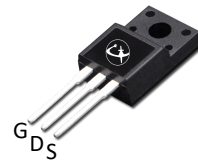
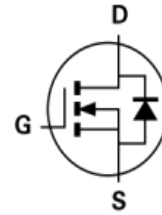


MAIN CHARACTERISTICS

I_D	7A
V_{DS}	800V
$R_{DS(on)-typ}$ (@VGS=15V Tc=25°C)	490mΩ

Features

- High Speed Switching
- High Blocking Voltage with Low RDS(on)
- Easy to Parallel
- Simple to Drive
- RoHS Compliant



TO-220F

Benefits

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

Application

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

Package parameters

Part Number	Package	Mode Name	Pack
LSC500M65F	TO-220F	LSC500M65F	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_{GS}	-18/+22	V
Gate-Source Voltage,max.Transient Voltage $t_p \leq 0.5\mu s, D < 0.001$	V_{GSmax}	-18/+22	V
Recommended Operation Value	V_{GSop}	-4/+18	V
Continue Drain Current TC=25°C	I_D	7	A
Continue Drain Current TC=100°C		5	A
Pulsed Drain Current (Note1)	I_{DM}	13	A
Power Dissipation TC=25°C	P_D	35	W
Power Dissipation TC=100°C		13	W
Operating Temperature Range	T_J	-40 to +175	°C
Storage Temperature Range	T_{STG}	-40 to +150	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	5.5	°C/W
Thermal Resistance, Junction to	$R_{\theta JA}$	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	$V_{GS} = 0 V, I_D = 100\mu A$	BV_{DSS}	800	-	-	V
Drain-Source Leakage Current	$V_{DS} = 800 V, V_{GS} = 0 V$	I_{DSS}	-	1	10	μA
Gate Leakage Current	$V_{GS} = 18 V, V_{DS} = 0 V$	I_{GSS}	-	-	250	nA
Gate-Source Threshold Voltage	$V_{DS}=V_{GS}, I_D=1mA, T_J=25^\circ C$	$V_{GS(th)}$	2	2.9	4	V
	$V_{DS}=V_{GS}, I_D=1mA, T_J=175^\circ C$		-	2.1	-	V
Drain-Source On-State Resistance	$V_{GS} = 15 V, I_D = 3.3 A$	$R_{DS(on)}$	-	640	864	m Ω
	$V_{GS} = 15 V, I_D = 3.3 A, T_J = 175^\circ C$		-	670	-	
	$V_{GS} = 18 V, I_D = 3.3 A$		-	490	637	
	$V_{GS} = 18 V, I_D = 3.3 A, T_J = 175^\circ C$		-	610	-	
Forward Transconductance	$V_{DS}=20V, I_D=3.3A$	g_{fs}		2.1		S
Input Capacitance	$V_{GS} = 0 V, V_{DS} = 600 V, f = 1MHz$	C_{iss}	-	116	-	pF
Output Capacitance		C_{oss}	-	18	-	pF
Reverse Transfer Capacitance		C_{rss}	-	2.8	-	pF
Coss Stored Energy		E_{oss}	-	2.4	-	μJ
Internal Gate Resistance	$f=1MHz$	$R_{G(int)}$	-	36	-	Ω
Total Gate Charge(Note2)	$I_D = 3.3A, V_{DD} = 400 V, V_{GS} = 4/18 V$	Q_G	-	7	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	1.3	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	4.2	-	nC
Turn-on Delay Time(Note2)	$V_{DS} = 400 V, I_D = 3.3A, V_{GS} = -4/18 V, R_G = 2.5\Omega, L=200\mu H, T_c=25^\circ C$	$t_{d(ON)}$	-	3	-	ns
Rise Time(Note2)		t_r	-	12	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	9	-	ns
Fall Time(Note2)		t_f	-	18	-	ns
Turn-On Energy		E_{on}	-	24	-	μJ
Turn-Off Energy		E_{off}	-	4	-	μJ

Electrical Characteristics at Tc=25°C unless otherwise specified

Parameter	Test Condition	Symbol	Min	Typ	Max	Unit
Turn-on Delay Time(Note2)	VDS = 400 V, ID = 3.3A, VGS = -4/18 V, RG = 2.5Ω, L=200μH, Tc=175°C	t _{d(ON)}	-	3	-	ns
Rise Time(Note2)		t _r	-	11	-	ns
Turn-Off Delay Time(Note2)		t _{d(OFF)}	-	10	-	ns
Fall Time(Note2)		t _f	-	19	-	ns
Turn-On Energy		Eon	-	22	-	μJ
Turn-Off Energy		Eoff	-	4	-	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	Tc=25°C	I _S	-	7	-	A
Maximun Body-Diode Continuous Current	Tc=175°C		-	3	-	A
Maximun Body-Diode Pulsed Current(Note2)		I _{SM}	-	-	13	A
Drain-Source Diode Forward Voltage	VGS=-4V, ISD=1.7A Tc=25°C	V _{SD}	-	4	-	V
	VGS=-4V, ISD=1.7A Tc=175°C		-	3.6	-	V
	VGS=-4V, ISD=3.3A Tc=25°C	V _{SD}	-	4.5	-	V
	VGS=-4V, ISD=3.3A Tc=175°C		-	4	-	V
Reverse Recovery Time(Note2)	VGS=-4V, ISD=3.3A, Tj=25°C	trr	-	45	-	ns
Reverse Recovery Charge(Note2)	VR=400V, di/dt=1990A/μs, Tj=25°C	Qrr	-	54	-	nC
Peak Reverse Recovery Current		Irrm	-	2	-	A
Reverse Recovery Time(Note2)	VGS=-4V, ISD=1.7A, Tj=175°C	trr	-	48	-	ns
Reverse Recovery Charge(Note2)	VR=400V, di/dt=1990A/μs, Tj=175°C	Qrr	-	52	-	nC
Peak Reverse Recovery Current		Irrm	-	2.3	-	A

