

MAIN CHARACTERISTICS

I_D	48A
V_{DS}	800V
$R_{DS(on)-Typ@ V_{GS}=18V}$	33m Ω

Features

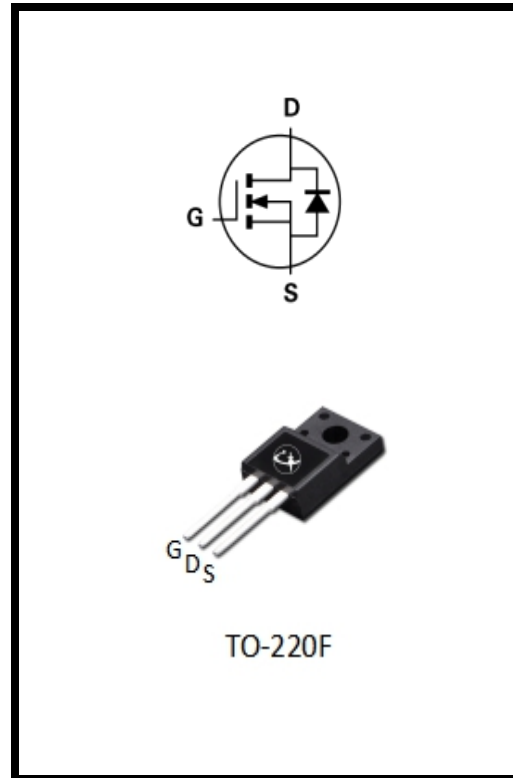
- High Speed Switching
- High Blocking Voltage with Low $R_{DS(on)}$
- Easy to Parallel
- Simple to Drive
- RoHS Compliant

Benefits

- Increased Power Density
- Faster Operating Frequency
- Reduction of Heat Sink Requirements
- Higher Efficiency
- Reduced EMI

Application

- Power Factor Correction Modules
- Switch Mode Power Supplies
- DC-AC Inverters
- High Voltage DC/DC Converters



Product specification classification

Part Number	Package	Mode Name	Pack
LSC040M65F	TO-220F	LSC040M65F	Tube

Maximum Ratings at Tc=25°C unless otherwise specified

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	800	V
Gate-Source Voltage	V_{GSmax}	-8/+22	V
Gate-Source Voltage, max. Transient Voltage (tp≤0.5μs, D<0.001)	V_{GSmax}	-8/+22	V
Recommended Operation Value	V_{GSop}	0/+18	V
Continue Drain Current TC=25°C	I_D	48	A
Continue Drain Current TC=100°C		34	A
Pulsed Drain Current (Note1)	I_{DM}	96	A
Power Dissipation Tc=25°C	P_D	107	W
Power Dissipation Tc=100°C		54	W
Operating Temperature Range	T_J	-40 to +175	°C
Storage Temperature Range	T_{STG}	-40 to +150	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.4	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	40	°C/W

Note1:Pulse test: 300 μs pulse width, 2 % duty cycle

Electrical Characteristics at Tc=25°C unless otherwise specified

Parameter	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0 \text{ V}, I_D = 100\mu\text{A}$	BV_{DSS}	800	-	-	V
Drain-Source Leakage Current	$V_{DS} = 650 \text{ V}, V_{GS} = 0 \text{ V}$	I_{DSS}	-	1	10	μA
Gate Leakage Current	$V_{GS} = 18 \text{ V}, V_{DS} = 0 \text{ V}$	I_{GSS}	-	-	250	nA
Gate-Source Threshold Voltage Tc=25°C	$V_{DS} = V_{GS}, I_D = 10 \text{ mA}$	$V_{GS(th)}$	3	4.1	5	V
Gate-Source Threshold Voltage Tc=175°C			-	3	-	V
Drain-Source On-State Resistance	$V_{GS} = 15 \text{ V}, I_D = 30 \text{ A}$	$R_{DS(on)}$	-	65	89	mΩ
	$V_{GS} = 15 \text{ V}, I_D = 30 \text{ A}, T_J = 175^\circ\text{C}$		-	48	-	
	$V_{GS} = 18 \text{ V}, I_D = 30 \text{ A}$		-	33	43	
	$V_{GS} = 18 \text{ V}, I_D = 30 \text{ A}, T_J = 175^\circ\text{C}$		-	41	-	
Forward Transconductance	$V_{DS} = 20 \text{ V}, I_D = 30 \text{ A}$	g_{fs}		15		S
Input Capacitance	$V_{GS} = 0 \text{ V}, V_{DS} = 600 \text{ V}, f = 1 \text{ MHz}$	C_{iss}	-	1924	-	pF
Output Capacitance		C_{oss}	-	145	-	pF
Reverse Transfer Capacitance		C_{rss}	-	6.7	-	pF
Coss Stored Energy		E_{oss}	-	25	-	pF
Internal Gate Resistance	$f = 1 \text{ MHz}$	$R_{G(int)}$	-	1	-	Ω
Total Gate Charge(Note2)	$I_D = 30 \text{ A}, V_{DD} = 400 \text{ V}, V_{GS} = 0/18 \text{ V}$	Q_G	-	68	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	18	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	23	-	nC
Turn-on Delay Time(Note2)	$V_{DS} = 400 \text{ V}, I_D = 30 \text{ A}, V_{GS} = 0/+18 \text{ V}, R_G = 2.5 \Omega, L = 200\mu\text{H}, T_J = 25^\circ\text{C}$	$t_{d(ON)}$	-	28	-	ns
Rise Time(Note2)		t_r	-	13	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	17	-	ns
Fall Time(Note2)		t_f	-	6	-	ns
Turn-on Switching Energy		E_{on}	-	215	-	μJ
Turn-off Switching Energy		E_{off}	-	28	-	μJ

