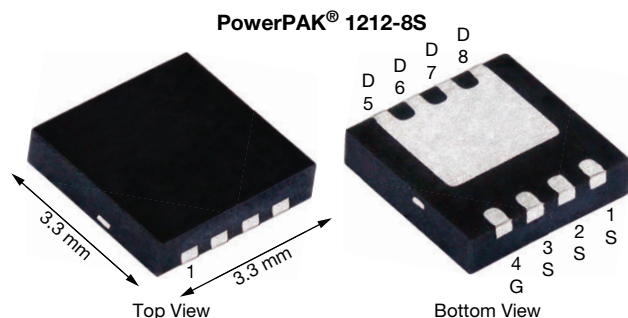


N-Channel 30 V (D-S) MOSFET



PRODUCT SUMMARY	
V_{DS} (V)	30
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 10$ V	0.00120
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 4.5$ V	0.00185
Q_g typ. (nC)	28.7
I_D (A)	80 ^{a, g}
Configuration	Single

ORDERING INFORMATION	
Package	PowerPAK 1212-8S
Lead (Pb)-free and halogen-free	SiSS04DN-T1-GE3

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)				
PARAMETER	SYMBOL	LIMIT	UNIT	
Drain-source voltage	V_{DS}	30	V	
Gate-source voltage	V_{GS}	+16 / -12	V	
Continuous drain current ($T_J = 150$ °C)	$T_C = 25$ °C	80 ^a	A	
	$T_C = 70$ °C	80 ^a		
	$T_A = 25$ °C	50.5 ^{b, c}		
	$T_A = 70$ °C	40.3 ^{b, c}		
Pulsed drain current ($t = 100$ μ s)	I_{DM}	300	A	
Continuous source-drain diode current	$T_C = 25$ °C	59.7	A	
	$T_A = 25$ °C	4.5 ^{b, c}		
Single pulse avalanche current	$L = 0.1$ mH	30	mJ	
Single pulse avalanche energy	E_{AS}	45		
Maximum power dissipation	$T_C = 25$ °C	65.7	W	
	$T_C = 70$ °C	42		
	$T_A = 25$ °C	5 ^{b, c}		
	$T_A = 70$ °C	3.2 ^{b, c}		
Operating junction and storage temperature range	T_J, T_{stg}	-55 to +150	°C	
Soldering recommendations (peak temperature) ^c		260		

THERMAL RESISTANCE RATINGS				
PARAMETER	SYMBOL	TYPICAL	MAXIMUM	UNIT
Maximum junction-to-ambient ^b	$t \leq 10$ s	R_{thJA}	20	°C/W
Maximum junction-to-case (drain)	Steady state	R_{thJC}	1.5	°C/W

Notes

- Package limited
- 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 63 °C/W
- $T_C = 25$ °C

FEATURES

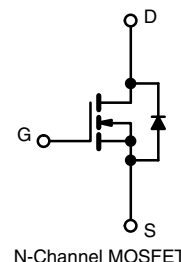
- TrenchFET® Gen IV power MOSFET
- Very low $R_{DS(on)}$ in a compact and thermally enhanced package
- Optimized Q_g , Q_{gd} , and Q_{gd}/Q_{gs} ratio reduces switching related power loss
- 100 % R_g and UIS tested
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Synchronous rectification
- Synchronous buck converter
- High power density DC/DC
- OR-ing
- Load switching



