SamHop Microelectronics Corp.

SDK03N04

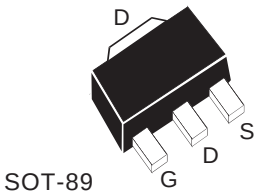
Ver 1.3

N-Channel Enhancement Mode Field Effect Transistor

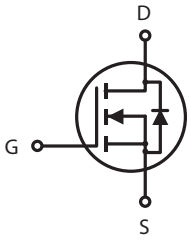
PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (Ω) Typ
400V	1.5A	3.5 @ VGS=10V

FEATURES

- Super high dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- SOT-89 Package.



SOT-89



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

Symbol	Parameter		Limit	Units
V_{DS}	Drain-Source Voltage		400	V
V_{GS}	Gate-Source Voltage		±30	V
I_D	Drain Current-Continuous [a]	T_A=25°C	1.5	A
		T_A=70°C	1.2	A
I_{DM}	-Pulsed [b]		6	A
E_{AS}	Single Pulse Avalanche Energy [d]		10.4	mJ
P_D	Maximum Power Dissipation	T_A=25°C	1.25	W
		T_A=70°C	0.8	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	100	°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	400			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=320V , V_{GS}=0V			1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}= ±30V , V_{DS}=0V			±100	nA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	2	2.9	4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V , I_D=1A		3.5	4.0	ohm
g_{FS}	Forward Transconductance	V_{DS}=10V , I_D=1A		0.7		S
DYNAMIC CHARACTERISTICS [c]						
C_{ISS}	Input Capacitance	V_{DS}=25V,V_{GS}=0V f=1.0MHz		186		pF
C_{OSS}	Output Capacitance			38		pF
C_{RSS}	Reverse Transfer Capacitance			7		pF
SWITCHING CHARACTERISTICS [c]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=200V I_D=1A V_{GS}=10V R_{GEN}=25 ohm		13		ns
t_r	Rise Time			27		ns
$t_{D(OFF)}$	Turn-Off Delay Time			55		ns
t_f	Fall Time			128		ns
Q_g	Total Gate Charge	V_{DS}=200V,I_D=1A,V_{GS}=10V		6		nC
Q_{gs}	Gate-Source Charge	V_{DS}=200V,I_D=1A, V_{GS}=10V		1.9		nC
Q_{gd}	Gate-Drain Charge			2		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
I_S	Maximum Continuous Drain-Source Diode Forward Current				1	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=1A		0.81	1.4	V

Notes

a.Surface Mounted on FR4 Board,t ≤ 10sec.
b.Pulse Test:Pulse Width ≤ 300us, Duty Cycle ≤ 2%.
c.Guaranteed by design, not subject to production testing.
d.Starting T_J=25°C,L=1mH,R_G=25Ω,V_{DD} = 50V.(See Figure12)

