SamHop Microelectronics Corp.

STF1016C

Ver 1.0

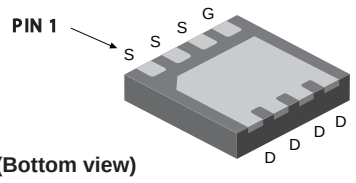
N-Channel Enhancement Mode Field Effect Transistor

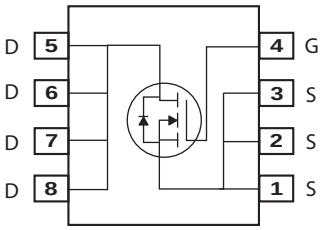
PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Typ
100V	40A	17 @ VGS=10V
		19 @ VGS=4.5V

FEATURES

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

DFN 3.3 X 3.3





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

Symbol	Parameter		Limit	Units
V_{DS}	Drain-Source Voltage [d]		100	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Drain Current-Continuous [c]	T_C=25°C	40	A
		T_C=100°C	25.3	A
		T_A=25°C	8	A
I_{DM}	-Pulsed [a c]		160	A
E_{AS}	Single Pulse Avalanche Energy [e]		196	mJ
P_D	Maximum Power Dissipation	T_C=25°C	62.5	W
		T_A=25°C	1.92	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	65	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	2	°C/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage [d]	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=20A		17	19.5	m ohm
		V_{GS}=4.5V , I_D=19A		19	23	m ohm
g_{FS}	Forward Transconductance	V_{DS}=10V , I_D=20A		71		S
DYNAMIC CHARACTERISTICS [b]						
C_{ISS}	Input Capacitance	V_{DS}=25V,V_{GS}=0V f=1.0MHz		2568		pF
C_{OSS}	Output Capacitance			190		pF
C_{RSS}	Reverse Transfer Capacitance			158		pF
SWITCHING CHARACTERISTICS [b]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=50V I_D=1A V_{GS}=10V R_{GEN}= 6 ohm		48		ns
t_r	Rise Time			53		ns
$t_{D(OFF)}$	Turn-Off Delay Time			115		ns
t_f	Fall Time			24		ns
Q_g	Total Gate Charge	V_{DS}=50V,I_D=5A,V_{GS}=10V		42		nC
Q_{gs}	Gate-Source Charge	V_{DS}=50V,I_D=5A, V_{GS}=10V		4		nC
Q_{gd}	Gate-Drain Charge			12		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=8A		0.77	1.2	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.Pulse Test:Pulse Width < 1us, Duty Cycle < 1%.
e.Starting T_J=25°C,L=0.5mH,VDD = 50V.(See Figure13)
f.Mounted on FR4 Board of 1 inch^2 , 2oz.

