SamHop Microelectronics Corp.

SDM9410

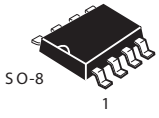
PRELIMINARY

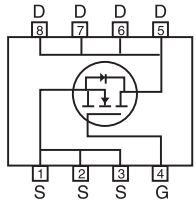
N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) MAX
30V	7A	30 @ V_{GS} = 10V
		50 @ V_{GS} = 4.5V

FEATURES

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





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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous [a] @ T_J=125°C	I_D	7	A
-Pulsed [b] (300ms Pulse Width)	I_{DM}	28	A
Drain-Source Diode Forward Current [a]	I_S	2.8	A
Maximum Power Dissipation [a]	P_D	2.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient [a]	$R_{\theta JA}$	50	°C/W

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

Parameter	Symbol	Condition	Min	Typ [c]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V			1	uA
Gate-Body Leakage	I_{GSS}	V_{GS} = ±20V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS [b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D = 250uA	1	1.8	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=7A			30	m ohm
		V_{GS}=4.5V, I_D= 3.5A			50	m ohm
On-State Drain Current	$I_{D(ON)}$	V_{DS} = 5V, V_{GS} = 10V	30			A
Forward Transconductance	g_{FS}	V_{DS} = 5V, I_D=7A		12		S
DYNAMIC CHARACTERISTICS [c]						
Input Capacitance	C_{ISS}	V_{DS}=15V, V_{GS} = 0V f=1.0MHz		510		pF
Output Capacitance	C_{OSS}			235		pF
Reverse Transfer Capacitance	C_{RSS}			56		pF
SWITCHING CHARACTERISTICS [c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD} = 15V, I_D = 1A, V_{GS} = 10V, R_{GEN} = 10 ohm		21	40	ns
Rise Time	t_r			20	40	ns
Turn-Off Delay Time	$t_{D(OFF)}$			27	55	ns
Fall Time	t_f			115	230	ns
Total Gate Charge	Q_g	V_{DS}=15V, I_D=1A, V_{GS}=10V		13	20	nC
		V_{DS}=15V, I_D=1A, V_{GS}=4.5V		6.5	10	nC
Gate-Source Charge	Q_{gs}	V_{DS}=15V, I_D = 1A, V_{GS}=10V		2		nC
Gate-Drain Charge	Q_{gd}			2.3		nC

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

Parameter	Symbol	Condition	Min	Typ[c]	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS [b]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, Is =5.3A		0.76	1.1	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.

