SPECIFICATION SHEET

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

SPECIFICATION SHEET NO.	S1107 – LGE3M14120QL0T	
ORIGINAL MFG/PART NO.	LGE Diodes/LGE3M14120Q-L	
NEXTGEN PART CODE	LGE3M14120QL0T	Indicate This Code For RFQ /Order
DATE	Nov. 07, 2025	
REVISION	A3	Updated With Most Recent Data
DESCRIPTION AND MAIN PARAMETRICS	Silicon Carbide (SiC) 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 $R_{DS(ON)}$: 14mΩ Typ. Continuous Drain Current (I_D) @ Tc=25℃: 152A Operating Temperature: -40°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. 07, 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
- Temperature Independent Turn-off Switching Losses
- Higher System Efficiency
- Cooling Effort Reduction
- 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)

APPLICATION

- EV Motor Drive
- PV String Inverters
- Solar Power Optimizer
- Switch Mode 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 LGE3M14120QL0T For RFQ and Order.

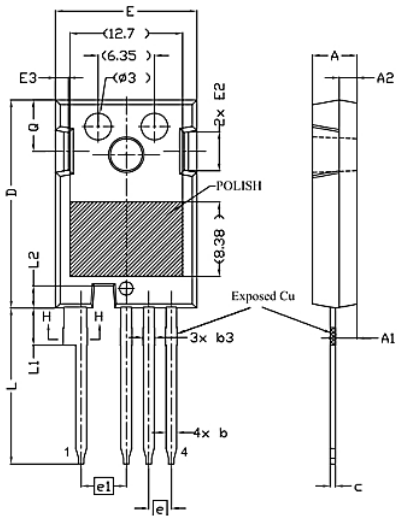
PART CODE GUIDE

RFQ
Request For Quotation

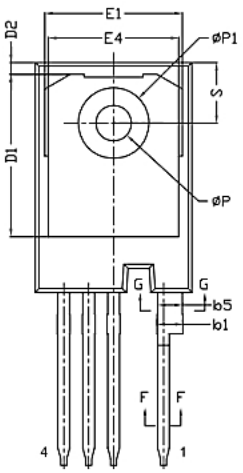
CODE	NAME	KEY SPECIFICATION OPTION
LGE3M	Product Series Code	Silicon Carbide (SiC) MOSFET, 4 Pins, Case TO-247-4, LGE3M L Series
14	Current Drain-source On-state Resistance $R_{DS(ON)}$ Code	14: 14mΩ
120	Drain-Source Voltage (V_{DS}) Code	120: 1200V Max.
Q	Package Case Code	B: TO-247-3; E: TO-263-2; 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

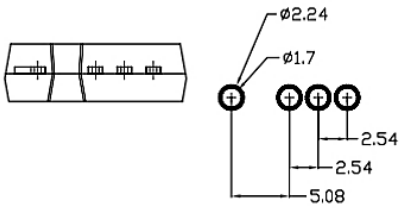
DIMENSION - - Unit: (mm), Case TO-247-4 Outline

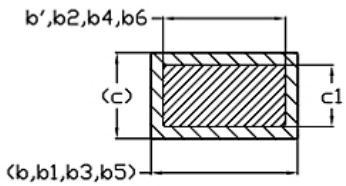
Top View



Side View



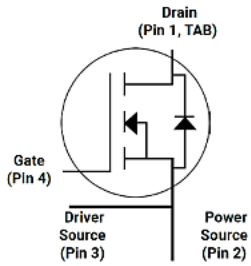


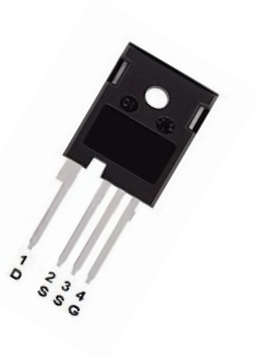


Section F-F, G-G,H-H

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

VDS	ID @ Tc=25℃	R DS(on)	MARKING	PACKAGE/CASE
1200V	152A	14mΩ	LGE3M14120Q	TO-247-4

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

PARAMETER	SYMBOL	TEST CONDITIONS	VALUE	UNIT
Drain-Source Voltage	$V_{DS, Max}$	V_{GS}=0V, I_D=100μA	1200	V
Gate-Source Voltage	$V_{GS, MAX}$	Absolute maximum values	-8/+22	V
Gate-Source Voltage	V_{Gsop}	Recommended operational values	-4/+18	V
Continuous Drain Current Note Fig.19	I_D	V_{GS}=18V, Tc=25°C	152	A
		V_{GS}=18V, Tc=100°C	108	
Pulsed Drain Current Note Fig.22	$I_{D (pulse)}$	Pulse width tp limited by Tj, max	340	A
Power Dissipation Note Fig.20	P_D	TC=25°C, Tj=175°C	625	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}		-40 ~ +175	°C
Soldering Temperature	T_L	1.6mm (0.063”) from case for 10s	260	°C
Mounting Torque	T_M	M3 or 6-32 screw	1 8.8	Nm lbf-in

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			MIN.	TYP.	MAX	
Thermal Resistance Note Fig.21	$R_{th(j-c)}$	Junction-case	-	0.24	-	°C/W
	$R_{th(j-a)}$	Junction to ambient	-	33	-	

Note : Not subject to production test. Parameter verified by design/characterization.

ELECTRICAL CHARACTERISTICS – PART I Static Characteristics (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	1200	-	-	V
Gates Threshold Voltage Note Fig.11	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=28mA	2.3	2.8	4	V
		V_{DS}=V_{GS},I_D=28mA, T_j=175°C	-	2.0	-	
Zero Gates Voltage Drain Current	I_{DSS}	V_{DS}=1200V, V_{GS}=0V	-	1	100	μA
Gates-Source Leakage Crurent	I_{GSS}	V_{GS}=18V, V_{DS}=0V	-	-	100	nA
Current Drain-source On-state Resistance Note Fig.4, 5, 6	$R_{DS(ON)}$	V_{GS}=15V, I_D=100A	-	17	21	mΩ
		V_{GS}=15V, I_D=100A Tj=175°C	-	28	-	
		V_{GS}=18V, I_D=100A	-	14	18	
		V_{GS}=18V, I_D=100A Tj=175°C	-	27	-	
Transconductance Note Fig.7	g_{fs}	V_{DS}=20V, I_{DS}=100A	-	71	-	S
		V_{DS}=20V, I_{DS}=100A, Tj=175°C	-	63	-	
Internal Gate Resistance	$R_{g,int}$	V_{AC} =25mV, f=1MHz		0.9		Ω
Diode Forward Voltage Note Fig.8, 9, 10	V_{SD}	V_{GS} =-4V, I_{SD} =50A		4.0		V
		V_{GS} =-4V, I_{SD} =50A, T_J=175°C		3.5		V

