

### MAIN CHARACTERISTICS

$I_D$	39A
$V_{DS}$	800V
$R_{DS(on)-typ}$ (@VGS=18V Tc=25°C)	53mΩ

### 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

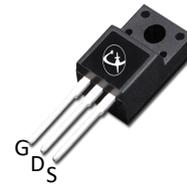
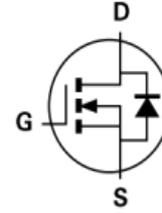
- Power Factor Correction Modules
- Switch Mode Power Supplies
- DC-AC Inverters
- High Voltage DC/DC Converters

### 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°C maximum, 10s per JESD 22-B106

### Product specification classification

Part Number	Package	Mode Name	Pack
LSC060M65F	TO-220F	LSC060M65F	Tube



TO-220F

### 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°C	$I_D$	39	A
Continue Drain Current TC=100°C		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  $\mu$ s 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	-	$\mu A$
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	$V_{GS} = 18 V, I_D = 20 A$	$R_{DS(on)}$	-	53	73	m $\Omega$
	$V_{GS} = 18 V, I_D = 20 A, T_J = 175^\circ C$		-	58	-	
Internal Gate Resistance	f=1MHz	$R_G$	-	2.1	-	$\Omega$
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		$C_{riss}$	-	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)	$V_{DS} = 400 V, I_D = 20 A, V_{GS} = -4/+18 V, R_G = 2.5 \Omega, L = 200\mu H$	$t_{d(ON)}$	-	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		$E_{on}$	-	108	-	$\mu J$
Turn-off Switching Energy		$E_{off}$	-	35	-	$\mu J$

**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 <sub>S</sub>	-	18	-	A
	VGS=-4V Tc=100°C		-	12	-	A
Maximun Body-Diode Pulsed Current(Note2)		I <sub>SM</sub>	-	-	80	A
Drain-Source Diode Forward Voltage	VGS=-4V, ISD=10A Tj=25°C	V <sub>SD</sub>	-	4.6	-	V
	VGS=-4V, ISD=10A Tj=175°C		-	4	-	V
	VGS=-4V, ISD=20A Tj=25°C		-	5.4	-	V
	VGS=-4V, ISD=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

