

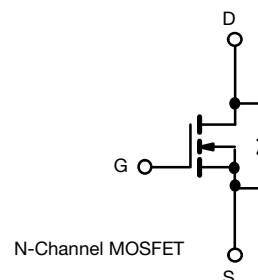
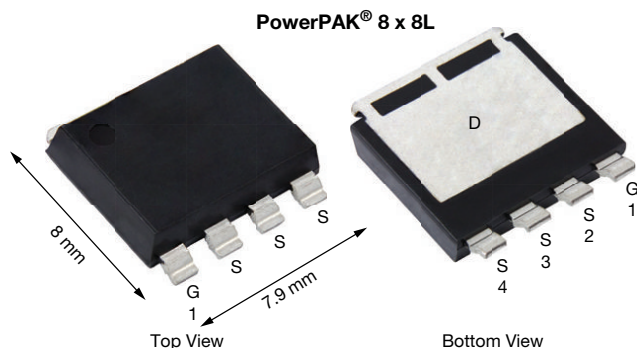
Automotive N-Channel 80 V (D-S) 175 °C MOSFET



RoHS
COMPLIANT
HALOGEN
FREE

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



PRODUCT SUMMARY	
V_{DS} (V)	80
$R_{DS(on)}$ (Ω) at $V_{GS} = 10$ V	0.0014
I_D (A)	430
Configuration	Single
Package	PowerPAK 8 x 8L

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	$T_C = 25$ °C	I_D	430	A
	$T_C = 125$ °C		250	
Continuous source current (diode conduction)		I_S	450	
Pulsed drain current ^a		I_{DM}	1200	
Single pulse avalanche current	$L = 0.1$ mH	I_{AS}	65	mJ
		E_{AS}	211	
Maximum power dissipation	$T_C = 25$ °C	P_D	600	W
	$T_C = 125$ °C		200	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to +175	°C
Soldering recommendations (peak temperature) ^{c, d}			260	

THERMAL RESISTANCE RATINGS				
PARAMETER		SYMBOL	LIMIT	UNIT
Junction-to-ambient	PCB mount ^b	R_{thJA}	40	°C/W
Junction-to-case (drain)		R_{thJC}	0.25	

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). The PowerPAK 8 x 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
- Rework conditions: manual soldering with a soldering iron is not recommended for leadless components

