



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

PRODUCT SUMMARY

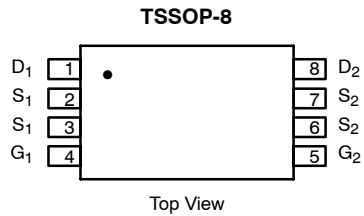
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-12	0.021 @ $V_{GS} = -4.5$ V	-5.8
	0.028 @ $V_{GS} = -2.5$ V	-5.0
	0.037 @ $V_{GS} = -1.8$ V	-4.4

FEATURES

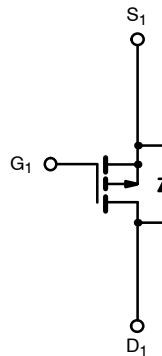
- TrenchFET® Power MOSFET

APPLICATIONS

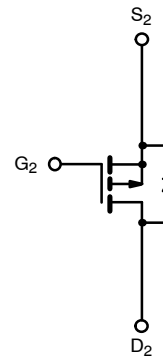
- Load Switch
- Battery Switch



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}	± 8		
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25°C	I _D	-5.8	-4.9	A
	T _A = 70°C		-4.6	-3.9	
Pulsed Drain Current (10 μs Pulse Width)		I _{DM}	-30		
Continuous Source Current (Diode Conduction) ^a		I _S	-1.0	-0.7	
Maximum Power Dissipation ^a	T _A = 25°C	P _D	1.14	0.83	W
	T _A = 70°C		0.73	0.53	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to 150		°C

THERMAL RESISTANCE RATINGS

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

Notes

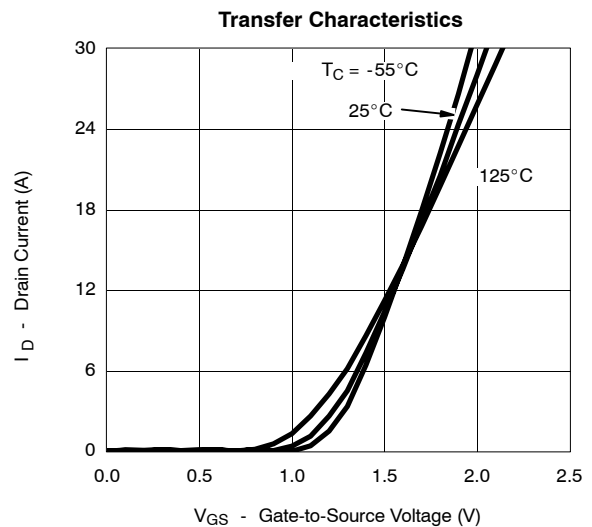
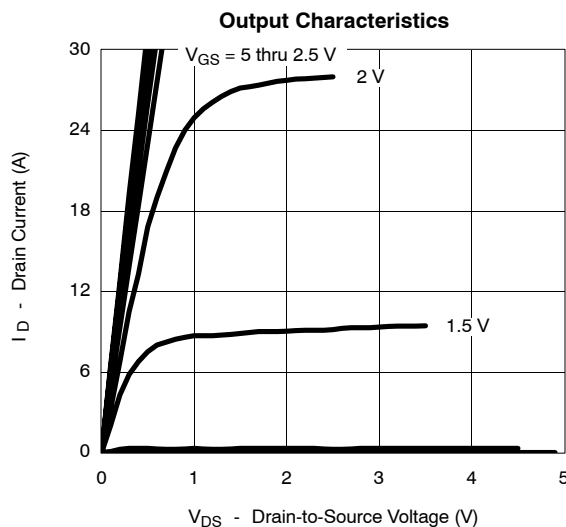
a. Surface Mounted on 1" x 1" FR4 Board.

