LIPTAI

MSL035R250PH

MOSFETs Silicon 250V N-Channel MOS

■ Applications

• Synchronus Rectification

• Industrial and Motor Drive

• DC/DC and AC/DC Converters

• Power Tools

• BMS

■ Features

• High-Speed Switching

• Low $R_{DS(ON)}$

• Good stability and uniformity with high EAS

• RoHS and Halogen-Free Compliant

• 100% UIS and RG Tested

■ Product Summary

V_{DS}	250	V
I_D	90	A
$R_{DS(ON),Typ}@10V$	29	mΩ
Q_g	365	nC

Gate： 1

Drain： 2
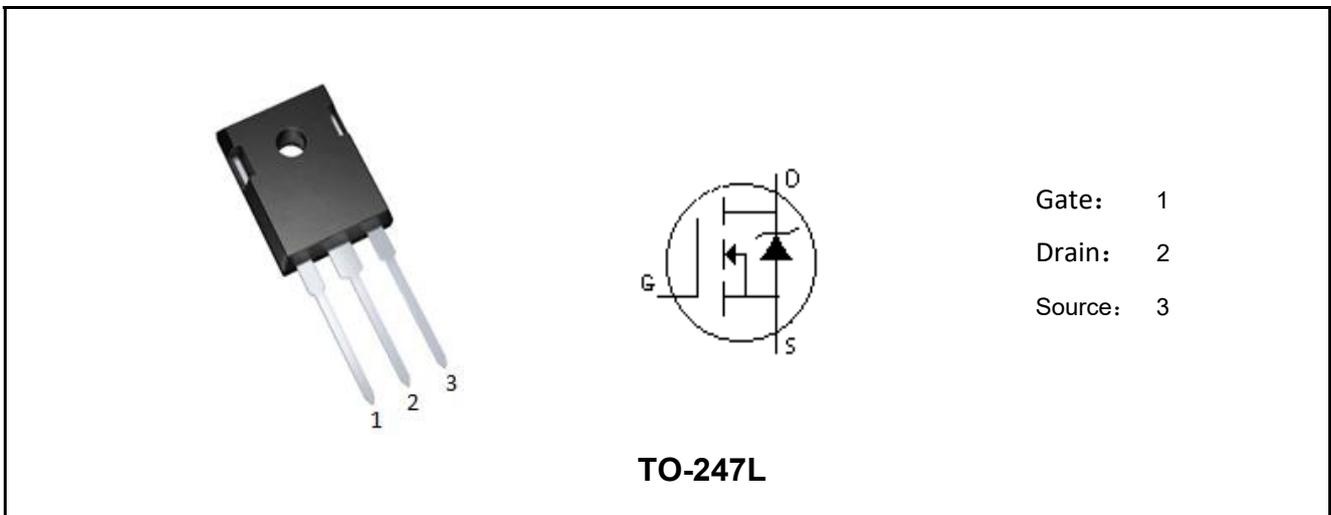
Source： 3

TO-247L

Marking	Package	Packaging	Min. package quantity
MSL035R250PH	TO-247L	Tube	450

■ Absolute Maximum Ratings（Tc=25℃ unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	250	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current Tc=25℃ (Note 1)	I_D	90	A
Continuous Drain Current Tc=100℃ (Note 1)		65	A
Drain Current-Pulsed (Note 1)	I_{DM}	360	A
Total Dissipation	P_D	310	W
Junction Temperature	T_j	150	℃
Storage Temperature	T_{stg}	-55-150	℃
Single Pulse Avalanche Energy (Note 2)	E_{AS}	2680	mJ

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

■ Thermal Characteristics

Parameter	Symbol	Max	Unit
Maximum Junction-to-Case	$R_{\theta JC}$	0.4	℃/W
Maximum Junction-to-Ambient	$R_{\theta JA}$	40	℃/W

Note 1：Ensure that the channel temperature does not exceed 150℃.

Note 2：V_{DD}=50V, Tch= 25℃(initial), L=0.5mH, R_g=25Ω.
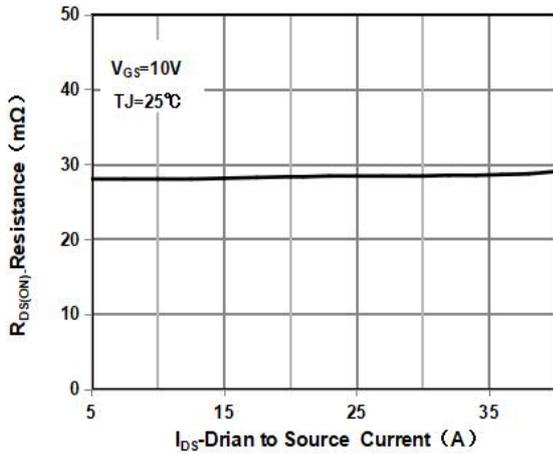
Note：This transistor is sensitive to electrostatic discharge and should be handled with care.

