

### MAIN CHARACTERISTICS

|                                                         |               |
|---------------------------------------------------------|---------------|
| $I_D$                                                   | 15A           |
| $V_{DS}$                                                | 800V          |
| $R_{DS(on)-typ}$<br>(@ $V_{GS}=18V$ $T_C=25^{\circ}C$ ) | 175m $\Omega$ |

### Features

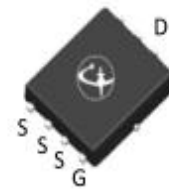
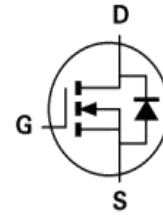
- High Speed Switching
- High Blocking Voltage with Low  $R_{DS(on)}$
- Easy to Parallel
- Simple to Drive
- RoHS Compliant

### Benefits

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

### Application

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



PDFN5x6

### Product specification classification

| Part Number | Package | Mode Name  | Pack |
|-------------|---------|------------|------|
| LSC180M65G  | PDFN5*6 | LSC180M65G | Tape |

### Maximum Ratings at Tc=25°C unless otherwise specified

| Parameter                                                       | Symbol          | Value       | Unit |
|-----------------------------------------------------------------|-----------------|-------------|------|
| Drain-Source Voltage                                            | $V_{DS}$        | 800         | V    |
| Gate-Source Voltage                                             | $V_{GSmax}$     | -8/+22      | V    |
| Gate-Source Voltage, max. Transient Voltage (tp≤0.5μs, D<0.001) | $V_{GSmax}$     | -8/+22      | V    |
| Recommended Operation Value                                     | $V_{GSop}$      | -4/+18      | V    |
| Continue Drain Current TC=25°C                                  | $I_D$           | 15          | A    |
| Continue Drain Current TC=100°C                                 |                 | 11          | A    |
| Pulsed Drain Current (Note1)                                    | $I_{DM}$        | 30          | A    |
| Power Dissipation                                               | $P_D$           | 48          | W    |
| Operating Temperature Range                                     | $T_J$           | -40 to +175 | °C   |
| Storage Temperature Range                                       | $T_{STG}$       | -40 to +175 | °C   |
| Thermal Resistance, Junction to Case                            | $R_{\theta JC}$ | 2.1         | °C/W |
| Thermal Resistance, Junction to Ambient                         | $R_{\theta JA}$ | 30          | °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         | $V_{GS} = 0\text{ V}, I_D = 100\mu\text{A}$                                                                      | $BV_{DSS}$   | 800 | -   | -   | V    |
| Drain-Source Leakage Current           | $V_{DS} = 650\text{ V}, V_{GS} = 0\text{ V}$                                                                     | $I_{DSS}$    | -   | 1   | 10  | μA   |
| Gate Leakage Current                   | $V_{GS} = 18\text{ V}, V_{DS} = 0\text{ V}$                                                                      | $I_{GSS}$    | -   | -   | 250 | nA   |
| Gate-Source Threshold Voltage Tc=25°C  | $V_{DS} = V_{GS}, I_D = 2.5\text{ mA}$                                                                           | $V_{GS(th)}$ | 2   | 2.8 | 4   | V    |
| Gate-Source Threshold Voltage Tc=175°C |                                                                                                                  |              | -   | 2   | -   | V    |
| Drain-Source On-State Resistance       | $V_{GS} = 15\text{ V}, I_D = 10\text{ A}$                                                                        | $R_{DS(on)}$ | -   | 232 | 290 | mΩ   |
|                                        | $V_{GS} = 15\text{ V}, I_D = 10\text{ A}, T_J = 175^\circ\text{C}$                                               |              | -   | 240 | -   |      |
|                                        | $V_{GS} = 18\text{ V}, I_D = 10\text{ A}$                                                                        |              | -   | 175 | 208 |      |
|                                        | $V_{GS} = 18\text{ V}, I_D = 10\text{ A}, T_J = 175^\circ\text{C}$                                               |              | -   | 188 | -   |      |
