SPECIFICATION SHEET

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

SPECIFICATION SHEET NO.	S1112 – LGE3M60065QL0T	
ORIGINAL MFG/PART NO.	LGE Diodes/LGE3M60065Q-L	
NEXTGEN PART CODE	LGE3M60065QL0T	Indicate This Code For RFQ /Order
DATE	Nov. 12, 2025	
REVISION	A5	Updated With Most Recent Data
DESCRIPTION AND MAIN PARAMETRICS	Silicon Carbide (SiC) Power MOSFET, 4 Pins, Case TO-247-4, LGE3M L Series, N-Channel, Drain-Source Voltage (V_{DS}): 650V Max. Current Drain-source On-state Resistance $R_{DS(ON)}$: 59mΩ Typical Continuous Drain Current (I_D) @ Tc=25℃: 51A Operating Temperature: -55°C ~ 175°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. 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 Frequency Operation with Low On-Resistance
- Fast Intrinsic Diode With Low Reverse Recovery
- Higher System Efficiency
- Parallel Device Convenience without Thermal Runaway
- Hard Switching & Higher Reliability
- 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

- Motor Drives
- Solar / Wind Inverters
- AC/DC Converters
- DC/DC Converters
- Uninterruptable Power Supplies

ELECTRICAL CHARACTERISTICS

- See Page 5 ~ Page 8.
- All Products Parameters are Subject To NextGen Components' Final Confirmation.

HOW TO ORDER

- Please Follow Up Part Code Guide And Indicate NextGen Part Code LGE3M60065QL0T For RFQ and Order.

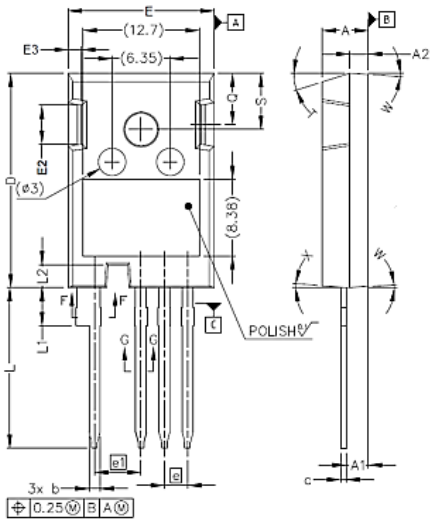
PART CODE GUIDE

RFQ
Request For Quotation

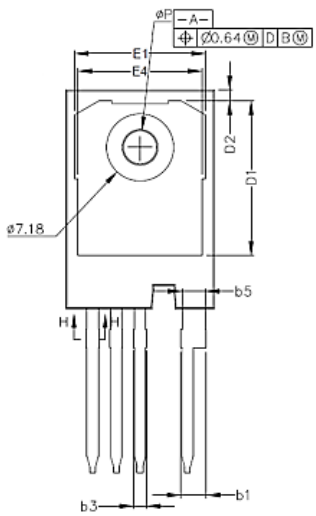
CODE	NAME	KEY SPECIFICATION OPTION
LGE3M	Product Series Code	Silicon Carbide (SiC) Power MOSFET, 4 Pins, Case TO-247-4, LGE3M L Series
60	Current Drain-source On-state Resistance $R_{DS(ON)}$ Code	60: 59mΩ Typical
065	Drain-Source Voltage (V_{DS}) Code	065: 650V Max.
Q	Package Case Code	B: TO-247-3; 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; XX: Letter A~Z, a~z or digits (0~9) for Special/Custom Parameters

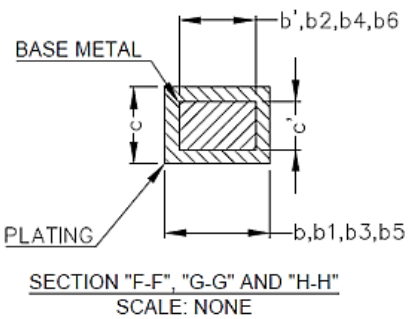
DIMENSION - - Unit: (mm), Case TO-247-4 Outline

