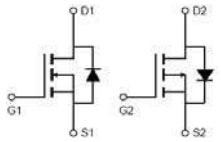
AP4910GD

N and P-Channel Enhancement Mosfet

DATA SHEET

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

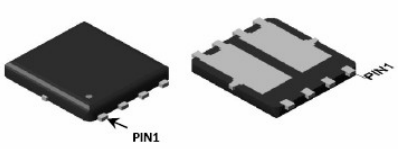


Schematic diagram

Marking and pin assignment

Application

- PWM applications
- Load Switch
- Power management



Top View **Bottom View**

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)

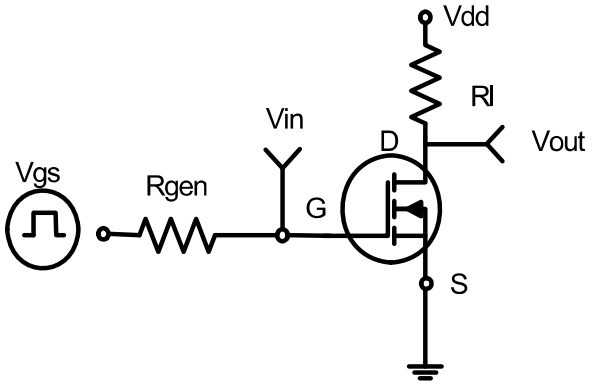


Figure 1:Switching Test Circuit

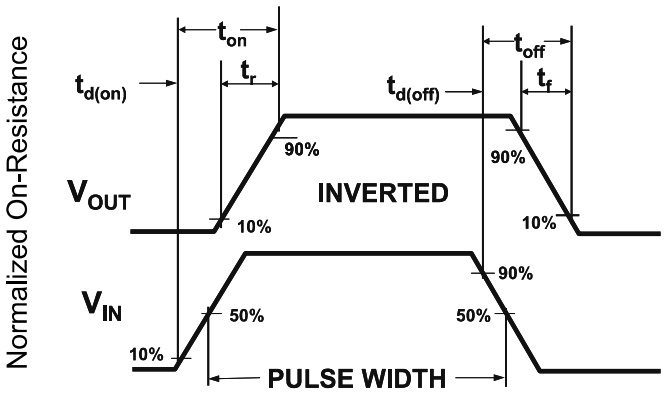


Figure 2:Switching Waveforms

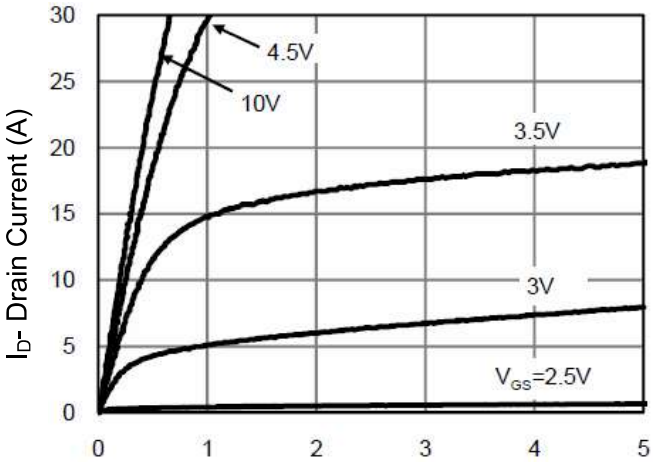


Figure 3 Output Characteristics

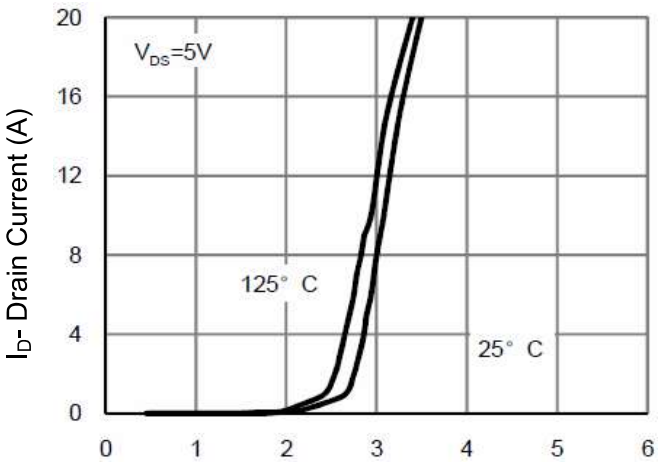


Figure 4 Transfer Characteristics

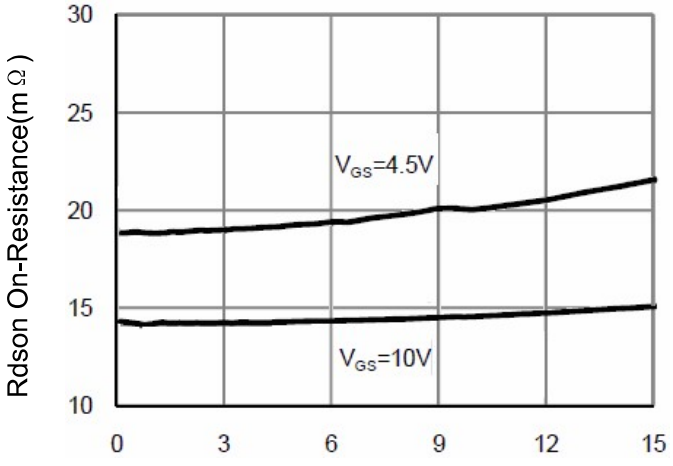


Figure 5 Drain-Source On-Resistance

