



VMDSEMI

**VUTY002R52APA**

**Datasheet**



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## General Description

## Symbol

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

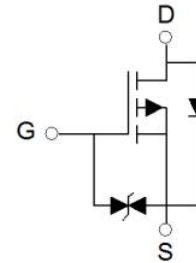


Figure 1 Symbol of VUTY002R52APA

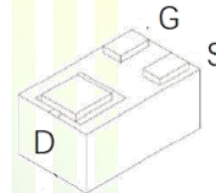
## Features

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

## Application

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

## Package Type



## WBFBP-03E

Figure 2 Package Type of VUTY002R52APA

## Ordering Information

Product Name	Package
VUTY002R52APA	WBFBP-03E

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DSS}$	-20	V
Gate-Source Voltage	$V_{GSS}$	$\pm 12$	V
Continuous Drain Current <sup>Note1</sup>	$I_D$	-0.66	A
Pulsed Drain Current <sup>Note2</sup>	$I_{DM}$	-2.0	
Total Power Dissipation <sup>Note4</sup>	$P_D$	0.3	W
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 to 150	$^\circ\text{C}$

**Thermal Resistance**

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Case <sup>Note5</sup>	$R_{\theta JC}$		416		$^\circ\text{C}/\text{W}$

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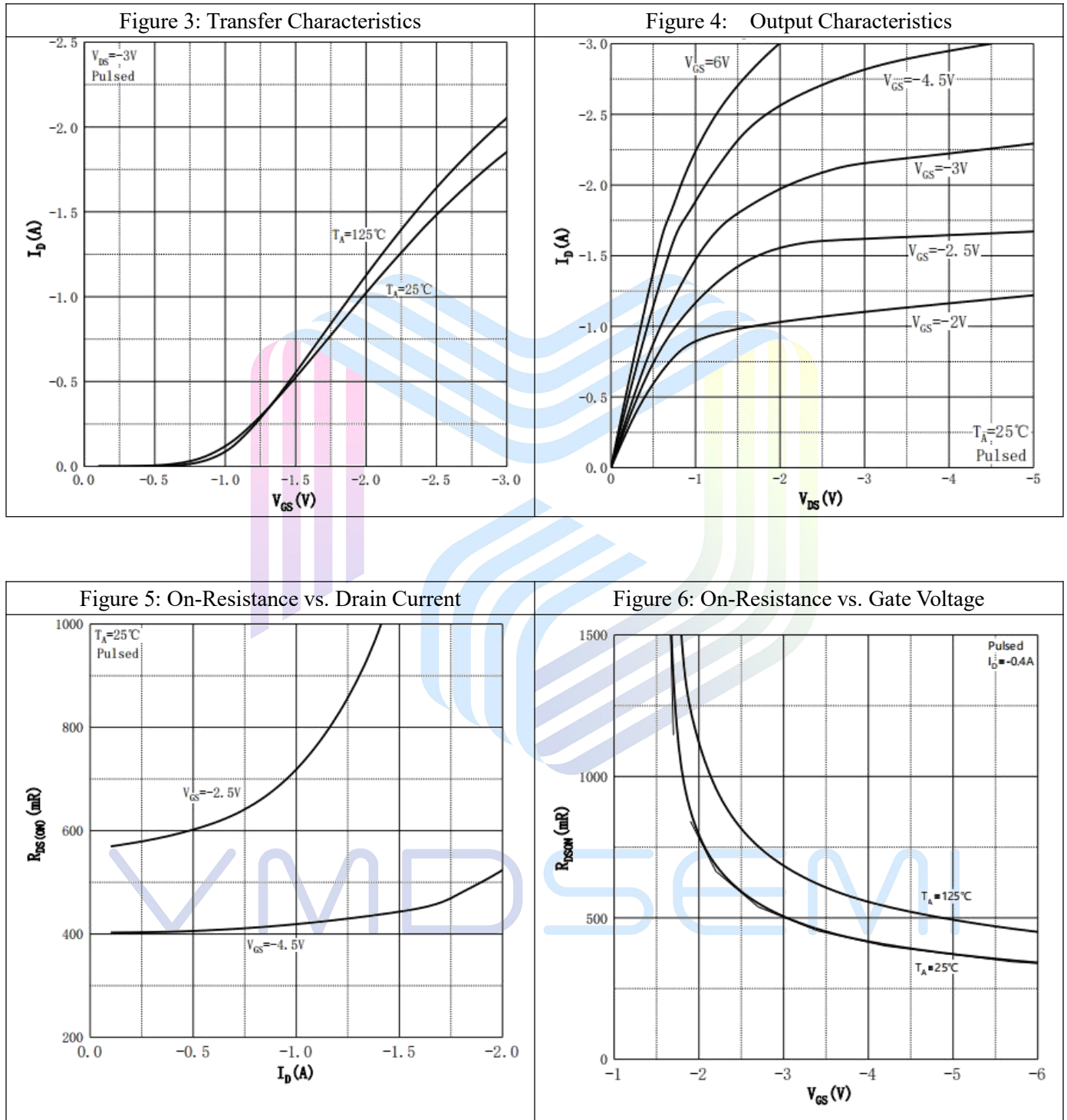
**Electrical Characteristics** ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

