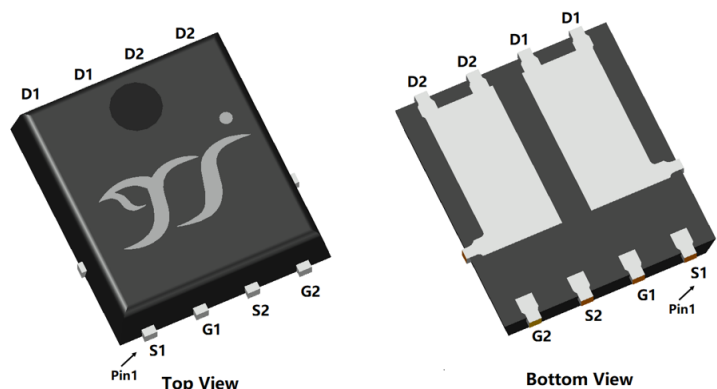


N-Channel and P-Channel Complementary MOSFET



PDFN5060-8L

Product Summary

NMOS

• V_{DS}	60V
• I_D	20A
• $R_{DS(ON)}$ (at $V_{GS}=10V$)	<34m Ω
• $R_{DS(ON)}$ (at $V_{GS}=4.5V$)	<44m Ω

PMOS

• V_{DS}	-60V
• I_D	-7.7A
• $R_{DS(ON)}$ (at $V_{GS}=-10V$)	<134m Ω
• $R_{DS(ON)}$ (at $V_{GS}=-4.5V$)	<181m Ω

- 100% EAS Tested
- 100% ∇V_{DS} Tested

General Description

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- High Speed switching
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Wireless charger
- Load switch
- Power management
- DC fan

Limiting Values

Parameter	Conditions			Symbol	NMOS		PMOS		Unit
					Min	Max	Min	Max	
Drain-source Voltage				V _{DS}	-	60	-	-60	V
Gate-source Voltage				V _{GS}	-20	20	-20	20	
Continuous Drain Current (Note 1,2)	Steady-State	T _A =25°C	NMOS:V _{GS} =10V, PMOS:V _{GS} =-10V	I _D	-	5.5	-	-2.8	A
		T _A =100°C			-	3.4	-	-1.7	
Continuous Drain Current (Note 1,3)	Steady-State	T _C =25°C	NMOS:V _{GS} =10V, PMOS:V _{GS} =-10V, Chip limitation		-	20	-	-7.7	
		T _C =100°C			-	12.6	-	-4.8	
Pulsed Drain Current	T _C =25°C, t _p ≤10μs			I _{DM}	-	80	-	-30.8	
Maximum Body-Diode Continuous Current	T _C =25°C			I _S	-	20	-	-7.7	
Avalanche Energy (non-repetitive)	NMOS:T _J =25°C, V _G =10V, R _G =25Ω, L=0.5mH, I _{AS} =12.6A			EAS	-	39.6	-	12.2	mJ
	PMOS:T _J =25°C, V _G =-10V, R _G =25Ω, L=0.5mH, I _{AS} =-7A								
Total Power Dissipation (Note 1,2)	Steady-State	T _A =25°C	P _D	-	2.08	-	2	W	
		T _A =100°C		-	0.83	-	0.8		
Total Power Dissipation (Note 1,3)	Steady-State	T _C =25°C		-	29.7	-	15.2		
		T _C =100°C		-	11.9	-	6.1		
Junction and Storage Temperature Range				T _J , T _{STG}	-55	150	-55	150	°C

Thermal Resistance

Parameter		Symbol	NMOS		PMOS		Units
			Typ	Max	Typ	Max	
Thermal Resistance Junction-to-Ambient (Note 2)	Steady-State	$R_{\theta JA}$	-	60	-	62	$^{\circ}C/W$
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	-	4.2	-	8.2	



YJG034NP06A

■ NMOS Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V,I _b =250μA,T _j =25°C	60	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V,V _{GS} =0V,T _j =25°C	-	-	1	μA
		V _{DS} =60V,V _{GS} =0V,T _j =125°C	-	-	100	
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V,V _{DS} =0V,T _j =25°C	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =250μA,T _j =25°C	1	1.5	2	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V,I _D =7.5A,T _j =25°C	-	26	34	mΩ
		V _{GS} =4.5V,I _D =4.5A,T _j =25°C	-	29.5	44	
Diode Forward Voltage	V _{SD}	I _S =7.5A,V _{GS} =0V,T _j =25°C	-	0.84	1.2	V
Gate Resistance	R _G	f=1MHz,T _j =25°C	-	1.7	-	Ω
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =30V,V _{GS} =0V,f=1MHz,T _j =25°C	-	1171	-	pF
Output Capacitance	C _{oss}		-	65	-	
Reverse Transfer Capacitance	C _{rss}		-	55	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V,V _{DS} =30V,I _D =7.5A,T _j =25°C	-	22.7	-	nC
Gate-Source Charge	Q _{gs}		-	3.2	-	
Gate-Drain Charge	Q _{gd}		-	4.6	-	
Reverse Recovery Charge	Q _{rr}	I _F =7.5A,di/dt=100A/μs,V _{GS} =0V,V _R =30V,T _j =25°C	-	18	-	nC
Reverse Recovery Time	t _{rr}		-	19	-	ns
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V,V _{DS} =30V,I _D =7.5A,R _{GEN} =3Ω,T _j =25°C	-	8.4	-	ns
Turn-on Rise Time	t _r		-	3.5	-	
Turn-off Delay Time	t _{D(off)}		-	27.6	-	
Turn-off Fall Time	t _f		-	3.9	-	



