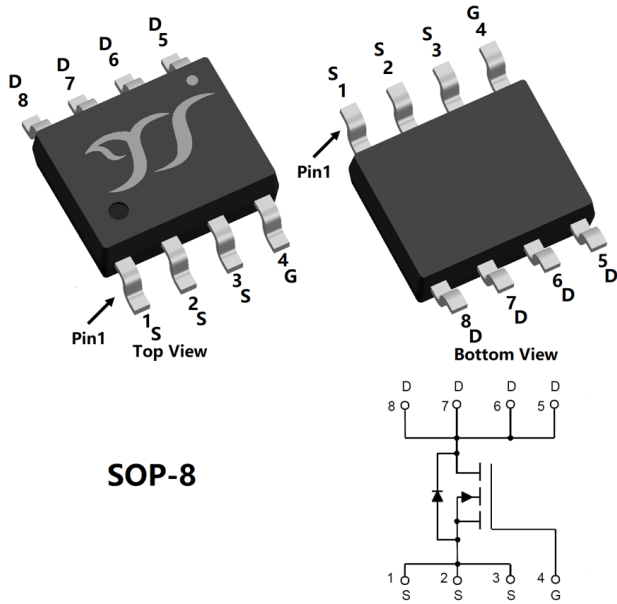


N-Channel Enhancement Mode Field Effect Transistor



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% EAS Tested

General Description

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 3
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

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}	± 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 ^A		I_{DM}	48	A
Avalanche energy ^B		EAS	132	mJ
Total Power Dissipation ^C		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 ^D	$t \leq 10\text{S}$	$R_{\theta JA}$	31	40	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Ambient ^D	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_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	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V	T _J =25°C		1	μA
			T _J =55°C		5	
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	1.2	1.7	2.5	V
Static Drain-Source On-Resistance	R _{Ds(ON)}	V _{GS} = 10V, I _D =12A		6.8	8.5	mΩ
		V _{GS} = 4.5V, I _D =10A		8.3	12	
Diode Forward Voltage	V _{SD}	I _S =12A, V _{GS} =0V		0.85	1.3	V
Maximum Body-Diode Continuous Current	I _S				12	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =35V, V _{GS} =0V, f=1MHZ		2000		pF
Output Capacitance	C _{oss}			390		
Reverse Transfer Capacitance	C _{rss}			13		
Gate Resistance	R _g	f=1MHZ, Open drain		1.6		Ω
Switching Parameters						
Total Gate Charge	Q _g (10V)	V _{DS} =30V, I _D =12A		34		nC
Total Gate Charge	Q _g (4.5V)			15.8		
Gate-Source Charge	Q _{gs}			7.8		
Gate-Drain Charge	Q _{gd}			5.2		
Reverse Recovery Charge	Q _{rr}	I _F =12A, di/dt=200A/us		36		ns
Reverse Recovery Time	t _{rr}			27		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =30V, I _D =12A R _{GEN} =3Ω		10		ns
Turn-on Rise Time	t _r			36		
Turn-off Delay Time	t _{D(off)}			30		
Turn-off fall Time	t _f			57		