| Input Capacitance                      | $V_{GS} = 0\text{ V}, V_{DS} = 600\text{ V}, f = 1\text{ MHz}$                                                   | $C_{iss}$    | -   | 308 | -   | pF   |
| Output Capacitance                     |                                                                                                                  | $C_{oss}$    | -   | 32  | -   | pF   |
| Reverse Transfer Capacitance           |                                                                                                                  | $C_{rss}$    | -   | 4.2 | -   | pF   |
| Coss Stored Energy                     |                                                                                                                  | $E_{oss}$    | -   | 5.3 | -   | pF   |
| Internal Gate Resistance               | f=1MHz                                                                                                           | $R_{G(int)}$ | -   | 3.9 | -   | Ω    |
| Total Gate Charge(Note2)               | $I_D = 10\text{ A}, V_{DD} = 400\text{ V}, V_{GS} = -4/+18\text{ V}$                                             | $Q_G$        | -   | 14  | -   | nC   |
| Gate to Source Charge(Note2)           |                                                                                                                  | $Q_{GS}$     | -   | 2.8 | -   | nC   |
| Gate to Drain Charge(Note2)            |                                                                                                                  | $Q_{GD}$     | -   | 6.4 | -   | nC   |
| Turn-on Delay Time(Note2)              | $V_{DS} = 400\text{ V}, I_D = 10\text{ A}, V_{GS} = -4/+18\text{ V}, RG = 2.5\text{ }\Omega, L = 200\mu\text{H}$ | $t_{d(ON)}$  | -   | 6   | -   | ns   |
| Rise Time(Note2)                       |                                                                                                                  | $t_r$        | -   | 9   | -   | ns   |
| Turn-Off Delay Time(Note2)             |                                                                                                                  | $t_{d(OFF)}$ | -   | 8   | -   | ns   |
| Fall Time(Note2)                       |                                                                                                                  | $t_f$        | -   | 11  | -   | ns   |
| Turn-on Switching Energy               |                                                                                                                  | $E_{on}$     | -   | 27  | -   | μJ   |
| Turn-off Switching Energy              |                                                                                                                  | $E_{off}$    | -   | 6   | -   | 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    | V <sub>GS</sub> =-4V T <sub>C</sub> =25°C                                                                      | I <sub>S</sub>   | -    | 15   | -    | A    |
|                                          | V <sub>GS</sub> =-4V T <sub>C</sub> =100°C                                                                     |                  | -    | 8    | -    | A    |
| Maximun Body-Diode Pulsed Current(Note2) |                                                                                                                | I <sub>SM</sub>  | -    | -    | 30   | A    |
| Drain-Source Diode Forward Voltage       | V <sub>GS</sub> =-4V, I <sub>SD</sub> =5A T <sub>J</sub> =25°                                                  | V <sub>SD</sub>  | -    | 4    | -    | V    |
|                                          | V <sub>GS</sub> =-4V, I <sub>SD</sub> =5A T <sub>J</sub> =175                                                  |                  | -    | 3.7  | -    | V    |
| Reverse Recovery Time(Note2)             | V <sub>GS</sub> =-4V, I <sub>SD</sub> =5A,<br>V <sub>R</sub> =400V,<br>di/dt=1400A/μs,<br>T <sub>J</sub> =25°C | trr              | -    | 12   | -    | ns   |
| Reverse Recovery Charge(Note2)           |                                                                                                                | Q <sub>rr</sub>  | -    | 62   | -    | nC   |
| Peak Reverse Recovery Current            |                                                                                                                | I <sub>rrm</sub> | -    | 5    | -    | A    |