N-Channel MOSFET

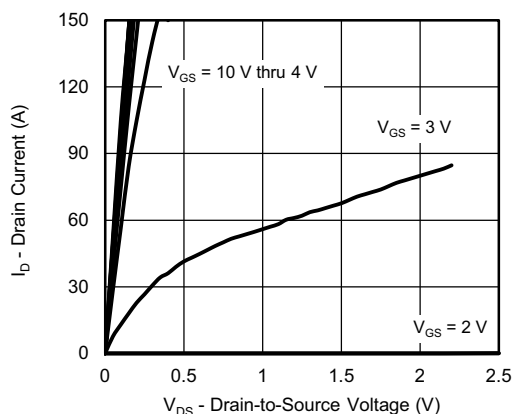
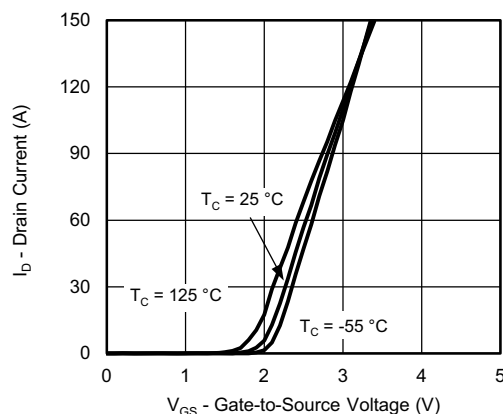
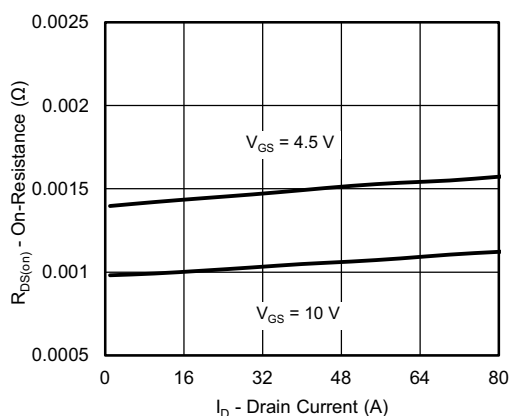
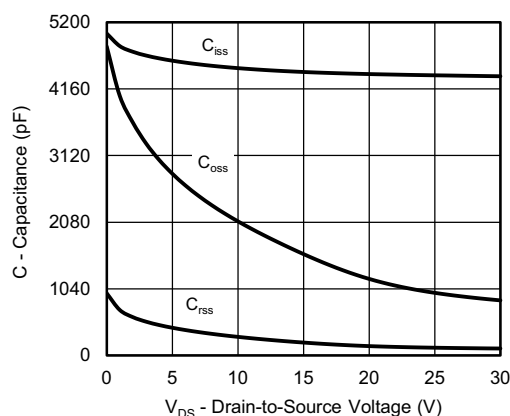
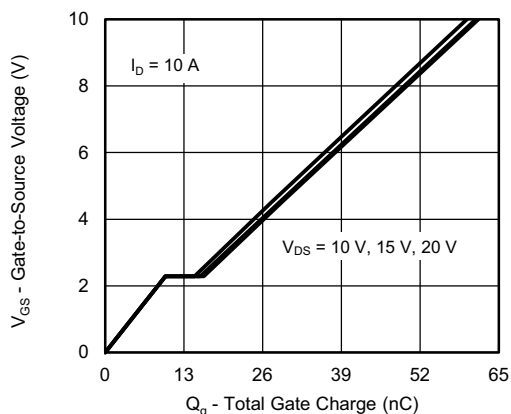
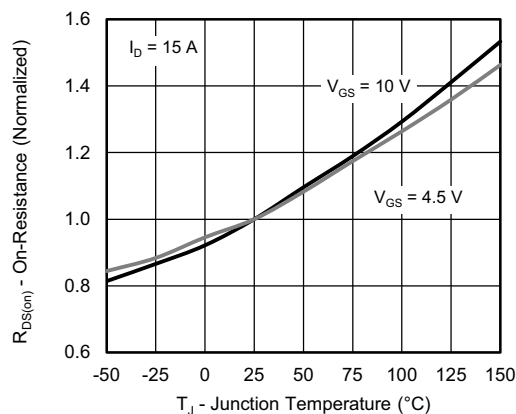


SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	30	-	-	V
V _{DS} temperature coefficient	ΔV _{DS} /T _J	I _D = 10 mA	-	17	-	mV/°C
V _{GS(th)} temperature coefficient	ΔV _{GS(th)} /T _J	I _D = 250 μA	-	-4.4	-	
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1	-	2.2	V
Gate-source leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = +16 / -12 V	-	-	100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V	-	-	1	μA
		V _{DS} = 30 V, V _{GS} = 0 V, T _J = 70 °C	-	-	15	
On-state drain current ^a	I _{D(on)}	V _{DS} ≥ 10 V, V _{GS} = 10 V	30	-	-	A
Drain-source on-state resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 15 A	-	0.00100	0.00120	Ω
		V _{GS} = 4.5 V, I _D = 10 A	-	0.00145	0.00185	
Forward transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 15 A	-	95	-	S
Dynamic ^b						
Input capacitance	C _{iss}	V _{DS} = 15 V, V _{GS} = 0 V, f = 1 MHz	-	4460	-	pF
Output capacitance	C _{oss}		-	1615	-	
Reverse transfer capacitance	C _{rss}		-	202	-	
Total gate charge	Q _g	V _{DS} = 15 V, V _{GS} = 10 V, I _D =10 A	-	61.5	93	nC
		V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 10 A	-	28.7	44	
Gate-source charge	Q _{gs}		-	10	-	
Gate-drain charge	Q _{gd}	-	5.8	-		
Gate resistance	R _g	f = 1 MHz	0.2	0.7	1.3	Ω
Turn-on delay time	t _{d(on)}	V _{DD} = 15 V, R _L = 1.5 Ω, I _D ≅ 10 A, V _{GEN} = 10 V, R _g = 1 Ω	-	12	24	ns
Rise time	t _r		-	21	42	
Turn-off delay time	t _{d(off)}		-	26	52	
Fall time	t _f		-	10	20	
Turn-on delay time	t _{d(on)}	V _{DD} = 15 V, R _L = 1.5 Ω, I _D ≅ 10 A, V _{GEN} = 4.5 V, R _g = 1 Ω	-	25	50	
Rise time	t _r		-	39	78	
Turn-off delay time	t _{d(off)}		-	30	60	
Fall time	t _f		-	21	42	
Drain-Source Body Diode Characteristics						
Continuous source-drain diode current	I _S	T _C = 25 °C	-	-	59.7	A
Pulse diode forward current	I _{SM}		-	-	300	
Body diode voltage	V _{SD}	I _S = 5 A, V _{GS} = 0 V	-	0.72	1.1	V
Body diode reverse recovery time	t _{rr}	I _F = 15 A, di/dt = 100 A/μs, T _J = 25 °C	-	56	112	ns
Body diode reverse recovery charge	Q _{rr}		-	66	132	nC
Reverse recovery fall time	t _a		-	25	-	ns
Reverse recovery rise time	t _b		-	31	-	

Notes

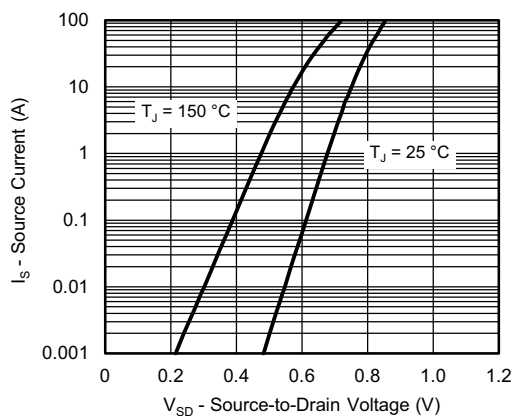
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
b. Guaranteed by design, not subject to production testing

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.

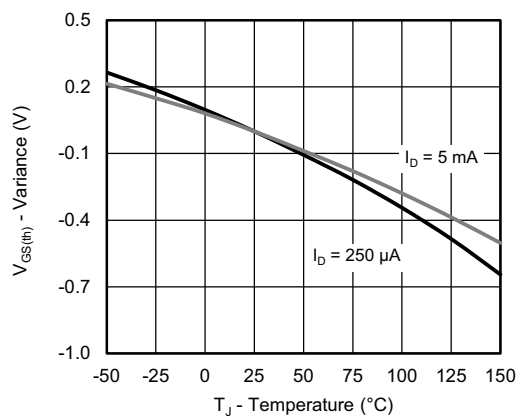
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Output Characteristics

Transfer Characteristics

On-Resistance vs. Drain Current and Gate Voltage

Capacitance

Gate Charge

On-Resistance vs. Junction Temperature



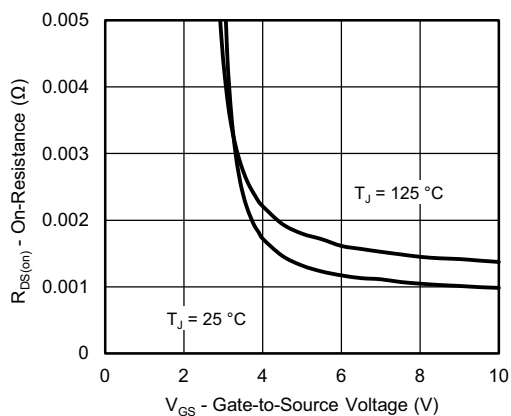
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



