

MOSFETs Silicon 100V N-Channel MOS
■ Applications

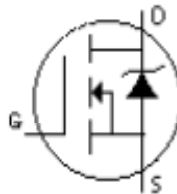
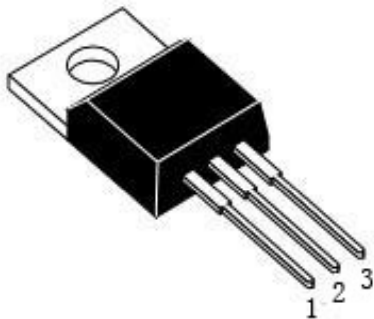
- Synchronous Rectification
- Industrial and Motor Drive
- DC/DC and AC/DC Converters

■ Features

- High-Speed Switching
- Low $R_{DS(ON)}$
- Low Gate Charge
- Capable of 4.5 V Gate Drive
- RoHS and Halogen-Free Compliant
- 100% UIS and RG Tested

■ Product Summary

V_{DS}	100	V
I_D	70	A
$R_{DS(ON)}, Typ @ 10V$	9.5	mΩ
$R_{DS(ON)}, Typ @ 4.5V$	12	mΩ
Q_g	24	nC



Gate: 1
Drain: 2
Source: 3

TO-220

Marking	Package	Packaging	Min. package quantity
MC8D5R100SL	TO-220	Tube	1000



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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current Tc=25°C (Note 1)	I_D	70	A
Continuous Drain Current Tc=100°C (Note 1)		48	A
Drain Current-Pulsed (Note 1)	I_{DM}	190	A
Total Dissipation	P_D	125	W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{stg}	-55-150	°C
Single Pulse Avalanche Energy (Note 2)	E_{AS}	190	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	$R_{\theta JC}$	1	°C/W
Maximum Junction-to-Ambient	$R_{\theta JA}$	60	°C/W

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

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.

