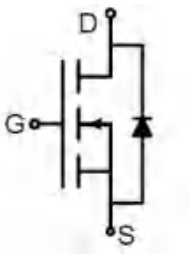
AP3400D

N-Channel Enhancement Mosfet

DATA SHEET

Feature

- 30V,5.8A
  $R_{DS(ON)}$ <28mΩ @V_{GS}=10V TYP=23 mΩ
  $R_{DS(ON)}$ <33mΩ @V_{GS}=4.5V TYP=26 mΩ
  $R_{DS(ON)}$ <46mΩ @V_{GS}=2.5V TYP=39 mΩ
- Advanced Trench Technology
- Lead free product is acquired



Schematic diagram

SOT-23 top view

Application

- Interfacing Switching
- Load Switching
- Power management

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
A09T	AP3400D	Sot-23	7 inch	-	3000

ABSOLUTE MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current (T_a =25℃)	I_D	5.8	A
Continuous Drain Current (T_a =70℃)	I_D	3.8	A
Pulsed Drain Current	I_{DM}	28	A
Power Dissipation	P_D	1.36	W
Thermal Resistance from Junction to Ambient(4)	$R_{\theta JA}$	`92	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET 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	30	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =30V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±12V,V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage(3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.4	1.0	1.5	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =10V, I_D =5.8A	-	23	28	mΩ
		V_{GS} =4.5V, I_D =3A	-	26	33	
		V_{GS} =2.5V, I_D =1A	-	39	46	
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =15V, V_{GS} =0V, f =1MHz	-	825	-	pF
Output Capacitance	C_{oss}		-	96	-	
Reverse Transfer Capacitance	C_{rss}		-	75	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=15V, I_D=3A, V_{GS}=10V, R_G=3Ω	-	4.5	-	ns
Turn-on rise time	t_r		-	4	-	
Turn-off delay time	$t_{d(off)}$		-	24	-	
Turn-off fall time	t_f		-	3.8	-	
Total Gate Charge	Qg	VDS=15V, ID=5.8A, VGS=4.5V	-	9.5	-	nC
Gate-Source Charge	Qgs		-	1.3	-	
Gate-Drain Charge	Qgd		-	3.2	-	
Source-Drain Diode characteristics						
Diode Forward voltage(3)	V_{DS}	V_{GS} =0V, I_S=5.8A	-	-	1.2	V
Diode Forward current(4)	I_S		-	-	5.8	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

