

SPECIFICATION SHEET NO.	S1111 – LGE3M70120QL0T	
ORIGINAL MFG/PART NO.	 LGE Diodes/LGE3M70120Q-L	
NEXTGEN PART CODE	LGE3M70120QL0T	Indicate This Code For RFQ /Order
DATE	Nov. 11, 2025	
REVISION	A4	Updated With Most Recent Data
DESCRIPTION AND MAIN PARAMETRICS	<p>Silicon Carbide (SiC) Power MOSFET, 4 Pins, Case TO-247-4, LGE3M L Series, AEC-Q101 and PPAP Capable, Drain-Source Voltage (V_{DS}): 1200V Max.</p> <p>Current Drain-source On-state Resistance R_{DS(ON)}: 68mΩ Typ.</p> <p>Continuous Drain Current (I_D) @ T_c=25°C: 39A</p> <p>Operating Temperature: -40°C ~ 175°C (T_J)</p> <p>Package in Tube, 30pcs/Tube</p> <p>RoHS/RoHS III compliant, RoHS Annex III lead Exemption (Exempt per RoHS EU 2015/863) and Halogen Free (HF)</p>	
CUSTOMER		
CUSTOMER PART NUMBER		
CROSS REF. PART NUMBER		
MEMO		

VENDOR APPROVE		
Issued/Checked/Approved		
		
Effective Date: Nov. 11, 2025		

CUSTOMER APPROVE	
Date:	

MAIN FEATURE

- 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
- 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)



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



APPLICATION

- Motor Drives
- Solar / Wind Inverters
- EV Charging Station
- 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 LGE3M70120QL0T For RFQ and Order.

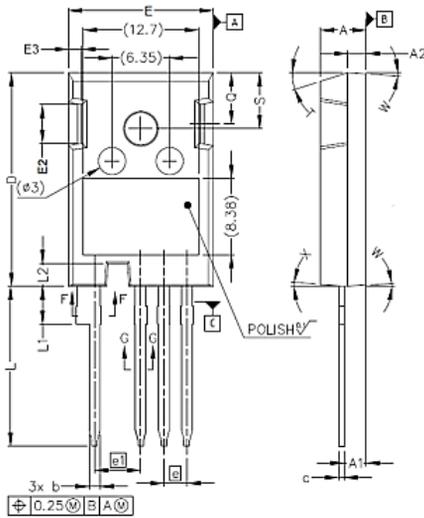
PART CODE GUIDE

RFQ
Request For Quotation

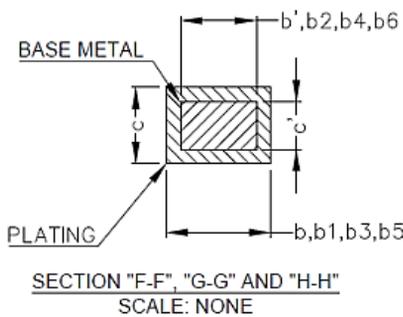
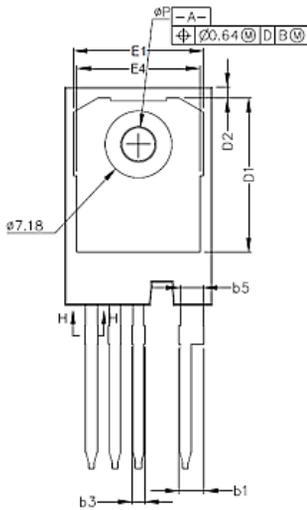
CODE	NAME	KEY SPECIFICATION OPTION
LGE3M	Product Series Code	Silicon Carbide (SiC) Power MOSFET, 4 Pins, Case TO-247-4, LGE3M L Series
70	Current Drain-source On-state Resistance R _{DS(ON)} Code	70: 68mΩ
120	Drain-Source Voltage (V _{DS}) Code	120: 1200V Max.
Q	Package Case Code	B: TO-247-3; E: TO-263-2; J: TO-263-7; Q: TO-247-4;
LOT	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

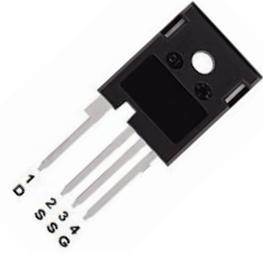
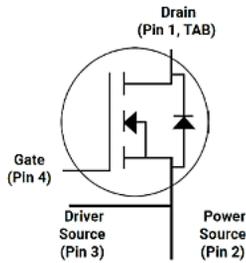


Note:

- 1.All Metal Surfaces: Tin Plated, except Area Of Cut
- 2.Dimensioning & Tolerancing Confirm To Asme Y14.5M-1994

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°C	R DS(on)	MARKING	PACKAGE/CASE
1200V	39A	68mΩ	LGE3M70120Q	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		1200	V
Gate-Source Voltage (Dynamic)	V GS, MAX	Tsurge <100ns	-10/+25	V
Gate-Source Voltage (Static)	V Gsop	Static	-5/+20	V
Continuous Drain Current	I D	VGS=20V, Tc=25°C	39	A
		VGS=20V, Tc=100°C	27	
Pulsed Drain Current	I D (pulse)	Tc=25°C	85	A
Total Power Dissipation	P D	TC=25°C	200	W
Avalanche Energy	EAS	VDD = 100V, VGS=20V, L=2mH	256	mJ
Avalanche Peak Current	I AV	VDD = 100V, VGS=20V, L=2mH	16	A
Operating Junction and Storage Temperature Range	T J, T STG		-40~ +175	°C

