SamHop Microelectronics Corp.

SP632S

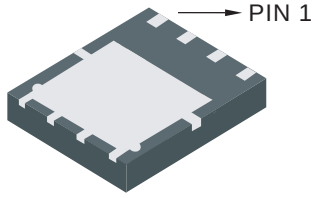
Ver 1.1

N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
60V	10A	16 @ VGS=10V
		24 @ VGS=4.5V

FEATURES

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



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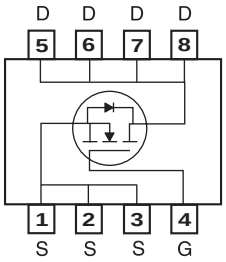


ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise noted)

Symbol	Parameter		Limit	Units
V_{DS}	Drain-Source Voltage		60	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Drain Current-Continuous [a d]	T_C=25°C	42	A
		T_C=100°C	26	A
		T_A=25°C	10	A
		T_A=70°C	8	A
I_{DM}	-Pulsed [d]		35	A
E_{AS}	Single Pulse Avalanche Energy [c]		156	mJ
P_D	Maximum Power Dissipation [a]	T_C=25°C	54	W
		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
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	2.3	°C/W

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	60			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=48V , 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	1.5	3	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V , I_D=5A		13	16	m ohm
		V_{GS}=4.5V , I_D=4A		18	24	m ohm
g_{FS}	Forward Transconductance	V_{DS}=10V , I_D=5A		15		S
DYNAMIC CHARACTERISTICS [b]						
C_{ISS}	Input Capacitance	V_{DS}=25V,V_{GS}=0V f=1.0MHz		2280		pF
C_{OSS}	Output Capacitance			144		pF
C_{RSS}	Reverse Transfer Capacitance			117		pF
SWITCHING CHARACTERISTICS [b]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=30V I_D=1A V_{GS}=10V R_{GEN}= 6 ohm		37		ns
t_r	Rise Time			27		ns
$t_{D(OFF)}$	Turn-Off Delay Time			99		ns
t_f	Fall Time			20		ns
Q_g	Total Gate Charge	V_{DS}=30V,I_D=5A,V_{GS}=10V		32		nC
		V_{DS}=30V,I_D=5A,V_{GS}=4.5V		15.6		nC
Q_{gs}	Gate-Source Charge	V_{DS}=30V,I_D=5A, V_{GS}=10V		3		nC
Q_{gd}	Gate-Drain Charge			7.6		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=1A		0.75	1.2	V

Notes

a.Surface Mounted on FR4 Board of 1 $inch^2$, 1oz.
b.Guaranteed by design, not subject to production testing.
c.Starting T_J=25°C,L=0.5mH,V_{DD} = 30V.(See Figure13)
d.Drain current limited by maximum junction temperature.

