SPECIFICATION SHEET

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

SPECIFICATION SHEET NO.	S1112 – LGE3M40120QL0T	
ORIGINAL MFG/PART NO.	LGE Diodes/LGE3M40120Q-L	
NEXTGEN PART CODE	LGE3M40120QL0T	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}): 1200V Max. Current Drain-source On-state Resistance $R_{DS(ON)}$: 40mΩ Typical Continuous Drain Current (I_D) @ Tc=25℃: 59A 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.

- Low On-Resistance
- Fast Switching Speed With Low Capacitances
- Fast Intrinsic Diode With Low Reverse Recovery (Q_{RR})
- Higher System Efficiency
- Parallel Device Convenience without Thermal Runaway
- High Temperature Application
- 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 Drives
- Solar Inverters
- DC/DC Converters
- Switched 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 LGE3M40120QL0T For RFQ and Order.

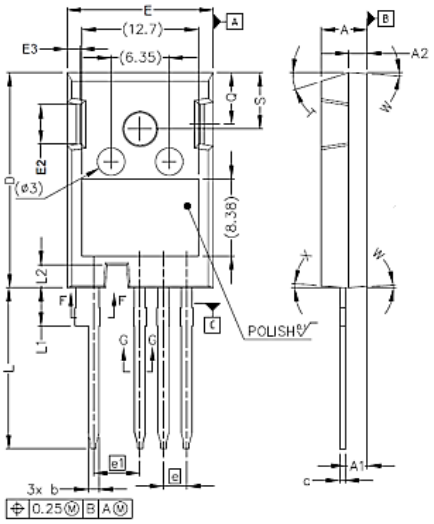
PART CODE GUIDE

RFQ
Request For Quotation

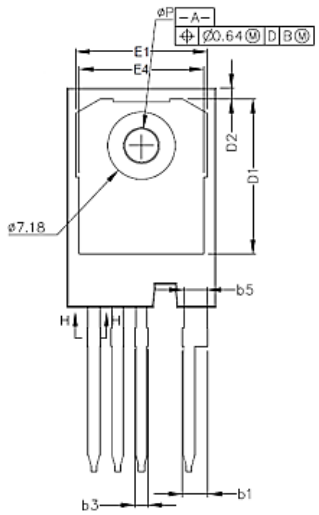
CODE	NAME	KEY SPECIFICATION OPTION
LGE3M	Product Series Code	Silicon Carbide (SiC) Power MOSFET, 4 Pins, Case TO-247-4, LGE3M L Series
40	Current Drain-source On-state Resistance $R_{DS(ON)}$ Code	40: 40mΩ Typical
120	Drain-Source Voltage (V_{DS}) Code	120: 1200V Max.
Q	Package Case Code	B: TO-247-3; 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

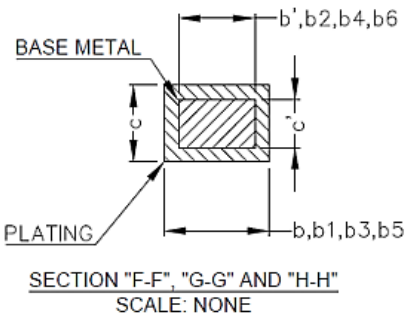
DIMENSION - - Unit: (mm), Case TO-247-4 Outline

Top View



Side View

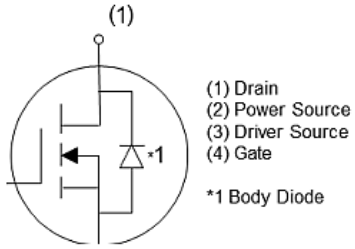




SECTION "F-F", "G-G" AND "H-H"
SCALE: NONE

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



1200V N-CHANNEL SiC MOSFET

VDS	ID @ Tc=25℃	R DS(on)	MARKING	PACKAGE/CASE
1200V	59A	40mΩ	LGE3M40120Q	TO-247-4

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

PARAMETER	SYMBOL	TEST CONDITIONS	VALUE	UNIT
Drain-Source Voltage	V DS		1200	V
Gate-Source Voltage (Dynamic)	V GS		-10/+22	V
Gate-Source Voltage (Static)	V GS		-6/+18	V
Continuous Drain Current(Note 1)	I D	Tc=25°C	59	A
		Tc=100°C	45	
Pulsed Drain Current(Note 2)	I DM		100	A
Power Dissipation	P D	TC=25°C	300	W
Operating Junction Temperature	T J		-55~ +175	°C
Storage Temperature	T STG		-55~ +175	℃

Note:

1. The Max Drain Current Limited By Maximum Junction Temperature
2. Repetitive Rating: Pulse Width Limited By Maximum Junction Temperature

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			MIN.	TYP.	MAX	
Thermal Resistance	$R_{th(j-c)}$	Junction-case, Steady-State	-	0.5	-	°C/W
Thermal Resistance	$R_{th(j-a)}$	Junction-Ambient, Steady-State	-	40	-	°C/W

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

- Static Characteristics

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=100μA	1200	-	-	V
Gates Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=9.5mA	2.2	3.2	4.5	V
		V_{DS}=V_{GS},I_D=9.5mA, T_J=175℃	-	2.2	-	
Zero Gates Voltage Drain Current	I_{DSS}	V_{DS}=1200V, V_{GS}=0V	-	5	50	μA
Gates Leakage Crurent	I_{GSS}	V_{GS}=+18V, V_{DS}=0V	-	-	100	nA
		V_{GS}=-6V, V_{DS}=0V	-	-	100	nA
Drain-source On-state Resistance	$R_{DS(ON)}$	V_{GS}=18V, I_D=33.3A	-	40	54	mΩ
		V_{GS}=18V, I_D=33.3A T_J=175°C	-	64	-	
Forward Transconductance	G_{FS}	V_{DS}=20V, I_D=33.3A	-	16	-	S
		V_{DS}=20V, I_D=33.3A, T_J=175°C	-	17	-	

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

- Switching Characteristics(Note3)
- Note 3: All switching characteristics reference TO247-3L.

