



Dual P-Channel 25-V (G-S) MOSFET

PRODUCT SUMMARY

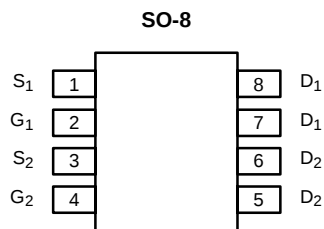
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-30	0.026 @ $V_{GS} = -10$ V	-7.2
	0.033 @ $V_{GS} = -6$ V	-6.4

FEATURES

- TrenchFET® Power MOSFET
- 25-V V_{GS} Provides Extra Head Room for Safe Operation

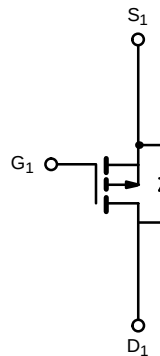
APPLICATIONS

- Notebook
 - Load Switch
 - Battery Charger Switch

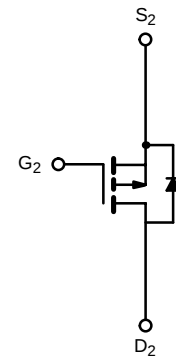


Top View

Ordering Information: Si4971DY
Si4971DY-T1 (with Tape and Reel)



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}	± 25		
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25°C	I _D	- 7.2	- 5.4	A
	T _A = 70°C		- 5.7	- 4.3	
Pulsed Drain Current		I _{DM}	- 30		
continuous Source Current (Diode Conduction) ^a		I _S	- 1.7	- 0.9	
Maximum Power Dissipation ^a	T _A = 25°C	P _D	2.0	1.1	W
	T _A = 70°C		1.3	0.7	
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}	46	62.5	$^\circ\text{C/W}$
	Steady State		80	110	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	24	32	

Notes

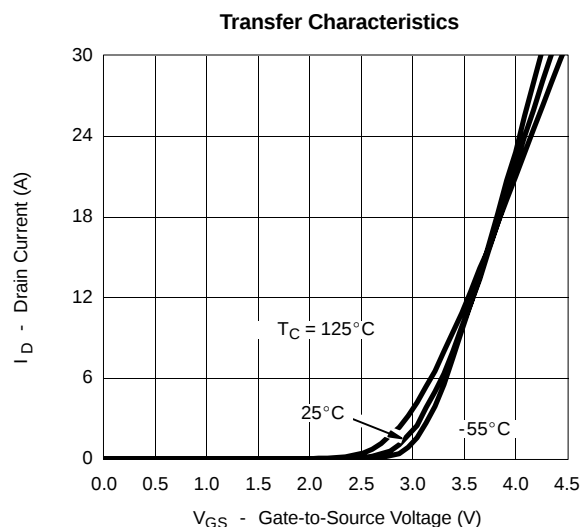
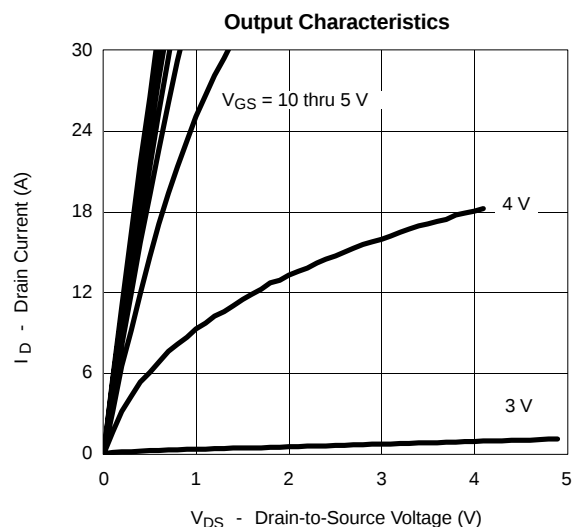
a. Surface Mounted on 1" x 1" FR4 Board.

