ZHEJIANG UNIU-NE Technology CO.,LTD

浙 江 宇 力 微 新 能 源 科 技 有 限 公 司

AP4910GD Data Sheet

V 1 . 1

Feature

- **N-Channel**

V_{DD}=40V,I_D=30A

$R_{DS(ON)}$ <16mΩ @V_{GS}=10V TYP 14mΩ

$R_{DS(ON)}$ <25mΩ @V_{GS}=4.5V TYP 20mΩ

- **P-Channel**

V_{DD}=-40V,I_D=-40A

$R_{DS(ON)}$ <16mΩ @V_{GS}=-10V TYP 13.5mΩ

$R_{DS(ON)}$ <25mΩ @V_{GS}=-4.5V TYP 16.5mΩ

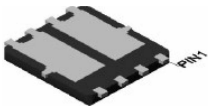
- Lead free product is acquired
- High power and current handing capability
- Surface mount package

Application

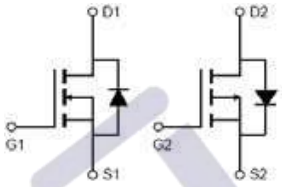
- PWM applications
- Load Switch
- Power management

PIN1

Top View



Bottom View



Schematic diagram

Marking and pin assignment

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
4910GD	AP4910GD	PDFN5X6	13 inch	-	5000

ABSOLUTE MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V_{DS}	40	-40	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Continuous Drain Current (T_a =25℃)	I_D	30	-40	A
Continuous Drain Current (T_a =100℃)	I_D	21	-28	A
Pulsed Drain Currenr (1)	I_{DM}	70	-120	A
Power Dissipation	P_D	45		W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	3.45		℃/W
Junction Temperature	T_J	150		℃
Storage Temperature	T_{STG}	-55~ +150		℃

N-CH ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	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(2)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1	1.6	2.5	V
Drain-source on-resistance(2)	$R_{DS(on)}$	V_{GS} =10V, I_D =15A		14	16	mΩ
		V_{GS} =4.5V, I_D =10A		20	25	
Forward tranconductance(2)	g_{FS}	V_{DS} =10V, I_D =10A		15		S
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =20V, V_{GS} =0V, f =1MHz		980		pF
Output Capacitance	C_{oss}			110		
Reverse Transfer Capacitance	C_{rss}			96		
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=20V, I_D=15A V_{GS}=10V, R_G=3Ω		5.5		ns
Turn-on rise time	t_r			14		
Turn-off delay time	$t_{d(off)}$			24		
Turn-off fall time	t_f			12		
Total Gate Charge	Qg	VDS=20V, ID=15A, VGS=10V		22.9		nC
Gate-Source Charge	Qgs			3.5		
Gate-Drain Charge	Qgd			5.3		
Source-Drain Diode characteristics						
Diode Forward voltage(2)	V_{DS}	V_{GS} =0V, I_S=10A			1.2	V
Diode Forward current(3)	I_S		-	-	30	A

Typical Electrical and Thermal Characteristics (Curves)

