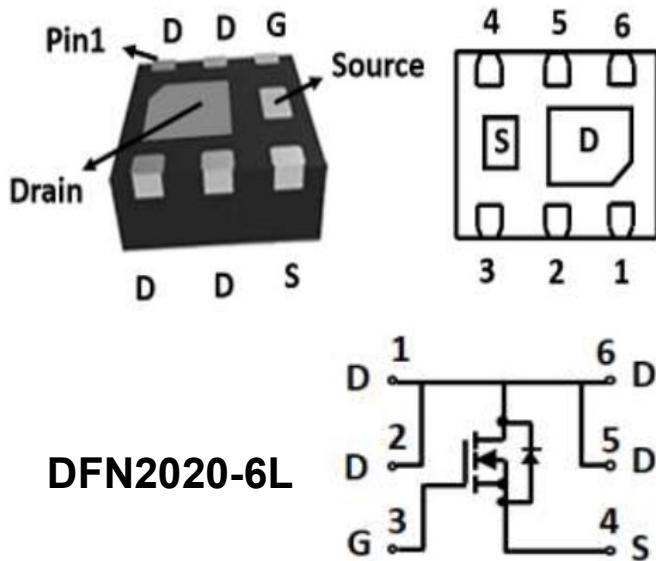


N-Channel Enhancement Mode Field Effect Transistor



DFN2020-6L

Product Summary

- V_{DS} 20V
- I_D 12A
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) <13mohm
- $R_{DS(ON)}$ (at $V_{GS}=2.5V$) <16mohm
- $R_{DS(ON)}$ (at $V_{GS}=1.8V$) <25mohm
- 100% ∇V_{DS} Tested

General Description

- Trench Power LV MOSFET technology
- High Power and current handling capability

Applications

- PWM application
- Load switch

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

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	20	V
Gate-source Voltage	V_{GS}	± 10	V
Drain Current	I_D	$T_A=25^\circ C$	12
		$T_A=70^\circ C$	9.6
Pulsed Drain Current ^A	I_{DM}	50	A
Total Power Dissipation	P_D	$T_A=25^\circ C$	2.5
		$T_A=70^\circ C$	1.6
Thermal Resistance Junction-to-Ambient ^B	$R_{\theta JA}$	50	$^\circ C/W$
Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	$^\circ C$

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJQ2012A	F1	N2012A	3000	30000	120000	7" reel



YJQ2012A

■ Electrical Characteristics (T_J=25°C 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			1	μA
Gate-Body Leakage Current	I _{GSS1}	V _{GS} =±10V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.45	0.62	1.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =5A		10	13	mΩ
		V _{GS} =2.5V, I _D =3A		12.5	16	
		V _{GS} =1.8V, I _D =2A		17	25	
Diode Forward Voltage	V _{SD}	I _S =5A, V _{GS} =0V			1.2	V
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHZ		777		pF
Output Capacitance	C _{oss}			164		
Reverse Transfer Capacitance	C _{rss}			140		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =4.5V, V _{DS} =10V, I _D =5.6A		25.5		nC
Gate-Source Charge	Q _{gs}			2.8		
Gate-Drain Charge	Q _{gd}			4.6		
Turn-on Delay Time	t _{D(on)}	V _{GS} =4.5V, V _{DS} =10V, R _L =1.5Ω R _{GEN} =3Ω		4.4		nC
Turn-on Rise Time	t _r			28.2		
Turn-off Delay Time	t _{D(off)}			16.2		
Turn-off fall Time	t _f			26		

A. Pulse Test: Pulse Width ≤ 300us, Duty cycle ≤ 2%.

B. R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{θJC} is guaranteed by design, while R_{θJA} is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.



