

N-Channel Enhancement Mode Field Effect Transistor

Product Summary

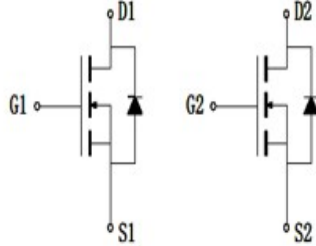
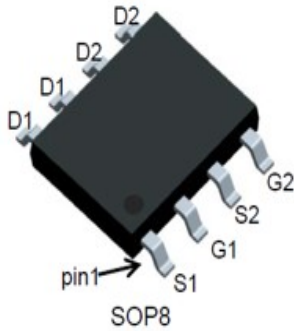
- V_{DS} 40V
- I_D 7A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) < 36mohm
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) < 51mohm

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



SOP-8

■ 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	I_D	$T_A=25^\circ\text{C}$	7
		$T_A=70^\circ\text{C}$	5.6
Pulsed Drain Current ^A	I_{DM}	28	A
Total Power Dissipation @ $T_A=25^\circ\text{C}$ Steady State	P_D	3	W
Thermal Resistance Junction-to-Ambient ^B	$R_{\theta JA}$	42	$^\circ\text{C}/\text{W}$
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
YJSD07N04A	F2	Q07N04A	4000	8000	64000	13" reel



YJSD07N04A

■ 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	1.5	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=6.0A$		29.6	36	m Ω
		$V_{GS}=4.5V, I_D=5.0A$		38.4	51	
Diode Forward Voltage	V_{SD}	$I_S=7.0A, V_{GS}=0V$		0.8	1.2	V
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=20V, V_{GS}=0V, f=1\text{MHz}$		381		pF
Output Capacitance	C_{oss}			48		
Reverse Transfer Capacitance	C_{rss}			40		
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=20V, I_D=5.0A$		9.8		nC
Gate-Source Charge	Q_{gs}			1.9		
Gate-Drain Charge	Q_{gd}			2.1		
Reverse Recovery Charge	Q_{rr}	$I_F=7.0A, di/dt=100A/\mu s$		2.6		ns
Reverse Recovery Time	t_{rr}			19		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DS}=30V, I_D=1.5A$ $R_{GEN}=3\Omega$		4		ns
Turn-on Rise Time	t_r			21		
Turn-off Delay Time	$t_{D(off)}$			12		
Turn-off fall Time	t_f			20		

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

B. $R_{\theta JA}$ is the sum of the junction-to-lead and lead-to-ambient thermal resistance, where the lead thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JL}$ is guaranteed by design, while $R_{\theta JA}$ 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