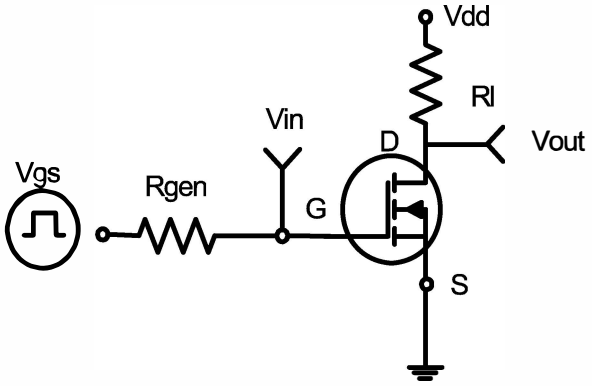


Figure 1:Switching Test Circuit

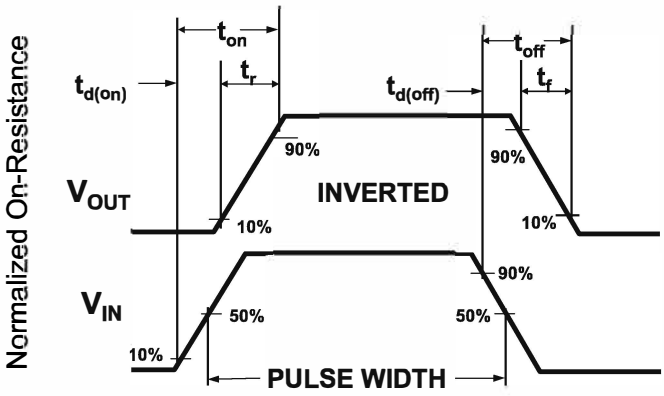


Figure 2:Switching Waveforms

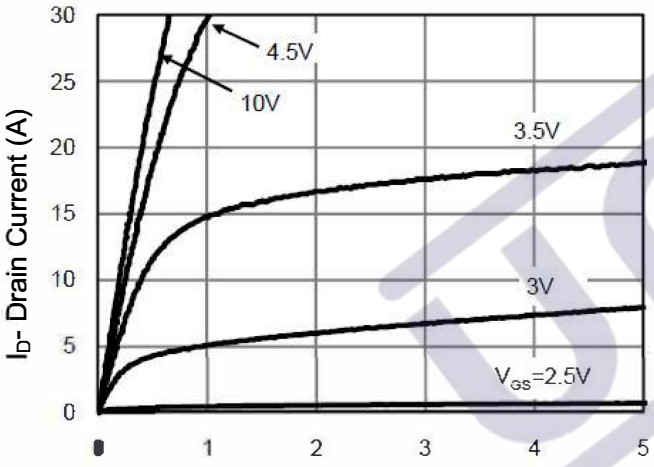


Figure 3 Output Characteristics

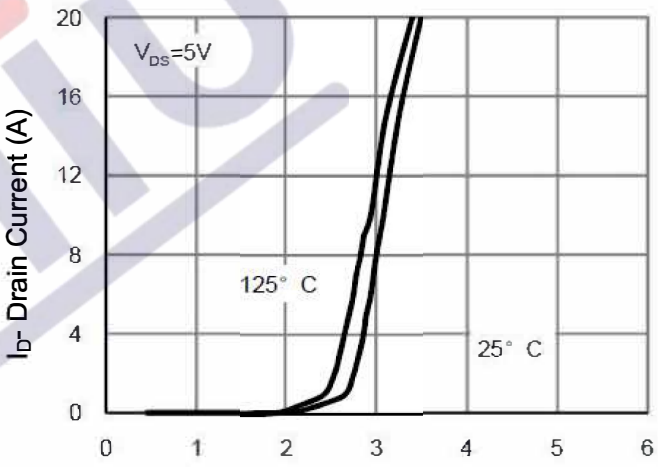


Figure 4 Transfer Characteristics

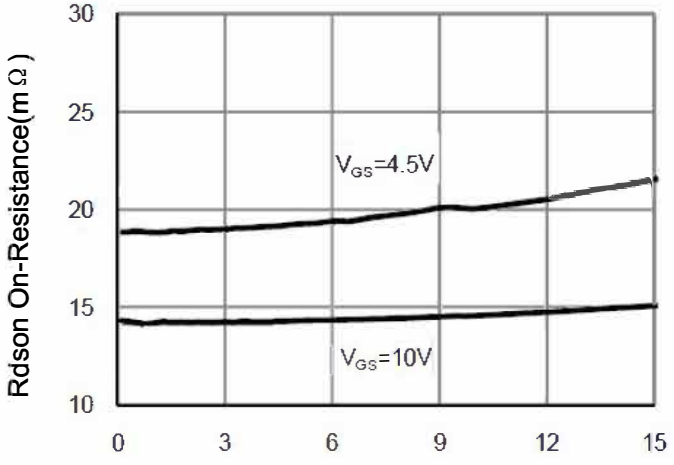
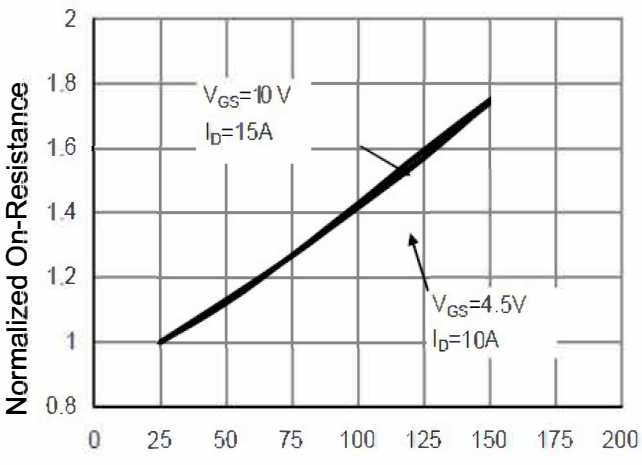


