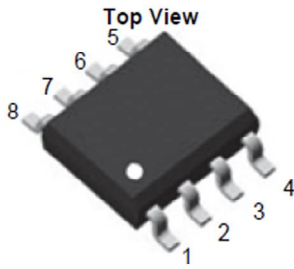
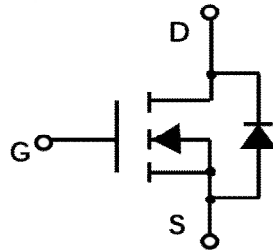
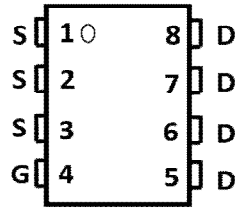


## N-Channel Enhancement Mode Field Effect Transistor



**SOP-8**



### Product Summary

- $V_{DS}$  60V
- $I_D$  12A
- $R_{DS(ON)}$  ( at  $V_{GS}=10V$ ) < 8.5 mohm
- $R_{DS(ON)}$  ( at  $V_{GS}=4.5V$ ) < 12 mohm
- 100% UIS Tested
- 100%  $\nabla V_{DS}$  Tested

### General Description

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$

### Applications

- DC-DC Converters
- Power management functions
- Industrial and Motor Drive application

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

Parameter		Symbol	Limit	Unit
Drain-source Voltage		$V_{DS}$	60	V
Gate-source Voltage		$V_{GS}$	$\pm 20$	V
Drain Current (Silicon limited)	$T_A=25^\circ\text{C}$	$I_D$	12	A
	$T_A=100^\circ\text{C}$		7.5	
Pulsed Drain Current <sup>A</sup>		$I_{DM}$	48	A
Avalanche energy <sup>B</sup>		$E_{AS}$	132	mJ
Total Power Dissipation <sup>C</sup>		$P_D$	3.1	W
Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$

### ■ Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient <sup>D</sup>	$t \leq 10S$	$R_{\theta JA}$	31	40	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Ambient <sup>D</sup>	Steady-State		59	75	
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JL}$	16	24	

### ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJS12G06D	F2	Q12G06D	4000	8000	64000	13" reel



# YJS12G06D

## ■ Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	60			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V	T <sub>J</sub> =25°C		1	μA
			T <sub>J</sub> =55°C		5	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	1.2	1.7	2.5	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> =12A		6.8	8.5	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> =10A		8.3	12	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =12A, V <sub>GS</sub> =0V		0.85	1.3	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>				12	A
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =35V, V <sub>GS</sub> =0V, f=1MHZ		2000		pF
Output Capacitance	C <sub>oss</sub>			390		
Reverse Transfer Capacitance	C <sub>rss</sub>			13		
Gate Resistance	R <sub>g</sub>	f=1MHZ, Open drain		1.6		Ω
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub> (10V)	V <sub>DS</sub> =30V, I <sub>D</sub> =12A		34		nC
Total Gate Charge	Q <sub>g</sub> (4.5V)			15.8		
Gate-Source Charge	Q <sub>gs</sub>			7.8		
Gate-Drain Charge	Q <sub>gd</sub>			5.2		
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =20A, di/dt=200A/us		36		
Reverse Recovery Time	t <sub>rr</sub>			27		
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> =30V, I <sub>D</sub> =12A R <sub>GEN</sub> =3Ω		10		ns
Turn-on Rise Time	t <sub>r</sub>			36		
Turn-off Delay Time	t <sub>D(off)</sub>			30		
Turn-off fall Time	t <sub>f</sub>			57		

A. Repetitive rating; pulse width limited by max. junction temperature.

B. V<sub>DD</sub>=50V, R<sub>G</sub>=25Ω, L=0.5mH, I<sub>AS</sub>=23A,.

C. Pd is based on max. junction temperature, using ≤10s junction-ambient thermal resistance.

D. The value of RθJA is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25° C. The Power dissipation PDSM is based on RθJA ≤ 10s and the maximum allowed junction temperature of 150° C. The value in any given application depends on the user's specific board design.