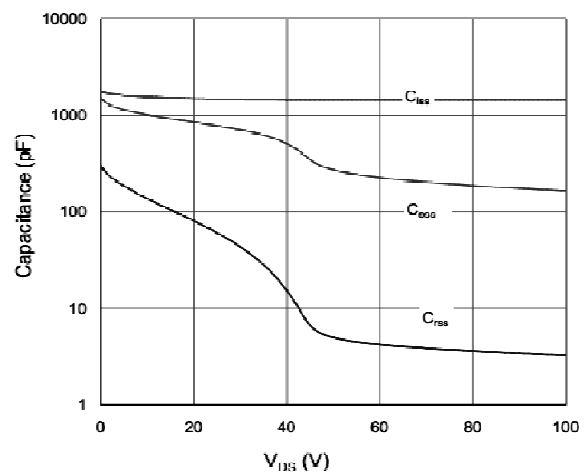
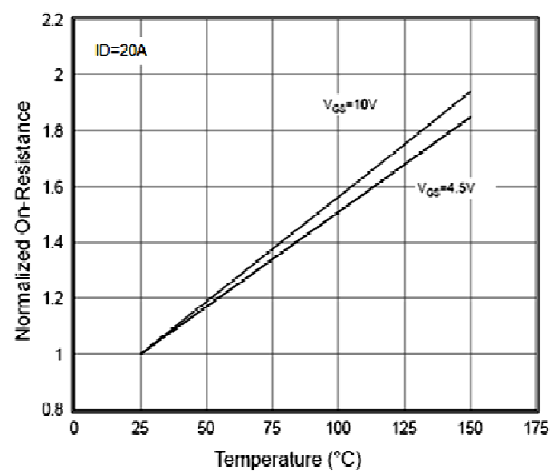
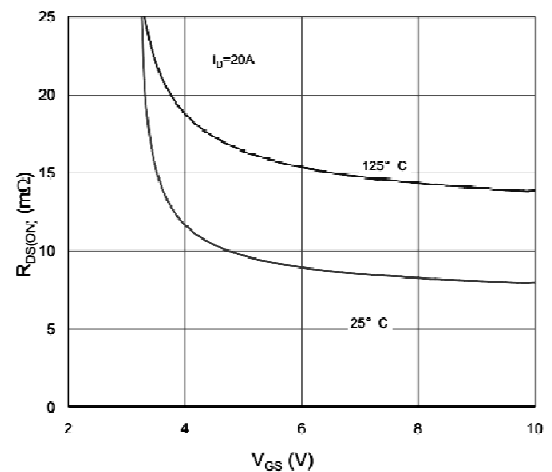
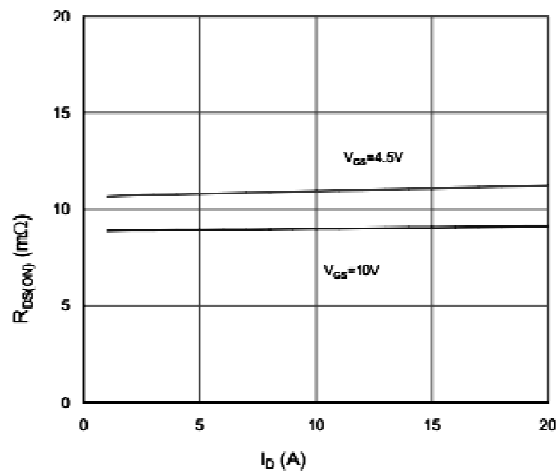
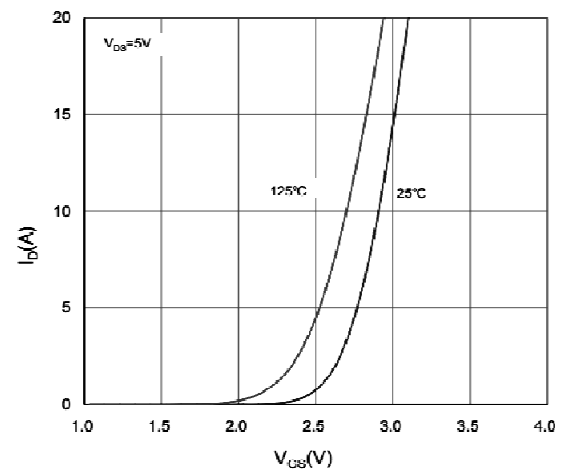
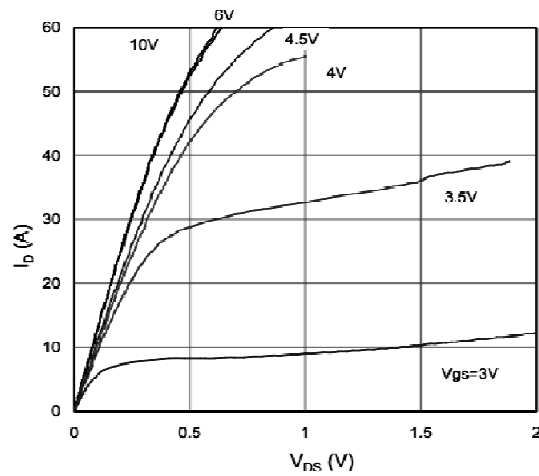


