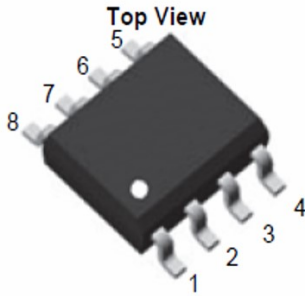
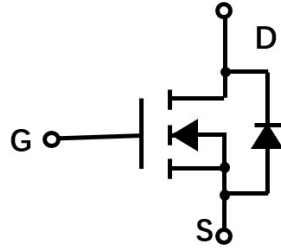
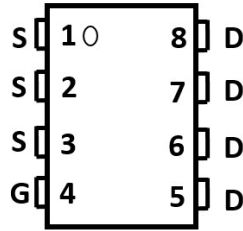


N-Channel Enhancement Mode Field Effect Transistor



SOP-8



Product Summary

- V_{DS} 40 V
- I_D 10 A
- $R_{DS(ON)}$ (at $V_{GS} = 10V$) < 15mohm
- $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) < 24mohm

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	$T_A=25^\circ\text{C}$	I_D	10	A
	$T_A=100^\circ\text{C}$		7.0	
Pulsed Drain Current ^A		I_{DM}	50	A
Single Pulse Avalanche Energy ^B		E_{AS}	70	mJ
Total Power Dissipation	$T_A=25^\circ\text{C}$	P_D	3.0	W
	$T_A=100^\circ\text{C}$		1.2	
Thermal Resistance Junction-to-Lead ^C		$R_{\theta JL}$	30	$^\circ\text{C}/\text{W}$
		$R_{\theta JA}$	41.5	
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
YJS10N04A	F2	Q10N04	4000	8000	64000	13" reel



YJS10N04A

■ 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	$R_{DS(on)}$	$V_{GS}=10V, I_D=8.0A$		12.5	15	m Ω
		$V_{GS}=4.5V, I_D=4.0A$		15.5	24	
Diode Forward Voltage	V_{SD}	$I_S=10A, V_{GS}=0V$		0.85	1.2	V
Maximum Body-Diode Continuous Current	I_S				10	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=20V, V_{GS}=0V, f=1\text{MHz}$		917		pF
Output Capacitance	C_{oss}			128		
Reverse Transfer Capacitance	C_{rss}			108		
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=20V, I_D=20A$		23.6		nC
Gate-Source Charge	Q_{gs}			4.4		
Gate-Drain Charge	Q_{gd}			6.3		
Reverse Recovery Charge	Q_{rr}	$I_F=20A, di/dt=100A/\mu s$		0.4		ns
Reverse Recovery Time	t_{rr}			7		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=20V, I_D=2A, R_L=1\Omega$ $R_{GEN}=3\Omega$		10		ns
Turn-on Rise Time	t_r			56		
Turn-off Delay Time	$t_{D(off)}$			27		
Turn-off fall Time	t_f			72		

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 case 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

