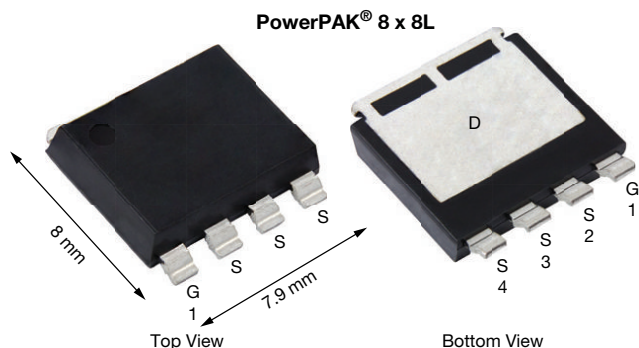


Automotive N-Channel 100 V (D-S) 175 °C MOSFET

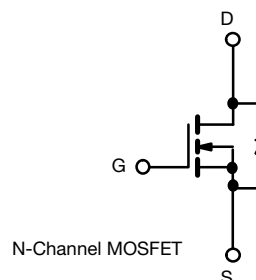


FEATURES

- TrenchFET® Gen IV power MOSFET
- AEC-Q101 qualified
- 100 % R_g and UIS tested
- Thin 1.9 mm height
- Material categorization:
for definitions of compliance please see
www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE



PRODUCT SUMMARY

V_{DS} (V)	100
$R_{DS(on)}$ (Ω) at $V_{GS} = 10$ V	0.0092
$R_{DS(on)}$ (Ω) at $V_{GS} = 4.5$ V	0.0103
I_D (A) ^e	61
Configuration	Single

ORDERING INFORMATION

Package	PowerPAK 8 x 8L
Lead (Pb)-free and halogen-free	SQJQ116EL (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}	100	V
Gate-source voltage		V _{GS}	± 20	
Continuous drain current ^e	T _C = 25 °C	I _D	61	A
	T _C = 125 °C		35	
Continuous source current (diode conduction) ^e		I _S	81	
Pulsed drain current ^{a, e}		I _{DM}	212	
Single pulse avalanche current	L = 0.1 mH	I _{AS}	35	
Single pulse avalanche energy		E _{AS}	63	
Maximum power dissipation ^e	T _C = 25 °C	P _D	91	W
	T _C = 125 °C		30	
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}	42	°C/W
Junction-to-case (drain) ^d		R _{thJC}	1.64	

