

MAIN CHARACTERISTICS

I_D	74A
V_{DS}	1200V
$R_{os(on)-Typ@ V_{gs}=18V}$	33m Ω

FEATURES

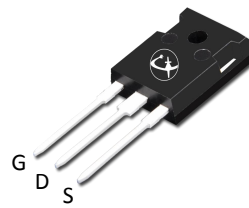
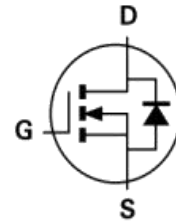
- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low RDS(on)
- Easy to Parallel
- Simple to Drive
- RoHS Compliant

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



TO-247

Product specification classification

Part Number	Package	Mode Name	Pack
LSC040M120B	TO-247	LSC040M120B	Tube

Maximum Ratings at Tc=25°C unless otherwise specified

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	1200	V
Gate-Source Voltage	V_{GS}	-8/+22	V
Recommended Operation Value	VGSop	-4/+18	V
Continue Drain Current Tc=25°C	I_D	74	A
Continue Drain Current Tc=100°C		52	
Pulsed Drain Current	I_{DM}	150	A
Power Dissipation TC=25°C	P_D	312	W
Power Dissipation TC=100°C		156	
Operating Temperature Range	T_J	-40 to +175	°C
Storage Temperature Range	T_{STG}	-40 to +175	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.48	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	26.8	°C/W

Note1:Pulse test: 300 μ 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}	1200	-	-	V
Drain-Source Leakage Current	$V_{DS} = 1200 V, V_{GS} = 0 V$	I_{DSS}	-	1	5	μA
Gate Leakage Current	$V_{GS} = 18 V, V_{DS} = 0 V$	I_{GSS}	-	-	250	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 10 mA$	$V_{GS(th)}$	2	2.6	4	V
	$V_{DS} = V_{GS}, I_D = 10 mA$ $T_J = 175^\circ C$		-	2	-	V
Drain-Source On-State Resistance	$V_{GS} = 18 V, I_D = 40 A$	$R_{DS(on)}$	-	33	50	m Ω
	$V_{GS} = 18 V, I_D = 40 A,$ $T_J = 175^\circ C$		-	47	-	m Ω
Internal Gate Resistance	f=1MHz	$R_{G(int)}$	-	2.1	-	Ω
Input Capacitance	$V_{DS}=1000V, V_{GS}=0V,$ f=100kHz	C_{iss}	-	2975	-	pF
Output Capacitance		C_{oss}	-	119	-	pF
Reverse Transfer Capacitance		C_{rss}	-	12	-	pF
Coss Stored Energy		Eoss	-	175	-	μJ
Total Gate Charge(Note2)		Q_G	-	117	-	nC
Gate to Source Charge(Note2)	$I_D = 40A, V_{DD} = 800V,$ $V_{GS} = -4/+ 18 V$	Q_{GS}	-	38	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	27	-	nC

Electrical Characteristics at Tc=25°C unless otherwise specified

Turn-on Switching Energy	$V_{DS} = 800 V, I_D = 40A,$ $V_{GS} = -4/+18 V,$ $R_{G(int)} = 2.5 \Omega L=200\mu H$	Eon	-	485	-	μJ
Turn-off Switching Energy		Eoff	-	75	-	μJ
Turn-on Delay Time(Note2)		$t_{d(ON)}$	-	18	-	ns
Rise Time(Note2)		t_r	-	21	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	31	-	ns
Fall Time(Note2)		t_f	-	9	-	ns

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 = -4 V, Tc=25°C	I _S	-	45	-	A
	VGS = -4 V, Tc=100°C		-	20	-	A
Maximun Body-Diode Pulsed Current(Note2)		I _{SM}	-	150	-	A
Drain-Source Diode Forward Voltage	VGS = -4 V, ISD = 20 A	V _{SD}	-	5	6.6	V
	VGS = -4 V, ISD=20A, Tj=175°C		-	4.4	-	V
Reverse Recovery Time(Note2)	VGS = -4 V, I _{SD} = 20 A,	trr	-	19	-	ns
Reverse Recovery Charge(Note2)	V _R =800V, dIF/dt =3900	Qrr	-	500	-	nC
Peak Reverse Recovery Current	A/μs	Irrm	-	50	-	A