Test Circuit

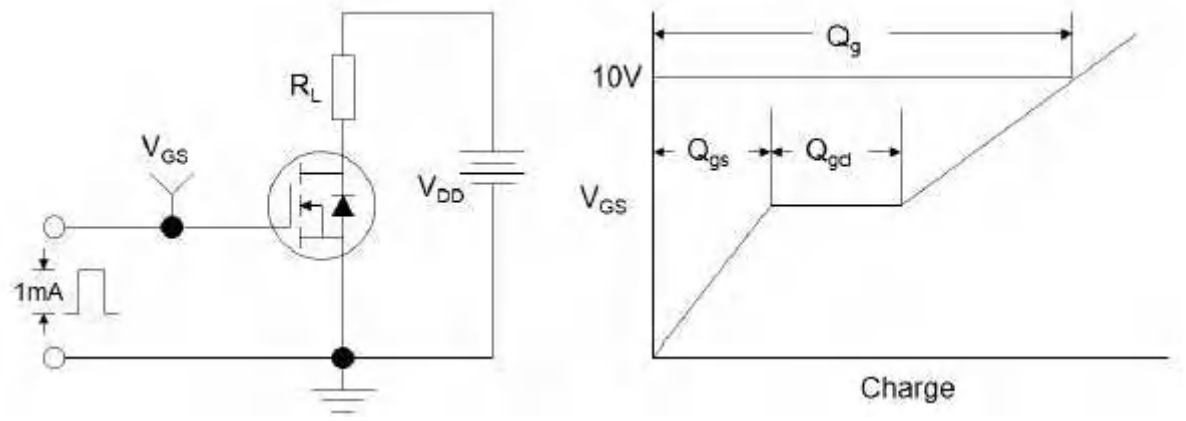


Figure1:Gate Charge Test Circuit & Waveform

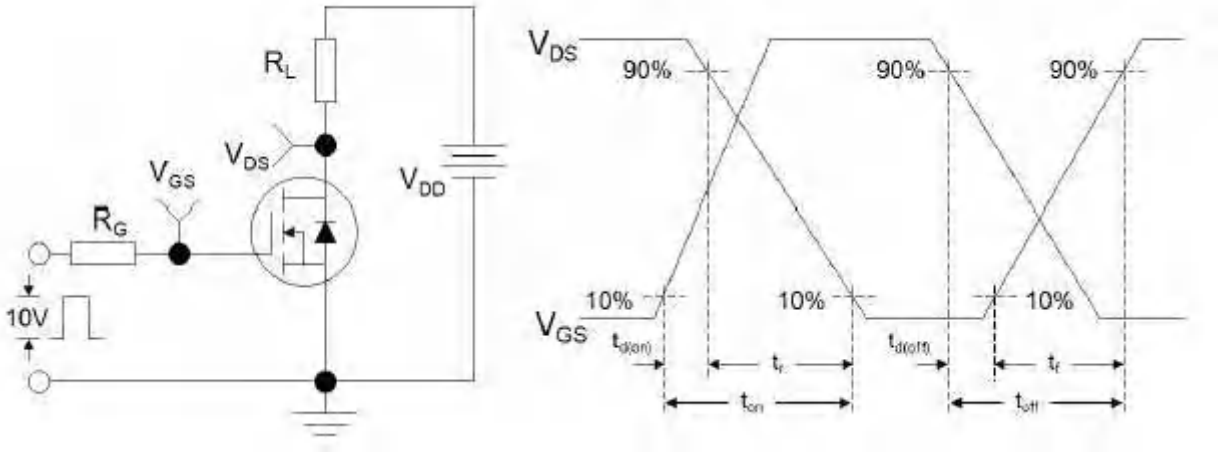


Figure 2: Resistive Switching Test Circuit & Waveforms

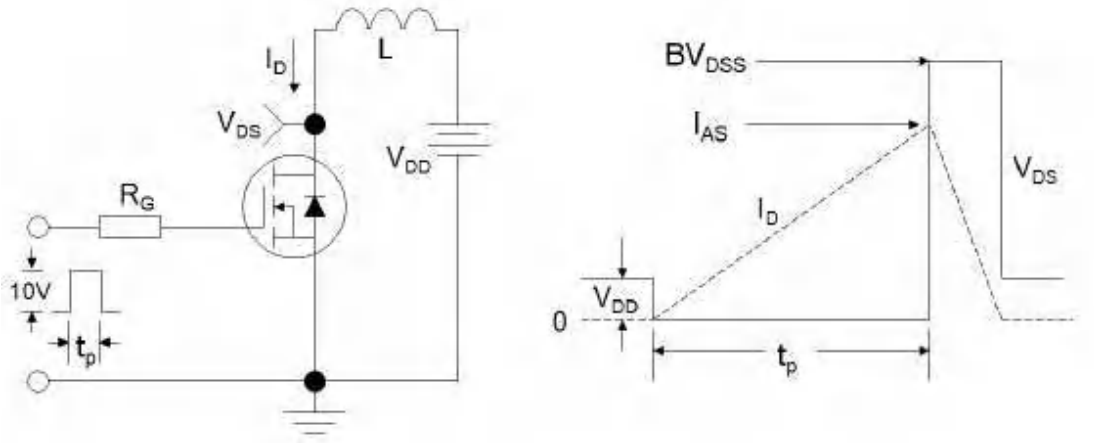


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

Typical Performance Characteristics

Figure 1. Output Characteristics

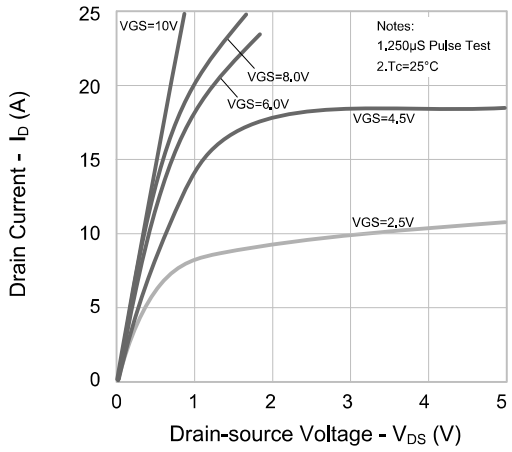


