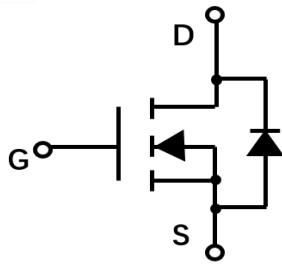
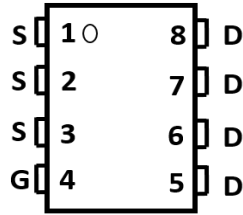


**SOP-8**



### Product Summary

- $V_{DS}$  60V
- $I_D$  12A
- $R_{DS(ON)}$  ( at  $V_{GS}=10V$ ) < 9 mohm
- $R_{DS(ON)}$  ( at  $V_{GS}=4.5V$ ) < 13 mohm

### General Description

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$

### Applications

- DC-DC Converters
- Power management functions
- Industrial and Motor Drive application

### ■ Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	$V_{DS}$	60	V
Gate-source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current	$I_D$	$T_C=25^\circ\text{C}$	12
		$T_C=100^\circ\text{C}$	7.5
Pulsed Drain Current <sup>A</sup>	$I_{DM}$	48	A
Total Power Dissipation	$P_D$	$T_C=25^\circ\text{C}$	3.1
		$T_C=100^\circ\text{C}$	1.24
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	$t \leq 10\mu\text{s}$	40
		Steady-State	75
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	24	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$

### ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
LMS12G06A	F2	Q12N06	4000	8000	64000	13" reel

## ■ Electrical Characteristics ( $T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$	$T_J=25^\circ\text{C}$		1	$\mu A$
			$T_J=55^\circ\text{C}$		5	
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.7	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=12A$		8.2	9	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$		10.5	13	
Diode Forward Voltage	$V_{SD}$	$I_S=12A, V_{GS}=0V$		0.8	1.2	V
Maximum Body-Diode Continuous Current	$I_S$				12	A
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=30V, V_{GS}=0V, f=1\text{MHz}$		1980		pF
Output Capacitance	$C_{oss}$			470		
Reverse Transfer Capacitance	$C_{rss}$			14		
<b>Switching Parameters</b>						
Total Gate Charge	$Q_g$	$V_{GS}=10V, V_{DS}=30V, I_D=12A$		31		nC
Gate-Source Charge	$Q_{gs}$			6		
Gate-Drain Charge	$Q_{gd}$			5		
Reverse Recovery Charge	$Q_{rr}$	$I_F=20A, di/dt=500A/\mu s$		17		ns
Reverse Recovery Time	$t_{rr}$			58		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=30V, R_L=1\Omega, R_{GEN}=3\Omega$		10		ns
Turn-on Rise Time	$t_r$			5		
Turn-off Delay Time	$t_{D(off)}$			30		
Turn-off fall Time	$t_f$			8		

A. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

## ■ Typical Performance Characteristics

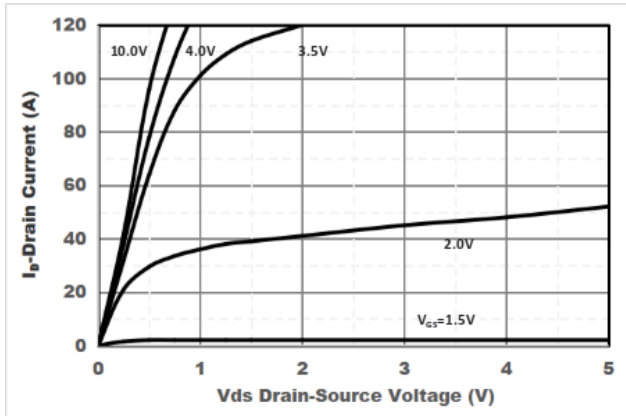


Figure1. Output Characteristics

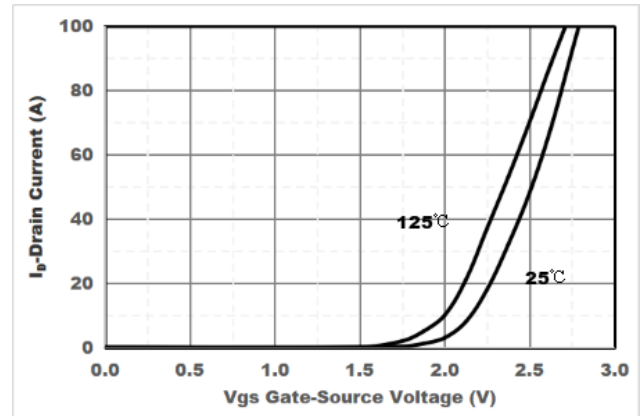


Figure2. Transfer Characteristics

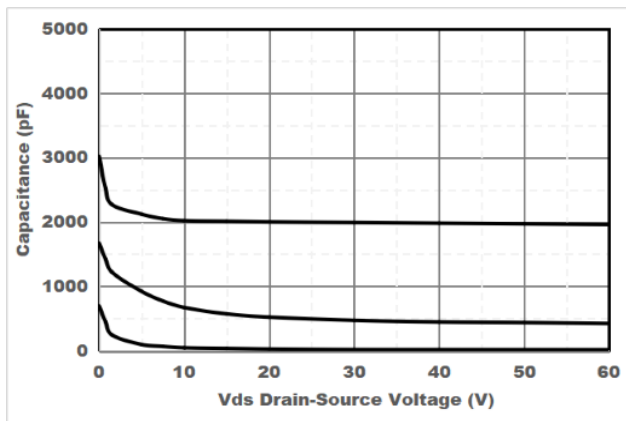


Figure3. Capacitance Characteristics

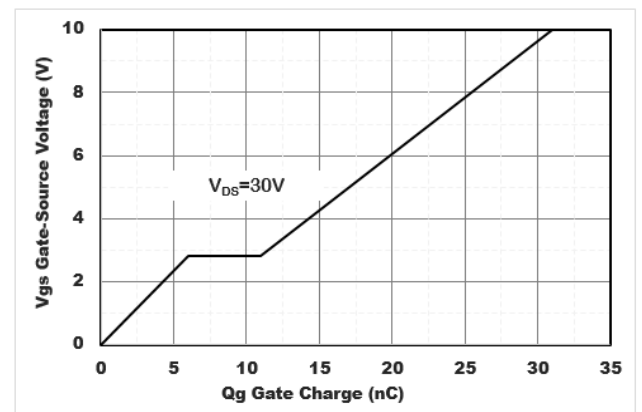


Figure4. Gate Charge

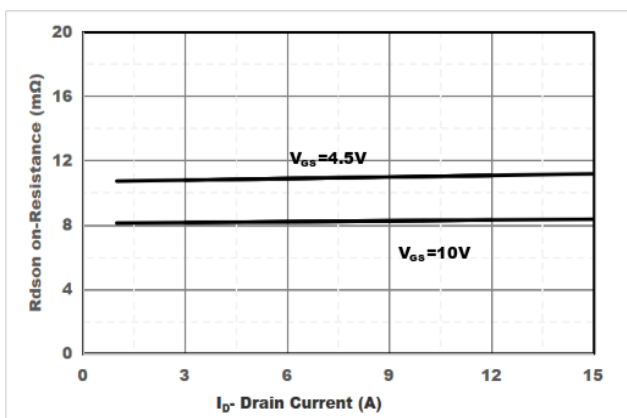


Figure5. Drain-Source on Resistance

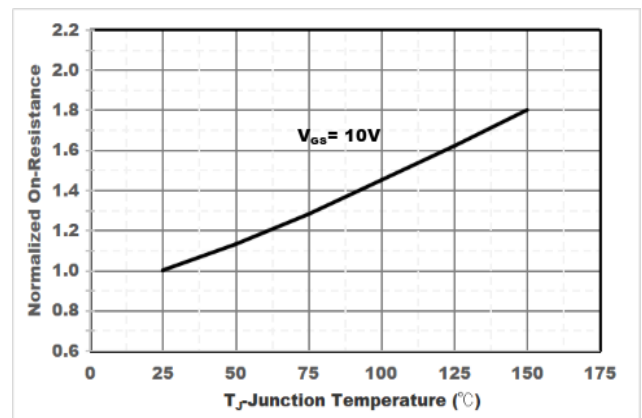


Figure6. Drain-Source on Resistance

