

SI6913DQ-T1-GE3-VB Datasheet

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

PRODUCT SUMMARY		
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
- 30	0.036 at V _{GS} = - 10 V	- 5.2
	0.055 at V _{GS} = - 4.5 V	- 4.2

FEATURES

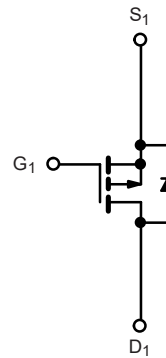
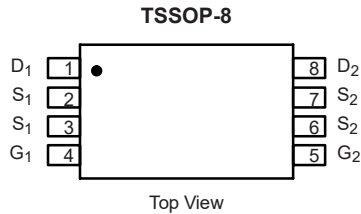
- Halogen-free
- TrenchFET[®] Power MOSFETs



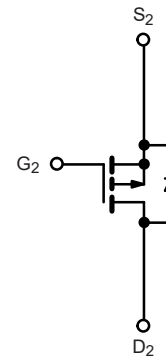
RoHS
COMPLIANT

APPLICATIONS

- Load Switch
- Battery Switch



P-Channel MOSFET



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T _A = 25 °C, unless otherwise noted				
Parameter	Symbol	10 s	Steady State	Unit
Drain-Source Voltage	V _{DS}	- 30		V
Gate-Source Voltage	V _{GS}	± 20		
Continuous Drain Current (T _J = 150 °C) ^a	I _D	T _A = 25 °C	- 5.2	- 4.1
		T _A = 70 °C	- 4.2	- 3.6
Pulsed Drain Current (10 μs Pulse Width)	I _{DM}	- 30		A
Continuous Source Current (Diode Conduction) ^a	I _S	- 1.0	- 0.70	
Maximum Power Dissipation ^a	P _D	T _A = 25 °C	1.14	0.83
		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	R _{thJA}	t ≤ 10 s	86	110
		Steady State	124	150
Maximum Junction-to-Foot	R _{thJF}	52	65	°C/W

Notes:

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

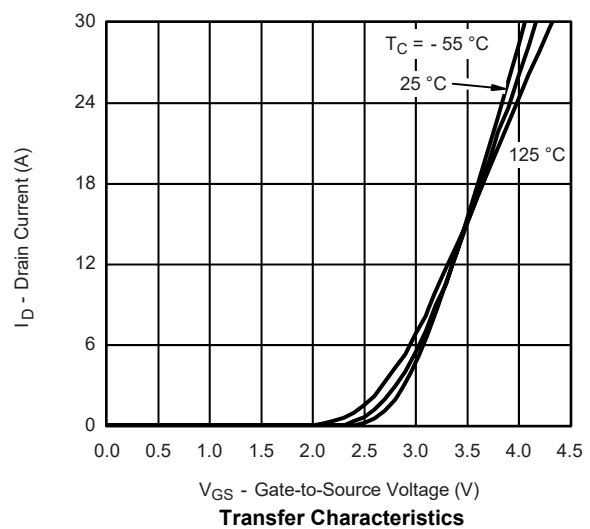
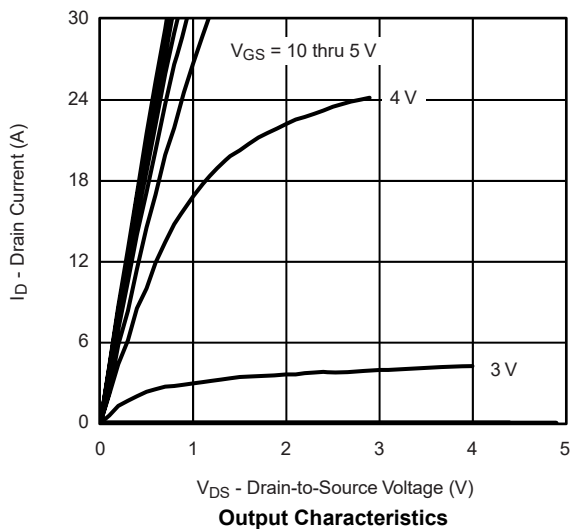
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-1.0		-3.0	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			-10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq -5\text{ V}, V_{GS} = -10\text{ V}$	-15			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -4.7\text{ A}$		0.036		Ω
		$V_{GS} = -4.5\text{ V}, I_D = -3.8\text{ A}$		0.055		
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -4.7\text{ A}$		14		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -1.0\text{ A}, V_{GS} = 0\text{ V}$		-0.74	-1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -15\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -4.7\text{ A}$		13	20	nC
Gate-Source Charge	Q_{gs}		3			
Gate-Drain Charge	Q_{gd}		5.8			
Gate Resistance	R_g	$f = 1.0\text{ MHz}$		4.6		Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}, R_L = 15\text{ }\Omega$ $I_D \cong -1\text{ A}, V_{GEN} = -10\text{ V}, R_G = 6\text{ }\Omega$		13	20	ns
Rise Time	t_r		14	22		
Turn-Off Delay Time	$t_{d(off)}$		52	80		
Fall Time	t_f		26	40		
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -1.0\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		40	60	

