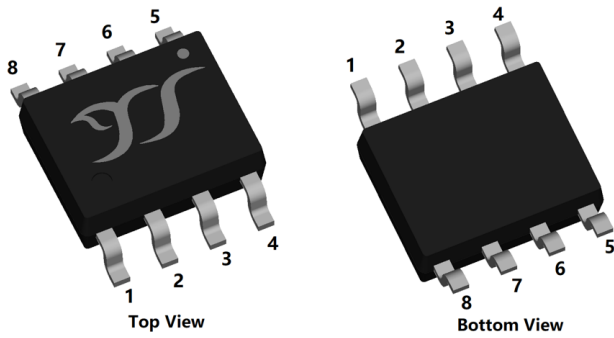


N-Channel Enhancement Mode Field Effect Transistor



SOP-8

Product Summary

- V_{DS} 100 V
- I_D 12A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) < 19m Ω
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) < 24m Ω

General Description

- Split gate trench MOSFET technology
- Low $R_{DS(on)}$ & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Moisture Sensitivity Level 3
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Power management
- Portable equipment

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

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	100	V
Gate-source Voltage	V_{GS}	± 20	V
Drain Current	I_D	$T_A=25^\circ C$	12
		$T_A=100^\circ C$	7.6
Pulsed Drain Current ^A	I_{DM}	50	A
Total Power Dissipation ^B	P_D	$T_A=25^\circ C$	4.1
		$T_A=100^\circ C$	1.6
Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	$^\circ C$

■ Thermal resistance

Parameter	Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient ^C	$R_{\theta JA}$	25	30	$^\circ C/W$

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJS12G10B	F2	Q12G10B	4000	8000	64000	13" reel



YJS12G10B

■ 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	100	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V	-	-	1	μA
		V _{DS} =100V, V _{GS} =0V, T _J =150°C	-	-	100	
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	1.9	2.8	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =12A	-	14.5	19	mΩ
		V _{GS} =4.5V, I _D =10A	-	18	24	
Diode Forward Voltage	V _{SD}	I _S =12A, V _{GS} =0V	-	0.9	1.2	V
Gate resistance	R _G	f=1MHz, Open drain	-	1.3	-	Ω
Maximum Body-Diode Continuous Current	I _S		-	-	12	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f=1MHz	-	1150	-	pF
Output Capacitance	C _{oss}		-	380	-	
Reverse Transfer Capacitance	C _{rss}		-	8.5	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =50V, I _D =10A	-	32	-	nC
Gate-Source Charge	Q _{gs}		-	11	-	
Gate-Drain Charge	Q _{gd}		-	5	-	
Reverse Recovery Charge	Q _{rr}	I _F =10A, di/dt=100A/us	-	84	-	nC
Reverse Recovery Time	t _{rr}		-	51.5	-	ns
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =50V, I _D =10A R _{GEN} =2.2Ω	-	51	-	ns
Turn-on Rise Time	t _r		-	14.4	-	
Turn-off Delay Time	t _{D(off)}		-	69.2	-	
Turn-off fall Time	t _f		-	20.6	-	

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

B. P_d is based on max. junction temperature, using junction-case and junction-ambient thermal resistance.

C. The value of R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in the still air environment with T_A =25°C.

The maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.



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Typical Electrical and Thermal Characteristics Diagrams

