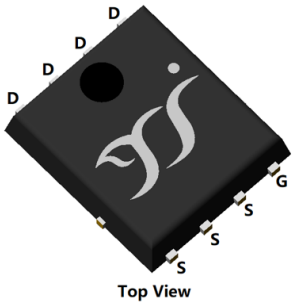
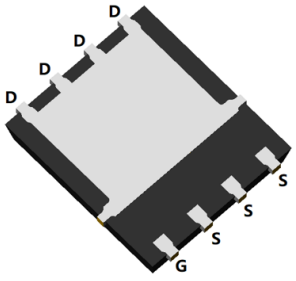
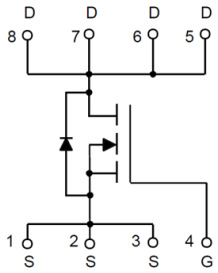
N-Channel Enhancement Mode Field Effect Transistor



Top View



Bottom View



PDFN5060-8L

Product Summary

- V_{DS} 40V
- I_D 30A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜16mΩ
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜20mΩ
- 100% EAS Tested
- 100% ▽V_{DS} Tested

General Description

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Part no. with suffix "Q" means AEC-Q101 qualified

Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor
- 12V Automotive systems

■ 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	T_A=25℃	I_D	8.8	A
	T_A =100℃		6	
	T_C=25℃		30	
	T_C =100℃		21	
Pulsed Drain Current [A]		I_{DM}	90	A
Avalanche energy [B]		EAS	40	mJ
Total Power Dissipation [C]	T_A=25℃	P_D	2.5	W
	T_A =100℃		1	
	T_C=25℃		35.7	
	T_C =100℃		14	
Thermal Resistance Junction-to-Case		$R_{\theta JC}$	3.5	℃/W
Thermal Resistance Junction-to-Ambient [D]		$R_{\theta JA}$	50	℃/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
YJG30N04AQ	F1	YJG30N04A	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	1.6	2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A		10	16	mΩ
		V_{GS}=4.5V, I_D=10A		13.5	20	mΩ
Diode Forward Voltage	V_{SD}	I_S=18A, V_{GS}=0V		0.85	1.2	V
Gate resistance	R_G	f=1MHz		2.7		Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1MHz		1000		pF
Output Capacitance	C_{oss}			105		
Reverse Transfer Capacitance	C_{rss}			85		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=20V, I_D=20A	-	23	-	nC
Gate-Source Charge	Q_{gs}		-	3.5	-	
Gate-Drain Charge	Q_{gd}		-	6.5	-	
Reverse Recovery Charge	Q_{rr}	I_F=20A, di/dt=300A/us	-	10	-	nC
Reverse Recovery Time	t_{rr}		-	12	-	ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DD}=20V, I_D=20A R_{GEN}=3Ω	-	3.8	-	ns
Turn-on Rise Time	t_r		-	58	-	
Turn-off Delay Time	$t_{D(off)}$		-	20	-	
Turn-off fall Time	t_f		-	2.6	-	

A. Repetitive rating; pulse width limited by max. junction temperature.
B. T_J=25℃, V_{DD}=35V, V_G=10V, L=1mH, IAS=9A.
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 1 in^2 FR-4 board with 2oz. Copper, in the still air environment with T_A =25℃. The maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