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

## RATINGS AND CHARACTERISTIC CURVES

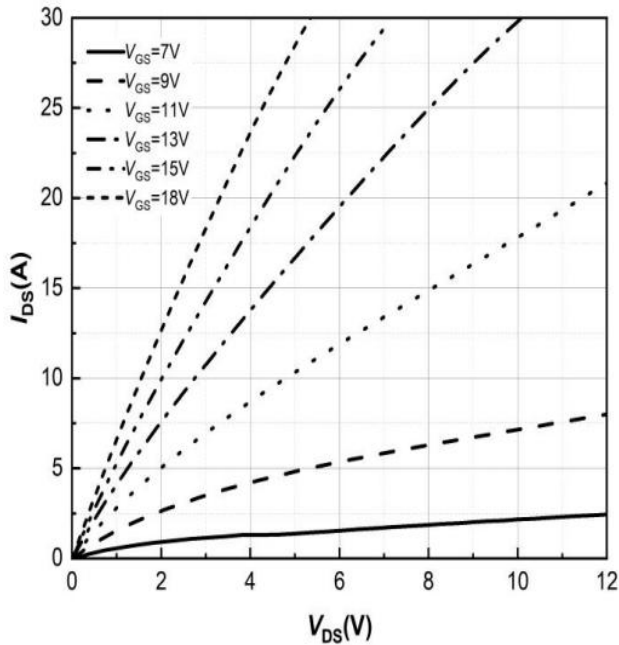


Figure 1. Output Characteristics  
 $T_j = 25^\circ\text{C}$

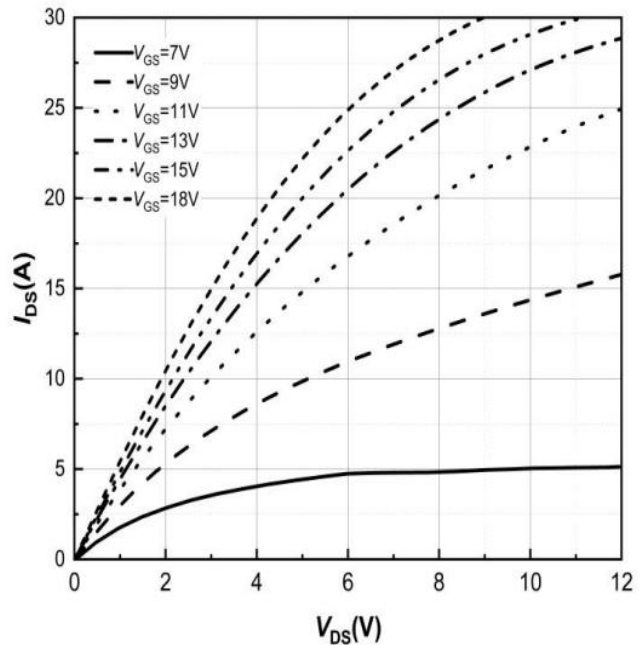


Figure 2. Output Characteristics  
 $T_j = 175^\circ\text{C}$

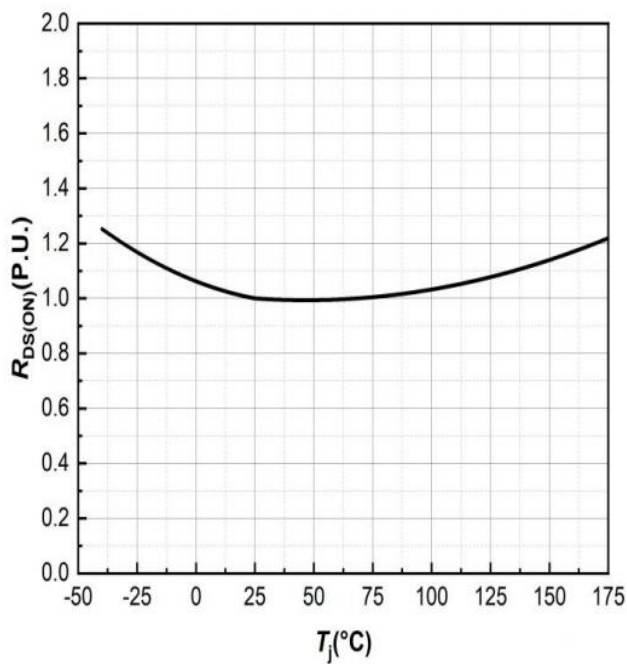


Figure 3. Normalized On-Resistance vs. Temperature

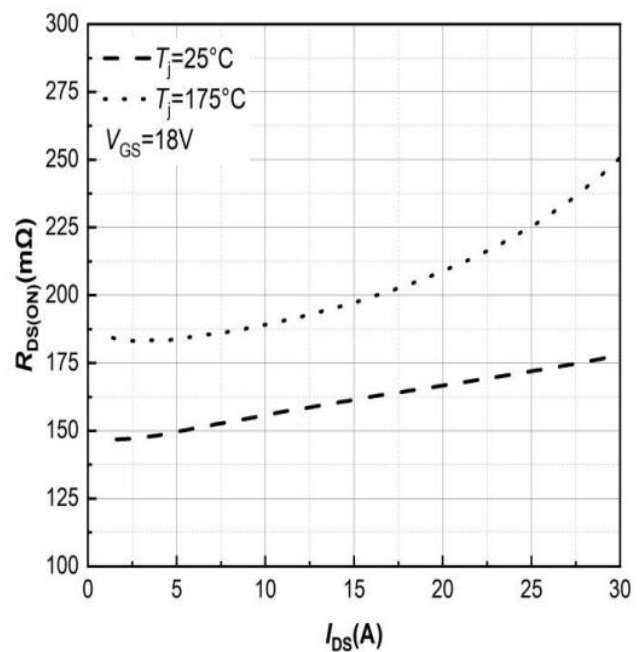


Figure 4. On-Resistance vs. Drain Current For Various Temperatures

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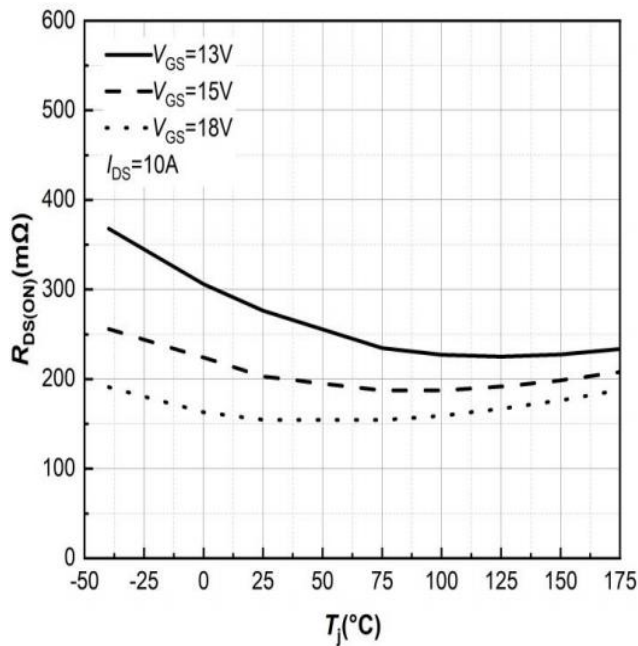


