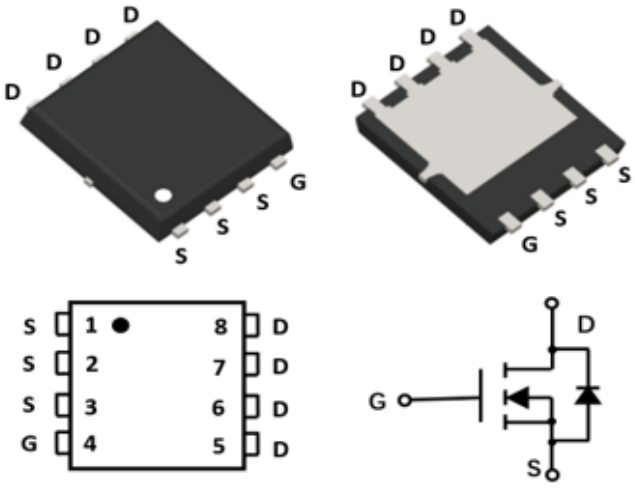
N-Channel Enhancement Mode Field Effect Transistor

PDFN5060



Product Summary

- V_{DS} 40V
- I_D 200A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜1.35mohm
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜2.1mohm
- 100% UIS Tested
- 100% ▽V_{DS} Tested

General Description

- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Applications

- Consumer electronic power supply
- Motor control
- Synchronous- rectification
- Invertors

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

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	40	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current	Tc=25℃	I_D	200	A
	Tc=100℃		152	
Pulsed Drain Current [A]		I_{DM}	600	A
Avalanche energy [B]		E_{AS}	625	mJ
Total Power Dissipation [C]	Tc=25℃	P_D	120	W
	Tc=100℃		48	
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

■Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient [D]	t≤10S	$R_{\theta JA}$	14	19	℃/W
Thermal Resistance Junction-to-Ambient [D]	Steady-State		37	48	
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	0.85	1.04	

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJG200G04AR	F1	G200G04AR	5000	10000	100000	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	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V,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	1.8	2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A	-	1.1	1.35	mΩ
		V_{GS}=4.5V, I_D=20A	-	1.5	2.1	mΩ
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V	-	-	1.3	V
Maximum Body-Diode Continuous Current	I_S		-	-	200	A
Gate resistance	R_G	f=1MHz, Open drain	-	3.4	-	Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V,f=1MHZ	-	7100	-	pF
Output Capacitance	C_{oss}		-	1298	-	
Reverse Transfer Capacitance	C_{rss}		-	55	-	
Switching Parameters						
Total Gate Charge	$Q_{g(10V)}$	V_{GS}=10V,V_{DS}=20V,I_D=20A	-	132	-	nC
Gate-Source Charge	Q_{gs}		-	25	-	
Gate-Drain Charge	Q_{gd}		-	24.6	-	
Reverse Recovery Charge	Q_{rr}	I_F=20A, di/dt=100A/us	-	54	-	
Reverse Recovery Time	t_{rr}		-	56	-	ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DD}=20V,I_D=20A R_{GEN}=2.2Ω	-	18.8	-	
Turn-on Rise Time	t_r		-	70.1	-	
Turn-off Delay Time	$t_{D(off)}$		-	136.8	-	
Turn-off fall Time	t_f		-	92.3	-	

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

B. T_J=25℃, V_{DD}=25V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=50A.

C. P_d is based on max. junction temperature, using junction-case thermal resistance.

D. The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25° C. The Power dissipation PDSM is based on $R_{\theta JA}$ t≤ 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