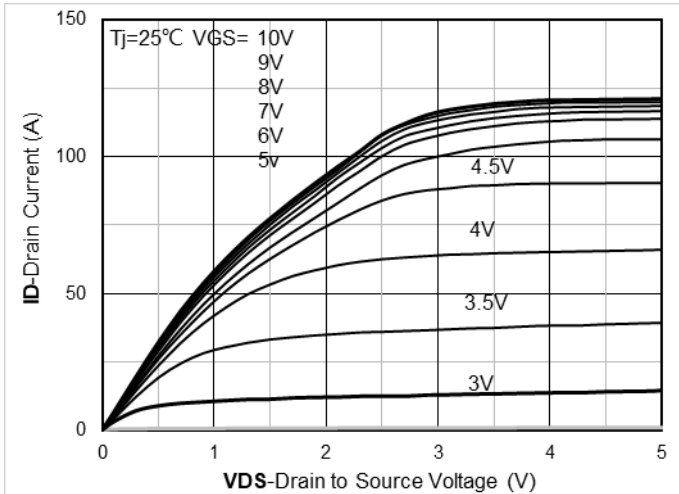


Figure 1. Output Characteristics

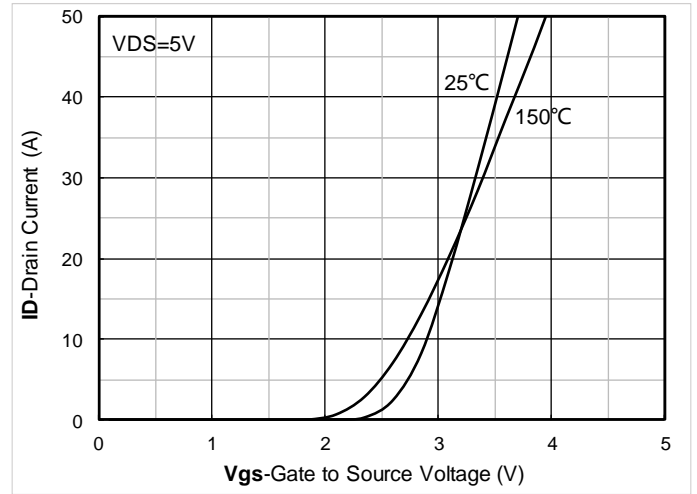


Figure 2. Transfer Characteristics

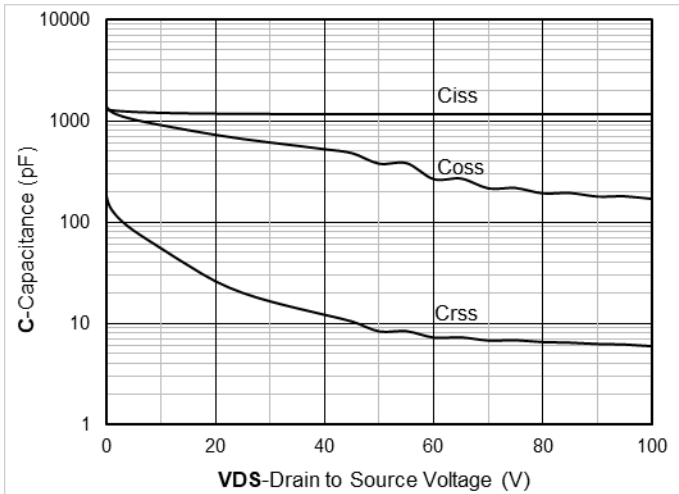


Figure 3. Capacitance Characteristics

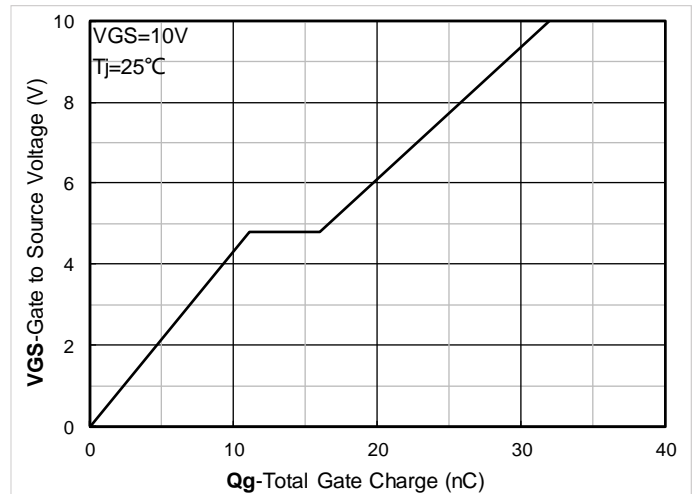