Notes:

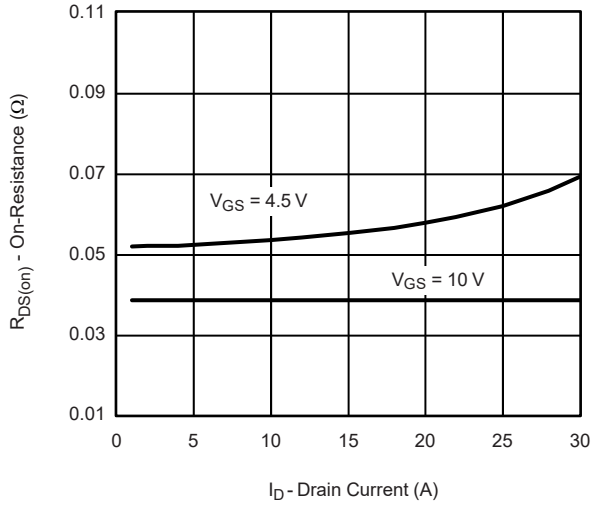
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.

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.

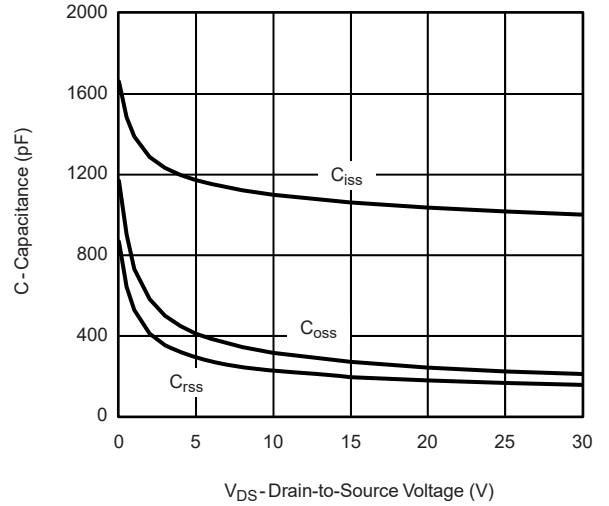
TYPICAL CHARACTERISTICS $25\text{ }^\circ\text{C}$, unless otherwise noted



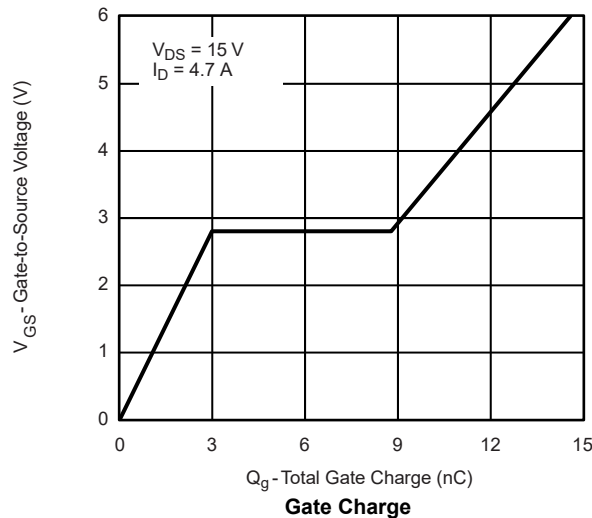
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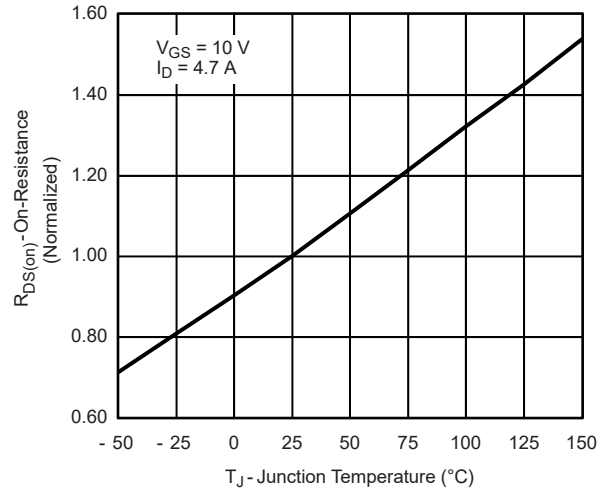
On-Resistance vs. Drain Current



