ME3D5R020TL

MOSFETs Silicon 20V N-Channel MOS

Applications

- DC/DC Converters
- Power Tools

Product Summary

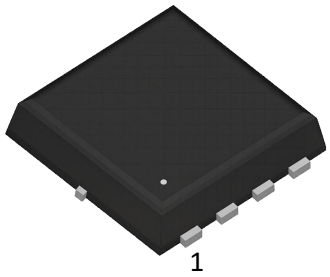
V_{DS}	20	V
I_D	80	A
$R_{DS(ON)}$,Typ@4.5V	2.8	mΩ
$R_{DS(ON)}$,Typ@2.5V	3.9	mΩ
Q_g	38	nC

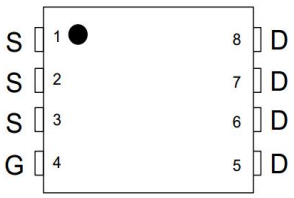
Features

- High-Speed Switching
- Low $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS and RG Tested

RoHS Pb Lead-free HF

DFN3x3





Gate： 4
Drain：5-8
Source：1-3

Package Marking and Ordering Information

Ordering code	Marking	Package	Packaging	Min. package quantity
ME3D5R020TL	3D502TL	DFN3x3	Tape & Reel	5000

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

Parameter			Symbol	Ratings	Unit
Drain-Source Voltage			V_{DS}	20	V
Gate-Source Voltage			V_{GS}	±12	V
Continuous Drain Current	Tc=25℃	(Note 1)	I_D	80	A
Continuous Drain Current	Tc=100℃	(Note 1)		50	A
Drain Current-Pulsed		(Note 1)	I_{DM}	300	A
Total Dissipation			P_D	35	W
Junction Temperature			T_j	150	℃
Storage Temperature			T_{stg}	-55-150	℃
Single Pulse Avalanche Energy		(Note 2)	E_{AS}	130	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	$R_{\theta JC}$	3.6	℃/W
Maximum Junction-to-Ambient	$R_{\theta JA}$	50	℃/W

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

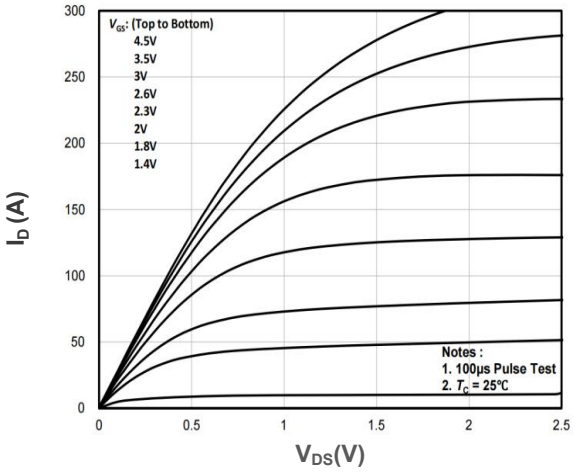
Note 2：V_{DD}=15V, Tch= 25℃(initial), L=0.5mH, R_g=25Ω.

