

AP4910GD

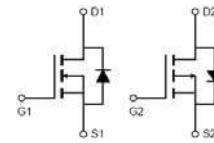
N and P-Channel Enhancement Mosfet

AIIPOWER

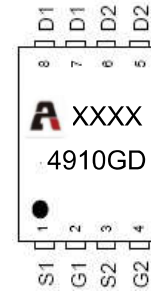
DATA SHEET

Feature

- **N-Channel**
 $V_{DD}=40V, I_D=30A$
 $R_{DS(ON)} < 16m\Omega @ V_{GS}=10V$ TYP 14m Ω
 $R_{DS(ON)} < 25m\Omega @ V_{GS}=4.5V$ TYP 20m Ω
- **P-Channel**
 $V_{DD}=-40V, I_D=-40A$
 $R_{DS(ON)} < 16m\Omega @ V_{GS}=-10V$ TYP 13.5m Ω
 $R_{DS(ON)} < 25m\Omega @ V_{GS}=-4.5V$ TYP 16.5m Ω
- Lead free product is acquired
- High power and current handing capability
- Surface mount package



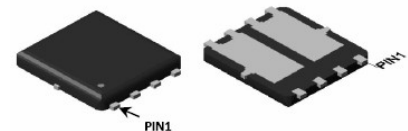
Schematic diagram



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 ($T_a=25^\circ\text{C}$ 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 ($T_a = 25^\circ\text{C}$)	I_D	30	-40	A
Continuous Drain Current ($T_a = 100^\circ\text{C}$)	I_D	21	-28	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	70	-120	A
Power Dissipation	P_D	45		W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	3.45		$^\circ\text{C}/\text{W}$
Junction Temperature	T_J	150		$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150		$^\circ\text{C}$

AP4910GD

N and P-Channel Enhancement Mosfet

AIIPOWER

DATA SHEET

N-CH ELECTRICAL CHARACTERISTICS($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 40V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Gate threshold voltage ⁽²⁾	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.6	2.5	V
Drain-source on-resistance ⁽²⁾	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 15A$		14	16	m Ω
		$V_{GS} = 4.5V, I_D = 10A$		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	$t_{d(on)}$	$V_{DD} = 20V, I_D = 15A$ $V_{GS} = 10V, R_G = 3\Omega$		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	Q_g	$V_{DS} = 20V, I_D = 15A,$ $V_{GS} = 10V$		22.9		nC
Gate-Source Charge	Q_{gs}			3.5		
Gate-Drain Charge	Q_{gd}			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)