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

B. V_{DD}=50V, R_G=25Ω, L=0.5mH, I_{AS}=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

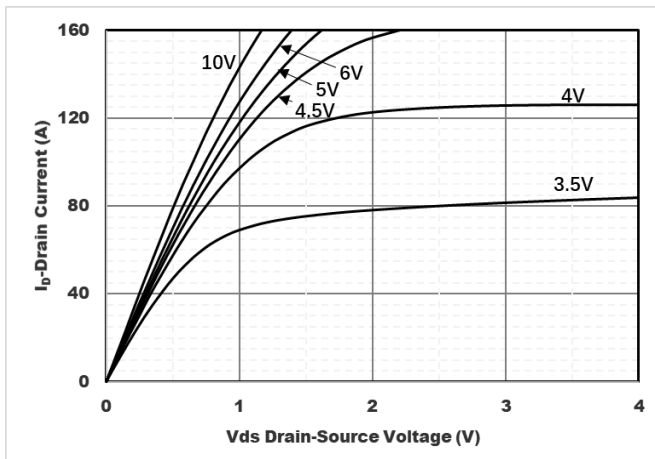


Figure1. Output Characteristics

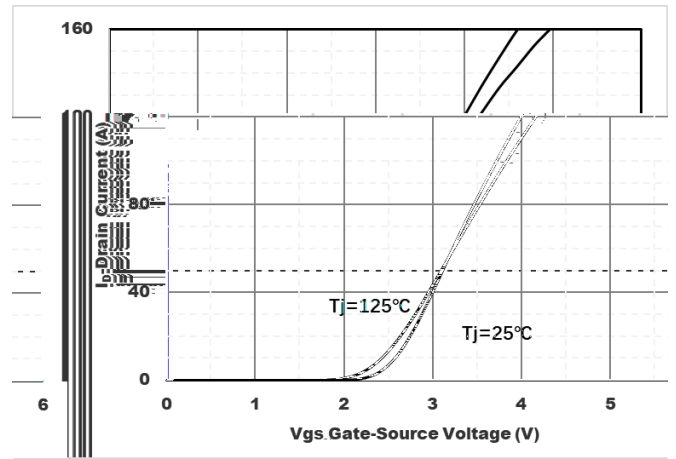


Figure2. Transfer Characteristics

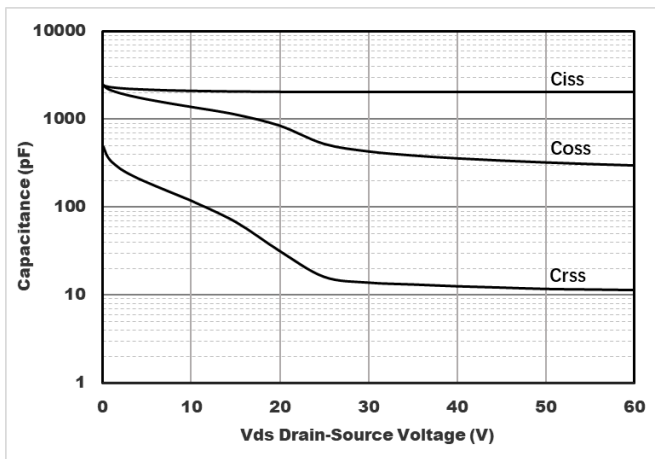