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

RATINGS AND CHARACTERISTIC CURVES

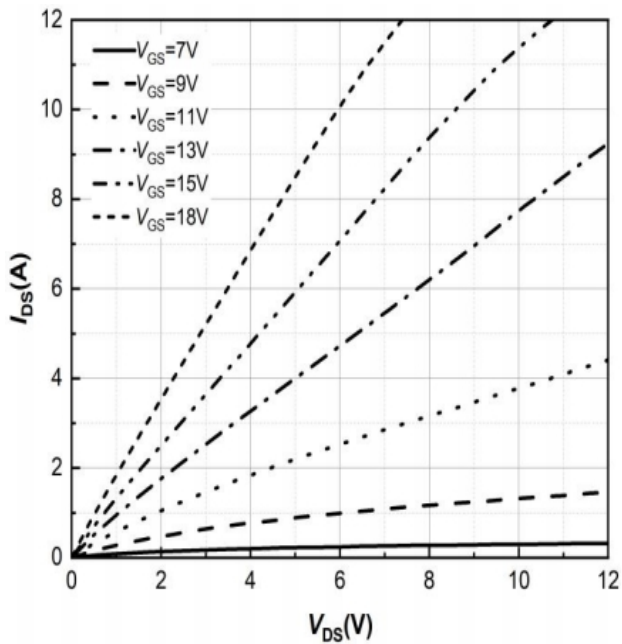


Figure 1. Output Characteristics
 $T_j = -40^\circ\text{C}$

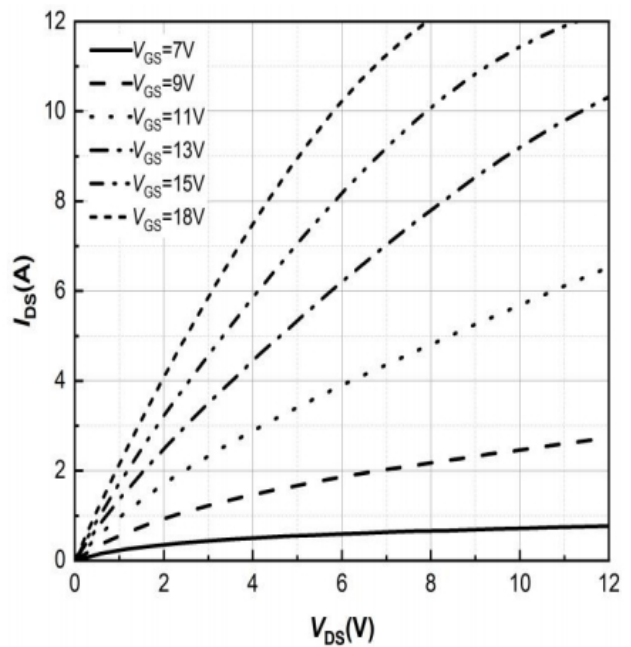


Figure 2. Output Characteristics
 $T_j = 25^\circ\text{C}$

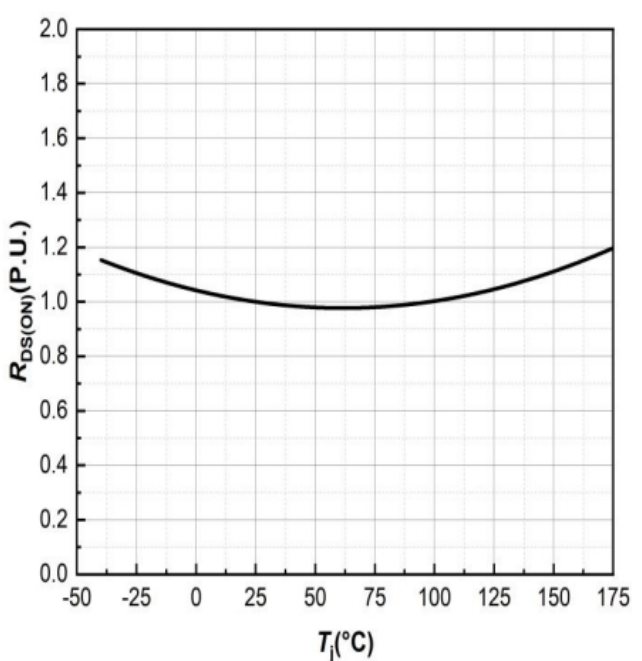
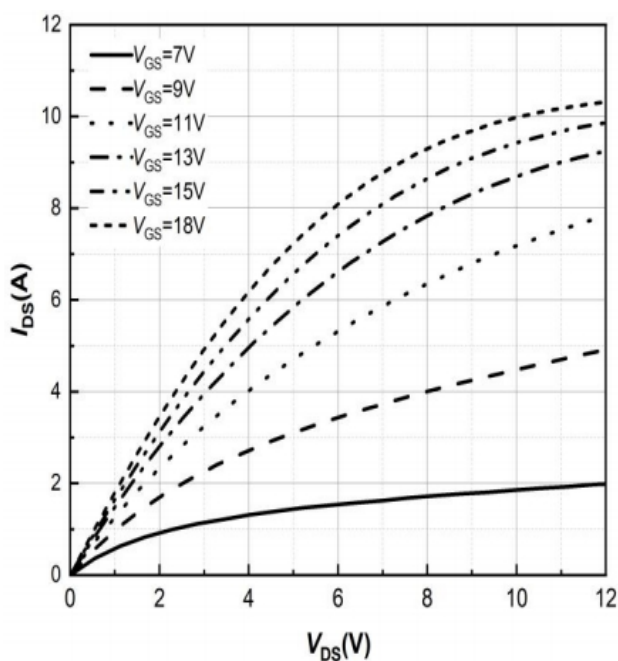


