

AP3139N5

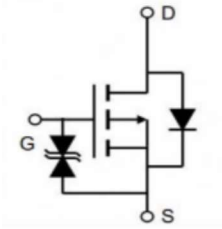
P-Channel Enhancement Mosfet

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)

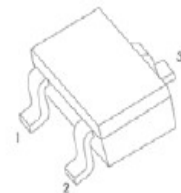


Equivalent Circuit

Application

- Interfacing Switching
- Load Switching
- Logic Level shift

SOT-523



1. GATE
2. SOURCE
3. DRAIN

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
KD	AP3139N5	SOT-523	7 inch	-	3000

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	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

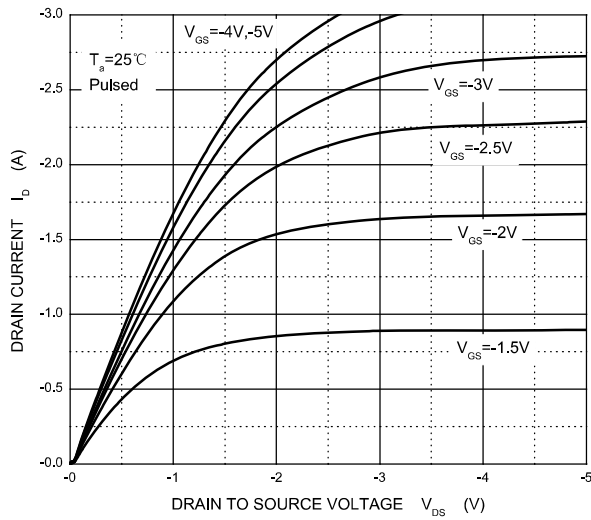
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-20	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} = -20V, V _{GS} = 0V	-	-	-1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±10V, V _{DS} = 0V	-	-	±20	μA
Gate threshold voltage ⁽³⁾	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-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	mΩ
		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 = 10Ω	-	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:

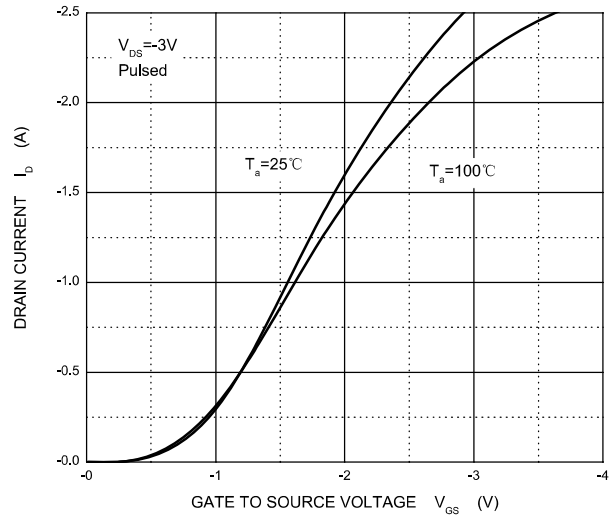
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. Pulse Test: pulse width ≤ 300μs, duty cycle ≤ 2%
3. Surface Mounted on FR4 Board, t ≤ 10 sec

