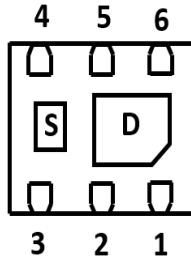
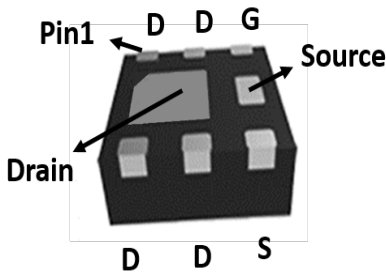
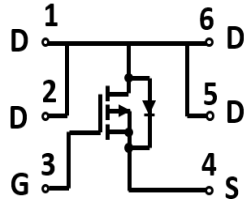


P-Channel Enhancement Mode Field Effect Transistor



DFN2020-6L



Product Summary

- V_{DS} -20V
- I_D -16A
- $R_{DS(ON)}$ (at $V_{GS} = -4.5V$) <19mohm
- $R_{DS(ON)}$ (at $V_{GS} = -2.5V$) <22mohm
- $R_{DS(ON)}$ (at $V_{GS} = -1.8V$) <30mohm

General Description

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

Applications

- Battery protection
- Load switch
- Power management

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

Parameter	Symbol	Maximum	Unit
Drain-source Voltage	V_{DS}	-20	V
Gate-source Voltage	V_{GS}	± 10	V
Drain Current	I_D	$T_C=25^\circ C$ @ Steady State	-16
		$T_C=70^\circ C$ @ Steady State	-12.8
Pulsed Drain Current ^A	I_{DM}	-64	A
Total Power Dissipation @ $T_C=25^\circ C$	P_D	18	W
Thermal Resistance Junction-to-Case @ Steady State	$R_{\theta JC}$	6.9	$^\circ C/W$
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
YJQ1216A	F1	Q1216	3000	30000	120000	7" reel



YJQ1216A

■ 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, T _C =25°C			-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±10V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =-250μA	-0.4	-0.62	-1.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = -4.5V, I _D =-10A		11	19	mΩ
		V _{GS} = -2.5V, I _D =-6.5A		14	22	
		V _{GS} = -1.8V, I _D =-4.0A		20	30	
Diode Forward Voltage	V _{SD}	I _S =-13A, V _{GS} =0V		-0.8	-1.2	V
Maximum Body-Diode Continuous Current	I _S				-13	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =-10V, V _{GS} =0V, f=1MHZ		2992		pF
Output Capacitance	C _{oss}			330		
Reverse Transfer Capacitance	C _{rss}			272		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =-10V, V _{DS} =-15V, I _D =-9.1A		72.8		nC
Gate Source Charge	Q _{gs}			6.6		
Gate Drain Charge	Q _{gd}			10.1		
Reverse Recovery Charge	Q _{rr}	I _F =-6A, di/dt=100A/us		34		
Reverse Recovery Time	t _{rr}			67		
Turn-on Delay Time	t _{D(on)}	V _{GS} =-10V, V _{DS} =-15V, I _D =-6A, R _{GEN} =2.5Ω		7		ns
Turn-on Rise Time	t _r			33		
Turn-off Delay Time	t _{D(off)}			130		
Turn-off Fall Time	t _f			132		

