SPECIFICATION SHEET

N-CHANNEL SIC POWER MOSFET TO-247-3 LGE3M L SERIES

SPECIFICATION SHEET NO.	S1114 – LGE3M650170BLT	
ORIGINAL MFG/PART NO.	LGE Diodes/LGE3M650170B-L	
NEXTGEN PART CODE	LGE3M650170BLT	Indicate This Code For RFQ /Order
DATE	Nov. 14, 2025	
REVISION	A7	Updated With Most Recent Data
DESCRIPTION AND MAIN PARAMETRICS	Silicon Carbide (SiC) MOSFET, 3 Pins, Case TO-247-3, LGE3M L Series, N-Channel, Drain-Source Voltage (V_{DS}): 1700V Drain-Source On-State Resistance $R_{DS(ON)}$: 650mΩ Typ. Continuous Drain Current (I_D) @ Tc=25℃: 7A Operating Temperature: -55°C ~ 150°C (T_J) Package in Tube, 30pcs/Tube 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. 14, 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
- Ultra-low Drain-gate capacitance
- Higher System Efficiency
- Reduced Cooling Requirements
- Increased System Reliability
- 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

- Auxiliary Power Supplies
- Switch Mode Power Supplies
- High-voltage Capacitive

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 LGE3M650170BLT For RFQ and Order.

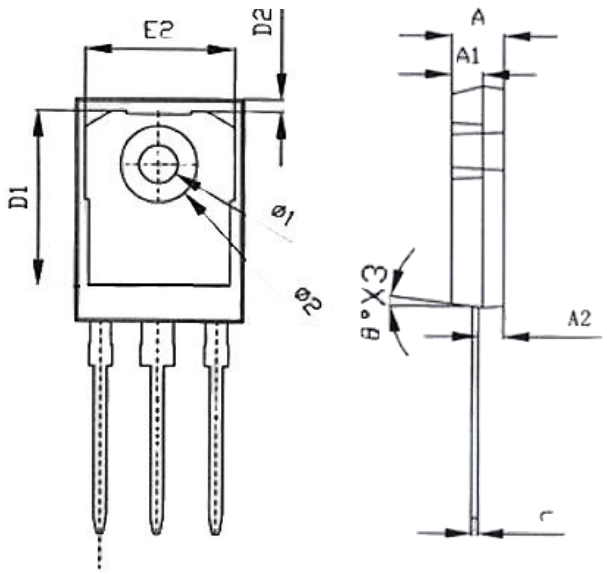
PART CODE GUIDE

RFQ
Request For Quotation

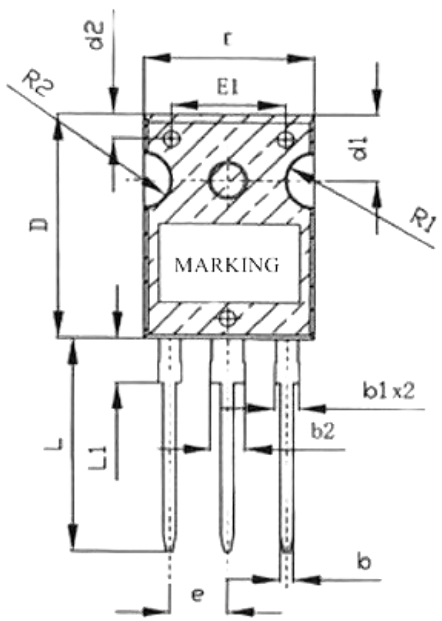
CODE	NAME	KEY SPECIFICATION OPTION
LGE3M	Product Series Code	Silicon Carbide (SiC) MOSFET, 3 Pins, Case TO-247-3, LGE3M L Series
650	Drain-Source On-State (V_{DS}) Resistance $R_{DS(ON)}$ Code	650: 650mΩ
170	Drain-Source Voltage (V_{DS}) Code	170: 1700V Max.
B	Package Case Code	B: TO-247-3; E: TO-263-2; 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-247-3 Outline

Top View

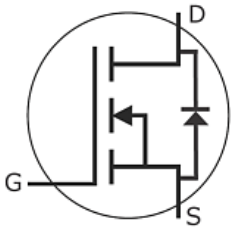


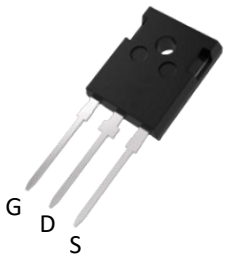
Side View



SYMBOL	TO-247-3		
	Min.	Typ.	Max.
A	4.9	5	5.1
A1	2.9	3	3.1
A2	2.31	2.36	2.41
b	1.16	1.2	1.26
b1	2.05	-	2.2
b2	3.05	-	3.2
c	0.58	0.6	0.66
D	20.9	21	21.1
D1	16.46	16.56	16.76
D2		1.17	
d1	6.05	6.15	6.25
d2	2.2	2.3	2.4
E	15.7	15.8	15.9
E1	-	10.5	-
E2	-	14.02	-
e	-	1.27bcs	-
L	19.82	19.92	20.02
L1	1.88	1.98	2.08
Θ	0°	7°	8°
R1	-	2.7	-
R2	-	2.5	-
Φ1	-	3.6	-
Φ2	-	7.19	-

