



New Product

Si6913DQ

Vishay Siliconix

## Dual P-Channel 12-V (D-S) MOSFET

## PRODUCT SUMMARY

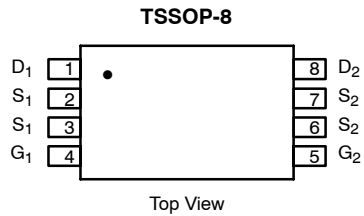
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-12	0.021 @ $V_{GS} = -4.5$ V	-5.8
	0.028 @ $V_{GS} = -2.5$ V	-5.0
	0.037 @ $V_{GS} = -1.8$ V	-4.4

## FEATURES

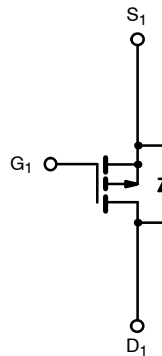
- TrenchFET® Power MOSFET

## APPLICATIONS

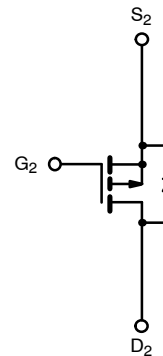
- Load Switch
- Battery Switch



Ordering Information: Si6913DQ-T1



P-Channel MOSFET



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)

Parameter		Symbol	10 secs	Steady State	Unit
Drain-Source Voltage		$V_{DS}$	-12		V
Gate-Source Voltage		$V_{GS}$	$\pm 8$		
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$T_A = 25^\circ\text{C}$	$I_D$	-5.8	-4.9	A
	$T_A = 70^\circ\text{C}$		-4.6	-3.9	
Pulsed Drain Current (10 $\mu\text{s}$ Pulse Width)		$I_{DM}$	-30		
Continuous Source Current (Diode Conduction) <sup>a</sup>		$I_S$	-1.0	-0.7	
Maximum Power Dissipation <sup>a</sup>	$T_A = 25^\circ\text{C}$	$P_D$	1.14	0.83	W
	$T_A = 70^\circ\text{C}$		0.73	0.53	
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$

## THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 10$ sec	$R_{thJA}$	86	110	$^\circ\text{C}/\text{W}$
	Steady State		124	150	
Maximum Junction-to-Foot (Drain)	Steady State	$R_{thJF}$	52	65	

## Notes

<sup>a</sup> Surface Mounted on 1" x 1" FR4 Board.