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		-3	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 20\ \text{V}$			± 100	nA
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 25\ \text{V}$			± 200	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -24\ \text{V}, V_{GS} = 0\ \text{V}$			-1	μA
		$V_{DS} = -24\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 55^\circ\text{C}$			-25	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = -5\ \text{V}, V_{GS} = -10\ \text{V}$	-30			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = -10\ \text{V}, I_D = -7.2\ \text{A}$		0.021	0.026	Ω
		$V_{GS} = -6\ \text{V}, I_D = -6.4\ \text{A}$		0.025	0.033	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -10\ \text{V}, I_D = -7.2\ \text{A}$		18		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -1.7\ \text{A}, V_{GS} = 0\ \text{V}$		-0.8	-1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -15\ \text{V}, V_{GS} = -10\ \text{V}, I_D = -7.2\ \text{A}$		30	45	nC
Gate-Source Charge	Q_{gs}			5.1		
Gate-Drain Charge	Q_{gd}			8.9		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\ \text{V}, R_L = 15\ \Omega$ $I_D \approx -1\ \text{A}, V_{GEN} = -10\ \text{V}, R_G = 6\ \Omega$		11	17	ns
Rise Time	t_r			15	25	
Turn-Off Delay Time	$t_{d(off)}$			75	120	
Fall Time	t_f			60	90	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -1.7\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		75	110	

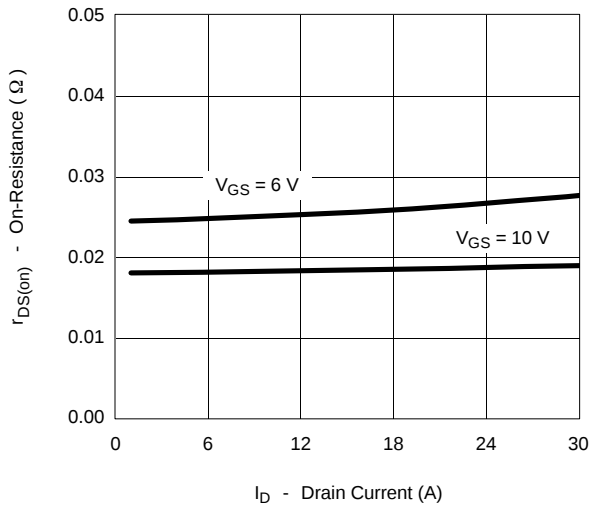
Notes

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

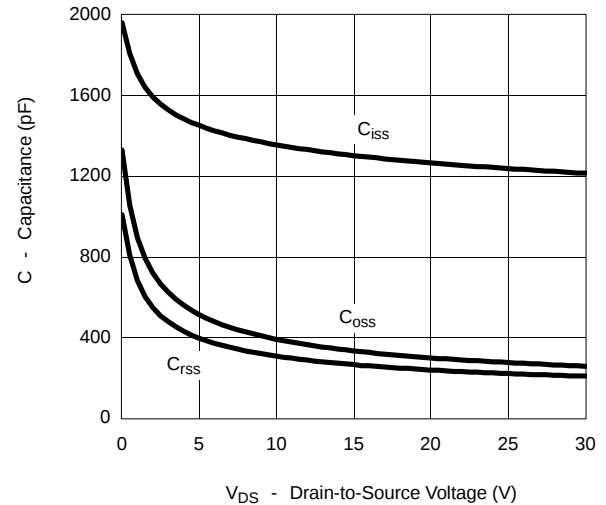
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

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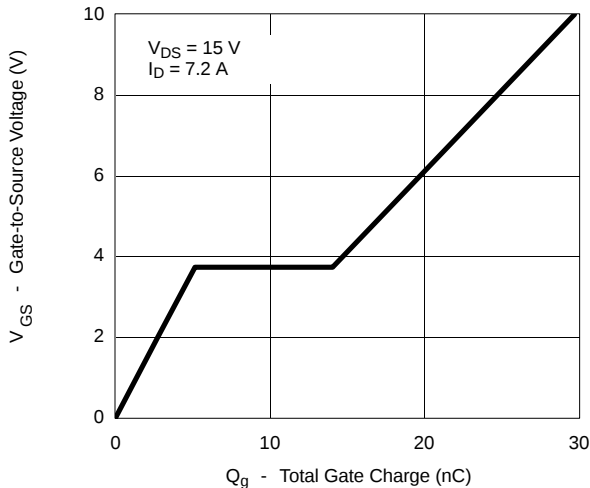
On-Resistance vs. Drain Current