ELECTRICAL CHARACTERISTICS PART I - T_c = 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	V _{GS(th)}	V _{DS} =V _{GS} , I _D =5mA	1.8	2.6	3.6	V
		V _{DS} =V _{GS} , I _D =5mA, T _j =150°C	-	1.9	-	
		V _{DS} =V _{GS} , I _D =5mA, T _j =175°C	-	1.8	-	
Zero Gates Voltage Drain Current	I _{DSS}	V _{DS} =1200V, V _{GS} =0V	0	1	50	μA
Gates-Source Leakage Current	I _{GSS}	V _{GS} =20V, V _{DS} =0V	0	1	200	nA
Gates-Source Leakage Current	I _{GSS}	V _{GS} =-5V, V _{DS} =0V	-200	-1	0	nA
Drain-source On-state Resistance	R _{DS(ON)}	V _{GS} =20V, I _D =20A	-	68	85	mΩ
		V _{GS} =20V, I _D =20A T _j =150°C	-	108	-	
		V _{GS} =20V, I _D =20A T _j =175°C	-	122	-	
Transconductance	g _{fs}	V _{DS} =20V, I _D =20A	-	10.3	-	S
		V _{DS} =20V, I _D =20A, T _j =150°C	-	9.7	-	
		V _{DS} =20V, I _D =20A, T _j =175°C	-	9.6	-	
Input Capacitance	C _{ISS}	V _{DS} =1000V, V _{GS} =0V f = 1MHz	-	1340	-	pF
Output Capacitance	C _{OSS}		-	63	-	pF
Reverse Transfer Capacitance	C _{RSS}		-	4	-	pF
C _{OSS} Stored Energy	E _{OSS}		-	41	-	μJ

ELECTRICAL CHARACTERISTICS PART II - $T_c = 25^\circ \text{C}$ (Unless Otherwise Specified)

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Total Gate Charge	Q_g	$V_{DS} = 800V,$ $V_{GS} = -5/20V$ $I_D = 20A$	-	69	-	nC
Gate-Source Charge	Q_{gs}		-	20	-	
Gate-Drain Charge	Q_{gd}		-	24	-	
Internal Gate Input Resistance	$R_{g(int)}$	$f = 1MHz,$ $I_D = 0A$	-	2.5	-	Ω
Series Inductance	L_s	$f = 1MHz$	-	4.5	-	nH
Turn - On Switching Energy	E_{on}	$V_{DS} = 800 V,$ $V_{GS} = -5V/20V,$ $I_D = 20A,$ $R_{G(ext)} = 2\Omega,$ $L = 100\mu H$	-	210	-	μJ
Turn - Off Switching Energy	E_{off}		-	33	-	μJ
Turn - On Delay Time	$t_{d(on)}$		-	10	-	ns
Rise Time	t_r		-	12	-	ns
Turn - Off Delay Time	$t_{d(off)}$		-	21	-	ns
Fall Time	t_f		-	9	-	ns

REVERSE DIODE CHARACTERISTICS - $T_c = 25^\circ\text{C}$ (Unless Otherwise Specified)

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			Min.	Typ.	Max.	
Diode Forward Voltage	V_{SD}	$V_{GS} = -5V, I_{SD} = 10A$	-	4.4	-	V
		$V_{GS} = -5V, I_{SD} = 10A,$ $T_J = 150^\circ\text{C}$	-	4.0	-	
		$V_{GS} = -5V, I_{SD} = 10A,$ $T_J = 175^\circ\text{C}$	-	3.9	-	
Continuous Diode Forward Current	I_S	$V_{GS} = -5V$	-	-	33	A
Reverse Recovery Time	T_{rr}	$V_{GS} = -5V,$ $I_{SD} = 20A,$ $V_R = 800V,$ $di/dt = 3300\text{ A}/\mu\text{s}$	-	14	-	nS
Reverse Recovery Charge	Q_{rr}		-	146	-	nC
Peak Reverse Recovery Current	I_{rrm}		-	20	-	A

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	CONDITIONS	VALUE			UNIT
			MIN.	TYP.	MAX	
Thermal Resistance	$R_{th(j-c)}$	Junction-case	-	0.60	0.75	$^\circ\text{C}/\text{W}$

TYPICAL PERFORMANCE (For Reference Only)

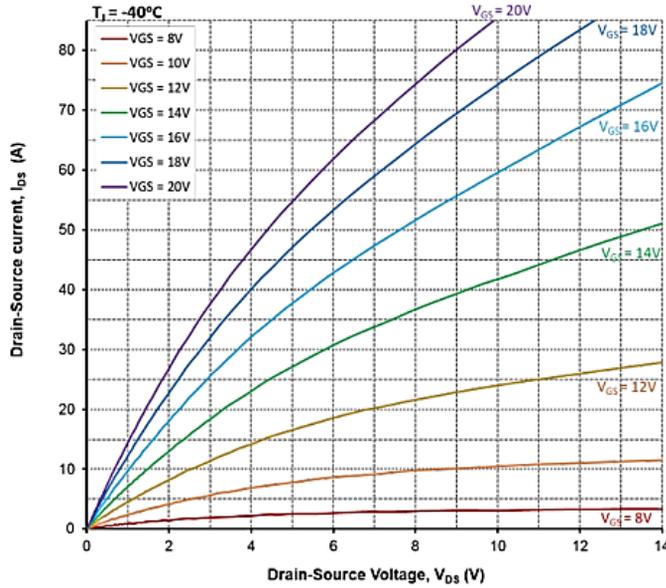


Figure 1. Output Characteristics, $T_J = -40^\circ\text{C}$

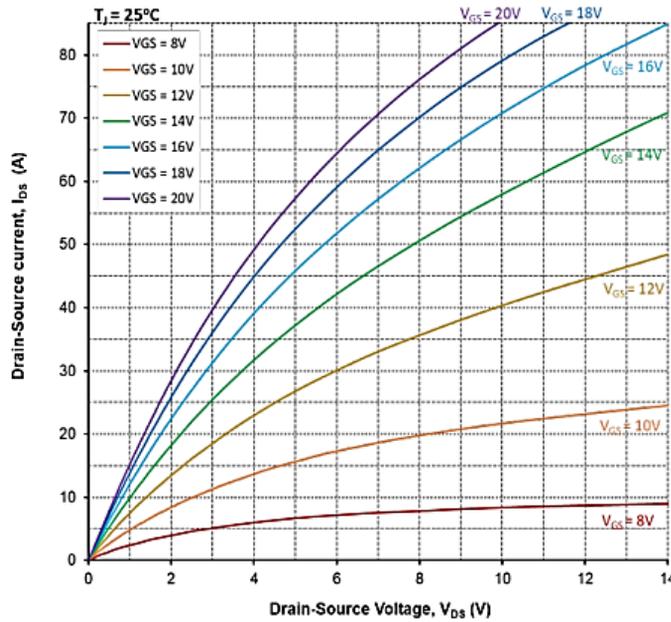


Figure 2. Output Characteristics, $T_J = 25^\circ\text{C}$

TYPICAL PERFORMANCE (For Reference Only)

