



New Product

**Si6876EDQ**  
Vishay Siliconix

## Bi-Directional N-Channel 30-V (D-S) MOSFET

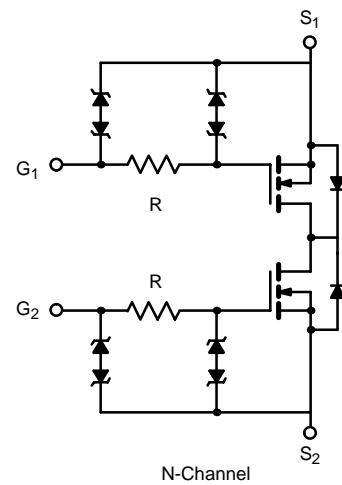
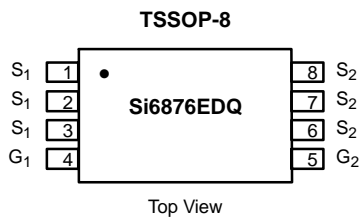
PRODUCT SUMMARY		
$V_{S1S2}$ (V)	$r_{S1S2(on)}$ ( $\Omega$ )	$I_{S1S2}$ (A)
30	0.025 @ $V_{GS} = 10$ V	6.2
	0.030 @ $V_{GS} = 4.5$ V	5.7
	0.050 @ $V_{GS} = 2.5$ V	4.5

### FEATURES

- TrenchFET® Power MOSFET
- Ultra-Low  $r_{SS(on)}$
- 4-kV ESD Protection

### APPLICATIONS

- Battery Protection Circuitry  
- 1-2 Cell Li+/LiP



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	10 secs	Steady State	Unit	
Source1—Source2 Voltage	$V_{S1S2}$	30		V	
Gate-Source Voltage	$V_{GS}$	$\pm 12$			
Continuous Source1—Source2 Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_{S1S2}$	$T_A = 25^\circ\text{C}$	6.2	5.0	A
		$T_A = 70^\circ\text{C}$	5.0	4.0	
Pulsed Source1-Source2 Current	$I_{SM}$	30			
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	1.78	1.19	W
		$T_A = 70^\circ\text{C}$	1.14	0.76	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	$t \leq 10$ sec.	55	70	$^\circ\text{C/W}$
		Steady State	85	105	
Maximum Junction-to-Foot (Source) <sup>a</sup>	$R_{thJF}$	35	45		

Notes

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

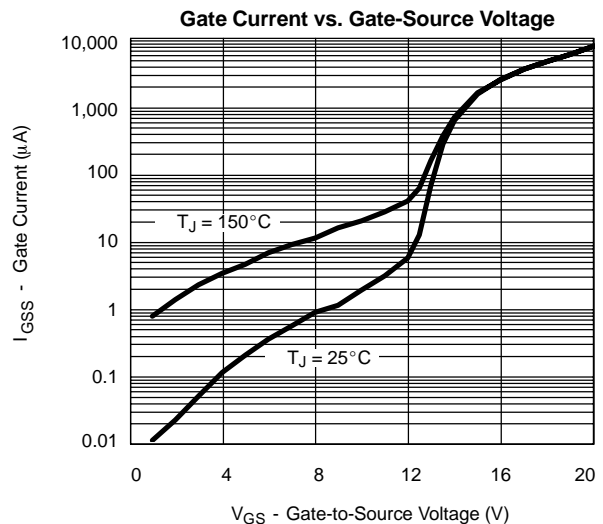
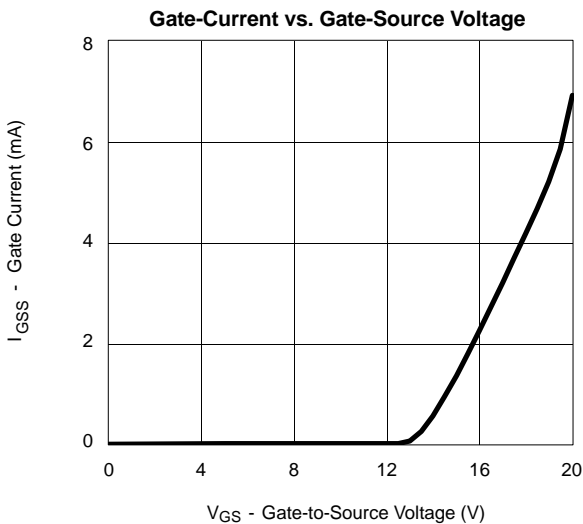


SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	0.45		1.5	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 4.5 V			± 500	nA
		V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 12 V			± 10	mA
Zero Gate Voltage Source Current	I <sub>S1S2</sub>	V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 70 °C			25	
On-State Source Current <sup>a</sup>	I <sub>S(on)</sub>	V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 4.5 V	20			A
Source1-Source2 On-State Resistance <sup>a</sup>	r <sub>S1S2(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 6.2 A		0.020	0.025	Ω
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5.7 A		0.024	0.030	
		V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 4.5 A		0.037	0.050	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 6.2 A		39		S
<b>Dynamic<sup>b</sup></b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 15 V, R <sub>L</sub> = 15 Ω I <sub>D</sub> = 1 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 6 Ω		1.3	2.5	μs
Rise Time	t <sub>r</sub>			3	6	
Turn-Off Delay Time	t <sub>d(off)</sub>			10	20	
Fall Time	t <sub>f</sub>			5.2	10	

