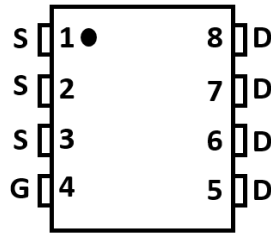
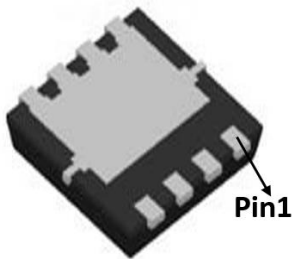
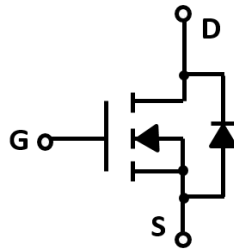


N-Channel Enhancement Mode Power MOSFET



DFN3.3X3.3



Product Summary

- V_{DS} 40V
- I_D 20A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) < 14.0 mohm
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) < 18.5 mohm
- 100% UIS Tested
- 100% ∇V_{DS} Tested

General Description

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

Applications

- High current load applications
- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

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

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	40	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_C=25^\circ\text{C}$	I_D	20	A
	$T_C=100^\circ\text{C}$		14	
Pulsed Drain Current ^A		I_{DM}	90	A
Single Pulse Avalanche Energy ^B		E_{AS}	70	mJ
Total Power Dissipation	$T_C=25^\circ\text{C}$	P_D	21	W
	$T_A=25^\circ\text{C}$		2.34	
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	5.9	$^\circ\text{C}/\text{W}$
		$R_{\theta JA}$	53.4	
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
LMQ20N04A	F1	Q20N04	5000	10000	100000	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}	$V_{GS}=0V, I_D=250\mu A$	40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		11	14	m Ω
		$V_{GS}=4.5V, I_D=10A$		14.3	18.5	
Diode Forward Voltage	V_{SD}	$I_S=10A, V_{GS}=0V$		0.7	1.2	V
Maximum Body-Diode Continuous Current	I_S				35	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=20V, V_{GS}=0V, f=1\text{MHz}$		750		pF
Output Capacitance	C_{oss}			150		
Reverse Transfer Capacitance	C_{rss}			80		
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=20V, I_D=20A$		15		nC
Gate-Source Charge	Q_{gs}			3		
Gate-Drain Charge	Q_{gd}			2.5		
Reverse Recovery Charge	Q_{rr}	$I_F=20A, di/dt=100A/\mu s$		26		ns
Reverse Recovery Time	t_{rr}			29		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=20V, I_D=2A, R_L=1\Omega$ $R_{GEN}=3\Omega$		6		ns
Turn-on Rise Time	t_r			17.5		
Turn-off Delay Time	$t_{D(off)}$			31		
Turn-off fall Time	t_f			17		

