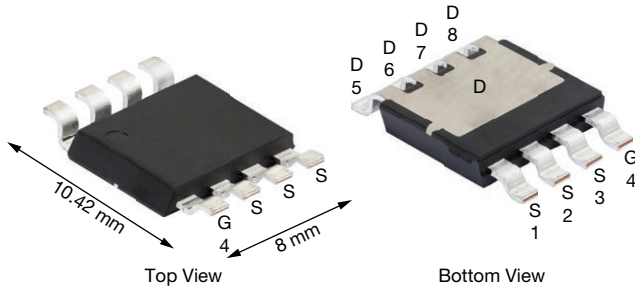
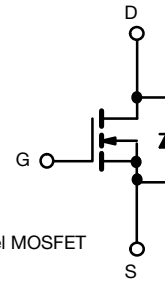


Automotive N-Channel 100 V (D-S) 175 °C MOSFET

PowerPAK® 8 x 8LR

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

 AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE


N-Channel MOSFET

PRODUCT SUMMARY	
V _{DS} (V)	100
R _{DS(on)} (Ω) at V _{GS} = 10 V	0.0036
I _D (A) ^e	105
Configuration	Single

ORDERING INFORMATION	
Package	PowerPAK 8 x 8LR
Lead (Pb)-free and halogen-free	SQJQ118ER (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	105	A
	T _C = 125 °C		61	
Continuous source current (diode conduction) ^e		I _S	97	
Pulsed drain current ^{a, e}		I _{DM}	423	
Single pulse avalanche current	L = 0.1 mH	I _{AS}	55	
Single pulse avalanche energy		E _{AS}	151	
Maximum power dissipation ^{c, e}	T _C = 25 °C	P _D	107	W
	T _C = 125 °C		35	
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}	1.4	

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). 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
- 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 °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		2	3	3.5	
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} = 10 V	I _D = 20 A	-	0.0028	0.0036	Ω
		V _{GS} = 10 V	I _D = 20 A, T _J = 125 °C	-	-	0.0074	
		V _{GS} = 10 V	I _D = 20 A, T _J = 175 °C	-	-	0.0098	
Forward transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 25 A		-	100	-	S
Dynamic ^b							
Input capacitance	C _{iss}	V _{GS} = 0 V	V _{DS} = 25 V, f = 1 MHz	-	7213	10 099	pF
Output capacitance	C _{oss}			-	973	1445	
Reverse transfer capacitance	C _{rss}			-	54	84	
Total gate charge ^c	Q _g	V _{GS} = 10 V	V _{DS} = 50 V, I _D = 20 A	-	122	186	nC
Gate-source charge ^c	Q _{gs}			-	30	-	
Gate-drain charge ^c	Q _{gd}			-	26	-	
Gate resistance	R _g	f = 1 MHz		0.4	1.1	2.2	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		-	17	27	ns
Rise time ^c	t _r			-	16	26	
Turn-off delay time ^c	t _{d(off)}			-	48	74	
Fall time ^c	t _f			-	13	20	
Source-Drain Diode Ratings and Characteristics ^b							
Pulsed current ^a	I _{SM}			-	-	388	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		-	63	126	ns
Body diode reverse recovery charge	Q _{rr}			-	151	302	nC
Reverse recovery fall time	t _a			-	49	-	ns
Reverse recovery rise time	t _b			-	14	-	
Body diode peak reverse recovery current	I _{RM(REC)}					-	-4.4

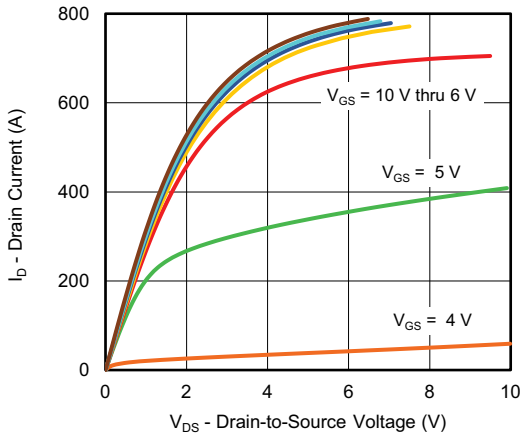
Notes

- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %
- b. Guaranteed by design, not subject to production testing
- c. Independent of operating temperature

