

**MOSFETs Silicon 55V N-Channel MOS****■ Applications**

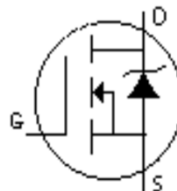
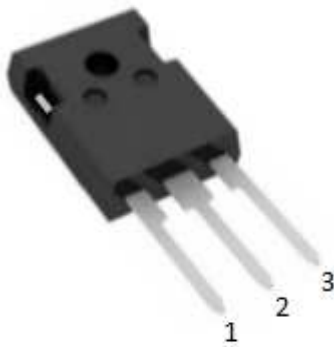
- Synchronous Rectification
- Industrial and Motor Drive
- DC/DC and AC/DC Converters
- Power Tools
- BMS

■ 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}	55	V
I_D	110	A
$R_{DS(ON)}, Typ@10V$	7.5	m Ω
Q_g	73	nC



Gate: 1
Drain: 2
Source: 3

TO-247

Marking	Package	Packaging	Min. package quantity
MS009R055PH	TO-247	Tube	450





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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	55	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current Tc=25°C (Note 1)	I_D	110	A
Continuous Drain Current Tc=100°C (Note 1)		70	A
Drain Current-Pulsed (Note 1)	I_{DM}	400	A
Total Dissipation	P_D	200	W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{stg}	-55-150	°C
Single Pulse Avalanche Energy (Note 2)	E_{AS}	1300	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	$R_{\theta JC}$	0.63	°C/W
Maximum Junction-to-Ambient	$R_{\theta JA}$	60	°C/W

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



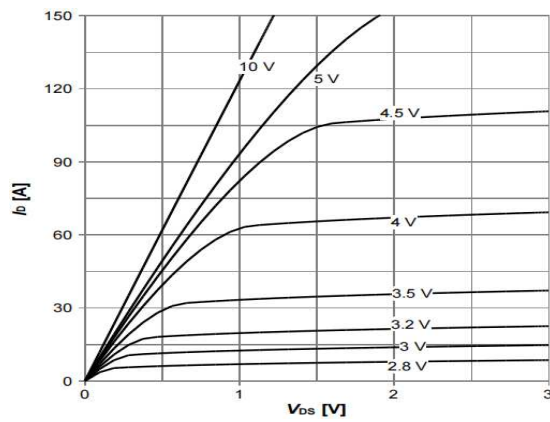
■ Electrical Characteristics (Tc=25°C unless otherwise noted)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Static Parameters							
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA		55	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =55V, 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		2.8	3.2	4.8	V
Drain-Source On Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A		-	7.5	9	mΩ
			Tj=125℃	-	12.4	-	
Dynamic Characteristics							
Input Capacitance	C _{iss}	V _{DS} =35V, V _{GS} =0V, f=1.0MHz		-	2140	-	pF
Output Capacitance	C _{oss}			-	607	-	pF
Reverse Transfer Capacitance	C _{rss}			-	142	-	pF
Gate Resistance	R _g	V _{DS} =0V, V _{GS} =0V, f=1.0MHz		-	4.24	-	Ω
Switching Paramters							
Turn-On Delay Time	t _{d(on)}	V _{DS} =30V, I _D =20A, V _{GS} =10V, R _G =10Ω		-	16	-	ns
Turn-On Rise Time	t _r			-	51	-	ns
Turn-Off Delay Time	t _{d(off)}			-	75	-	ns
Turn-Off Fall Time	t _f			-	30	-	ns
Total Gate Charge	Q _g	V _{DS} =30V, I _D =20A, V _{GS} =10V		-	73	-	nC
Gate-Source Charge	Q _{gs}			-	16	-	nC
Gate-Drain Charge	Q _{gd}			-	27	-	nC
Source-Drain Characteristics							
Diode Forward Voltage	V _{sd}	V _{GS} =0V, I _S =10A		-	0.8	1.3	V
Reverse Recovery Time	t _{rr}	V _R =50V, I _F =20A, di/dt=100A/us		-	118	-	ns
Reverse Recovery Charge	Q _{rr}			-	389	-	nC