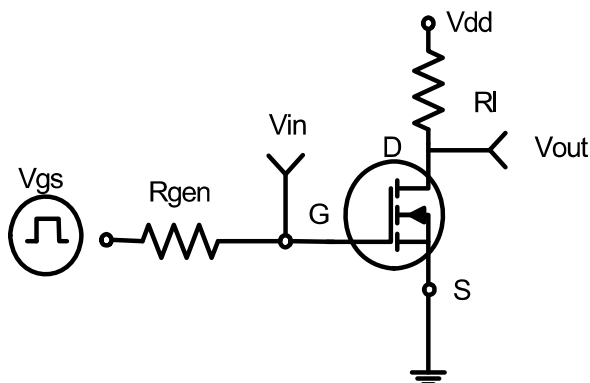


Figure 1: Switching Test Circuit

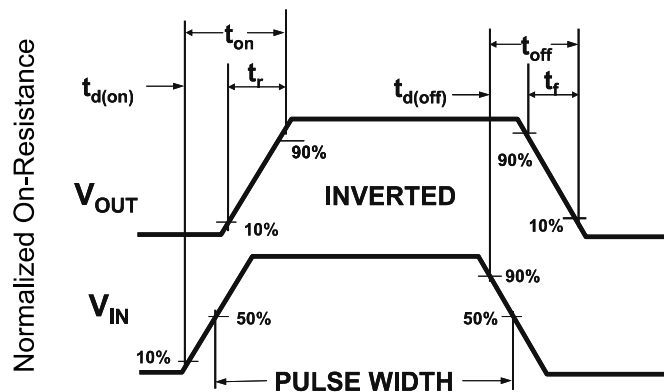


Figure 2: Switching Waveforms

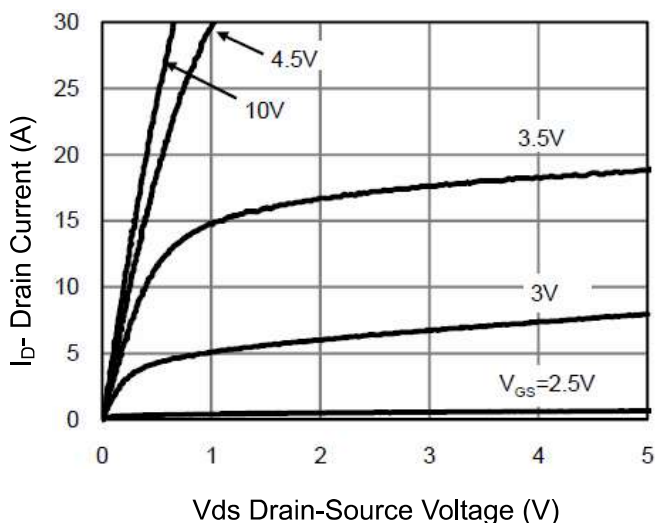


Figure 3 Output Characteristics

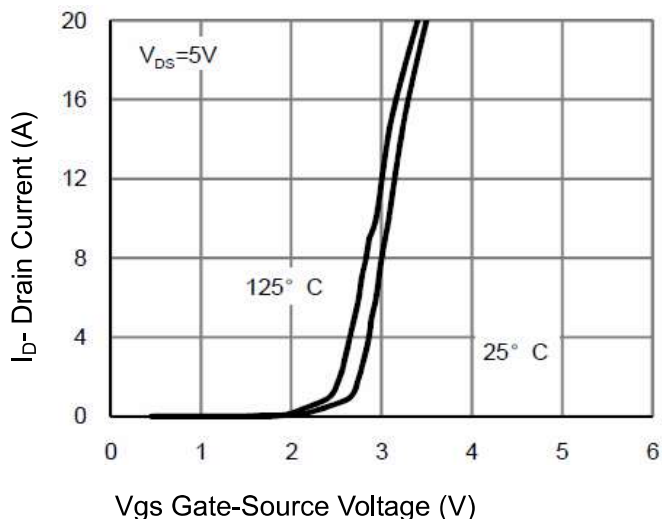


Figure 4 Transfer Characteristics

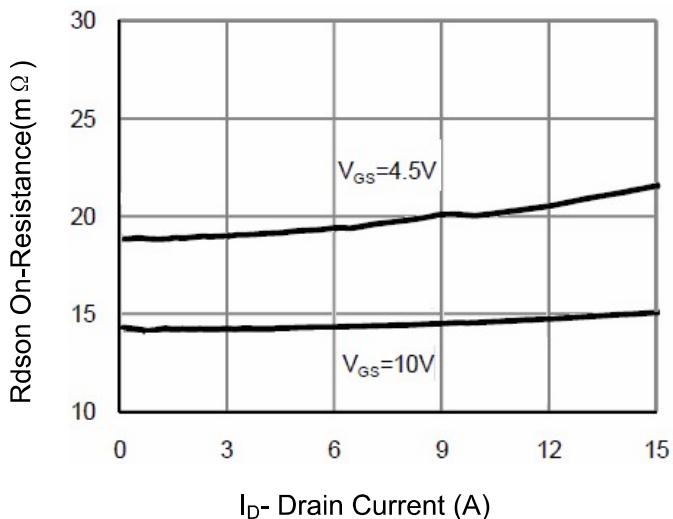


Figure 5 Drain-Source On-Resistance

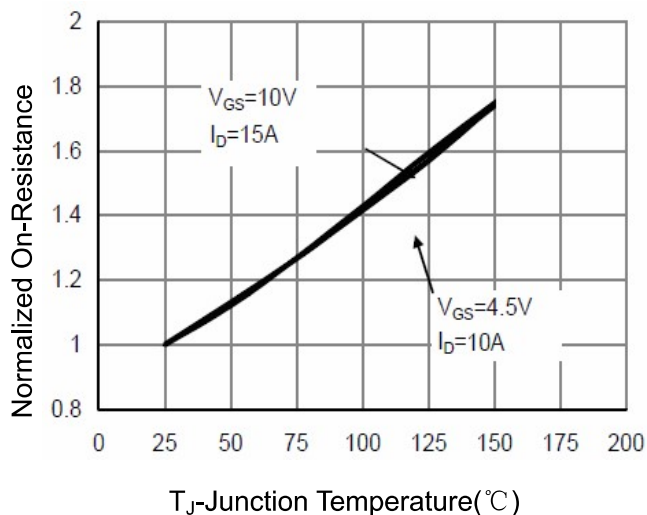
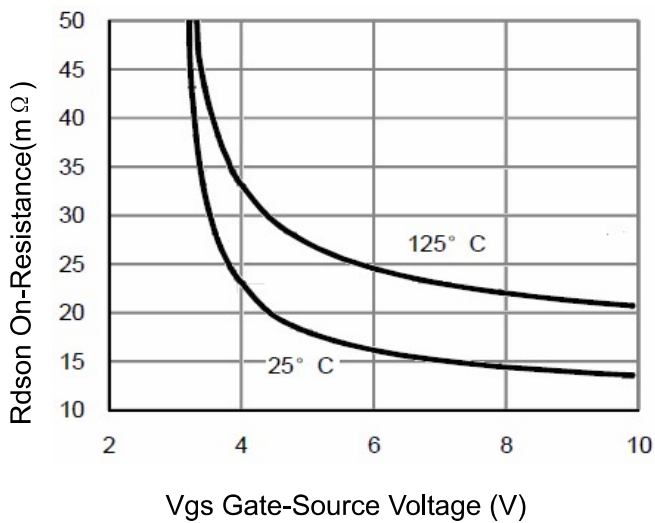
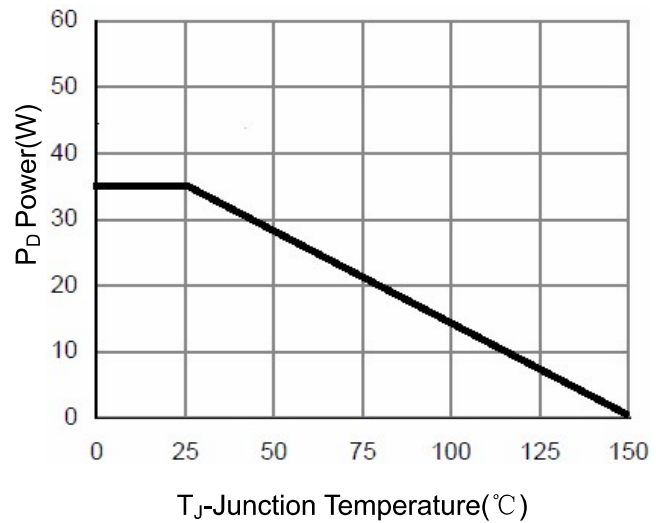