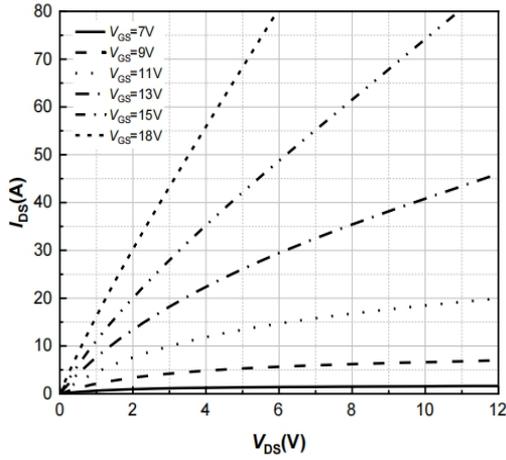


Figure 1. Output Characteristics  
 $T_j = -40^\circ\text{C}$

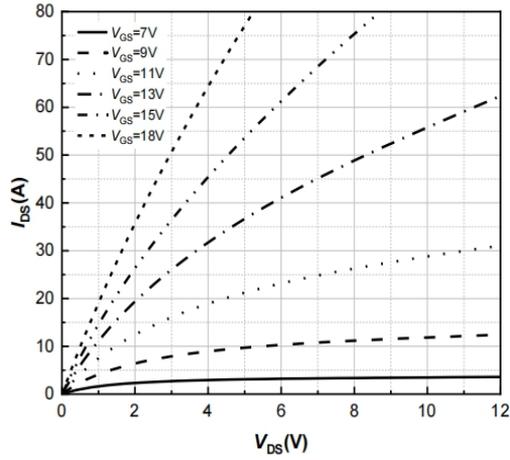


Figure 2. Output Characteristics  
 $T_j = 25^\circ\text{C}$

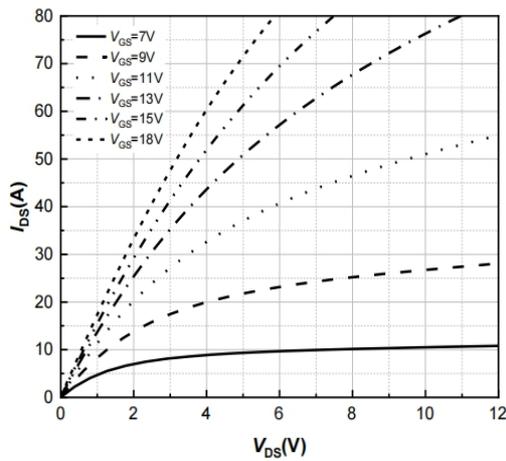


Figure 3. Output Characteristics  
 $T_j = 175^\circ\text{C}$

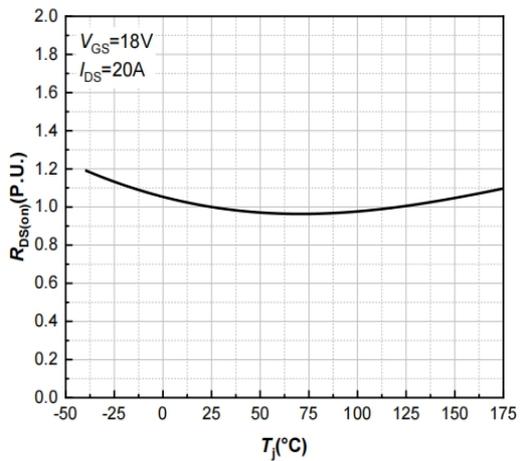


Figure 4. Normalized On-Resistance vs. Temperature

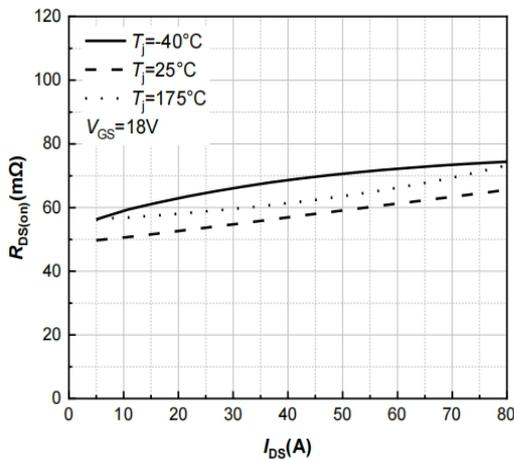


Figure 5. On-Resistance vs. Drain Current For Various Temperatures

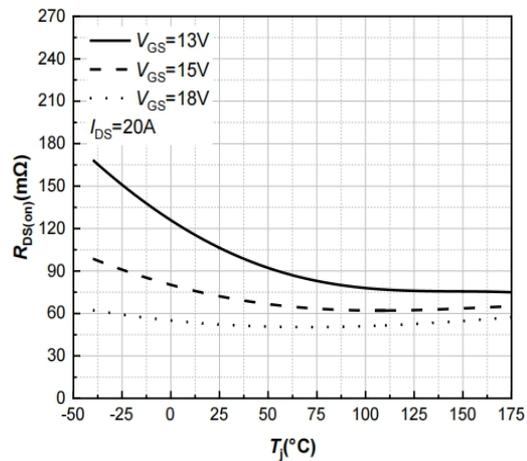


Figure 6. On-Resistance vs. Temperature For Various Gate Voltage

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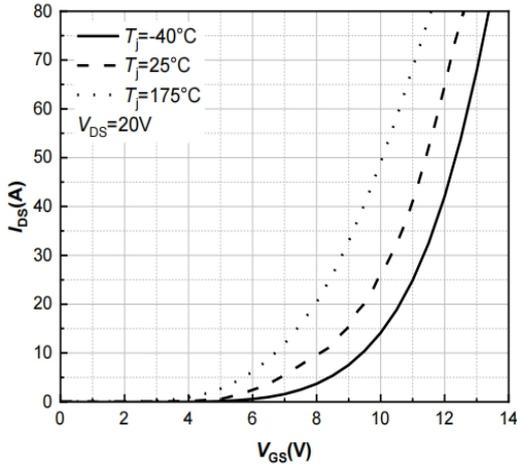


