

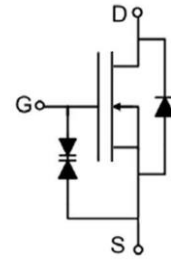
600V N-Channel Depletion Mode MOSFET

Description

The APD03N60AI uses advanced Depletion planar technology

This have low gate charge and operation .

This device is suitable for use as a Switching applic ation.

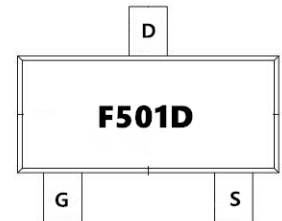


General Features

$V_{DS} = 600V$ $I_D = 0.03A$

$R_{DS(ON)} < 700\Omega$ @ $V_{GS}=10V$

ESD \geq 300V

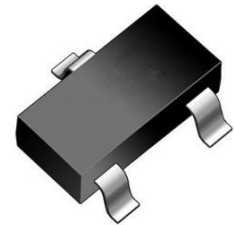


Application

Load Switch

PWM Application

Power management



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
APD03N60AI	SOT-23	F501D	3000

Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	600	V
VGSS	Gate-Source Voltage	± 20	V
ID	Continuous Drain Current $T_A = 25^\circ C$	0.03	A
	Continuous Drain Current $T_A = 100^\circ C$	0.02	A
IDM	Pulsed Drain Current note1	0.12	A
dv/dt	Peak Diode Recovery dv/dt	5.0	V/ns
VESD(G-S)	Gate source ESD (HBM-C= 100pF, R=1.5k Ω)	300	V
PD	Power Dissipation $T_A = 25^\circ C$	0.5	W
R θ JA	Thermal Resistance, Junction to Ambient	250	$^\circ C/W$
TJ, TSTG	Operating and Storage Temperature Range	-55 to +150	$^\circ C$



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Electrical Characteristics (T_C=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} = -5V, I _D =250μA	600	-	-	V
ID(off)	Off-state Drain to Source Current	V _{DS} =600V, V _{GS} = -5V, T _J =25°C	-	-	0.1	μA
		V _{DS} =480V, V _{GS} =-5V, T _J =125°C	-	-	10	μA
IGSS	Gate to Source Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
IDSS	On-state drain current	V _{GS} =0V, V _{DS} =25V	12	-	-	mA
VGS(th)	Gate Threshold Voltage	V _{DS} =3V, I _D =8μA	-2.7	-1.8	-1.0	V
RDS(on)	Static Drain-Source on-Resistance note2	V _{GS} =0V, I _D =3mA	-	350	700	Ω
		V _{GS} =10V, I _D =16mA	-	400	800	
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =-5V, f = 1.0MHz	-	50	-	pF
C _{oss}	Output Capacitance		-	4.53	-	pF
C _{rss}	Reverse Transfer Capacitance		-	1.08	-	pF
Q _g	Total Gate Charge	V _{DS} =400V, I _D =0.01A, V _{GS} =-5V to 5V	-	1.14	-	nC
Q _{gs}	Gate-Source Charge		-	0.5	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	0.37	-	nC
td(on)	Turn-on Delay Time	V _{DS} =300V, I _D =0.01A, R _{GEN} =6Ω, V _{GS} =-5V to 7V	-	9.9	-	ns
t _r	Turn-on Rise Time		-	55.8	-	ns
td(off)	Turn-off Delay Time		-	56.4	-	ns
t _f	Turn-off Fall Time		-	136	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	0.03	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	0.12	A
VSD	Diode Forward Voltage	I _F =16mA, V _{GS} =-5V	-	-	1.2	V
t _{rr}	Reverse Recovery Time	V _{GS} =-5V, I _F =0.01A,	-	243	-	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	-	636	-	nC

Notes:

- 1、 Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
- 2、 Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics

