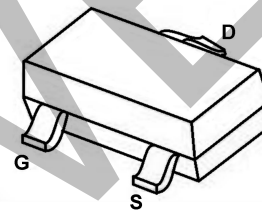
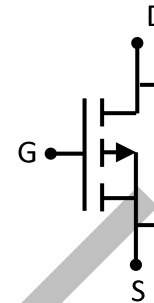


AP013P06N

P-Channel Enhancement Mosfet

Features

- -60V,-0.13A
 $R_{DS(ON)} < 3.6 \Omega @ V_{GS} = -10V$ TYP:2.2 Ω
 $R_{DS(ON)} < 5.4 \Omega @ V_{GS} = -4.5V$ TYP:2.6 Ω
- Energy Efficient
- Low Threshold Voltage
- High-speed Switching
- Miniature Surface Mount Package Saves Board Space



SOT-23

Applications

- DC-DC converters
- load switching
- power management in portable
- battery-powered product Portable appliances

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
13P06N	AP13P06N	SOT-23	-	-	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}	± 20	V
Continuous Drain Current ($T_a = 25^\circ\text{C}$)	I_D	-0.13	A
Continuous Drain Current ($T_a = 100^\circ\text{C}$)	I_D	-0.52	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	-7.6	A
Power Dissipation ($T_a = 25^\circ\text{C}$)	P_D	0.225	W
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-50~ +150	$^\circ\text{C}$

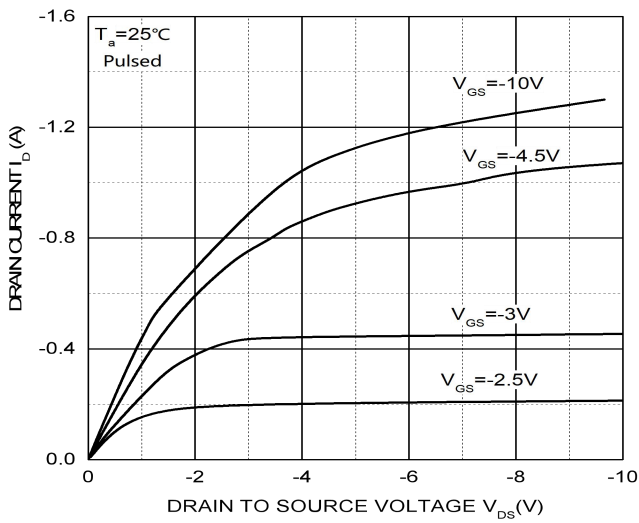
MOSFET ELECTRICAL CHARACTERISTICS($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-60	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -48V, V_{GS} = 0V, T_J = 25^{\circ}\text{C}$	-	-	-1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.8	-1.5	-2.5	V
Drain-source on-resistance ⁽³⁾	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -0.5A$	-	2.2	3.6	Ω
		$V_{GS} = -4.5V, I_D = -0.2A$	-	2.6	5.4	
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS} = -5V, V_{GS} = 0V, f = 1.0\text{MHz}$	-	30	-	pF
Output Capacitance	C_{oss}		-	10	-	
Reverse Transfer Capacitance	C_{rss}		-	5	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{DS} = -15V, I_D = -0.5A, R_L = 50\Omega$	-	2.5	-	ns
Turn-on rise time	t_r		-	1	-	
Turn-off delay time	$t_{d(off)}$		-	16	-	
Turn-off fall time	t_f		-	8	-	
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	$T_J = 25^{\circ}\text{C}, V_{GS} = 0V, I_S = -0.13A$	-	-	-1.3	V

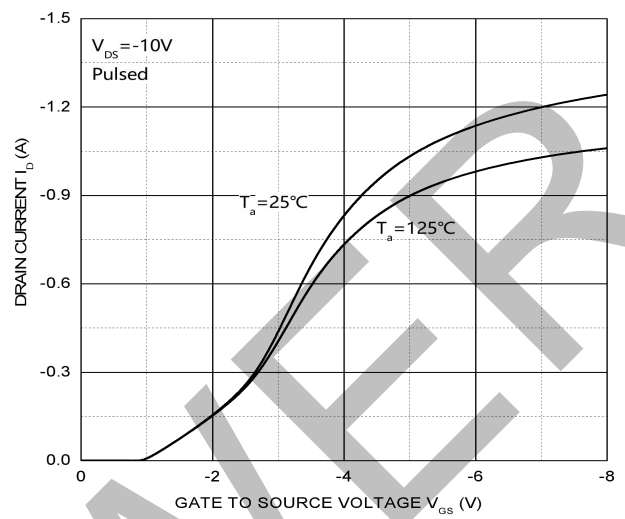
Notes:

1. Repetitive rating: Pulse width limited by junction temperature.
2. Surface mounted on FR4 board, $t_s \leq 10s$.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

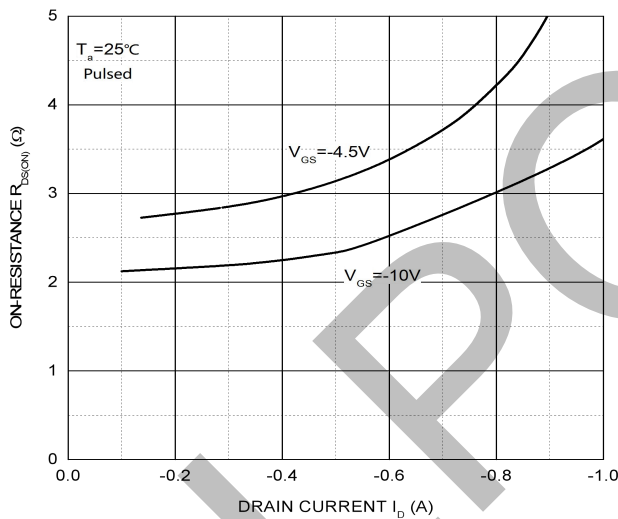
Typical Characteristics



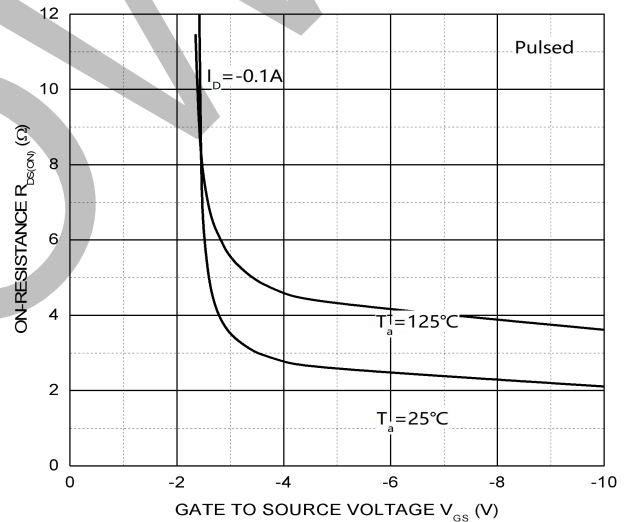
Output Characteristics



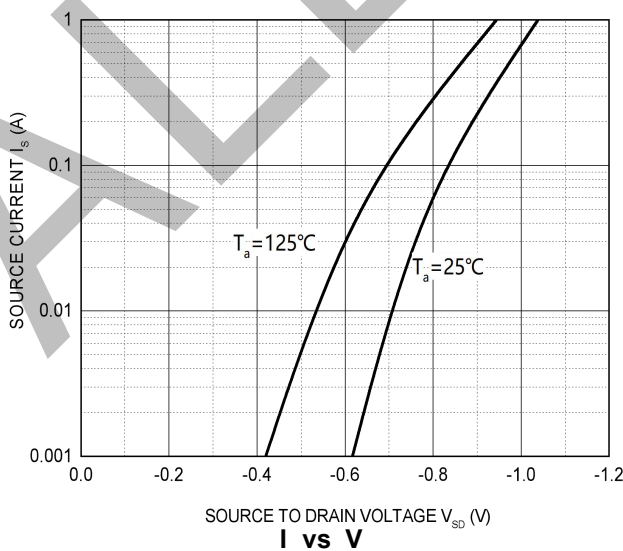
Transfer Characteristics



