N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max	
100V	9A	19	@ VGS=10V
		27	@ VGS=4.5V

FEATURES

- Super high dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- Suface Mount Package.

DFN 5x6

PIN1

D D D D
8 7 6 5
1 2 3 4
S S S G

ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise noted)

Symbol	Parameter		Limit	Units
V_{DS}	Drain-Source Voltage		100	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Drain Current-Continuous [c]	T_A=25°C	9	A
		T_A=70°C	7.2	A
I_{DM}	-Pulsed [a c]		32	A
E_{AS}	Single Pulse Avalanche Energy [d]		272	mJ
P_D	Maximum Power Dissipation	T_A=25°C	3.1	W
		T_A=70°C	2	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		-55 to 150	°C

THERMAL CHARACTERISTICS

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient		40	°C/W

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ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	100			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=80V , V_{GS}=0V			1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}= ±20V , V_{DS}=0V			±100	nA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	1	2	3	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V , I_D=4.5A		15	19	m ohm
		V_{GS}=4.5V , I_D=3.8A		20	27	m ohm
g_{FS}	Forward Transconductance	V_{DS}=10V , I_D=4.5A		21		S
DYNAMIC CHARACTERISTICS [b]						
C_{ISS}	Input Capacitance	V_{DS}=25V,V_{GS}=0V f=1.0MHz		1823		pF
C_{OSS}	Output Capacitance			224		pF
C_{RSS}	Reverse Transfer Capacitance			106		pF
SWITCHING CHARACTERISTICS [b]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=50V I_D=1A V_{GS}=10V R_{GEN}= 6 ohm		38		ns
t_r	Rise Time			39		ns
$t_{D(OFF)}$	Turn-Off Delay Time			47		ns
t_f	Fall Time			23		ns
Q_g	Total Gate Charge	V_{DS}=50V,I_D=4.5A,V_{GS}=10V		21		nC
		V_{DS}=50V,I_D=4.5A,V_{GS}=4.5V		11		nC
Q_{gs}	Gate-Source Charge	V_{DS}=50V,I_D=4.5A, V_{GS}=10V		3		nC
Q_{gd}	Gate-Drain Charge			6.6		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=5A		0.73	1.3	V

Notes

a. Pulse Test:Pulse Width ≤ 10us, Duty Cycle ≤ 1%.
b. Guaranteed by design, not subject to production testing.
c. Drain current limited by maximum junction temperature.
d. Starting T_J=25°C,L=0.5mH,V_{DD} = 50V.(See Figure13)
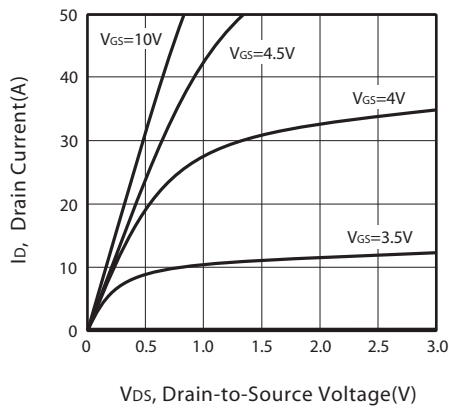e. Mounted on FR4 Board of 1 inch^2 , 2oz.

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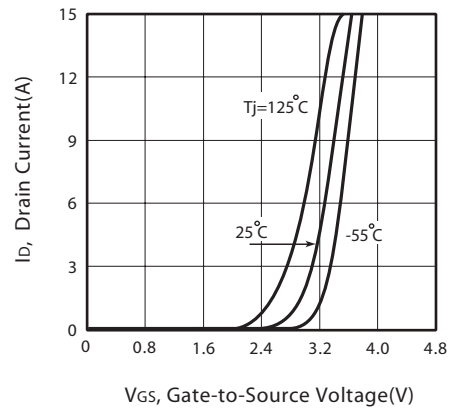Figure 1. Output Characteristics