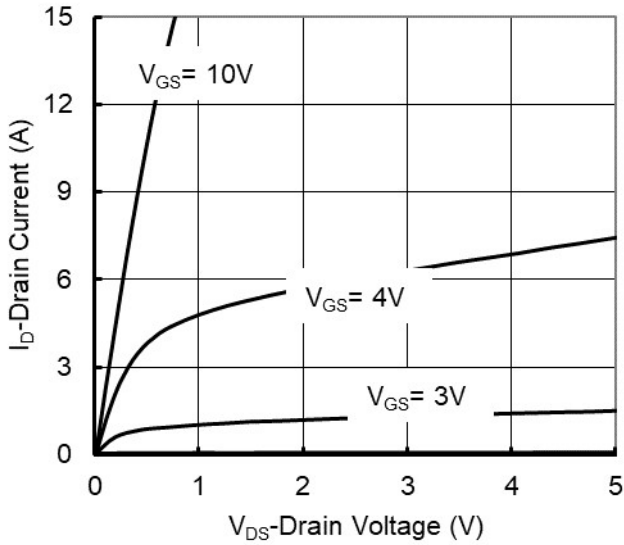


Figure1. Output Characteristics

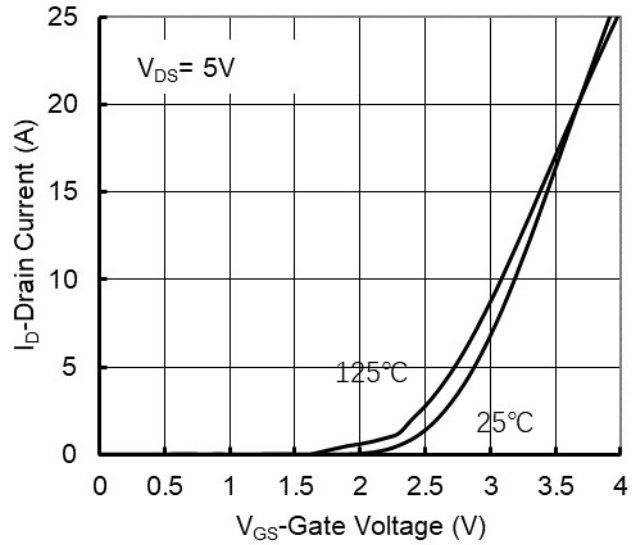


Figure2. Transfer Characteristics

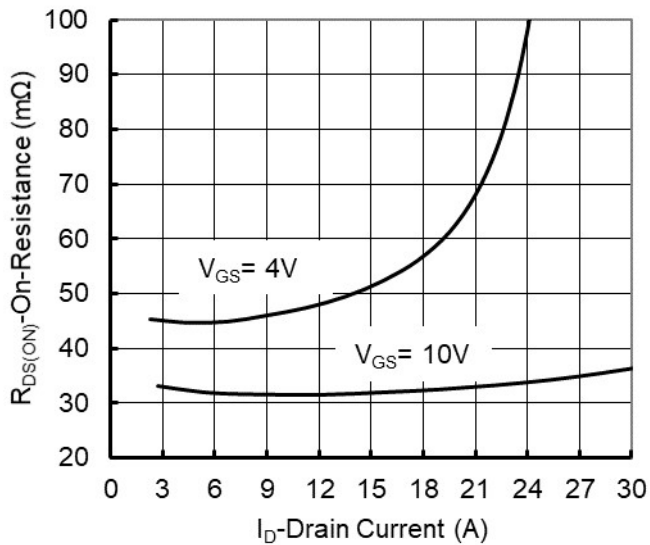


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

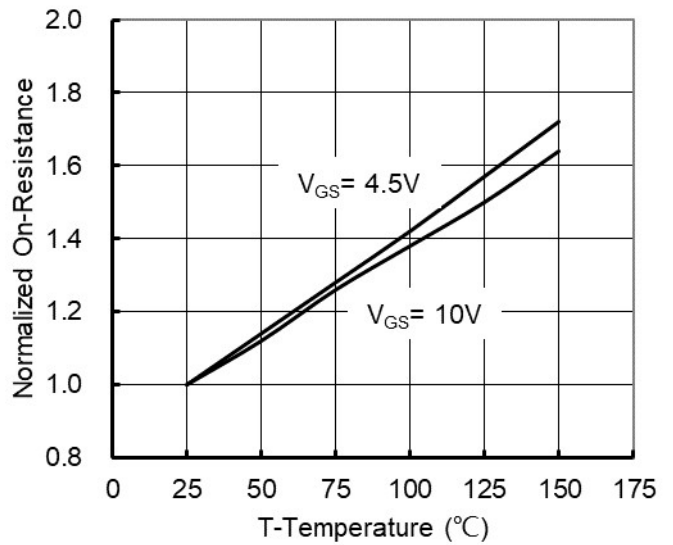


