



# **Dual P-Channel 30-V (D-S) MOSFET**

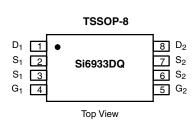
PRODUCT SUMMARY			
V <sub>DS</sub> (V)	$R_{DS(on)}(\Omega)$	I <sub>D</sub> (A)	
- 30	0.045 at V <sub>GS</sub> = - 10 V	± 3.5	
	0.085 at V <sub>GS</sub> = - 4.5 V	± 2.5	

#### **FEATURES**

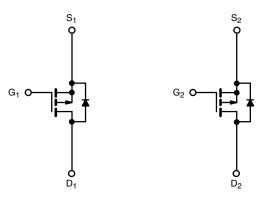
- Halogen-free
- TrenchFET<sup>®</sup> Power MOSFETs



**RoHS**COMPLIANT



Ordering Information: Si6933DQ-T1-GE3 (Lead (Pb)-free and Halogen-free)



P-Channel MOSFET

P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T <sub>A</sub> = 25 °C, unless otherwise noted					
Parameter		Symbol	Limit	Unit	
Drain-Source Voltage		V <sub>DS</sub>	- 30	V	
Gate-Source Voltage		V <sub>GS</sub>	± 20	$\neg$ $\lor$ $ $	
Continuous Drain Current /T 150 °C\8	T <sub>A</sub> = 25 °C	- I <sub>D</sub>	± 3.5		
Continuous Drain Current (T <sub>J</sub> = 150 °C) <sup>a</sup>	T <sub>A</sub> = 70 °C		± 2.8	_	
Pulsed Drain Current		I <sub>DM</sub>	± 20	Α	
Continuous Source Current (Diode Conduction) <sup>a</sup>		I <sub>S</sub>	- 1.25		
Mariana Daniar Dissis Aliand	T <sub>A</sub> = 25 °C	P <sub>D</sub>	1.0	W	
Maximum Power Dissipation <sup>a</sup>	T <sub>A</sub> = 70 °C	' D	0.64		
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>stg</sub>	- 55 to 150	°C	

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Limit	Unit	
Maximum Junction-to-Ambient <sup>a</sup>	R <sub>thJA</sub>	125	°C/W	

Notes:

a. Surface Mounted on FR4 board,  $t \leq 10 \ s.$ 

For SPICE model information via the Worldwide Web: http://www.vishay.com/www/product/spice.htm.

## Si6933DQ

## Vishay Siliconix



<b>SPECIFICATIONS</b> T <sub>J</sub> = 25 °C, unless otherwise noted								
Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit		
Static								
Gate Threshold Voltage	V <sub>GS(th)</sub>	$V_{DS} = V_{GS}$ , $I_D = -250 \mu A$	- 1.0			V		
Gate-Body Leakage	I <sub>GSS</sub>	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA		
Zara Cata Valtaga Drain Current		$V_{DS} = -30 \text{ V}, V_{GS} = 0 \text{ V}$			- 1	μΑ		
Zero Gate Voltage Drain Current	IDSS	$V_{DS} = -30 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55 ^{\circ}\text{C}$			- 25			
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	$V_{DS} \ge -5 \text{ V}, V_{GS} = -10 \text{ V}$	- 15			Α		
	D	$V_{GS} = -10 \text{ V}, I_D = 3.5 \text{ A}$		0.035	0.045	0		
Drain-Source On-State Resistance <sup>a</sup>	R <sub>DS(on)</sub>	$V_{GS} = -4.5 \text{ V}, I_D = 2.5 \text{ A}$		0.062	0.085	Ω		
Forward Transconductance <sup>a</sup>	9 <sub>fs</sub>	V <sub>DS</sub> = - 15 V, I <sub>D</sub> = - 3.5 A		7.2		S		
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	I <sub>S</sub> = - 1.25 A, V <sub>GS</sub> = 0 V		- 0.77	- 1.2	V		
Dynamic <sup>b</sup>								
Total Gate Charge	$Q_g$			17	30			
Gate-Source Charge	$Q_{gs}$	$V_{DS}$ = - 15 V, $V_{GS}$ = - 10 V, $I_D$ = - 3.5 A		4.4		nC		
Gate-Drain Charge	$Q_{gd}$			3.1				
Turn-On Delay Time	t <sub>d(on)</sub>			13	20			
Rise Time	t <sub>r</sub>	$V_{DD}$ = - 15 V, $R_L$ = 15 $\Omega$		10	20			
Turn-Off Delay Time	t <sub>d(off)</sub>	$I_D\cong$ - 1 A, $V_{GEN}=$ - 10 V, $R_G=6~\Omega$		33	60	ns		
Fall Time	t <sub>f</sub>			10	20			
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = - 1.25 A, dI/dt = 100 A/μs		30	60			