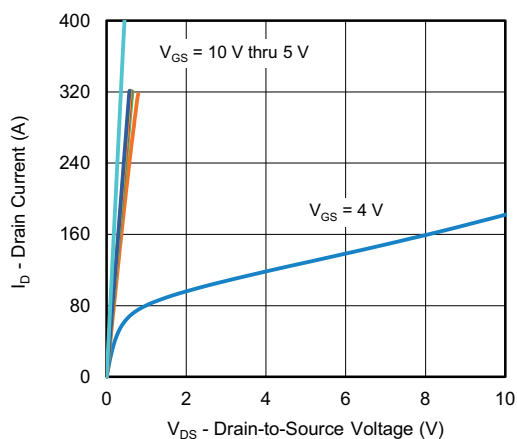
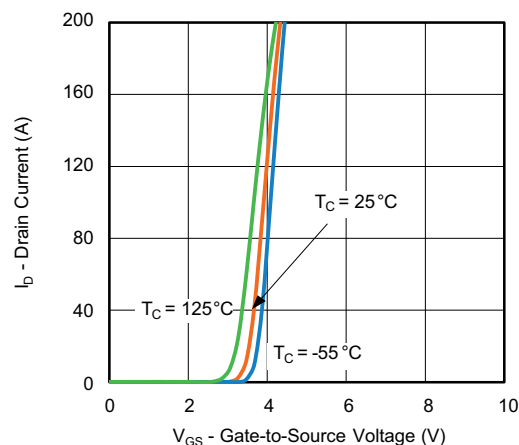
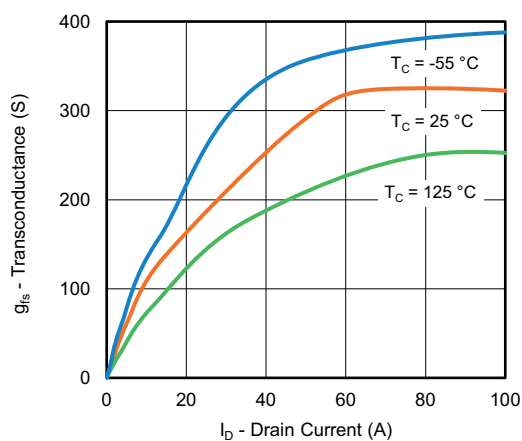
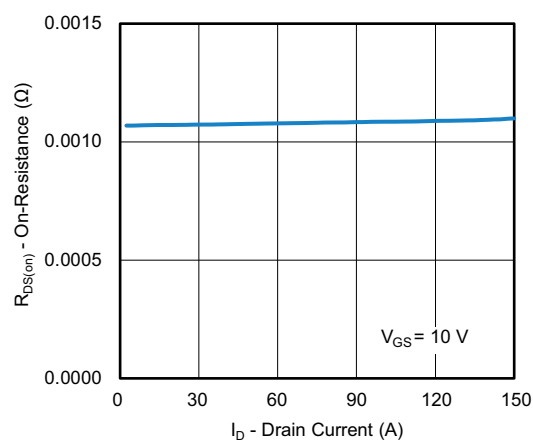
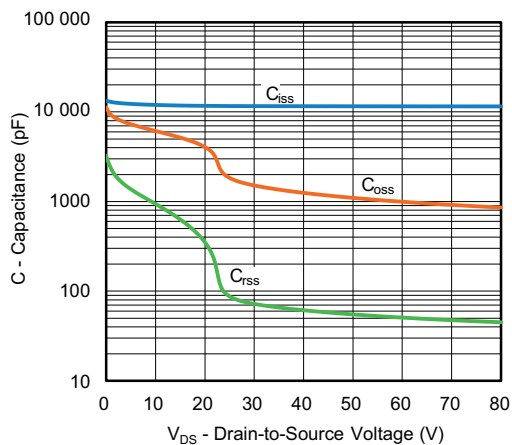
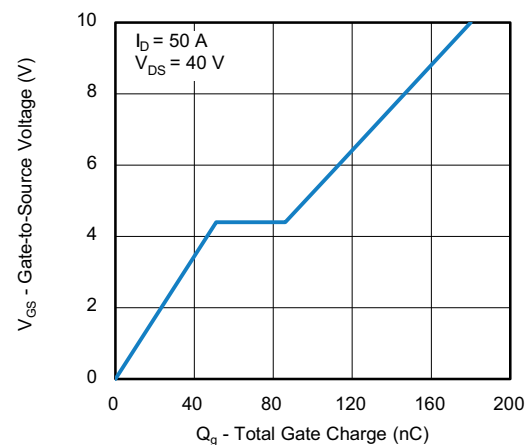


SPECIFICATIONS (T _C = 25 °C, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-source breakdown voltage	V _{DS}	V _{GS} = 0, I _D = 250 μA		80	-	-	V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA		2	3	3.5	
Gate-source 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} = 80 V	-	-	1	μA
		V _{GS} = 0 V	V _{DS} = 80 V, T _J = 125 °C	-	-	50	
		V _{GS} = 0 V	V _{DS} = 80 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	-	0.0011	0.0014	Ω
		V _{GS} = 10 V	I _D = 20 A, T _J = 125 °C	-	-	0.0026	
		V _{GS} = 10 V	I _D = 20 A, T _J = 175 °C	-	-	0.0033	
Forward transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 15 A		-	82	-	S
Dynamic ^b							
Input capacitance	C _{iss}	V _{GS} = 0 V	V _{DS} = 25 V, f = 1 MHz	-	11 435	16 010	pF
Output capacitance	C _{oss}			-	1896	2655	
Reverse transfer capacitance	C _{rss}			-	92	130	
Total gate charge ^c	Q _g	V _{GS} = 10 V	V _{DS} = 40 V, I _D = 50 A	-	181	272	nC
Gate-source charge ^c	Q _{gs}			-	51	-	
Gate-drain charge ^c	Q _{gd}			-	36	-	
Gate resistance	R _g	f = 1 MHz		0.7	1.3	2	Ω
Turn-on delay time ^c	t _{d(on)}	V _{DD} = 40 V, R _L = 0.8 Ω, I _D ≅ 50 A, V _{GEN} = 10 V, R _g = 1 Ω		-	21	28	ns
Rise time ^c	t _r			-	80	105	
Turn-off delay time ^c	t _{d(off)}			-	65	85	
Fall time ^c	t _f			-	20	28	
Source-Drain Diode Ratings and Characteristics ^b							
Pulsed current ^a	I _{SM}			-	-	1100	A
Forward voltage	V _{SD}	I _F = 40 A, V _{GS} = 0 V		-	0.7	1.2	V
Body diode reverse recovery time	t _{rr}	I _F = 10 A, di/dt = 100 A/μs		-	72	144	ns
Body diode reverse recovery charge	Q _{rr}			-	143	286	nC
Reverse recovery fall time	t _a			-	41	-	ns
Reverse recovery rise time	t _b			-	30	-	
Body diode peak reverse recovery current	I _{RM(REC)}			-	3.5	-	A