Si Chuan LIPTAI Electronic Co.,Ltd   2   2023.12
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■ Electrical Characteristics（Tc=25℃ unless otherwise noted)

| Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Static Parameters							
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V,I_D=250uA$		250	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=250V,V_{GS}=0V$		-	-	1	uA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm20V,V_{DS}=0V$		-	-	±100	nA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS},I_D=250uA$		2	3	4	V
Drain-Source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V,I_D=20A$		-	29	35	mΩ
			Tj=125℃	-	58	-	
Dynamic Characteristics							
Input Capacitance	C_{iss}	$V_{DS}=35V,V_{GS}=0V,$ f=1.0MHz		-	5840	-	pF
Output Capacitance	C_{oss}			-	715	-	pF
Reverse Transfer Capacitance	C_{rss}			-	405	-	pF
Gate Resistance	R_g	$V_{DS}=0V,V_{GS}=0V,$ f=1.0MHz		-	1.2	-	Ω
Switching Paramters							
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=100V,I_D=45A,$ $V_{GS}=10V,R_G=25Ω$		-	40	-	ns
Turn-On Rise Time	t_r			-	100	-	ns
Turn-Off Delay Time	$t_{d(off)}$			-	360	-	ns
Turn-Off Fall Time	t_f			-	130	-	ns
Total Gate Charge	Q_g	$V_{DS}=200V,I_D=25A,$ $V_{GS}=10V$		-	365	-	nC
Gate-Source Charge	Q_{gs}			-	33	-	nC
Gate-Drain Charge	Q_{gd}			-	173	-	nC
Source-Drain Characteristics							
Diode Forward Voltage	V_{sd}	$V_{GS}=0V,I_S=45A$		-	0.85	1.4	V
Reverse Recovery Time	t_{rr}	$V_R=200V,I_F=25A,$ di/dt=100A/us		-	380	-	ns
Reverse Recovery Charge	Q_{rr}			-	6	-	uC

■ Characteristics Curves
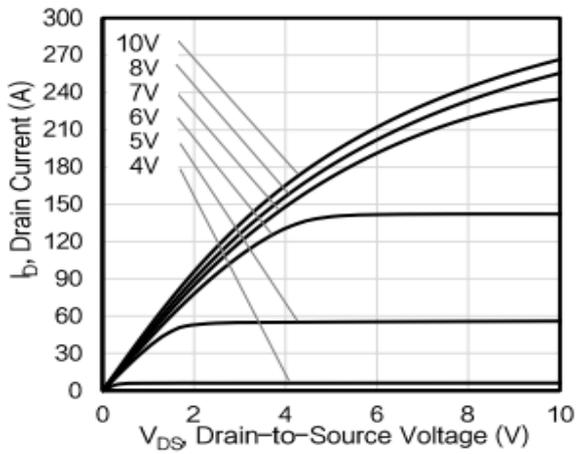
Output Characteritsics
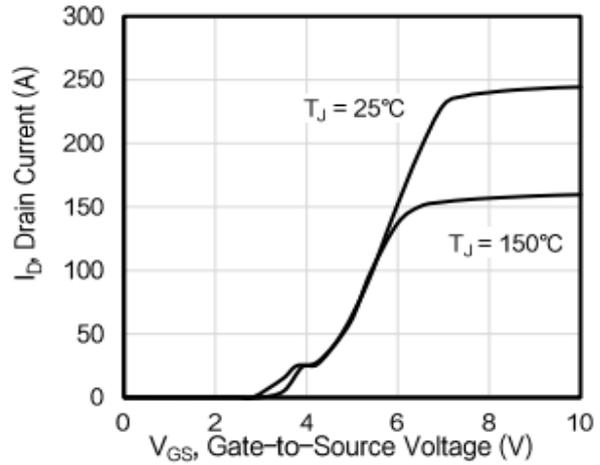
Transfer Characteritsics