Figure 2. Transfer Characteristics

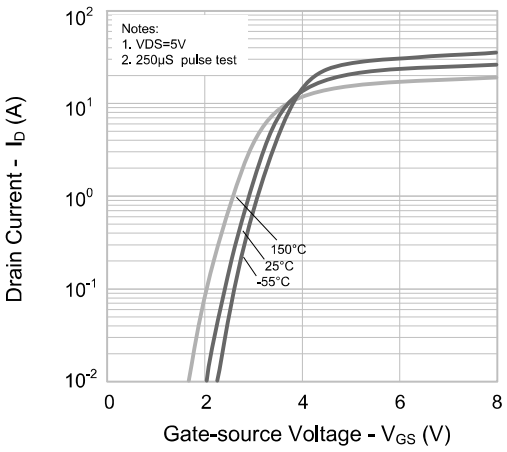


Figure 3. On-resistance vs. Drain Current

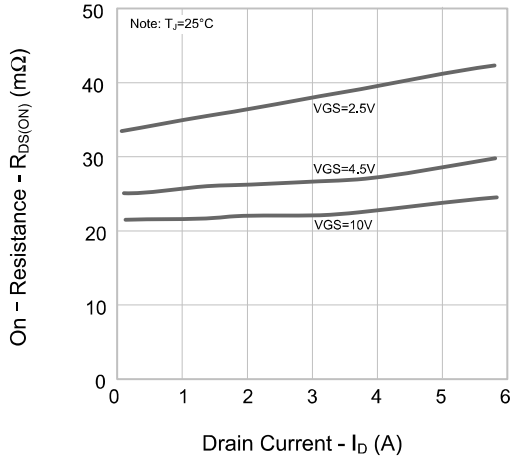


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

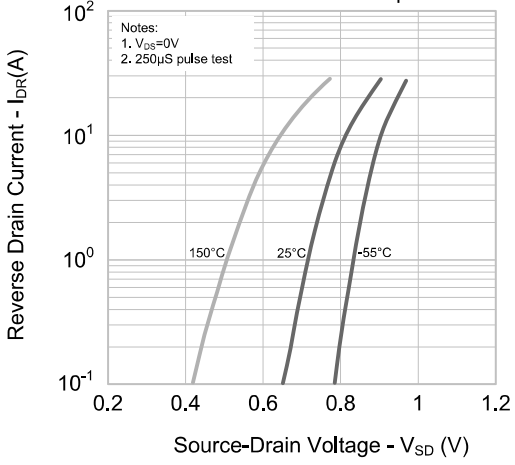


Figure 5. Capacitance Characteristics

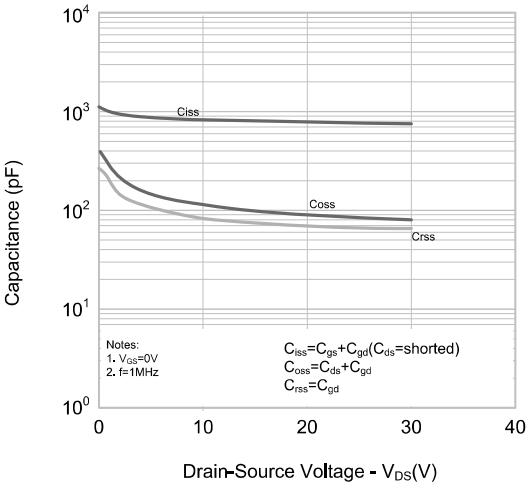
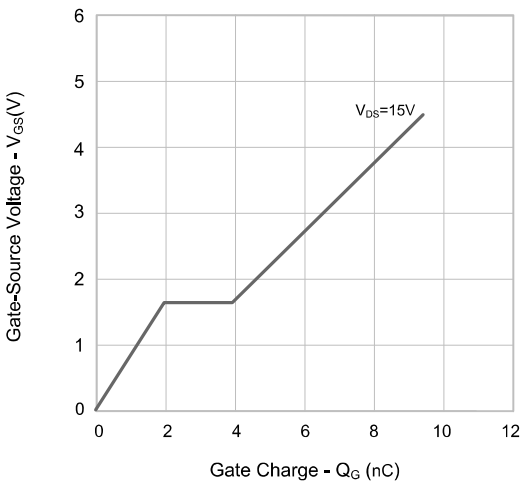