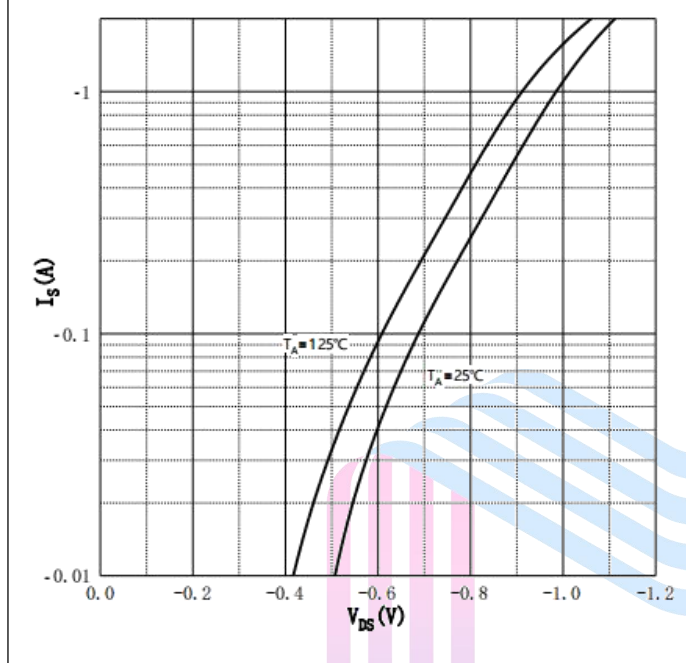
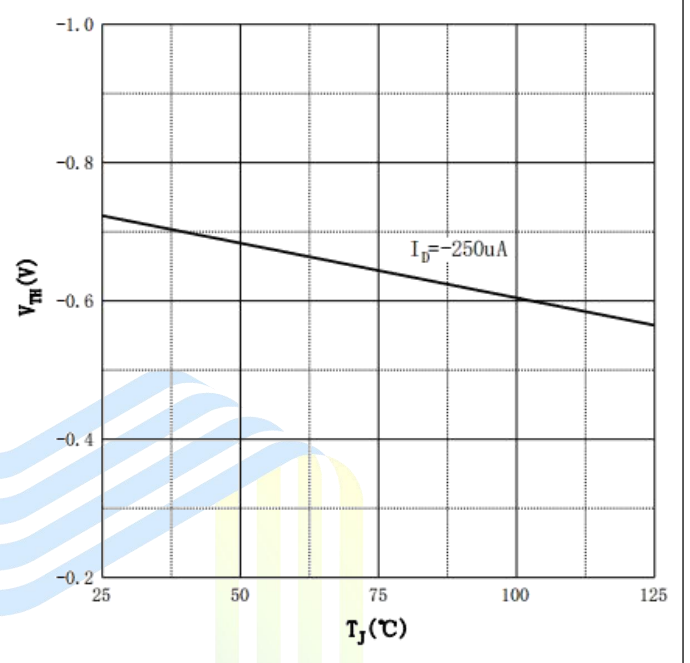
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Statistic Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	-20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-16V, V_{GS}=0V$			-1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$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

Notes :

