

SPECIFICATION SHEET NO.	S1107 – LGE3M50120BL0T	
ORIGINAL MFG/PART NO.	 LGE Diodes/LGE3M50120B -L	
NEXTGEN PART CODE	LGE3M50120BL0T	Indicate This Code For RFQ /Order
DATE	Nov. 07, 2025	
REVISION	A3	Updated With Most Recent Data
DESCRIPTION AND MAIN PARAMETRICS	<p>Silicon Carbide (SiC) MOSFET, 3 Pins, Case TO-247-3, LGE3M L Series, N-Channel, Drain-Source Voltage (V_{DS}): 1200V</p> <p>Drain-Source On-State Resistance R_{DS(ON)}: 50mΩ</p> <p>Continuous Drain Current (I_D) @ T_c=25°C: 58A</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. 07, 2025		

CUSTOMER APPROVE	
Date:	

MAIN FEATURE

- High Voltage with Low On-Resistance
- High Speed With Low Parasitic Capacitance
- High Junction Temperature
- Fast Recovery Diode
- 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)



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 Supplies

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 LGE3M50120BL0T For RFQ and Order.

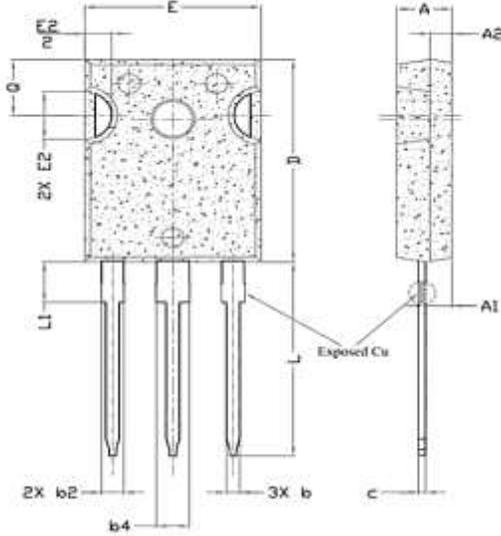
PART CODE GUIDE

RFQ
[Request For Quotation](#)

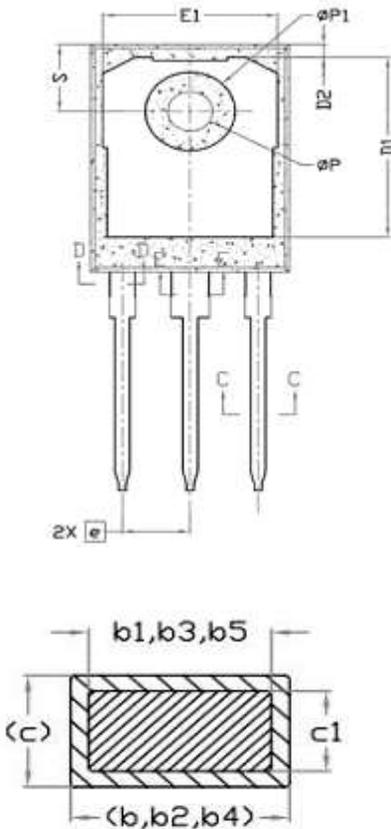
CODE	NAME	KEY SPECIFICATION OPTION
LGE3M	Product Series Code	Silicon Carbide (SiC) MOSFET, 3 Pins, Case TO-247-3, LGE3M L Series
50	Drain-Source On-State (V _{DS}) Resistance R _{DS(ON)} Code	50: 50mΩ
120	Drain-Source Voltage (V _{DS}) Code	120: 1200V Max.
B	Package Case Code	B: TO-247-3; E: TO-263-2; J: TO-263-7; Q: TO-247-4;
LOT	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-247-3 Outline

Top View



Side View

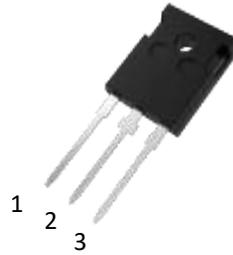
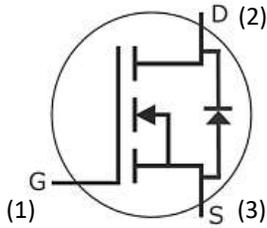


Section C-C,D-D,E-E

SYMBOL	TO-247-3			NOTES
	Min.	Typ.	Max.	
A	4.83	5.02	5.21	
A1	2.29	2.41	2.55	
A2	1.50	2.00	2.49	
b	1.12	1.20	1.33	
b1	1.12	1.20	1.28	
b2	1.91	2.00	2.39	6
b3	1.91	2.00	2.34	
b4	2.87	3.00	3.22	6,8
b5	2.87	3.00	3.18	
c	0.55	0.60	0.69	6
c1	0.55	0.60	0.65	
D	20.8	20.95	21.1	4
D1	16.25	16.55	17.65	5
D2	0.51	1.19	1.35	
E	15.75	15.94	16.13	4
E1	13.46	14.02	14.16	5
E2	4.32	4.91	5.49	3
e	5.44BSC			
L	19.81	20.07	20.32	6
L1	4.10	4.19	4.40	7
ØP	3.56	3.61	3.65	
ØP1	7.19REF.			
Q	5.39	5.79	6.20	
S	6.04	6.17	6.30	

Note:

1. Package Reference: JEDEC TO247, Variation AD.
2. Slot Required, Notch May Be Rounded
3. Dimension D & E Do Not Include 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	58A	50mΩ	LGE3M50120B	TO-247-3

