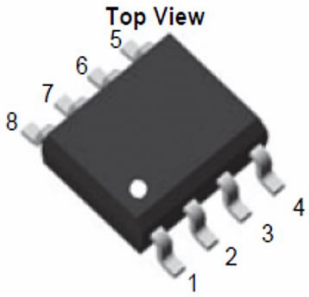
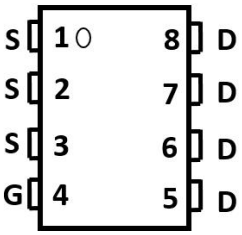
N-Channel Enhancement Mode Field Effect Transistor





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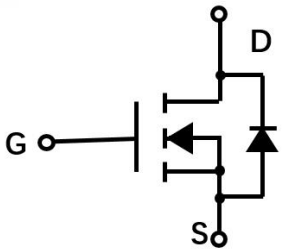


Product Summary

- V_{DS} 150V
- I_D 4.6A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜75 mohm
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜88 mohm

General Description

- Split Gate Trench MOSFET technology
- High Speed Power Switching, logic level
- Enhanced Body diode dv/dt capability
- Enhanced Avalanche Ruggedness
- 100% UIS Tested, 100% Rg Tested

Applications

- Synchronous Rectification in SMPS
- Hard Switching and High Speed Circuit
- Power Tools
- UPS
- Motor Control

■ Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Parameter		Symbol	Maximum	Unit
Drain-source Voltage		V_{DS}	150	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current	T_A=25℃	I_D	4.6	A
	T_A=100℃		2.9	
Pulsed Drain Current [A]		I_{DM}	35	A
Avalanche Energy, Single Pulse [B]		E_{AS}	3.75	mJ
Total Power Dissipation @ T_A=25℃		P_D	3.1	W
Thermal Resistance Junction-Lead		$R_{\theta JL}$	23	℃/W
Thermal Resistance Junction-to-Ambient	t≤ 10s	$R_{\theta JA}$	40	℃/W
	Steady State		75	℃/W
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJS05N15B	F2	Q05N15B	4000	8000	64000	13“ reel

■ Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Static Parameter							
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA		150			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=150V,V_{GS}=0V	T_J=25℃			1	μA
			T_J=100℃			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		1.0	2.0	3.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=5.0A			63	75	mΩ
		V_{GS}=4.5V, I_D=4.0A			70	88	
Trans conductance	g_{fs}	V_{DS} =5V, I_D =5A			18		S
Gate Resistance	R_G	V_{GS} =0V, V_{DS} Open, f=1MHz			5.0		Ω
Diode Forward Voltage	V_{SD}	I_S=5.0A,V_{GS}=0V			0.9	1.2	V
Maximum Body-Diode Continuous Current	I_S					5.0	A
Dynamic Parameters							
Input Capacitance	C_{iss}	V_{DS}=75V,V_{GS}=0V,f=1MHZ			625		pF
Output Capacitance	C_{oss}				37		
Reverse Transfer Capacitance	C_{rss}				13		
Switching Parameters							
Total Gate Charge (10V)	Q_g (10V)	V_{GS}=10V,V_{DD}=75V,I_D=5A			11.6		nC
Total Gate Charge (4.5V)	Q_g (4.5V)				6.5		
Gate Source Charge	Q_{gs}				1.2		
Gate Drain Charge	Q_{gd}				4		
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=10V,V_{DD}=75V, I_D=5A, R_{GEN}=10Ω			10		ns
Turn-on Rise Time	t_r				7		
Turn-off Delay Time	$t_{d(off)}$				14		
Turn-off Fall Time	t_f				3		
Reverse Recovery Time	t_{rr}	V_R =75V, I_F =5A, dI_F/dt=100A/μs			50		ns
Reverse Recovery Charge	Q_{rr}				70		nC

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.
B. L=0.3mH, T_A =25℃.