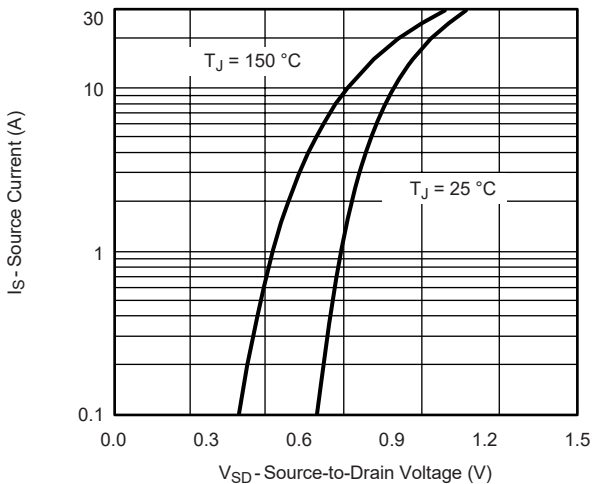
Capacitance



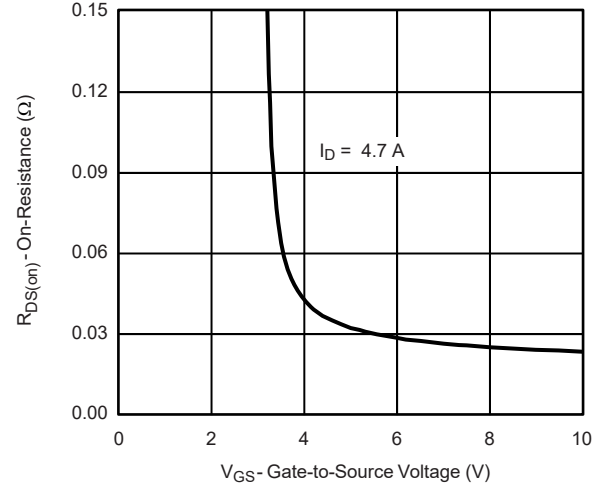
Gate Charge



On-Resistance vs. Junction Temperature

