

Applications

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

Product Summary

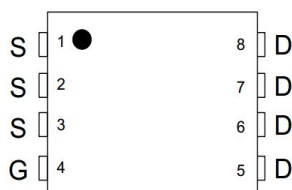
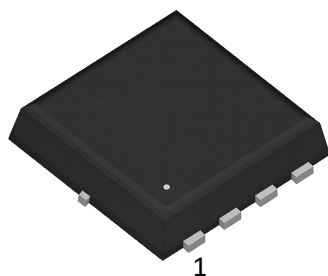
V_{DS}	40	V
I_D	92	A
$R_{DS(ON)}, Typ @ 10V$	3.5	mΩ
Q_g	21	nC

Features

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



DFN3x3



Gate: 4
Drain: 5-8
Source: 1-3

Package Marking and Ordering Information

Ordering code	Marking	Package	Packaging	Min. package quantity
ME004R040SH	0404SH	DFN3x3	Tape & Reel	5000

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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current Tc=25°C (Note 1)	I_D	92	A
Continuous Drain Current Tc=100°C (Note 1)		58	A
Drain Current-Pulsed (Note 1)	I_{DM}	280	A
Total Dissipation	P_D	57	W
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	-55-150	°C
Single Pulse Avalanche Energy (Note 2)	E_{AS}	220	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	$R_{\theta JC}$	2.2	°C/W
Maximum Junction-to-Ambient	$R_{\theta JA}$	50	°C/W

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

Note 2: $V_{DD}=40V$, $T_{ch}=25^{\circ}C$ (initial), $L=0.5mH$, $R_g=25\Omega$.

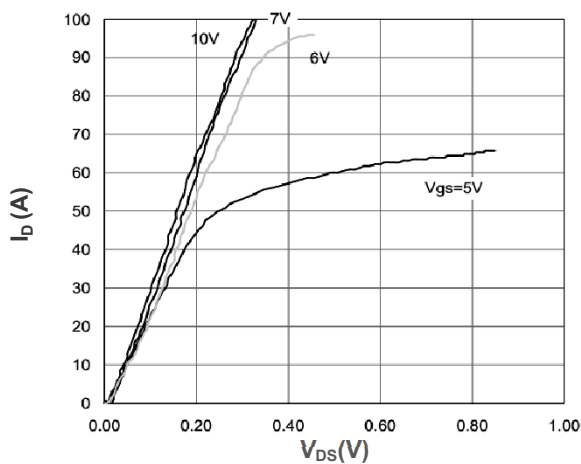
Note: This transistor is sensitive to electrostatic discharge and should be handled with care.

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

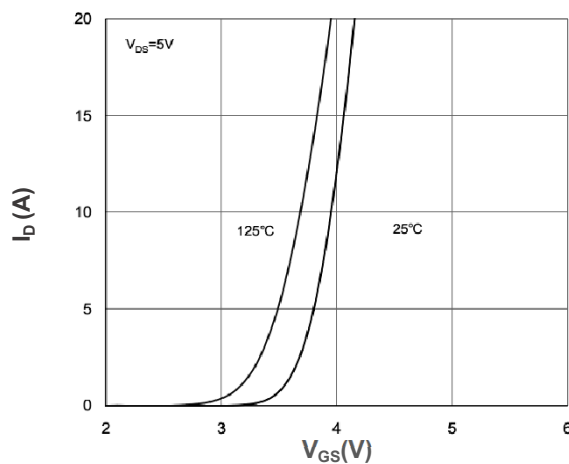
Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Static Parameters							
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA		40	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V		-	-	1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V		-	-	±100	nA
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =250uA		2.0	2.7	3.5	V
Drain-Source On Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A		-	3.5	4.0	mΩ
			Tj=125℃	-	5.3	-	
Dynamic Characteristics							
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f=1.0MHz		-	1400	-	pF
Output Capacitance	C _{oss}			-	477	-	pF
Reverse Transfer Capacitance	C _{rss}			-	44	-	pF
Gate Resistance	R _g	V _{DS} =0V, V _{GS} =0V, f=1.0MHz		-	2.1	-	Ω
Switching Paramters							
Turn-On Delay Time	t _{d(on)}	V _{DS} =20V, I _D =20A, V _{GS} =10V, R _L =2Ω		-	15	-	ns
Turn-On Rise Time	t _r			-	40	-	ns
Turn-Off Delay Time	t _{d(off)}			-	18	-	ns
Turn-Off Fall Time	t _f			-	10	-	ns
Total Gate Charge	Q _g	V _{DS} =20V, I _D =20A, V _{GS} =10V		-	21	-	nC
Gate-Source Charge	Q _{gs}			-	6	-	nC
Gate-Drain Charge	Q _{gd}			-	5	-	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 =20V, I _F =20A, di/dt=100A/us		-	38	-	ns
Reverse Recovery Charge	Q _{rr}			-	30	-	nC