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Turn On Delay Time	$T_{D(ON)}$	V_{DS} = 800 V, V_{GS} =-5V/18V, I_D = 33.3A, $R_{G(ext)}$ =5Ω, L=99μH Diode: Body Diode at V_{GS} = -5V	-	19	-	nS
Rise Time	T_R		-	22	-	nS
Turn Off Delay Time	$T_{D(OFF)}$		-	33	-	nS
Fall Time	T_F		-	22	-	nS
Turn On Energy	E_{ON}		-	1227	-	μJ
Turn Off Energy	E_{OFF}		-	160	-	μJ
Turn On Delay Time	$T_{D(ON)}$	V_{DS} = 800 V, V_{GS} =-5V/18V, I_D = 33.3A, $R_{G(ext)}$ =20Ω, L=99μH Diode: Body Diode at V_{GS} = -5V	-	30	-	nS
Rise Time	T_R		-	45	-	nS
Turn Off Delay Time	$T_{D(OFF)}$		-	88	-	nS
Fall Time	T_F		-	53	-	nS
Turn On Energy	E_{ON}		-	1970	-	μJ
Turn Off Energy	E_{OFF}		-	580	-	μJ

ELECTRICAL CHARACTERISTICS PART III- T_J = 25°C (Unless Otherwise Specified)

- Dynamic Characteristics

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Input Capacitance	C_{ISS}	V_{DS}=800V, V_{GS}=0V f = 100KHz, V_{AC} = 25 mV	-	2360	-	pF
Output Capacitance	C_{OSS}		-	108	-	pF
Reverse Transfer Capacitance	C_{RSS}		-	13	-	pF
C_{OSS} Stored Energy	E_{OSS}		-	43	-	µJ
Total Gate Charge	Q_g	V_{DS} =800V, V_{GS} =-5/18V I_D =33.3A	-	128	-	nC
Gate-Source Charge	Q_{gs}		-	38	-	
Gate-Drain Charge	Q_{gd}		-	58	-	
Gate Resistance	R_G	F = 1MHz, V_{AC} = 25 mV	-	3.3	-	Ω

DRAIN – SOURCE DIODE CHARACTERISTICS - T_J = 25° C (Unless Otherwise Specified)

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Diode Forward Voltage	V_{SD}	V_{GS} =-4V, I_{SD} =20A	-	4.5	-	V
		V_{GS} = -4V, I_{SD} = 20A, T_J = 175°C	-	4	-	
Maximum Continuous Drain-Source Diode Forward Current	I_S		-	59	-	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}		-	100	-	A
Reverse Recovery Time	T_{RR}	V_{GS} = -4V, I_{SD} = 33.3A, V_R= 800V, di/dt =650 A/µs	-	22	-	nS
Reverse Recovery Charge	Q_{RR}		-	92	-	nC
Peak Reverse Recovery Current	I_{RM}		-	7.5	-	A

ELECTRICAL CHARACTERISTICS DIAGRAMS(Note 4) (For Reference Only)

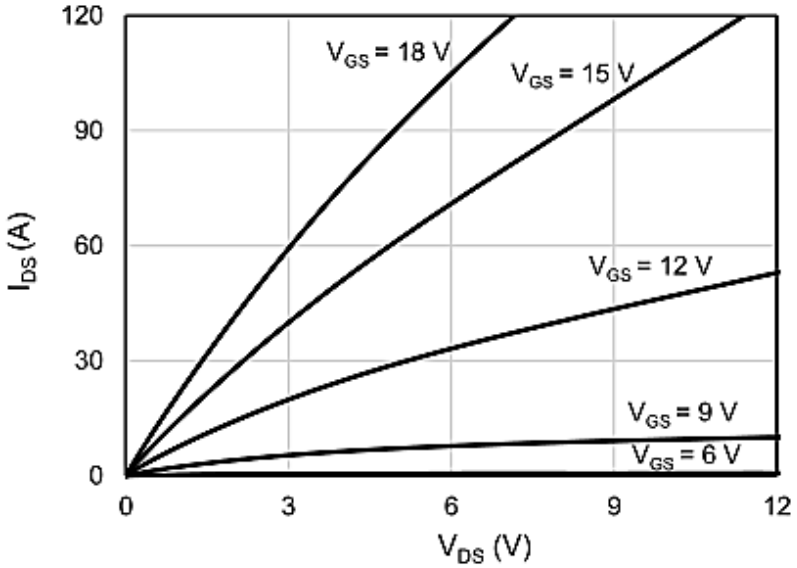


Figure 1: Output Characteristics T_J = -40℃

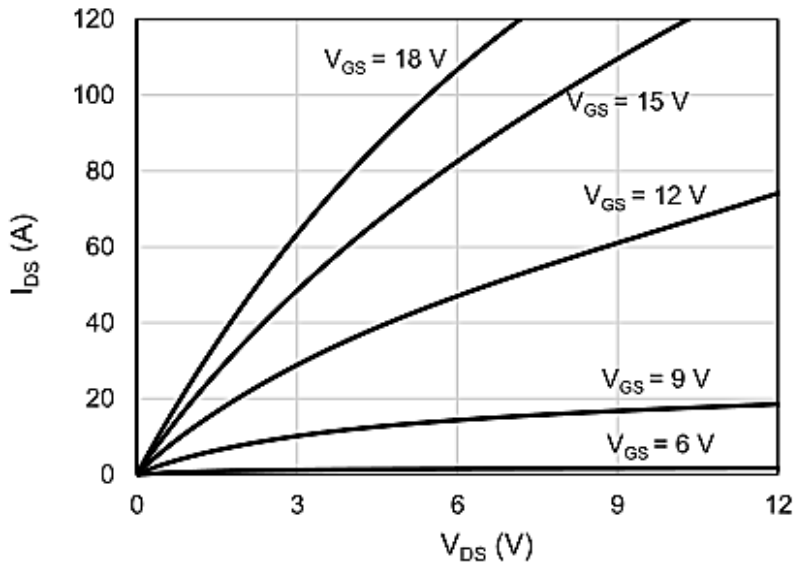


Figure 2: Output Characteristics T_J = 25℃

ELECTRICAL CHARACTERISTICS DIAGRAMS(Note 4) (For Reference Only)