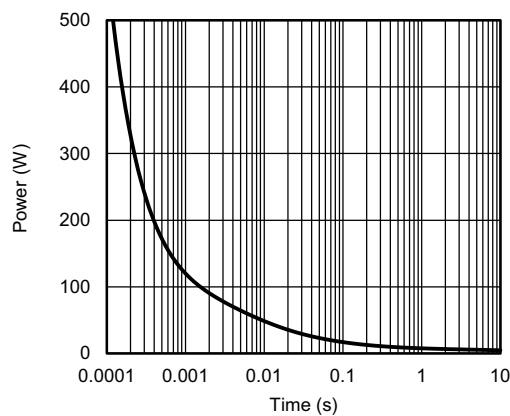
Source-Drain Diode Forward Voltage



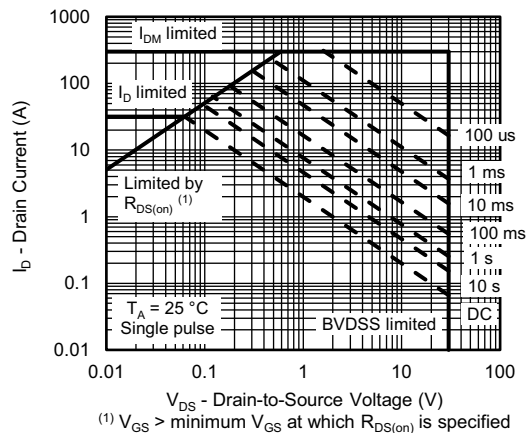
Threshold Voltage



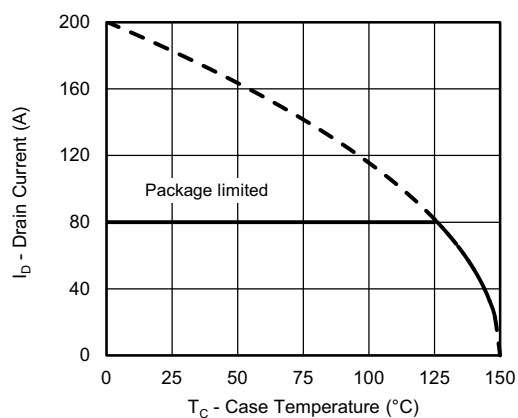
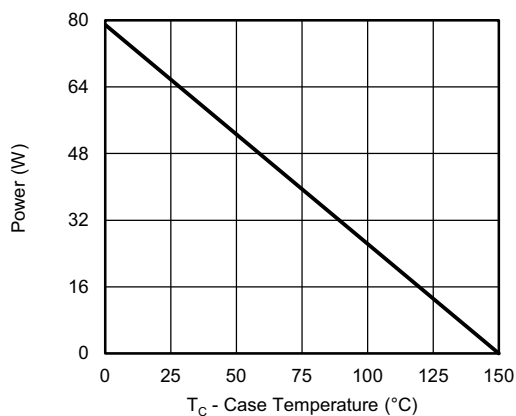
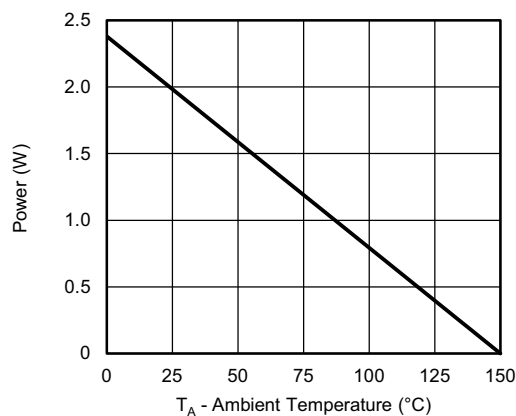
On-Resistance vs. Gate-to-Source Voltage