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

RATINGS AND CHARACTERISTIC CURVES

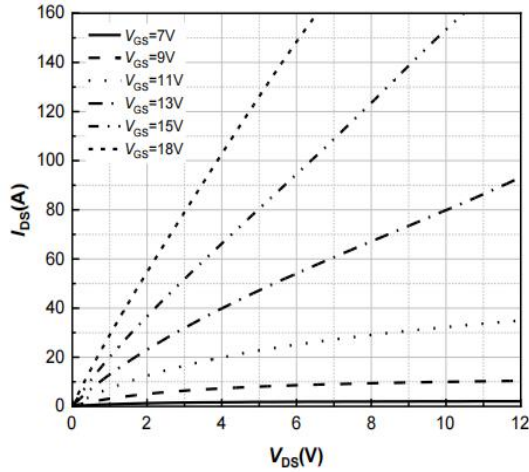


Figure 1. Output Characteristics
 $T_j = -40^\circ\text{C}$

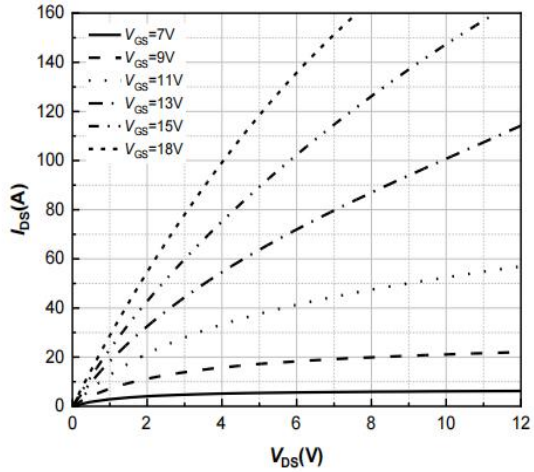


Figure 2. Output Characteristics
 $T_j = 25^\circ\text{C}$

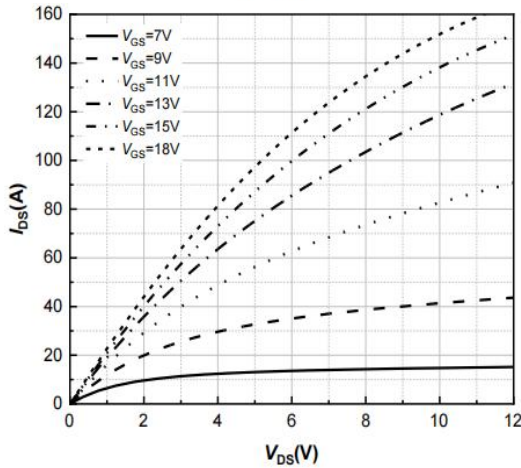


Figure 3. Output Characteristics
 $T_j = 175^\circ\text{C}$

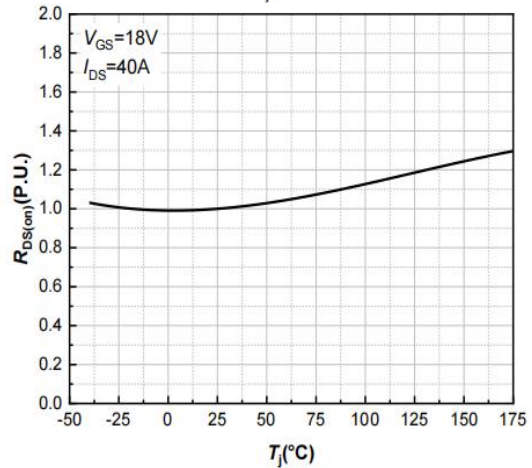


Figure 4. Normalized On-Resistance vs. Temperature

