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

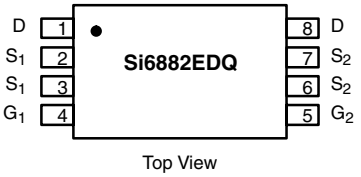
Pb-free Available

RoHS* COMPLIANT

APPLICATIONS

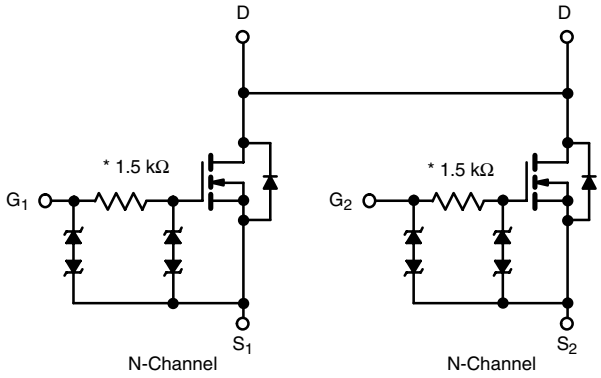
- 1-2 Cell Battery Protection Circuitry

TSSOP-8



Top View

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]	T_A = 25 °C	I_D	7.5	6	A
	T_A = 70 °C		6	5	
Pulsed Drain Current (10 µs Pulse Width)		I_{DM}	30		
Continuous Source Current (Diode Conduction)[a]		I_S	1.6	1.08	
Maximum Power Dissipation[a]	T_A = 25 °C	P_D	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]	t ≤ 10 sec	R_{thJA}	55	70	°C/W
	Steady State		85	105	
Maximum Junction-to-Foot (Drain)[a]	Steady State	R_{thJF}	35	45	

Notes:
a. Surface Mounted on FR4 Board.
b. t ≤ 10 sec.

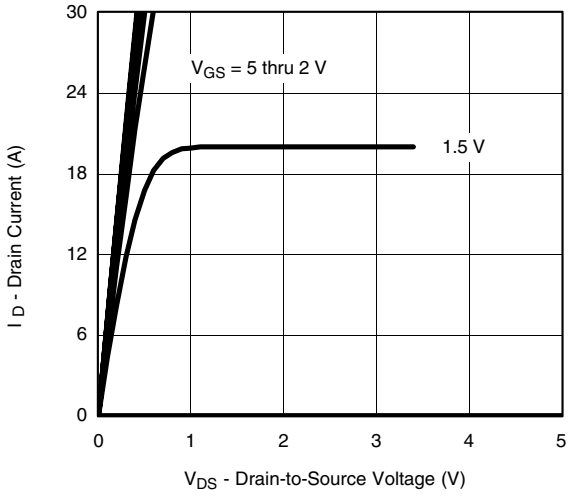
* Pb containing terminations are not RoHS compliant, exemptions may apply.

SPECIFICATIONS T_J = 25 °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 µA	0.45		0.85	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 4.5 V			± 250	nA
		V_{DS} = 0 V, V_{GS} = ± 12 V			± 10	mA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24 V, V_{GS} = 0 V			1	µA
		V_{DS} = 24 V, V_{GS} = 0 V, T_J = 70 °C			25	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 4.5 V	20			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 7.5 A		0.015	0.019	Ω
		V_{GS} = 3.7 V, I_D = 6.9 A		0.017	0.021	
		V_{GS} = 2.5 V, I_D = 6.5 A		0.017	0.023	
		V_{GS} = 1.8 V, I_D = 6.0 A		0.020	0.027	
Forward Transconductance[a]	g_{fs}	V_{DS} = 10 V, I_D = 7.5 A		39		S
Diode Forward Voltage[a]	V_{SD}	I_S = 1.6 A, V_{GS} = 0 V		0.65	1.1	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 7.5 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 V, R_L = 10 Ω I_D ≅ 1 A, V_{GEN} = 4.5 V, R_G = 6 Ω		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	

