NextGen Components,Inc.

SPECIFICATION SHEET

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

SPECIFICATION SHEET NO.	S1111 – LGE3M80120QL0T	
ORIGINAL MFG/PART NO.	LGE LGE Diodes/LGE3M80120Q-L	
NEXTGEN PART CODE	LGE3M80120QL0T	Indicate This Code For RFQ /Order
DATE	Nov. 11, 2025	
REVISION	A4	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}): 1200V Max. Current Drain-source On-state Resistance $R_{DS(ON)}$: 80mΩ Typ. Continuous Drain Current (I_D) @ Tc=25℃: 42A 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. 11, 2025

CUSTOMER APPROVE
Date:

MAIN FEATURE

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

RoHS
COMPLIANT

HF

REACH

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

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 LGE3M80120QL0T For RFQ and Order.

PART CODE GUIDE

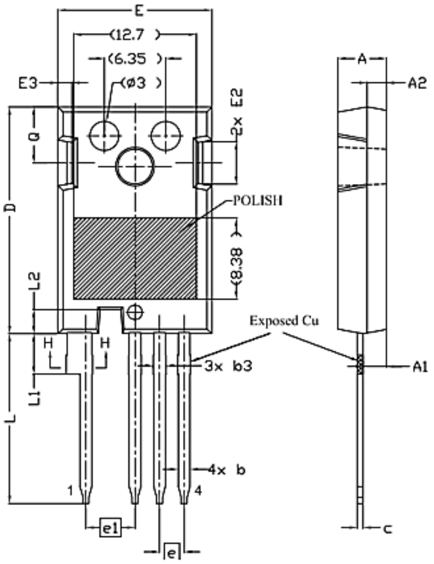
RFQ

Request For Quotation

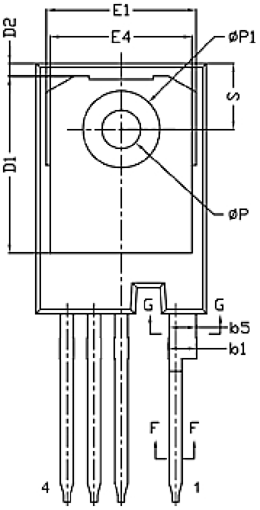
CODE	NAME	KEY SPECIFICATION OPTION
LGE3M	Product Series Code	Silicon Carbide (SiC) Power MOSFET, 4 Pins, Case TO-247-4, LGE3M L Series
80	Current Drain-source On-state Resistance $R_{DS(ON)}$ Code	80: 80mΩ
120	Drain-Source Voltage (V_{DS}) Code	120: 1200V Max.
Q	Package Case Code	B: TO-247-3; E: TO-263-2; J: TO-263-7; Q: TO-247-4;
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

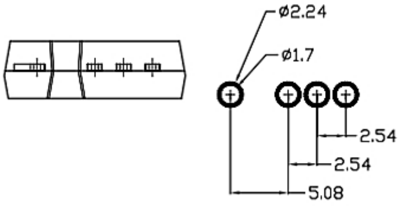
DIMENSION - - Unit: (mm), Case TO-247-4 Outline

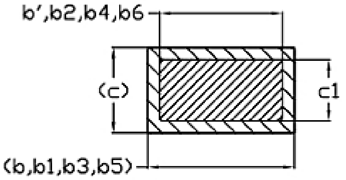
Top View



Side View



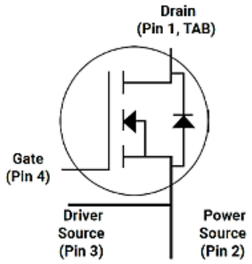


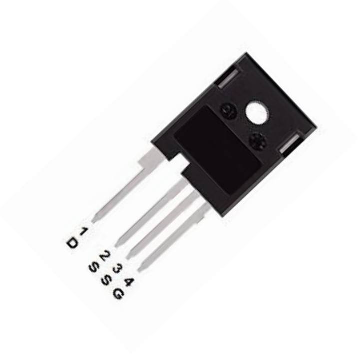


Section F-F, G-G,H-H

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

INTERNAL CIRCUIT DIAGRAM





1200V N-CHANNEL SiC MOSFET

V_{DS}	I_D @ Tc=25°C	$R_{DS(on)}$	MARKING	PACKAGE/CASE
1200V	42A	80mΩ	LGE3M80120Q	TO-247-4

MAX. RATINGS @Tc=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, Tc=25°C	42	A
		V_{GS}=20V, Tc=100°C	31	
Pulsed Drain Current	I_{DM}	Pulse width limited by SOA	70	A
Power Dissipation	P_{TOT}	Tc=25°C	300	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	-	0.5	-	°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,	-	-	±100	nA
Gate Threshold Voltage	V_{TH}	V_{GS}=V_{DS}, I_D=3.8mA	-	3.6	-	V
		Tc=175°C	-	2.7	-	
Drain-source On-state Resistance	R_{ON}	V_{GS}=20V, I_D=10A Tj=25°C	-	80	100	mΩ
		V_{GS}=20V, I_D=10A Tj=175°C	-	130	-	
Input Capacitance	C_{ISS}	V_{DS} =800V, V_{GS} =0V F=1MHz, V_{AC} =25mV	-	1680	-	pF
Output Capacitance	C_{OSS}		-	69	-	pF
Reverse Transfer Capacitance	C_{RSS}		-	6.7	-	pF
The Output Capacitor Stores Energy	E_{OSS}		-	27	-	µJ
Single Pulse Avalanche Energy	E_{AS}	I_D=20A,V_{DD}=50V, L=2mH	-	0.75	-	J
Total Gate Charge	Q_g	V_{DS} =800V, V_{GS} =-5/+20V I_D =20A	-	76	-	nC
Gate To Source Charge	Q_{gs}		-	29	-	nC
Gate To Drain Charge	Q_{gd}		-	34	-	nC