Typical Characteristics

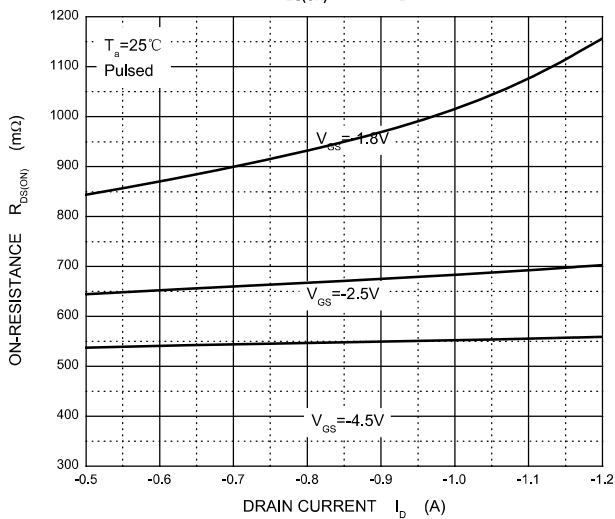
Output Characteristics



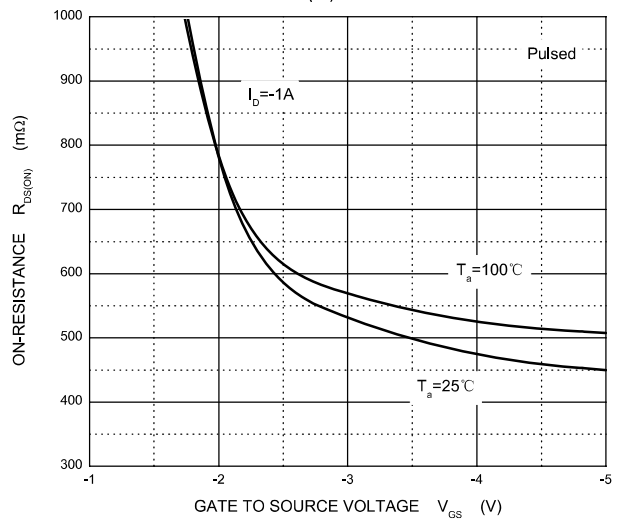
Transfer Characteristics



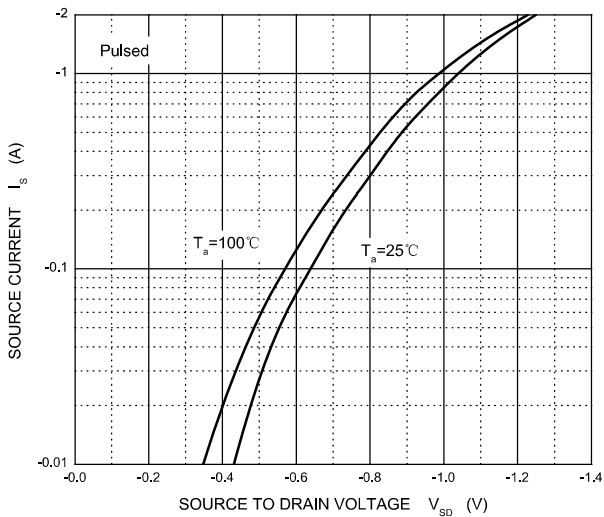
$R_{DS(ON)}$ — I_D



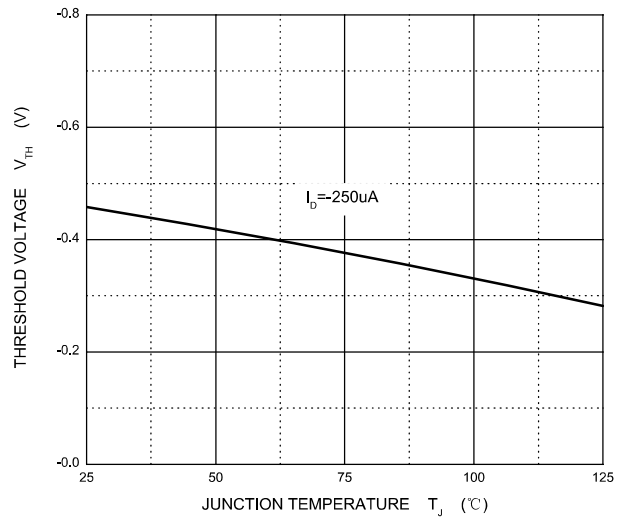
$R_{DS(ON)}$ — V_{GS}



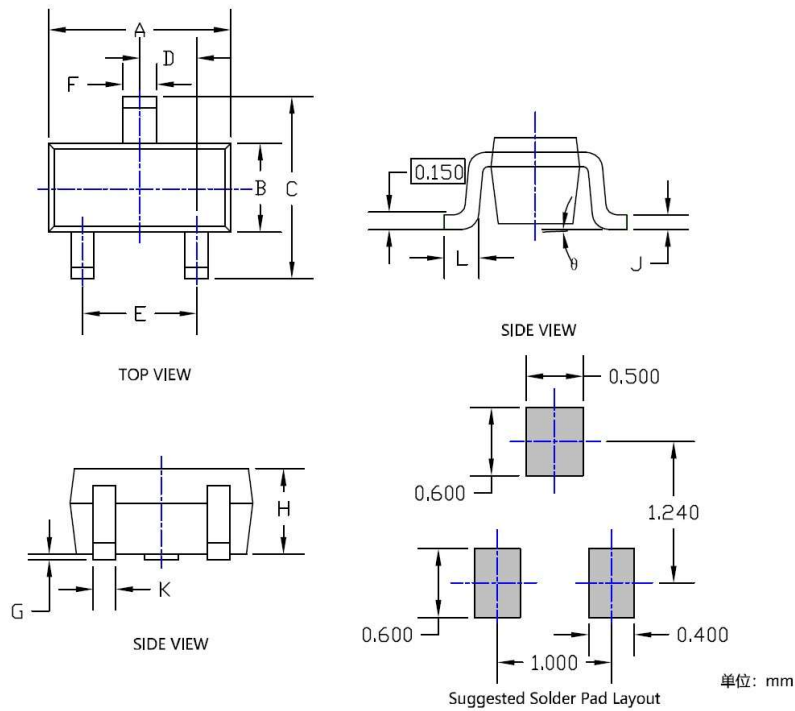
I_S — V_{SD}



Threshold Voltage



SOT-523 Package Information



SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.059	0.063	0.067	1.500	1.600	1.700
B	0.030	0.031	0.033	0.750	0.800	0.850
C	0.057	0.063	0.069	1.450	1.600	1.750
D	0.020TYP			0.500TYP		
E	0.035	0.039	0.043	0.900	1.000	1.100
F	0.010	0.014	0.018	0.250	0.350	0.450
G	0.000	---	0.004	0.000	---	0.100
H	0.024	0.028	0.031	0.600	0.700	0.800
J	0.004	---	0.008	0.100	---	0.200
K	0.006	0.010	0.014	0.150	0.250	0.350
L	0.010	---	0.018	0.260	---	0.460
θ	0°	---	8°	0°	---	8°

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.