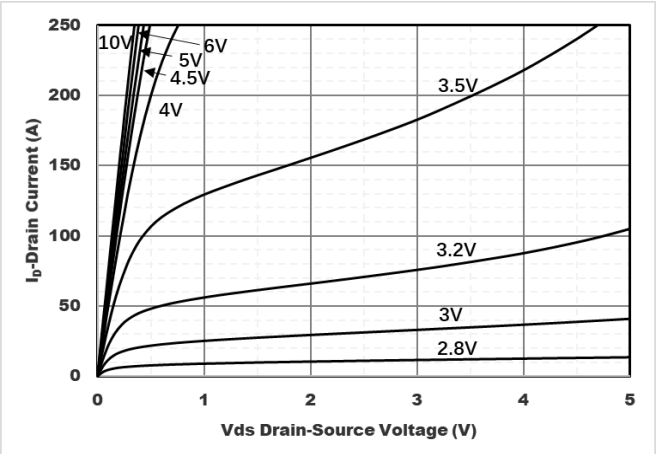


Figure1. Output Characteristics

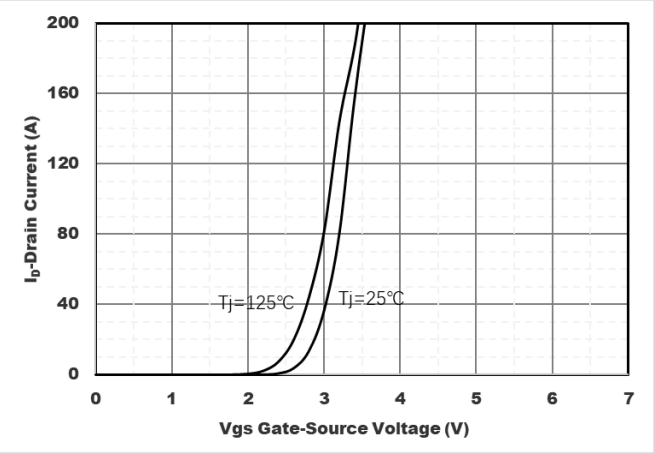


Figure2. Transfer Characteristics

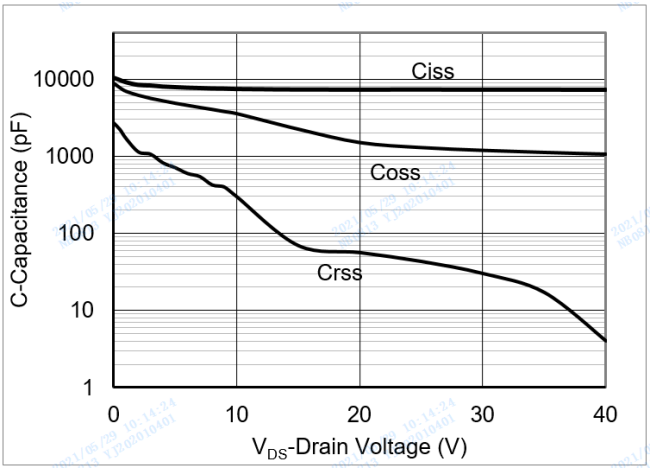


Figure3. Capacitance Characteristics

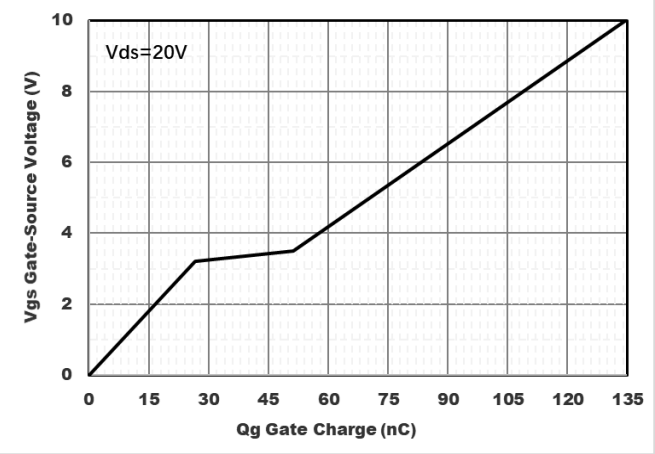


Figure4. Gate Charge

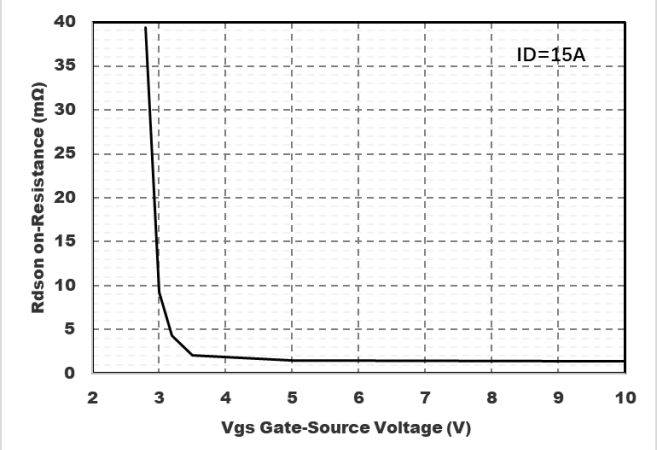


Figure5. : On-Resistance vs. Drain Current and Gate Voltage