Figure 4. Gate Charge

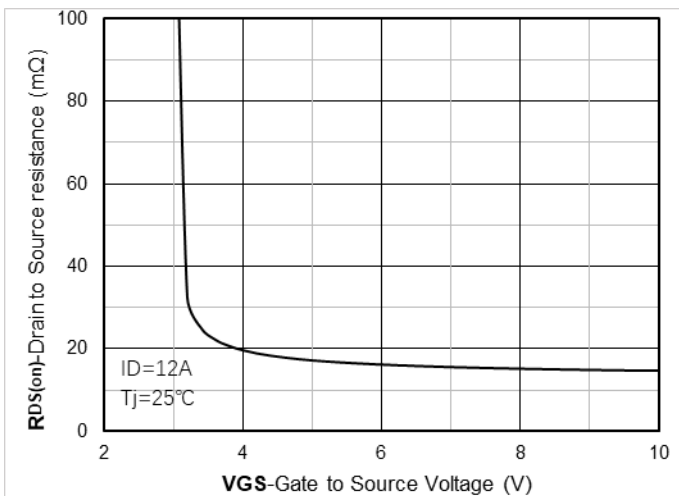


Figure 5. On-Resistance vs Gate to Source Voltage

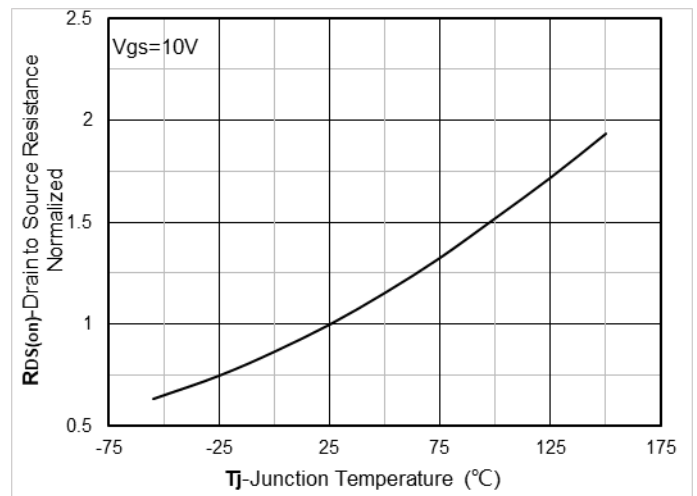


Figure 6. Normalized On-Resistance



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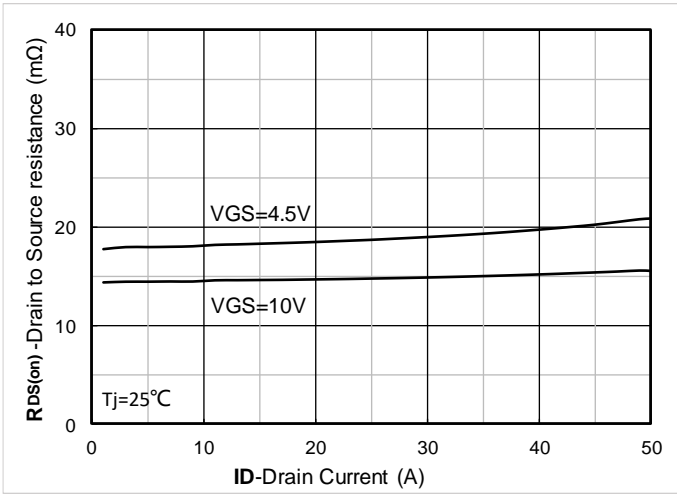


