SQJ980AEP

www.vishay.com

ISHA

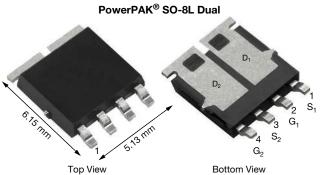
Vishay Siliconix

 D_2

S2

N-Channel MOSFET

Automotive Dual N-Channel 75 V (D-S) 175 °C MOSFET



FEATURES

- TrenchFET[®] Power MOSFET
- AEC-Q101 Qualified^d
- 100 % R_q and UIS Tested
- · Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

D₁

S.

N-Channel MOSFET



RoHS COMPLIANT HALOGEN FREE

·	
PRODUCT SUMMARY	
V _{DS} (V)	75
$R_{DS(on)}(\Omega)$ at $V_{GS} = 10 V$	0.050
$R_{DS(on)}$ (Ω) at V_{GS} = 4.5 V	0.066
I _D (A) per leg	8
Configuration	Dual

ORDERING INFORMATION	
Package	PowerPAK SO-8L
Lead (Pb)-free and halogen-free	SQJ980AEP (for detailed order number please see <u>www.vishay.com/doc?79771</u>)

ABSOLUTE MAXIMUM RATING	S (T _C = 25 °C, unless	otherwise noted	ł)		
PARAMETER		SYMBOL	LIMIT	UNIT	
Drain-Source Voltage		V _{DS}	75	V	
Gate-Source Voltage		V _{GS}	± 20		
Continuous Drain Current ^a	T _C = 25 °C		17		
	T _C = 125 °C	I _D	10		
Continuous Source Current (Diode Conduction) ^a		I _S	30	А	
Pulsed Drain Current ^b		I _{DM}	68		
Single Pulse Avalanche Current		I _{AS}	14		
Single Pulse Avalanche Energy	L = 0.1 mH	E _{AS}	10	mJ	
Mauianum Daura Dia dia dia dia d	T _C = 25 °C	P	34		
Maximum Power Dissipation ^b	T _C = 125 °C	P _D	11	W	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to + 175	°C	
Soldering Recommendations (Peak Temper		260	U		

THERMAL RESISTANCE RATINGS				
PARAMETER		SYMBOL	LIMIT	UNIT
Junction-to-Ambient	PCB Mount ^c	R _{thJA}	85	°C/W
Junction-to-Case (Drain)		R _{thJC}	4.3	C/W

Notes

a. Package limited.

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

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

d. Parametric verification ongoing.

e. See solder profile (www.vishay.com/doc?73257). The PowerPAK SO-8L is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection..

f. Rework conditions: manual soldering with a soldering iron is not recommended for leadless components.

S22-0380-Rev. B, 02-May-2022

1

Document Number: 62833

For technical questions, contact: automostechsupport@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishav.com/doc?91000