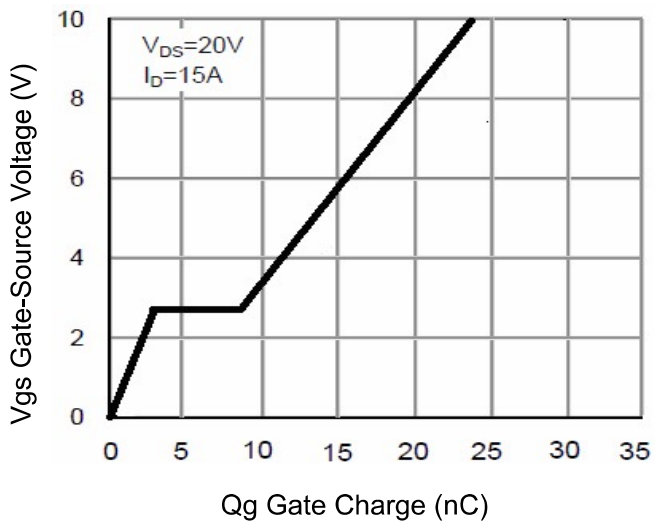
Figure 6 Drain-Source On-Resistance



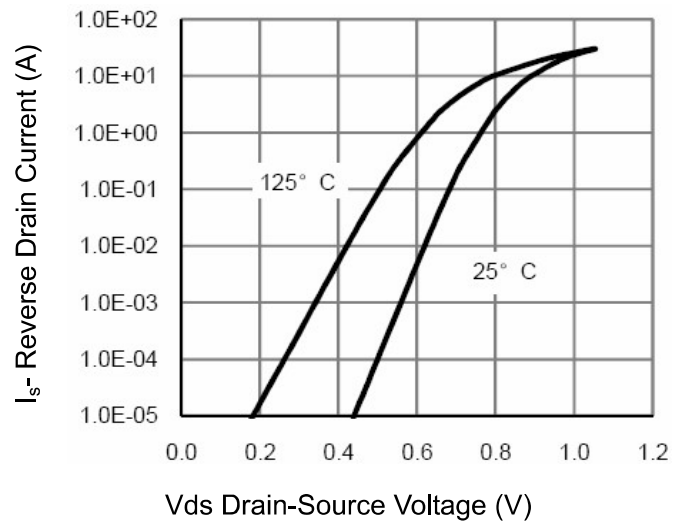
Vgs Gate-Source Voltage (V)
Figure 7 Rdson vs Vgs



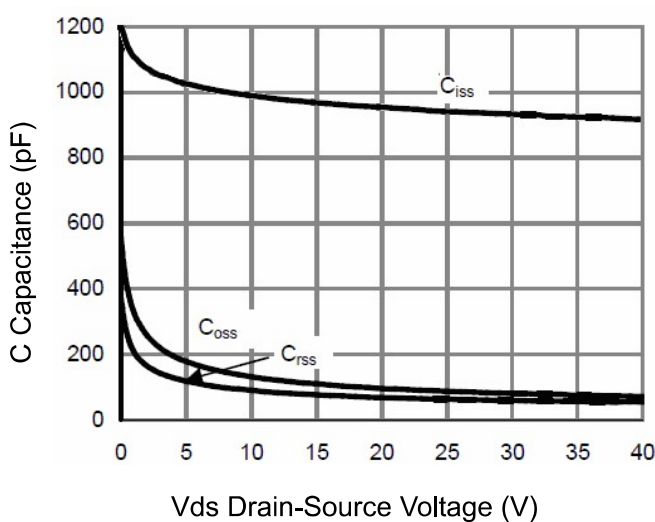
Tj-Junction Temperature (°C)
Figure 8 Power Dissipation