Figure 5. On-Resistance vs. Temperature For Various Gate Voltage

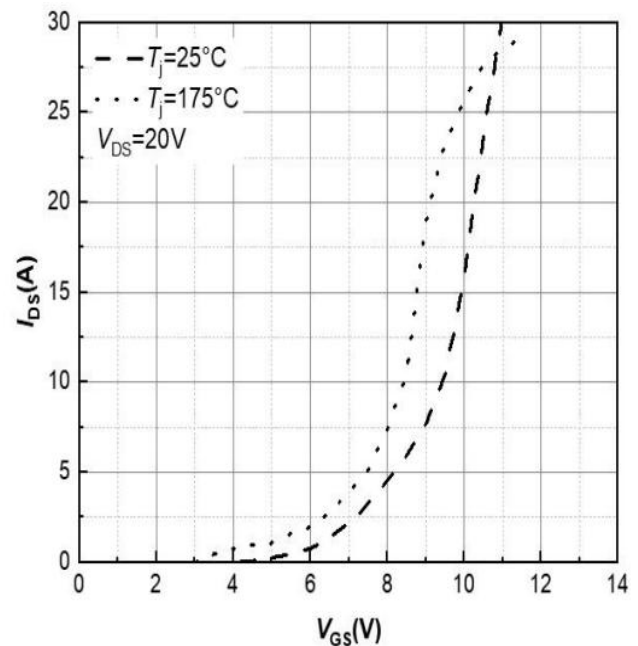


Figure 6. Transfer Characteristic for Various Junction Temperatures

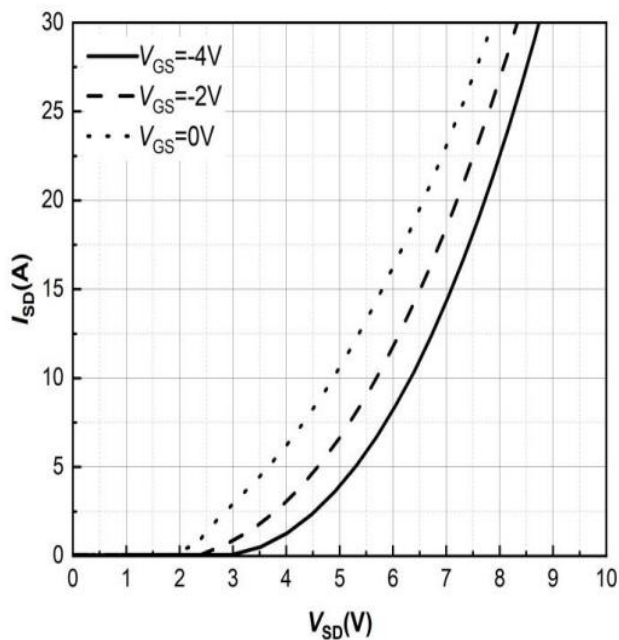


Figure 7. Body Diode Characteristic  $T_J=25^{\circ}\text{C}$

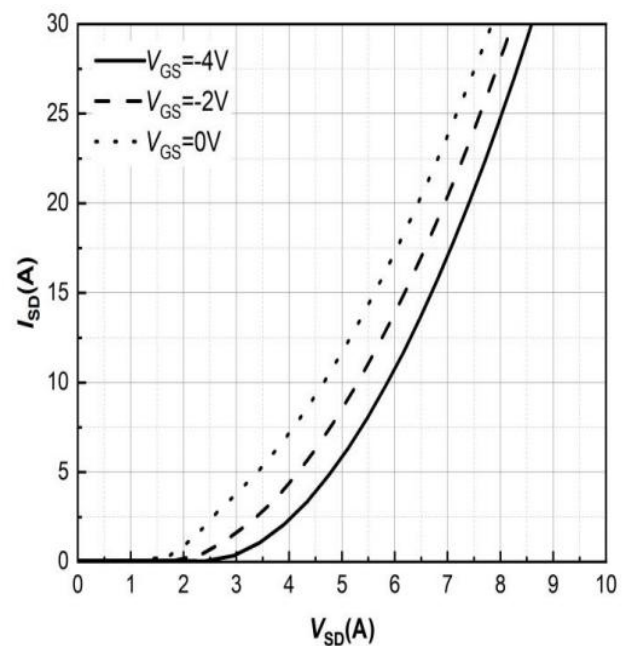


Figure 8. Body Diode Characteristic  $T_J=175^{\circ}\text{C}$

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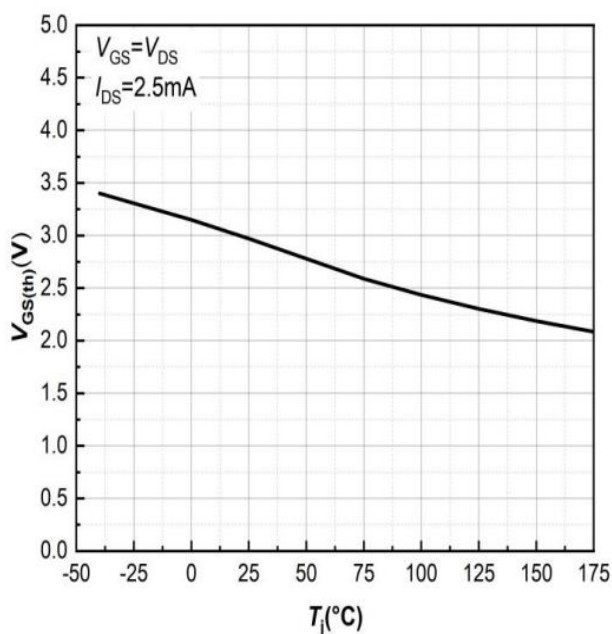


