

# APD7002K1

## N-Channel Enhancement Mosfet

# AIPOWER

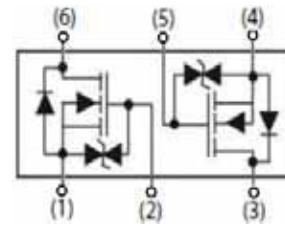
## DATA SHEET

### Features

- 60V,430mA  
 $R_{DS(ON)} < 3.0 \Omega @ V_{GS}=10V$  TYP:1.9  $\Omega$   
 $R_{DS(ON)} < 4.0 \Omega @ V_{GS}=4.5V$  TYP:2.4  $\Omega$
- Sensitive gate trigger current and
- Low Holding current.ESD protected diode.
- ESD rating:2200V HBM

### Applications

- General purpose switching
- Phase control



PIN1 , 4 : S  
PIN2 , 5 : G  
PIN3 , 6 : D

### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
702	APD7002K1	SOT-363	-	-	3000

### ABSOLUTE MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_C=25^\circ\text{C}$ ) <sup>(3)</sup>	$I_D$	0.43	A
Continuous Drain Current ( $T_C=100^\circ\text{C}$ ) <sup>(3)</sup>	$I_D$	0.25	A
Pulsed Drain Current <sup>(1,3)</sup>	$I_{DM}$	1.7	A
Drain Power Dissipation	$P_D$	0.83	W
Thermal Resistance- Junction to Ambient <sup>(2)</sup>	$R_{\theta JA}$	150	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~ +150	$^\circ\text{C}$

#### Notes:

1. Pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 2 \%$
2. Mounted on Large Heat Sink
3. Limited by bonding wire

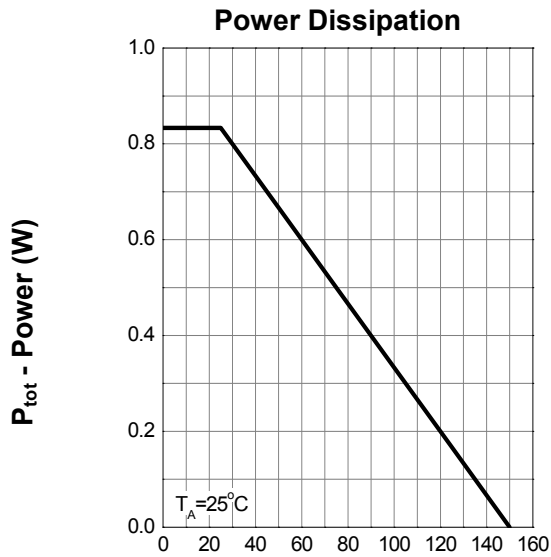
**MOSFET ELECTRICAL CHARACTERISTICS(T<sub>a</sub>=25°C unless otherwise noted)**

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	60	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =48V, 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	-	-	±10	μA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	-	2.5	V
Drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =0.4A	-	1.9	3.0	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.3A	-	2.4	4.0	Ω
<b>Dynamic characteristics</b>						
Input Capacitance	C <sub>iSS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f =1.0MHz	-	30	-	pF
Output Capacitance	C <sub>oss</sub>		-	4.2	-	
Reverse Transfer Capacitance	C <sub>rSS</sub>		-	3	-	
<b>Switching characteristics</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =30V, I <sub>D</sub> =0.2A, R <sub>G</sub> =25Ω, V <sub>G</sub> =10V	-	3.9	-	ns
Turn-on rise time	t <sub>r</sub>		-	3.5	-	
Turn-off delay time	t <sub>d(off)</sub>		-	16	-	
Turn-off fall time	t <sub>f</sub>		-	10	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =0.4A, V <sub>GS</sub> =4.5V	-	305	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	85	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	205	-	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage	V <sub>SD</sub>	T <sub>C</sub> =25°C, V <sub>GS</sub> =0V, I <sub>S</sub> =0.4A	-	0.7	1.3	V
Diode Forward current	I <sub>S</sub>	T <sub>C</sub> =25°C	-	-	100	A
Body Diode Reverse Recovery Time	t <sub>rr</sub>	T <sub>C</sub> =25°C, I <sub>F</sub> =0.4A, di/dt=100A/us		40		ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	T <sub>C</sub> =25°C, I <sub>F</sub> =0.4A, di/dt=100A/us		40		uc