■ Typical Performance Characteristics

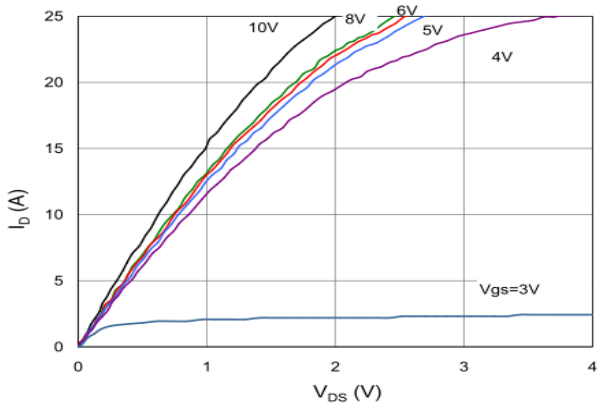


Figure1. Output Characteristics

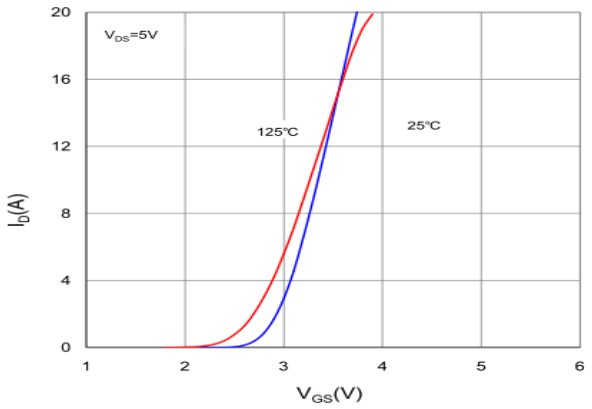


Figure2. Transfer Characteristics

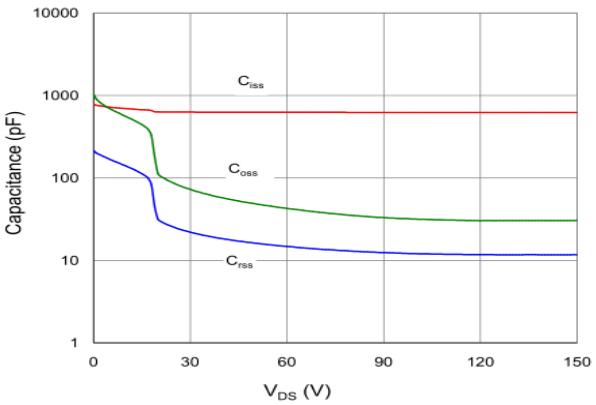


Figure3. Capacitance Characteristics

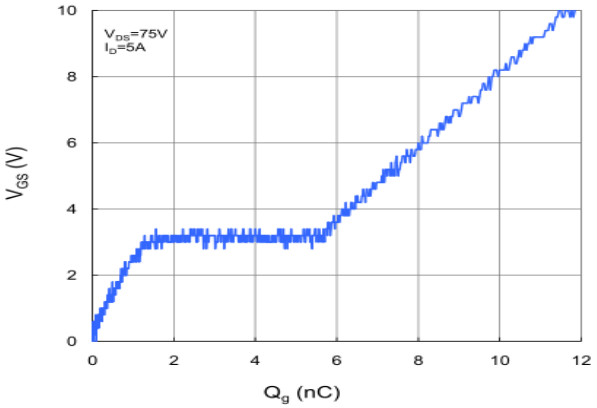


Figure4. Gate Charge

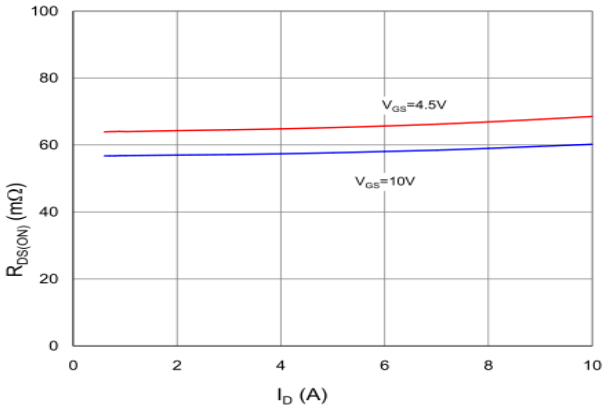