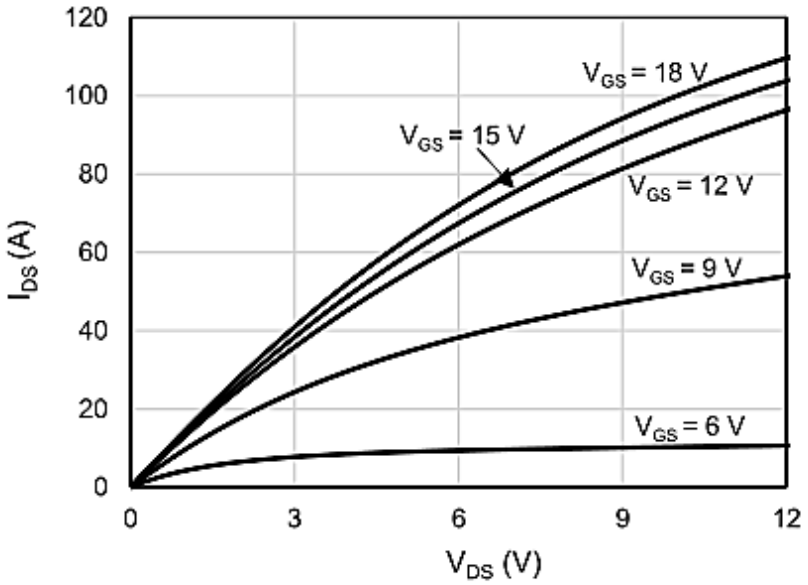


Figure 3: Output Characteristics T_J = 175℃

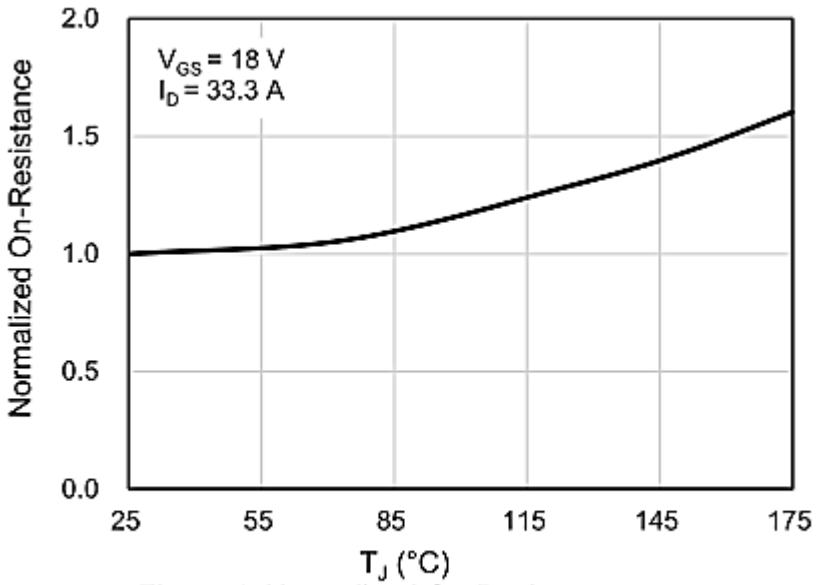


Figure 4: Normalized On-Resistance vs. Temperature

ELECTRICAL CHARACTERISTICS DIAGRAMS(Note 4) (For Reference Only)

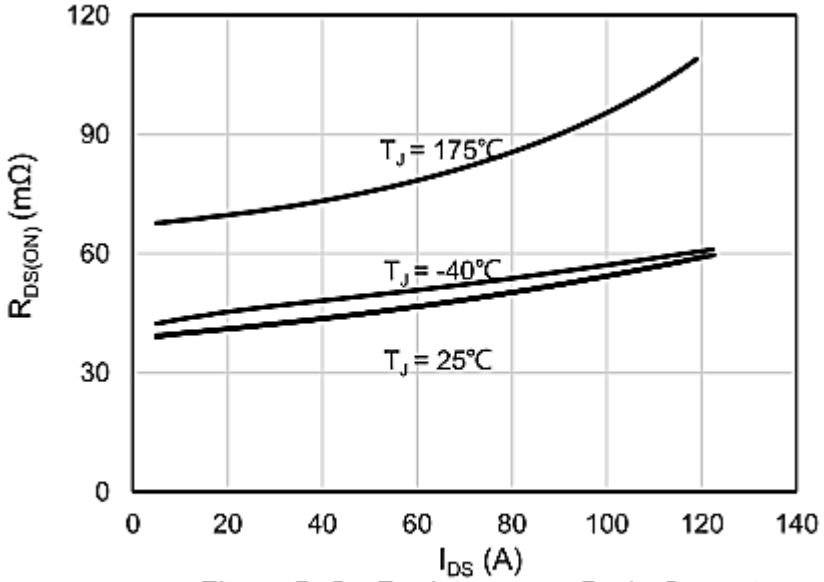


Figure 5: On-Resistance vs. Drain Current
For Various Temperatures

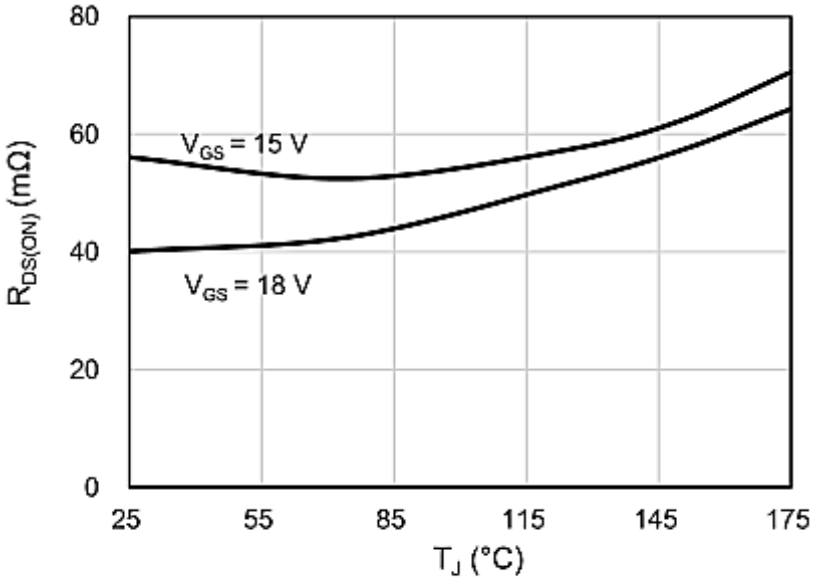


Figure 6: On-Resistance vs. Temperature
For Various Gate Voltage

ELECTRICAL CHARACTERISTICS DIAGRAMS(Note 4) (For Reference Only)

