# SPECIFICATION SHEET

## N-CHANNEL SIC POWER MOSFET TO-247-4 LGE3M L SERIES

| | | |
|---|---|---|
| SPECIFICATION SHEET NO. | S1112 – LGE3M45170QL0T | |
| ORIGINAL MFG/PART NO. | LGE Diodes/LGE3M45170Q-L | |
| NEXTGEN PART CODE | LGE3M45170QL0T | Indicate This Code For RFQ /Order |
| DATE | Nov. 12, 2025 | |
| REVISION | A5 | Updated With Most Recent Data |
| DESCRIPTION AND MAIN PARAMETRICS | Silicon Carbide (SiC) MOSFET, 4 Pins, Case TO-247-4, LGE3M L Series,<br>N-Channel, Drain-Source Voltage ($V_{DS}$): 1700V Max.<br>Current Drain-source On-state Resistance $R_{DS(ON)}$: 45mΩ Typical<br>Continuous Drain Current ($I_D$) @ Tc=25℃: 72A<br>Operating Temperature: -40°C ~ 175°C ($T_J$)<br>Package in Tube, 30pcs/Tube<br>RoHS/RoHS III compliant, RoHS Annex III lead Exemption (Exempt per RoHS EU 2015/863) and Halogen Free (HF) | |
| CUSTOMER | | |
| CUSTOMER PART NUMBER | | |
| CROSS REF. PART NUMBER | | |
| MEMO | | |

| VENDOR APPROVE | |
|---|---|
| Issued/Checked/Approved | Mandy Xu / Ruby Zhang / Jack Zhang |
| Effective Date: Nov. 12, 2025 | |

| CUSTOMER APPROVE |
|---|
| |
| Date: |

## MAIN FEATURE


*Image shown is a representation only. Exact specifications should be obtained from the product dimension.*

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitance
- Easy to Parallel and Simple to Drive
- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency
- Meet MSL 1 Requirement
- Cross Competitors Parts and More.
- RoHS/RoHS III compliant, RoHS Annex III lead Exemption (Exempt per RoHS EU 2015/863) and Halogen Free (HF)

## APPLICATION

- Power Supplies
- High Voltage DC/DC Converters
- Motor Drives
- Switch Mode Power Supplies
- Pulsed Power Applications

## ELECTRICAL CHARACTERISTICS

- See Page 5 ~ Page 7.
- All Products Parameters are Subject To NextGen Components' Final Confirmation.

## HOW TO ORDER

- Please Follow Up Part Code Guide And Indicate NextGen Part Code LGE3M45170QL0T For RFQ and Order.

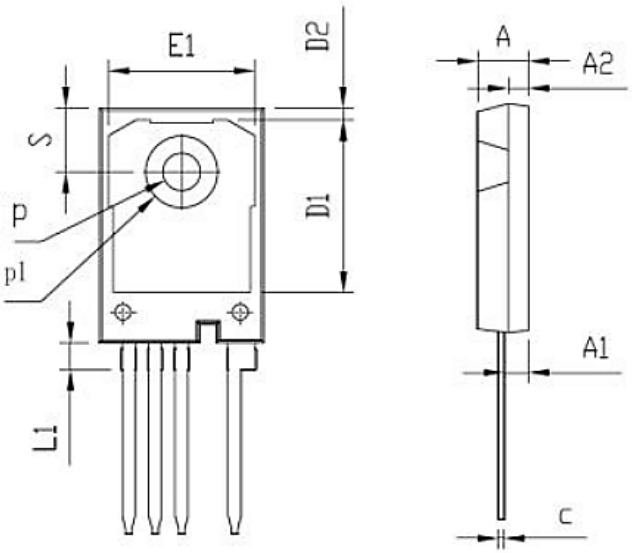
## PART CODE GUIDE

**RFQ**
Request For Quotation

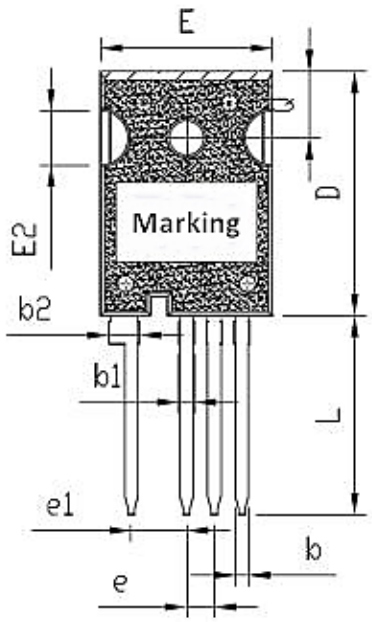
| CODE | NAME | KEY SPECIFICATION OPTION |
|---|---|---|
| LGE3M | Product Series Code | Silicon Carbide (SiC) Power MOSFET, 4 Pins, Case TO-247-4, LGE3M L Series |
| 45 | Current Drain-source On-state Resistance $R_{DS(ON)}$ Code | 45: 45mΩ Typical |
| 170 | Drain-Source Voltage ($V_{DS}$) Code | 170: 1700V Max. |
| Q | Package Case Code | B: TO-247-3; E: TO-263-2; J: TO-263-7; Q: TO-247-4; |
| L0T | Internal Control Code | Letter A~Z, a-z or Digits (0-9) |
| XX | Special/Custom Parameters | Blank: N/A;<br>XX: Letter A~Z, a~z or digits (0~9) for Special/Custom Parameters |