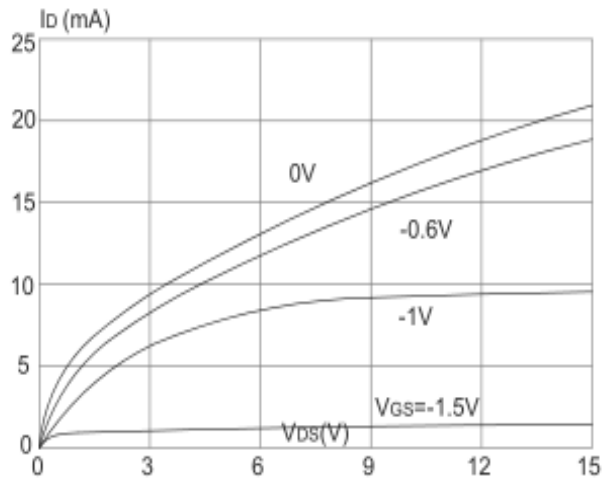


Figure 1: Output Characteristics

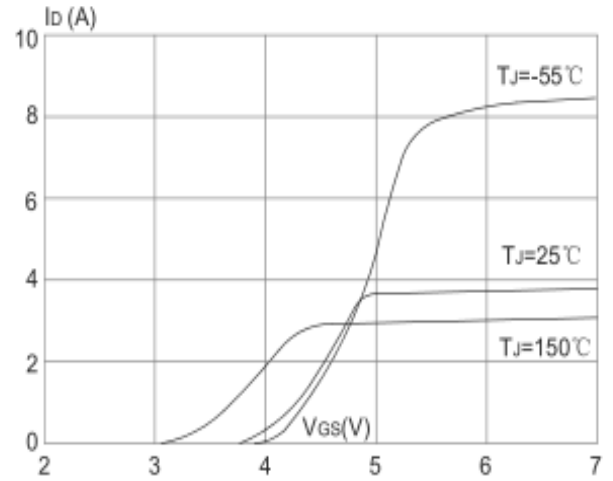


Figure 2: Typical Transfer Characteristics

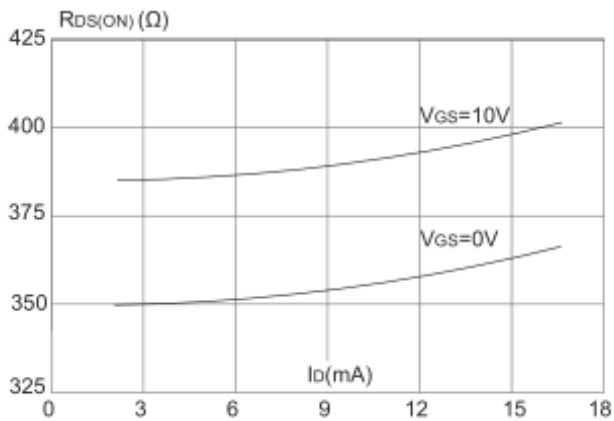


Figure 3: On-resistance vs. Drain Current

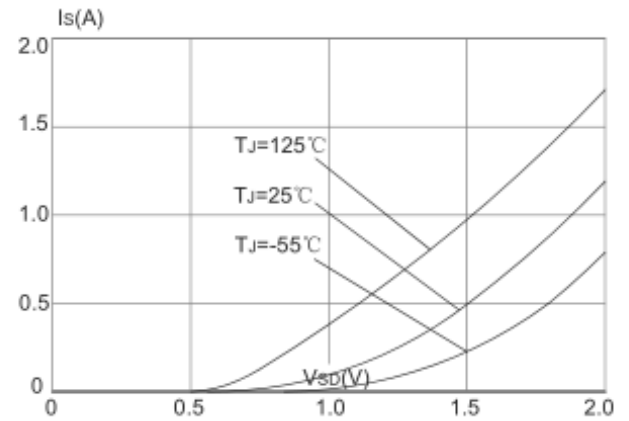


Figure 4: Body Diode Characteristics

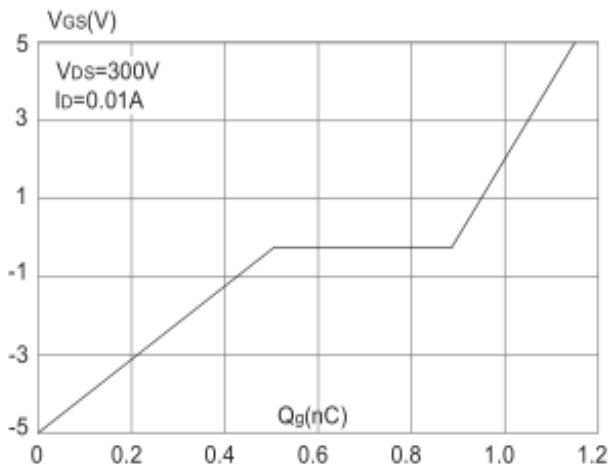


Figure 5: Gate Charge Characteristics