INTERNAL CIRCUIT DIAGRAM





1700V N-CHANNEL SiC MOSFET

VDS	ID @ Tc=25℃	R DS(on)	MARKING	PACKAGE/CASE
1700V	7A	650mΩ	LGE3M650170B	TO-247-3

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

PARAMETER	SYMBOL	TEST CONDITIONS	VALUE	UNIT
Drain-Source Voltage	V DSMax	V GS=0V, I D=100μA	1700	V
Gate-Source Voltage	V GSMAX	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	7.0	A
		V GS=20V, Tc=100°C	4.5	
Pulsed Drain Current	I D (pulse)	Pulse width tp limited by T jmax	9.0	A
Power Dissipation	P D	TC=25°C, Tj=150°C	62	W
Operating Junction Temperature Range	T J		-55 ~ +150	°C
Storage Temperature Range	T STG		-55 ~ +150	°C

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 Note Fig.11	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=1mA	2.0	2.6	4.0	V
		V_{DS}=V_{GS}, I_D=1mA, Tj=150°C	-	1.8	-	
Zero Gates Voltage Drain Crurent	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 On-State Resistance	$R_{DS(ON)}$	V_{GS}=20V, I_D=2A	-	650	850	mΩ
		V_{GS}=20V, I_D=2A, Tj=150°C	-	1300	-	
Transconductance Note Fig.4, 5, 6	g_{fs}	V_{DS}=20V, I_{DS}=2A	-	1.06	-	S
		V_{DS}=20V, I_{DS}=2A, Tj=150°C	-	1.14	-	
Input Capacitance Note Fig.15, 16	C_{iss}	V_{GS}=0V, V_{DS}=1000V, f=1MHz, V_{AC}=25mV	-	194	-	pF
Output Capacitance Note Fig.15, 16	C_{oss}		-	13	-	pF
Reverse Transfer Capacitance Note Fig.15, 16	C_{rss}		-	1.8	-	pF
Coss Stored Energy	E_{oss}		-	6.6	-	µJ
Turn-On Switching Energy	E_{on}	V_{DS}=1200V, V_{GS}=-5V/20V, I_D=2A, $R_{G(ext)}$ =2.5Ω, L=100µH	-	5	-	mJ
Turn-Off Switching Energy	E_{off}		-	9.2	-	mJ
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=1200V, V_{GS}=-5V/20V, I_D=2A, $R_{G(ext)}$ =2.5Ω, R_L=20Ω	-	13.8	-	ns
Rise Time	t_r		-	22.8	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	38	-	ns
Fall Time	t_f		-	14	-	ns

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

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Internal Gate Resistance	$R_{G(INT)}$	f=1MHz, V_{AC}=25mV	-	18	-	Ω
Gate to Source Charge	Q_{GS}	V_{DS}=1200V, V_{GS} =-5V/20V I_D =2A	-	5.4	-	nC
Gate to Drain Charge	Q_{GD}		-	7.6	-	nC
Total Gate Charge	Q_G		-	23	-	nC

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	-	4.2	-	V
		V_{GS} =-5V, I_{SD} =25A, Tj=150°C	-	3.9	-	V
Continuous Diode Forward Current	I_S	TC=25°C	-	-	7.0	A
Reverse Recovery Time	t_{rr}	V_R=1200V, I_{SD}=2A	-	25	-	ns
Reverse Recovery Charge	Q_{rr}		-	15	-	nC
Peak Reverse Recovery Current	I_{rrm}		-	2.8	-	A

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			MIN.	TYP.	MAX.	
Thermal Resistance	Rth(j-c)	junction-case	-	1.8	-	°C/W
Thermal Resistance	Rth(j-a)	Junction to Ambient	-	-	40	

TYPICAL PERFORMANCE (For Reference Only)