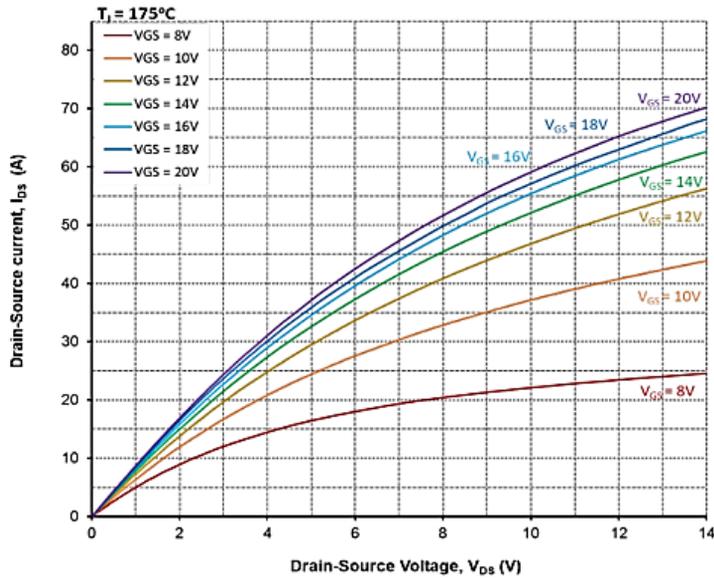


Figure 3. Output Characteristics, T_J = 175°C

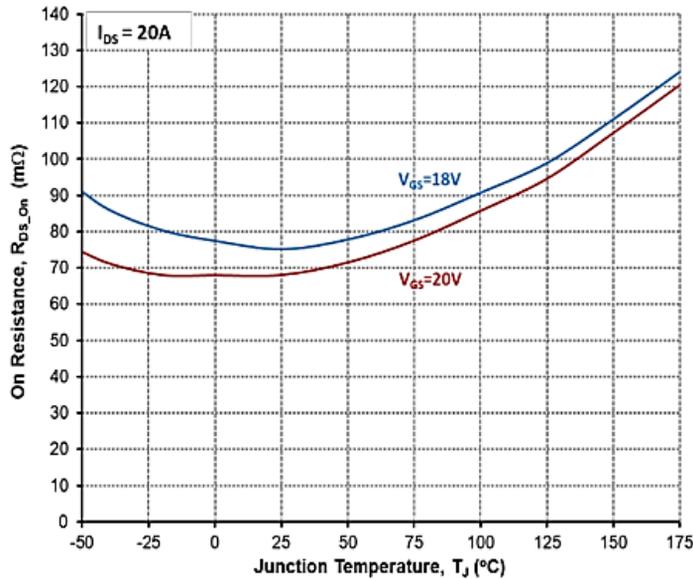


Figure 4. On-Resistance vs. Temperature

TYPICAL PERFORMANCE (For Reference Only)

