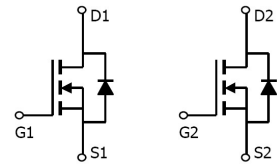


**Feature**

- 40V,20A  
 $R_{DS(on)} < 22m\Omega @ V_{GS}=10V$   
 $R_{DS(on)} < 30m\Omega @ V_{GS}=4.5V$
- Trench DMOS Power MOSFET
- Fast Switching
- Exceptional on-resistance and maximum DC current capability



Schematic diagram

**Application**

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch



Marking and pin assignment

**Package Marking and Ordering Information**

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
4008QD	AP4008QD	PDFN3X3	13 inch	-	5000

**ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub>=25°C unless otherwise noted)**

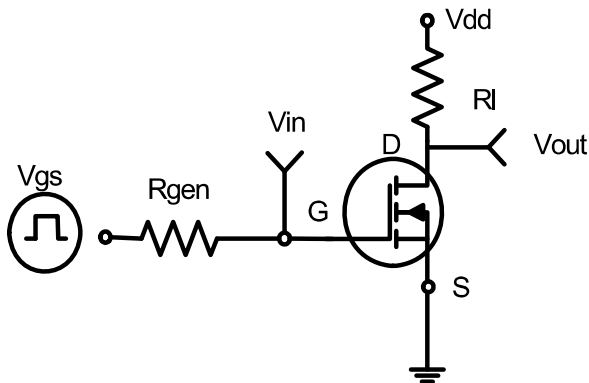
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	40	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current (T <sub>a</sub> =25°C)	I <sub>D</sub>	20	A
Continuous Drain Current (T <sub>a</sub> =100°C)	I <sub>D</sub>	13	A
Pulsed Drain Current <sup>(1)</sup>	I <sub>DM</sub>	48	A
Power Dissipation	P <sub>D</sub>	21	W
Thermal Resistance from Junction to Ambient	R <sub>θJA</sub>	6.25	°C/W
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>STG</sub>	-55~ +150	°C

**MOSFET ELECTRICAL CHARACTERISTICS(T<sub>a</sub>=25°C unless otherwise noted)**

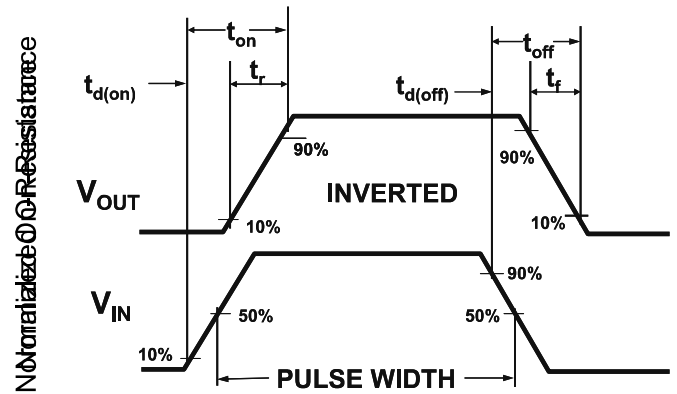
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	40	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =40V, V <sub>GS</sub> = 0V	-	-	1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V	-	-	±100	nA
Gate threshold voltage <sup>(2)</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	1.6	2.5	V
Drain-source on-resistance <sup>(2)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A	-	17	22	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A	-	22	30	
<b>Dynamic characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f =1MHz	-	1050	-	pF
Output Capacitance	C <sub>oss</sub>		-	84	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	72	-	
<b>Switching characteristics</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =20V, R <sub>L</sub> =1.5Ω V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω	-	11	-	ns
Turn-on rise time	t <sub>r</sub>		-	13	-	
Turn-off delay time	t <sub>d(off)</sub>		-	36	-	
Turn-off fall time	t <sub>f</sub>		-	9	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =20V, I <sub>D</sub> =5A, V <sub>GS</sub> =10V	-	11	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	1.9	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	2.2	-	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage <sup>(2)</sup>	V <sub>DS</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =10A	-	-	1.2	V
Diode Forward current <sup>(3)</sup>	I <sub>S</sub>		-	-	40	A

