

| | | |
|----------------------------------|--|---|
| SPECIFICATION SHEET NO. | S1111 – LGE3M160120QLT | |
| ORIGINAL MFG/PART NO. |  LGE Diodes/LGE3M160120Q-L | |
| NEXTGEN PART CODE | LGE3M160120QLT | Indicate This Code For RFQ /Order |
| DATE | Nov. 11, 2025 | |
| REVISION | A4 | Updated With Most Recent Data |
| DESCRIPTION AND MAIN PARAMETRICS | <p>Silicon Carbide (SiC) Power MOSFET, 4 Pins, Case TO-247-4, LGE3M L Series, N-Channel, Drain-Source Voltage (V_{DS}): 1200V Max.</p> <p>Current Drain-source On-state Resistance R_{DS(ON)}: 160mΩ Typ.</p> <p>Continuous Drain Current (I_D) @ T_c=25°C: 20A</p> <p>Operating Temperature: -55°C ~ 175°C (T_J)</p> <p>Package in Tube, 30pcs/Tube</p> <p>RoHS/RoHS III compliant, RoHS Annex III lead Exemption (Exempt per RoHS EU 2015/863) and Halogen Free (HF)</p> | |
| CUSTOMER | | |
| CUSTOMER PART NUMBER | | |
| CROSS REF. PART NUMBER | | |
| MEMO | | |

| | | |
|-------------------------------|---|---|
| VENDOR APPROVE | | |
| Issued/Checked/Approved |  |  |
| | |  |
| Effective Date: Nov. 11, 2025 | | |

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

MAIN FEATURE

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Parasitic Capacitance
- High Junction Temperature
- Fast Recovery Diode
- Kelvin Connection Driver
- Higher System Efficiency
- Parallel Device Convenience without Thermal Runaway
- Hard Switching & Higher Reliability
- Easy To Drive
- 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)



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



APPLICATION

- Motor Drive
- Photovoltaic Inverter
- UPS Power Supply
- High voltage DC / DC converter
- Switching Mode Power Supply

ELECTRICAL CHARACTERISTICS

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

HOW TO ORDER

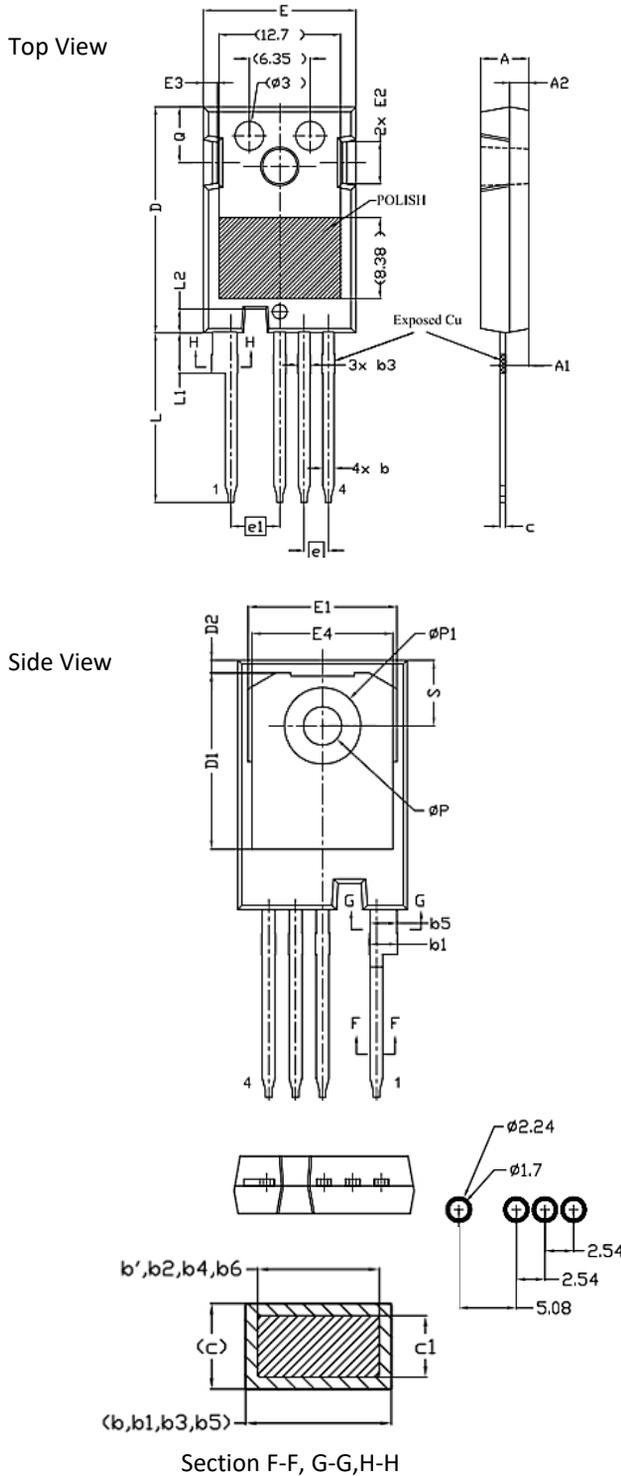
- Please Follow Up Part Code Guide And Indicate NextGen Part Code LGE3M160120QLT For RFQ and Order.

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 |
| 160 | Current Drain-source On-state Resistance R _{DS(ON)} Code | 160: 160mΩ |
| 120 | Drain-Source Voltage (V _{DS}) Code | 120: 1200V Max. |
| Q | Package Case Code | B: TO-247-3; E: TO-263-2; J: TO-263-7; Q: TO-247-4; |
| LT | Internal Control Code | Letter A~Z, a-z or Digits (0-9) |
| XX | Special/Custom Parameters | Blank: N/A; XX: Letter A~Z, a~z or digits (0~9) for Special/Custom Parameters |