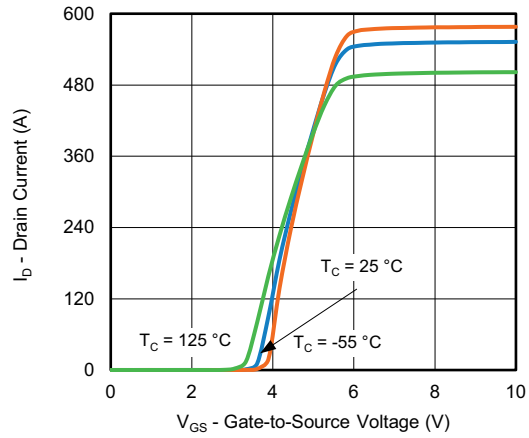
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



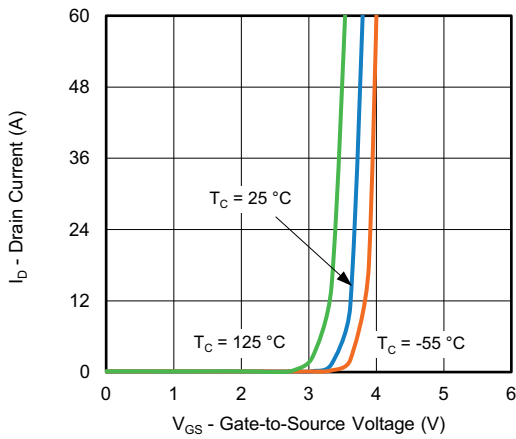
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



