

-20V 13mΩ P-channel MOSFET

Features

- Trench Technology Power MOSFET
- Low $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance

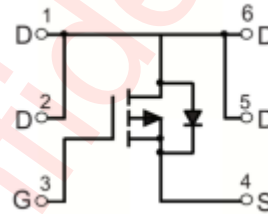
General Description

V_{DS}	$R_{DS(ON)}$ Typ.	I_D
-20V	13mΩ @ $V_{GS} = -4.5V$	-11A
	17mΩ @ $V_{GS} = -2.5V$	

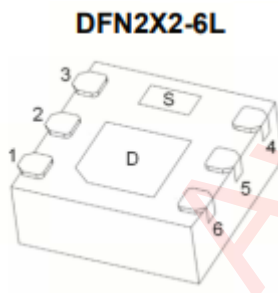
Applications

- Load Switch
- DC/DC Converter

Schematic diagram



Pin Configuration



Ordering Information

Part Number	Marking	Package	Environmental Information
AW402027PDNR	P2011	DFN2*2-6L	RoHS+HF

Absolute Maximum Ratings

$T_A = T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
V_{DS}	Drain Source Voltage	-20	V
V_{GS}	Gate Source Voltage	± 12	V
I_D	Drain Current Continuous ($T_A = 25^\circ\text{C}$) (NOTE 1,5)	-11	A
	Drain Current Continuous ($T_A = 100^\circ\text{C}$) (NOTE 1,5)	-7.1	
I_{DM}	Drain Current Pulsed (NOTE2)	-44	A
P_D	Power Dissipation ($T_C = 25^\circ\text{C}$) (NOTE 4,5)	2.6	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JA}$	Thermal Resistance, Junction-to-ambient Steady State (NOTE 5)	49	$^\circ\text{C/W}$

Electrical Characteristics

$T_J = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Static Characteristics						
BV_{DSS}	Drain Source Breakdown Voltage	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
I_{DSS}	Zero Gate Voltage Source Current	$V_{DS} = -20V, V_{GS} = 0V$			-1	μA
I_{GSS}	Gate Leakage Current	$V_{GS} = \pm 12V, V_{DS} = 0V$			± 100	nA
$V_{GS(TH)}$	Gate Threshold Voltage ^(NOTE 3)	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.4	-0.7	-1	V
$R_{DS(ON)}$	Drain Source on-state Resistance ^(NOTE 3)	$V_{GS} = -4.5V, I_D = -7.2A$		13	22	m Ω
		$V_{GS} = -2.5V, I_D = -6.4A$		17	27	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = -10V, V_{GS} = 0V,$ $F = 1\text{ MHz}$		1660		pF
C_{oss}	Output Capacitance			161		
C_{rss}	Reverse Transfer Capacitance			133		
R_g	Gate Resistance	$V_{DS} = 0V, V_{GS} = 0V,$ $F = 1\text{ MHz}$		10		Ω
Switching Characteristics						
Q_g	Total Gate Charge	$V_{DS} = -10V, I_D = -5A,$ $V_{GS} = -4.5V$		15.2		nC
Q_{gs}	Gate Source Charge			2.2		
Q_{gd}	Gate Drain Charge			3.3		
$t_{d(on)}$	Turn On Delay Time	$V_{DS} = -10V,$ $V_{GS} = -4.5V,$ $I_D = -10A,$ $R_G = 3\Omega$		8		ns
t_r	Rise Time			35		
$t_{d(off)}$	Turn Off Delay Time			70		
t_f	Fall Time			70		
Source- Drain Diode Characteristics and Maximum Ratings						
V_{SD}	Diode Forward Voltage ^(NOTE 3)	$V_{GS} = 0V, I_S = -1.9A$			-1.2	V

NOTES1: The maximum current rating is limited by package.

