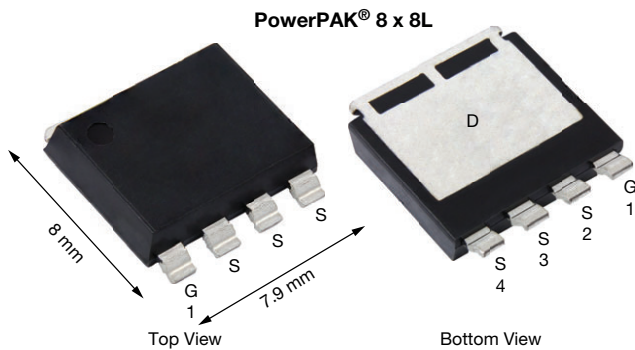


Automotive N-Channel 80 V (D-S) 175 °C MOSFET

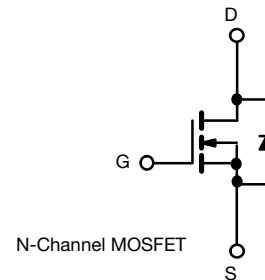


RoHS
COMPLIANT
HALOGEN
FREE



FEATURES

- TrenchFET® Gen V power MOSFET
- AEC-Q101 qualified
- 100 % R_g and UIS tested
- Thin 1.6 mm height
- Material categorization:
for definitions of compliance please see www.vishay.com/doc?99912



PRODUCT SUMMARY	
V_{DS} (V)	80
$R_{DS(on)}$ (Ω) at $V_{GS} = 10$ V	0.00144
I_D (A) ^e	352
Configuration	Single

ORDERING INFORMATION	
Package	PowerPAK 8 x 8L
Lead (Pb)-free and halogen-free	SQJQ580E (for detailed order number please see www.vishay.com/doc?79776)

ABSOLUTE MAXIMUM RATINGS ($T_C = 25$ °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-source voltage		V_{DS}	80	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current ^e	$T_C = 25$ °C	I_D	352	A
	$T_C = 125$ °C		203	
Continuous source current (diode conduction)		I_S	340	
Pulsed drain current ^{a, e}		I_{DM}	700	
Single pulse avalanche current	L = 0.1 mH	I_{AS}	75	mJ
Single pulse avalanche energy		E_{AS}	285	
Maximum power dissipation ^e	$T_C = 25$ °C	P_D	375	W
	$T_C = 125$ °C		125	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to +175	°C
Soldering recommendations (peak temperature) ^c			260	

THERMAL RESISTANCE RATINGS				
PARAMETER		SYMBOL	LIMIT	UNIT
Junction-to-ambient	PCB mount ^b	R_{thJA}	40	°C/W
Junction-to-case (drain) ^d		R_{thJC}	0.4	

Notes

- Pulse test; pulse width ≤ 300 μ s, duty cycle ≤ 2 %
- When mounted on 1" square PCB (FR4 material)
- See solder profile (www.vishay.com/doc?73257)
- As per JESD51-14
- Values based on R_{thJC} and T_C of 25 °C- Actual values achievable will be dependent on the thermal characteristics of the complete system