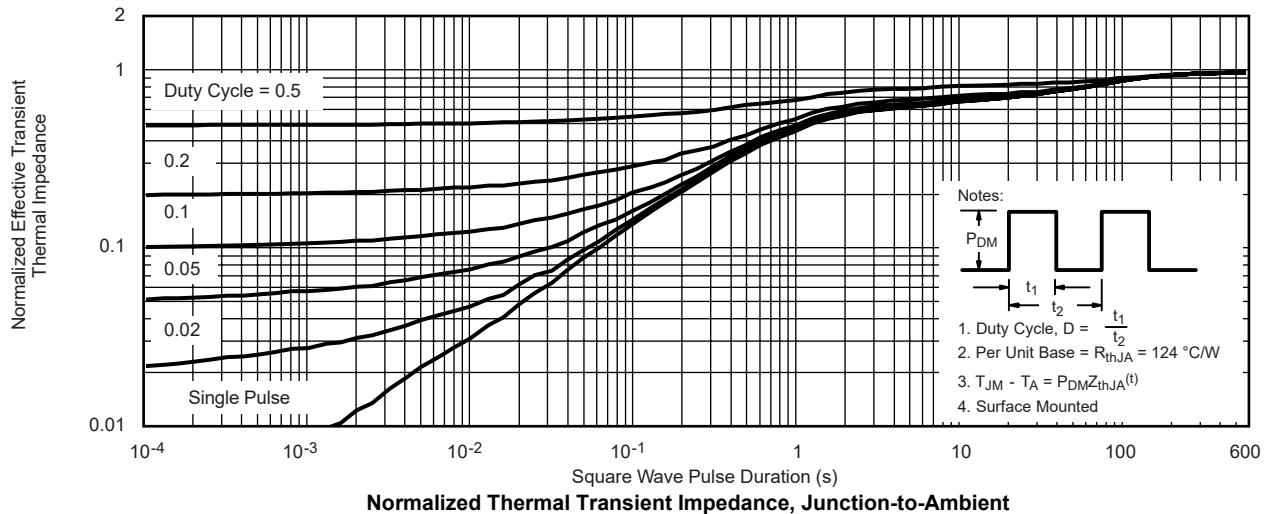
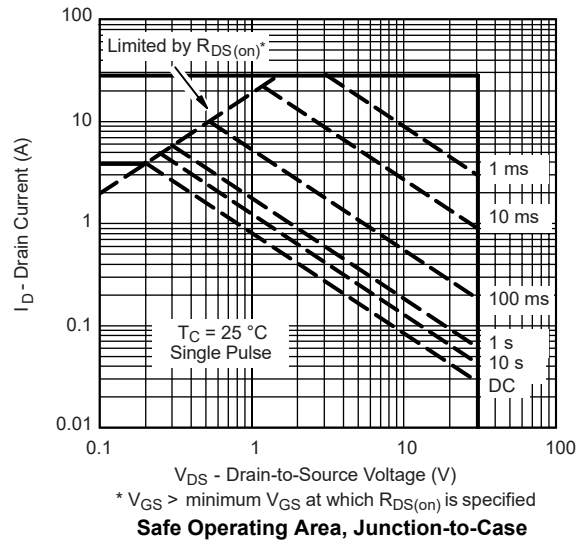
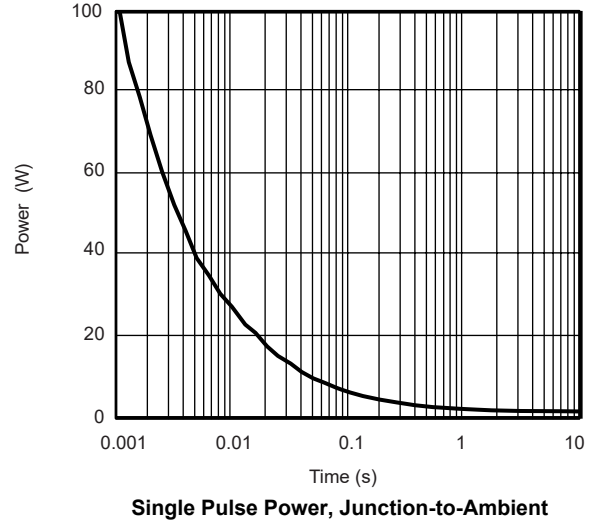
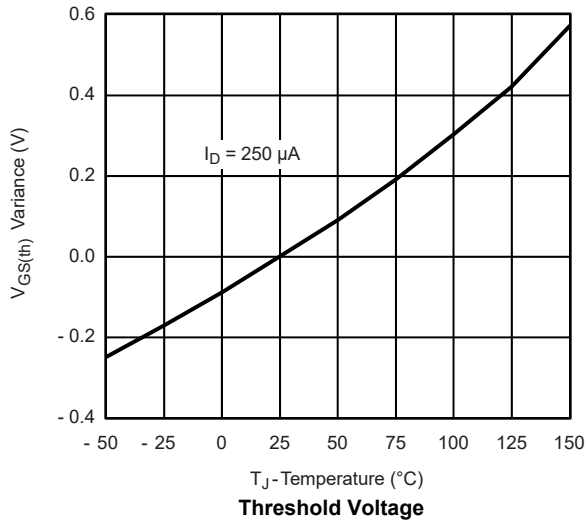