■ PMOS Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA, T _j =25°C	-60	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-60V, V _{GS} =0V, T _j =25°C	-	-	-1	μA
		V _{DS} =-60V, V _{GS} =0V, T _j =125°C	-	-	-100	
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V, T _j =25°C	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA, T _j =25°C	-1	-1.5	-2	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-5.4A, T _j =25°C	-	103	134	mΩ
		V _{GS} =-4.5V, I _D =-3.2A, T _j =25°C	-	121	181	
Diode Forward Voltage	V _{SD}	I _S =-5.4A, V _{GS} =0V, T _j =25°C	-	-0.91	-1.2	V
Gate Resistance	R _G	f=1MHZ, T _j =25°C	-	10	-	Ω
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =-30V, V _{GS} =0V, f=1MHZ, T _j =25°C	-	711	-	pF
Output Capacitance	C _{oss}		-	39	-	
Reverse Transfer Capacitance	C _{rss}		-	32	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =-10V, V _{DS} =-30V, I _D =-5.4A, T _j =25°C	-	16.4	-	nC
Gate-Source Charge	Q _{gs}		-	2.2	-	
Gate-Drain Charge	Q _{gd}		-	2.7	-	
Reverse Recovery Charge	Q _{rr}	I _F =-5.4A, di/dt=100A/us, V _{GS} =0V, V _R =-30V, T _j =25°C	-	27.7	-	nC
Reverse Recovery Time	t _{rr}		-	23	-	ns
Turn-on Delay Time	t _{D(on)}	V _{GS} =-10V, V _{DS} =-30V, I _D =-5.4A, R _{GEN} =3Ω, T _j =25°C	-	7	-	ns
Turn-on Rise Time	t _r		-	3.4	-	
Turn-off Delay Time	t _{D(off)}		-	25.2	-	
Turn-off Fall Time	t _f		-	6.1	-	

Note:

- The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
- The value of $R_{\theta JA}$ is measured with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in² pad of 2oz. Copper, in the still air environment with $T_A=25^\circ C$. The maximum allowed junction temperature of $150^\circ C$. The value in any given application depends on the user's specific board design.
- Thermal resistance from junction to soldering point (on the exposed drain pad).