DIMENSION - - Unit: (mm), Case TO-247-4 Outline

Top View

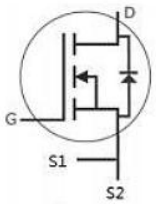



Side View




| SYMBOL | TO-247-4 | | |
|---|---|---|---|
| | Min. | NOM | Max. |
| A | - | 5.0 | - |
| A1 | - | 2.4 | - |
| A2 | - | 2.0 | - |
| b | - | 1.2 | - |
| b1 | - | 1.3 | - |
| b2 | - | 2.65 | - |
| c | - | 0.6 | - |
| D | - | 22.54 | - |
| D1 | - | 16.5 | - |
| D2 | - | 1.17 | - |
| e | - | 2.54 | - |
| e1 | - | 5.08 | - |
| E | - | 15.8 | - |
| E1 | - | 14.0 | - |
| E2 | - | 5.0 | - |
| L | - | 18.38 | - |
| L1 | - | 2.58 | - |
| p | - | 3.6 | - |
| p1 | - | 6.8 | - |
| Q | - | 6.15 | - |
| S | - | 6.15 | - |

## INTERNAL CIRCUIT DIAGRAM



S1: Driver Source
S2: Power Source


## 1700V N-CHANNEL SiC MOSFET

| VDS | ID @ Tc=25℃ | R DS(on) | MARKING | PACKAGE/CASE |
|---|---|---|---|---|
| 1700V | 72A | 45mΩ | LGE3M45170Q | TO-247-4 |

## MAX. RATINGS @Tc=25 °C (Unless Otherwise Specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| Drain-Source Voltage | $V_{DS, Max}$ | $V_{GS}$=0V, $I_D$=100μA | 1700 | V |
| Gate-Source Voltage | $V_{GS, MAX}$ | Absolute maximum values | -10/+25 | V |
| Gate-Source Voltage | $V_{Gsop}$ | Recommended operational values | -5/+20 | V |
| Continuous Drain Current | $I_D$ | $V_{GS}$=20V, Tc=25°C | 72 | A |
| | | $V_{GS}$=20V, Tc=100°C | 48 | |
| Pulsed Drain Current | $I_{D (pulse)}$ | Pulse width $t_p$ limited by $T_{Jmax}$ | 160 | A |
| Power Dissipation | $P_D$ | Tc=25°C， $T_J$=150℃ | 520 | W |
| Operating Junction Temperature | $T_J$ | | -40~ +175 | °C |
| Storage Temperature | $T_{STG}$ | | -40~ +175 | ℃ |

ELECTRICAL CHARACTERISTICS PART I - Tc = 25°C (Unless Otherwise Specified)

| PARAMETER | SYMBOL | CONDITIONS | VALUE | | | UNIT |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V, $I_D$=100µA | 1700 | - | - | V |
| Gates Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=18mA | 2.0 | 2.6 | 4.0 | V |
| Note Fig.11 | | $V_{DS}$=$V_{GS}$,$I_D$=18mA, $T_J$=150°C | - | 1.8 | - | |
| Zero Gates Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=1700V, $V_{GS}$=0V | - | 1 | 100 | µA |
| Gates-Source Leakage Crurent | $I_{GSS+}$ | $V_{GS}$=25V, $V_{DS}$=0V | - | 10 | 250 | nA |
| Gates-Source Leakage Crurent | $I_{GSS-}$ | $V_{GS}$=-10V, $V_{DS}$=0V | - | 10 | 250 | nA |
| Drain-source | $R_{DS(ON)}$ | $V_{GS}$=20V, $I_D$=50A | - | 45 | 70 | mΩ |
| On-state Resistance | | $V_{GS}$=20V, $I_D$=50A $T_J$=150°C | - | 90 | - | |
| Transconductance | $g_{fS}$ | $V_{GS}$=20V, $I_D$=50A | | 25.8 | | S |
| Note Fig.4,5,6 | | $V_{GS}$=20V, $I_D$=50A $T_J$=150°C | | 27 | | S |
| Input Capacitance | $C_{ISS}$ | $V_{DS}$=1000V $V_{GS}$=0V, f =1MHz $V_{AC}$=25mV | - | 3550 | - | pF |
| Note Fig.15,16 | | | | | | |
| Output Capacitance | $C_{OSS}$ | | - | 165 | - | pF |
| Note Fig.15,16 | | | | | | |
| Reverse Transfer Capacitance | $C_{RSS}$ | | - | 6.1 | - | pF |
| Note Fig.15,16 | | | | | | |
| $C_{OSS}$ Stored Energy | $E_{OSS}$ | | - | 101 | - | µJ |
| Turn - On Switching Energy | $E_{on}$ | $V_{DS}$ = 1200 V, $V_{GS}$ =-5V/20V, $I_D$ = 30A, Rg =2.5Ω, L=200uH | - | 3.1 | - | µJ |
| Turn - Off Switching Energy | $E_{off}$ | | - | 1.1 | - | µJ |
| Turn - On Delay Time | $t_{d(on)}$ | $V_{DS}$ = 1200 V, $V_{GS}$ =-5V/20V, $I_D$ = 30A, $R_g$ =2.5Ω, $R_L$=20Ω | - | 27 | - | ns |
| Rise Time | $t_r$ | | - | 32 | - | ns |