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

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Input Capacitance Note Fig.17,18	C_{ISS}	V_{DS} =1000V, V_{GS} =0V T_J =25°C, V_{AC} =25mV f=100KHz	-	5469	-	pF
Output Capacitance Note Fig.17,18	C_{OSS}		-	235	-	pF
Reverse Capacitance Note Fig.17,18	C_{RSS}		-	17.5	-	pF
Coss Stored Energy Note Fig.16	E_{OSS}		-	150	-	µJ
Gate Source Charge Note Fig.12	Q_{gs}	V_{DS} =800V, V_{GS} =-4/+18V I_D =100A	-	54	-	nC
Gate Drain Charge Note Fig.12	Q_{gd}		-	45	-	nC
Gate Charge Note Fig.12	Q_g		-	230	-	nC

ELECTRICAL CHARACTERISTICS – PART III Switching Characteristics

- Dynamic characteristics (Tc = 25℃ Unless Otherwise Specified)

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Turn On Switching Energy Note Fig.26	E_{on}	V_{DS} =800V, V_{GS} =-4/+18V I_D =100A, Rg = 2.5Ω, L= 120uH	-	812	-	µJ
Turn Off Switching Energy Note Fig.26	E_{off}		-	383	-	µJ
Turn On Delay Time Note Fig.27, 28	$t_{d(on)}$		-	19	-	ns
Rise Time Note Fig.27, 28	t_r		-	29	-	ns
Turn Off Delay Time Note Fig.27, 28	$t_{d(off)}$		-	42	-	ns
Fall Time Note Fig.27, 28	t_f		-	9.3	-	ns

- Body Diode Characteristics

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Diode Forward Voltage Note Fig.8, 9, 10	V_{SD}	V_{GS} =-4V, I_{SD} =50A	-	4.0	-	V
		V_{GS} =-4V, I_{SD}=50A T_J =175℃	-	3.5	-	V
Continuous Diode Forward Current	I_S	V_{GS} =-4V, Tc = 25°C	-	152	-	A
Reverse Recovery Time	T_{rr}	V_R =800V, V_{GS} =-4V I_D =100A di/dt = 3000A/µS, T_J =175°C	-	66	-	nS
Reverse Recovery Charge	Q_{rr}		-	1830	-	nC
Peak Reverse Recovery Current	I_{rrm}		-	52	-	A

Note : When using SiC Body Diode the maximum recommended VGS =-4 V

ELECTRICAL CHARACTERISTIC DIAGRAMS (For Reference Only)

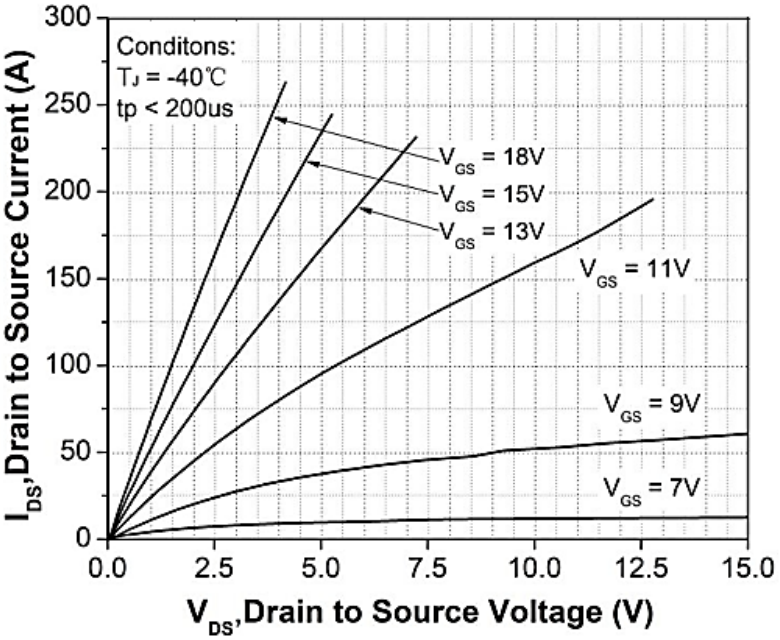


Figure 1. Output characteristics T_J = -40 ºC

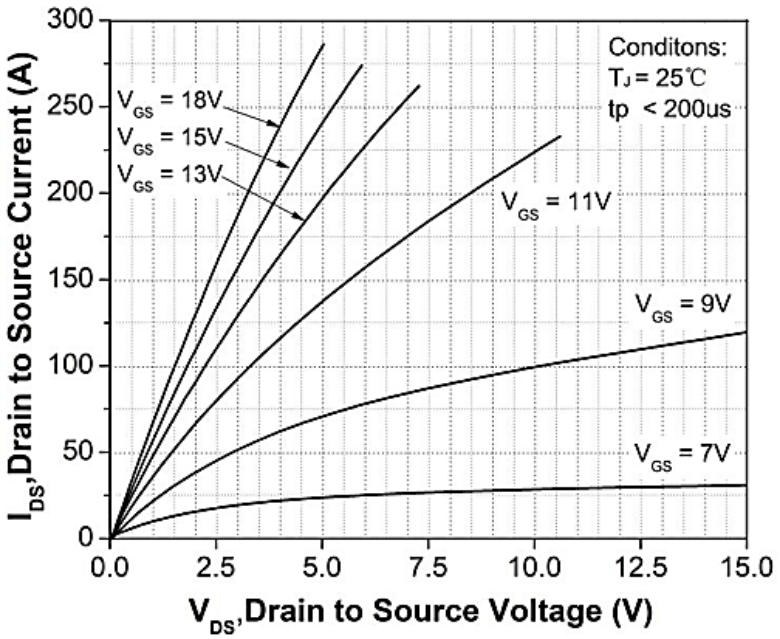


Figure 2. Output characteristics T_J = 25 ºC

ELECTRICAL CHARACTERISTIC DIAGRAMS (For Reference Only)

