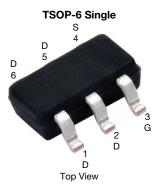
# **SQ3427EV**

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**Vishay Siliconix** 

# Automotive P-Channel 60 V (D-S) 175 °C MOSFET



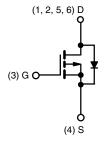
PRODUCT SUMMARY				
V <sub>DS</sub> (V)	-60			
$R_{DS(on)} (\Omega)$ at $V_{GS} = -10 V$	0.095			
$R_{DS(on)}$ ( $\Omega$ ) at $V_{GS}$ = -4.5 V	0.135			
I <sub>D</sub> (A)	-5.3			
Configuration	Single			

#### **FEATURES**

- TrenchFET<sup>®</sup> power MOSFET
- AEC-Q101 qualified <sup>c</sup>
- 100 %  $R_q$  and UIS tested
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>



COMPLIANT HALOGEN



P-Channel MOSFET

#### Marking Code: 8R

ORDERING INFORMATION	
Package	TSOP-6
Lead (Pb)-free and halogen-free	SQ3427EV (for detailed order number please see <u>www.vishay.com/doc?79771</u> )

<b>ABSOLUTE MAXIMUM RATINGS</b> (T <sub>C</sub> = 25 °C, unless otherwise noted)					
PARAMETER	SYMBOL	LIMIT	UNIT		
Drain-Source Voltage		V <sub>DS</sub>	-60	V	
Gate-Source Voltage		V <sub>GS</sub>	± 20	v	
Continuous Drain Current	T <sub>C</sub> = 25 °C	1	-5.3		
	T <sub>C</sub> = 125 °C	I <sub>D</sub>	-3		
Continuous Source Current (Diode Conduction)		I <sub>S</sub>	-6.3	А	
Pulsed Drain Current <sup>a</sup>		I <sub>DM</sub>	-21		
Single Pulse Avalanche Current	L = 0.1 mH	I <sub>AS</sub>	-21		
Single Pulse Avalanche Energy	L = 0.1 MH	E <sub>AS</sub>	22	mJ	
Maximum Power Dissipation <sup>a</sup>	T <sub>C</sub> = 25 °C	D	5	W	
	T <sub>C</sub> = 125 °C	P <sub>D</sub>	1.6	vv	
Operating Junction and Storage Temperature R	Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +175	°C	

THERMAL RESISTANCE RATINGS						
PARAMETER		SYMBOL	LIMIT	UNIT		
Junction-to-Ambient	PCB Mount <sup>b</sup>	R <sub>thJA</sub>	110	°C/W		
Junction-to-Foot (Drain)		R <sub>thJF</sub>	30	0/10		

#### Notes

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

b. When mounted on 1" square PCB (FR4 material).

c. Parametric verification ongoing.