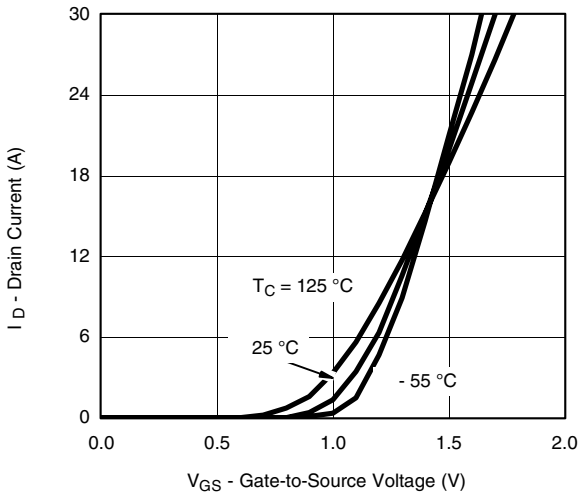
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

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 °C unless noted

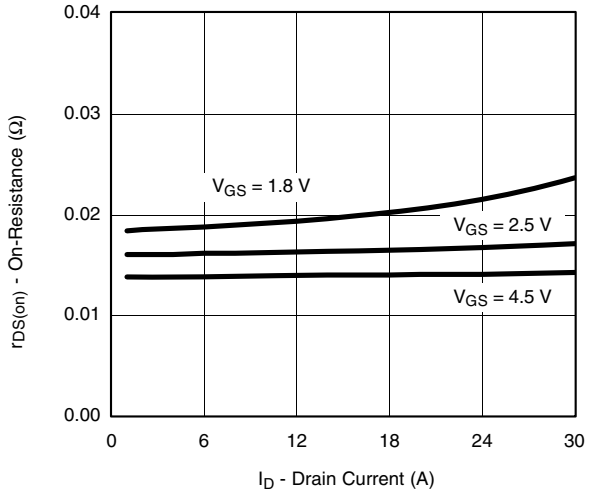


Output Characteristics

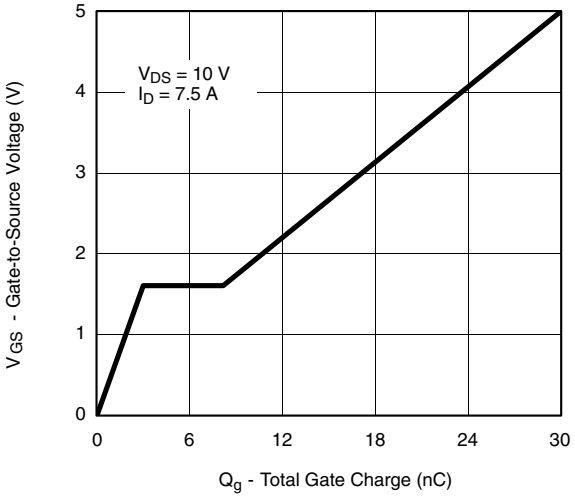


Transfer Characteristics

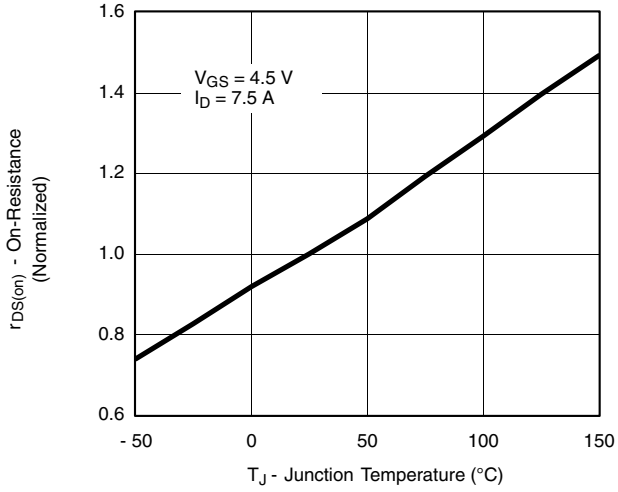
TYPICAL CHARACTERISTICS 25 °C unless noted