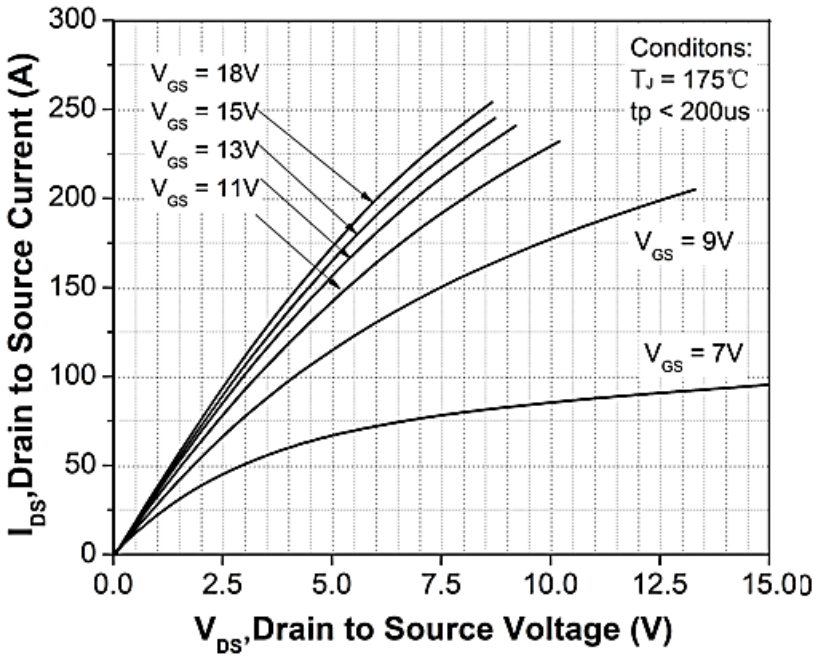


Figure 3. Output characteristics T_J = 175 ℃

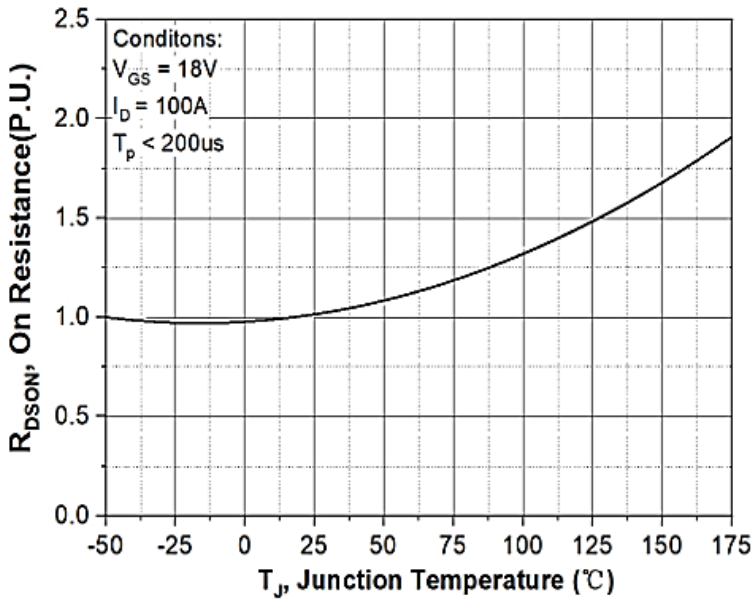


Figure 4. Normalized on-resistance vs. temperature

ELECTRICAL CHARACTERISTIC DIAGRAMS (For Reference Only)

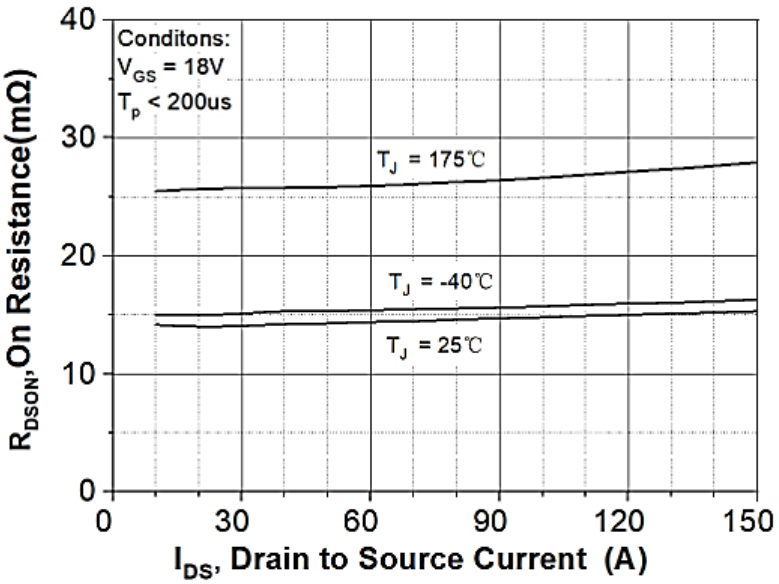


Figure 5. On-resistance vs. drain current

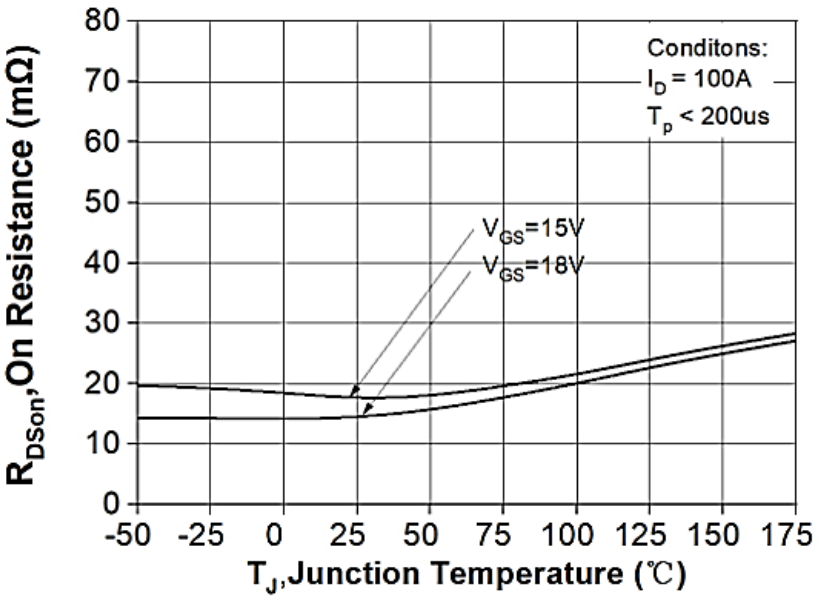


Figure 6. On-resistance vs. temperature for various gate voltage

ELECTRICAL CHARACTERISTIC DIAGRAMS (For Reference Only)