Figure 7. $R_{DS(on)}$ VS Drain Current

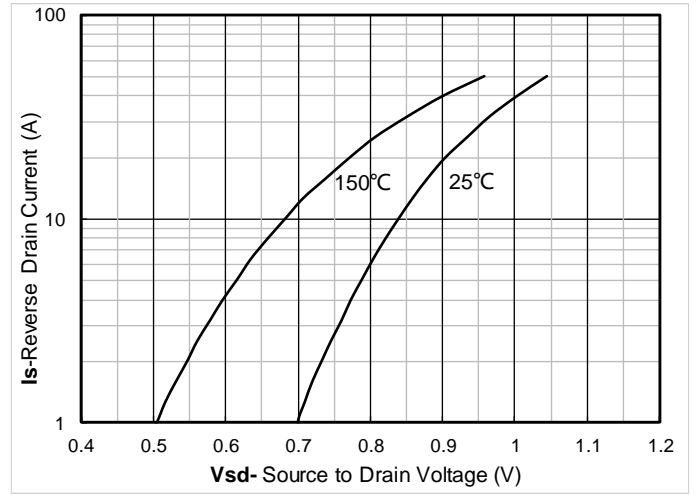


Figure 8. Forward characteristics of reverse diode

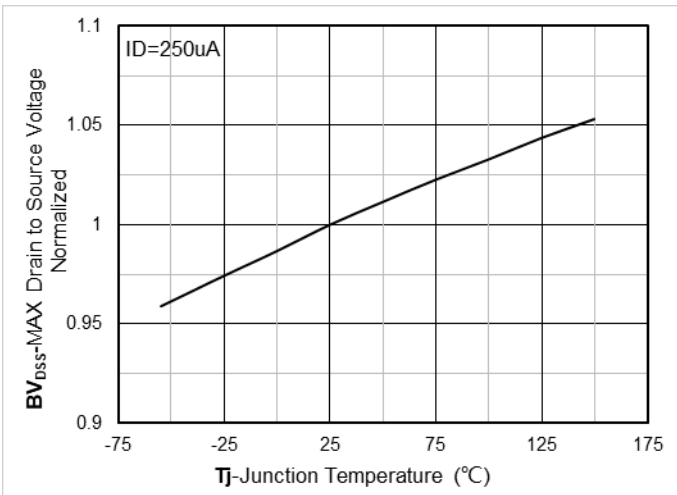


Figure 9. Normalized breakdown voltage

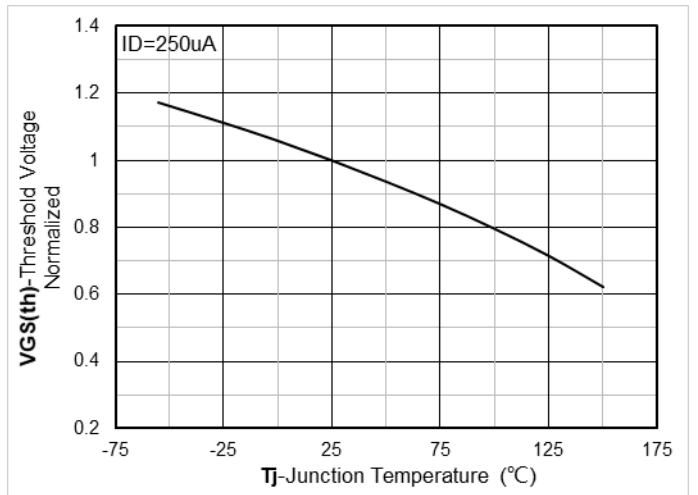


Figure 10. Normalized Threshold voltage

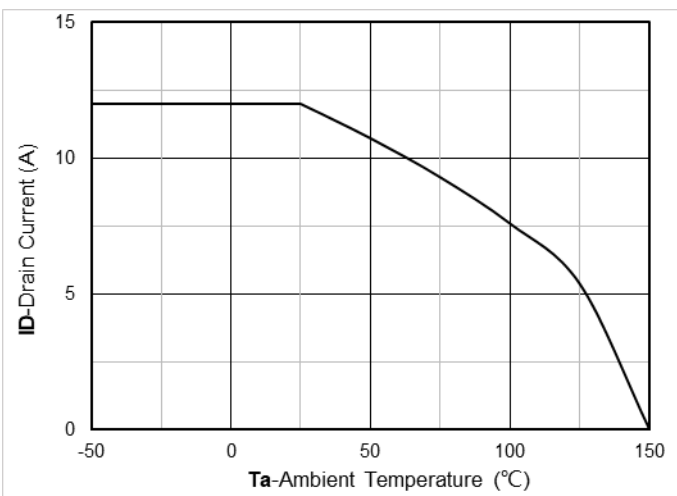


Figure 11. Current dissipation

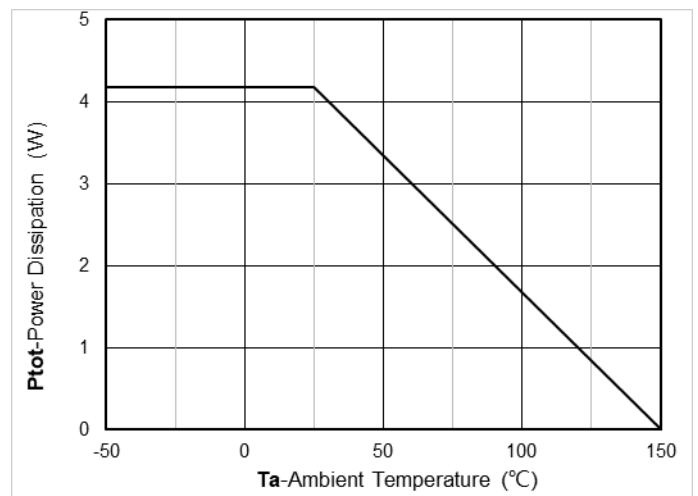


Figure 12. Power dissipation