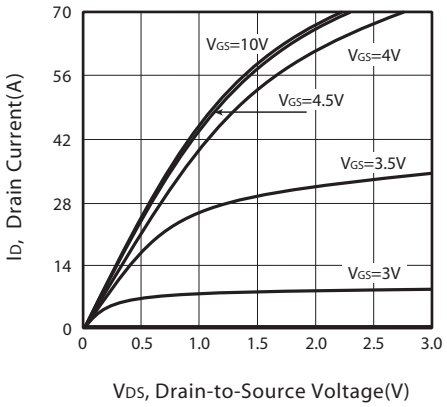


Figure 1. Output Characteristics

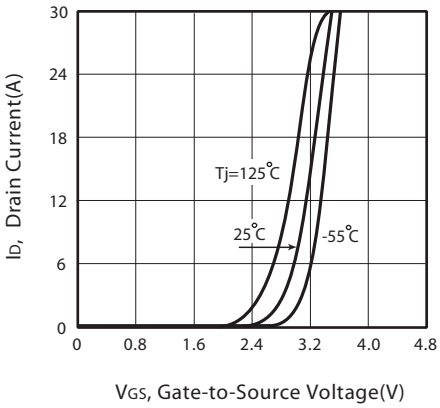


Figure 2. Transfer Characteristics

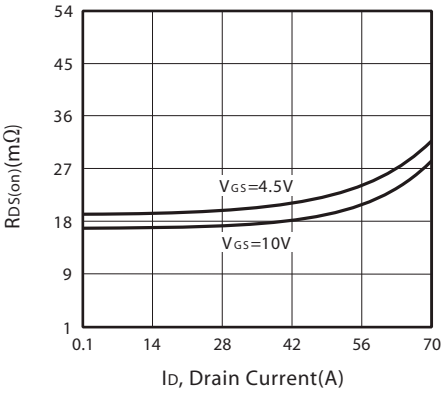


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

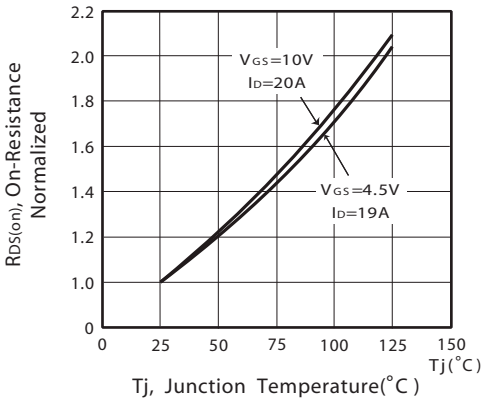


Figure 4. On-Resistance Variation with Drain Current and Temperature

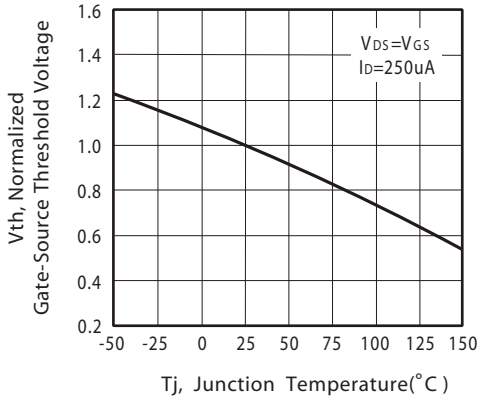


Figure 5. Gate Threshold Variation with Temperature

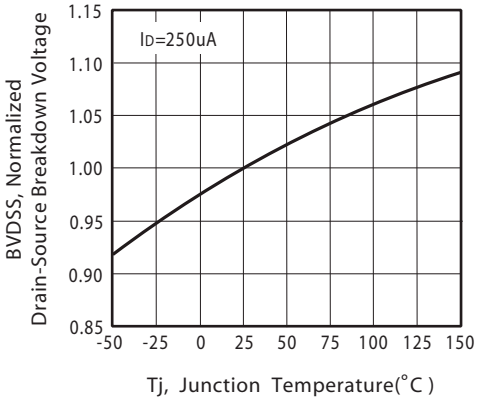


Figure 6. Breakdown Voltage Variation with Temperature