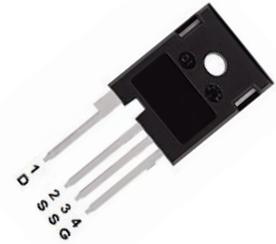
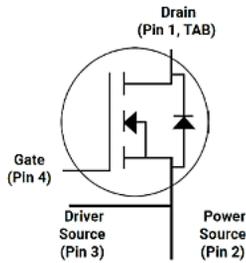
DIMENSION -- Unit: (mm), Case TO-247-4 Outline



| SYMBOL | TO-247-4 | | |
|--------|-----------|-------|-------|
| | Min. | Typ. | Max. |
| A | 4.83 | 5.02 | 5.21 |
| A1 | 2.29 | 2.41 | 2.54 |
| A2 | 1.91 | 2.00 | 2.16 |
| b' | 1.07 | 1.20 | 1.28 |
| b | 1.07 | 1.20 | 1.33 |
| b1 | 2.39 | 2.67 | 2.94 |
| b2 | 2.39 | 2.67 | 2.84 |
| b3 | 1.07 | 1.30 | 1.60 |
| b4 | 1.07 | 1.30 | 1.50 |
| b5 | 2.39 | 2.53 | 2.69 |
| b6 | 2.39 | 2.53 | 2.64 |
| c | 0.55 | 0.60 | 0.68 |
| c1 | 0.55 | 0.60 | 0.65 |
| D | 23.30 | 23.45 | 23.60 |
| D1 | 16.25 | 16.55 | 17.65 |
| D2 | 0.95 | 1.19 | 1.25 |
| E | 15.75 | 15.94 | 16.13 |
| E1 | 13.10 | 14.02 | 14.15 |
| E2 | 3.68 | 4.40 | 5.10 |
| E3 | 1.00 | 1.45 | 1.90 |
| E4 | 12.38 | 13.26 | 13.43 |
| e | 2.54 BSC | | |
| e1 | 5.08 BSC | | |
| L | 17.31 | 17.57 | 17.82 |
| L1 | 3.97 | 4.19 | 4.37 |
| L2 | 2.35 | 2.50 | 2.65 |
| ØP | 3.51 | 3.61 | 3.65 |
| ØP1 | 7.19 REF. | | |
| Q | 5.49 | 5.79 | 6.00 |
| S | 6.04 | 6.17 | 6.30 |

Note:

1. Package reference standard: JEDEC TO247.
2. Slots are required, and the slot openings can be circular.
3. Dimensions D and E exclude mold flash.

INTERNAL CIRCUIT DIAGRAM

1200V N-CHANNEL SiC MOSFET

| V _{DS} | I _D @ T _c =25°C | R _{DS(on)} | MARKING | PACKAGE/CASE |
|-----------------|--|---------------------|--------------|--------------|
| 1200V | 20A | 160mΩ | LGE3M160120Q | TO-247-4 |

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

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUE | UNIT |
|--|------------------|---|------------|------|
| Drain-Source Voltage | V _{DS} | V _{GS} =0V, I _D =100μA | 1200 | V |
| Gate-Source Voltage | V _{GS} | Recommended maximum | -5/+20 | V |
| Continuous Drain Current | I _D | V _{GS} =20V, T _c =25°C | 20 | A |
| | | V _{GS} =20V, T _c =100°C | 16 | |
| Pulsed Drain Current | I _{DM} | Pulse width limited by SOA | 50 | A |
| Power Dissipation | P _{TOT} | T _c =25°C | 138 | W |
| Operating and Junction Temperature Range | T _J | | -55 ~ +175 | °C |
| Storage Temperature Range | T _{STG} | | -55 ~ +175 | °C |
| Soldering Temperature | T _L | Wave soldering only allowed at leads, 1.6 mm from case for 10 s | 260 | °C |

THERMAL CHARACTERISTICS

| PARAMETER | SYMBOL | CONDITIONS | VALUE | | | UNIT |
|-----------------------------|---------------|---------------|-------|-------|------|------|
| | | | MIN. | TYP. | MAX. | |
| Thermal Resistance To Shell | $R_{th(j-c)}$ | Junction-case | - | 1.088 | - | °C/W |

ELECTRICAL CHARACTERISTICS – Part I Characteristics (Tc = 25°C Unless Otherwise Specified)

| PARAMETER | SYMBOL | CONDITIONS | VALUE | | | UNIT |
|------------------------------------|-----------|---|-------|------|------|------|
| | | | Min. | Typ. | Max. | |
| Zero Gates Voltage Drain Current | I_{DSS} | $V_{DS}=1200V, V_{GS}=0V$ | - | 5 | 100 | μA |
| Gate Leakage Crurent | I_{GSS} | $V_{DS}=0V, V_{GS}=-5/+20V,$ | - | 1 | ±100 | nA |
| Gate Threshold Voltage | V_{TH} | $V_{GS}=V_{DS}, I_D=1.9mA$ $T_c=175^\circ C$ | - | 2.9 | - | V |
| | | | - | 1.9 | - | |
| Drain-source On-state Resistance | R_{ON} | $V_{GS}=20V, I_D=10A$ $T_j=25^\circ C$ | - | 160 | 195 | mΩ |
| | | $V_{GS}=20V, I_D=10A$ $T_j=175^\circ C$ | - | 250 | - | |
| Input Capacitance | C_{ISS} | $V_{DS} = 800V,$ $V_{GS} = 0V$ $F=1MHz,$ $V_{AC} = 25mV$ | - | 885 | - | pF |
| Output Capacitance | C_{OSS} | | - | 38 | - | pF |
| Reverse Transfer Capacitance | C_{RSS} | | - | 2 | - | pF |
| The Output Capacitor Stores Energy | E_{OSS} | | - | 16 | - | μJ |
| Total Gate Charge | Q_g | $V_{DS} = 800V,$ $V_{GS} = -5/+20V$ $I_D = 10A$ | - | 43 | - | nC |
| Gate To Source Charge | Q_{gs} | | - | 9 | - | nC |
| Gate To Drain Charge | Q_{gd} | | - | 19 | - | nC |
| Gate Input Resistance | R_g | $f=1MHz$ | | 9.5 | | Ω |