Electrical Characteristics at Tc=25°C unless otherwise specified

Turn-on Delay Time(Note2)	VDS = 400 V, ID = 30 A, VGS = 0/+18 V, RG = 2.5 Ω, L=200μH, Tj=175°C	t _{d(ON)}	-	29	-	ns
Rise Time(Note2)		t _r	-	10	-	ns
Turn-Off Delay Time(Note2)		t _{d(OFF)}	-	20	-	ns
Fall Time(Note2)		t _f	-	6	-	ns
Turn-on Switching Energy		E _{on}	-	226	-	μJ
Turn-off Switching Energy		E _{off}	-	35	-	μJ

Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current	VGS=0V Tc=25°C	I _S	-	27	-	A
	VGS=0V Tc=100°C		-	14	-	A
Maximun Body-Diode Pulsed Current(Note2)		I _{SM}	-	-	96	A
Drain-Source Diode Forward Voltage	VGS=0V, I _{SD} =15A Tj=25°C	V _{SD}	-	3.1	-	V
	VGS=0V, I _{SD} =15A Tj=175°C		-	2.8	-	V
	VGS=0V, I _{SD} =30A Tj=25°C		-	4	-	V
	VGS=0V, I _{SD} =30A Tj=175°C		-	3.5	-	V
Reverse Recovery Time(Note2)	VGS=0V, I _{SD} =30A, VR=400V, di/dt=1300A/μs, Tj=25°C	t _{rr}	-	29	-	ns
Reverse Recovery Charge(Note2)		Q _{rr}	-	206	-	nC
Peak Reverse Recovery Current		I _{rrm}	-	11	-	A
Reverse Recovery Time(Note2)	VGS=0V, I _{SD} =30A, VR=400V, di/dt=1300A/μs, Tj=175°C	t _{rr}	-	56	-	ns
Reverse Recovery Charge(Note2)		Q _{rr}	-	518	-	nC
Peak Reverse Recovery Current		I _{rrm}	-	19	-	A