S21-1246-Rev. B, 10-Jan-2022

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Document Number: 67987

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**SQ3427EV** 

SPECIFICATIONS (T <sub>C</sub> = 25 °C,	unless other	wise noted)					
PARAMETER	SYMBOL	TES	MIN.	TYP.	MAX.	UNIT	
Static	•	•			•		•
Drain-Source Breakdown Voltage	V <sub>DS</sub>	V <sub>GS</sub> = 0, I <sub>D</sub> = -250 μA		-60	-	-	V
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =	V <sub>GS</sub> , I <sub>D</sub> = -250 μA	-1.5	-2	-2.5	v
Gate-Source Leakage	I <sub>GSS</sub>	V <sub>DS</sub> =	0 V, V <sub>GS</sub> = ± 20 V	-		± 100	nA
		$V_{GS} = 0 V$	V <sub>DS</sub> = -60 V	-	-	-1	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	$V_{GS} = 0 V$	V <sub>DS</sub> = -60 V, T <sub>J</sub> = 125 °C	-	-	-50	μA
		$V_{GS} = 0 V$	V <sub>DS</sub> = -60 V, T <sub>J</sub> = 175 °C	-	-	-150	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	$V_{GS} = -10 V$	$V_{DS} \le -5 V$	-10	-	-	Α
		$V_{GS} = -10 V$	I <sub>D</sub> = -4.5 A	-	0.079	0.095	
Drain Source On State Desistance a	В	$V_{GS} = -10 \text{ V}$	I <sub>D</sub> = -4.5 A, T <sub>J</sub> = 125 °C	-	-	0.148	Ω
Drain-Source On-State Resistance <sup>a</sup>	R <sub>DS(on)</sub>	$V_{GS} = -10 V$	l <sub>D</sub> = -4.5 A, T <sub>J</sub> = 175 °C	-	-	0.178	
		$V_{GS} = -4.5 V$	I <sub>D</sub> = -3.5 A	-	0.112	0.135	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub>	V <sub>DS</sub> = -15 V, I <sub>D</sub> = -4 A		9	-	S
Dynamic <sup>b</sup>							
Input Capacitance	C <sub>iss</sub>			-	700	1000	pF
Output Capacitance	Coss	$V_{GS} = 0 V$	V <sub>DS</sub> = -30 V, f = 1 MHz	-	90	120	
Reverse Transfer Capacitance	C <sub>rss</sub>			-	50	80	1
Total Gate Charge <sup>c</sup>	Qg			-	15.3	22	
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>	$V_{GS} = -10 V$	$V_{DS} = -30 \text{ V}, \text{ I}_{D} = -5 \text{ A}$	-	2.5	-	nC
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			-	5.4	-	
Gate Resistance	R <sub>g</sub>	f = 1 MHz		2.5	5	7.5	Ω
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>			-	8	12	
Rise Time <sup>c</sup>	t <sub>r</sub>	Vnn	$V_{DD} = -30 \text{ V. } \text{R}_{1} = 6 \Omega$		24	35	ns
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>	$I_D \cong -5$ Å, $V_{GEN} = -10$ V, $R_g = 1 \Omega$		-	25	38	
Fall Time <sup>c</sup>	t <sub>f</sub>			-	33	50	1
Source-Drain Diode Ratings and Chara	acteristics <sup>b</sup>						
Pulsed Current <sup>a</sup>	I <sub>SM</sub>			-	-	-21	Α
Forward Voltage	V <sub>SD</sub>	I <sub>F</sub> =	-1.6 A, V <sub>GS</sub> = 0 V	-	-0.8	-1.2	V

Notes

d. Pulse test; pulse width  $\leq$  300 µs, duty cycle  $\leq$  2 %.

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

f. Independent of operating temperature.

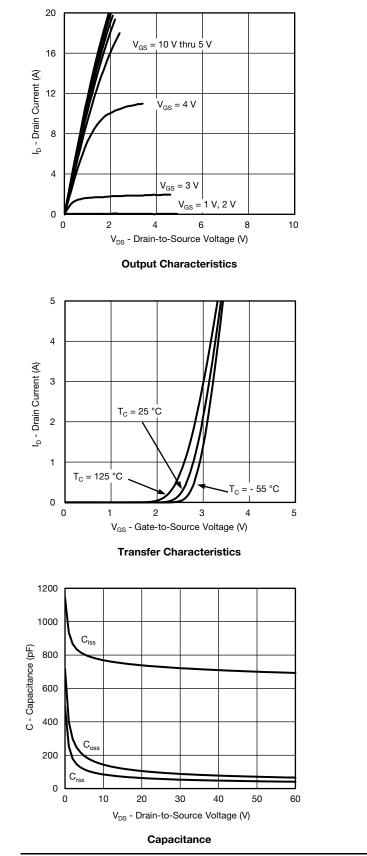
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

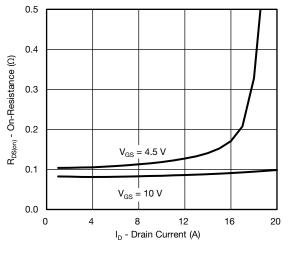
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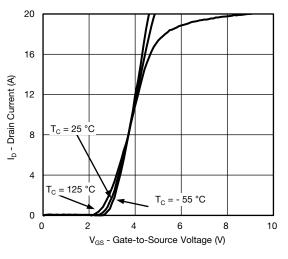
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#### TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

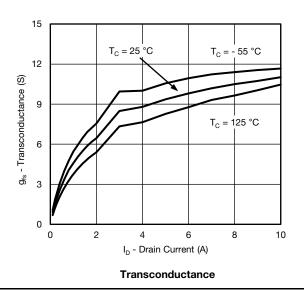




**On-Resistance vs. Drain Current and Gate Voltage** 







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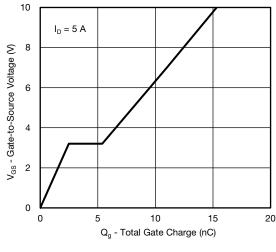
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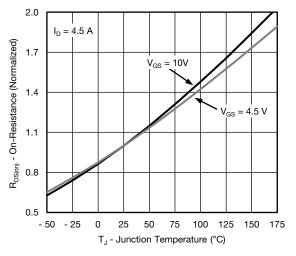
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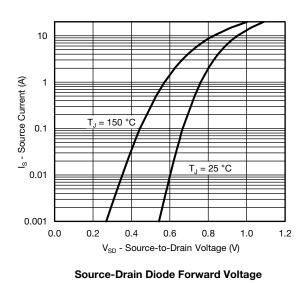
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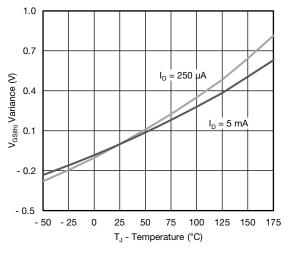