Figure 4: On-Resistance vs. Junction Temperature

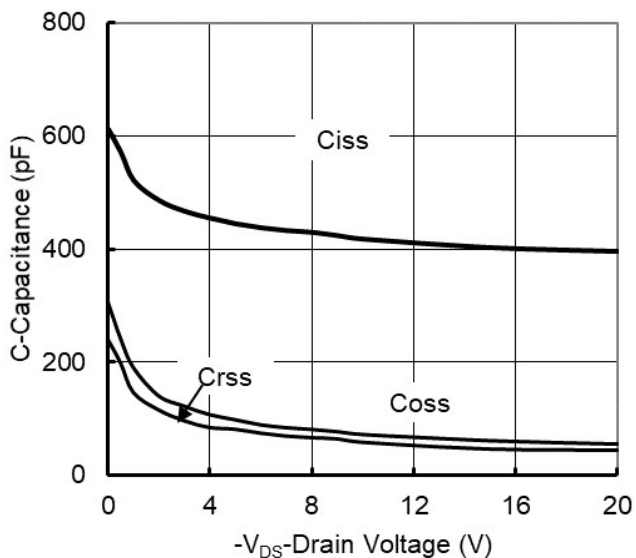


Figure5. Capacitance Characteristics

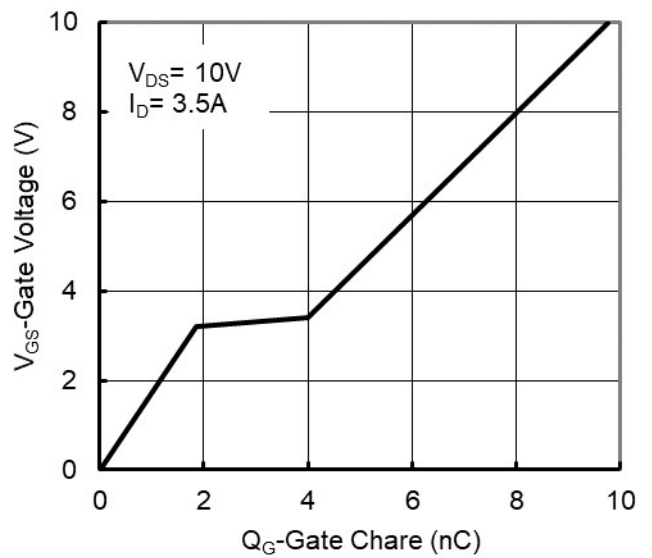


Figure6. Gate Charge

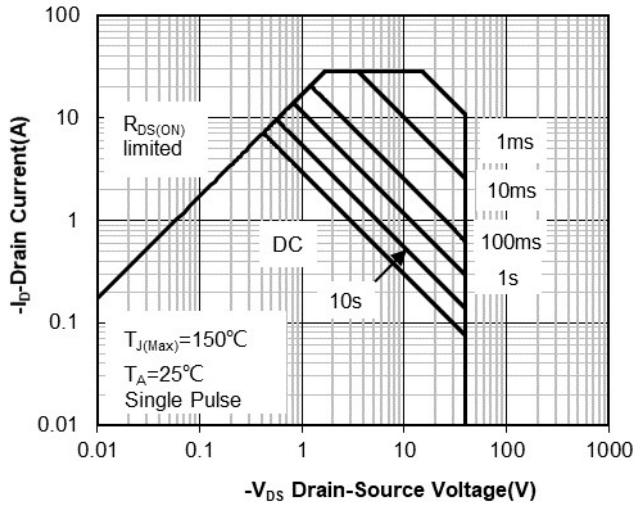


Figure7. Safe Operation Area

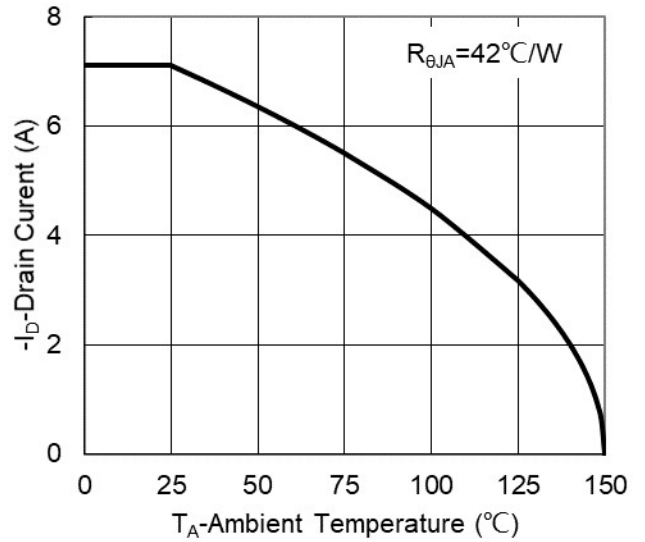