www.vishay.com

SQJ980AEP

Vishay Siliconix

PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static	-						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS}	= 0, I _D = 250 μA	75	-	-	v
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} =	= V _{GS} , I _D = 250 μΑ	1.5	2.0	2.5	v
Gate-Source Leakage	I _{GSS}	V _{DS} =	0 V, V _{GS} = ± 20 V	-	-	± 100	nA
		$V_{GS} = 0 V$	V _{DS} = 75 V	-	-	1	
Zero Gate Voltage Drain Current	I _{DSS}	$V_{GS} = 0 V$	V _{DS} = 75 V, T _J = 125 °C	-	-	50	μA
		$V_{GS} = 0 V$	V _{DS} = 75 V, T _J = 175 °C	-	-	150	
On-State Drain Current ^a	I _{D(on)}	V _{GS} = 10 V	$V_{DS} \ge 5 V$	30	-	-	Α
		V _{GS} = 10 V	I _D = 3.8 A	-	0.041	0.050	
Ducia Course On Otata Decistance		V _{GS} = 10 V	I _D = 3.8 A, T _J = 125 °C	-	-	0.089	
Drain-Source On-State Resistance ^a	R _{DS(on)}	$V_{GS} = 10 V$	I _D = 3.8 A, T _J = 175 °C	-	-	0.116	Ω
		$V_{GS} = 4.5 V$	I _D = 3.3 A	-	0.055	0.066	1
Forward Transconductanceb	9 _{fs}	V _{DS}	= 15 V, I _D = 3.8 A	-	14	-	S
Dynamic ^b	•	·					
Input Capacitance	C _{iss}			-	630	790	
Output Capacitance	C _{oss}	$V_{GS} = 0 V$	V _{DS} = 35 V, f = 1 MHz	-	84	105	pF
Reverse Transfer Capacitance	C _{rss}	1		-	36	45	
Total Gate Charge ^c	Qg			-	14	21	
Gate-Source Charge ^c	Q _{gs}	V _{GS} = 10 V	$V_{DS} = 35 \text{ V}, \text{ I}_{D} = 9.7 \text{ A}$	-	2.3	-	nC
Gate-Drain Charge ^c	Q _{gd}	1		-	2.9	-	
Gate Resistance	Rg		f = 1 MHz	1.3	2.67	4	Ω
Turn-On Delay Time ^c	t _{d(on)}			-	9	14	
Rise Time ^c	t _r	V _{DD} :	= 35 V, R_{L} = 35 Ω	-	10	15	
Turn-Off Delay Time ^c	t _{d(off)}	I _D ≅ 1 Å, '	$V_{GEN} = 10 \text{ V}, \text{ R}_{g} = 1 \Omega$	-	16	24	ns
Fall Time ^c	t _f	1		-	12	18	
Source-Drain Diode Ratings and Char	acteristics ^b	·					
Pulsed Current ^a	I _{SM}			-	-	68	А
Forward Voltage	V _{SD}	lc :	= 2.4 A, V _{GS} = 0	-	0.8	1.1	V

Notes

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

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

c. 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.

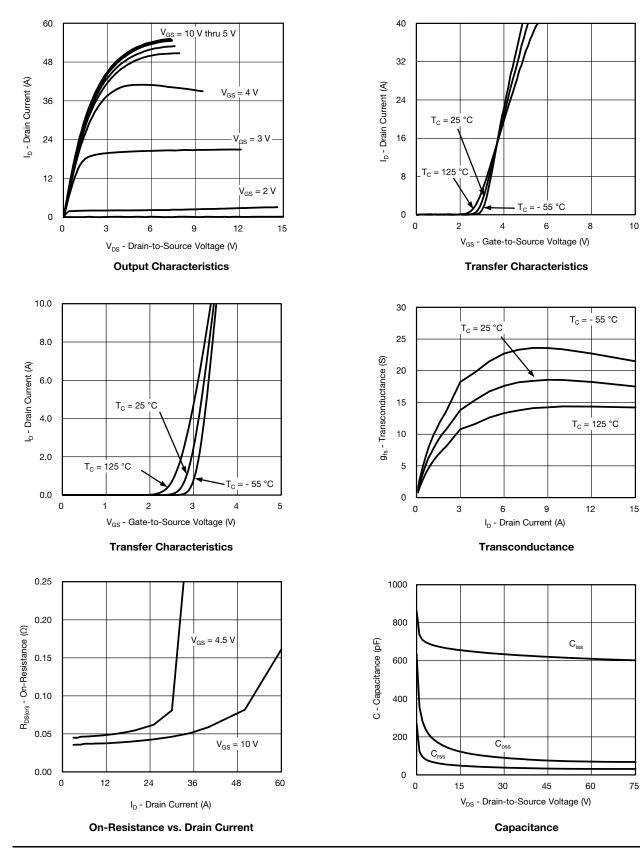
2



SQJ980AEP

Vishay Siliconix

TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



S22-0380-Rev. B, 02-May-2022

3

Document Number: 62833

75

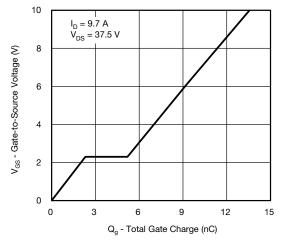
For technical questions, contact: automostechsu com THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000



