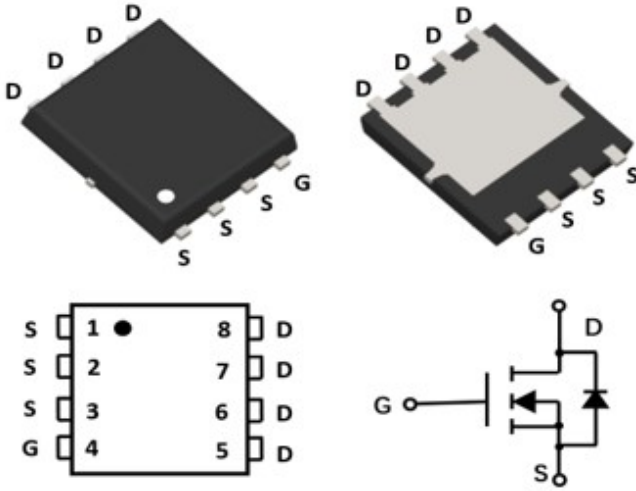


N-Channel Enhancement Mode Field Effect Transistor

PDFN 5X6



Product Summary

- V_{DS} 30V
- I_D 40A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) <7.5mohm
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) <11.5mohm
- 100% UIS Tested
- 100% ∇V_{DS} Tested

General Description

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

Applications

- High current load applications
- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

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

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	30	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_C=25^\circ C$	I_D	40	A
	$T_C=100^\circ C$		25	
Pulsed Drain Current ^A		I_{DM}	140	A
Total Power Dissipation	$T_C=25^\circ C$	P_D	45	W
	$T_C=100^\circ C$		18	
Total Power Dissipation	$T_A=25^\circ C$	P_D	5	W
Single Pulse Avalanche Energy ^B		E_{AS}	56	mJ
Thermal Resistance Junction-to-Case ^C		$R_{\theta JC}$	2.78	$^\circ C/W$
Thermal Resistance Junction-to-Ambient ^C		$R_{\theta JA}$	25	$^\circ C/W$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	$^\circ C$

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJG40N03A	F1	YJG40N03A	5000	10000	100000	13" reel



YJG40N03A

■ 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	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
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	1.5	2.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D =15A		5.5	7.5	mΩ
		V _{GS} = 4.5V, I _D =15A		9.5	11.5	
Diode Forward Voltage	V _{SD}	I _S =15A, V _{GS} =0V		0.85	1.2	V
Maximum Body-Diode Continuous Current	I _S				40	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1MHZ		1015		pF
Output Capacitance	C _{oss}			201		
Reverse Transfer Capacitance	C _{rss}			164		
Gate resistance	R _g	f=1MHz		2.0		Ω
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =15V, I _D =15A		23.6		nC
Gate-Source Charge	Q _{gs}			3.9		
Gate-Drain Charge	Q _{gd}			7		
Reverse Recovery Charge	Q _{rr}	I _F =25A, di/dt=100A/us		0.2		ns
Reverse Recovery Time	t _{rr}			5		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =20V, I _D =2A, R _L =1Ω R _{GEN} =3Ω		7		ns
Turn-on Rise Time	t _r			19		
Turn-off Delay Time	t _{D(off)}			24		
Turn-off fall Time	t _f			24		