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

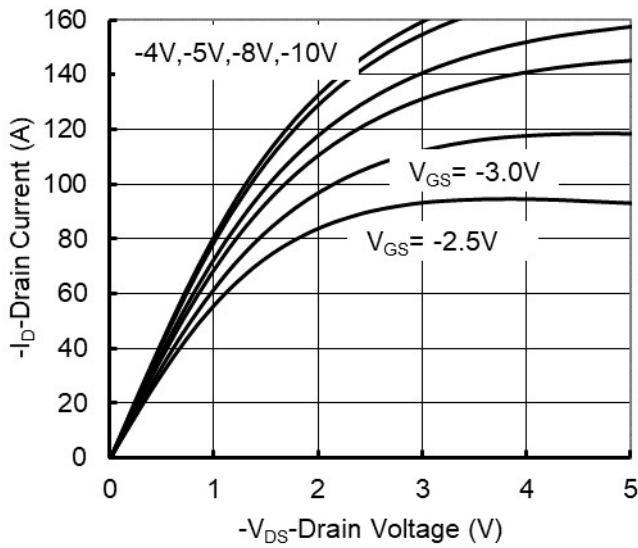


Figure 1. Output Characteristics

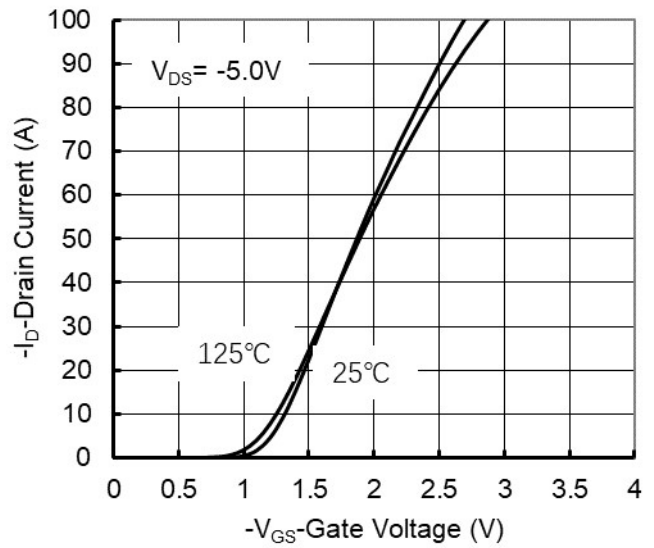


Figure 2. Transfer Characteristics

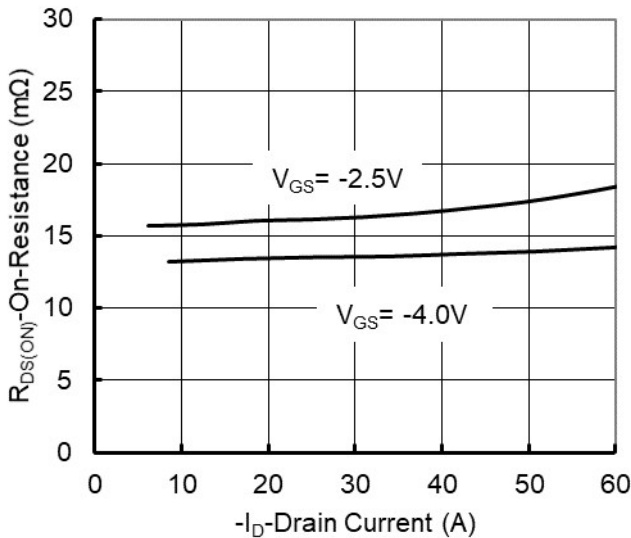


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

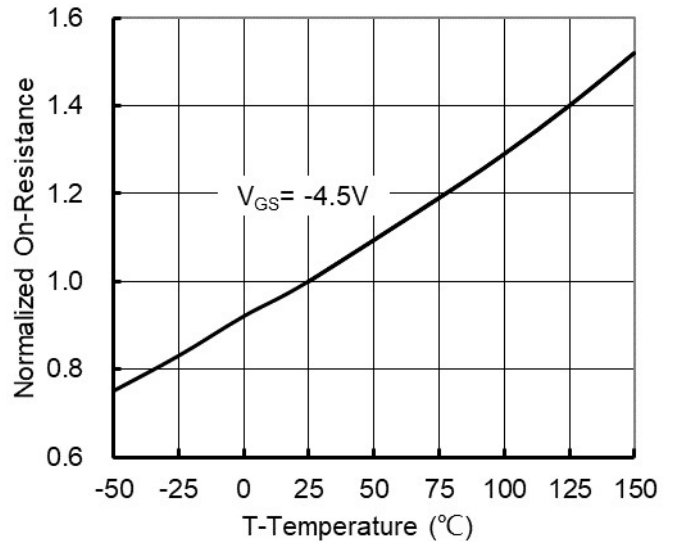


Figure 4. On-Resistance vs. Junction Temperature

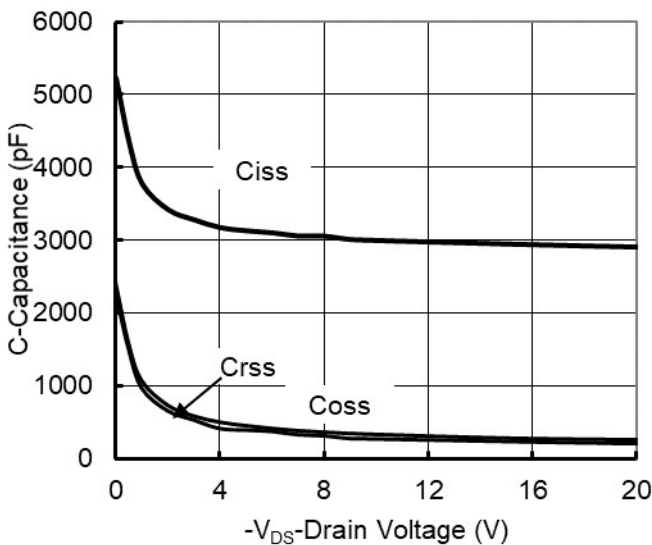


Figure 5. Capacitance Characteristics

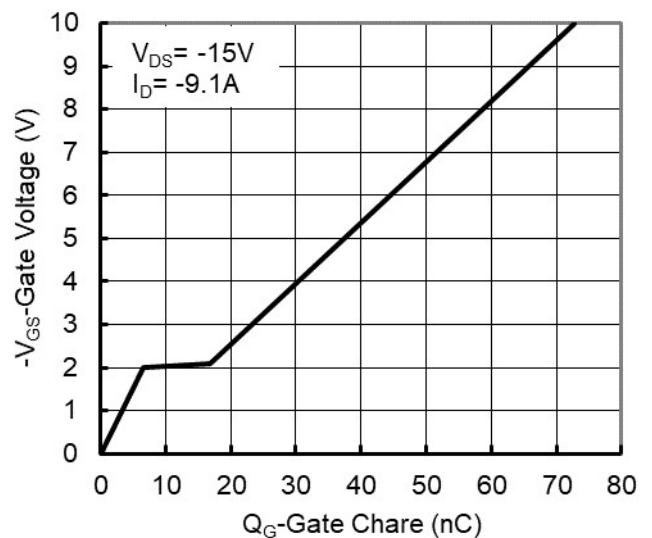


Figure 6. Gate Charge

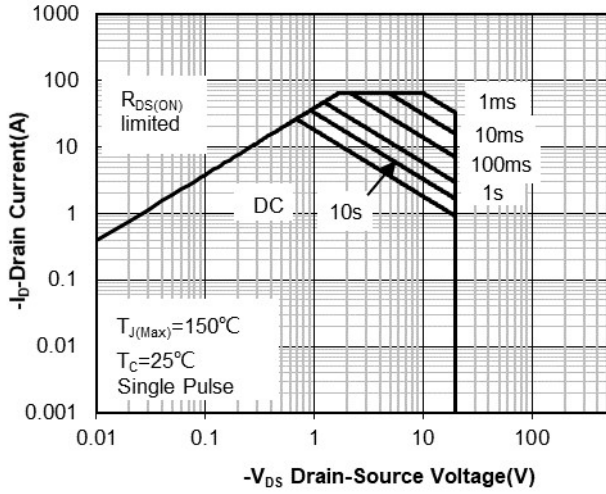