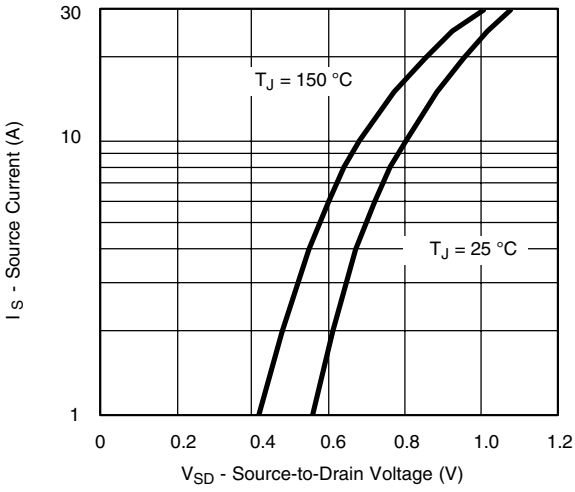
On-Resistance vs. Drain Current



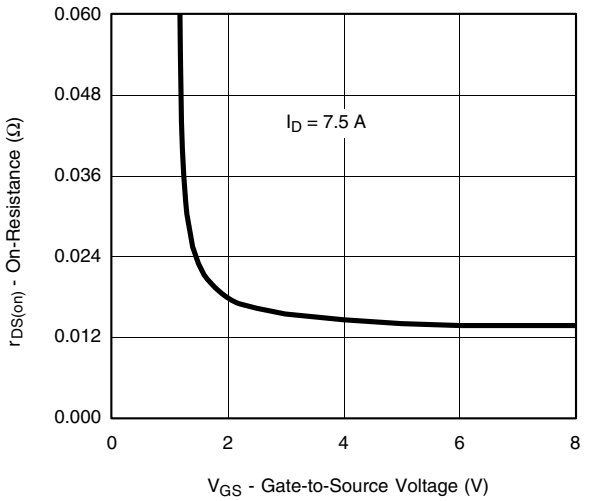
Gate Charge



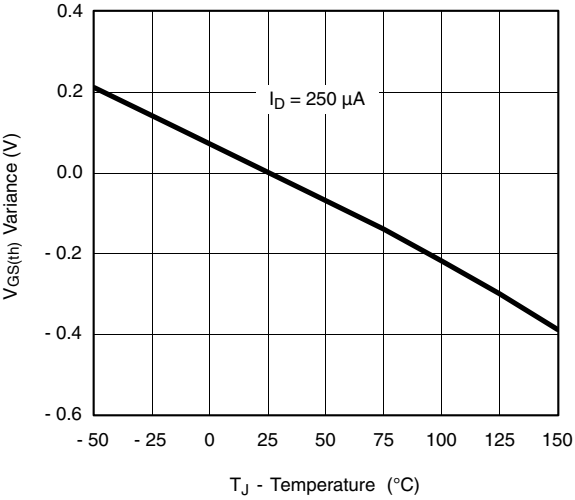
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