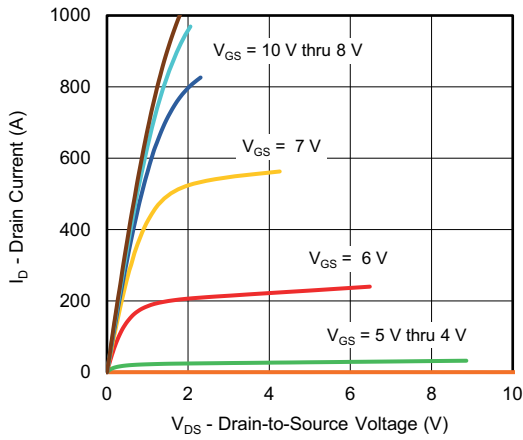
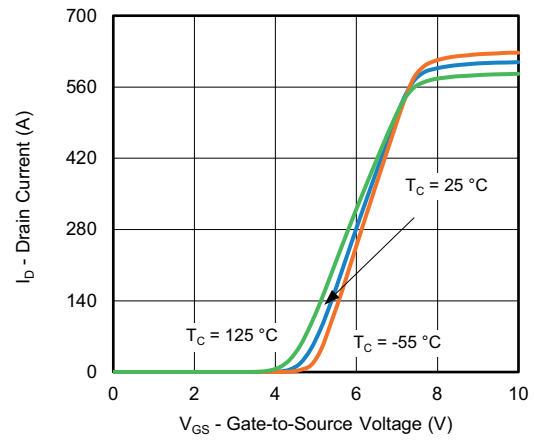
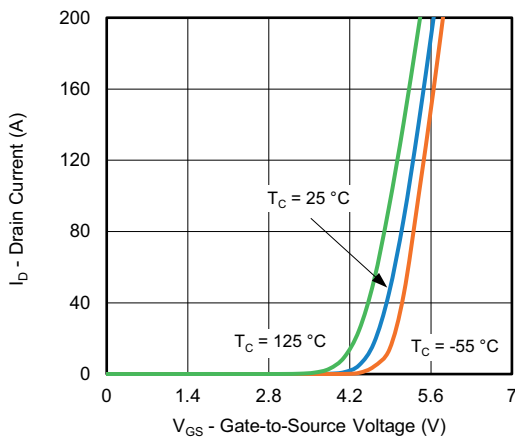
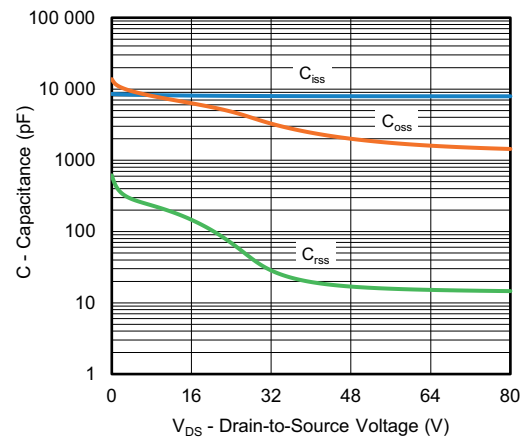
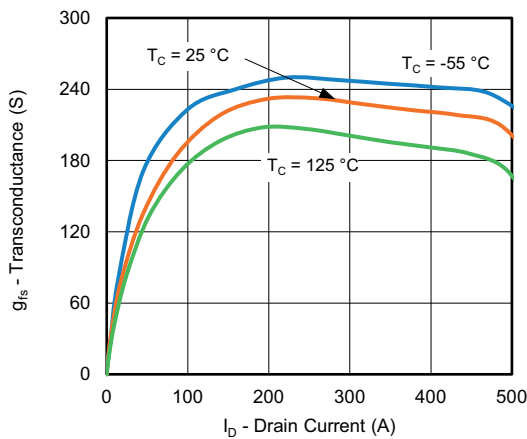
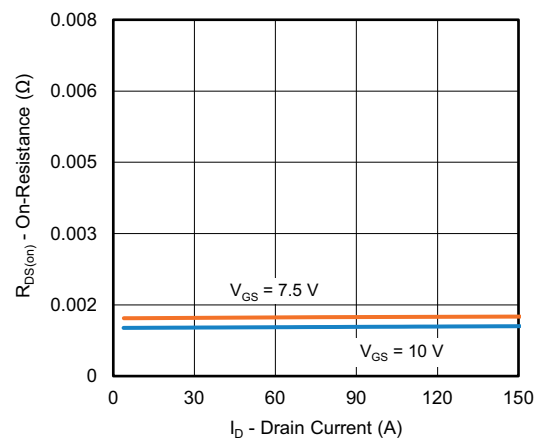