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

B. $T_J=25^\circ\text{C}$, $V_{DD}=20V$, $V_G=10V$, $L=0.5\text{mH}$, $R_G=25\Omega$

■ Typical Performance Characteristics

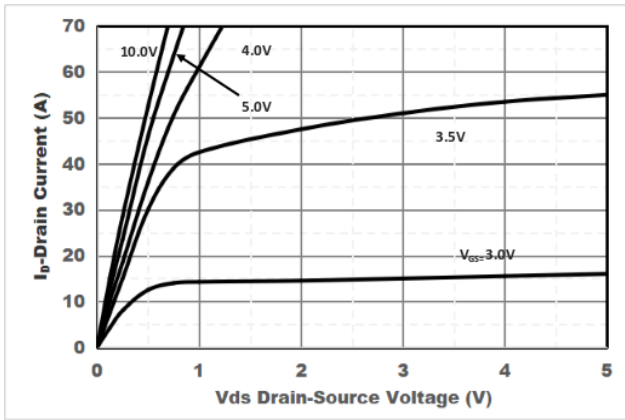


Figure1. Output Characteristics

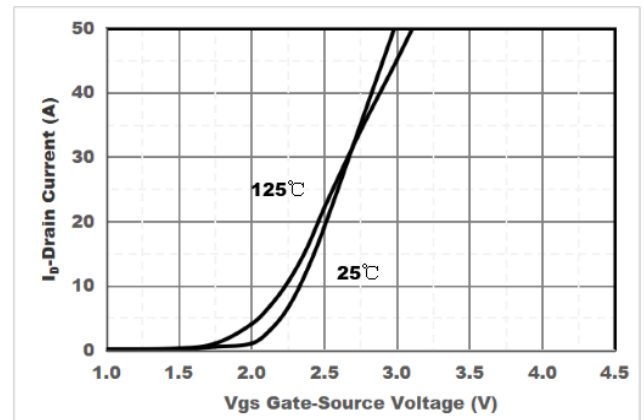


Figure2. Transfer Characteristics

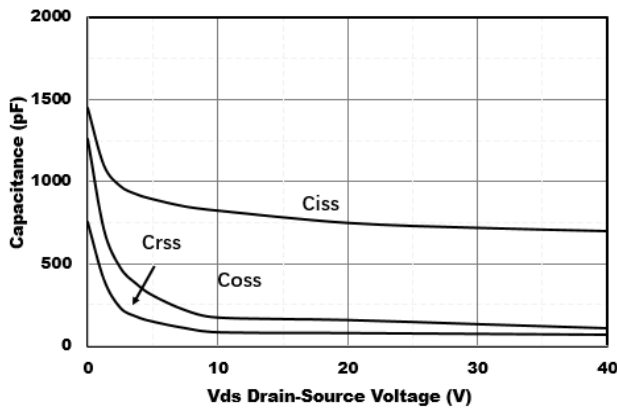


Figure3. Capacitance Characteristics

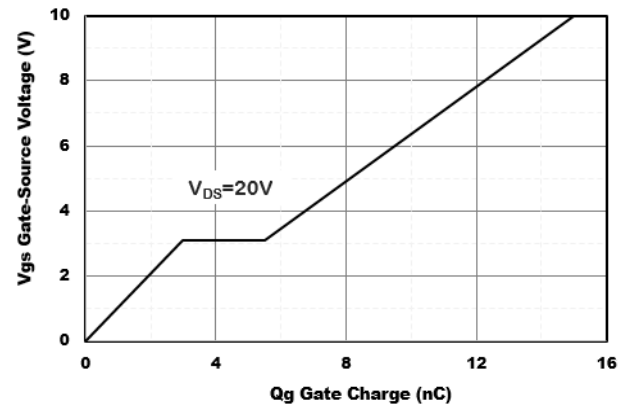


Figure4. Gate Charge

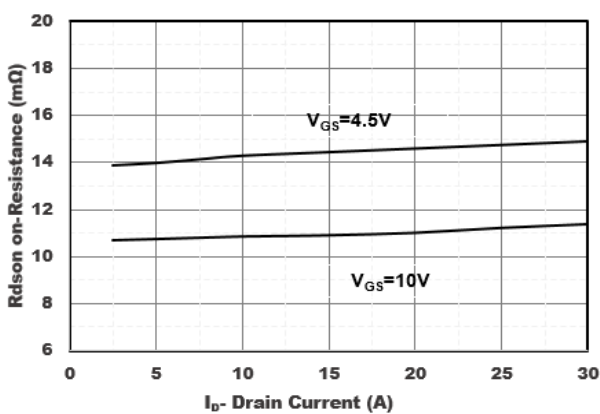


