



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

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-30	0.040 @ $V_{GS} = -10$ V	-4.2
	0.068 @ $V_{GS} = -4.5$ V	-3.2

FEATURES

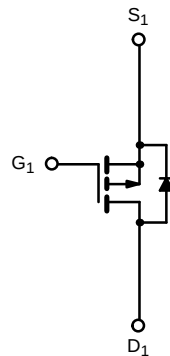
- TrenchFET® Power MOSFETS

APPLICATIONS

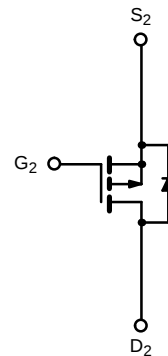
- Load Switch
- Battery Switch



Ordering Information: Si6991DQ T-1



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}	-30		V
Gate-Source Voltage		V _{GS}	±20		
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25°C	I _D	-4.2	-3.6	A
	T _A = 70°C		-3.3	-2.8	
Pulsed Drain Current (10 μs Pulse Width)		I _{DM}	-30		
Continuous Source Current (Diode Conduction) ^a		I _S	-1.0	-0.70	
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	Steady State	R_{thJF}	59	75	

Notes

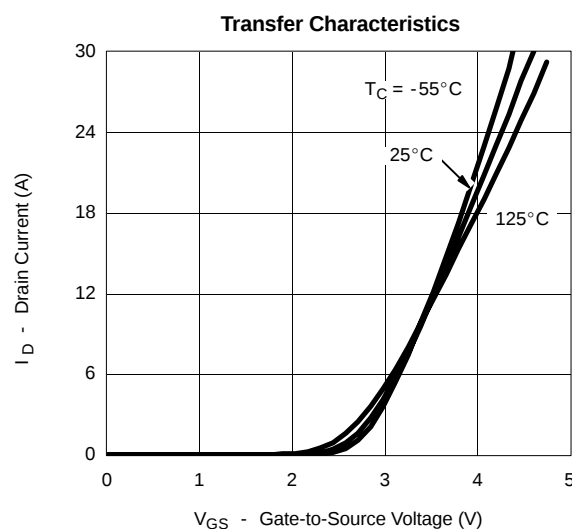
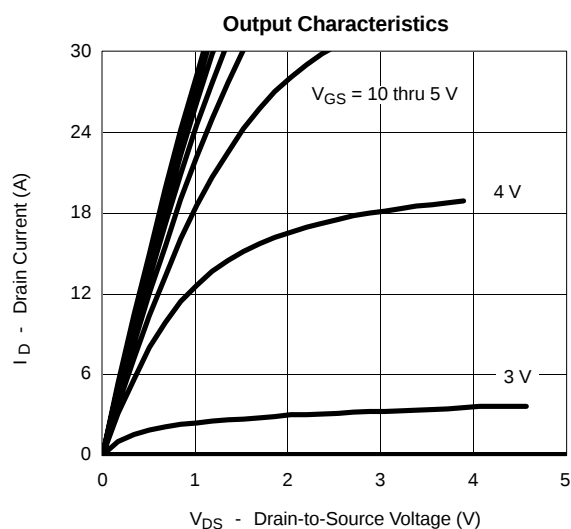
a. Surface Mounted on 1" x 1" FR4 Board.

