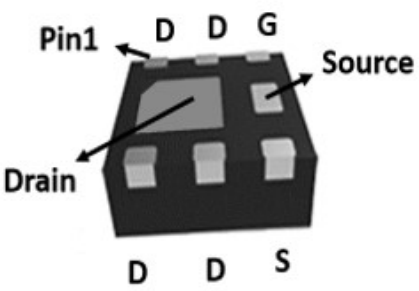
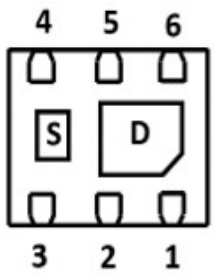
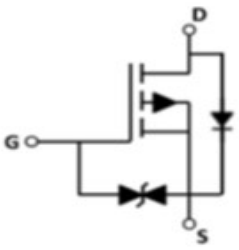
P-Channel Enhancement Mode Field Effect Transistor





DFN2020-6L



Product Summary

- V_{DS} -20V
- I_D -6.2A
- $R_{DS(ON)}$(at V_{GS}=-4.5V) ＜42 mohm
- $R_{DS(ON)}$(at V_{GS}=-2.5V) ＜55 mohm
- $R_{DS(ON)}$(at V_{GS}=-1.8V) ＜100 mohm
- ESD Protected Up to 4.0KV (HBM)

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℃unless otherwise noted)

Parameter		Symbol	Maximum	Unit
Drain-source Voltage		V_{DS}	-20	V
Gate-source Voltage		V_{GS}	±12	V
Drain Current	T_A=25℃ Steady State	I_D	-6.2	A
	T_A=70℃ Steady State		-4.96	
Pulsed Drain Current [A]		I_{DM}	-23	A
Total Power Dissipation @ T_A=25℃ Steady State		P_D	2.2	W
Thermal Resistance Junction-to-Ambient @ Steady State [B]		$R_{\theta JA}$	56.8	℃/ W
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJQ3415A	F1	3415	3000	30000	120000	7“ reel

■ Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=-250μA	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V,V_{GS}=0V,T_C=25℃			-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±10V, V_{DS}=0V		±2.5	±10	μA
		V_{GS}= ±8V, V_{DS}=0V		±900	±2000	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=-250μA	-0.40	-0.62	-1.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= -4.5V, I_D=-5.6A		29	42	mΩ
		V_{GS}= -2.5V, I_D=-4.3A		36	55	
		V_{GS}= -1.8V, I_D=-2.0A		55	100	
Diode Forward Voltage	V_{SD}	I_S=-6.2A,V_{GS}=0V		-0.8	-1.2	V
Maximum Body-Diode Continuous Current	I_S				-6.2	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=-10V,V_{GS}=0V,f=1MHZ		1010		pF
Output Capacitance	C_{oss}			130		
Reverse Transfer Capacitance	C_{rss}			109		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=-4.5V,V_{DD}=-10V,I_D=-4A		10.98		nC
Gate Source Charge	Q_{gs}			2.17		
Gate Drain Charge	Q_{gd}			2.54		
Reverse Recovery Chrage	Q_{rr}	I_F=-4A, di/dt=100A/us		4.38		
Reverse Recovery Time	t_{rr}			24.8		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=-4.5V,V_{DD}=-10V, R_L=2.5Ω, R_{GEN}=3Ω		8.4		
Turn-on Rise Time	t_r			36.2		
Turn-off Delay Time	$t_{D(off)}$			76.8		
Turn-off Fall Time	t_f			56.2		

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.
B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

