



VMDSEMI

**VUSA006R360PA**

**Datasheet**



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**General Description**

**Symbol**

$V_{(BR)DSS}$	$R_{DS(ON)_{max}}$	$I_D$
-60V	36mΩ@-10V	-8A

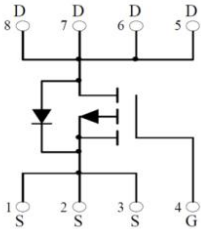


Figure 1    Symbol of VUSA006R360PA

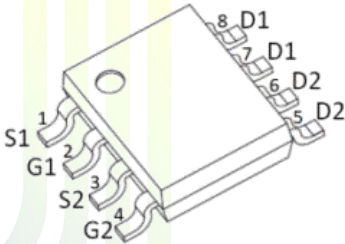
**Features**

**Package Type**

- Trench FET Power MOSFET
- Excellent  $R_{DS(on)}$
- Low Gate Charge
- Low Gate Resistance

**Application**

- Power switching application
- DC-DC Converter



**SOP8**

Figure 2    Package Type of VUSA006R360PA

**Ordering Information**

Product Name	Package
VUSA006R360PA	SOP8

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>Note1</sup>	$I_D$	-8	A
Pulsed Drain Current <sup>Note2</sup>	$I_{DM}$	-32	
Total Power Dissipation <sup>Note4</sup>	$P_D$	2.5	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-Ambient <sup>Note5</sup>	$R_{\theta JA}$		50		$^\circ\text{C/W}$

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**36m $\Omega$ , -60V, P-Channel Power MOSFET**
**VUSA006R360PA**
**Electrical Characteristics** ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> = 250uA	-60			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -48V, V <sub>GS</sub> =0V			-1	uA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
Gate Threshold Voltage <sup>Note3</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1.0	-2.0	-3.0	V
Static Drain-Source On-Resistance <sup>Note3</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> = -6A		25	36	mΩ
Forward tranconductance <sup>Note3</sup>	g <sub>FS</sub>	V <sub>DS</sub> =-5V, I <sub>D</sub> = -6A	10			S
Dynamic Characteristics						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =-30V		3018		pF
Output Capacitance	C <sub>OSS</sub>	V <sub>GS</sub> =0V		173		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>	f=1MHz		163		pF
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-30V		57		nC
Gate-Source Charge	Q <sub>gs</sub>	V <sub>GS</sub> =-10V		12		
Gate-Drain Charge	Q <sub>gd</sub>	I <sub>D</sub> = -8A		12.5		
Gate Resistance	R <sub>g</sub>	f = 1MHz, Open drain		3.5		Ω
Switching Parameters						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -30V		11		ns
Turn-on Rise Time	t <sub>r</sub>	V <sub>GS</sub> = -10V		7.4		
Turn-off Delay Time	t <sub>d(off)</sub>	R <sub>L</sub> =4Ω		48		
Turn-off Fall Time	t <sub>f</sub>	R <sub>G</sub> =3Ω,		15.2		
Diode Characteristics						
Diode Forward Voltage <sup>Note3</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> = -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  $\leq 1\%$ .
- 3.Pulse Test : Pulse Width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- 4.The power dissipation  $P_D$  is limited by  $T_{J(MAX)} = 150^\circ\text{C}$ .And device mounted on a large heatsink
- 5.Device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ\text{C}$ .