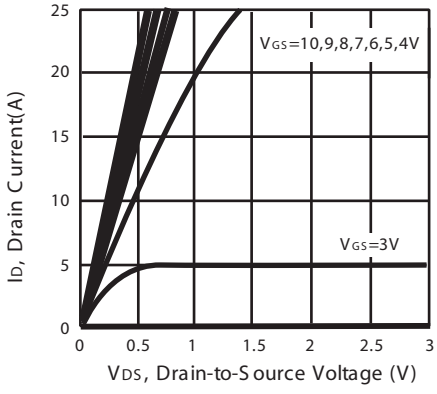


Figure 1. Output Characteristics

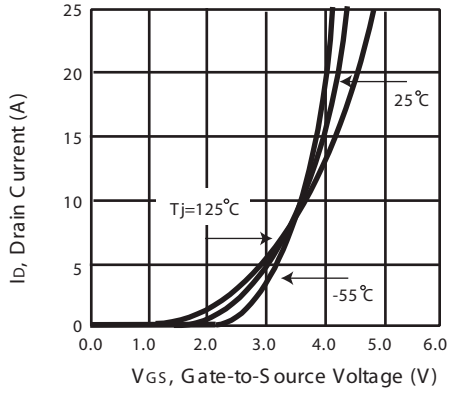


Figure 2. Transfer Characteristics

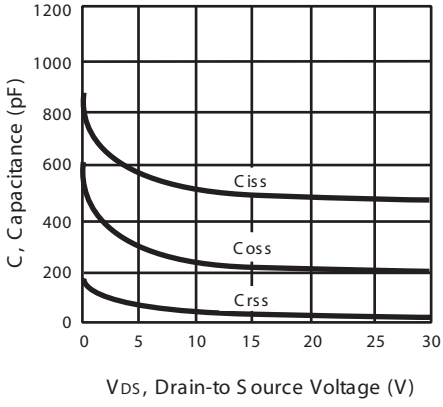


Figure 3. Capacitance

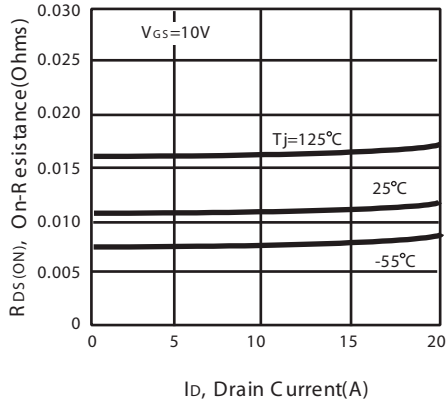


Figure 4. On-Resistance Variation with Drain Current and Temperature

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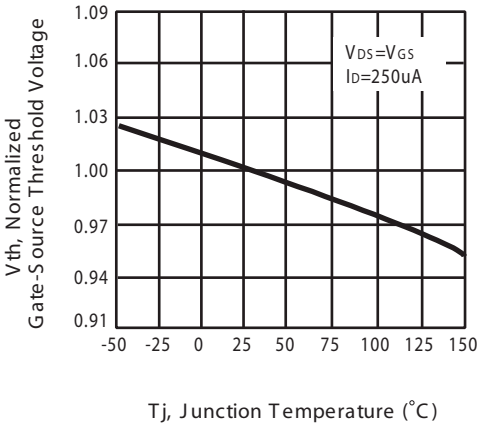