SPECIFICATIONS ($T_C = 25\text{ }^\circ\text{C}$, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-source breakdown voltage	V_{DS}	$V_{GS} = 0, I_D = 250\text{ }\mu\text{A}$		80	-	-	V
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$		2.2	2.8	3.5	
Gate-source leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$		-	-	± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{GS} = 0\text{ V}$	$V_{DS} = 80\text{ V}$	-	-	1	μA
		$V_{GS} = 0\text{ V}$	$V_{DS} = 80\text{ V}, T_J = 125\text{ }^\circ\text{C}$	-	-	50	
		$V_{GS} = 0\text{ V}$	$V_{DS} = 80\text{ V}, T_J = 175\text{ }^\circ\text{C}$	-	-	500	
On-state drain current ^a	$I_{D(on)}$	$V_{GS} = 10\text{ V}$	$V_{DS} \geq 5\text{ V}$	50	-	-	A
Drain-source on-state resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}$	$I_D = 20\text{ A}$	-	0.0012	0.00144	Ω
		$V_{GS} = 10\text{ V}$	$I_D = 20\text{ A}, T_J = 125\text{ }^\circ\text{C}$	-	-	0.0025	
		$V_{GS} = 10\text{ V}$	$I_D = 20\text{ A}, T_J = 175\text{ }^\circ\text{C}$	-	-	0.0031	
Forward transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 25\text{ A}$		-	100	-	S
Dynamic ^b							
Input capacitance	C_{iss}	$V_{GS} = 0\text{ V}$	$V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	-	8037	11 252	pF
Output capacitance	C_{oss}			-	4450	6250	
Reverse transfer capacitance	C_{rss}			-	52	73	
Total gate charge ^c	Q_g	$V_{GS} = 10\text{ V}$	$V_{DS} = 40\text{ V}, I_D = 50\text{ A}$	-	93	140	nC
Gate-source charge ^c	Q_{gs}			-	46	-	
Gate-drain charge ^c	Q_{gd}			-	8	-	
Gate resistance	R_g	$f = 1\text{ MHz}$		0.9	1.8	2.7	Ω
Turn-on delay time ^c	$t_{d(on)}$	$V_{DD} = 40\text{ V}, R_L = 0.8\text{ }\Omega,$ $I_D = 50\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\text{ }\Omega$		-	21	32	ns
Rise time ^c	t_r			-	16	24	
Turn-off delay time ^c	$t_{d(off)}$			-	37	56	
Fall time ^c	t_f			-	11	17	
Source-Drain Diode Ratings and Characteristics ^b							
Pulsed current ^a	I_{SM}			-	-	700	A
Forward voltage	V_{SD}	$I_F = 40\text{ A}, V_{GS} = 0\text{ V}$		-	0.7	1.1	V
Body diode reverse recovery time	t_{rr}	$I_F = 40\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		-	97	194	ns
Body diode reverse recovery charge	Q_{rr}			-	254	508	nC
Reverse recovery fall time	t_a			-	60	-	ns
Reverse recovery rise time	t_b			-	37	-	
Body diode peak reverse recovery current	$I_{RM(REC)}$					-	-4.6