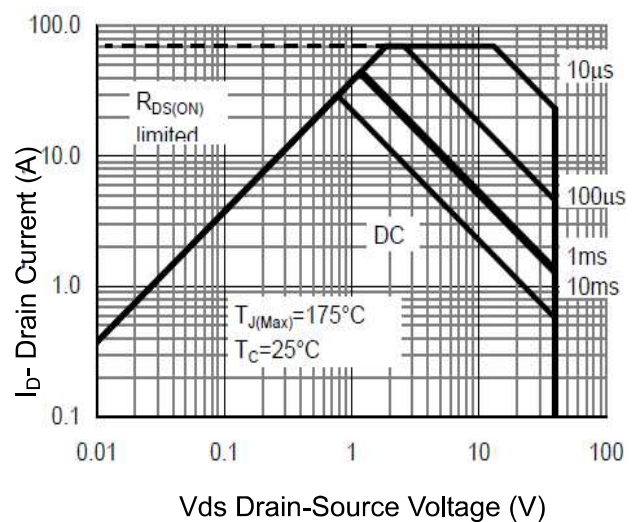
Qg Gate Charge (nC)
Figure 9 Gate Charge



Vds Drain-Source Voltage (V)
Figure 10 Source-Drain Diode Forward



Vds Drain-Source Voltage (V)
Figure 11 Capacitance vs Vds



Vds Drain-Source Voltage (V)
Figure 12 Safe Operation Area

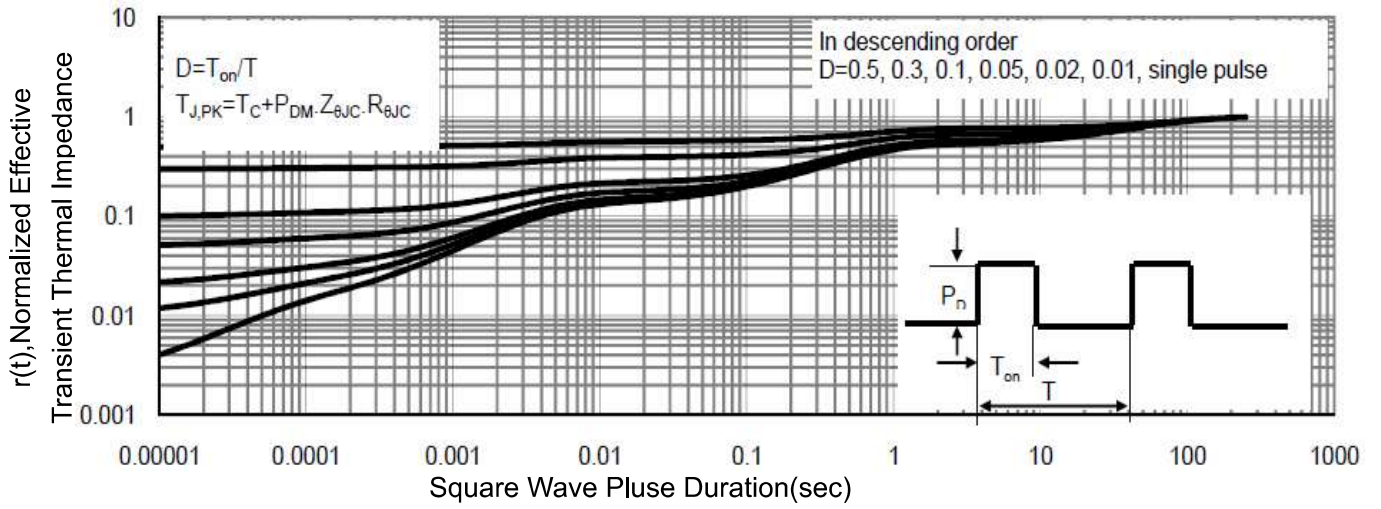


Figure 13 Normalized Maximum Transient Thermal Impedance

AP4910GD

N and P-Channel Enhancement Mosfet

AIIPOWER

DATA SHEET

P-CH ELECTRICAL CHARACTERISTICS($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -40V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Gate threshold voltage ⁽²⁾	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.6	-2.5	V
Drain-source on-resistance ⁽²⁾	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -15A$		13.5	16	m Ω
		$V_{GS} = -4.5V, I_D = -10A$		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	$t_{d(on)}$	$V_{DD} = -20V, I_D = -20A$ $V_{GS} = -10V, R_G = 3.0\Omega$		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	Q_g	$V_{DS} = -20V, I_D = -20A,$ $V_{GS} = -10V$		31		nC
Gate-Source Charge	Q_{gs}			5.5		
Gate-Drain Charge	Q_{gd}			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 $\leq 300\mu s$, duty cycle $\leq 2\%$
3. Surface Mounted on FR4 Board, $t \leq 10$ sec