Figure 7. Transfer Characteristic for Various Junction Temperatures

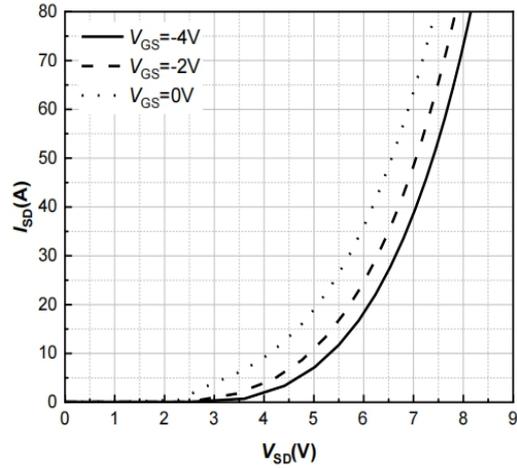


Figure 8. Body Diode Characteristic  $T_J = -40^\circ\text{C}$

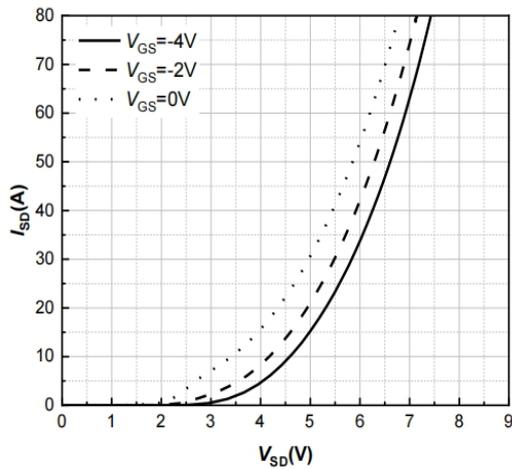


Figure 9. Body Diode Characteristic  $T_J = 25^\circ\text{C}$

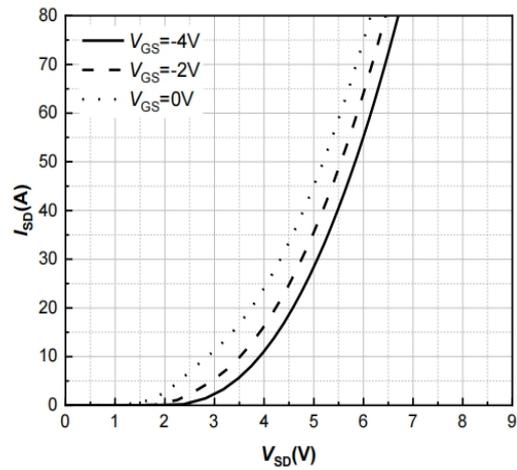


Figure 10. Body Diode Characteristic  $T_J = 175^\circ\text{C}$

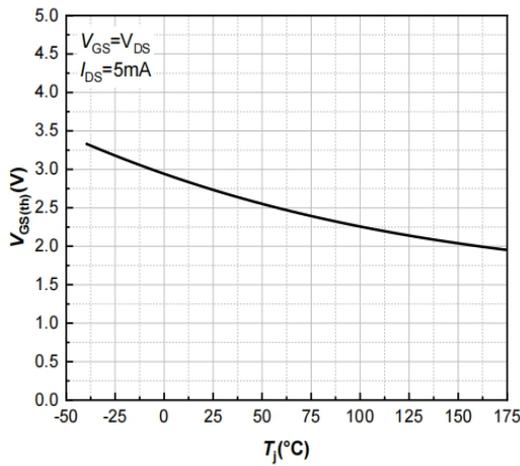


Figure 11. Threshold Voltage vs. Temperature

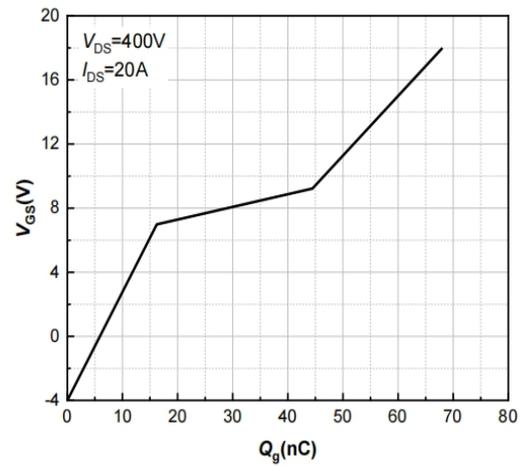