■Typical Electrical and Thermal Characteristics Diagrams

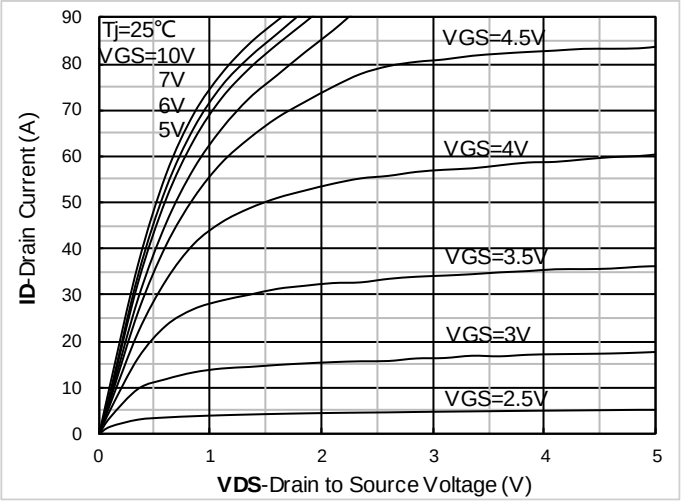


Figure 1. Output Characteristics

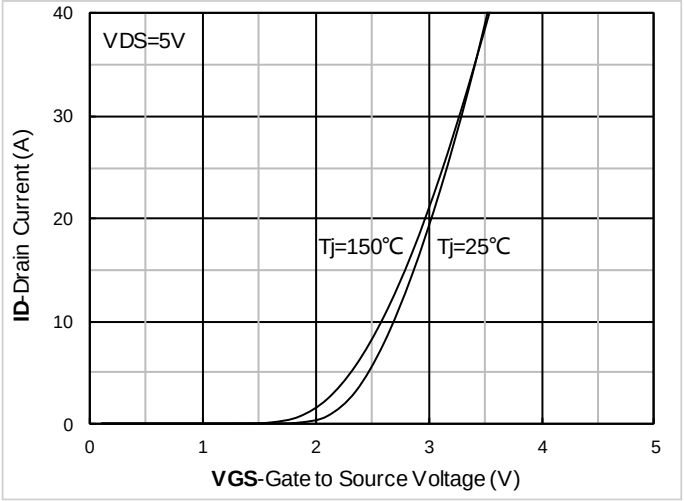


Figure 2. Transfer Characteristics

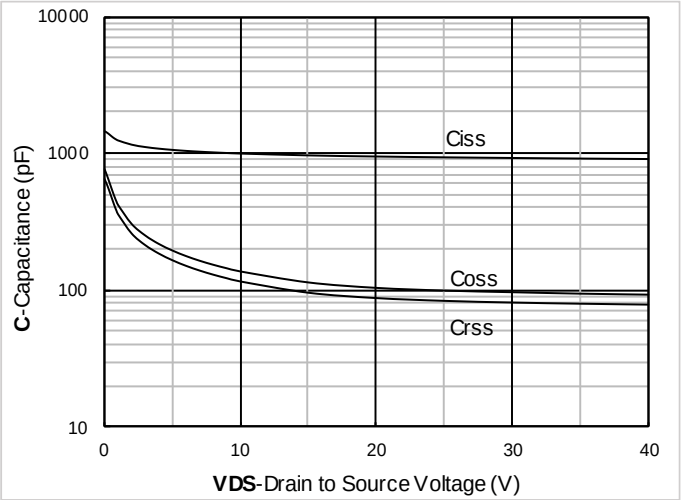


Figure 3. Capacitance Characteristics

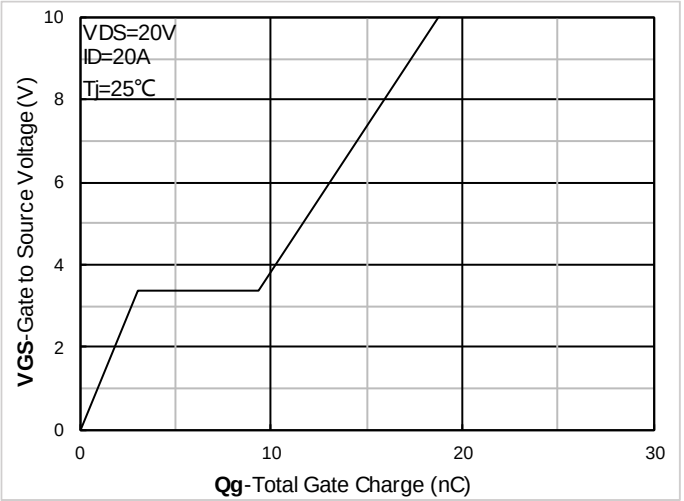


Figure 4. Gate Charge