## Typical Performance Characteristics

Figure 3: Transfer Characteristics

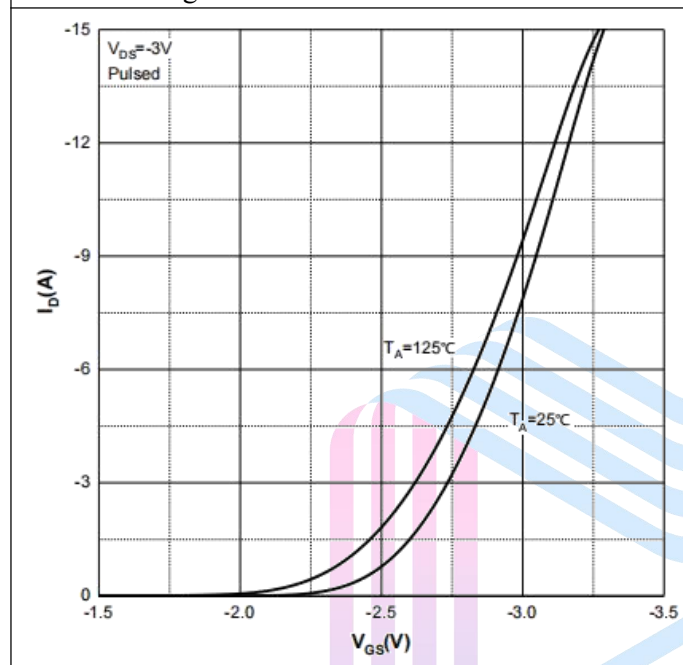


Figure 4: Output Characteristics

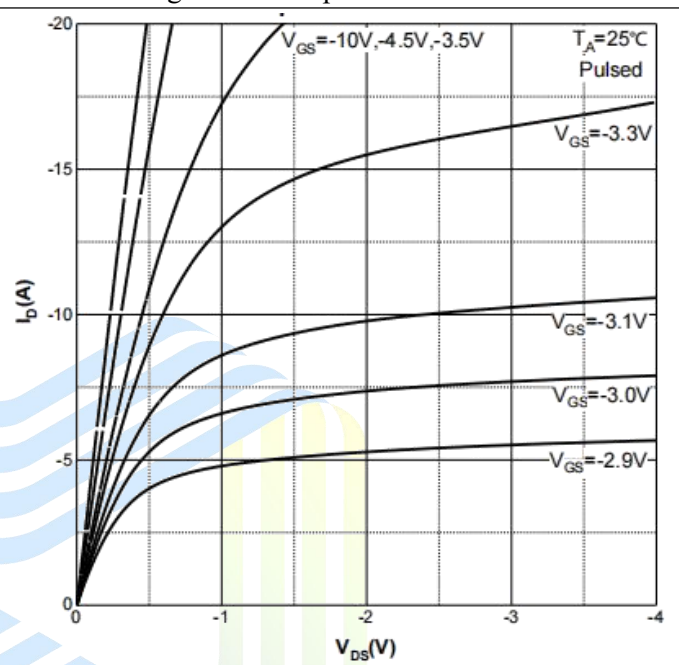