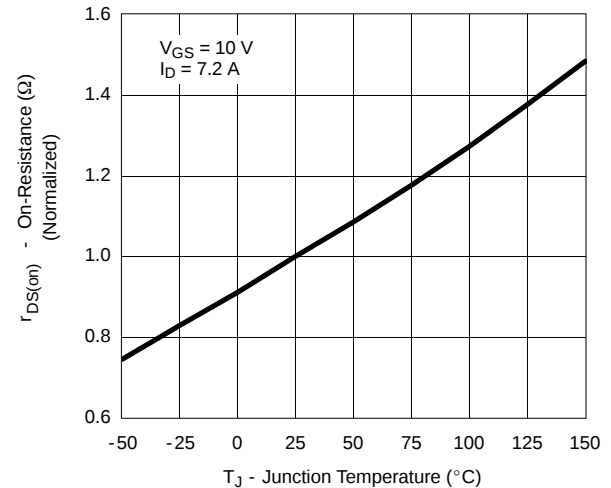
Capacitance



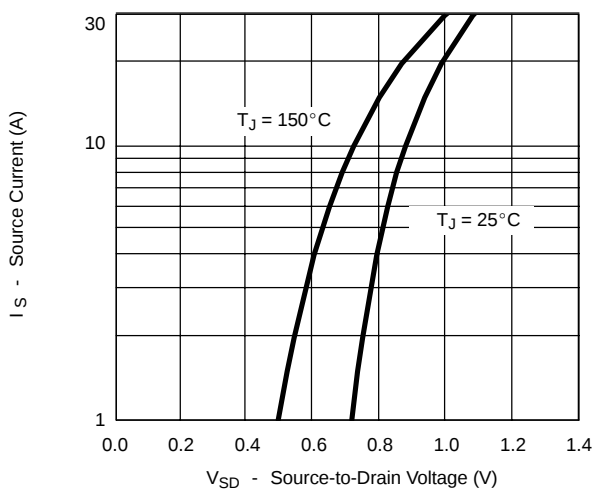
Gate Charge



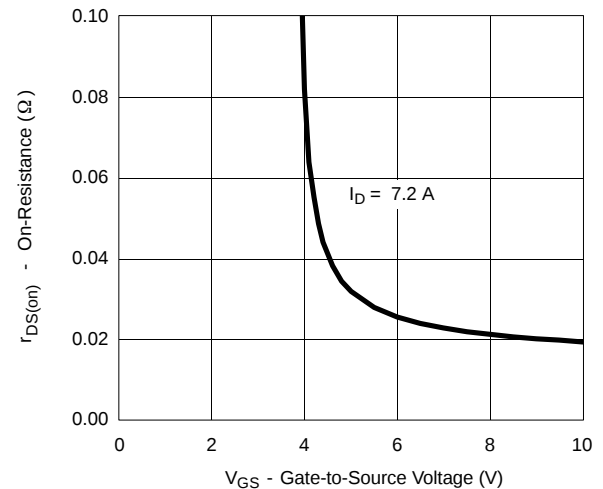
On-Resistance vs. Junction Temperature

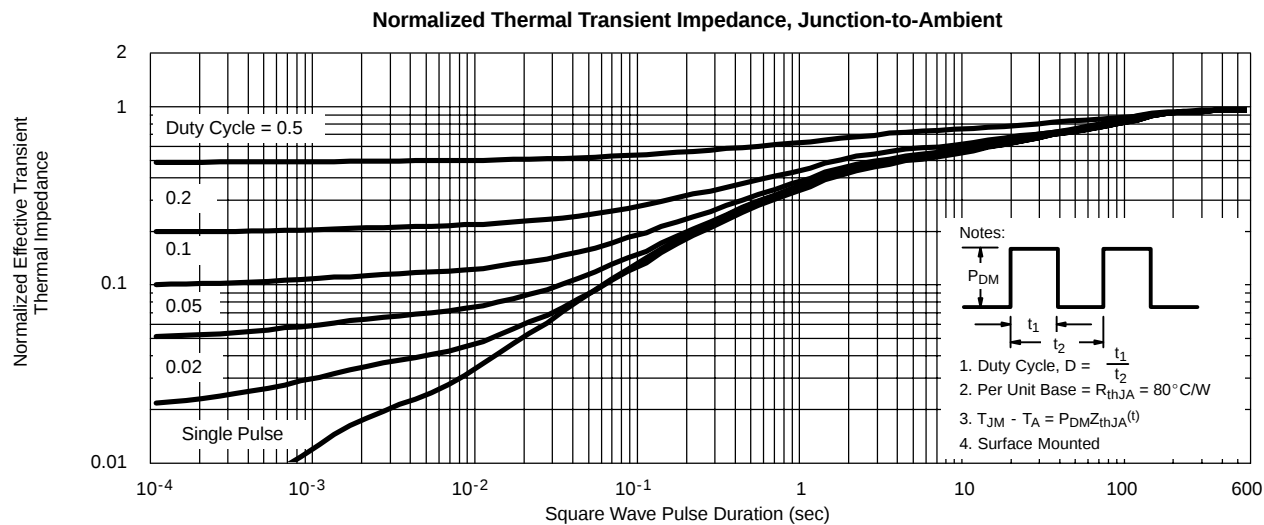
