



N-Channel 1.8-V (G-S) Battery Switch, ESD Protection

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
24	0.019 at $V_{GS} = 4.5$ V	7.5
	0.021 at $V_{GS} = 3.7$ V	6.9
	0.023 at $V_{GS} = 2.5$ V	6.5
	0.027 at $V_{GS} = 1.8$ V	6.0

FEATURES

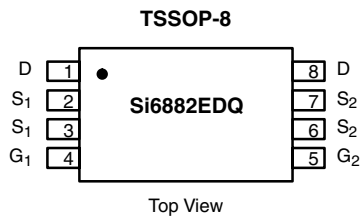
- TrenchFET[®] Power MOSFET
- ESD Protected: 4000 V
- Common Drain



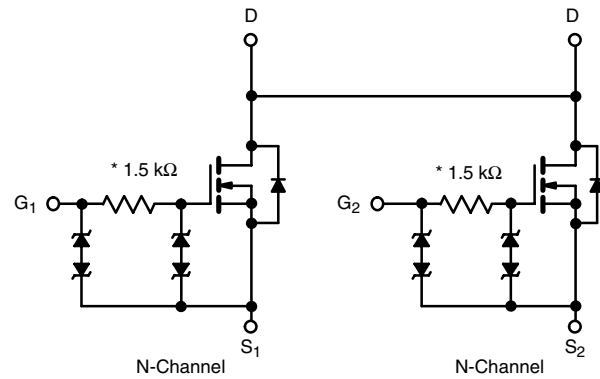
RoHS*
COMPLIANT

APPLICATIONS

- 1-2 Cell Battery Protection Circuitry



Ordering Information: Si6882EDQ-T1
Si6882EDQ-T1-E3 (Lead (Pb)-free)



* Typical value by design

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted					
Parameter	Symbol	10 sec	Steady State	Unit	
Drain-Source Voltage	V_{DS}	24		V	
Gate-Source Voltage	V_{GS}	± 12			
Continuous Drain Current ($T_J = 150$ °C) ^a	I_D	$T_A = 25$ °C	7.5	6	A
		$T_A = 70$ °C	6	5	
Pulsed Drain Current (10 μ s Pulse Width)	I_{DM}	30			
Continuous Source Current (Diode Conduction) ^a	I_S	1.6	1.08		
Maximum Power Dissipation ^a	P_D	$T_A = 25$ °C	1.78	1.19	W
		$T_A = 70$ °C	1.14	0.76	
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}	$t \leq 10$ sec	55	70	°C/W
		Steady State	85	105	
Maximum Junction-to-Foot (Drain) ^a	R_{thJF}	35	45		

Notes:

- a. Surface Mounted on FR4 Board.
b. $t \leq 10$ sec.

* Pb containing terminations are not RoHS compliant, exemptions may apply.



SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	0.45		0.85	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 4.5\text{ V}$			± 250	nA
		$V_{DS} = 0\text{ V}, V_{GS} = \pm 12\text{ V}$			± 10	mA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}, T_J = 70\text{ }^\circ\text{C}$			25	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 4.5\text{ V}$	20			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 7.5\text{ A}$		0.015	0.019	Ω
		$V_{GS} = 3.7\text{ V}, I_D = 6.9\text{ A}$		0.017	0.021	
		$V_{GS} = 2.5\text{ V}, I_D = 6.5\text{ A}$		0.017	0.023	
		$V_{GS} = 1.8\text{ V}, I_D = 6.0\text{ A}$		0.020	0.027	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10\text{ V}, I_D = 7.5\text{ A}$		39		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 1.6\text{ A}, V_{GS} = 0\text{ V}$		0.65	1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 10\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 7.5\text{ A}$		27	40	nC
Gate-Source Charge	Q_{gs}			3.0		
Gate-Drain Charge	Q_{gd}			5.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10\text{ V}, R_L = 10\text{ }\Omega$ $I_D \cong 1\text{ A}, V_{GEN} = 4.5\text{ V}, R_G = 6\text{ }\Omega$		1.5	2.3	μs
Rise Time	t_r			800	1200	
Turn-Off Delay Time	$t_{d(off)}$			6	10	
Fall Time	t_f			5.5	10	