Typical Electrical and Thermal Characteristics

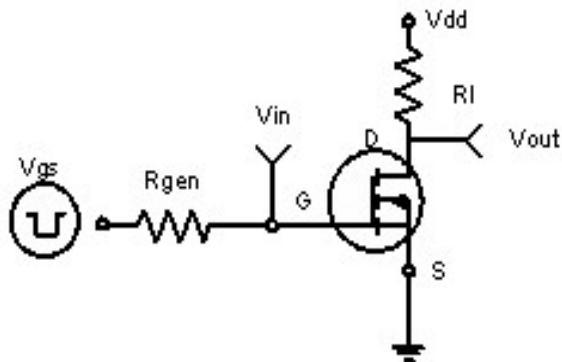


Figure 1 Switching Test Circuit

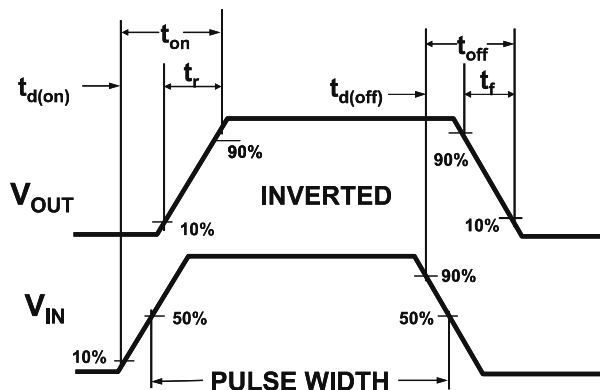


Figure 2 Switching Waveforms

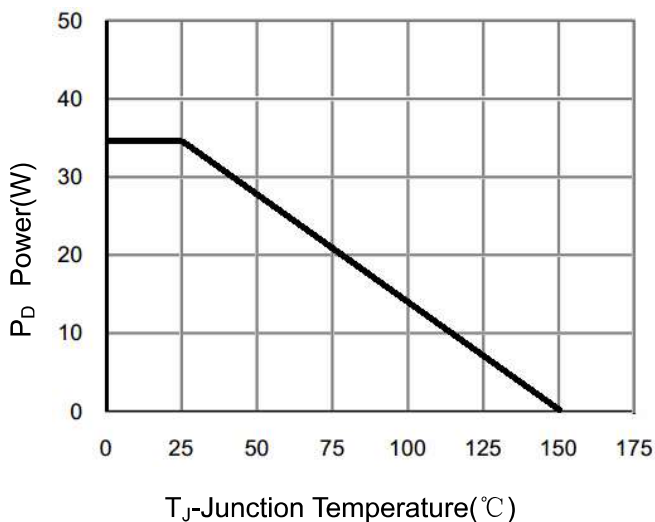


Figure 3 Power Dissipation

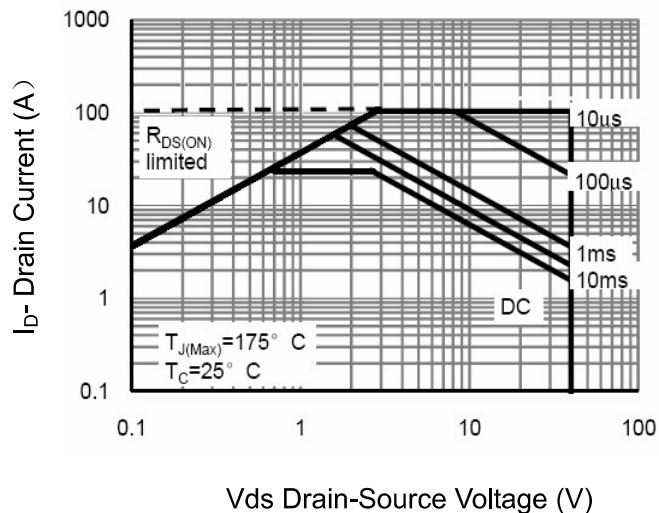