Figure8. Maximum Continuous Drain Current vs Ambient Temperature

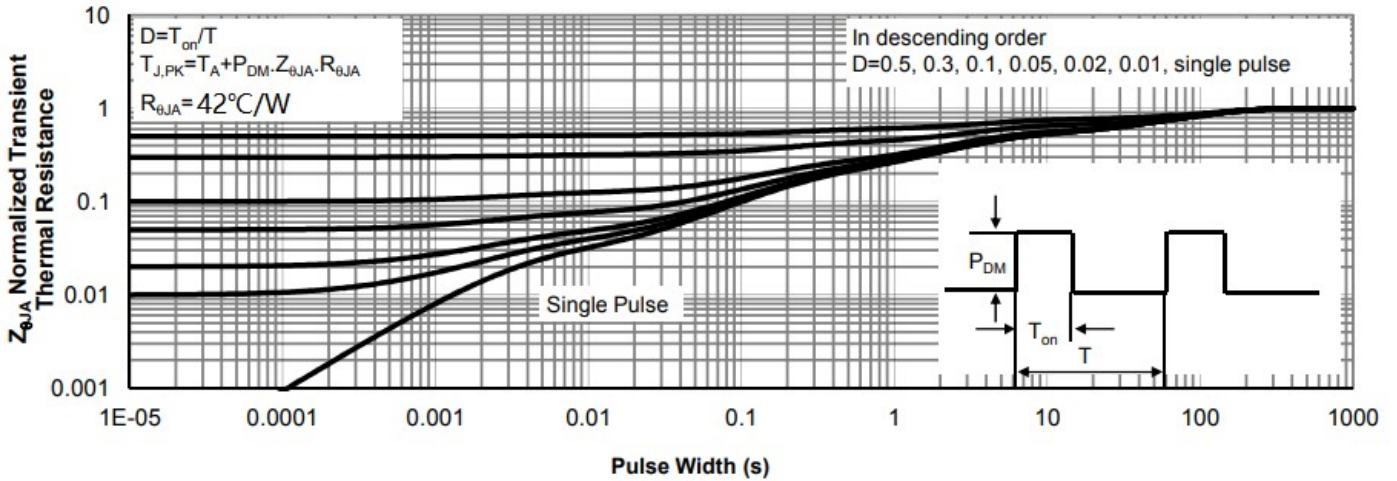
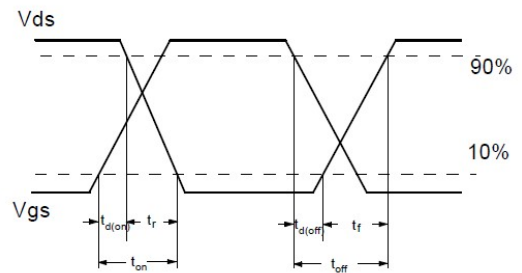
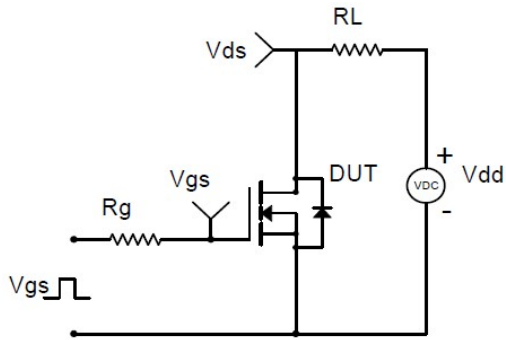
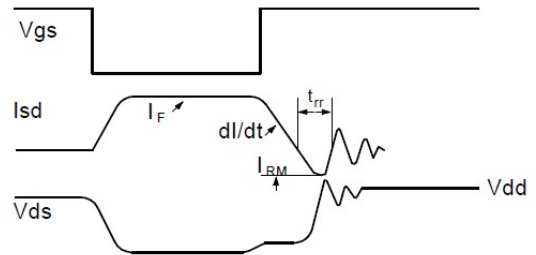
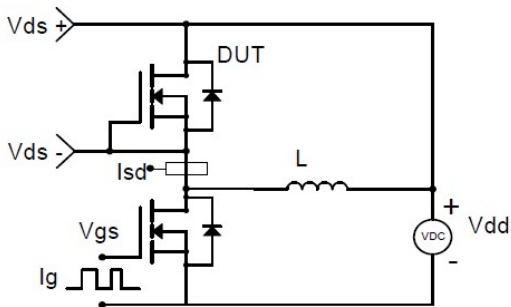