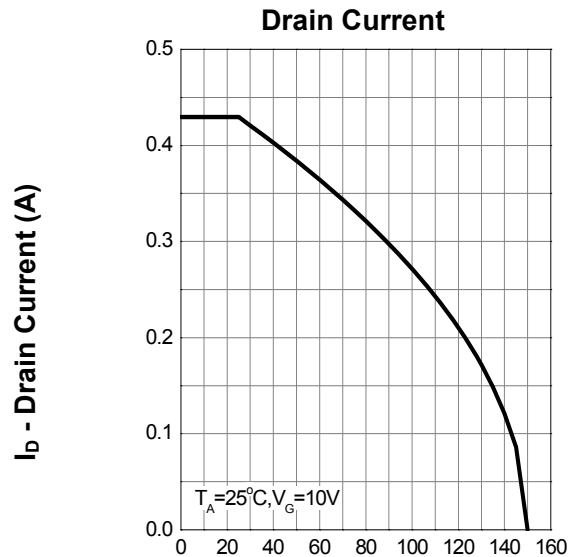
**Notes:**

- a) Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2%
- b) Guaranteed by design, not subject to production testing

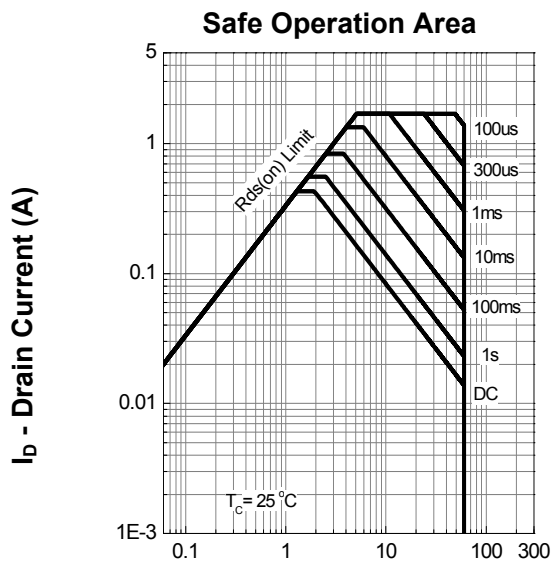
Typcal Characteristics (cont.)



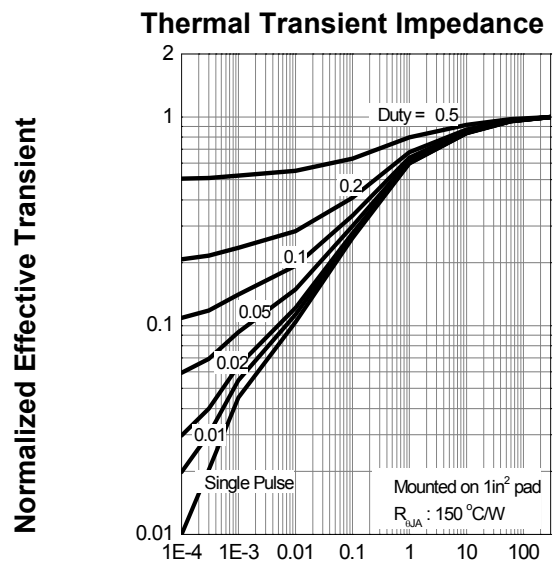
$T_j$  - Junction Temperature ( $^\circ\text{C}$ )