Figure 5 Drain-Source On-Resistance



ure 6 Drain-Sourc -Resistance

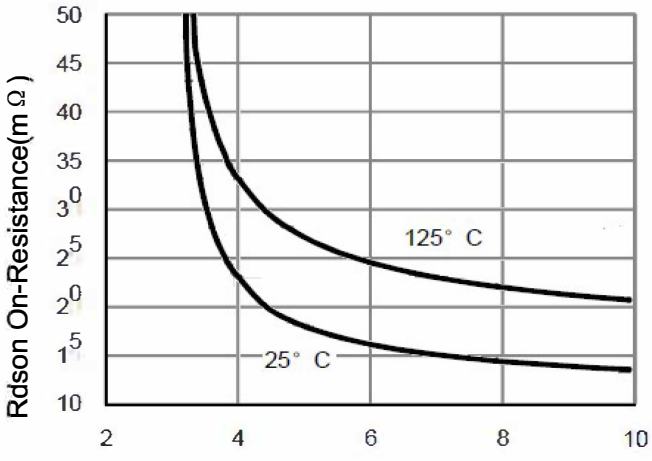


Figure7 Rdson vs Vgs

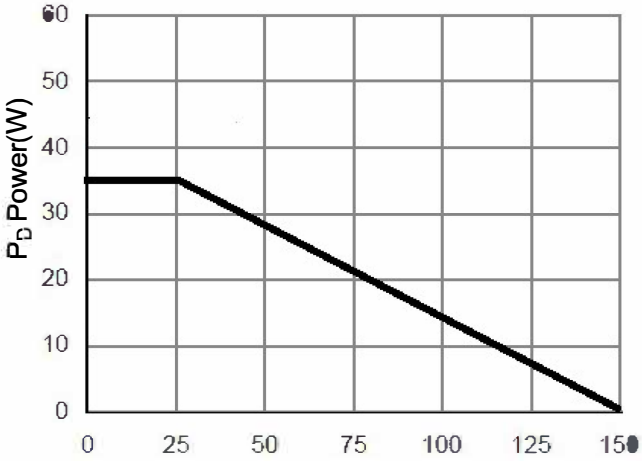


Figure 8 Power Dissipation

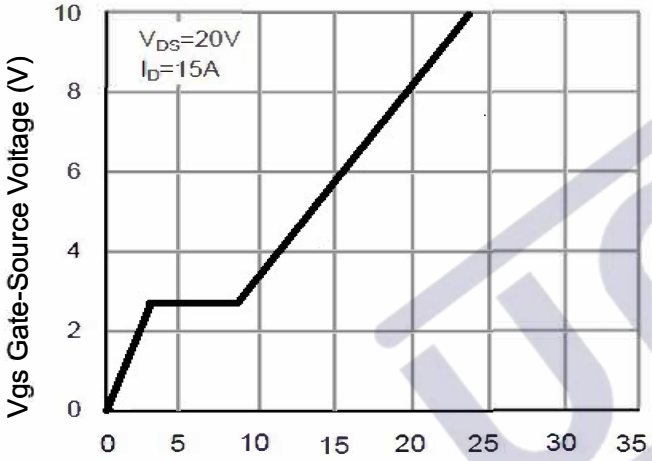


Figure 9 Gate Charge

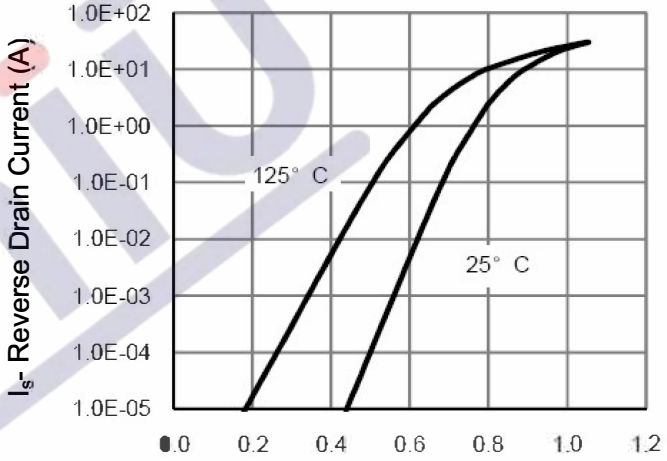


Figure 10 Source- Drain Diode Forward

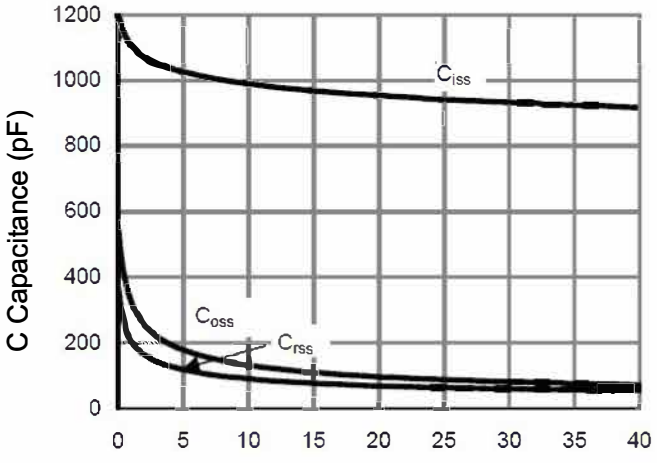


Figure 11 Capacitance vs Vds

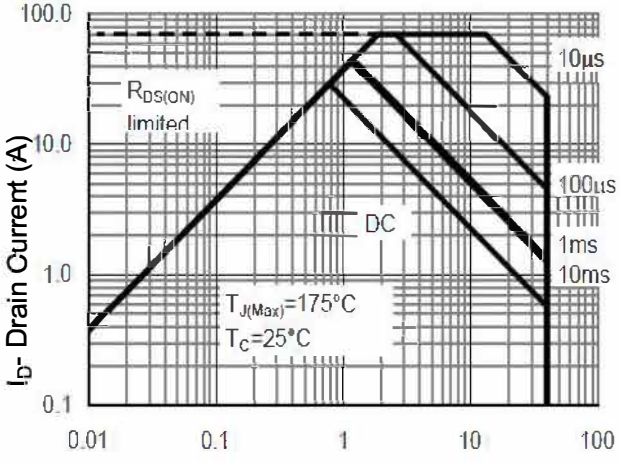


Figure 12 Safe Operation Area

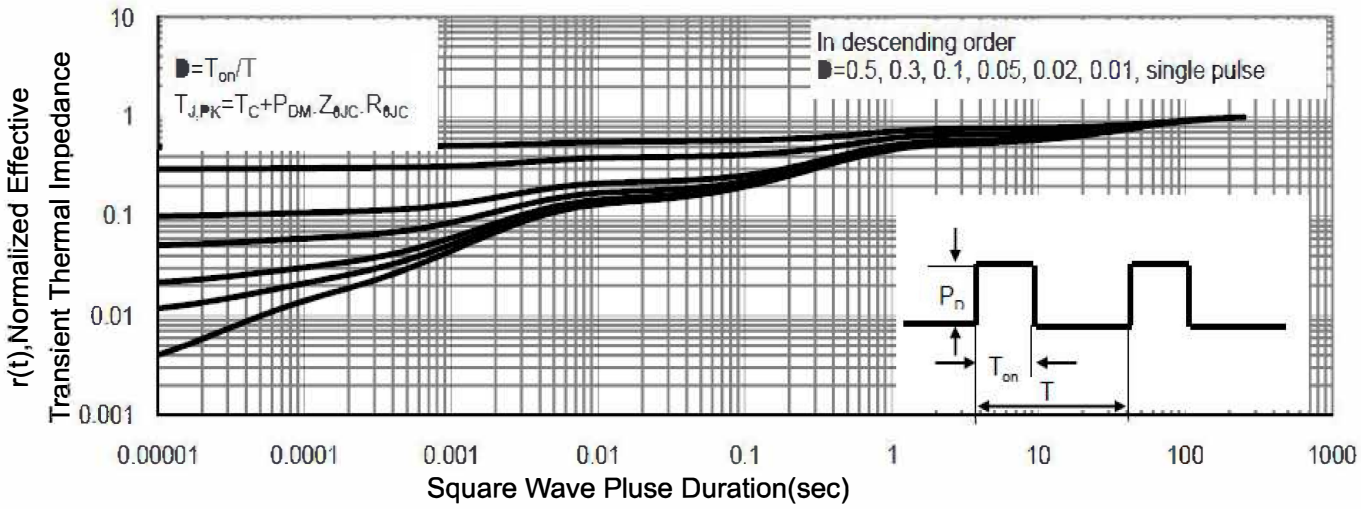


Figure 13 Normalized Maximum Transient Thermal Impedance

P-CH ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	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(2)		V_{DS} =V_{GS}, I_D =-250μA	-1	-1.6	-2.5	V
Drain-source on-resistance(2)	$R_{DS(on)}$	V_{GS} =-10V, I_D =-15A		13.5	16	mΩ
		V_{GS} =-4.5V, I_D =-10A		16.5	25	
Forward tranconductance(2)	g_{FS}	V_{DS} =-10V, I_D =-10A		25		S
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =-25V, V_{GS} =0V, f =1MHz		2000		pF
Output Capacitance	C_{oss}			300		
Reverse Transfer Capacitance	C_{rss}			275		
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=-20V, I_D=-20A V_{GS}=-10V, R_G=3.0Ω		11		ns
Turn-on rise time	t_r			9.5		
Turn-off delay time	$t_{d(off)}$			24		
Turn-off fall time	t_f			12		
Total Gate Charge	Qg	VDS=-20V, ID=-20A, VGS=-10V		31		nC
Gate-Source Charge	Qgs			5.5		
Gate-Drain Charge	Qgd			6.5		
Source-Drain Diode characteristics						
Diode Forward voltage(2)	V_{DS}	V_{GS} =0V, I_S=-10A			1.2	V
Diode Forward current(3)	I_S		-	-	-40	A

