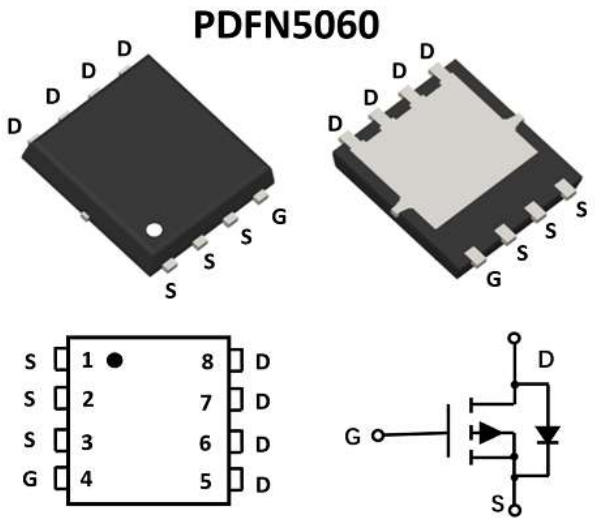
P-Channel Enhancement Mode Field Effect Transistor



Product Summary

- V_{DS} -60V
- I_D -25A
- $R_{DS(ON)}$(at V_{GS}=-10V) ＜50 mohm
- $R_{DS(ON)}$(at V_{GS}=-4.5V) ＜65 mohm
- 100% UIS Tested
- 100% ▽V_{DS} Tested

General Description

- Split gate trench MOSFET technology
- Low $R_{DS(on)}$ & FOM
- Low Crss
- Extremely low switching loss
- Excellent stability and uniformity

Applications

- Automotive Systems
- Industrial DC/DC Conversion Circuits

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

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	-60	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current	Tc=25℃	I_D	-25	A
	Tc=100℃		-16	
Pulsed Drain Current [A]		I_{DM}	-75	A
Avalanche energy [B]		E_{AS}	81	mJ
Total Power Dissipation [C]	Tc=25℃	P_D	60	W
	Tc=100℃		24	
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	$R_{\theta JA}$	15	20	℃/W
Thermal Resistance Junction-to-Ambient [D]	Steady-State		40	50	
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	1.7	2.1	

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJG25GP06A	F1	YJG25GP06A	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		-60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-60V,V_{GS}=0V	T_J=25℃			-1	μA
			T_J=55℃			-5	
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		-1.3	-1.8	-2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= -10V, I_D=-20A			38	50	mΩ
		V_{GS}= -4.5V, I_D=-10A			48	65	
Gate Resistance	Rg	f=1MHz, Open Drain			12		Ω
Diode Forward Voltage	V_{SD}	I_S=-20A,V_{GS}=0V			-0.95	-1.3	V
Maximum Body-Diode Continuous Current	I_S					-25	A
Dynamic Parameters							
Input Capacitance	C_{iss}	V_{DS}=-30V,V_{GS}=0V,f=1MHZ			1100		pF
Output Capacitance	C_{oss}				350		
Reverse Transfer Capacitance	C_{rss}				28		
Switching Parameters							
Total Gate Charge	$Q_{g(-10V)}$	V_{GS}=-10V,V_{DS}=-30V,I_D=-20A			18.7		nC
Total Gate Charge	$Q_{g(-4.5V)}$				8.8		
Gate-Source Charge	Q_{gs}				4.7		
Gate-Drain Charge	Q_{gd}				3.0		
Reverse Recovery Chrage	Q_{rr}	I_F=-20A, di/dt=100A/us			8.2		
Reverse Recovery Time	t_{rr}				20.2		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=-10V,V_{DD}=-30V,R_L=2.5Ω R_{GEN}=6Ω			7.5		
Turn-on Rise Time	t_r				39.5		
Turn-off Delay Time	$t_{D(off)}$				43.6		
Turn-off fall Time	t_f				55.1		

A. Repetitive rating; pulse width limited by max. junction temperature.
B. V_{DD}=50V, R_G=25Ω, L=0.5mH, I_{AS}=18A.
C. Pd is based on max. junction temperature, using junction-case thermal resistance.
D. The value of RqJA is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C. The Power dissipation PDSM is based on R qJA 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

