

MOSFETs Silicon 200V N-Channel MOS
■ Applications

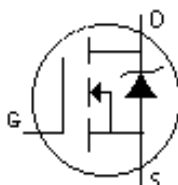
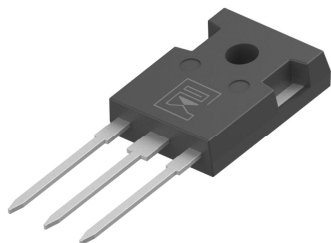
- Synchronus Rectification
- Industrial and Motor Drive
- DC/DC and AC/DC Converters
- Power Tools

■ Features

- High-Speed Switching
- Low $R_{DS(ON)}$
- Low Gate Charge
- Enhanced Avalanche Ruggedness
- RoHS and Halogen-Free Compliant
- 100% UIS and RG Tested

■ Product Summary

V_{DS}	200	V
I_D	67	A
$R_{DS(ON)}, Typ @ 10V$	22	mΩ
Q_g	45	nC



Gate: 1
Drain: 2
Source: 3

TO-247L

Marking	Package	Packaging	Min. package quantity
MSL025R200SH	TO-247L	Tube	450



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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current Tc=25°C (Note 1)	I_D	67	A
Continuous Drain Current Tc=100°C (Note 1)		48	A
Drain Current-Pulsed (Note 1)	I_{DM}	270	A
Total Dissipation	P_D	250	W
Junction Temperature	T_j	175	°C
Storage Temperature	T_{stg}	-55-175	°C
Single Pulse Avalanche Energy (Note 2)	E_{AS}	564	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	$R_{\theta JC}$	0.6	°C/W
Maximum Junction-to-Ambient	$R_{\theta JA}$	40	°C/W

Note 1: Ensure that the channel temperature does not exceed 175°C.

Note 2: $V_{DD}=50V$, $T_{ch}=25^{\circ}C$ (initial), $L=0.5mH$, $R_g=25\Omega$.

Note: This transistor is sensitive to electrostatic discharge and should be handled with care.



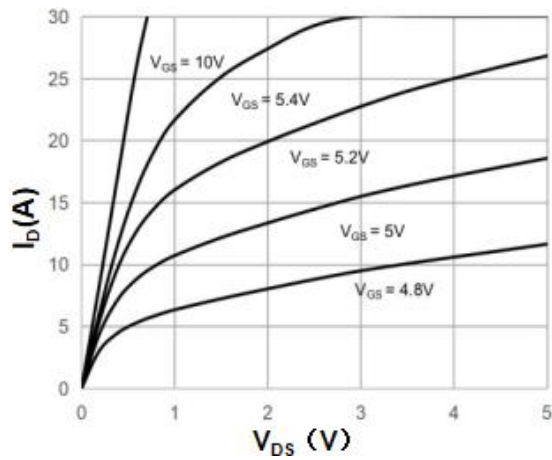
■ Electrical Characteristics (Tc=25°C unless otherwise noted)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Static Parameters							
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V,I _D =250uA		200	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =200V,V _{GS} =0V		-	-	1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V,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		-	22	25	mΩ
			Tj=125℃	-	39	-	
Dynamic Characteristics							
Input Capacitance	C _{iss}	V _{DS} =25V,V _{GS} =0V, f=1.0MHz		-	1300	-	pF
Output Capacitance	C _{oss}			-	1890	-	pF
Reverse Transfer Capacitance	C _{rss}			-	50	-	pF
Gate Resistance	R _g	V _{DS} =0V,V _{GS} =0V, f=1.0MHz		-	0.7	-	Ω
Switching Paramters							
Turn-On Delay Time	t _{d(on)}	V _{DS} =100V,I _D =20A, V _{GS} =10V,R _G =2.5Ω		-	28	-	ns
Turn-On Rise Time	t _r			-	23	-	ns
Turn-Off Delay Time	t _{d(off)}			-	35	-	ns
Turn-Off Rise Time	t _f			-	24	-	ns
Total Gate Charge	Q _g	V _{DS} =100V,I _D =20A, V _{GS} =10V		-	45	-	nC
Gate-Source Charge	Q _{gs}			-	15	-	nC
Gate-Drain Charge	Q _{gd}			-	13	-	nC
Source-Drain Characteristics							
Diode Forward Voltage	V _{sd}	V _{GS} =0V,I _S =10A		-	0.75	1.2	V
Reverse Recovery Time	t _{rr}	V _R =100V,I _F =20A, di/dt=100A/us		-	120	-	ns
Reverse Recovery Charge	Q _{rr}			-	0.4	-	uC