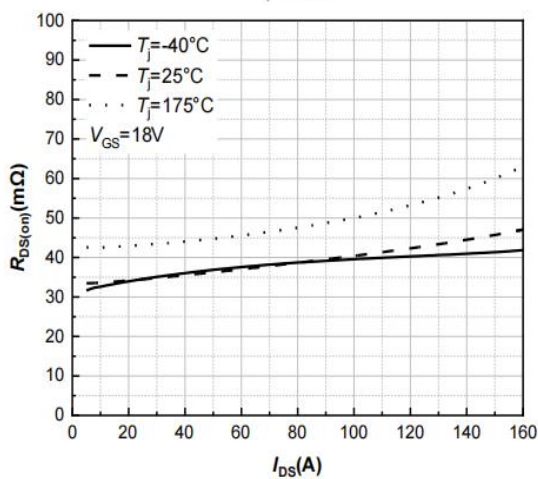


Figure 5. On-Resistance vs. Drain Current For Various Temperatures

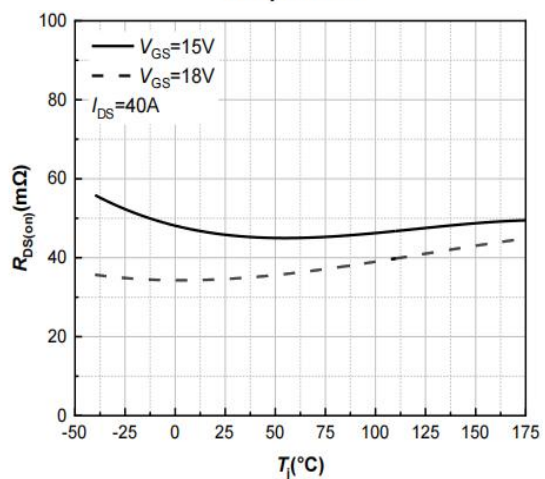


Figure 6. On-Resistance vs. Temperature For Various Gate Voltage

RATINGS AND CHARACTERISTIC CURVES

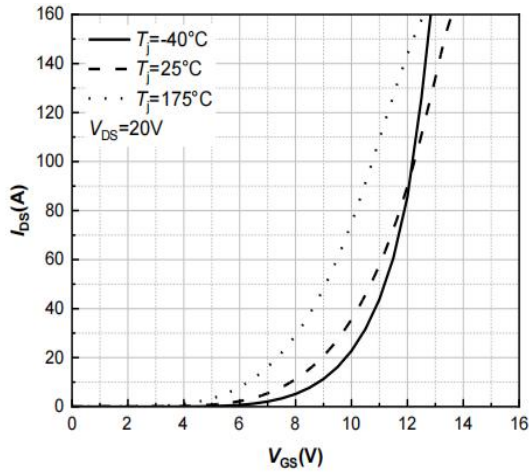


Figure 7. Transfer Characteristic for Various Junction Temperatures

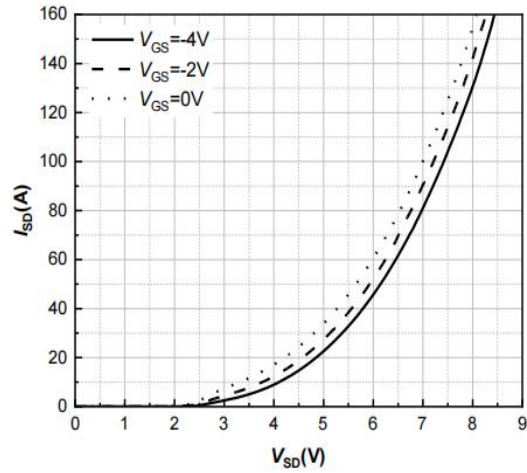


Figure 8. Body Diode Characteristic $T_J = -40^\circ\text{C}$

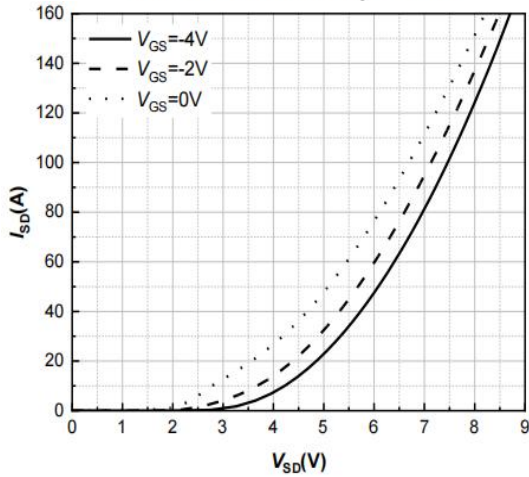