Top View



Side View

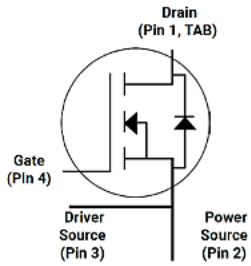


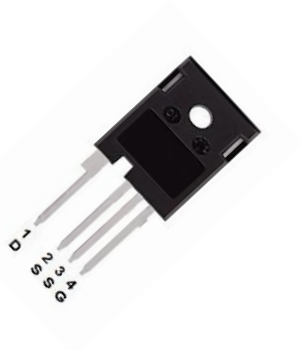


SECTION "F-F", "G-G" AND "H-H"
SCALE: NONE

SYMBOL	TO-247-4	
	Min.	Max.
A	4.83	5.21
A1	2.29	2.54
A2	1.91	2.16
b’	1.07	1.28
b	1.07	1.33
b1	2.39	2.94
b2	2.39	2.84
b3	1.07	1.60
b4	1.07	1.50
b5	2.39	2.69
b6	2.39	2.64
c’	0.55	0.65
c	0.55	0.68
D	23.30	23.60
D1	16.25	17.65
D2	0.95	1.25
E	15.75	16.13
E1	13.10	14.15
E2	3.68	5.10
E3	1.00	1.90
E4	12.38	13.43
e	2.54 BSC	
e1	5.08 BSC	
N	4	
L	17.31	17.82
L1	3.97	4.37
L2	2.35	2.65
ØP	3.51	3.65
Q	5.49	6.00
S	6.04	6.30
T	17.5° REF.	
W	3.5° REF.	
X	4° REF.	

INTERNAL CIRCUIT DIAGRAM





650V N-CHANNEL SiC MOSFET

VDS	ID @ Tc=25℃	R DS(on)	MARKING	PACKAGE/CASE
650V	51A	59mΩ	LGE3M60065Q	TO-247-4

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

- Stresses exceeding those listed in the maximum ratings table may damage the device.
- If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

PARAMETER	SYMBOL	TEST CONDITIONS	VALUE	UNIT
Drain-Source Voltage	$V_{DS, Max}$	VGS=0V, ID=100μA	650	V
Gate-Source Voltage (Dynamic)	$V_{GS, MAX}$	AC (f>1 Hz)	-8/+23	V
Gate-Source Voltage (Static)	V_{Gsop}	Static	-4/+18	V
Continuous Drain Current	I_D	VGS=18V, Tc=25°C	51	A
		VGS=18V, Tc=100°C	36	
Pulsed Drain Current	$I_{D (pulse)}$	TC=25°C	97	A
Short Circuit Capability	t_{sc}	VDD = 400V, VGS=18V	9	μS
Short Circuit Capability	I_{DS}	VDD = 400V, VGS=18V	300	A
Total Power Dissipation	P_D	TC=25°C	208	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}		-55~ +175	°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	650	-	-	V
Gates Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=5mA	1.9	2.7	3.9	V
		V_{DS}=V_{GS},I_D=5mA, T_j=150°C	-	2.0	-	
		V_{DS}=V_{GS},I_D=5mA, T_j=175°C	-	1.9	-	
Zero Gates Voltage Drain Current	I_{DSS}	V_{DS}=650V, V_{GS}=0V	0	1	100	µA
Gates-Source Leakage Crurent	I_{GSS}	V_{GS}=18V, V_{DS}=0V	0	10	200	nA
Gates-Source Leakage Crurent	I_{GSS}	V_{GS}=-4V, V_{DS}=0V	-200	-10	0	nA
Drain-source On-state Resistance	$R_{DS(ON)}$	V_{GS}=16V, I_D=15A	-	68	-	mΩ
		V_{GS}=16V, I_D=15A Tj=150°C	-	68	-	
		V_{GS}=16V, I_D=15A Tj=175°C	-	72	-	
		V_{GS}=18V, I_D=20A	-	59	75	
		V_{GS}=18V, I_D=20A Tj=150°C	-	64	-	
		V_{GS}=18V, I_D=20A Tj=175°C	-	68	-	
Transconductance	g_{fs}	V_{DS}=20V, I_{DS}=20A	-	11	-	S
		V_{DS}=20V, I_{DS}=20A, Tj=150°C	-	10.7	-	
		V_{DS}=20V, I_{DS}=20A, Tj=175°C	-	10.5	-	

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

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Input Capacitance	C_{ISS}	V_{DS}=400V, V_{GS}=0V f = 1MHz	-	1600	-	pF
Output Capacitance	C_{OSS}		-	145	-	pF
Reverse Transfer Capacitance	C_{RSS}		-	11	-	pF
Coss Stored Energy	E_{OSS}		-	14	-	µJ
Total Gate Charge	Q_g	V_{DS} =400V, V_{GS} =-4/18V I_D =20A	-	78	-	nC
Gate-Source Charge	Q_{gs}		-	21	-	
Gate-Drain Charge	Q_{gd}		-	34	-	
Internal Gate Input Resistance	$R_{g(int)}$	f = 1MH, I_D=0A	-	2.1	-	Ω
Turn - On Switching Energy	E_{on}	V_{DS} = 400 V, V_{GS} =-4V/18V, I_D = 20A, $R_{G(ext)}$ =2Ω, L=200µH	-	15	-	µJ
Turn - Off Switching Energy	E_{off}		-	12	-	µJ
Turn - On Delay Time	$t_{d(on)}$		-	10	-	ns
Rise Time	t_r		-	8	-	ns
Turn - Off Delay Time	$t_{d(off)}$		-	19	-	ns
Fall Time	t_f		-	5	-	ns
Avalanche Capability	E_{AS}	V_{DD} = 100V, V_{GS}=20V, L=1mH		200		mJ
Avalanche Capability	I_{AV}			20		A