ELECTRICAL CHARACTERISTICS – Part II Characteristics (Tc = 25°C Unless Otherwise Specified)

| PARAMETER | SYMBOL | CONDITIONS | VALUE | | | UNIT |
|---------------------------|----------------------|---|-------|-------|------|------|
| | | | Min. | Typ. | Max. | |
| Turn On Switching Energy | E _{on} | V _{DS} = 800V, V _{GS} = -2/+20V I _D = 10A, R _{G(ext)} = 5.1Ω, L = 450μH | - | 139.3 | - | μJ |
| Turn Off Switching Energy | E _{off} | | - | 39.2 | - | μJ |
| Turn On Delay Time | t _{d (on)} | | - | 6.4 | - | ns |
| Rise Time | t _r | | - | 19.4 | - | ns |
| Turn Off Delay Time | t _{d (off)} | | - | 11.8 | - | ns |
| Fall time | T _f | | - | 14 | - | ns |

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

| PARAMETER | SYMBOL | CONDITIONS | VALUE | | | UNIT |
|-------------------------------|------------------|---|-------|-------|------|------|
| | | | Min. | Typ. | Max. | |
| Diode Forward Voltage | V _{SD} | V _{GS} = 0V, I _{SD} = 5A T _J = 175°C | - | 4.1 | - | V |
| | | | - | 3.7 | - | V |
| Reverse Recovery Time | T _{rr} | V _R = 800V, V _{GS} = -2V/+20V I _{SD} = 10A di/dt = 1000A/μS, R _{G(ext)} = 13Ω, | - | 33.2 | - | nS |
| Reverse Recovery Charge | Q _{rr} | | - | 101.5 | - | nC |
| Reverse Recovery Peak Current | I _{rrm} | | - | 5.6 | - | A |