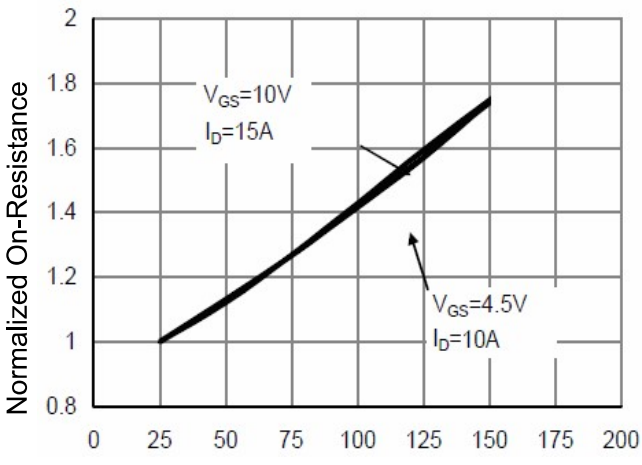


Figure 6 Drain-Source On-Resistance

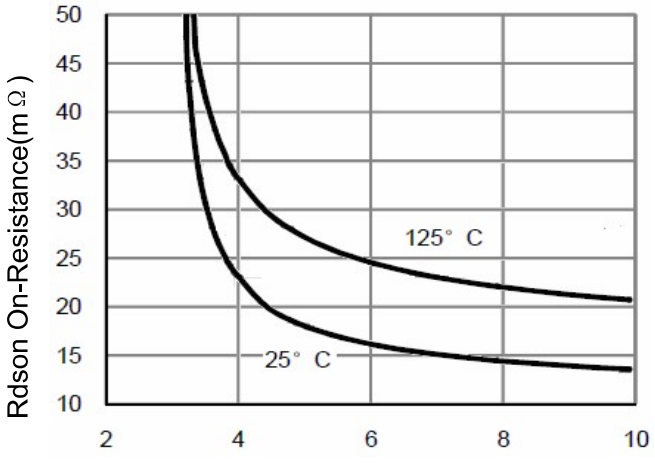


Figure7 Rdson vs Vgs

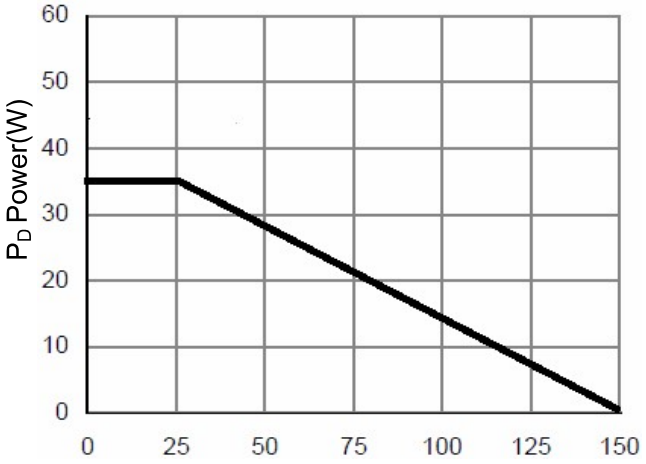


Figure 8 Power Dissipation

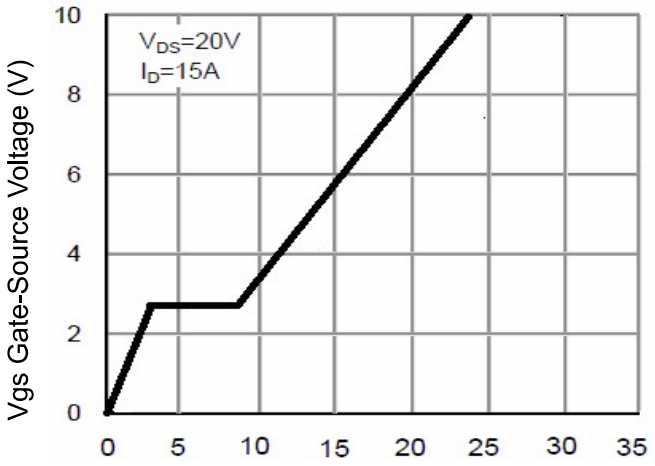


Figure 9 Gate Charge

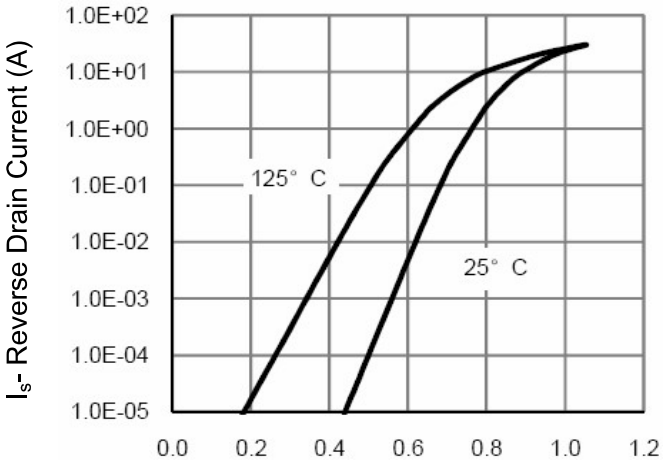


Figure 10 Source- Drain Diode Forward

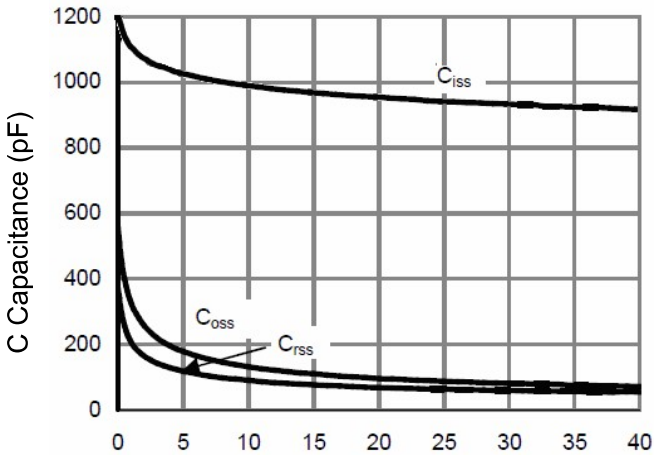