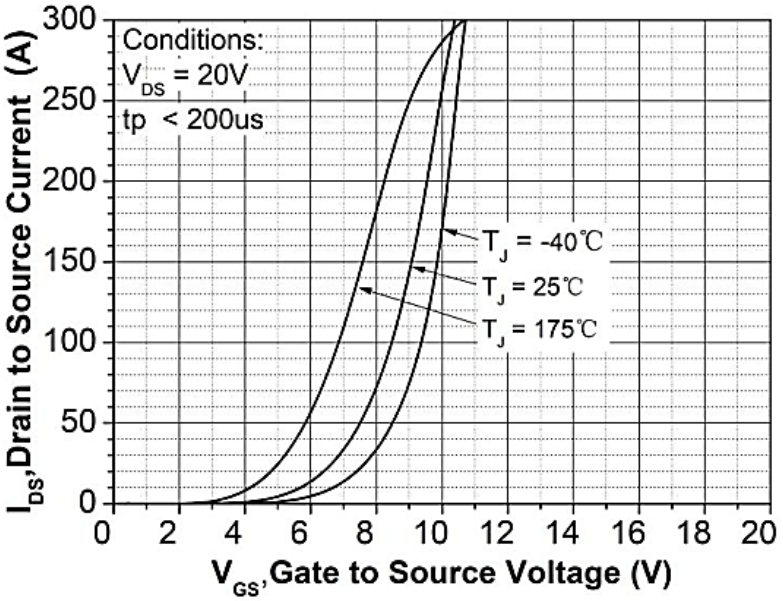


Figure 7. Transfer characteristic for various junction temperatures

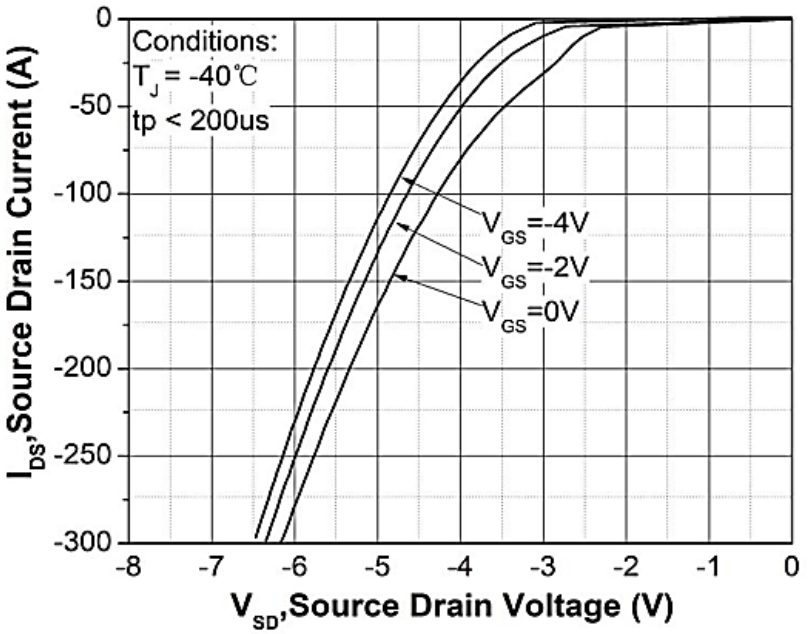


Figure 8. Body diode characteristic at T_J = -40 ℃

ELECTRICAL CHARACTERISTIC DIAGRAMS (For Reference Only)

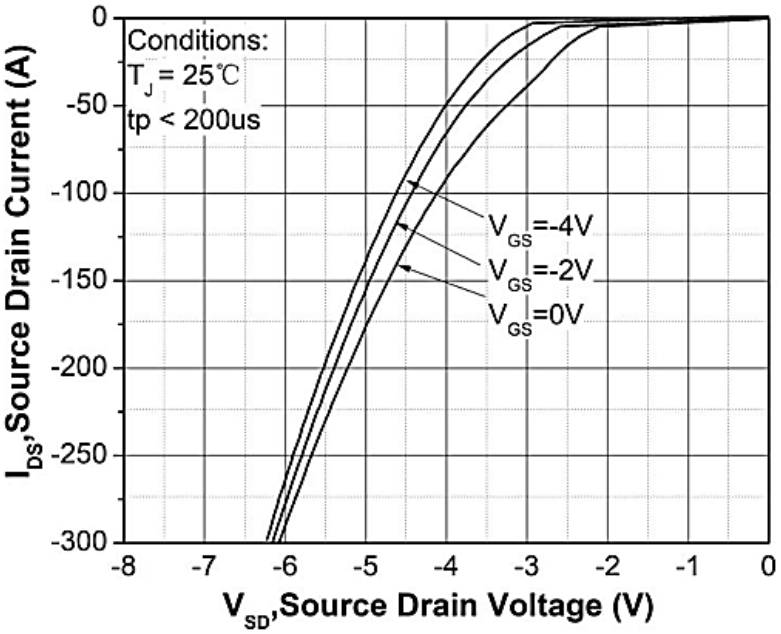


Figure 9. Body diode characteristic at T = 25 ºC

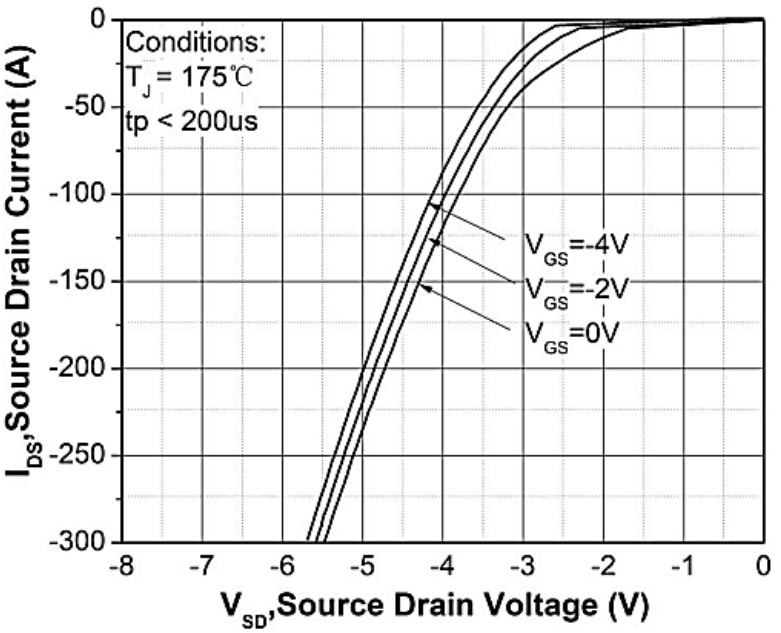


Figure 10. Body diode characteristic at T = 175ºC

ELECTRICAL CHARACTERISTIC DIAGRAMS (For Reference Only)