Figure 9. Body Diode Characteristic $T_J = 25^\circ\text{C}$

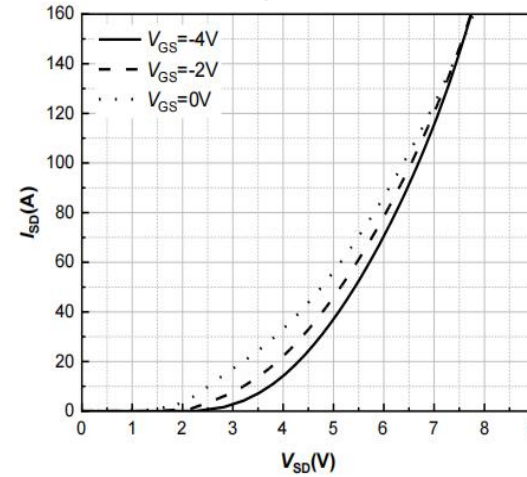


Figure 10. Body Diode Characteristic $T_J = 175^\circ\text{C}$

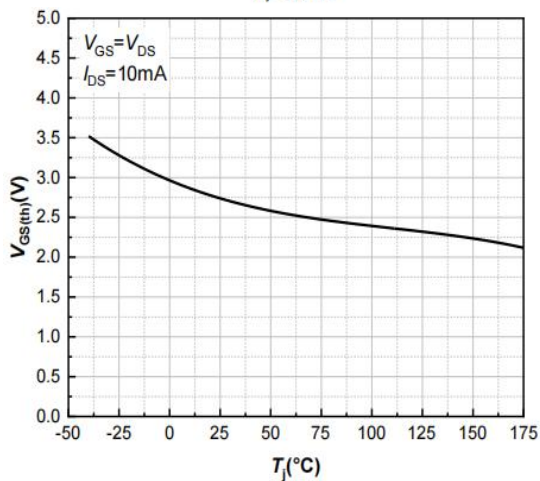


Figure 11. Threshold Voltage vs. Temperature

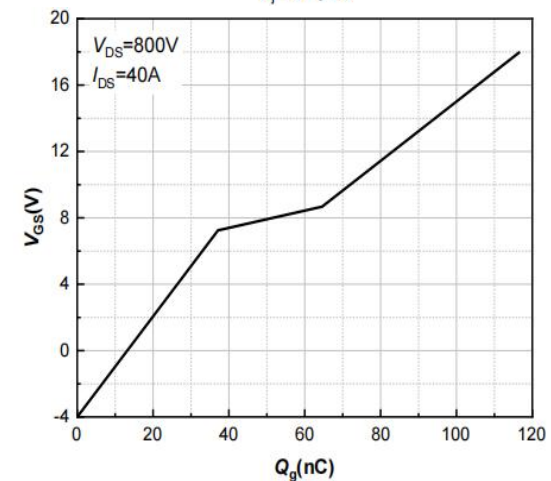


Figure 12. Gate Charge Characteristics

RATINGS AND CHARACTERISTIC CURVES

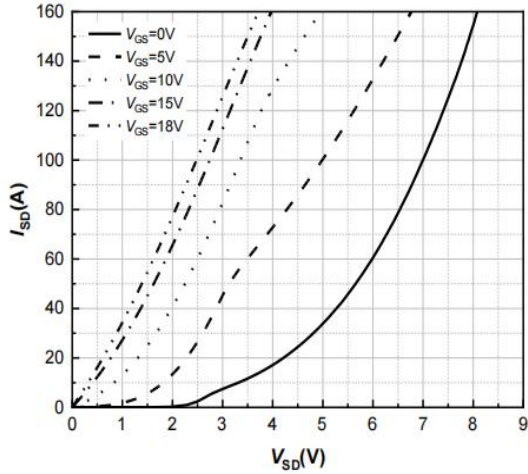


Figure 13. 3rd Quadrant Characteristic
 $T_j = -40^\circ\text{C}$