Note2:Pulse test: 300 μs pulse width, 2 % duty cycle

RATINGS AND CHARACTERISTIC CURVES

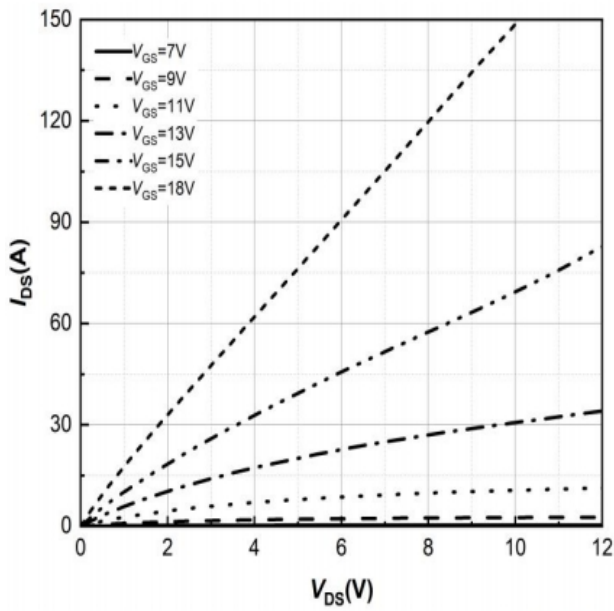


Figure 1. Output Characteristics
 $T_j = -40^\circ\text{C}$

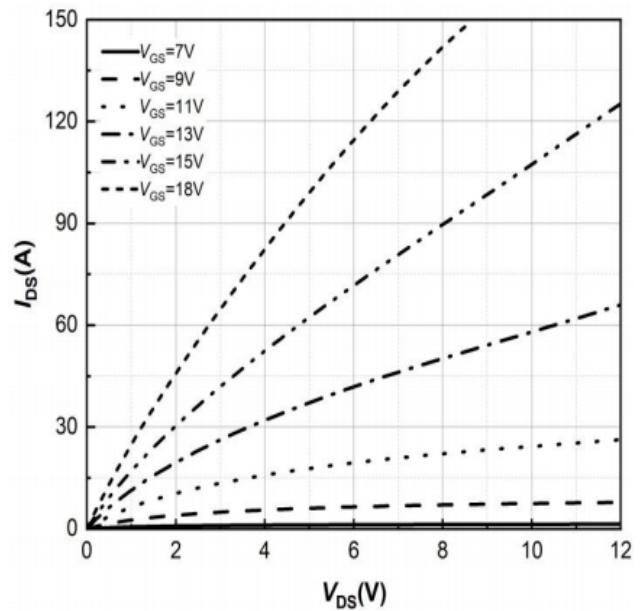


Figure 2. Output Characteristics
 $T_j = 25^\circ\text{C}$

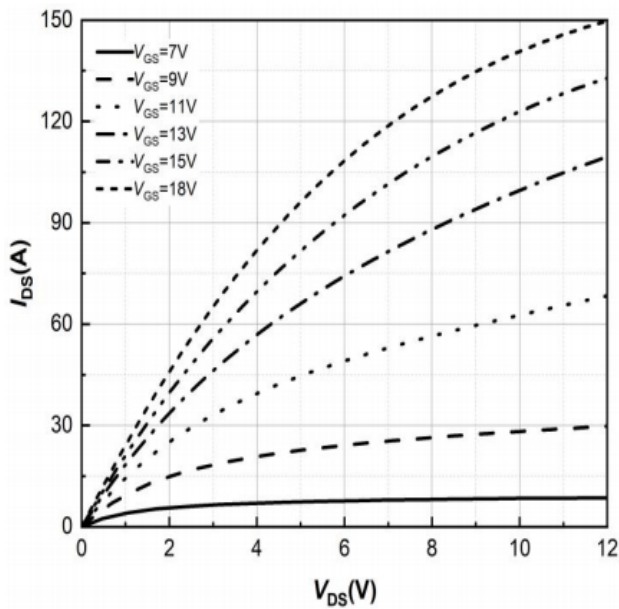


Figure 3. Output Characteristics
 $T_j = 175^\circ\text{C}$

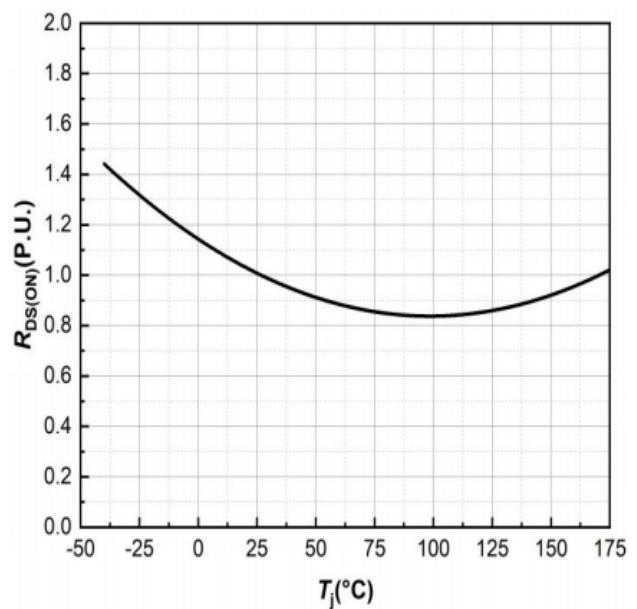


Figure 4. Normalized On-Resistance vs. Temperature

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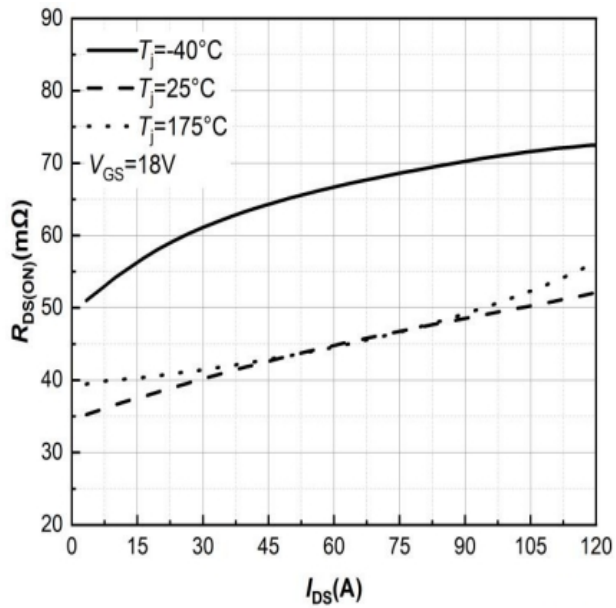