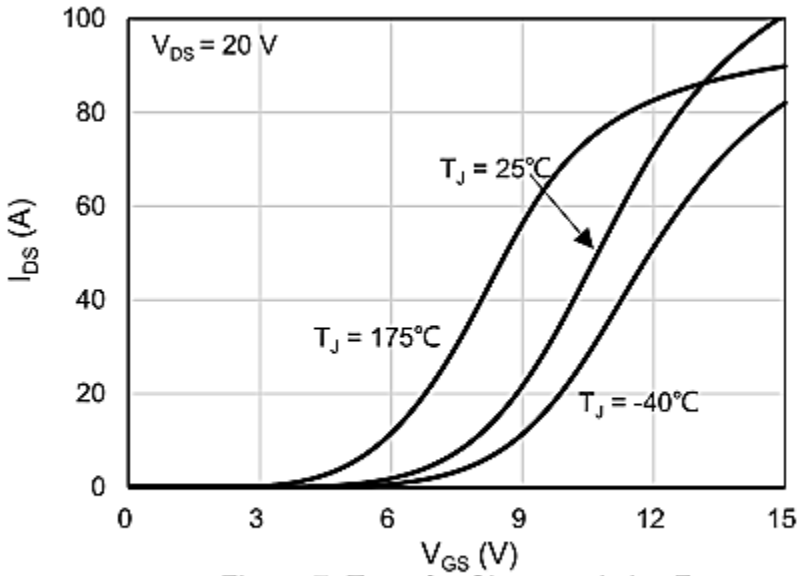


Figure 7: Transfer Characteristics For Various Junction Temparature

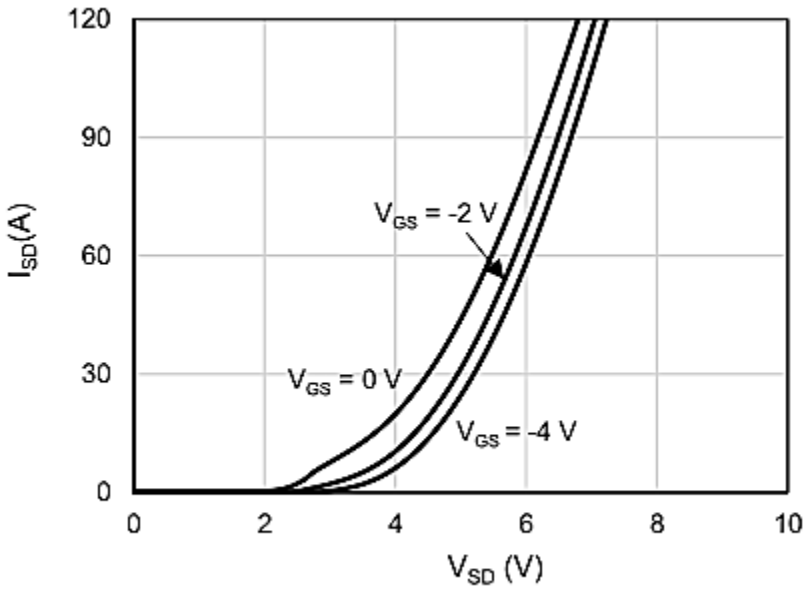


Figure 8: Body Diode Characteristics at -40°C

ELECTRICAL CHARACTERISTICS DIAGRAMS(Note 4) (For Reference Only)

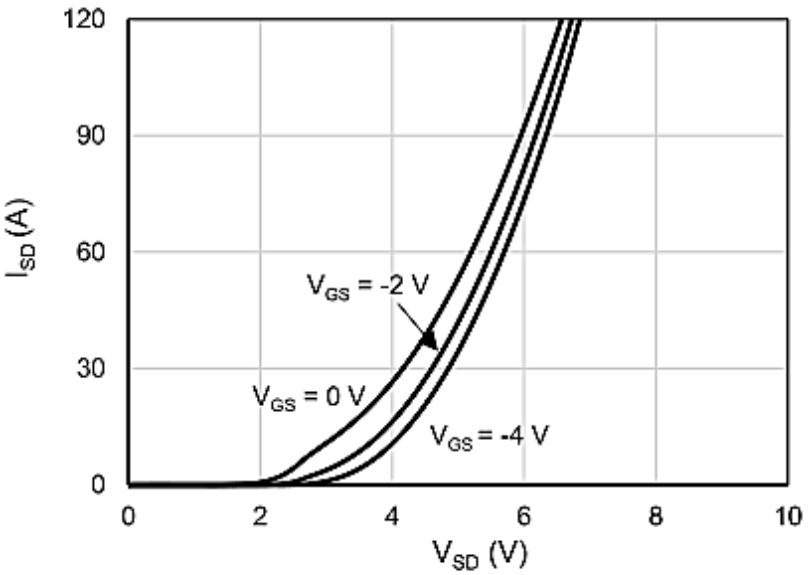


Figure 9: Body Diode Characteristics at 25°C

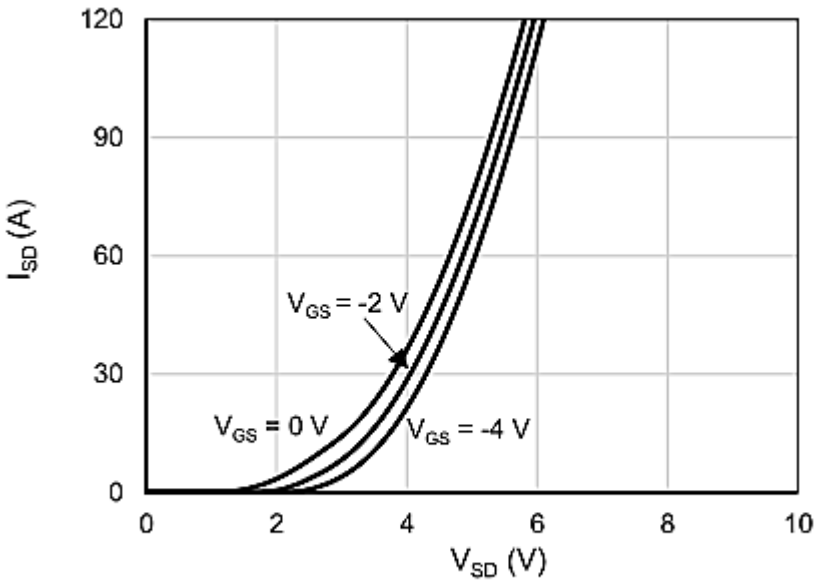


Figure 10: Body Diode Characteristics at 175°C

ELECTRICAL CHARACTERISTICS DIAGRAMS(Note 4) (For Reference Only)