Figure 3. Output Characteristics
 $T_j=175^\circ\text{C}$

Figure 4. Normalized On-Resistance vs.
Temperature

RATINGS AND CHARACTERISTIC CURVES

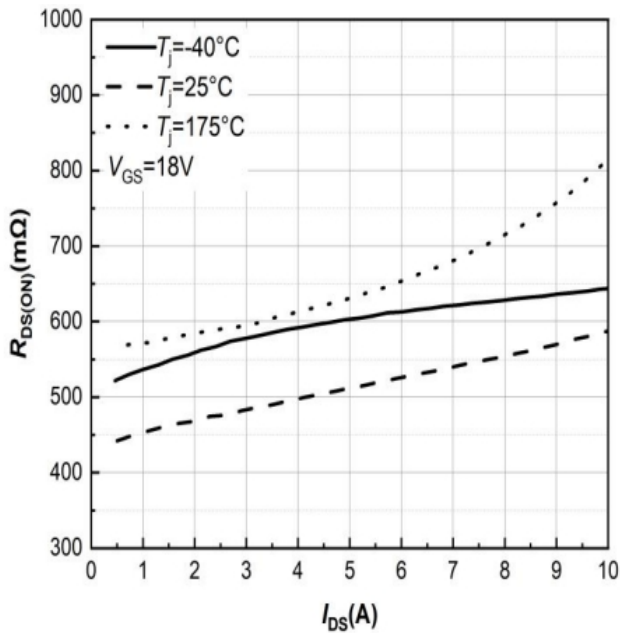


Figure 5. On-Resistance vs. Drain Current
For Various Temperatures

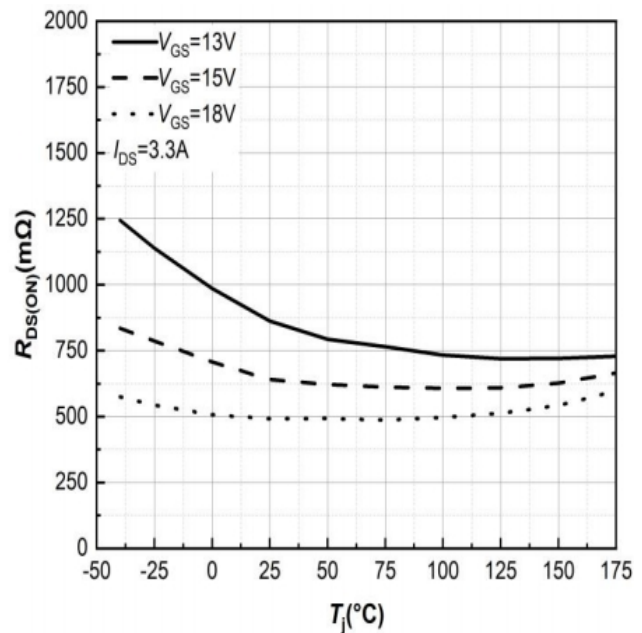


Figure 6. On-Resistance vs. Temperature
For Various Gate Voltage

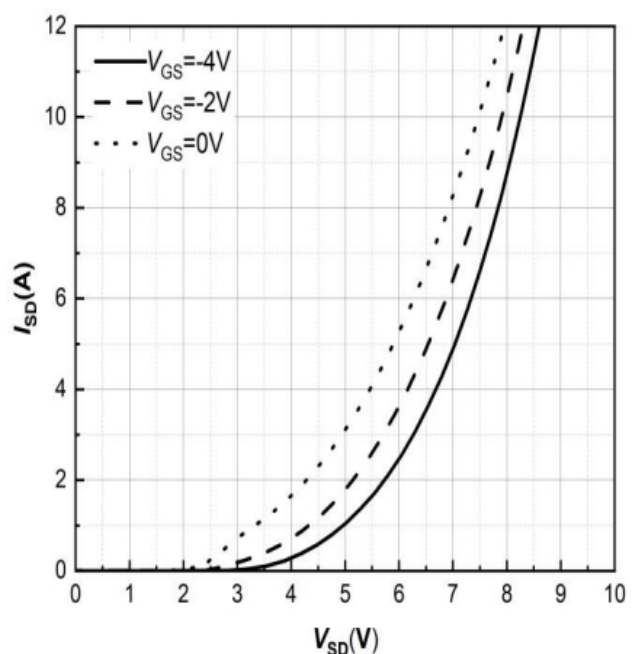
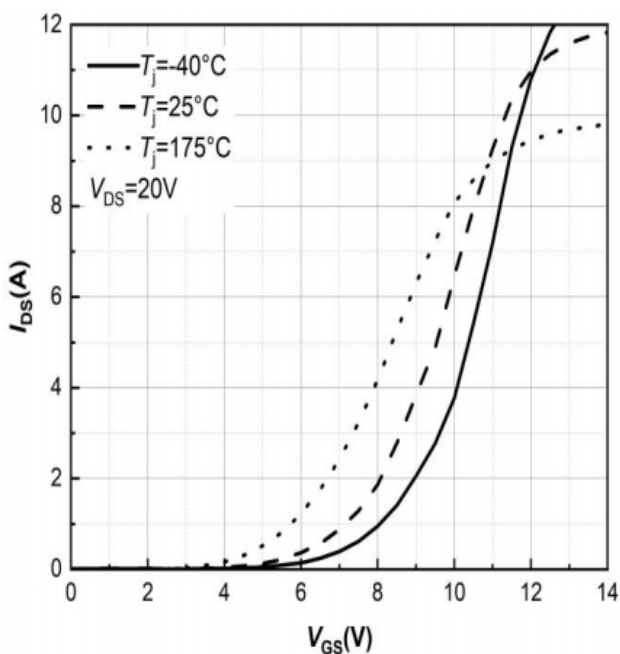