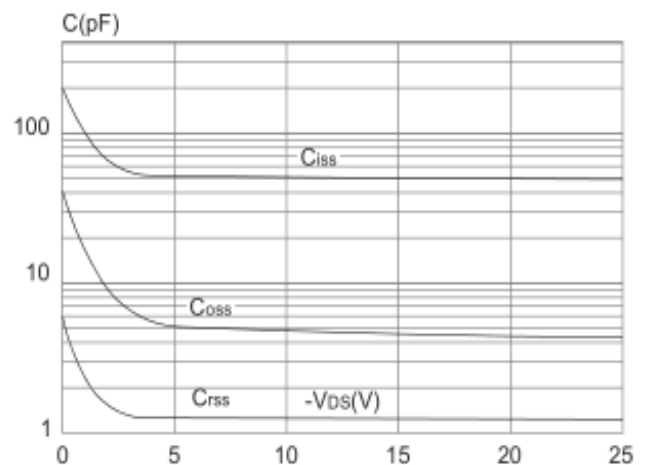


Figure 6: Capacitance Characteristics

600V N-Channel Depletion Mode MOSFET

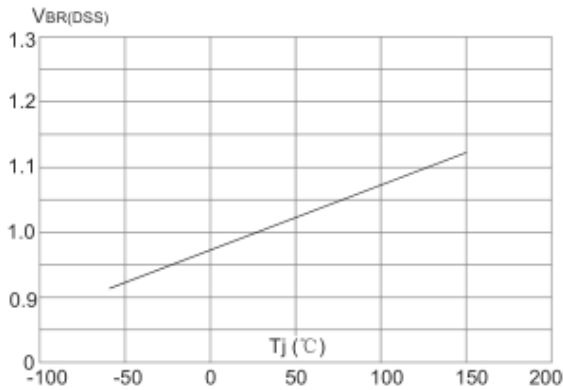


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

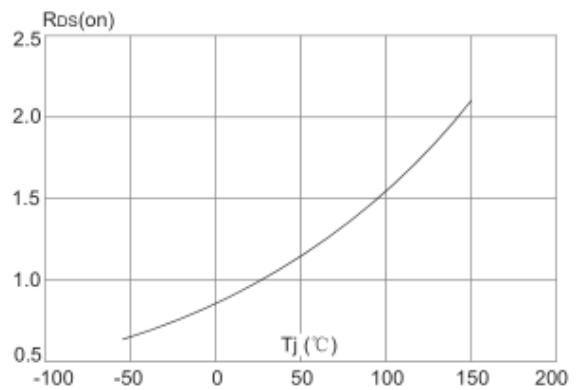


Figure 8: Normalized on Resistance vs. Junction Temperature

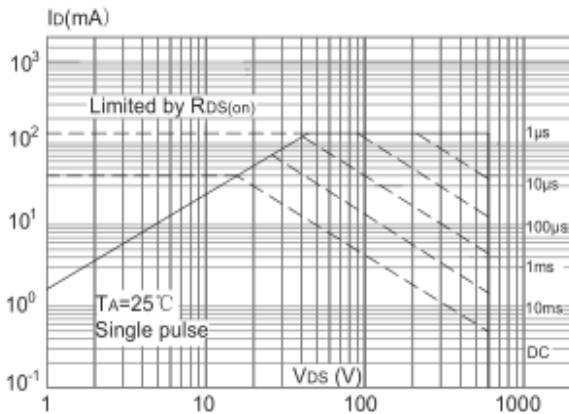


Figure 9: Maximum Safe Operating Area