Figure 5. On-Resistance vs. Drain Current For Various Temperatures

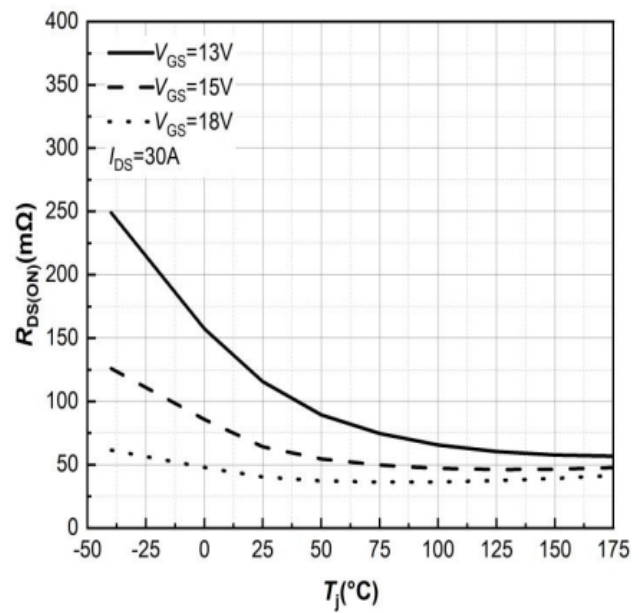


Figure 6. On-Resistance vs. Temperature For Various Gate Voltage

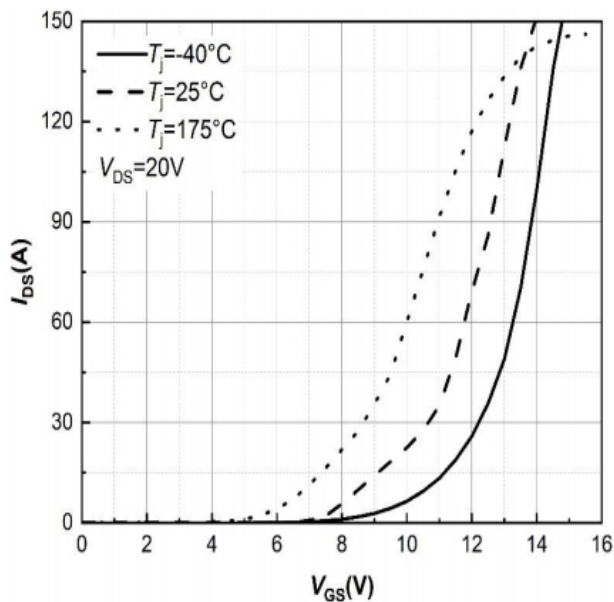


Figure 7. Transfer Characteristic for Various Junction Temperatures

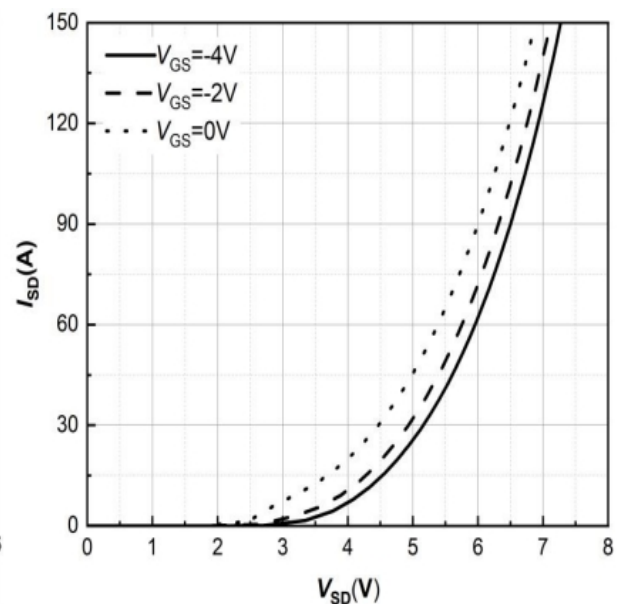


Figure 8. Body Diode Characteristic $T_j = -40^\circ\text{C}$

RATINGS AND CHARACTERISTIC CURVES

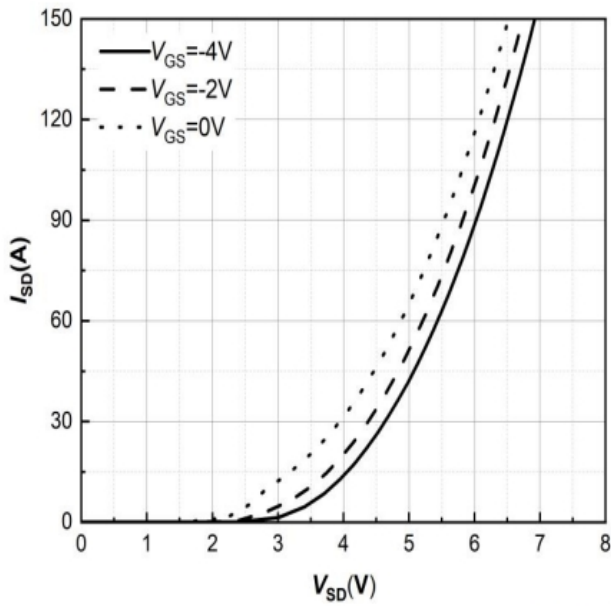


Figure 9. Body Diode Characteristic
 $T_j = 25^\circ\text{C}$

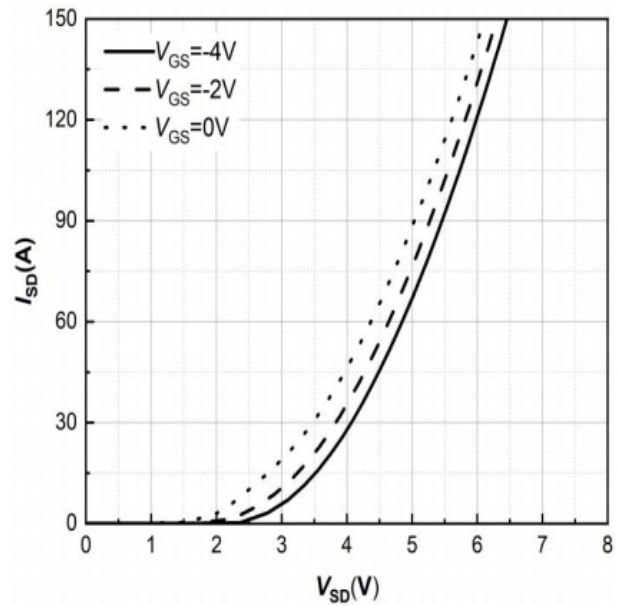


Figure 10. Body Diode Characteristic
 $T_j = 175^\circ\text{C}$

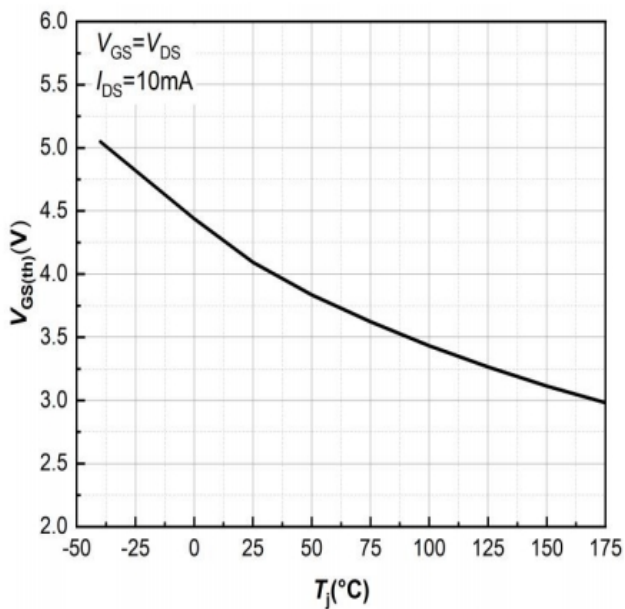


Figure 11. Threshold Voltage vs.
Temperature

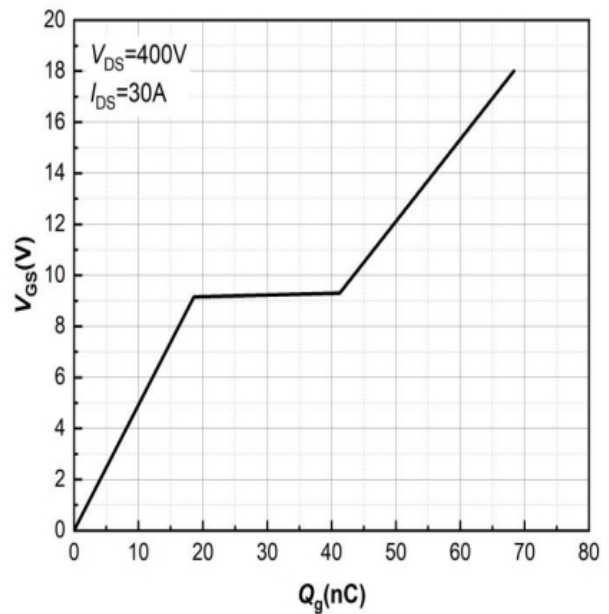


Figure 12. Gate Charge Characteristics

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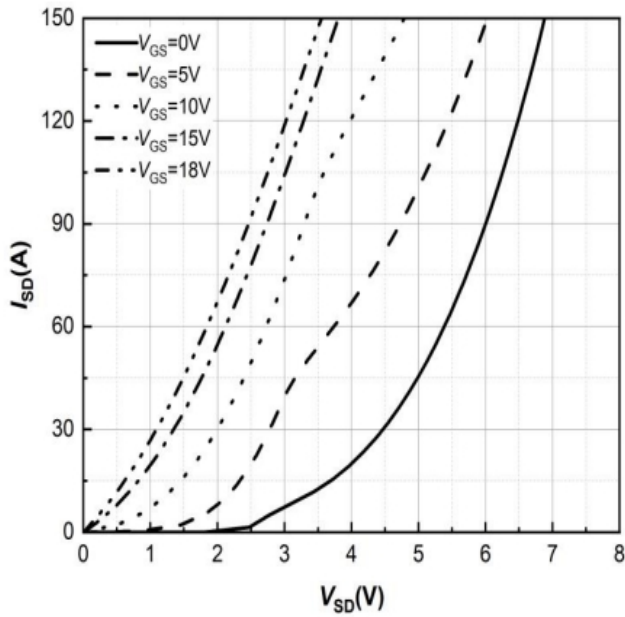