Notes

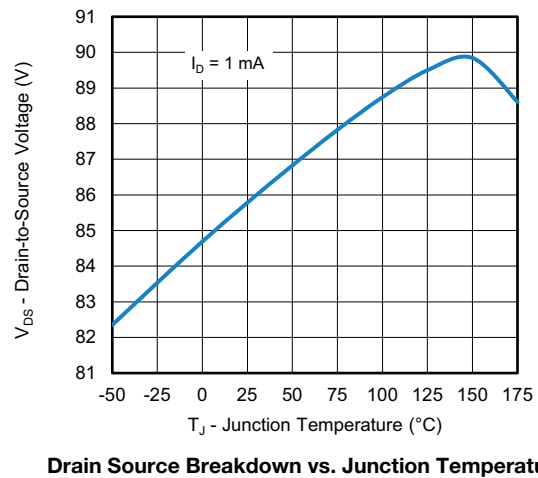
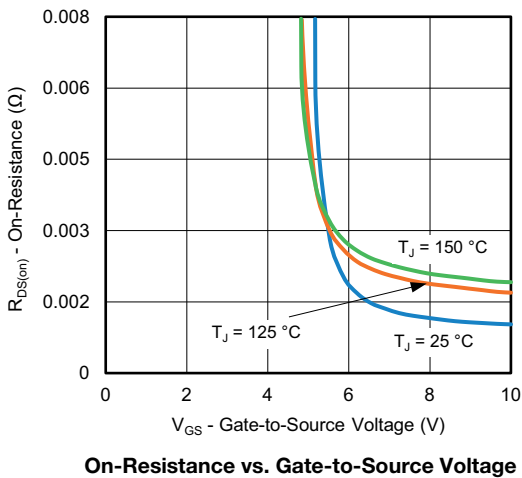
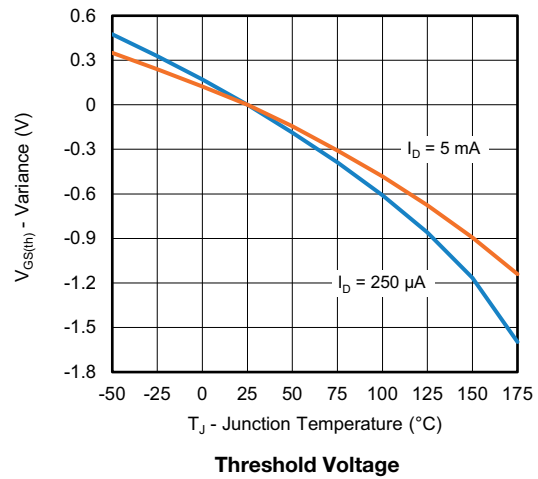
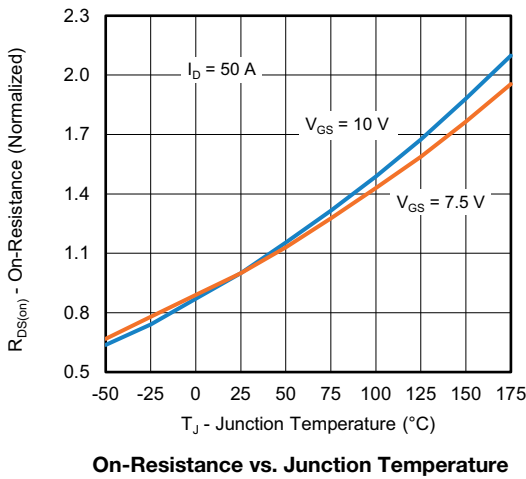
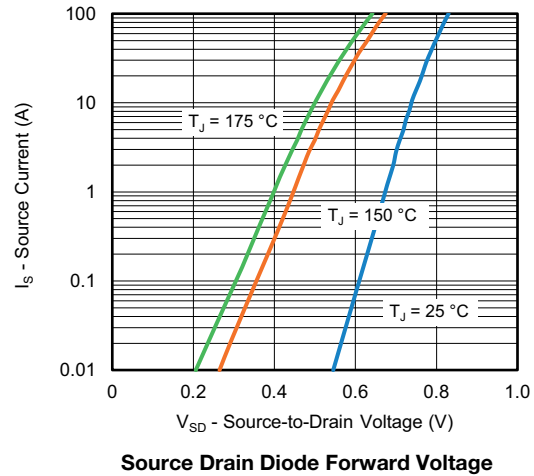
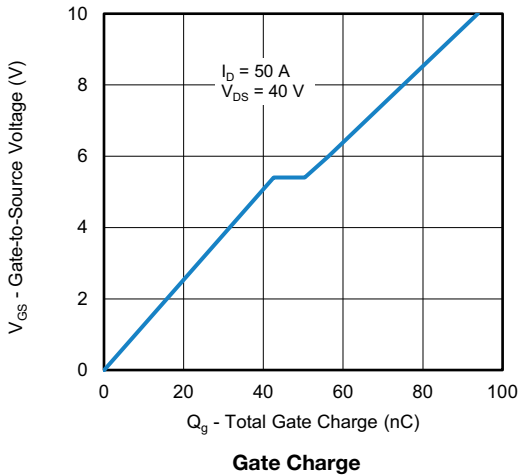
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
- b. Guaranteed by design, not subject to production testing
- c. Independent of operating temperature

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.

