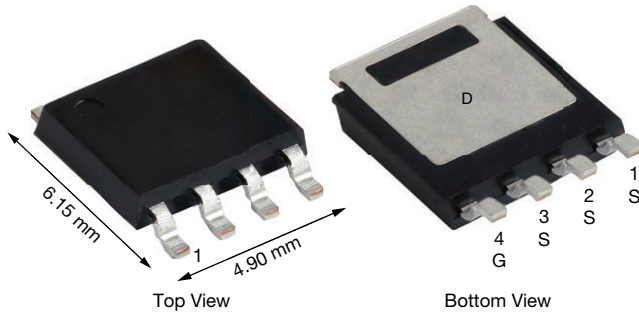
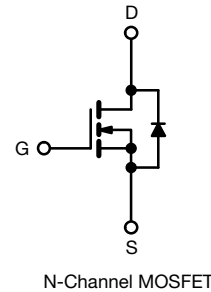


Automotive N-Channel 80 V (D-S) 175 °C MOSFET

PowerPAK® SO-8L

FEATURES

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


RoHS
 COMPLIANT
 HALOGEN
FREE


N-Channel MOSFET

PRODUCT SUMMARY	
V _{DS} (V)	80
R _{DS(on)} (Ω) at V _{GS} = 10 V	0.0075
I _D (A)	118
Configuration	Single
Package	PowerPAK SO-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	118	A
	T _C = 125 °C		68	
Continuous source current (diode conduction)		I _S	210	
Pulsed drain current		I _{DM}	240	
Single pulse avalanche current	L = 0.1 mH	I _{AS}	32	
Single pulse avalanche energy		E _{AS}	51	mJ
Maximum power dissipation	T _C = 25 °C	P _D	234	W
	T _C = 125 °C		78	
Operating junction and storage temperature range		T _J , T _{stg}	-55 to +175	°C
Soldering recommendations (peak temperature) ^b			260	

THERMAL RESISTANCE RATINGS				
PARAMETER		SYMBOL	LIMIT	UNIT
Junction-to-ambient	PCB mount ^a	R _{thJA}	42	°C/W
Junction-to-case (drain)		R _{thJC}	0.64	

Notes

- When mounted on 1" square PCB (FR4 material)
- See solder profile (www.vishay.com/doc?273257). 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



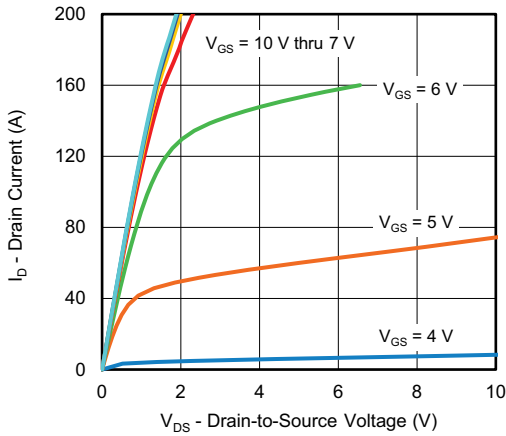
SPECIFICATIONS (T _C = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V _{DS}	V _{GS} = 0, I _D = 250 μA	80	-	-	V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2.2	2.7	3.5	
Gate-source 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	-	-	250	
On-state drain current ^a	I _{D(on)}	V _{GS} = 10 V, V _{DS} ≥ 5 V	30	-	-	A
Drain-source on-state resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 15 A	-	0.0060	0.0075	Ω
		V _{GS} = 10 V, I _D = 15 A, T _J = 125 °C	-	-	0.0124	
		V _{GS} = 10 V, I _D = 15 A, T _J = 175 °C	-	-	0.0156	
Forward transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 10 A	-	67	-	S
Dynamic ^b						
Input capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz	-	2484	3478	pF
Output capacitance	C _{oss}		-	1029	1441	
Reverse transfer capacitance	C _{rss}		-	76	107	
Total gate charge ^c	Q _g	V _{GS} = 10 V, V _{DS} = 40 V, I _D = 30 A	-	46	69	nC
Gate-source charge ^c	Q _{gs}		-	12	-	
Gate-drain charge ^c	Q _{gd}		-	13	-	
Gate resistance	R _g	f = 1 MHz	0.6	1.2	1.8	Ω
Turn-on delay time ^c	t _{d(on)}	V _{DD} = 40 V, R _L = 1.33 Ω, I _D ≅ 30 A, V _{GEN} = 10 V, R _g = 1 Ω	-	12	18	ns
Rise time ^c	t _r		-	4	6	
Turn-off delay time ^c	t _{d(off)}		-	23	35	
Fall time ^c	t _f		-	5	8	
Source-Drain Diode Ratings and Characteristics ^b						
Pulsed current ^a	I _{SM}		-	-	240	A
Forward voltage	V _{SD}	I _F = 15 A, V _{GS} = 0 V	-	-	1.1	V
Body diode reverse recovery time	t _{rr}	I _F = 10 A, di/dt = 100 A/μs	-	37	74	ns
Body diode reverse recovery charge	Q _{rr}		-	38	76	nC
Reverse recovery fall time	t _a		-	21	-	ns
Reverse recovery rise time	t _b		-	15	-	
Body diode peak reverse recovery current	I _{RM(REC)}			-	-2.0	-

