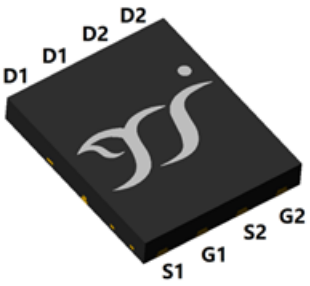
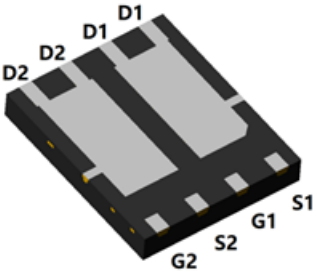
N-Channel Enhancement Mode Field Effect Transistor

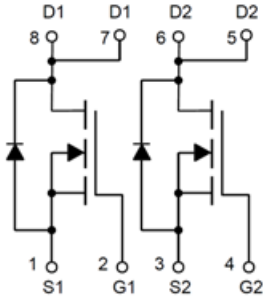


Top View



Bottom View

DFN5060-8L



Product Summary

NMOS (Die1)

- V_{DS} 30V
- I_D 40A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜9.2mohm
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜14.5mohm

NMOS (Die2)

- V_{DS} 30V
- I_D 40A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜9.2mohm
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜14.5mohm

- 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

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

Parameter		Symbol	N-Die1	N-Die2	Unit
Drain-source Voltage		V_{DS}	30	30	V
Gate-source Voltage		V_{GS}	±20	±20	V
Drain Current	T_C=25℃	I_D	40	40	A
	T_C=100℃		25	25	
Pulsed Drain Current [A]		I_{DM}	140	140	A
Total Power Dissipation	T_C=25℃	P_D	21	21	W
	T_C=100℃		8.4	8.4	W
Total Power Dissipation	T_A=25℃	P_D	5	5	W
Single Pulse Avalanche Energy [B]		E_{AS}	49	49	mJ
Thermal Resistance Junction-to-Case [C]		$R_{\theta JC}$	6	6	℃/ W
Thermal Resistance Junction-to-Ambient [C]		$R_{\theta JA}$	25	25	℃/ W
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	-55～+150	℃

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJGD40N03A	F1	YJGD40N03A	5000	10000	100000	13“ reel

■ NMOS (Die1/Die2) 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	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		7.2	9.2	mΩ
		V_{GS}= 4.5V, I_D=10A		11	14.5	
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	Rg	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		
Reverse Recovery Time	t_{rr}			5		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DD}=20V, I_D=2A,R_L=1Ω R_{GEN}=3Ω		7		
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℃, V_{DD}=25V, V_G=10V, L=0.5mH, I_{AS}=14A

C. $R_{\theta JA}$ 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. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ 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