## ELECTRICAL CHARACTERISTICS PART II - Tc = 25° C (Unless Otherwise Specified)

| PARAMETER | SYMBOL | CONDITIONS | VALUE | | | UNIT |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| Turn - Off Delay Time | td (off) | $V_{DS}$ = 1200 V, $V_{GS}$ =-5V/20V, $I_D$ = 30A, $R_g$ =2.5Ω $R_L$=20Ω | | 36 | | ns |
| Fall Time | t f | | | 10 | | ns |
| Total Gate Charge | Q g | $V_{DS}$ =1200V, $V_{GS}$ =-5/20V $I_D$ =50A | - | 193 | - | nC |
| Gate-Source Charge | Q gs | | - | 54 | - | |
| Gate-Drain Charge | Q gd | | - | 25 | - | |
| Internal Gate Resistance | R g(int) | f = 1MH, $V_{AC}$=25mV | - | 2.6 | - | Ω |

## REVERSE DIODE CHARACTERISTICS - Tc = 25° C (Unless Otherwise Specified)

| PARAMETER | SYMBOL | CONDITIONS | VALUE | | | UNIT |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| Diode Forward Voltage Note Fig.8,9,10 | V SD | $V_{GS}$ =-5V, $I_{SD}$ =25A | - | 3.6 | - | V |
| | | $V_{GS}$ = -5V, $I_{SD}$ = 25A, $T_J$ = 150°C | - | 3.3 | - | |
| Continuous Diode Forward Current | I S | Tc=25°C | - | - | 72 | A |
| Reverse Recovery Time | T rr | $I_{SD}$ = 50A, $V_R$= 1200V | - | 55 | - | nS |
| Reverse Recovery Charge | Q rr | | - | 220 | - | nC |
| Peak Reverse Recovery Current | I rrm | | - | 6.7 | - | A |

## THERMAL CHARACTERISTICS

| PARAMETER | SYMBOL | CONDITIONS | VALUE | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN. | TYP. | MAX | |
| Thermal Resistance | R th(j-c) | Junction-case | - | 0.24 | 0.28 | °C/W |

TYPICAL PERFORMANCE (For Reference Only)

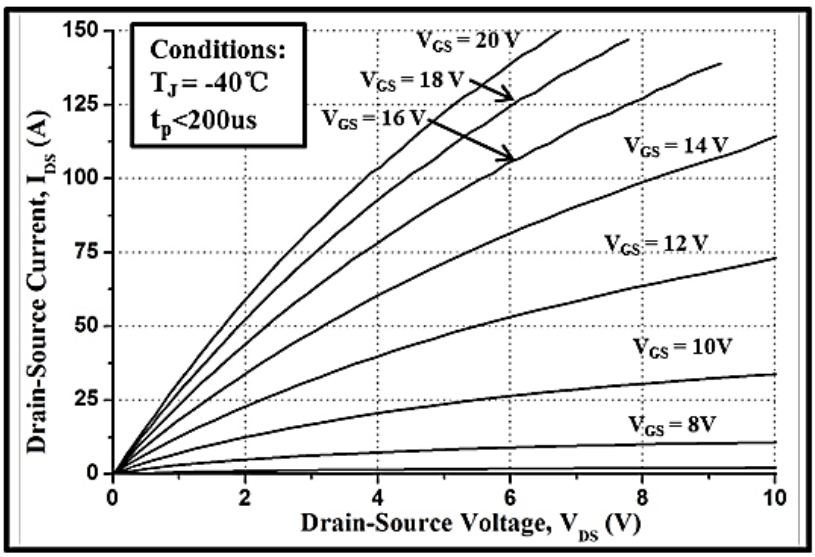



**Figure 1. Output Characteristics $T_J$ = -40 °C**

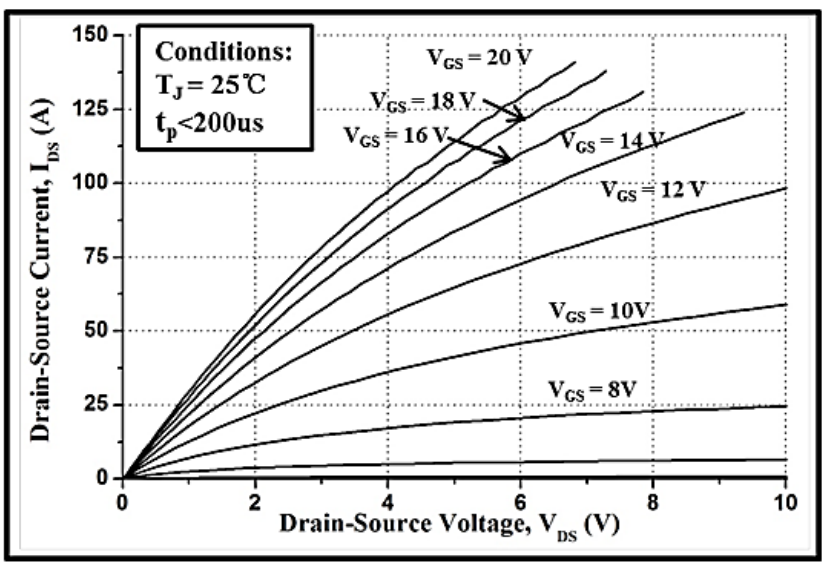



**Figure 2. Output Characteristics $T_J$ = 25 °C**

TYPICAL PERFORMANCE (For Reference Only)