Figure 9. Threshold Voltage vs. Temperature

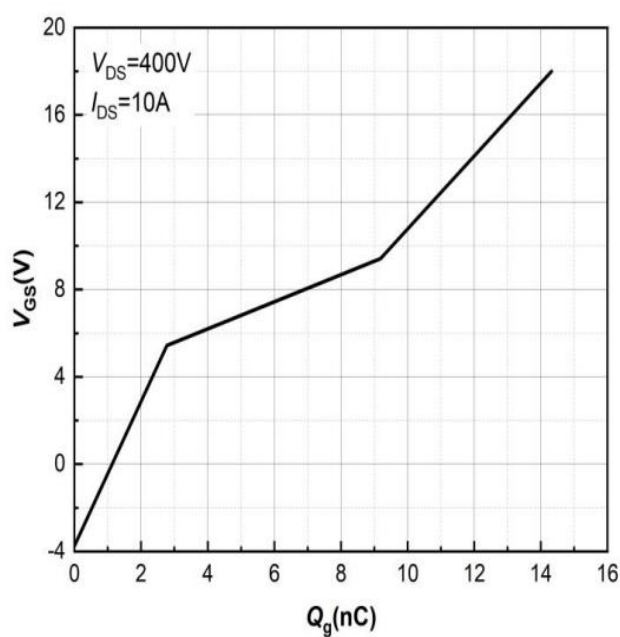


Figure 10. Gate Charge Characteristics

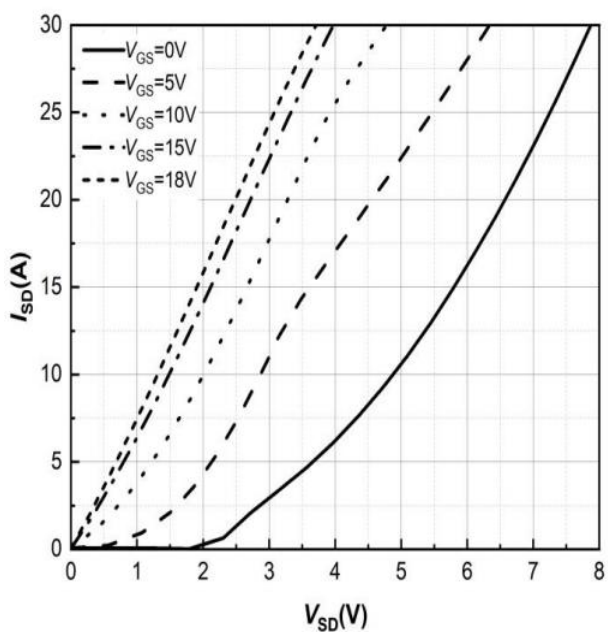


Figure 11. 3rd Quadrant Characteristic  
 $T_J=25^{\circ}\text{C}$

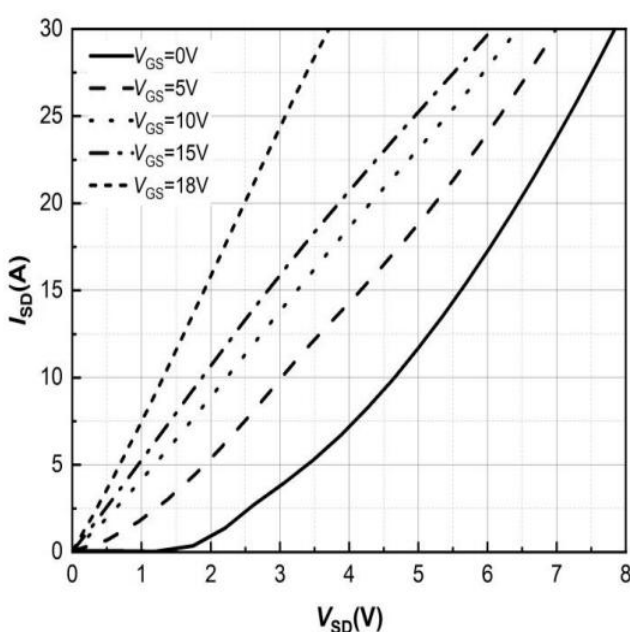


Figure 12. 3rd Quadrant Characteristic  
 $T_J=175^{\circ}\text{C}$