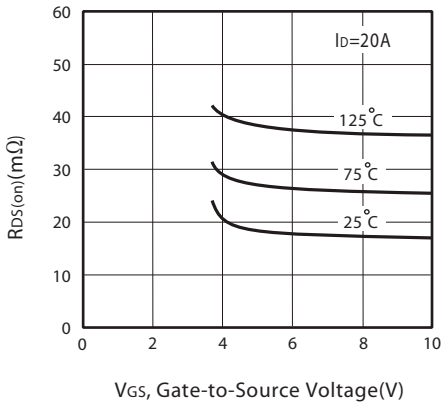


Figure 7. On-Resistance vs. Gate-Source Voltage

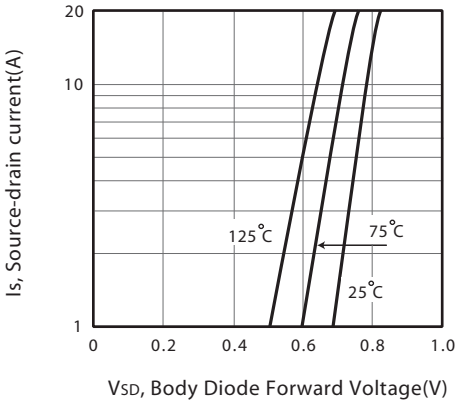


Figure 8. Body Diode Forward Voltage Variation with Source Current

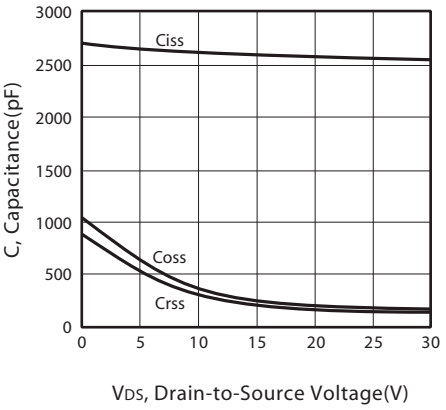


Figure 9. Capacitance

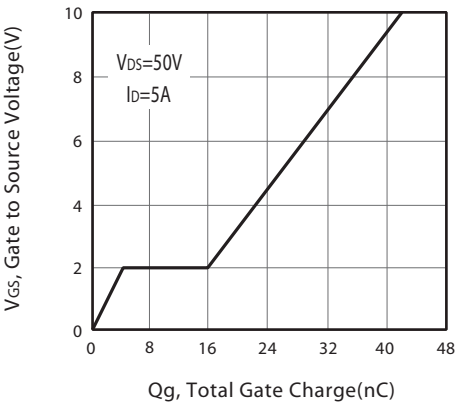


Figure 10. Gate Charge

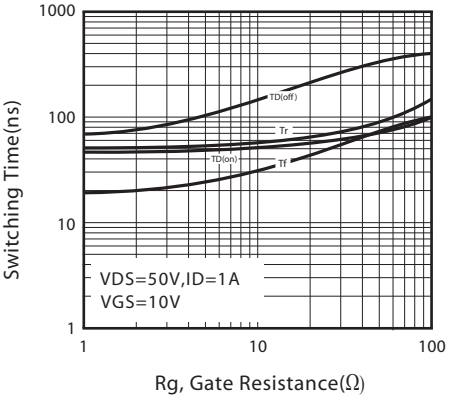


Figure 11. switching characteristics

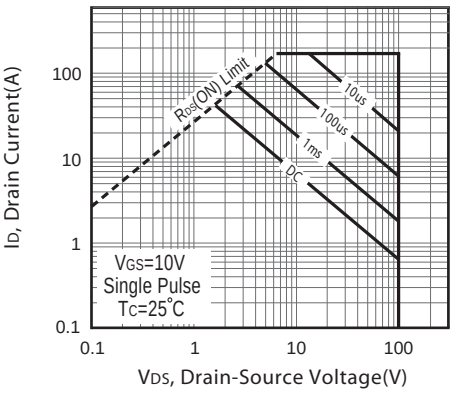
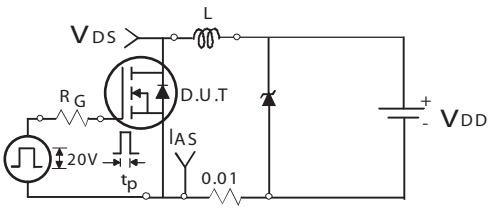
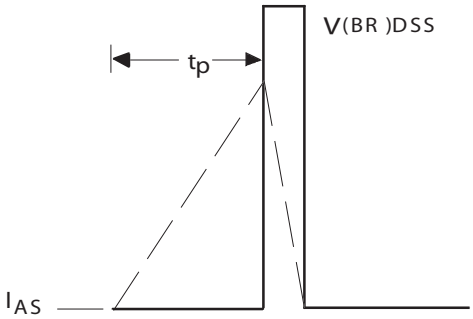