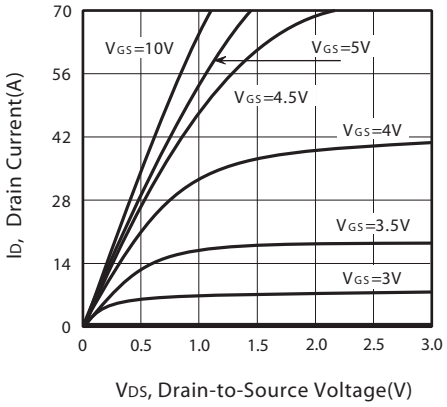


Figure 1. Output Characteristics

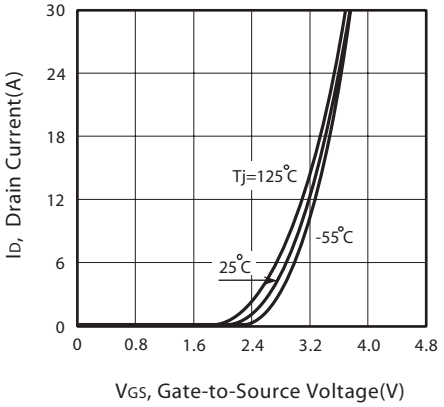


Figure 2. Transfer Characteristics

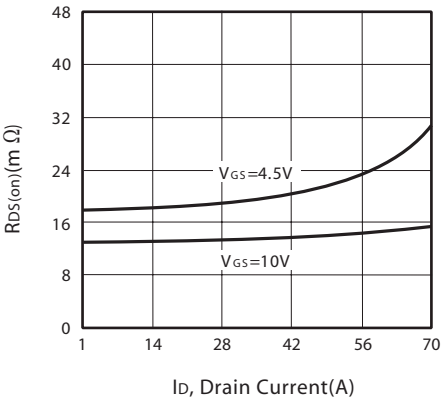


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

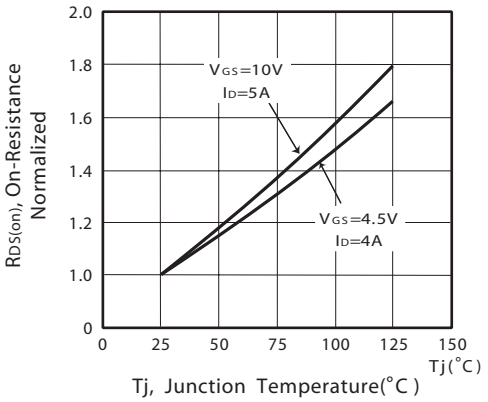


Figure 4. On-Resistance Variation with Drain Current and Temperature

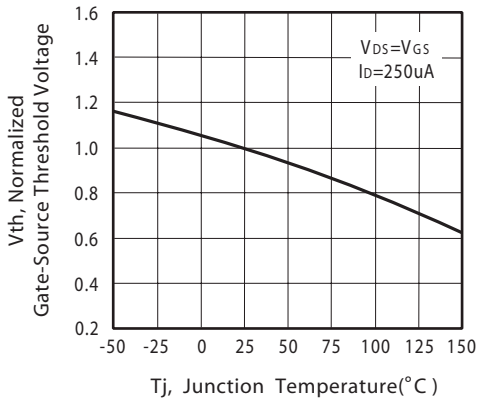


Figure 5. Gate Threshold Variation with Temperature

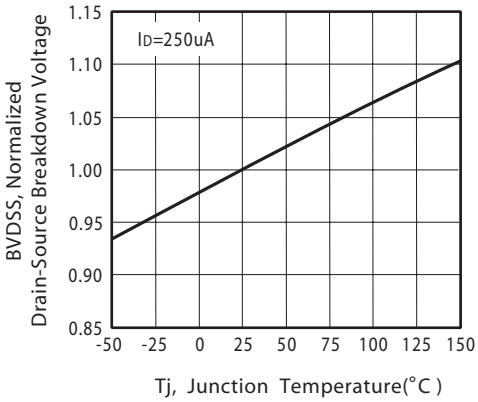


Figure 6. Breakdown Voltage Variation with Temperature