Figure 4 Safe Operation Area

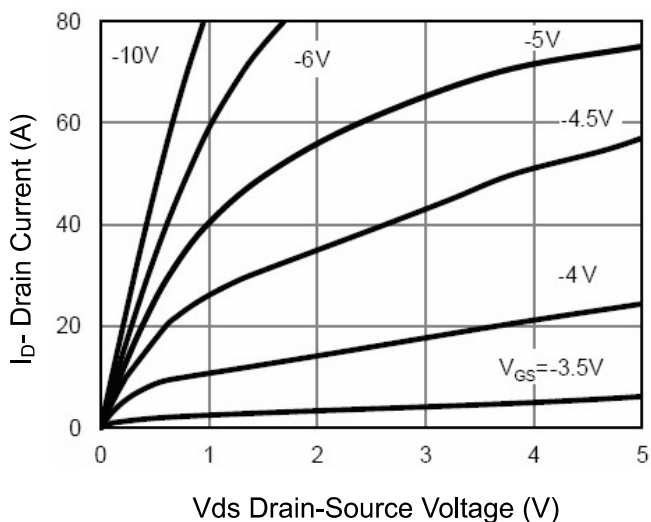


Figure 5 Output Characteristics

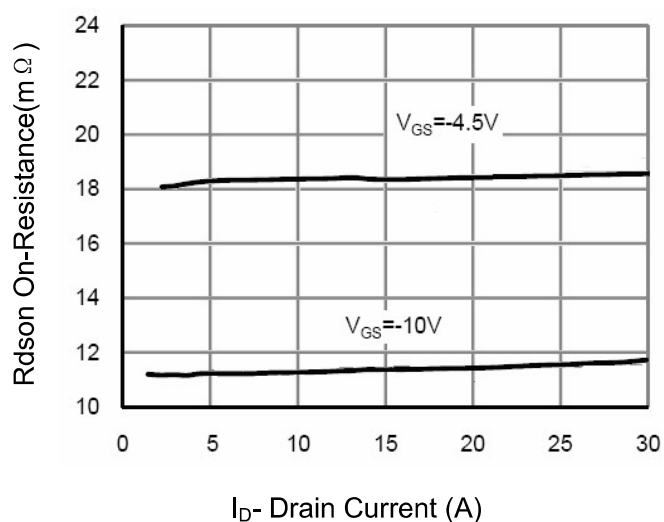


Figure 6 Drain-Source On-Resistance

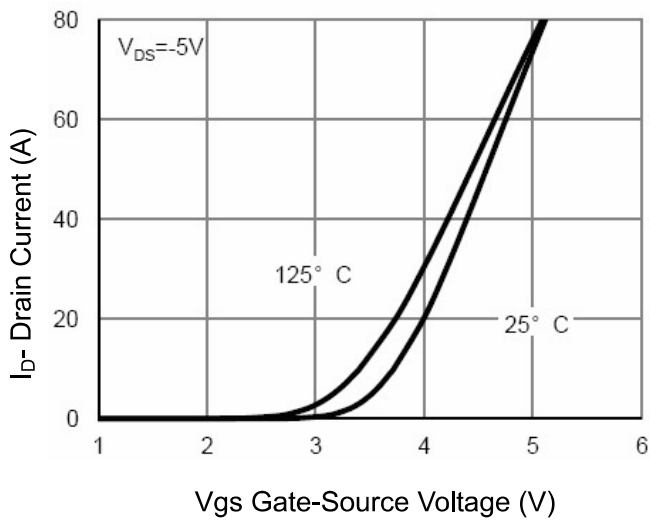


Figure 7 Transfer Characteristics