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

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Diode Forward Voltage	V_{SD}	V_{GS} =-4V, I_{SD} =10A	-	3.9	-	V
		V_{GS} = -4V, I_{SD} = 10A, T_J = 150℃	-	3.5	-	
		V_{GS} = -4V, I_{SD} = 10A, T_J = 175℃	-	3.4	-	
Continuous Diode Forward Current	I_S	V_{GS} =-4V	-	35	-	A
Reverse Recovery Time	T_{rr}	V_{GS} = -4V, I_{SD} = 20A, V_R= 400V, dif/dt =2000 A/µs	-	20	-	nS
Reverse Recovery Charge	Q_{rr}		-	160	-	nC
Peak Reverse Recovery Current	I_{rrm}		-	14	-	A

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			MIN.	TYP.	MAX.	
Thermal Resistance (per device)	$R_{th(j-c)}$	Junction-case	-	0.60	0.72	°C/W

TYPICAL PERFORMANCE (For Reference Only)

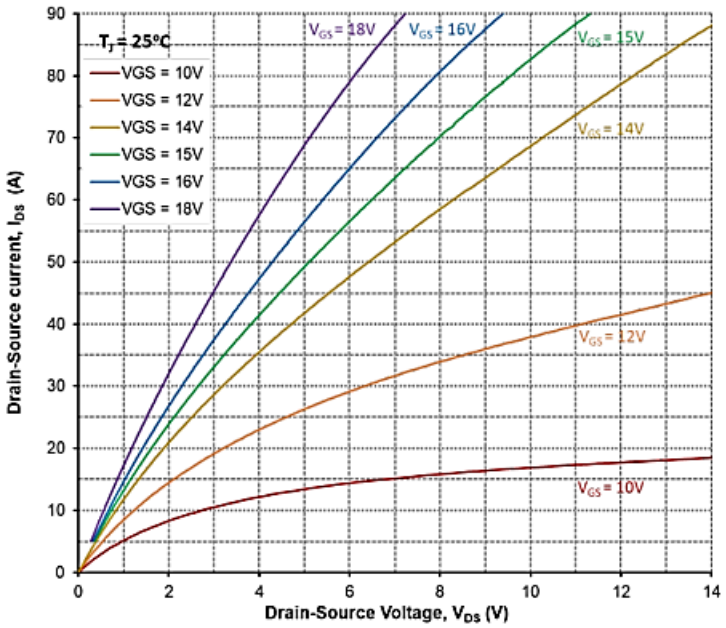


Figure 1. Output Characteristics, T_J = 25°C

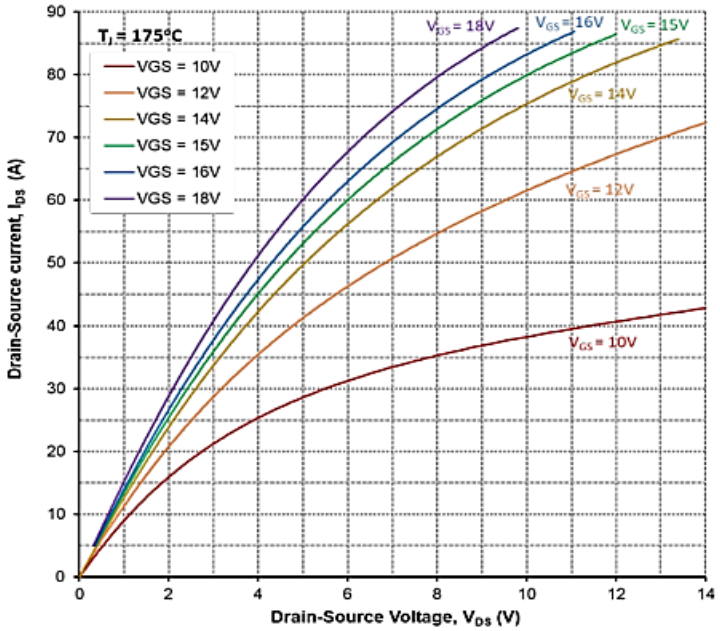


Figure 2. Output Characteristics, T_J = 175°C

TYPICAL PERFORMANCE (For Reference Only)