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. Pulse Test: pulse width≤300μs, duty cycle≤2%
3. Surface Mounted on FR4 Board,t≤10 sec

Typical Electrical and Thermal Characteristics

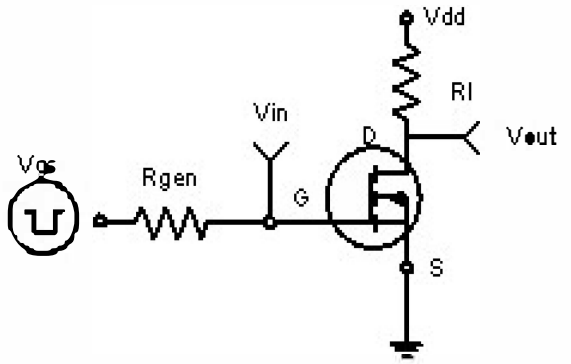


Figure 1 Switching Test Circuit

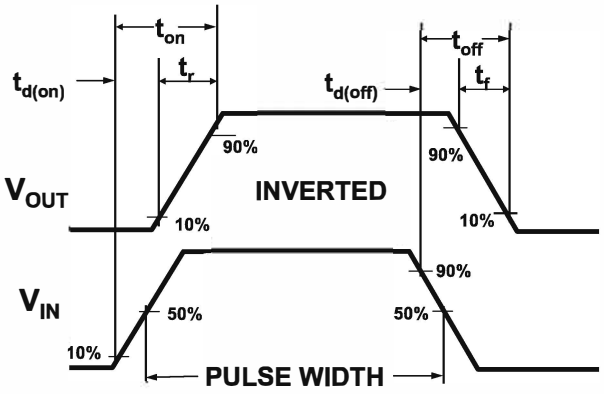
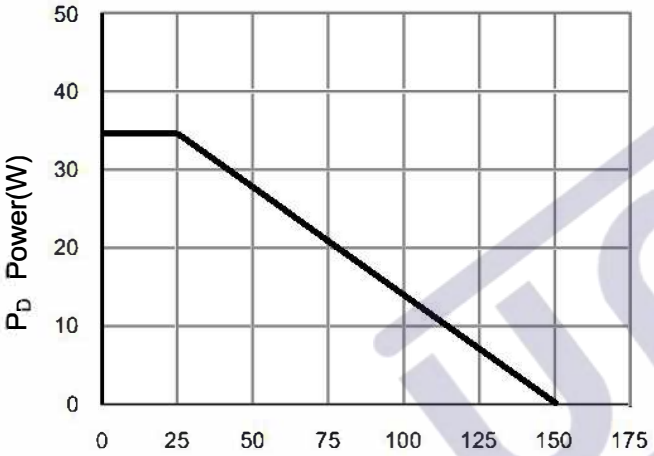
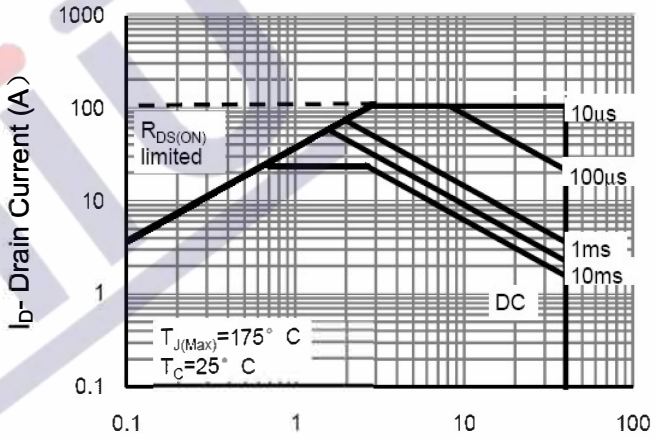


Figure 2 Switching Waveforms



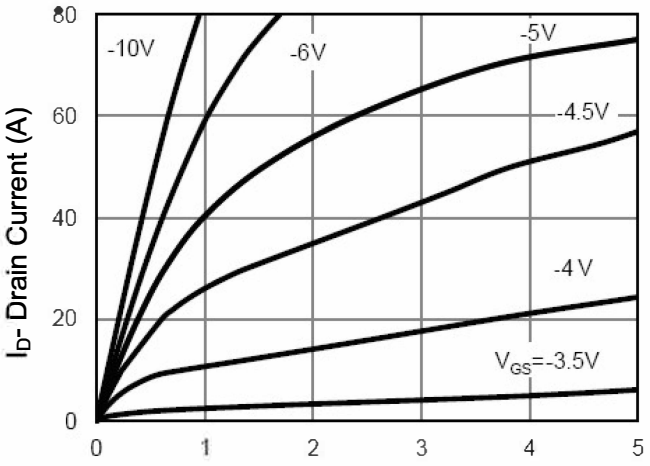
T_J-Junction Temperature(℃)