#### Notes:

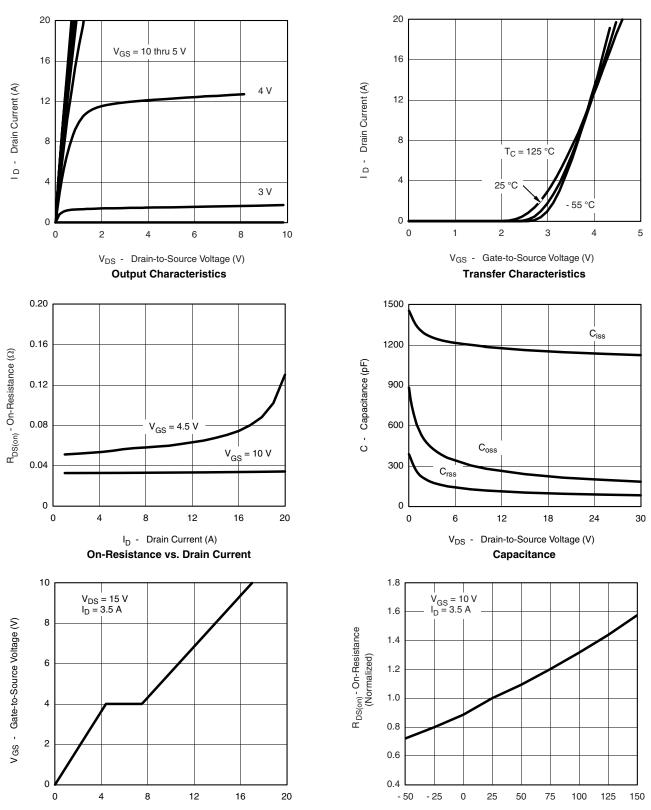
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

a. Pulse test; pulse width  $\leq 300~\mu s,$  duty cycle  $\leq 2~\%.$ 

b. Guaranteed by design, not subject to production testing.



#### TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Total Gate Charge (nC)

**Gate Charge** 

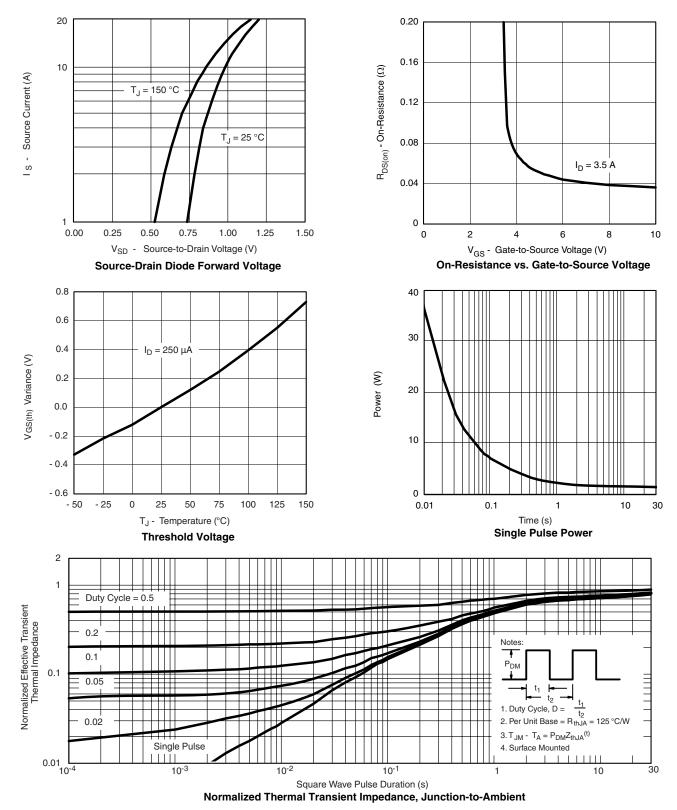
T<sub>J</sub> - Junction Temperature (°C)

On-Resistance vs. Junction Temperature

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#### TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



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