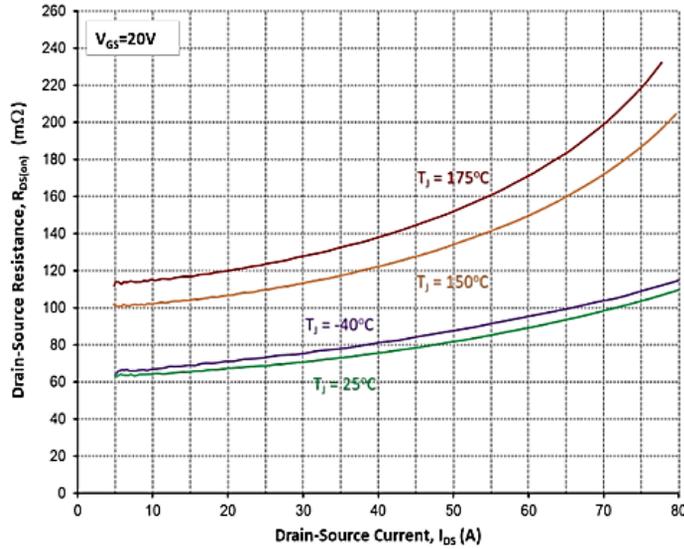


Figure 5. On-Resistance vs. Drain Current For Various Temperatures

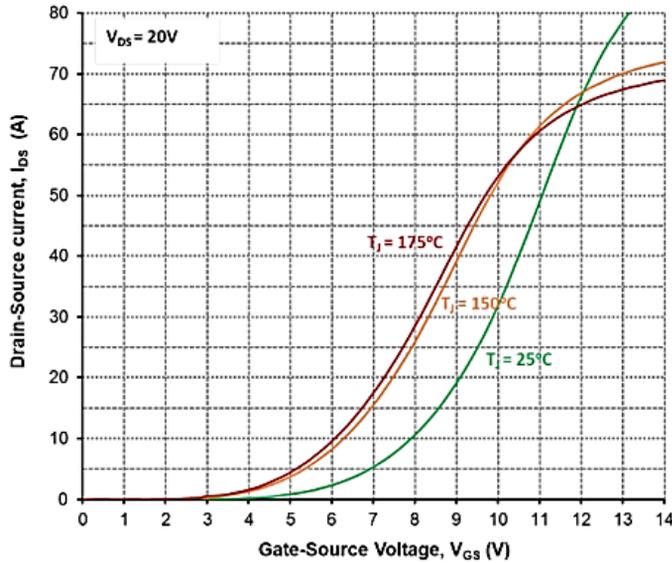


Figure 6. Transfer Characteristic For Various Junction Temperatures

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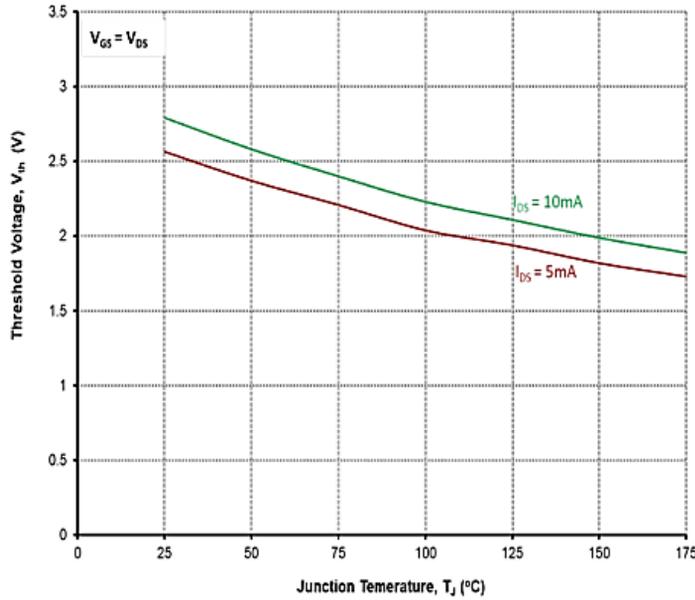


Figure 7. Threshold Voltage vs. Temperature

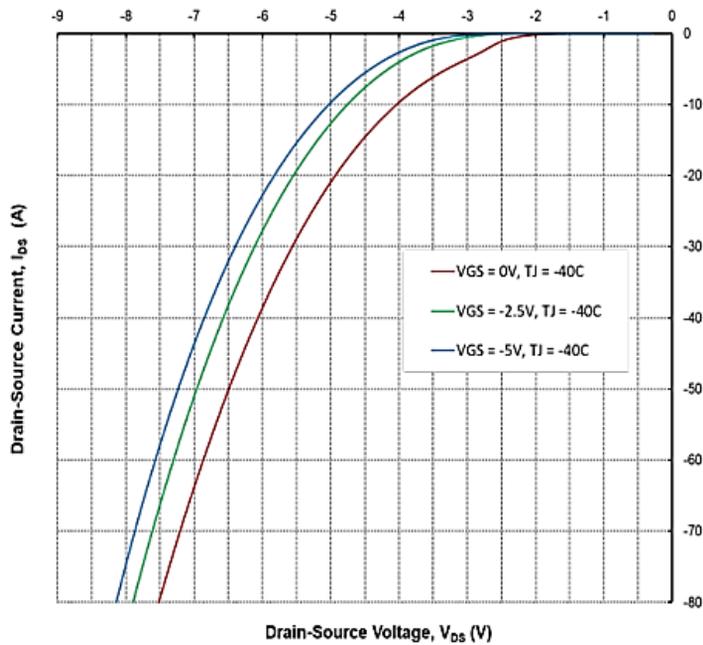


Figure 8. Body Diode Characteristics @ -40°C

TYPICAL PERFORMANCE (For Reference Only)

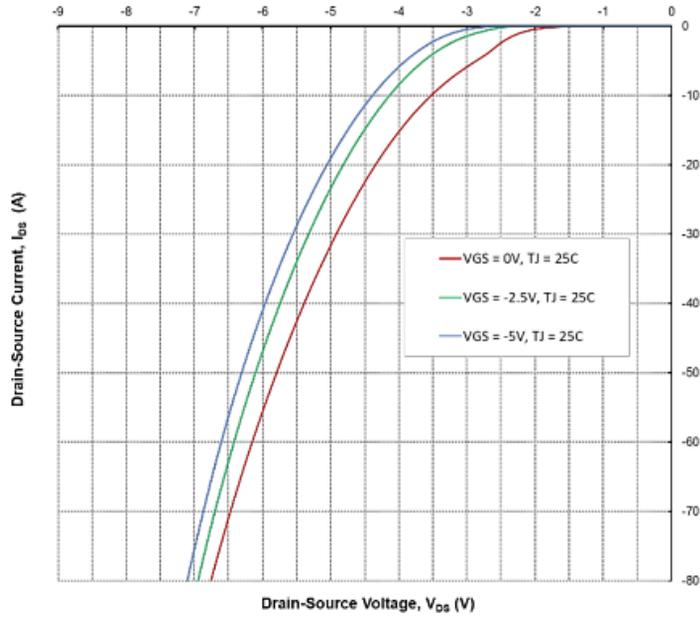


Figure 9. Body Diode Characteristics @ 25°C

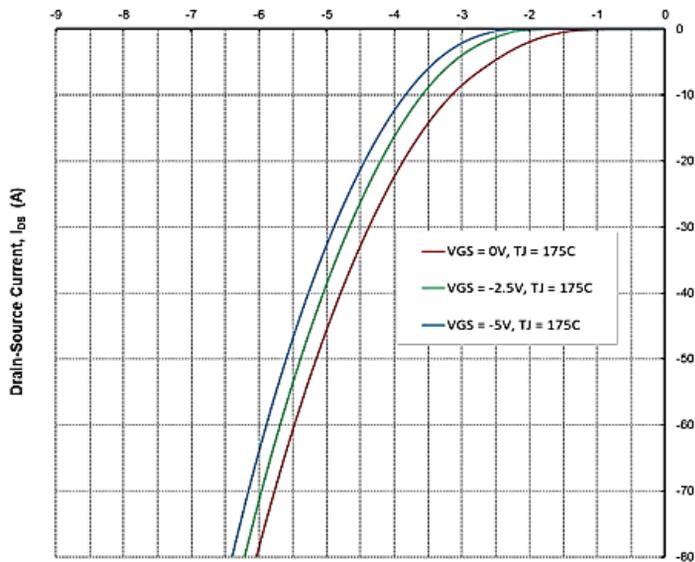


Figure 10. Body Diode Characteristics @ 175°C

TYPICAL PERFORMANCE (For Reference Only)