Figure 12. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

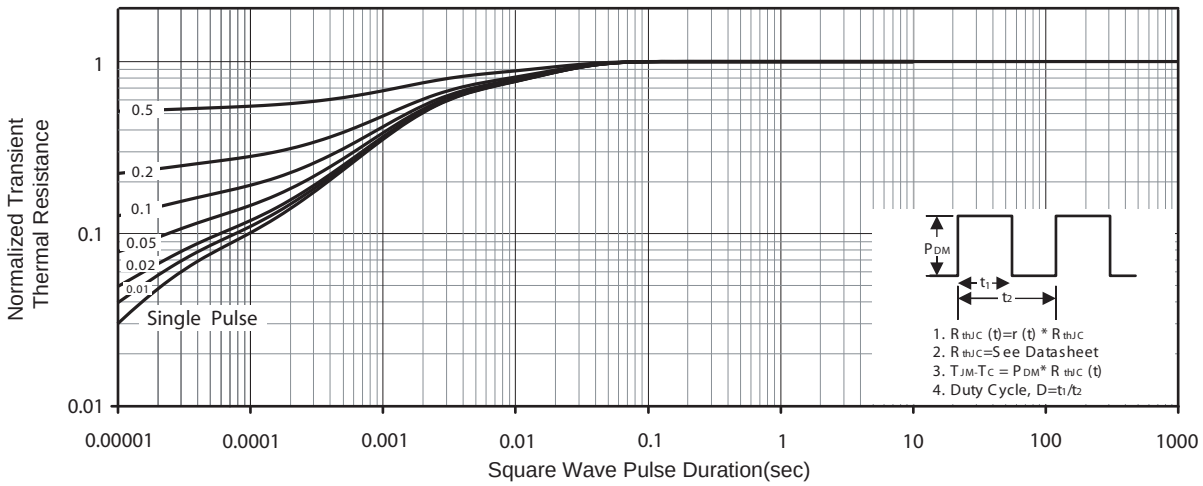
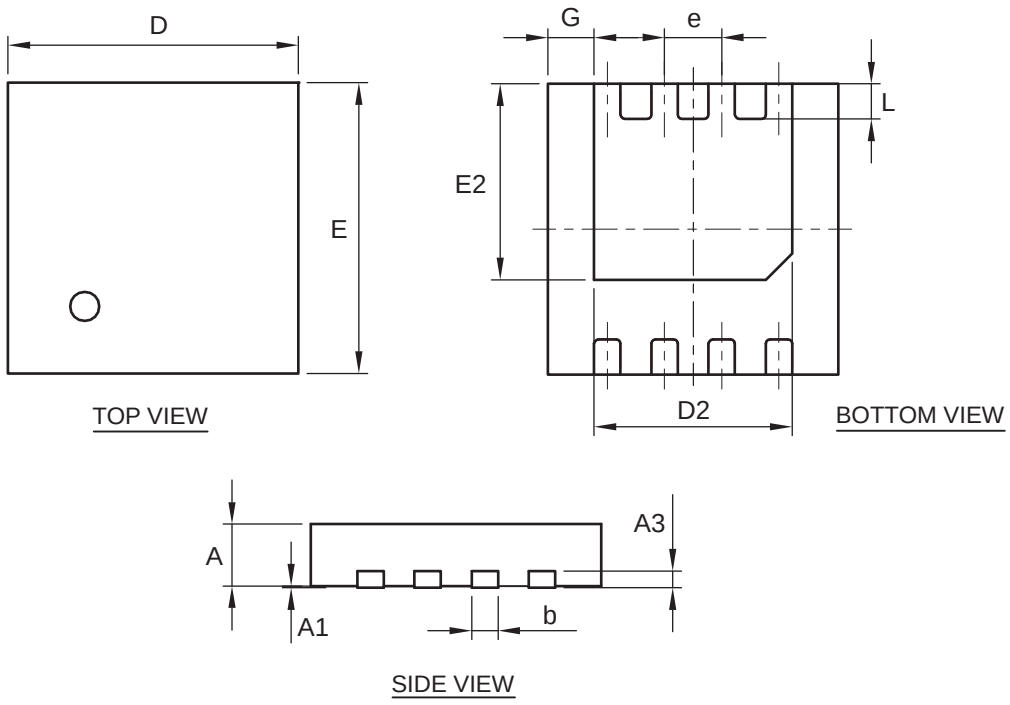