Figure 13. 3rd Quadrant Characteristic
 $T_j = -40^\circ\text{C}$

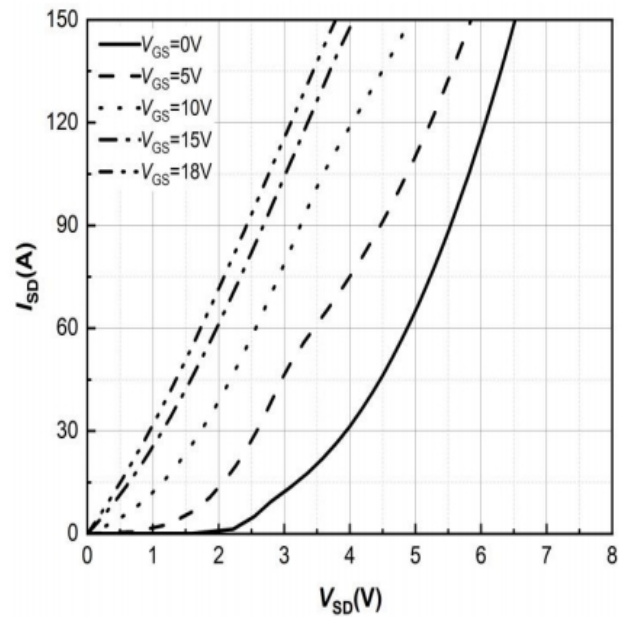


Figure 14. 3rd Quadrant Characteristic
 $T_j = 25^\circ\text{C}$

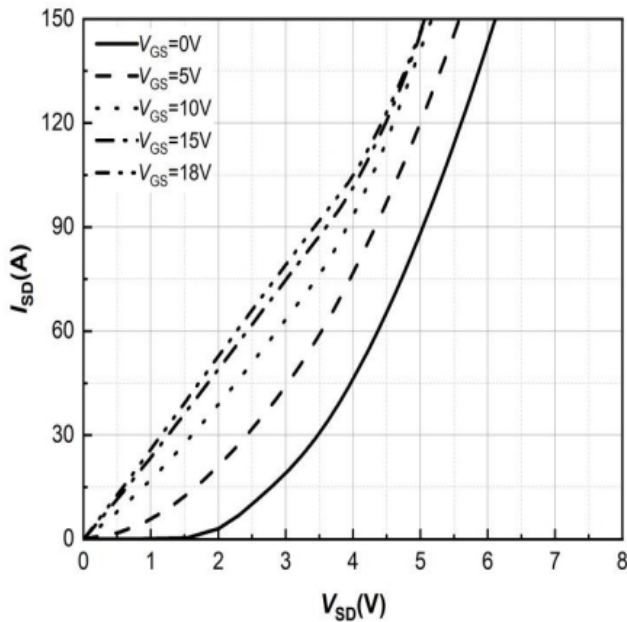


Figure 15. 3rd Quadrant Characteristic
 $T_j = 175^\circ\text{C}$

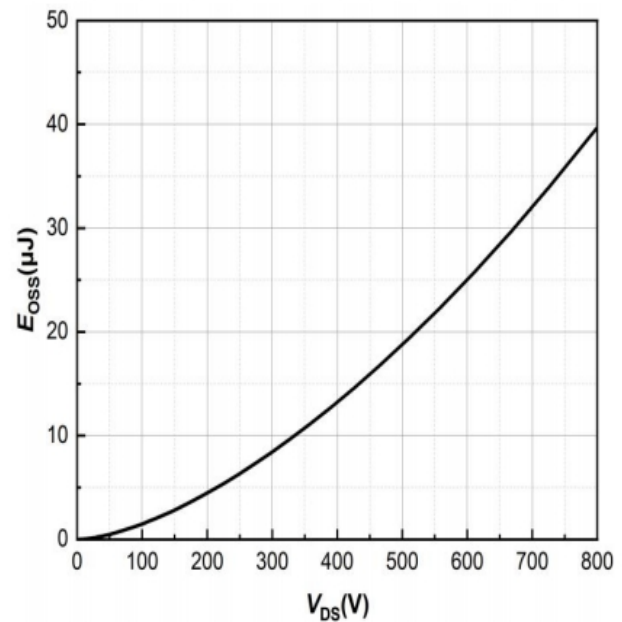


Figure 16. Output Capacitor Stored Energy

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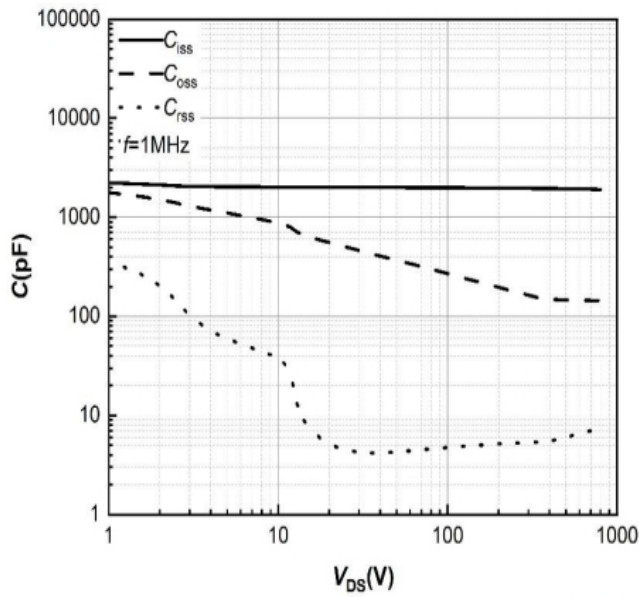