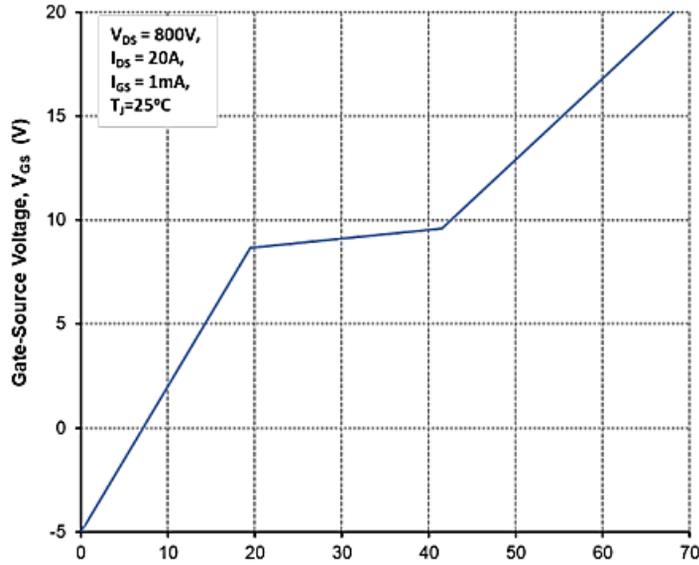


Figure 11. Gate Charge Characteristics

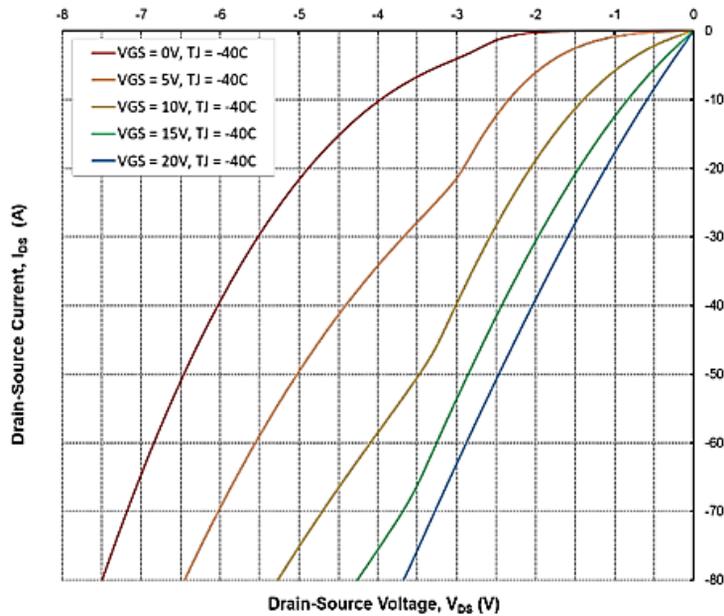


Figure 12. 3rd Quadrant Characteristics @ $-40^\circ C$

TYPICAL PERFORMANCE (For Reference Only)

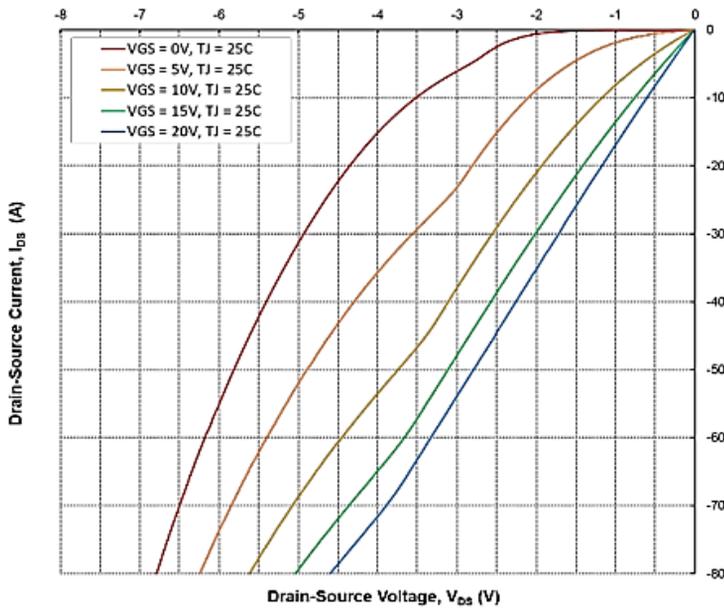


Figure 13. 3rd Quadrant Characteristics @ 25°C

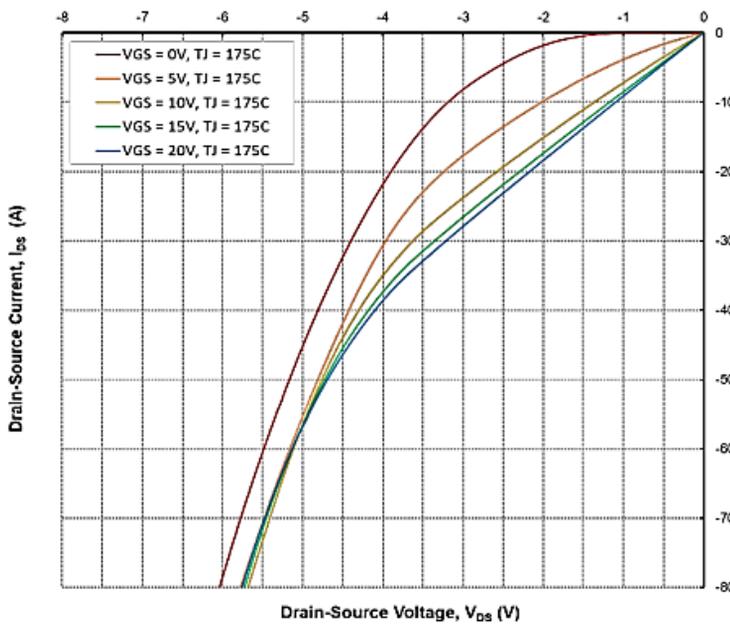


Figure 14. 3rd Quadrant Characteristics @ 175°C

TYPICAL PERFORMANCE (For Reference Only)