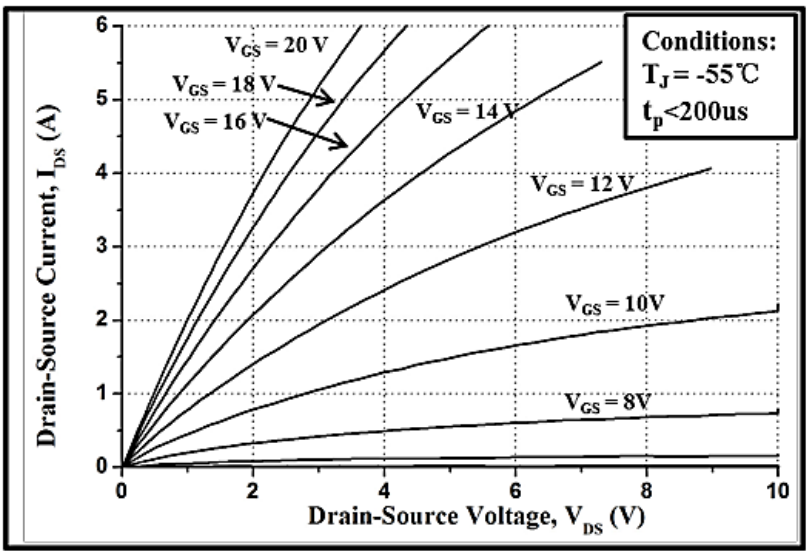


Figure 1. Output Characteristics T_J = -55 °C

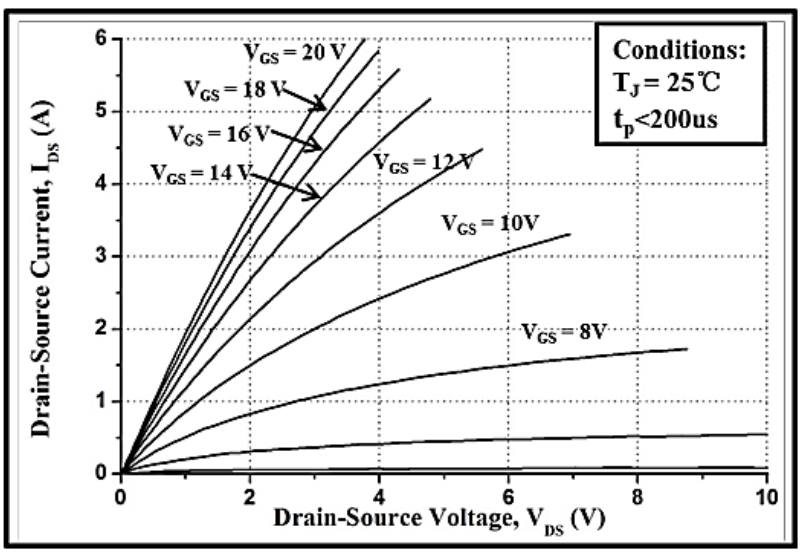


Figure 2. Output Characteristics T_J = 25 °C

TYPICAL PERFORMANCE (For Reference Only)

