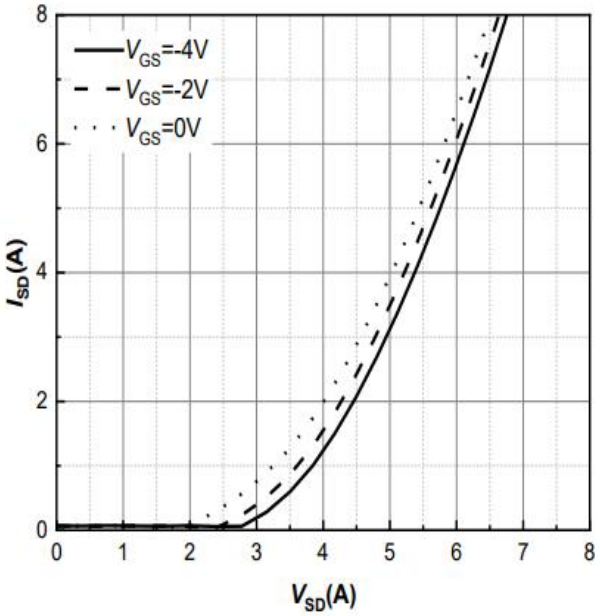



Figure 10. **Body Diode Characteristic $T_j$=175°C**

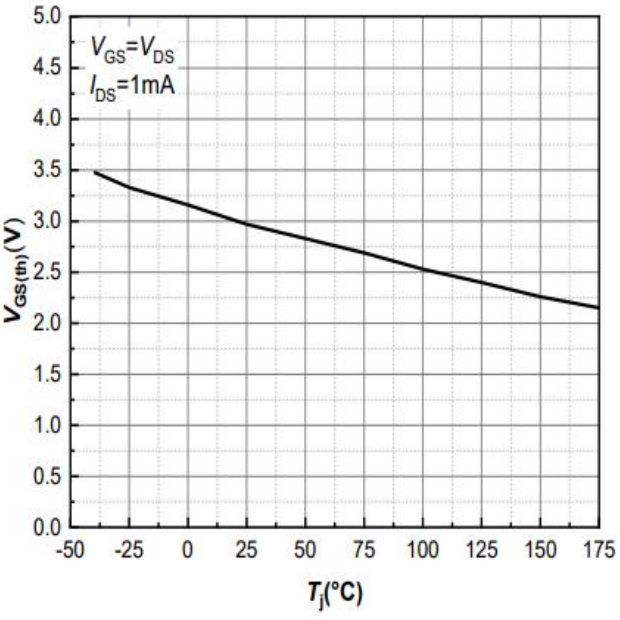



Figure 11. **Threshold Voltage vs. Temperature**

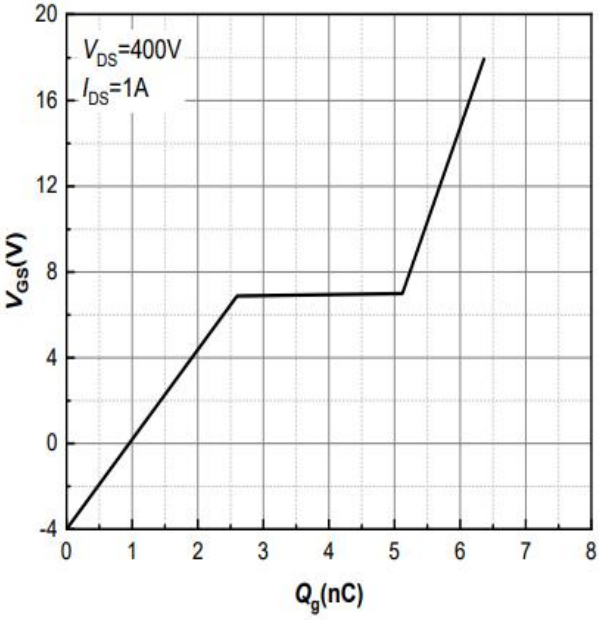



Figure 12. **Gate Charge Characteristics**

## RATINGS AND CHARACTERISTIC CURVES

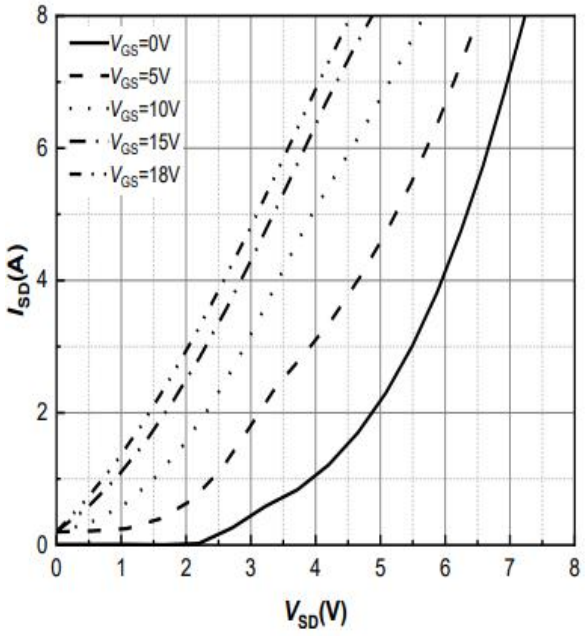



Figure 13. **3rd Quadrant Characteristic $T_j$=-55°C**

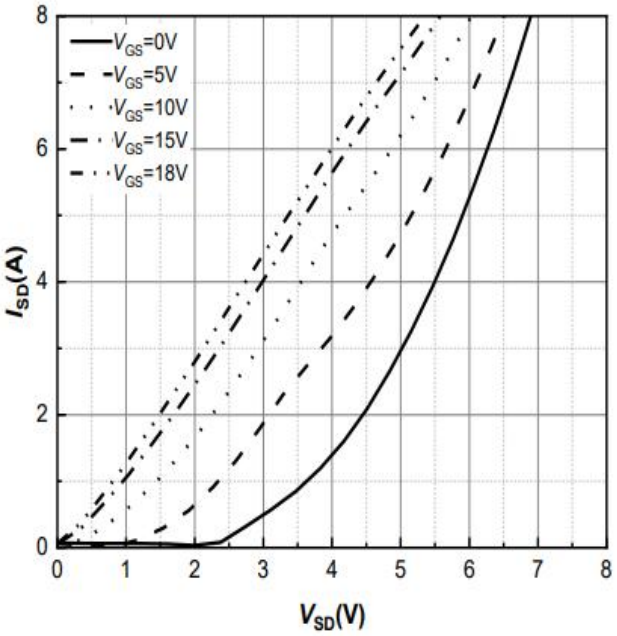



Figure 14. **3rd Quadrant Characteristic $T_j$=25°C**

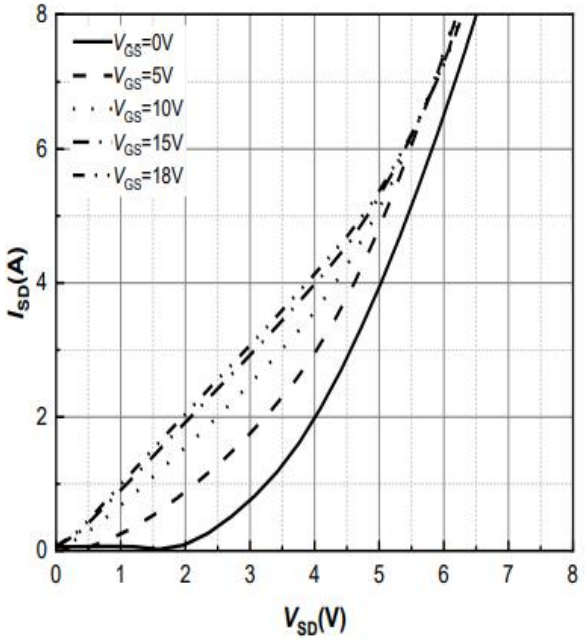