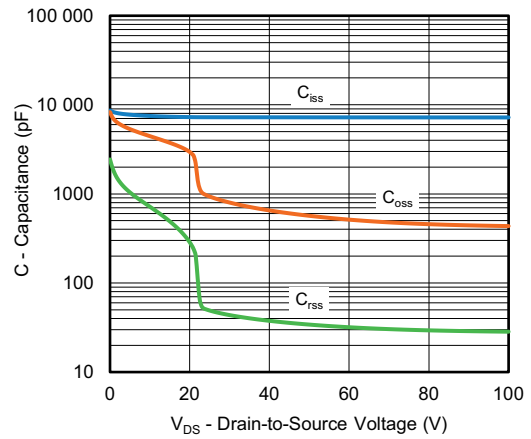
Output Characteristics



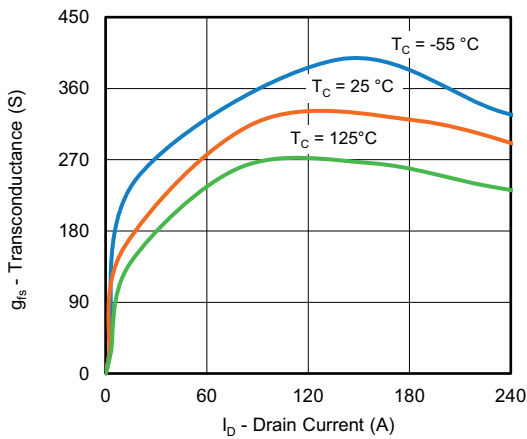
Transfer Characteristics



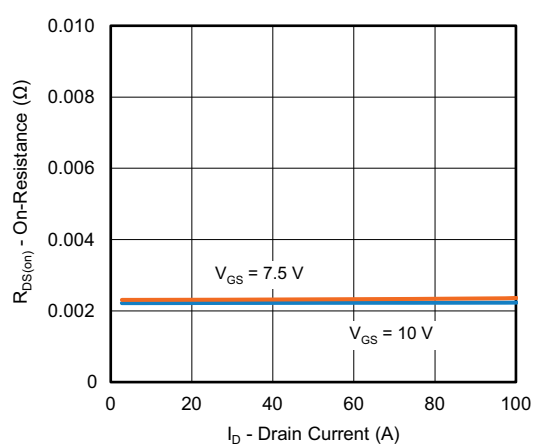
Transfer Characteristics



Capacitance



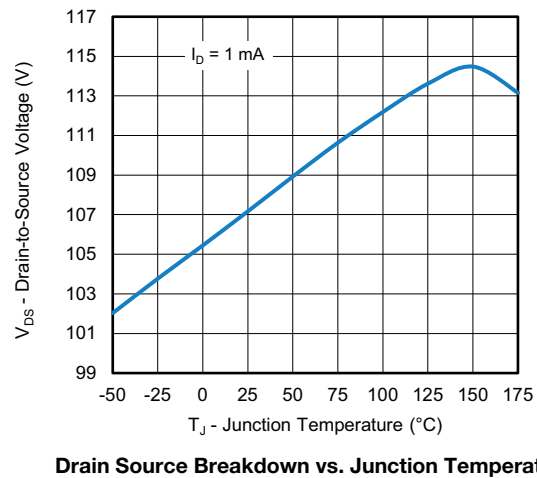
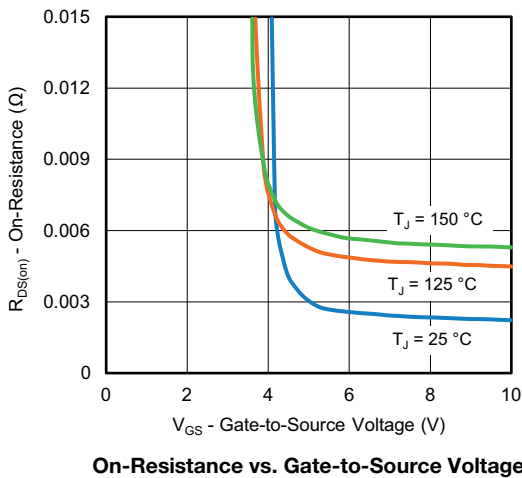
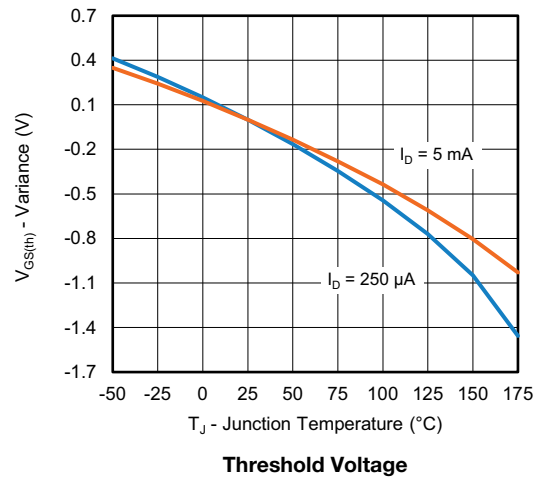
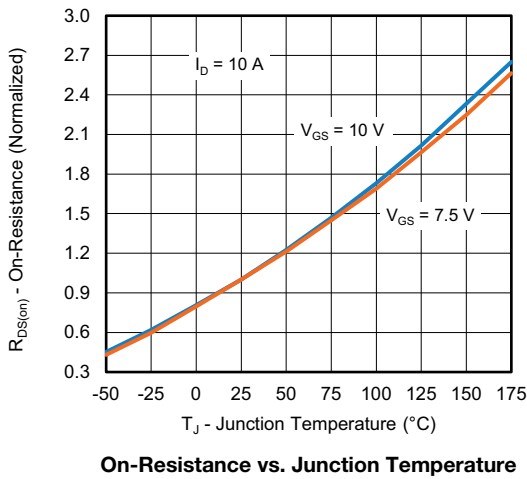
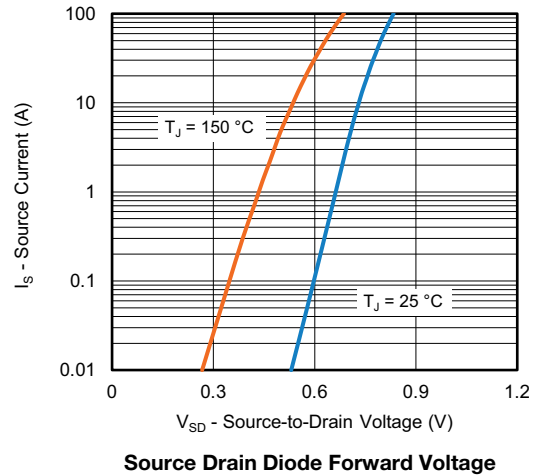
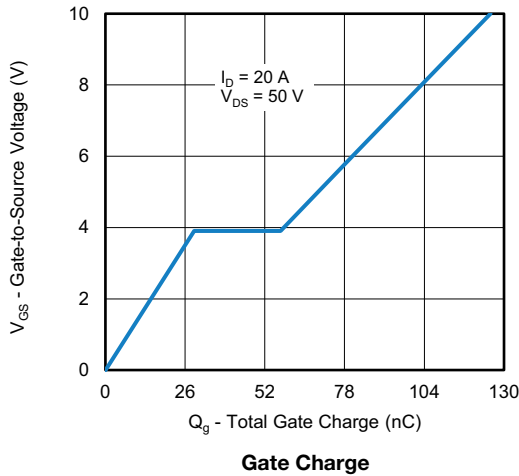
Transconductance