■ Typical Performance Characteristics

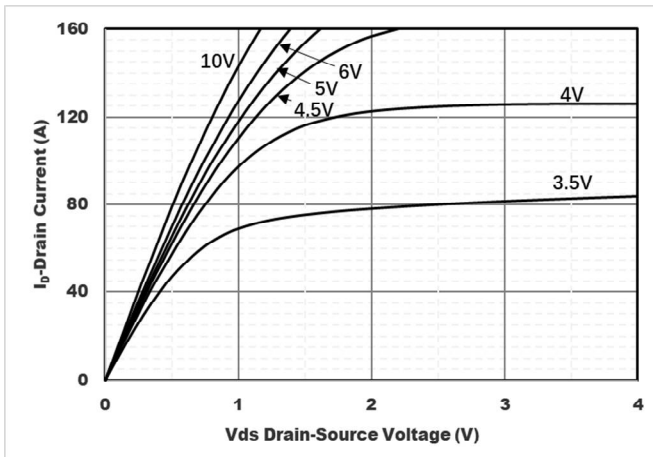


Figure1. Output Characteristics

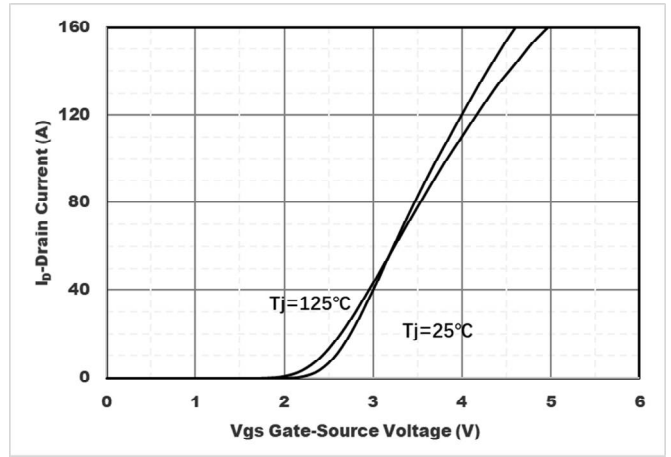


Figure2. Transfer Characteristics

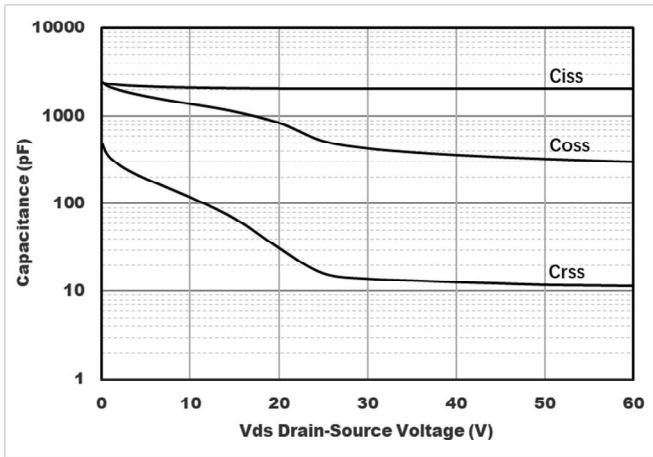


Figure3. Capacitance Characteristics

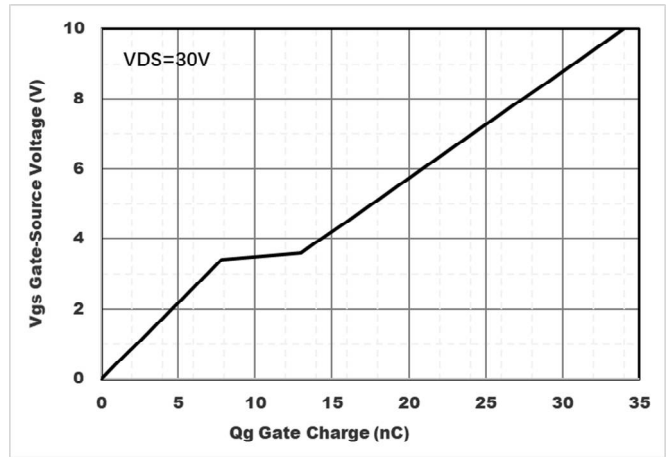