Notes

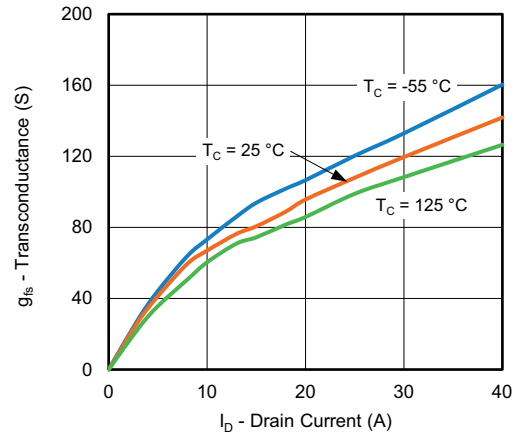
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %
- Guaranteed by design, not subject to production testing
- Independent of operating temperature

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.

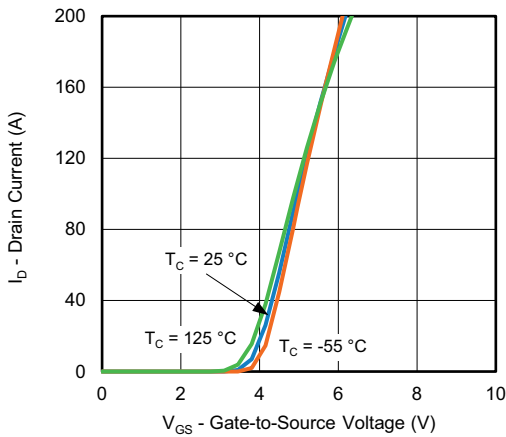
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