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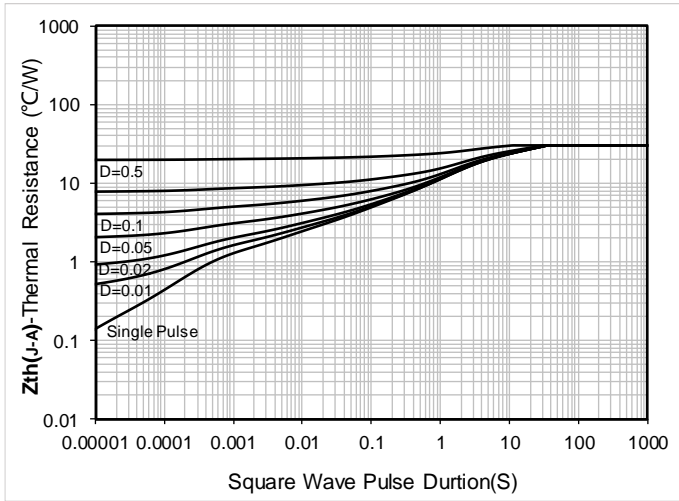


Figure 13. Maximum Transient Thermal Impedance

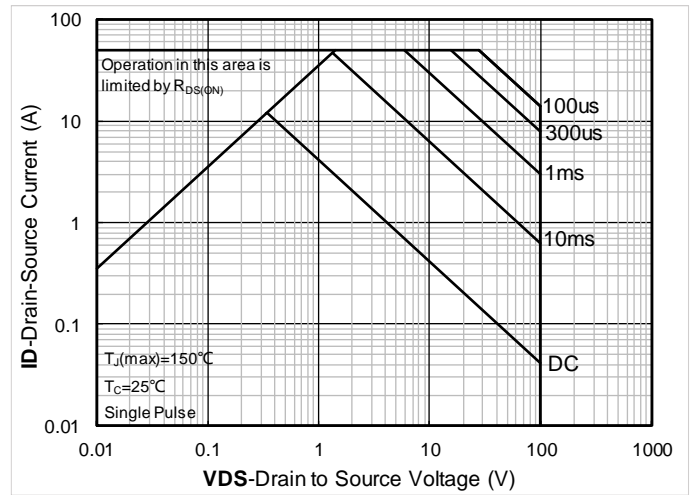
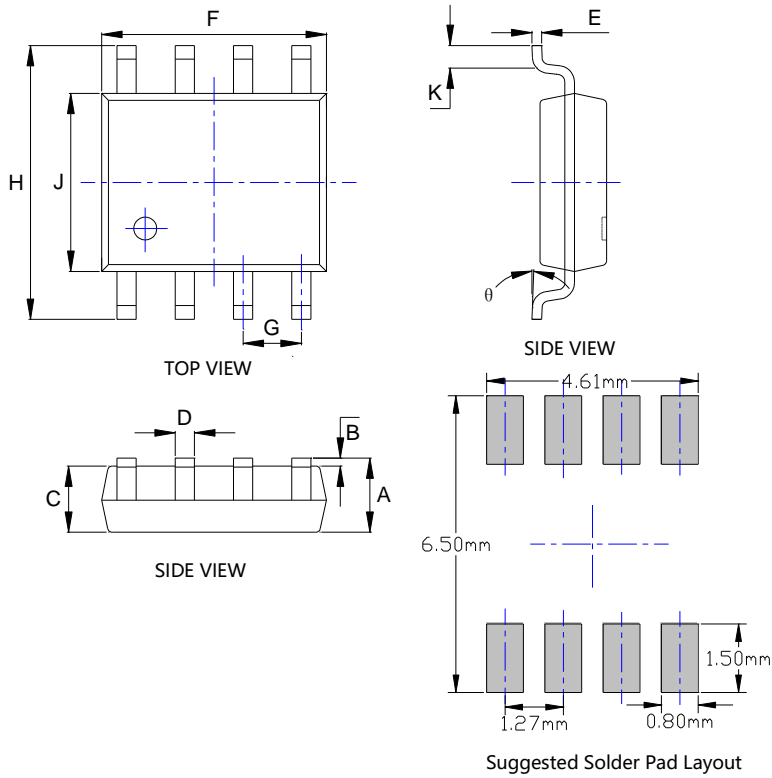


Figure 14. Safe Operation Area



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■ SOP8 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.



YJS12G10B

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