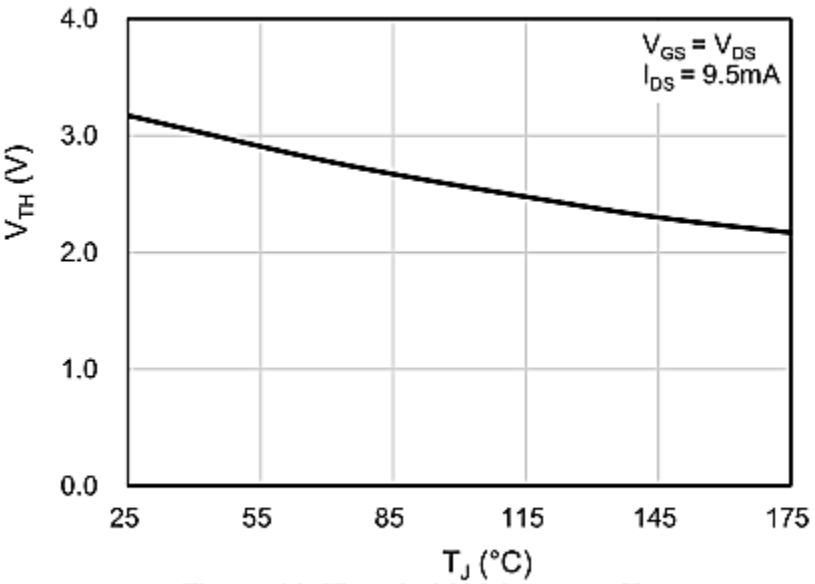


Figure 11: Threshold Voltage vs. Temperature

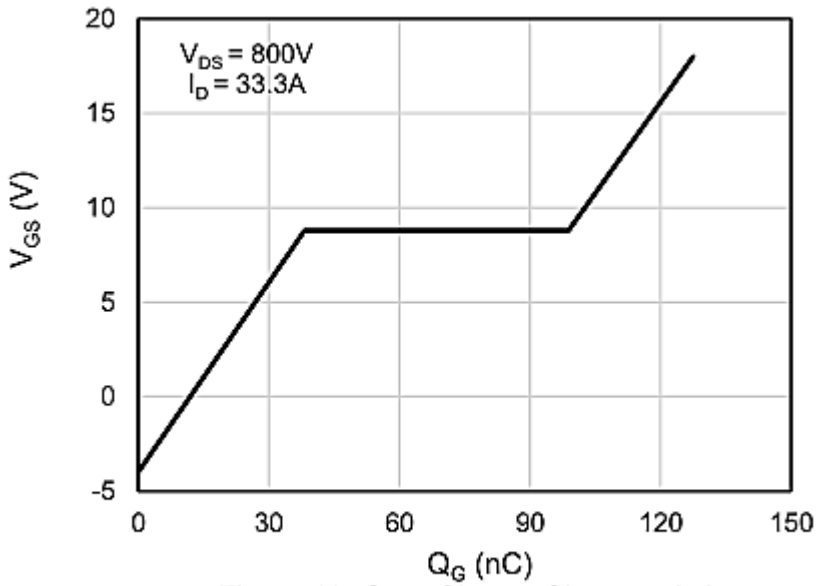


Figure 12: Gate-Charge Characteristics

ELECTRICAL CHARACTERISTICS DIAGRAMS(Note 4) (For Reference Only)

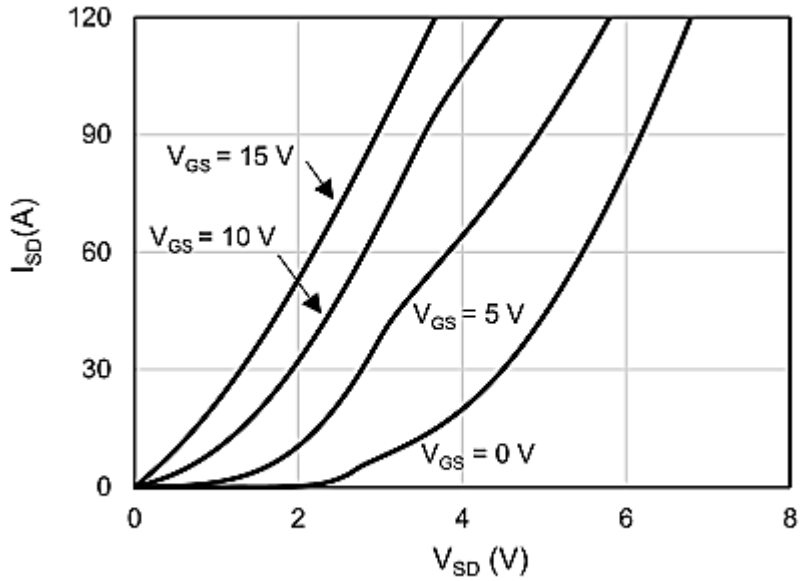


Figure 13: 3rd Quadrant Characteristics at -40℃

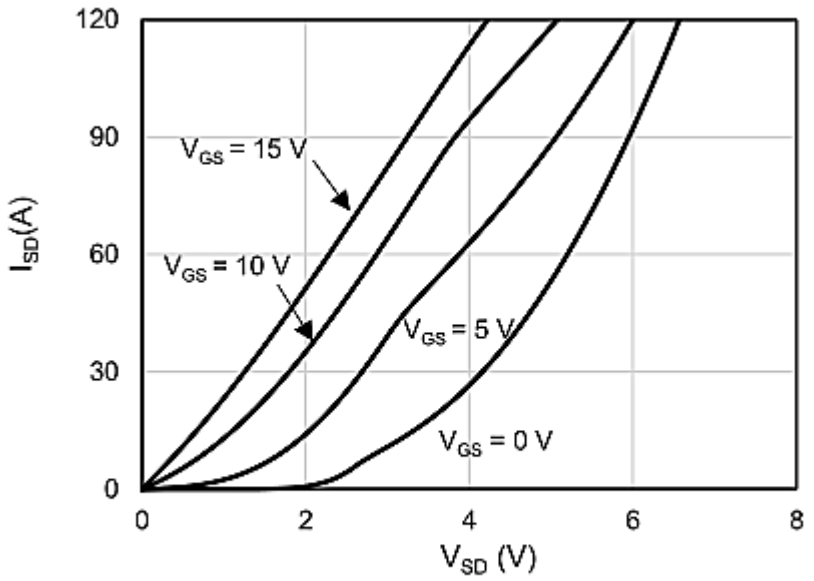


Figure 14: 3rd Quadrant Characteristics at 25℃

ELECTRICAL CHARACTERISTICS DIAGRAMS(Note 4) (For Reference Only)

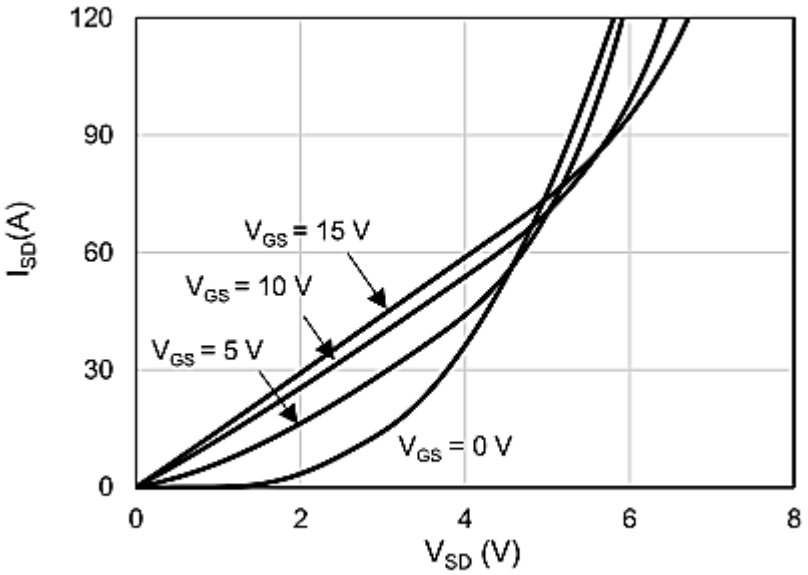


Figure 15: 3rd Quadrant Characteristics at 175℃

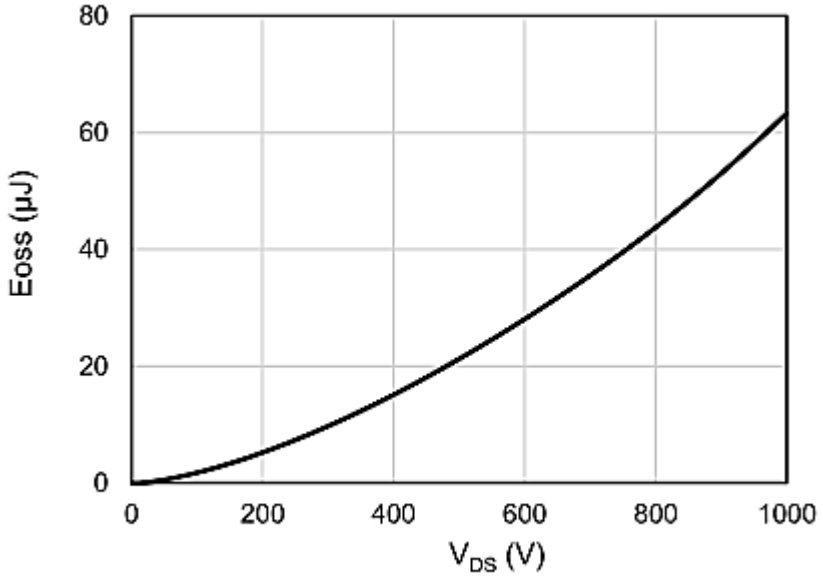


Figure 16: Output Capacitor Stord Energy

ELECTRICAL CHARACTERISTICS DIAGRAMS(Note 4) (For Reference Only)