■ NMOS Typical Electrical and Thermal Characteristics Diagrams

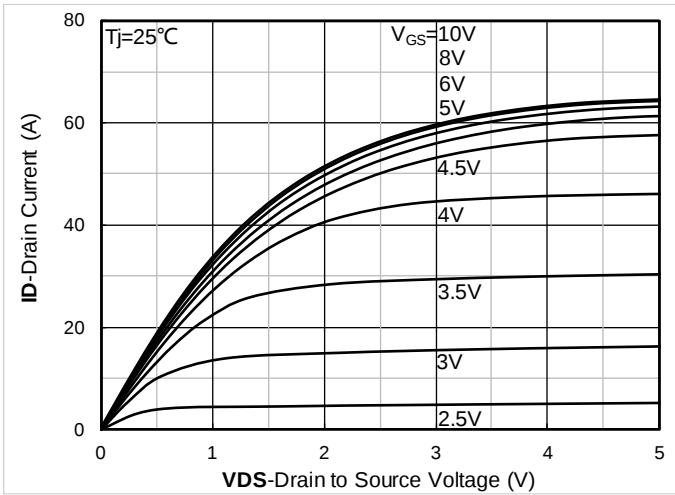


Figure 1. Output Characteristics; typical values

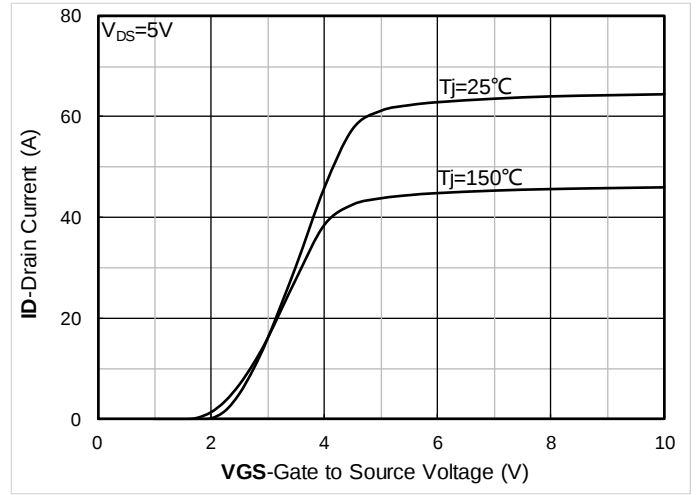


Figure 2. Transfer Characteristics; typical values

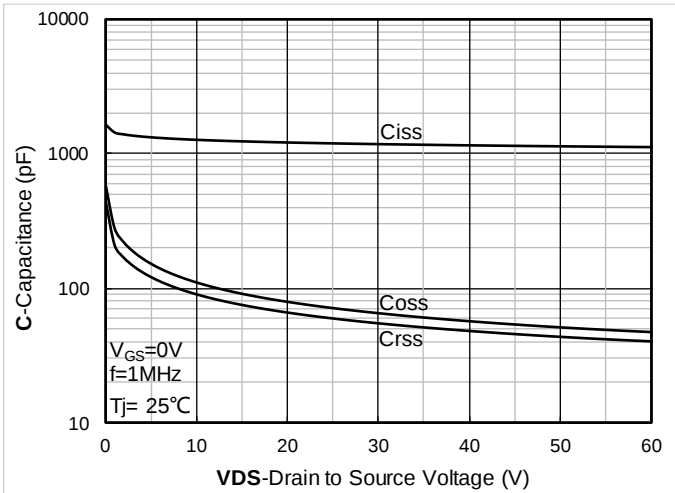


Figure 3. Capacitance Characteristics; typical values

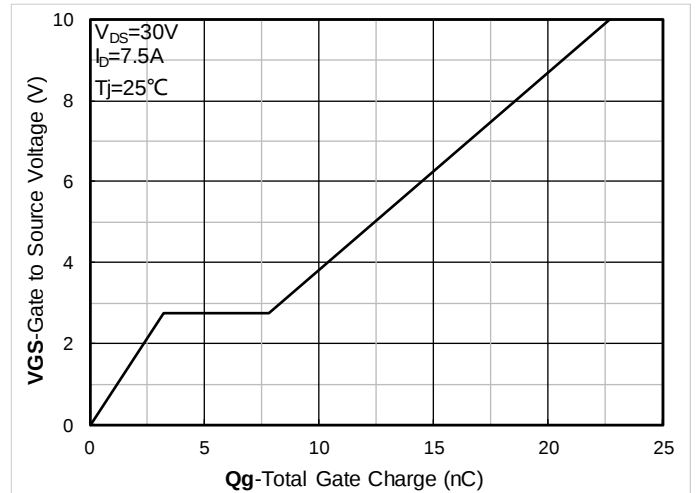


Figure 4. Gate Charge; typical values

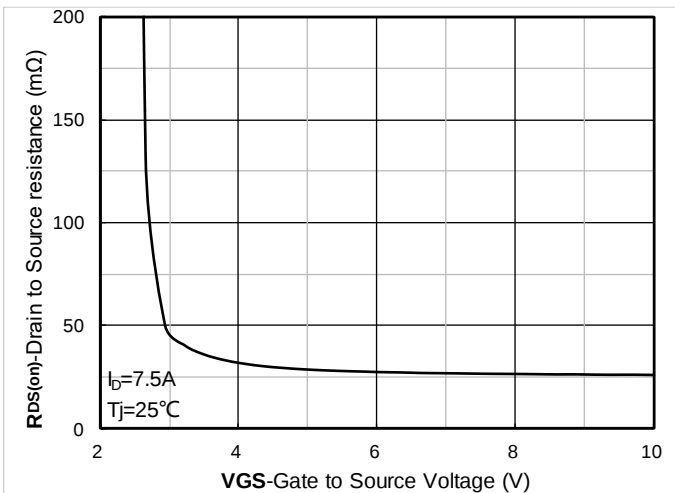