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

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Gate Input Resistance	R_g	f=1MHZ		4.2		Ω
Turn On Switching Energy	E_{on}	V_{DS} =800V, V_{GS} =-3.5/20V I_D =20A, $R_{G(ext)}$ = 2.0Ω, L= 290μH	-	154	-	μJ
Turn Off Switching Energy	E_{off}		-	80	-	μJ
Turn On Delay Time	$t_{d(on)}$		-	8.9	-	ns
Rise Time	t_r		-	19.9	-	ns
Turn Off Delay Time	$t_{d(off)}$		-	14.7	-	ns
Fall time	T_f			9.5		ns

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

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Diode Forward Voltage	V_{SD}	V_{GS} =0V, I_{SD}=10A T_J =175℃	-	4.7	-	V
			-	4.2	-	V
Reverse Recovery Time	T_{rr}	V_R =800V, V_{GS} =0V I_{SD} =20A di/dt = 1100A/μS	-	10.2	-	nS
Reverse Recovery Charge	Q_{rr}		-	64	-	nC
Reverse Recovery Peak Current	I_{rrm}		-	11.3	-	A

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

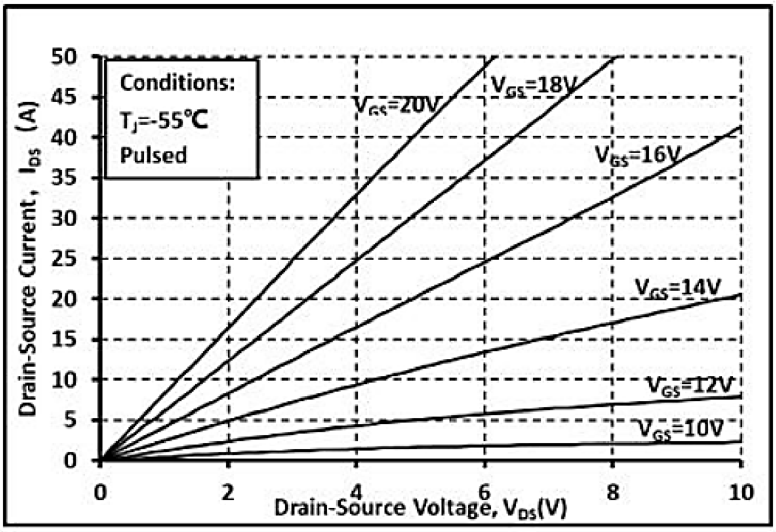


Figure 1. Output Characteristics TJ=55°C

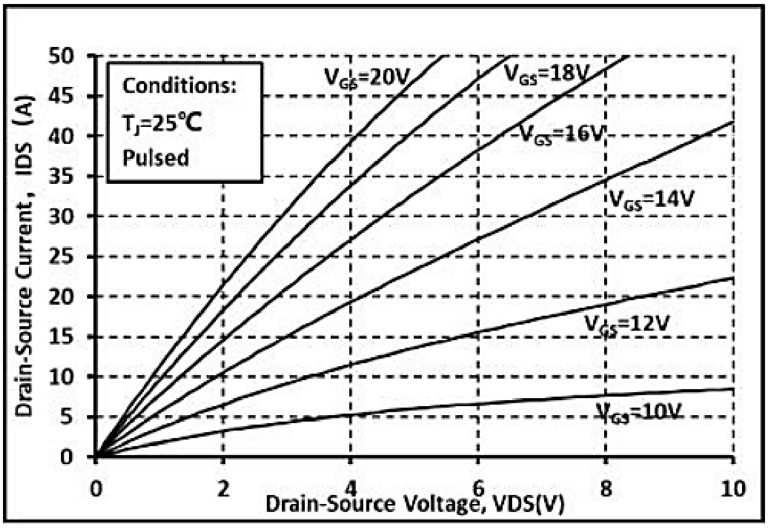


Figure 2. Output Characteristics TJ=25°C

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