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

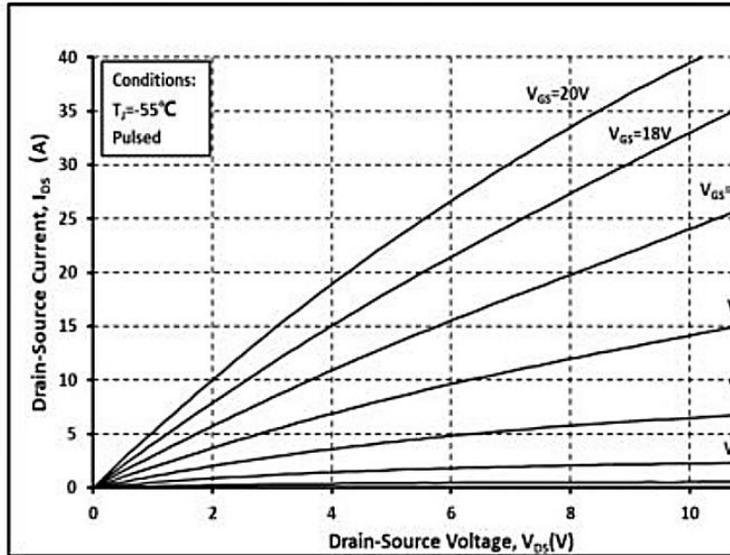


Figure 1. Output Characteristics $T_J = 55^\circ\text{C}$

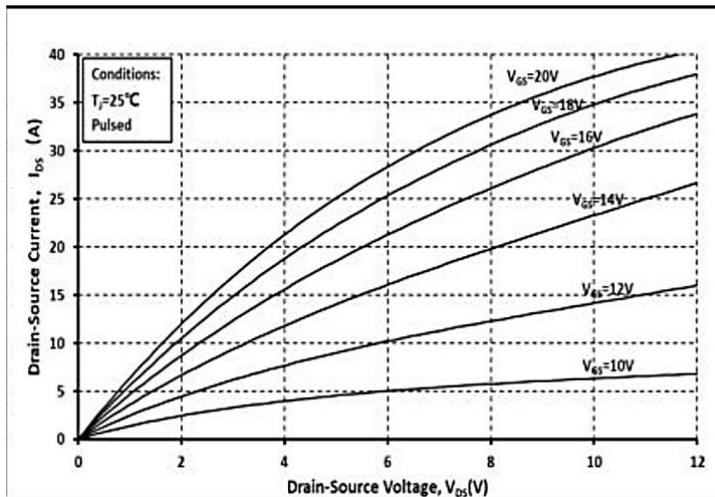


Figure 2. Output Characteristics $T_J = 25^\circ\text{C}$

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

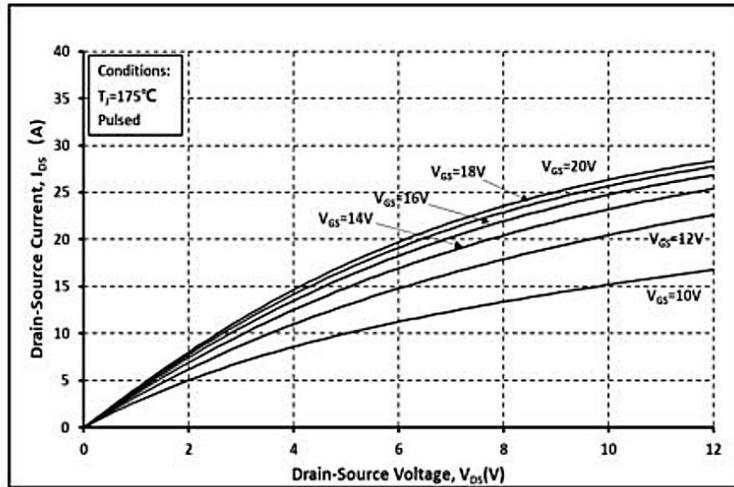


Figure 3. Output Characteristics $T_J = 175^\circ\text{C}$

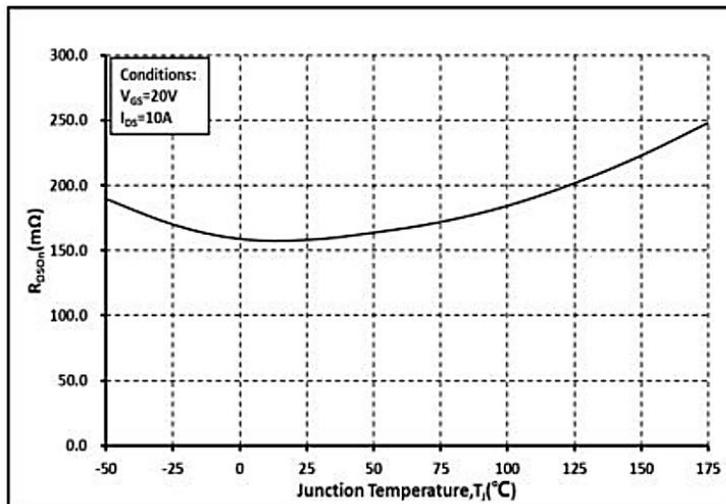


Figure 4. On-Resistance vs. Temperature

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

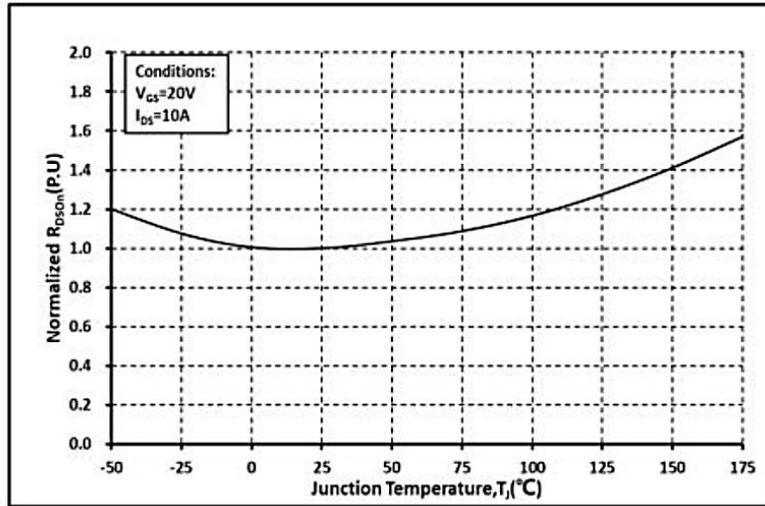


Figure 5. Normalized On-Resistance vs. Temperature

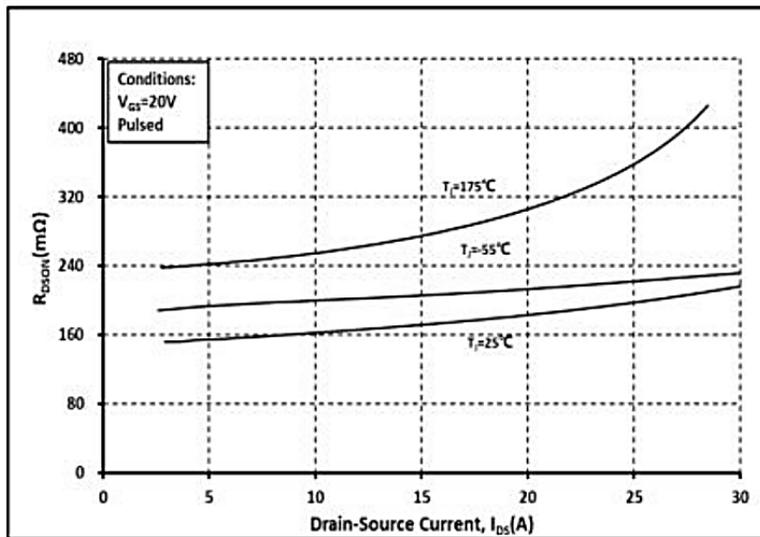


Figure 6. On-Resistance Vs. Drain-Source Current @ Various Temperature

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