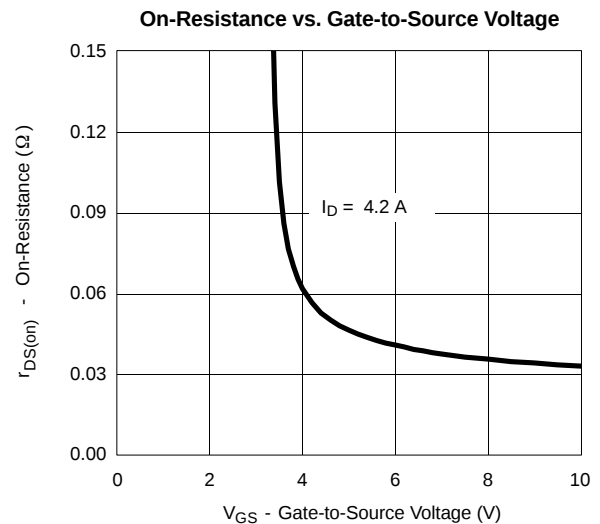
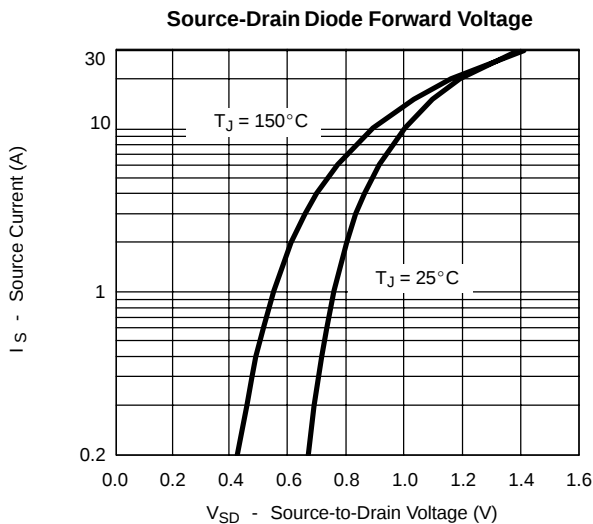
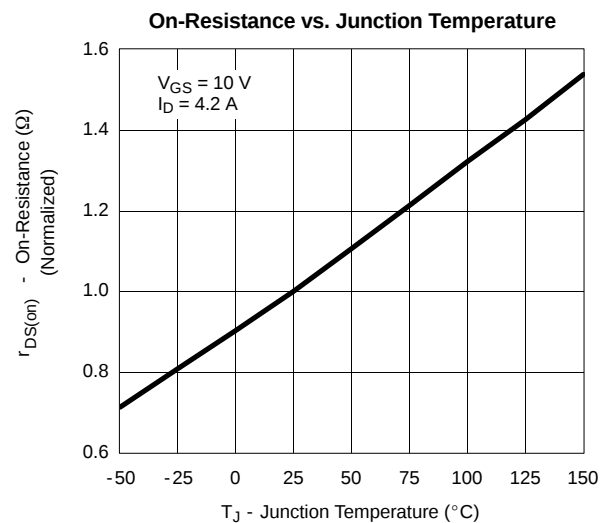
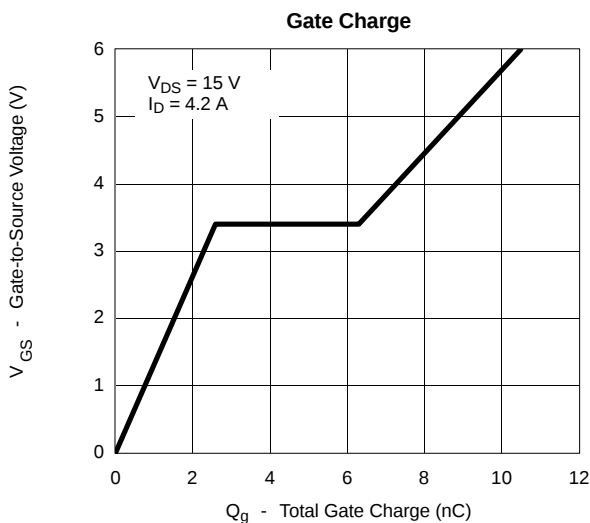
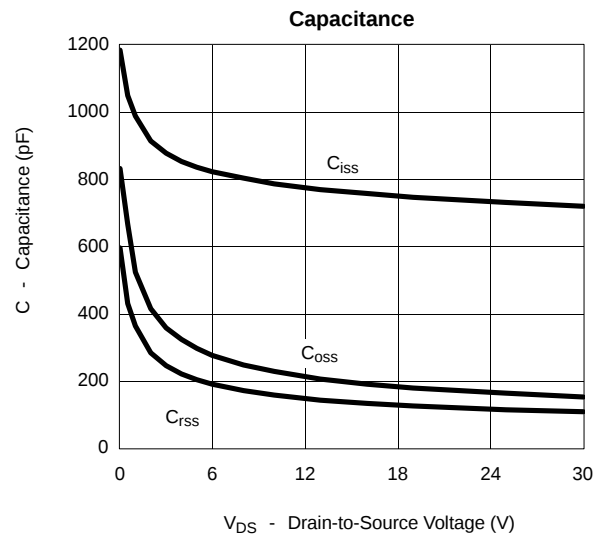
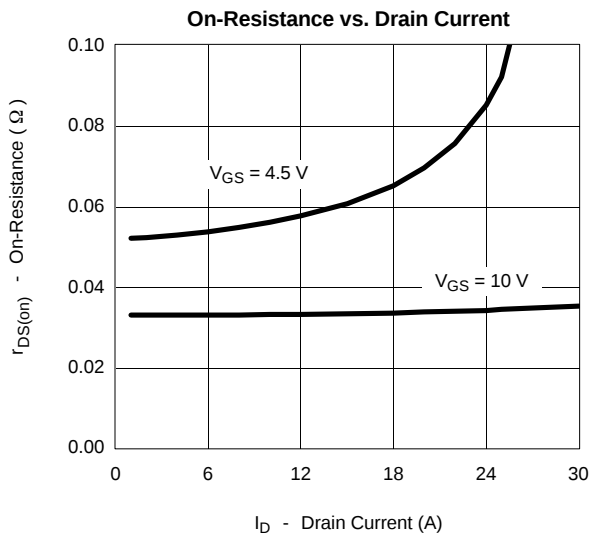
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