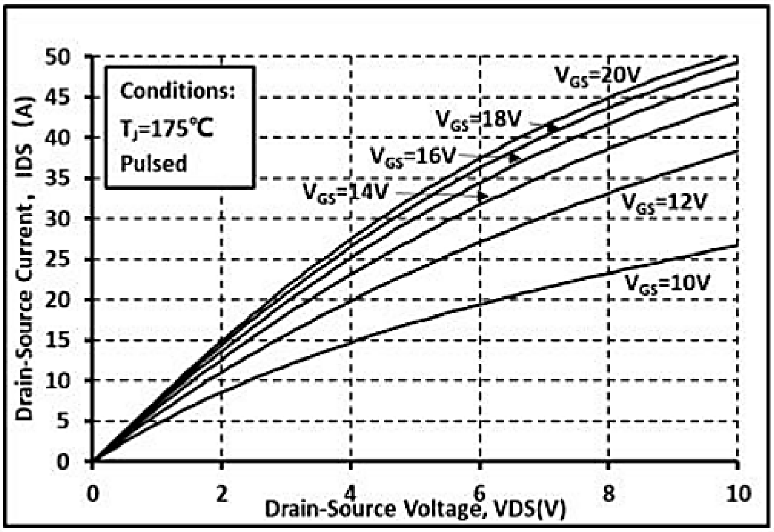


Figure 3. Output Characteristics TJ=175℃

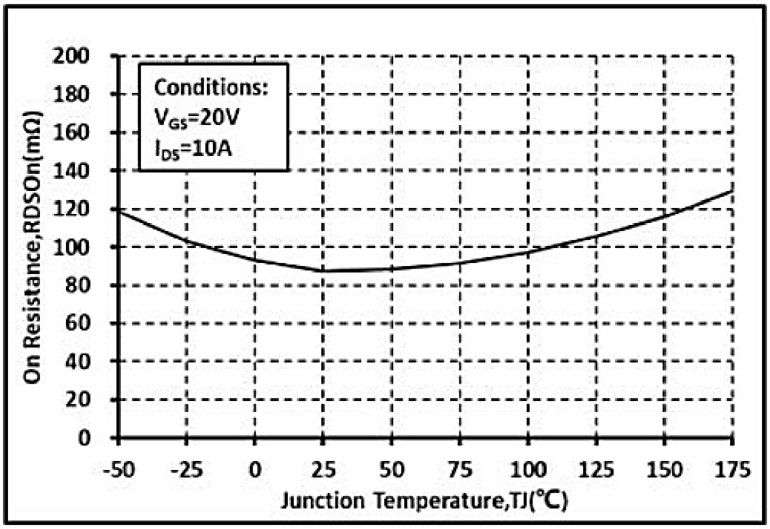


Figure 4. On-Resistance vs. Temperature

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

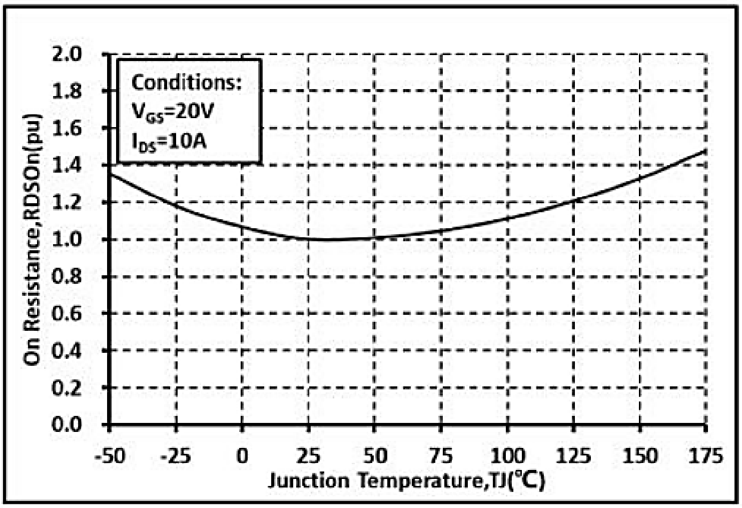


Figure 5. Normalized On-Resistance vs. Temperature

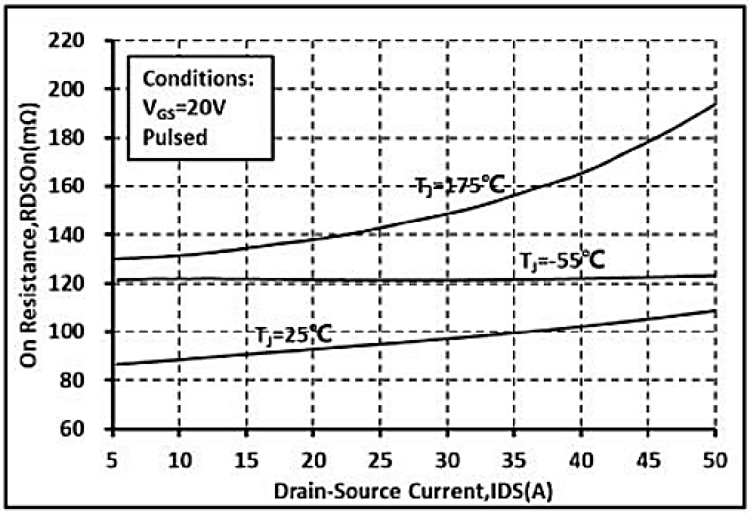


Figure 6. On-Resistance Vs. Drain-Source Current @ Various Temperature

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

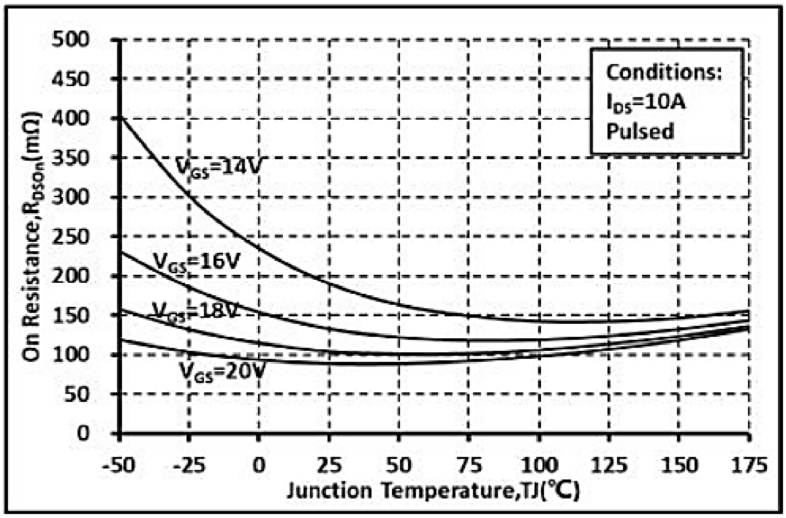


Figure 7. On-Resistance @VGS vs. Temperature