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

B. T_J=25°C, V_{DD}=20V, V_G=10V, L=0.5mH, R_g=25Ω

C. 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

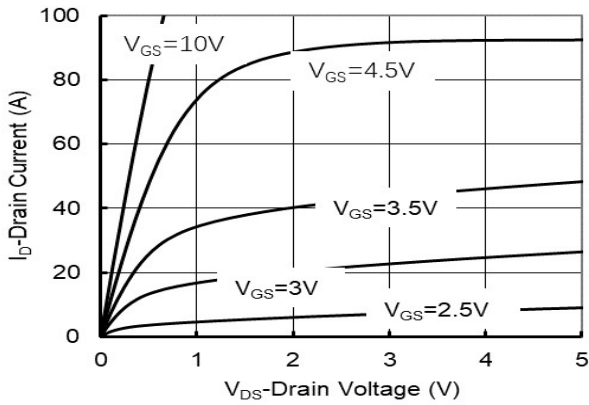


Figure1. Output Characteristics

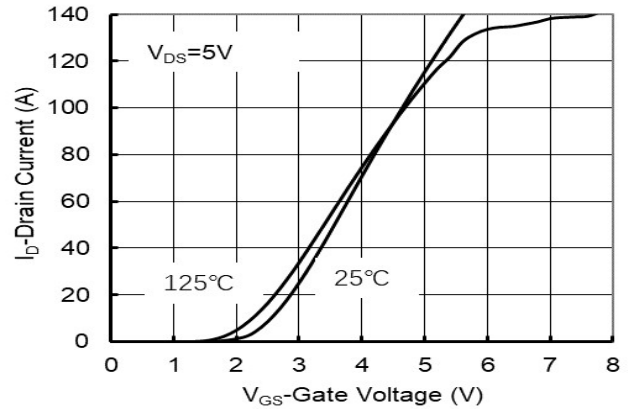


Figure2. Transfer Characteristics

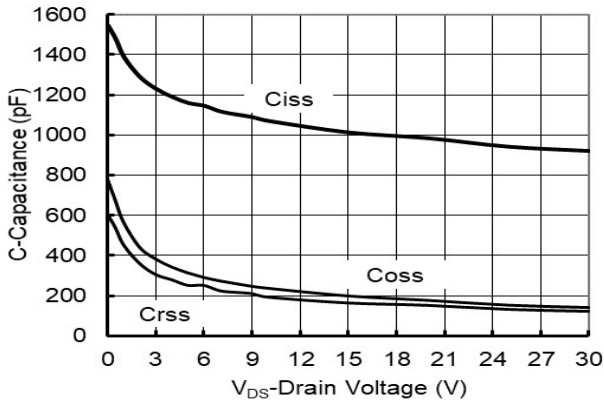


Figure3. Capacitance Characteristics

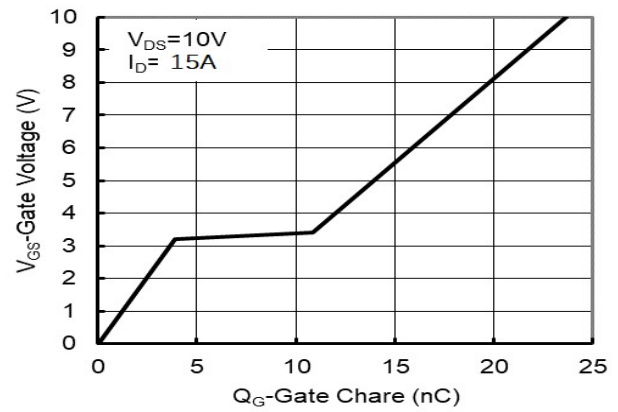


Figure4. Gate Charge

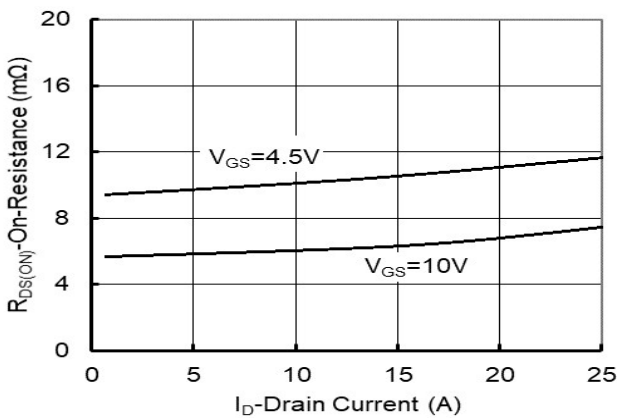


Figure5. Drain-Source on Resistance

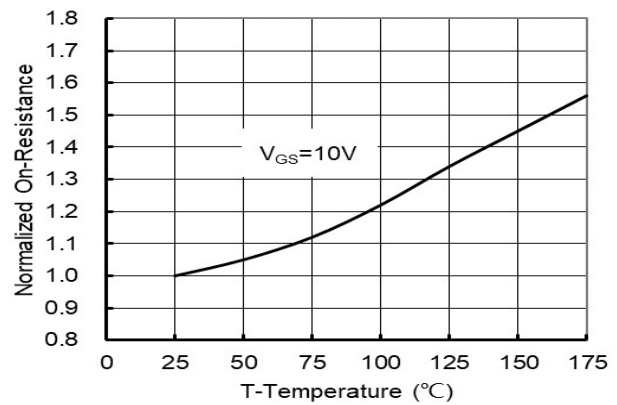


Figure6. Drain-Source on Resistance



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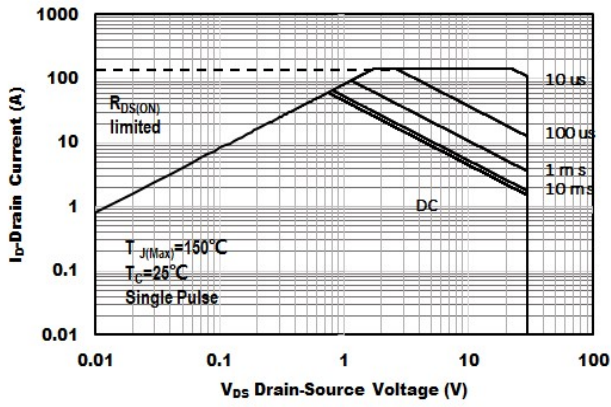