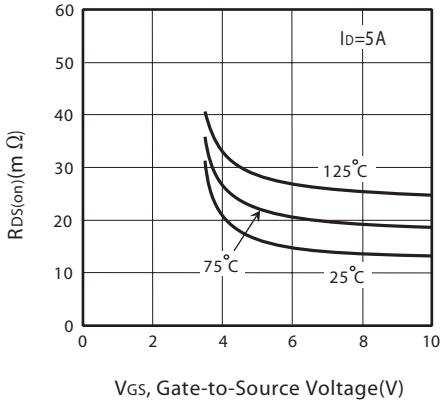


Figure 7. On-Resistance vs. Gate-Source Voltage

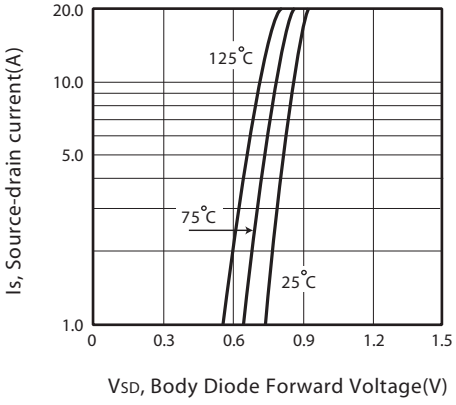


Figure 8. Body Diode Forward Voltage Variation with Source Current

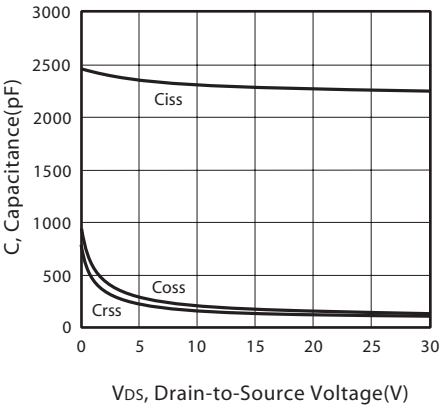


Figure 9. Capacitance

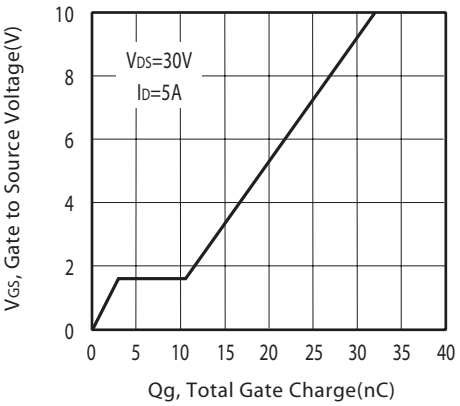


Figure 10. Gate Charge

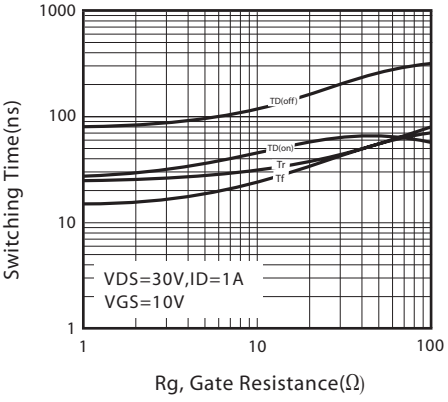


Figure 11. switching characteristics

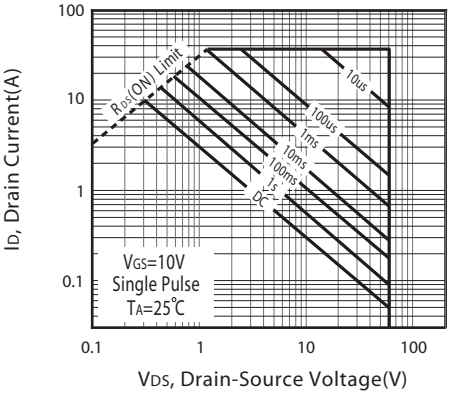
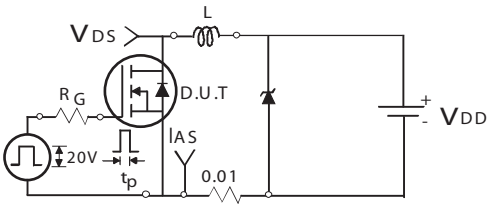
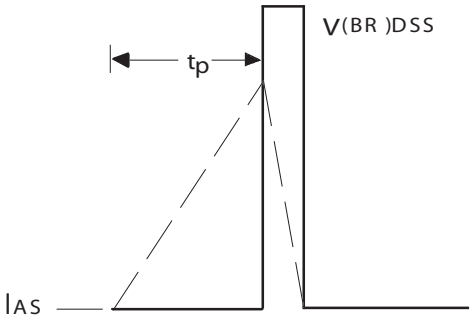


