

AP3139N7

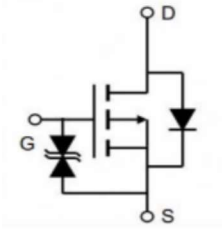
P-Channel Enhancement Mosfet

AIPOWER

DATA SHEET

Feature

- -20V,-0.66A
 $R_{DS(ON)} < 520m\Omega @ V_{GS} = -4.5V$ TYP:430 m Ω
 $R_{DS(ON)} < 700m\Omega @ V_{GS} = -2.5V$ TYP:624 m Ω
 $R_{DS(ON)} < 1200m\Omega @ V_{GS} = -1.8V$ TYP:950 m Ω
- Advanced Trench Technology
- Lead free product is acquired
- ESD Protected Up to 2.0KV(HBM)

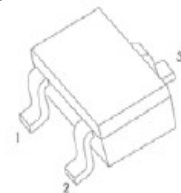


Equivalent Circuit

Application

- Interfacing Switching
- Load Switching
- Logic Level shift

SOT-723



1. GATE
2. SOURCE
3. DRAIN

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
KD	AP3139N7	SOT-723	7 inch	-	8000

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ($T_C=25^\circ\text{C}$)	I_D	-0.66	A
Continuous Drain Current ($T_C=70^\circ\text{C}$)	I_D	-0.35	A
Pulsed Drain Current	I_{DM}	-1.2	A
Power Dissipation	P_D	0.15	W
Thermal Resistance from Junction to Ambient ⁽⁴⁾	$R_{\theta JA}$	833	$^\circ\text{C}/\text{W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

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

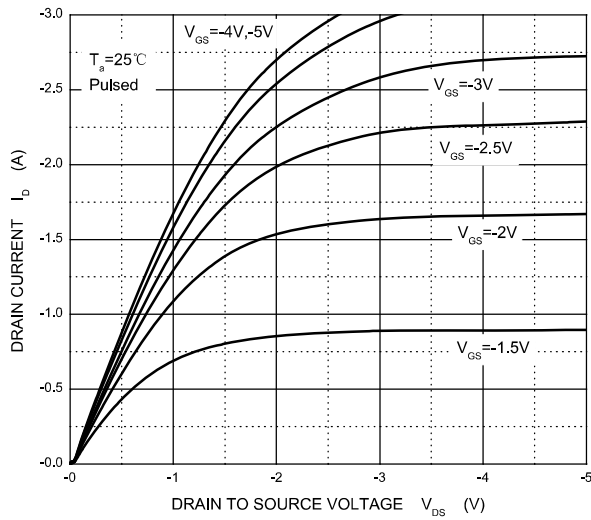
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -20V, V_{GS} = 0V$	-	-	-1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 10V, V_{DS} = 0V$	-	-	± 20	μA
Gate threshold voltage ⁽³⁾	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.35	-0.45	-1.1	V
Drain-source on-resistance ⁽³⁾	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -0.65A$	-	430	520	m Ω
		$V_{GS} = -2.5V, I_D = -0.55A$	-	624	700	
		$V_{GS} = -1.8V, I_D = -0.45A$		950	1200	
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS} = -16V, V_{GS} = 0V, f = 1MHz$	-	113	-	pF
Output Capacitance	C_{oss}		-	15	-	
Reverse Transfer Capacitance	C_{rss}		-	9	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -10V, I_D = -0.5A,$ $V_{GS} = -4.5V, R_G = 10\Omega$	-	9	-	ns
Turn-on rise time	t_r		-	5.8	-	
Turn-off delay time	$t_{d(off)}$		-	32.7	-	
Turn-off fall time	t_f		-	20.3	-	
Total Gate Charge	Q_g	$V_{DS} = -15V, I_D = -1A,$ $V_{GS} = -4.5V$	-	1.8	-	nC
Gate-Source Charge	Q_{gs}		-	0.31	-	
Gate-Drain Charge	Q_{gd}		-	0.3	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽³⁾	V_{DS}	$V_{GS} = 0V, I_S = -0.5A$	-	-	-1.2	V
Diode Forward current ⁽⁴⁾	I_S		-	-	-0.66	A