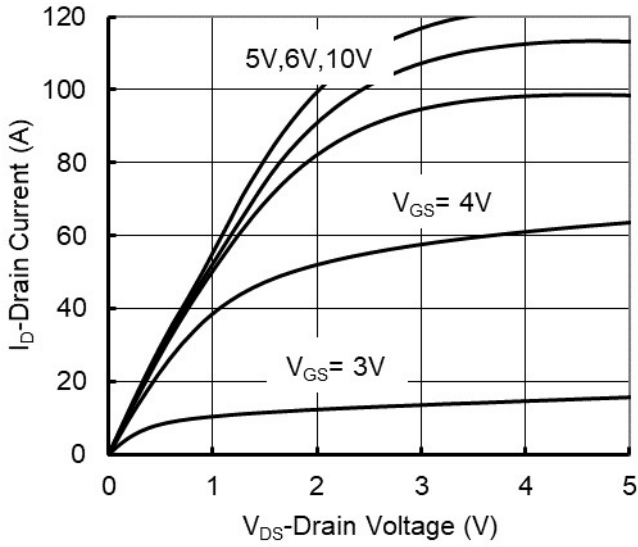


Figure 1. Output Characteristics

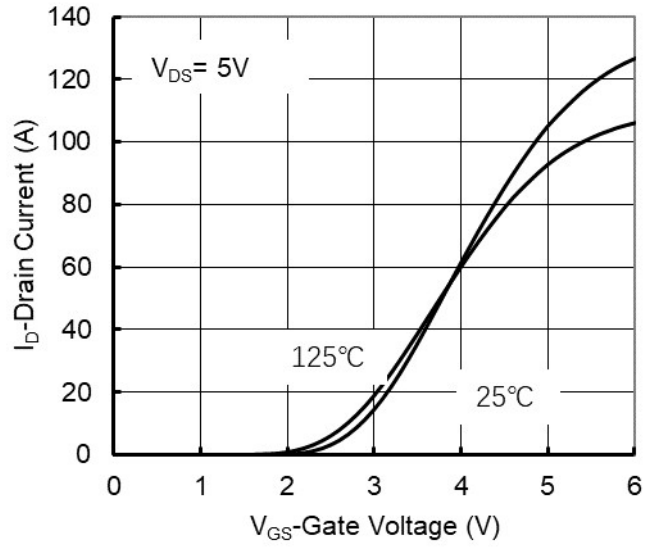


Figure 2. Transfer Characteristics

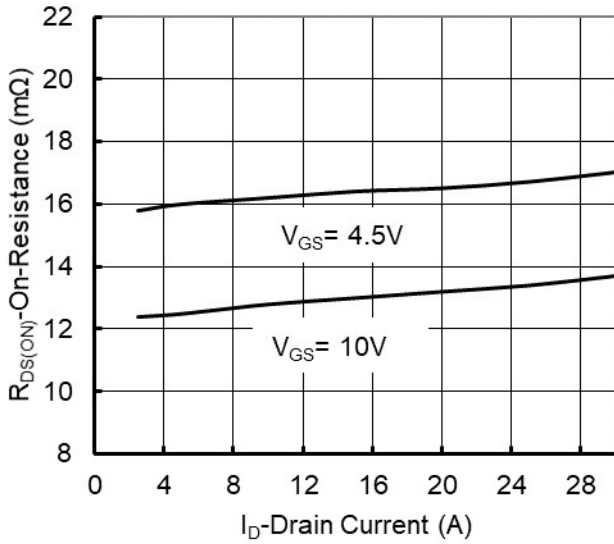


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

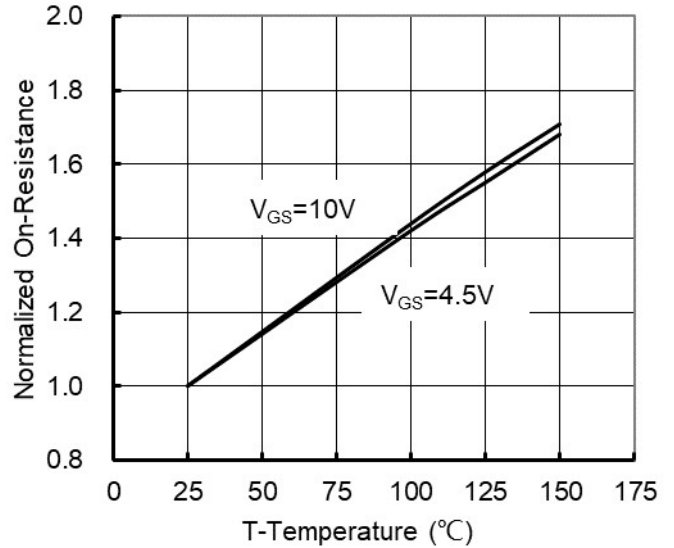