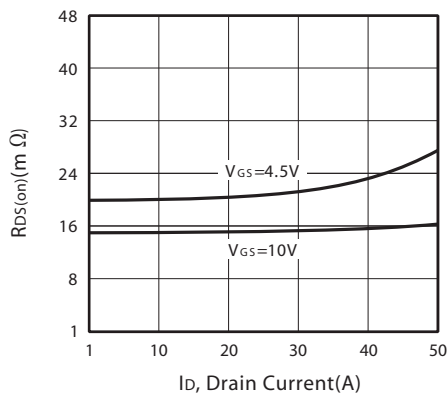Figure 2. Transfer Characteristics

Figure 3. On-Resistance vs. Drain Current
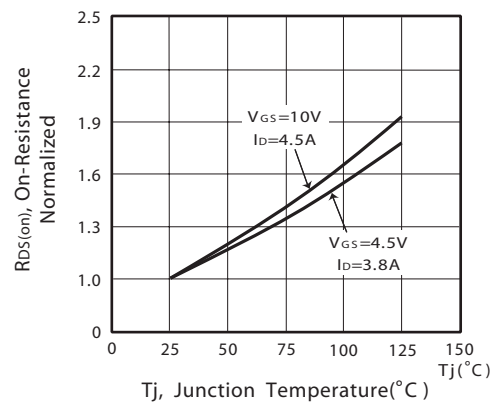and Gate Voltage

Figure 4. On-Resistance Variation with Drain
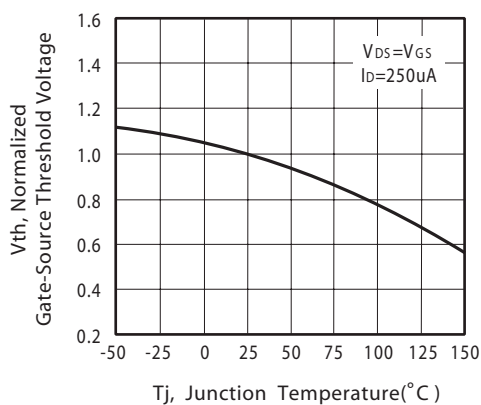Current and Temperature

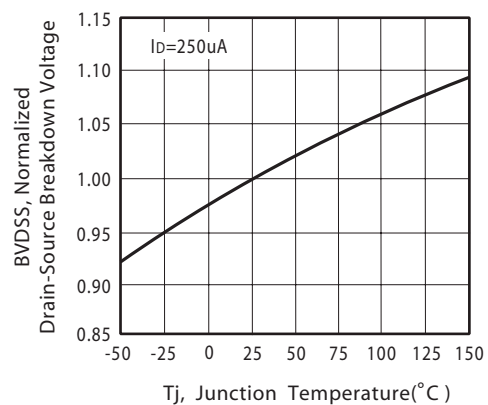Figure 5. Gate Threshold Variation
with Temperature

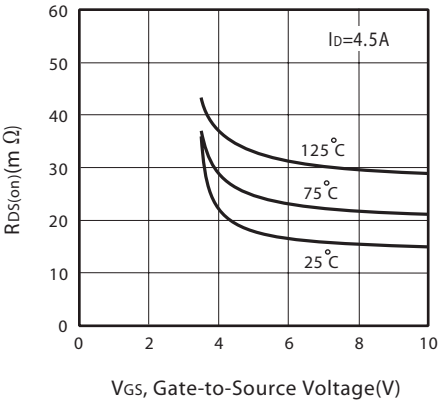Figure 6. Breakdown Voltage Variation
with Temperature

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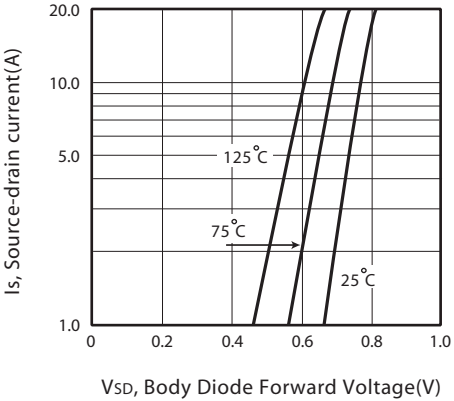Figure 7. On-Resistance vs. Gate-Source Voltage