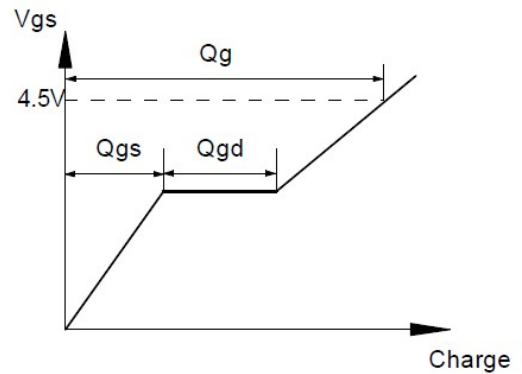
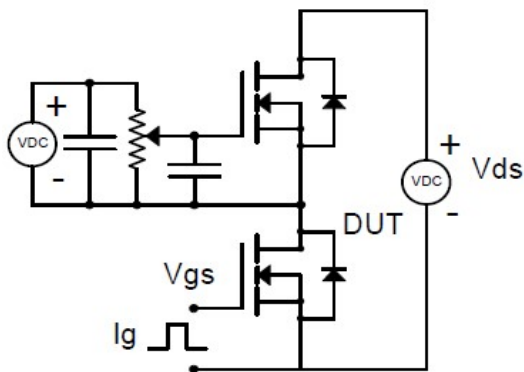
Figure9. Normalized Maximum Transient Thermal Impedance



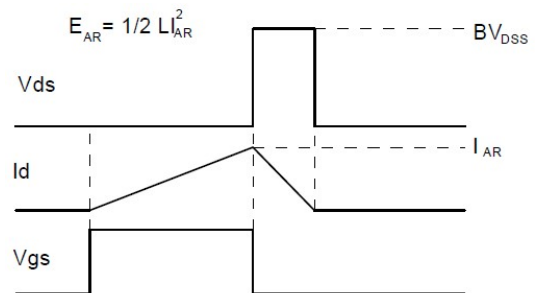
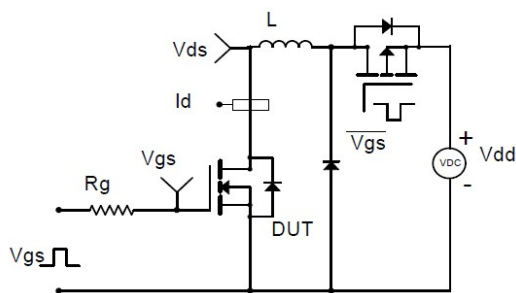
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform

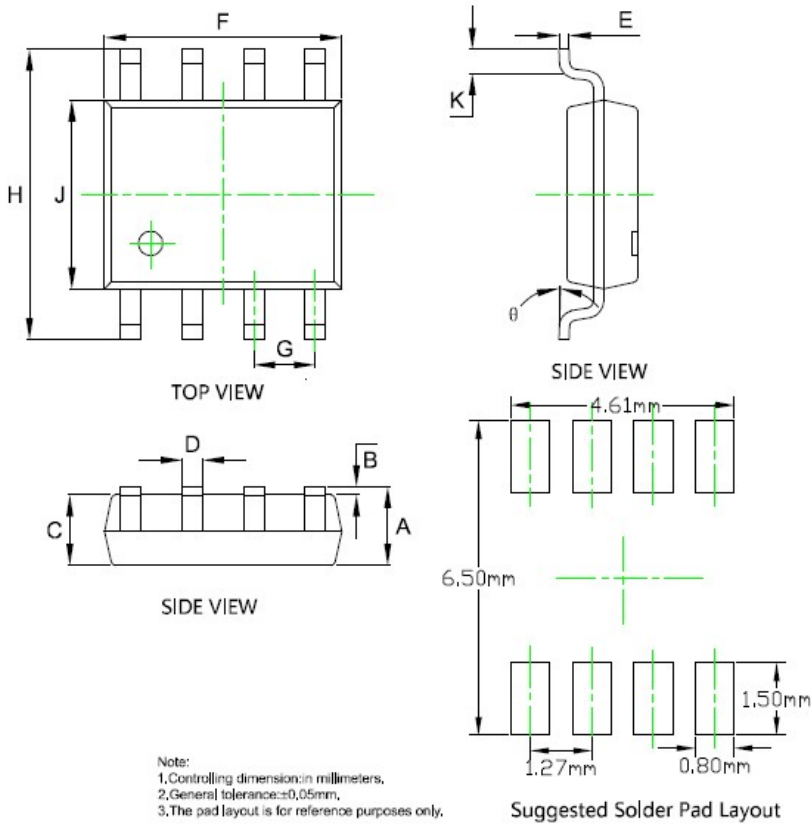


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



YJSD07N04A

■ SOP-8 Package Information



SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	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	0.050BSC		1.270BSC	
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°



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