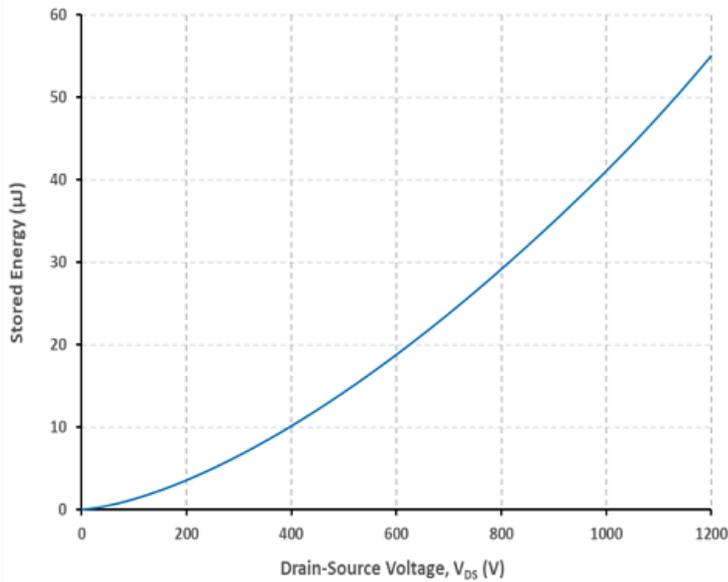


Figure 15. Output Capacitor Stored Energy

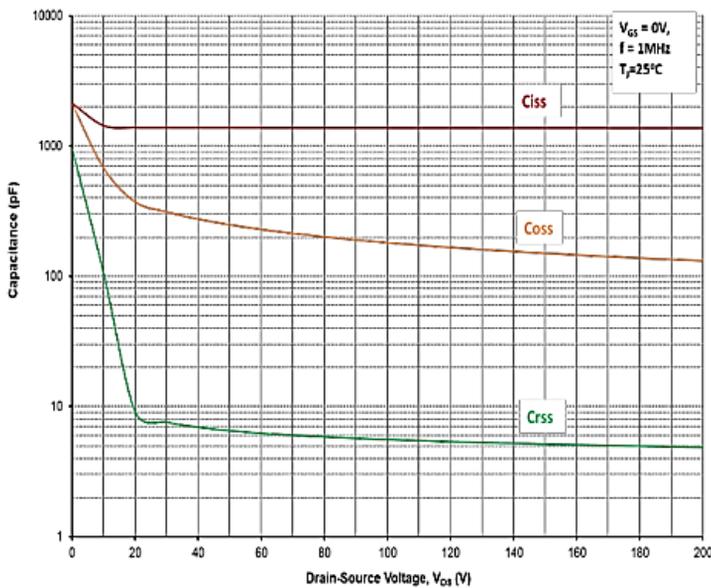


Figure 16. Capacitances vs. Drain-Source Voltage (0-200V)

TYPICAL PERFORMANCE (For Reference Only)

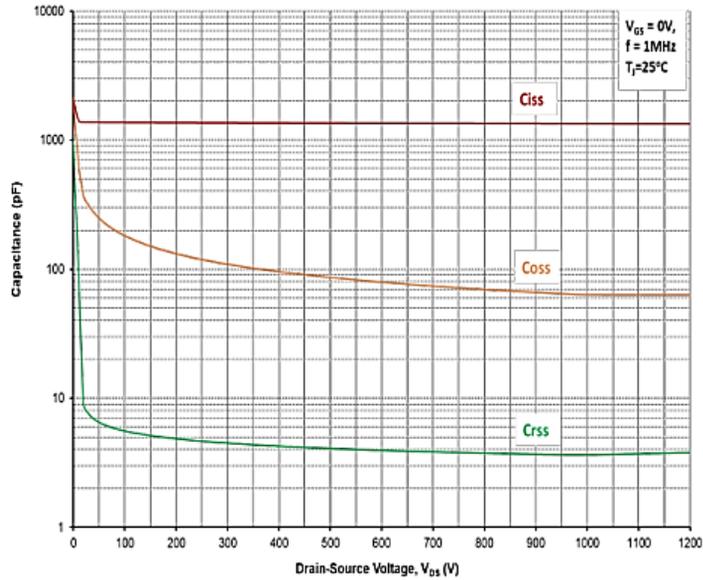


Figure 17. Capacitances vs. Drain-Source Voltage (0-1200V)

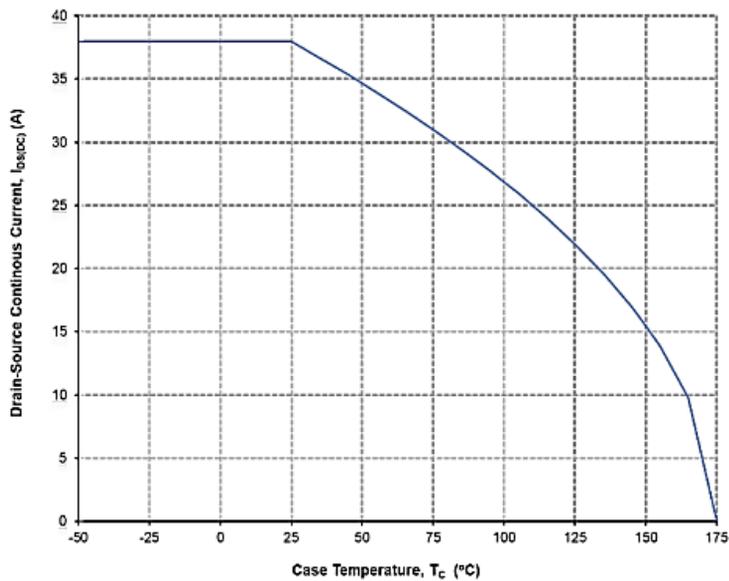


Figure 18. Continuous Drain Current Derating vs. Case Temperature

TYPICAL PERFORMANCE (For Reference Only)

