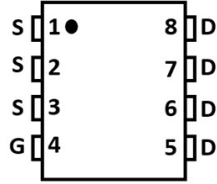
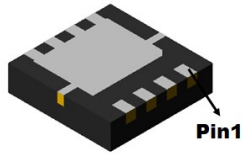
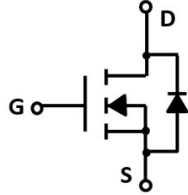


N-Channel Enhancement Mode Field Effect Transistor



DFN3.3X3.3



Product Summary

- V_{DS} 20 V
- I_D 47 A
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) < 6 mohm
- $R_{DS(ON)}$ (at $V_{GS}=2.5V$) < 8 mohm
- $R_{DS(ON)}$ (at $V_{GS}=1.8V$) < 14 mohm

General Description

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

Applications

- DC-DC Converters
- Power management functions

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

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	20	V
Gate-source Voltage	V_{GS}	± 10	V
Drain Current	I_D	$T_A=25^\circ\text{C}$	47
		$T_A=70^\circ\text{C}$	38
Pulsed Drain Current ^A	I_{DM}	188	A
Total Power Dissipation	P_D	21	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	5.9	$^\circ\text{C}/\text{W}$
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
YJQ47N02A	F1	Q47N02A	5000	10000	100000	13" reel



YJQ47N02A

■ 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	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±10V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	0.45	0.62	1.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 4.5V, I _D =20A		4.5	6	mΩ
		V _{GS} = 2.5V, I _D =15A		5.7	8	
		V _{GS} = 1.8V, I _D =10A		7.6	14	
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V		0.8	1.2	V
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHZ		2250		pF
Output Capacitance	C _{oss}			334		
Reverse Transfer Capacitance	C _{rss}			271		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =4.5V, V _{DS} =10V, I _D =15A		27.9		nC
Gate-Source Charge	Q _{gs}			4.1		
Gate-Drain Charge	Q _{gd}			7.4		
Body Diode Reverse Recovery Charge	Q _{rr}	I _F =15A, di/dt=100A/μs		2.2		
Body Diode Reverse Recovery Time	T _{rr}			16.3		
Turn-on Delay Time	t _{D(on)}	V _{GS} =4.5V, V _{DD} =10V, I _D =10A, R _{GEN} =3Ω		13		ns
Turn-on Rise Time	t _r			53		
Turn-off Delay Time	t _{D(off)}			61		
Turn-off fall Time	t _f			76		

A. Pulse Test: Pulse Width ≤ 300μs, Duty cycle ≤ 2%.

B. R_{θJA} is the sum of the junction-to-Case and Case-to-ambient thermal resistance, where the Case thermal reference is defined as the solder mounting surface of the drain pins. R_{θJC} is guaranteed by design, while R_{θJA} 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

