

N-Channel 80 V (D-S) MOSFET



PRODUCT SUMMARY				
V _{DS} (V)	80			
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 10 \text{ V}$	0.010			
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 7.5 \text{ V}$	0.0157			
Q _g typ. (nC)	9.2			
I _D (A) ^a	51			
Configuration	Single			

FEATURES

- TrenchFET® Gen V power MOSFET
- Very low R_{DS} x Q_g figure-of-merit (FOM)
- Tuned for the lowest R_{DS} x Q_{oss} FOM

• 100 % R_a and UIS tested

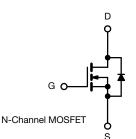
· Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



COMPLIANT HALOGEN **FREE**



- · Synchronous rectification
- · Primary side switch
- DC/DC converters
- · OR-ing and hot swap switch
- Power supplies
- Motor drive control
- · Battery management



ORDERING INFORMATION	
Package	PowerPAK 1212-8S
Lead (Pb)-free and halogen-free	SiSS5810DN-T1-GE3

PARAMETER		SYMBOL	LIMIT	UNIT	
Drain-source voltage		V _{DS}	80	V	
Gate-source voltage		V _{GS}	± 20	v	
Continuous drain current (T _J = 150 °C)	T _C = 25 °C		51		
	T _C = 70 °C		40.8		
	T _A = 25 °C	I _D	13.9 ^{b, c}		
	T _A = 70 °C		11.1 ^{b, c}		
Pulsed drain current (t = 100 μs)		I _{DM}	100	A	
Continuous source-drain diode current	T _C = 25 °C		47.3		
	T _A = 25 °C	Is	3.5 b, c		
Single pulse avalanche current	L = 0.1 mH	I _{AS}	20		
Single pulse avalanche energy	L = U.1 MH	E _{AS}	20	mJ	
Maximum power dissipation	T _C = 25 °C		52		
	T _C = 70 °C		33.3		
	T _A = 25 °C	P _D	3.9 ^{b, c}	W	
	T _A = 70 °C		2.5 ^{b, c}		
Operating junction and storage temperature range		T _J , T _{stg}	-55 to +150	°C	
Soldering recommendations (peak temperature) d, e			260		

THERMAL RESISTANCE RATINGS							
PARAMETER	SYMBOL	TYPICAL	MAXIMUM	UNIT			
Maximum junction-to-ambient ^b	t ≤ 10 s	R _{thJA}	23	32	°C/W		
Maximum junction-to-case (drain)	Steady state	R _{thJC}	1.9	2.4	- C/VV		

Notes

- a. $T_C = 25 \,^{\circ}C$
- b. Surface mounted on 1" x 1" FR4 board
- t = 10 s
- See solder profile (www.vishay.com/doc?73257). The PowerPAK 1212-8S 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 Maximum under steady state conditions is 81 °C/W



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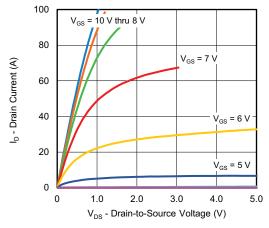
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Static						•	
Drain-source breakdown voltage	V_{DS}	$V_{GS} = 0 \text{ V}, I_{D} = 1 \text{ mA}$	80	-	-	V	
V _{DS} temperature coefficient	$\Delta V_{DS}/T_{J}$	I _D = 10 mA	-	47	-	14/00	
V _{GS(th)} temperature coefficient	$\Delta V_{GS(th)}/T_J$	I _D = 250 μA	-	-8.9	-	mV/°C	
Gate-source threshold voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_D = 250 \mu A$	2	-	4	V	
Gate-source leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$	-	-	± 100	nA	
-		V _{DS} = 64 V, V _{GS} = 0 V	-	-	1		
Zero gate voltage drain current	I _{DSS}	V _{DS} = 64 V, V _{GS} = 0 V, T _J = 70 °C	-	-	10	μA	
	_	$V_{GS} = 10 \text{ V}, I_D = 10 \text{ A}$	-	0.0082	0.010	Ω	
Drain-source on-state resistance a	R _{DS(on)}	V _{GS} = 7.5 V, I _D = 10 A	-	0.0121	0.0157		
Forward transconductance a	9 _{fs}	V _{DS} = 10 V, I _D = 10 A	-	15	-	S	
Dynamic ^b				L	L	I	
Input capacitance	C _{iss}	V _{DS} = 40 V, V _{GS} = 0 V, f = 1 MHz	-	900	-	pF	
Output capacitance	Coss		-	380	-		
Reverse transfer capacitance	C _{rss}		-	7.2	-		
	_	$V_{DS} = 40 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 10 \text{ A}$	-	12.2	18.5	nC	
Total gate charge	Q _g	$V_{DS} = 40 \text{ V}, V_{GS} = 7.5 \text{ V}, I_D = 10 \text{ A}$	-	9.2	14.0		
Gate-source charge	Q _{gs}		-	5.8	-		
Gate-drain charge	Q _{gd}		-	1.5	-		
Output charge	Q _{oss}	V _{DS} = 40 V, V _{GS} = 0 V	-	38	-		
Gate resistance	R _q	f = 1 MHz	0.5	1.2	2.1	Ω	
Turn-on delay time	t _{d(on)}	$V_{DD} = 40 \text{ V}, \text{ R}_L = 4 \Omega$ $I_D \cong 10 \text{ A}, \text{ V}_{GEN} = 10 \text{ V}, \text{ R}_g = 1 \Omega$	-	10	20		
Rise time	t _r		-	4	8		
Turn-off delay time	t _{d(off)}		-	12	24		
Fall time	t _f		-	5	10		
Turn-on delay time	t _{d(on)}		-	12	24	ns	
Rise time	t _r	$\begin{aligned} V_{DD} &= 40 \text{ V}, \text{ R}_L = 4 \Omega \\ I_D &\cong 10 \text{ A}, V_{GEN} = 7.5 \text{ V}, \text{ R}_g = 1 \Omega \end{aligned}$	-	5	10		
Turn-off delay time	t _{d(off)}		-	12	24		
Fall time	t _f		-	6	12		
Drain-Source Body Diode Characteristic	s				l	·	
Continuous source-drain diode current	Is	T _C = 25 °C	-	-	47.3		
Pulse diode forward current (t _p = 100 μs)	I _{SM}		-	-	100	Α	
Body diode voltage	V _{SD}	I _S = 5 A	-	0.8	1.1	V	
Body diode reverse recovery time	t _{rr}		-	44	88	ns	
Body diode reverse recovery charge	Q _{rr}	$I_F = 10 \text{ A}, \text{ di/dt} = 100 \text{ A/}\mu\text{s},$	-	40	80	nC	
Reverse recovery fall time	ta	$T_J = 25 ^{\circ}\text{C}$	-	20	-	ns	
Reverse recovery rise time	t _b		-	24	-		