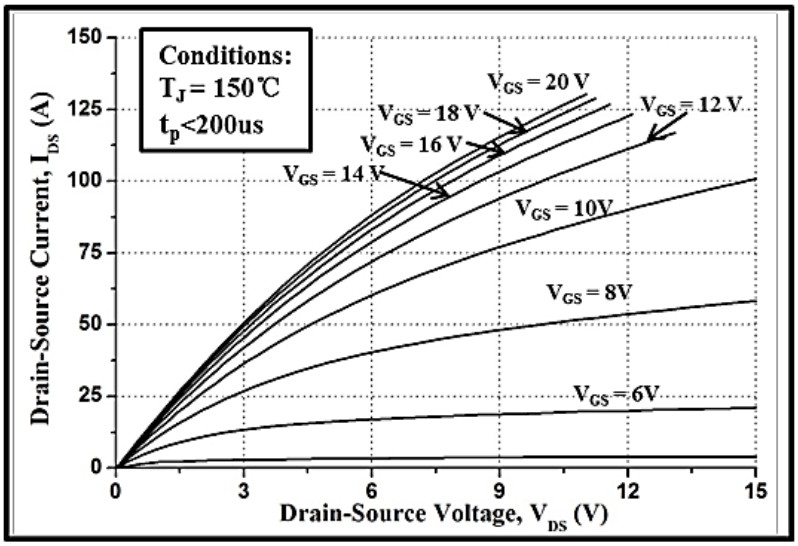



**Figure 3. Output Characteristics $T_J$ = 150 °C**

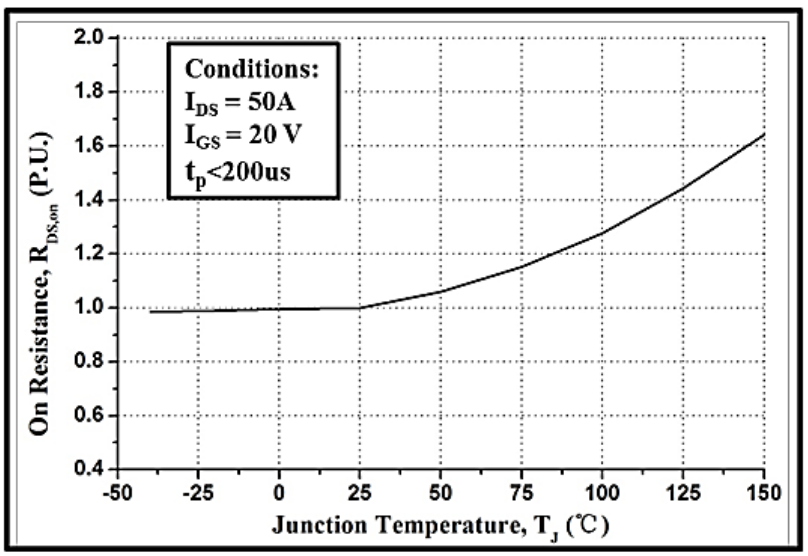



**Figure 4. Normalized On-Resistance vs. Temperature**

TYPICAL PERFORMANCE (For Reference Only)