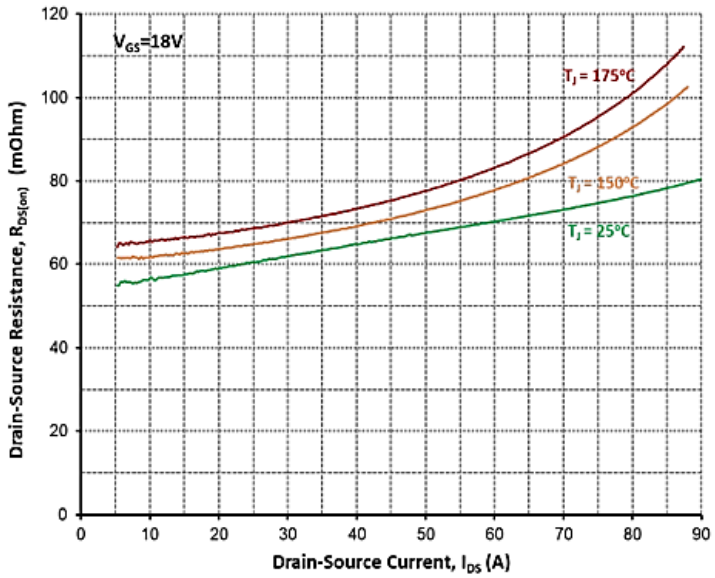


Figure 3. On-Resistance vs. Drain Current
For Various Temperatures

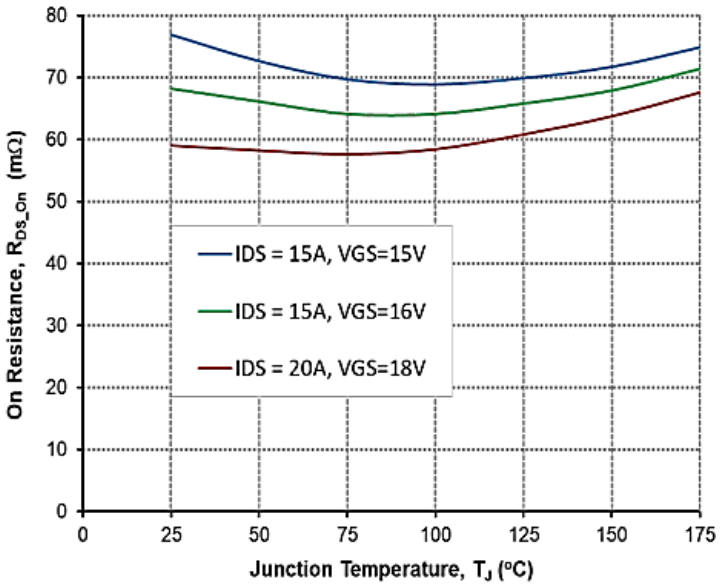


Figure 4. On-Resistance vs. Temperature

TYPICAL PERFORMANCE (For Reference Only)