Figure 11 Capacitance vs Vds

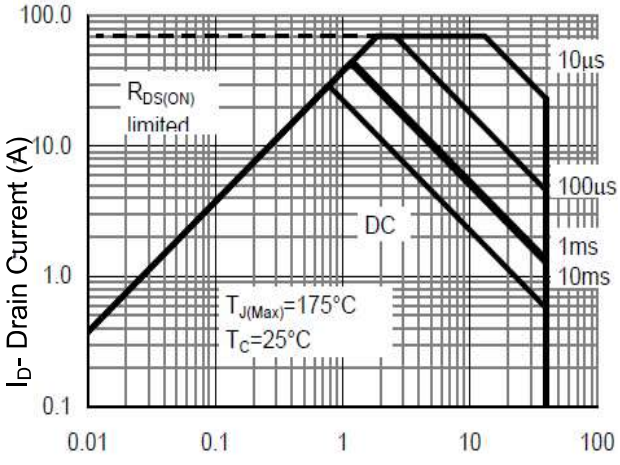


Figure 12 Safe Operation Area

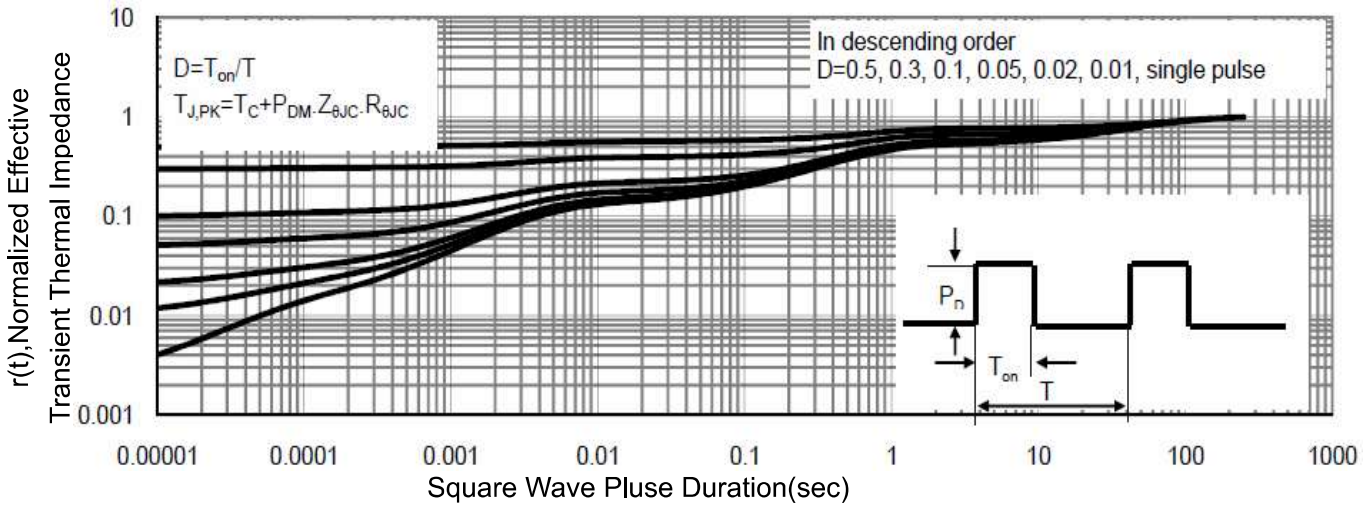


Figure 13 Normalized Maximum Transient Thermal Impedance

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)	$V_{GS(th)}$	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		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