Figure 7. Transfer Characteristic for Various Junction Temperatures

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

RATINGS AND CHARACTERISTIC CURVES

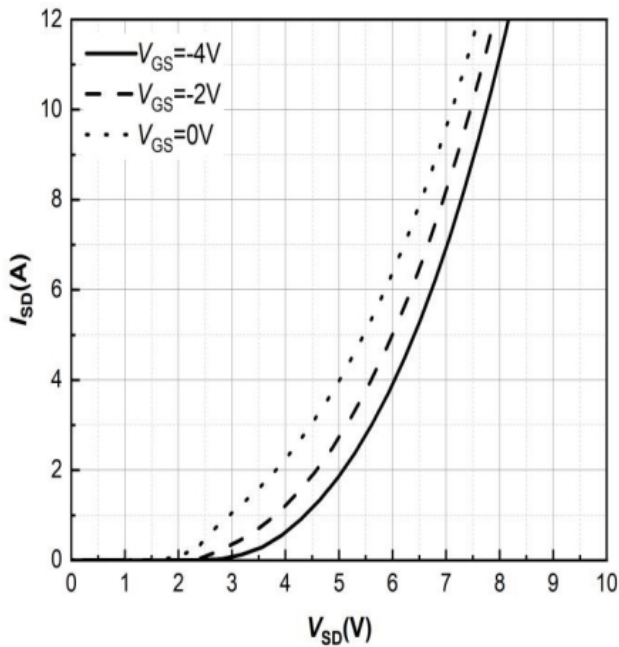


Figure 9. Body Diode Characteristic
 $T_J = 25^\circ\text{C}$

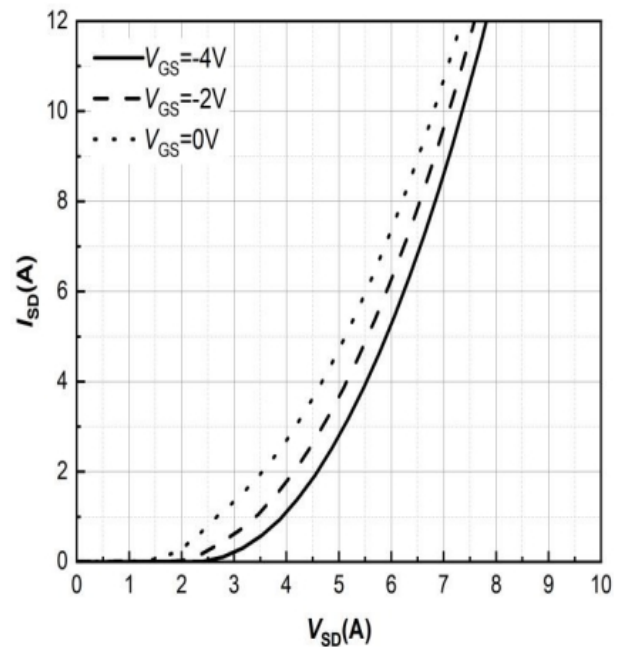


Figure 10. Body Diode Characteristic
 $T_J = 175^\circ\text{C}$

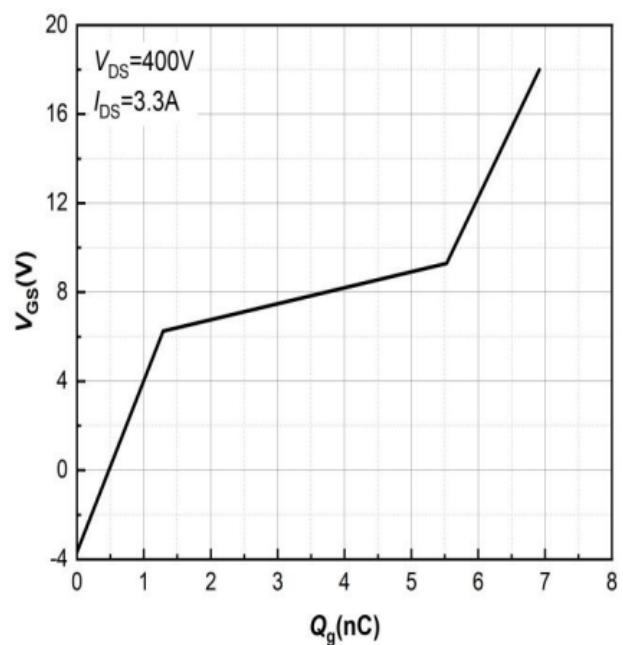
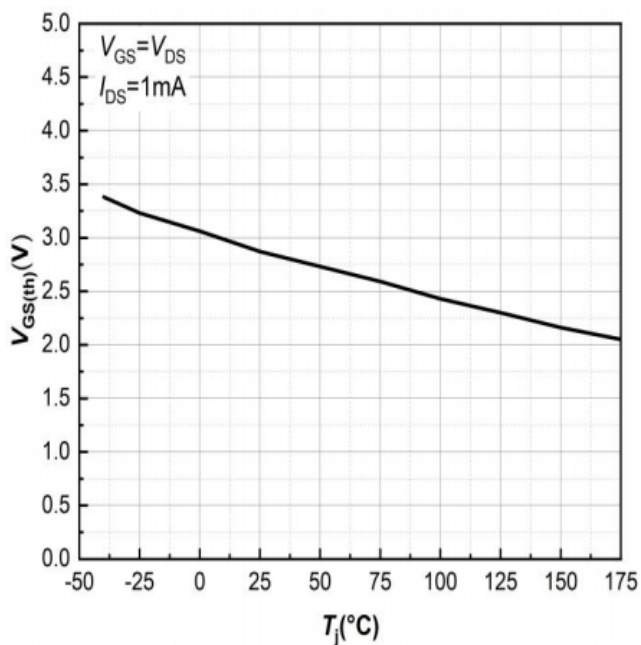