On Resistance Vs Drain Current
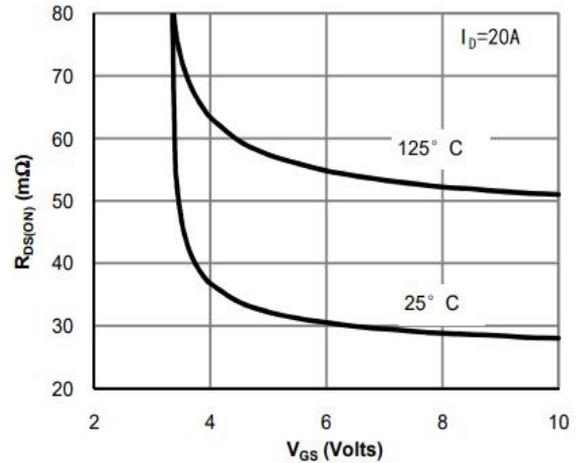
On Resistance Vs Gate Source Voltage
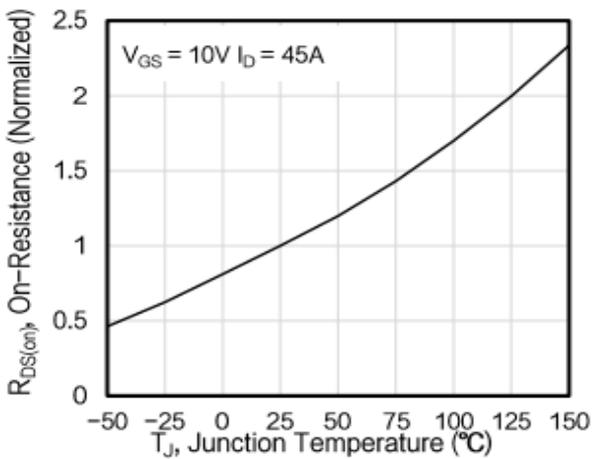
Rdson-JunctionTemperature
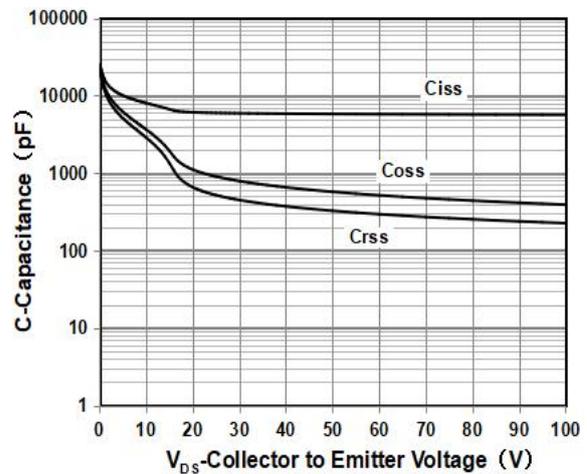

Capacitance
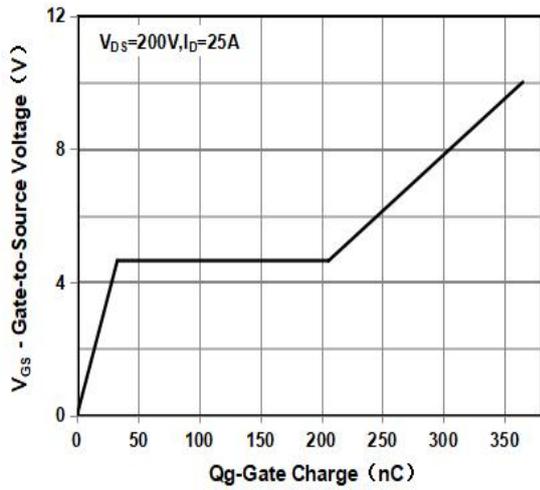
Gate Charge Waveform
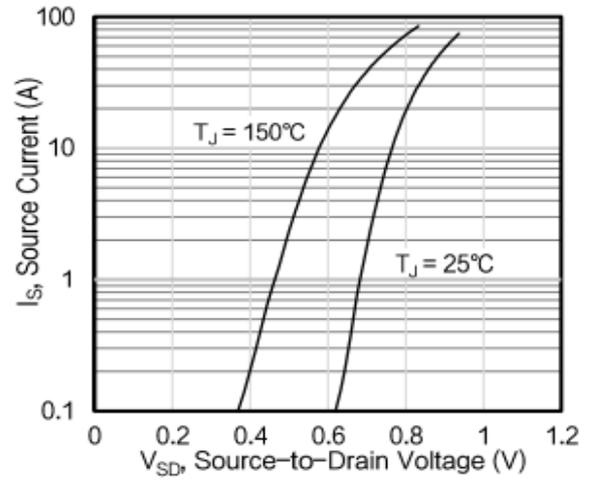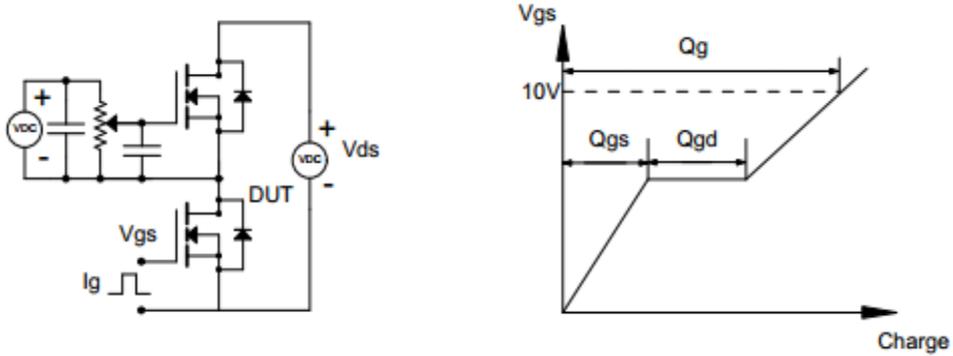
Source-Drain Diode Forward Voltage
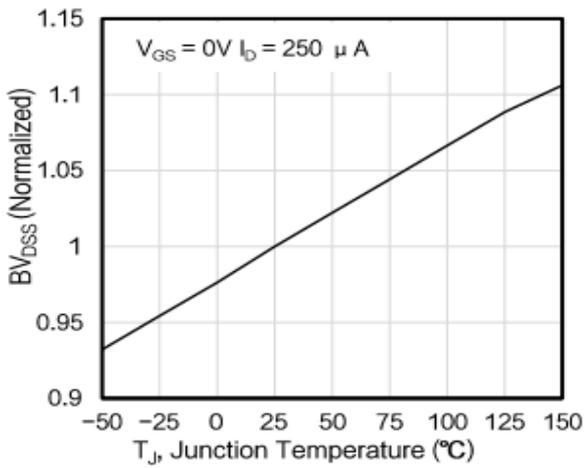
BVDSS Variation vs. Temperature