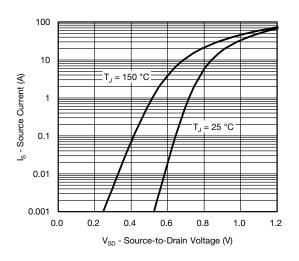
SQJ980AEP

Vishay Siliconix

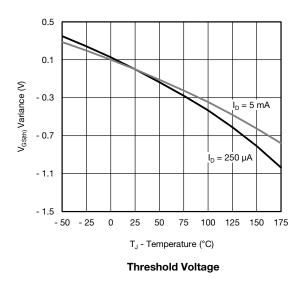
TYPICAL CHARACTERISTICS ($T_A = 25 \text{ °C}$, unless otherwise noted)

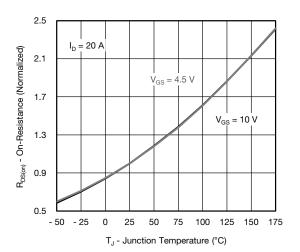




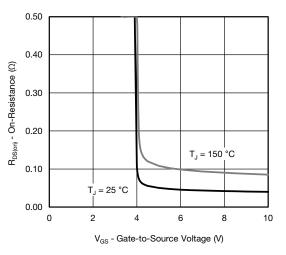


Source Drain Diode Forward Voltage

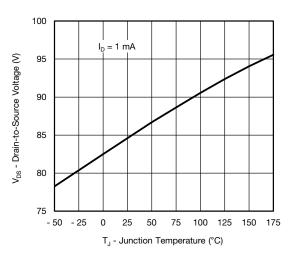




On-Resistance vs. Junction Temperature



On-Resistance vs. Gate-to-Source Voltage



Drain Source Breakdown vs. Junction Temperature

S22-0380-Rev. B, 02-May-2022

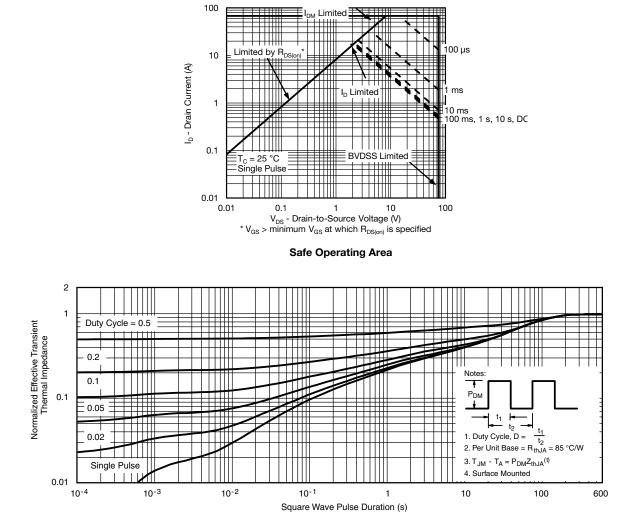
4

Document Number: 62833

For technical questions, contact: <u>automostechsupport@vishay.com</u> THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT <u>www.vishay.com/doc?91000</u>



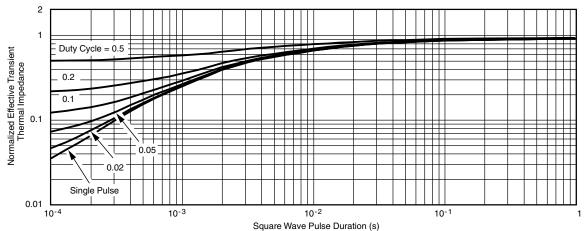
THERMAL RATINGS ($T_A = 25 \text{ °C}$, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



THERMAL RATINGS (T_A = 25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Case

Note

The characteristics shown in the two graphs

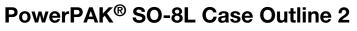
- Normalized Transient Thermal Impedance Junction-to-Ambient (25 °C)