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	58	A
		V _{GS} =20V, T _c =100°C	43	
Pulsed Drain Current	I _{DM}	Pulse width limited by SOA	145	A
Power Dissipation	P _{TOT}	T _c =25°C	327	W
Operating Junction Temperature Range	T _J		-55 ~ +175	°C
Storage Temperature Range	T _{STG}		-55 ~ +175	°C
Solder Temperature	T _L	Wave soldering only allowed at leads, 1.6 mm from case for 10 s	260	°C

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

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Zero Gates Voltage Drain Crurent	I _{DSS}	V _{DS} =1200V, V _{GS} =0V	-	5	100	μA
Gate Leakage Crurent	I _{GSS}	V _{GS} =-5/20V, V _{DS} =0V	-	1	±100	nA
Gate Threshold Voltage	V _{TH}	V _{DS} =V _{GS} , I _D =6mA,	-	3.2	-	V
		V _{DS} =V _{GS} , I _D =6mA, T _C =175°C	-	2.2	-	
Drain-Source On-State Resistance	R _{ON}	V _{GS} =20V, I _D =20A, T _J =25°C	-	50	65	mΩ
		V _{GS} =20V, I _D =20A, T _J =175°C	-	80	-	
Input Capacitance	C _{iss}	V _{DS} =800V, V _{GS} =0V, f=1MHz, V _{AC} =25mV	-	2770	-	pF
Output Capacitance	C _{oss}		-	110	-	pF
Reverse Transfer Capacitance	C _{rss}		-	10	-	pF
The output capacitor stores energy	E _{oss}		-	45	-	μJ
Total Gate Charge	Q _g	V _{DS} =800V, I _D =20A, V _{GS} =-5V/20V	-	120	-	nC
Gate To Source Charge	Q _{gs}		-	25	-	nC
Gate To Drain Charge	Q _{gd}		-	48	-	nC
Gate Input Resistance	R _g	f=1MHz	-	2.8	-	Ω
Turn-On Switching Energy	E _{on}	V _{DS} =800V, V _{GS} =-2V/20V, I _D =30A, R _{G(ext)} =3.3Ω, L=450μH	-	877	-	μJ
Turn-Off Switching Energy	E _{off}		-	211	-	μJ
Turn-On Delay Time	t _{d(on)}		-	31	-	ns
Rise Time	t _r		-	22	-	ns
Turn-Off Delay Time	t _{d(off)}		-	22	-	ns
Fall Time	t _f		-	19	-	ns

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

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _{SD} = 20A,	-	4.9	-	V
		V _{GS} = 0V, I _{SD} = 20A, T _J = 175°C	-	4.4	-	
Reverse Recovery Time	t _{rr}	V _{GS} = -2V/+20V, I _{SD} = 30A V _R = 800V, di/dt = 1000 A/μs, R _{G(ext)} = 10Ω L = 450μH	-	44.4	-	ns
Reverse Recovery Charge	Q _{rr}		-	212.6	-	nC
Reverse Recovery Peak Current	I _{rrm}		-	10.8	-	A

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			MIN.	TYP.	MAX.	
Thermal Resistance To Shell	R _{th(j-c)}		-	0.459	-	°C/W

TYPICAL PERFORMANCE (For Reference Only)

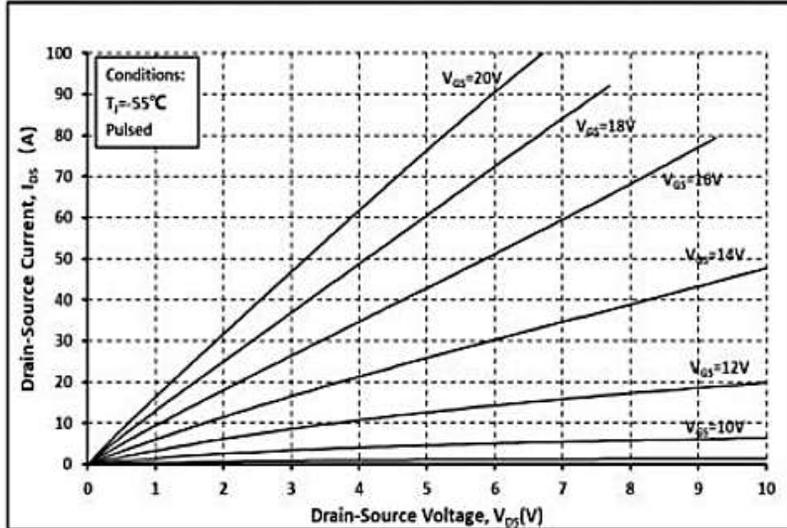


Figure 1. Output Characteristics $T_J = 55^\circ\text{C}$

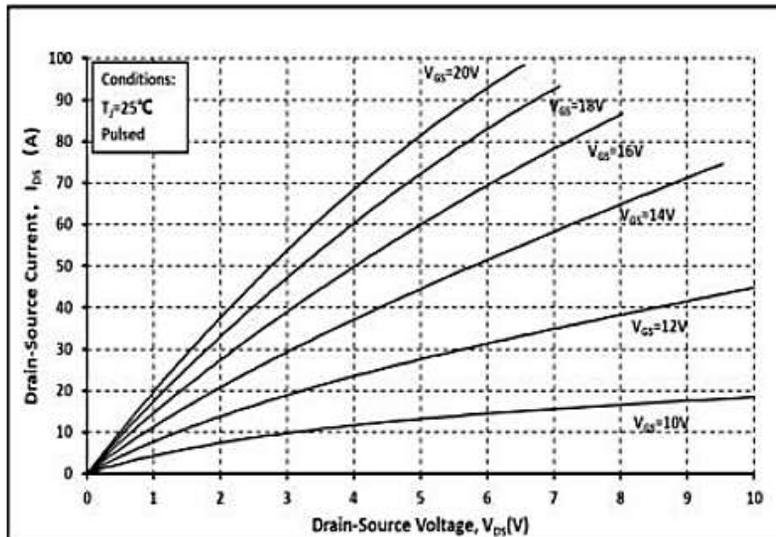


Figure 2. Output Characteristics $T_J = 25^\circ\text{C}$

TYPICAL PERFORMANCE (For Reference Only)