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

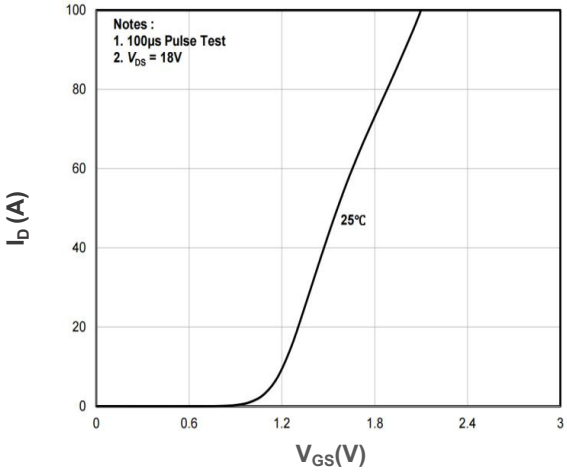
Electrical Characteristics（Tc=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250uA	20	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=20V,V_{GS}=0V	-	-	1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS},I_D=250uA	0.4	0.7	1.0	V
Drain-Source On Resistance	$R_{DS(ON)}$	V_{GS}=2.5V,I_D=15A	-	3.9	5.5	mΩ
		V_{GS}=4.5V,I_D=20A	-	2.8	3.5	
		Tj=150℃	-	4.4	-	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V, f=500KHz	-	3000	-	pF
Output Capacitance	C_{oss}		-	401	-	pF
Reverse Transfer Capacitance	C_{rss}		-	380	-	pF
Gate Resistance	R_g	V_{DS}=0V,V_{GS}=0V, f=1.0MHz	-	2.7	-	Ω
Switching Paramters						
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=15V,I_D=15A, V_{GS}=4.5V,R_L=2.5Ω	-	15	-	ns
Turn-On Rise Time	t_r		-	33	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	81	-	ns
Turn-Off Fall Time	t_f		-	132	-	ns
Total Gate Charge	Q_g	V_{DS}=10V,I_D=50A, V_{GS}=10V	-	38	-	nC
Gate-Source Charge	Q_{gs}		-	6	-	nC
Gate-Drain Charge	Q_{gd}		-	20	-	nC
Source-Drain Characteristics						
Diode Forward Voltage	V_{sd}	V_{GS}=0V,I_S=50A	-	0.8	1.2	V
Reverse Recovery Time	t_{rr}	V_R=10V,I_F=15A, di/dt=100A/us	-	50	-	ns
Reverse Recovery Charge	Q_{rr}		-	35	-	nC