Notes

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

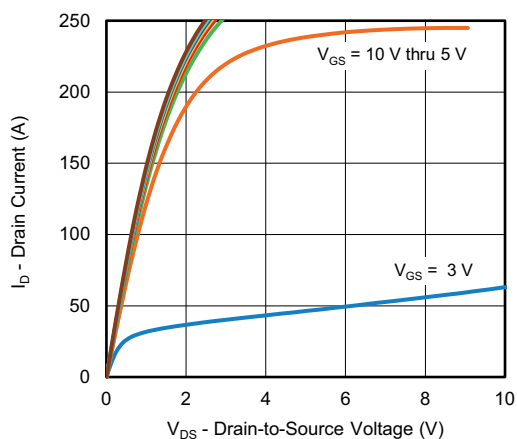
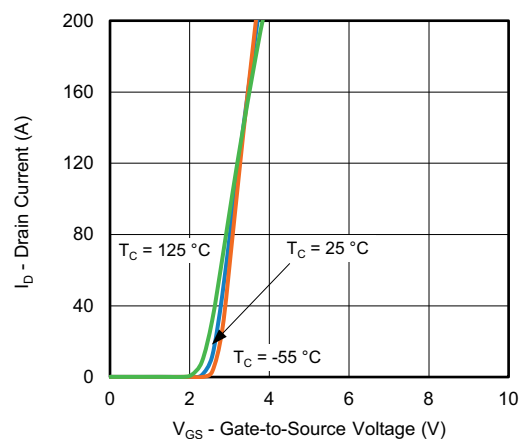
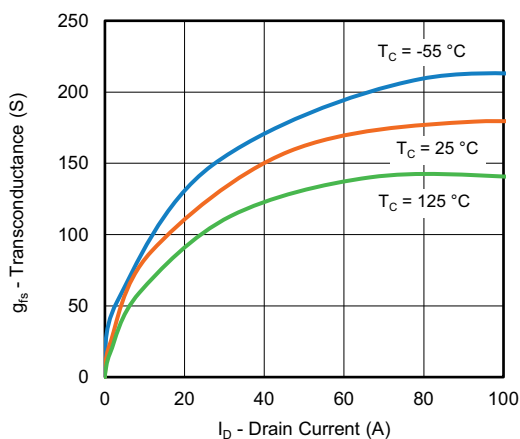
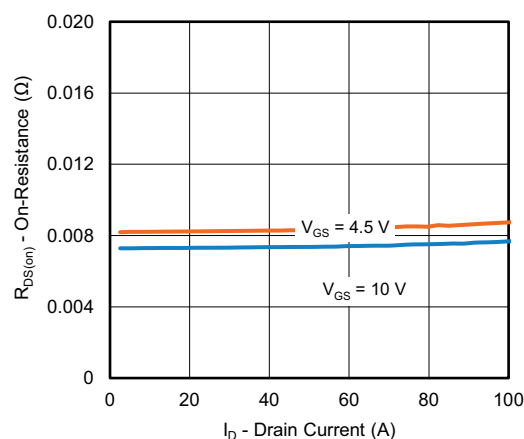
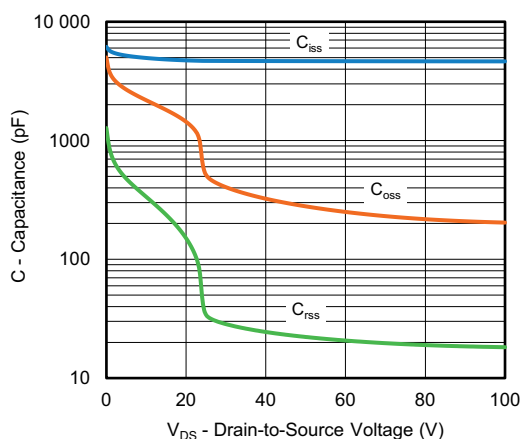
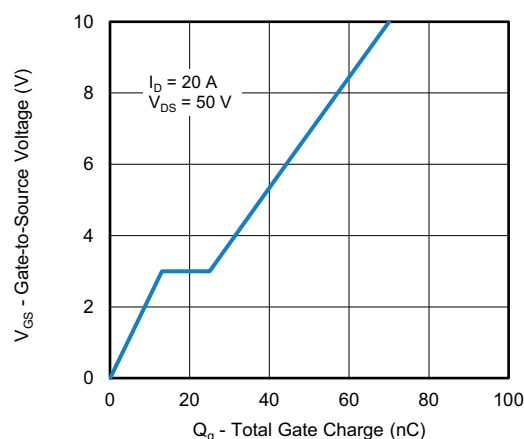


SPECIFICATIONS (T _C = 25 °C, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-source breakdown voltage	V _{DS}	V _{GS} = 0, I _D = 250 μA		100	-	-	V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA		1.4	1.9	2.5	
Gate-source leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V		-	-	± 100	nA
Zero gate voltage drain current	I _{DSS}	V _{GS} = 0 V	V _{DS} = 100 V	-	-	1	μA
		V _{GS} = 0 V	V _{DS} = 100 V, T _J = 125 °C	-	-	50	
		V _{GS} = 0 V	V _{DS} = 100 V, T _J = 175 °C	-	-	500	
On-state drain current ^a	I _{D(on)}	V _{GS} = 10 V	V _{DS} ≥ 5 V	50	-	-	A
Drain-source on-state resistance ^a	R _{DS(on)}	V _{GS} = 4.5 V	I _D = 20 A	-	0.0086	0.0103	Ω
		V _{GS} = 10 V	I _D = 20 A	-	0.0077	0.0092	
		V _{GS} = 10 V	I _D = 20 A, T _J = 125 °C	-	-	0.0190	
		V _{GS} = 10 V	I _D = 20 A, T _J = 175 °C	-	-	0.0240	
Forward transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 40 A		-	150	-	S
Dynamic ^b							
Input capacitance	C _{iss}	V _{GS} = 0 V	V _{DS} = 25 V, f = 1 MHz	-	4670	6538	pF
Output capacitance	C _{oss}			-	464	650	
Reverse transfer capacitance	C _{rss}			-	29	41	
Total gate charge ^c	Q _g	V _{GS} = 10 V	V _{DS} = 50 V, I _D = 20 A	-	70	105	nC
Gate-source charge ^c	Q _{gs}			-	13	-	
Gate-drain charge ^c	Q _{gd}			-	12	-	
Gate resistance	R _g	f = 1 MHz		0.4	1.0	1.6	Ω
Turn-on delay time ^c	t _{d(on)}	V _{DD} = 50 V, R _L = 2.5 Ω, I _D ≅ 20 A, V _{GEN} = 10 V, R _g = 1 Ω		-	13	20	ns
Rise time ^c	t _r			-	4	8	
Turn-off delay time ^c	t _{d(off)}			-	34	51	
Fall time ^c	t _f			-	6	9	
Source-Drain Diode Ratings and Characteristics ^b							
Pulsed current ^a	I _{SM}			-	-	212	A
Forward voltage	V _{SD}	I _F = 40 A, V _{GS} = 0 V		-	0.7	1.1	V
Body diode reverse recovery time	t _{rr}	I _F = 15 A, di/dt = 100 A/μs		-	43	86	ns
Body diode reverse recovery charge	Q _{rr}			-	77	154	nC
Reverse recovery fall time	t _a			-	36	-	ns
Reverse recovery rise time	t _b			-	7	-	
Body diode peak reverse recovery current	I _{RM(REC)}			-	3.2	-	A

