



VMDSEMI

VUDA002R52APA

Datasheet

General Summary

$V_{(BR)DSS}$	$R_{DS(ON)_{max}}$	I_D
-20V	520mΩ@-4.5V	-0.66A
	780mΩ@-2.5V	
	1100mΩ@-1.8V	

Symbol

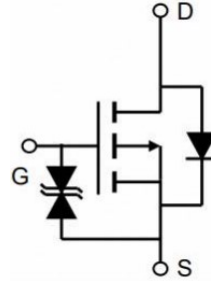


Figure 1 Symbol of VUDA002R52APA

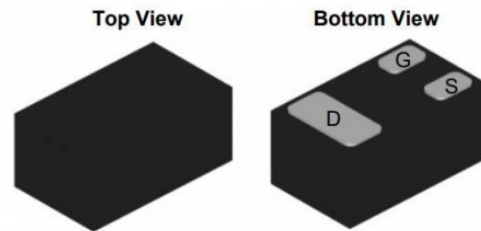
Features

- Trench Technology Power MOSFET
- Low Gate charge
- Low $R_{DS(ON)}$
- ESD Protected

Application

- Load Switching
- Low Current Inverters
- Low Current DC/DC Converters

Package Type



DFN1006-3L

Figure 2 Package Type of VUDA002R52APA

Ordering Information

Product Name	Package
VUDA002R52APA	DFN1006-3L

Absolute Maximum Ratings ($T_A = 25\text{ °C}$, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	± 12	V
Continuous Drain Current ^{Note1,5}	I_D	-0.66	A
Pulsed Drain Current ^{Note2}	I_{DM}	-2.0	A
Max Power Dissipation ^{Note4,5}	P_D	0.3	W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55 to 150	°C

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Ambient ^{Note5}	$R_{\theta JA}$		416		°C/W

Electrical Characteristics $T_J = 25\text{ }^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-16V, V_{GS}=0V$			-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$			± 10	μA
Gate Threshold Voltage ^{Note2}	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.7	-1.0	V
Static Drain-Source On-Resistance ^{Note2}	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-0.5A$		400	520	mΩ
		$V_{GS}=-2.5V, I_D=-0.3A$		570	780	
		$V_{GS}=-1.8V, I_D=-0.12A$		810	1100	
Forward tranconductance	g_{FS}	$V_{DS}=-5V, I_D=-0.4A$		1		S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	$V_{DS}=-10V$ $V_{GS}=0V$ $f=1MHz$		79		pF
Output Capacitance	C_{OSS}			15		
Reverse Transfer Capacitance	C_{RSS}			13		
Switching Characteristics ^{Note4}						
Total Gate Charge	Q_g	$V_{DS}=-10V$ $V_{GS}=-4.5V$ $I_D=-0.2A$		2.26		nC
Gate-source Charge	Q_{gs}			0.45		
Gate-drain Charge	Q_{gd}			0.24		
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=-10V$ $V_{GS}=-4.5V$ $R_L=50\Omega$ $R_G=3\Omega$		8		ns
Rise Time	t_r			5.5		
Turn-off Delay Time	$t_{d(off)}$			30		
Fall Time	t_f			17		
Diode Characteristics						
Diode Forward Voltage ^{Note3}	V_{SD}	$V_{GS}=0V, I_{SD}=-0.5A$			1.2	V

Notes:

1. The maximum current rating is limited by package.
2. Repetitive rating: pulse width limited by $T_{J(MAX)} = 150^\circ\text{C}$.
3. Pulse Test: Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ\text{C}$.
5. Device mounted on $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.