## RATINGS AND CHARACTERISTIC CURVES

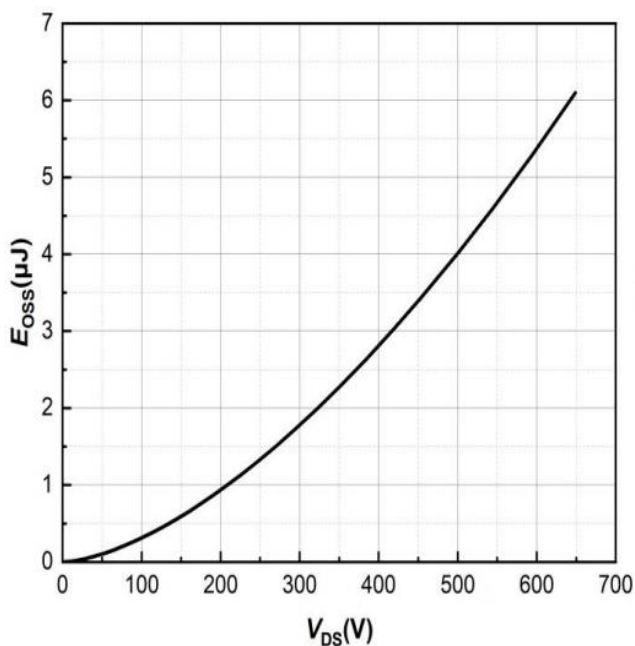


Figure 13. Output Capacitor Stored Energy

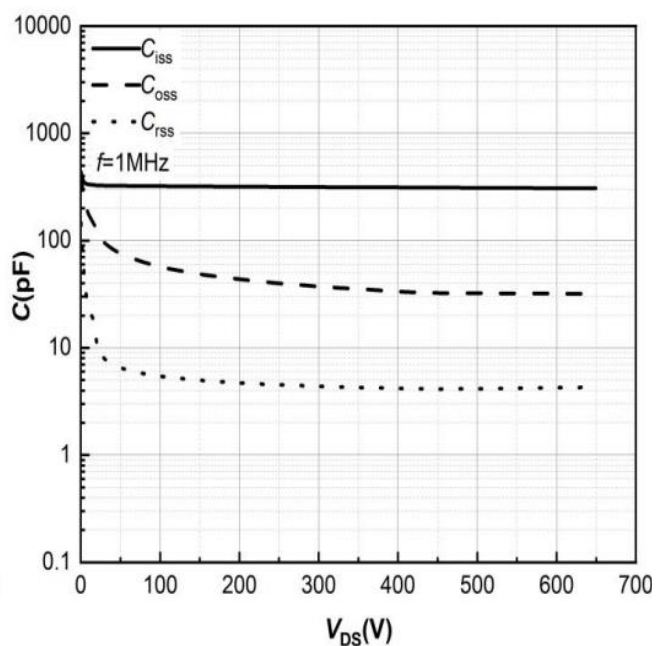


Figure 14. Capacitances vs. Drain-Source

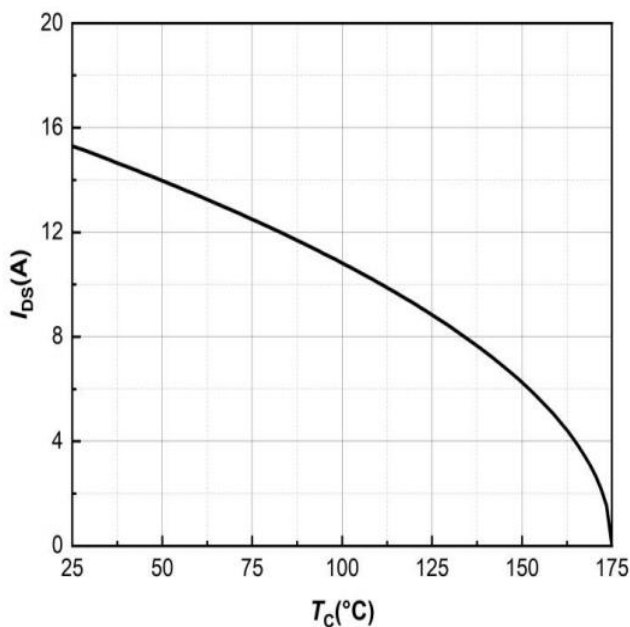


Figure 15. Continuous Drain Current Derating vs. Case Temperature

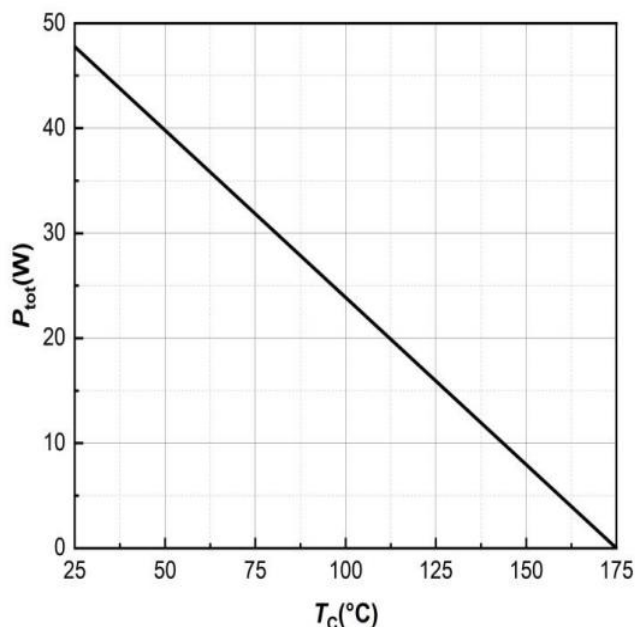


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