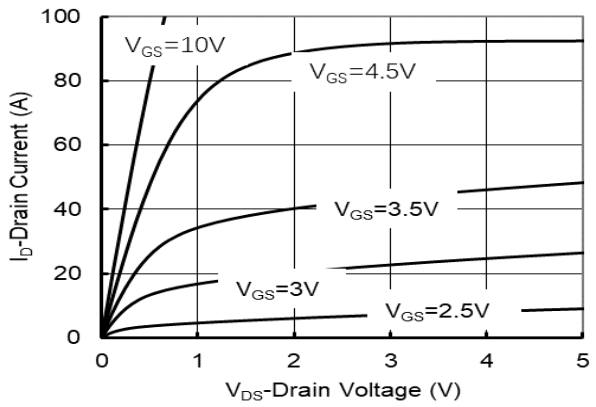


Figure1. Output Characteristics

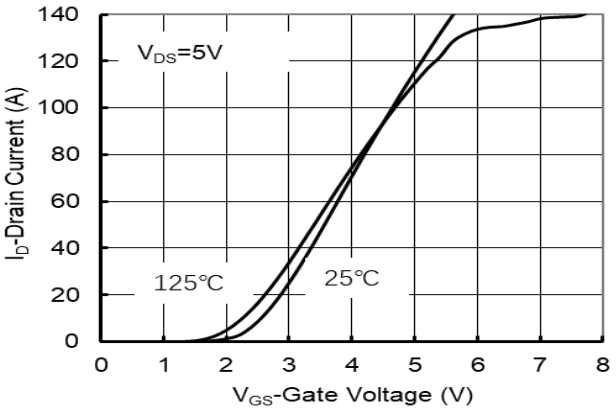


Figure2. Transfer Characteristics

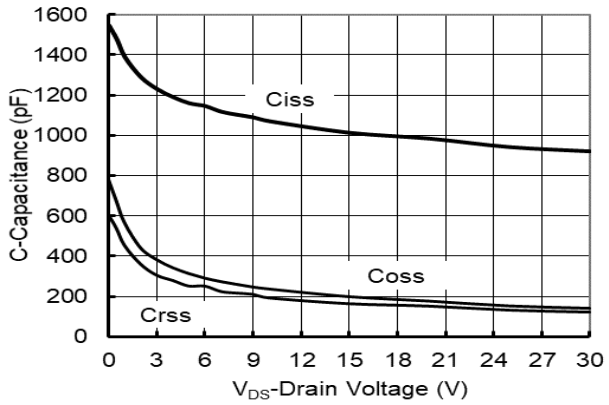


Figure3. Capacitance Characteristics

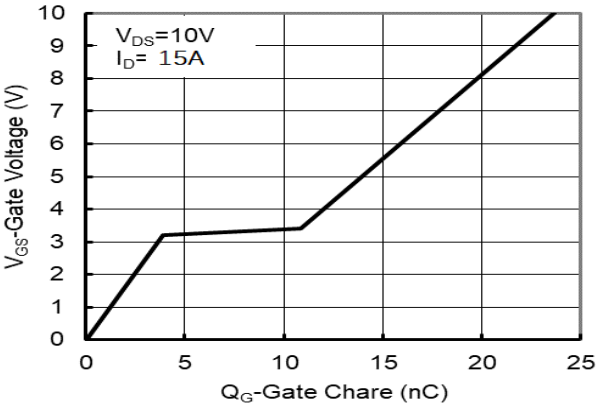


Figure4. Gate Charge

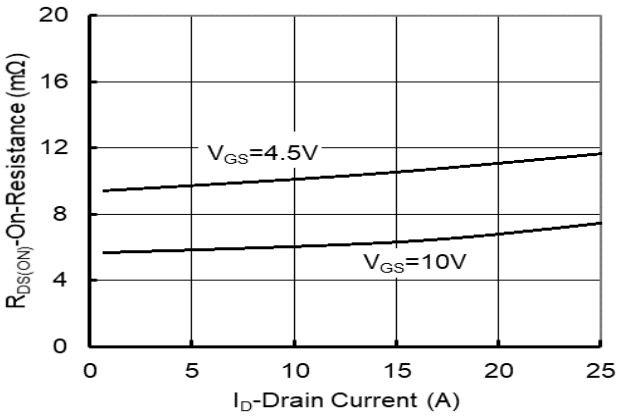


Figure5. Drain-Source on Resistance

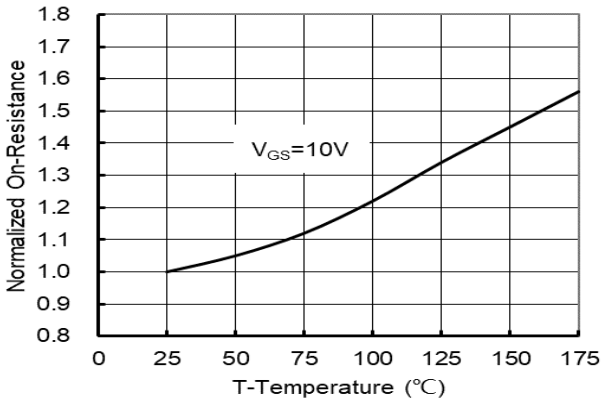


Figure6. Drain-Source on Resistance

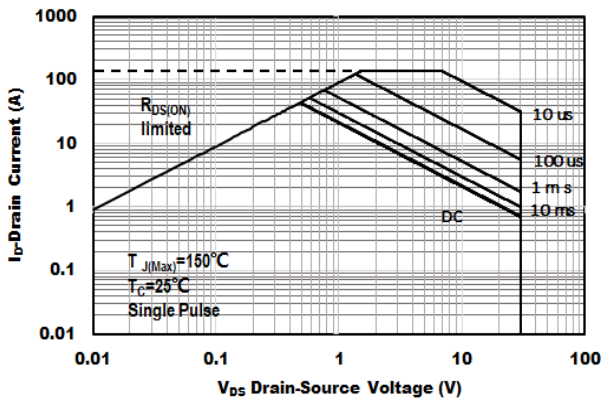


Figure7. Safe Operation Area

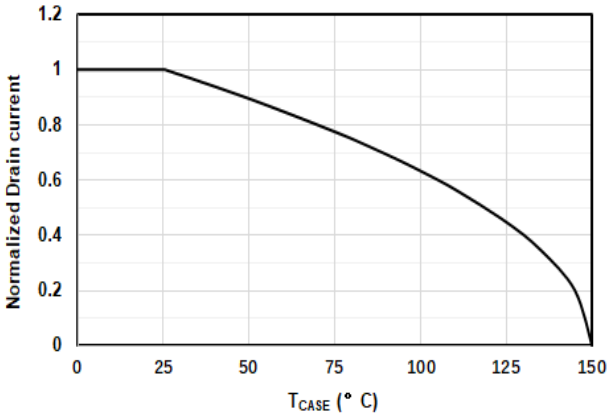


Figure8. Drain current vs. Case Temperature