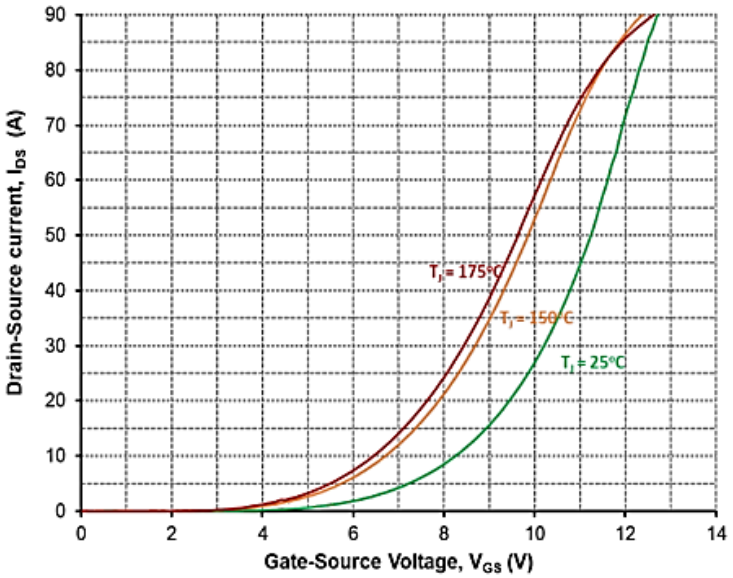


Figure 5. Transfer Characteristic For Various Junction Temperatures

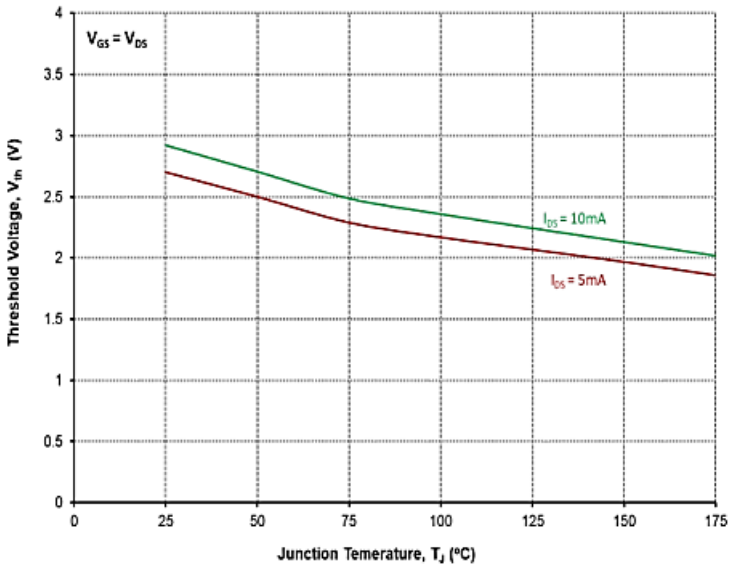


Figure 6. Threshold Voltage vs. Temperature

TYPICAL PERFORMANCE (For Reference Only)

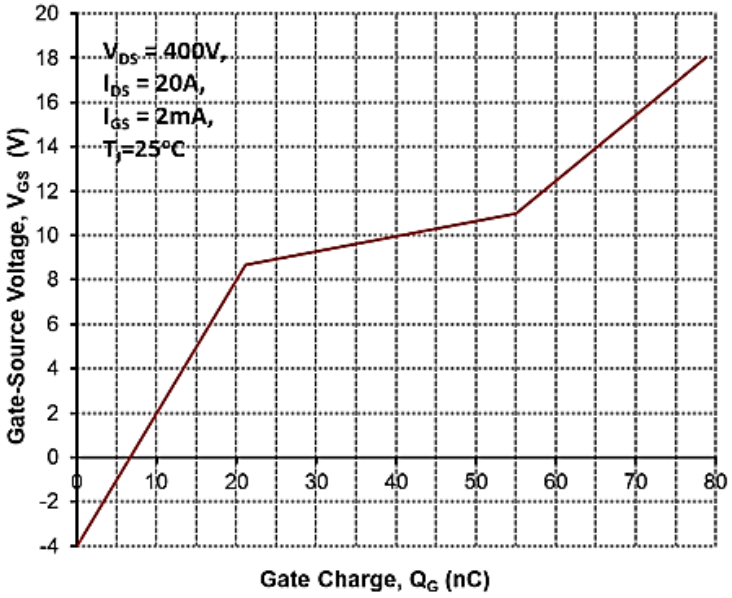


Figure 7. Gate Charge Characteristics

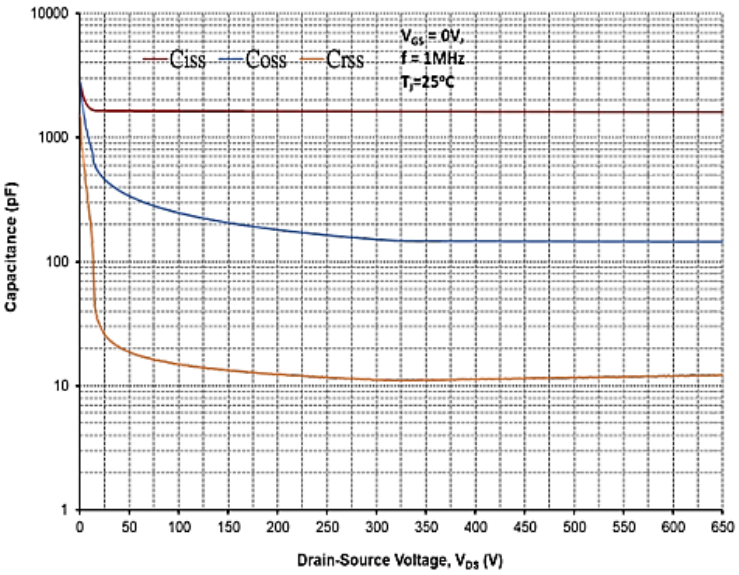


Figure 8. Capacitances vs. Drain-Source Voltage (0-650V)

TYPICAL PERFORMANCE (For Reference Only)