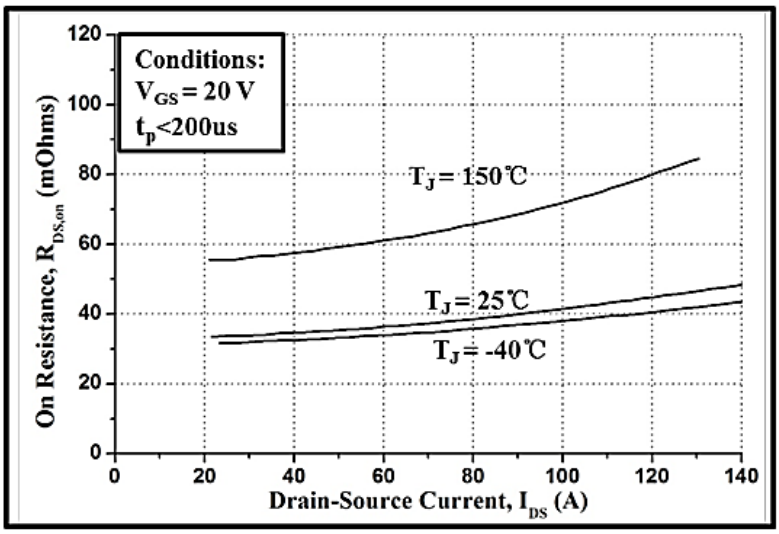



**Figure 5. On-Resistance vs. Drain Current For Various Temperatures**

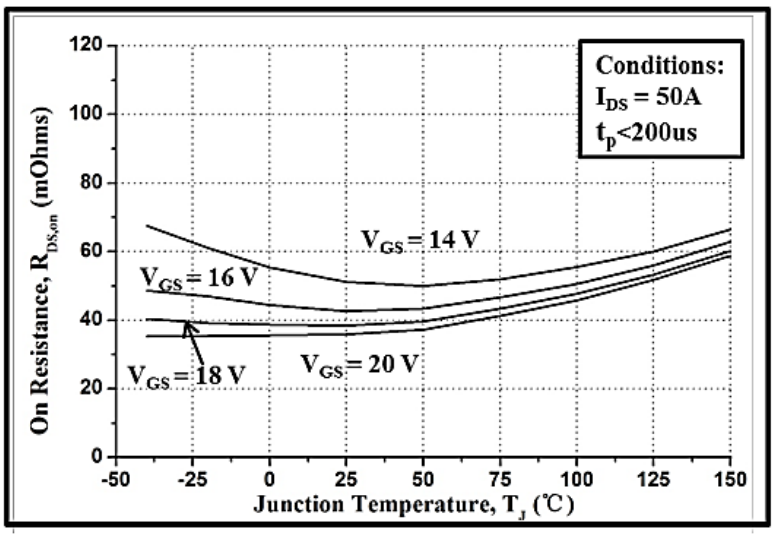



**Figure 6. On-Resistance vs. Temperature For Various Gate Voltage**

TYPICAL PERFORMANCE (For Reference Only)

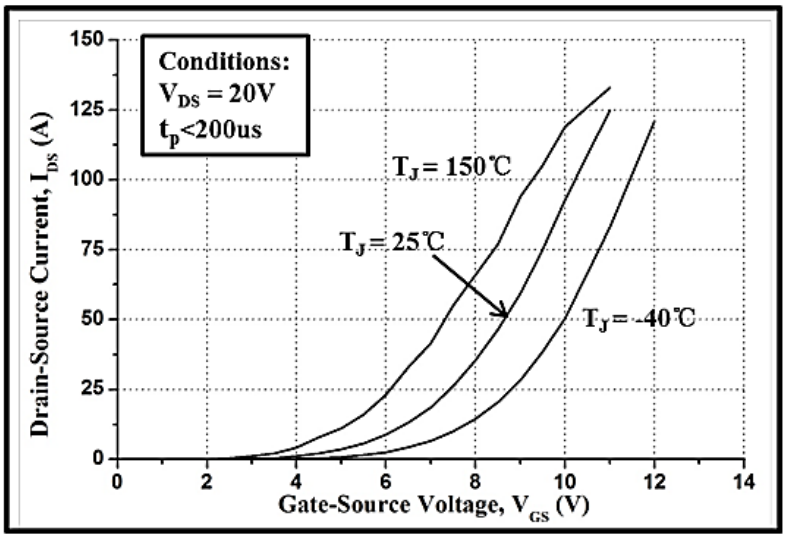



**Figure 7. Transfer Characteristic for Various Junction Temperatures**

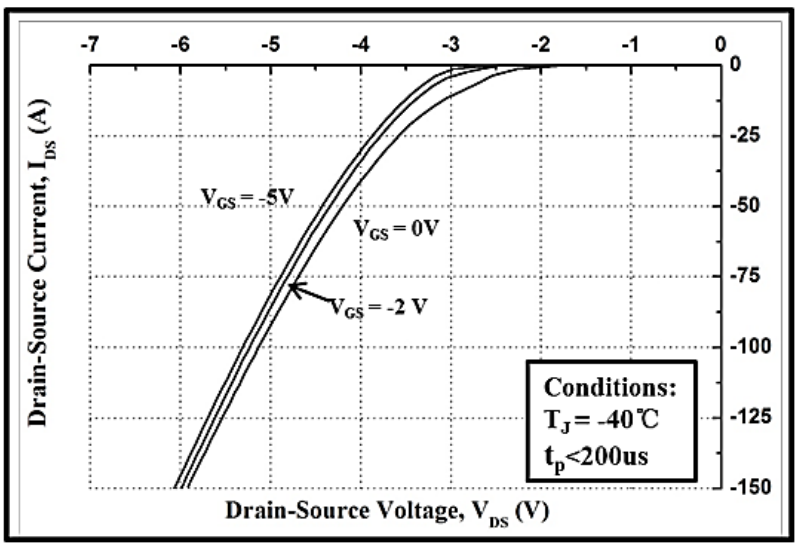



**Figure 8. Body Diode Characteristic at -40 °C**

TYPICAL PERFORMANCE (For Reference Only)