Notes

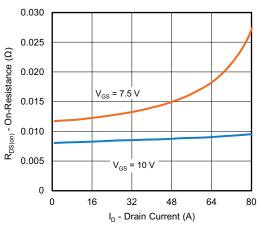
- a. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%$
- b. Guaranteed by design, not subject to production testing

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.

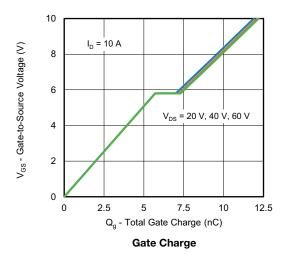


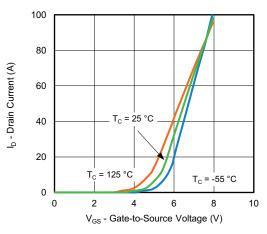


Output Characteristics

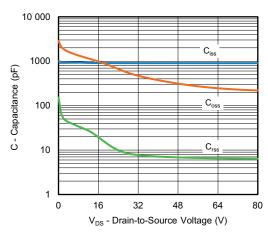


On-Resistance vs. Drain Current

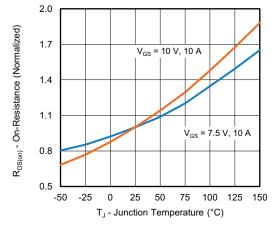




Transfer Characteristics

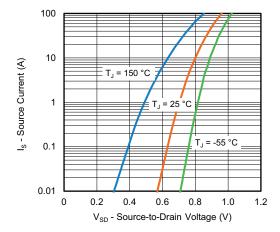


Capacitance

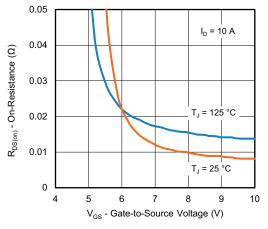


On-Resistance vs. Junction Temperature

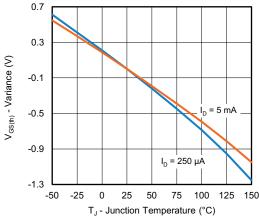




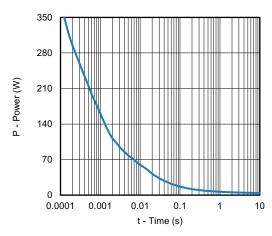
Source-Drain Diode Forward Voltage



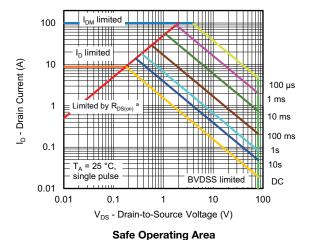
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



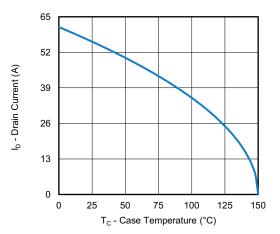
Single Pulse Power, Junction-to-Ambient



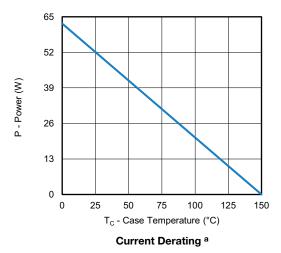
Note

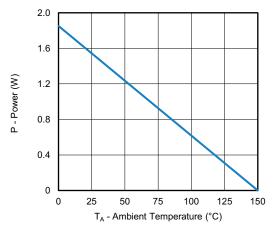
a. $V_{GS} > minimum V_{GS}$ at which $R_{DS(on)}$ is specified





Power, Junction-to-Case



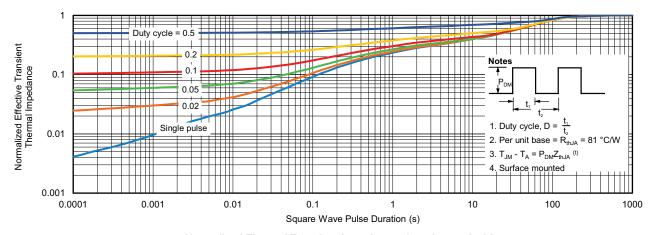


Power, Junction-to-Ambient

Note

a. The power dissipation P_D is based on T_J max. = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit





Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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