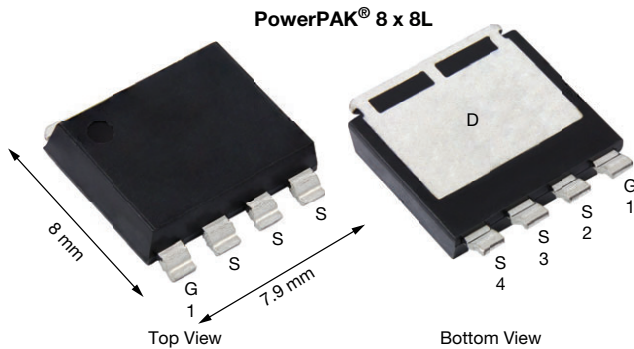


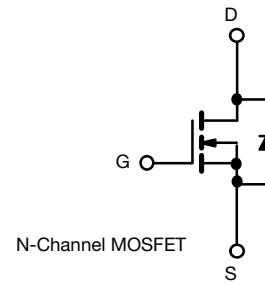
Automotive N-Channel 200 V (D-S) 175 °C MOSFET

 AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE


FEATURES

- TrenchFET® 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)	200
R _{DS(on)} (Ω) at V _{GS} = 10 V	0.0143
I _D (A) ^e	95
Configuration	Single

ORDERING INFORMATION	
Package	PowerPAK® 8 x 8L
Lead (Pb)-free and halogen-free	SQJQ190E (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}	200	V
Gate-source voltage		V _{GS}	± 20	
Continuous drain current ^e	T _C = 25 °C	I _D	95	A
	T _C = 125 °C		55	
Continuous source current (diode conduction)		I _S	340	
Pulsed drain current ^{a, e}		I _{DM}	254	
Single pulse avalanche current	L = 0.1 mH	I _{AS}	44	
Single pulse avalanche energy		E _{AS}	96	
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) ^e		R _{thJC}	0.4	

Notes

- Pulse test; pulse width ≤ 300 μs, 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



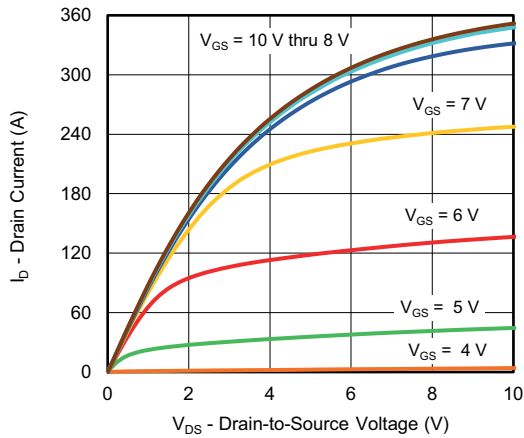
SPECIFICATIONS ($T_C = 25\text{ }^\circ\text{C}$, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-source breakdown voltage	V_{DS}	$V_{GS} = 0, I_D = 250\text{ }\mu\text{A}$		200	-	-	V
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$		2	3	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}	$V_{GS} = 0\text{ V}$	$V_{DS} = 200\text{ V}$	-	-	1	μA
		$V_{GS} = 0\text{ V}$	$V_{DS} = 200\text{ V}, T_J = 125\text{ }^\circ\text{C}$	-	-	50	
		$V_{GS} = 0\text{ V}$	$V_{DS} = 200\text{ V}, T_J = 175\text{ }^\circ\text{C}$	-	-	1000	
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	$R_{DS(on)}$	$V_{GS} = 10\text{ V}$	$I_D = 20\text{ A}$	-	0.0119	0.0143	Ω
		$V_{GS} = 10\text{ V}$	$I_D = 20\text{ A}, T_J = 125\text{ }^\circ\text{C}$	-	-	0.0298	
		$V_{GS} = 10\text{ V}$	$I_D = 20\text{ A}, T_J = 175\text{ }^\circ\text{C}$	-	-	0.0409	
Forward transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 30\text{ A}$		-	55	-	S
Dynamic ^b							
Input capacitance	C_{iss}	$V_{GS} = 0\text{ V}$	$V_{DS} = 100\text{ V}, f = 1\text{ MHz}$	-	3187	4800	pF
Output capacitance	C_{oss}			-	347	550	
Reverse transfer capacitance	C_{rss}			-	13	25	
Total gate charge ^c	Q_g	$V_{GS} = 10\text{ V}$	$V_{DS} = 100\text{ V}, I_D = 30\text{ A}$	-	52	80	nC
Gate-source charge ^c	Q_{gs}			-	15	-	
Gate-drain charge ^c	Q_{gd}			-	14	-	
Gate resistance	R_g	$f = 1\text{ MHz}$		1.8	3.68	5.7	Ω
Turn-on delay time ^c	$t_{d(on)}$	$V_{DD} = 100\text{ V}, R_L = 3.33\text{ }\Omega,$ $I_D \cong 30\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\text{ }\Omega$		-	12	20	ns
Rise time ^c	t_r			-	6	10	
Turn-off delay time ^c	$t_{d(off)}$			-	37	60	
Fall time ^c	t_f			-	8	15	
Source-Drain Diode Ratings and Characteristics ^b							
Pulsed current ^a	I_{SM}			-	-	254	A
Forward voltage	V_{SD}	$I_F = 40\text{ A}, V_{GS} = 0\text{ V}$		-	0.81	1.1	V
Body diode reverse recovery time	t_{rr}	$I_F = 20\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		-	117	234	ns
Body diode reverse recovery charge	Q_{rr}			-	631	1262	nC
Reverse recovery fall time	t_a			-	96	-	ns
Reverse recovery rise time	t_b			-	21	-	
Body diode peak reverse recovery current	$I_{RM(REC)}$					-	-10