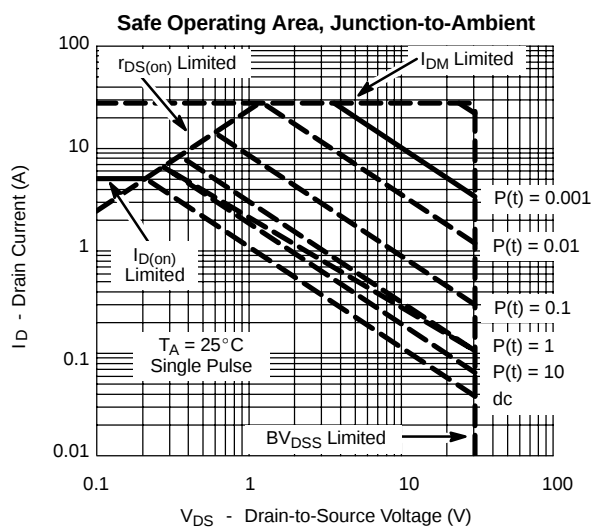
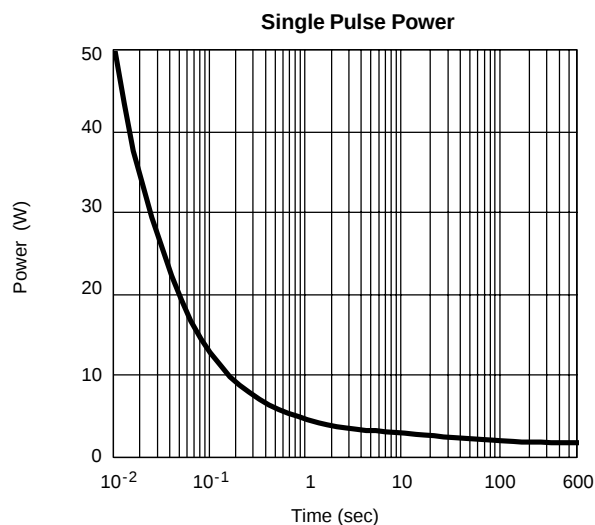
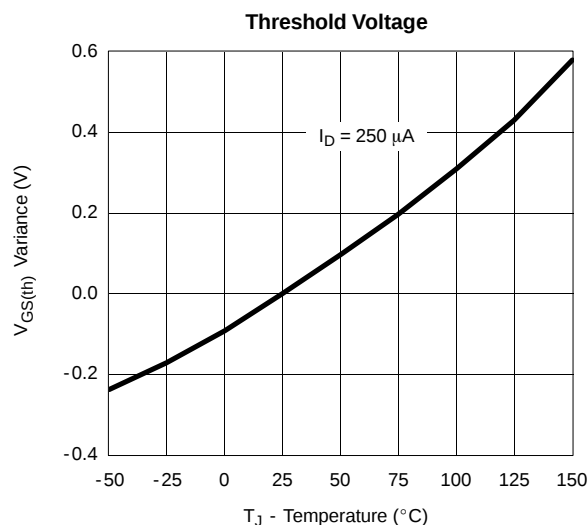


Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)




TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