Figure 3 Power Dissipation



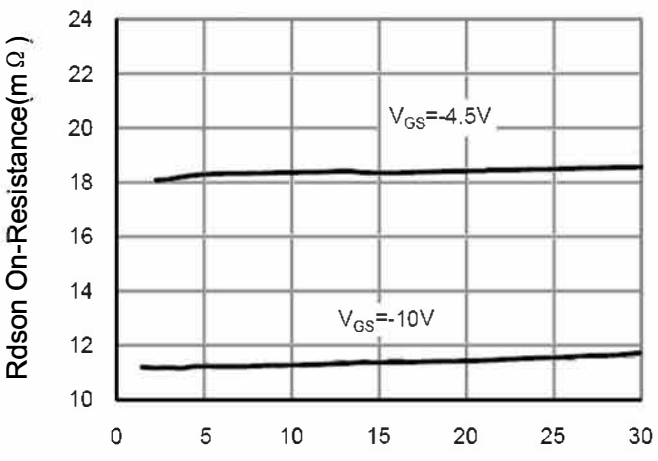
Vds Drain-Source Voltage (V)

Figure 4 Safe Operation Area



Vds Drain-Source Voltage (V)

Figure 5 Output Characteristics



I_D- Drain Current (A)

Figure 6 Drain-Source On-Resistance

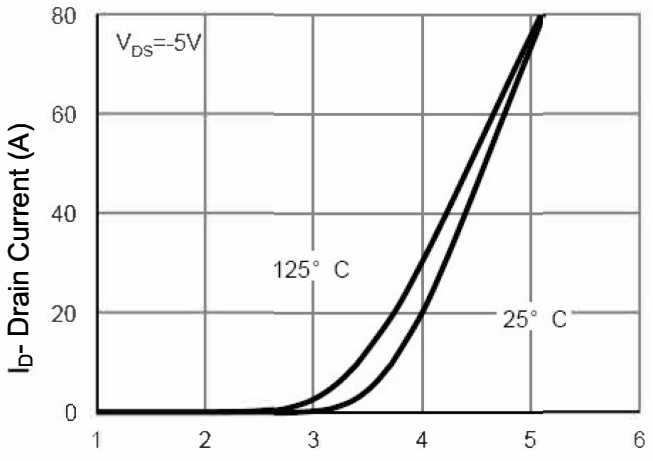


Figure 7 Transfer Characteristics

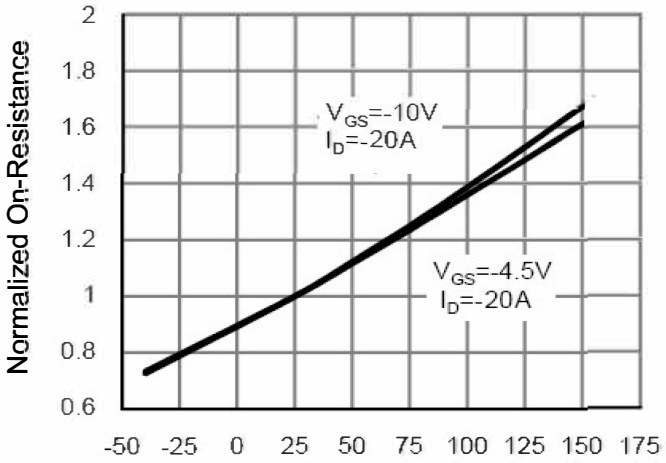