Figure 12. Gate Charge Characteristics

## RATINGS AND CHARACTERISTIC CURVES

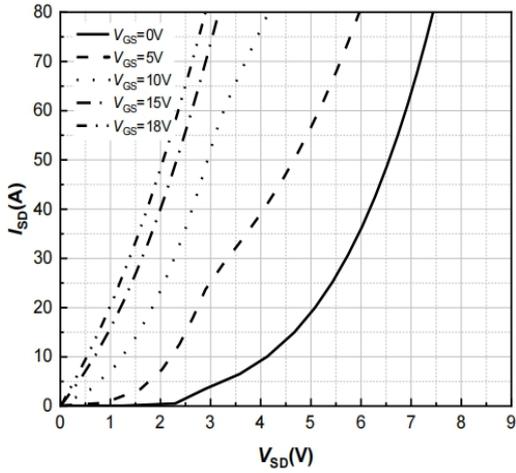


Figure 13. 3rd Quadrant Characteristic  
 $T_j = -40^\circ\text{C}$

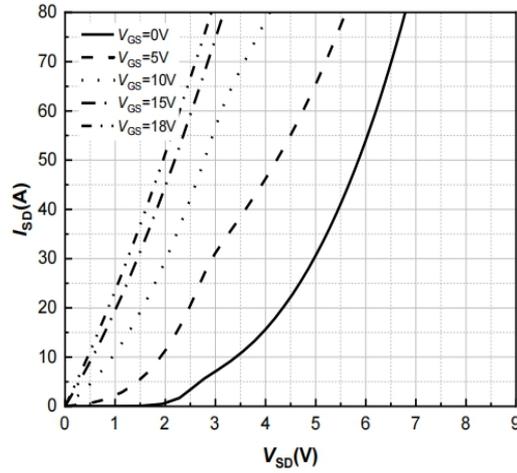


Figure 14. 3rd Quadrant Characteristic  
 $T_j = 25^\circ\text{C}$

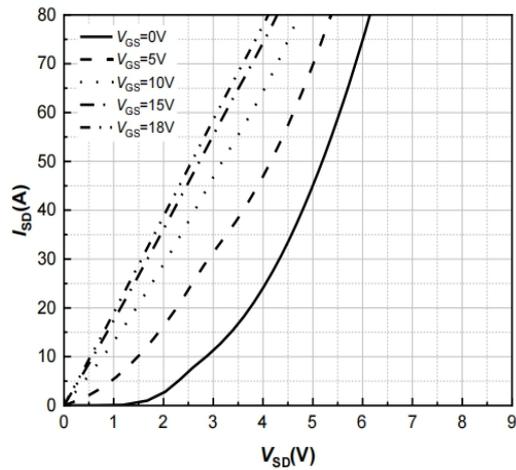


Figure 15. 3rd Quadrant Characteristic  
 $T_j = 175^\circ\text{C}$

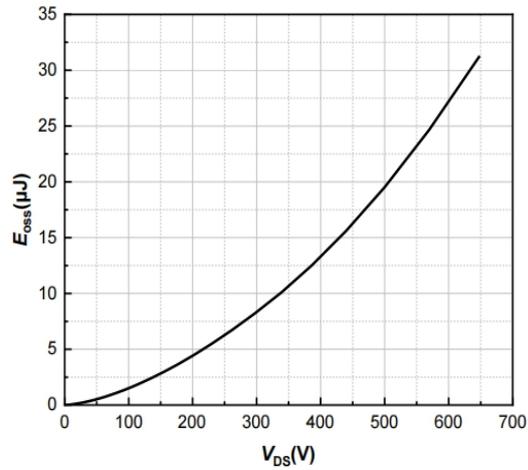


Figure 16. Output Capacitor Stored Energy

