VUSA006R160NA

Datasheet

16mΩ, 60V, N-Channel Power MOSFET VUSA006R160NA

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
60V	16mΩ@10V	9A
	18mΩ@4.5V	

Symbol

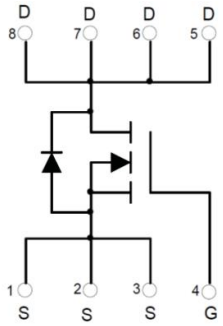


Figure 1 Symbol of VUSA006R160NA

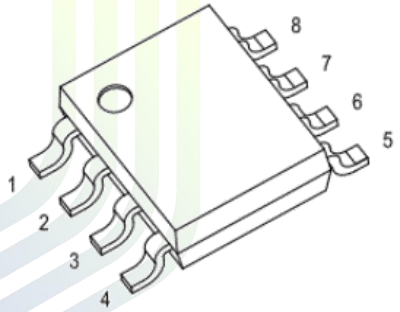
Features

- High density cell design for ultra low $R_{DS(ON)}$
- Excellent package for good heat dissipation

Application

- Hard switched and high frequency circuits
- Power Switch Application
- Uninterruptible power supply

Package Type



SOP8

Figure 2 Package Type of VUSA006R160NA

Ordering Information

Product Name	Package
VUSA006R160NA	SOP8

Absolute Maximum Ratings (T_A= 25 ºC, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[Note1]	I_D	9	A
Pulsed Drain Current [Note2]	I_{DM}	36	
Single Pulsed Avalanche Energy[Note6]	E_{AS}	16	mJ
Total Power Dissipation[Note4]	P_D	3.1	W
Junction Temperature	T_J	150	ºC
Storage Temperature	T_{STG}	-55 to 150	ºC

Thermal Resistance

Parameter		Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Ambient [Note5]	Stead State	$R_{\theta JA}$		65		ºC/W
Thermal Resistance, Junction-to-Ambient[Note5]	t≤ 10S	$R_{\theta JA}$		40		ºC/W

Electrical Characteristics (T_A= 25 ºC, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D= 250uA	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 60V, V_{GS}=0V			1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS}= 0V			±100	nA
Gate Threshold Voltage[Note3]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1	1.5	2.5	V
Static Drain-Source On-Resistance[Note3]	$R_{DS(ON)}$	V_{GS}=10V, I_D= 9A		8.7	16	mΩ
		V_{GS}=4.5V, I_D= 9A		11.5	18	
Forward Transconductance[Note3]	g_{FS}	V_{DS}=5V, I_D= 9A	10	20		S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=30V		2595		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		177		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		163		pF
Total Gate Charge	Q_g	V_{DS}=30V		62		nC
Gate-Source Charge	Q_{gs}	V_{GS}=10V		10		
Gate-Drain Charge	Q_{gd}	I_D=8A		21		
Gate Resistance	Rg	f = 1MHz, Open drain		2		Ω
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 30V		9.5		ns
Turn-on Rise Time	t_r	V_{GS}= 10V		7		
Turn-off Delay Time	$t_{d(off)}$	R_L=3Ω		35		
Turn-off Fall Time	t_f	R_G=3Ω		6		
Diode Characteristics						
Diode Forward Voltage [Note3]	V_{SD}	V_{GS}=0V, I_S= 9A			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 ≤ 10μs, duty cycle ≤ 1%.

3.Pulse Test : Pulse Width ≤ 380μs, duty cycle ≤ 2%.

4.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.And device mounted on a large heatsink