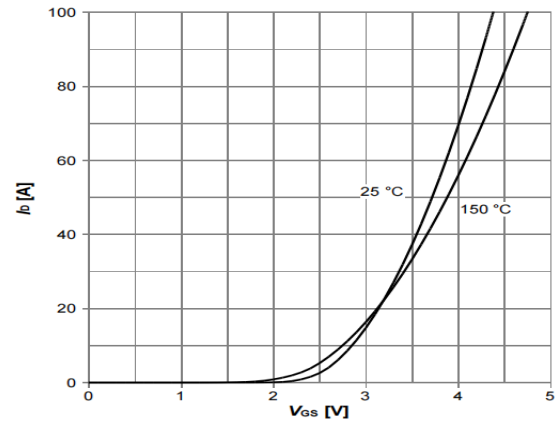




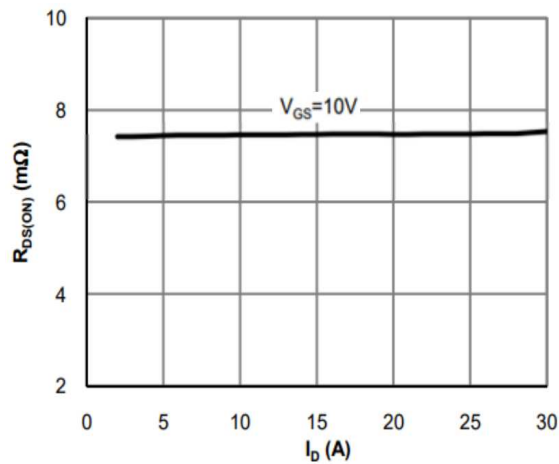
■ Characteristics Curves



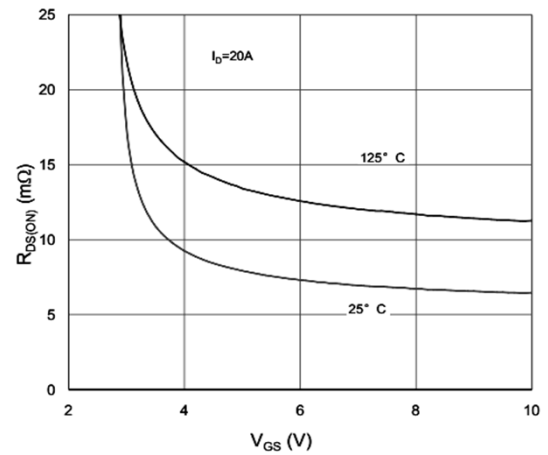
Output Characteristcs



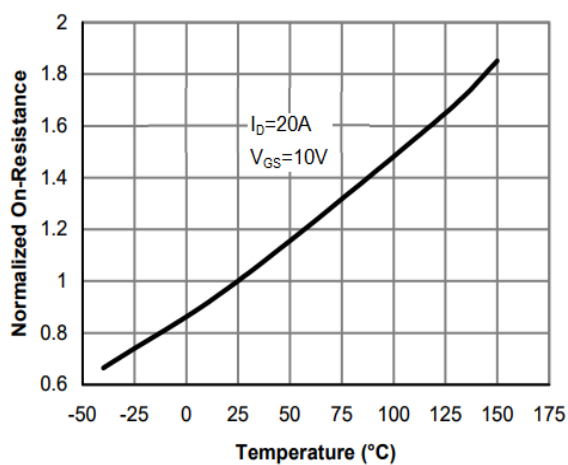
Transfer Characteristcs



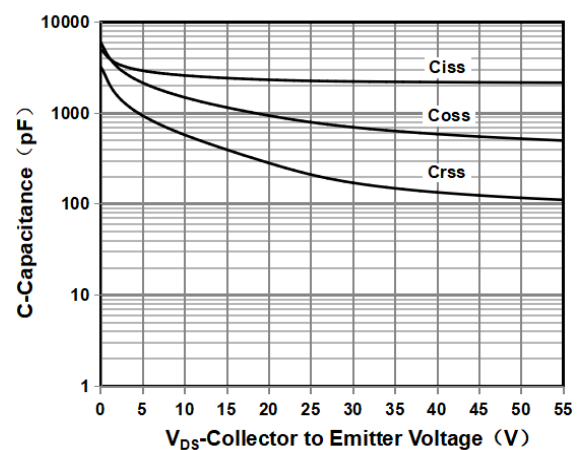
On Resistance Vs Drain Current



On Resistance Vs Gate Source Voltage

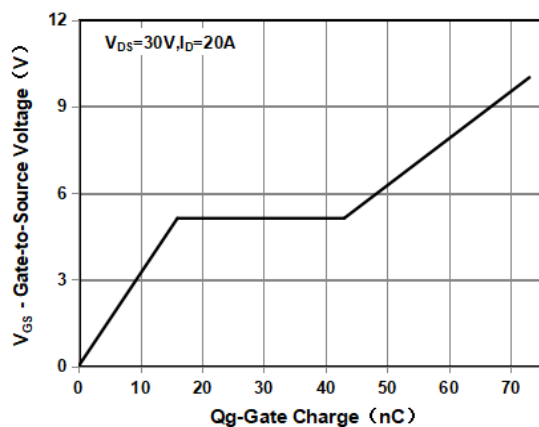


Rdson-JunctionTemperature

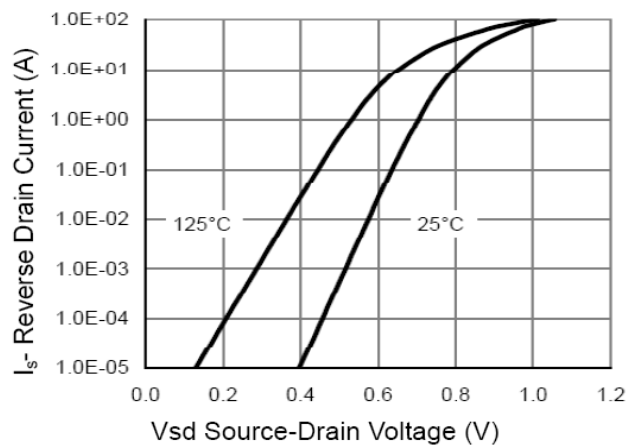


Capacitance

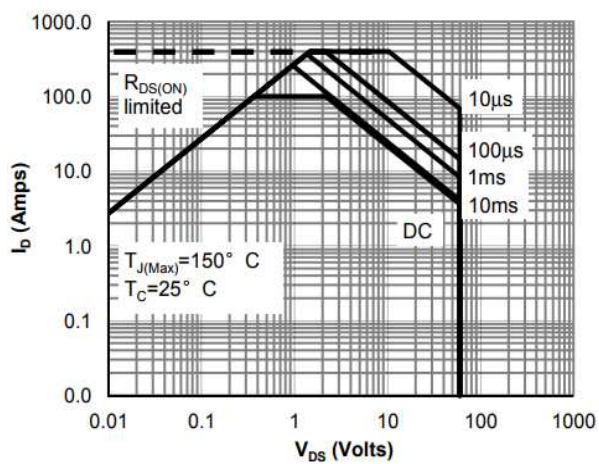




Gate Charge Waveform



Source-Drain Diode Forward Voltage



Maximum Safe Operating Area

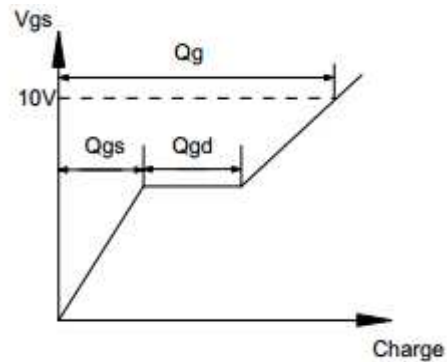