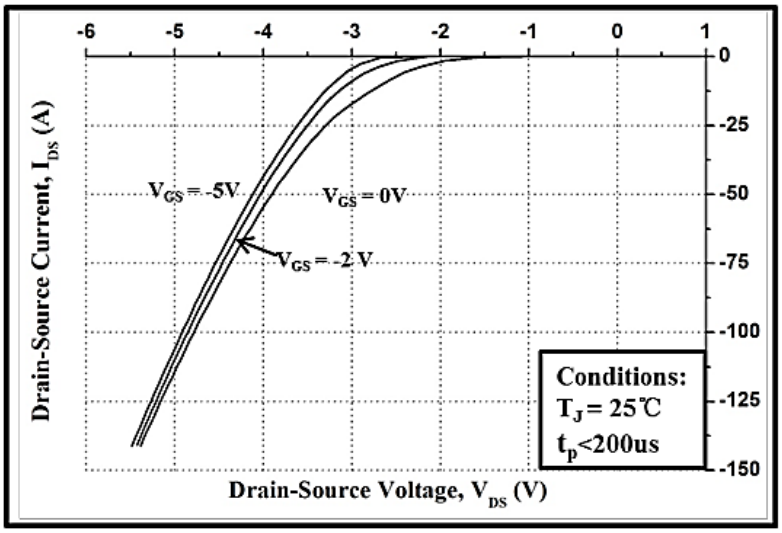



**Figure 9. Body Diode Characteristic at 25 ºC**

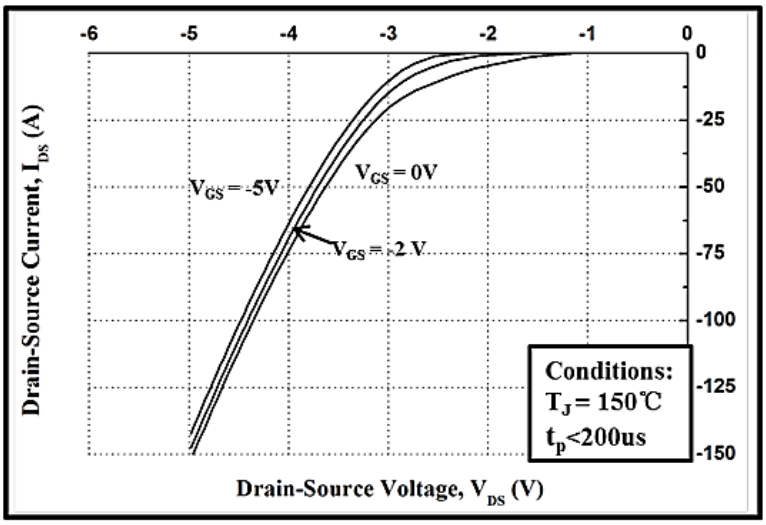



**Figure 10. Body Diode Characteristic at 150 ºC**

TYPICAL PERFORMANCE (For Reference Only)

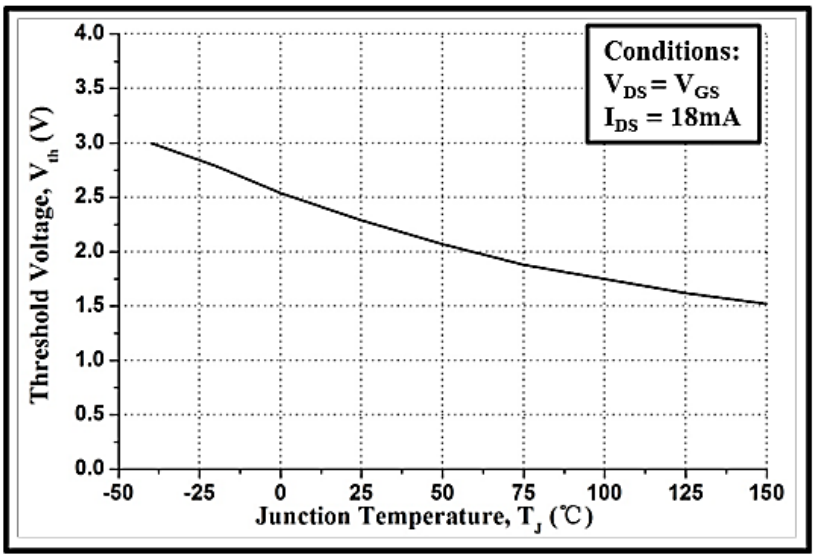



Figure 11. Threshold Voltage vs. Temperature

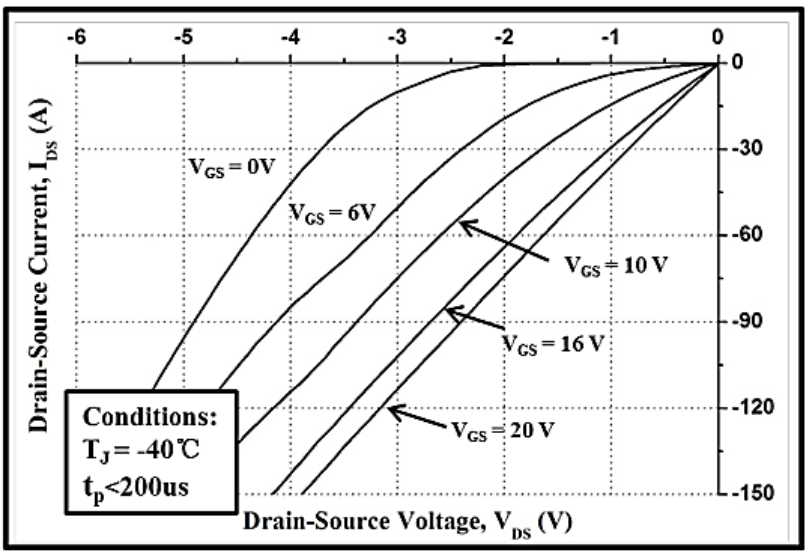



Figure 12. 3rd Quadrant Characteristic at -40 °C

TYPICAL PERFORMANCE (For Reference Only)