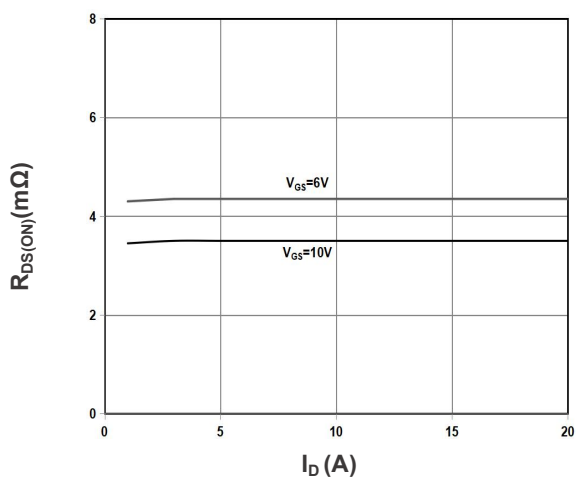
Characteristics Curves



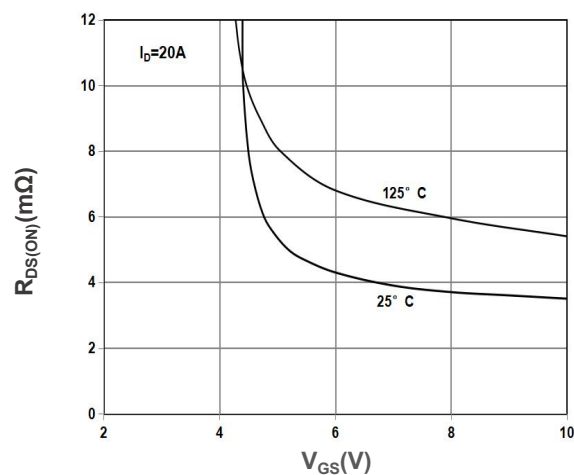
Output Characteristics



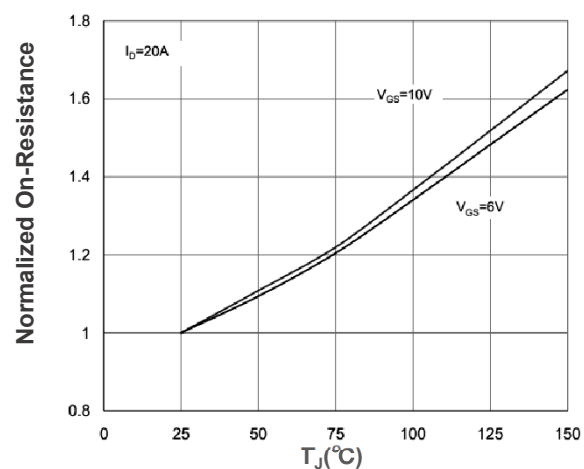
Transfer Characteristics



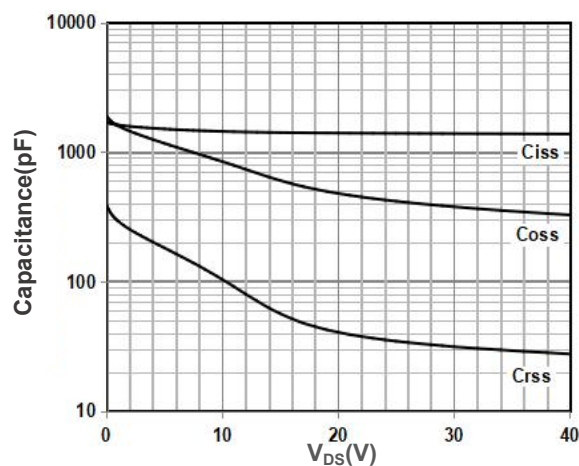
On Resistance Vs Drain Current



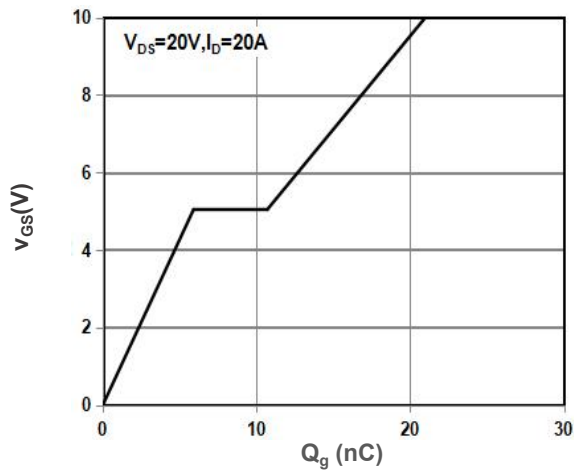
On Resistance Vs Gate Source Voltage



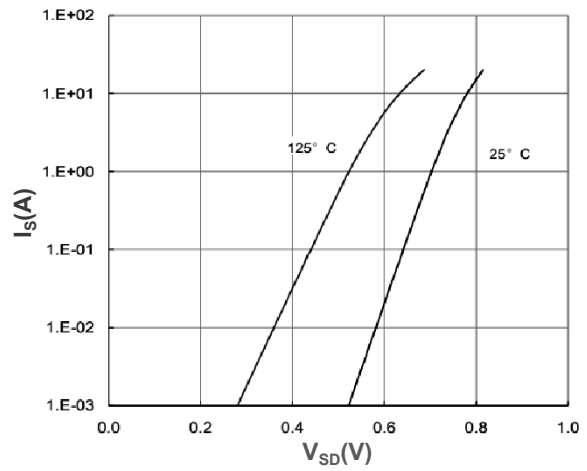
Rdson-JunctionTemperature



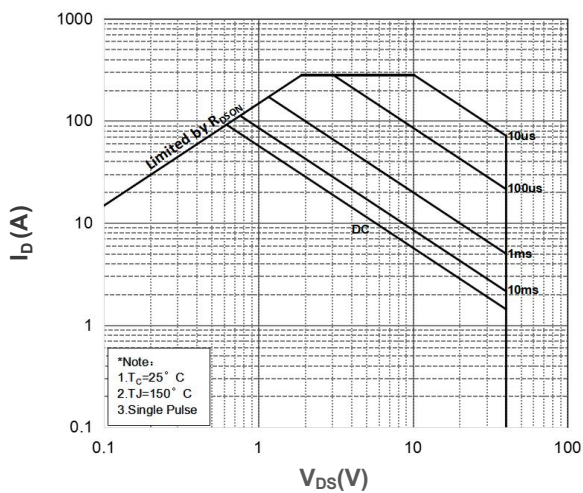