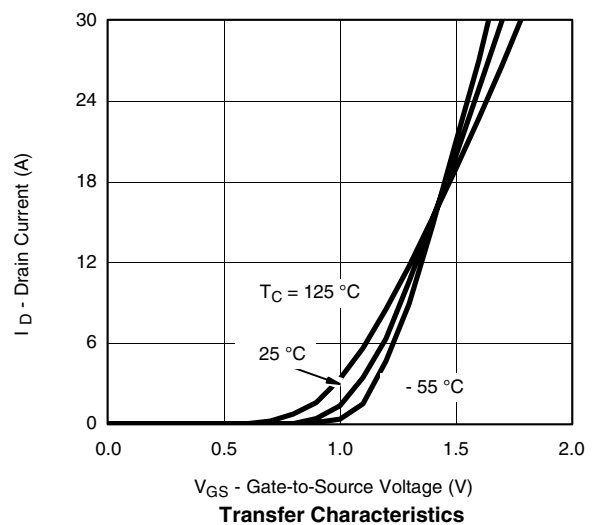
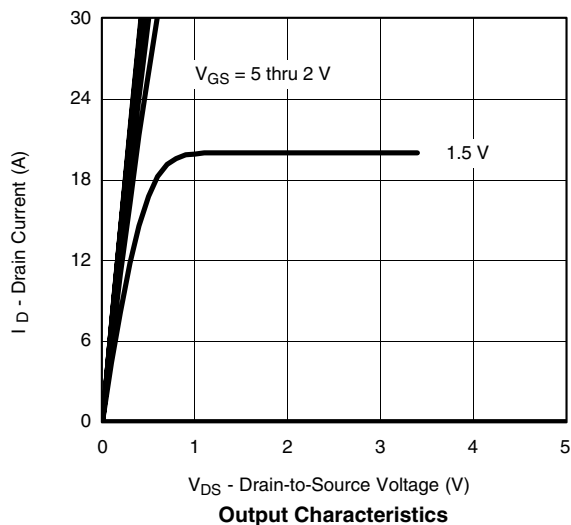
Notes:

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

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

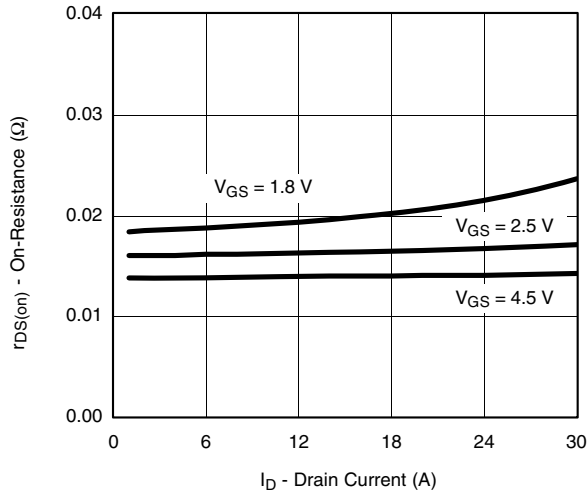
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

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

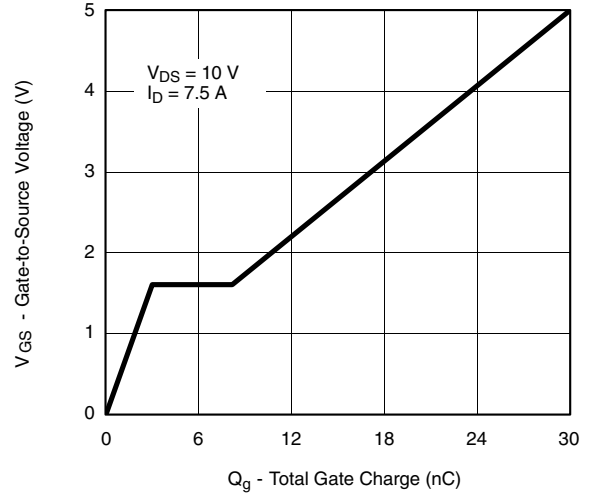




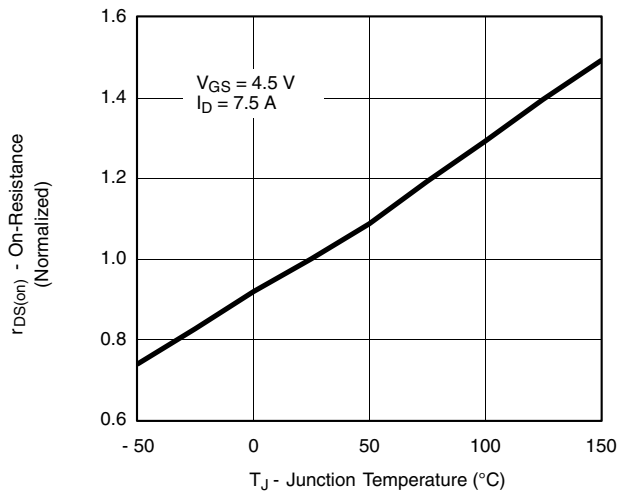
TYPICAL CHARACTERISTICS 25 °C unless noted