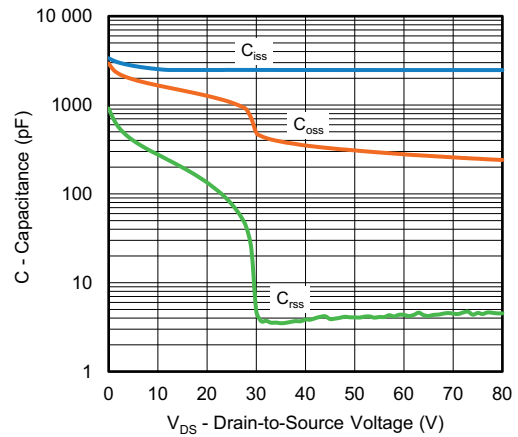
Output Characteristics



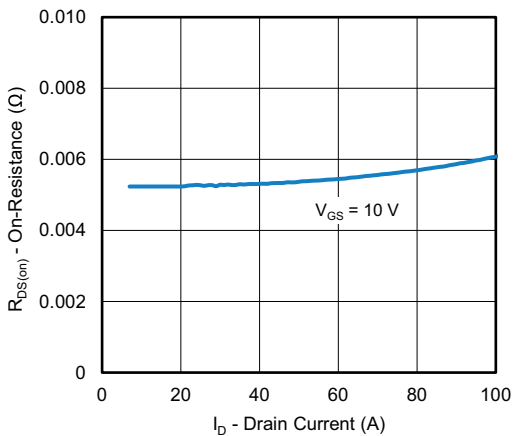
Transconductance



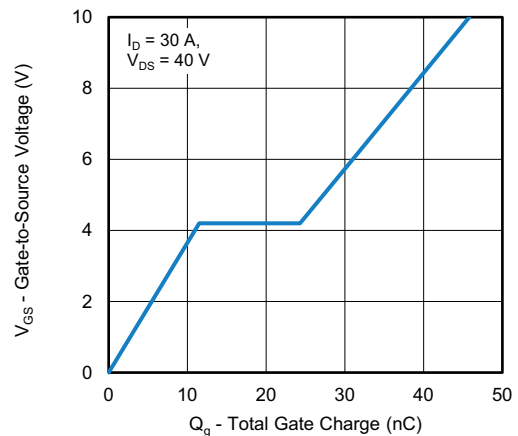
Transfer Characteristics



Capacitance



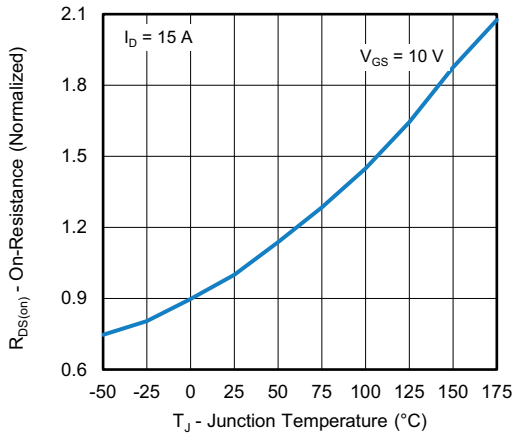
On-Resistance vs. Drain Current



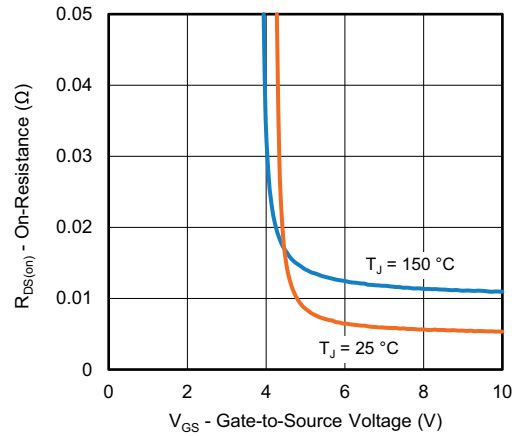
Gate Charge



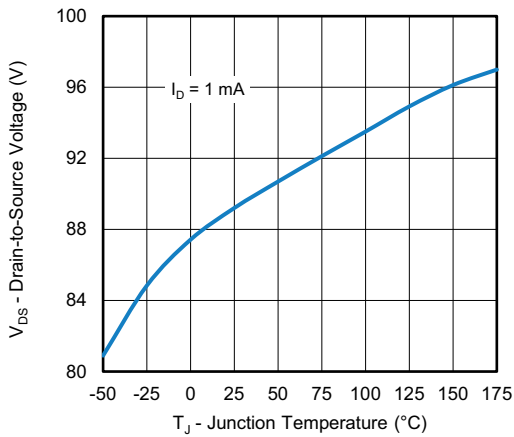
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



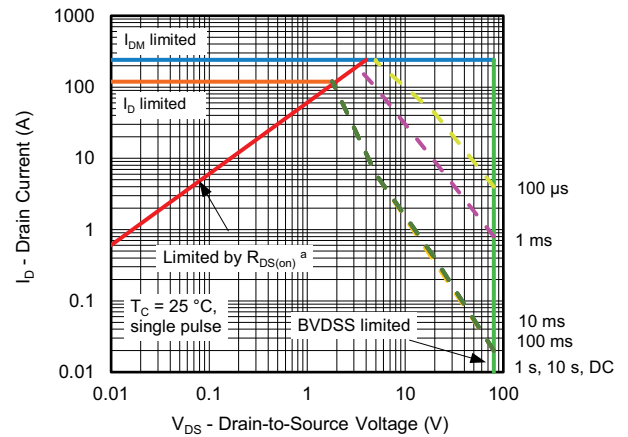
On-Resistance vs. Junction Temperature



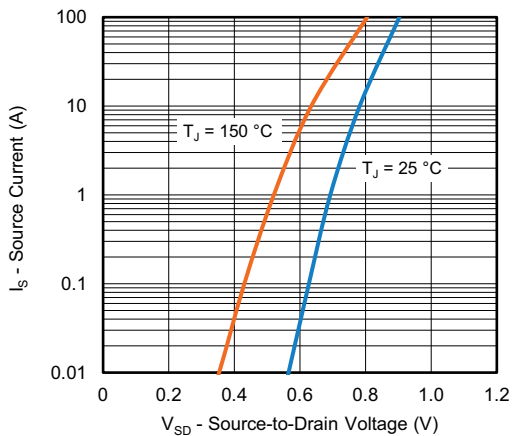
On-Resistance vs. Gate to Source Voltage