Figure 11. Threshold Voltage vs. Temperature

Figure 12. Gate Charge Characteristics

RATINGS AND CHARACTERISTIC CURVES

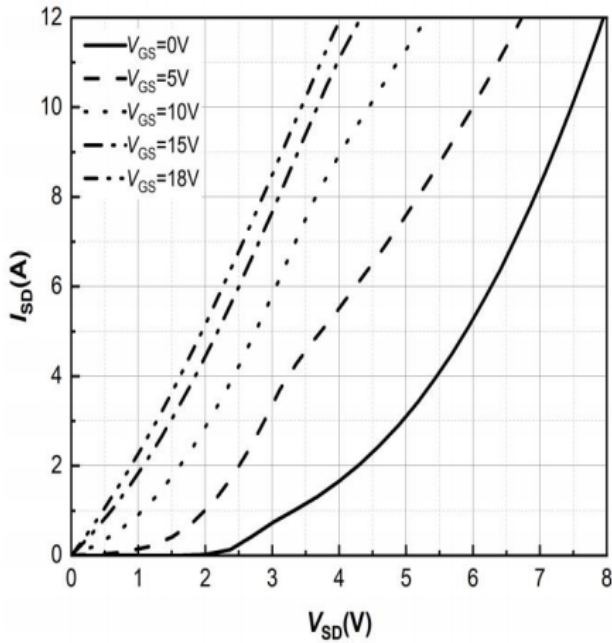


Figure 13. 3rd Quadrant Characteristic
 $T_j = -40^\circ\text{C}$

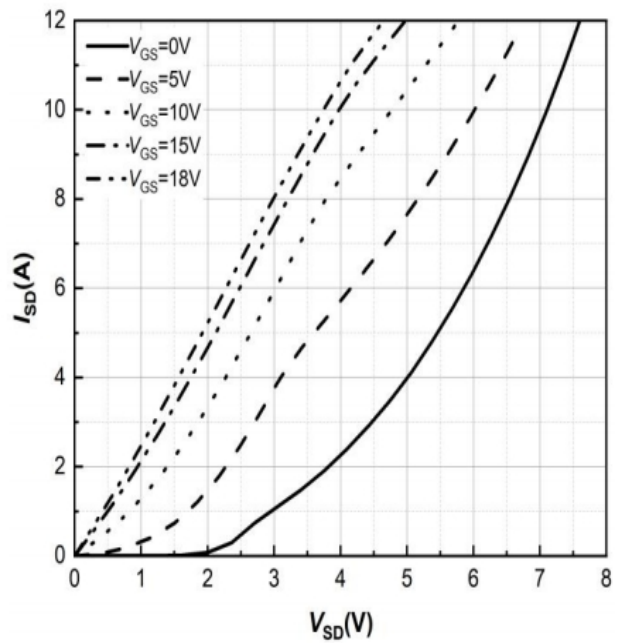


Figure 14. 3rd Quadrant Characteristic
 $T_j = 25^\circ\text{C}$

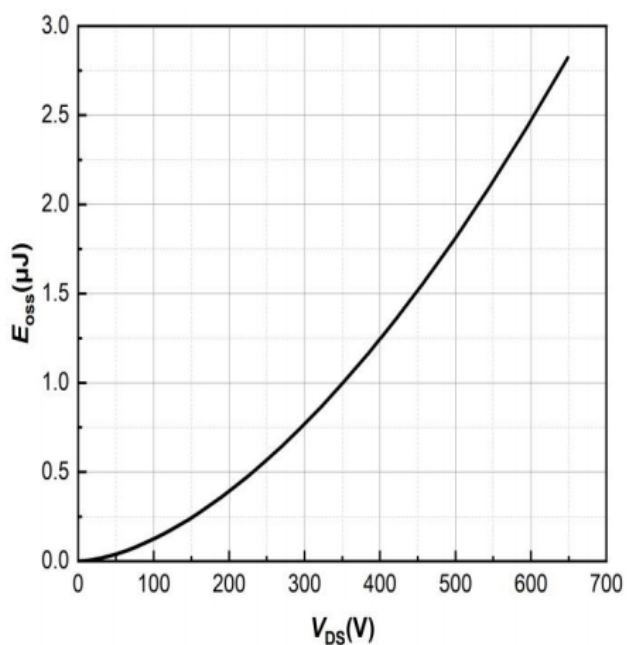
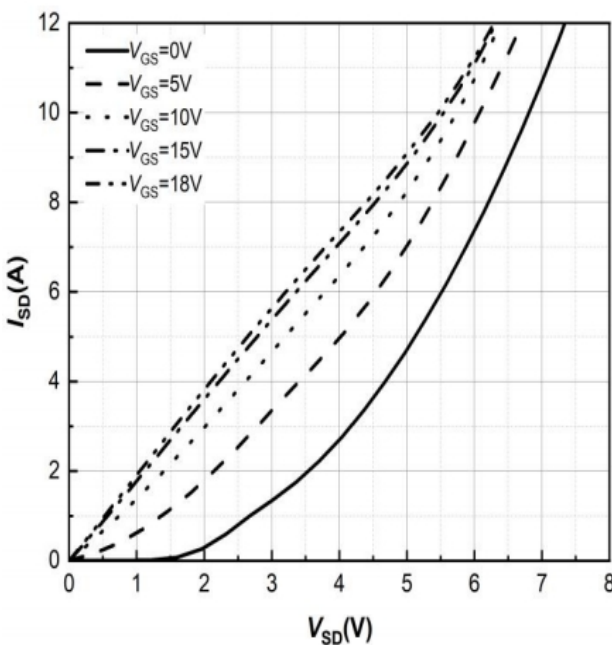