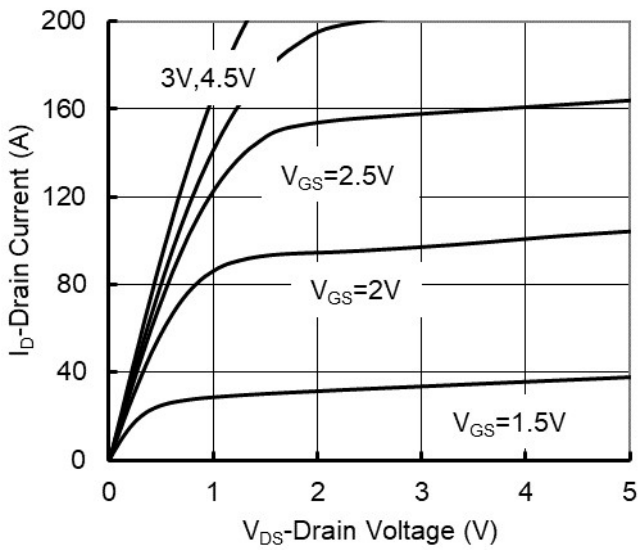


Figure1. Output Characteristics

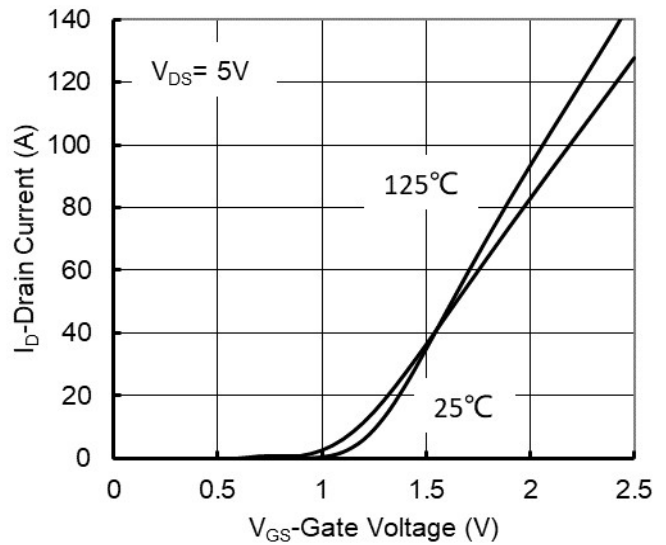


Figure2. Transfer Characteristics

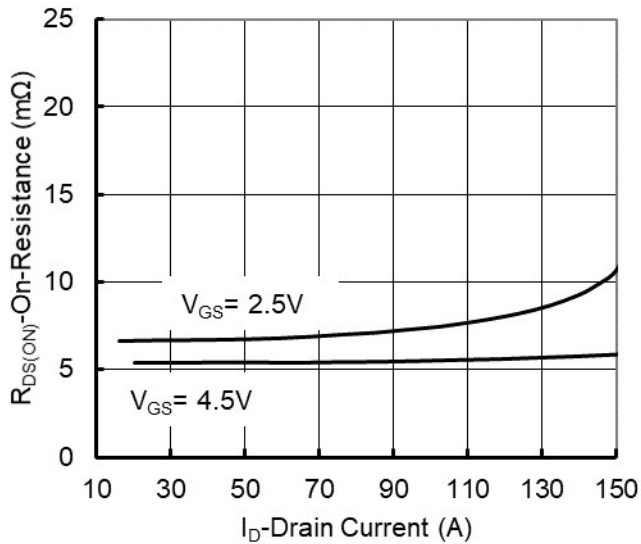


Figure3. On-Resistance vs. Drain Current