## RATINGS AND CHARACTERISTIC CURVES

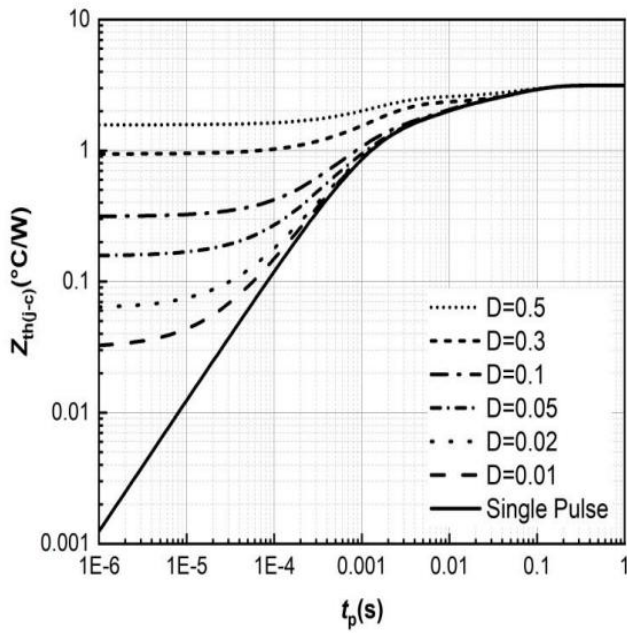


Figure 17. Transient Thermal Impedance

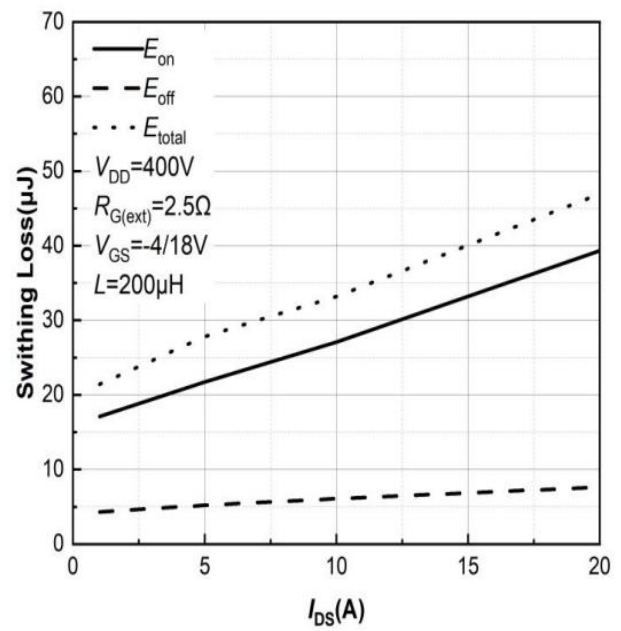


Figure 18. Clamped Inductive Switching Energy vs. Drain Current  
 $T_J = 25^\circ\text{C}$

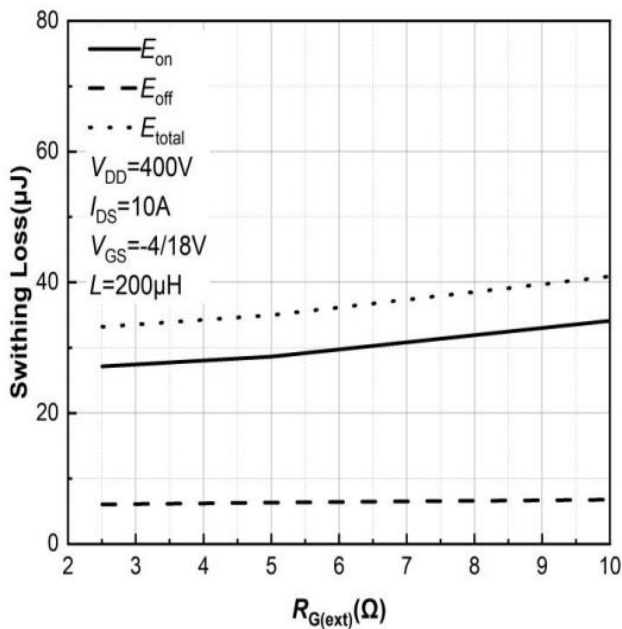


Figure 19. Clamped Inductive Switching Energy vs.  $R_{G(\text{ext})}$   
 $T_J = 25^\circ\text{C}$