Notes:

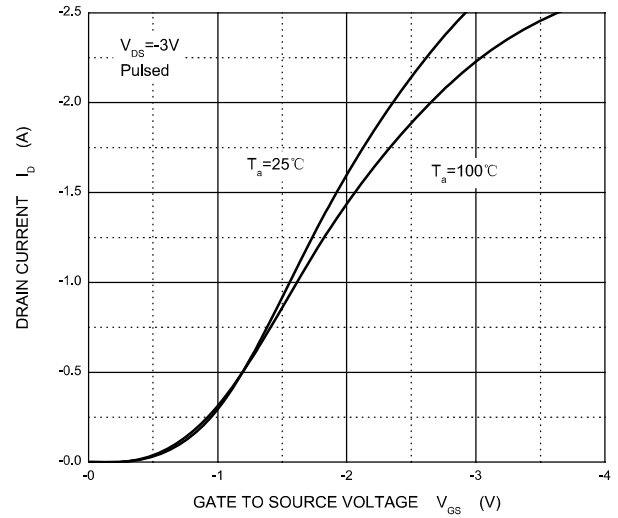
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. Pulse Test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. Surface Mounted on FR4 Board, $t \leq 10$ sec

Typical Characteristics

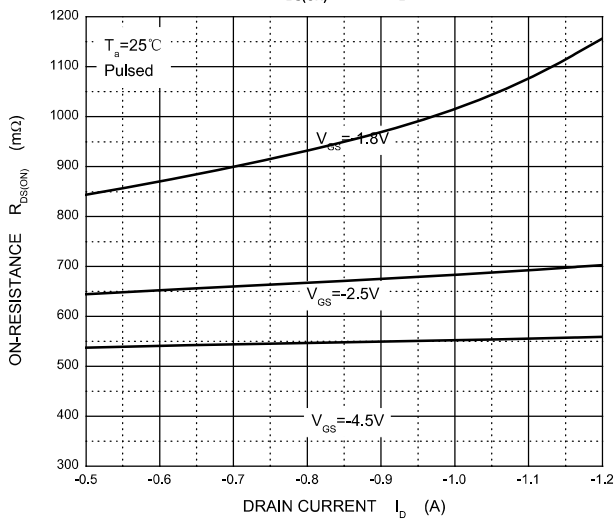
Output Characteristics



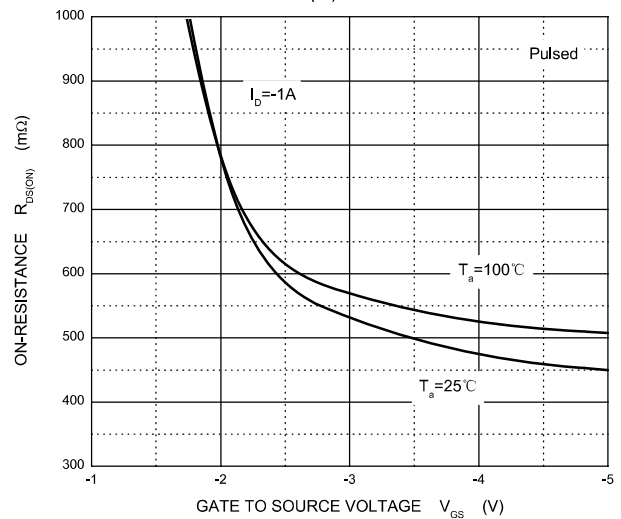
Transfer Characteristics



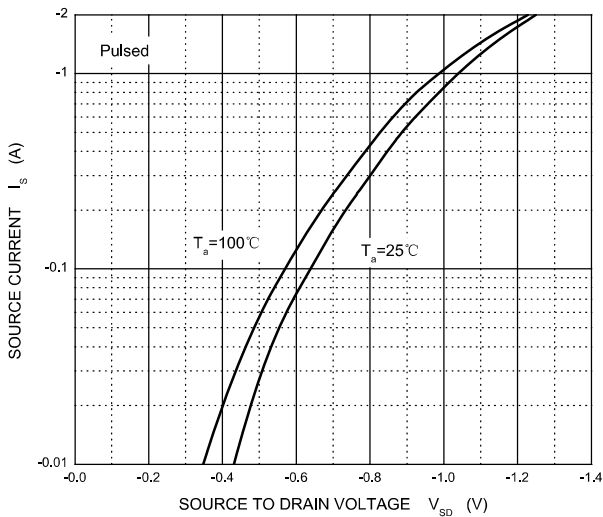
$R_{DS(ON)}$ — I_D



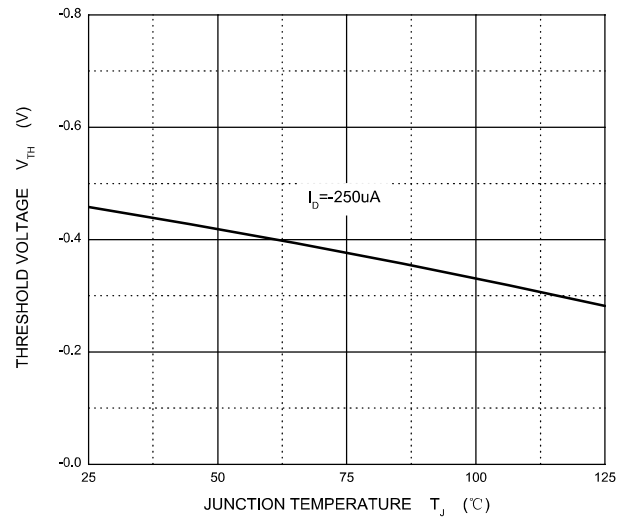
$R_{DS(ON)}$ — V_{GS}



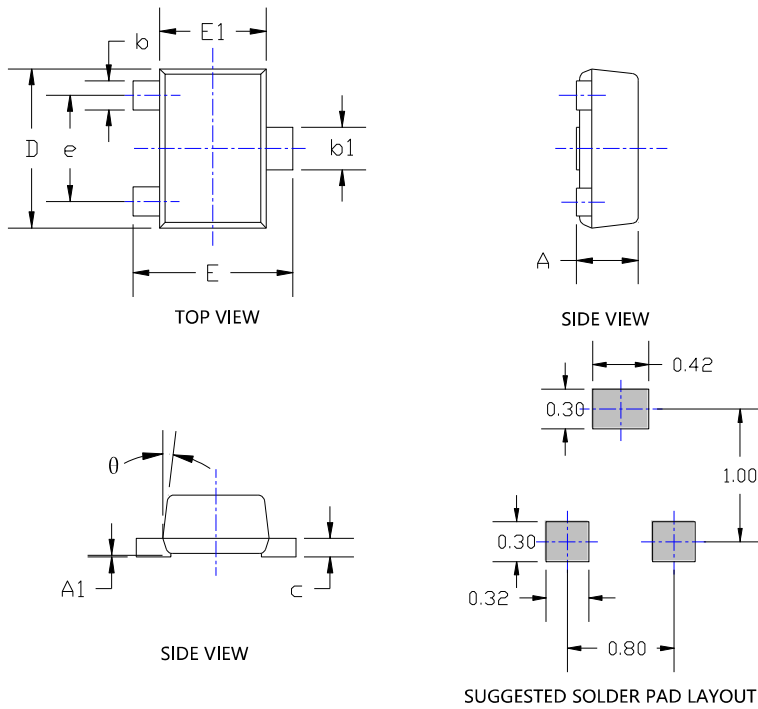
I_S — V_{SD}



Threshold Voltage



SOT-723 Package Information



SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.017	0.022	0.430	0.550
A1	0.000	0.002	0.000	0.050
b	0.007	0.011	0.170	0.270
b1	0.011	0.015	0.270	0.370
c	0.003	0.008	0.080	0.200
D	0.045	0.049	1.150	1.250
E	0.045	0.049	1.150	1.250
E1	0.030	0.033	0.750	0.850
e	0.031TYP.		0.800TYP.	
θ	7°REF.		7°REF.	

NOTE:
 1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
 2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
 3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.