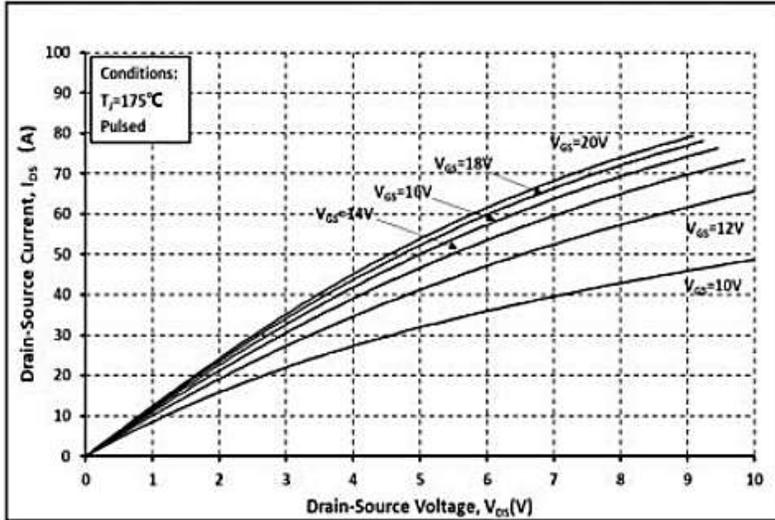


Figure 3. Output Characteristics $T_J=175^\circ\text{C}$

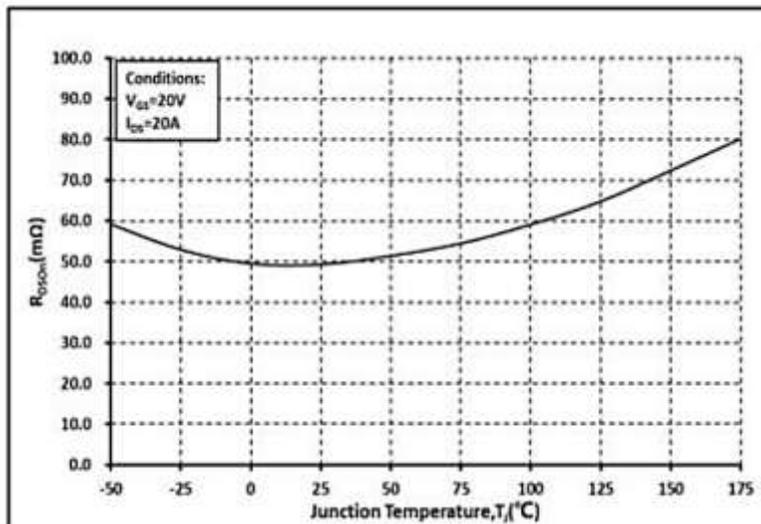


Figure 4. On-Resistance vs. Temperature

TYPICAL PERFORMANCE (For Reference Only)

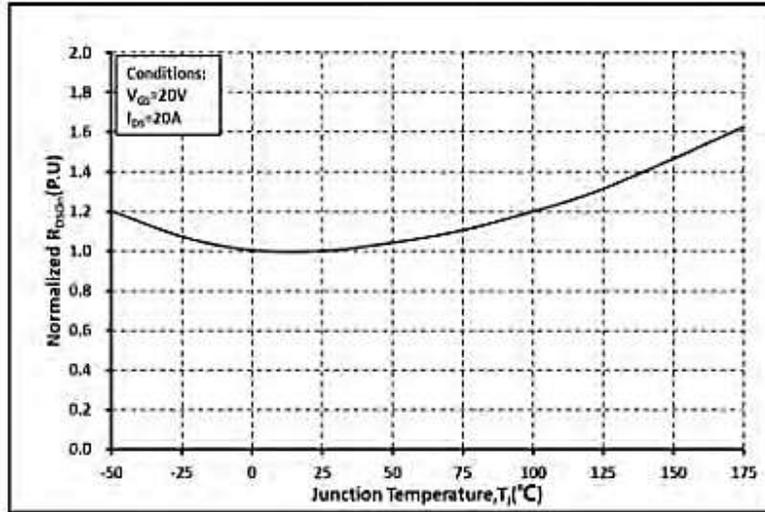


Figure 5. Normalized On-Resistance vs. Temperature

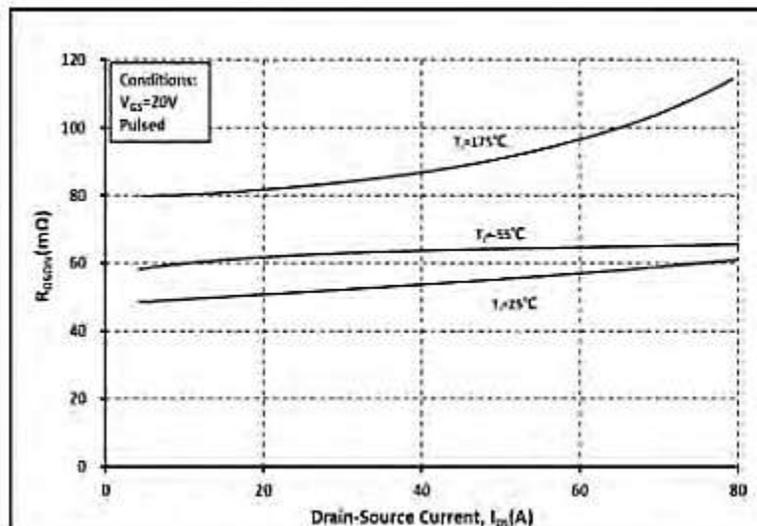


Figure 6. On-Resistance Vs. Drain-Source Current @ Various Temperature

TYPICAL PERFORMANCE (For Reference Only)

