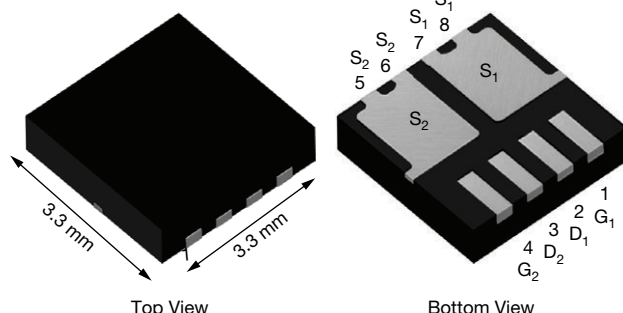


Common - Drain Dual N-Channel 30 V (S1-S2) MOSFET

PowerPAK® 1212-8SCD


FEATURES

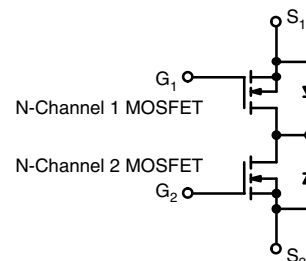
- TrenchFET® Gen IV power MOSFET
- Very low source-to-source on resistance
- Integrated common-drain n-channel MOSFETs in a compact and thermally enhanced package
- 100 % R_g and UIS tested
- Optimizes circuit layout for bi-directional current flow
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Battery management
- Load switching



PRODUCT SUMMARY

V_{S1S2} (V)	30
$R_{S1S2(on)}$ max. (Ω) at $V_{GS} = 10$ V	0.005
$R_{S1S2(on)}$ max. (Ω) at $V_{GS} = 4.5$ V	0.007
Q_g typ. (nC)	16.1 ^h
I_{S1S2} (A)	60 ^{a, g}
Configuration	Dual

ORDERING INFORMATION

Package	PowerPAK 1212-8SCD
Lead (Pb)-free and halogen-free	SiSF00DN-T1-GE3

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-source voltage	V_{S1S2}	30	V
Gate-source voltage	V_{GS}	+20 / -16	
Continuous drain current ($T_J = 150$ °C)	I_{S1S2}	60 ^a	A
		60 ^a	
		25.5 ^{b, c}	
		20.4 ^{b, c}	
Pulsed drain current ($t = 100$ μ s)	I_{S1S2M}	120	
Maximum power dissipation	P_{S1S2}	69.4	W
		44.4	
		5.2 ^{b, c}	
		3.3 ^{b, c}	
Operating junction and storage temperature range	T_J, T_{stg}	-55 to +150	°C
Soldering recommendations (peak temperature) °		260	

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	TYPICAL	MAXIMUM	UNIT
Maximum junction-to-ambient ^b	R_{thJA}	19	24	°C/W
Maximum junction-to-case (drain)	R_{thJC}	1.4	1.8	