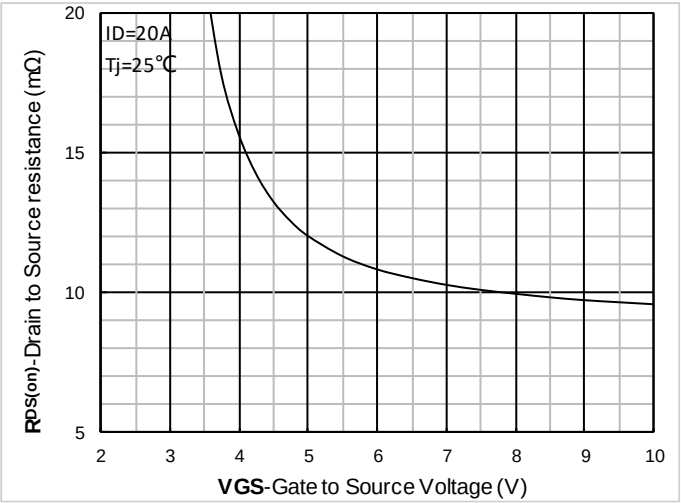


Figure 5. On-Resistance vs Gate to Source Voltage

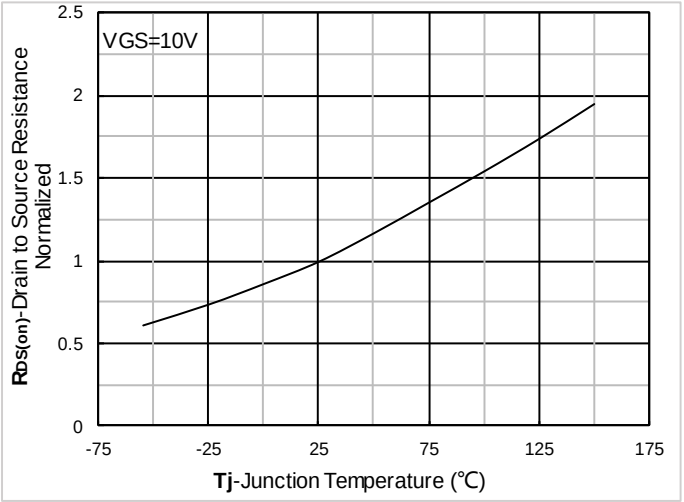


Figure 6. Normalized On-Resistance

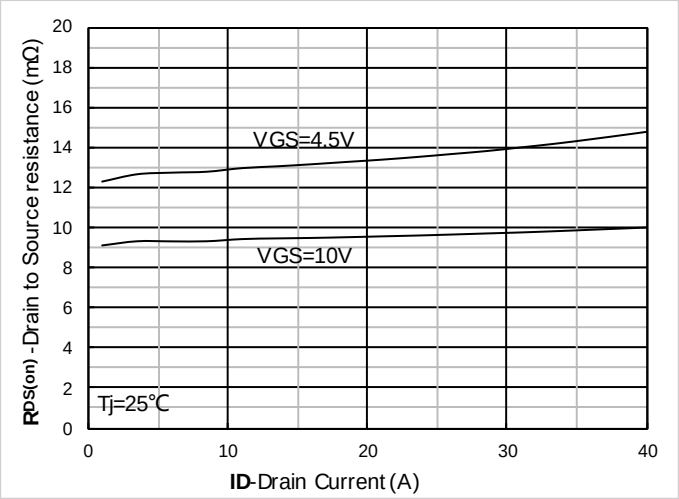


Figure 7. $R_{DS(on)}$ VS Drain Current

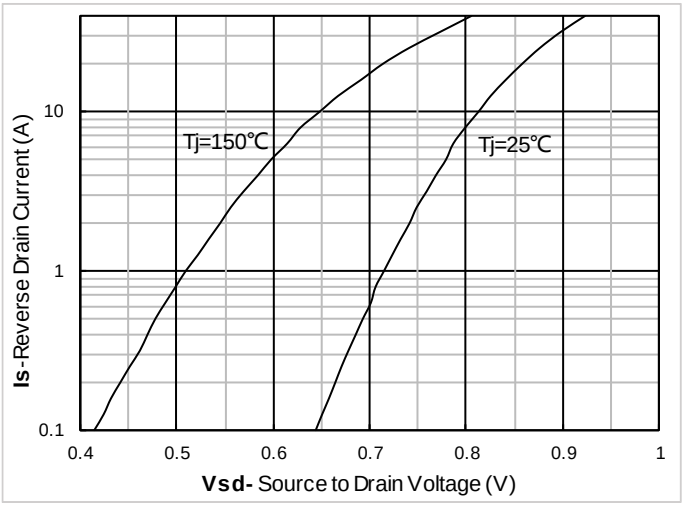


Figure 8. Forward characteristics of reverse diode

