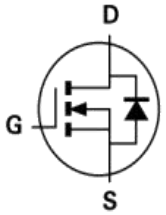
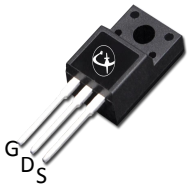
LSC060M65F

SiC N-Channel MOSFET

MAIN CHARACTERISTICS

I_D	40A
V_{DS}	800V
R_{DSON}-typ （@VGS=18V Tc=25°C）	50mΩ





TO-220F

FEATURES

- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low RDS(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

APPLICATIONS

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

MECHANICAL DATA

- Case: Molded plastic
- Mounting Position: Any
- Molded Plastic: UL Flammability Classification Rating 94V-0
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Solder bath temperature 275℃ maximum,10s per JESD 22-B106

Product specification classification

Part Number	Package	Mode Name	Pack
LSC060M65F	TO-220F	LSC060M65F	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}	-8/+22	V
Recommended Operation Value	V_{GSop}	-4/+18	V
Continue Drain Current TC=25℃	I_D	40	A
Continue Drain Current TC=100℃		28	A
Pulsed Drain Current (Note1)	I_{DM}	80	A
Power Dissipation	P_D	98	W
Operating Temperature Range	T_J	-40 to +175	°C
Storage Temperature Range	T_{STG}	-40 to +175	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.52	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	60	°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 = 100uA	BV_{DSS}	800	-	-	V
Drain-Source Leakage Current	VDS = 800 V, VGS = 0 V	I_{DSS}	-	-	1	μA
Gate Leakage Current	V_{GS} = +18 V, V_{DS} = 0 V	I_{GSS}	-	-	250	nA
	V_{GS} = -4 V, V_{DS} = 0 V		-	-	-250	nA
Gate-Source Threshold Voltage	V_{DS} = V_{GS} , I_D = 5 mA	$V_{GS(th)}$	2	2.7	4	V
Drain-Source On-State Resistance	V_{GS} = 18 V, I_D = 20 A	$R_{DS(on)}$	-	50	73	mΩ
	VGS = 18 V, ID =20 A, TJ = 175℃		-	58	-	
Internal Gate Resistance	f=1MHz	RG	-	2.1	-	Ω
Input Capacitance	V_{GS} = 0 V, V_{DS} = 600 V, f = 1MHz	C_{iss}	-	1301	-	pF
Output Capacitance		C_{oss}	-	138	-	pF
Reverse Transfer Capacitance		C_{rss}	-	14	-	pF
Total Gate Charge(Note2)	I_D = 20 A, V_{DD} = 400 V, V_{GS} =-4/+ 18 V	Q_G	-	68	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	17	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	22	-	nC
Turn-on Delay Time(Note2)	VDS = 400 V, ID = 20 A, VGS = -4/+18 V, RG =2.5 Ω L=200μH	$t_{d(ON)}$	-	13	-	ns
Rise Time(Note2)		t_r	-	20	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	20	-	ns
Fall Time(Note2)		t_f	-	9	-	ns
Turn-on Switching Energy		Eon	-	108	-	μJ
Turn-off Switching Energy		Eoff	-	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=-4V Tc=25°C	I_S	-	33	-	A
	VGS=-4V Tc=100°C		-	16	-	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	80	A
Drain-Source Diode Forward Voltage	V_{GS}=-4V, I_{SD}=10A Tj=25°C	V_{SD}	-	4.6	-	V
	V_{GS}=-4V,I_{SD}=10A Tj=175°C		-	4	-	V
	V_{GS}=-4V,I_{SD}=20A Tj=25°C		-	5.4	-	V
	V_{GS}=-4V,I_{SD}=20A Tj=175°C		-	4.6	-	V
Reverse Recovery Time(Note2)	VGS=-4V, ISD=20A, VR=400V, di/dt=989A/μs	trr	-	18	-	ns
Reverse Recovery Charge(Note2)		Qrr	-	104	-	nC
Peak Reverse Recovery Current		Irrm	-	10.2	-	A