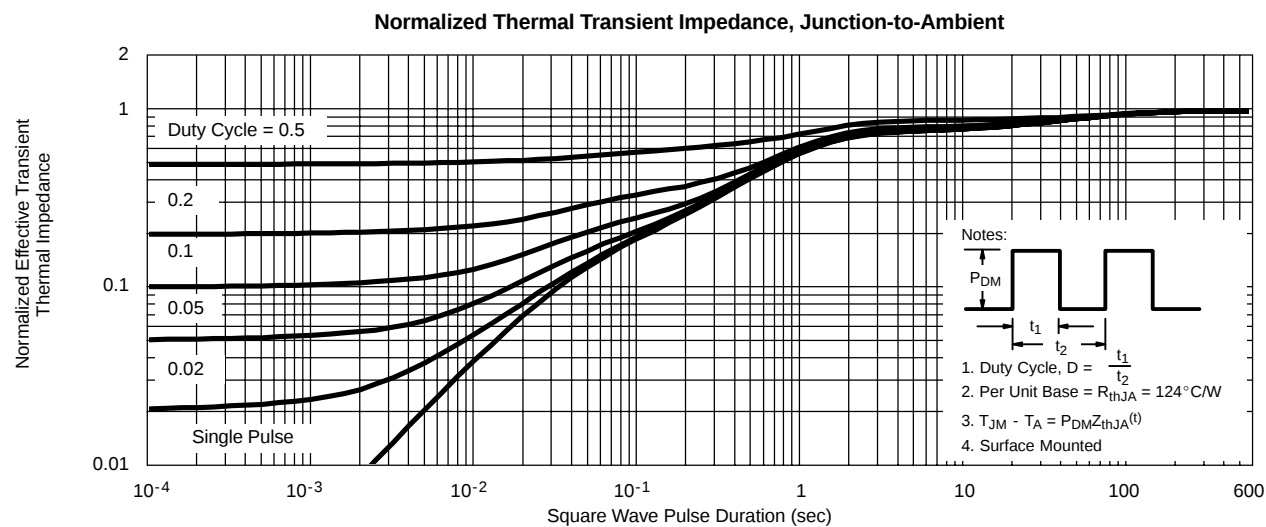
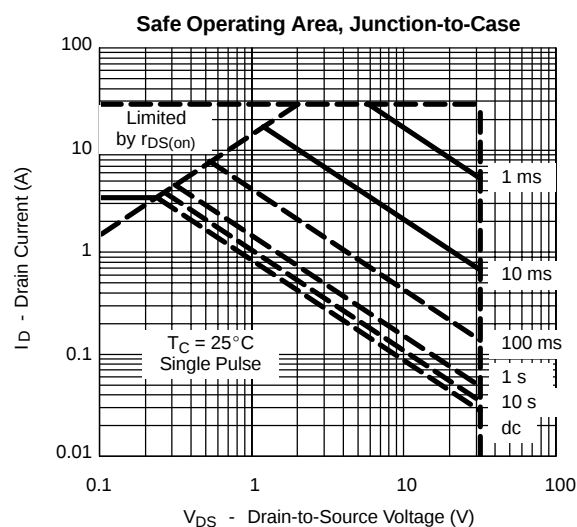
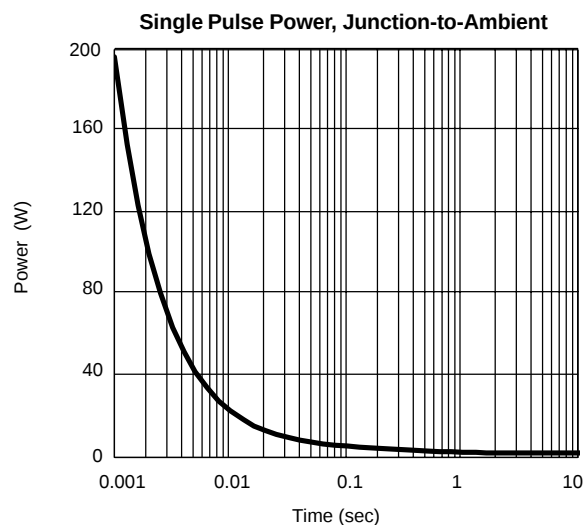
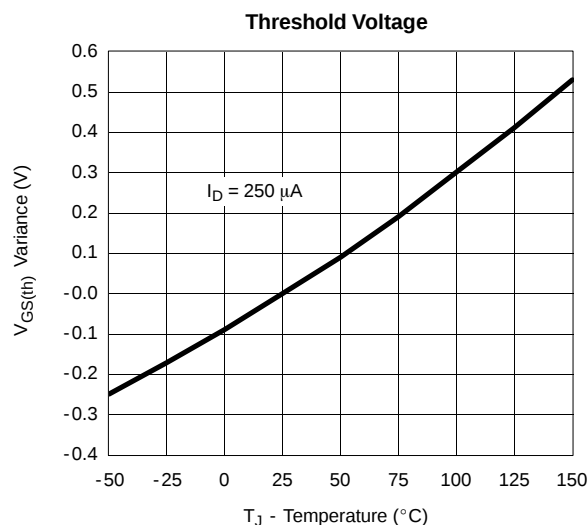
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250\ \mu\text{A}$	-1.0		-3.0	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}$, $V_{GS} = \pm 20\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -24\ \text{V}$, $V_{GS} = 0\ \text{V}$			-1	μA
		$V_{DS} = -24\ \text{V}$, $V_{GS} = 0\ \text{V}$, $T_J = 55^\circ\text{C}$			-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	$r_{DS(on)}$	$V_{GS} = -10\ \text{V}$, $I_D = -4.2\ \text{A}$		0.032	0.040	Ω
		$V_{GS} = -4.5\ \text{V}$, $I_D = -3.2\ \text{A}$		0.054	0.068	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\ \text{V}$, $I_D = -4.2\ \text{A}$		13		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -1.0\ \text{A}$, $V_{GS} = 0\ \text{V}$		-0.76	-1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -15\ \text{V}$, $V_{GS} = -4.5\ \text{V}$, $I_D = -4.2\ \text{A}$		8	12	nC
Gate-Source Charge	Q_{gs}			2.6		
Gate-Drain Charge	Q_{gd}			3.7		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\ \text{V}$, $R_L = 15\ \Omega$ $I_D \cong -1\ \text{A}$, $V_{GEN} = -10\ \text{V}$, $R_G = 6\ \Omega$		10	15	ns
Rise Time	t_r			10	15	
Turn-Off Delay Time	$t_{d(off)}$			45	70	
Fall Time	t_f			27	40	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -1.0\ \text{A}$, $di/dt = 100\ \text{A}/\mu\text{s}$		30	50	

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)

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

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)




TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