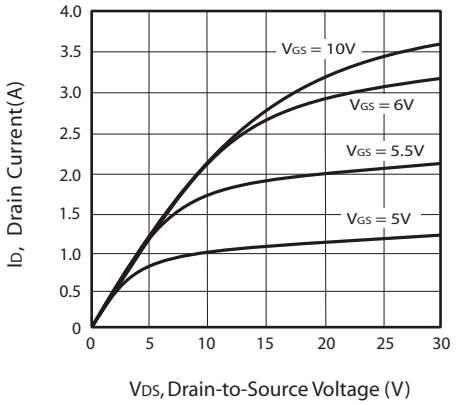


Figure 1. Output Characteristics

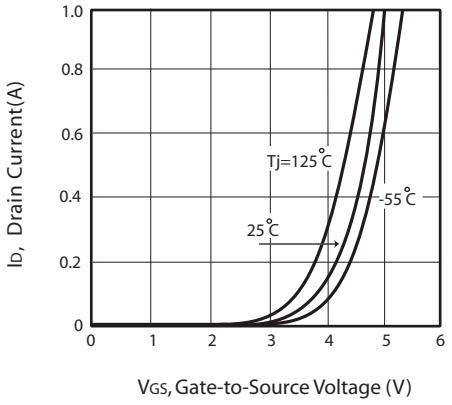


Figure 2. Transfer Characteristics

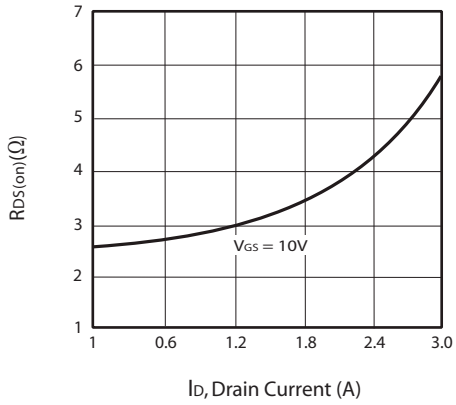


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

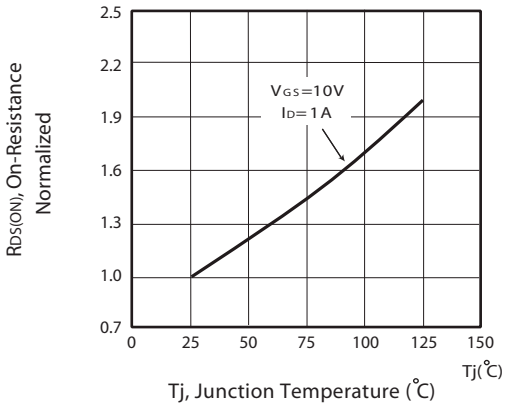


Figure 4. On-Resistance Variation with Drain Current and Temperature

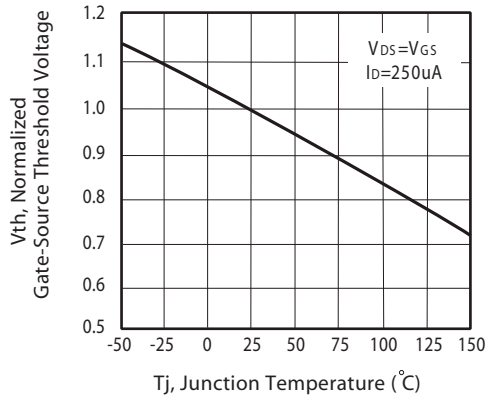


Figure 5. Gate Threshold Variation with Temperature

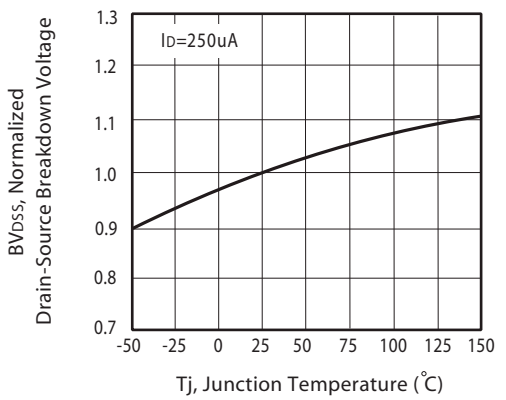


Figure 6. Breakdown Voltage Variation with Temperature

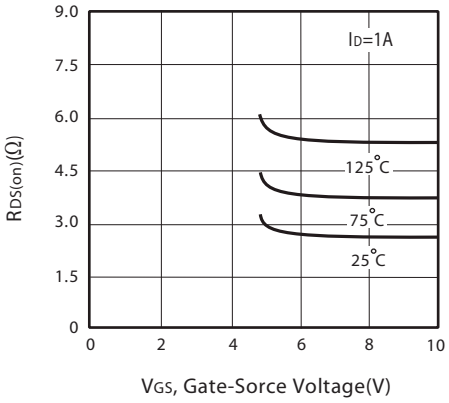