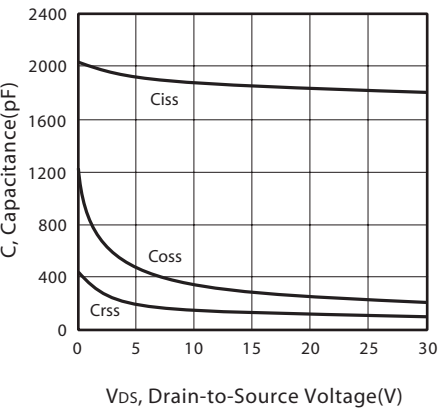Figure 8. Body Diode Forward Voltage Variation with Source Current
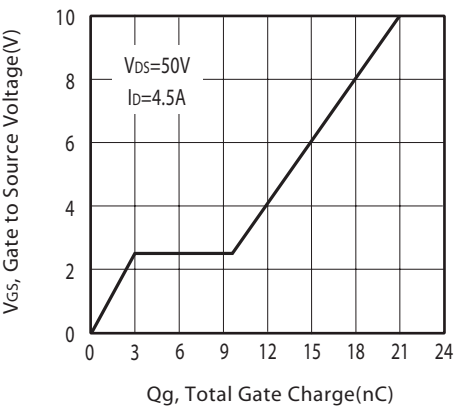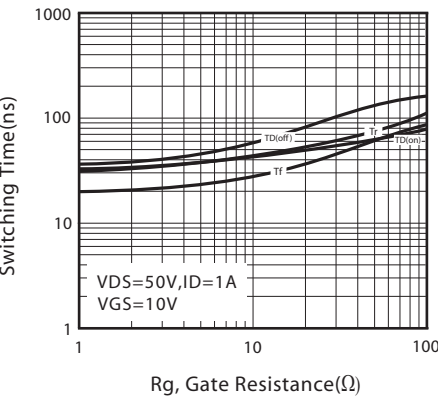

Figure 9. Capacitance

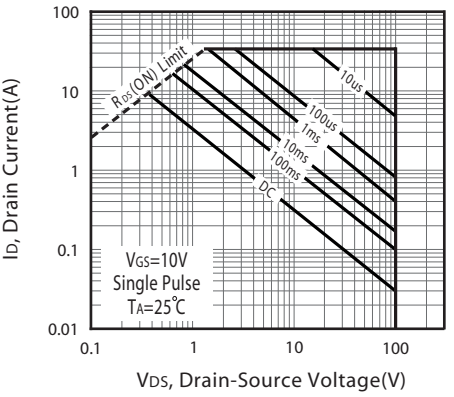Figure 10. Gate Charge

Figure 11. switching characteristics

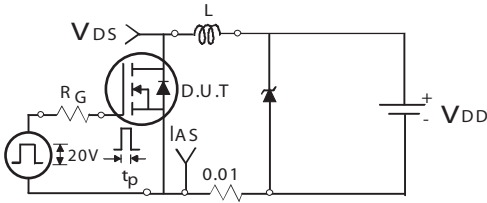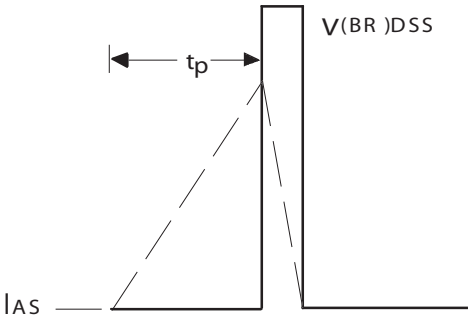Figure 12. Maximum Safe Operating Area

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Unclamped Inductive Test Circuit

Figure 13a.

Unclamped Inductive Waveforms

Figure 13b.

Figure 13. Normalized Thermal Transient Impedance Curve

1. $R_{thJA}(t) = r(t) * R_{thJA}$
2. R_{thJA} = See Datasheet
3. $T_{JM} - T_A = P_{DM} * R_{thJA}(t)$
4. Duty Cycle, $D = t_1/t_2$

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PACKAGE OUTLINE DIMENSIONS

DFN 5x6-8L

TOP VIEW

BOTTOM VIEW

SIDE VIEW

SYMBOLS	MILLIMETERS		
	MIN	NOM	MAX
A	0.85	0.95	1.00
A1	0.00	——	0.05
b	0.30	0.40	0.50
c	0.15	0.20	0.25
D	5.20 BSC		
D1	4.35 BSC		
E	5.55 BSC		
E1	6.05 BSC		
E2	3.62 BSC		
e	1.27 BSC		
L	0.45	0.55	0.65
L1	0.00	——	0.15
L2	0.68 REF		
θ	0°	——	10°

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TOP MARKING DEFINITION

DFN 5x6-8L

SamHop Logo

1020 — Product No.

XXXXXX

Pin 1

SMC internal code No. (A,B,C...Z)

Wafer Lot Number

Production Date (1,2 ~ 9, A,B.....)

Production Month (1,2 ~ 9, A,B,C)

Production Year (2009 = 9, 2010 = A.....)