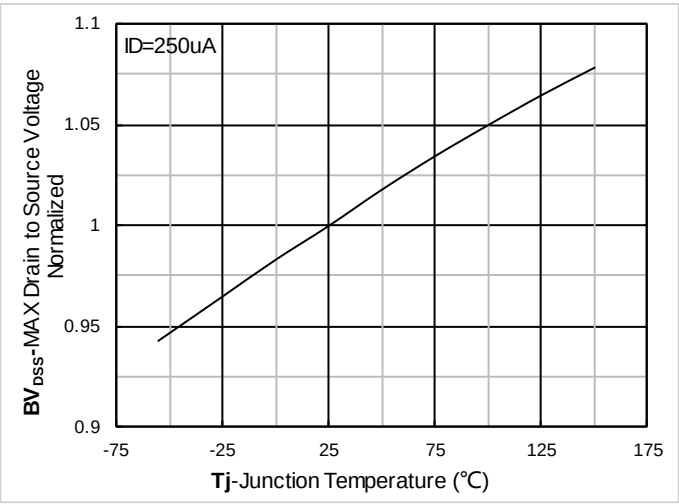


Figure 9. Normalized breakdown voltage

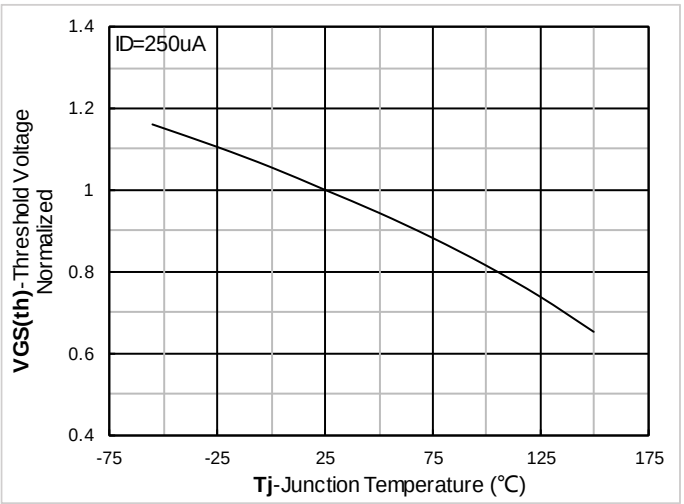


Figure 10. Normalized Threshold voltage

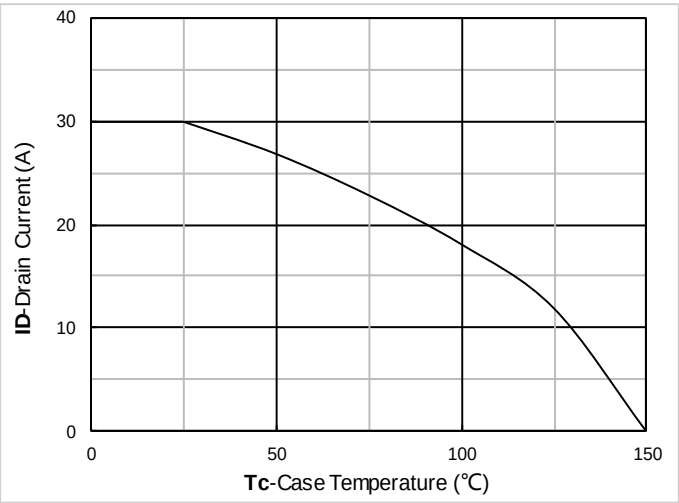


Figure 11. Current dissipation

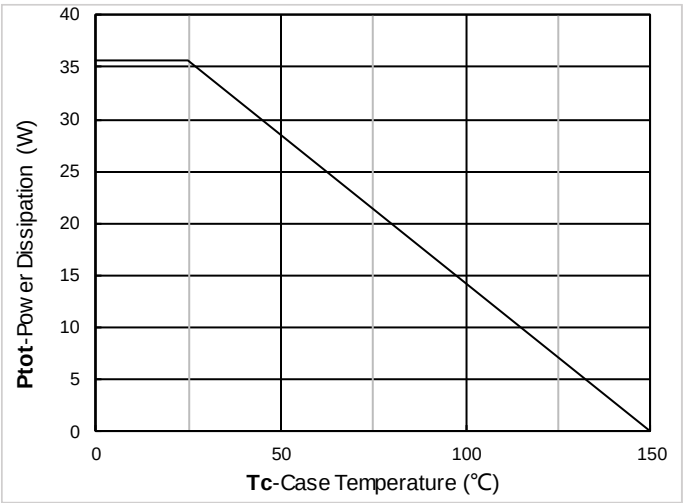


Figure 12. Power dissipation

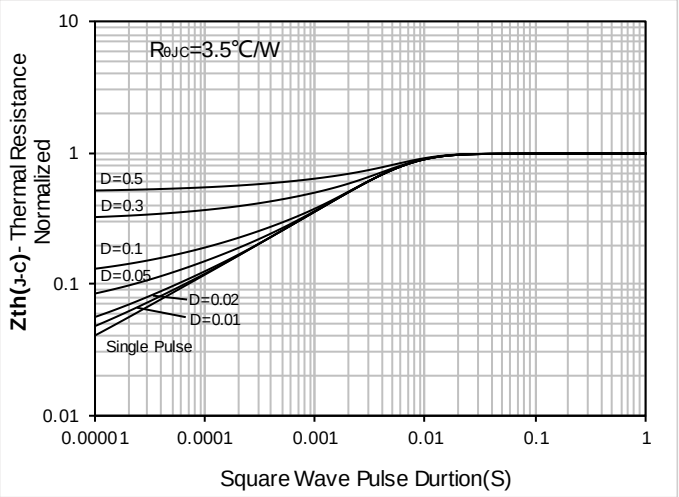