Figure 7. On-Resistance vs. Gate-Source Voltage

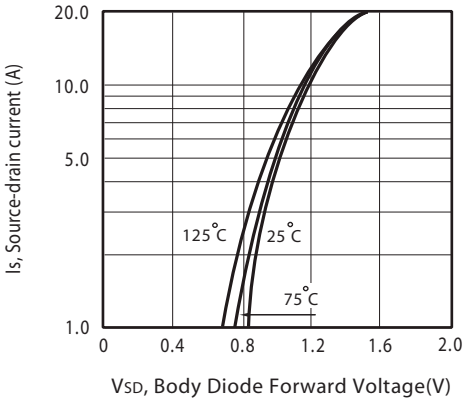


Figure 8. Body Diode Forward Voltage Variation with Source Current

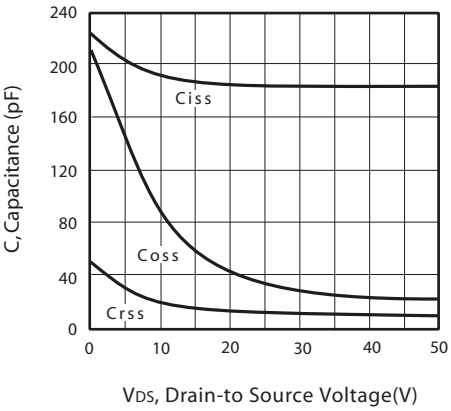


Figure 9. Capacitance

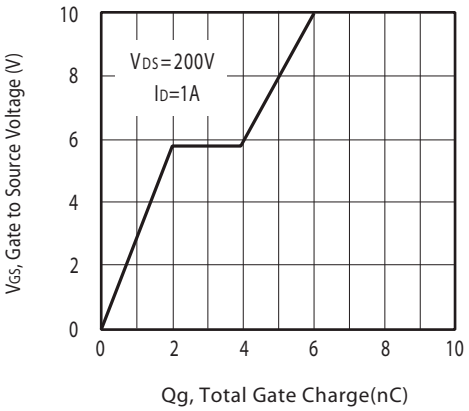


Figure 10. Gate Charge

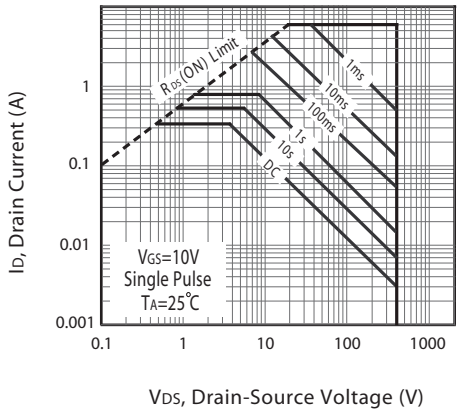
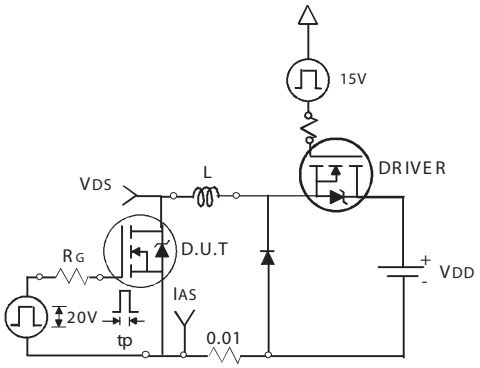
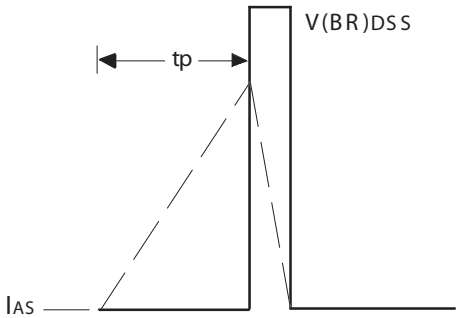


Figure 11. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 12a.



Unclamped Inductive Waveforms

Figure 12b.

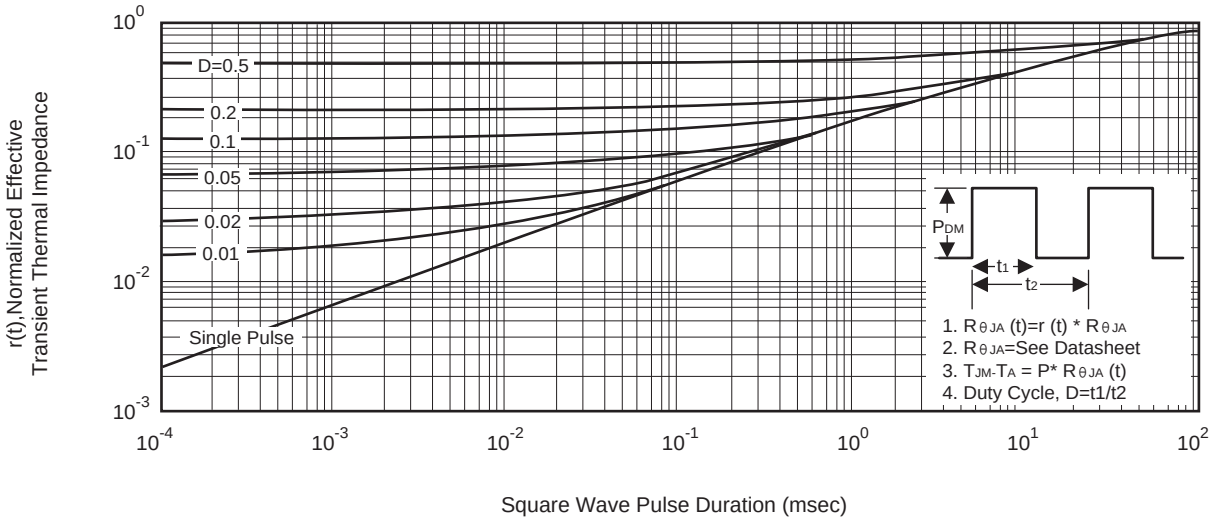
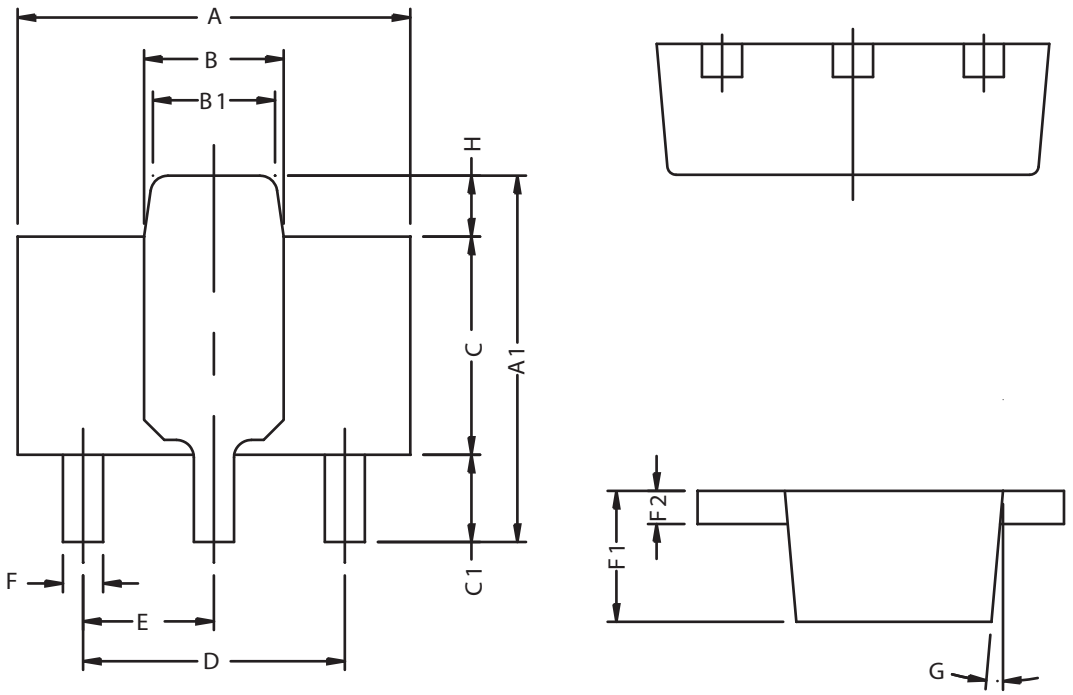