Notes

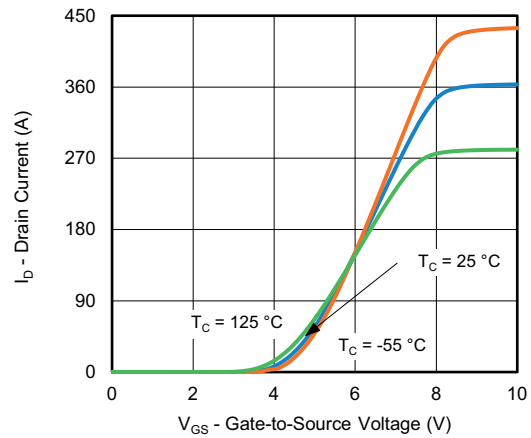
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
- Guaranteed by design, not subject to production testing
- Independent of operating temperature

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.

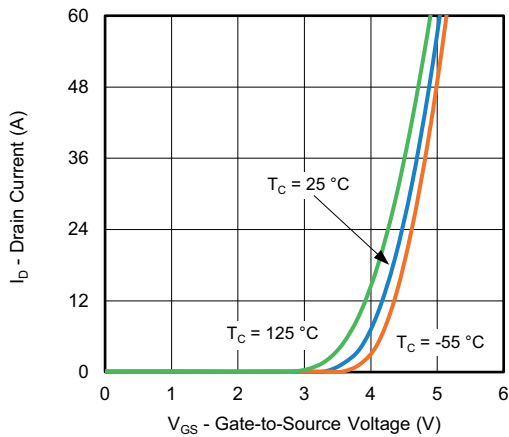
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