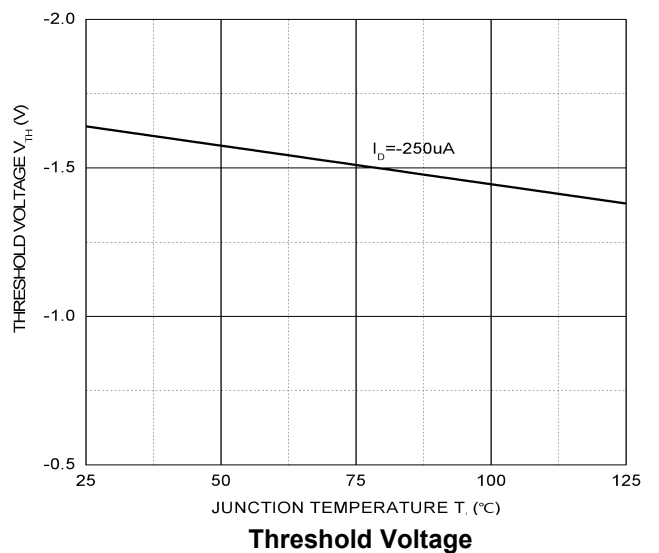
$R_{DS(on)}$ vs. I_D



$R_{DS(on)}$ vs. V_{GS}

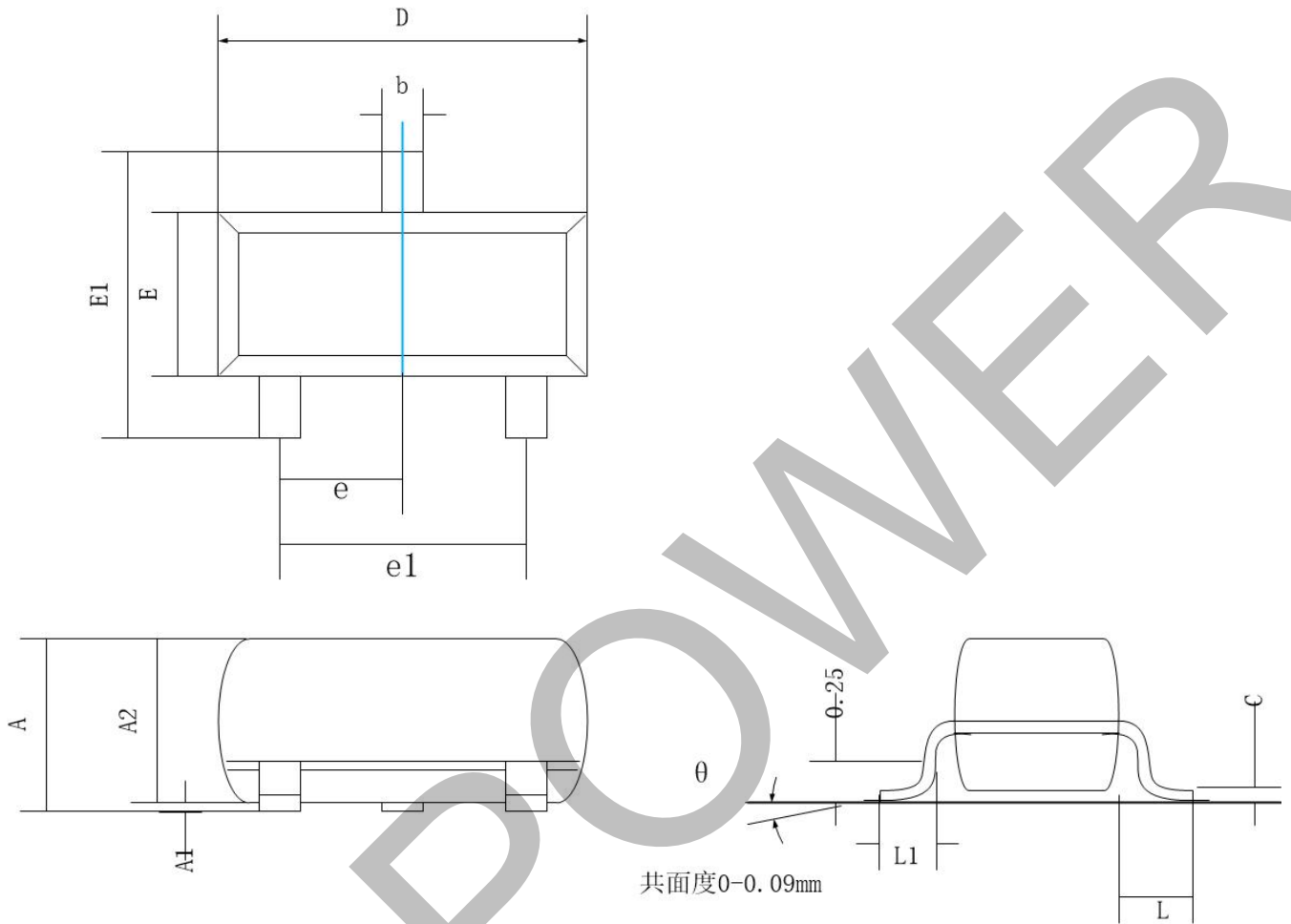


I vs V



Threshold Voltage

SOT-23 Package Information



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	0.90	1.15
A1	0.00	0.10
A2	0.90	1.05
b	0.30	0.50
c	0.08	0.15
D	2.80	3.00
E	1.20	1.40
E1	2.25	2.55
e	0.95 REF.	
e1	1.80	2.00
L	0.55 REF.	
L1	0.30	0.50