Source-Drain Diode Forward Voltage

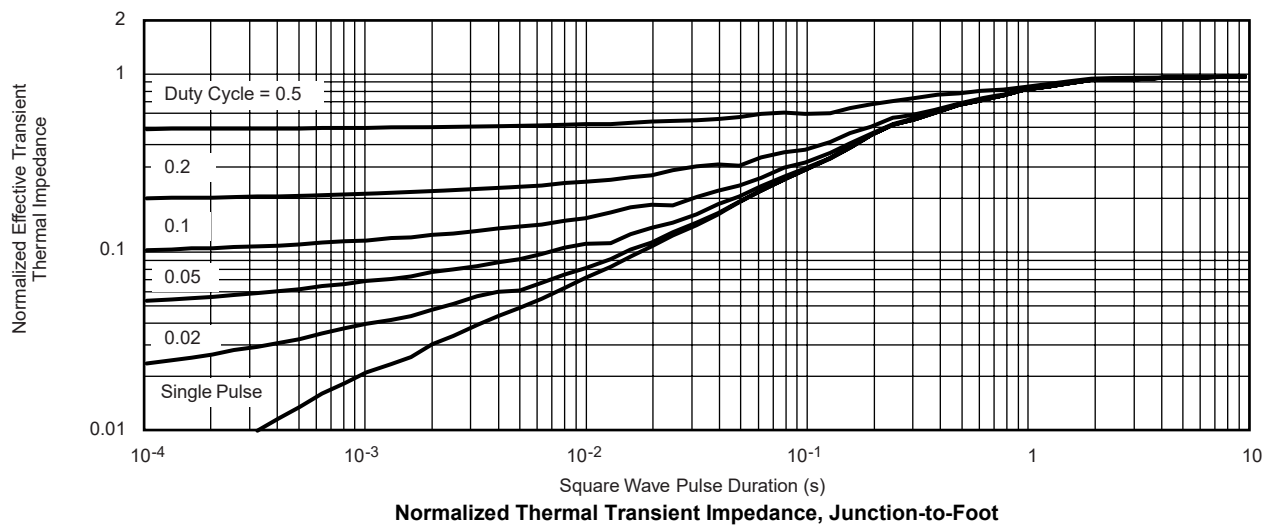


On-Resistance vs. Gate-to-Source Voltage

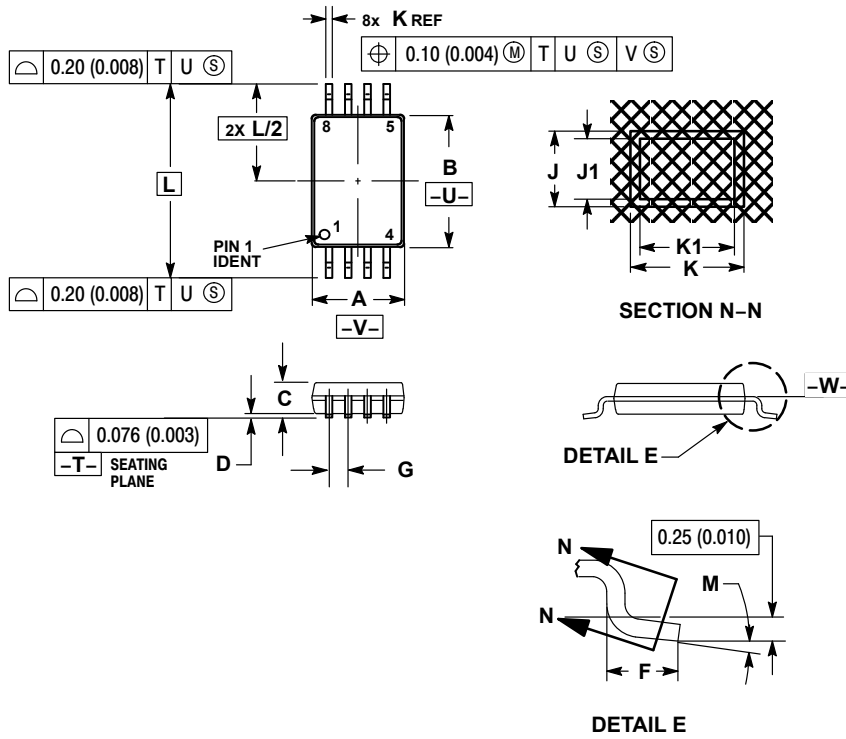
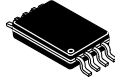
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TSSOP-8



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.90	3.10	0.114	0.122
B	4.30	4.50	0.169	0.177
C	---	1.10	---	0.043
D	0.05	0.15	0.002	0.006
F	0.50	0.70	0.020	0.028
G	0.65 BSC		0.026 BSC	
J	0.09	0.20	0.004	0.008
J1	0.09	0.16	0.004	0.006
K	0.19	0.30	0.007	0.012
K1	0.19	0.25	0.007	0.010
L	6.40 BSC		0.252 BSC	
M	0°	8°	0	8°

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