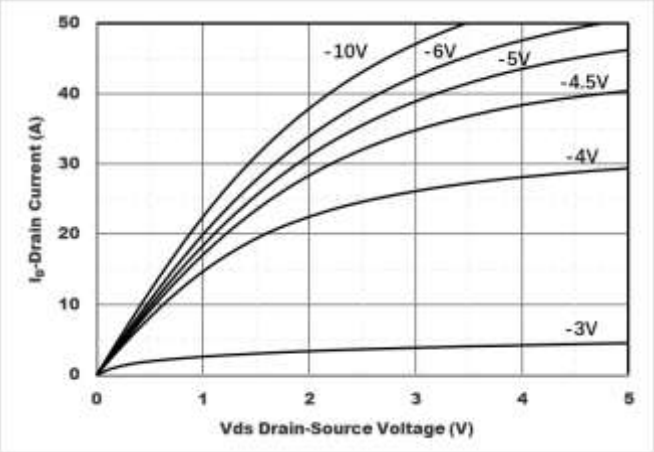


Figure1. Output Characteristics

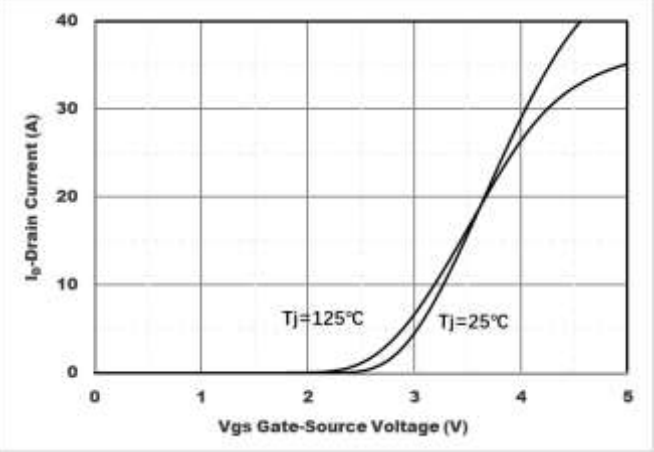


Figure2. Transfer Characteristics

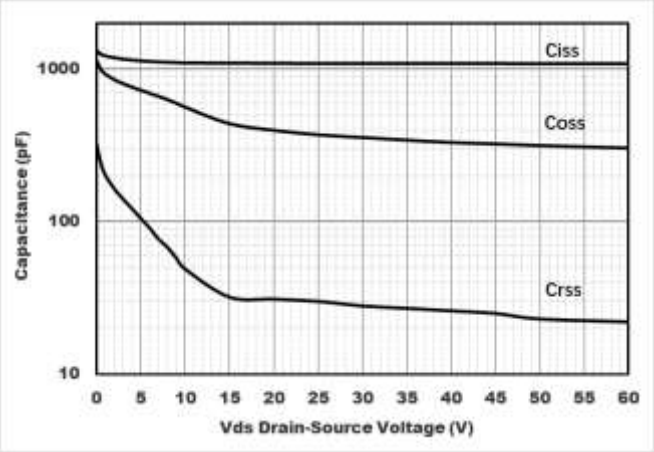


Figure3. Capacitance Characteristics

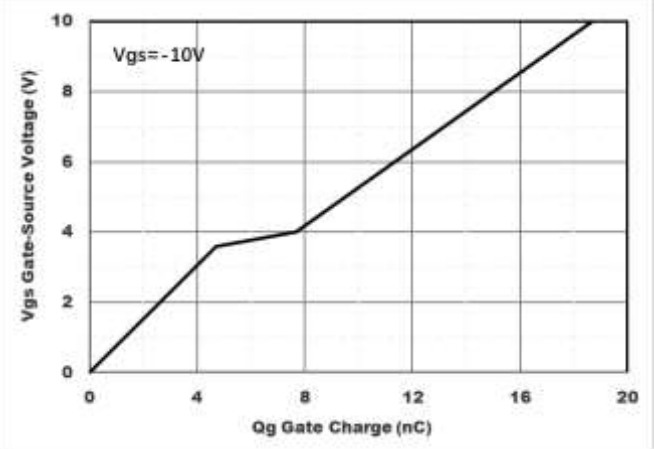


Figure4. Gate Charge

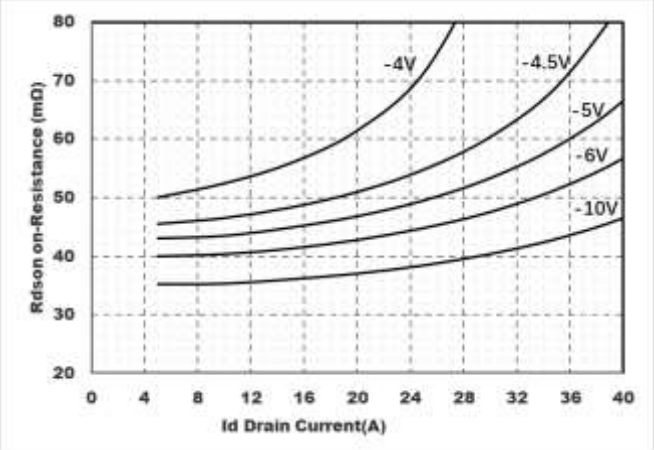