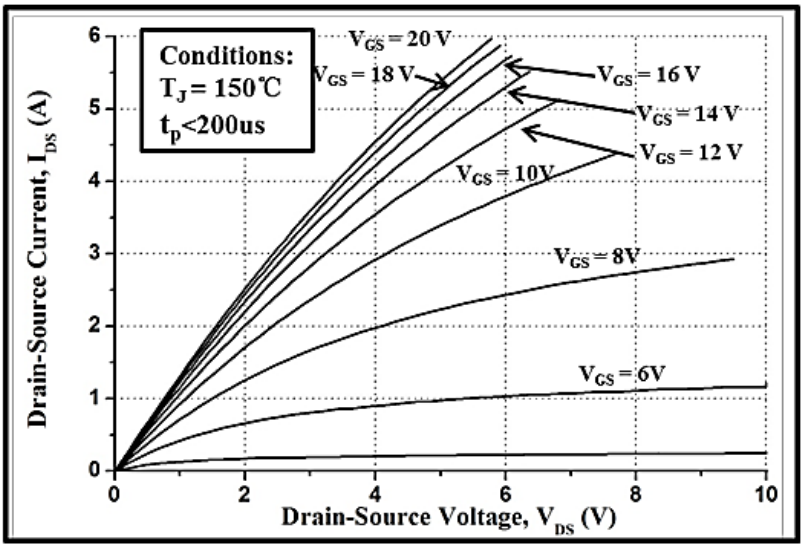


Figure 3. Output Characteristics T_J = 150 °C

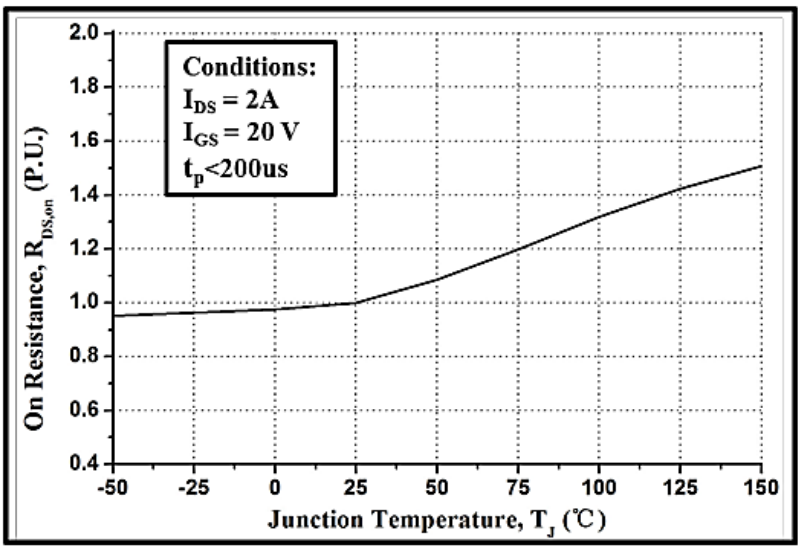


Figure 4. Normalized On-Resistance vs. Temperature

TYPICAL PERFORMANCE (For Reference Only)

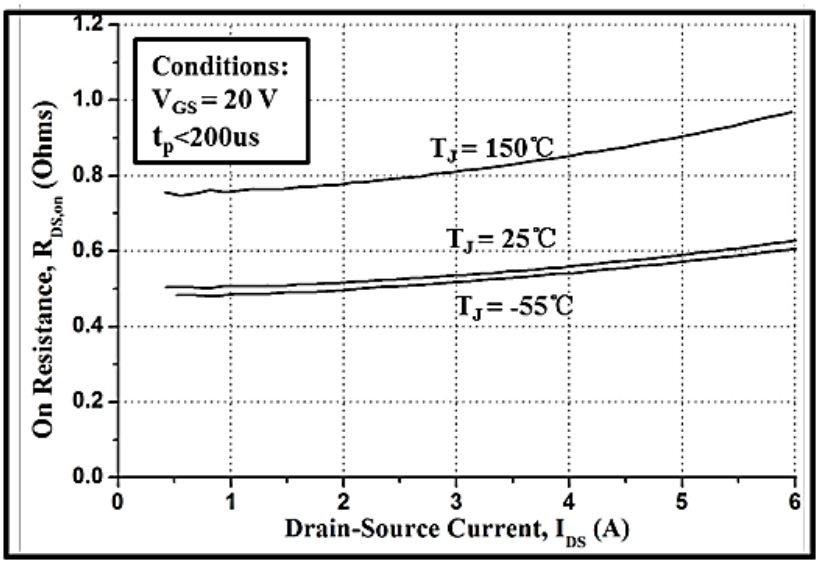


Figure 5. On-Resistance vs. Drain Current For Various Temperatures

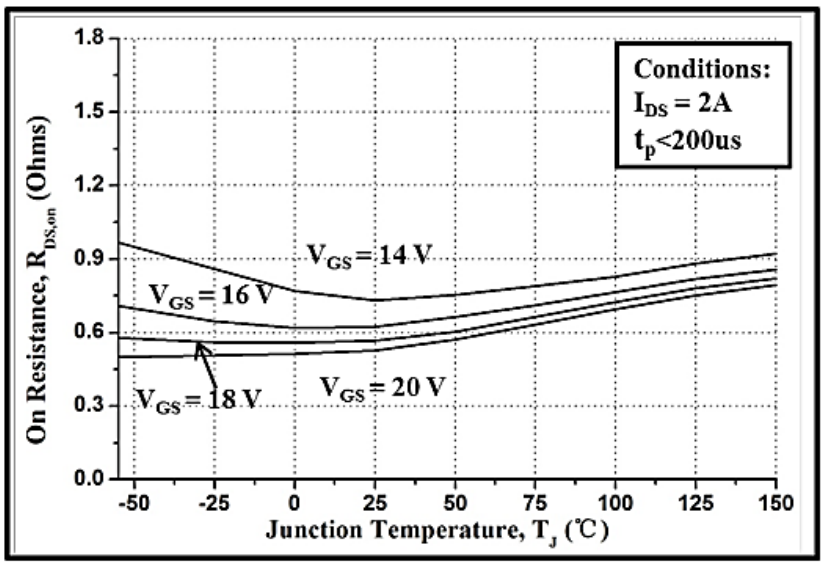


Figure 6. On-Resistance vs. Temperature For Various Gate Voltage

TYPICAL PERFORMANCE (For Reference Only)