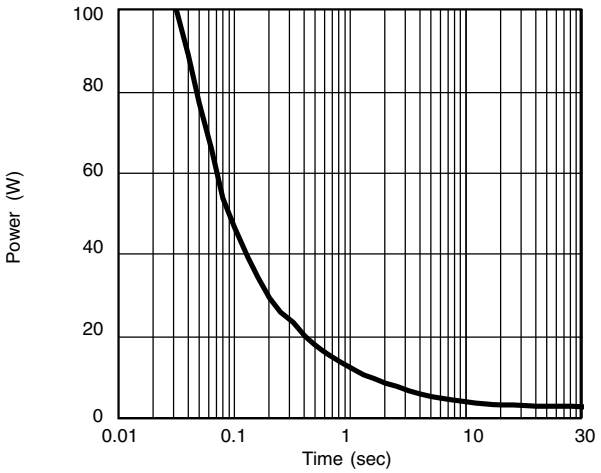


On-Resistance vs. Gate-to-Source Voltage

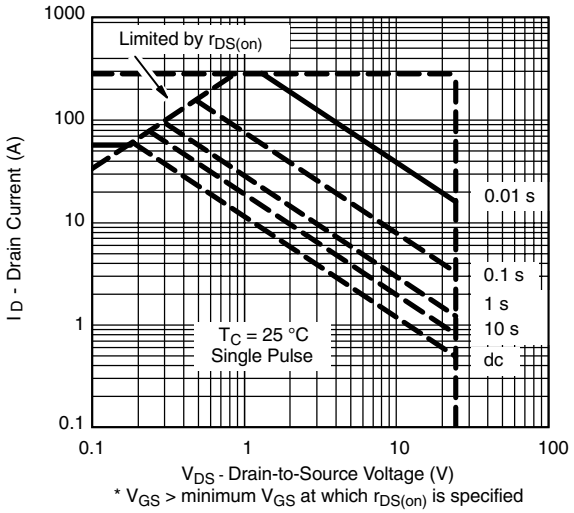


Threshold Voltage

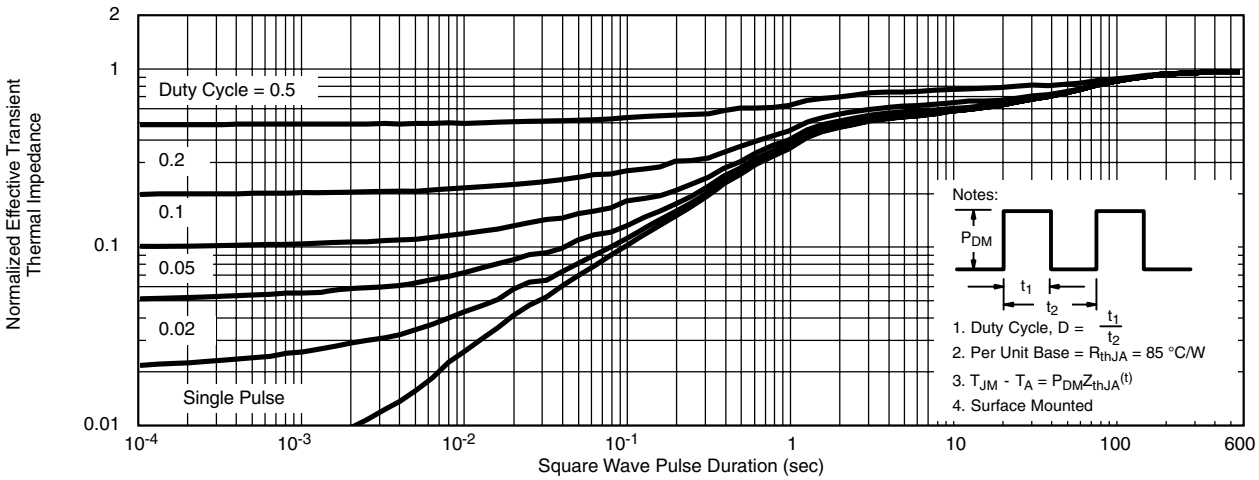
TYPICAL CHARACTERISTICS 25 °C unless noted



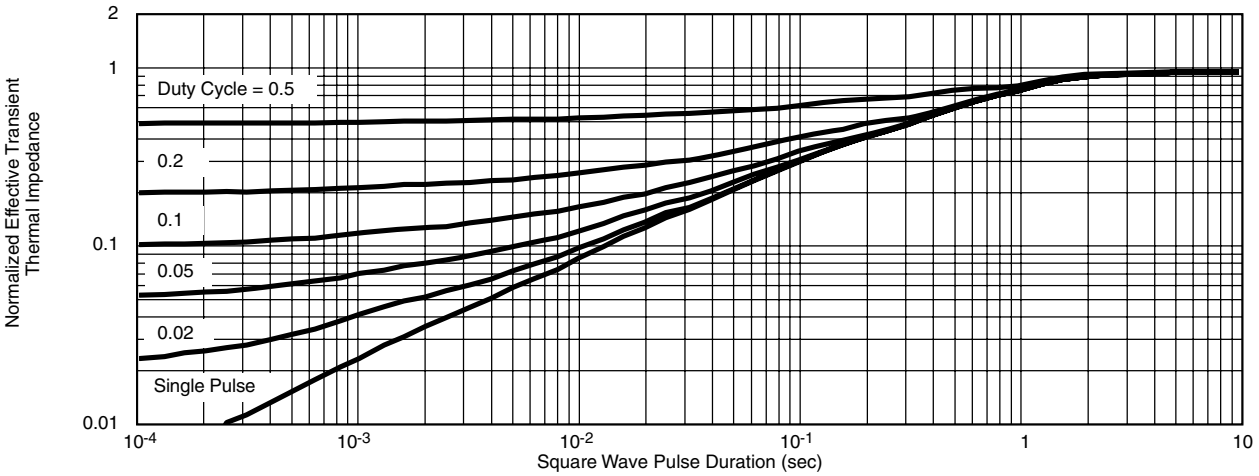
Single Pulse Power



Safe Operating Area, Junction-to-Case



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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