Figure 17. Capacitances vs. Drain-Source

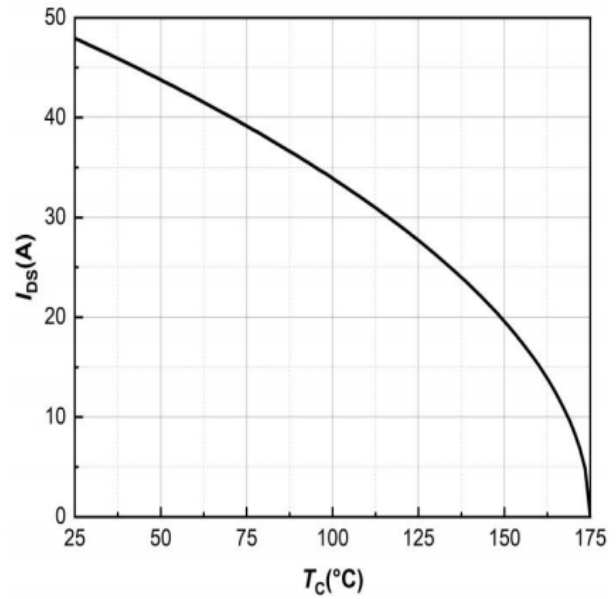


Figure 18. Continuous Drain Current Derating vs. Case Temperature

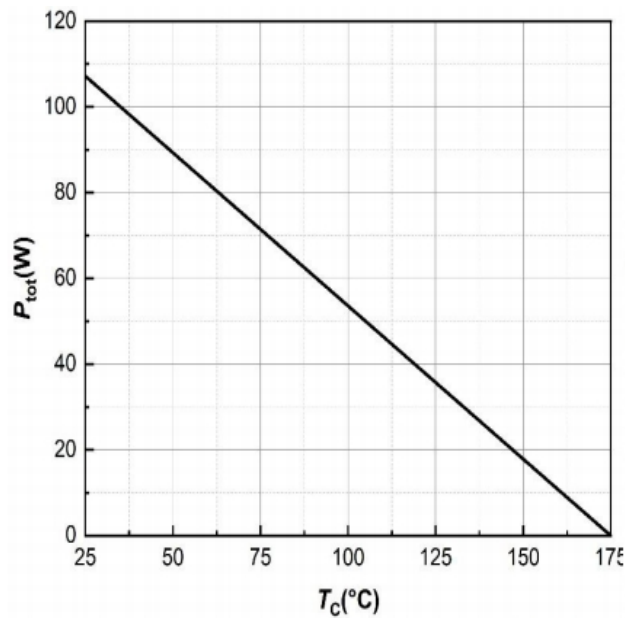


Figure 19. Maximum Power Dissipation Derating vs. Case Temperature

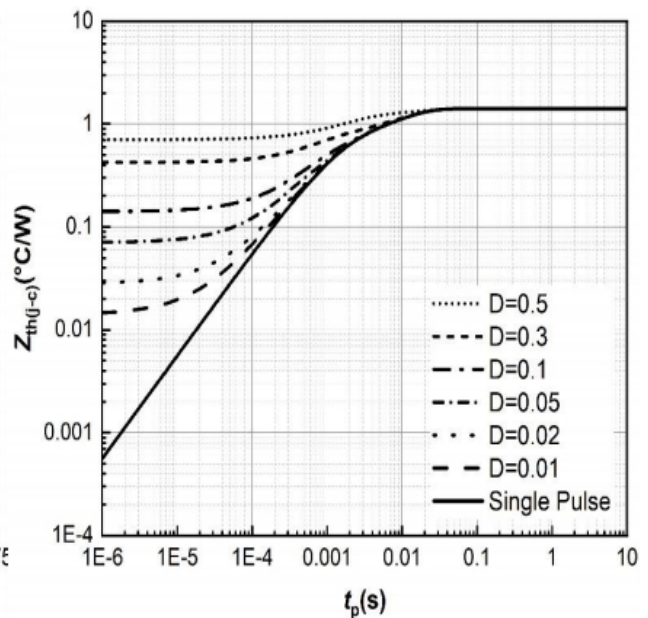


Figure 20. Transient Thermal Impedance

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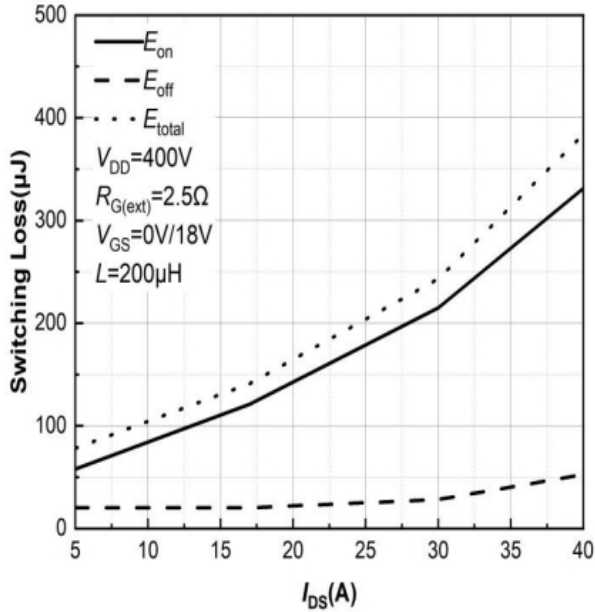