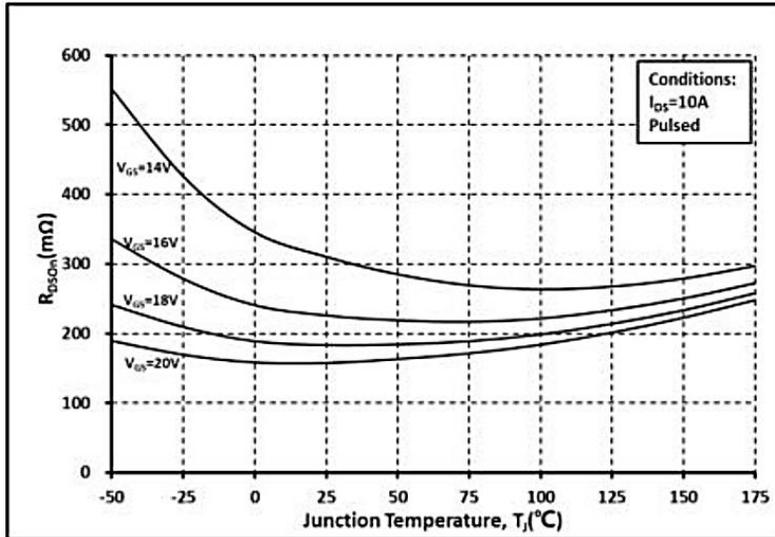


Figure 7. On-Resistance @V_{GS} vs. Temperature

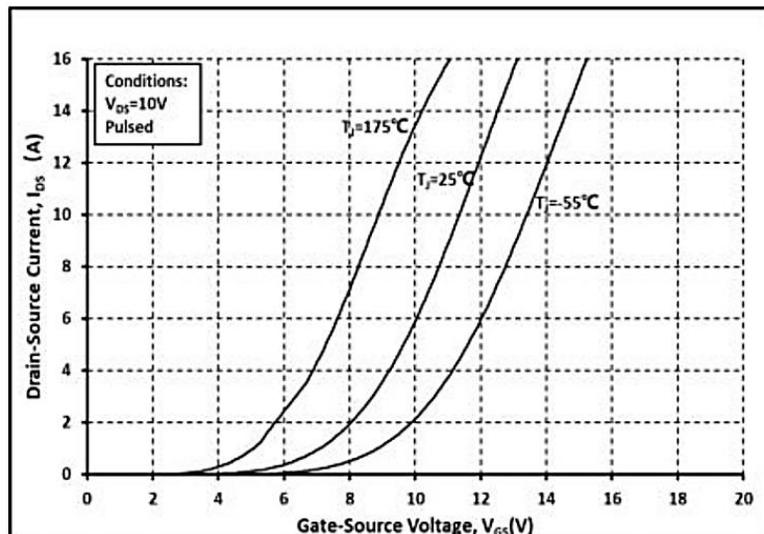


Figure 8. Transfer Characteristic For Various Junction Temperatures

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

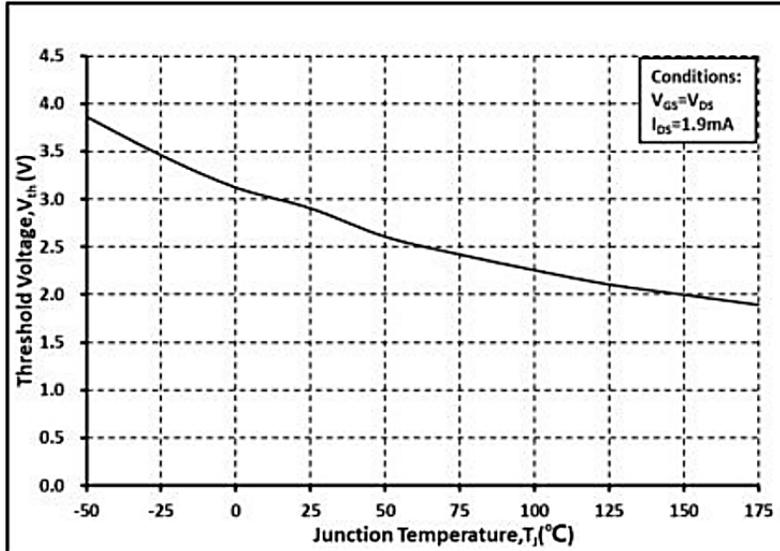


Figure 9. Threshold Voltage vs. Temperature

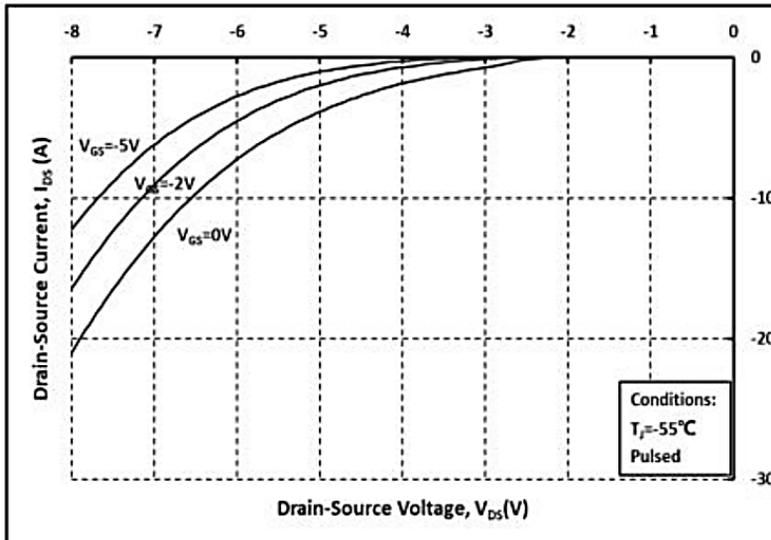


Figure 10. Body Diode Characteristics @ $T_j = -55^\circ\text{C}$

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

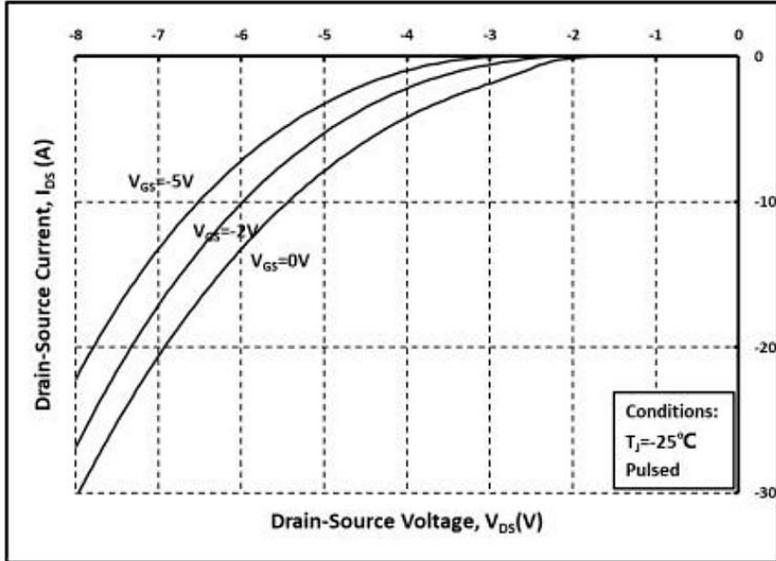


Figure 11. Body Diode Characteristics @ $T_J=25^\circ\text{C}$

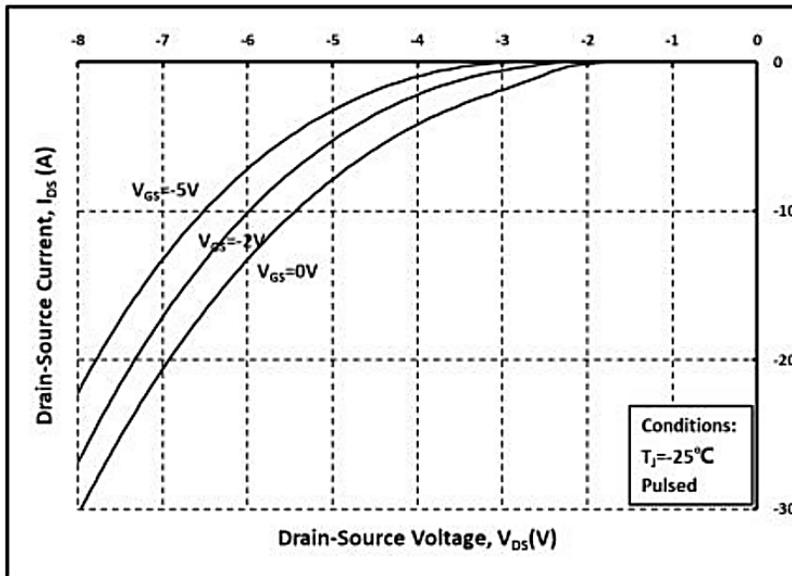


Figure 12. Body Diode Characteristics @ $T_J=175^\circ\text{C}$

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

