

SOP-8

Product Summary

- V_{DS} 30V
- I_D 8.5A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) <23 mohm
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) <32 mohm

General Description

- Trench Power LV MOSFET technology
- High density cell design for low $R_{DS(ON)}$
- High Speed switching

Applications

- Battery protection
- Load switch
- Power management

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

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	30	V
Gate-source Voltage	V_{GS}	± 20	V
Drain Current	I_D	$T_A=25^\circ\text{C}$ @ Steady State	8.5
		$T_A=70^\circ\text{C}$ @ Steady State	6.8
Pulsed Drain Current ^A	I_{DM}	34	A
Total Power Dissipation @ $T_A=25^\circ\text{C}$	P_D	2.5	W
Thermal Resistance Junction-to-Ambient @ Steady State ^B	$R_{\theta JA}$	50	$^\circ\text{C}/\text{W}$
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
LMS3404A	F2	Q3404A.	4000	8000	64000	13" reel

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}= \pm 20V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.5	2.2	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=8.5A$		21	23	m Ω
		$V_{GS}=4.5V, I_D=6.0A$		27	32	
Diode Forward Voltage	V_{SD}	$I_S=8.5A, V_{GS}=0V$		0.8	1.2	V
Maximum Body-Diode Continuous Current	I_S				8.5	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHZ}$		490		pF
Output Capacitance	C_{oss}			92		
Reverse Transfer Capacitance	C_{riss}			68		
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=4.5V, V_{DS}=15V, I_D=8.5A$		5.2		nC
Gate Source Charge	Q_{gs}			0.9		
Gate Drain Charge	Q_{gd}			1.3		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=4.5V, V_{DD}=15V, I_D=8.5A, R_{GEN}=2.8\Omega$		4.5		ns
Turn-on Rise Time	t_r			2.5		
Turn-off Delay Time	$t_{D(off)}$			14.5		
Turn-off Fall Time	t_f			3.5		