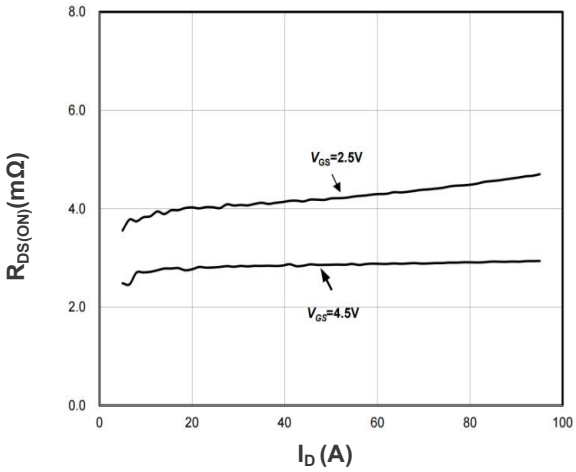
Characteristics Curves



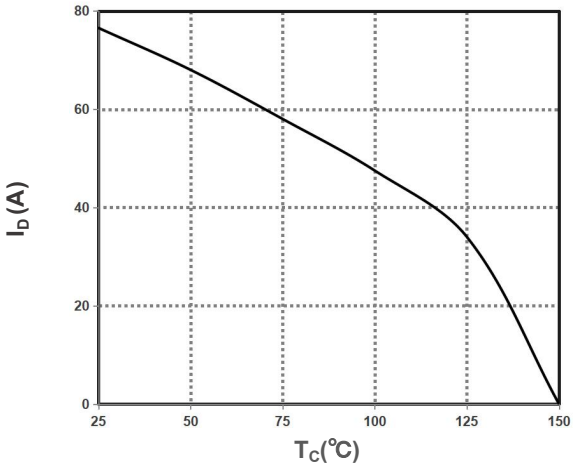
Output Characteritsics



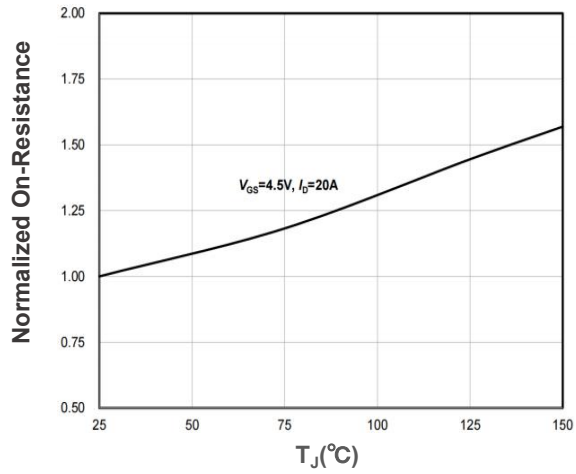
Transfer Characteritsics



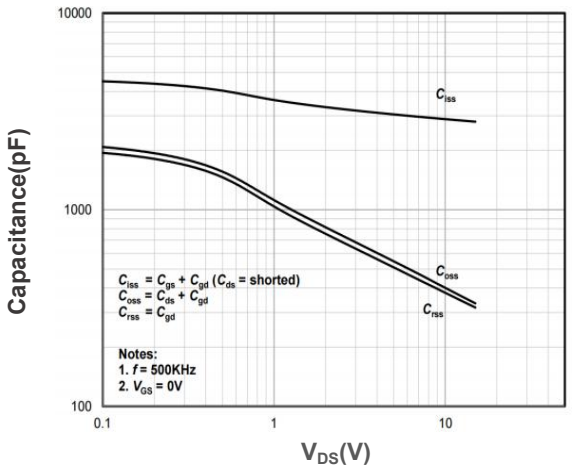
On Resistance Vs Drain Current



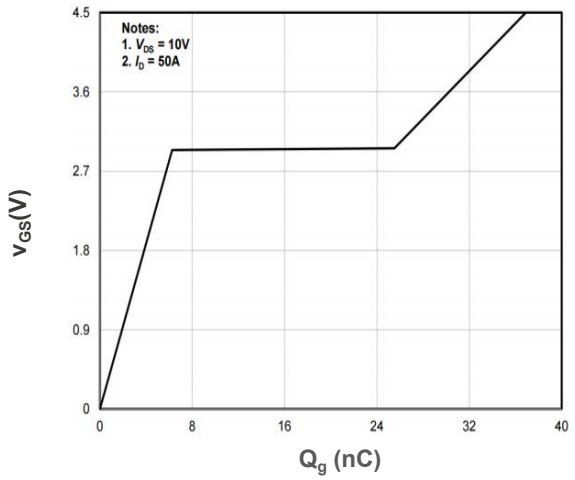
Drain Current Vs Temperature



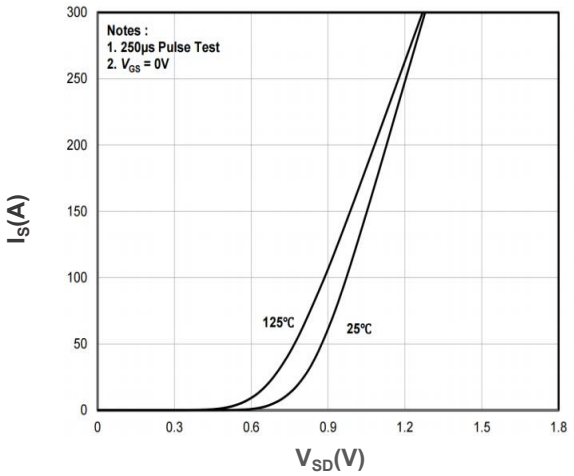
Rdson-JunctionTemperature



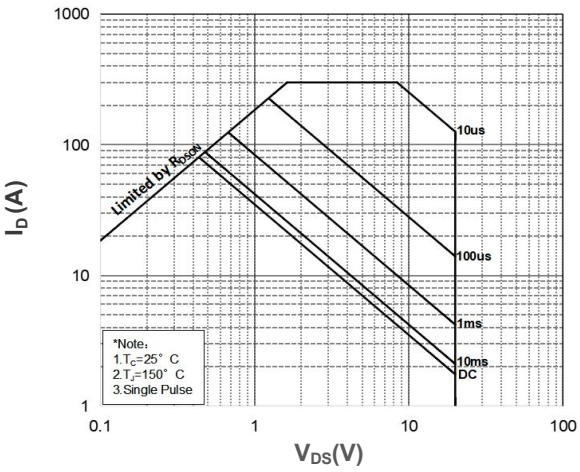
Capacitance



Gate Charge Waveform



Source-Drain Diode Forward Voltage

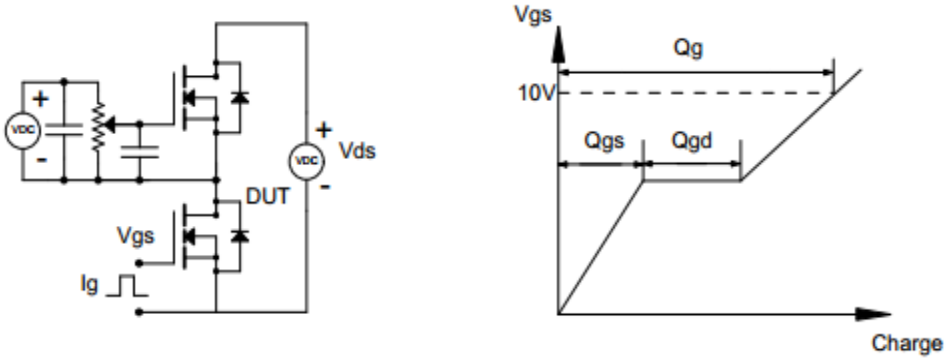