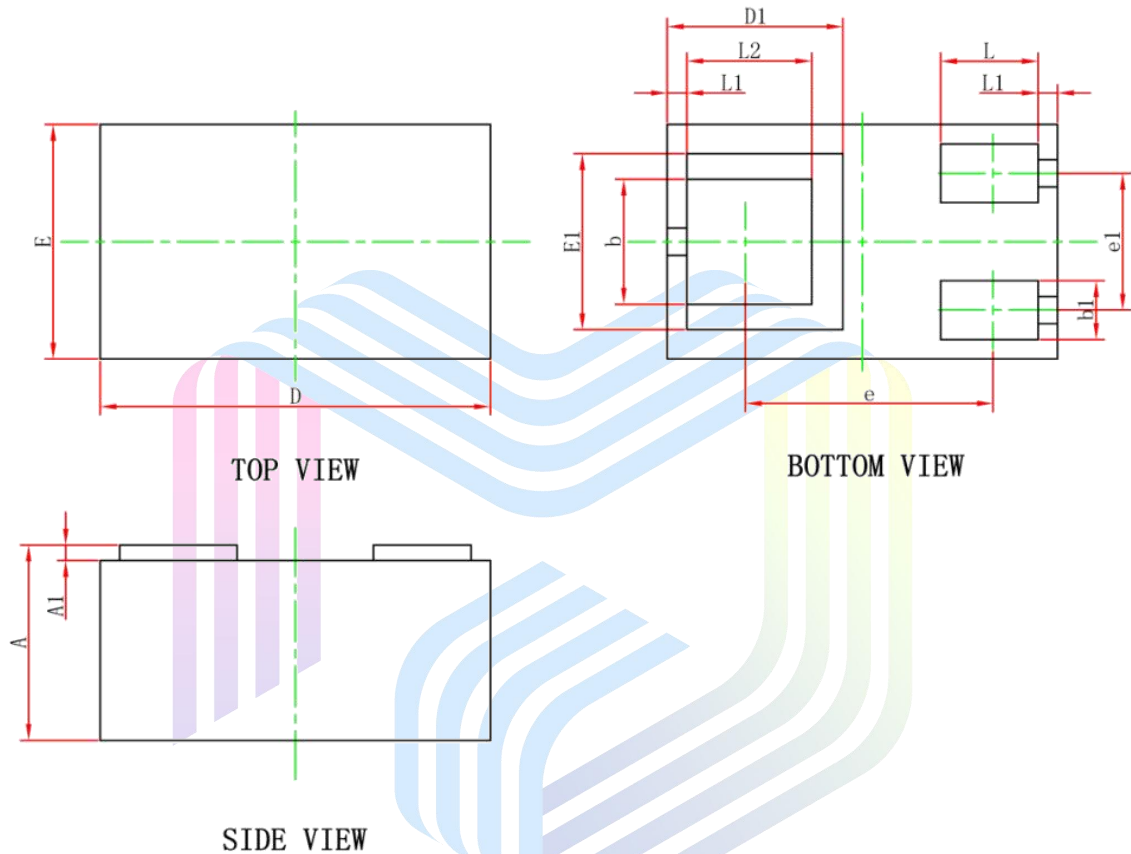
- 1.The maximum current rating is limited by package.And device mounted on a large heatsink.
- 2.Pulse Test : Pulse Width  $\leq 10\mu s$ , duty cycle  $\leq 1\%$ .
- 4.Pulse Test : Pulse Width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- 5.The power dissipation  $P_D$  is limited by  $T_{J(MAX)} = 150^\circ\text{C}$ .And device mounted on a large heatsink
- 6.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: Body Diode Characteristics**

**Figure 8: Threshold Voltage**


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**Mechanical Dimensions:**
**WBFBP-03E Package Information**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.450	0.550	0.018	0.022
A1	0.010	0.100	0.000	0.004
D	0.950	1.050	0.037	0.041
E	0.550	0.650	0.022	0.026
D1	0.450REF		0.018REF	
E1	0.450REF		0.018REF	
b	0.270	0.370	0.011	0.015
b1	0.100	0.200	0.004	0.008
e	0.635REF		0.025REF	
e1	0.300	0.400	0.012	0.016
L	0.200	0.300	0.008	0.012
L1	0.050REF		0.002REF	
L2	0.270	0.370	0.011	0.015

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**Via-Media Semiconductor Limited Company**

<http://www.vmdsemi.com>

**Main Sites:**

**- Headquarters**

Hangzhou Via-Media Semiconductor Co., LTD.  
1305-1306, Building 71, No. 90, Wensan Road, Xihu  
District, Hangzhou, Zhejiang Province, P.R. China  
Tel: +86-0571-8515 0563

**- Chengdu Office**

Chengdu Winhi Semiconductor Co., LTD.  
Floor 15, Building 5, No. 171, Hele 2<sup>nd</sup> Street,  
Chengdu, Sichuan Province, P.R. China  
Tel: +86-028-8505 0771

**- Shanghai**

Shanghai R&D Center.  
1506~1508, Xinyin Building, 888 Yishan Road,  
Shanghai, P.R of China  
Tel: +86- 021-54201999

**- Shenzhen**

Shenzhen Sales office  
Room 4A15, Block AB, Tianxiang Building,  
Chegongmiao , Futian District, Shenzhen, P.R of China  
Tel: +86-0755- 82570682

**- Xi'an**

Xi'an R&D Center  
1703B, Building A, Greenland Center, Jinye Road,  
High-Tech Zone, Xi'an, Shaanxi, P.R of China