Figure 21. Clamped Inductive Switching Energy vs. Drain Current
 $T_j=25^{\circ}\text{C}$

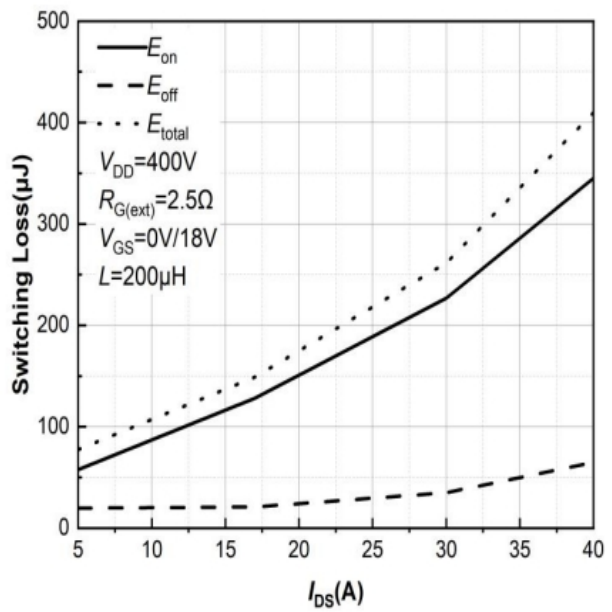


Figure 22. Clamped Inductive Switching Energy vs. Drain Current
 $T_j=175^{\circ}\text{C}$

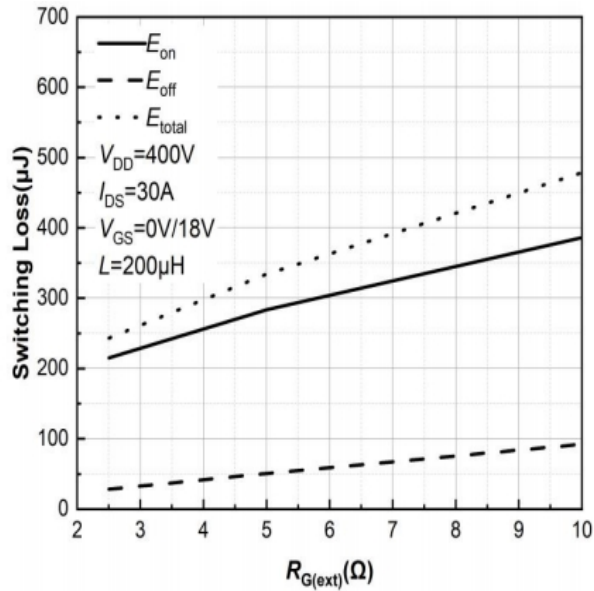


Figure 23. Clamped Inductive Switching Energy vs. $R_{G(\text{ext})}$
 $T_j=25^{\circ}\text{C}$

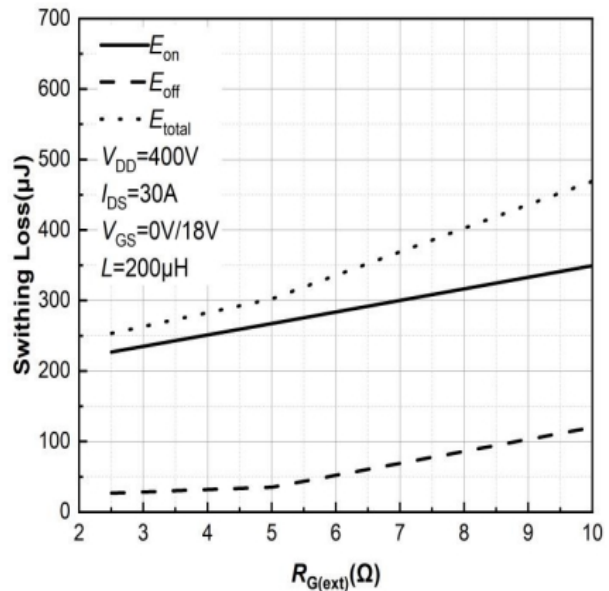
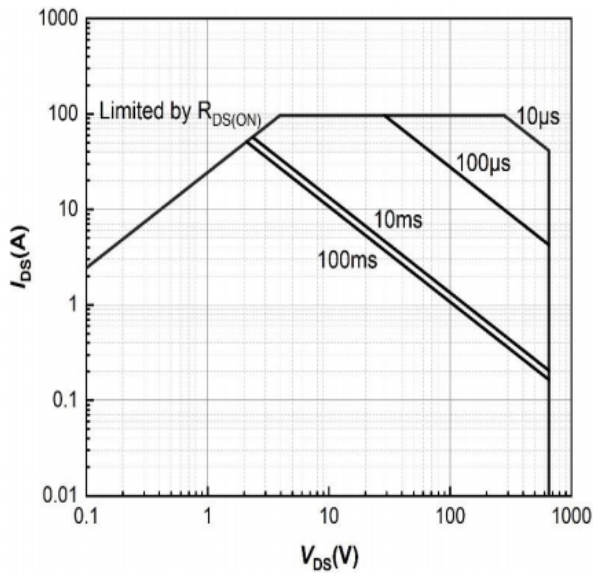
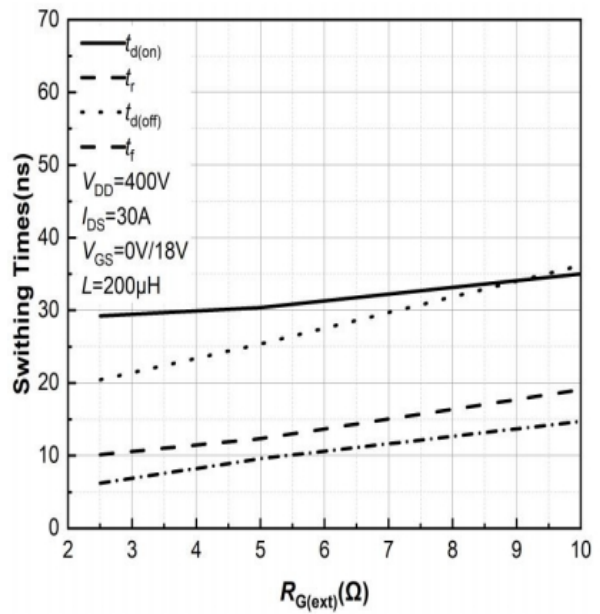
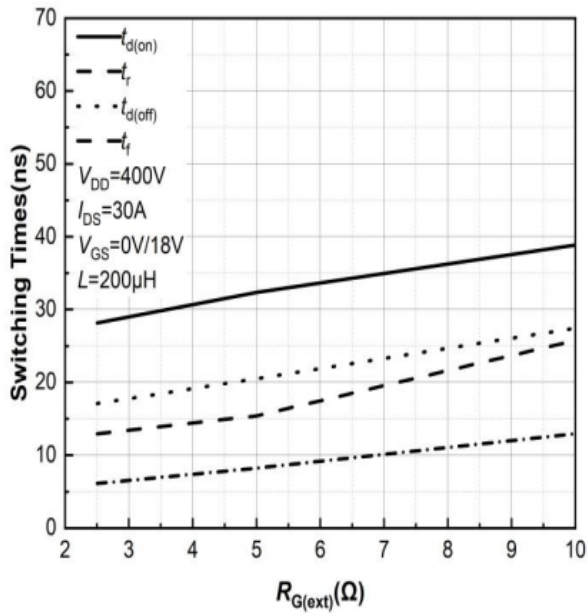