Figure4. Gate Charge

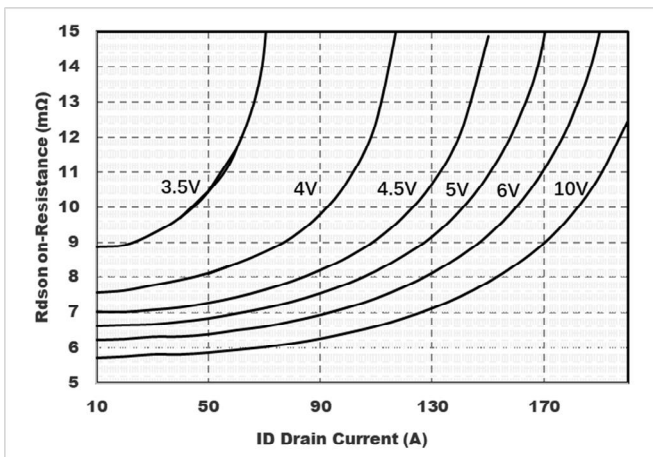


Figure5. Drain-Source on Resistance

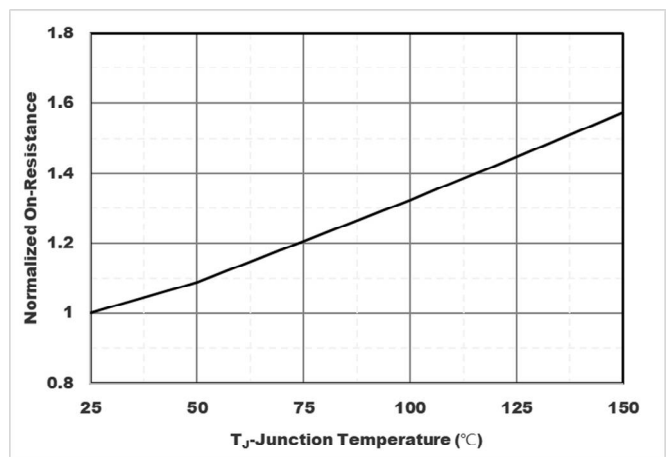


Figure6. Normalized On-Resistance



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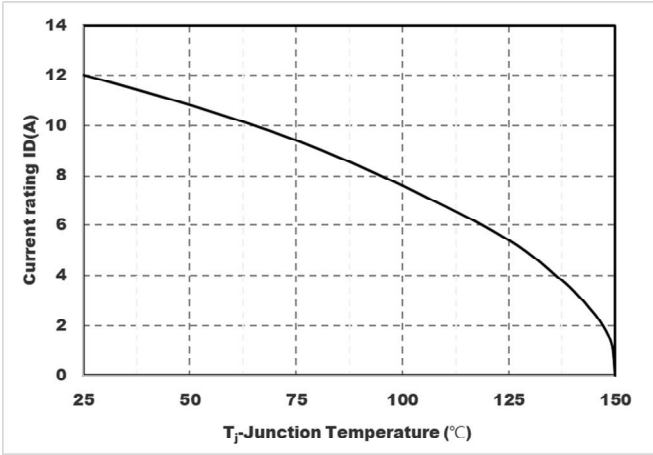