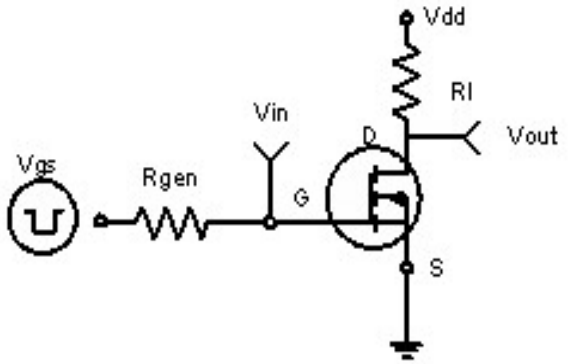


Figure 1 Switching Test Circuit

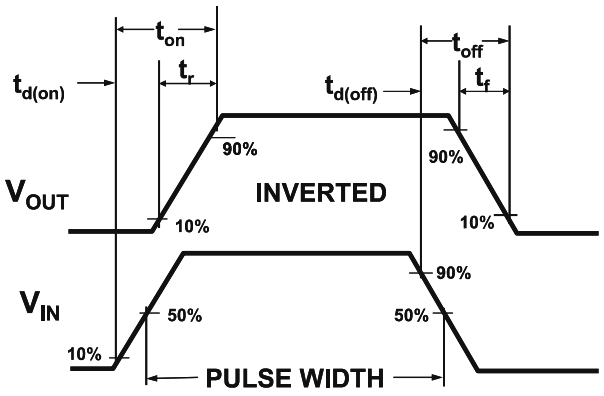
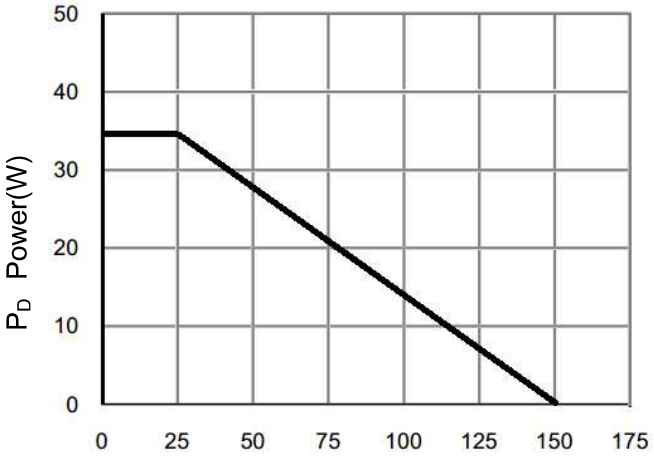
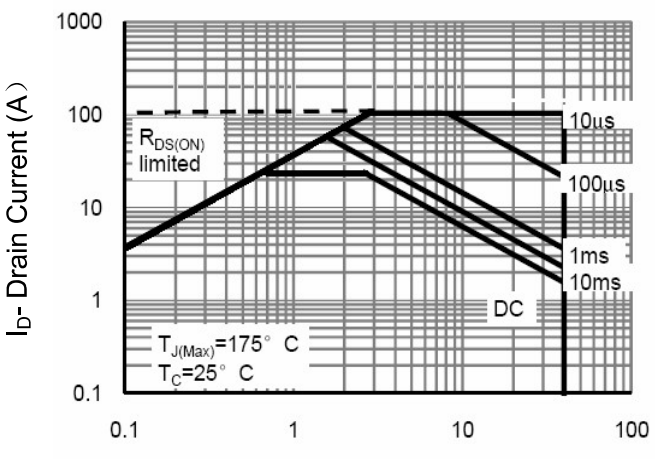


Figure 2 Switching Waveforms



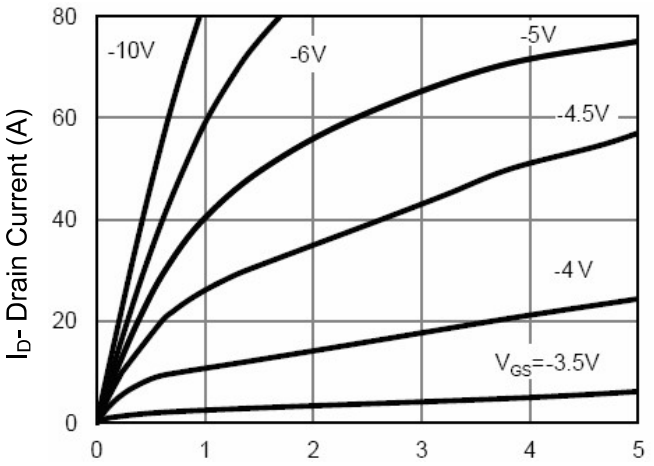
T_J-Junction Temperature(℃)

Figure 3 Power Dissipation



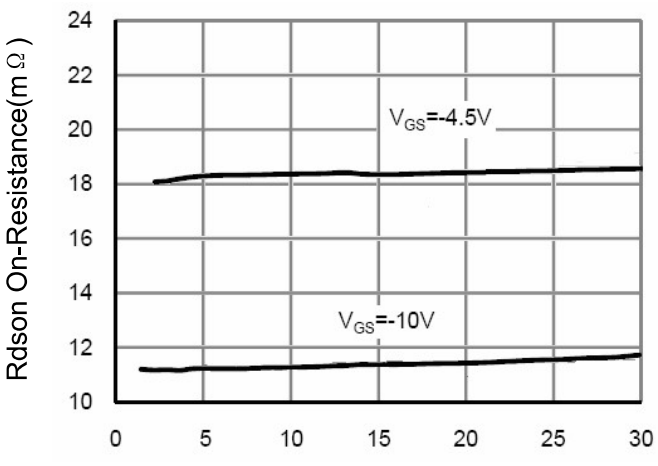
Vds Drain-Source Voltage (V)