Figure 6. Gate Charge



Typical Performance Characteristics

Figure 7. Breakdown Voltage vs. Temperature Characteristics

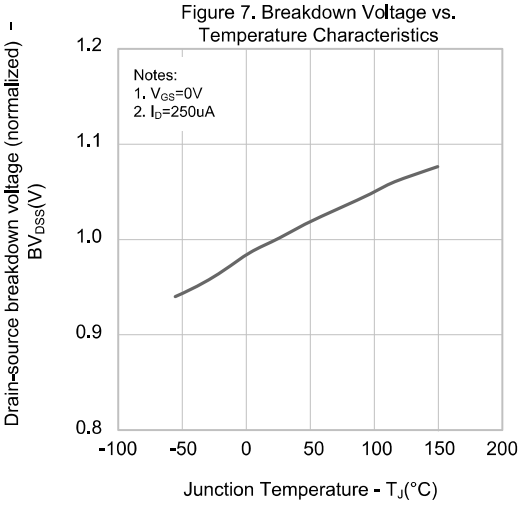


Figure 8. On-resistance vs. Temperature Characteristics

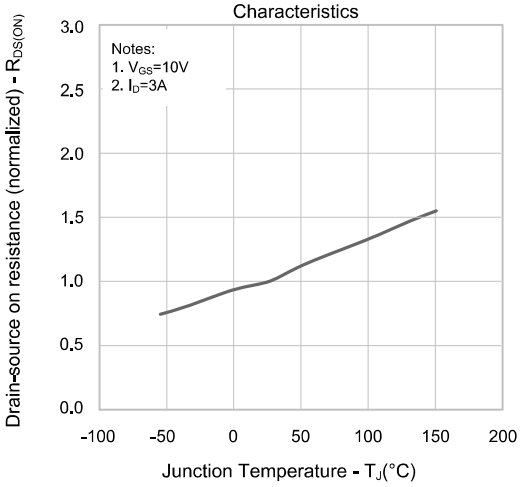
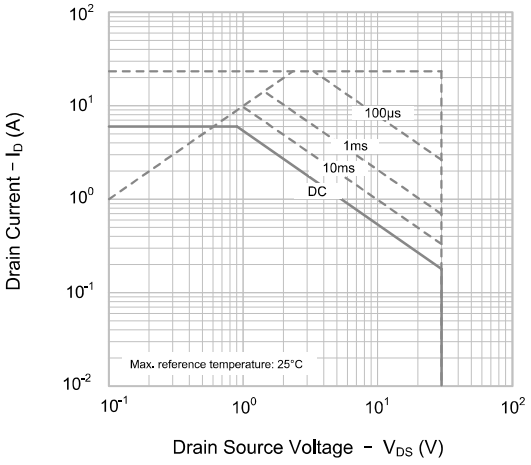
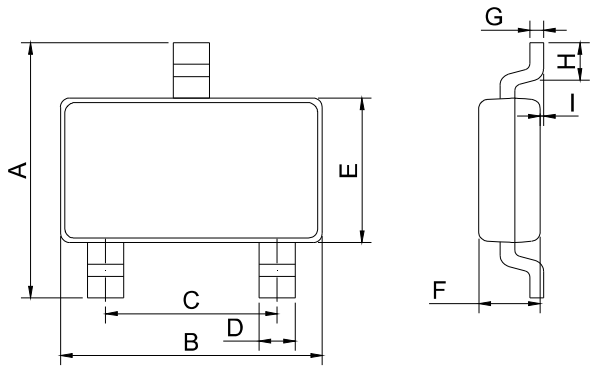


Figure 9. Max. Safe Operating Area



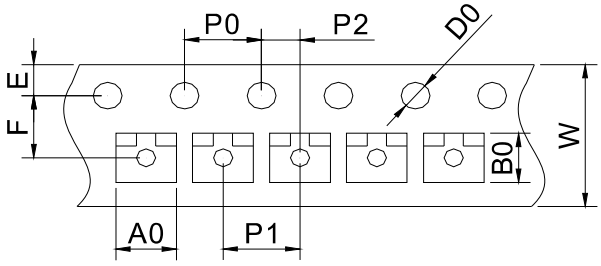
SOT-23 Package Information

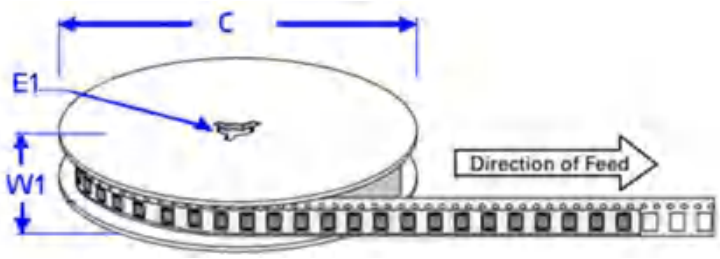


SOT-23

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.30	2.40	2.50	0.091	0.095	0.098
B	2.80	2.90	3.00	0.110	0.114	0.118
C	1.90 REF			0.075 REF		
D	0.35	0.40	0.45	0.014	0.016	0.018
E	1.20	1.30	1.40	0.047	0.051	0.055
F	0.90	1.00	1.10	0.035	0.039	0.043
G		0.10	0.15		0.004	0.006
H	0.20			0.008		
I	0		0.10	0		0.004

Package Information-SOT-23





Ref.	Dimensions	
	Millimeters	Inches
A0	3.15 ± 0.3	0.124 ± 0.012
B0	2.77 ± 0.3	0.109 ± 0.012
C	178	7.0
D0	1.50±0.1	0.059 ± 0.004
E	1.75 ± 0.2	0.069 ± 0.008
E1	13.3±0.3	0.524± 0.012
F	3.5 ± 0.2	0.138 ± 0.008
P0	4.00 ± 0.2	0.157 ± 0.008
P1	4.00 ± 0.2	0.157 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	8.00 ± 0.2	0.315 ± 0.008
W1	11.5±1.0	0.453 ± 0.039