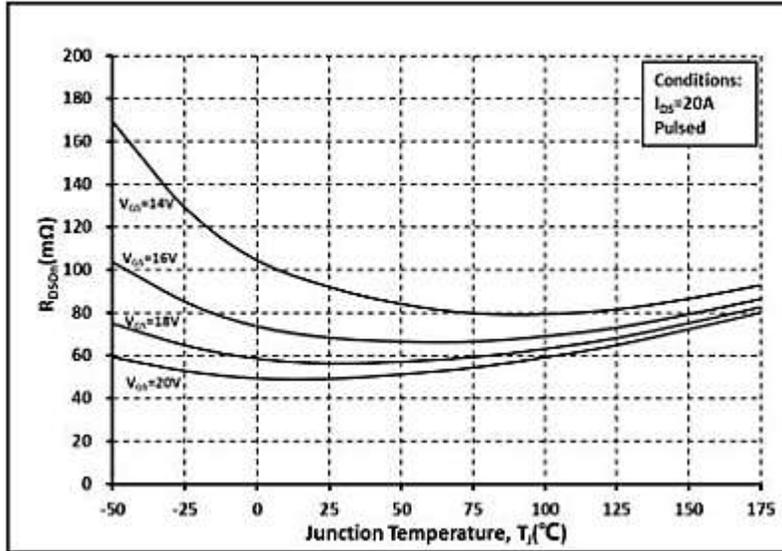


Figure 7. On-Resistance @ V_{GS} vs. Temperature

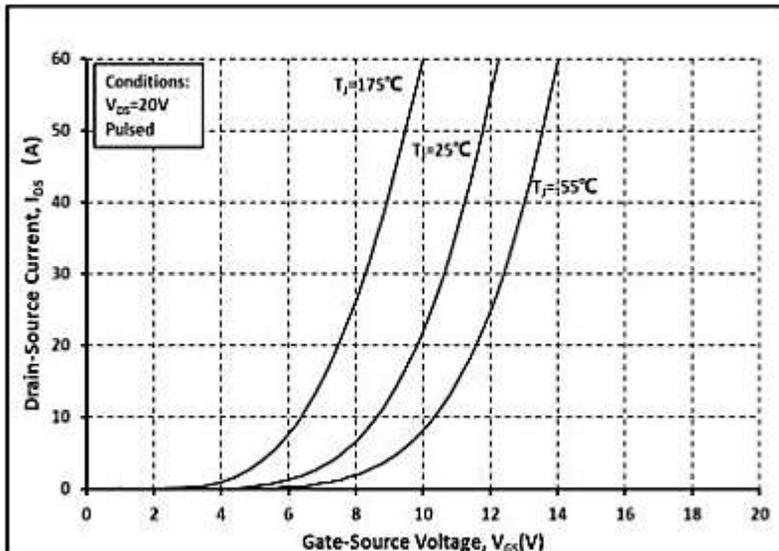


Figure 8. Transfer Characteristic For Various Junction Temperatures

TYPICAL PERFORMANCE (For Reference Only)