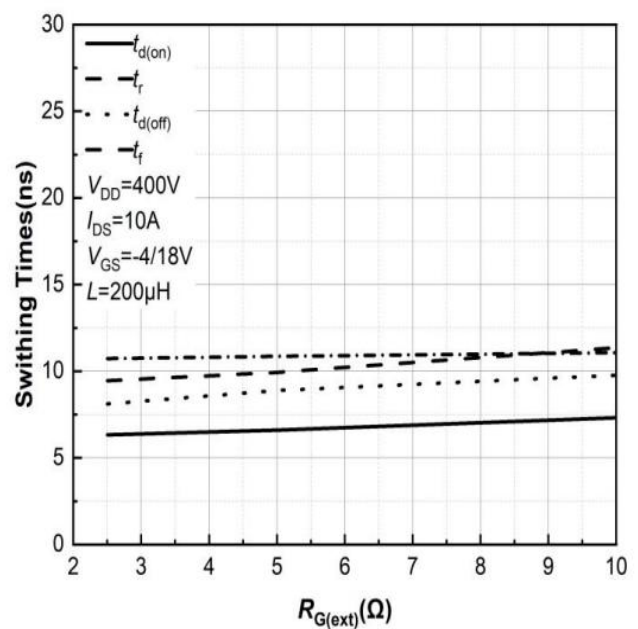


Figure 20. Switching Times vs.  $R_{G(\text{ext})}$   
 $T_J = 25^\circ\text{C}$

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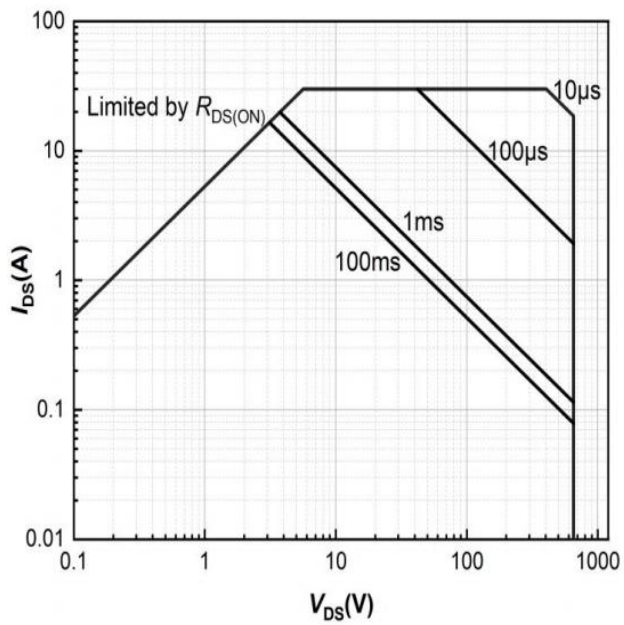
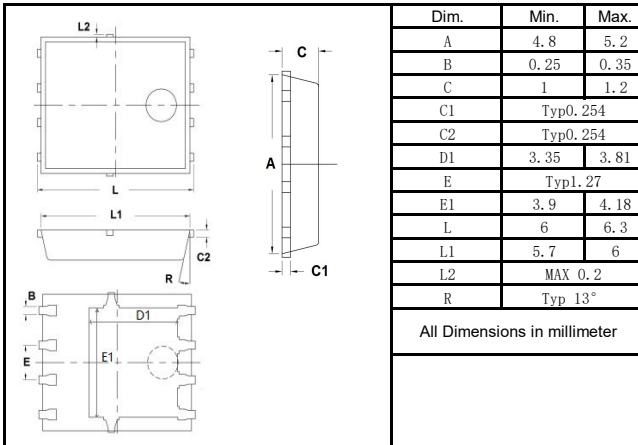


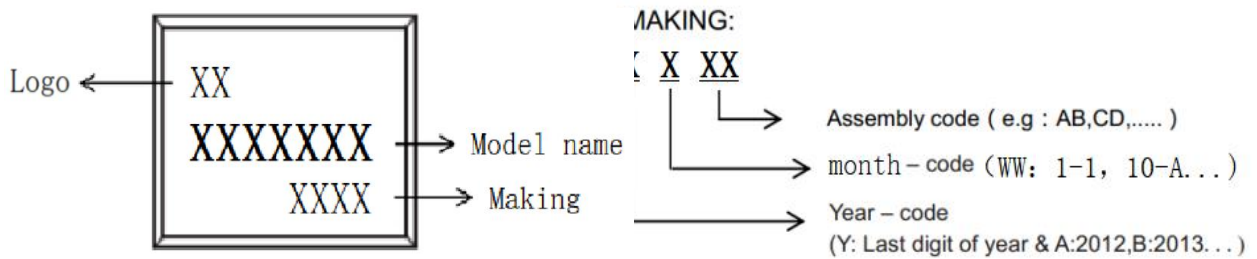
Figure 21. **Safe Operating Area**

### Package Outline Dimensions millimeters

PDFN5\*6



### Marking on the body



### packing instruction

| PKG     | Minimal Package                                                                     | Mini Box                                                                             | Box                                                                                   |
|---------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| PDFN5x6 |  |  |  |
|         | 5000pcs/disk                                                                        | 10000pcs/disk                                                                        | 50000pcs/box                                                                          |



# LSC180M65G

## SiC N-Channel MOSFET

### 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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### Revision History

| Rev | Changes       | Date      |
|-----|---------------|-----------|
| 1.0 | First version | 2026/3/10 |