■ Typical Performance Characteristics

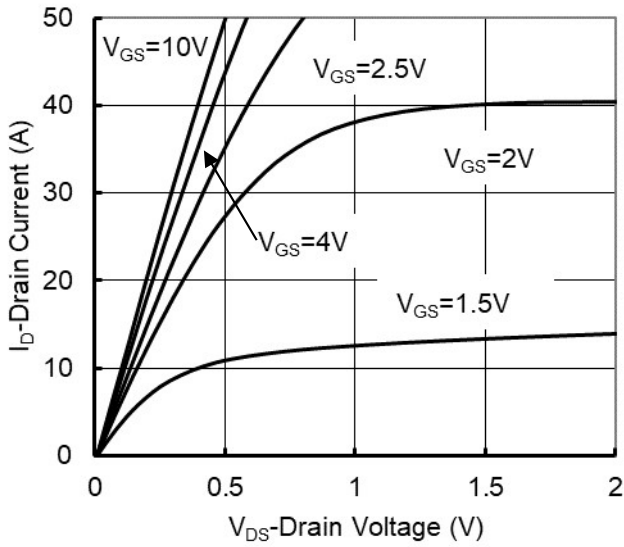


Figure1. Output Characteristics

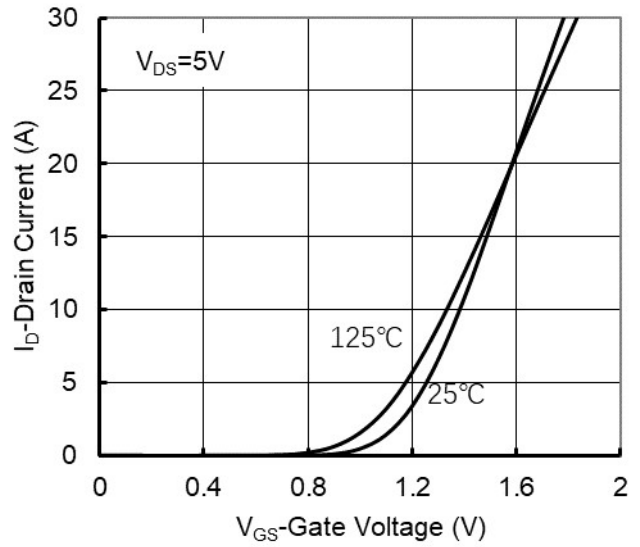


Figure2. Transfer Characteristics

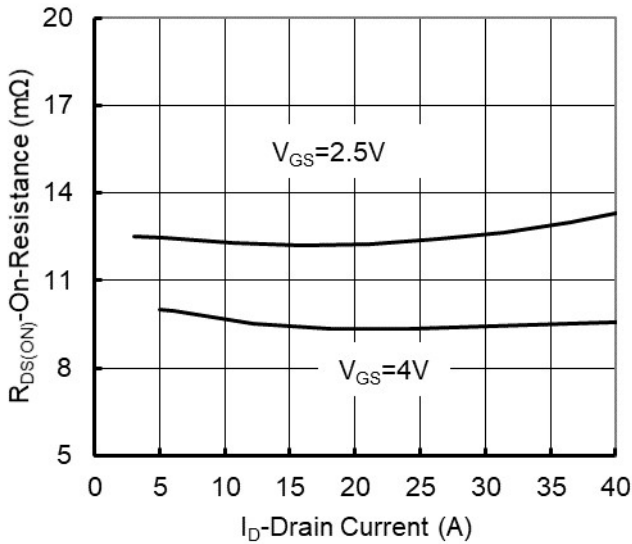


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

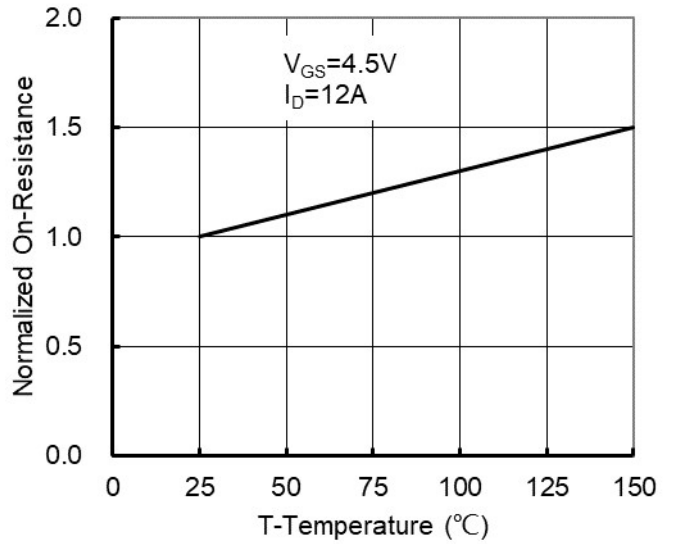


Figure 4: On-Resistance vs. Junction Temperature

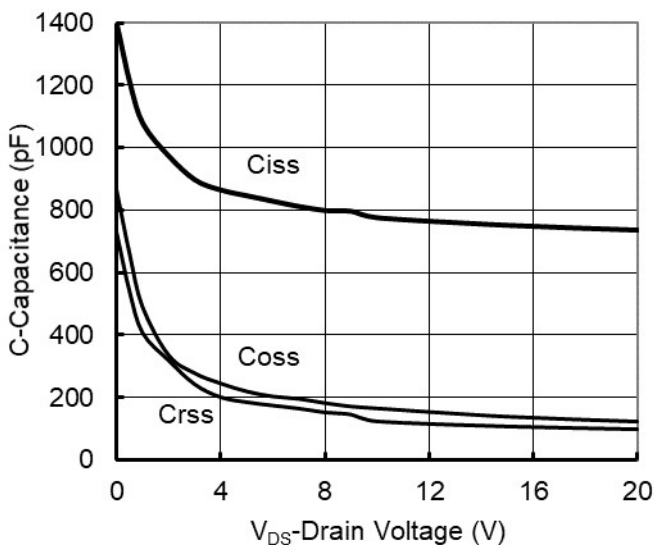


Figure5. Capacitance Characteristics