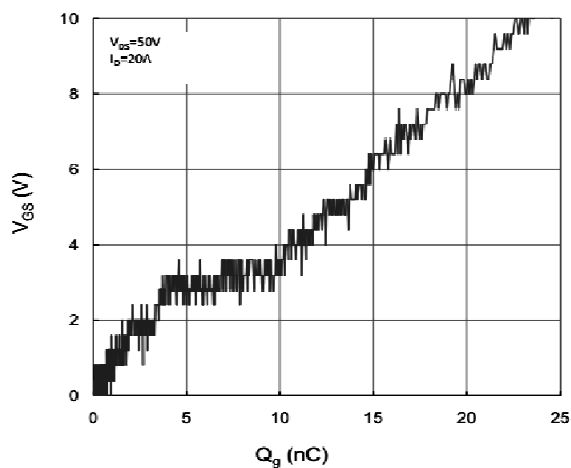
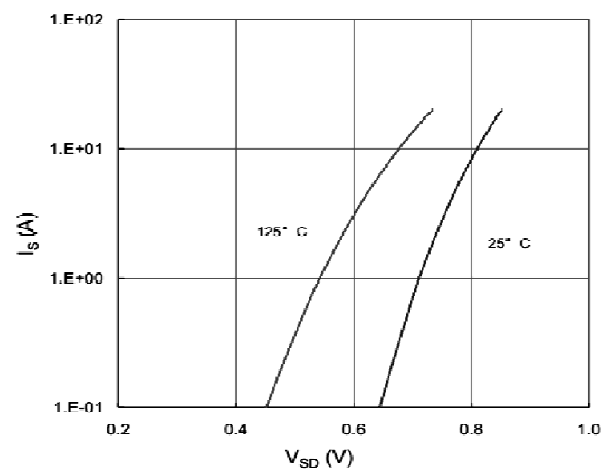
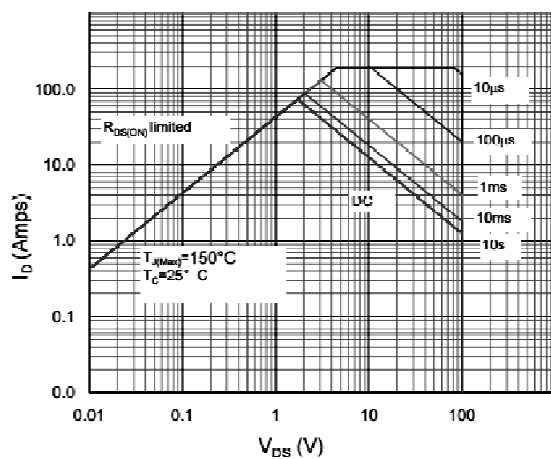
■ Electrical Characteristics (Tc=25°C unless otherwise noted)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Static Parameters							
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA		100	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =100V, 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		1.3	1.7	2.4	V
Drain-Source On Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =15A		-	12	14	mΩ
			Tj=125℃	-	20	-	
		V _{GS} =10V, I _D =20A		-	9.5	11.5	
			Tj=125℃	-	16	-	
Dynamic Characteristics							
Input Capacitance	C _{iss}	V _{DS} =35V, V _{GS} =0V, f=1.0MHz		-	1650	-	pF
Output Capacitance	C _{oss}			-	650	-	pF
Reverse Transfer Capacitance	C _{rss}			-	25	-	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} =50V, I _D =50A, V _{GS} =10V, R _G =3Ω		-	6	-	ns
Turn-On Rise Time	t _r			-	5	-	ns
Turn-Off Delay Time	t _{d(off)}			-	18	-	ns
Turn-Off Rise Time	t _f			-	4	-	ns
Total Gate Charge	Q _g	V _{DS} =50V, I _D =20A, V _{GS} =10V		-	24	-	nC
	Q _g (4.5V)			-	12	-	nC
Gate-Source Charge	Q _{gs}			-	4	-	nC
Gate-Drain Charge	Q _{gd}			-	6	-	nC
Source-Drain Characteristics							
Diode Forward Voltage	V _{sd}	V _{GS} =0V, I _S =10A		-	0.8	1.2	V
Reverse Recovery Time	t _{rr}	V _R =50V, I _F =20A, di/dt=500A/us		-	42	-	ns
Reverse Recovery Charge	Q _{rr}			-	155	-	nC