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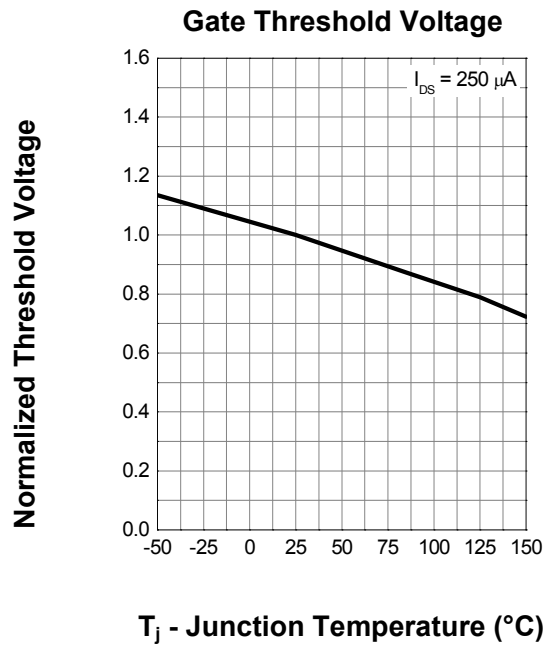
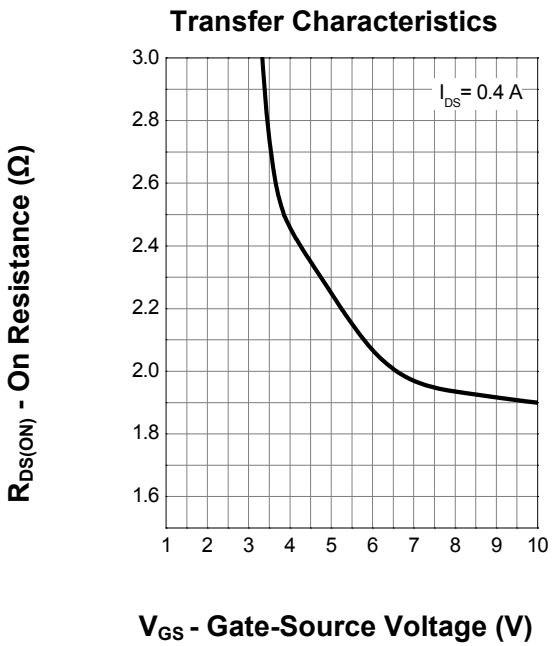
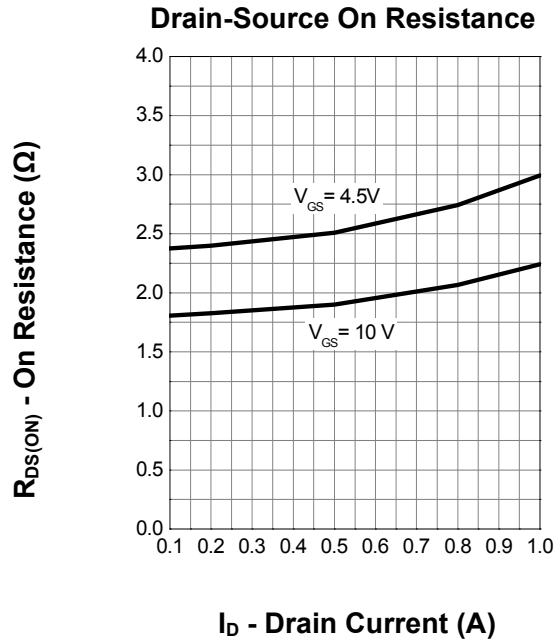
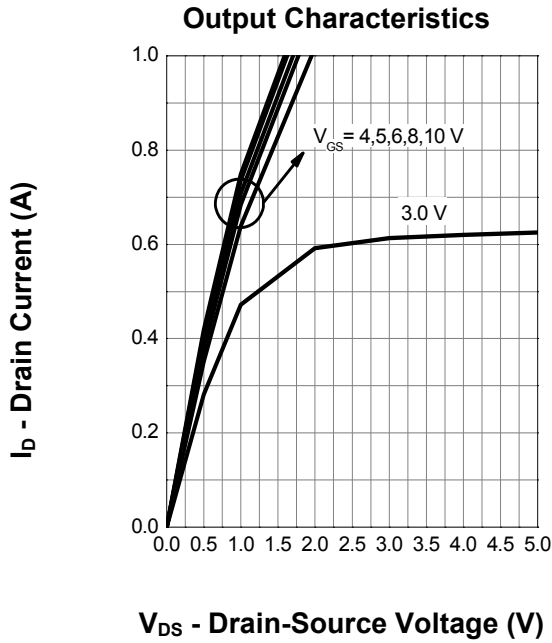


$V_{DS}$  - Drain-Source Voltage (V)