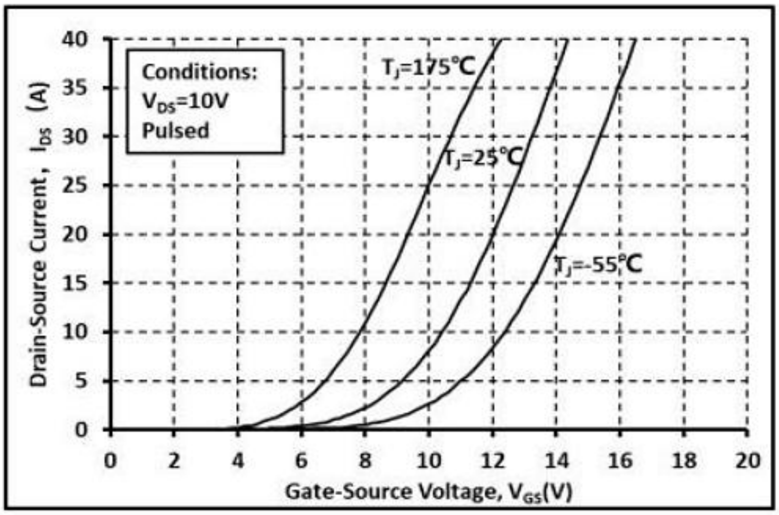


Figure 8. Transfer Characteristic For Various Junction Temperatures

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

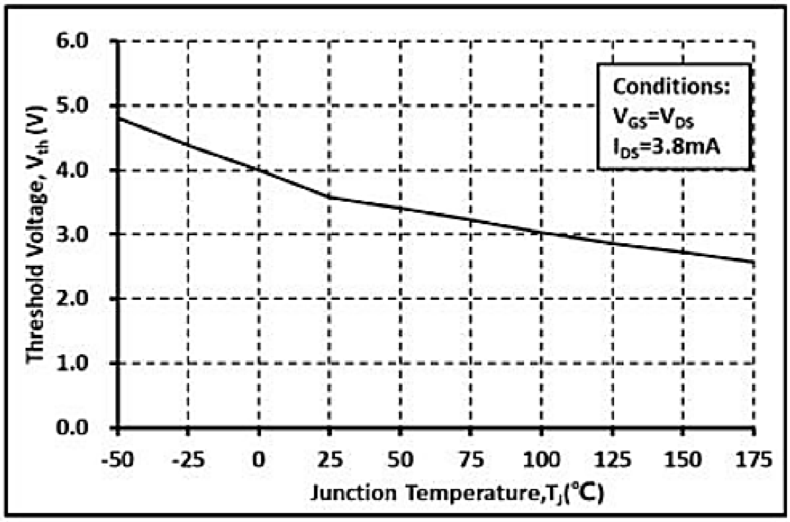


Figure 9. Threshold Voltage vs. Temperature

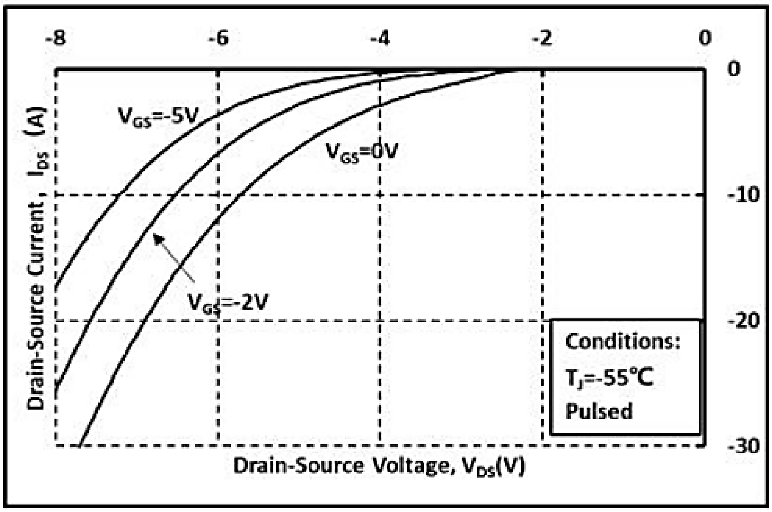


Figure 10. Body Diode Characteristics @ T_J=-55℃

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

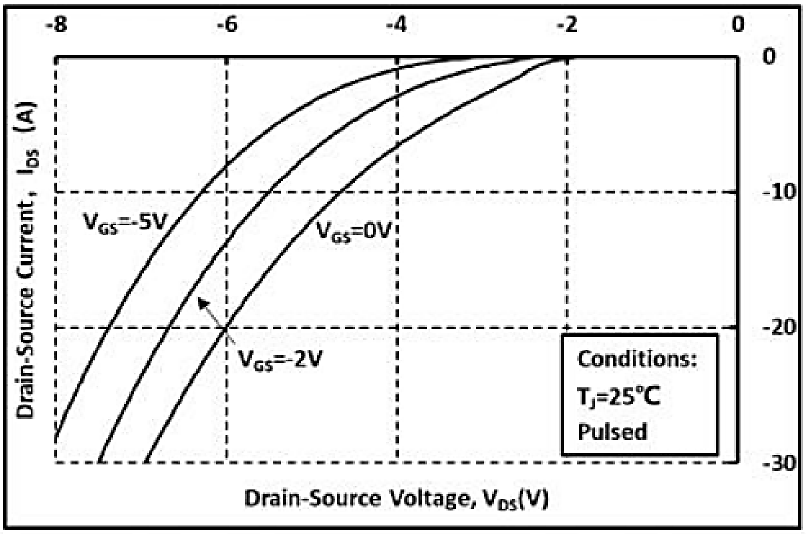


Figure 11. Body Diode Characteristics @ TJ=25℃

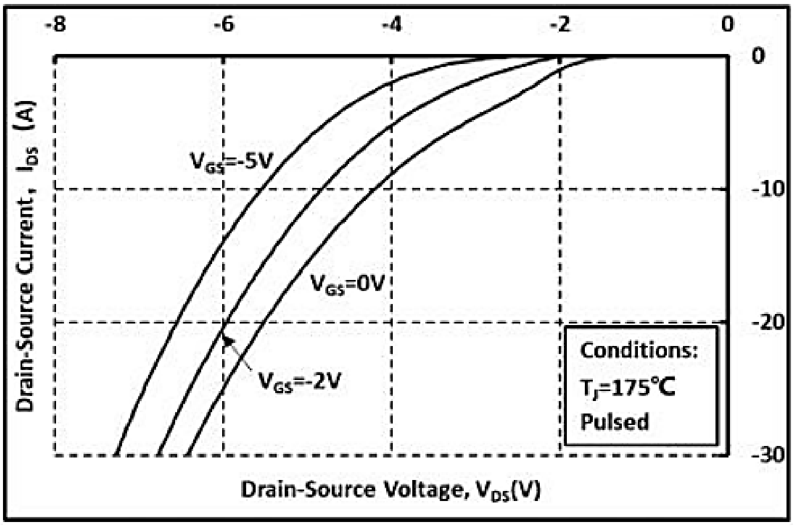