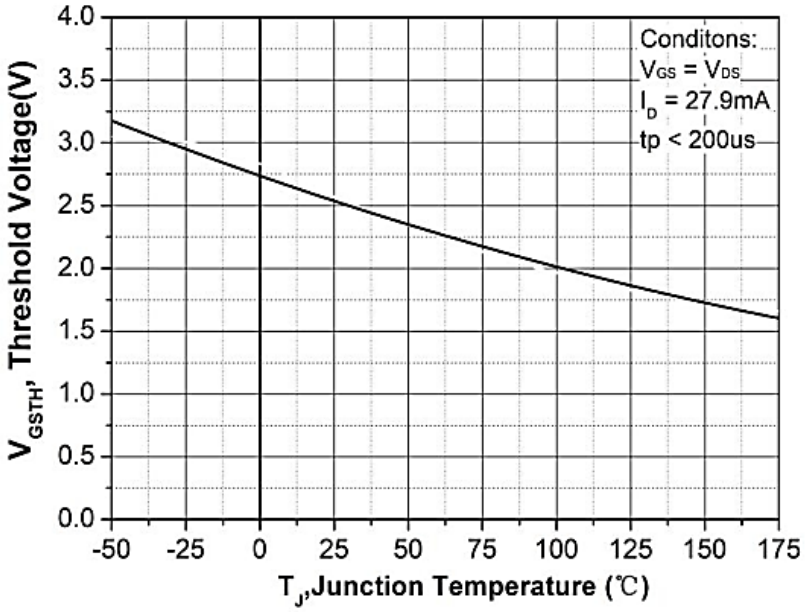


Figure 11. Threshold voltage vs. temperature

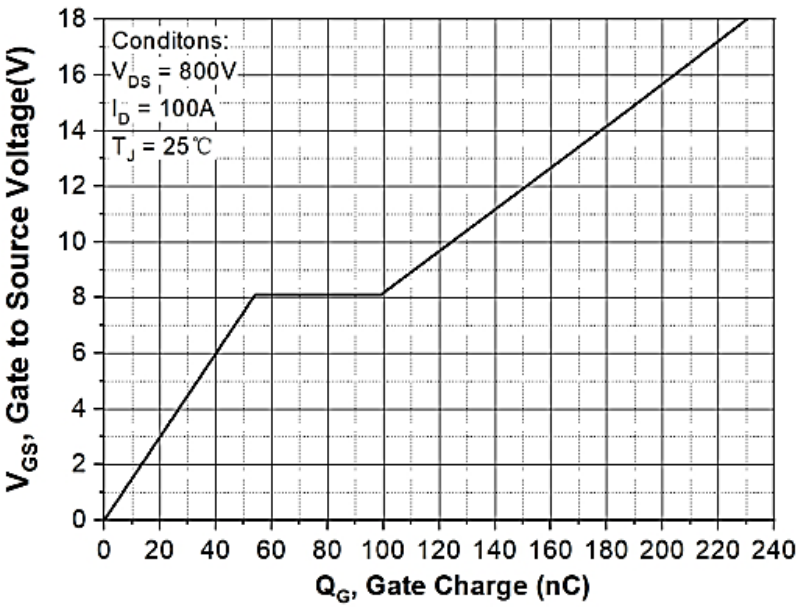


Figure 12. Gate charge characteristic

ELECTRICAL CHARACTERISTIC DIAGRAMS (For Reference Only)

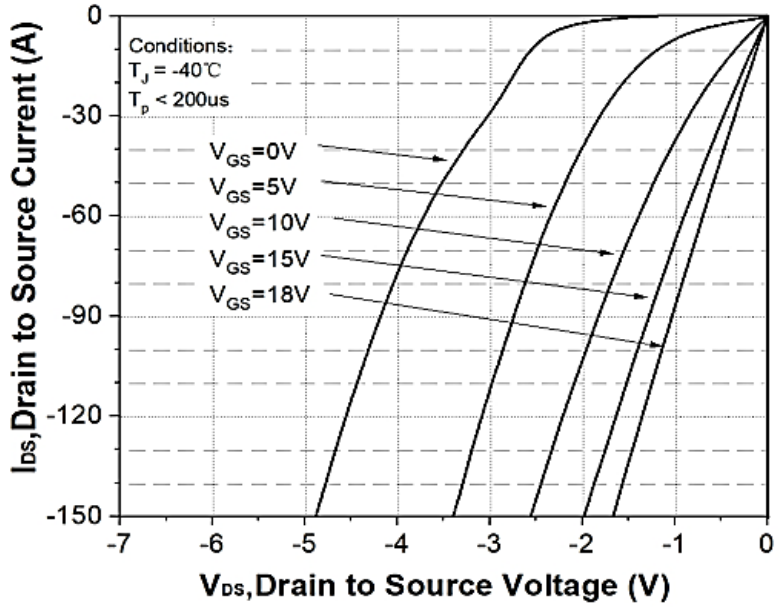


Figure 13. 3rd quadrant characteristic at T_J = -40 ºC

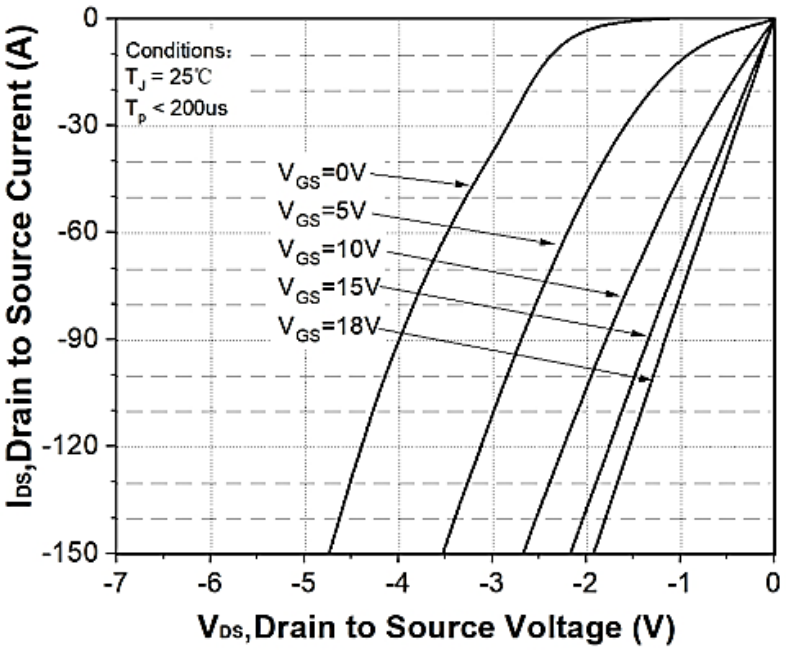


Figure 14. 3rd quadrant characteristic at T_J = 25 ºC

ELECTRICAL CHARACTERISTIC DIAGRAMS (For Reference Only)