Figure 15. 3rd Quadrant Characteristic
 $T_J=175^{\circ}\text{C}$

LSC500M65F

SiC N-Channel MOSFET

Figure 16. Output Capacitor Stored Energy

RATINGS AND CHARACTERISTIC CURVES

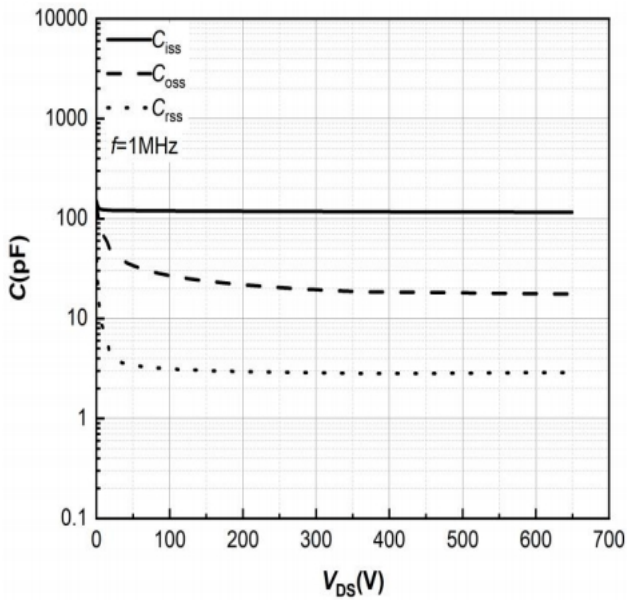


Figure 17. Capacitances vs. Drain-Source

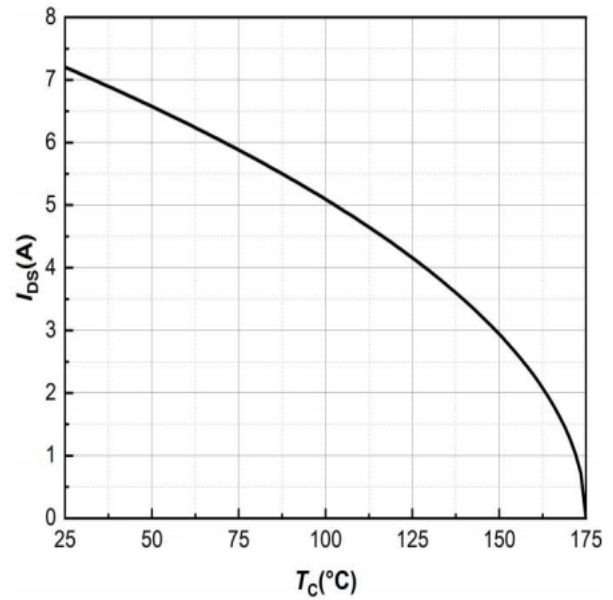


Figure 18. Continuous Drain Current Derating vs. Case Temperature

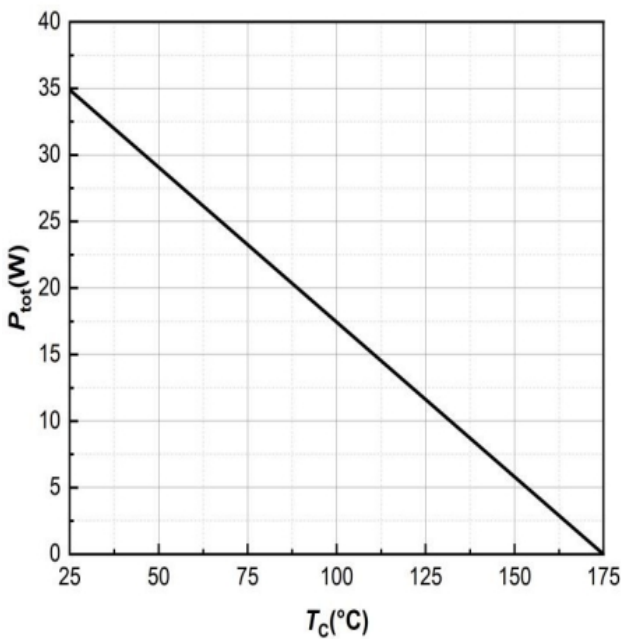


Figure 19. Maximum Power Dissipation Derating vs. Case Temperature

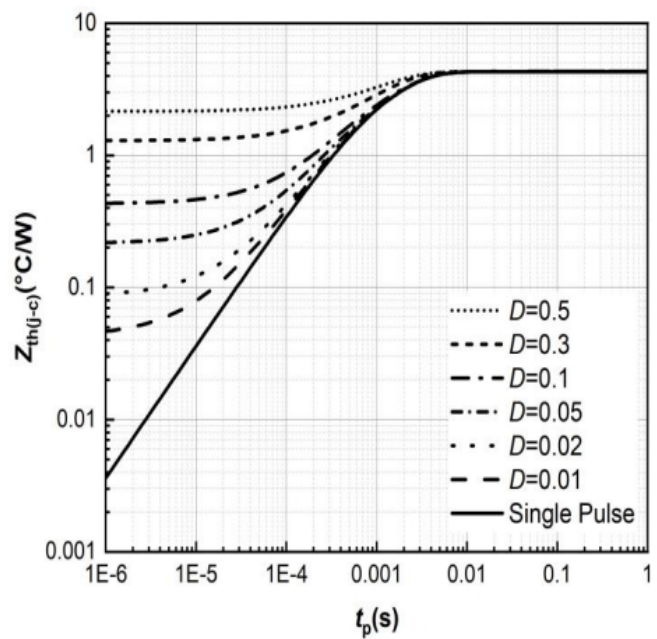


Figure 20. Transient Thermal Impedance

RATINGS AND CHARACTERISTIC CURVES

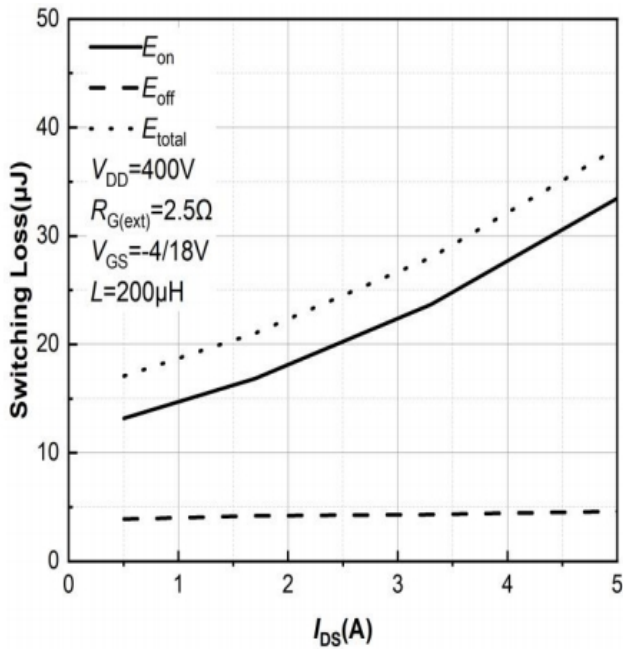


Figure 21. Clamped Inductive Switching Energy vs. Drain Current
 $T_j=25^\circ\text{C}$