Notes

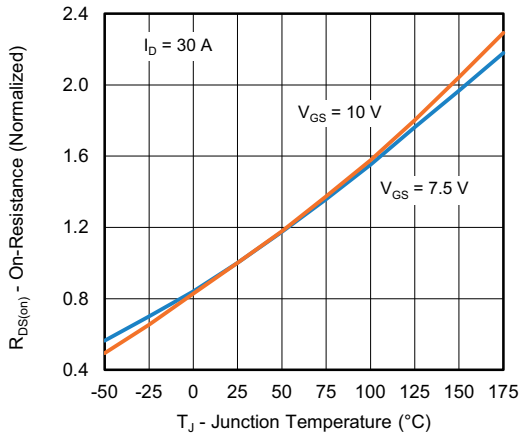
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
b. Guaranteed by design, not subject to production testing
c. Independent of operating temperature

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.

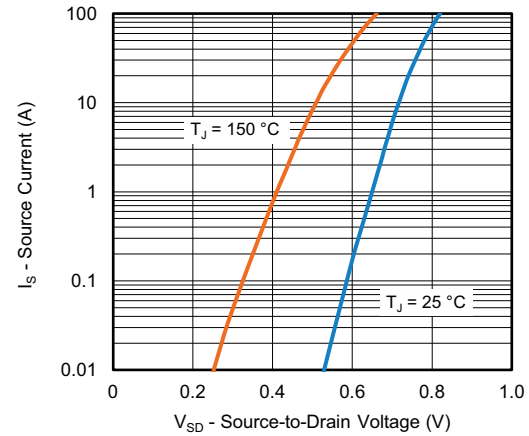
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)

Output Characteristics

Transfer Characteristics

Transconductance

On-Resistance vs. Drain Current

Capacitance

Gate Charge



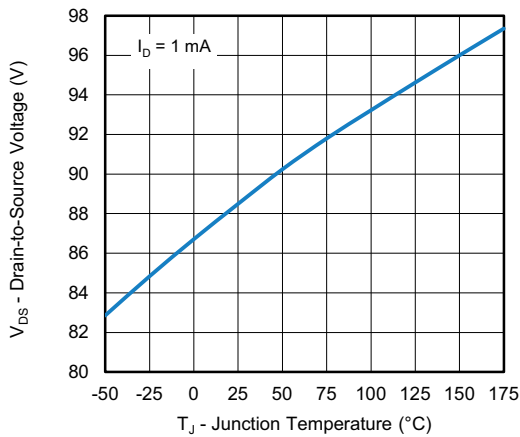
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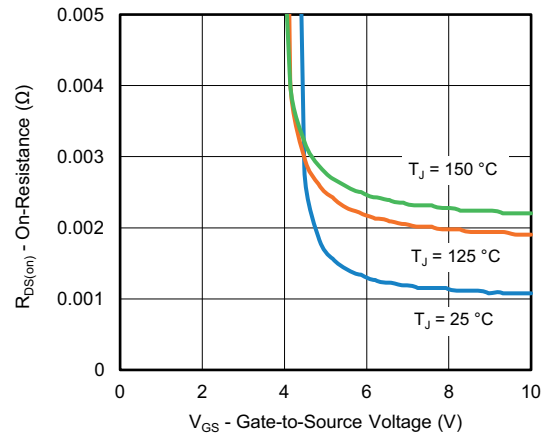
On-Resistance vs. Junction Temperature