Notes

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

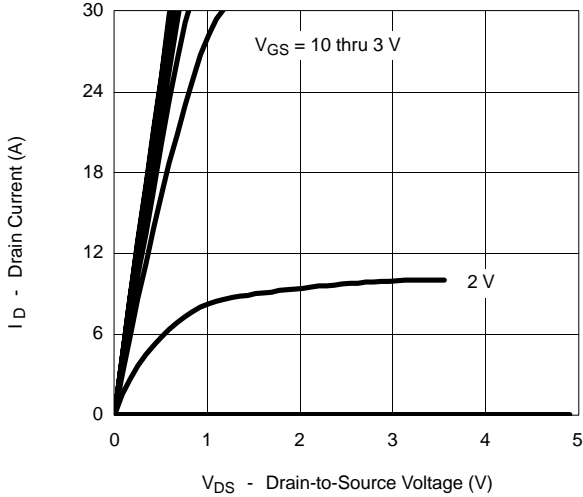
**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**



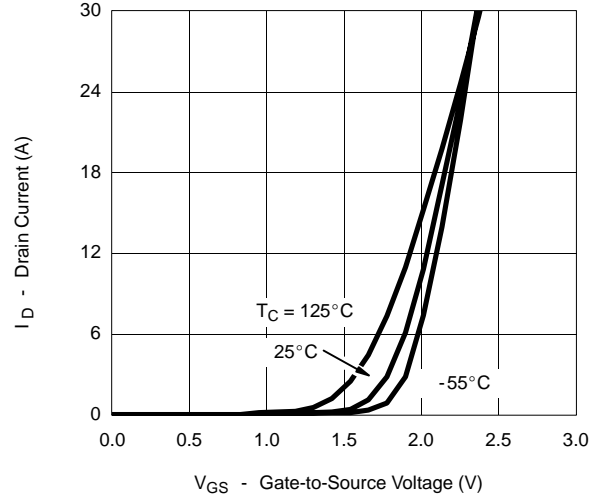


**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

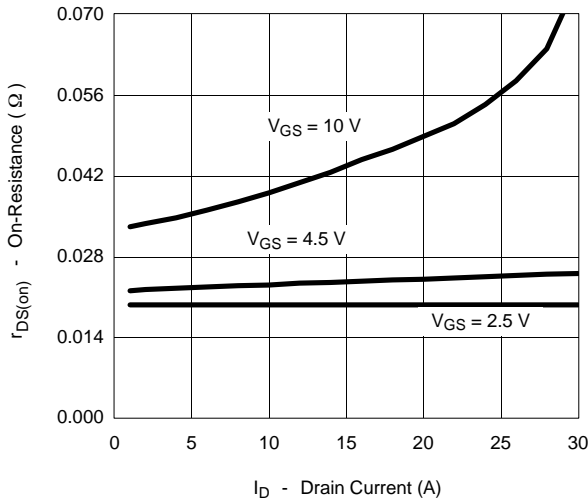
Output Characteristics



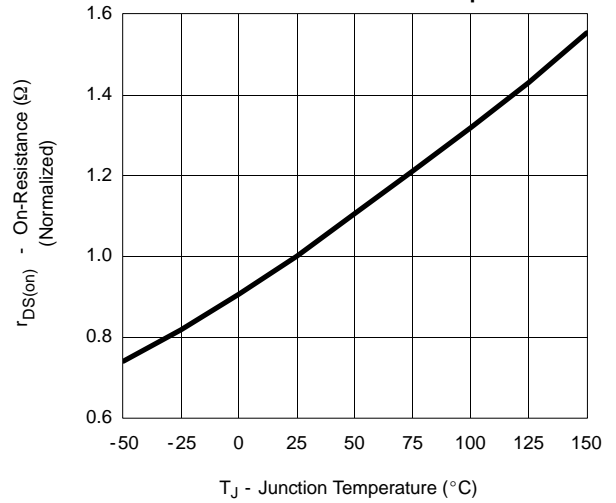
Transfer Characteristics



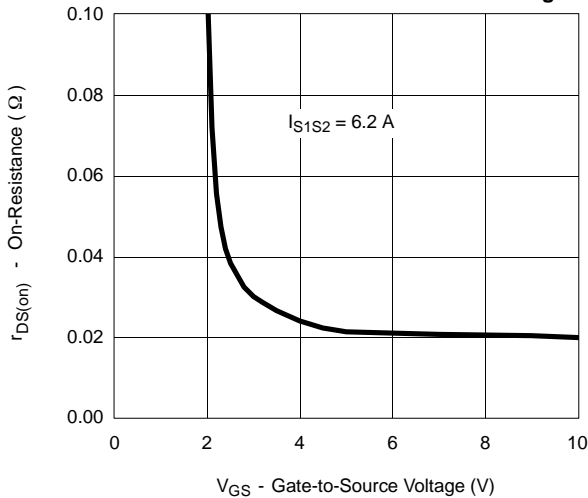
On-Resistance vs. Drain Current



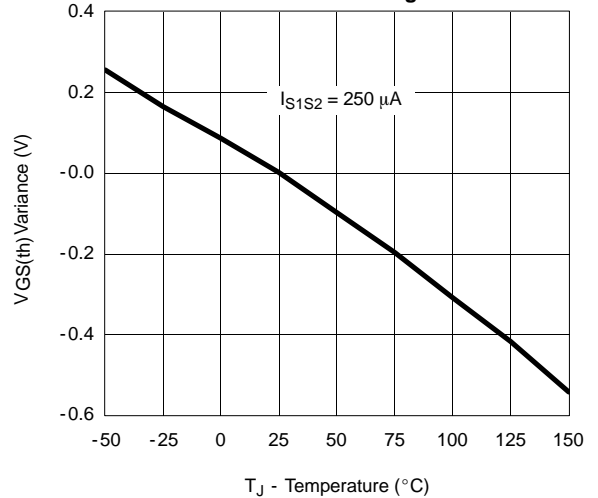
On-Resistance vs. Junction Temperature



On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage





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