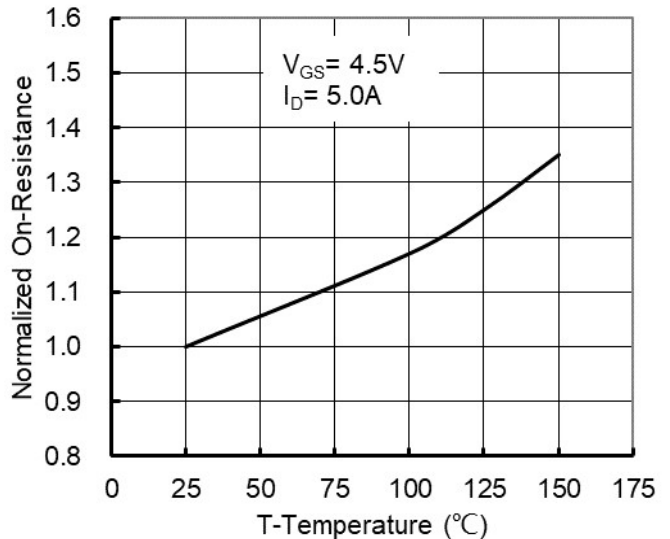


Figure4. On-Resistance vs. Junction Temperature

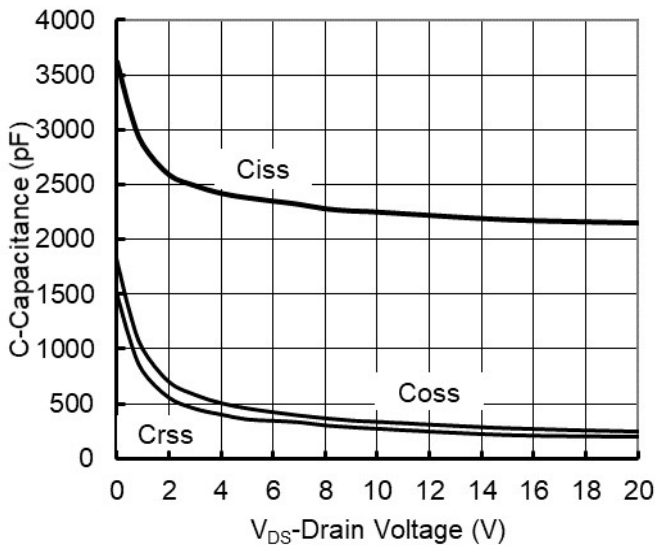


Figure5. Capacitance Characteristics

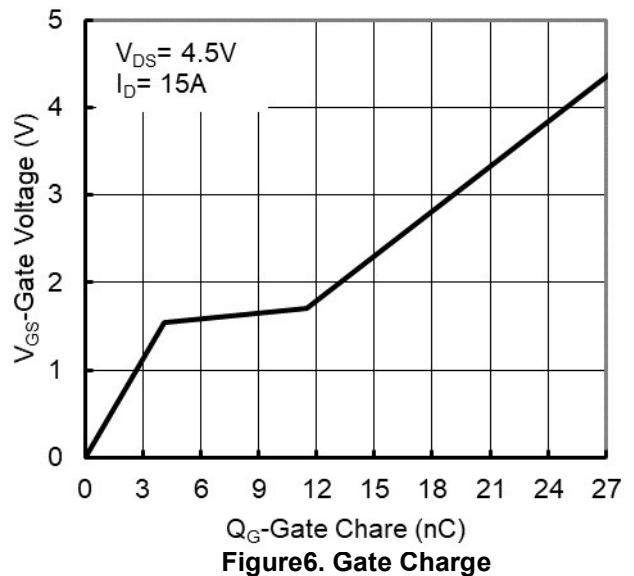