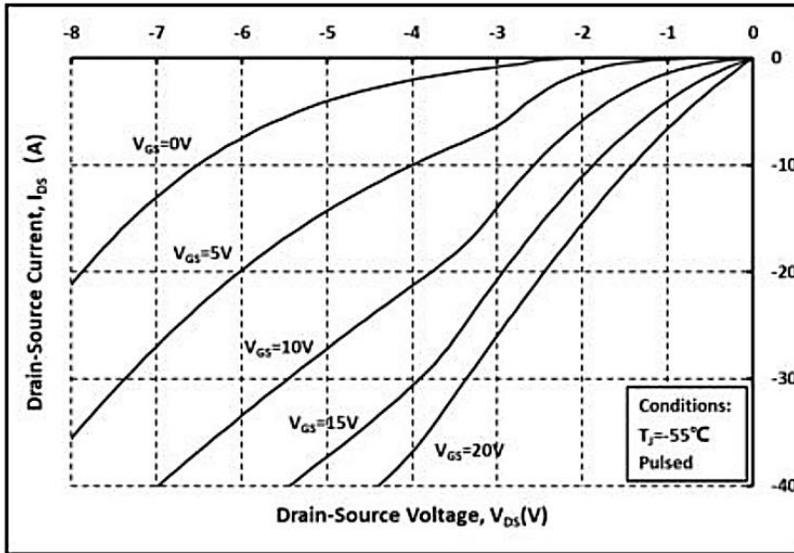


Figure 13. 3rd Quadrant Characteristics @ $T_J = -55^\circ\text{C}$

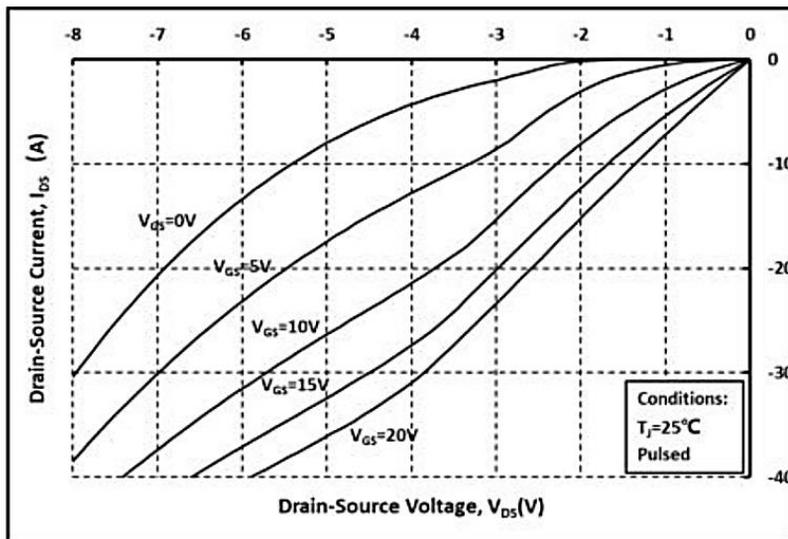


Figure 14. 3rd Quadrant Characteristics @ $T_J = 25^\circ\text{C}$

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

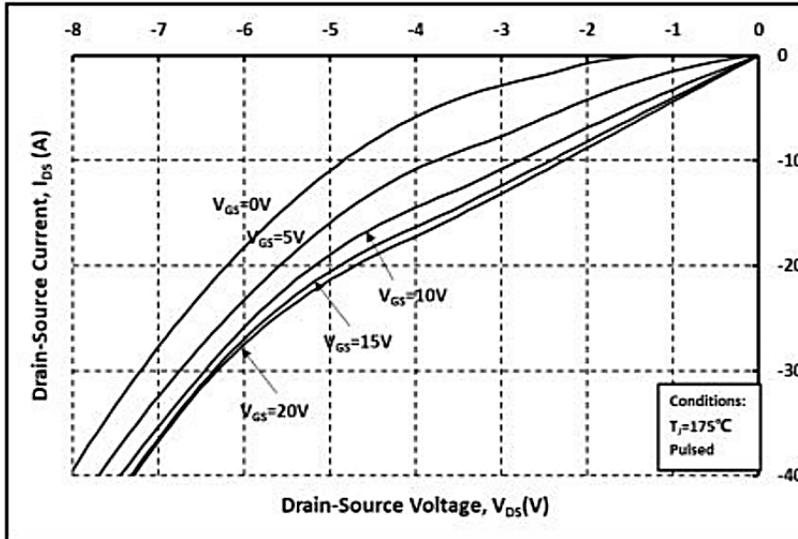


Figure 15. 3rd Quadrant Characteristics @ $T_J=175^\circ\text{C}$

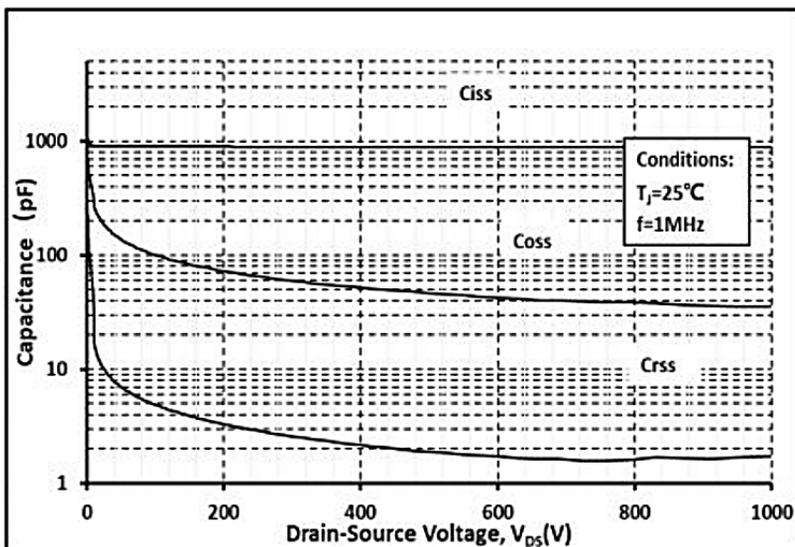


Figure 16. Capacitances vs. Drain-Source Voltage

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

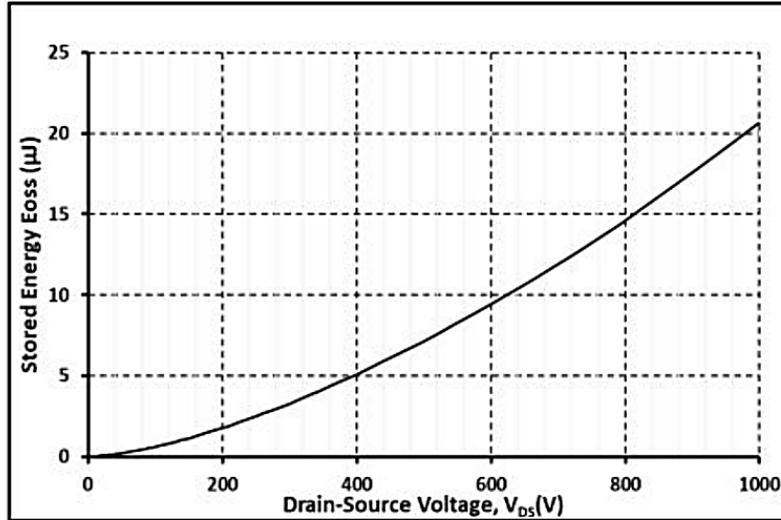


Figure 17. Output Capacitor Stored Energy

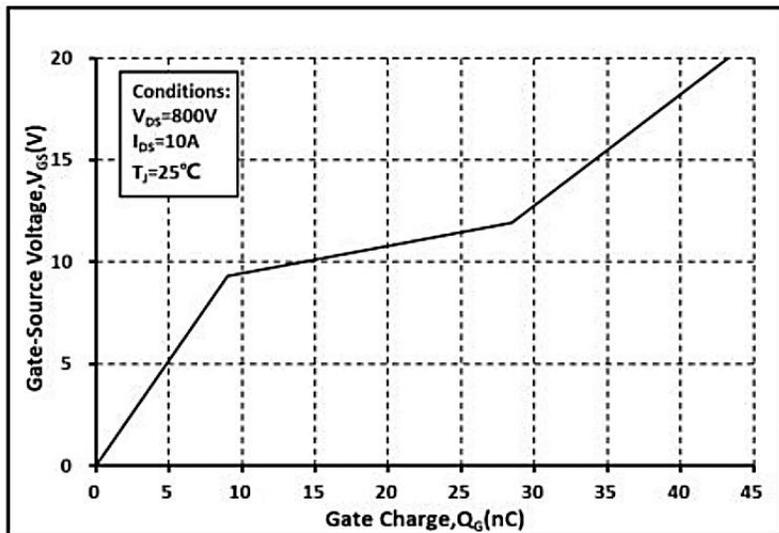


Figure 18. Gate Charge Characteristics

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

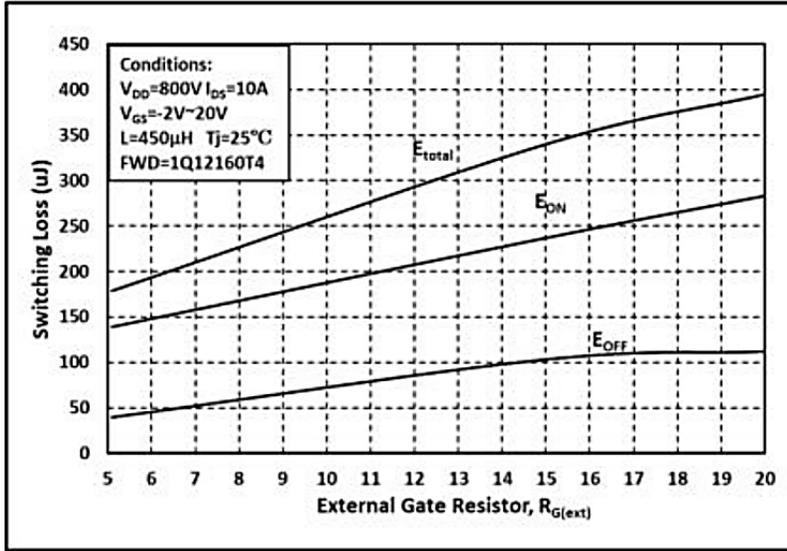