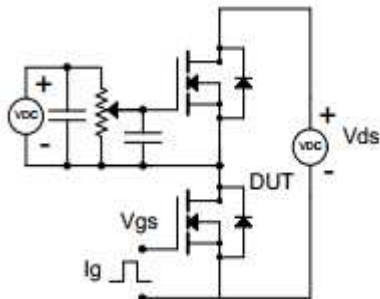
Note : The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



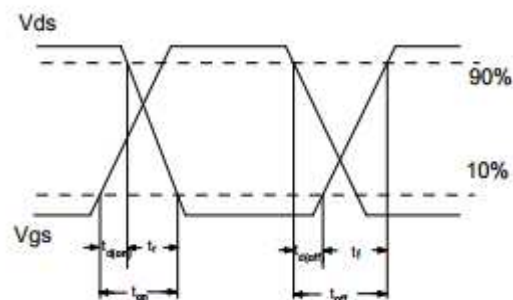
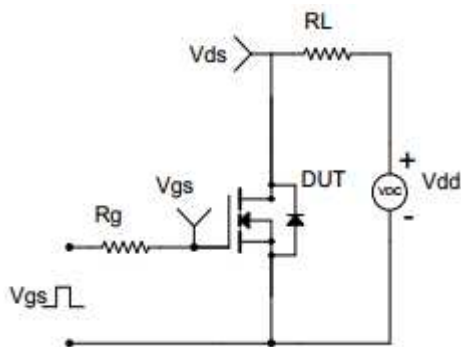


■ Test Circuit & Waveform

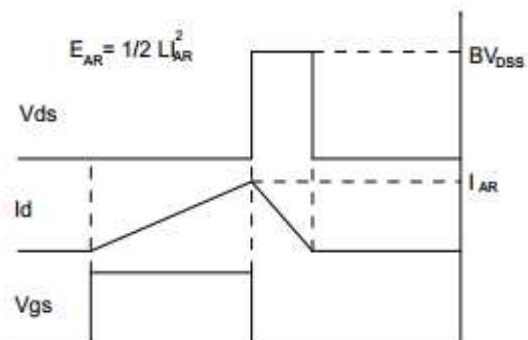
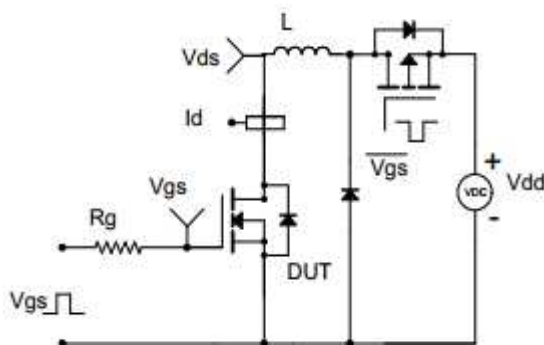
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveform





■ TO-247 Package Dimensions

Unit: mm

Symbol	Min	Nom	Max	Symbol	Min	Nom	Max
A	4.60		5.15	A1	1.30		1.60
b	2.86		3.26	b1	1.86		2.26
b2		1.20		C		0.50	
D	19.00		21.00	E	15.45		15.75
E1	12.00		13.06	e		5.45	
L	14.00		14.60	L1	5.20		5.88
L2	24.00		24.40	L3	10.00		10.60
ΦP		3.50		Q	2.30		2.70