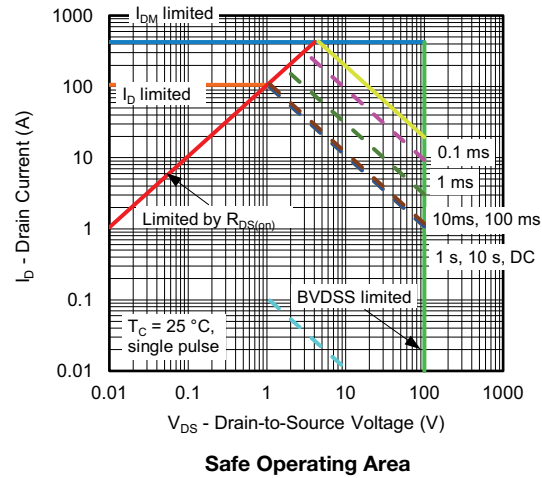


On-Resistance vs. Drain Current



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



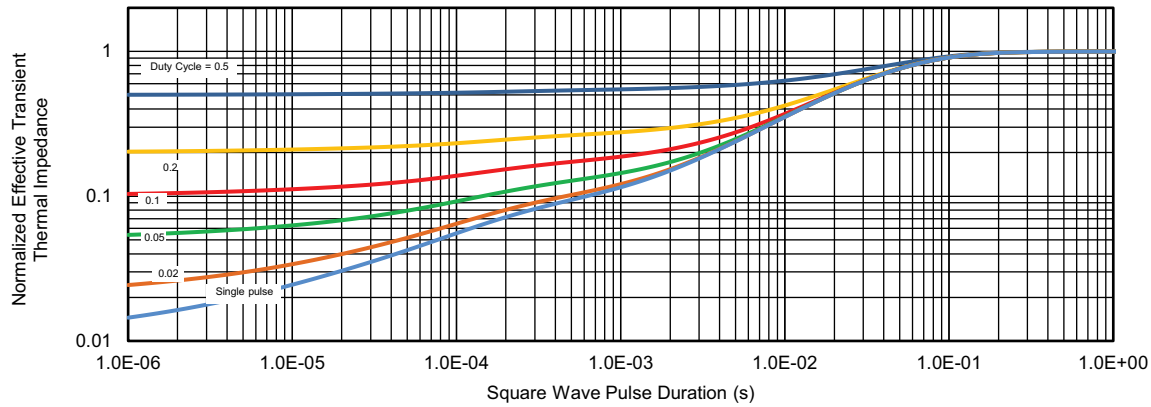


Note

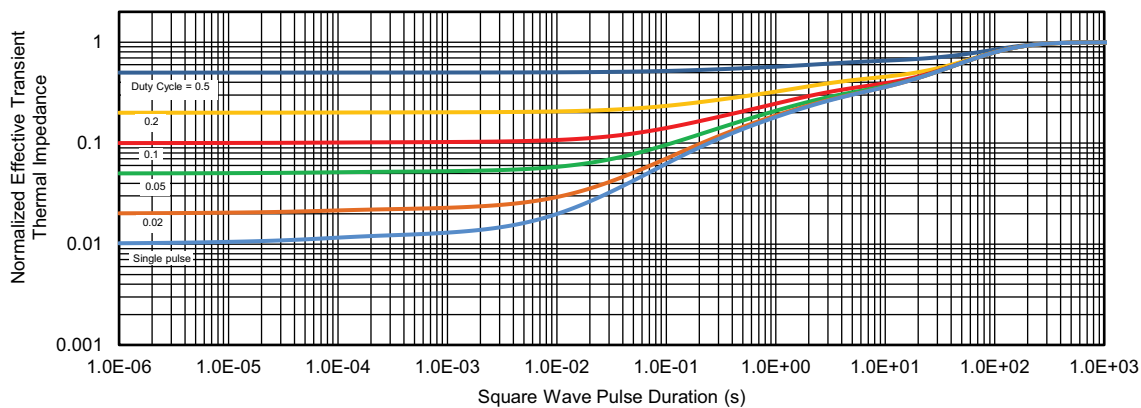
- a. $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified



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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