Note ：The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

■ Test Circuit & Waveform

Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveform
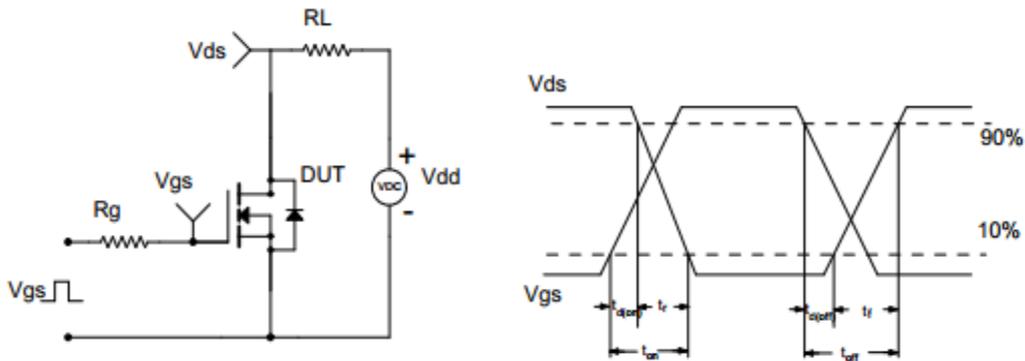
Unclamped Inductive Switching (UIS) Test Circuit & Waveform

$$E_{AR} = 1/2\, L I_{AR}^2$$
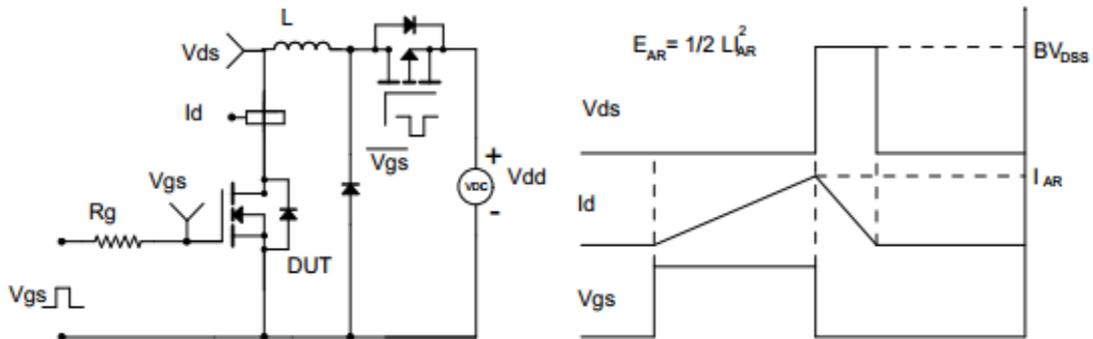
■ TO-247L Package Dimensions

Unit：mm

Symbol	Min	Nom	Max	Symbol	Min	Nom	Max
A	4.80		5.20	E1	13.00		13.60
A1	2.20	2.40	2.60	E2	5.00		5.50
A2	1.85		2.15	E3	1.90		2.60
b	1.07		1.33	e		5.44	
b2	1.90		2.16	L	19.30		19.90
b4	2.90		3.20	L1	3.75	3.95	4.15
c	0.52		0.68	ΦP	3.40		3.80
D	20.70		21.30	ΦP1	7.00		7.40
D1	16.15		16.95	S	6.04	6.15	6.30
E	15.50		16.10				