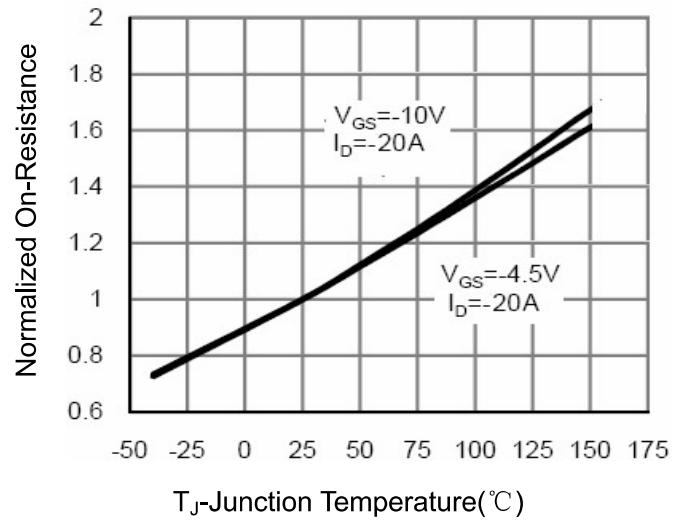


Figure 8 Drain-Source On-Resistance

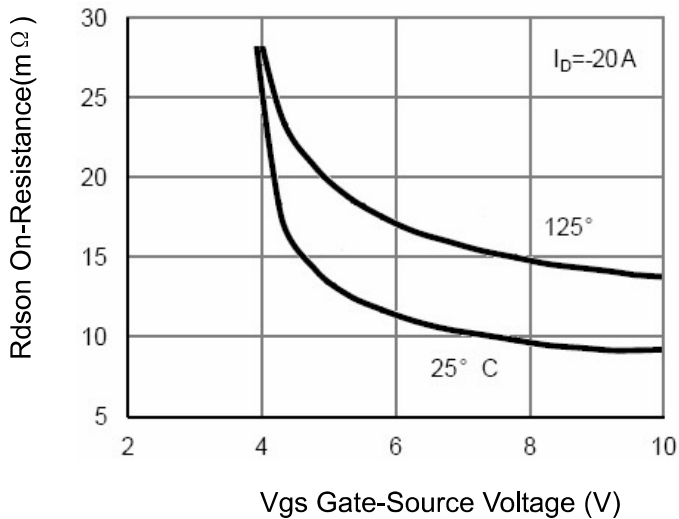


Figure 9 Rdson vs Vgs

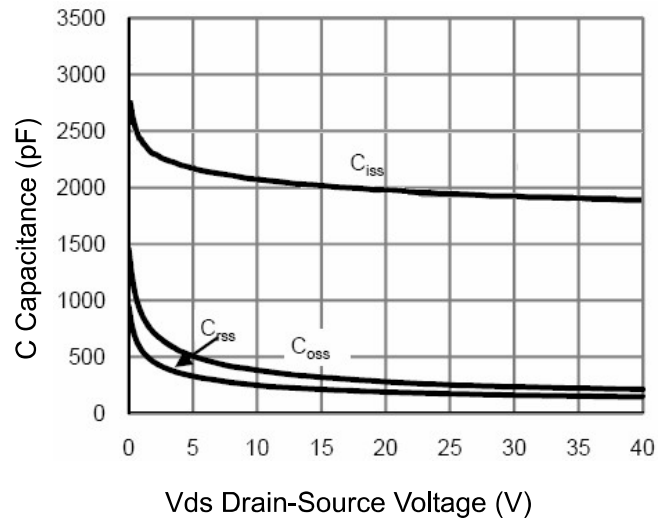


Figure 10 Capacitance vs Vds

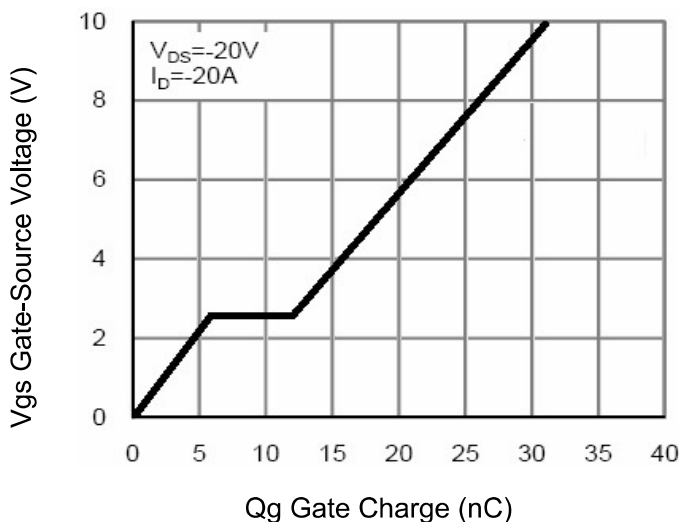


Figure 11 Gate Charge

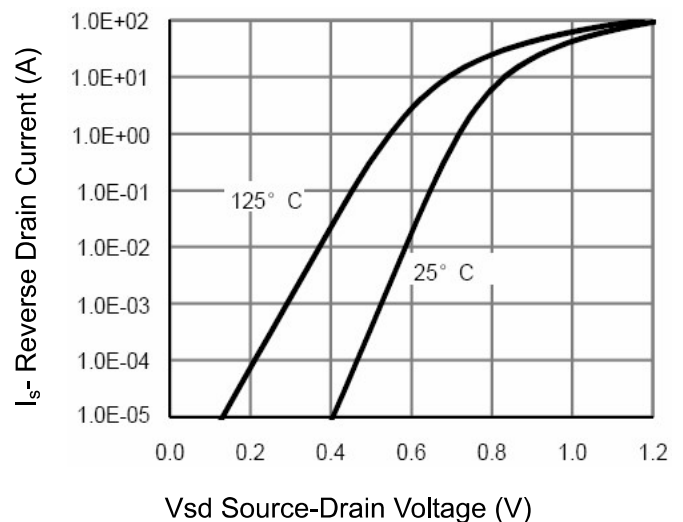