■ Characteristics Curves



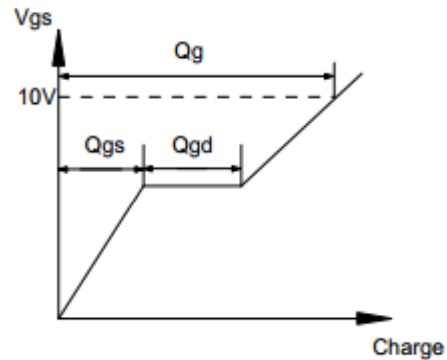
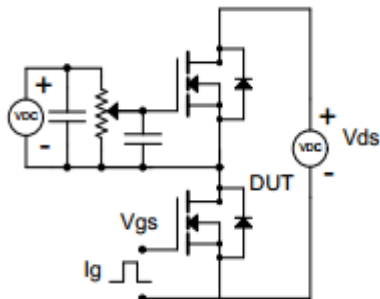
**Gate Charge Waveform****Source-Drain Diode Forward Voltage****Maximum Safe Operating Area**

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

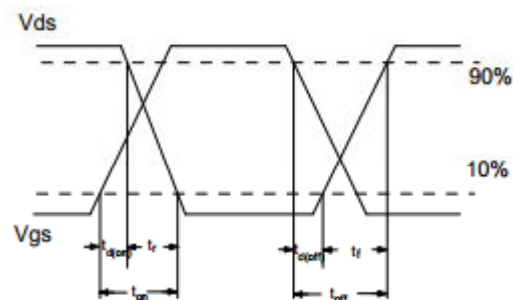
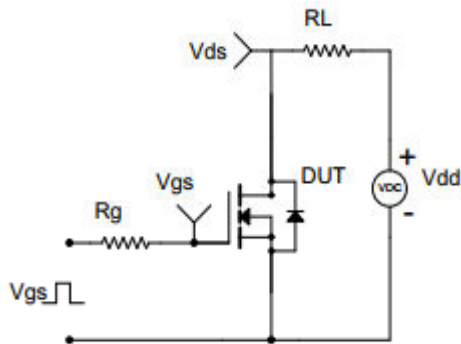


■ Test Circuit & Waveform

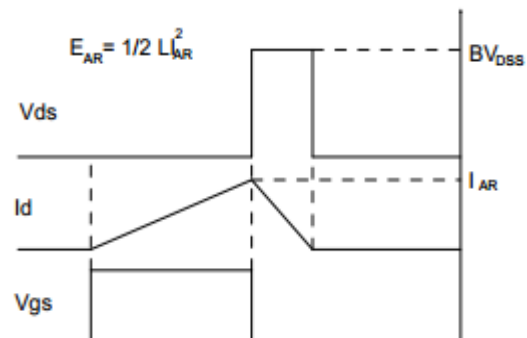
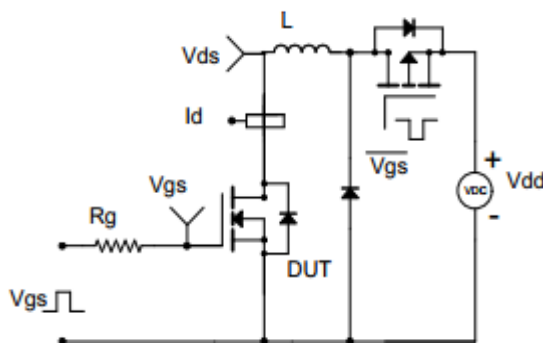
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveform



**■ TO-220 Package Dimensions**

Unit: mm

Symbol	Min	Nom	Max	Symbol	Min	Nom	Max
A	4.00		4.80	e	2.44	2.54	2.64
B	1.20		1.40	F	1.10		1.40
B1	1.00		1.40	L	12.50		14.50
b1	0.75		0.95	L1	3.00	3.50	4.00
c	0.40		0.55	ΦP	3.70	3.80	3.90
D	15.00		16.50	Q	2.50		3.00
D1	5.90		6.90	Q1	2.00		2.90
E	9.90		10.70	Y	8.02	8.12	8.22