5.Device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

6.E_{AS} Test Condition V_{DD} = 15V, V_{GS} = 10V, L= 0.1mH, I_{AS} =18A

Typical Performance Characteristics

Figure 3: Transfer Characteristics

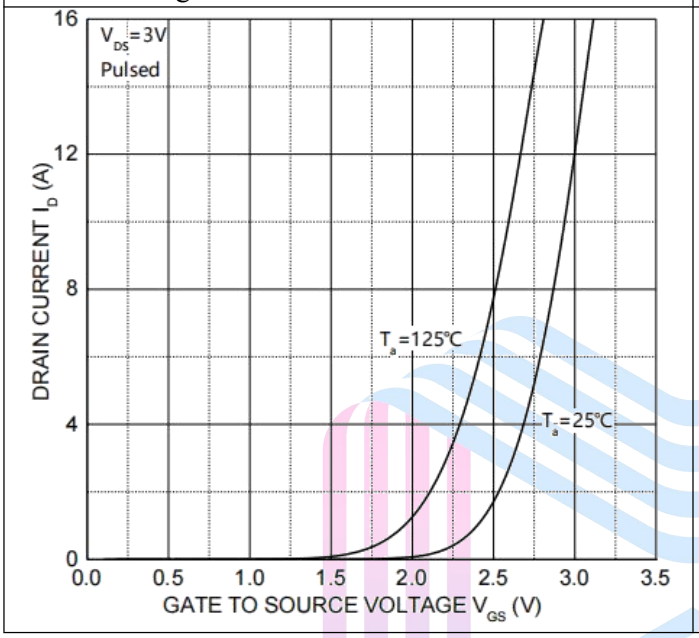


Figure 4: Output Characteristics

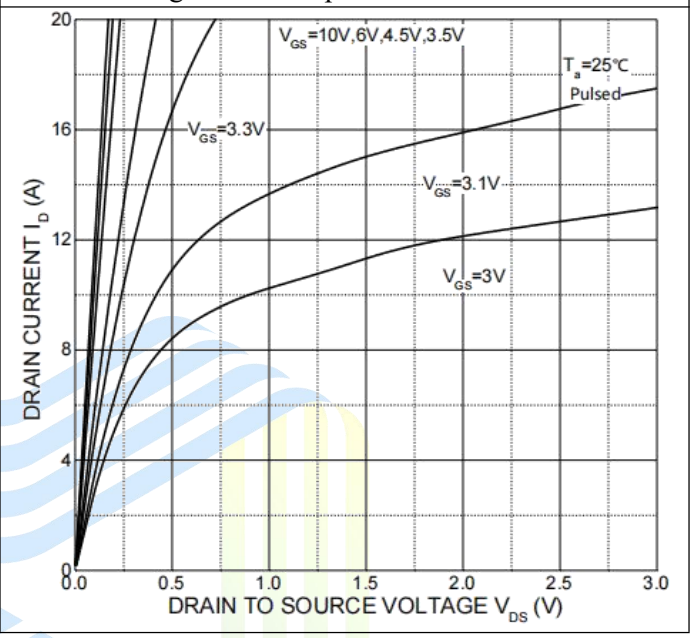


Figure 5: On-Resistance vs. Drain Current

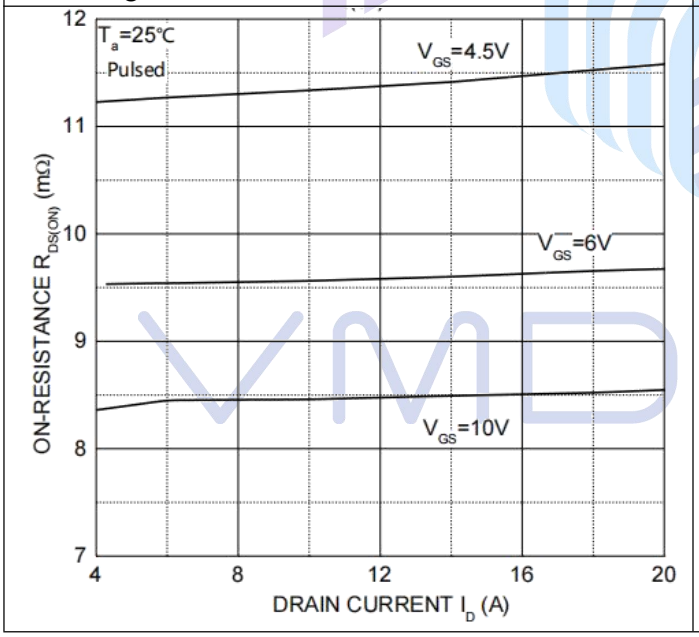


Figure 6: On-Resistance vs. Gate Voltage

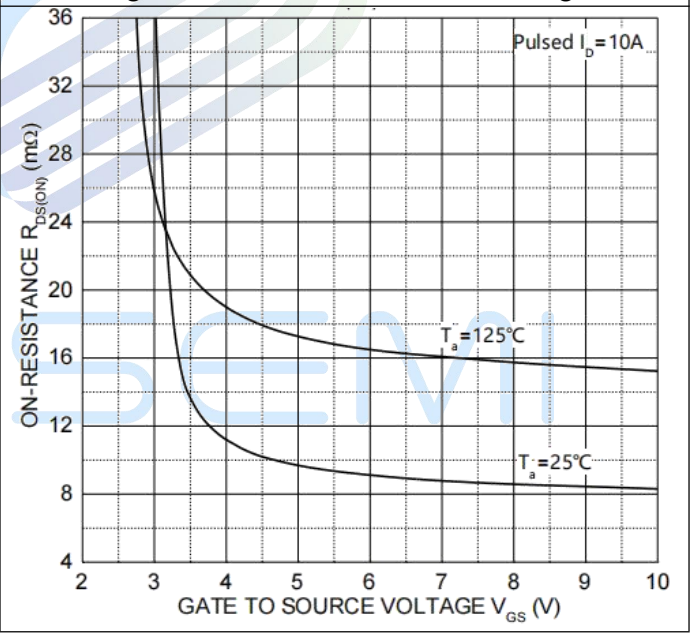