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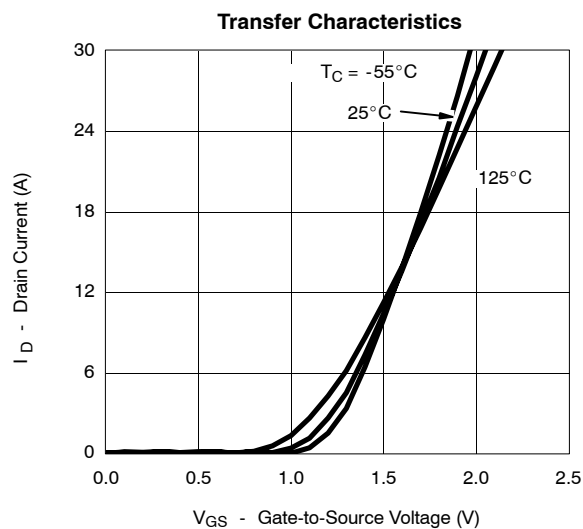
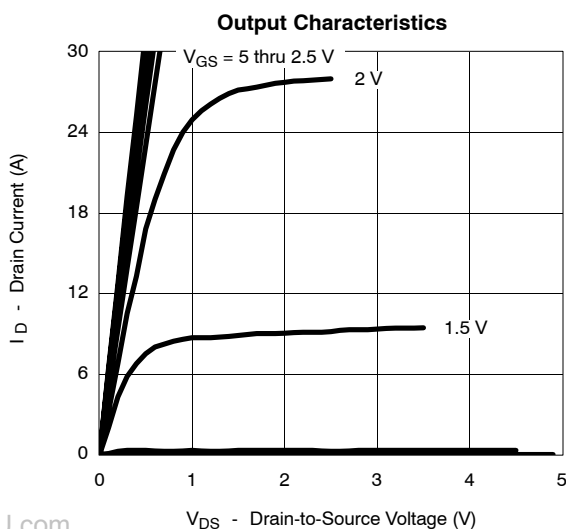
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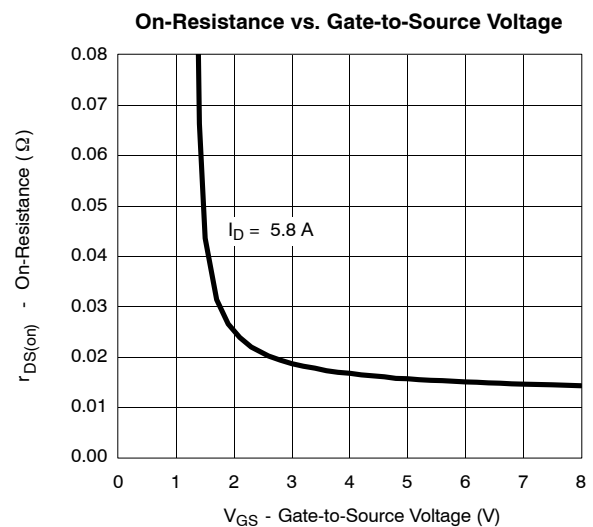
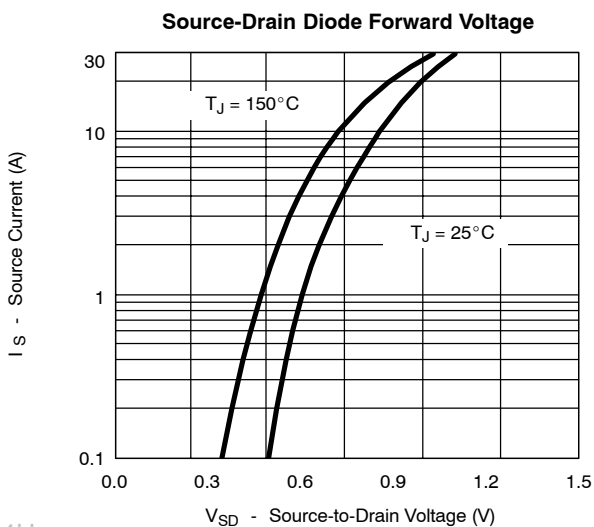
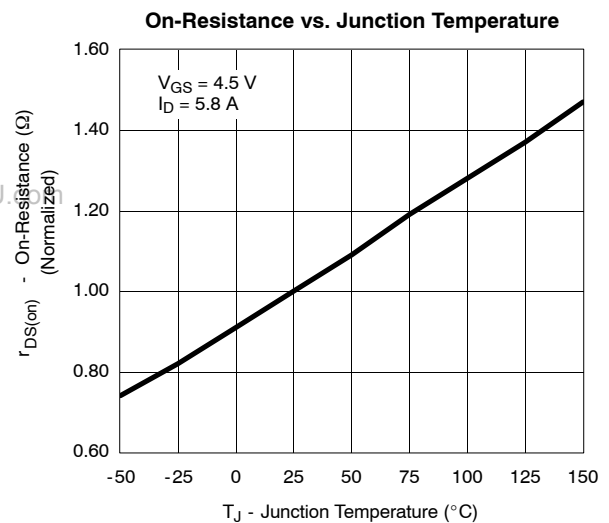
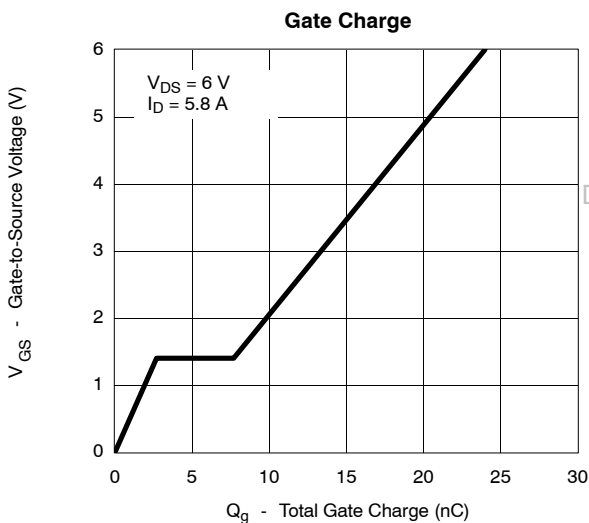
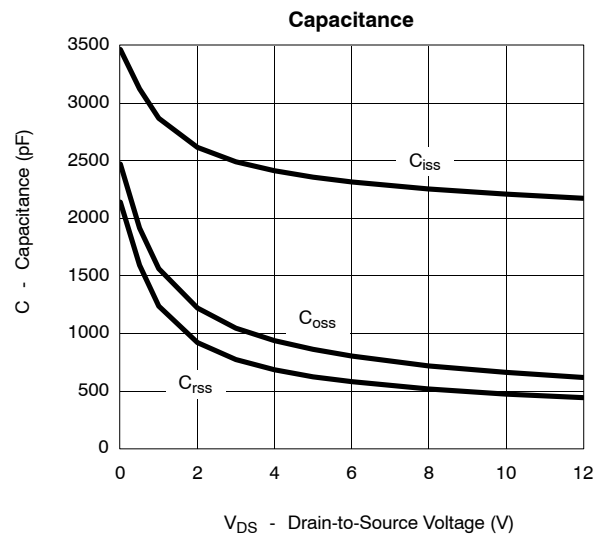
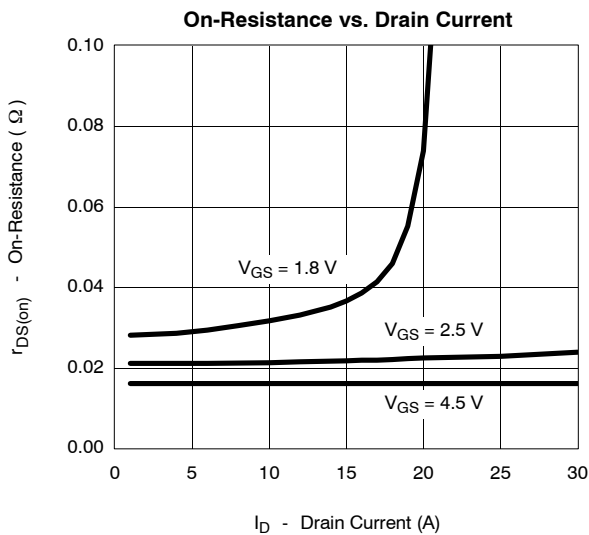
**SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -400 μA	-0.40		-0.9	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -12 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -12 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 70 °C			-25	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = -5 V, V <sub>GS</sub> = -4.5 V	-20			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -5.8 A		0.016	0.021	Ω
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -5.0 A		0.021	0.028	
		V <sub>GS</sub> = -1.8 V, I <sub>D</sub> = -4.4 A		0.029	0.037	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -5 V, I <sub>D</sub> = -5.8 A		25		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = -1.0 A, V <sub>GS</sub> = 0 V		-0.61	-1.1	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -6 V, V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -5.8 A		18.5	28	nC
Gate-Source Charge	Q <sub>gs</sub>			2.7		
Gate-Drain Charge	Q <sub>gd</sub>			5.0		
Gate Resistance	R <sub>g</sub>	f = 1.0 MHz		4.6		Ω
Turn-On Delay Time	t <sub>d(on)</sub>	DataSheet4U.com V <sub>DD</sub> = -6 V, R <sub>L</sub> = 6 Ω I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -4.5 V, R <sub>G</sub> = 6 Ω		45	70	ns
Rise Time	t <sub>r</sub>			80	120	
Turn-Off Delay Time	t <sub>d(off)</sub>			130	200	
Fall Time	t <sub>f</sub>			80	120	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> = -1.0 A, di/dt = 100 A/μs		65	