Maximum Safe Operating Area

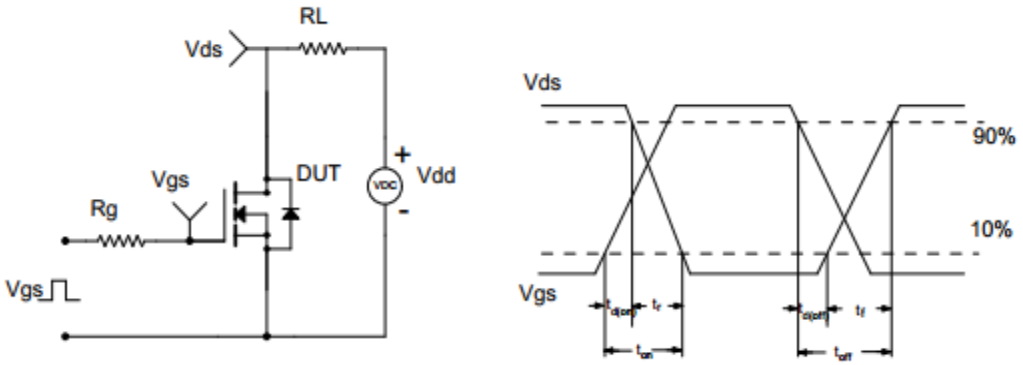
Note： The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Test Circuit & Waveform

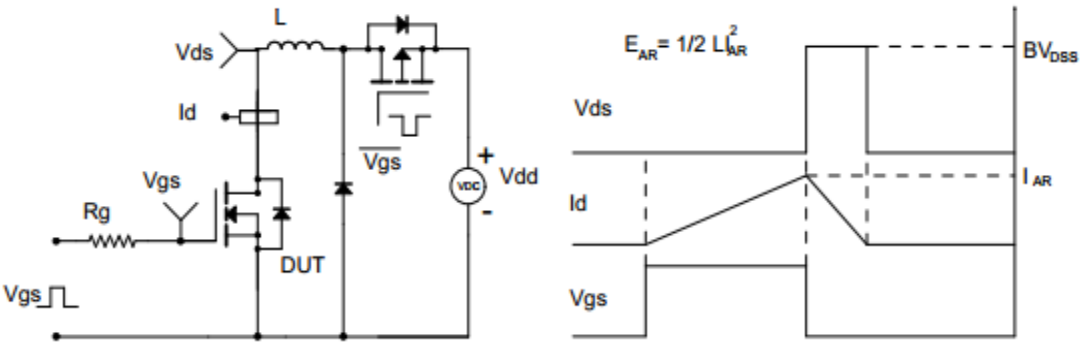
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveform



DFN3x3 Package Dimensions

Unit：mm

Symbol	Min	Nom	Max	Symbol	Min	Nom	Max
A	0.7	0.8	0.9	e	0.55	0.65	0.75
b	0.2	0.30	0.4	H1	0.345	0.545	0.745
C	0.1	0.15	0.2	H2	0.25	0.45	0.65
D	3.00	3.10	3.20	K		0.67	
D1	2.35	2.45	2.55	L1		0.15	
E	3.00	3.10	3.20	L2		0.15	
E1	3.2	3.4	3.6	N	0	–	0.1
E2	1.635	1.735	1.835				