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

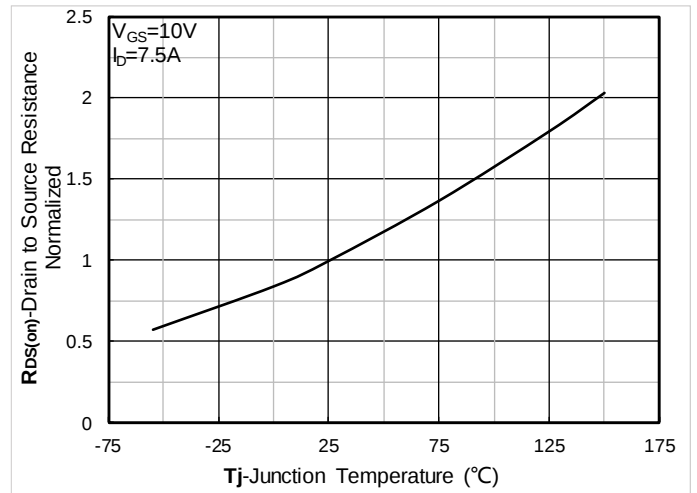


Figure 6. Normalized On-Resistance

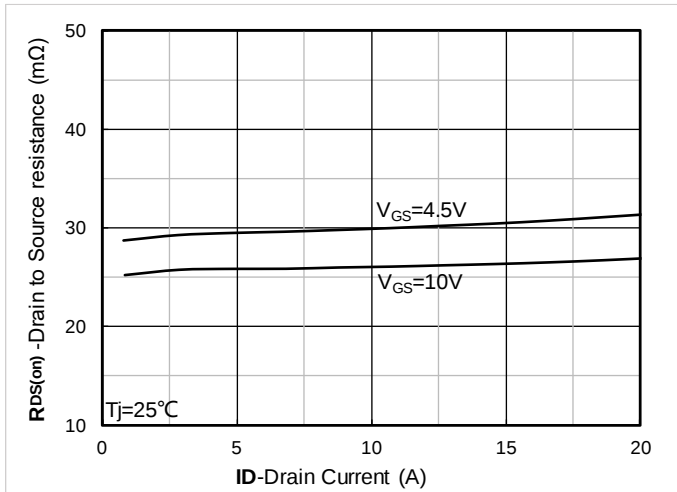


Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

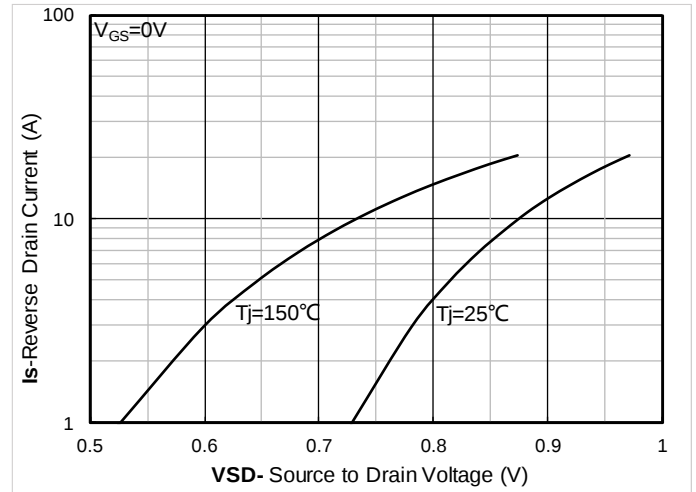


Figure 8. Forward characteristics of reverse diode; typical values

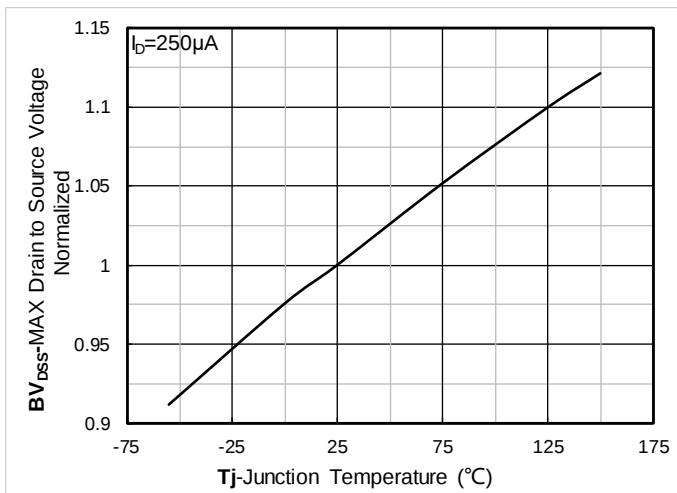


Figure 9. Normalized breakdown voltage

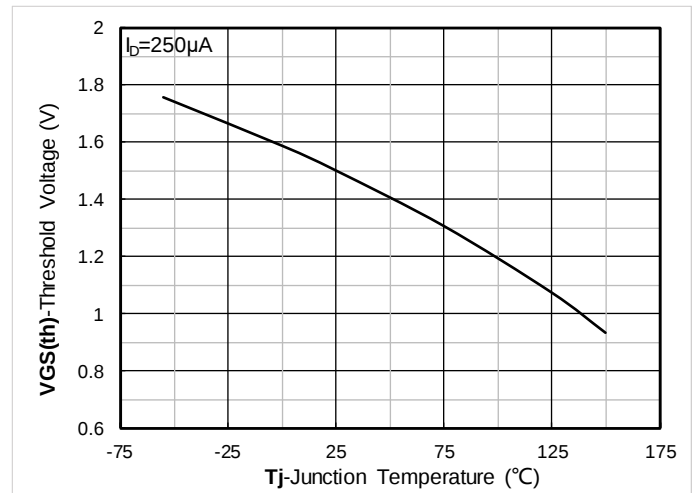


Figure 10. Gate Threshold voltage; typical values