## Notes

- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.  
b. Guaranteed by design, not subject to production testing.

**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**


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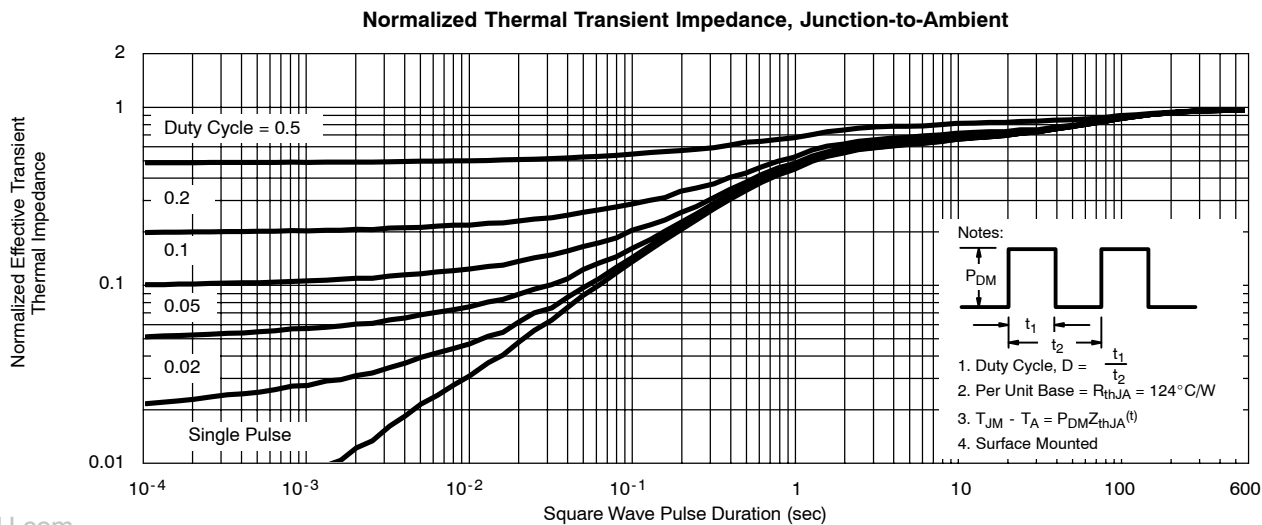
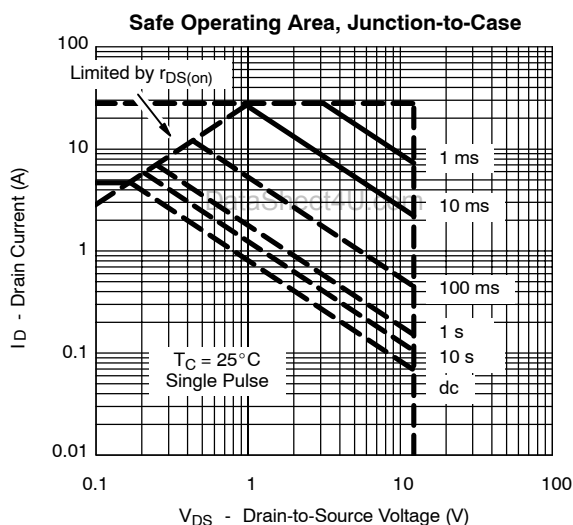
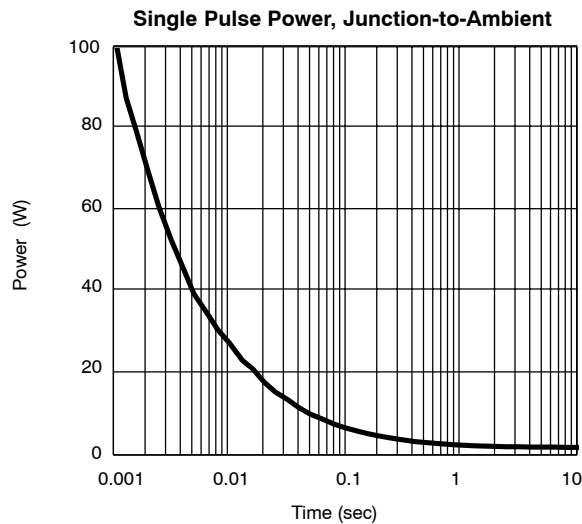
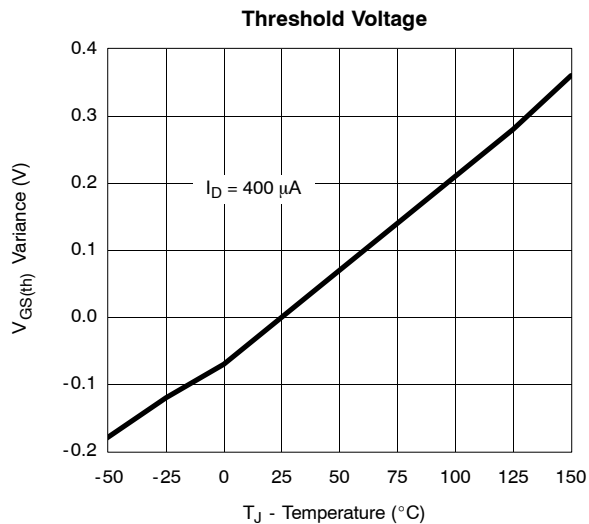
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