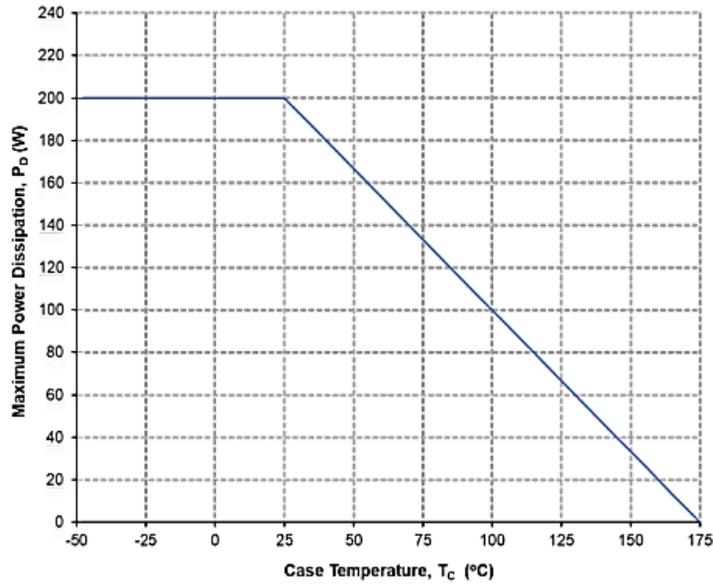


Figure 19. Maximum Power Dissipation Derating vs. Case Temperature

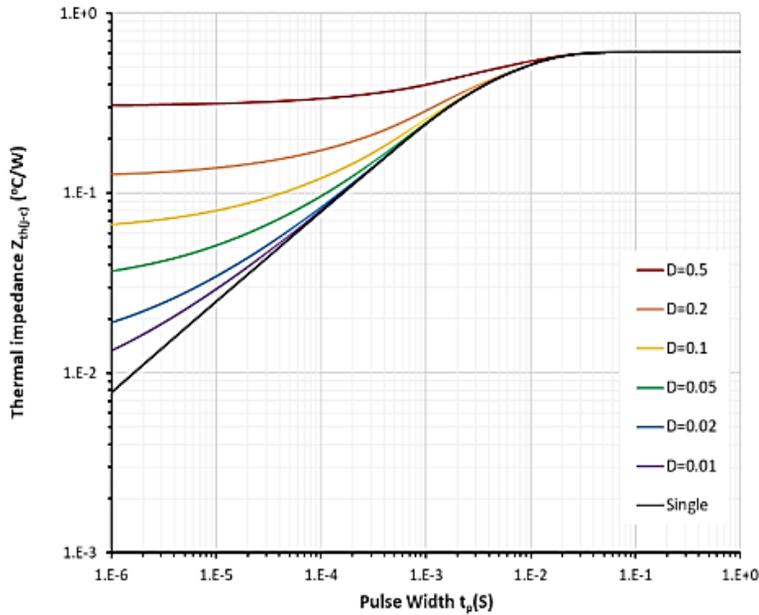


Figure 20. Transient Thermal Impedance (Junction to Case)

TYPICAL PERFORMANCE (For Reference Only)

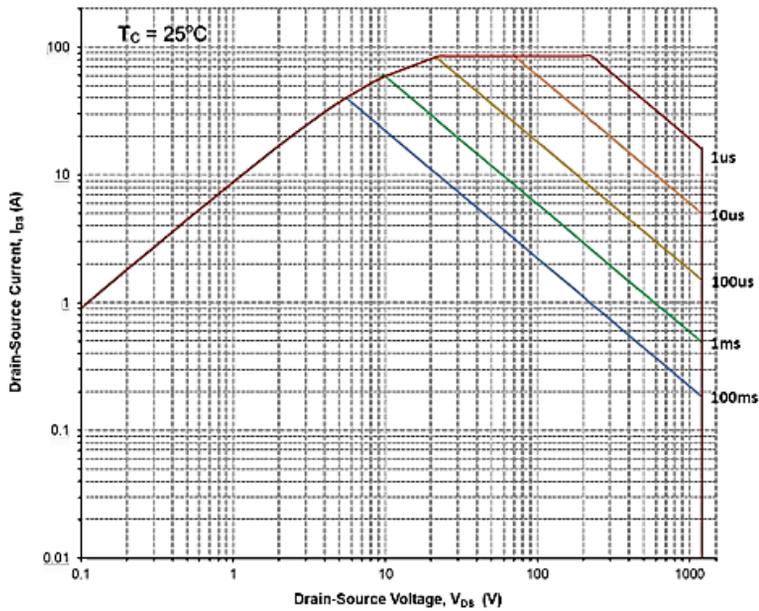


Figure 21. Safe Operating Area

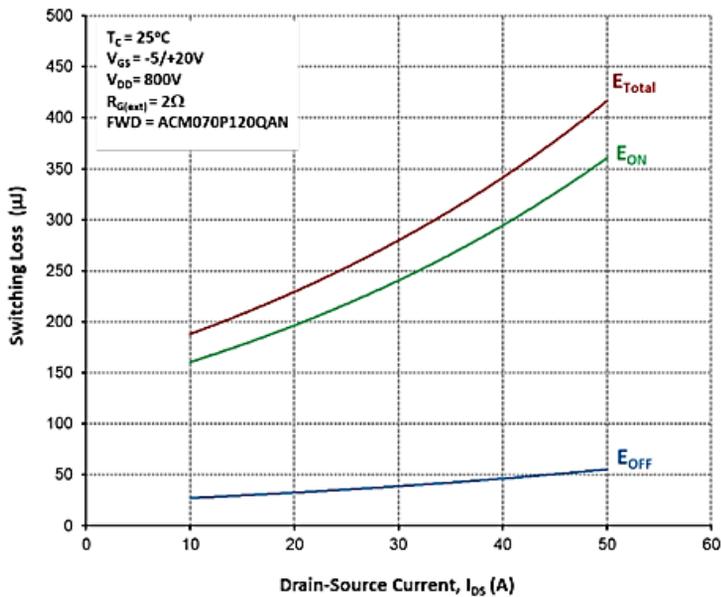


Figure 22. Switching energy vs Drain current

TYPICAL PERFORMANCE (For Reference Only)