Figure3. Capacitance Characteristics

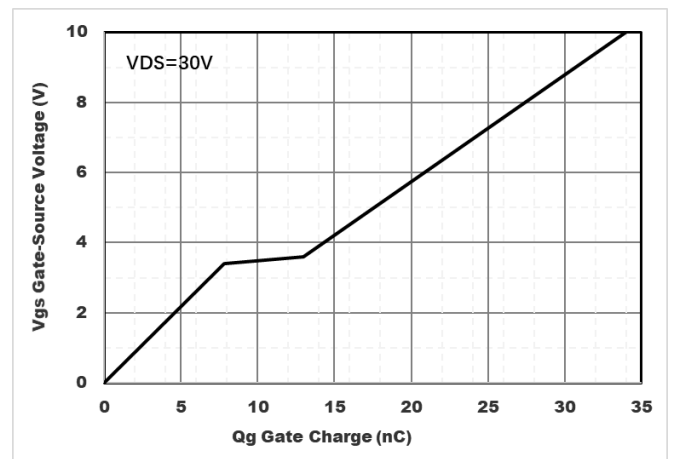


Figure4. Gate Charge

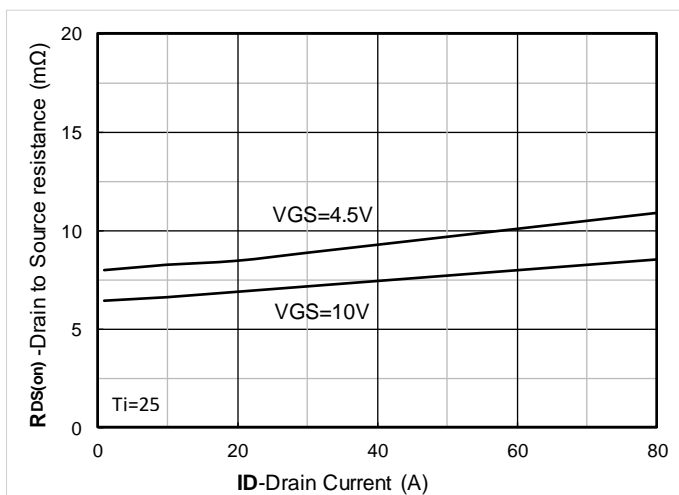


Figure5. Drain-Source on Resistance

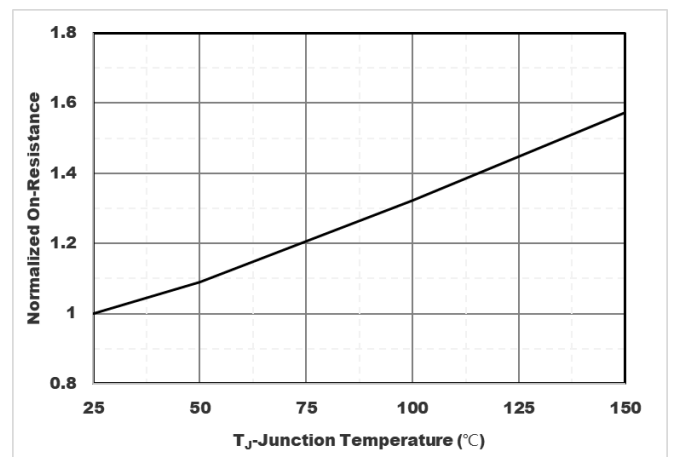


Figure6. Normalized On-Resistance



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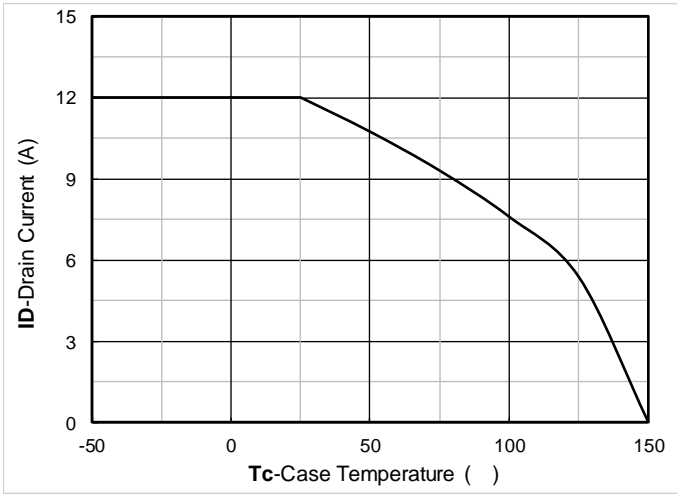