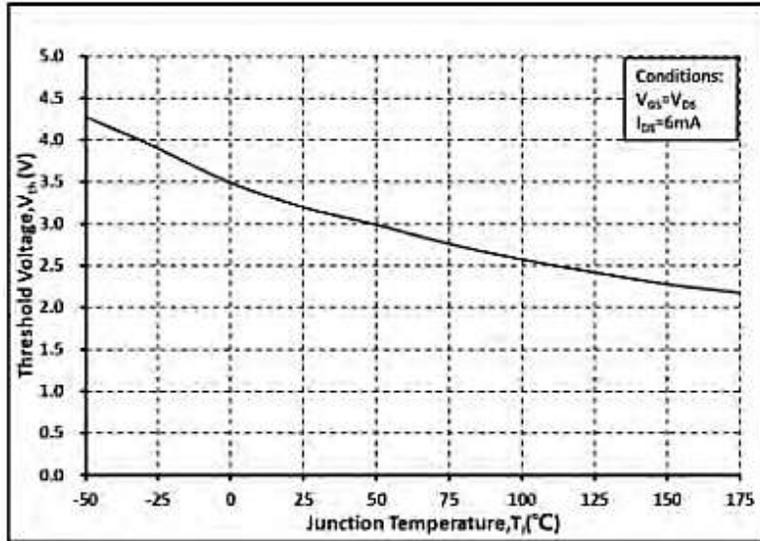


Figure 9. Threshold Voltage vs. Temperature

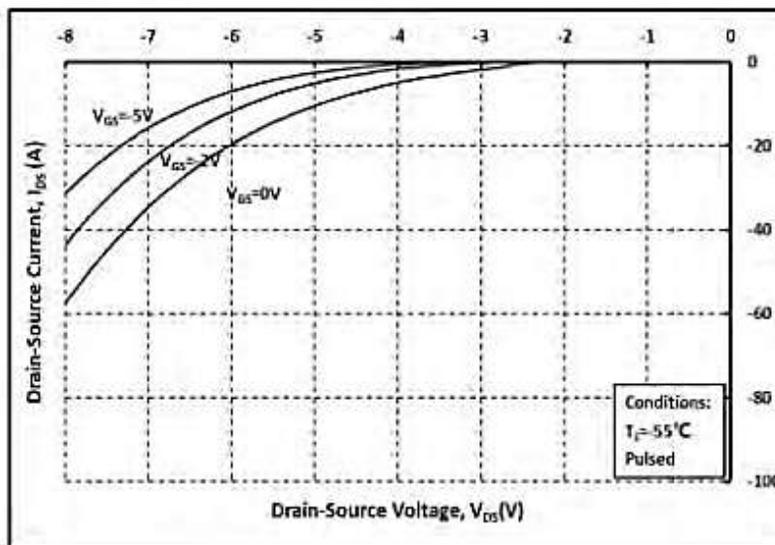


Figure 10. Body Diode Characteristics @ $T_j = -55^\circ\text{C}$

TYPICAL PERFORMANCE (For Reference Only)

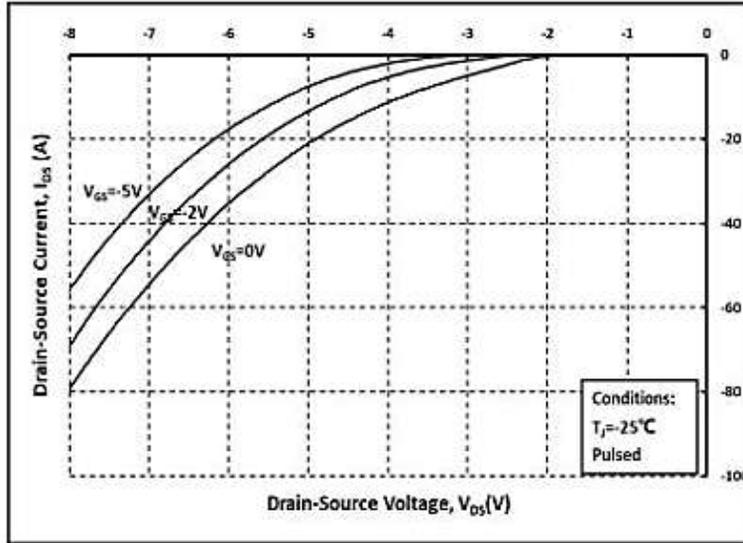


Figure 11. Body Diode Characteristics @ $T_J = 25^\circ\text{C}$

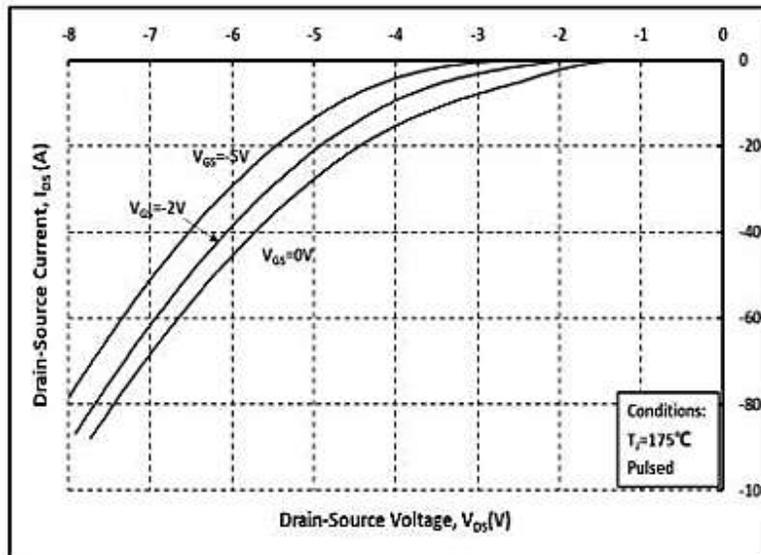


Figure 12. Body Diode Characteristics @ $T_J = 175^\circ\text{C}$

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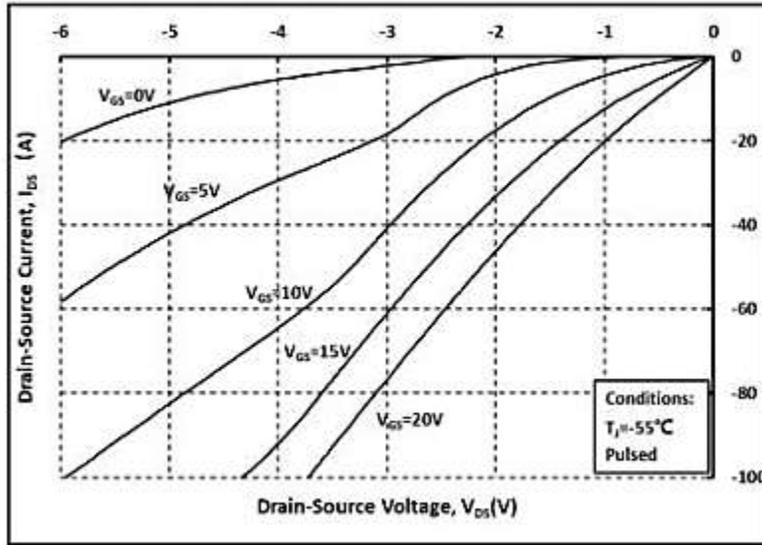