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

B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

■ Typical Performance Characteristics

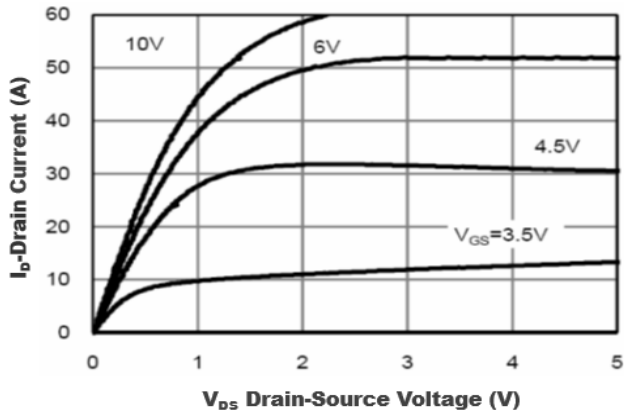


Figure1. Output Characteristics

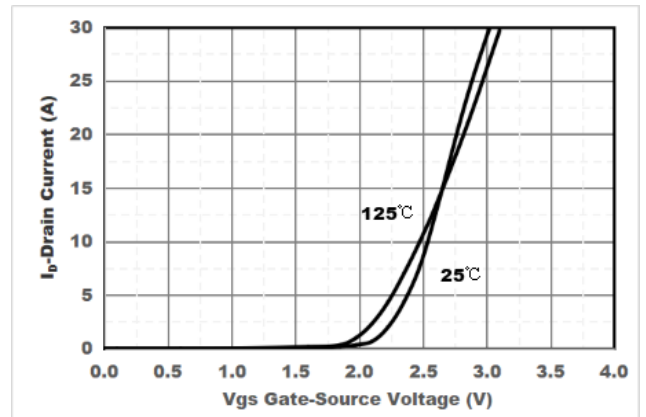


Figure2. Transfer Characteristics

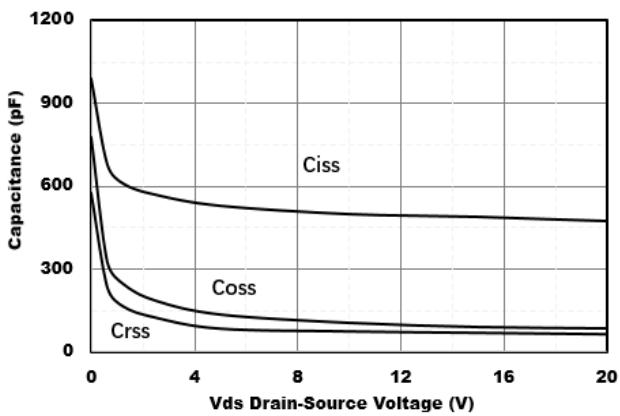


Figure3. Capacitance Characteristics

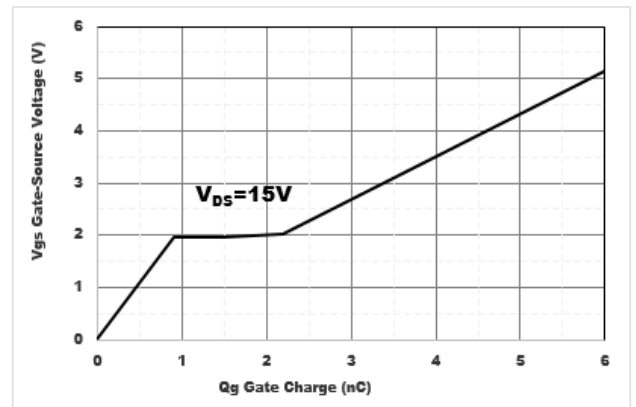


Figure4. Gate Charge

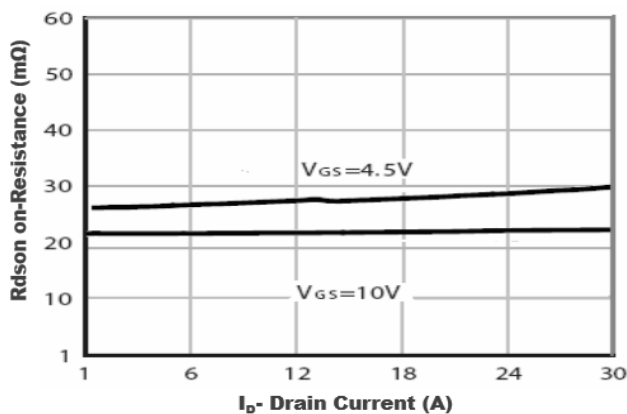


Figure5. Drain-Source on Resistance

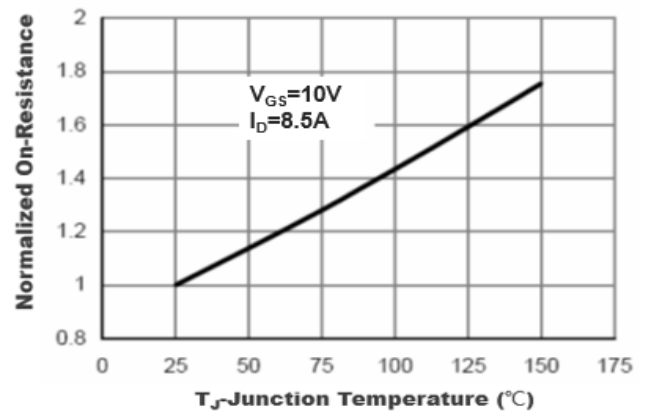


Figure6. Drain-Source on Resistance

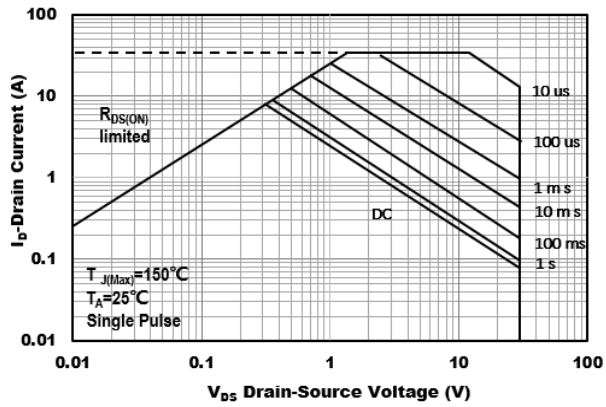


Figure7. Safe Operation Area

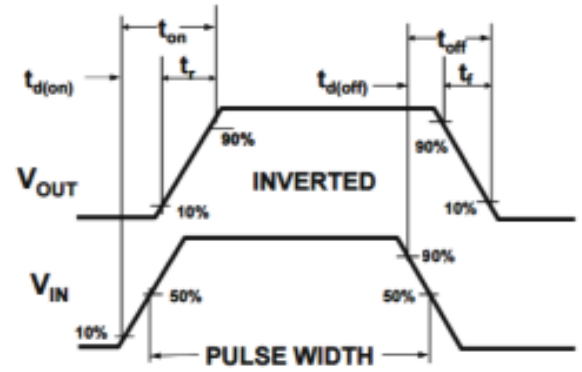
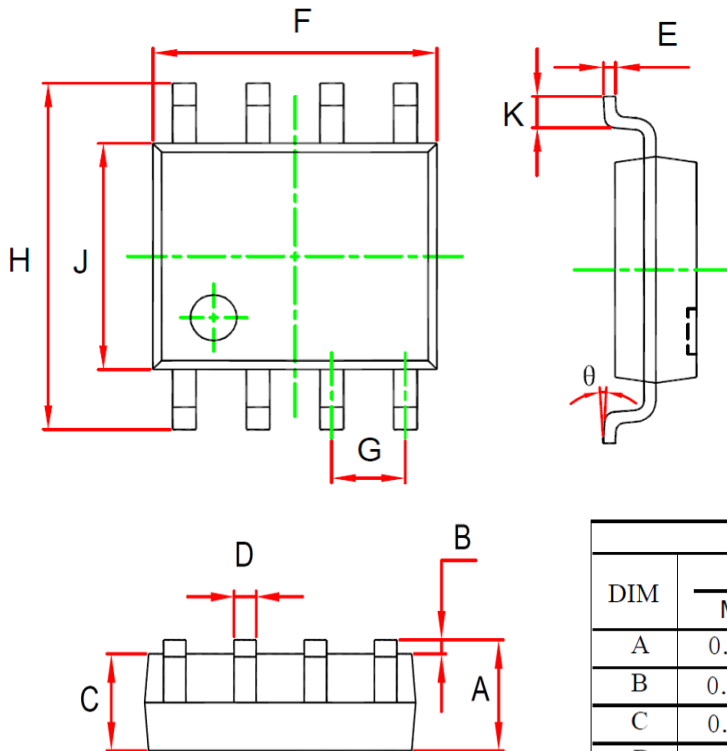


Figure8. Switching wave

■ SOP-8 Package information



DIMENSIONS					
DIM	INCHES		MM		NOTE
	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	
θ	0°	8°	0°	8°	