Figure5. Drain-Source on Resistance

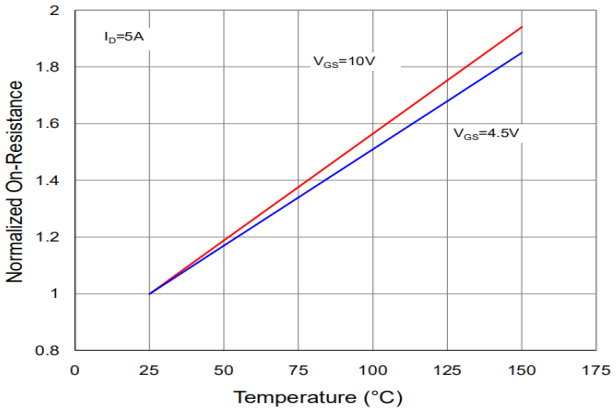


Figure6. Normalized On-Resistance vs. Junction Temperature

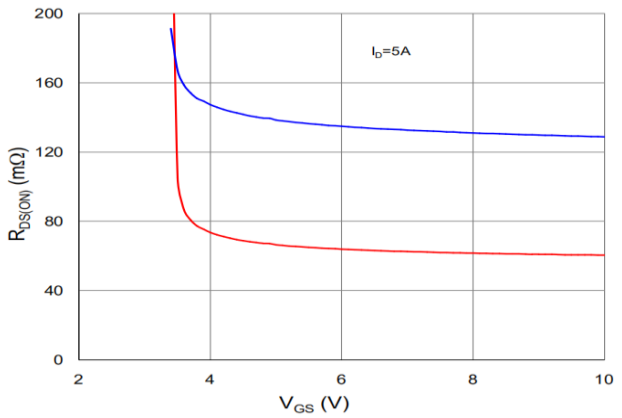


Figure7. On-Resistance vs. Gate-Source Voltage

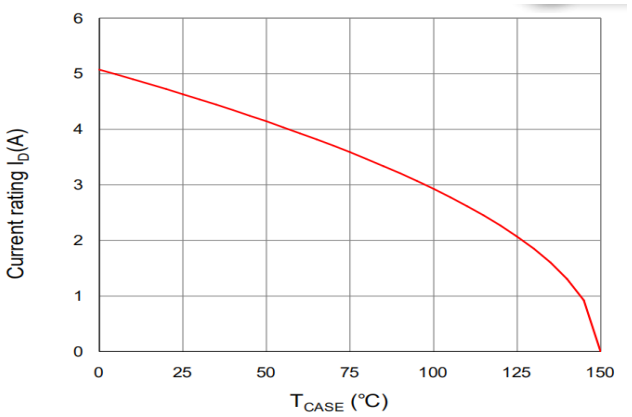


Figure8. Drain Current vs. Case Temperature

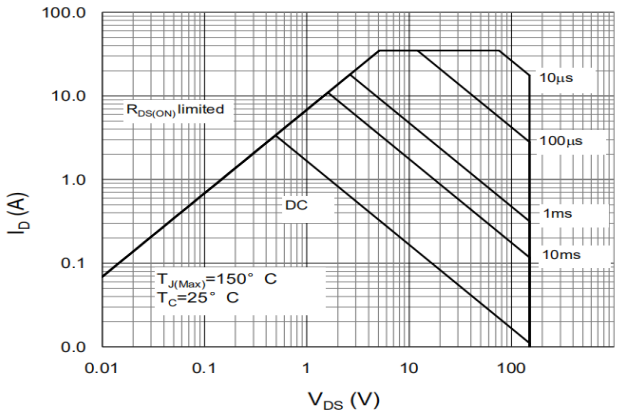


Figure9. Safe Operation Area