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

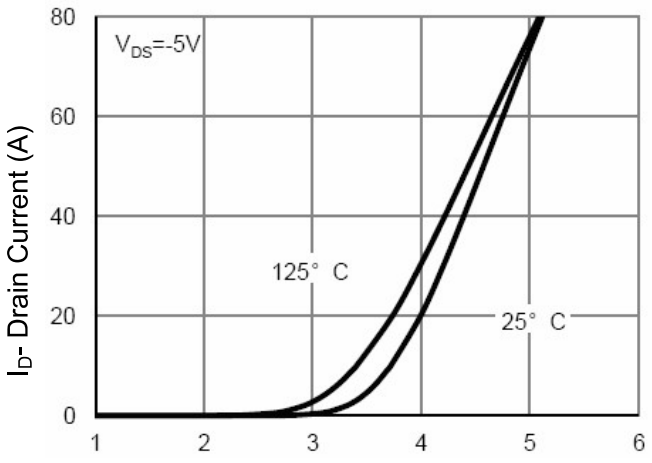


Figure 7 Transfer Characteristics

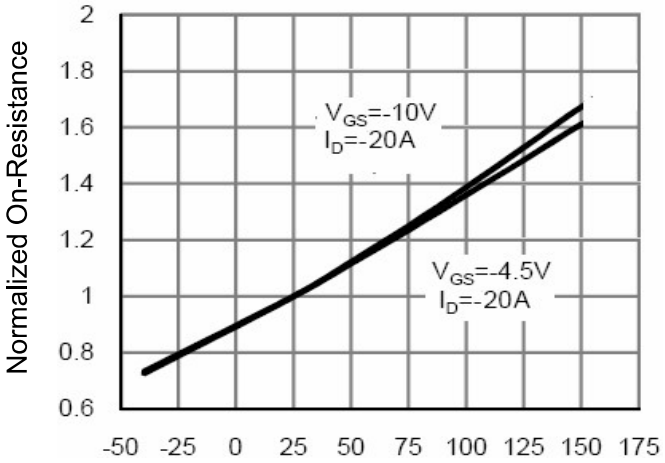


Figure 8 Drain-Source On-Resistance

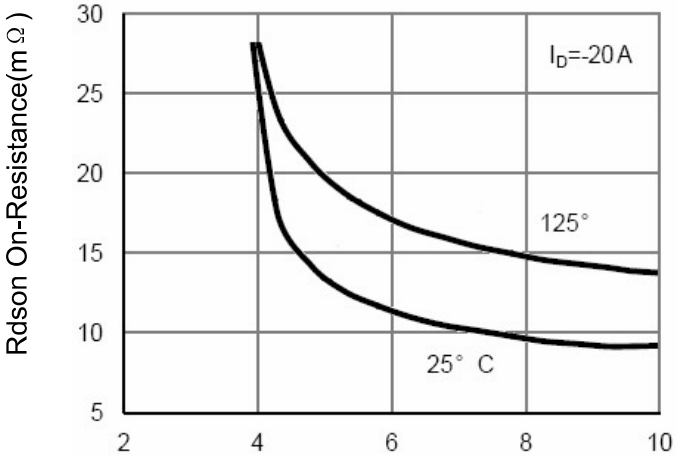