Figure 13. 3rd Quadrant Characteristics @ $T_J = -55^\circ\text{C}$

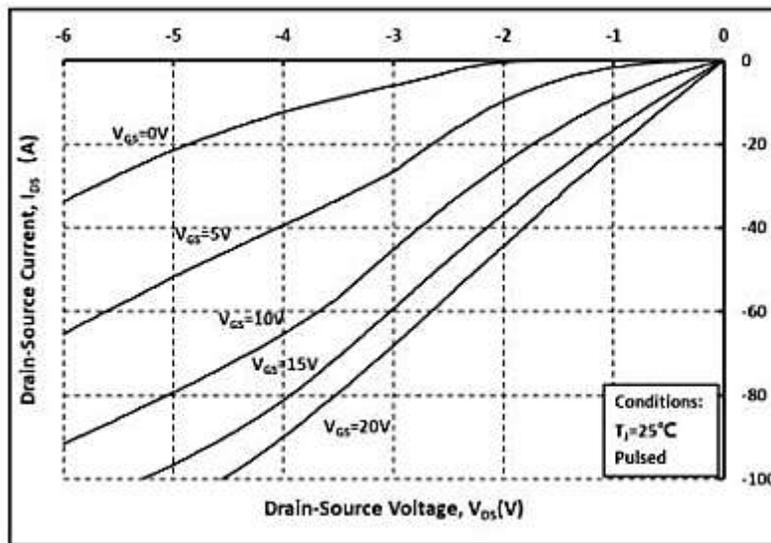


Figure 14. 3rd Quadrant Characteristics @ $T_J = 25^\circ\text{C}$

TYPICAL PERFORMANCE (For Reference Only)

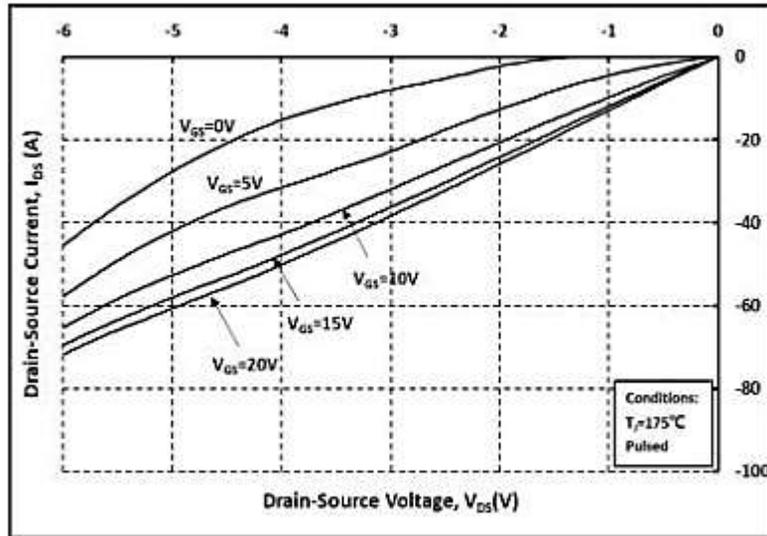


Figure 15. 3rd Quadrant Characteristics @ $T_j = 175^\circ\text{C}$

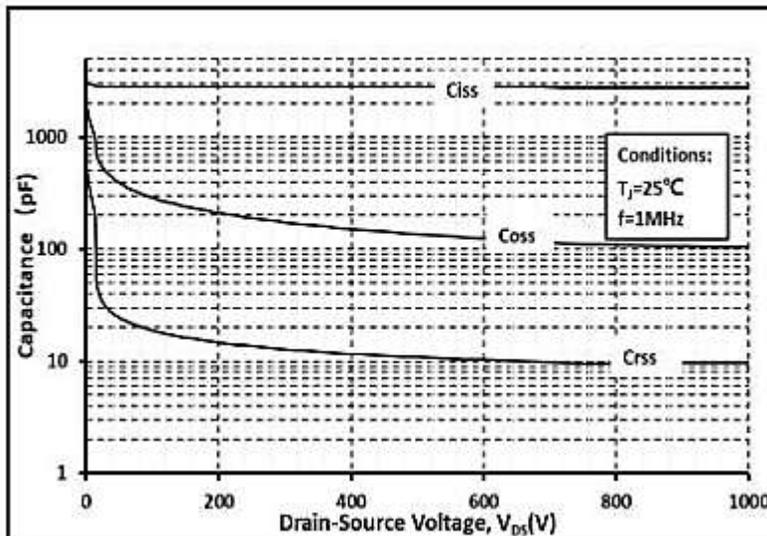


Figure 16. Capacitances vs. Drain-Source Voltage

TYPICAL PERFORMANCE (For Reference Only)