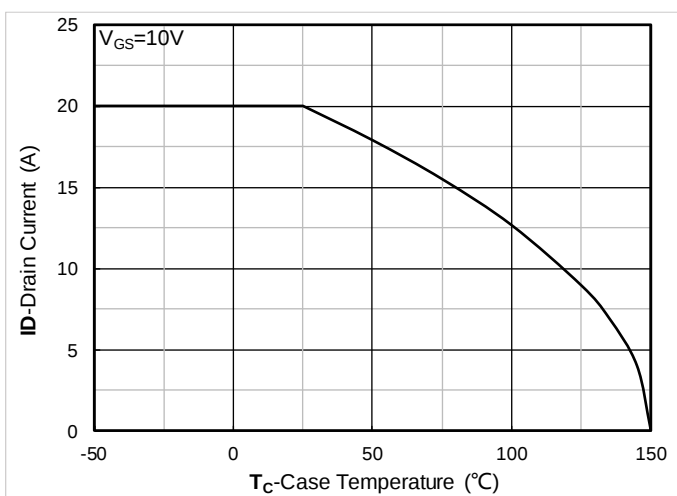


Figure 11. Current dissipation

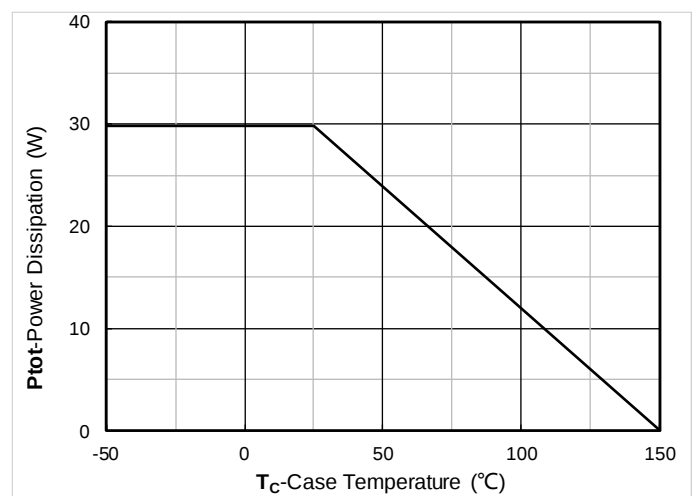


Figure 12. Power dissipation

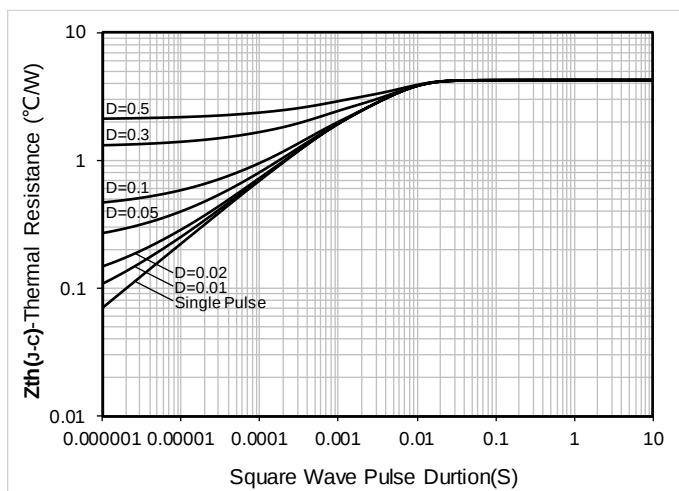


Figure 13. Maximum Transient Thermal Impedance

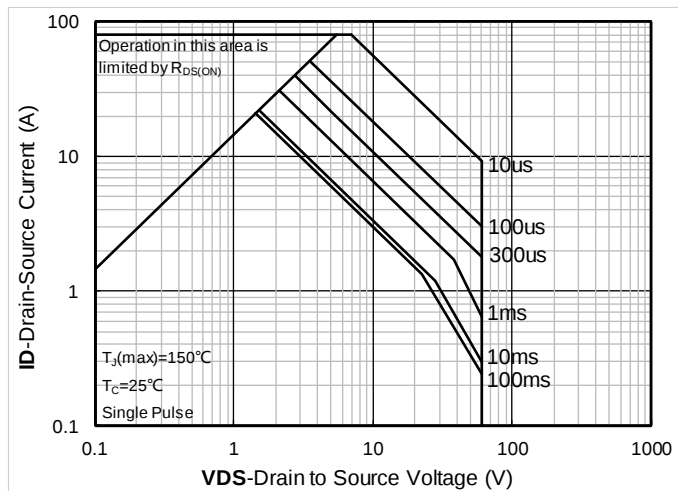


Figure 14. Safe Operation Area

PMOS Typical Electrical and Thermal Characteristics Diagrams

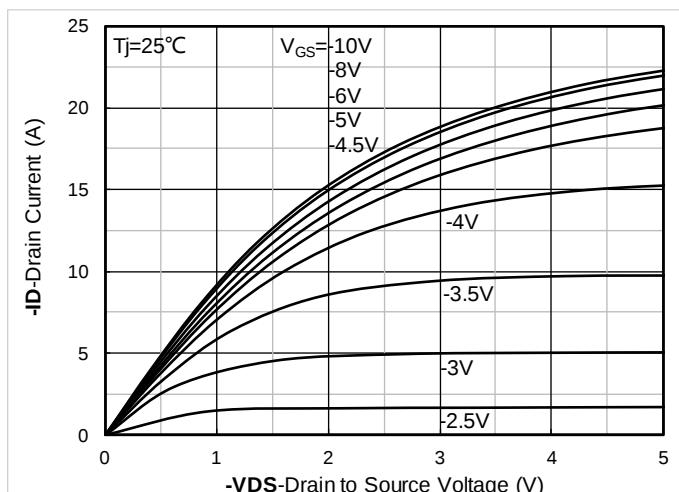


Figure 1. Output Characteristics; typical values

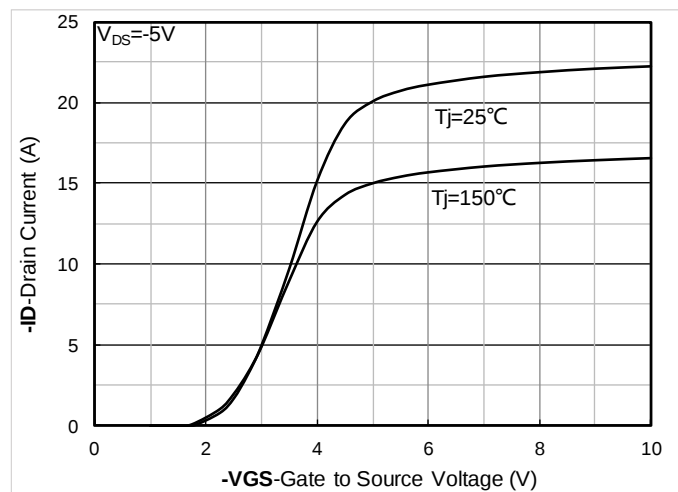