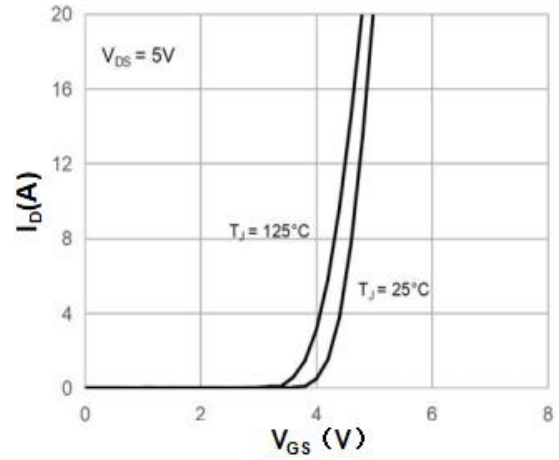




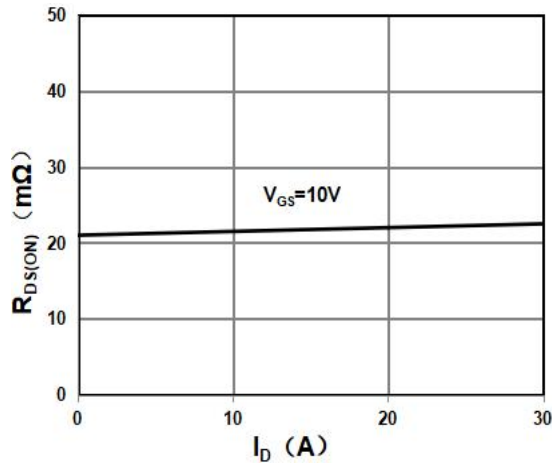
■ Characteristics Curves



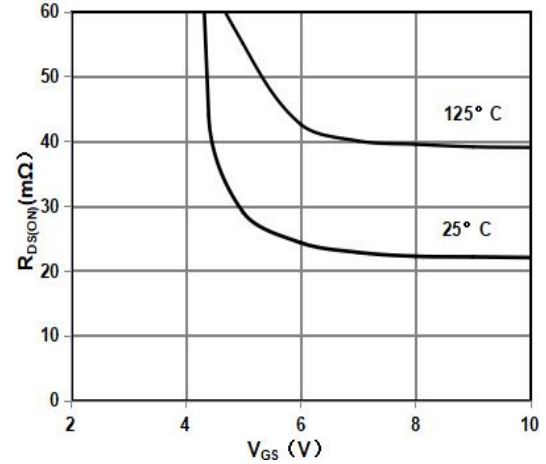
Output Characteristics



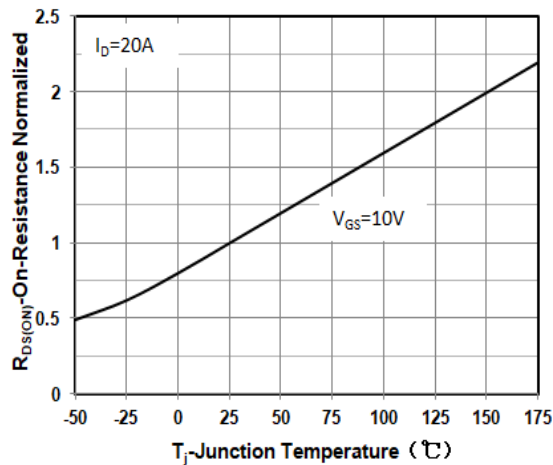
Transfer Characteristics



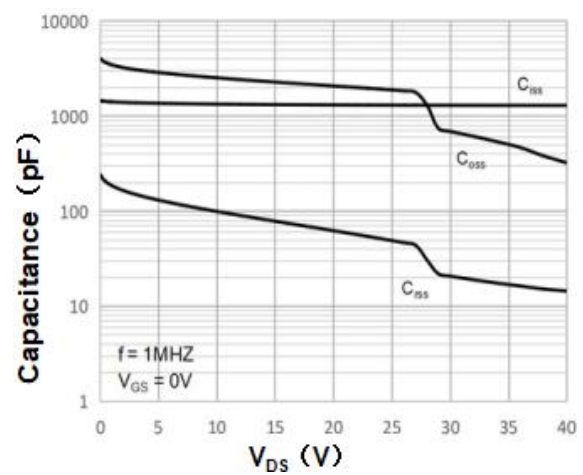
On Resistance Vs Drain Current



On Resistance Vs Gate Source Voltage

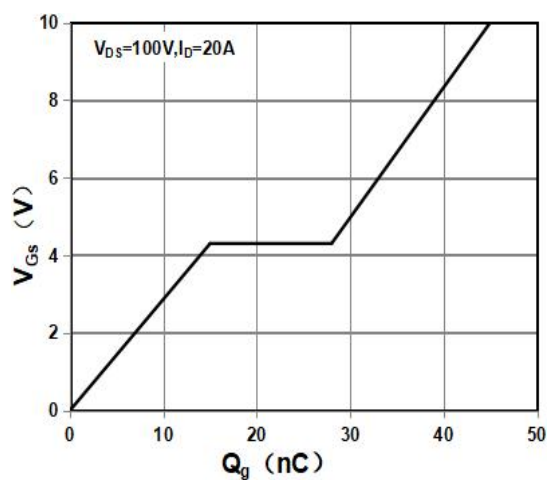


Rdson-Junction Temperature

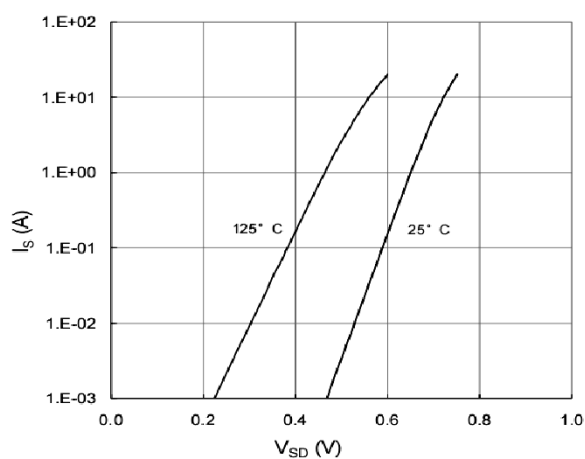


Capacitance

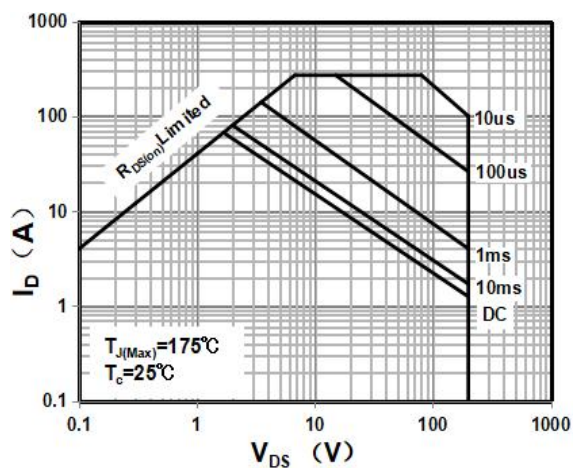