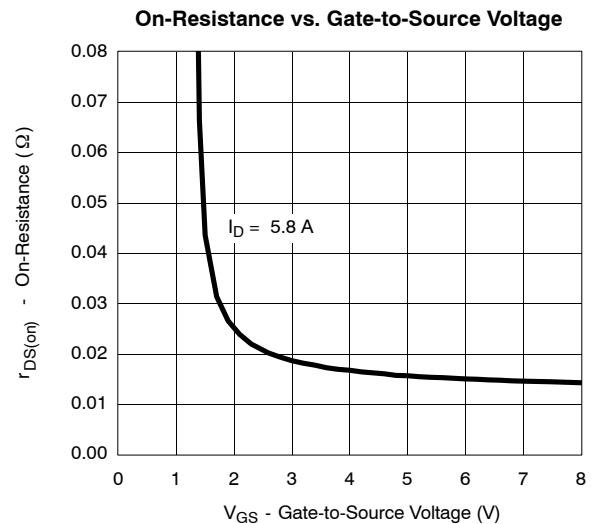
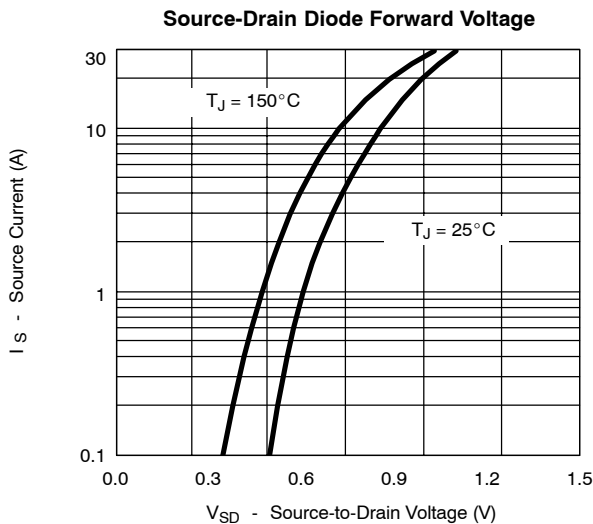
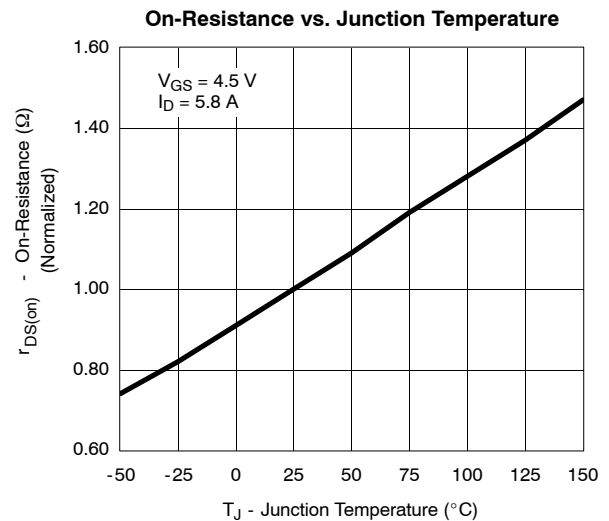
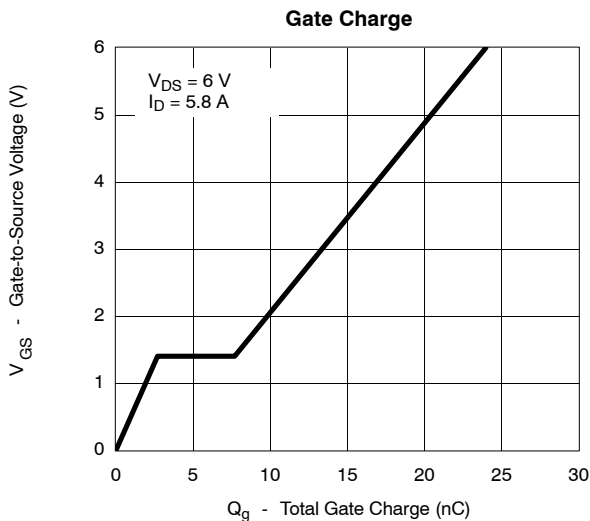
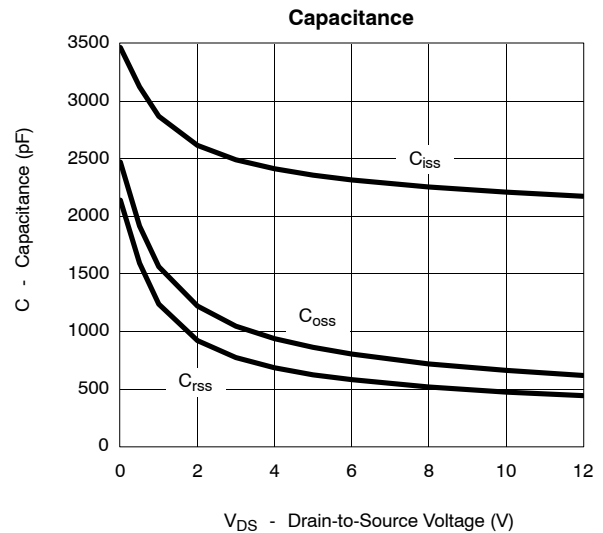
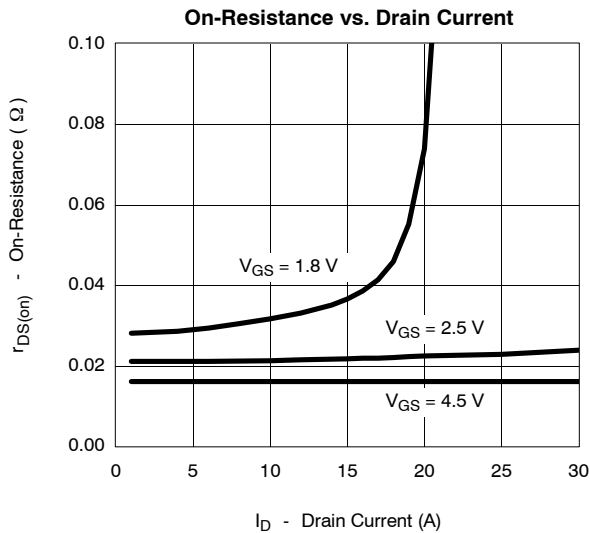
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