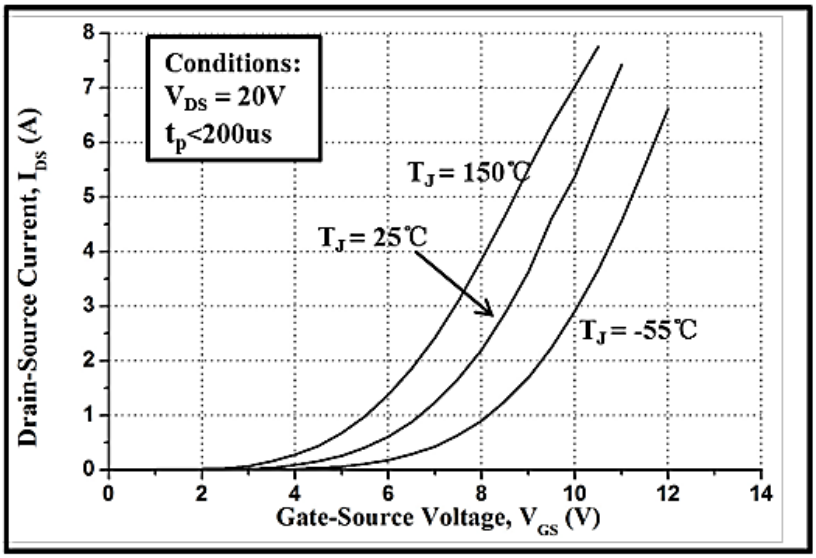


Figure 7. Transfer Characteristic for Various Junction Temperatures

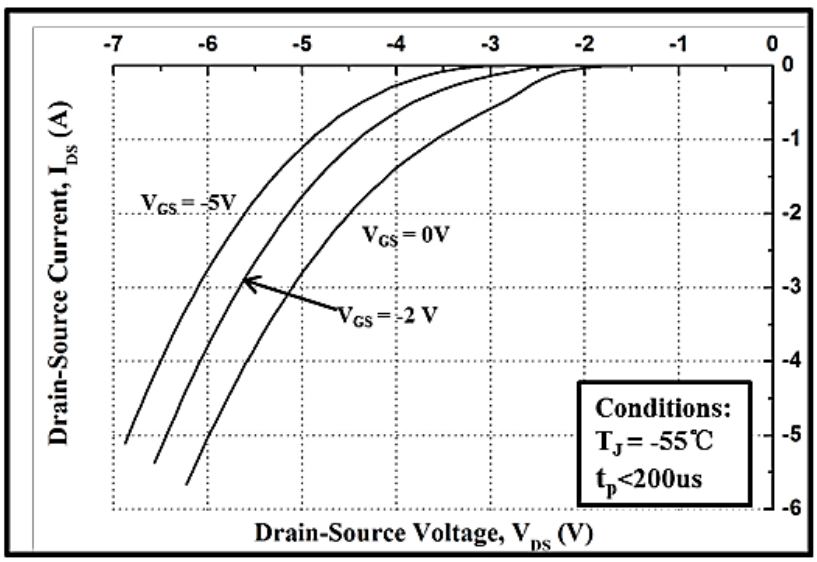


Figure 8. Body Diode Characteristic at -55 °C

TYPICAL PERFORMANCE (For Reference Only)