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

RATINGS AND CHARACTERISTIC CURVES

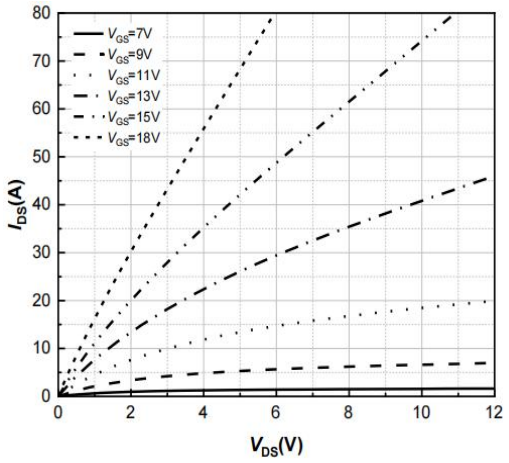


Figure 1. **Output Characteristics T_j=-40°C**

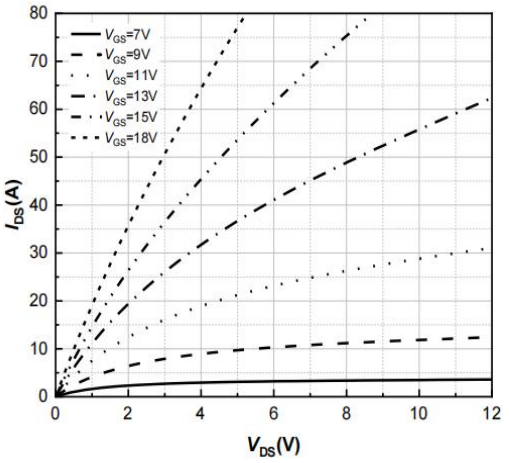


Figure 2. **Output Characteristics T_j=25°C**

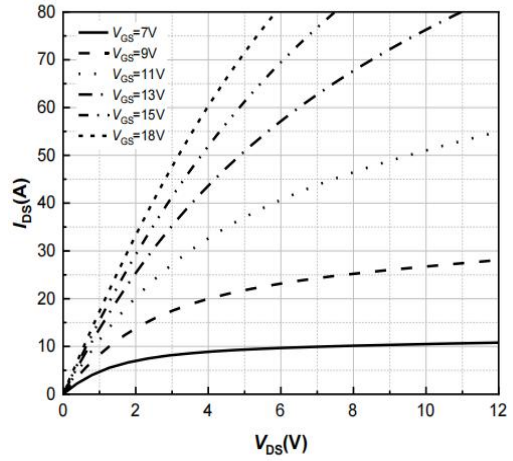


Figure 3. **Output Characteristics T_j=175°C**

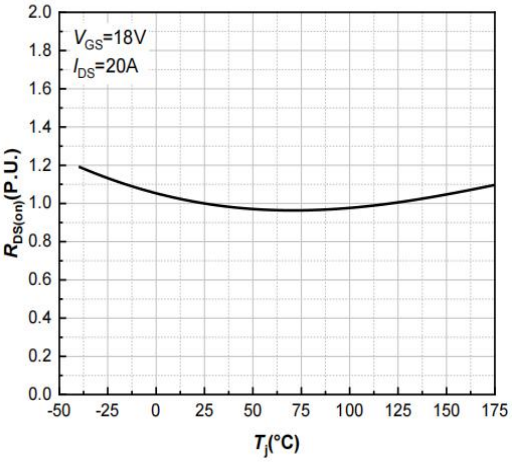


Figure 4. **Normalized On-Resistance vs. Temperature**

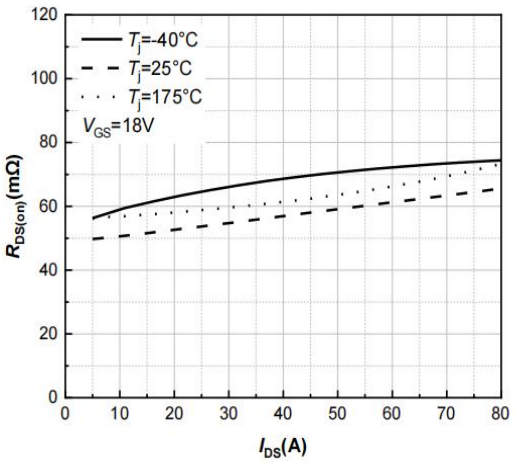