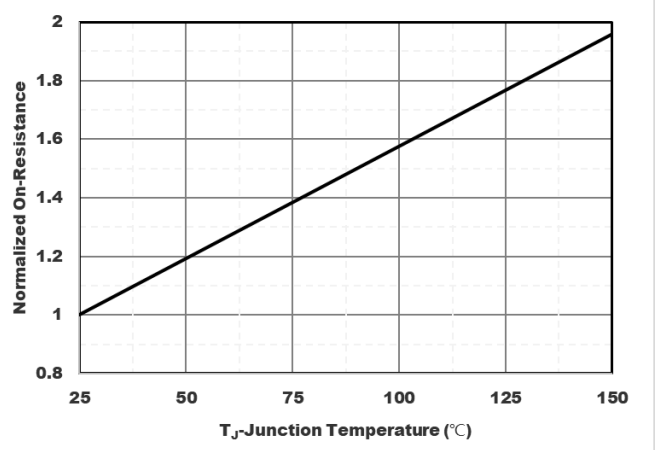


Figure6.Normalized On-Resistance

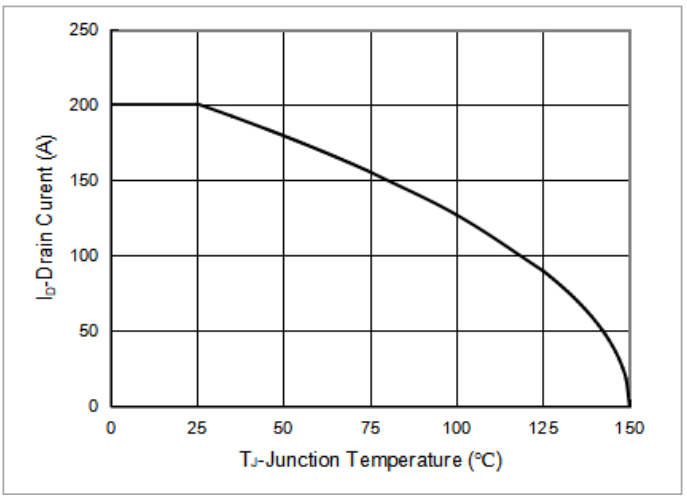


Figure7. Drain current

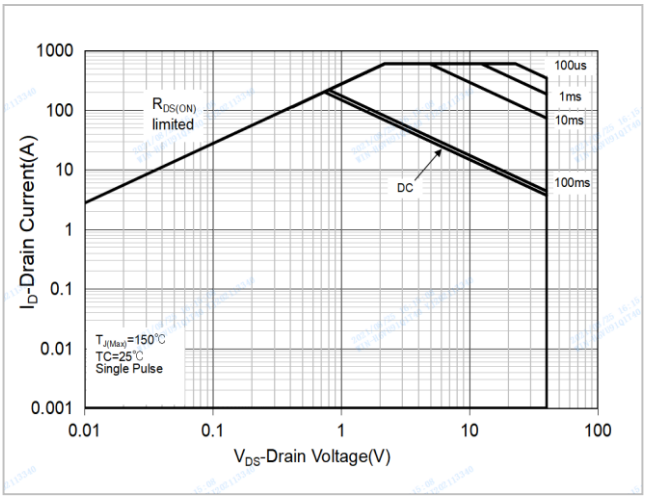


Figure8.Safe Operation Area

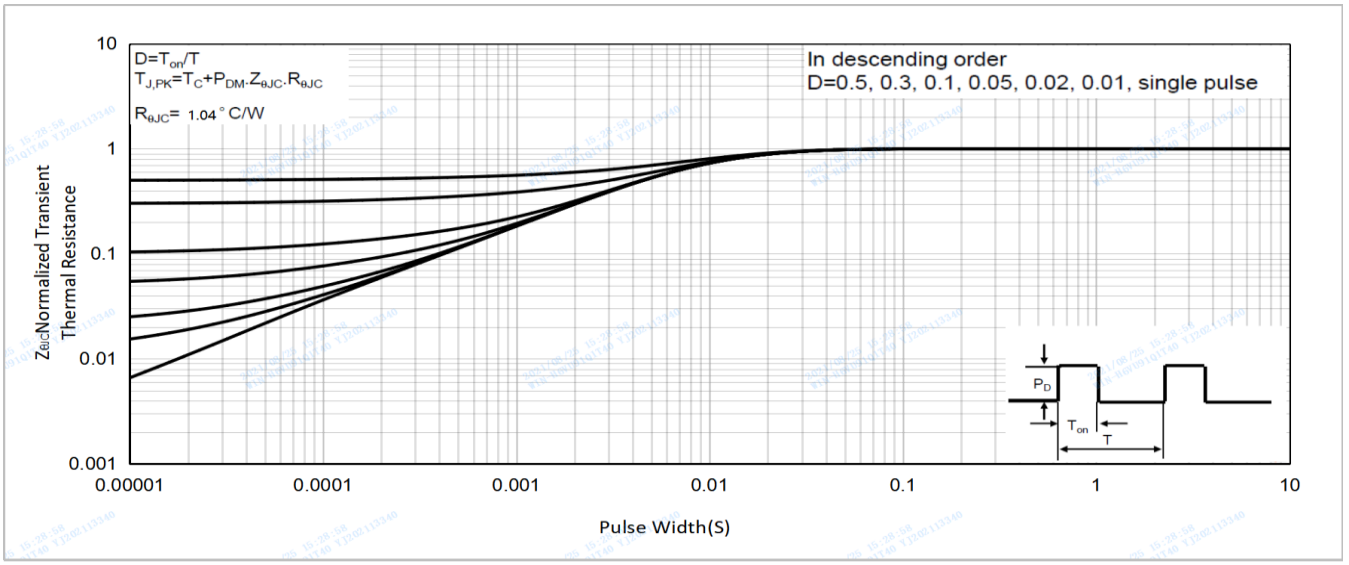
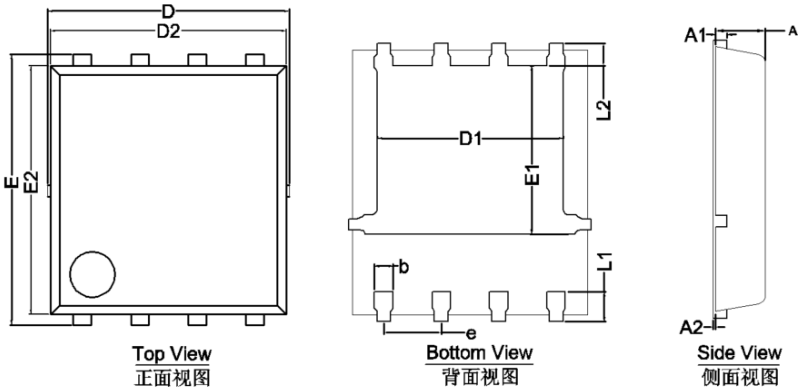
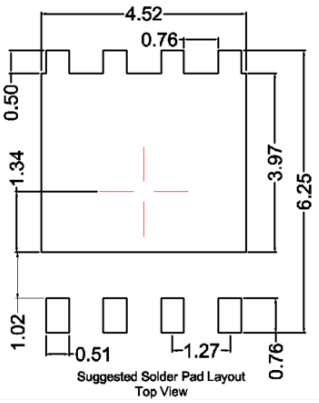


Figure9.Normalized Maximum Transient thermal impedance

■ PDFN5060-8L-D-0.95MM Package information





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

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
D	5.15	5.35	5.55
E	5.95	6.05	6.15
A	0.85	0.95	1.00
A1		0.203 BSC	
A2			0.08
D1	4.25	4.35	4.45
E1	3.525	3.625	3.725
D2		5.20	
E2		5.55	
L1	0.45	0.55	0.65
L2		0.68 BSC	
b	0.3	0.4	0.5
e		1.27 BSC	

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