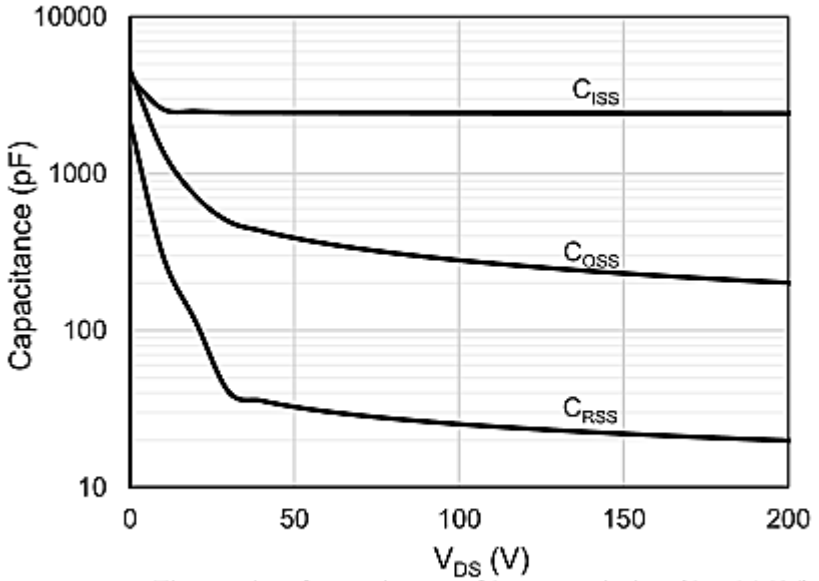


Figure 17: Capacitance Characteristics (0 - 200V)

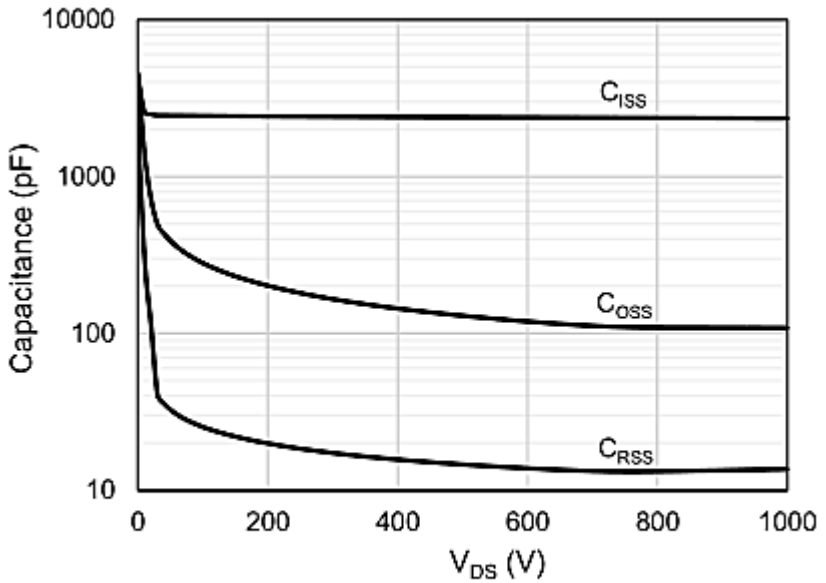


Figure 18: Capacitance Characteristics (0-1000V)

ELECTRICAL CHARACTERISTICS DIAGRAMS(Note 4) (For Reference Only)

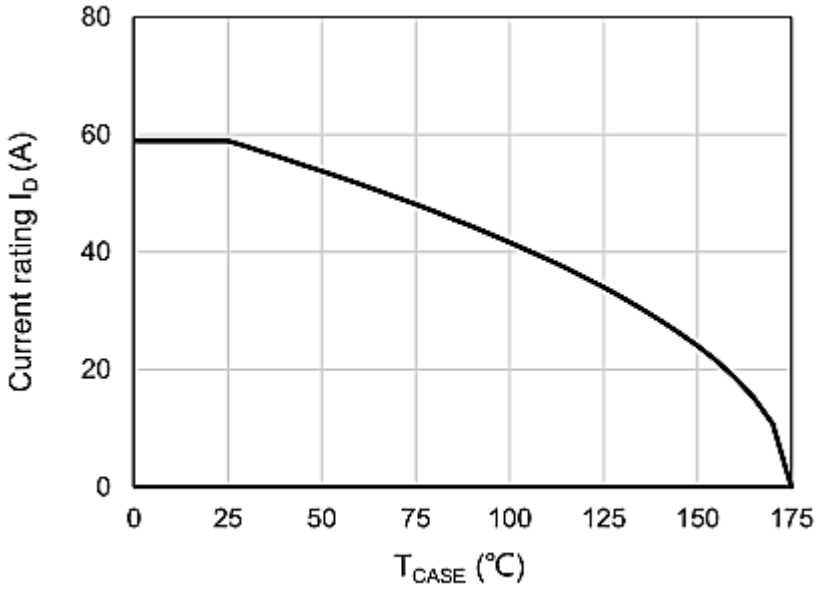


Figure 19: Current De-rating

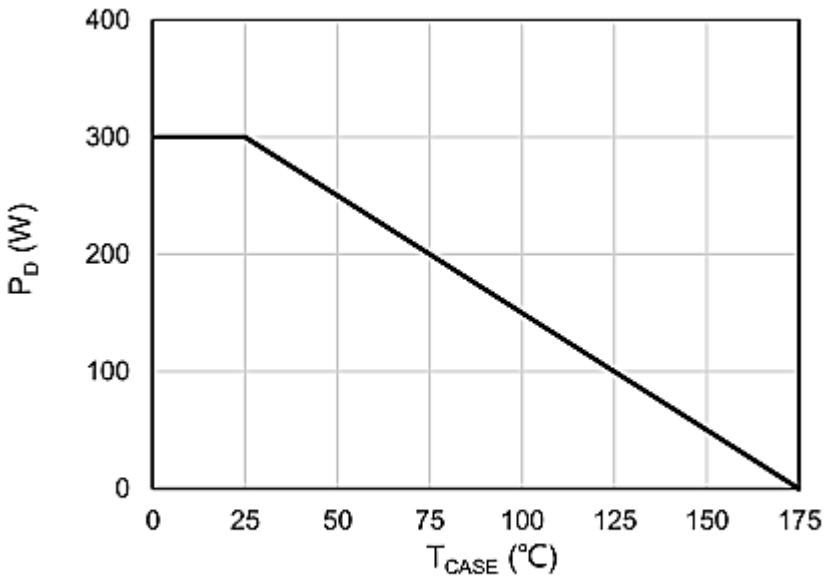


Figure 20: Maximum Power Disspation Derating vs CaseTemperature

ELECTRICAL CHARACTERISTICS DIAGRAMS(Note 4) (For Reference Only)