Notes

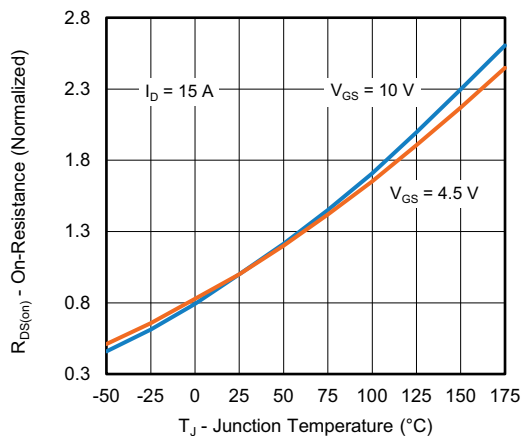
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
b. Guaranteed by design, not subject to production testing
c. Independent of operating temperature

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.

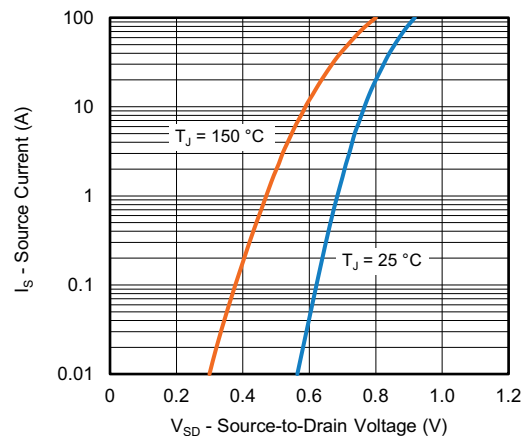
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)

Output Characteristics

Transfer Characteristics

Transconductance

On-Resistance vs. Drain Current

Capacitance

Gate Charge



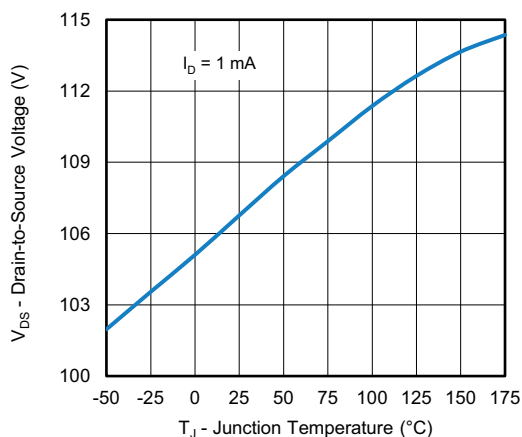
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)