Figure5. Drain-Source on Resistance

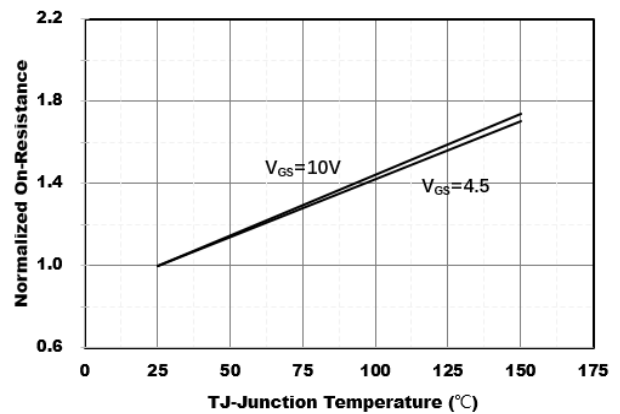


Figure6. Drain-Source on Resistance

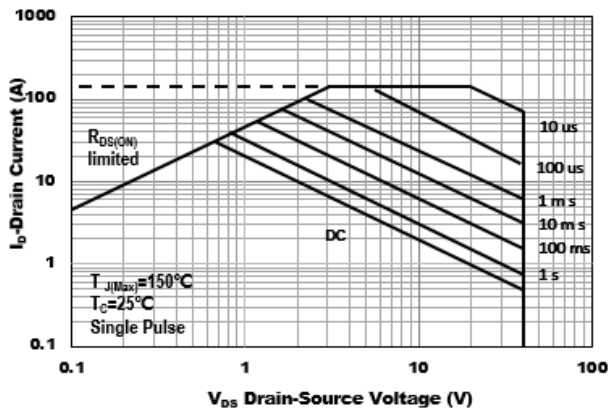


Figure7. Safe Operation Area

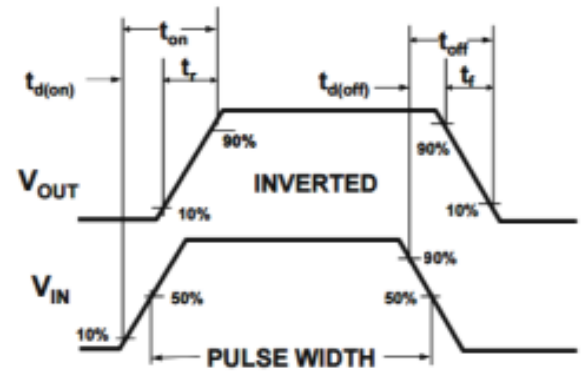
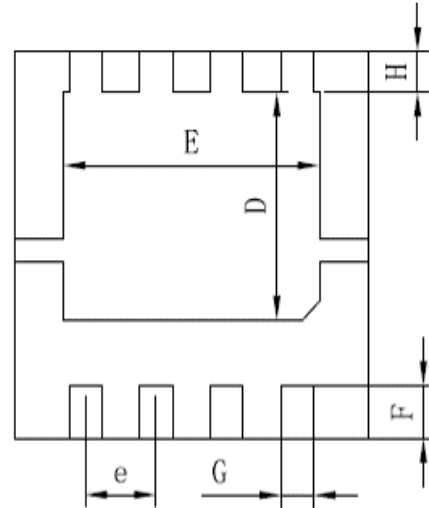
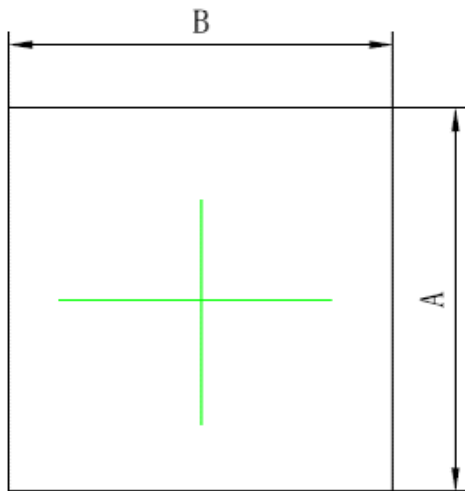


Figure8. Switching wave

■ DFN3.3X3.3 Package information



A	B	C	C1
3.25±0.05	3.25±0.05	0.8±0.05	0.2±0.02
C2	D	E	F
0.05Max	1.9±0.1	2.35±0.15	0.45±0.05
G	H	e	
0.3±0.05	0.35±0.05	0.65±0.05	
单位: mm			