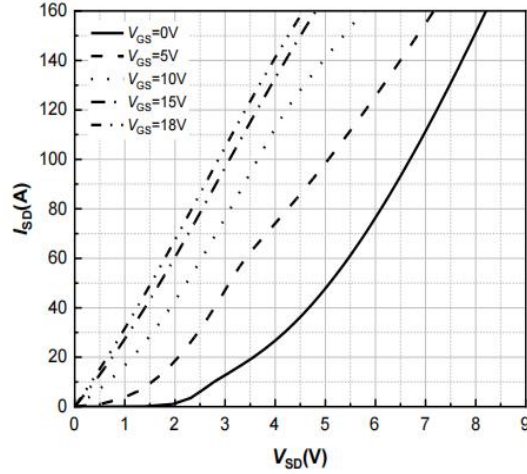


Figure 14. 3rd Quadrant Characteristic
 $T_j = 25^\circ\text{C}$

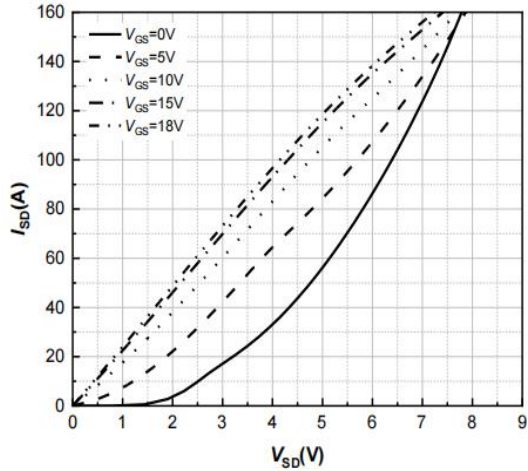


Figure 15. 3rd Quadrant Characteristic
 $T_j = 175^\circ\text{C}$

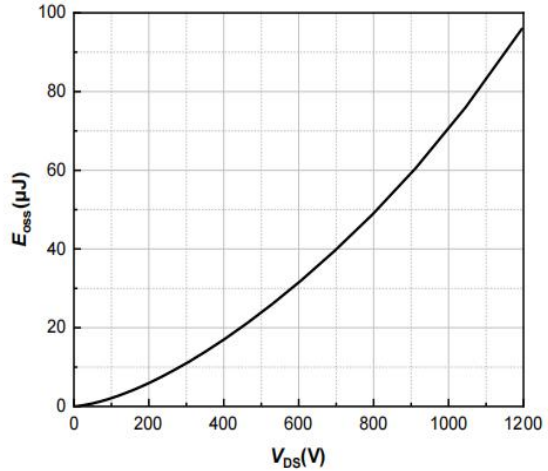


Figure 16. Output Capacitor Stored Energy

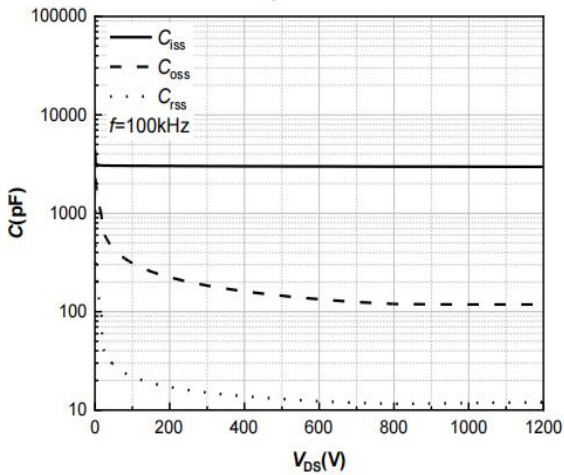


Figure 17. Capacitances vs. Drain-Source

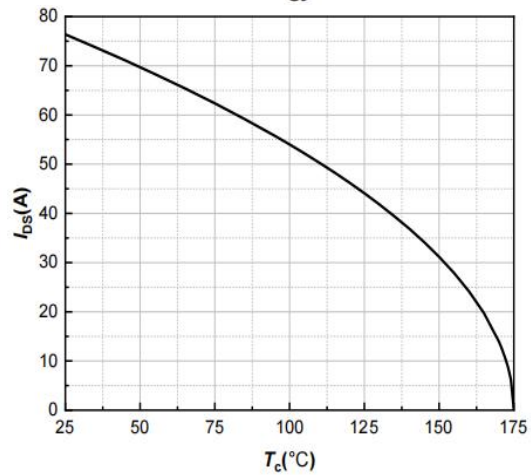


Figure 18. Continuous Drain Current Derating vs. Case Temperature

RATINGS AND CHARACTERISTIC CURVES