Figure 12. Body Diode Characteristics @ TJ=175℃

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

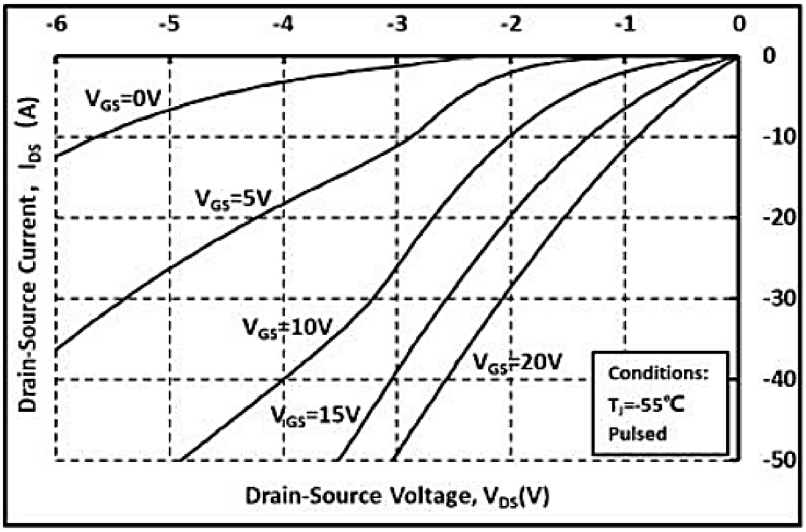


Figure 13. 3rd Quadrant Characteristics @ T_J=-55℃

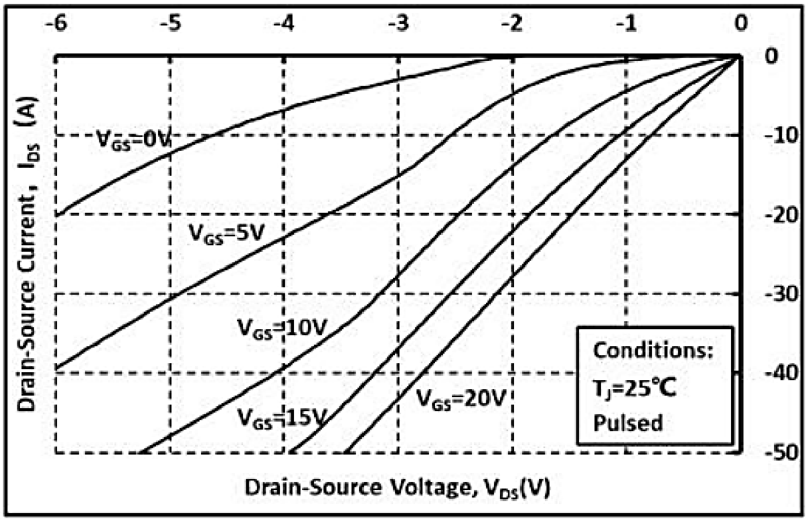


Figure 14. 3rd Quadrant Characteristics @ T_J=25℃

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

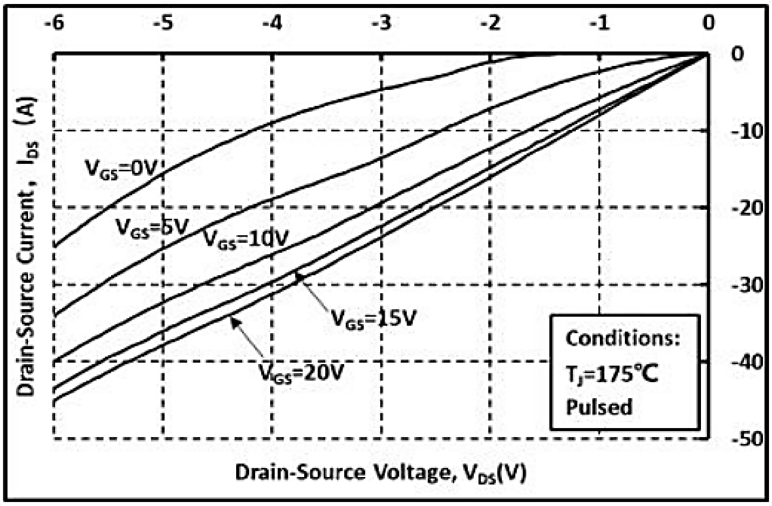


Figure 15. 3rd Quadrant Characteristics @ T_J=175℃

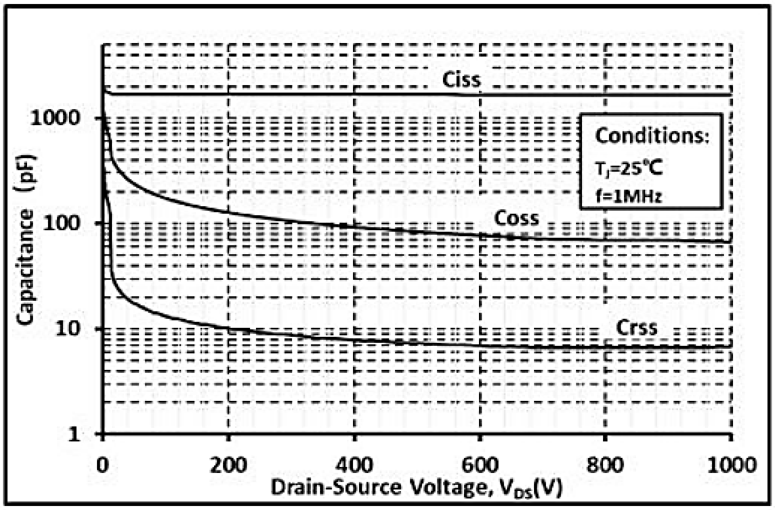


Figure 16. Capacitances vs. Drain-Source Voltage

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