Figure7. Drain current

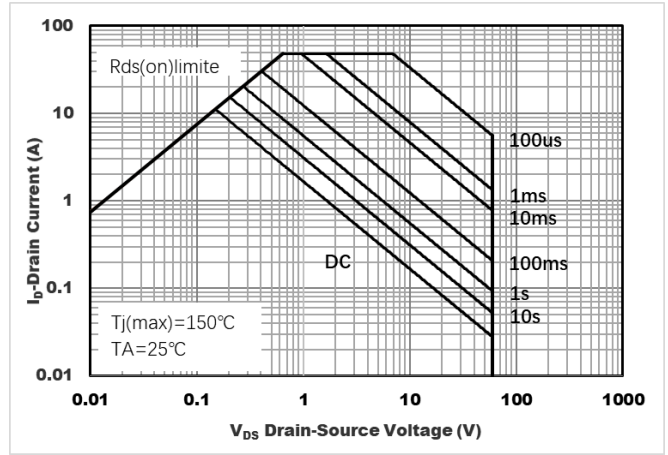


Figure8. Safe Operation Area

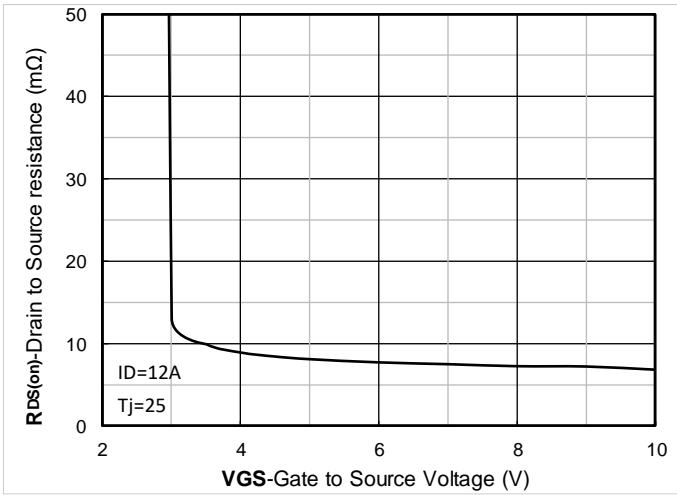


Figure 9. On-Resistance vs Gate to Source Voltage

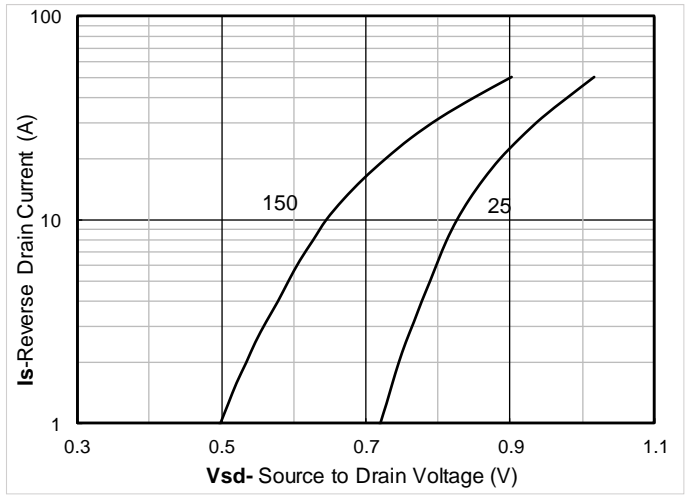


Figure 10. Forward characteristics of reverse diode

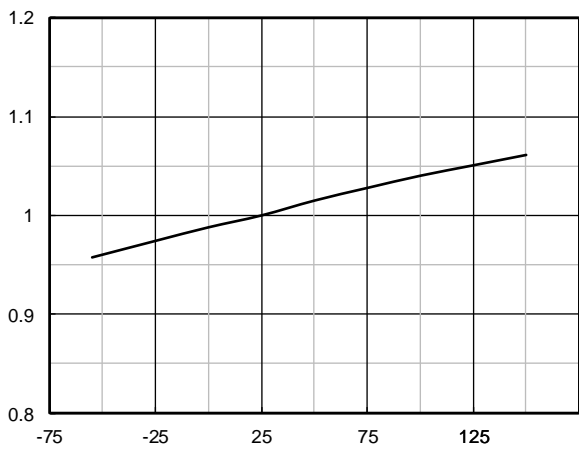


Figure 11. Normalized breakdown voltage

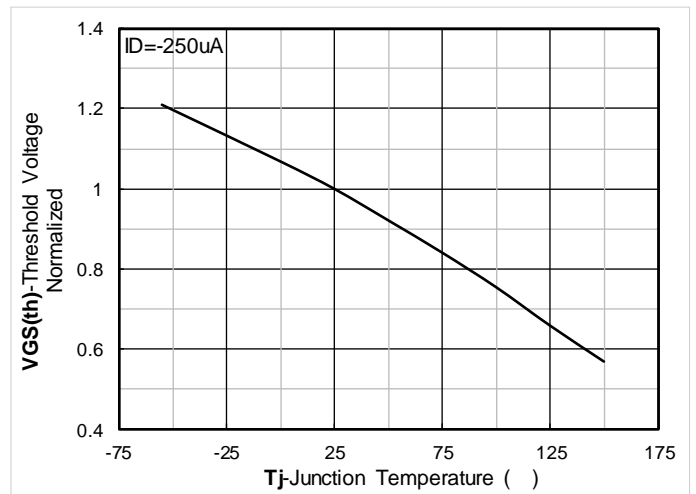


Figure 12. Normalized Threshold voltage