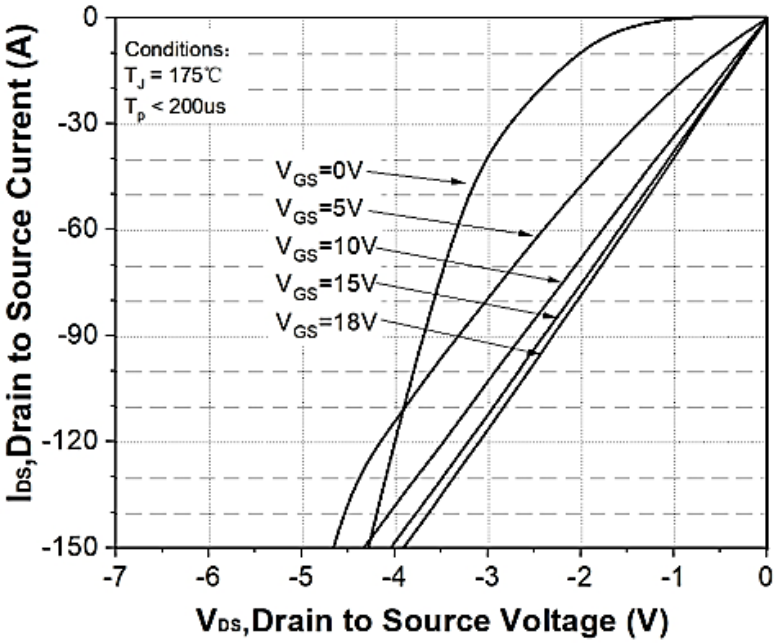


Figure 15. 3rd quadrant characteristic at T_J = 175 °C

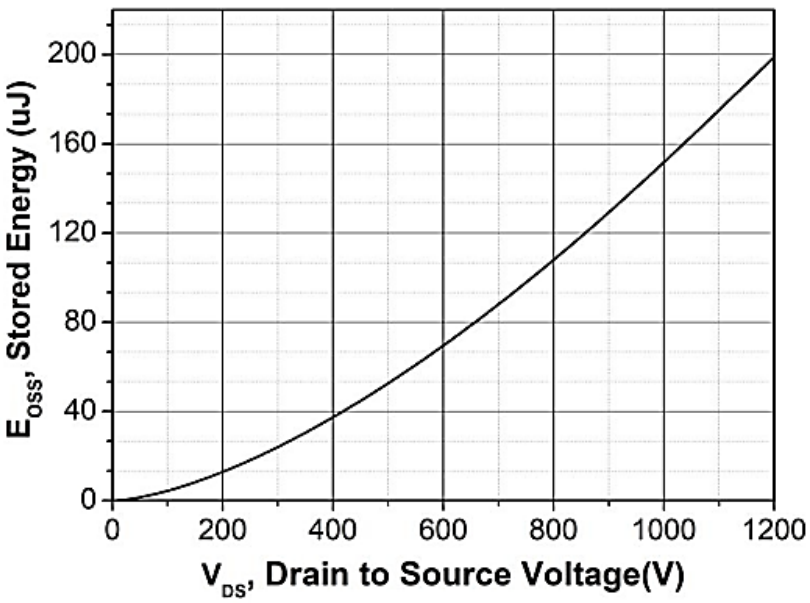


Figure 16. Output capacitor stored energy

ELECTRICAL CHARACTERISTIC DIAGRAMS (For Reference Only)

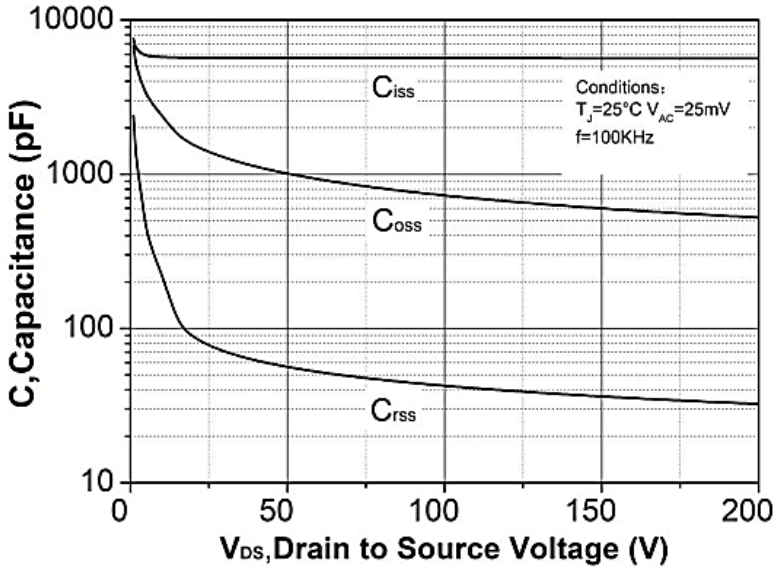


Figure 17. Capacitances vs. drain-source voltage (0 - 200V)

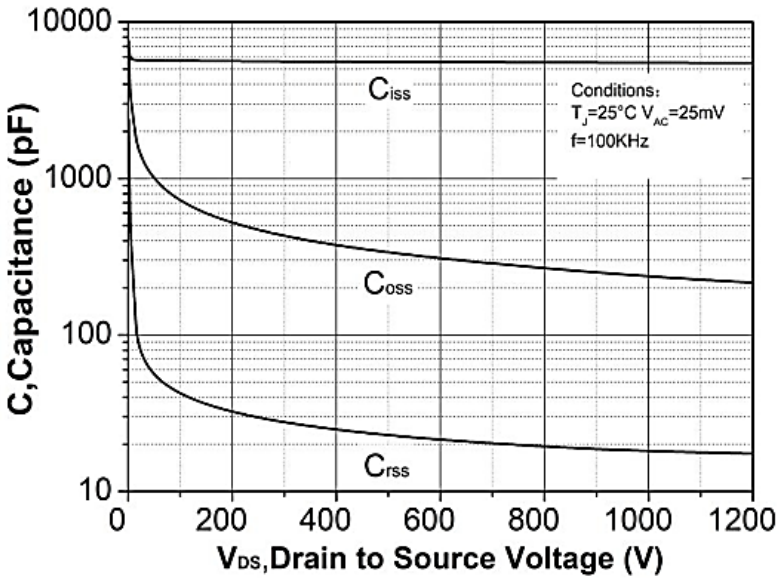


Figure 18. Capacitances vs. drain-source voltage (0 - 1200V)

ELECTRICAL CHARACTERISTIC DIAGRAMS (For Reference Only)

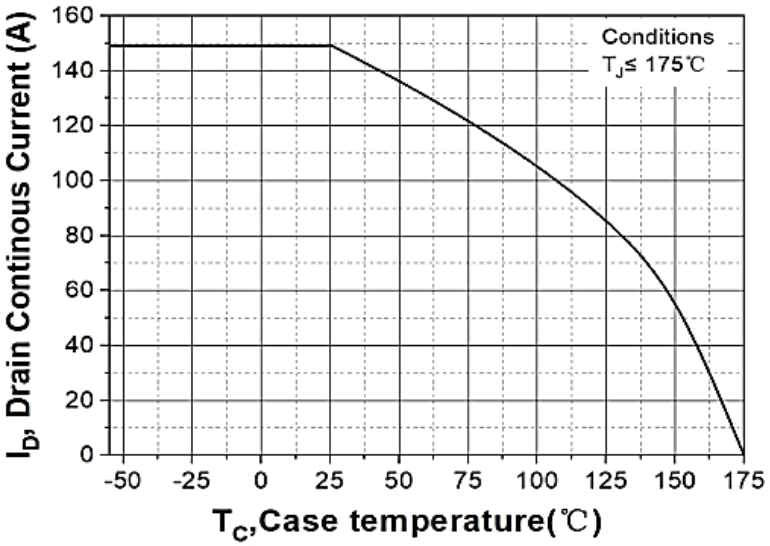


Figure 19. Continuous drain current derating vs.case temperature

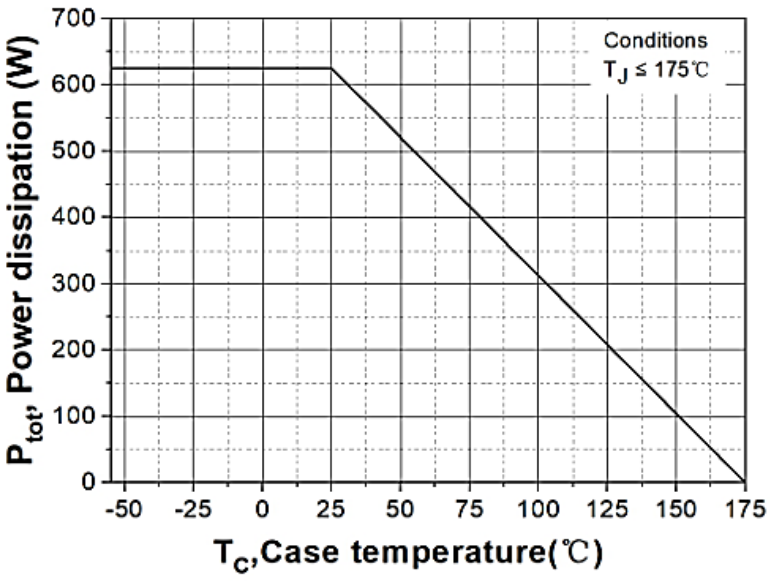


Figure 20. Maximum power dissipation derating vs.
case temperature

ELECTRICAL CHARACTERISTIC DIAGRAMS (For Reference Only)