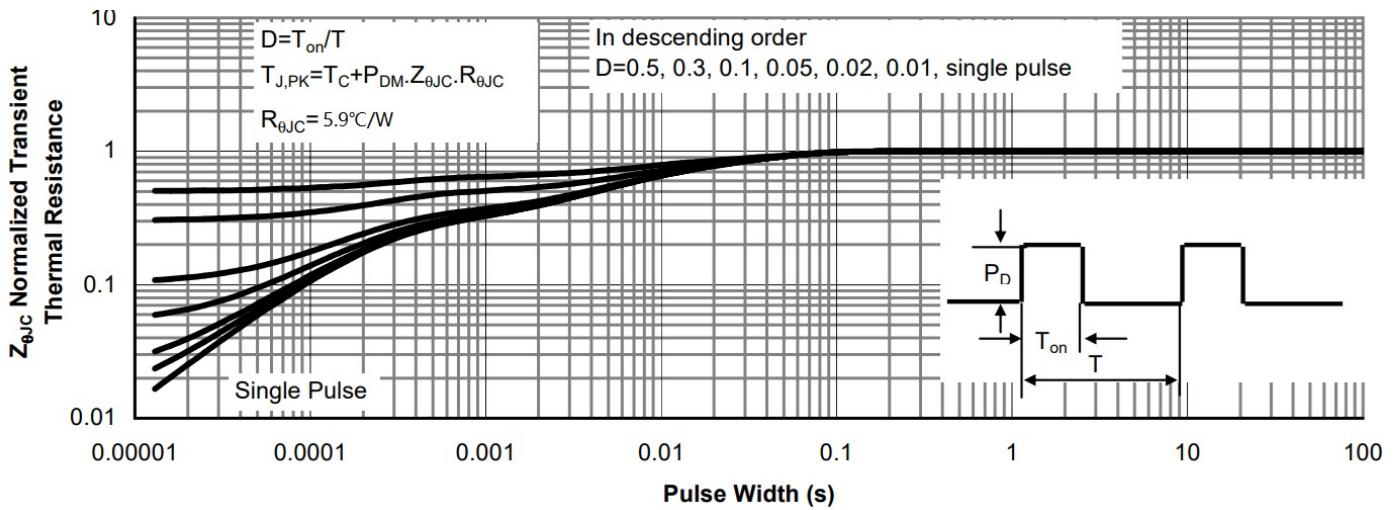
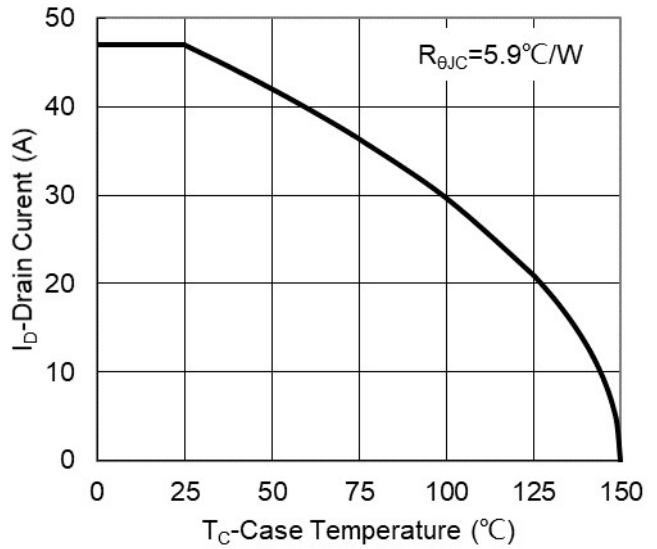
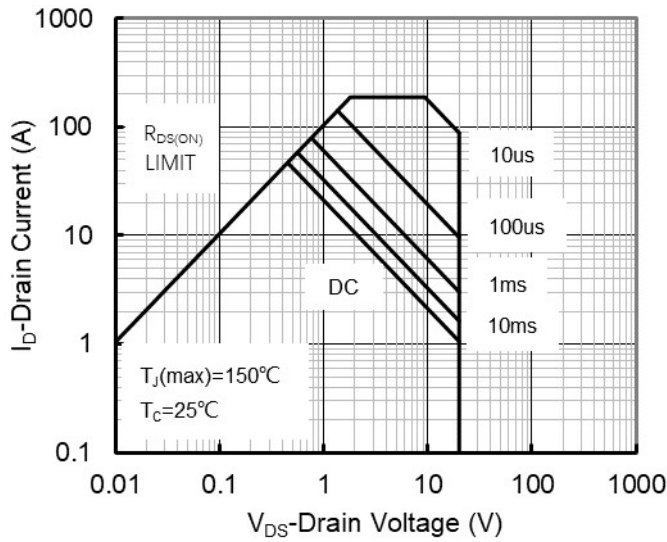
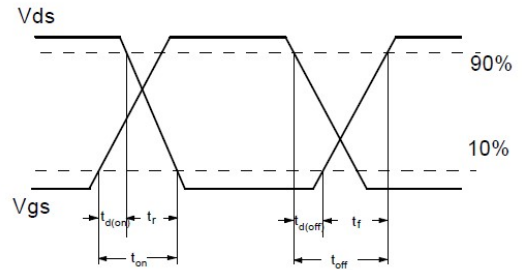
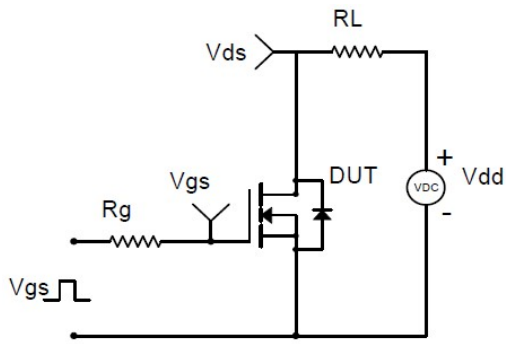