Figure 5: On-Resistance vs. Drain Current

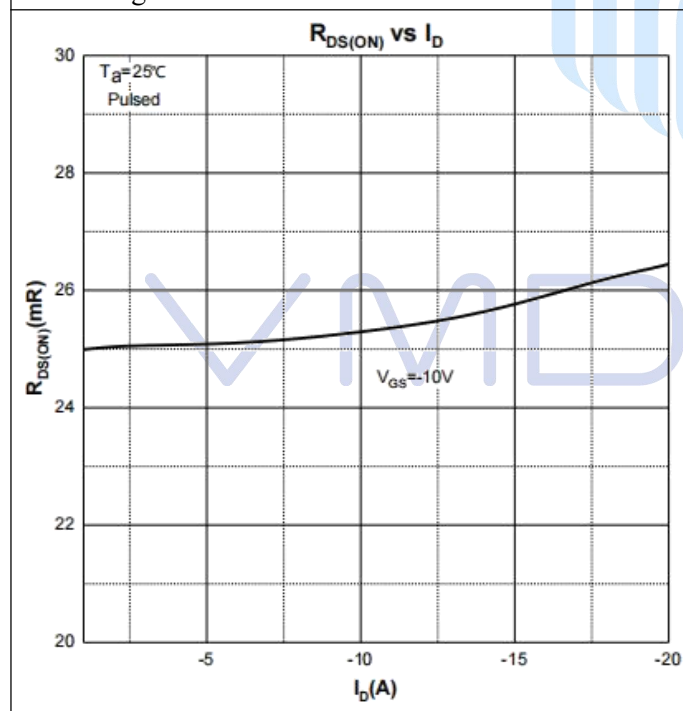
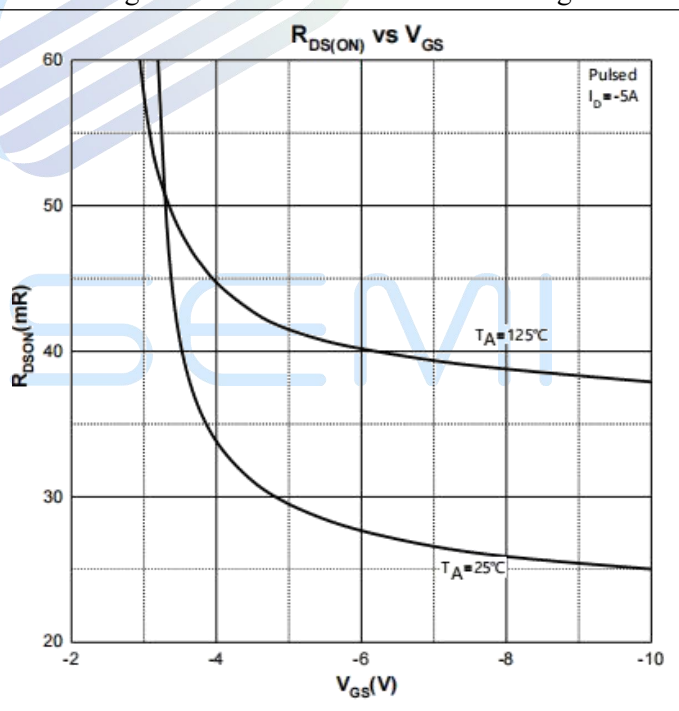
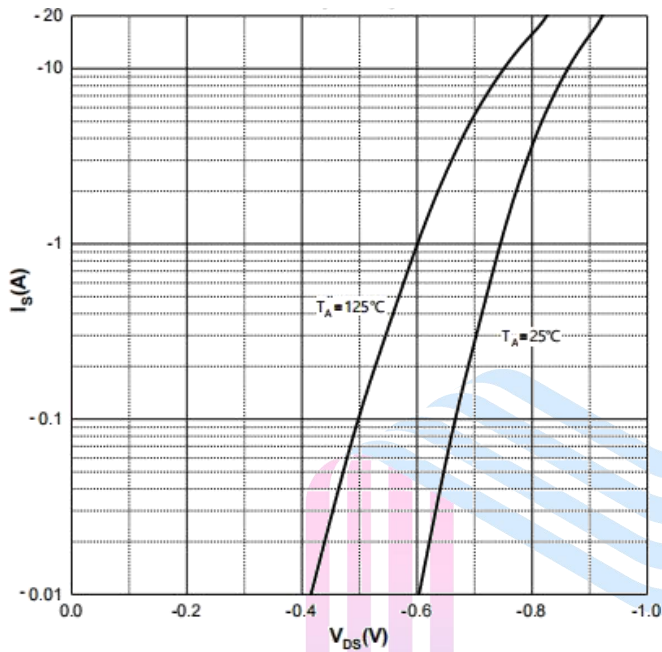
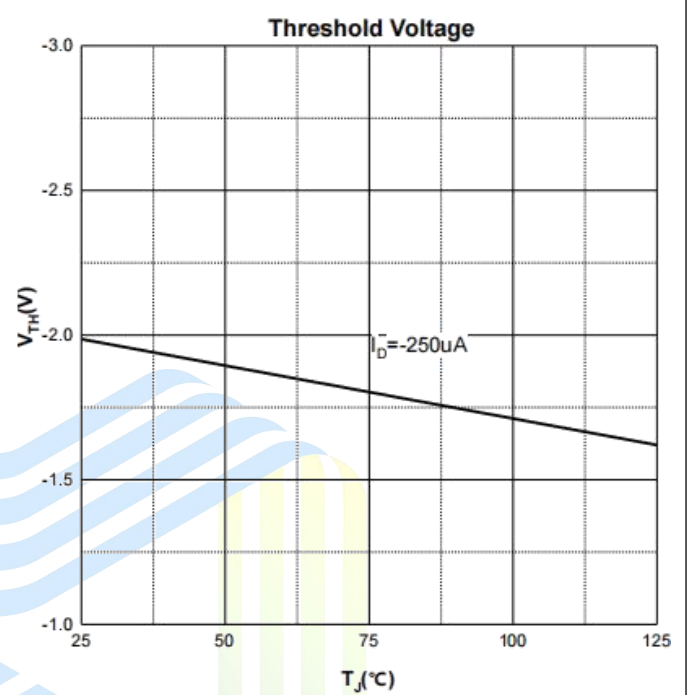