Figure7. Safe Operation Area

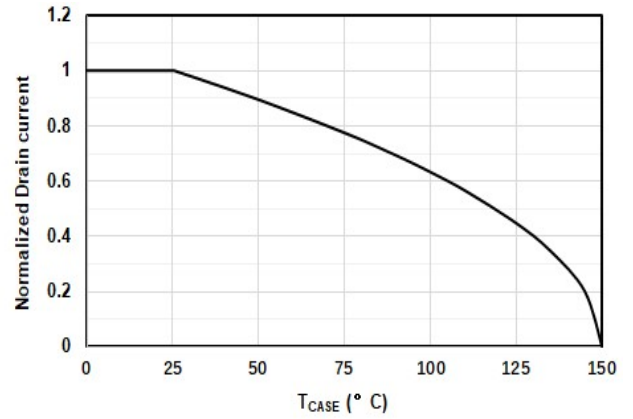


Figure8. Drain current vs. Case Temperature

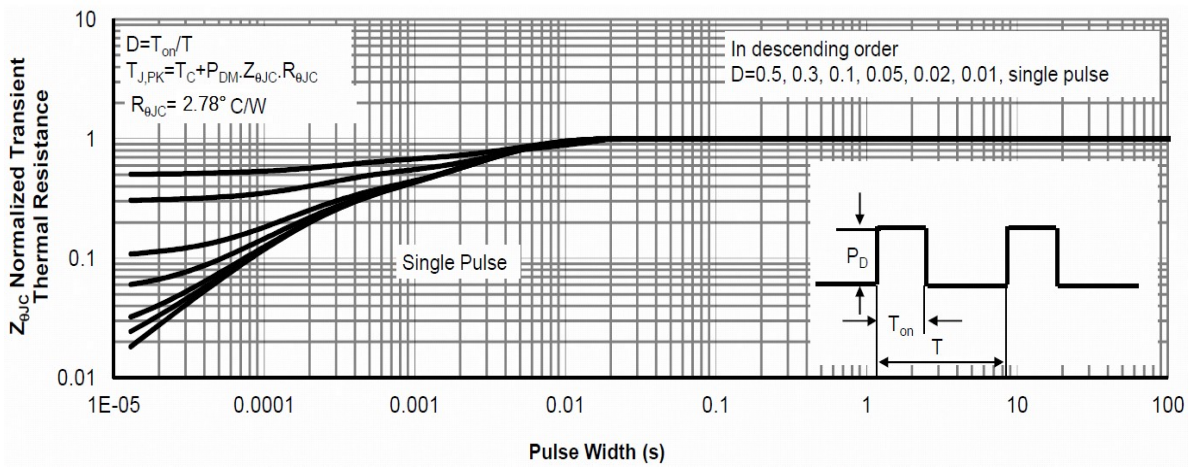
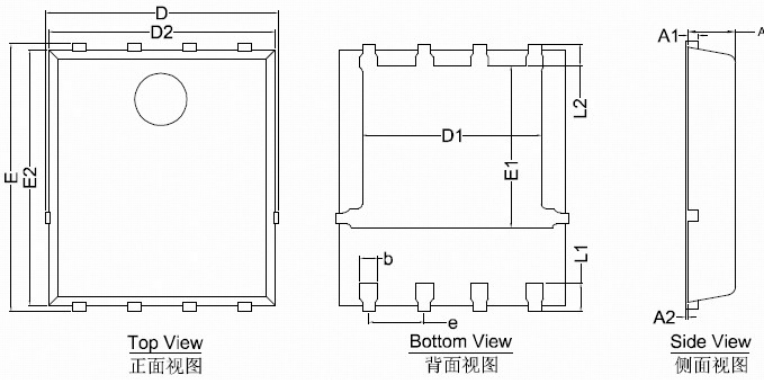


Figure 9. Normalized Maximum Transient Thermal Impedance

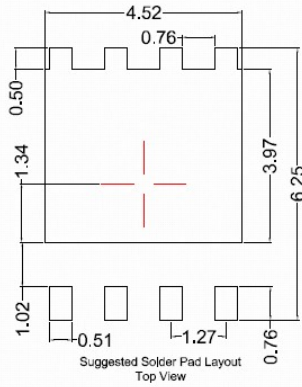


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■ PDFN 5x6 Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
D	5.15	5.35	5.55
E	5.95	6.15	6.35
A	1.00	1.10	1.20
A1	0.254 BSC		
A2			0.10
D1	3.92	4.12	4.32
E1	3.52	3.72	3.92
D2	5.00	5.20	5.40
E2	5.66	5.86	6.06
L1	0.56	0.66	0.76
L2	0.50 BSC		
b	0.31	0.41	0.51
e	1.27 BSC		



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.10\text{mm}$.
 3. The pad layout is for reference purposes only.



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