Typical Performance Characteristics

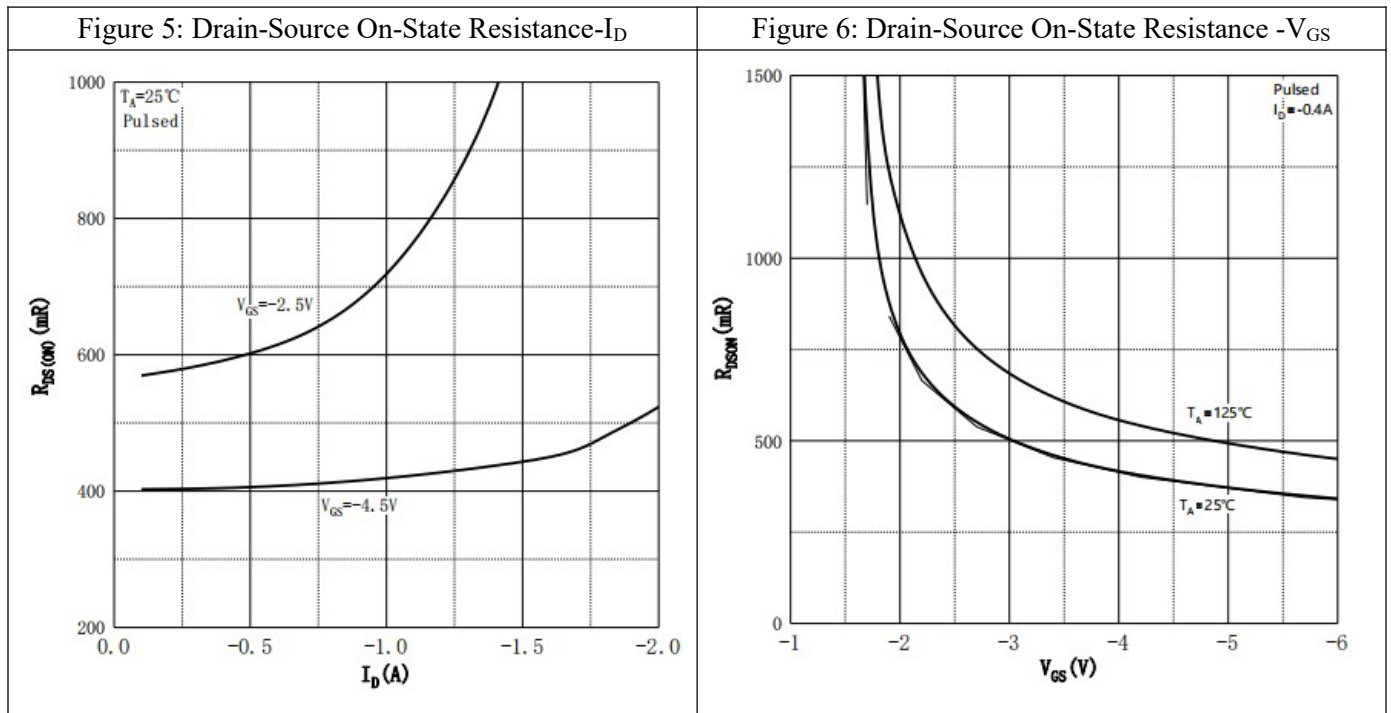
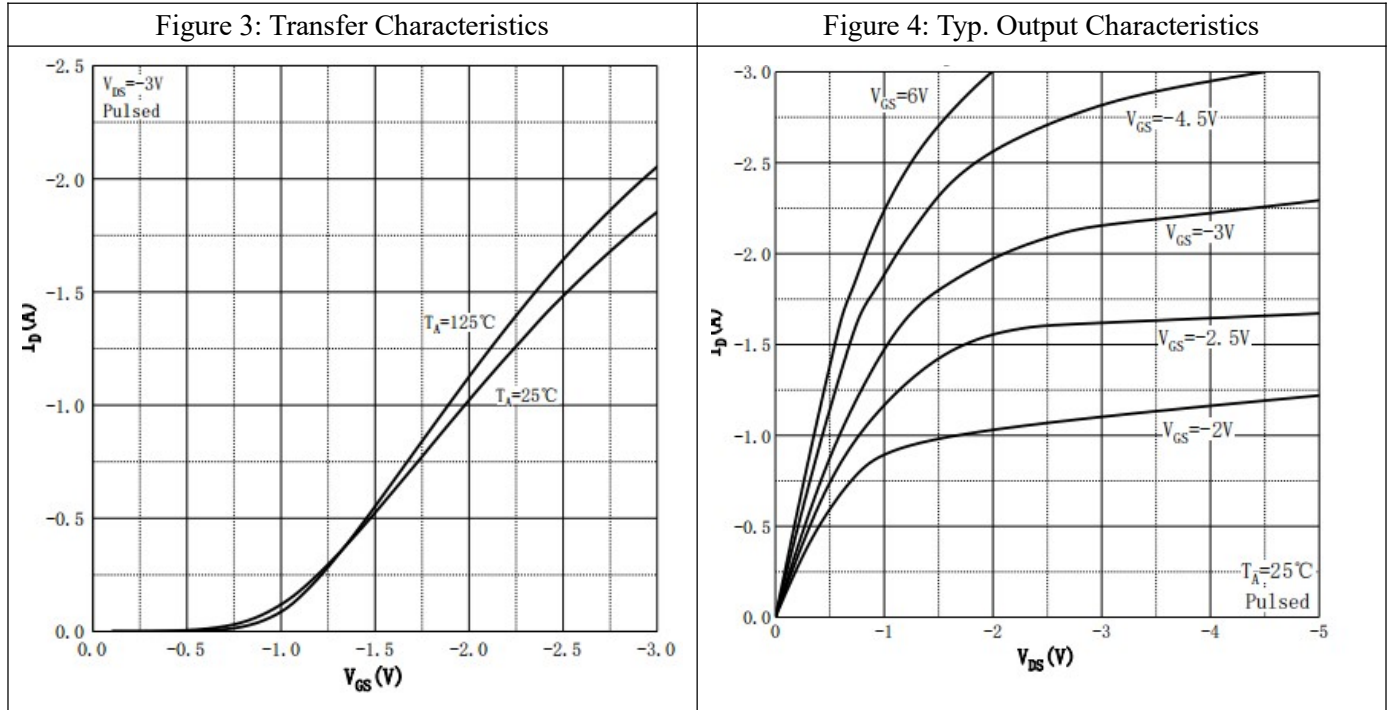
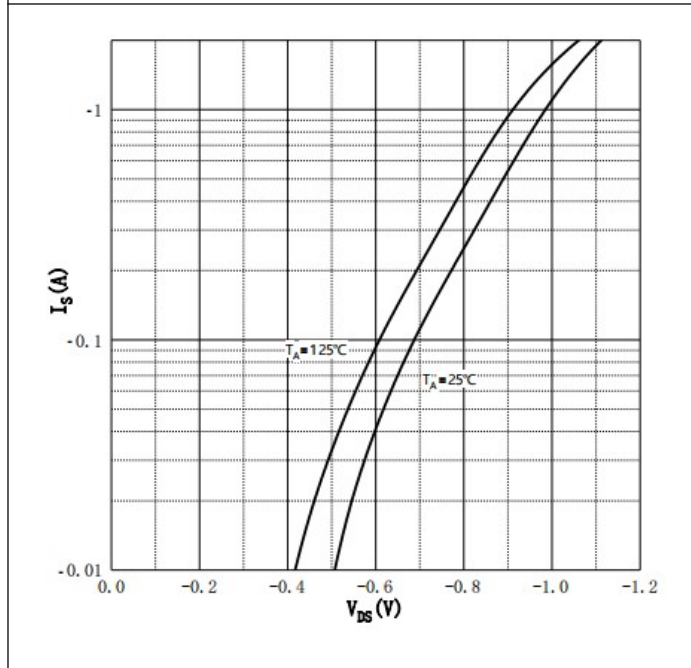
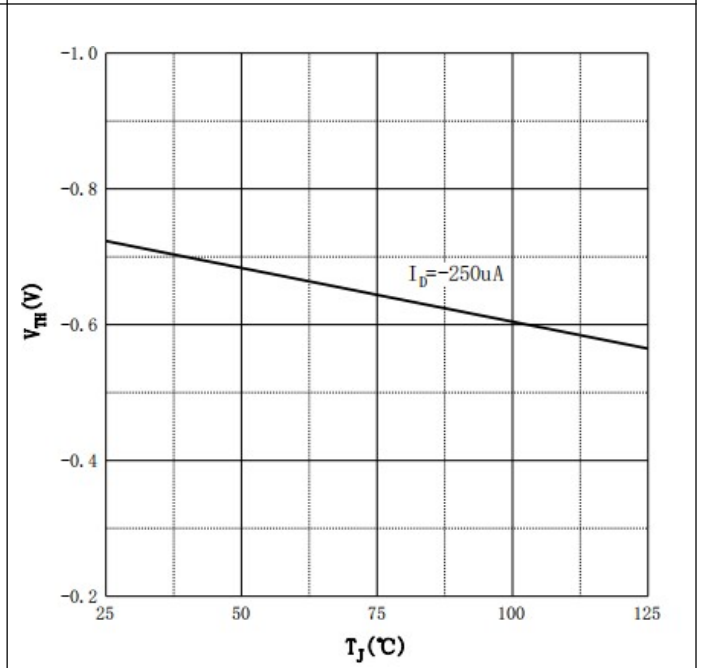
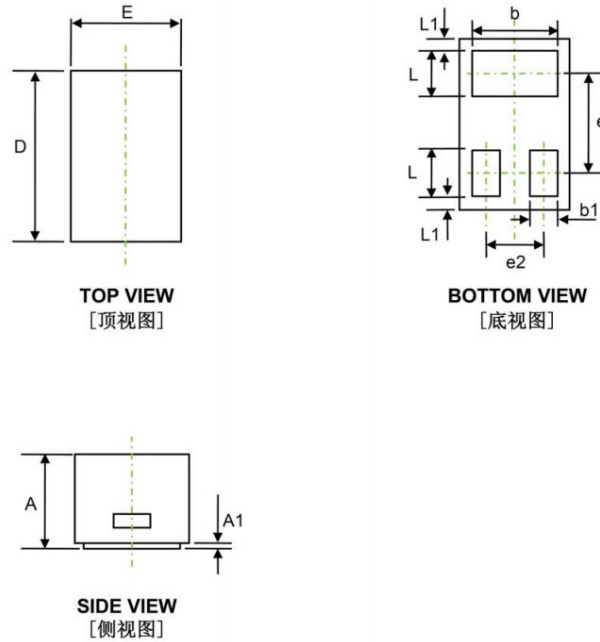


Figure 7: Source Current

Figure 8: Threshold Voltage


Mechanical Dimensions:
DFN1006-3L Package Information


Symbol	Dimensions (Unit: mm)		
	Min.	TYP.	Max.
A	0.40	0.47	0.55
A1	0.00	0.03	0.05
D	0.95	1.00	1.05
E	0.55	0.60	0.65
b	0.40	0.50	0.60
e	-	0.65	-
E2	-	0.35	-
L1	0.05REF		
L	0.20	0.25	0.30
b1	0.10	0.15	0.20

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