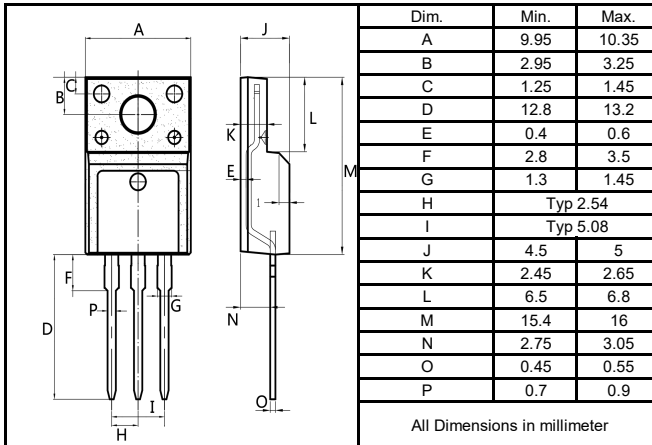
Figure 24. Clamped Inductive Switching Energy vs. $R_{G(\text{ext})}$
 $T_j=175^{\circ}\text{C}$

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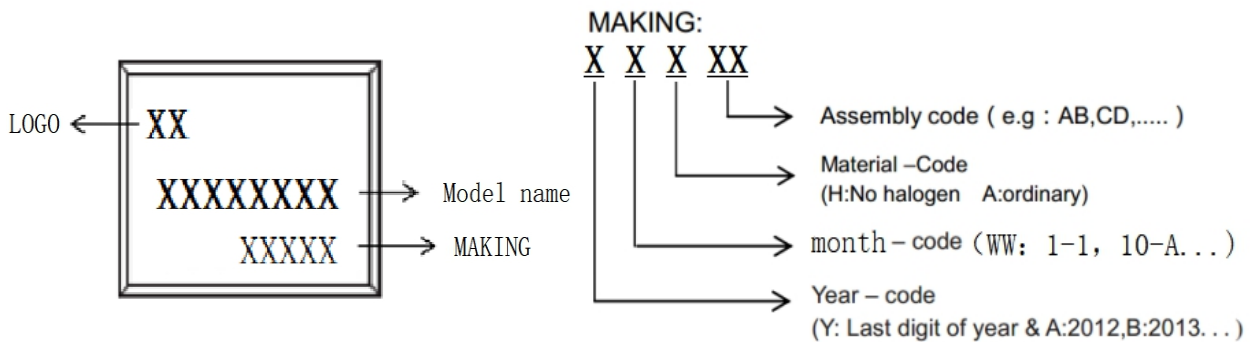


Package Outline Dimensions millimeters

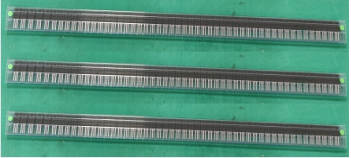
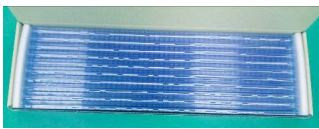
TO-220F



Marking on the body



packing instruction

PKG	Minimal Package	Box	Carton
TO-220F			
	50pcs/pdpe	1000pcs/box	5000pcs/carton



LSC040M65F

SiC N-Channel MOSFET

Notice

All product, product specifications and data are subject to change without notice to improve. The right to explain is owned by LINGXUN electronics company.

Confirm that operation temperature is within the specified range described in the product specification. Avoid applying power exceeding normal rated

power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.

LINGXUN electronics shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

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Revision History

Rev	Changes	Date
1.0	First version	2025/11/27