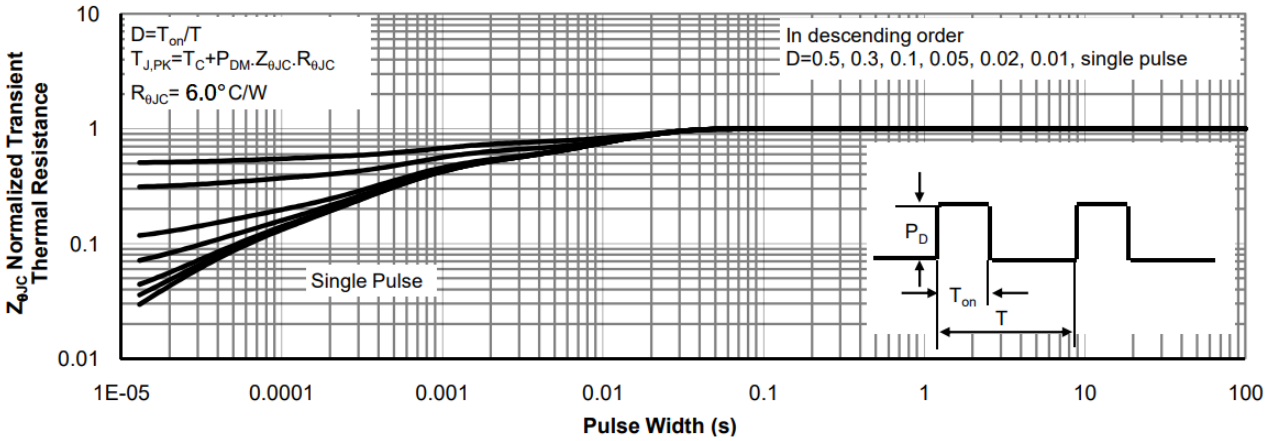
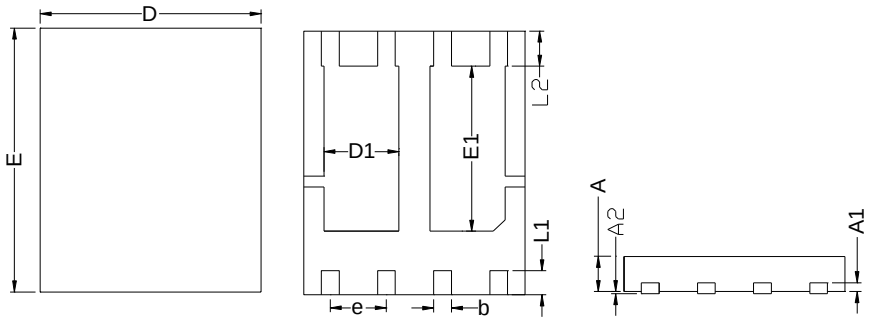


Figure 9. Normalized Maximum Transient Thermal Impedance

■ DFN5060-8L Package Information



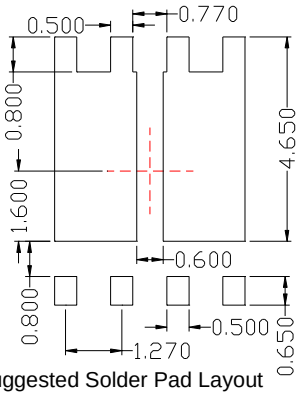
Top View
正面视图

Bottom View
背面视图

Side View
侧面视图

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
D	4.90	5.00	5.10
E	5.90	6.00	6.10
A	0.70	0.80	0.90
A1		0.20 BSC	
A2			0.10
D1	1.60	1.70	1.80
E1	3.65	3.75	3.85
L1	0.45	0.55	0.65
L2		0.80 BSC	
b	0.30	0.40	0.50
e		1.27 BSC	

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



Suggested Solder Pad Layout
Top View

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