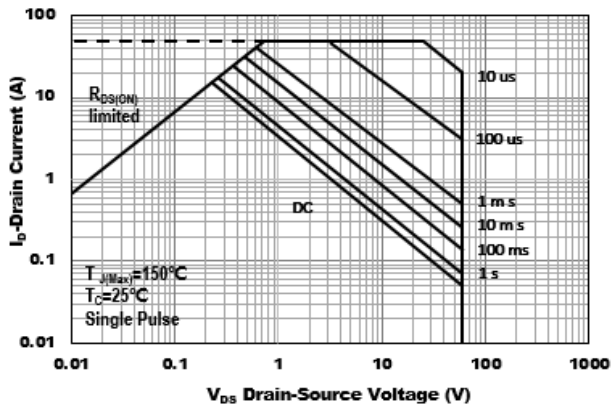


Figure7. Safe Operation Area

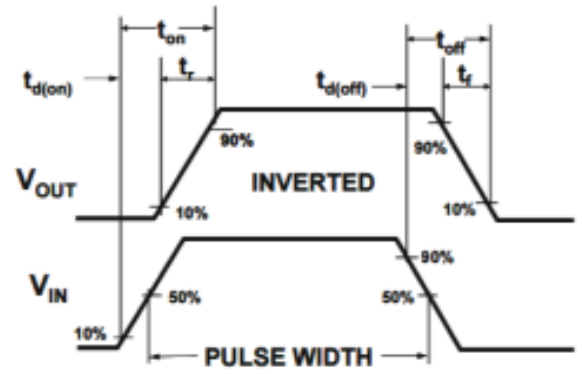
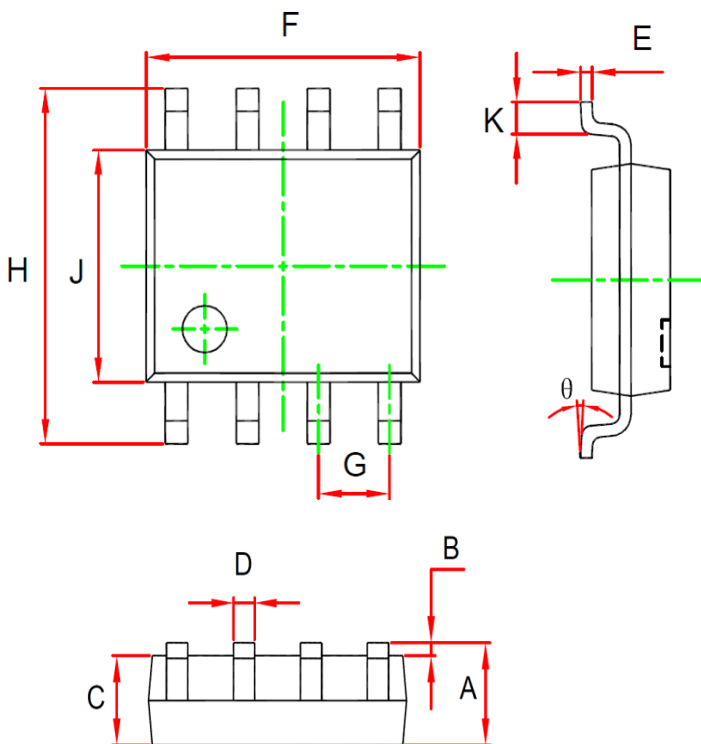


Figure8. Switching wave

## ■ SOP-8 Package information



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.053	0.069	1.350	1.750	
B	0.004	0.010	0.100	0.250	
C	0.053	0.061	1.350	1.550	
D	0.013	0.020	0.330	0.510	
E	0.007	0.010	0.170	0.250	
F	0.189	0.197	4.800	5.000	
G	0.050 (BSC)		1.270 (BSC)		
H	0.228	0.244	5.800	6.200	
J	0.150	0.157	3.800	4.000	
K	0.016	0.050	0.400	1.270	
$\theta$	0°	8°	0°	8°	