Notes

- Package limited
- Surface mounted on 1" x 1" FR4 board
- $t = 10$ s
- See solder profile (www.vishay.com/doc?73257). The PowerPAK 1212-8SCD 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
- Single 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
Gate-source threshold voltage	V _{GS(th)}	V _{S1S2} = V _{GS} , I _D = 250 μA	1	-	2.1	
Gate-source leakage	I _{GSS}	V _{S1S2} = 0 V, V _{GS} = +20 / -16 V	-	-	100	nA
Zero gate voltage drain current	I _{DSS}	V _{S1S2} = 30 V, V _{GS} = 0 V	-	-	1	μA
		V _{S1S2} = 30 V, V _{GS} = 0 V, T _J = 70 °C	-	-	15	
On-state drain current ^a	I _{S1S2(on)}	V _{S1S2} ≥ 10 V, V _{GS} = 10 V	20	-	-	A
Drain-source on-state resistance ^a	R _{S1S2(on)}	V _{GS} = 10 V, I _{S1S2} = 10 A	-	0.0042	0.0050	Ω
		V _{GS} = 4.5 V, I _{S1S2} = 5 A	-	0.0056	0.0070	
Forward transconductance ^a	g _{fs}	V _{S1S2} = 15 V, I _{S1S2} = 20 A	-	130	-	S
Dynamic ^{b, c}						
Input capacitance	C _{iss}	V _{DS} = 15 V, V _{GS} = 0 V, f = 1 MHz	-	2700	-	pF
Output capacitance	C _{oss}		-	865	-	
Reverse transfer capacitance	C _{rss}		-	51	-	
Total gate charge	Q _g	V _{DS} = 15 V, V _{GS} = 10 V, I _D =10 A	-	35	53	nC
		V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 10 A	-	16.1	24.2	
Q _{gs}	-		7	-		
Q _{gd}	-		2.5	-		
Gate resistance	R _g	f = 1 MHz	0.3	1.5	3	Ω
Turn-on delay time	t _{d(on)}	V _{DD} = 15 V, R _L = 1 Ω, I _{S1S2} ≅ 10 A, V _{GEN} = 10 V, R _g = 1 Ω	-	10	20	ns
Rise time	t _r		-	32	65	
Turn-off delay time	t _{d(off)}		-	22	45	
Fall time	t _f		-	10	20	
Turn-on delay time	t _{d(on)}	V _{DD} = 15 V, R _L = 1 Ω, I _D ≅ 10 A, V _{GEN} = 4.5 V, R _g = 1 Ω	-	21	45	
Rise time	t _r		-	60	120	
Turn-off delay time	t _{d(off)}		-	25	50	
Fall time	t _f		-	15	30	
Drain-Source Body Diode Characteristics ^c						
Continuous source-drain diode current	I _{S1S2}	T _C = 25 °C	-	-	60	A
Pulse diode forward current	I _{S1S2M}		-	-	120	
Body diode reverse recovery time	t _{rr}	I _F = 10 A, di/dt = 100 A/μs, T _J = 25 °C	-	42	85	ns
Body diode reverse recovery charge	Q _{rr}		-	42	85	nC
Reverse recovery fall time	t _a		-	23	-	ns
Reverse recovery rise time	t _b		-	19	-	

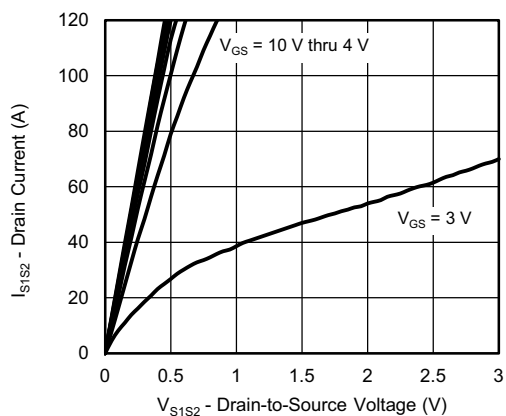
Notes

- 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. On single MOSFET

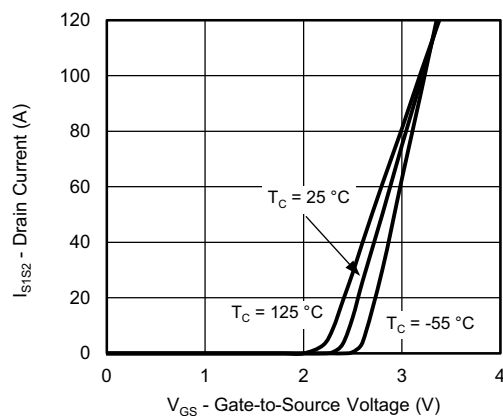
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



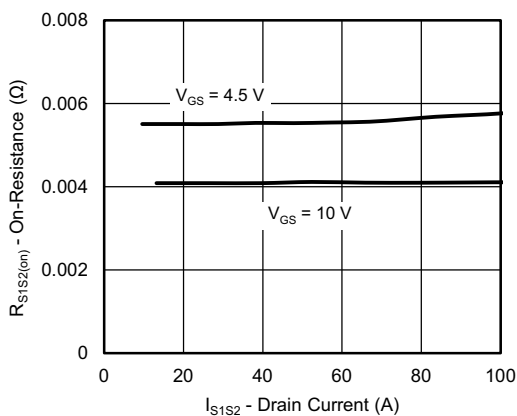
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