Figure 5. **On-Resistance vs. Drain Current For Various Temperatures**

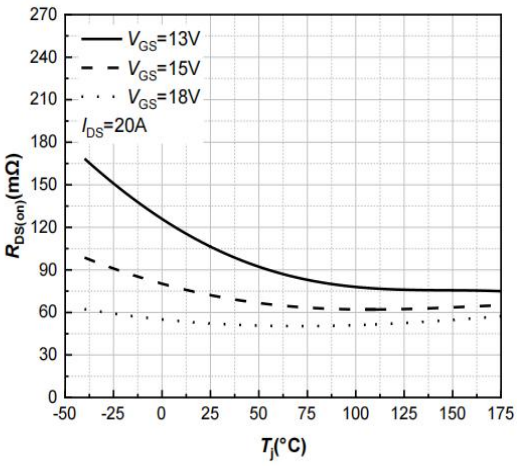


Figure 6. **On-Resistance vs. Temperature For Various Gate Voltage**

RATINGS AND CHARACTERISTIC CURVES

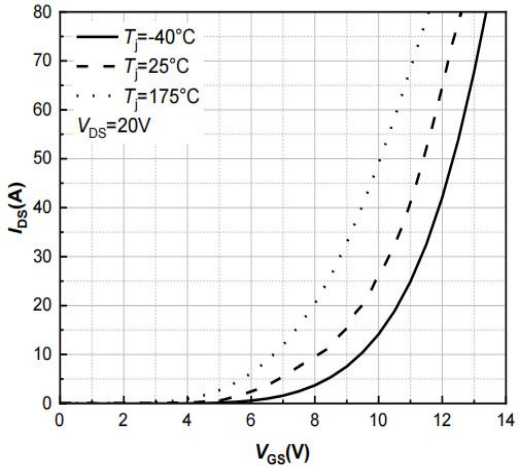


Figure 7. **Transfer Characteristic for Various Junction Temperatures**

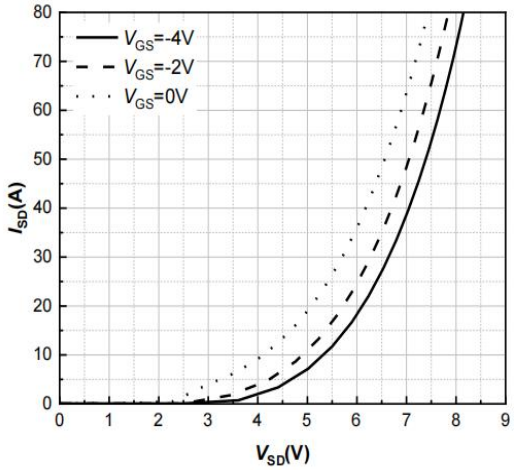


Figure 8. **Body Diode Characteristic T_j=-40°C**

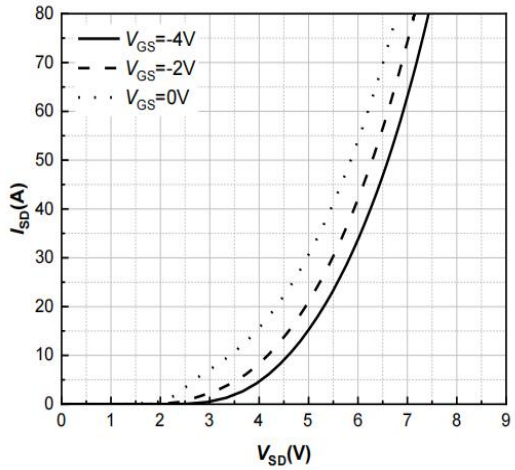


Figure 9. **Body Diode Characteristic T_j=25°C**