Figure 4. On-Resistance vs. Junction Temperature

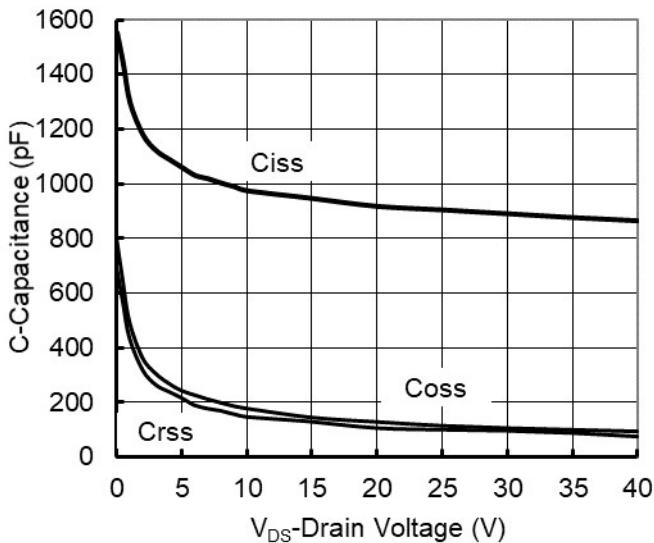


Figure 5. Capacitance Characteristics

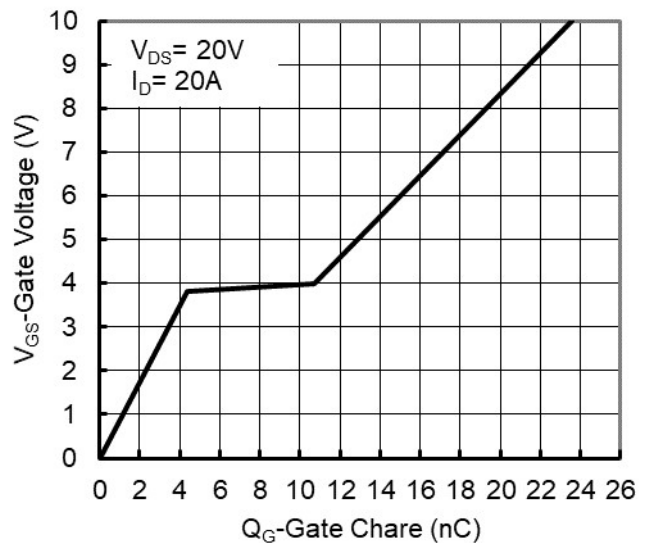


Figure 6. Gate Charge



YJS10N04A

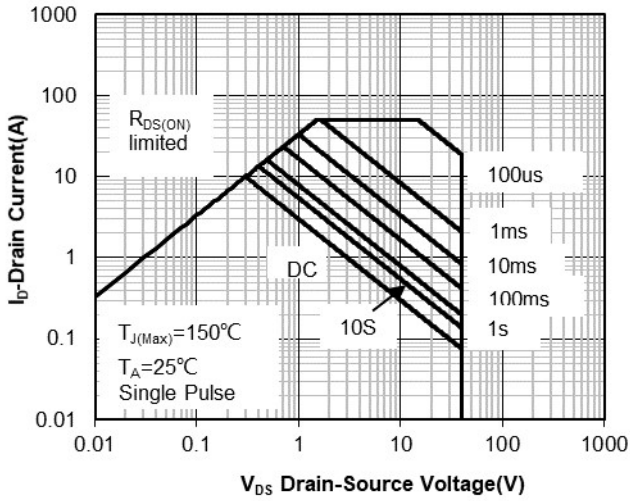


Figure 7. Safe Operation Area