Figure 7: Body Diode Characteristics

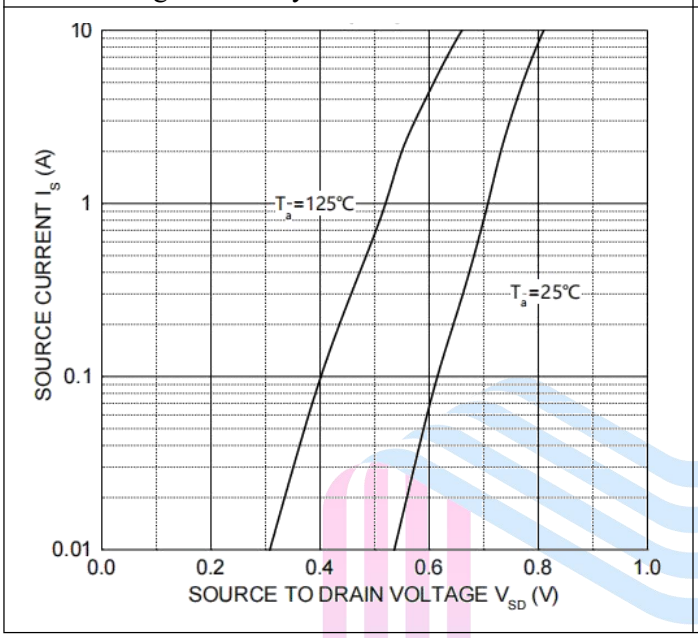
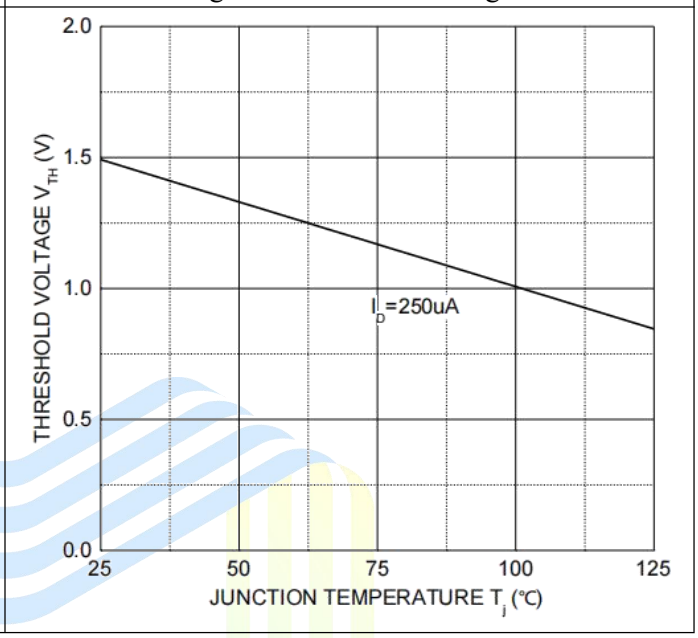
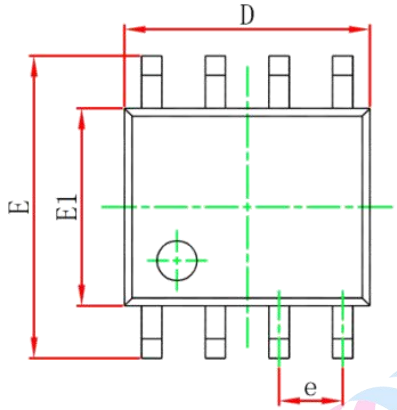


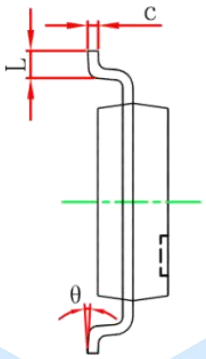
Figure 8: Threshold Voltage

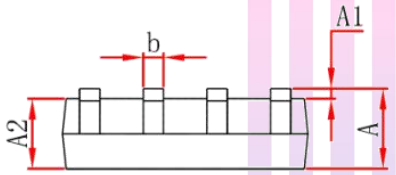


Mechanical Dimensions:

SOP8 Package Information







Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	**Max**	**Min**	**Max**
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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