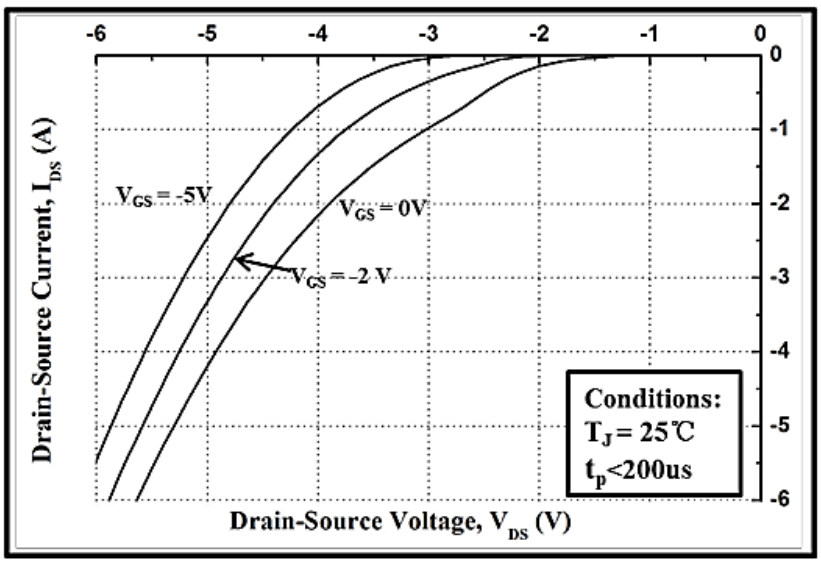


Figure 9. Body Diode Characteristic at 25 ºC

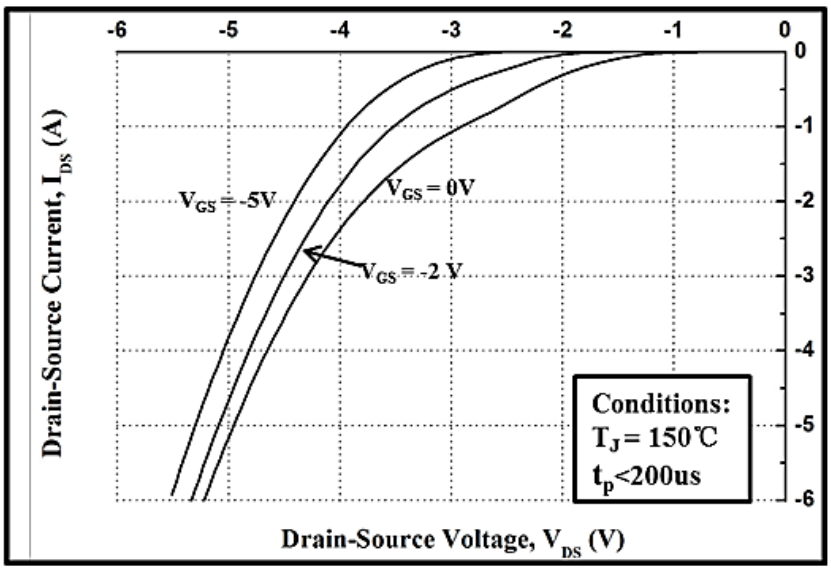


Figure 10. Body Diode Characteristic at 150 ºC

TYPICAL PERFORMANCE (For Reference Only)

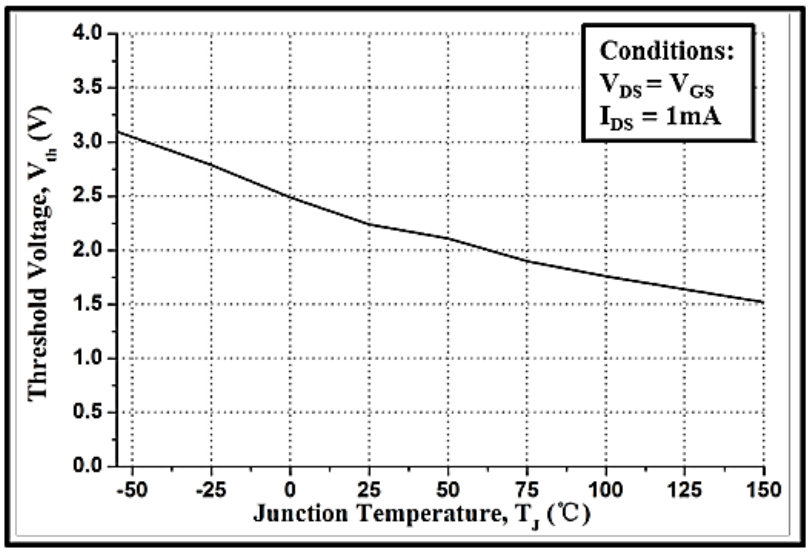


Figure 11. Threshold Voltage vs. Temperature

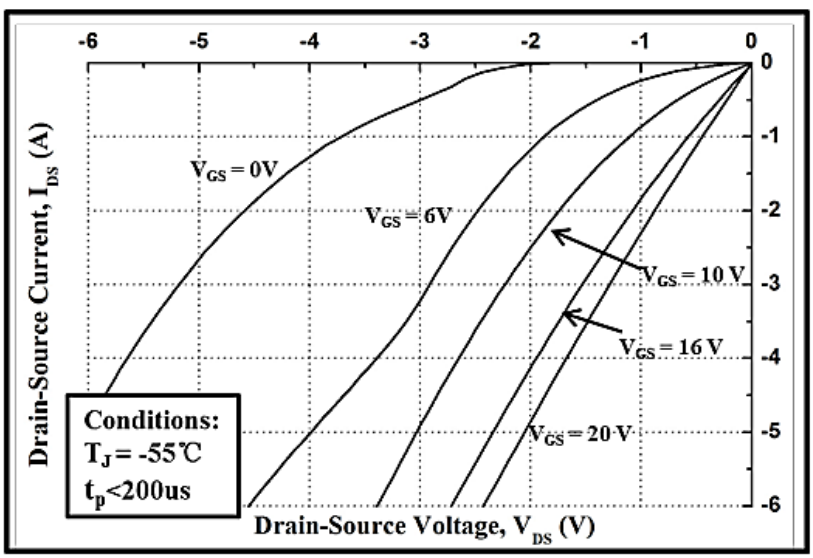


Figure 12. 3rd Quadrant Characteristic at -55 °C

TYPICAL PERFORMANCE (For Reference Only)