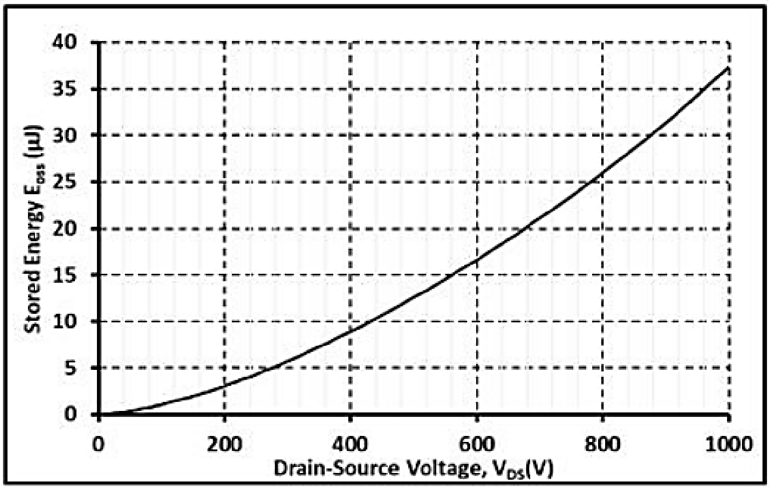


Figure 17. Output Capacitor Stored Energy

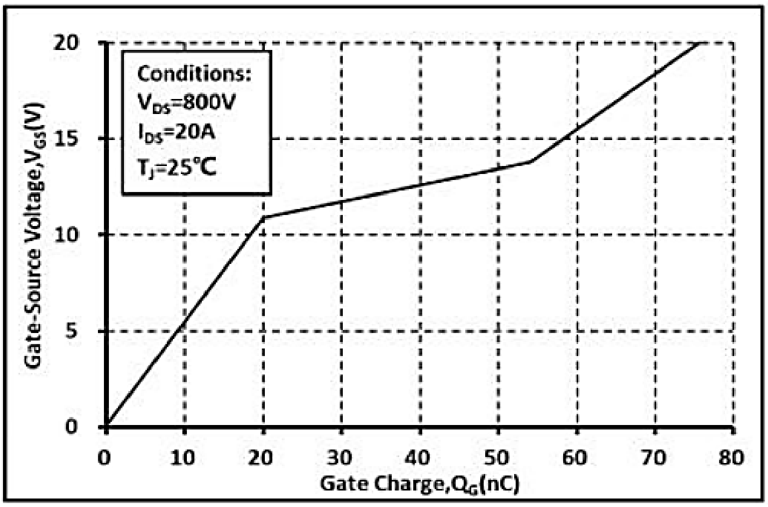


Figure 18. Gate Charge Characteristics

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

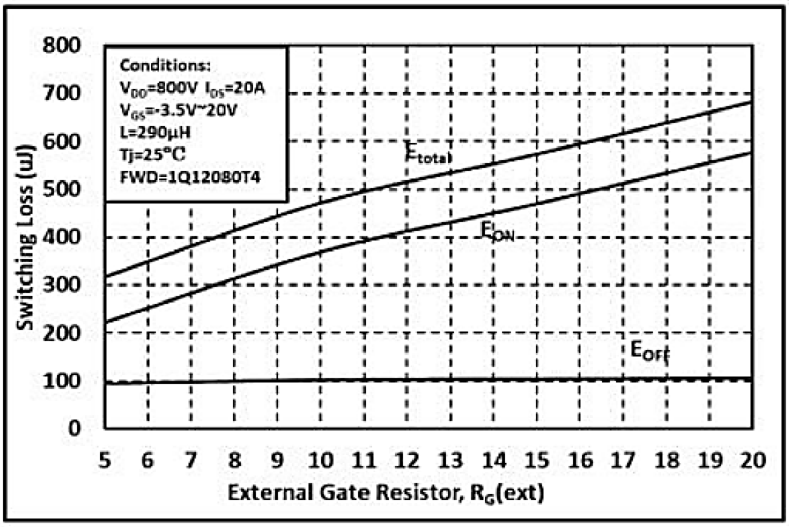


Figure 19. Switching Energy vs. External Gate Resistor

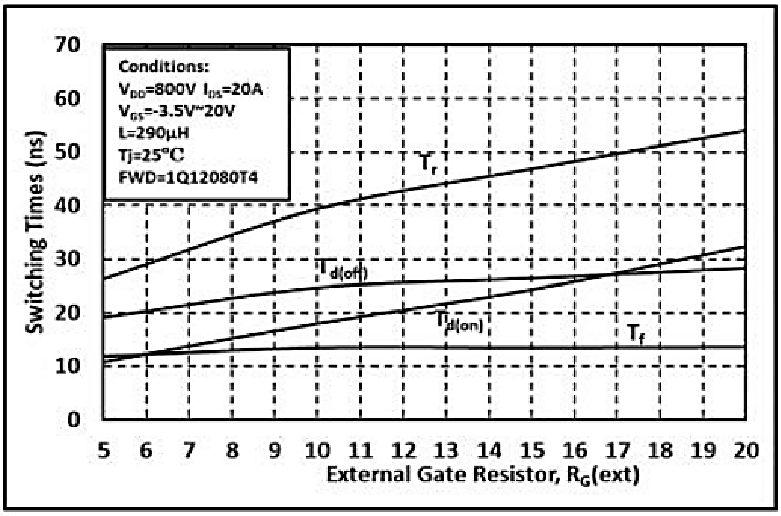


Figure 20. Switching Time vs. External Gate Resistor

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

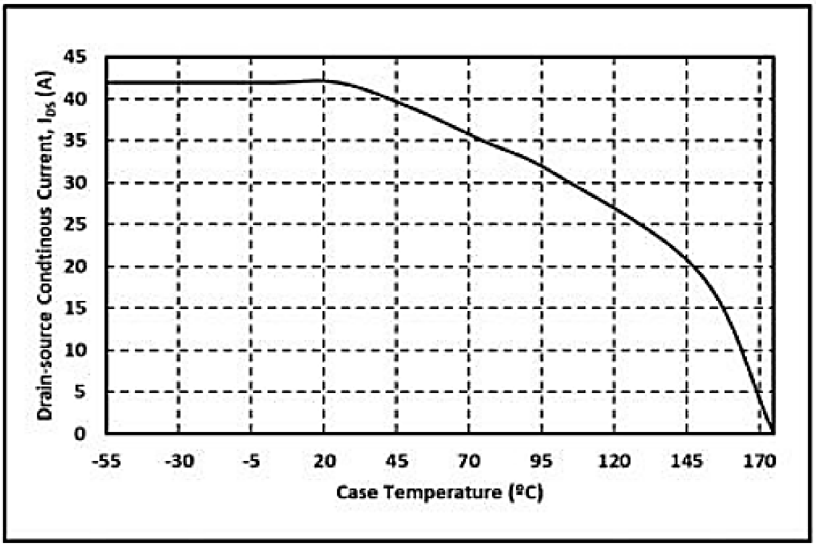