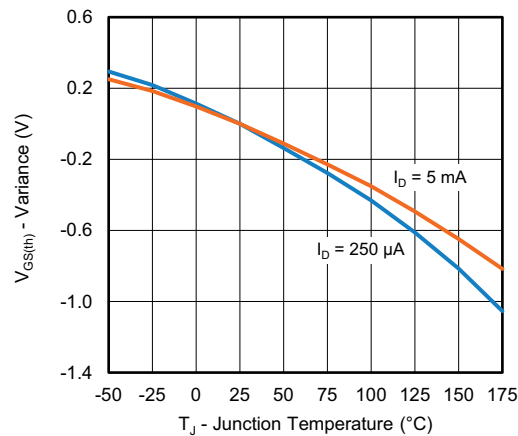
Drain Source Breakdown vs. Junction Temperature



Safe Operating Area



Source Drain Diode Forward Voltage



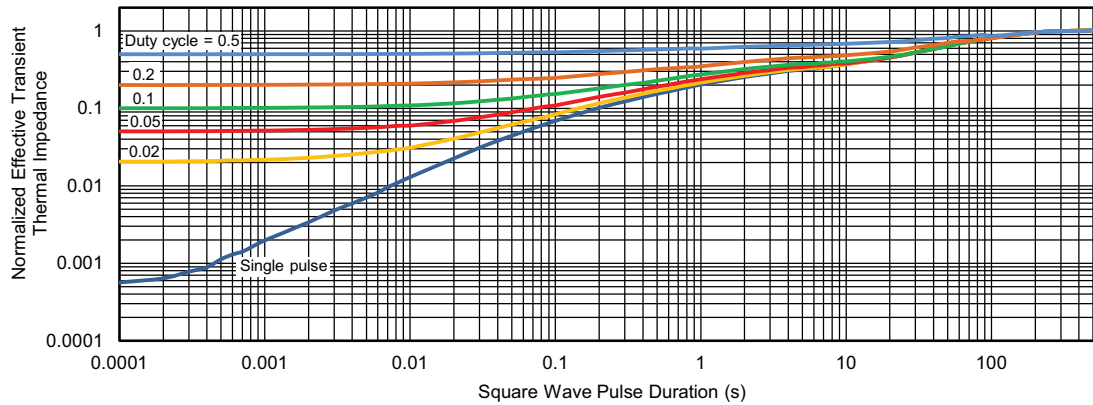
Threshold Voltage

Note

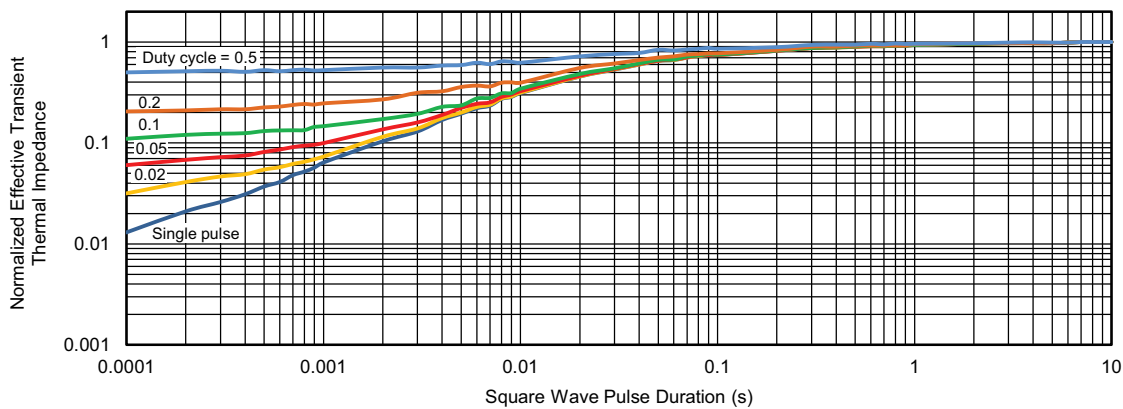
a. V_{GS} > minimum V_{GS} at which R_{DS(on)} is specified



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



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

Note

- The characteristics shown in the two graphs
 - Normalized Transient Thermal Impedance Junction-to-Ambient (25 °C)
 - Normalized Transient Thermal Impedance Junction-to-Case (25 °C)
 are given for general guidelines only to enable the user to get a “ball park” indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions

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