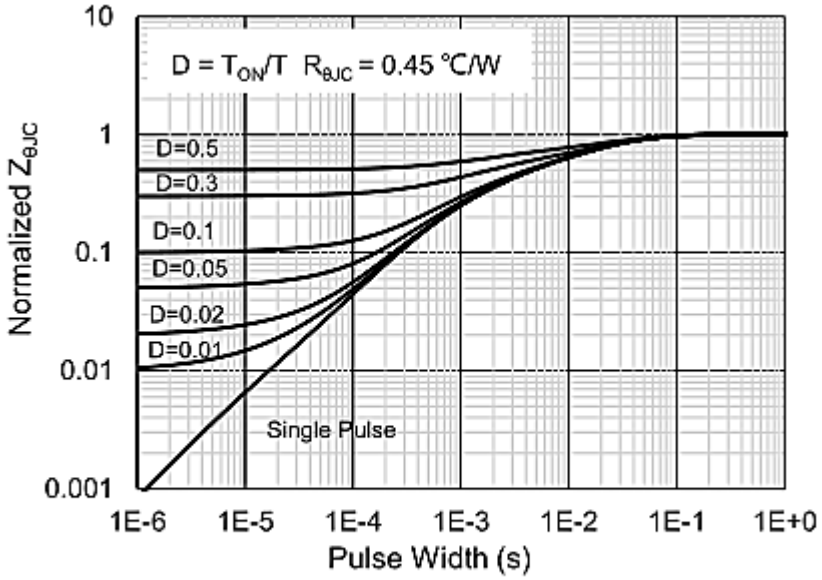


Figure 21: Normalized Maximum Transient Thermal Impedance

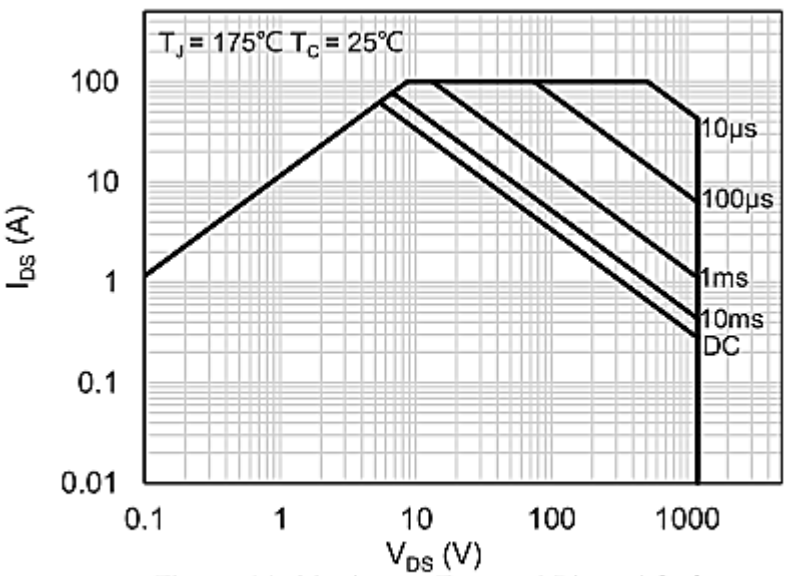


Figure 22: Maximum Forward Biased Safe Operating Area

ELECTRICAL CHARACTERISTICS DIAGRAMS(Note 4) (For Reference Only)

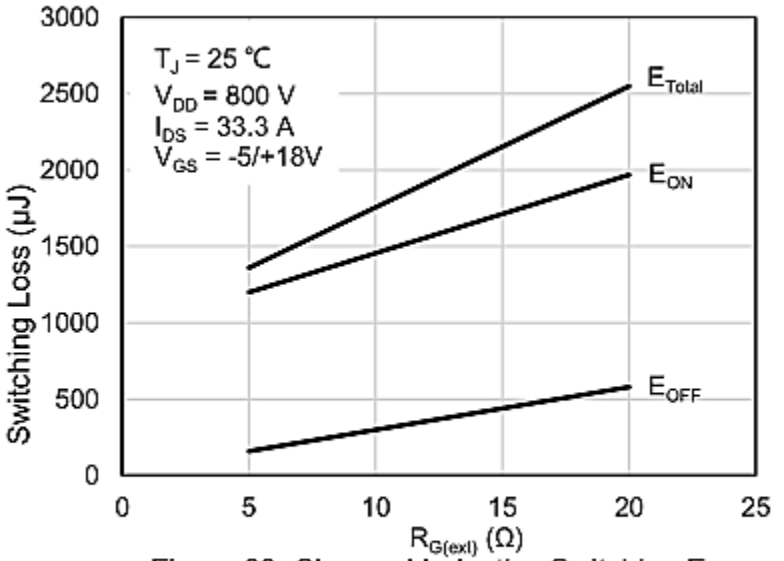


Figure 23: Clamped Inductive Switching Energy vs. $R_{G(ext)}$

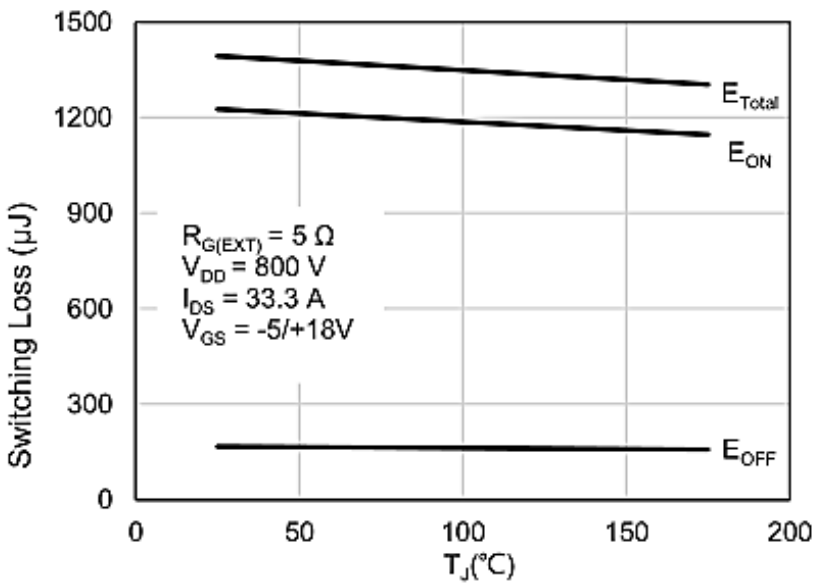


Figure 24: Clamped Inductive Switching Energy vs. T_J

ELECTRICAL CHARACTERISTICS DIAGRAMS(Note 4) (For Reference Only)