Figure 7. Safe Operation Area

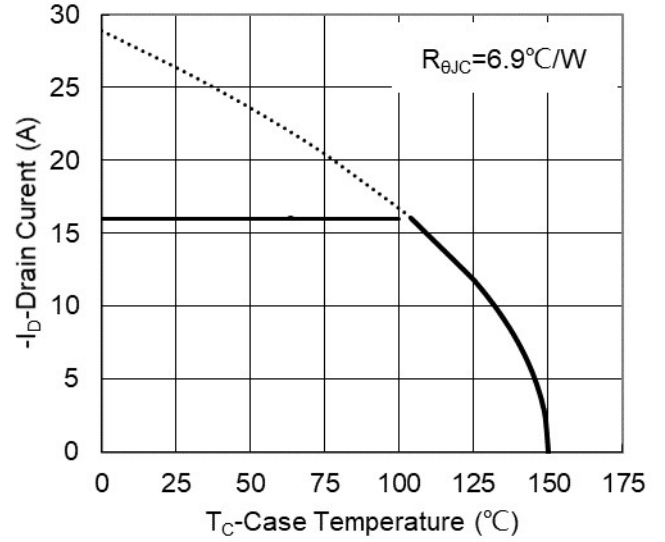
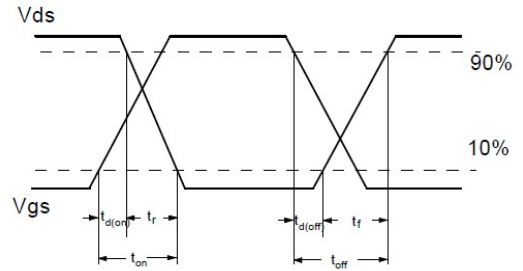
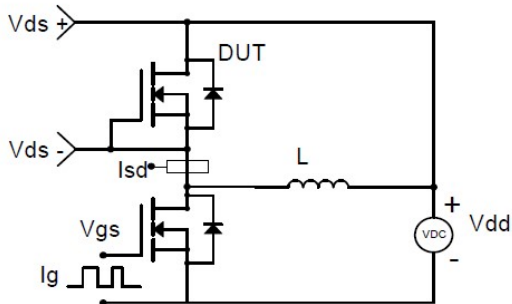


Figure 8. Maximum Continuous Drain Current vs Case Temperature



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform

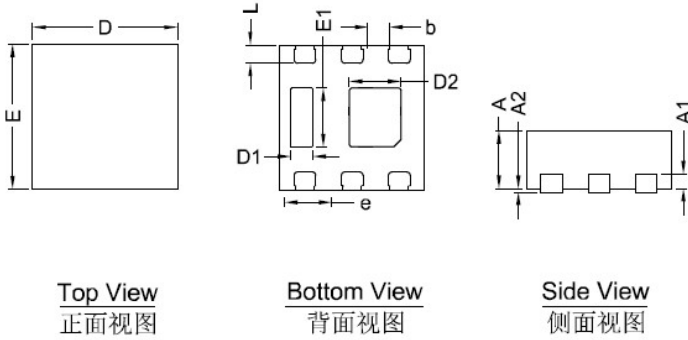


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



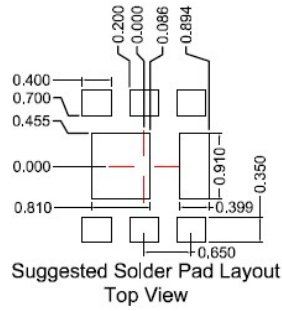
YJQ1216A

■DFN2020-6L(0.80mm) Package information



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.





YJQ1216A

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