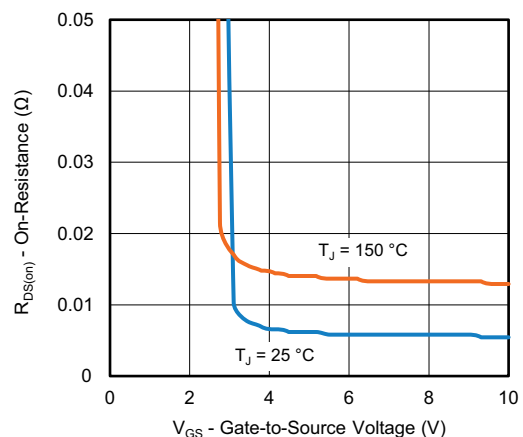
On-Resistance vs. Junction Temperature



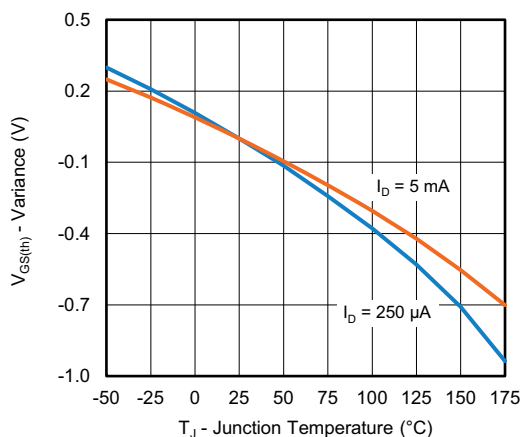
Source Drain Diode Forward Voltage



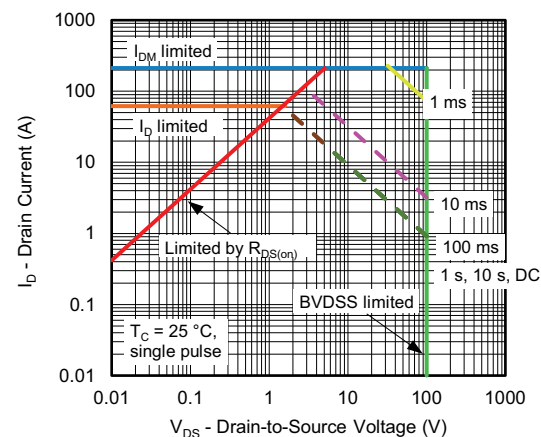
Drain Source Breakdown vs. Junction Temperature



On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



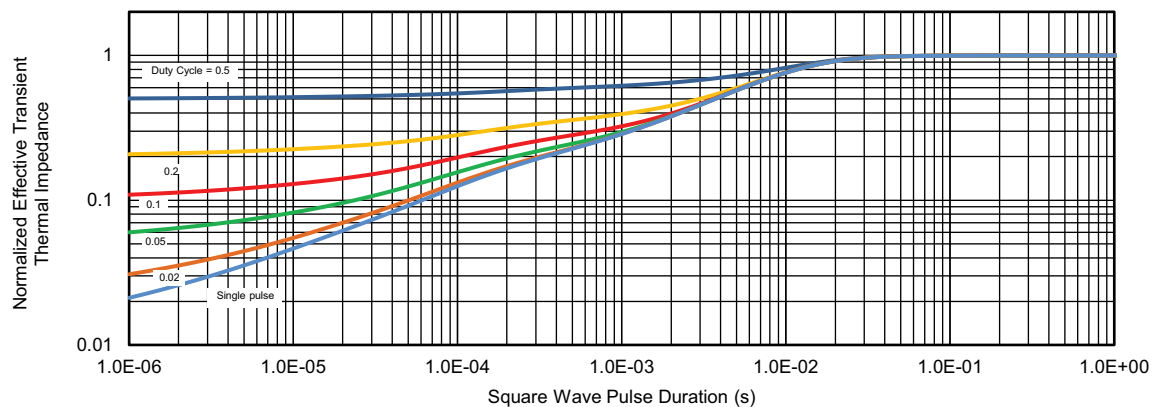
Safe Operating Area

Note

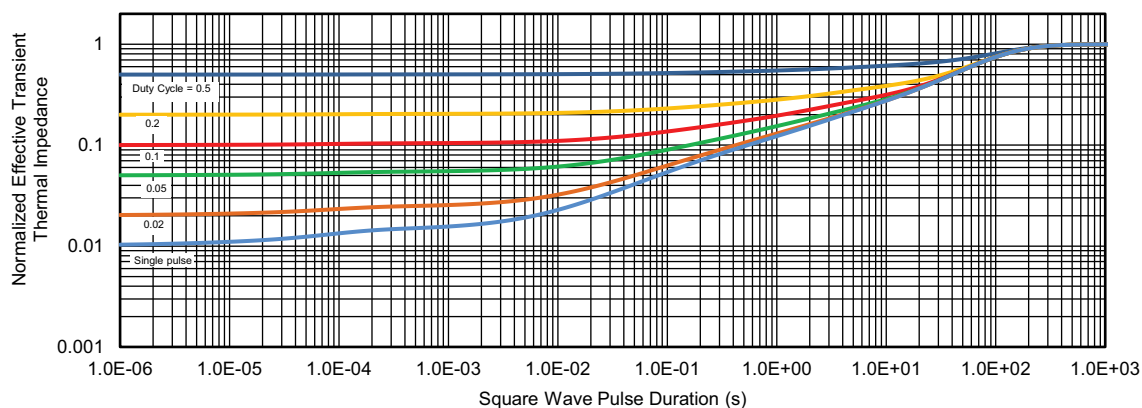
- a. $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified



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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