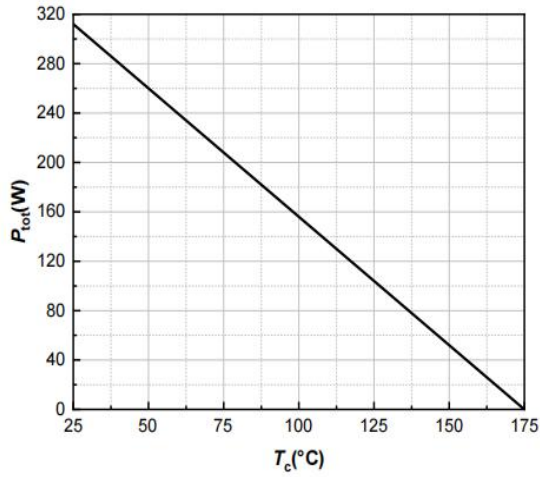


Figure 19. Maximum Power Dissipation Derating vs. Case Temperature

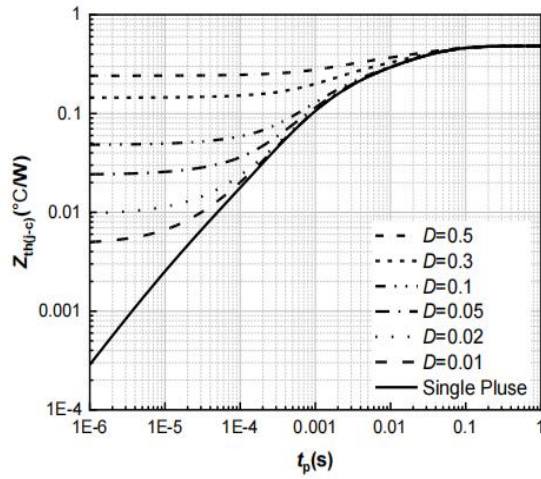


Figure 20. Transient Thermal Impedance

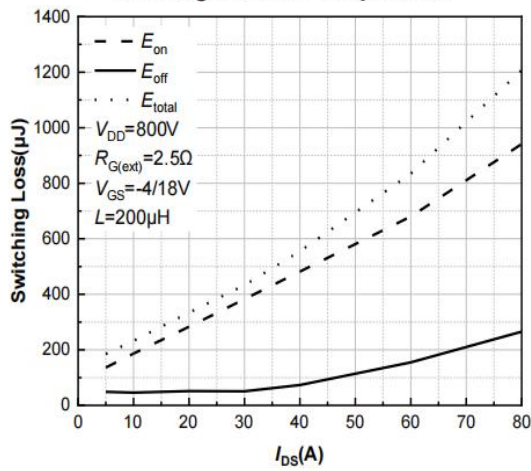


Figure 21. Clamped Inductive Switching Energy vs. Drain Current

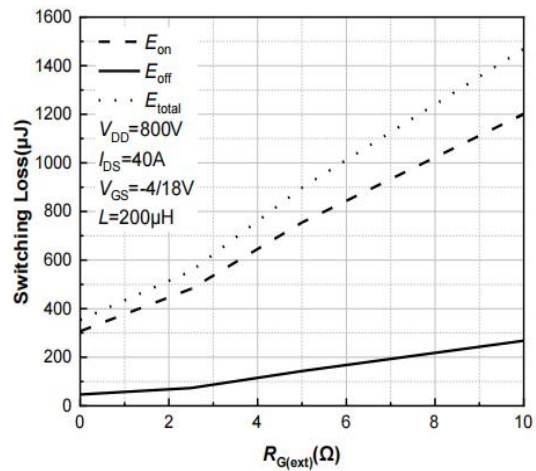


Figure 22. Clamped Inductive Switching Energy vs. $R_{G(ext)}$

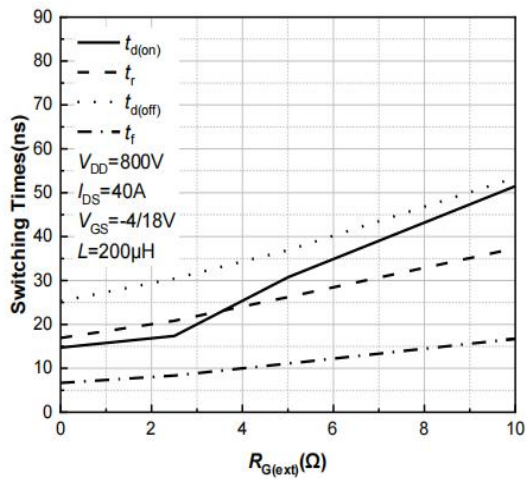


Figure 23. Switching Times vs. $R_{G(ext)}$