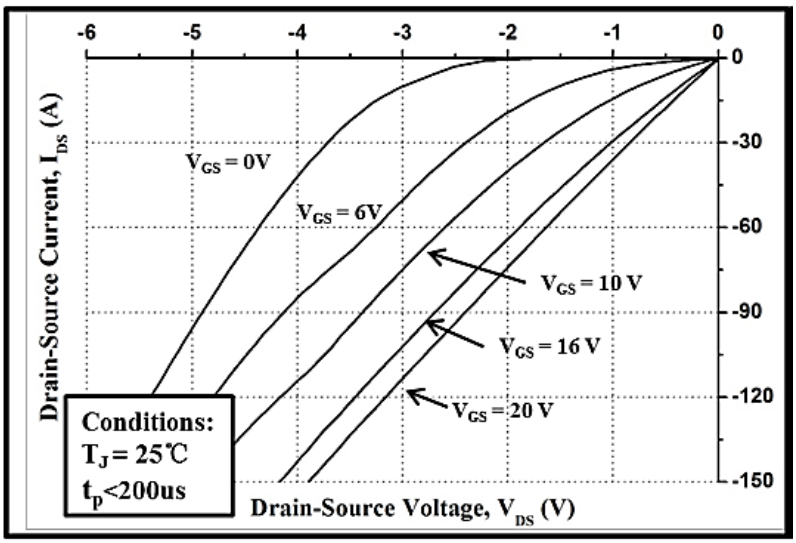



**Figure 13. 3rd Quadrant Characteristic at 25°C**

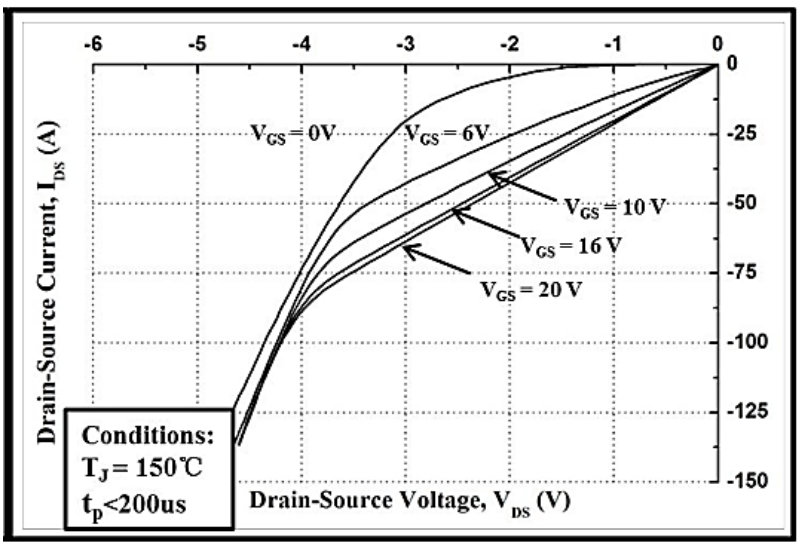



**Figure 14. 3rd Quadrant Characteristic at 150 °C**

TYPICAL PERFORMANCE (For Reference Only)