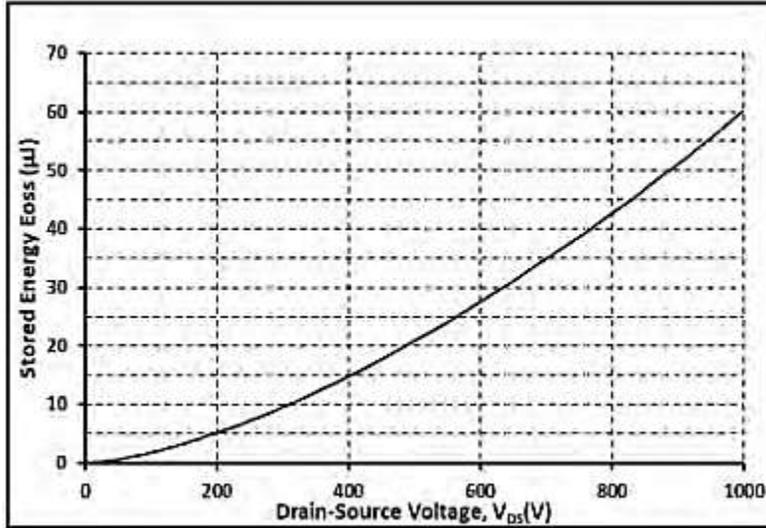


Figure 17. Output Capacitor Stored Energy

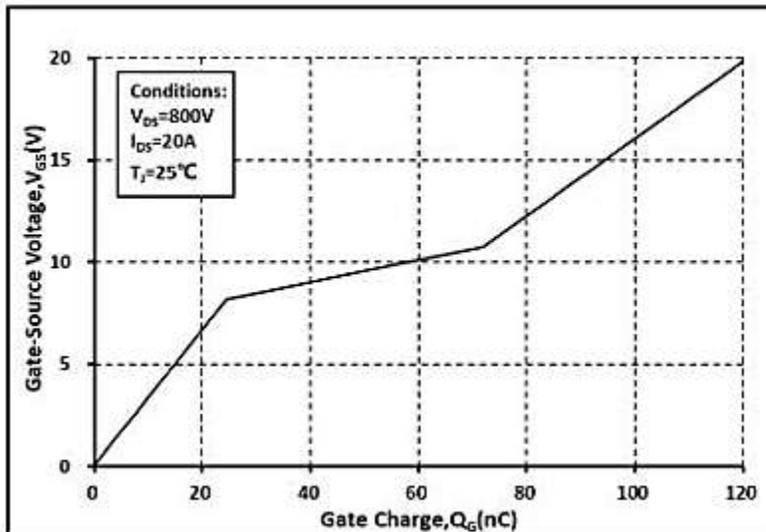


Figure 18. Gate Charge Characteristics

TYPICAL PERFORMANCE (For Reference Only)

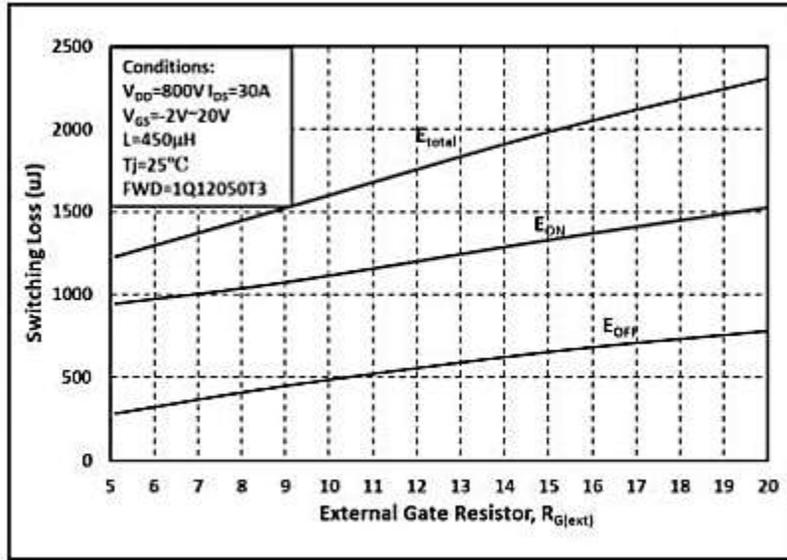


Figure 19. Switching Energy vs. External Gate Resistor

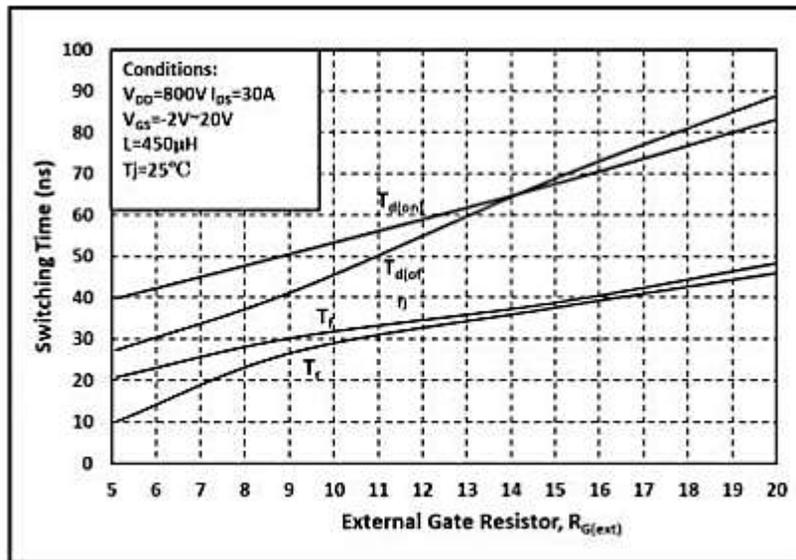


Figure 20. Switching Time vs. External Gate Resistor

TYPICAL PERFORMANCE (For Reference Only)