Figure 6: On-Resistance vs. Gate Voltage

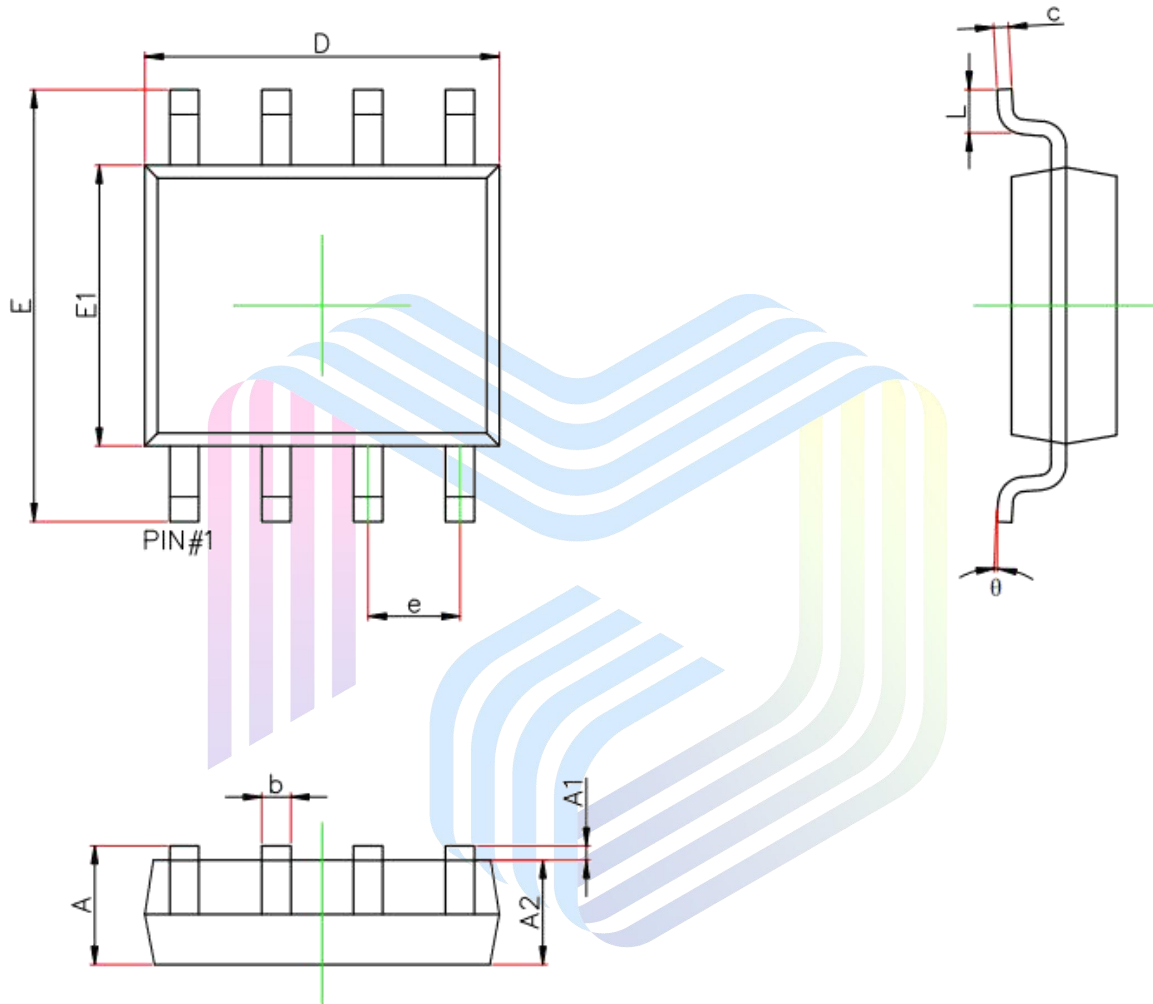


**Figure 7: Body Diode Characteristics**

**Figure 8: Threshold Voltage**


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## 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	0.156	0.250	0.006	0.010
D	4.700	5.100	0.185	0.201
e	1.270(BSC)		0.050(BSC)	
E	5.800	6.200	0.228	0.244
E1	3.700	4.100	0.146	0.161
L	0.400	1.270	0.016	0.05
θ	0°	8°	0°	8°



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