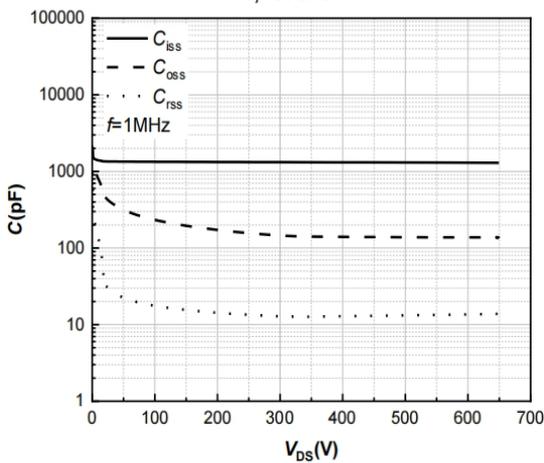


Figure 17. Capacitances vs. Drain-Source

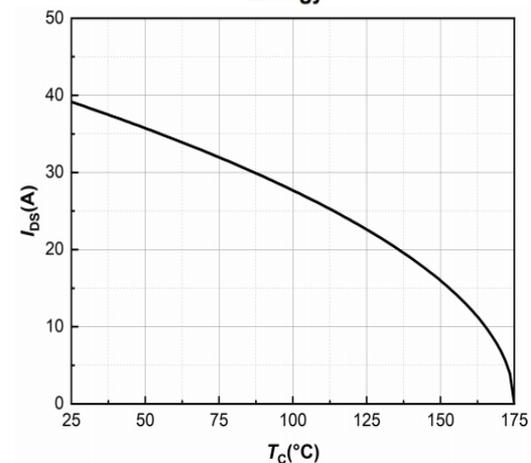


Figure 18. Continuous Drain Current Derating vs. Case Temperature

## RATINGS AND CHARACTERISTIC CURVES

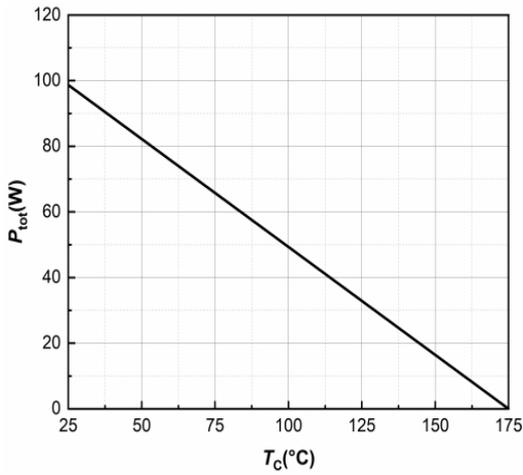


Figure 19. Maximum Power Dissipation Derating vs. Case Temperature

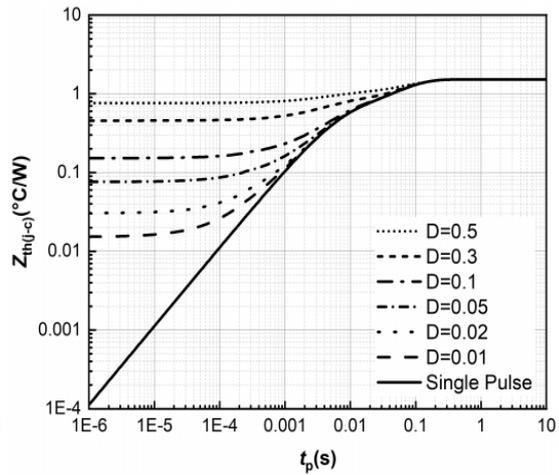


Figure 20. Transient Thermal Impedance

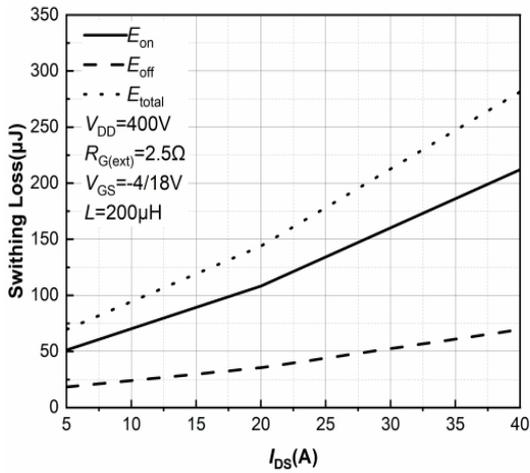


Figure 21. Clamped Inductive Switching Energy vs. Drain Current