Figure 9 Rdson vs Vgs

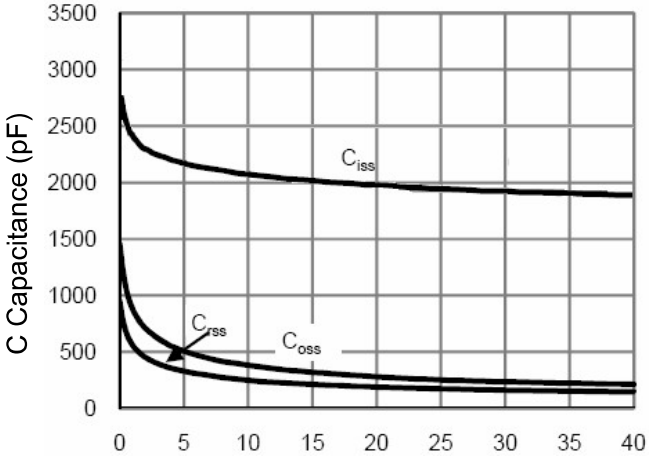


Figure 10 Capacitance vs Vds

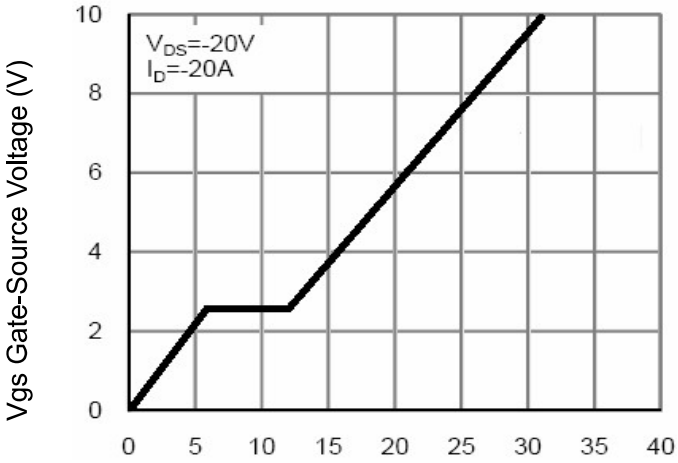


Figure 11 Gate Charge

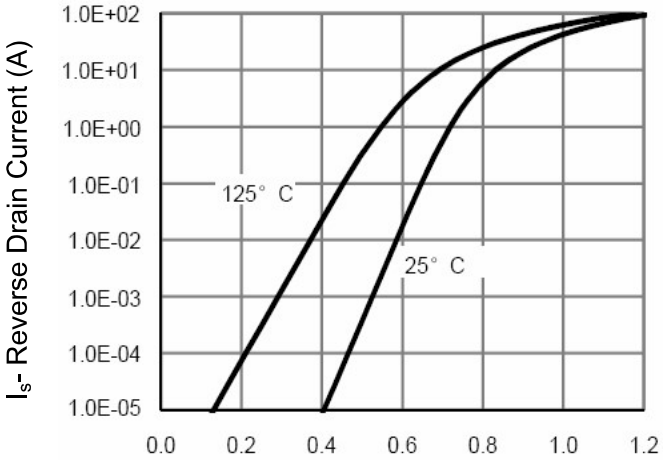


Figure 12 Source- Drain Diode Forward