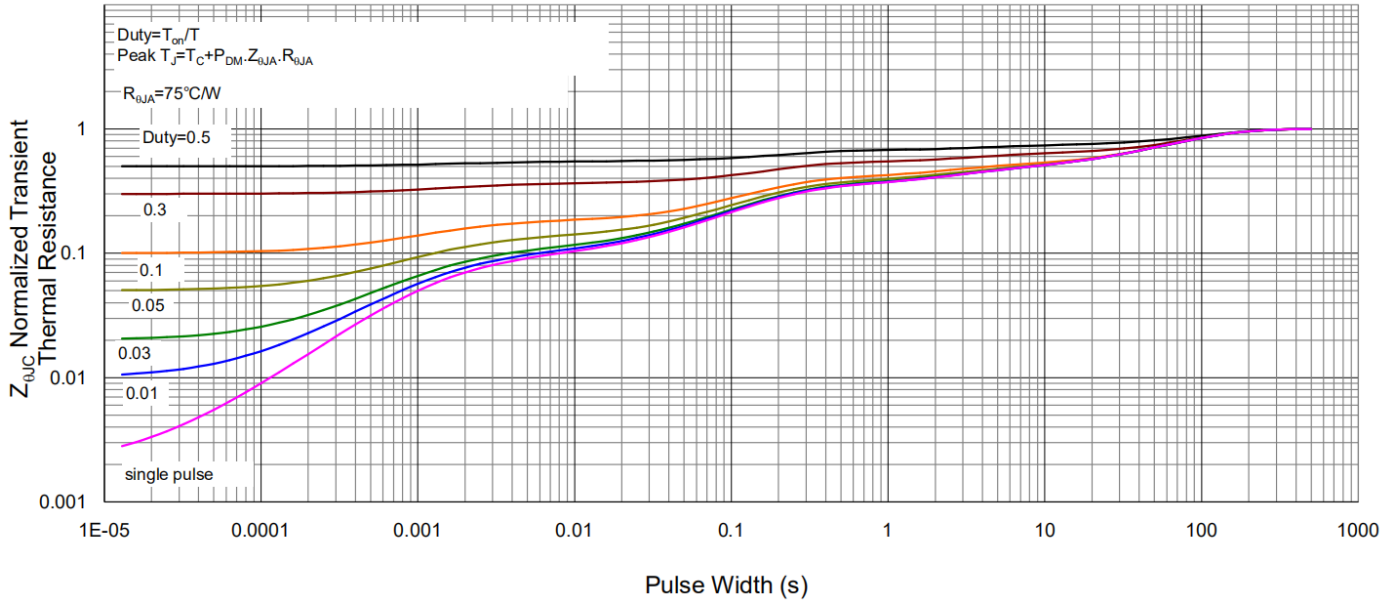


Figure 10. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

Figure A: Gate Charge Test Circuit & Waveforms

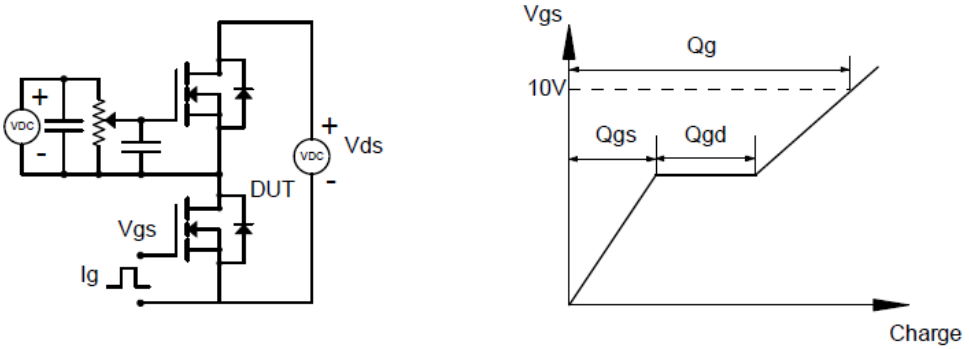


Figure B: Resistive Switching Test Circuit & Waveforms

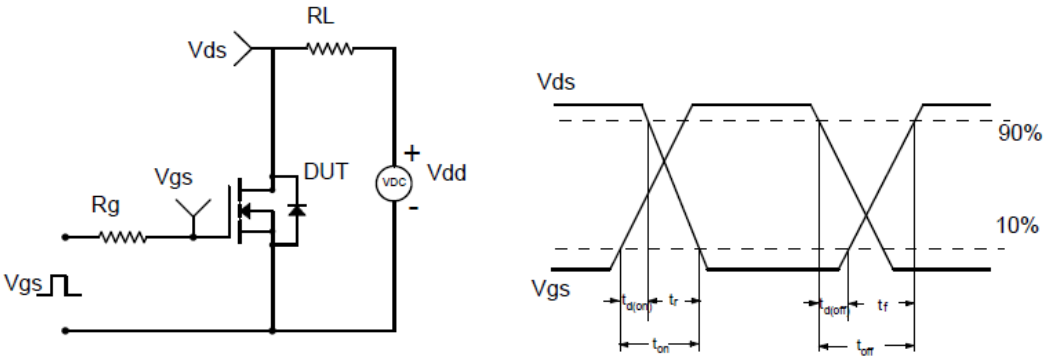


Figure C: Unclamped Inductive Switching (UIS) Test

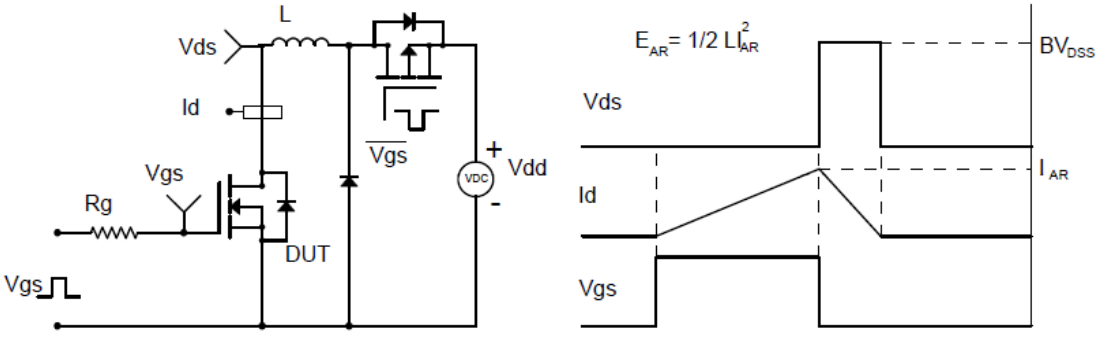