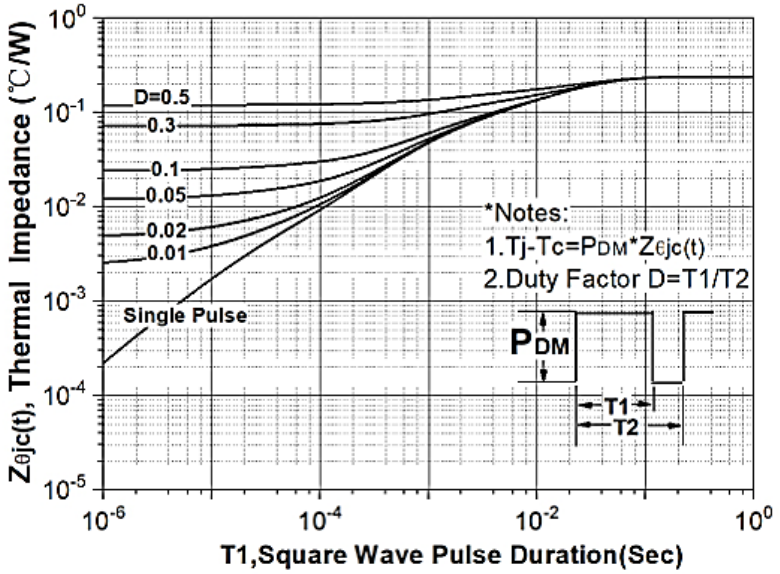


Figure 21. Transient thermal impedance (junction - case)

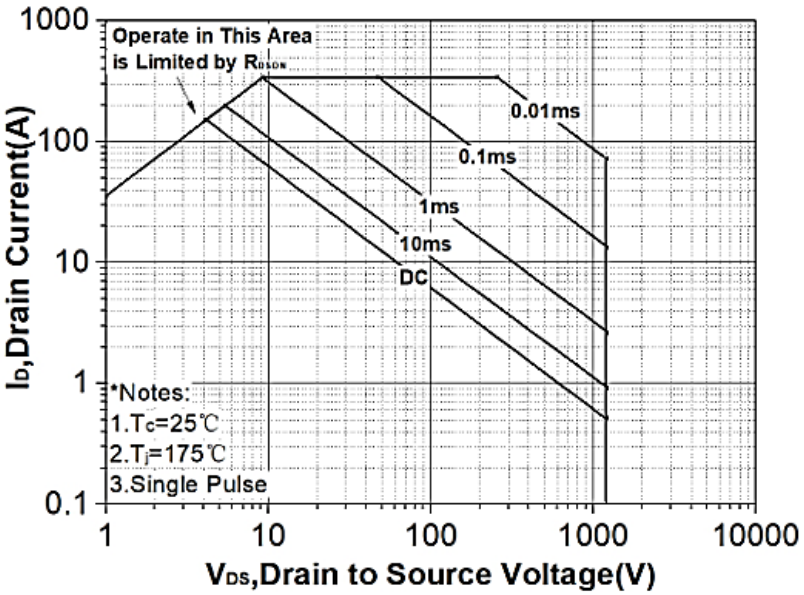


Figure 22. Safe operating area

ELECTRICAL CHARACTERISTIC DIAGRAMS (For Reference Only)

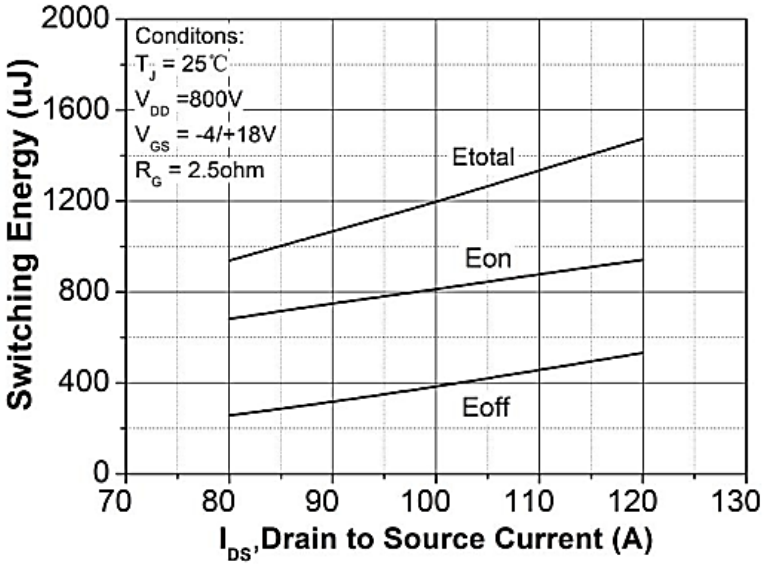


Figure 23. Clamped Inductive switching energy vs. drain current (V_{DD} = 800V)

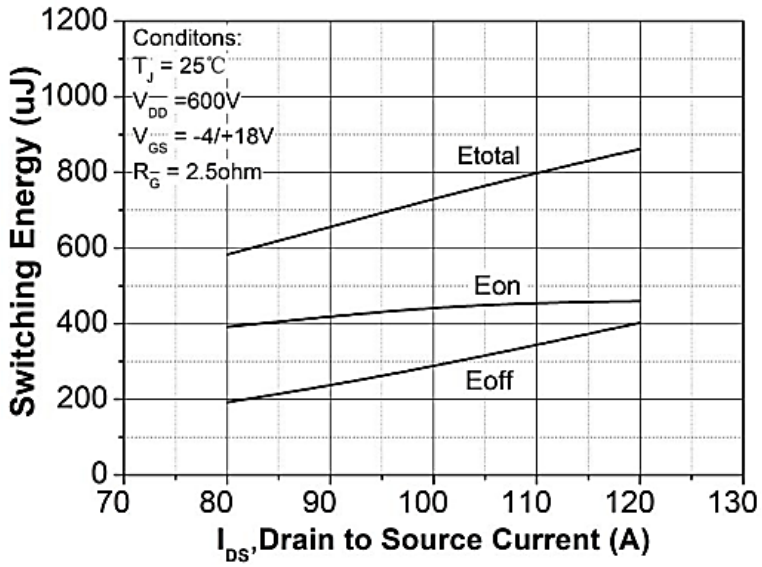


Figure 24. Clamped inductive switching energy vs. drain current (V_{DD} = 600V)

ELECTRICAL CHARACTERISTIC DIAGRAMS (For Reference Only)