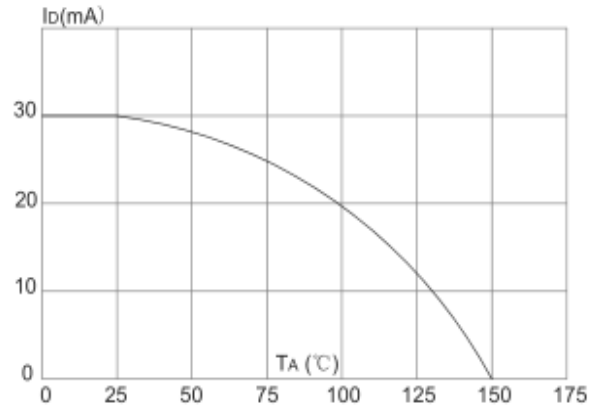


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

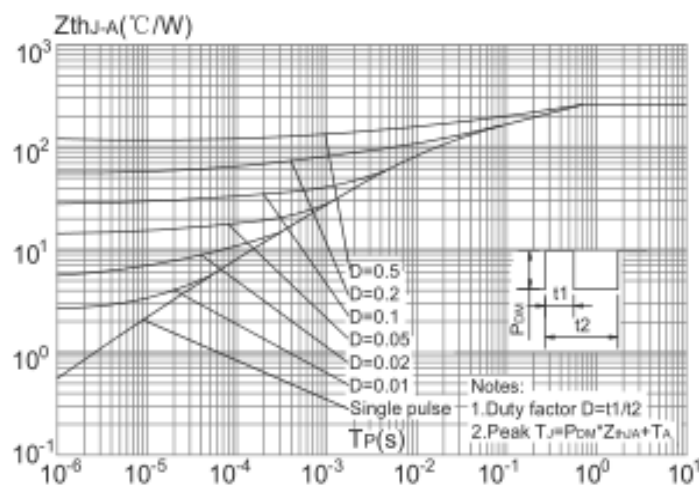
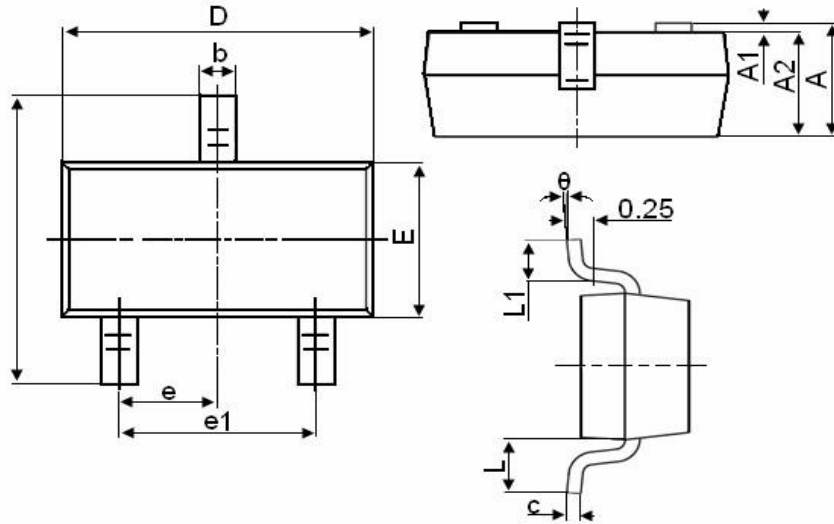


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



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Package Mechanical Data-SOT-23



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°