Figure 5. Gate Threshold Variation with Temperature

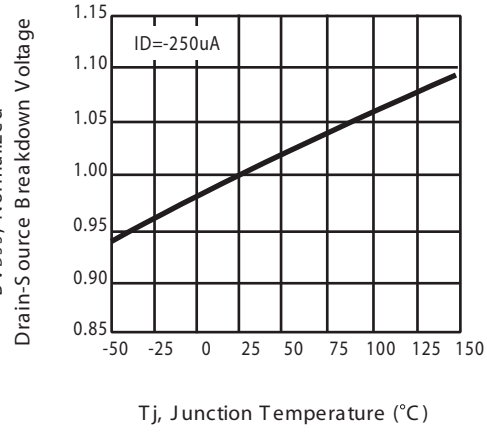


Figure 6. Breakdown Voltage Variation with Temperature

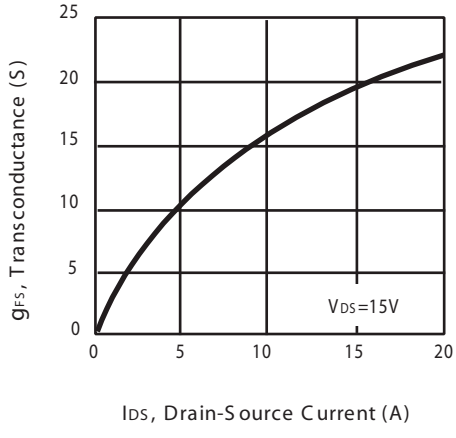


Figure 7. Transconductance Variation with Drain Current

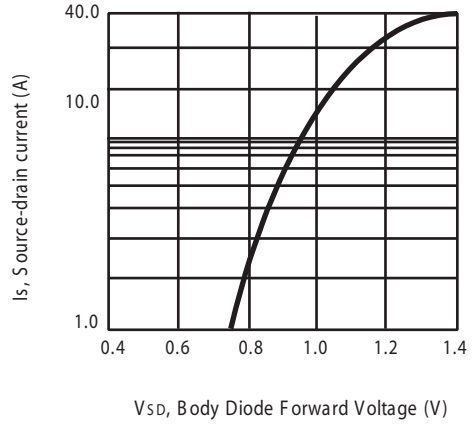


Figure 8. Body Diode Forward Voltage Variation with Source Current

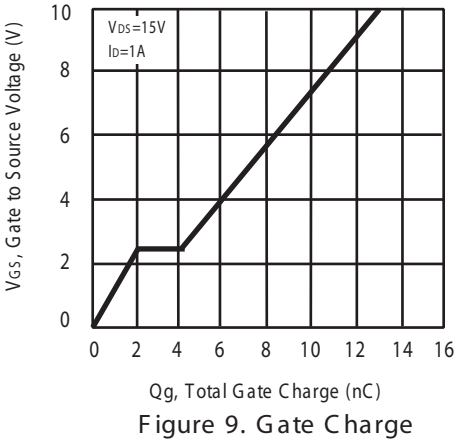


Figure 9. Gate Charge

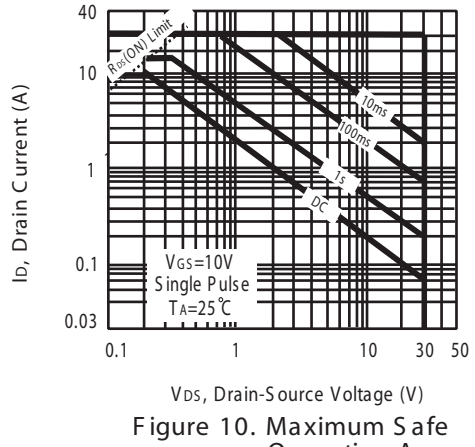


Figure 10. Maximum Safe Operating Area

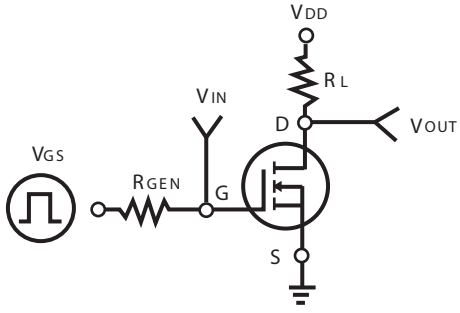


Figure 11. Switching Test Circuit

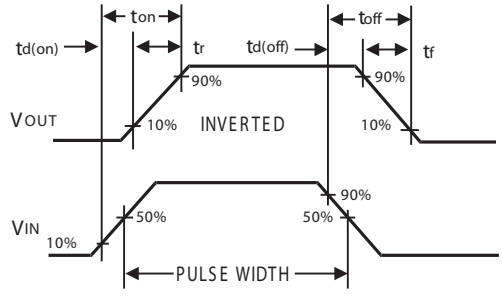


Figure 12. Switching Waveforms

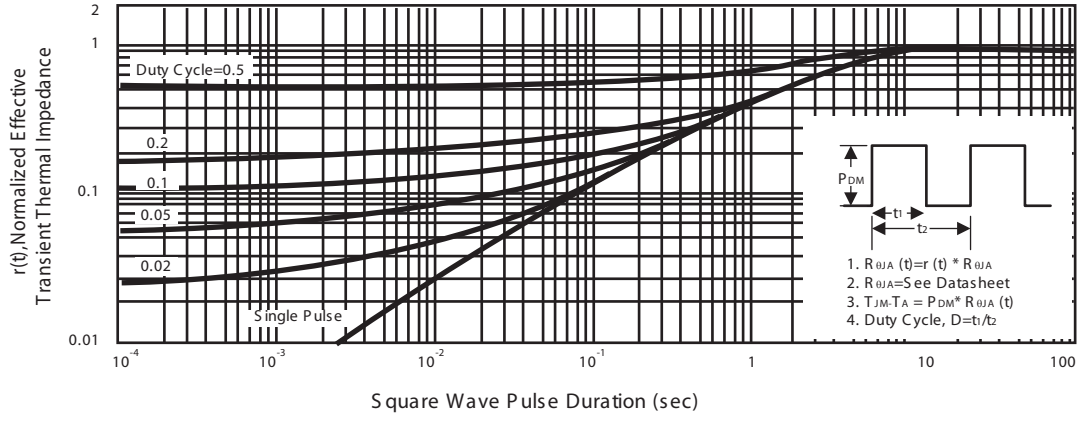


Figure 13. Normalized Thermal Transient Impedance Curve