Figure 13. Normalized Thermal Transient Impedance Curve

PACKAGE OUTLINE DIMENSIONS

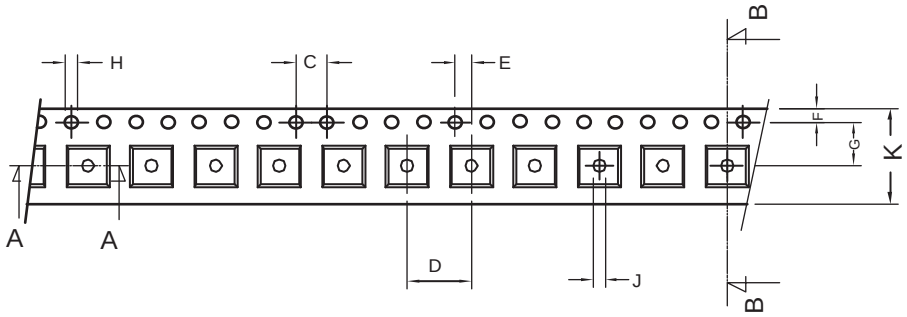
SOT-89

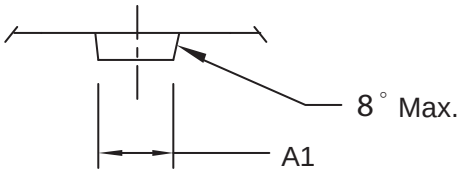


REF.	DIMENSIONS Milimeters	
	MIN.	MAX.
A	4.40	4.60
A1	4.05	4.25
B	1.50	1.70
B1	1.30	1.50
C	2.40	2.60
C1	0.89	1.20
D	3.00 REF.	
E	1.50 REF.	
F	0.40	0.52
F1	1.40	1.60
F2	0.35	0.41
G	5° TYP.	
H	0.70 REF.	

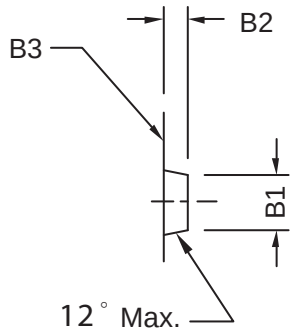
SOT-89 Tape

SOT-89 Carrier Tape





SECTION A-A



SECTION B-B

unit:㎜

PACKAGE	A1	B1	B2	C	D	E	B3	F	G	H	J	K	10C
SOP 8N 150㎜	4.85 ±0.10	4.45 ±0.10	1.85 ±0.10	4.0 ±0.10	8.0 ±0.10	2.0 ±0.05	0.254 ±0.02	1.75 ±0.10	5.5 ±0.05	1.50 ±0.10	1.5 ±0.25	12.0 +0.30 -0.10	40.0 ±0.20