Figure5. **:** On-Resistance vs. Gate to Source Voltage

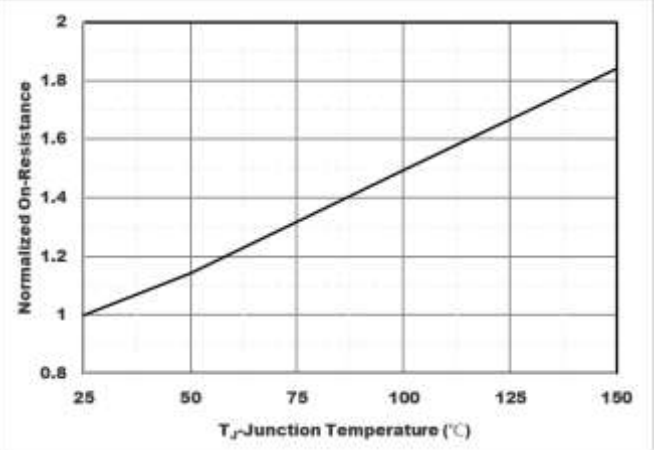


Figure6.Normalized On-Resistance

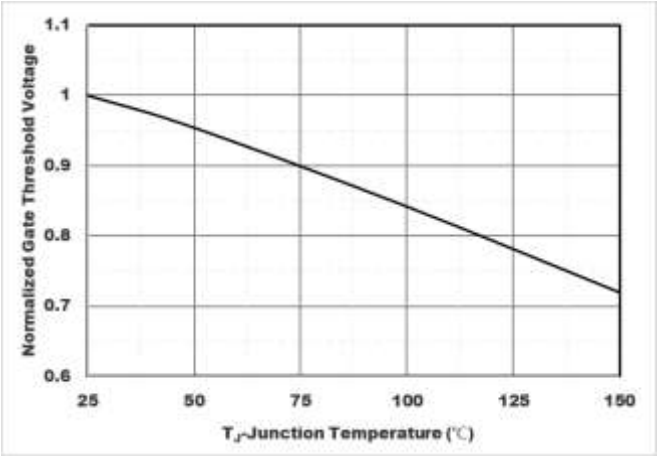


Figure7. Normalized Gate Threshold Voltage

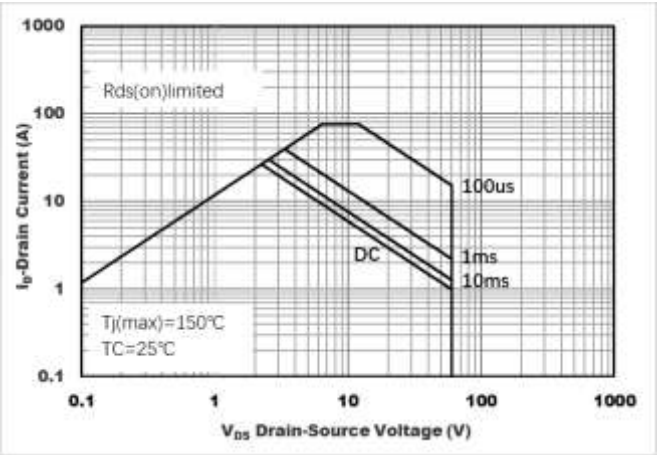


Figure8.Safe Operation Area

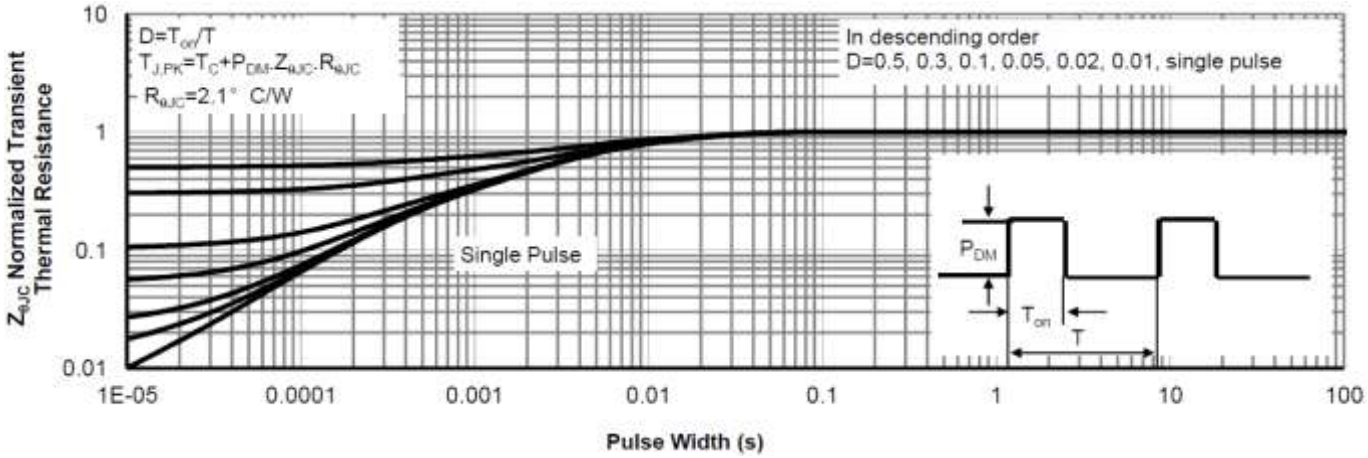