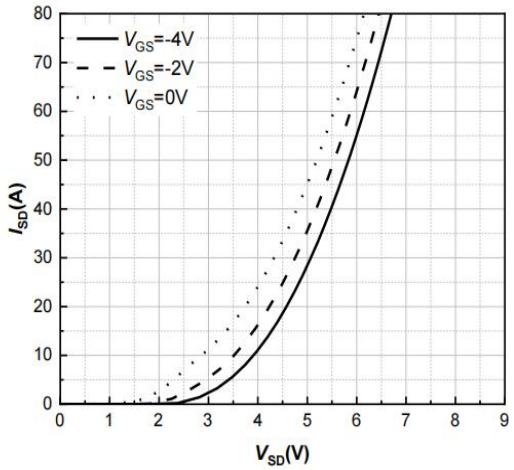


Figure 10. **Body Diode Characteristic T_j=175°C**

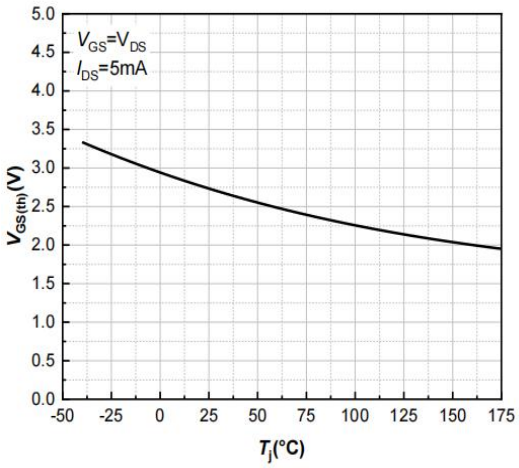


Figure 11. **Threshold Voltage vs. Temperature**

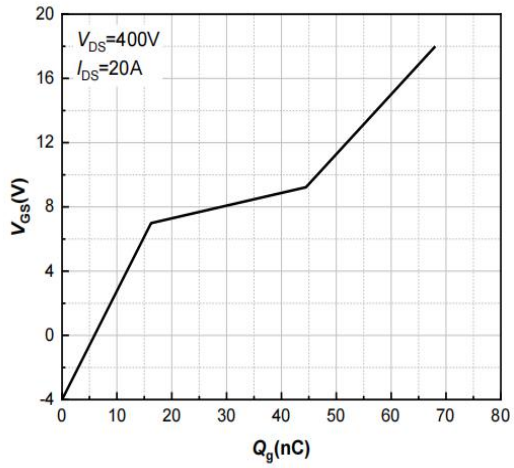


Figure 12. **Gate Charge Characteristics**

RATINGS AND CHARACTERISTIC CURVES

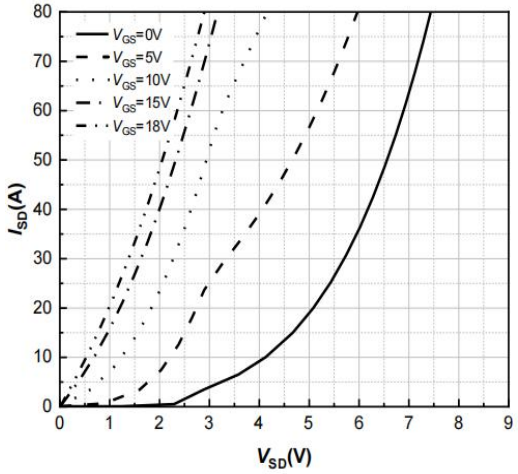


Figure 13. **3rd Quadrant Characteristic T_j=-40°C**

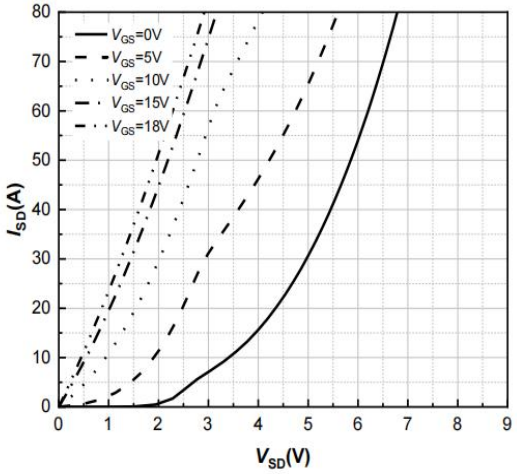


Figure 14. **3rd Quadrant Characteristic T_j=25°C**