Figure 2. Transfer Characteristics; typical values

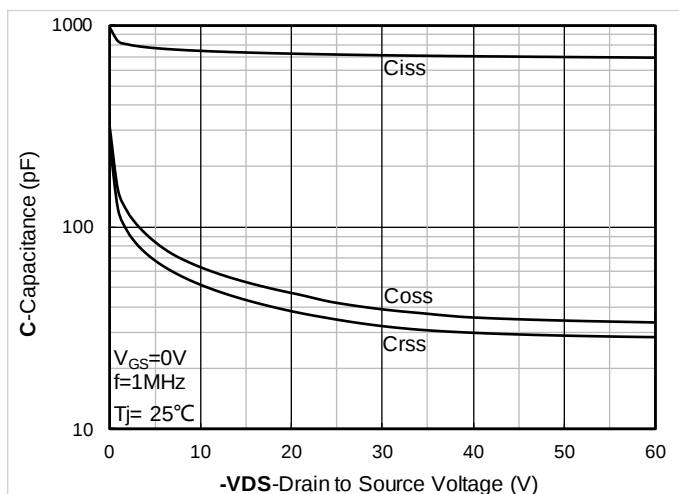


Figure 3. Capacitance Characteristics; typical values

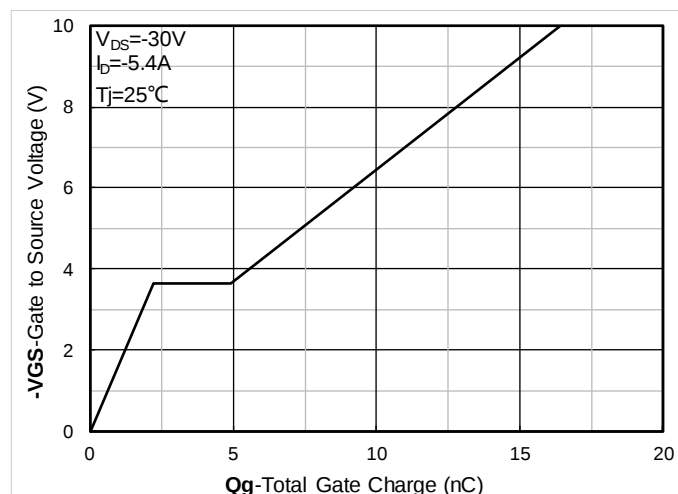


Figure 4. Gate Charge; typical values

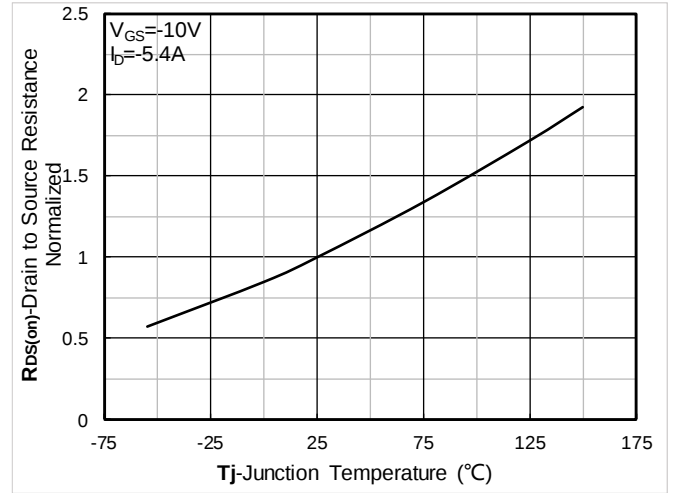
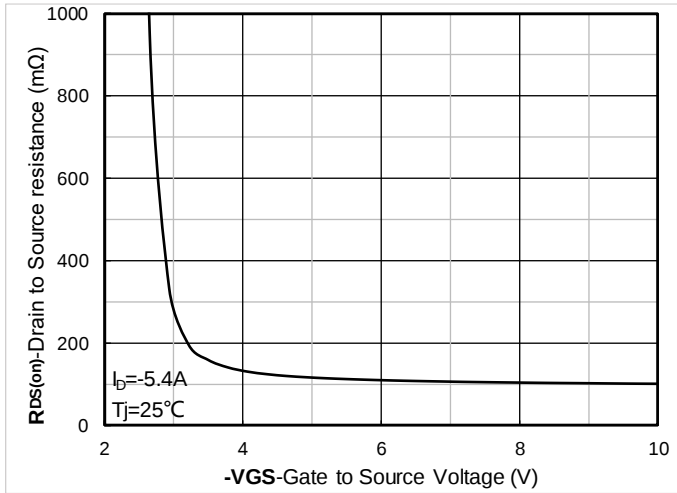


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

Figure 6. Normalized On-Resistance

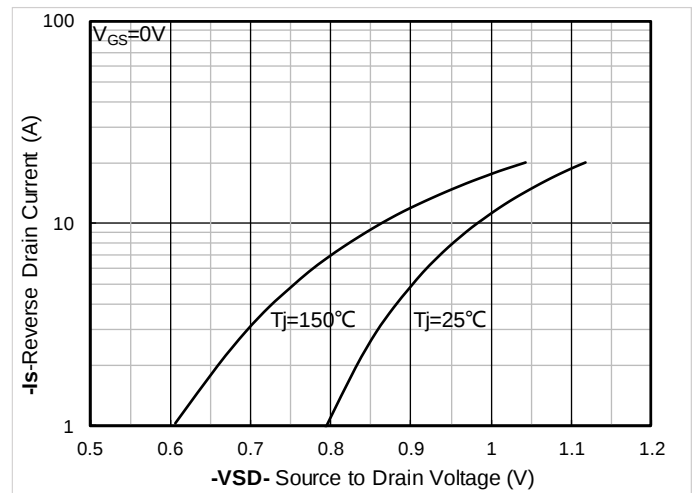
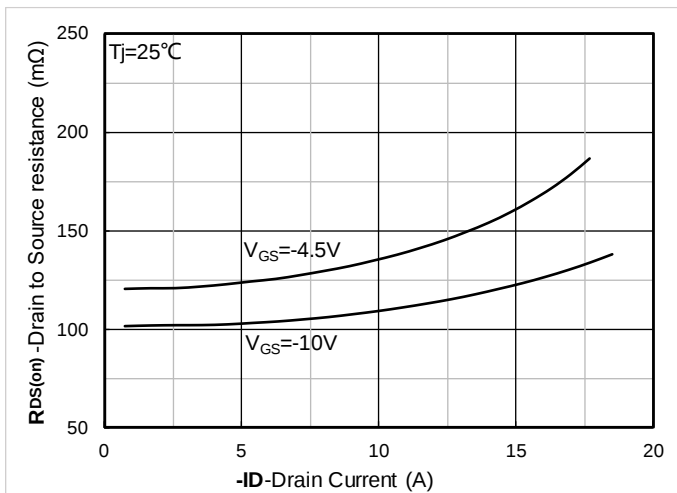


Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

Figure 8. Forward characteristics of reverse diode; typical values

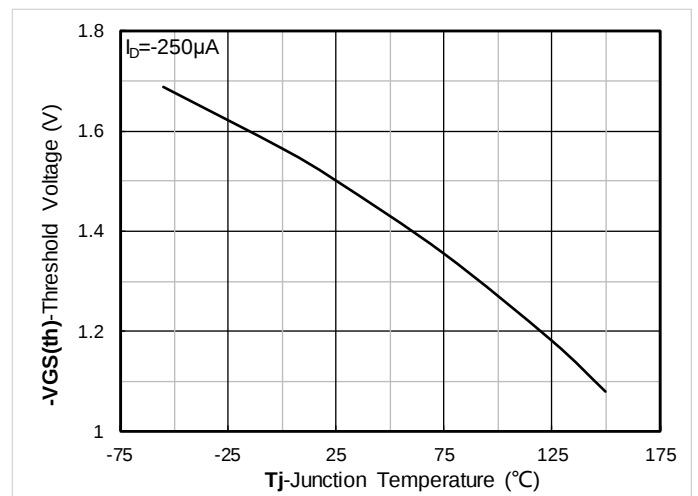
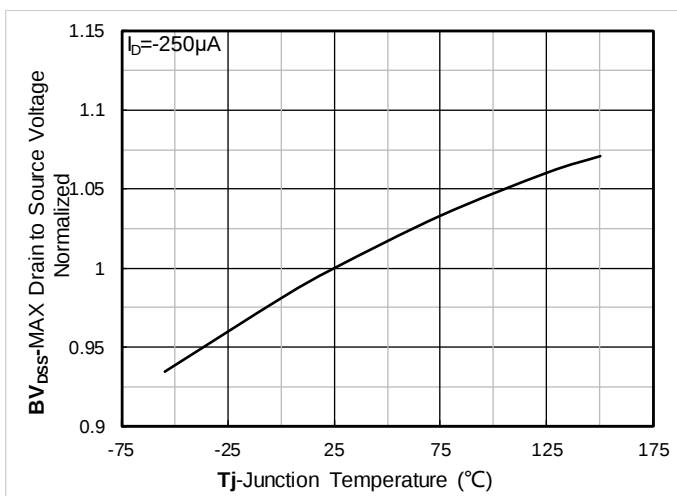