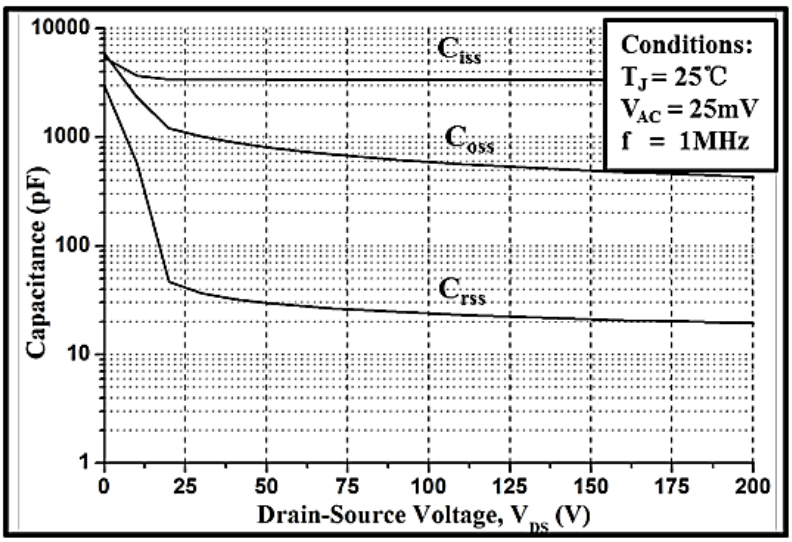



**Figure 15. Capacitances vs. Drain-Source Voltage (0 - 200V)**

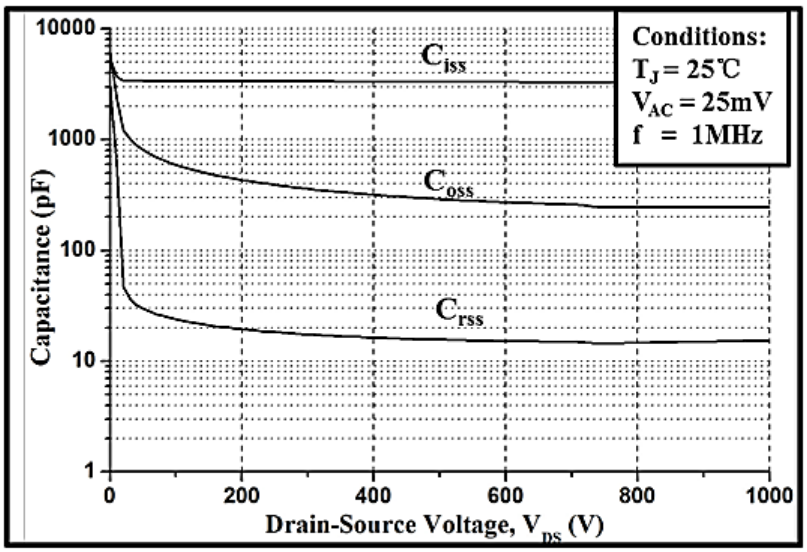



**Figure 16. Capacitances vs. Drain-Source Voltage (0 - 1000V)**

TYPICAL PERFORMANCE (For Reference Only)

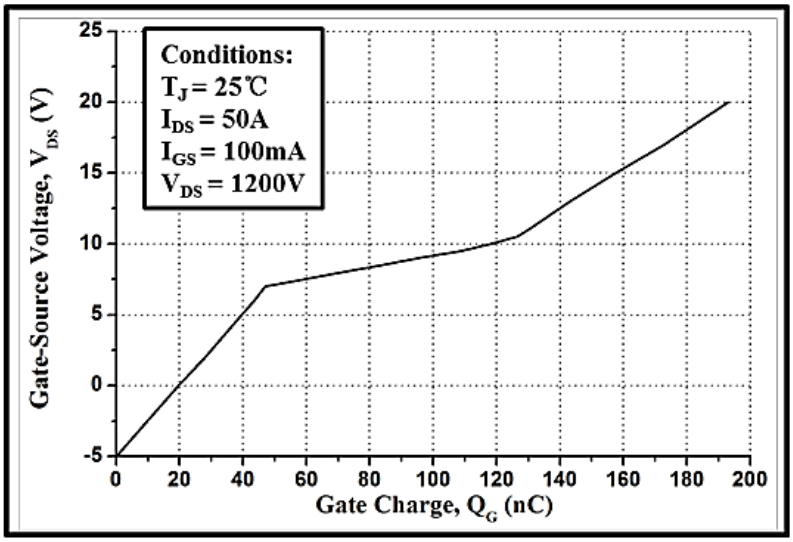



**Figure 17. Gate Charge Characteristic**

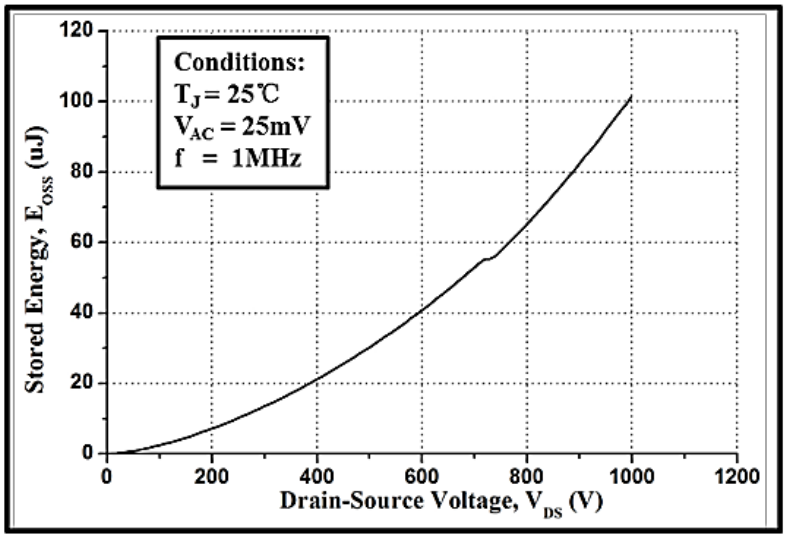



**Figure 18. Output Capacitor Stored Energy**

## IMPORTANT NOTES AND DISCLAIMER

1. ROHS COMPLIANCE: The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU RoHS Directive (EU) 2015/863 EC (RoHS3). RoHS Test Report for this product can be obtained can be obtained at Download Center.
2. REACH COMPLIANCE: REACH substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, REACH Test Report for this product can be obtained can be obtained at Download Center.
3. All Product parametric performance is indicated in the Electrical Characteristics for the listed herein test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
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8. *NextGen* requires that customers first obtain an RMA (Returned Merchandise Authorization) number prior to returning any products. Returns must be made within 30 days of the date of invoice, be in the original packaging, unused and like-new condition. At the time of quoting or purchasing, a product may say that it is Non-Cancelable/ Non-Returnable (NCNR). These products are not returnable and not refundable.