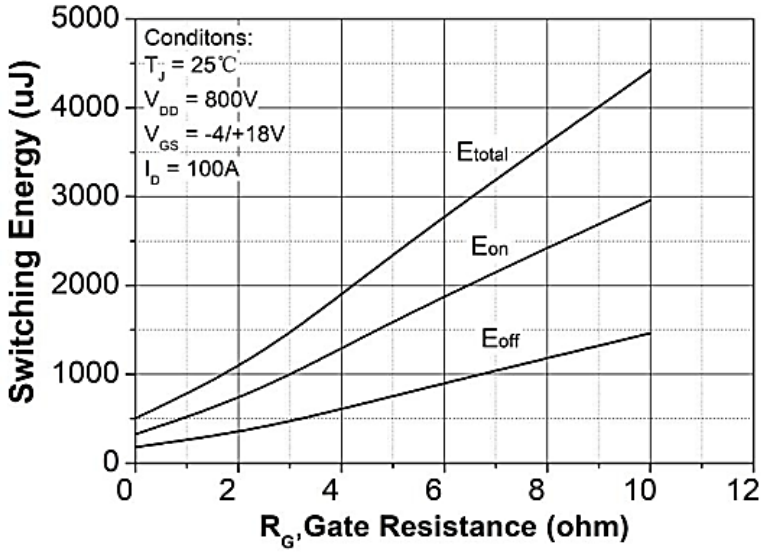


Figure 25. Clamped inductive switching energy vs. R_G(ext)

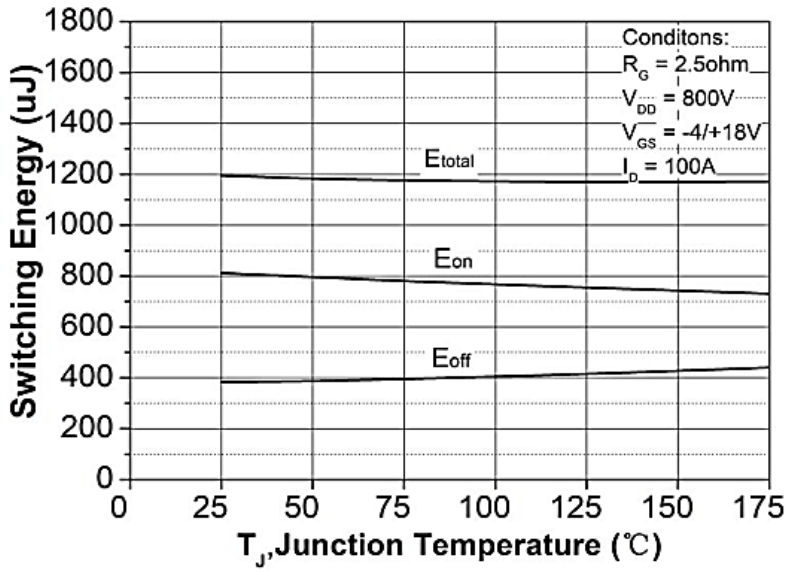


Figure 26. Clamped inductive switching energy vs. temperature

ELECTRICAL CHARACTERISTIC DIAGRAMS (For Reference Only)

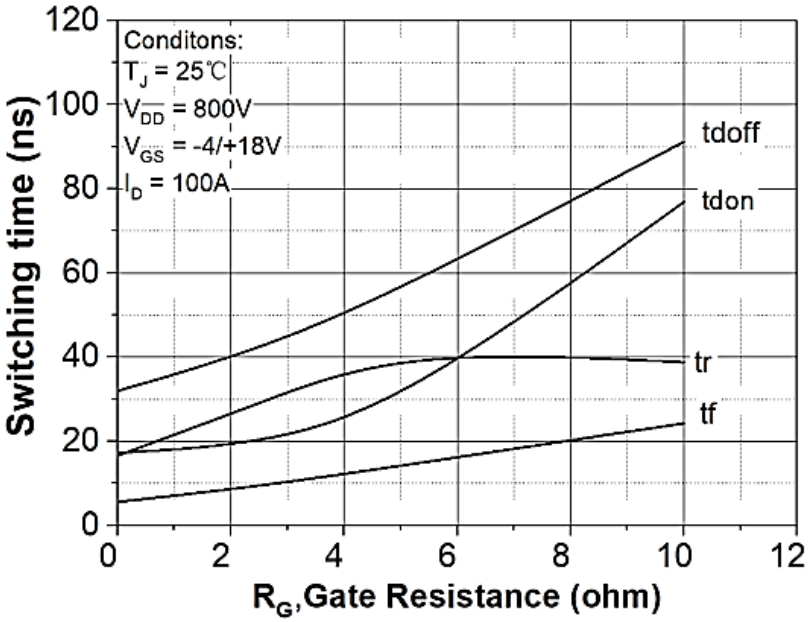


Figure 27. Switching times vs. R_G(ext)

TEST CONDITIONS

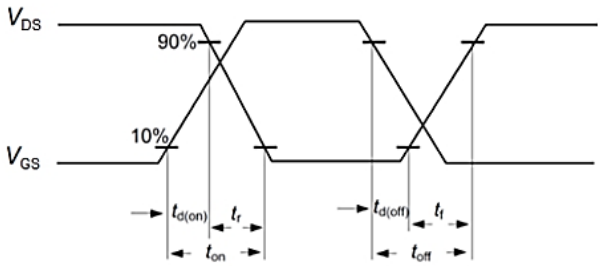


Figure A. Definition of switching times

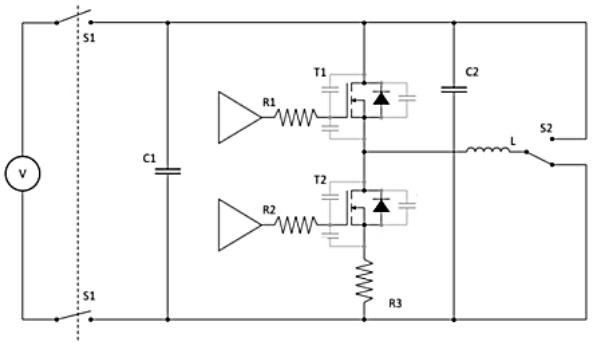


Figure B. Dynamic test circuit

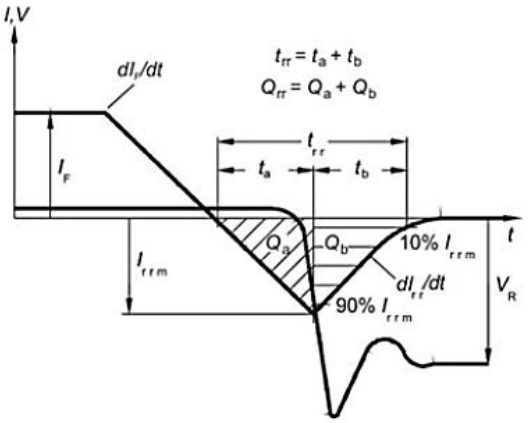


Figure C. Definition of diode switching characteristics

Figure C. Definition of body diode switching characteristics

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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.
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