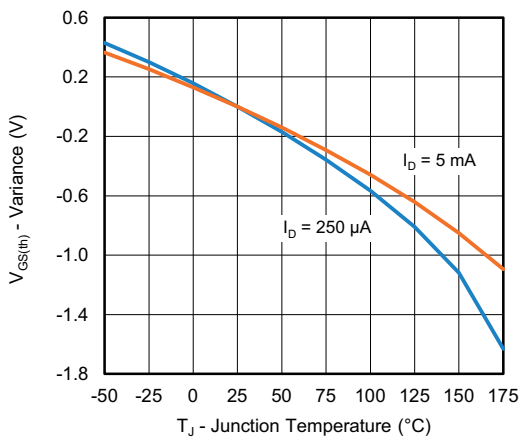
Source Drain Diode Forward Voltage



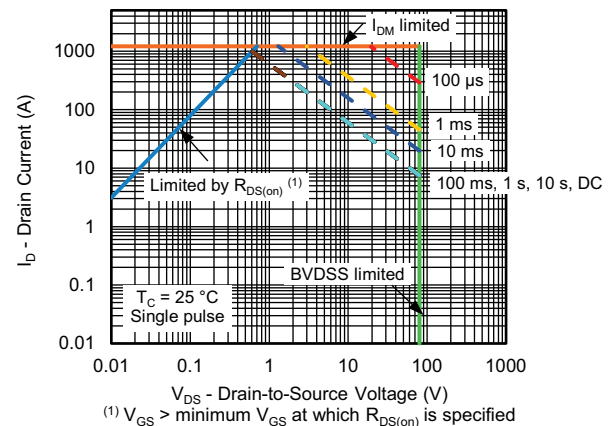
Drain Source Breakdown vs. Junction Temperature



On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



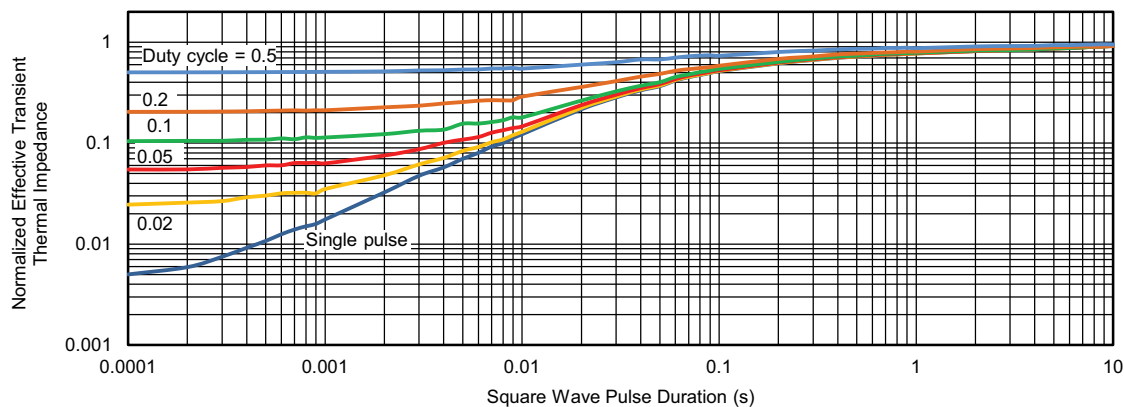
Safe Operating Area

Note

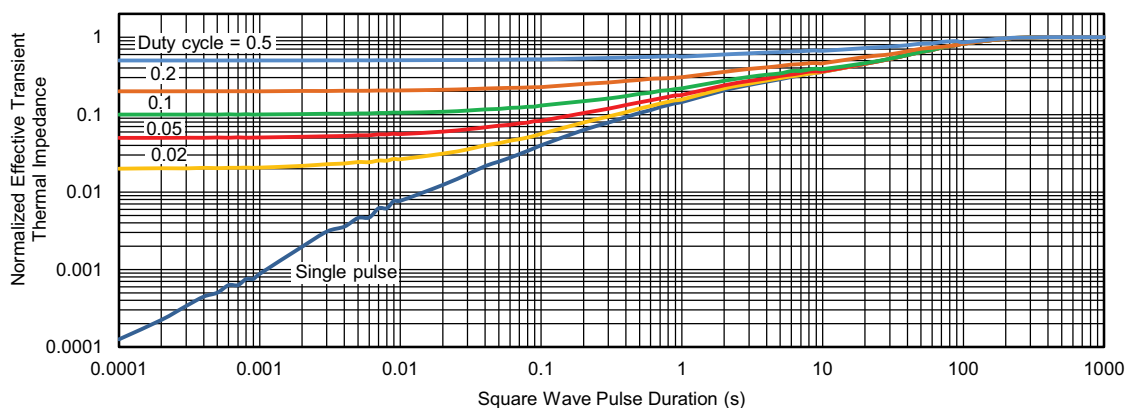
- $V_{GS} > \text{minimum } V_{GS} \text{ at which } R_{DS(on)} \text{ is specified}$



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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