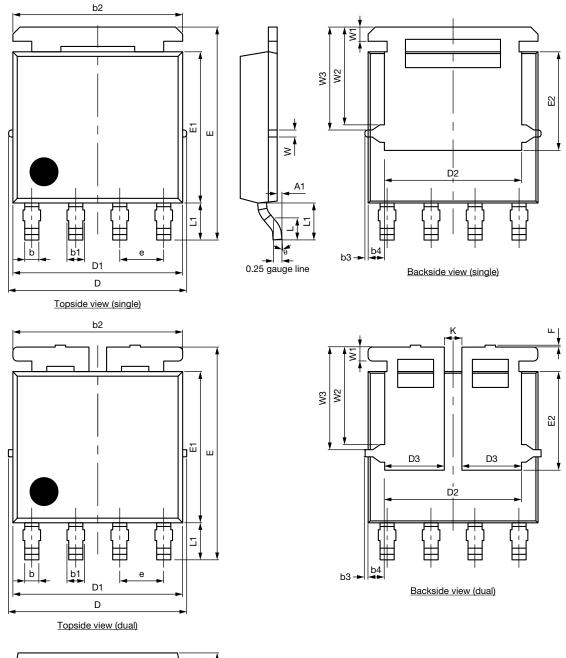
- Normalized Transient Thermal Impedance Junction-to-Case (25 °C)

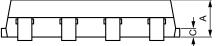
are given for general guidelines only to enable the user to get a "ball park" indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

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 www.vishay.com/ppg?62833.









1 For technical questions, contact: <u>pmostechsupport@vishay.com</u>

Package Information



Vishay Siliconix

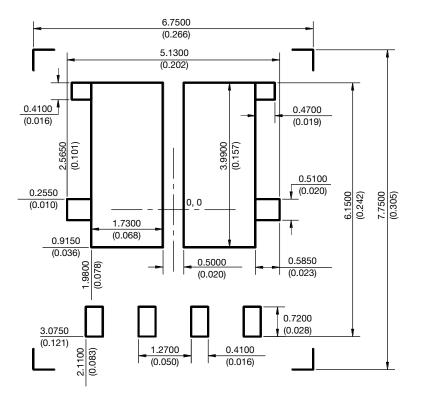
DIM.	MILLIMETERS			INCHES			
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX	
А	1.00	1.07	1.14	0.039	0.042	0.045	
A1	0.00	-	0.127	0.00	-	0.005	
b	0.33	0.41	0.48	0.013	0.016	0.019	
b1	0.44	0.51	0.58	0.017	0.020	0.023	
b2	4.80	4.90	5.00	0.189	0.193	0.197	
b3		0.094			0.004		
b4		0.47			0.019		
С	0.20	0.25	0.30	0.008	0.010	0.012	
D	5.00	5.13	5.25	0.197	0.202	0.207	
D1	4.80	4.90	5.00	0.189	0.193	0.197	
D2	3.86	3.96	4.06	0.152	0.156	0.160	
D3	1.63	1.73	1.83	0.064	0.068	0.072	
е		1.27 BSC		0.050 BSC			
E	6.05	6.15	6.25	0.238	0.242	0.246	
E1	4.27	4.37	4.47	0.168	0.172	0.176	
E2	2.75	2.85	2.95	0.108	0.112	0.116	
F	-	-	0.15	-	-	0.006	
L	0.62	0.72	0.82	0.024	0.028	0.032	
L1	0.92	1.07	1.22	0.036	0.042	0.048	
К		0.51			0.020		
W		0.23			0.009		
W1	0.41			0.016			
W2	2.82			0.111			
W3		2.96			0.117		
θ	0°	-	10°	0°	-	10°	

Note

• Millimeters will govern



RECOMMENDED MINIMUM PAD FOR PowerPAK® SO-8L DUAL



Recommended Minimum Pads Dimensions in mm (inches) Keep-out 6.75 (0.266) x 7.75 (0.305)

Revision: 07-Feb-12



Vishay

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.