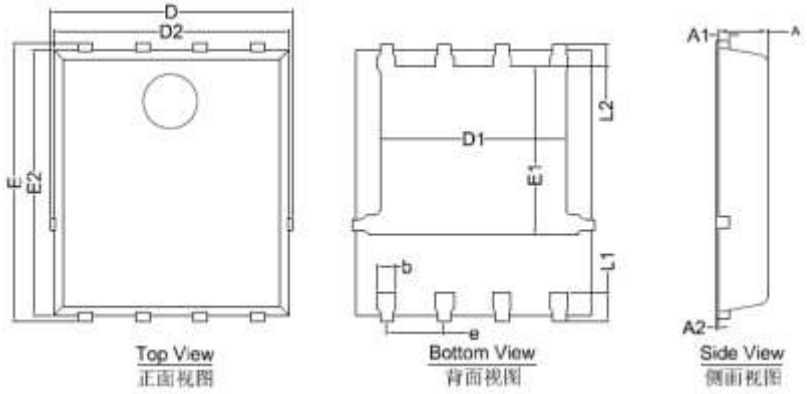
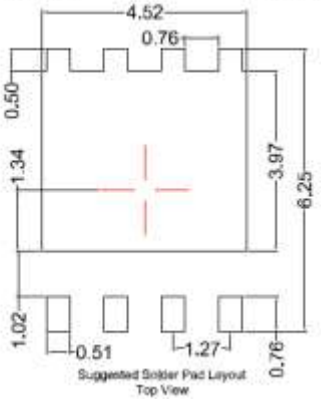


Figure9.Normalized Maximum Transient thermal impedance

■ PDFN5060-8L 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:±0.10mm.
3.The pad layout is for reference purposes only.

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