Figure 12 Source- Drain Diode Forward

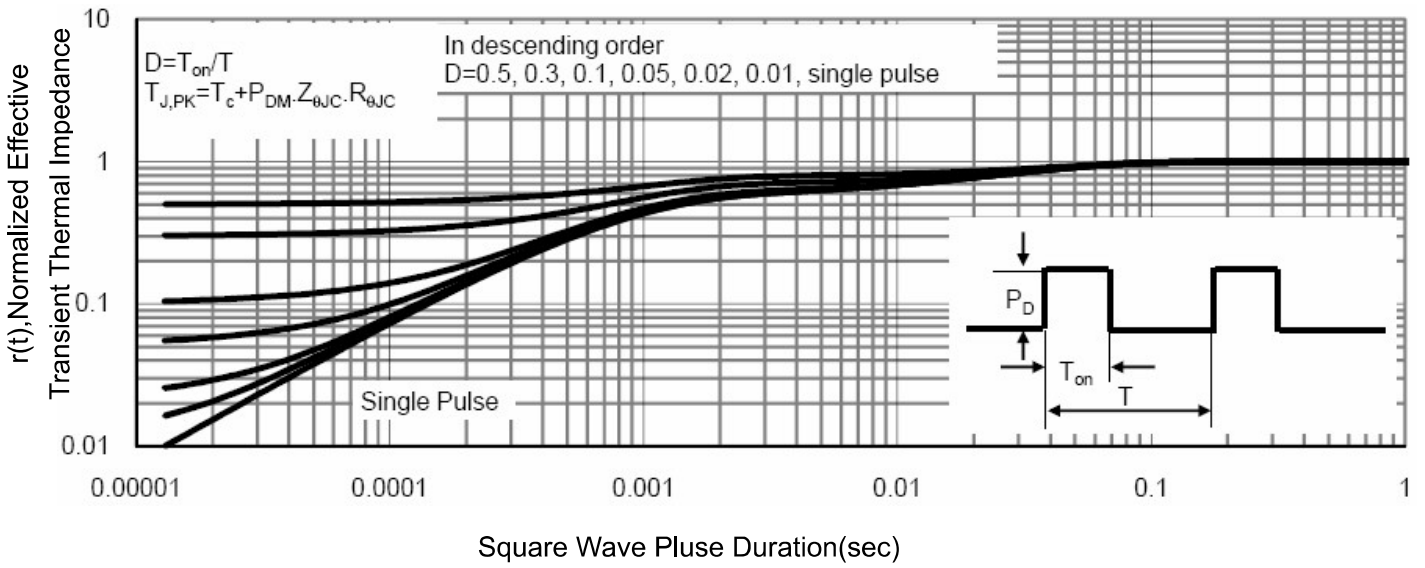
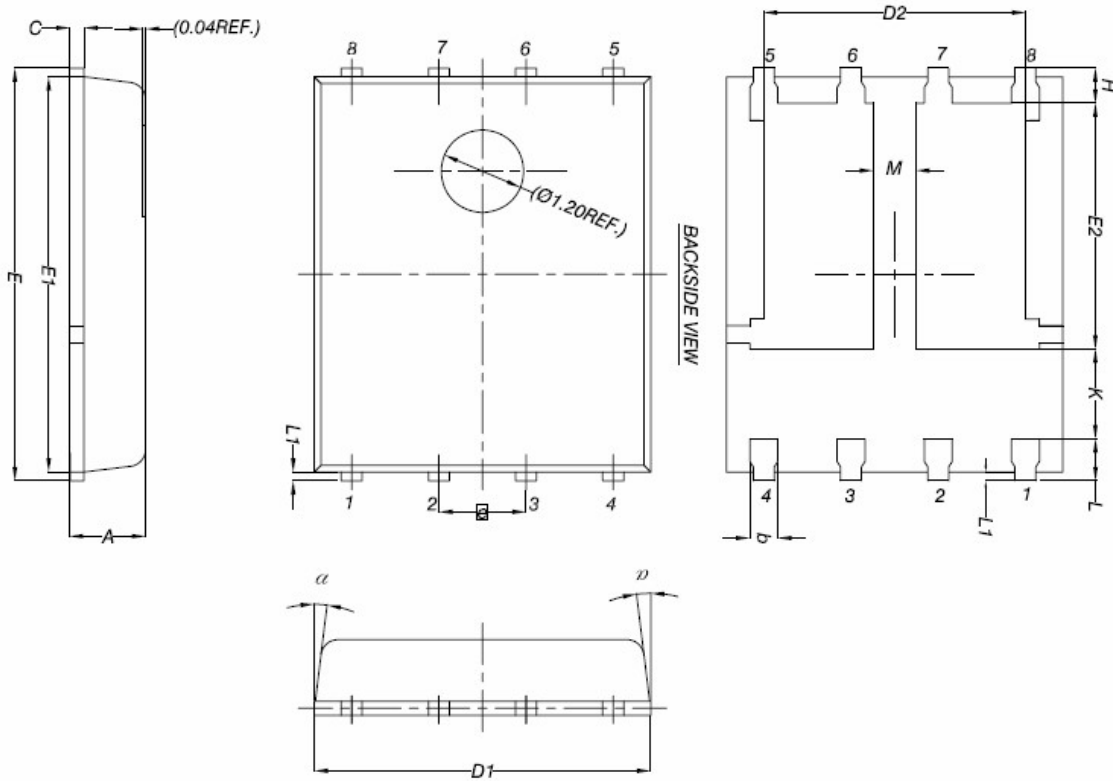


Figure 13 Normalized Maximum Transient Thermal Impedance

AP4910GD
N and P-Channel Enhancement Mosfet

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°