■ Typical Performance Characteristics

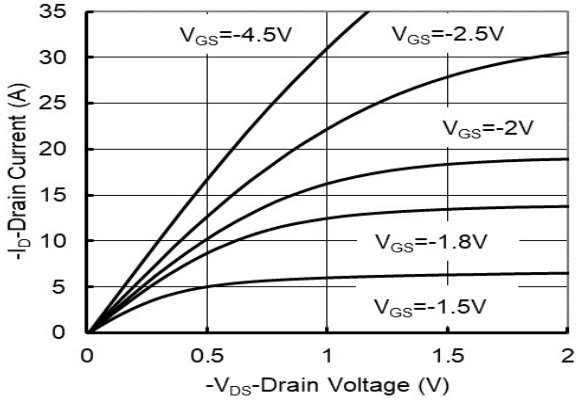


Figure1. Output Characteristics

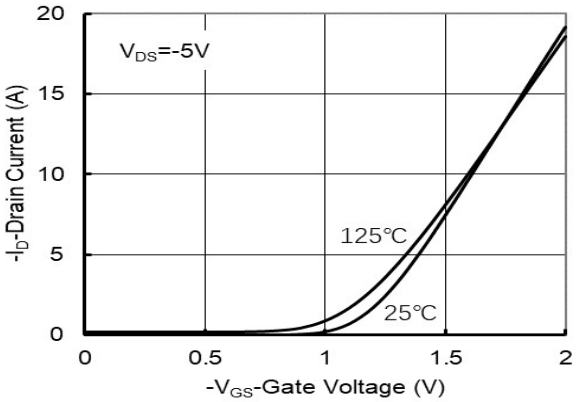


Figure2. Transfer Characteristics

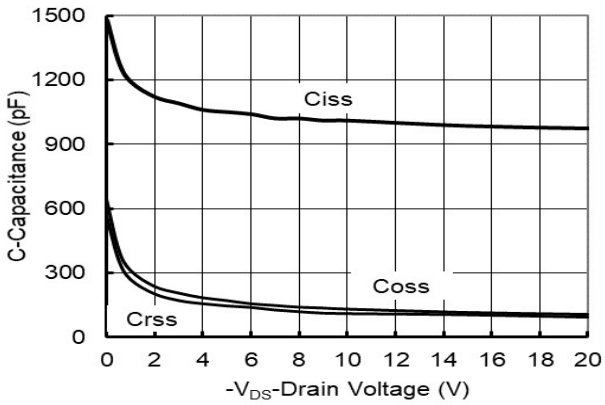


Figure3. Capacitance Characteristics

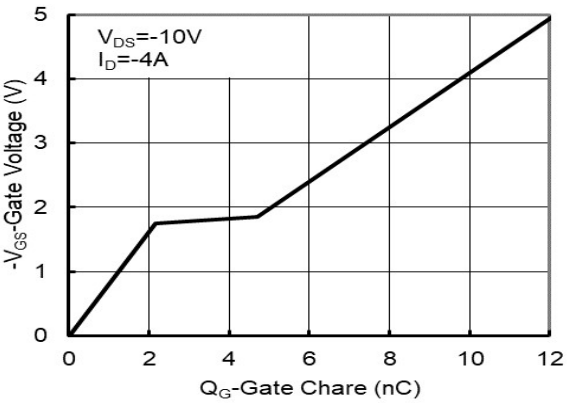


Figure4. Gate Charge

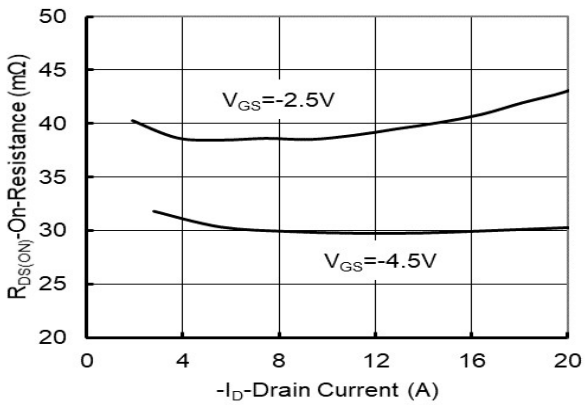


Figure5. Drain-Source on Resistance

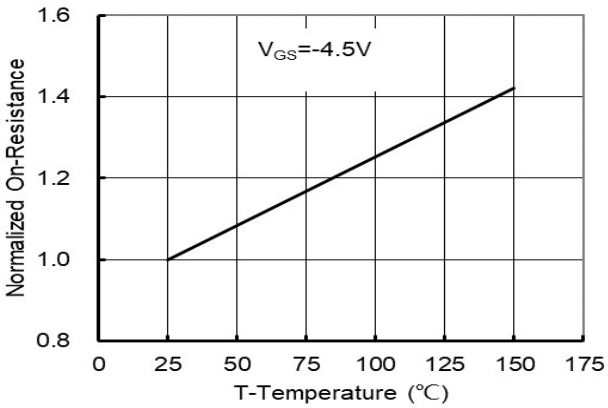


Figure6. Drain-Source on Resistance

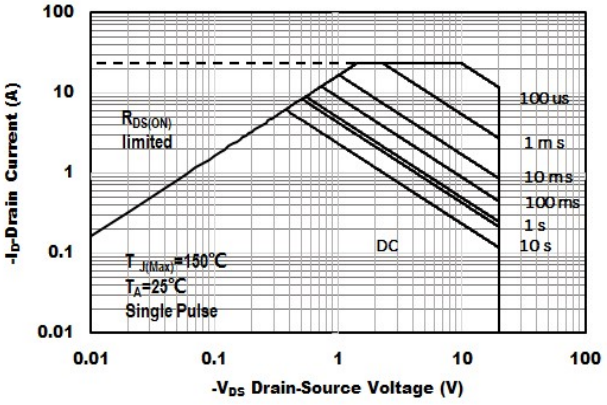


Figure7. Safe Operation Area

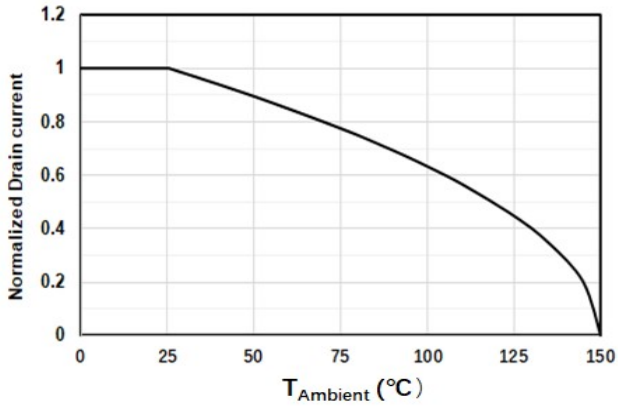


Figure8. Drain Current vs Ambient temperature

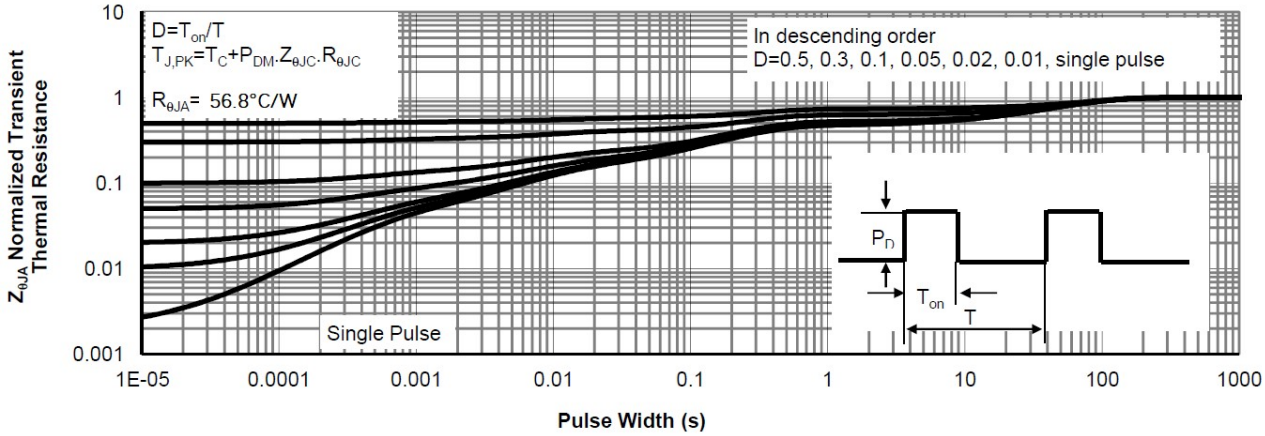
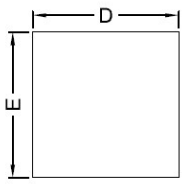
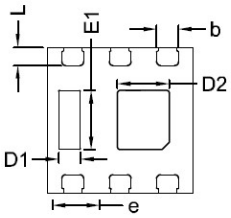


Figure9. Normalized Maximum Transient Thermal Impedance

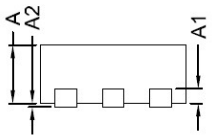
■ DFN2020-6L Package information



Top View
正面视图



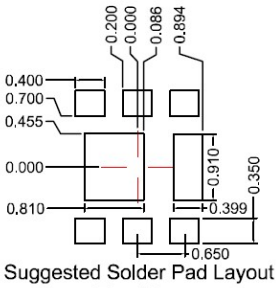
Bottom View
背面视图



Side View
侧面视图

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
D	1.90	2.00	2.10
E	1.90	2.00	2.10
A	0.70	0.80	0.90
A1		0.20 BSC	
A2			0.10
D1	0.20	0.30	0.40
D2	0.61	0.71	0.81
E1	0.71	0.81	0.91
L	0.15	0.25	0.35
b	0.20	0.30	0.40
e		0.65 BSC	

Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.10mm.
3.The pad layout is for reference purposes only.



Suggested Solder Pad Layout
Top View

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