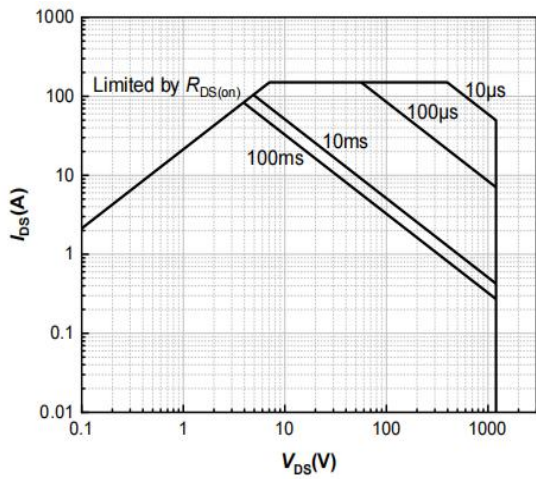
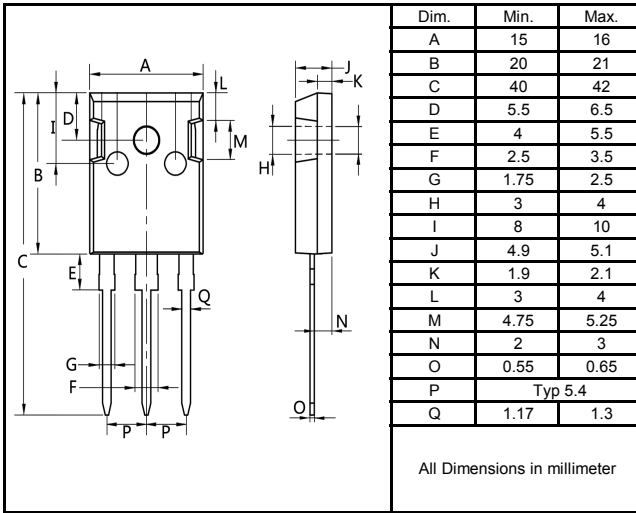


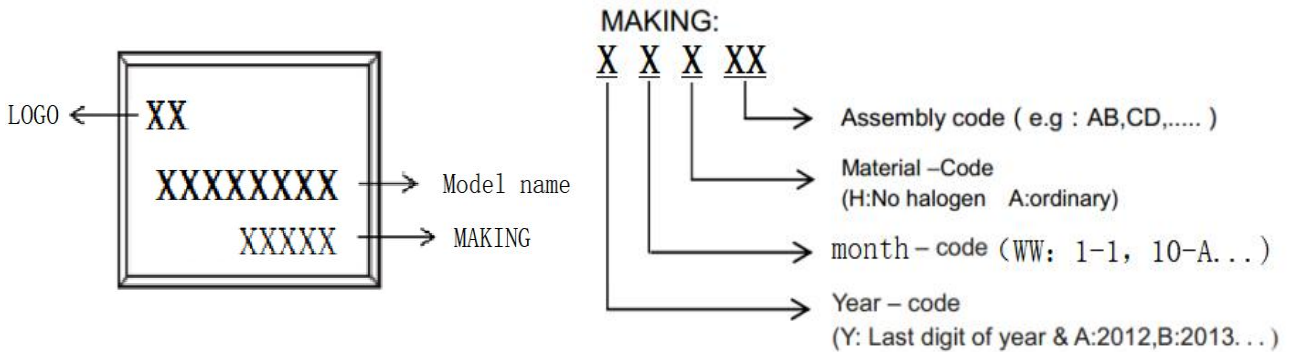
Figure 24. Safe Operating Area

Package Outline Dimensions millimeters

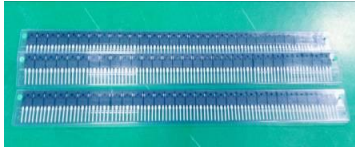


T0-247



Marking on the body



Packing instruction

PKG	Minimal Package	Box	Carton
TO-247			
	30pcs/pdpe	600pcs/box	3000pcs/Carton



LSC040M120B

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 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	2025/10/9