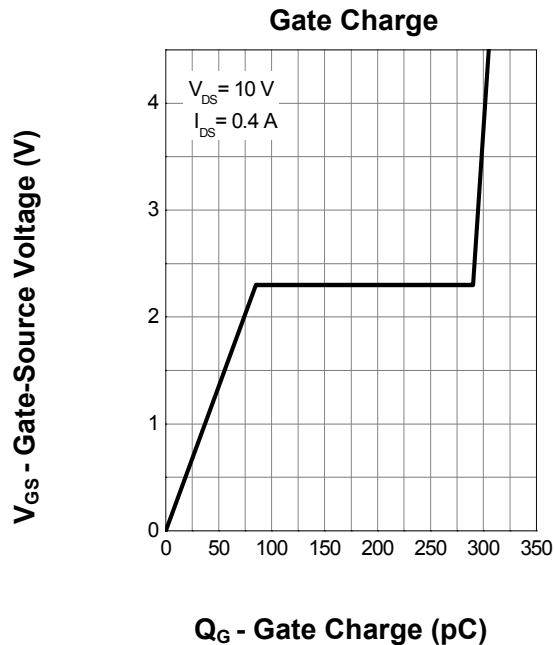
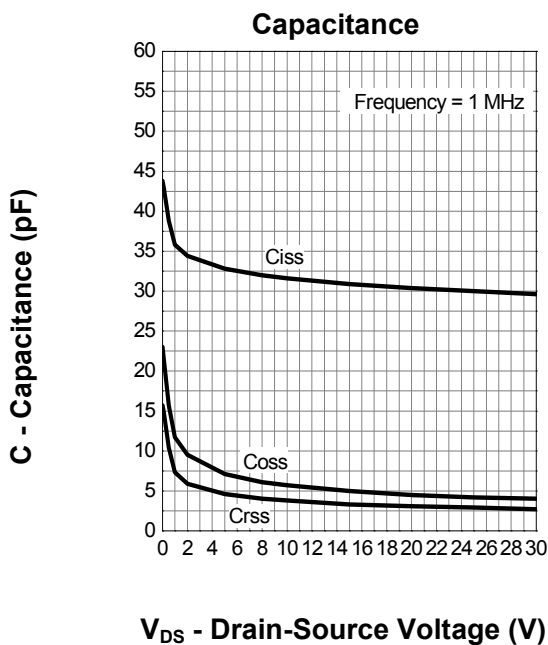
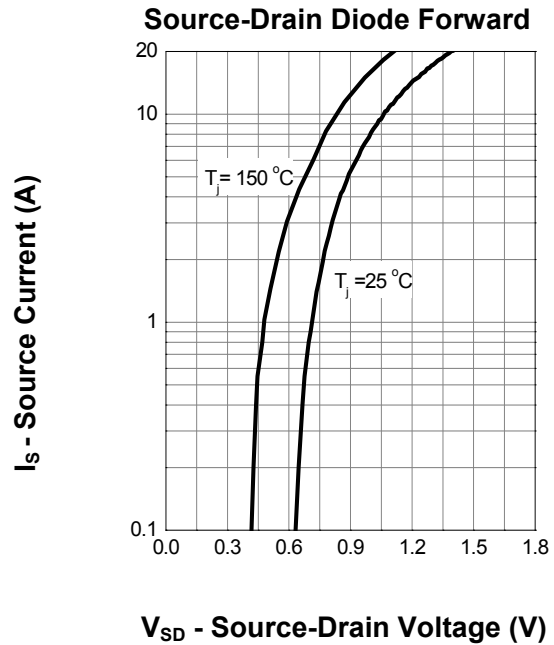
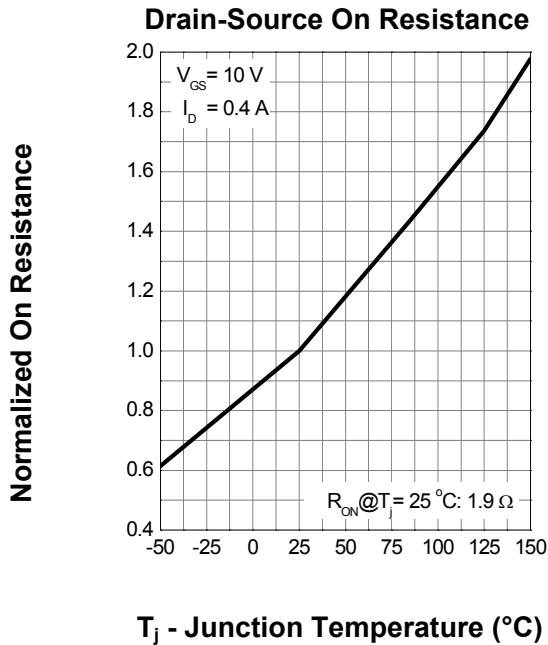


Square Wave Pulse Duration (sec)

Typcal Characteristics (cont.)