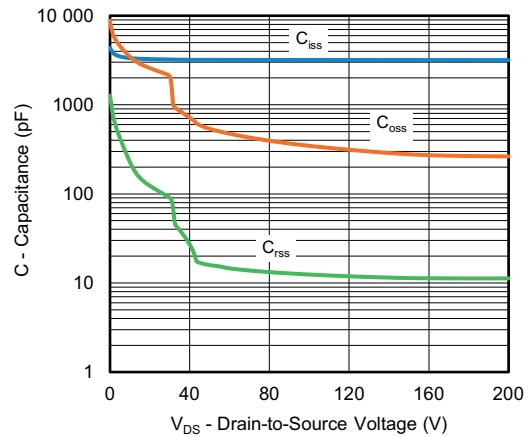
Output Characteristics



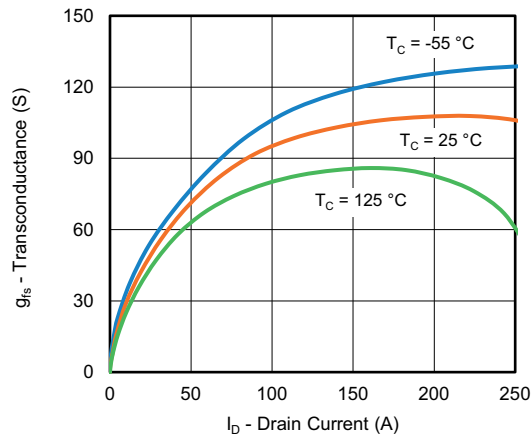
Transfer Characteristics



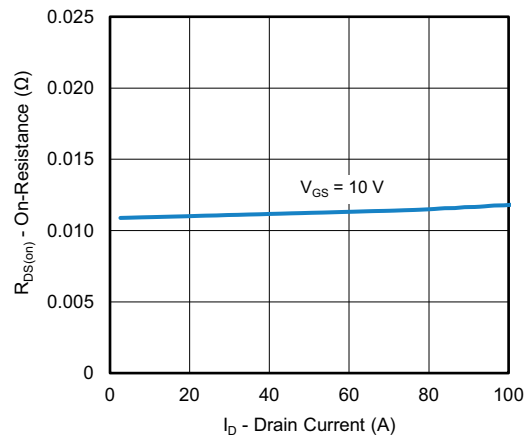
Transfer Characteristics



Capacitance



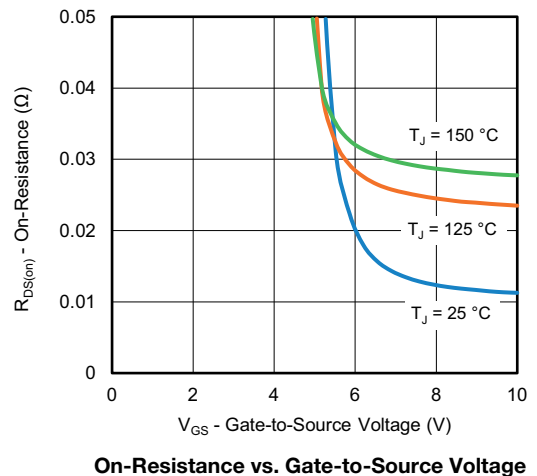
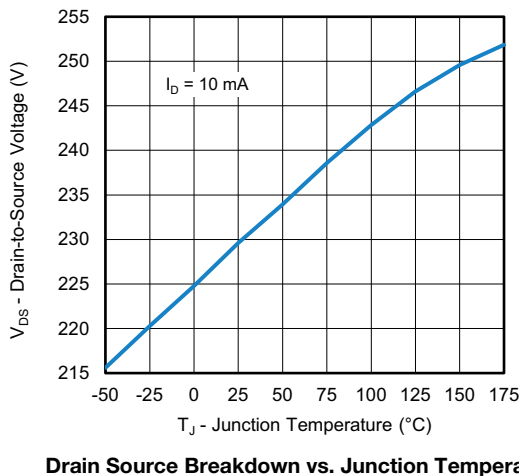
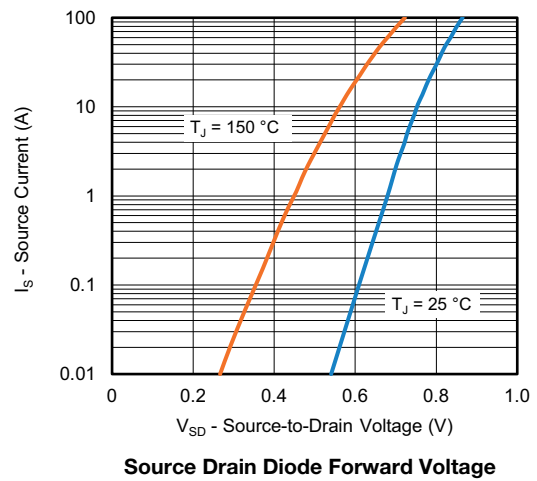
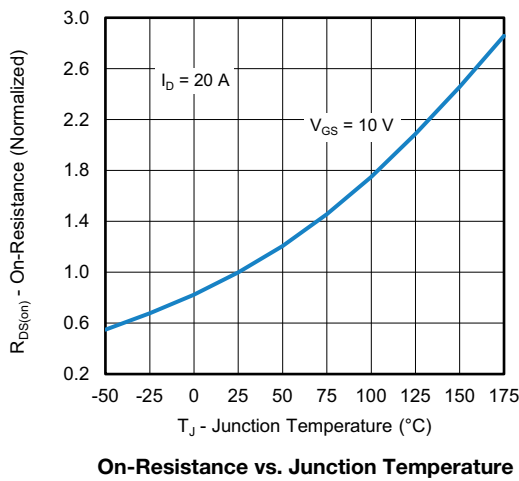
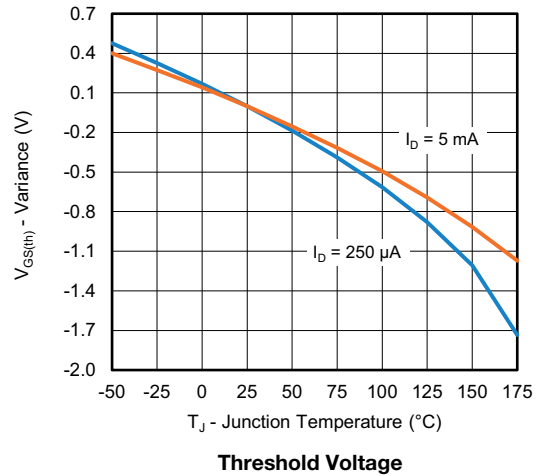
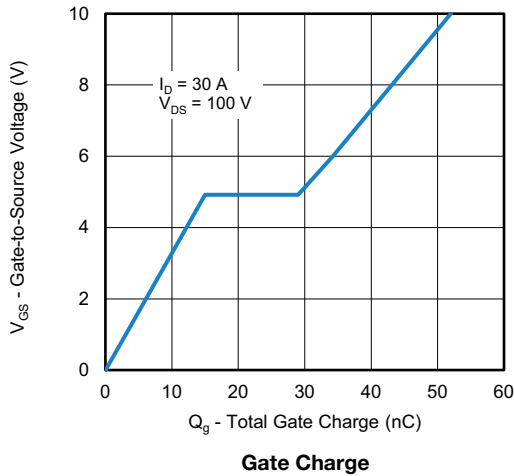
Transconductance