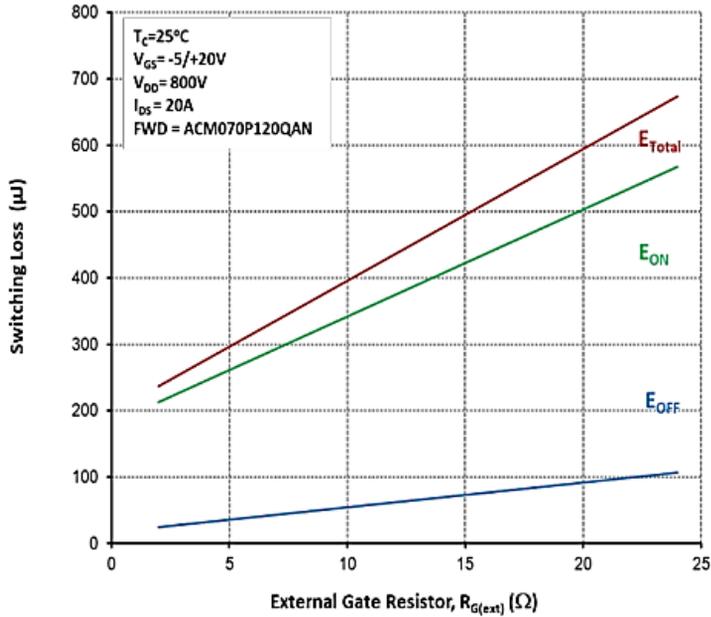


Figure 23. Switching energy vs External Gate Resistor

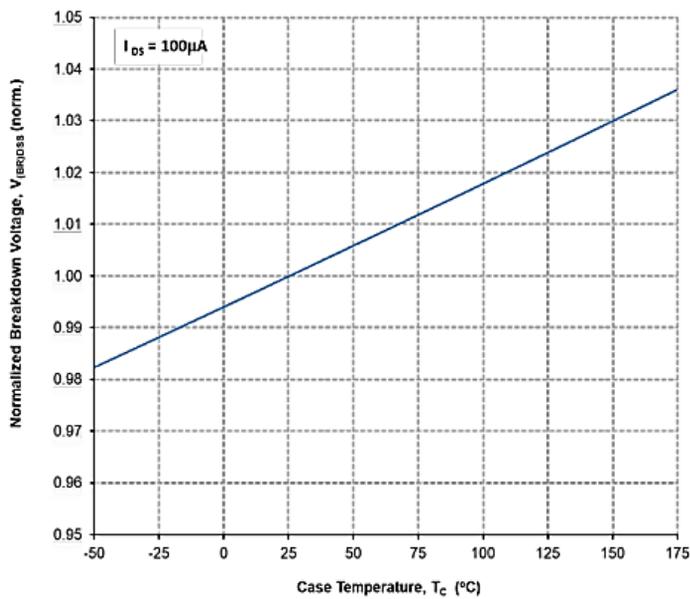
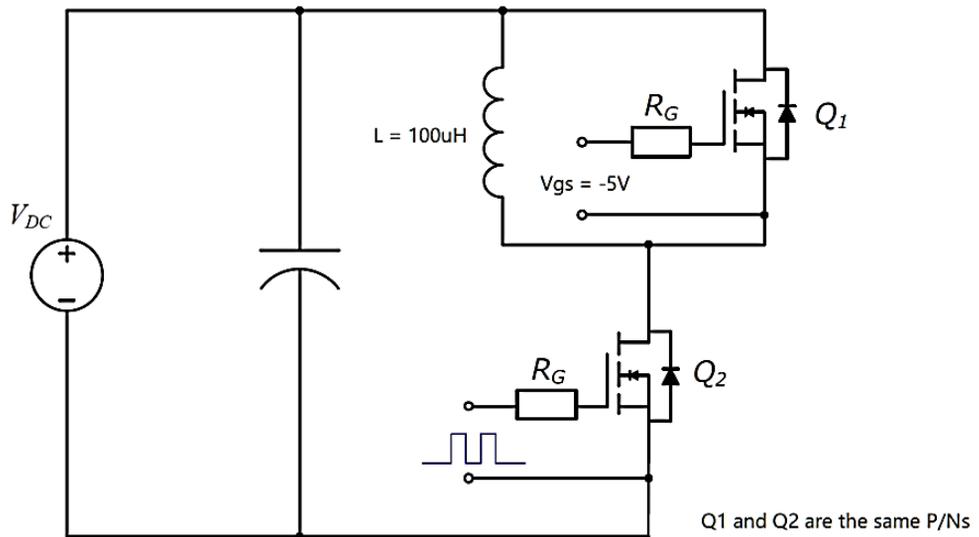
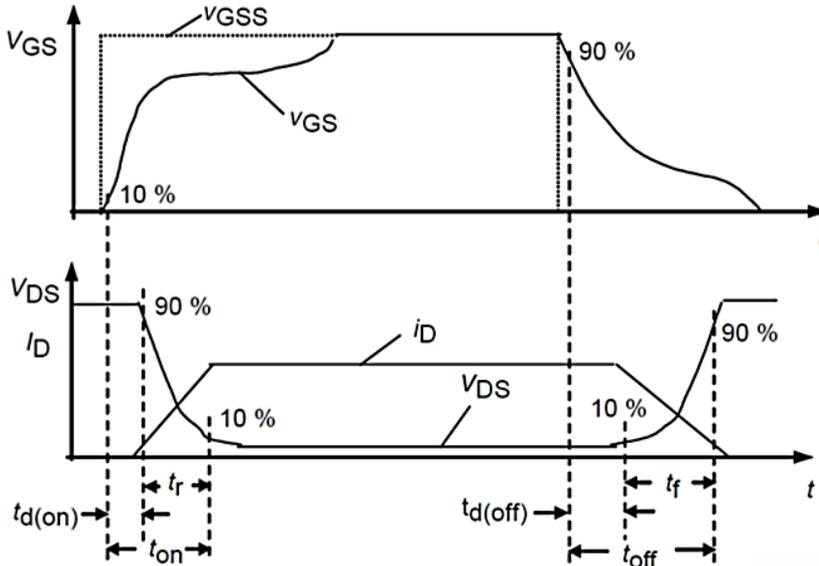


Figure 24. Normalized breakdown voltage vs Temperature

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 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 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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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.