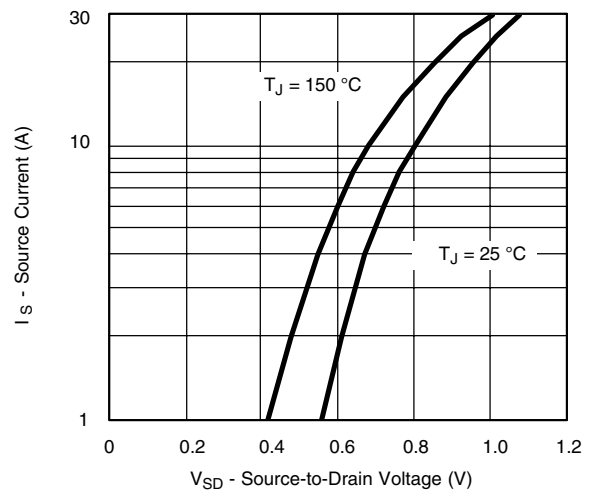
On-Resistance vs. Drain Current



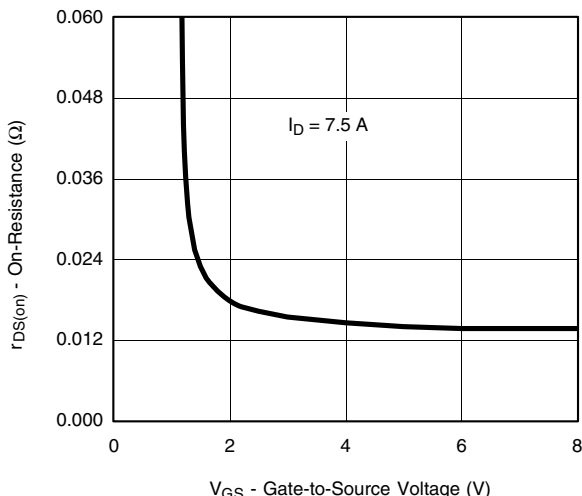
Gate Charge



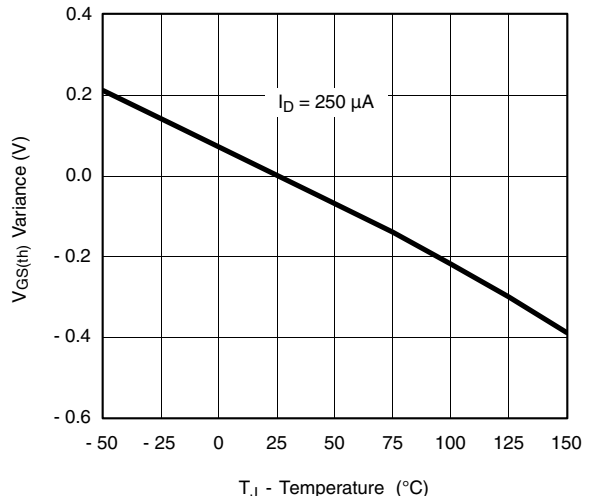
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