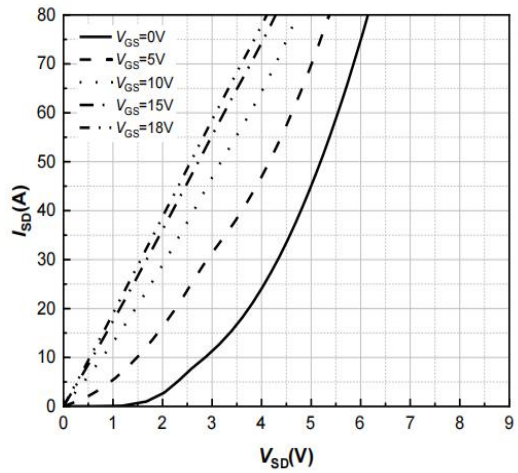


Figure 15. **3rd Quadrant Characteristic T_j=175°C**

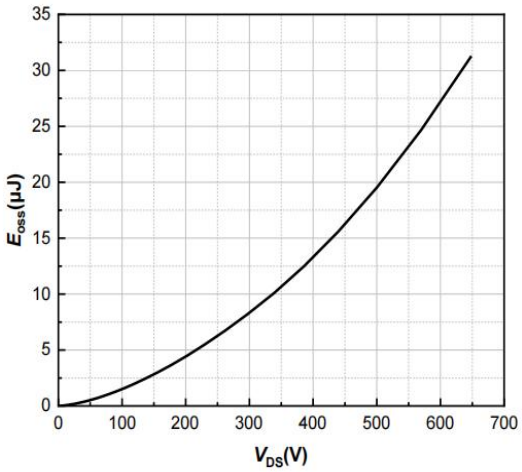


Figure 16. **Output Capacitor Stored Energy**

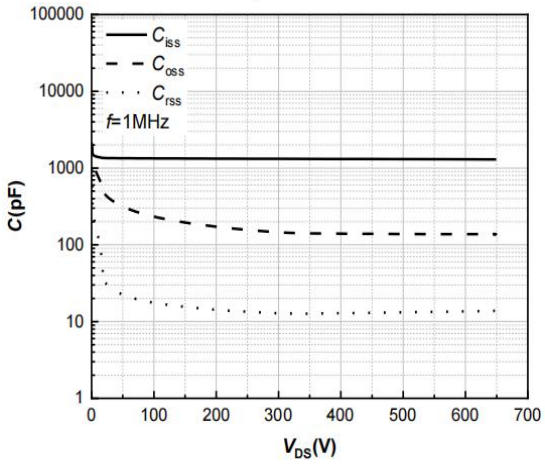


Figure 17. **Capacitances vs. Drain-Source**

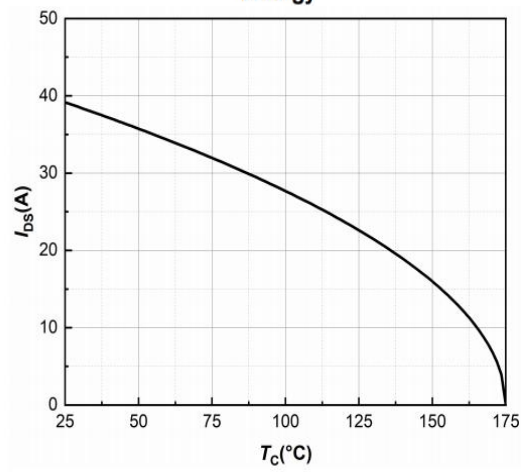


Figure 18. **Continuous Drain Current Derating vs. Case Temperature**

RATINGS AND CHARACTERISTIC CURVES

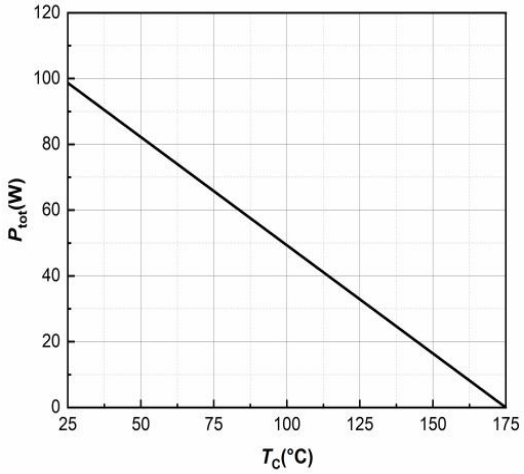


Figure 19. **Maximum Power Dissipation Derating vs. Case Temperature**