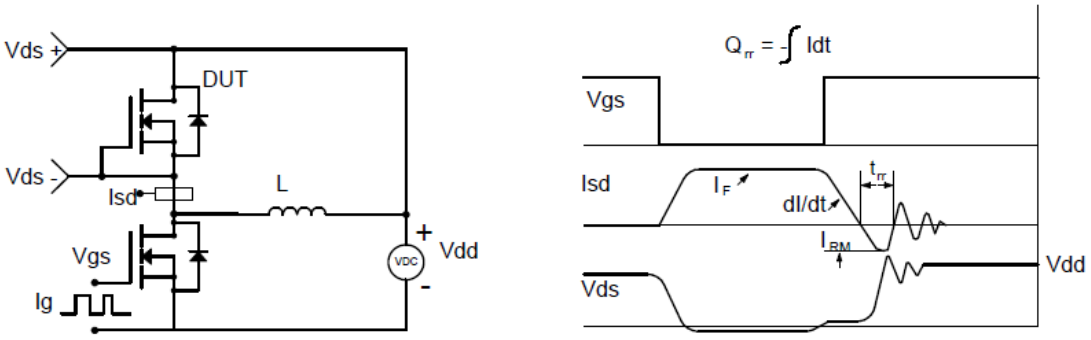
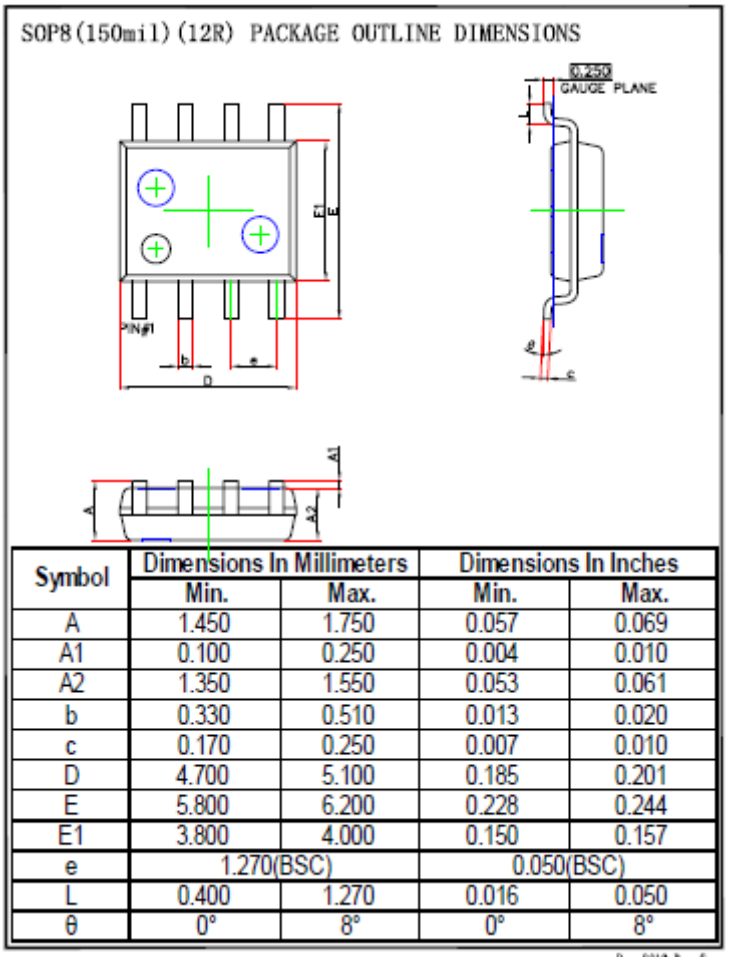


Figure D: Diode Recovery Test Circuit & Waveforms



■ SOP-8 Package information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.450	1.750	0.057	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.201
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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