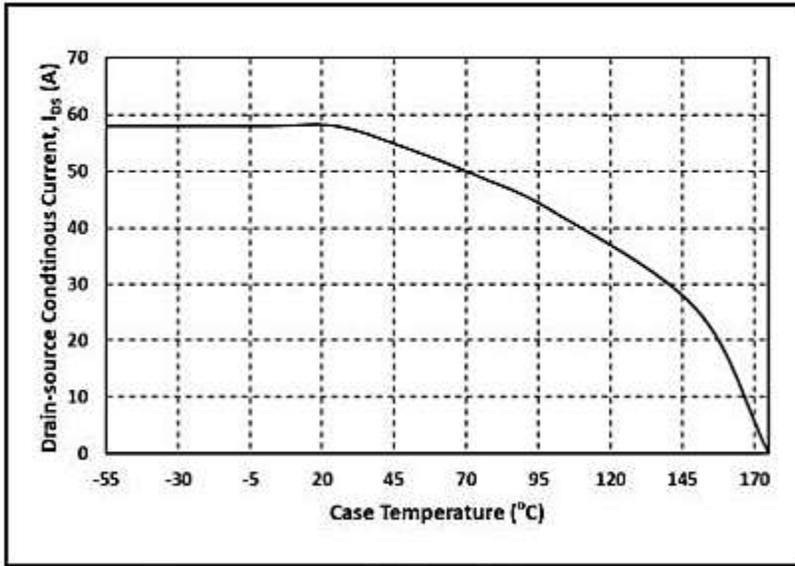


Figure 21. Continuous Drain Current Derating vs. Case Temperature

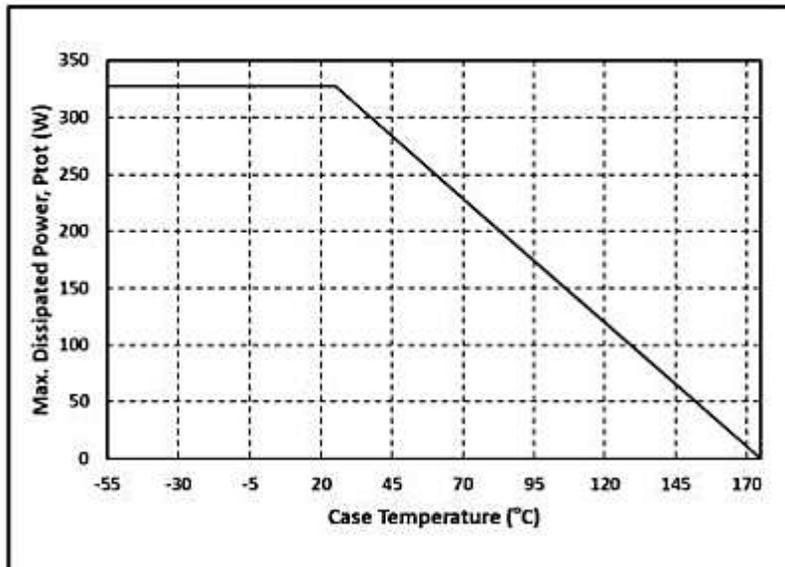


Figure 22. Maximum Power Dissipation Derating vs. Case Temperature

TYPICAL PERFORMANCE (For Reference Only)

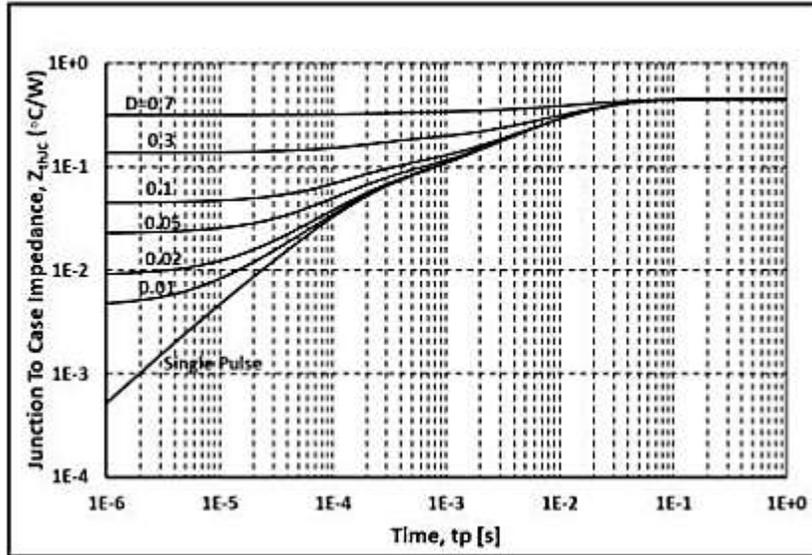


Figure 23. Transient Thermal Impedance (Junction to Case)

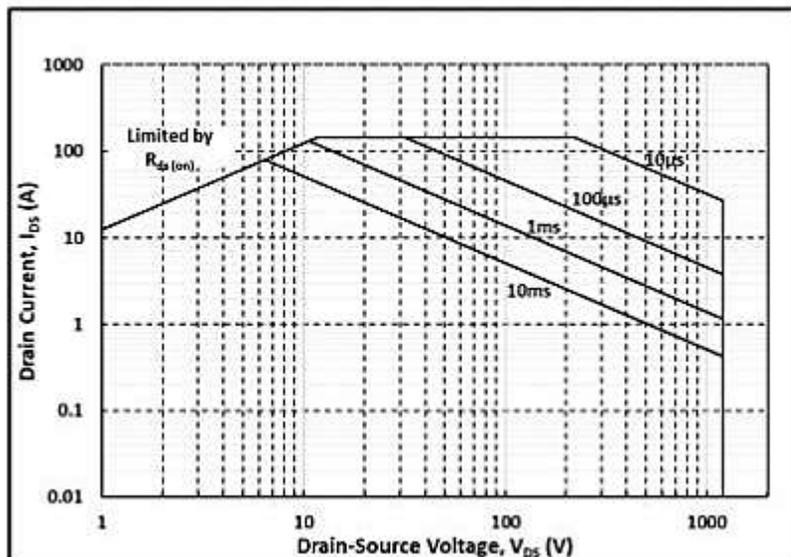


Figure 24. Safe Operating Area

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.
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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.