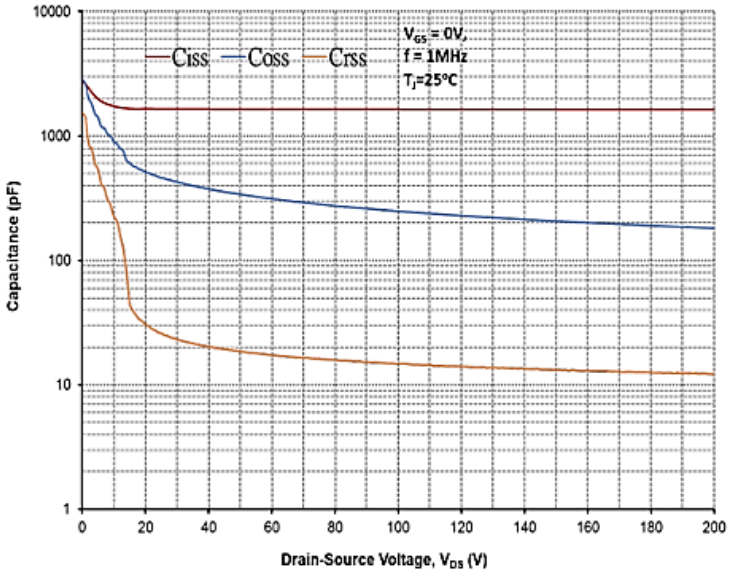


Figure 9. Capacitances vs. Drain-Source Voltage (0-200V)

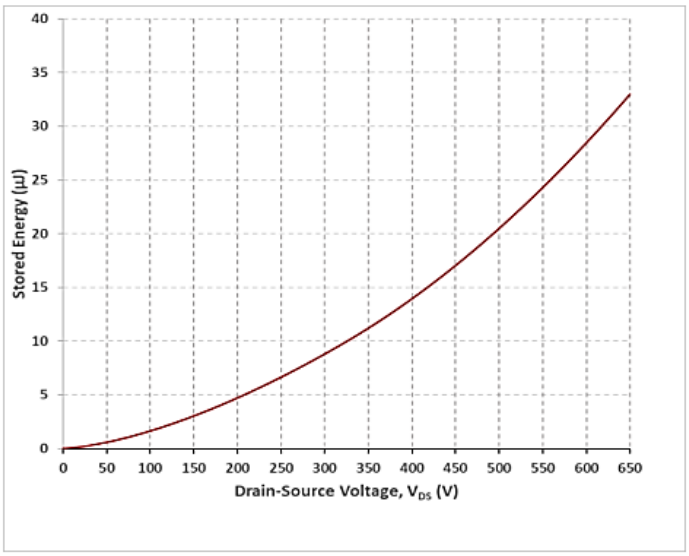


Figure 10. Output Capacitor Stored Energy

TYPICAL PERFORMANCE (For Reference Only)

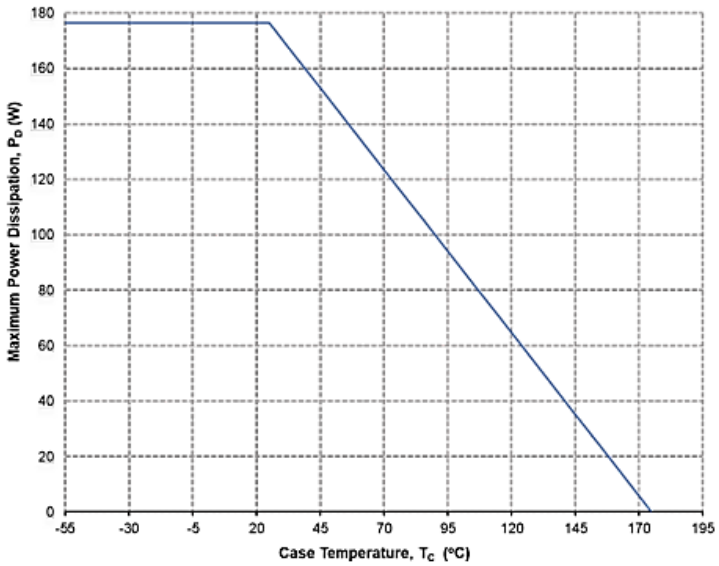


Figure 11. Maximum Power Dissipation Derating vs. Case Temperature

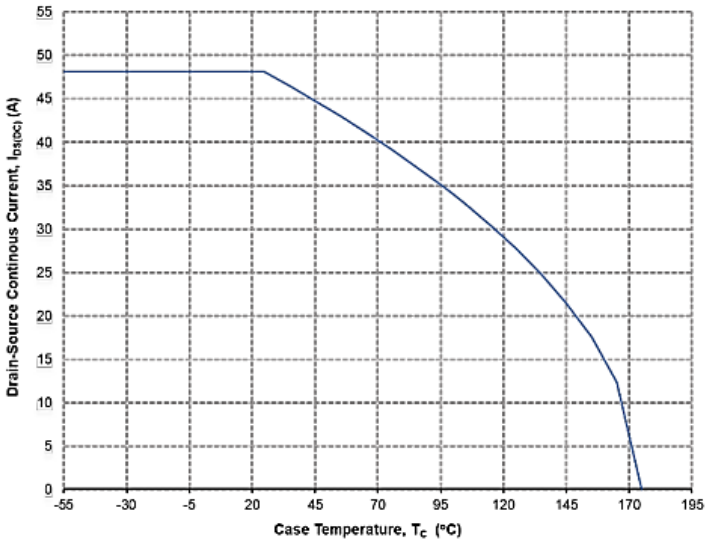


Figure 12. Continuous Drain Current Derating vs. Case Temperature

TYPICAL PERFORMANCE (For Reference Only)