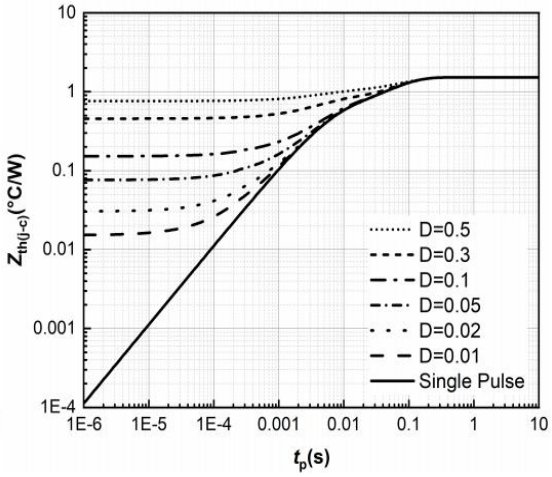


Figure 20. **Transient Thermal Impedance**

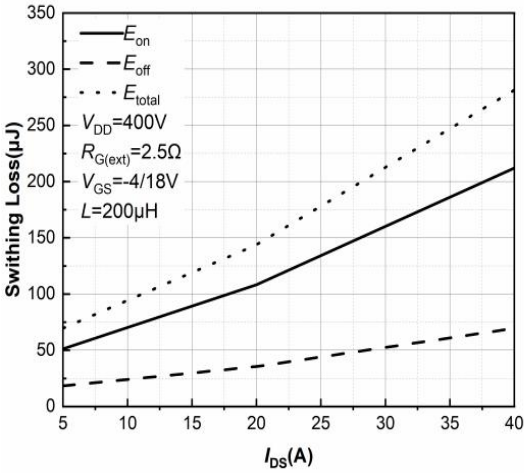


Figure 21. **Clamped Inductive Switching Energy vs. Drain Current**

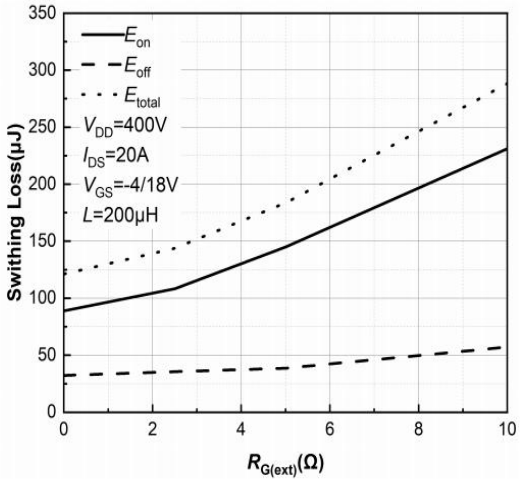


Figure 22. **Clamped Inductive Switching Energy vs. $R_{G(ext)}$**

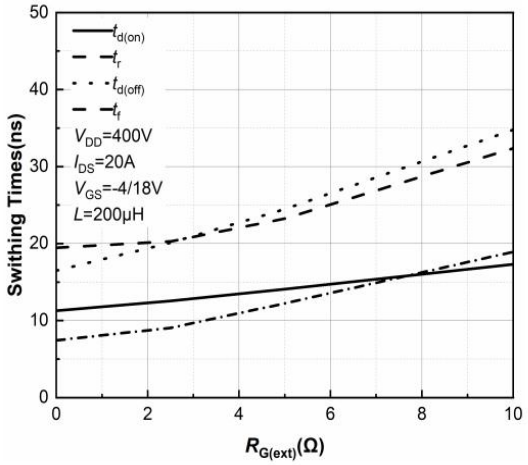


Figure 23. **Switching Times vs. $R_{G(ext)}$**

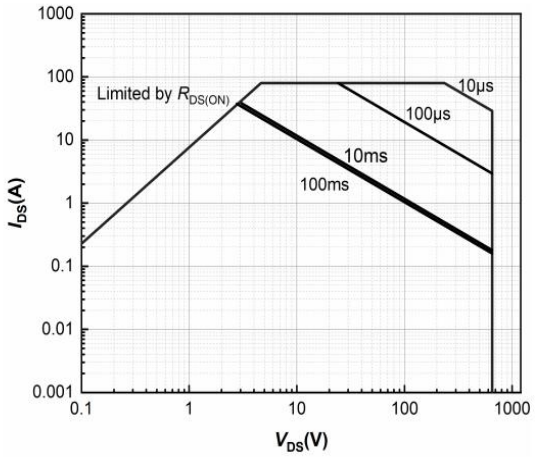
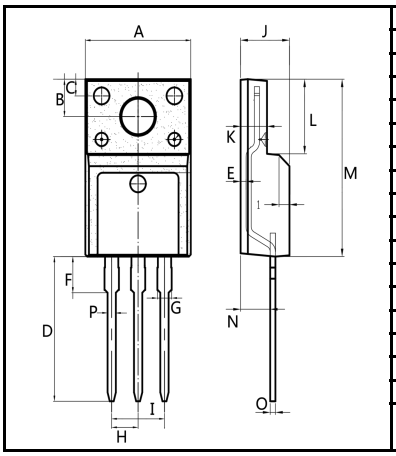


Figure 24. **Safe Operating Area**