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

Output Characteristics

Transfer Characteristics

Transfer Characteristics

Capacitance

Transconductance

On-Resistance vs. Drain Current

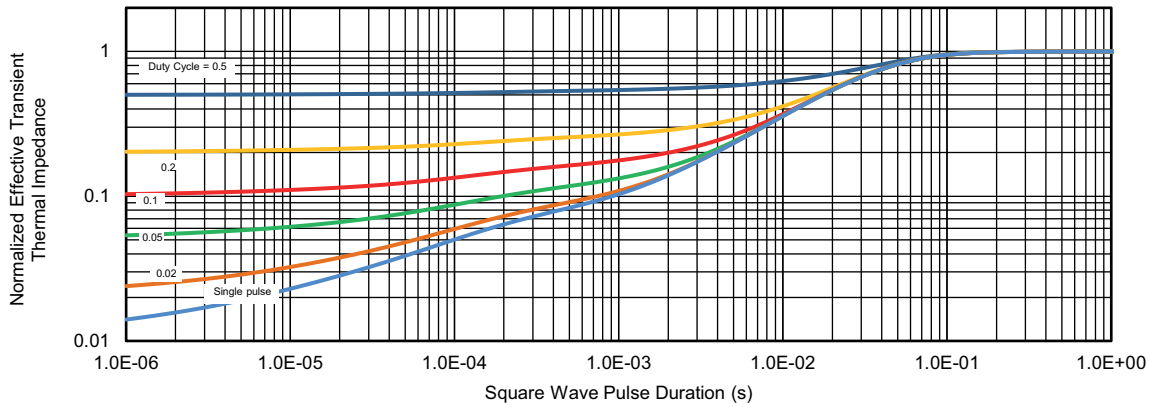


TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)

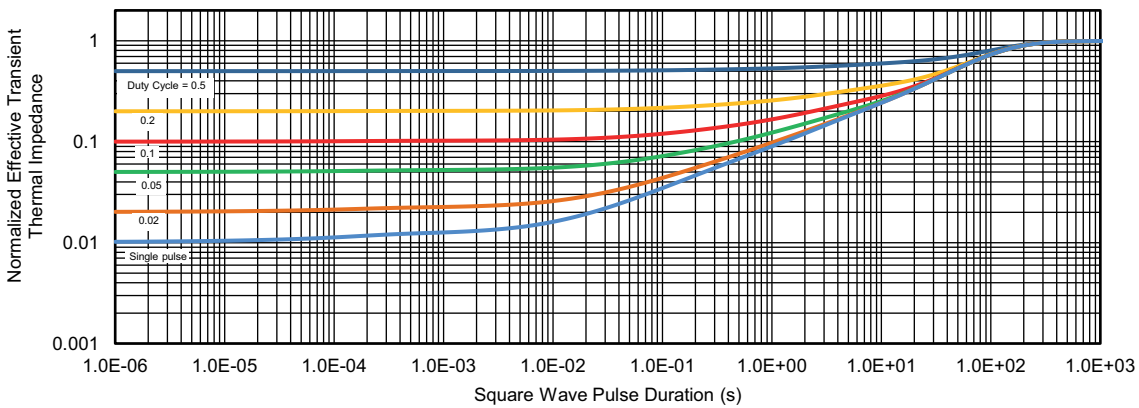




THERMAL RATINGS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Case



Normalized Thermal Transient Impedance, Junction-to-Ambient

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