Figure 8 Drain-Source On-Resistance

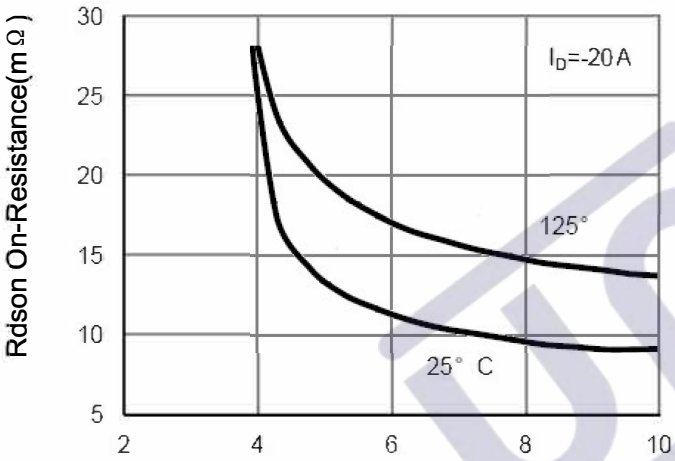


Figure 9 Rdson vs Vgs

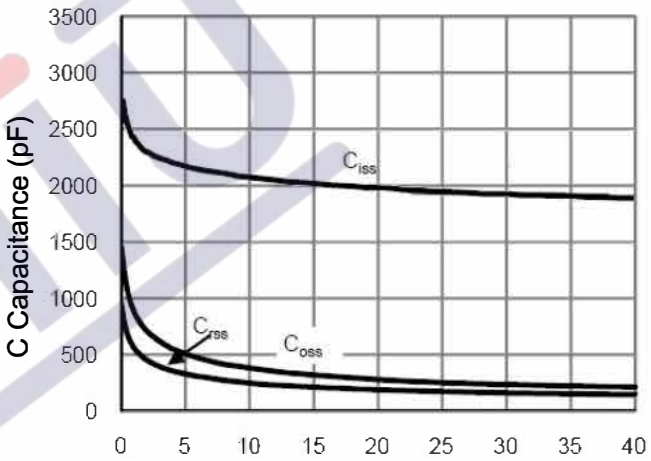


Figure 10 Capacitance vs Vds

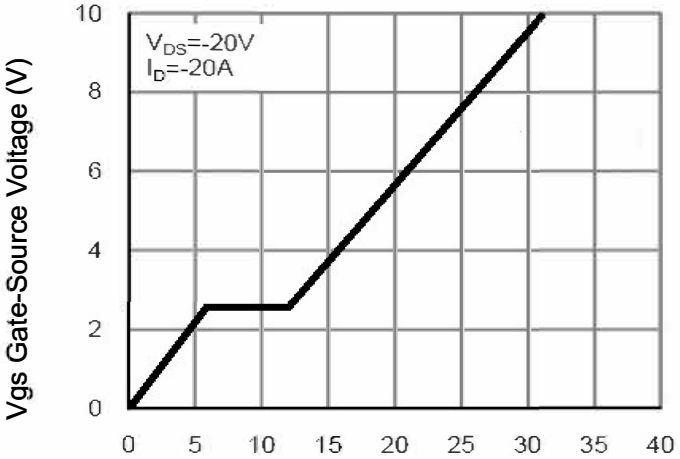


Figure 11 Gate Charge

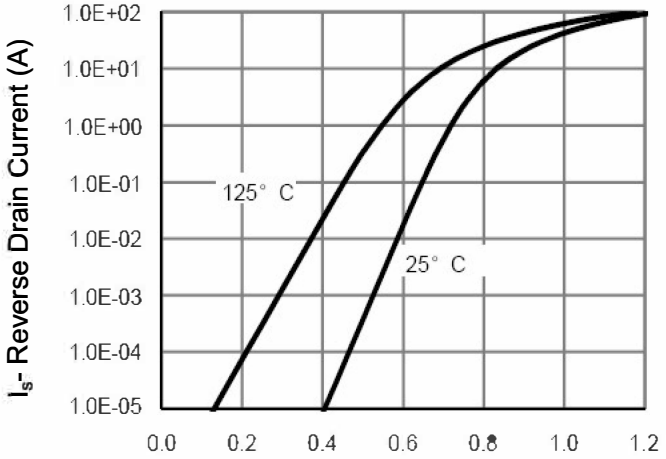


Figure 12 Source- Drain Diode Forward

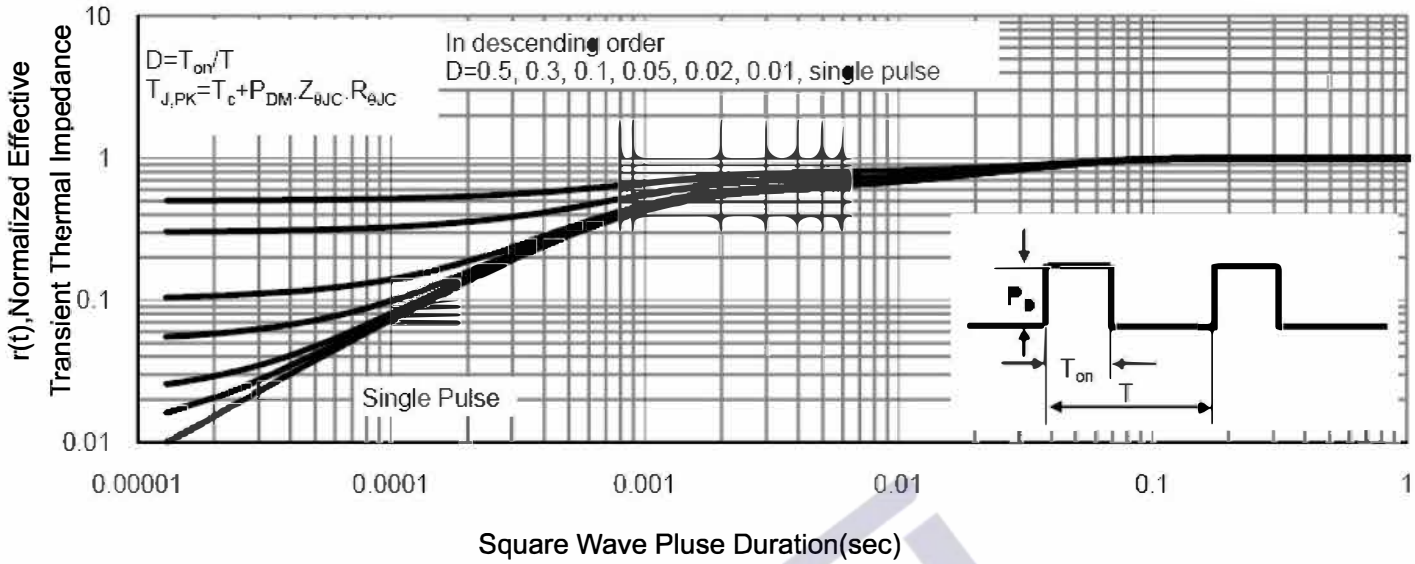
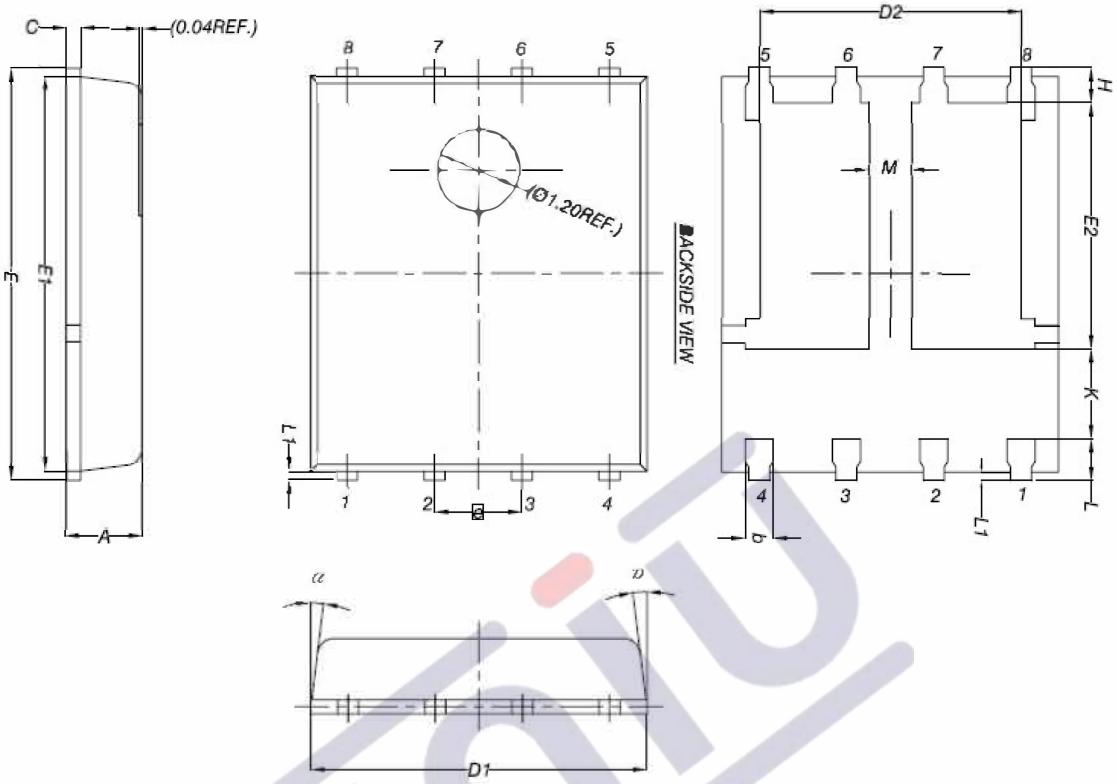


Figure 13 Normalized Maximum Transient Thermal Impedance

PDFN5X6-8L Package Information



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.58	3.78
e	1.27 BSC		
H	0.41	0.51	0.61
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
M	0.50	-	-
α	0°	-	12°

1、版本记录

DATE	REV.	DESCRIPTION
2021/04/19	1.0	首次发布
2023/05/21	1.1	优化电路

2、免责声明

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