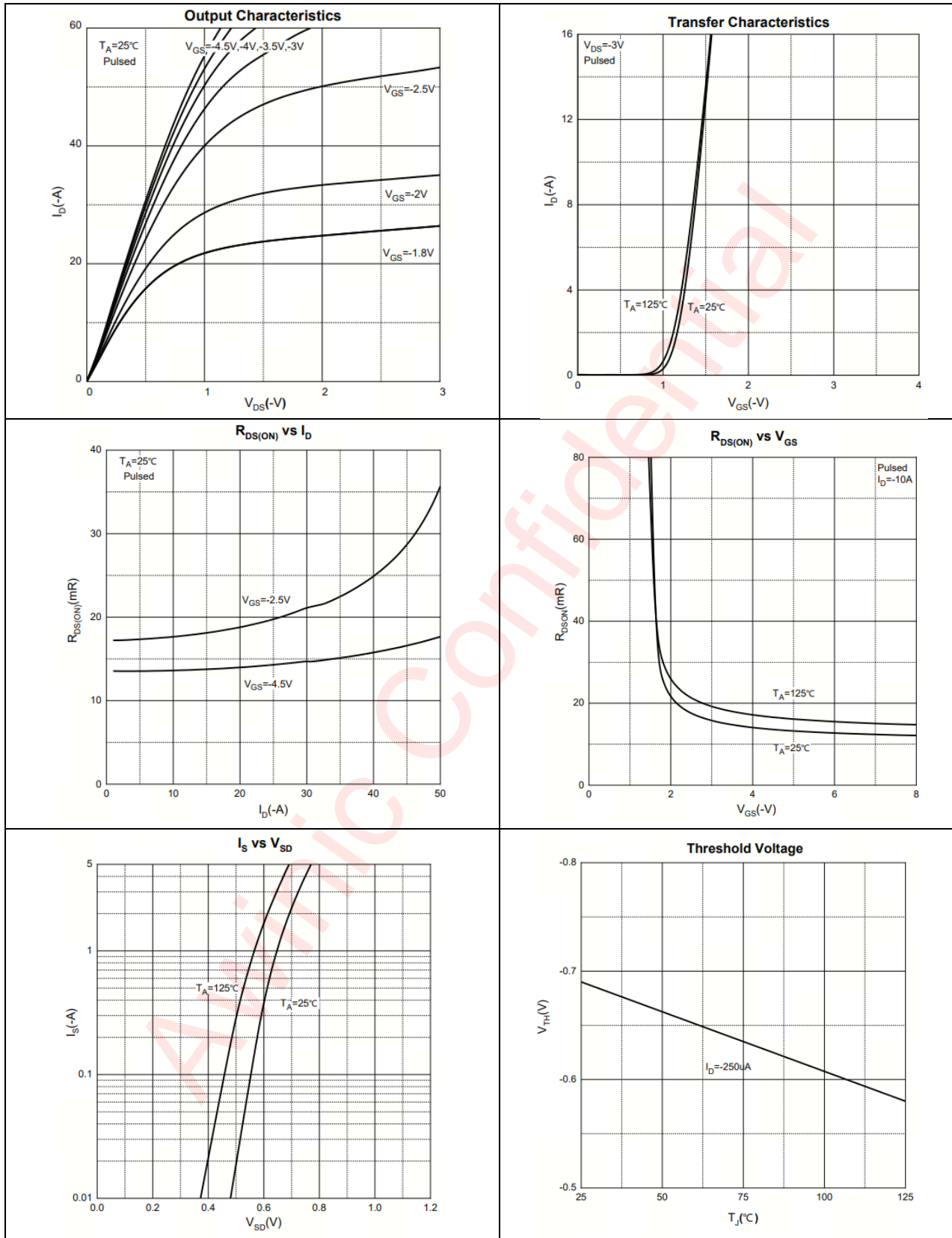
NOTES2: Pulse Test : Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.

NOTES3: Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.

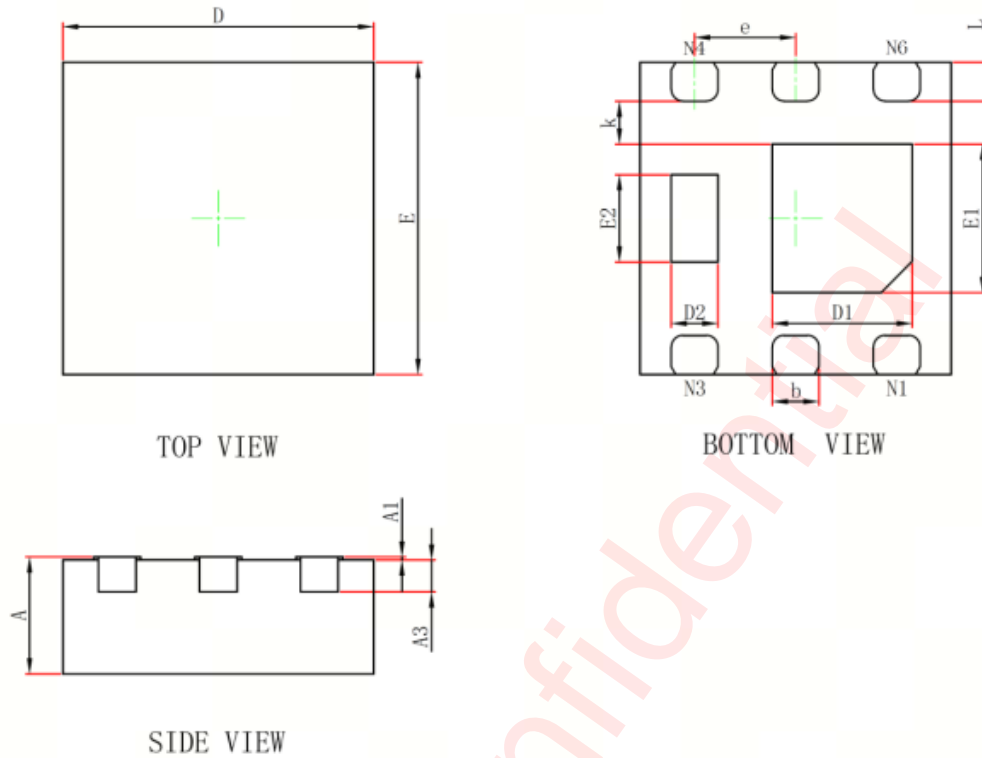
NOTES4: The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ\text{C}$.

NOTES5: Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.

Electrical Characteristics Diagrams



Package Description



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0	0.050	0	0.002
A3	2.03REF		0.008REF	
D	1.900	2.100	0.075	0.083
E	1.900	2.100	0.075	0.083
D1	0.800	1.000	0.031	0.039
E1	0.850	1.050	0.033	0.041
D2	0.200	0.400	0.008	0.016
E2	0.460	0.660	0.018	0.026
k	0.200MIN		0.008MIN	
b	0.250	0.350	0.010	0.014
e	0.65BSC		0.026TYP	
L	0.174	0.326	0.007	0.013

Revision History

Version	Date	Change Record
V1.0	Nov. 2023	Officially released

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