Figure 14. Normalized Thermal Transient Impedance Curve

PACKAGE OUTLINE DIMENSIONS

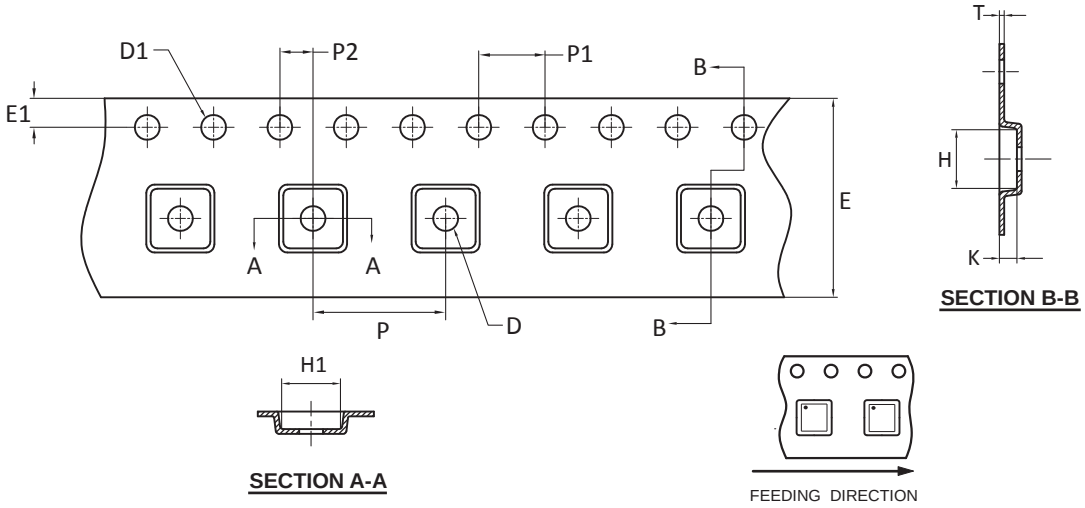
DFN 3.3 x 3.3



SYMBOLS	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.70	0.75	0.80
A1	—	—	0.05
A3	0.10	0.15	0.25
b	0.24	0.30	0.35
D	3.15	3.30	3.40
D2	2.10	2.25	2.35
E	3.15	3.30	3.40
E2	2.15	2.25	2.35
e	0.60	0.65	0.70
G	0.475	0.525	0.575
L	0.35	0.40	0.45

DFN 3.3 x 3.3 Tape and Reel Data

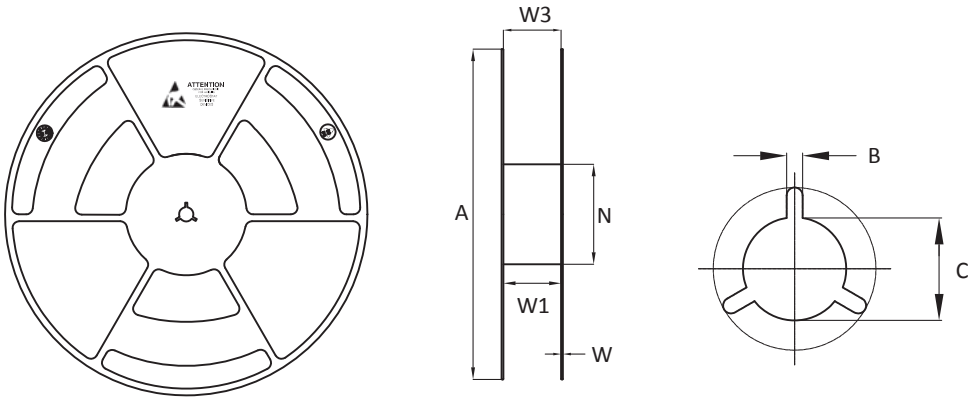
DFN 3.3 x 3.3 Tape



Unit : mm

PACKAGE	D	D1	E	E1	H	H1	K	P	P1	P2	T
DFN 3.3x3.3	ϕ1.50 (MIN)	ϕ1.50 +0.10 - 0.00	12.0 +0.30 - 0.10	1.75 ±0.10	3.60 ±0.10	3.60 ±0.10	1.05 ±0.10	8.0 ±0.10	4.0 ±0.10	2.0 ±0.05	0.3 ±0.05

DFN 3.3 x 3.3 Reel



Unit : mm

TAPE SIZE	A	N	W	W1	W3	B	C
12 mm	330 ±2.0	101.6 ±2.0	1.3 +∞ -0.0	12.4 +2.0 -0.0	12.4 +3.0 -0.0	1.7 -2.6	13.2 +3.0 -0.2

TOP MARKING DEFINITION

DFN 3.3 x 3.3