**On-Resistance vs. Junction Temperature** 

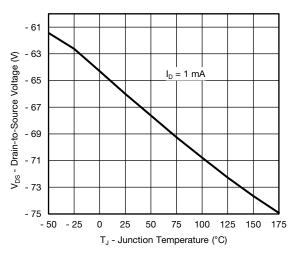


0.5 0.4  $R_{DS(on)}$  - On-Resistance ( $\Omega$ ) 0.3 T<sub>J</sub> = 150 °C 0.2 0.1 T<sub>J</sub> = 25 °C 0.0 2 4 8 10 0 6 V<sub>GS</sub> - Gate-to-Source Voltage (V)

**On-Resistance vs. Gate-to-Source Voltage** 







Drain-to-Source Voltage vs. Junction Temperature

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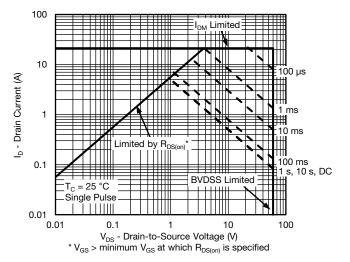
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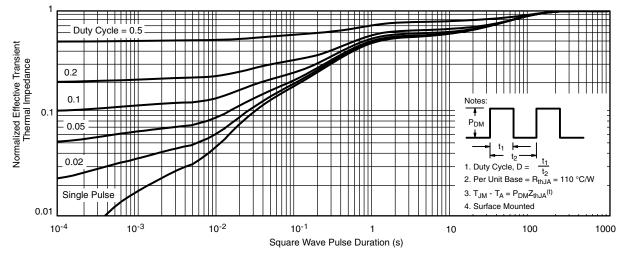


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#### TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Safe Operating Area, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

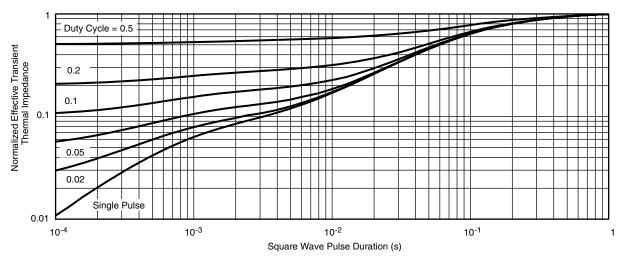


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#### TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Foot

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see <u>www.vishay.com/ppg?67987</u>.



Package Information

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TSOP: 5/6-LEAD JEDEC Part Number: MO-193C









6-LEAD TSOP



	MILLIMETERS			INCHES		
Dim	Min	Nom	Max	Min	Nom	Max
Α	0.91	-	1.10	0.036	-	0.043
<b>A</b> <sub>1</sub>	0.01	-	0.10	0.0004	-	0.004
A <sub>2</sub>	0.90	-	1.00	0.035	0.038	0.039
b	0.30	0.32	0.45	0.012	0.013	0.018
С	0.10	0.15	0.20	0.004	0.006	0.008
D	2.95	3.05	3.10	0.116	0.120	0.122
Е	2.70	2.85	2.98	0.106	0.112	0.117
E <sub>1</sub>	1.55	1.65	1.70	0.061	0.065	0.067
е		0.95 BSC		0.0374 BSC		
<b>e</b> <sub>1</sub>	1.80	1.90	2.00	0.071	0.075	0.079
L	0.32	-	0.50	0.012	-	0.020
L <sub>1</sub>		0.60 Ref			0.024 Ref	
L <sub>2</sub>	0.25 BSC			0.010 BSC		
R	0.10	-	-	0.004	-	-
θ	0°	4°	8°	0°	4°	8°
$\theta_1$	7° Nom				7° Nom	
ECN: C-06593-Rev. I, 18-Dec-06 DWG: 5540						

### **PAD** Pattern



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# **Recommended Land Pattern For TSOP-5L / TSOP-6L**





TSOP 5L





#### Note

• All dimensions are in inches (millimeter)

ECN: C22-0860-Rev. B, 24-Oct-2022	
DWG: 3010	

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