Figure7. Drain current

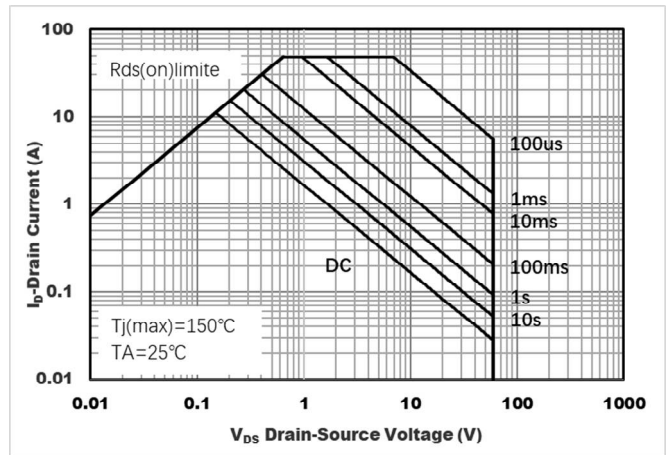


Figure8. Safe Operation Area

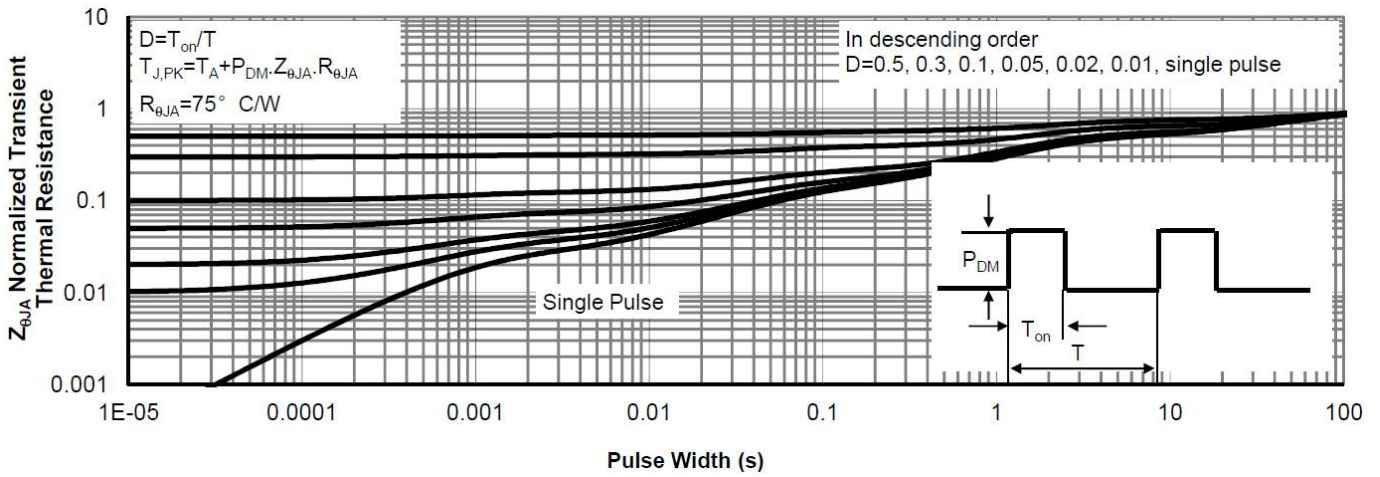
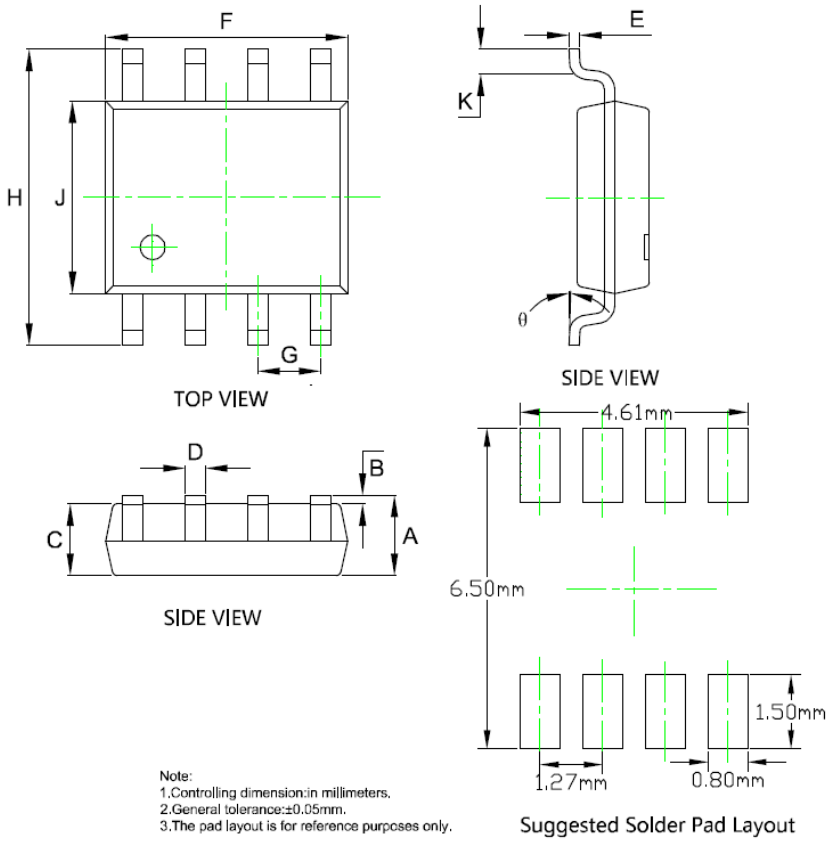


Figure8. Normalized Maximum Transient Thermal Impedance



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## ■ 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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