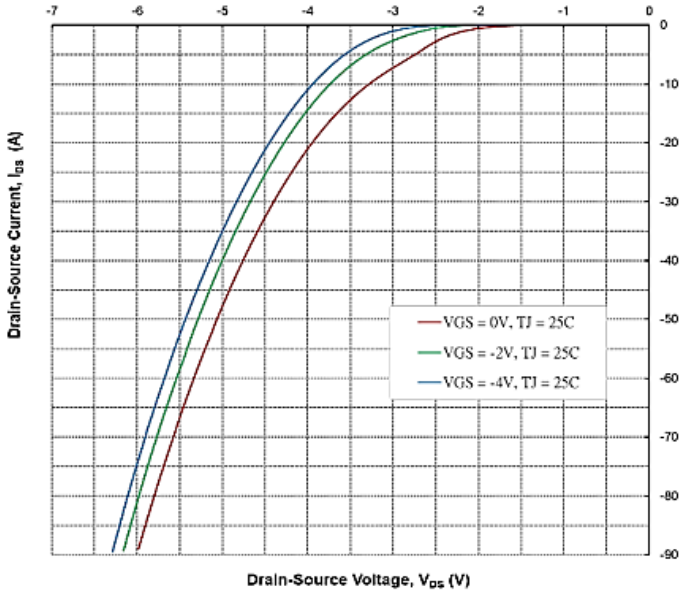


Figure 13. Body Diode Characteristics @ 25°C

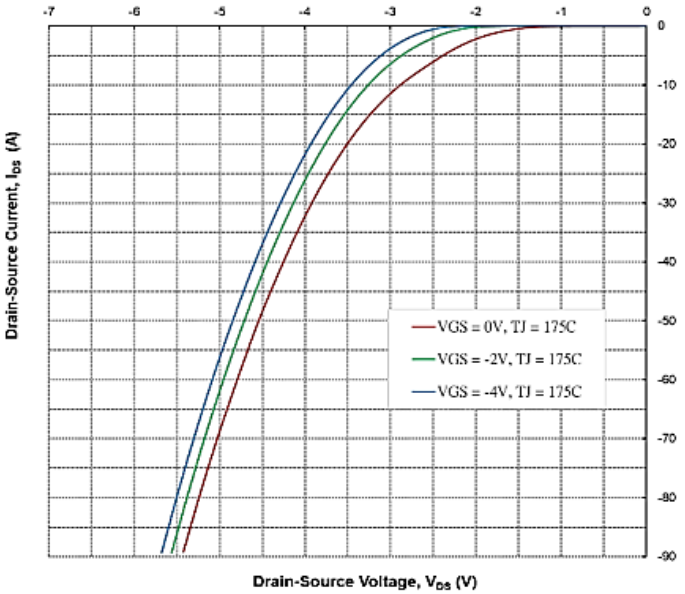


Figure 14. Body Diode Characteristics @ 175°C

TYPICAL PERFORMANCE (For Reference Only)