Figure 19. Switching Energy vs. External Gate Resistor

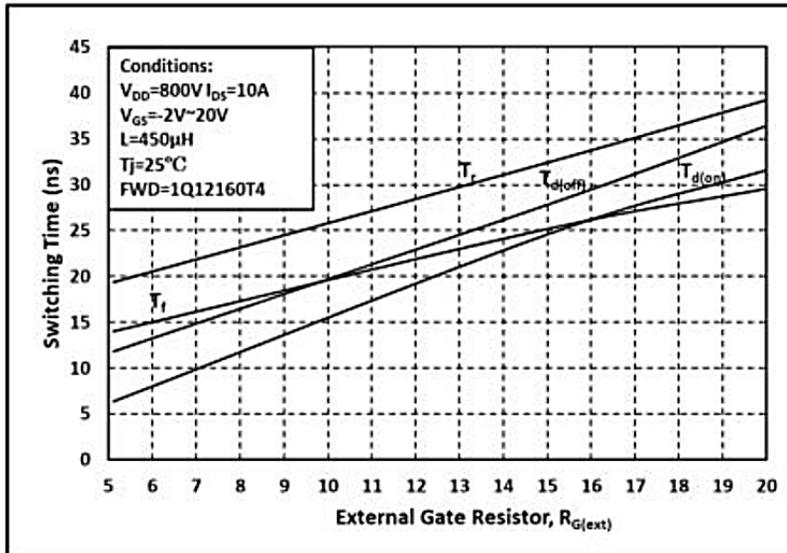


Figure 20. Switching Time vs. External Gate Resistor

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

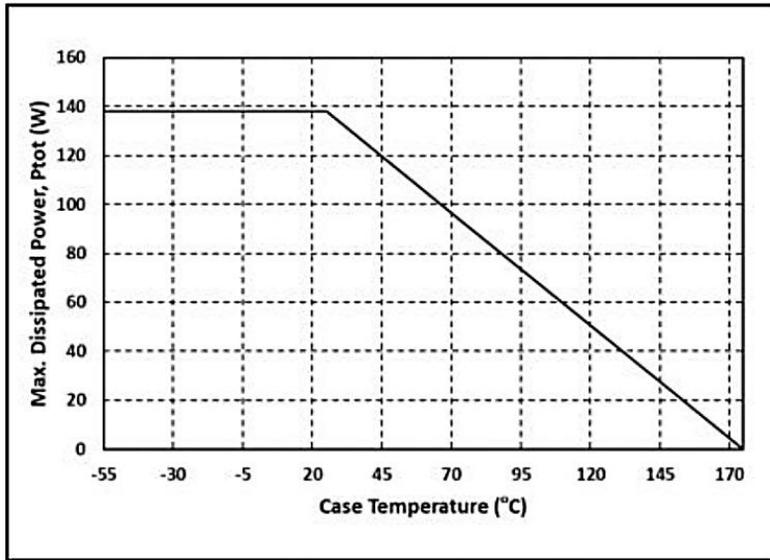


Figure 21. Continuous Drain Current Derating vs. Case Temperature

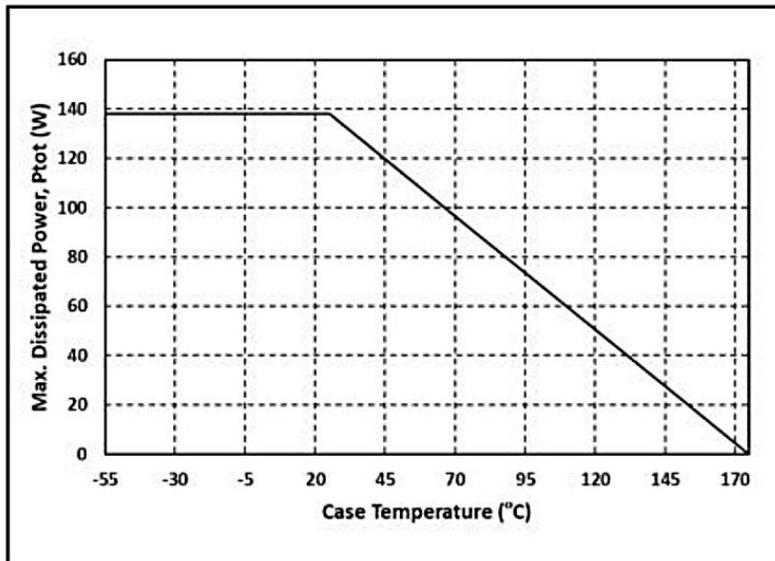


Figure 22. Maximum Power Dissipation Derating vs. Case Temperature

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

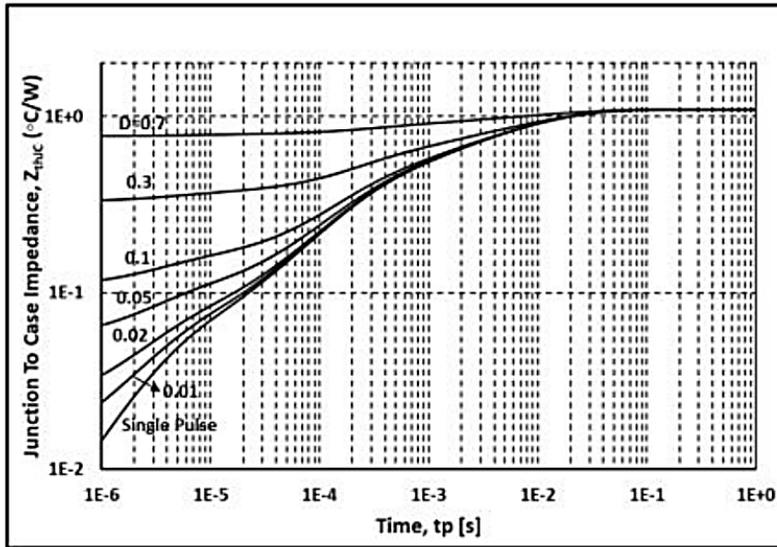


Figure 23. Transient Thermal Impedance (Junction to Case)

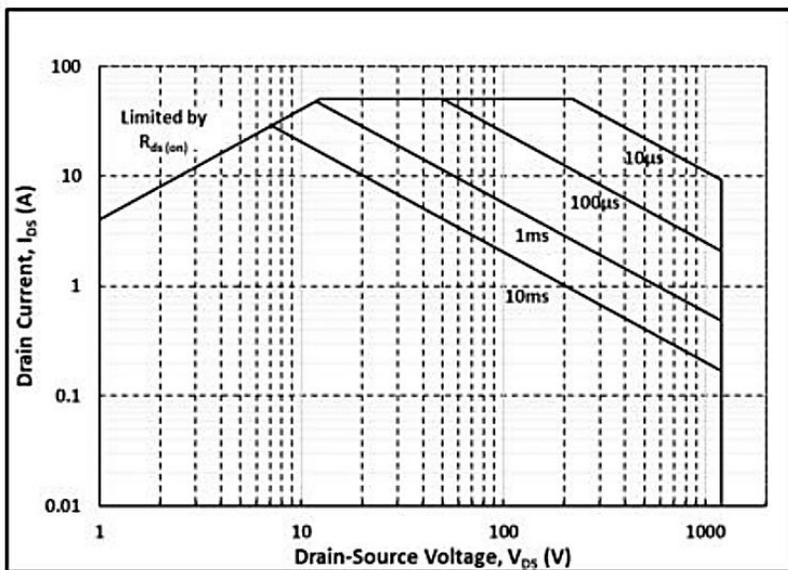


Figure 24. Safe Operating Area

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 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 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.
4. NextGen Component, Inc (*NextGen*) reserves the right to make changes to this document and its products and specifications at any time without notice. Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.
5. *NextGen* makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, not does *NextGen* assume any liability for application assistance or customer product design.
6. *NextGen* does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application. No license is granted by implication or otherwise under any intellectual property rights of NextGen.
7. *NextGen* products are not authorized for use as critical components in life support devices or systems without express written approval by *NextGen*.
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.