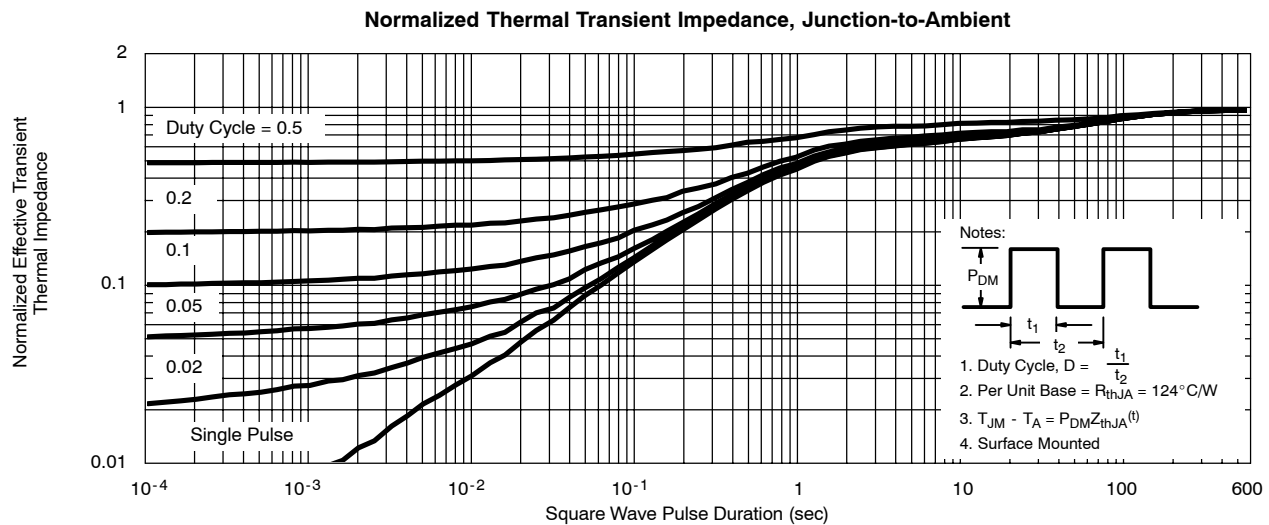
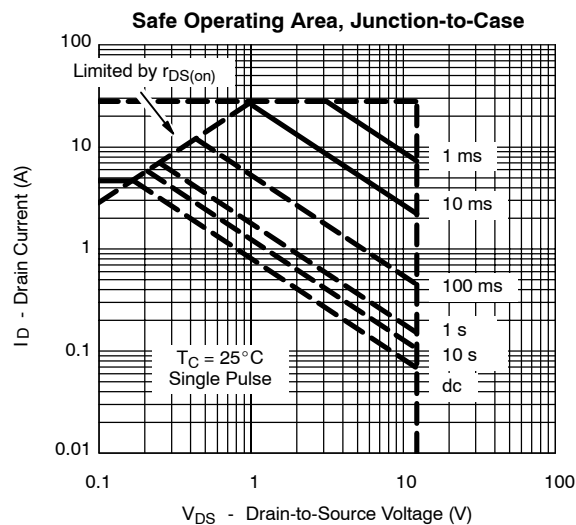
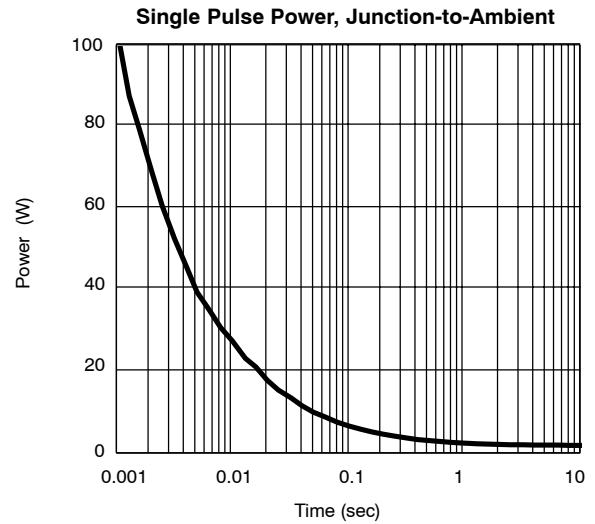
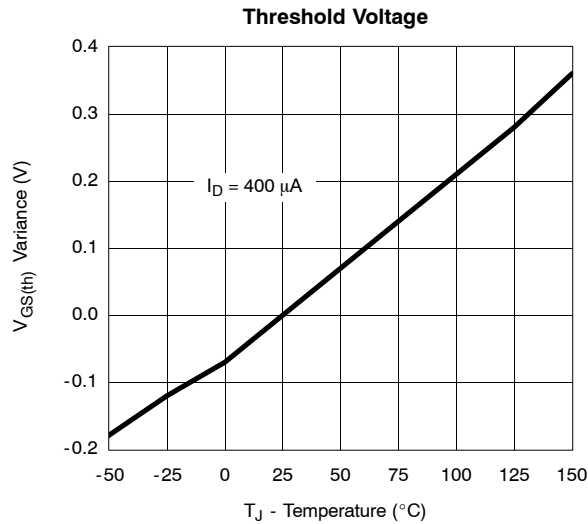
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -400\ \mu\text{A}$	-0.40		-0.9	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 8\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -12\ \text{V}, V_{GS} = 0\ \text{V}$			-1	μA
		$V_{DS} = -12\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 70^\circ\text{C}$			-25	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = -5\ \text{V}, V_{GS} = -4.5\ \text{V}$	-20			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = -4.5\ \text{V}, I_D = -5.8\ \text{A}$		0.016	0.021	Ω
		$V_{GS} = -2.5\ \text{V}, I_D = -5.0\ \text{A}$		0.021	0.028	
		$V_{GS} = -1.8\ \text{V}, I_D = -4.4\ \text{A}$		0.029	0.037	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -5\ \text{V}, I_D = -5.8\ \text{A}$		25		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -1.0\ \text{A}, V_{GS} = 0\ \text{V}$		-0.61	-1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -6\ \text{V}, V_{GS} = -4.5\ \text{V}, I_D = -5.8\ \text{A}$		18.5	28	nC
Gate-Source Charge	Q_{gs}			2.7		
Gate-Drain Charge	Q_{gd}			5.0		
Gate Resistance	R_g	$f = 1.0\ \text{MHz}$		4.6		Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -6\ \text{V}, R_L = 6\ \Omega$ $I_D \approx -1\ \text{A}, V_{GEN} = -4.5\ \text{V}, R_G = 6\ \Omega$		45	70	ns
Rise Time	t_r			80	120	
Turn-Off Delay Time	$t_{d(off)}$			130	200	
Fall Time	t_f			80	120	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -1.0\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		65	100	

Notes

- a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

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