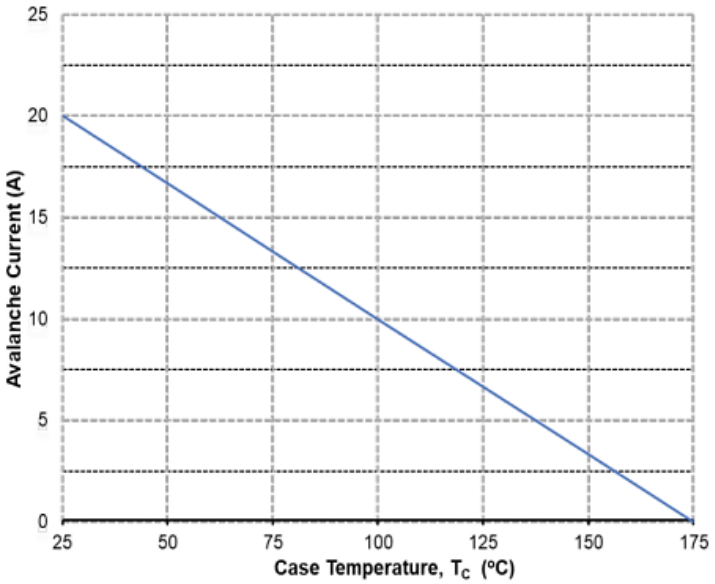


Figure 15. Single Avalanche vs. Temperature

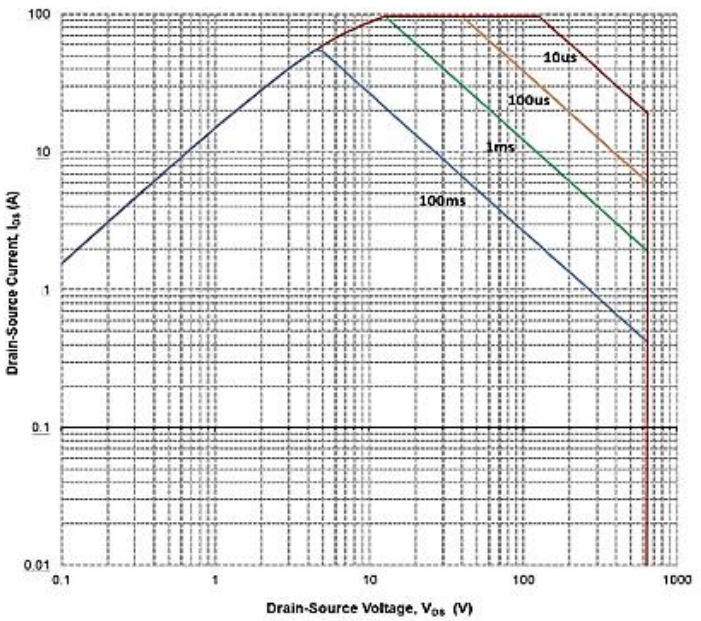
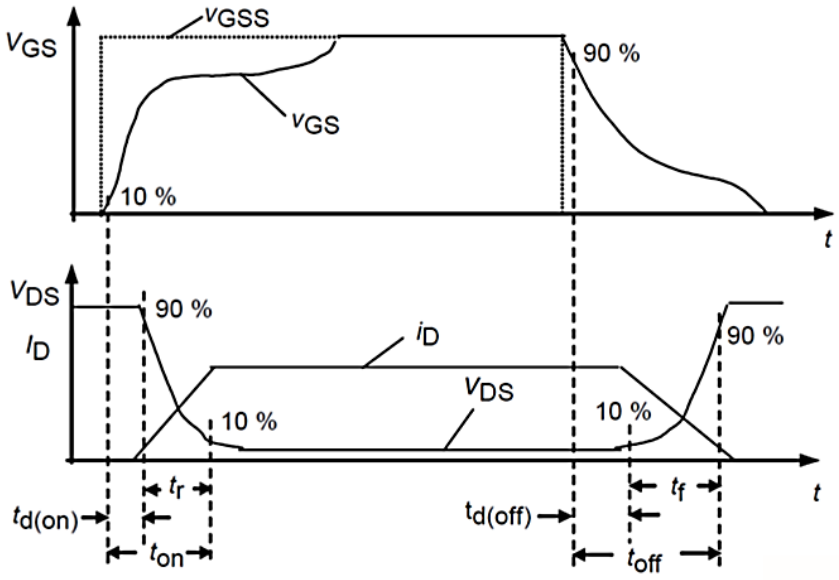
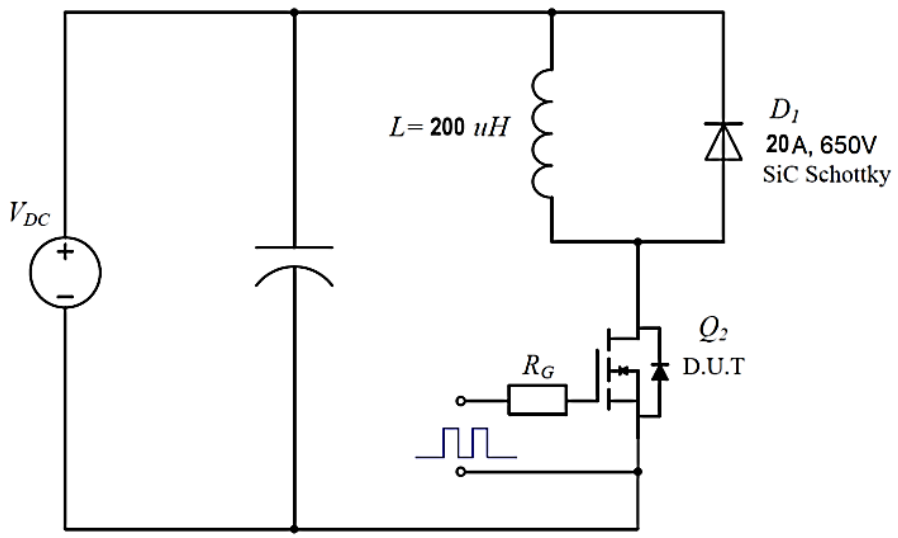


Figure 16. Safe Operating Area

SWITCHING TIMES DEFINITION AND TEST CIRCUIT





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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