On-Resistance vs. Drain Current

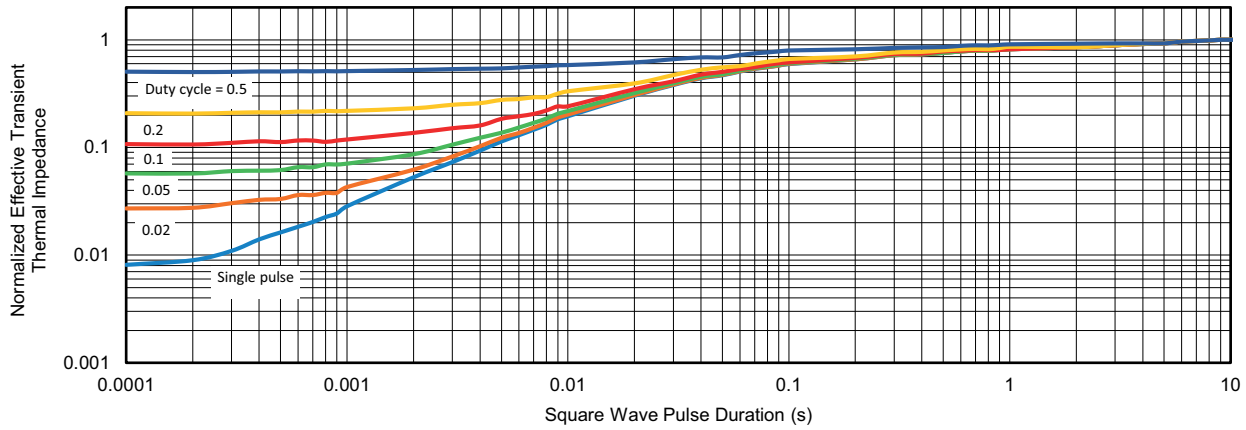


TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)

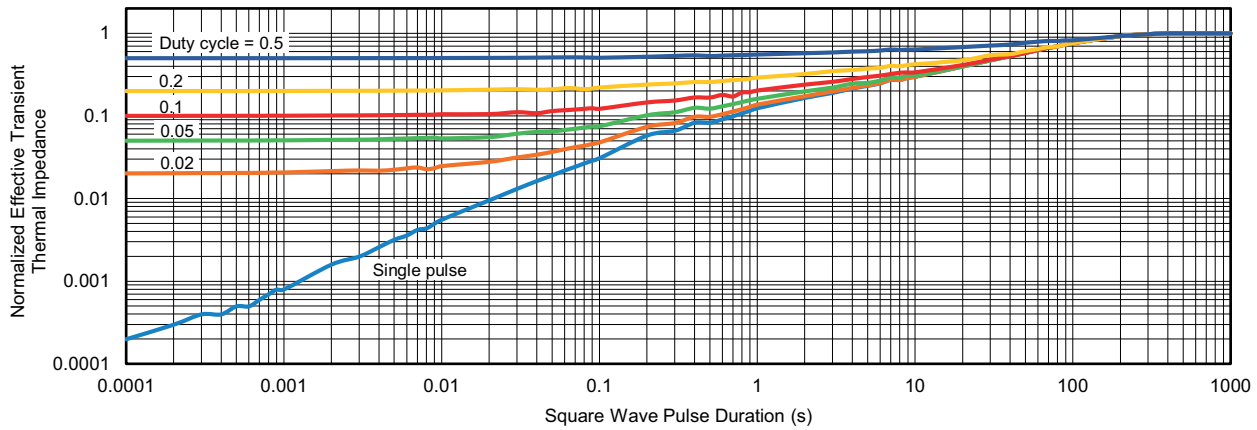




THERMAL RATINGS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Case



Normalized Thermal Transient Impedance, Junction-to-Ambient

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