Figure 9. Normalized breakdown voltage

Figure 10. Gate Threshold voltage; typical values

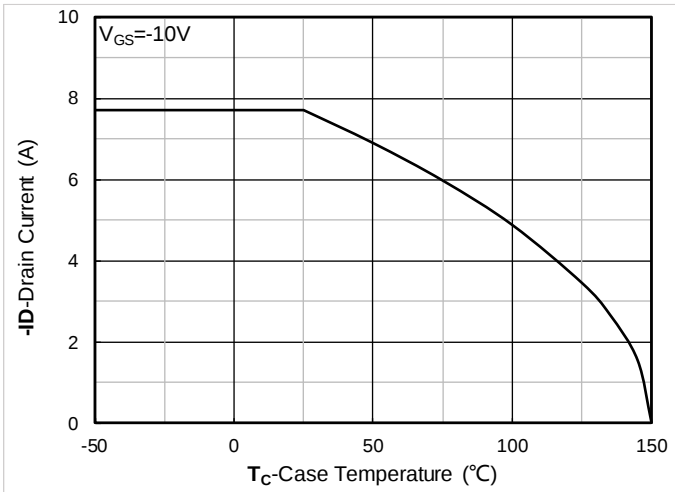


Figure 11. Current dissipation

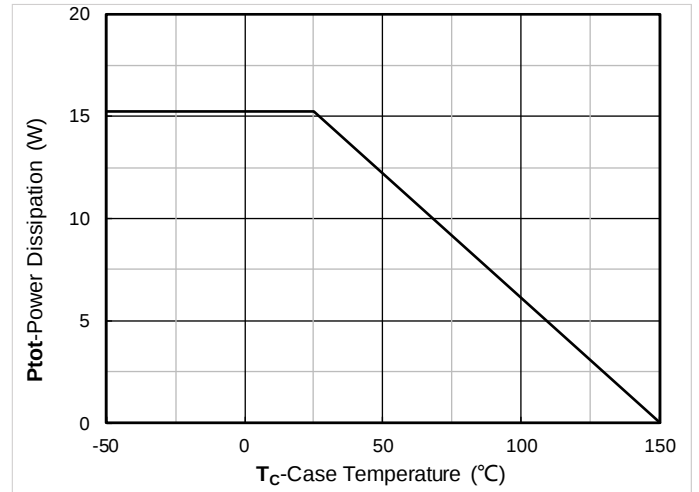


Figure 12. Power dissipation

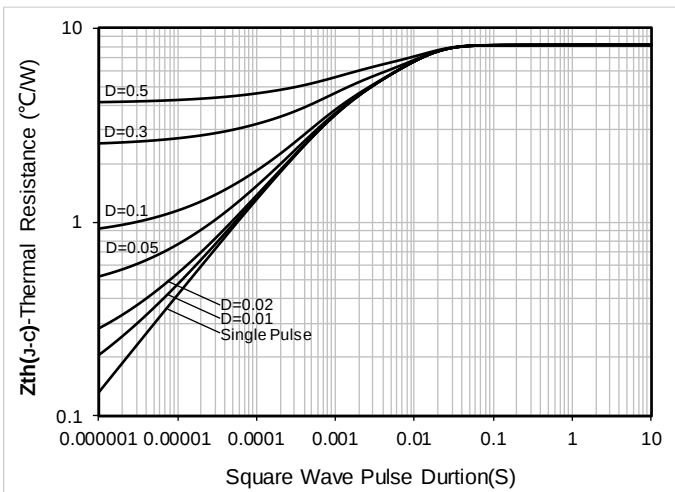


Figure 13. Maximum Transient Thermal Impedance

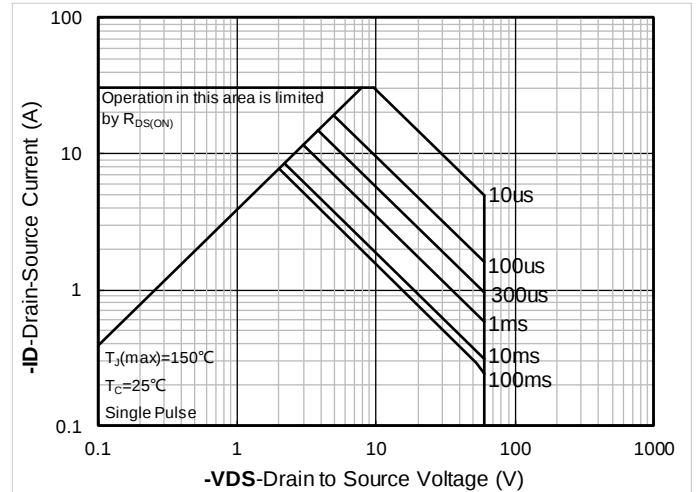
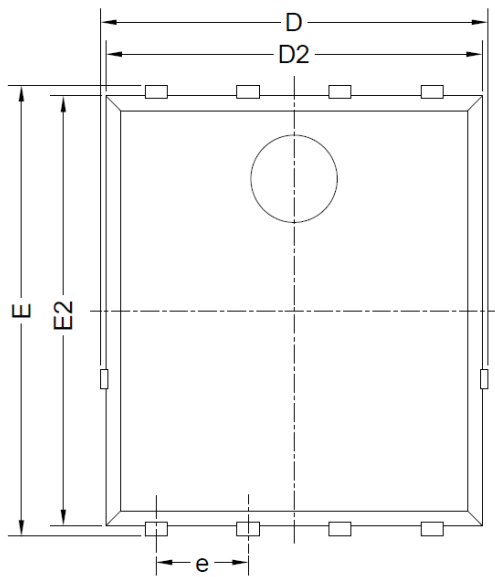


Figure 14. Safe Operation Area

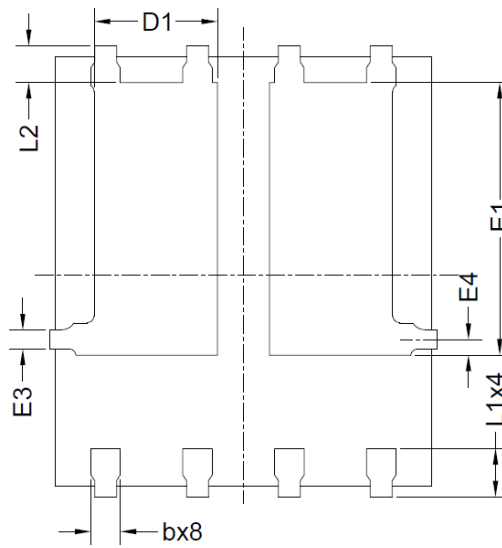


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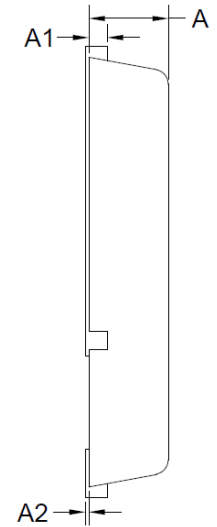
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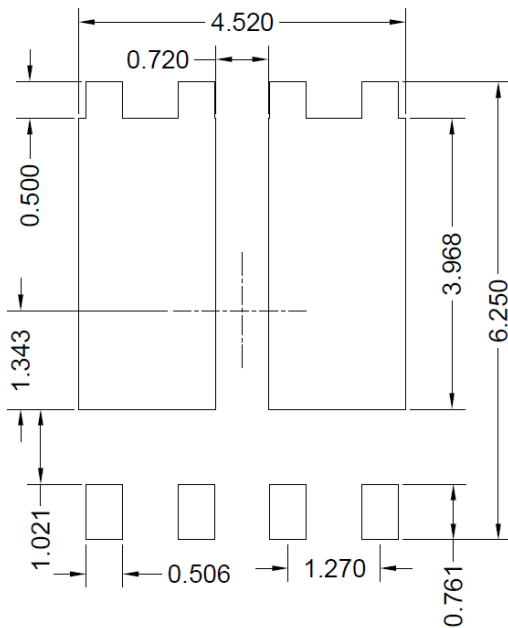
Top View
正面视图



Bottom View
背面视图



Side View
侧面视图



Suggested Solder Pad Layout
Top View

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	1.50	1.70	1.90
E1	3.52	3.72	3.92
D2	5.00	5.20	5.40
E2	5.66	5.86	6.06
E3	0.254REF		
E4	0.21REF		
L1	0.56	0.66	0.76
L2	0.50 BSC		
b	0.31	0.41	0.51
e	1.27 BSC		

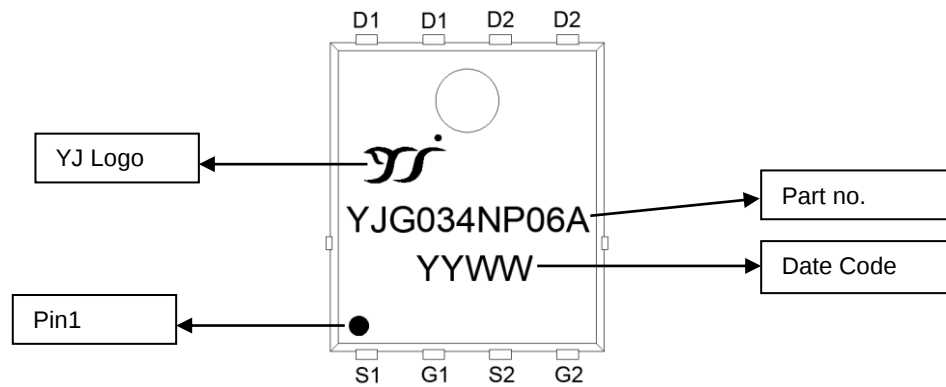
Note:

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



YJG034NP06A

■ Marking Information



Note:

1. All marking is at middle of the product body
2. All marking is in laser printing
3. YJG034NP06A is part no., YYWW is date code, "YY" is year, "WW" is week
4. Body color: Black



Disclaimer

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The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

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