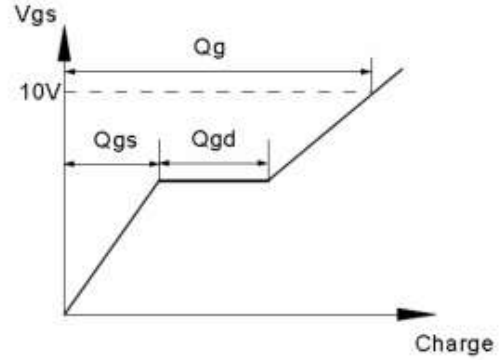
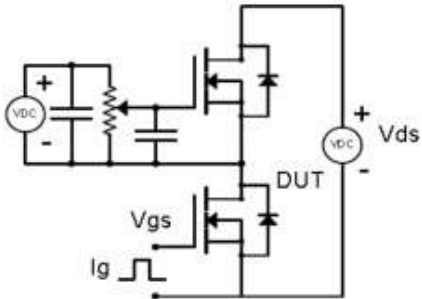


**Typcal Characteristics (cont.)**

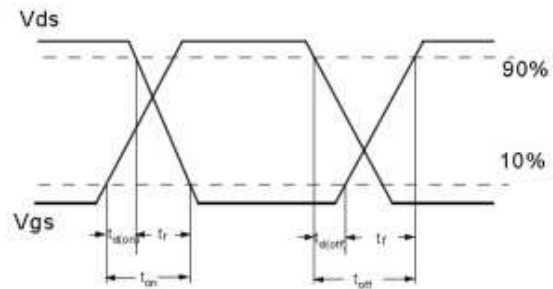
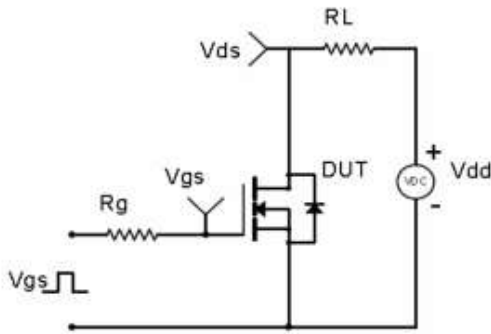


**Test Circuit & Waveform**

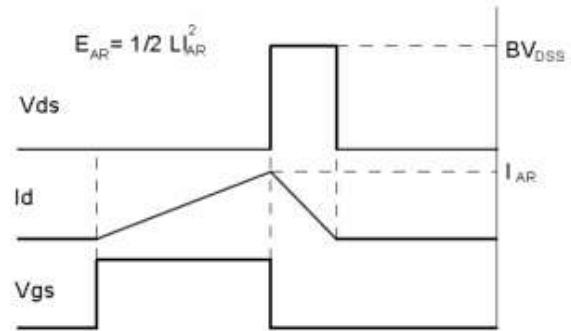
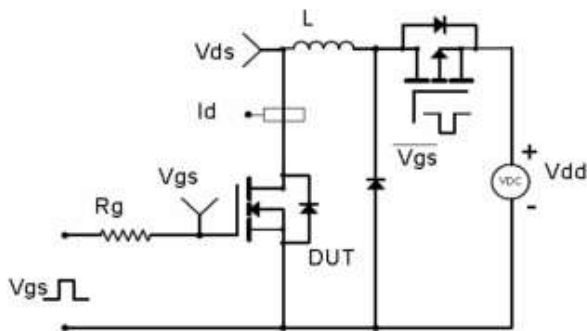
Gate Charge Test Circuit & Waveform



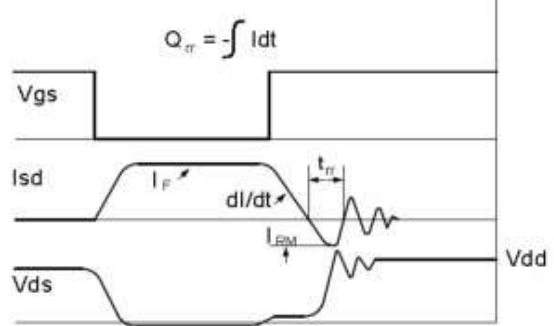
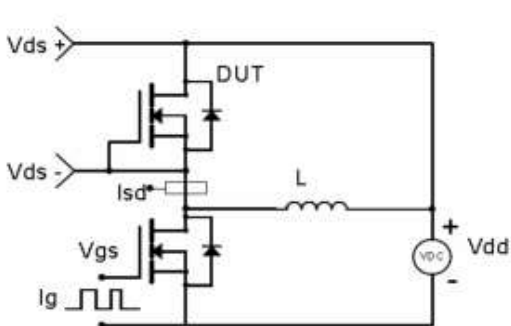
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



**Package Dimensio**