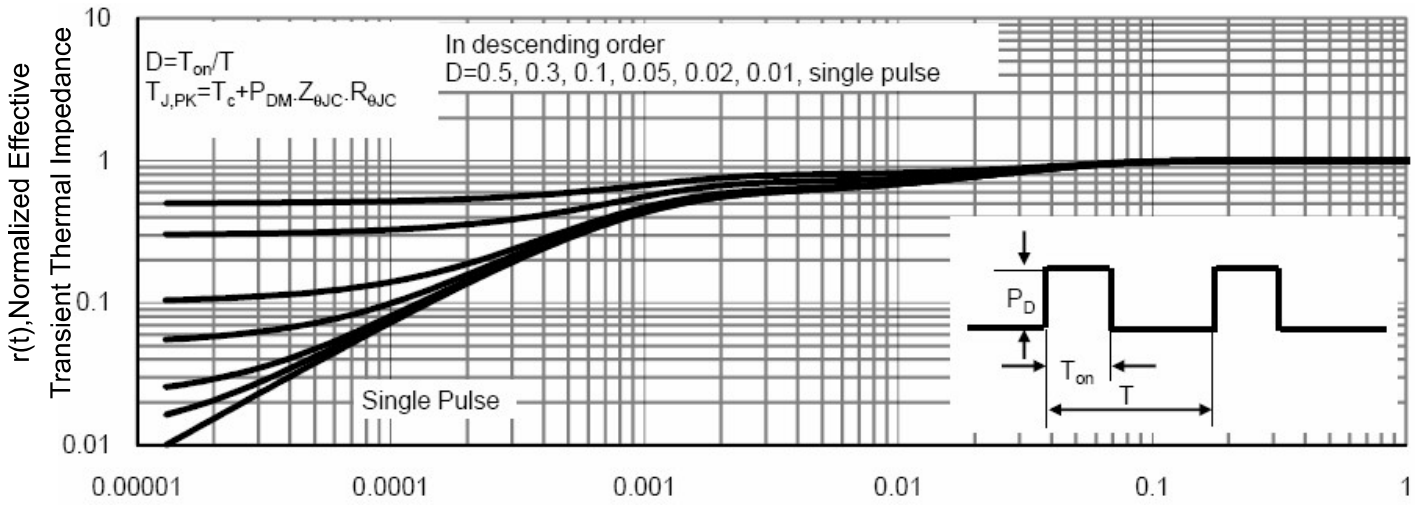
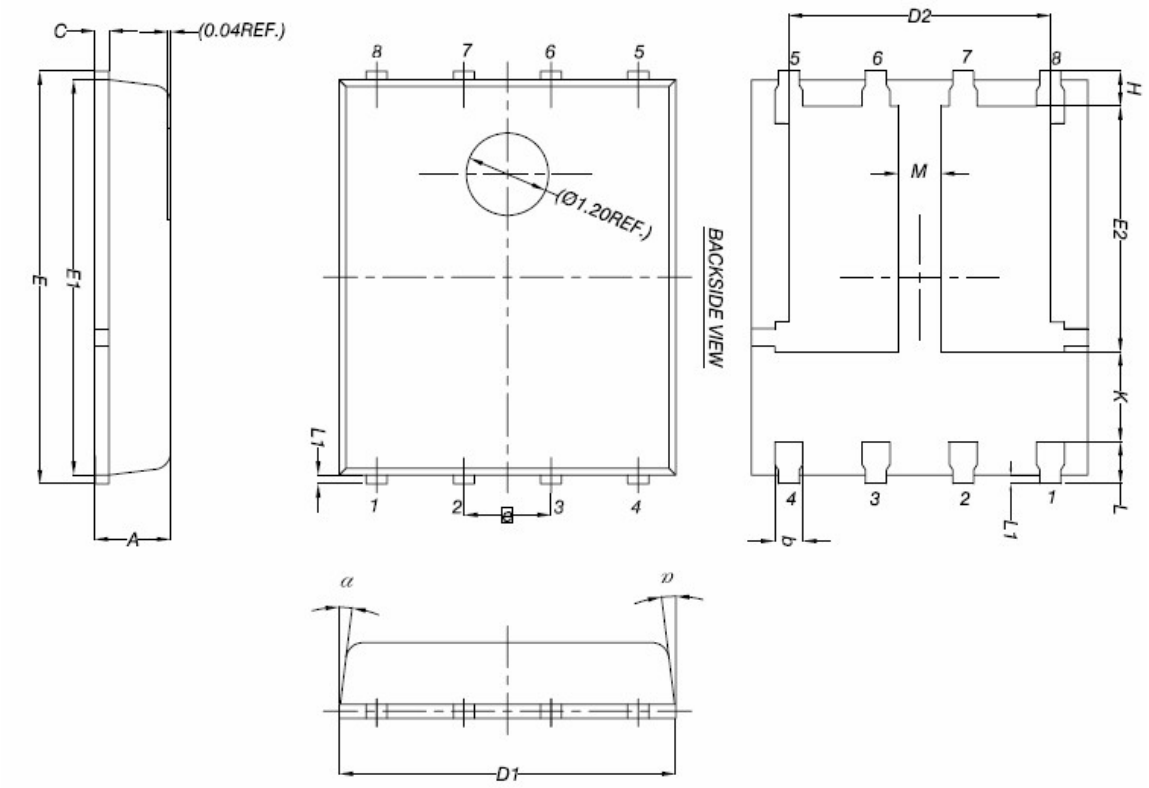


Figure 13 Normalized Maximum Transient Thermal Impedance

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°

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