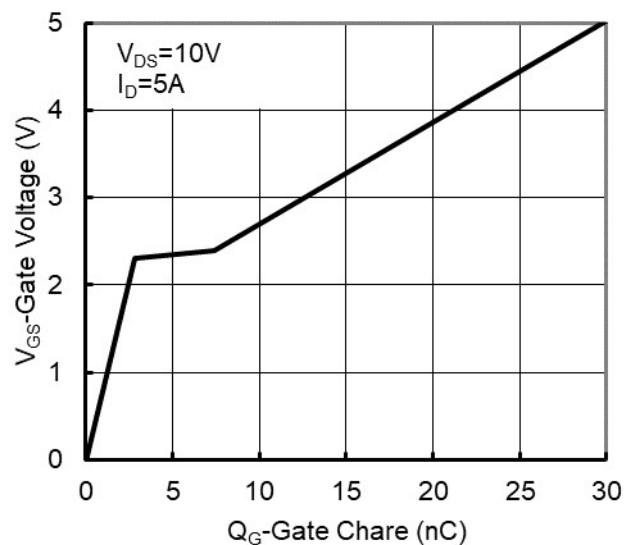


Figure6. Gate Charge

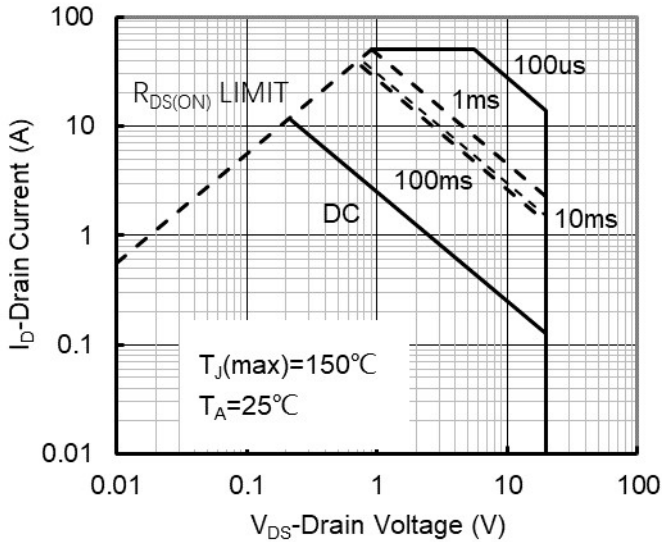


Figure7. Safe Operation Area

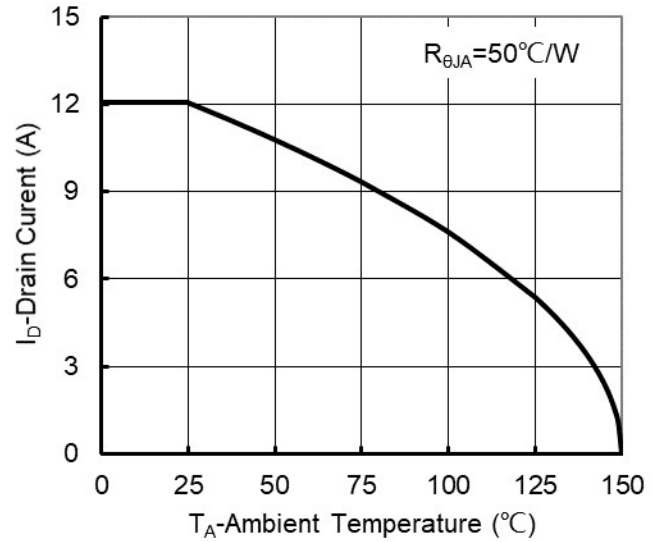


Figure8. Maximum Continuous Drain Current vs Ambient Temperature

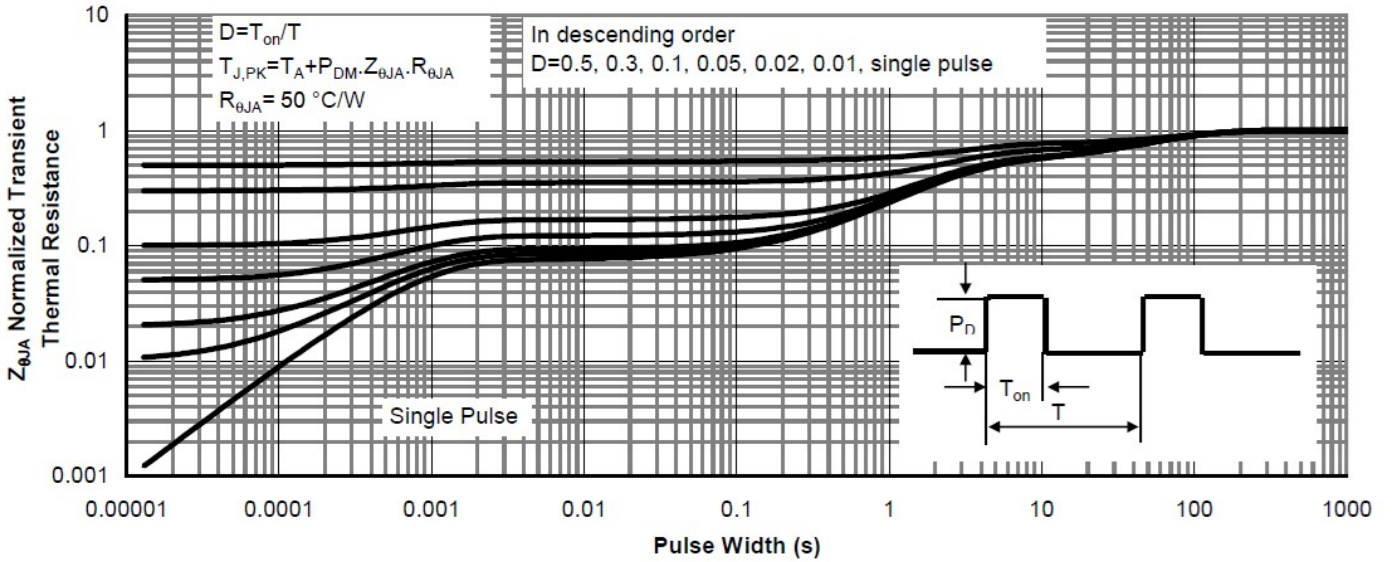


Figure9. Normalized Maximum Transient Thermal Impedance



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform

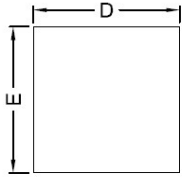


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

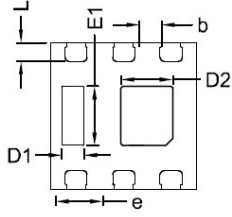


YJQ2012A

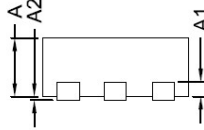
DFN2020-6L Package Information



Top View
正面视图



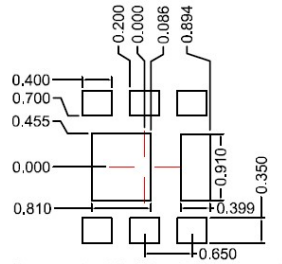
Bottom View
背面视图



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: $\pm 0.10\text{mm}$.
 3. The pad layout is for reference purposes only.



Suggested Solder Pad Layout
Top View



Disclaimer

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