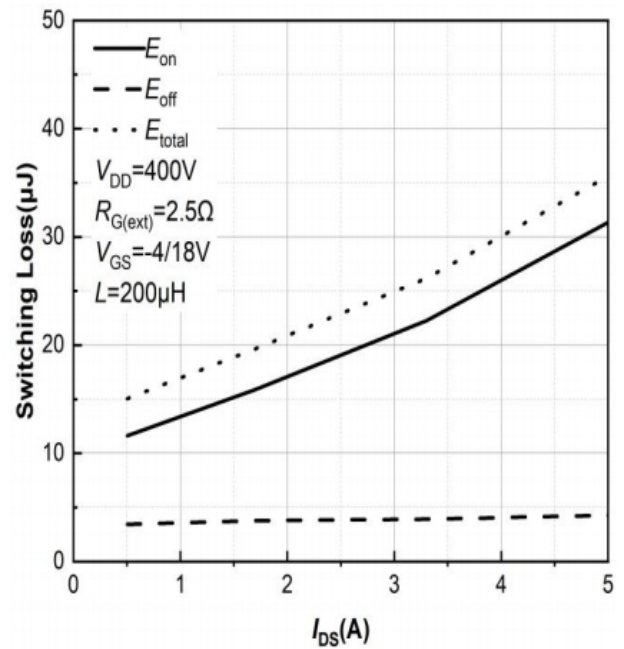


Figure 22. Clamped Inductive Switching Energy vs. Drain Current
 $T_j=175^\circ\text{C}$

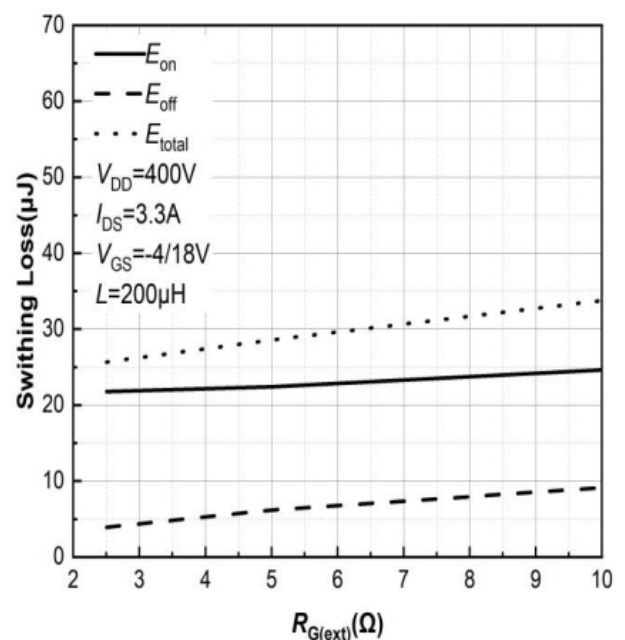
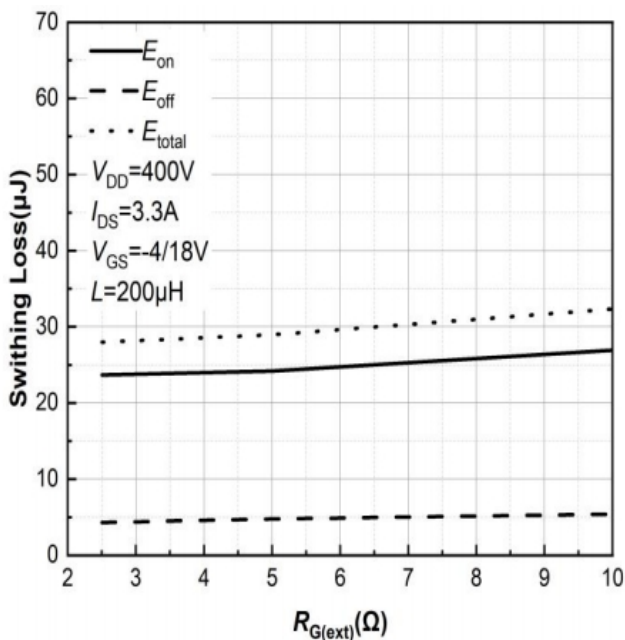


Figure 23. **Clamped Inductive Switching**
Energy vs. $R_{G(ext)}$
 $T_J=25^{\circ}\text{C}$