Figure6. Gate Charge

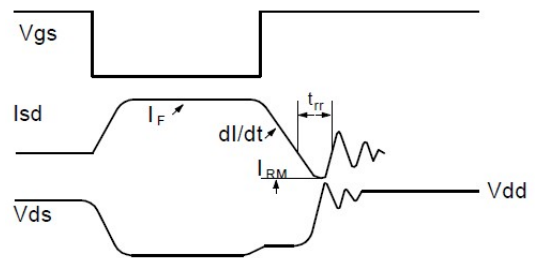
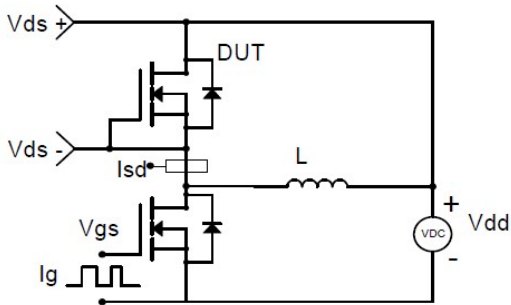


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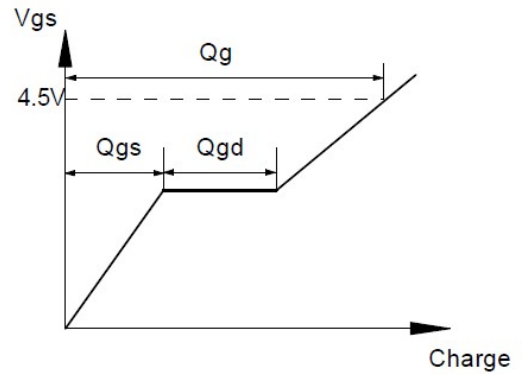
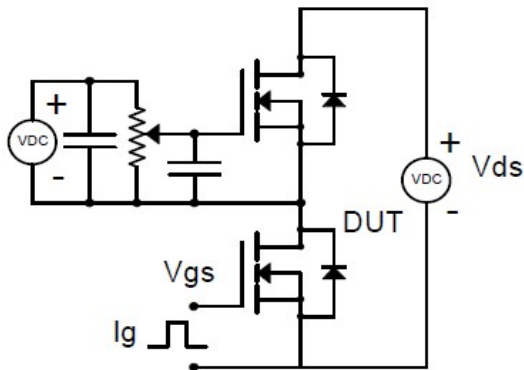




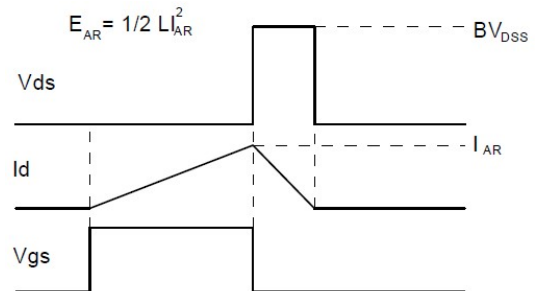
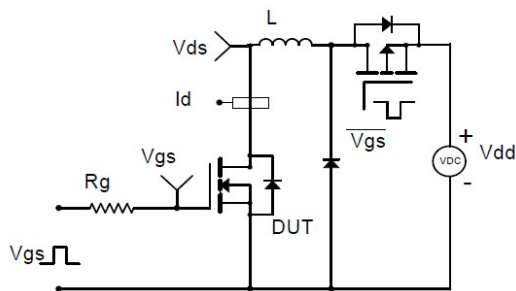
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Gate Charge Test Circuit & Waveform

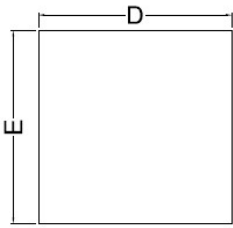


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

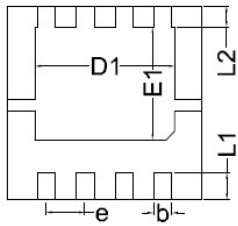


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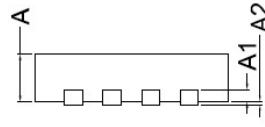
■ DFN3.3x3.3 Package Information



Top View
正面视图

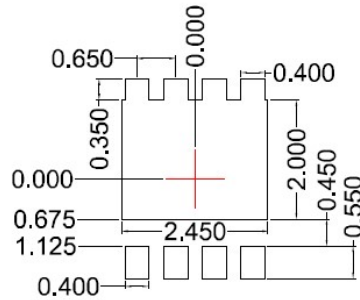


Bottom View
背面视图



Side View
侧面视图

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
D	3.15	3.25	3.35
E	3.15	3.25	3.35
A	0.70	0.80	0.90
A1	0.20 BSC		
A2			0.10
D1	2.20	2.35	2.50
E1	1.80	1.90	2.00
L1	0.35	0.45	0.55
L2	0.35 BSC		
b	0.20	0.30	0.40
e	0.65 BSC		



Suggested Solder Pad Layout
Top View

Note:

1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.10 mm.
3. The pad layout is for reference purposes only.



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