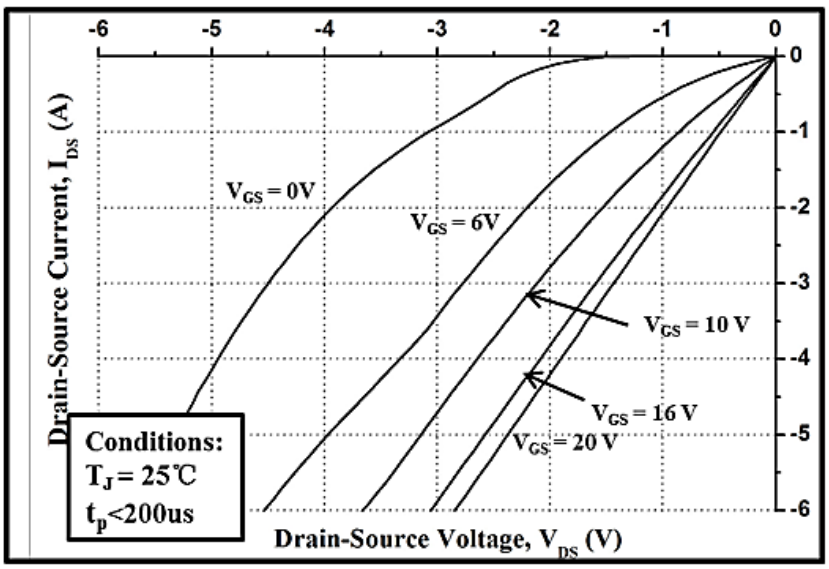


Figure 13. 3rd Quadrant Characteristic at 25 ºC

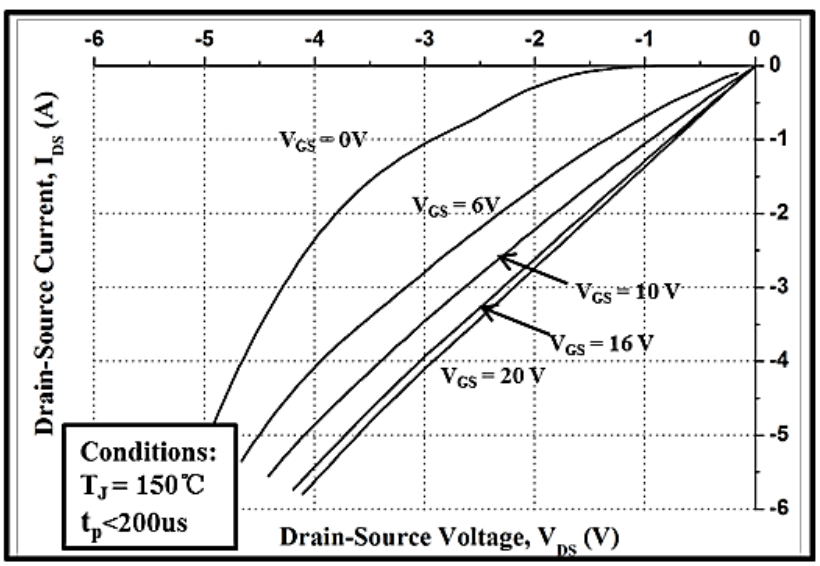


Figure 14. 3rd Quadrant Characteristic at 150 ºC

TYPICAL PERFORMANCE (For Reference Only)

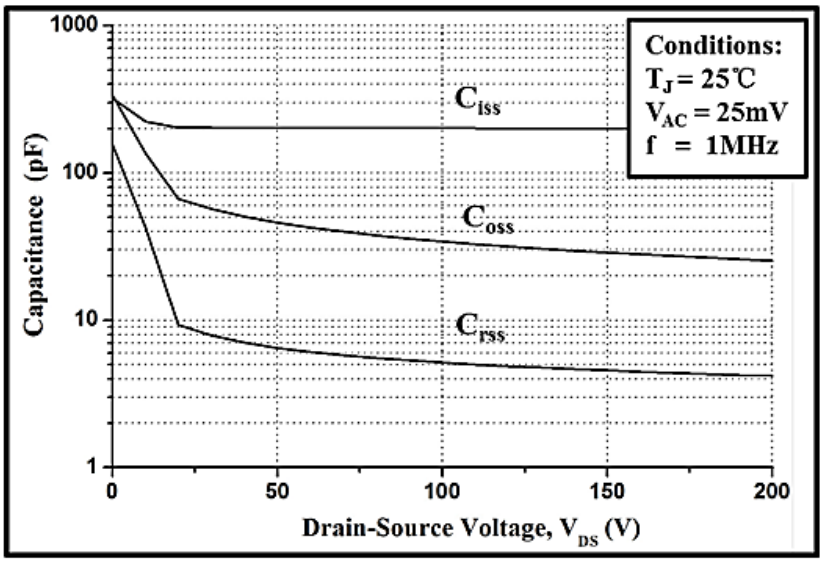


Figure 15. Capacitances vs. Drain-Source Voltage (0 - 200V)