Figure 12. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

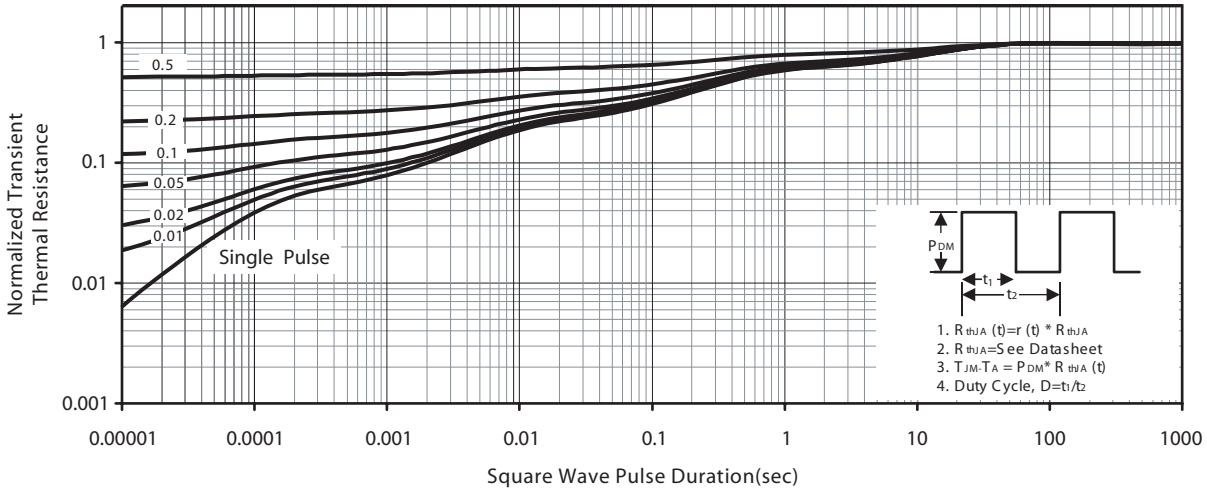


Figure 13. Normalized Thermal Transient Impedance Curve

PACKAGE OUTLINE DIMENSIONS

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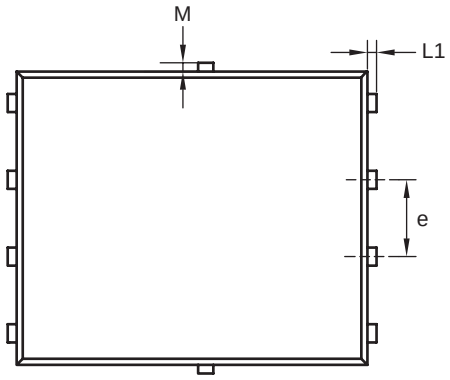

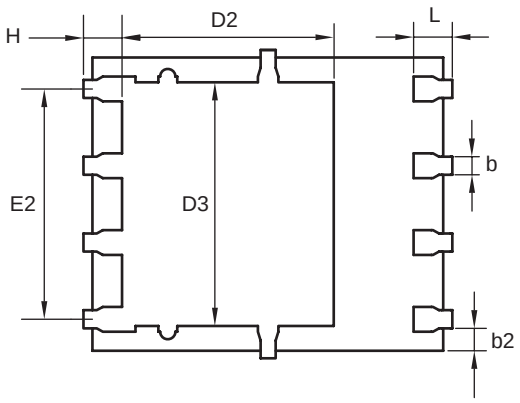

SYMBOLS	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
b	0.20	0.30	0.40
b2	0.25	0.35	0.45
C	0.15	0.25	0.35
D	5.90	6.10	6.30
D1	5.60	5.80	6.00
D2		3.50 REF.	
D3		4.00 REF.	
E	5.00	5.20	5.40
E1	4.70	4.90	5.10
E2	3.61	3.81	4.01
e	1.17	1.27	1.37
H		0.63 REF.	
L	0.53	0.63	0.73
L1	0.05	0.15	0.25
M	0.05	0.15	0.25
θ	8^o	10^o	12^o