Figure 13. Maximum Transient Thermal Impedance

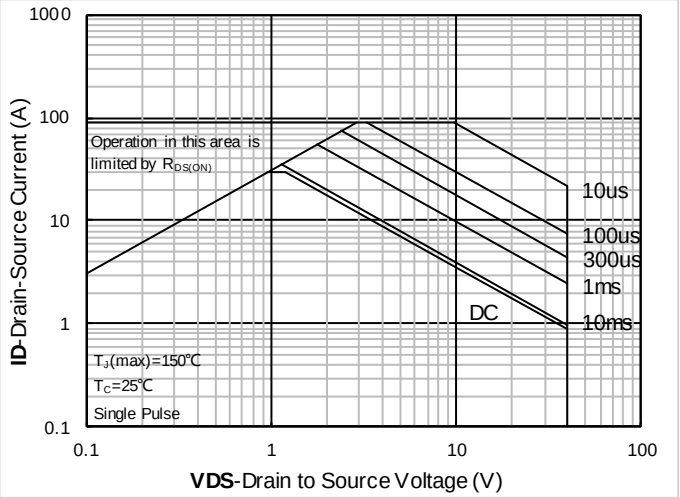
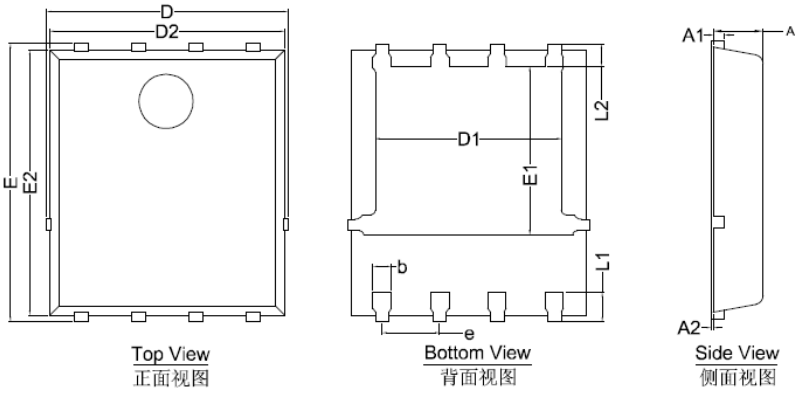
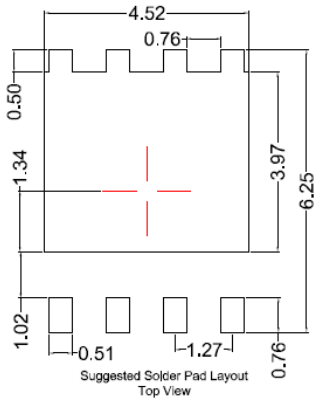


Figure 14. Safe Operation Area

■ PDFN5060-8L-1.1MM 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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