Capacitance



Gate Charge Waveform



Source-Drain Diode Forward Voltage



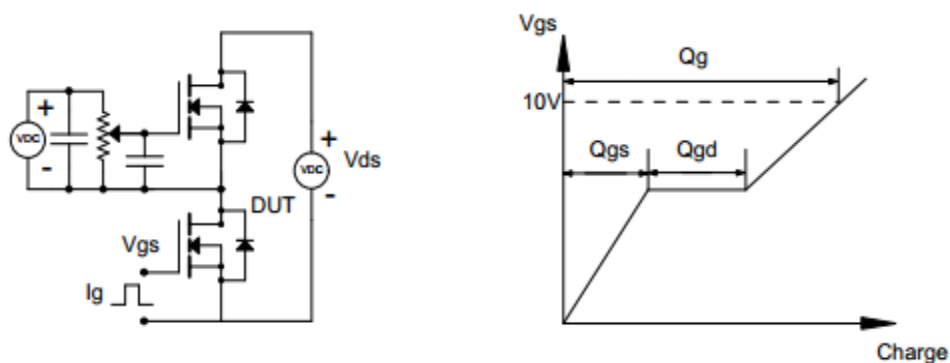
Maximum Safe Operating Area

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

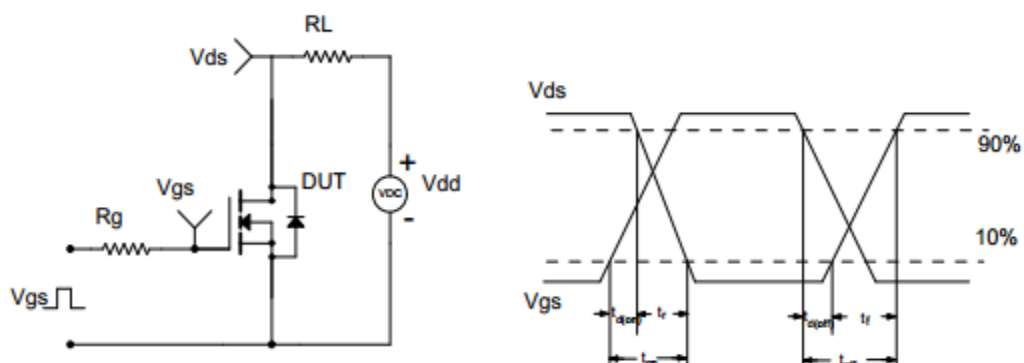


Test Circuit & Waveform

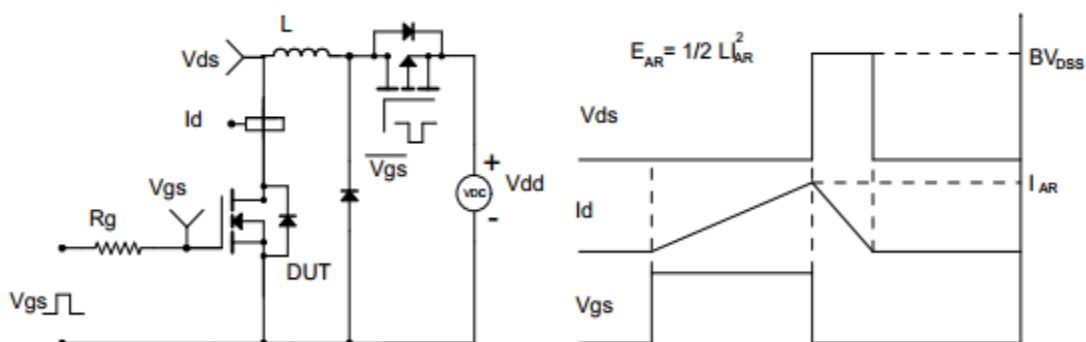
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveform





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				