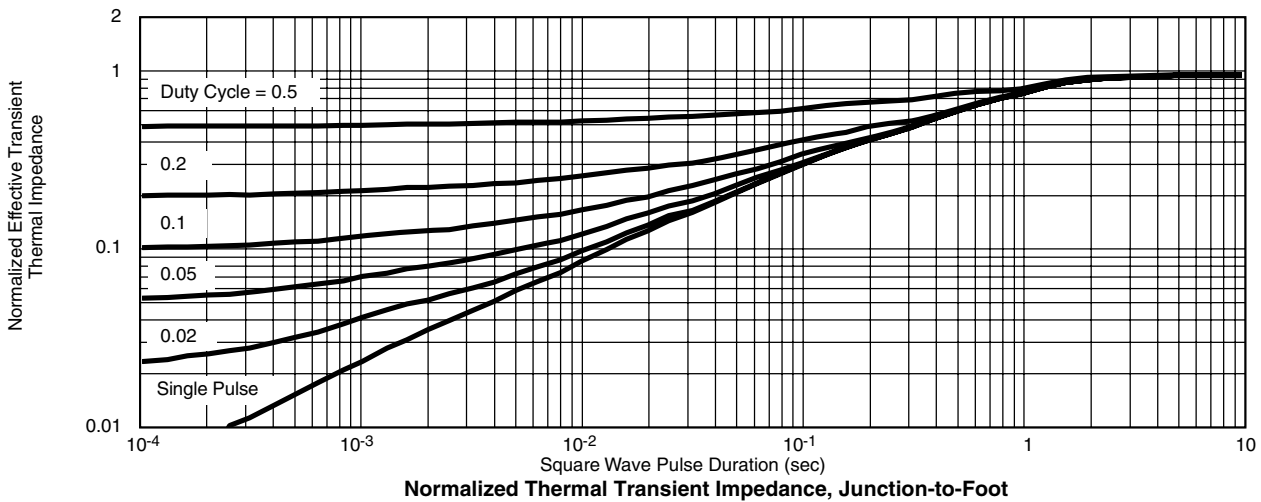
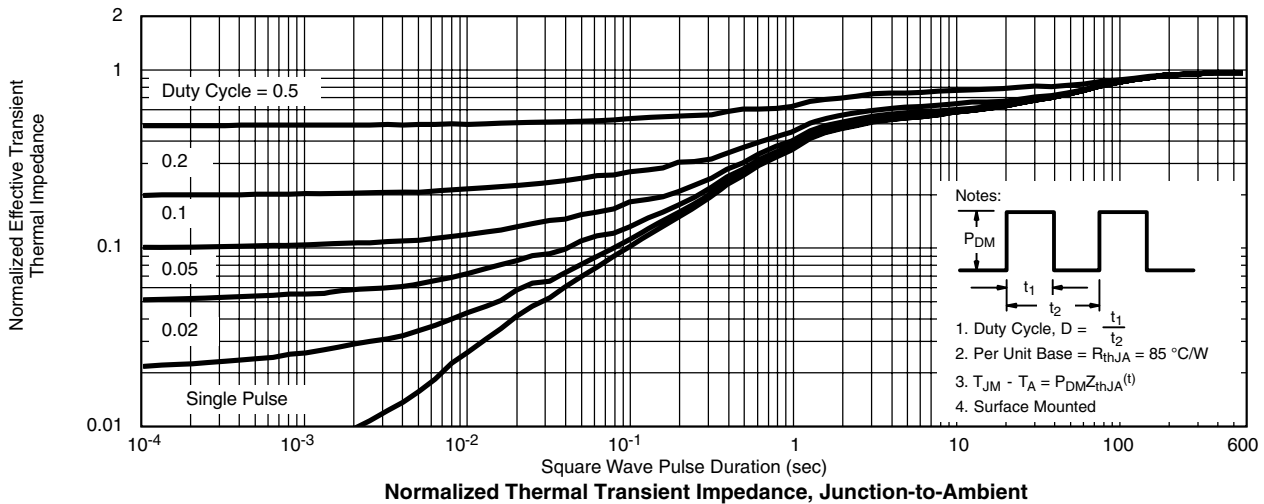
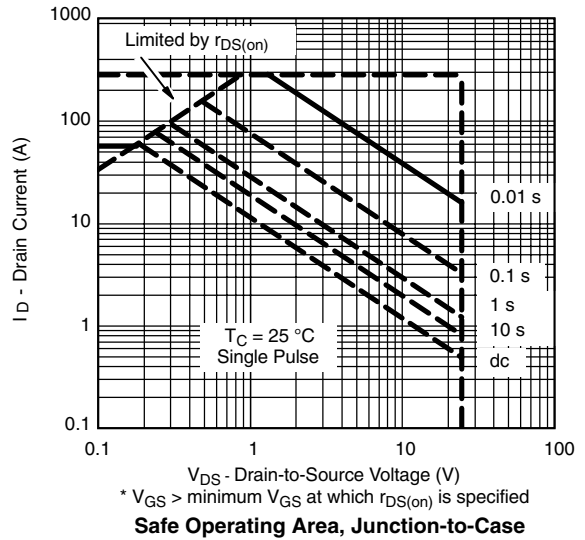
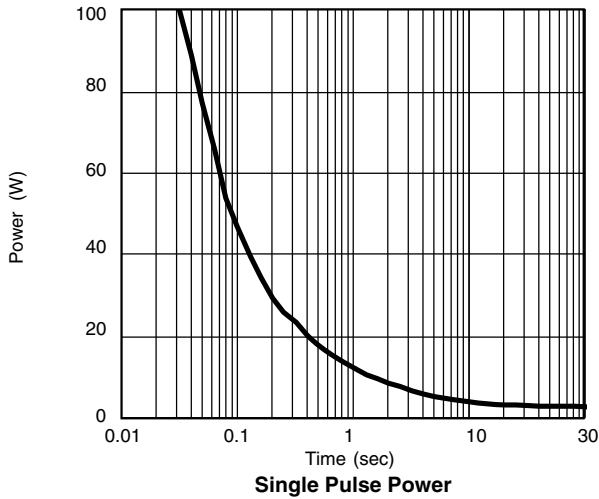
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



TYPICAL CHARACTERISTICS 25 °C unless noted



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