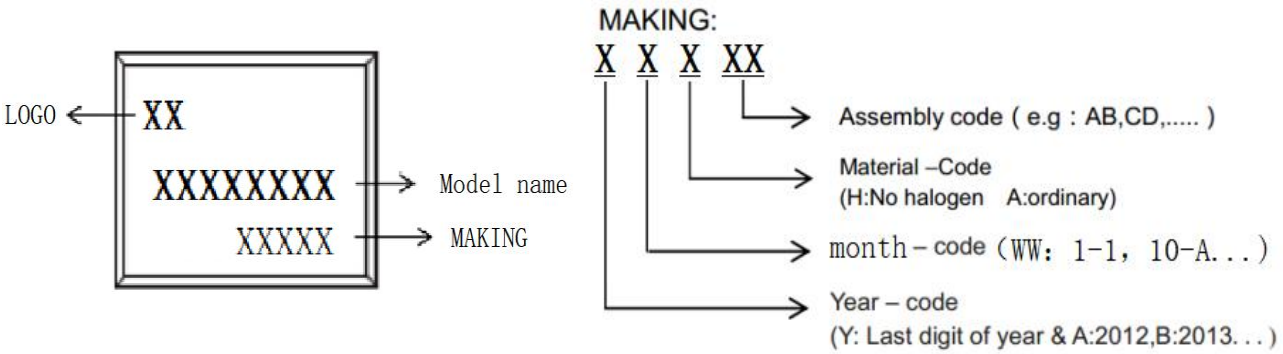
Package Outline Dimensions millimeters

TO-220F

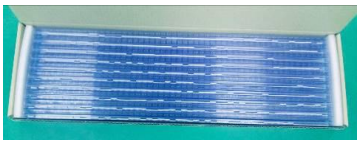


Dim.	Min.	Max.
A	9.95	10.35
B	2.95	3.25
C	1.25	1.45
D	12.8	13.2
E	0.4	0.6
F	2.8	3.5
G	1.3	1.45
H	Typ 2.54	
I	Typ 5.08	
J	4.5	5
K	2.45	2.65
L	6.5	6.8
M	15.4	16
N	2.75	3.05
O	0.45	0.55
P	0.7	0.9
All Dimensions in millimeter		

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 poer exceeding normal rated

poer; 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	2025/8/30