Gate Charge Waveform



Source-Drain Diode Forward Voltage



Maximum Safe Operating Area

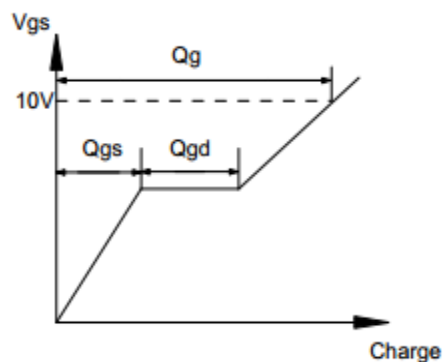
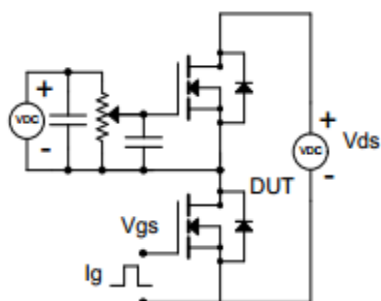
Note : The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



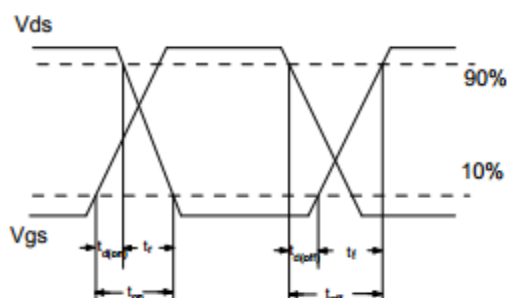
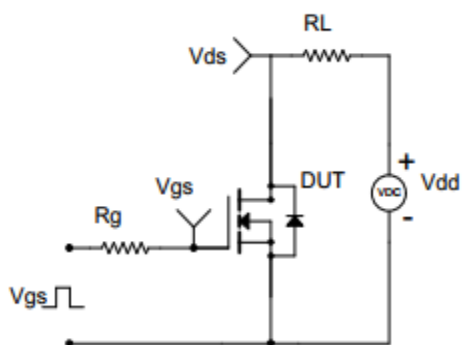


■ Test Circuit & Waveform

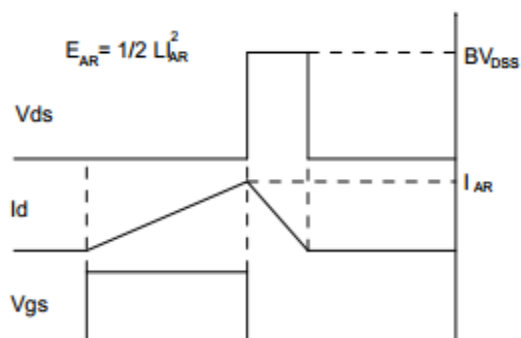
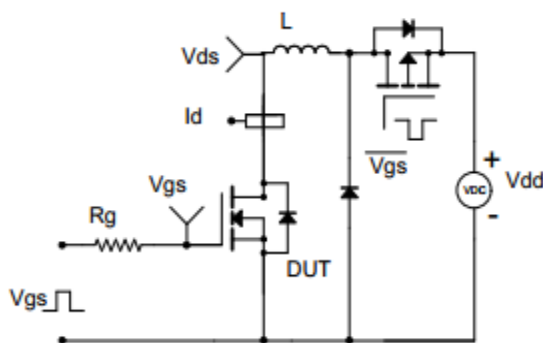
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveform



**■ 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				