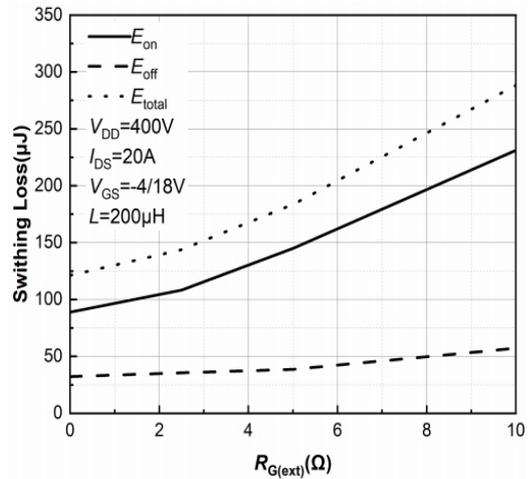


Figure 22. Clamped Inductive Switching Energy vs.  $R_{G(ext)}$

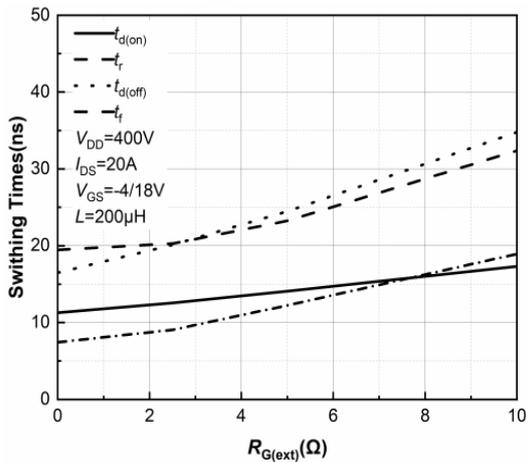


Figure 23. Switching Times vs.  $R_{G(ext)}$

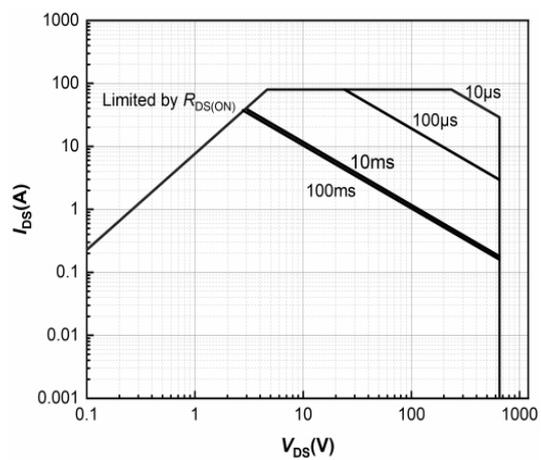
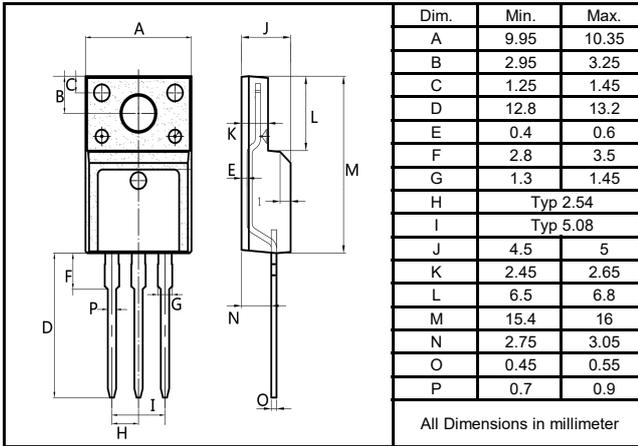


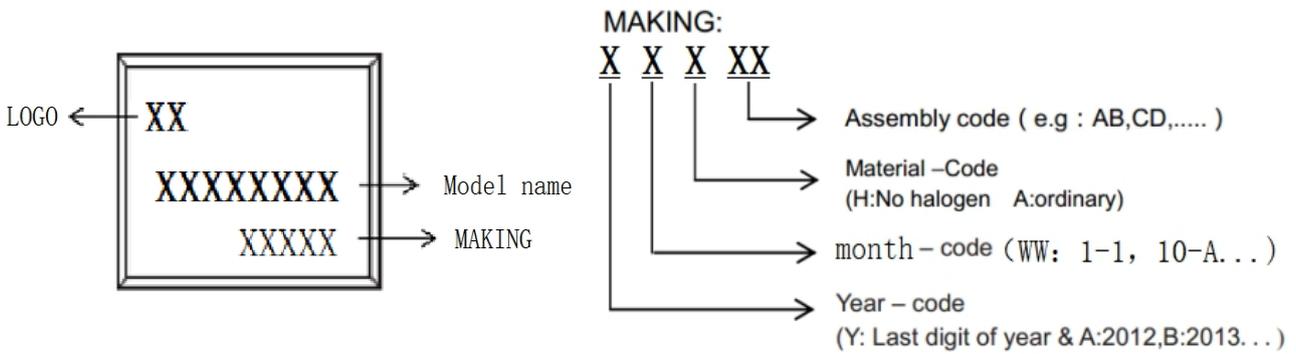
Figure 24. Safe Operating Area

## Package Outline Dimensions millimeters

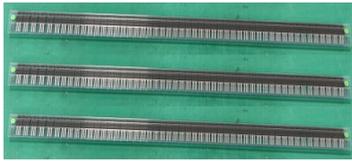
TO-220F



## 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	2025/8/30