Figure 15. **3rd Quadrant Characteristic $T_j$=175°C**

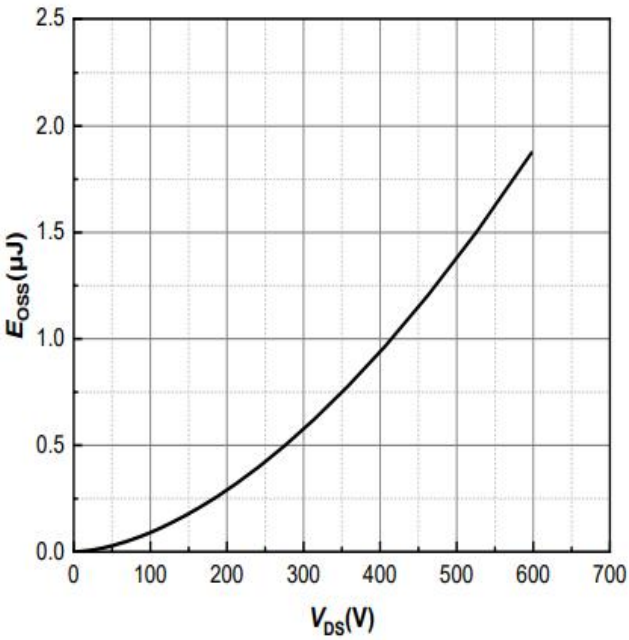



Figure 16. **Output Capacitor Stored Energy**

## RATINGS AND CHARACTERISTIC CURVES

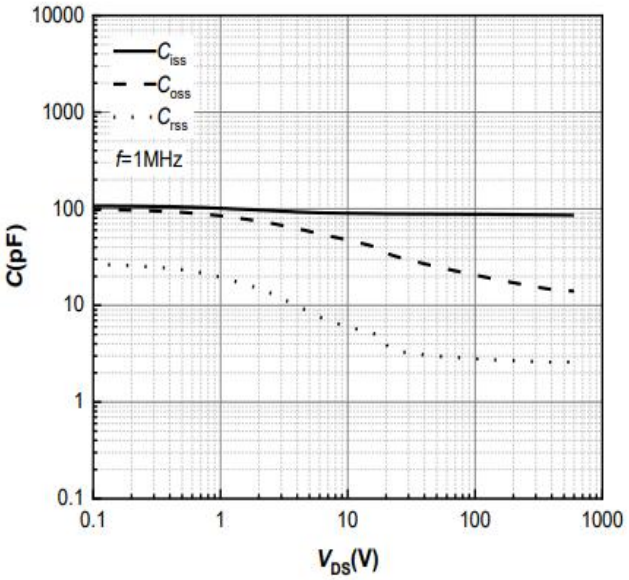
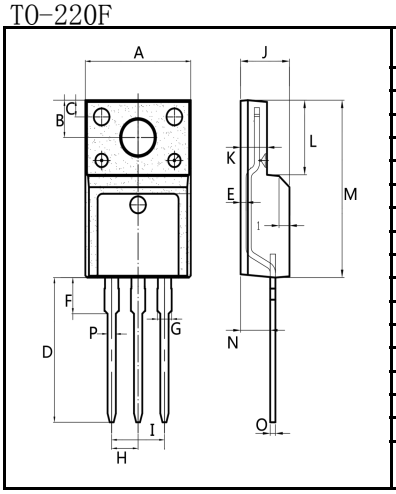



Figure 17. **Capacitances vs. Drain-Source**

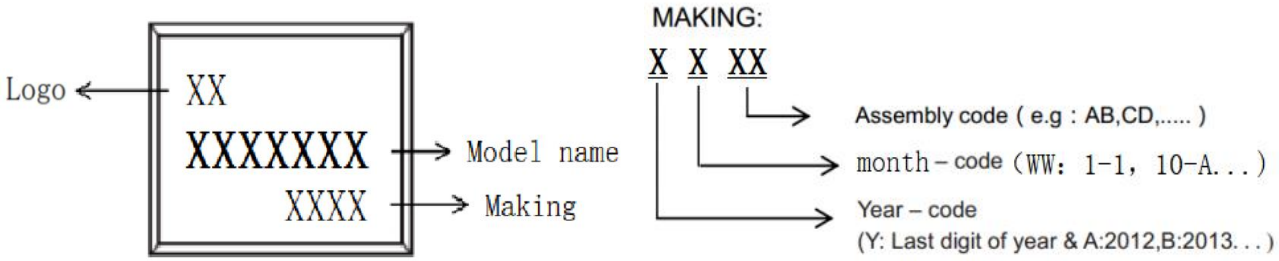
## Package Outline Dimensions millimeters

TO-220F




| Dim. | Min. | Max. |
|---|---|---|
| A | 9.95 | 10.25 |
| B | 2.95 | 3.25 |
| C | 1.25 | 1.45 |
| D | 12.8 | 13.2 |
| E | 0.4 | 0.6 |
| F | 2.8 | 3.5 |
| G | 1.3 | 1.45 |
| H | Typ 2.54 | |
| I | Typ 5.08 | |
| J | 4.5 | 5 |
| K | 2.45 | 2.65 |
| L | 6.5 | 6.8 |
| M | 15.4 | 16 |
| N | 2.75 | 3.05 |
| O | 0.45 | 0.55 |
| P | 0.7 | 0.9 |
| All Dimensions in millimeter | | |

## Marking on the body




## packing instruction

| PKG | Minimal Package | Box | Carton |
|---|---|---|---|
| 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 poer exceeding normal rated

poer; 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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## Revision History

| Rev | Changes | Date |
|---|---|---|
| 2.0 | First version | 2026/6/1 |