Single Pulse Power, Junction-to-Ambient



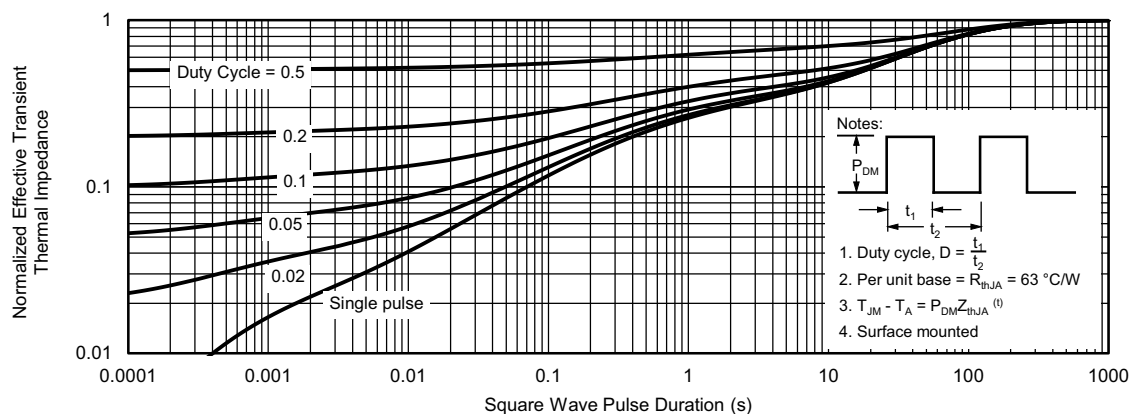
Safe Operating Area, Junction-to-Ambient

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Current Derating ^a

Power, Junction-to-Case (Drain)

Power, Junction-to-Ambient
Note

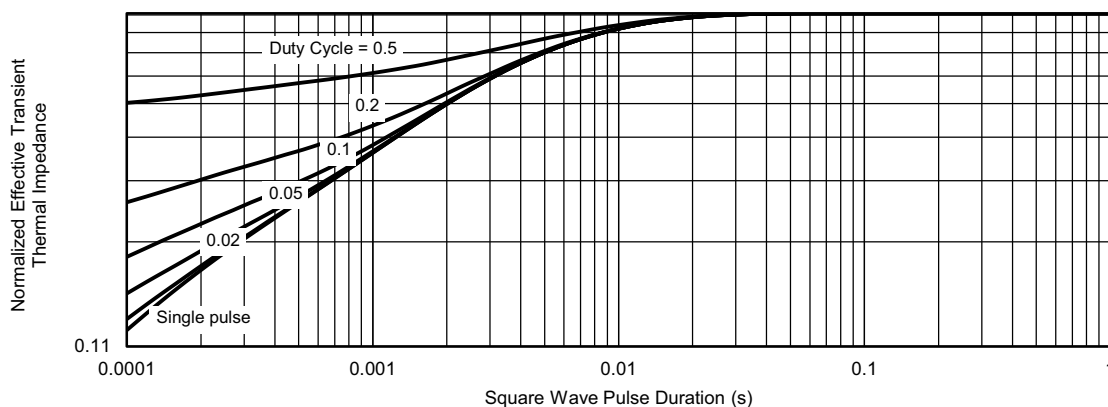
- a. The power dissipation P_D is based on T_J max. = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case (Drain)

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Case Outline for PowerPAK® 1212-8S



DIM.	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.67	0.75	0.83	0.027	0.030	0.033
A1	0	-	0.05	0	-	0.002
A3	0.20 REF			0.008 REF		
b	0.30 BSC			0.012 BSC		
D	3.30 BSC			0.130 BSC		
D1	2.15	2.25	2.35	0.084	0.088	0.092
E	3.30 BSC			0.130 BSC		
E1	1.60	1.70	1.80	0.063	0.067	0.071
e	0.65 BSC			0.026 BSC		
K	0.76 TYP			0.030 TYP		
K1	0.41 TYP			0.016 TYP		
L	0.43 BSC			0.017 BSC		
z	0.525 TYP			0.021 TYP		
ECN: C12-0200-Rev. A, 12-Mar-12 DWG: 6008						

Note

- Millimeters will govern.

RECOMMENDED MINIMUM PADS FOR PowerPAK® 1212-8 Single



Recommended Minimum Pads
Dimensions in Inches/(mm)

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