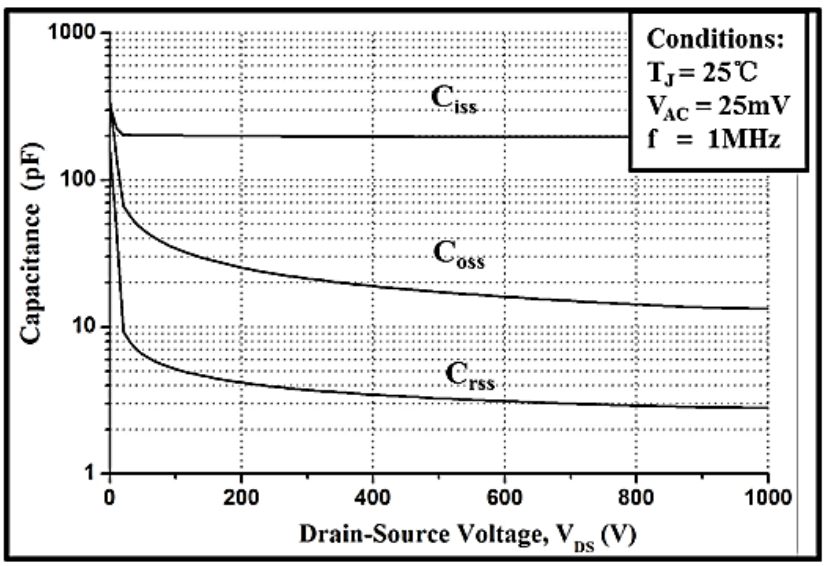


Figure 16. Capacitances vs. Drain-Source Voltage (0 - 1000V)

TYPICAL PERFORMANCE (For Reference Only)

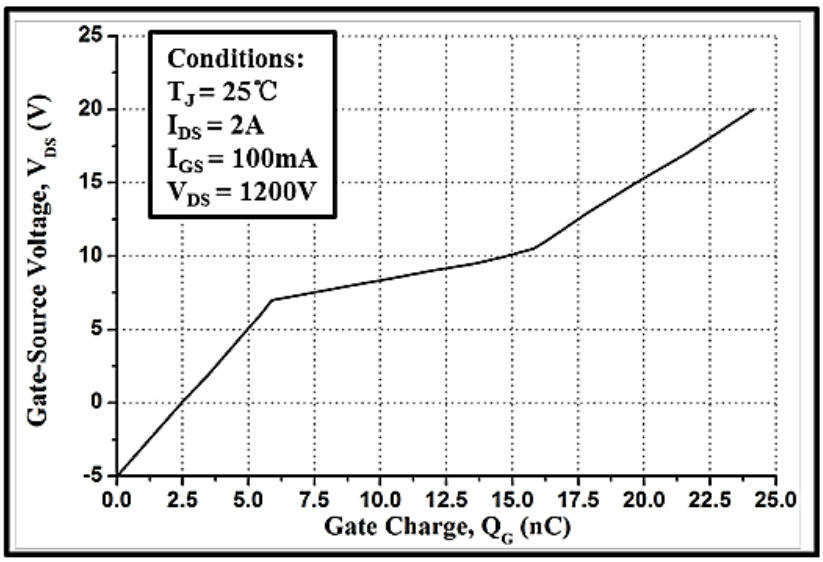


Figure 17. Gate Charge Characteristic

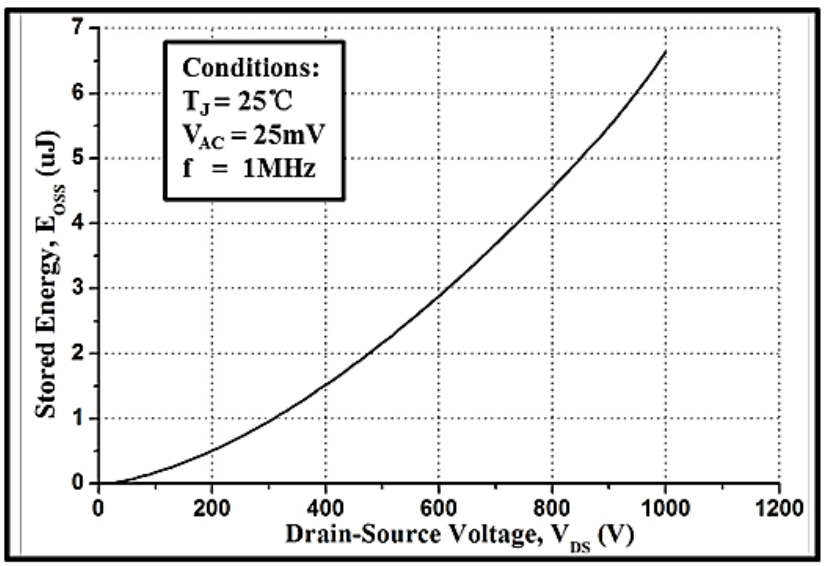


Figure 18. Output Capacitor Stored Energy

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.
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.