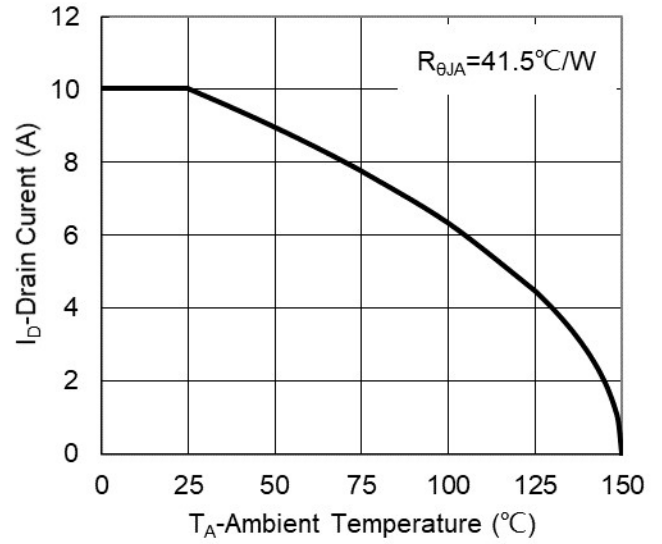


Figure 8. Maximum Continuous Drain Current vs Ambient Temperature

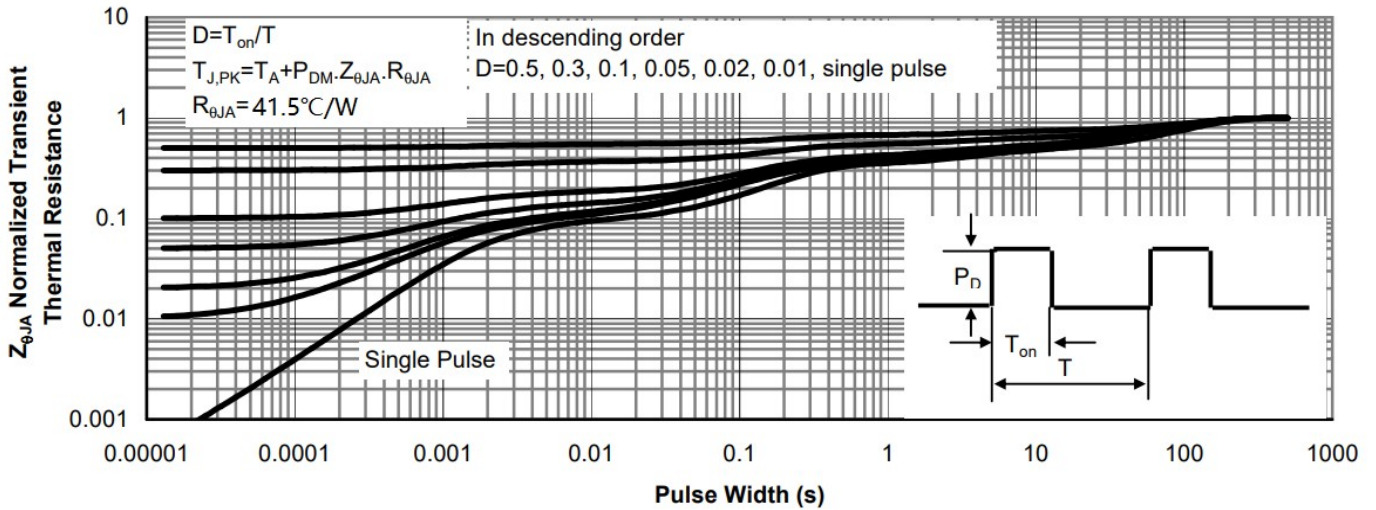
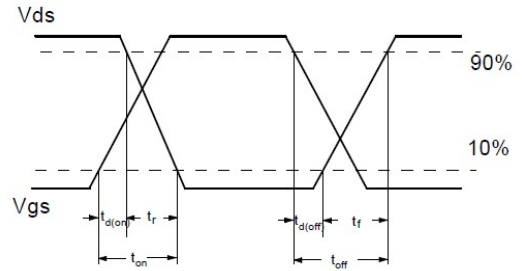
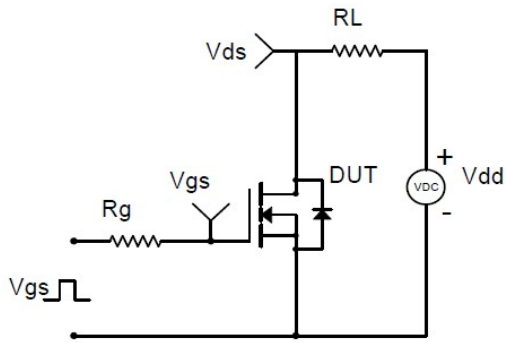
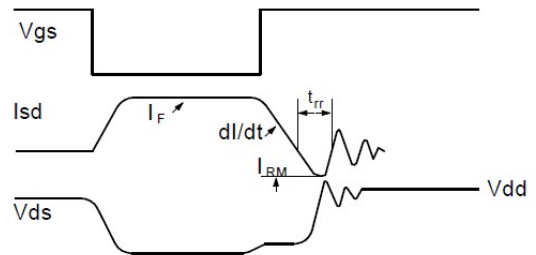
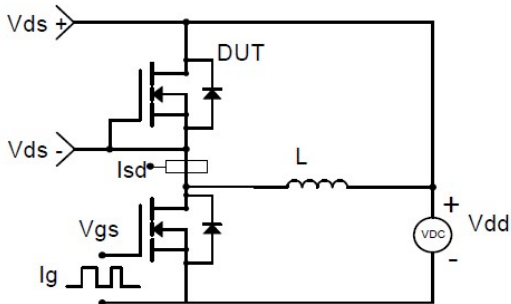