**Notes:**

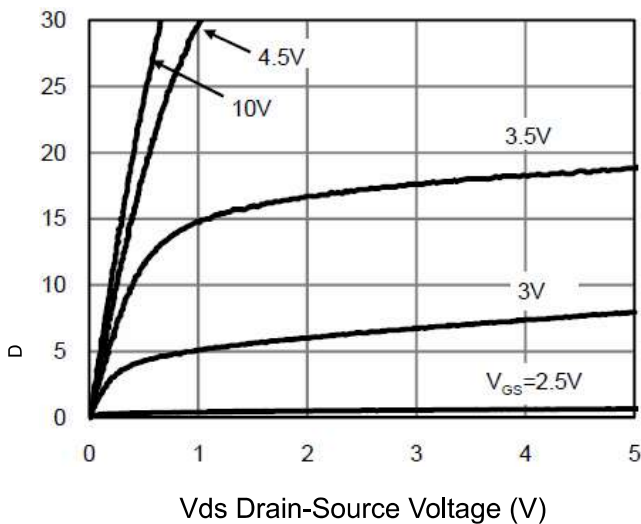
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. Pulse Test: pulse width≤300μs, duty cycle≤2%
3. Surface Mounted on FR4 Board,t≤10 sec



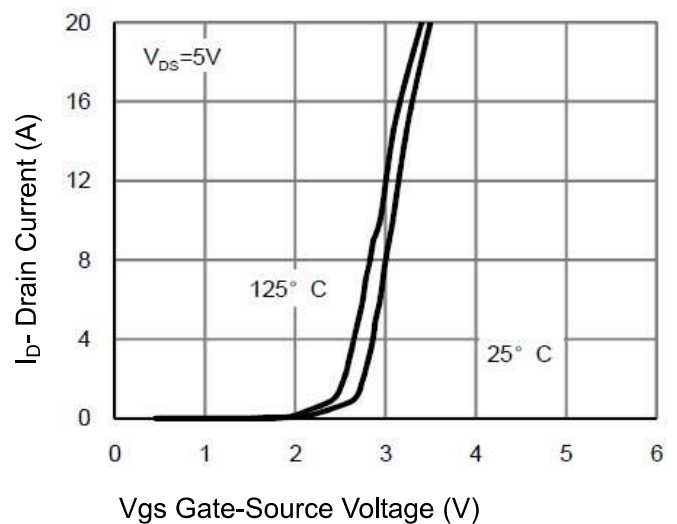
**Figure 1: Switching Test Circuit**



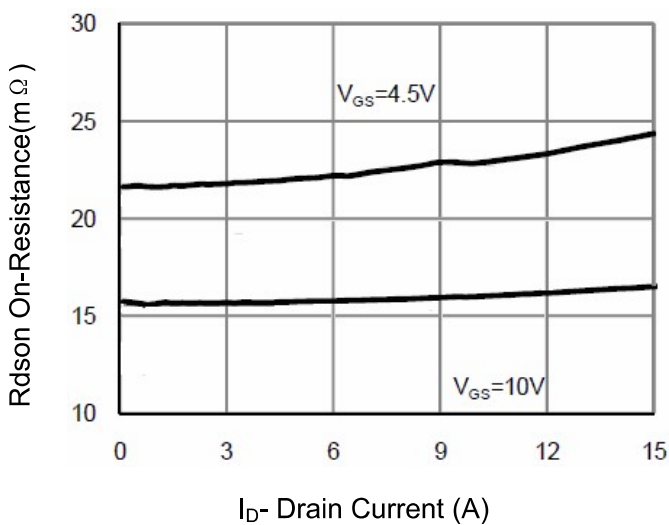