Figure 21. Continuous Drain Current Derating vs. Case Temperature

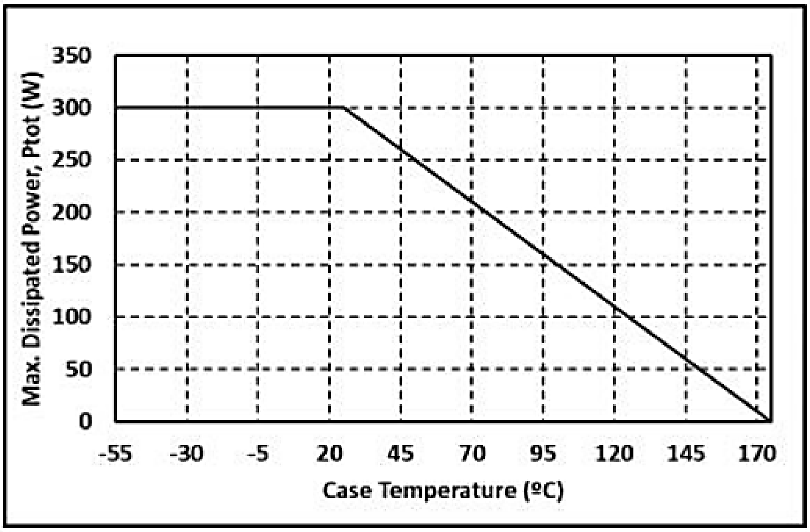


Figure 22. Maximum Power Dissipation Derating vs. Case Temperature

ELECTRICAL CHARACTERISTIC CURVES (For Reference Only)

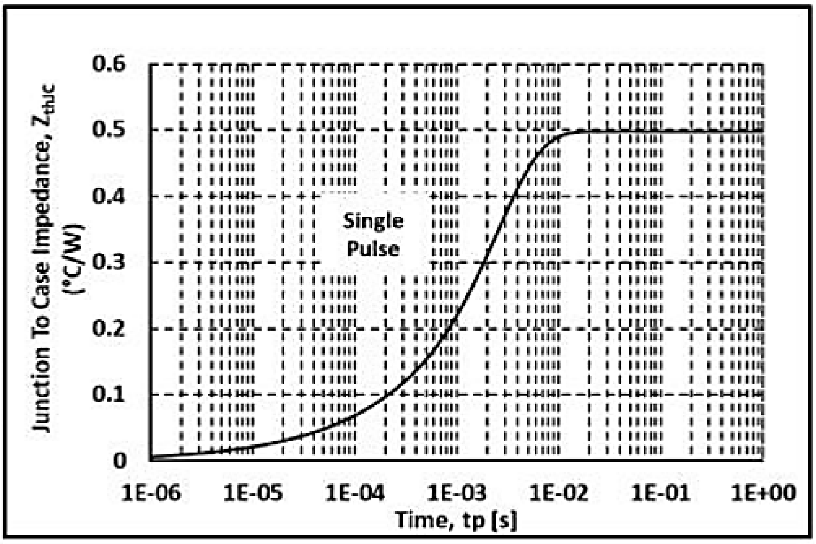


Figure 23. Transient Thermal Impedance (Junction to Case)

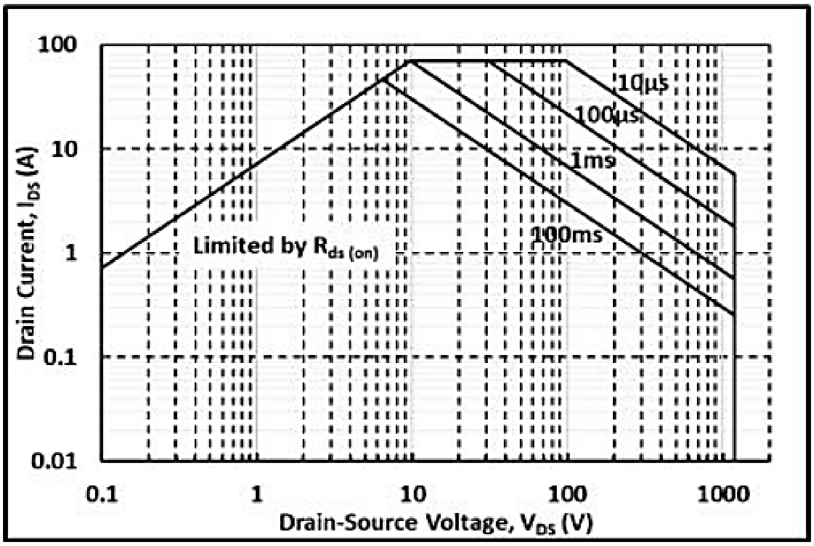


Figure 24. Safe Operating Area

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 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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