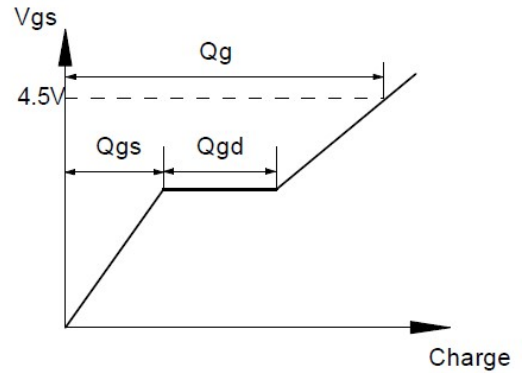
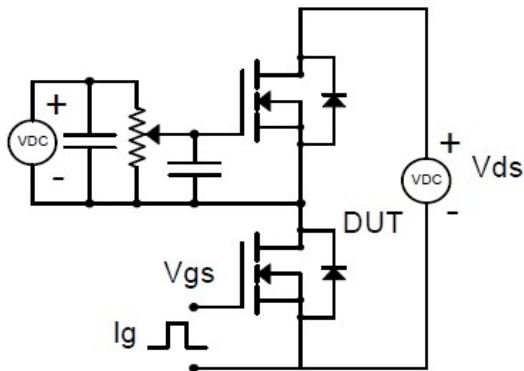
Figure 9. Normalized Maximum Transient Thermal Impedance



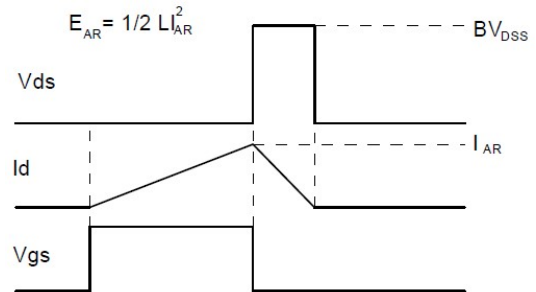
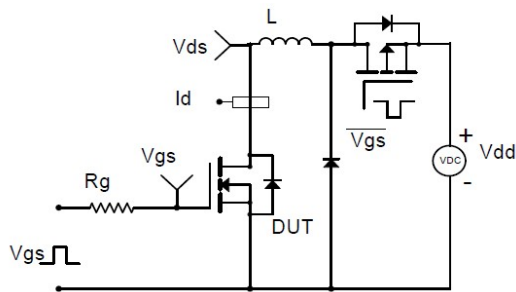
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform

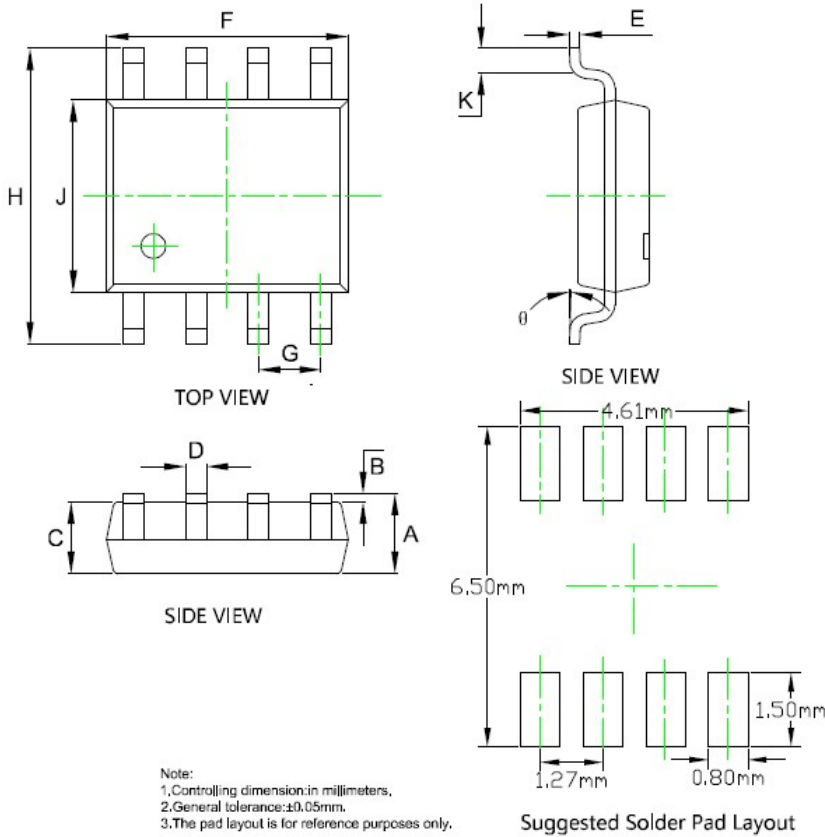


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



YJS10N04A

■ 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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