**Figure 2: Switching Waveforms**



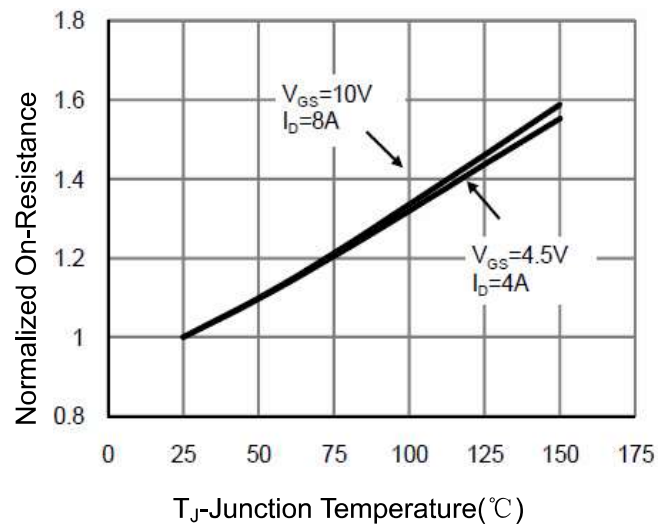
**Figure 3 Output Characteristics**



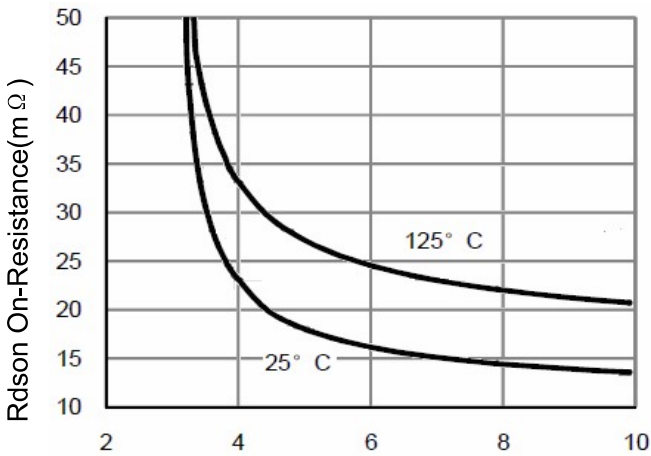
**Figure 4 Transfer Characteristics**



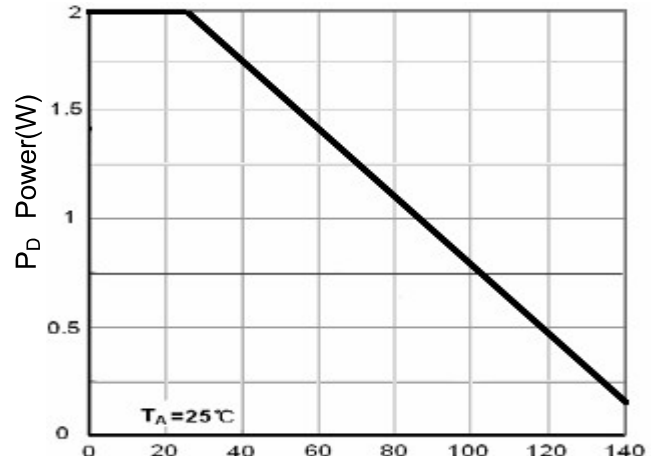
**Figure 5 Drain-Source On-Resistance**



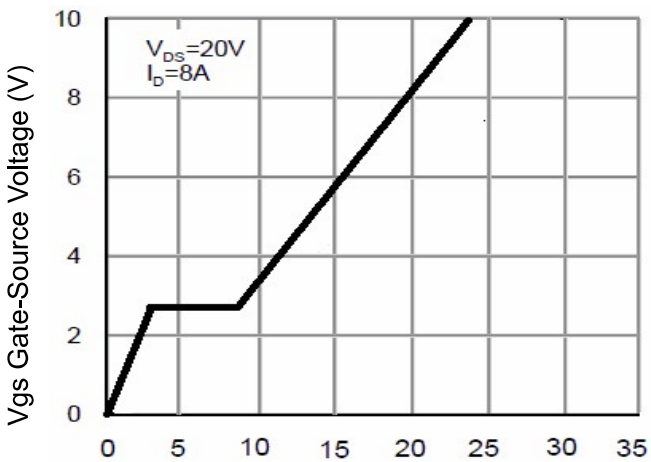
**Figure 6 Drain-Source On-Resistance**



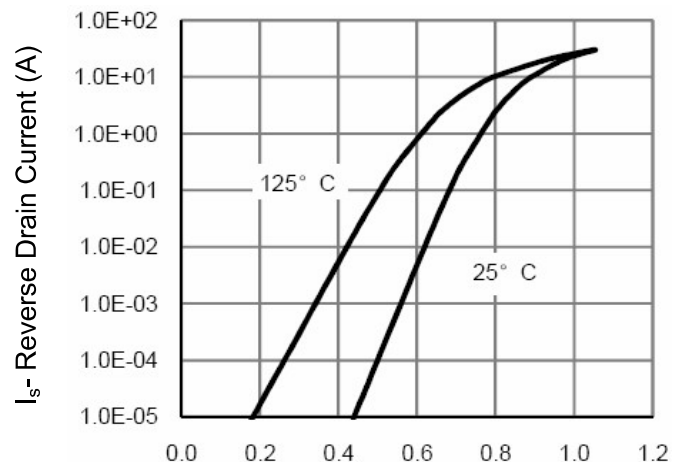