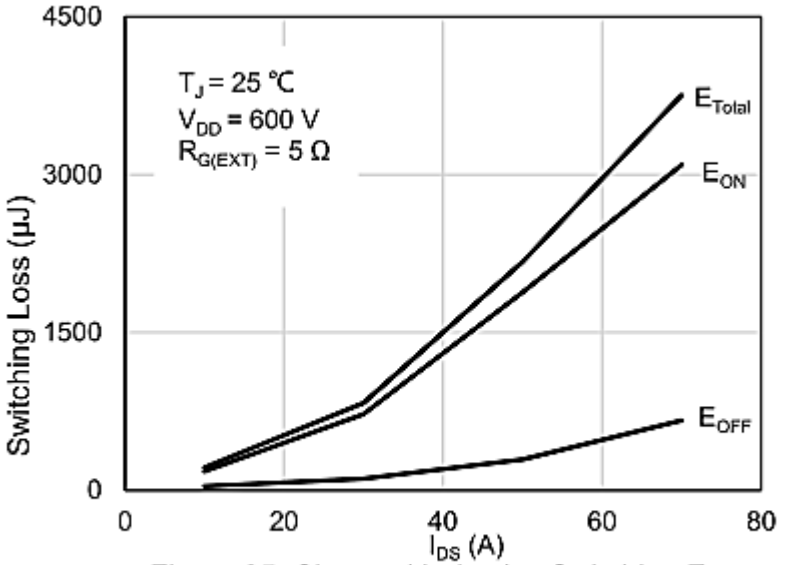


Figure 25: Clamped Inductive Switching Energy vs. Drain Current (V_{DD} = 600 V)

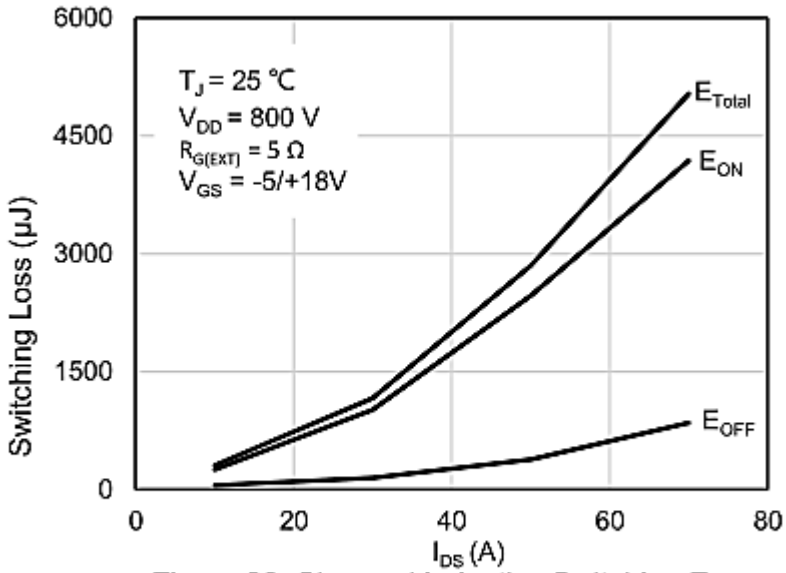
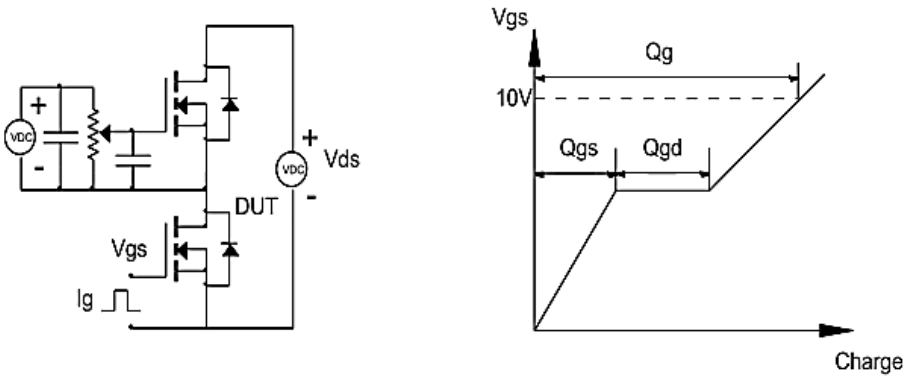


Figure 26: Clamped Inductive Switching Energy vs. Drain Current (V_{DD} = 800 V)

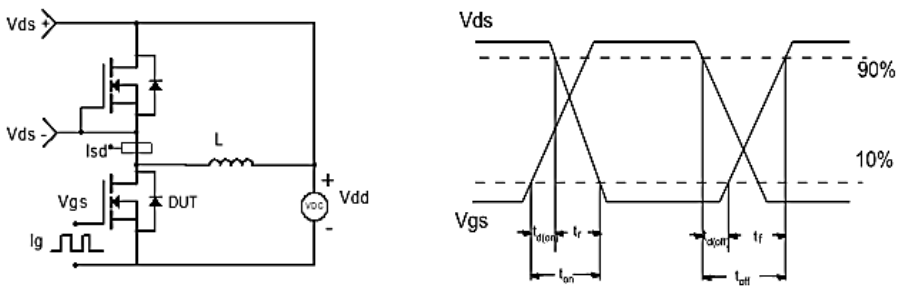
Note 4: All figures reference TO247-3L.

TEST CIRCUIT AND WAVEFORM

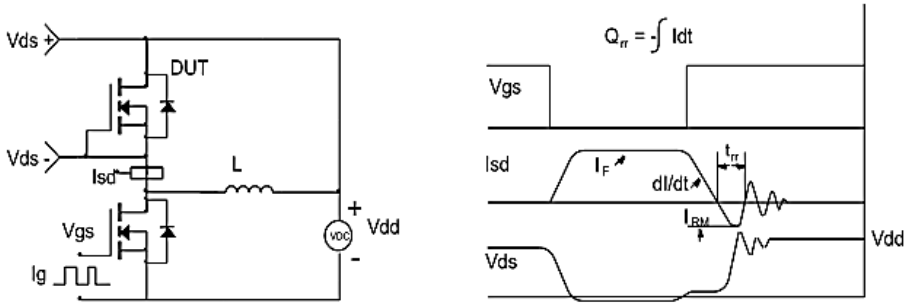
Gate Charge Test Circuit & Waveform



Clamped Inductive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



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