LSC500M65F

SiC N-Channel MOSFET

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

RATINGS AND CHARACTERISTIC CURVES

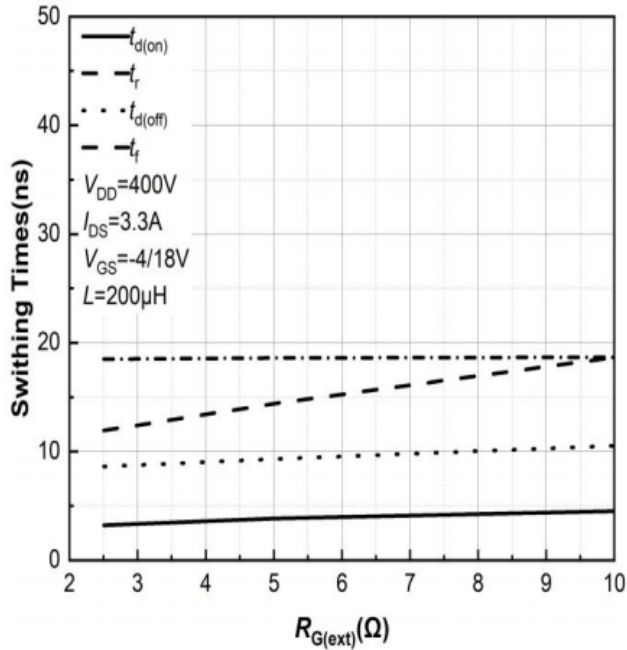


Figure 25. **Switching Times vs. $R_{G(ext)}$**
 $T_J=25^{\circ}\text{C}$

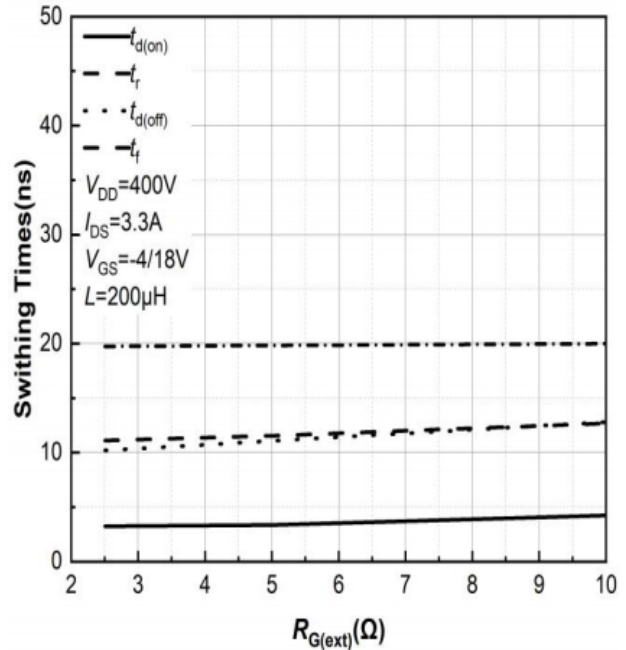


Figure 26. **Switching Times vs. $R_{G(ext)}$**
 $T_J=175^{\circ}\text{C}$

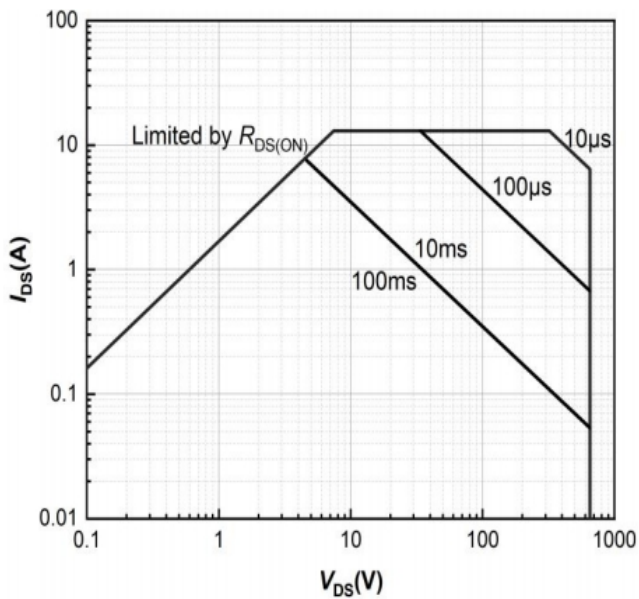
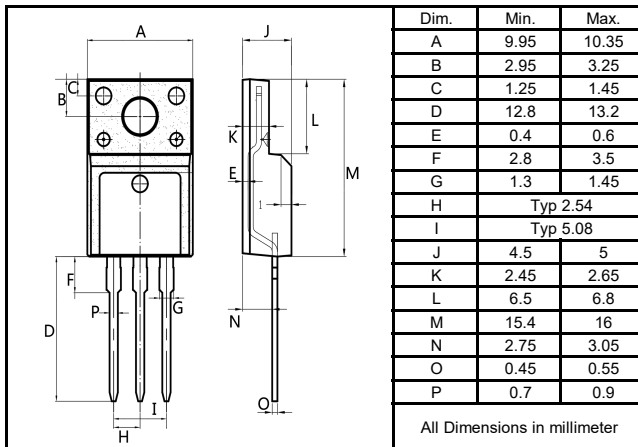


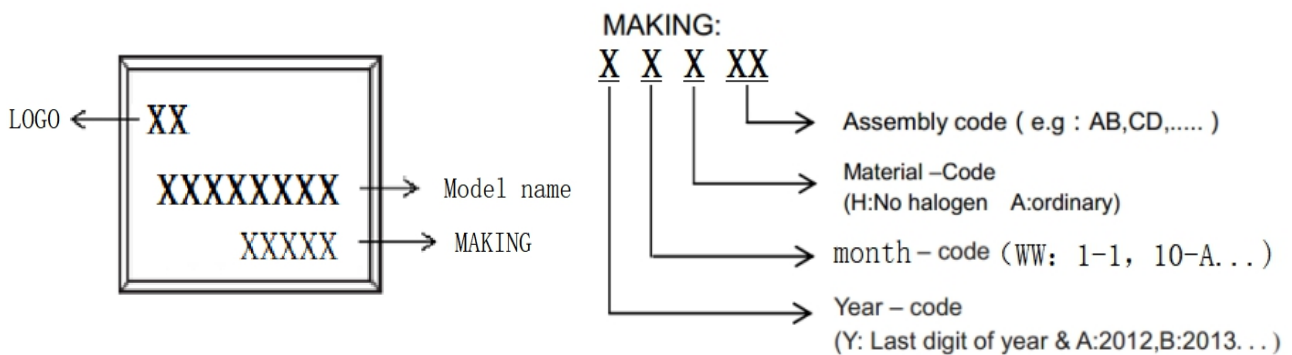
Figure 27. **Safe Operating Area**

Package Outline Dimensions millimeters

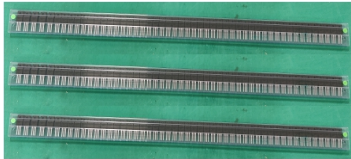
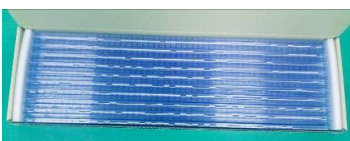
TO-220F



Marking on the body



packing instruction

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

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	2025/9/8