Vgs Gate-Source Voltage (V)  
**Figure 7 Rdson vs Vgs**



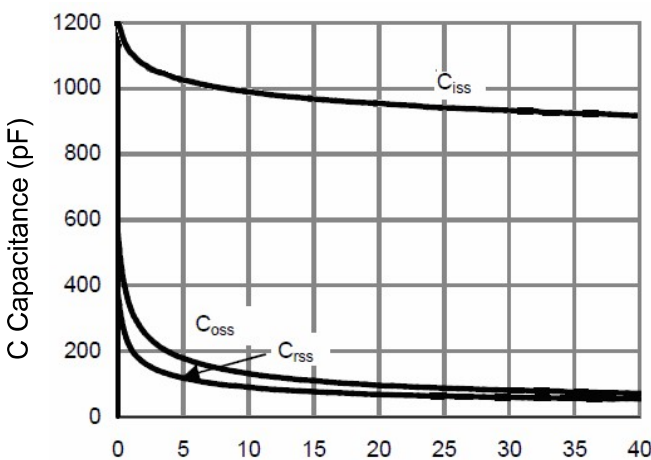
Tj Junction Temperature (°C)  
**Figure 8 Power Dissipation**



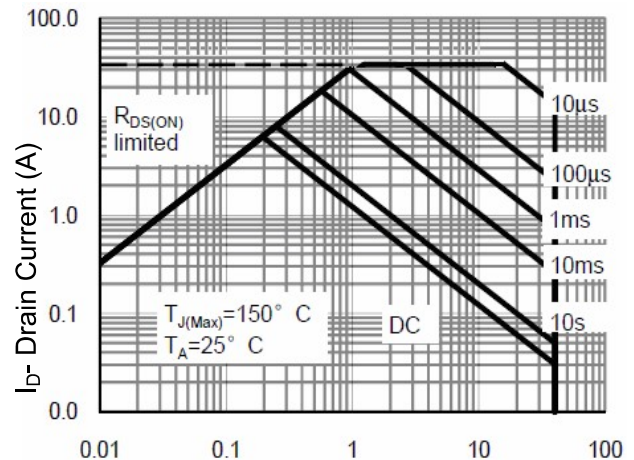
Qg Gate Charge (nC)  
**Figure 9 Gate Charge**



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**

**PACKAGE OUTLINE DIMENSIONS**