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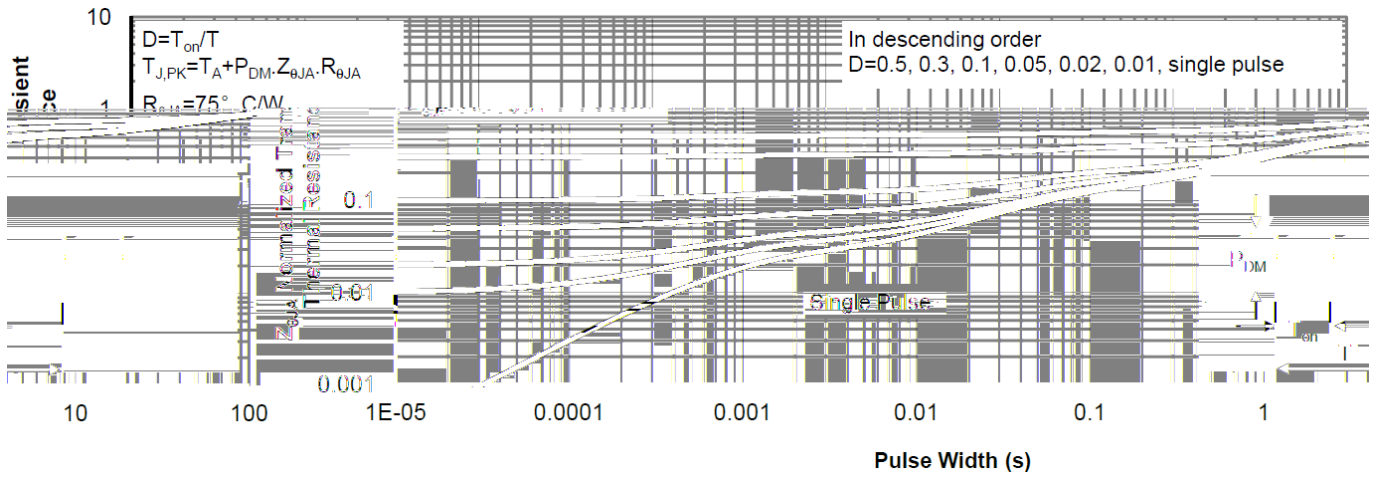
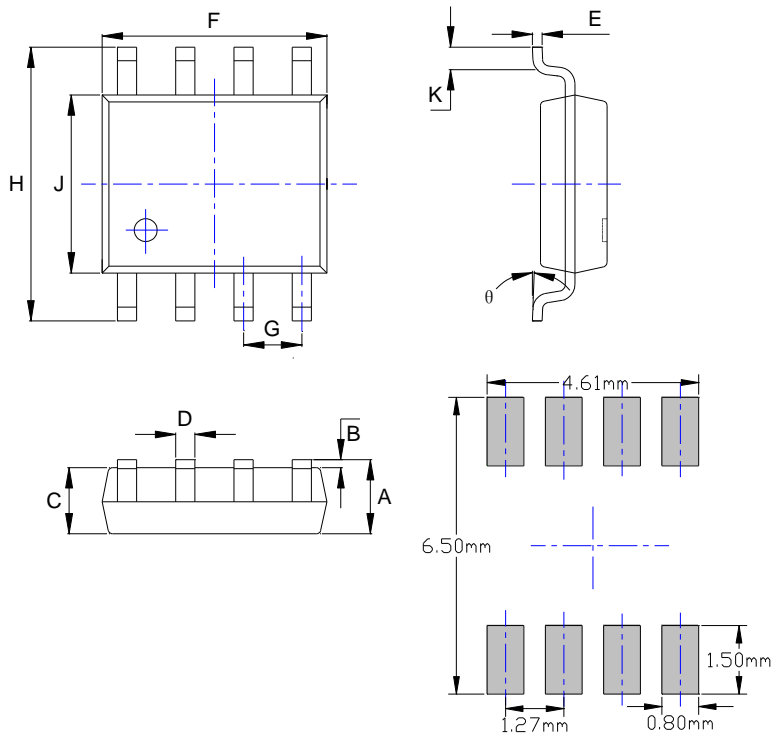


Figure13. Normalized Maximum Transient Thermal Impedance



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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°

Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.



YJS12G06D

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