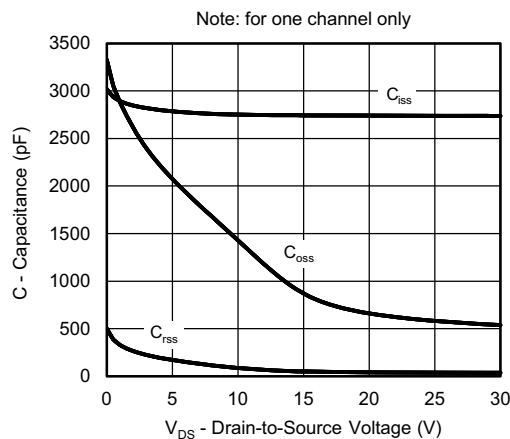
Output Characteristics



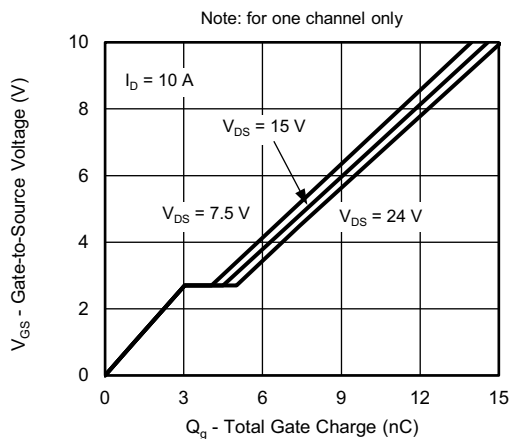
Transfer Characteristics



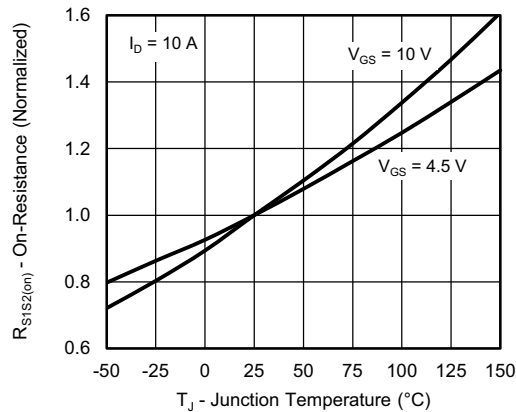
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



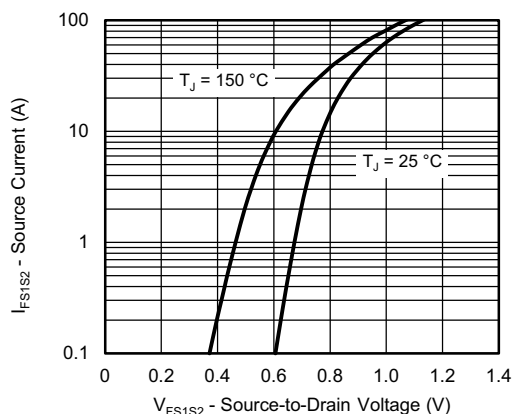
Gate Charge



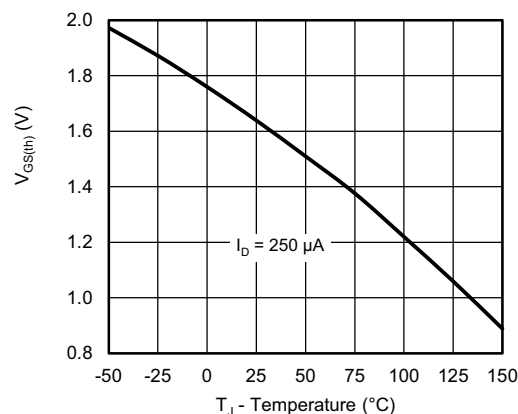
On-Resistance vs. Junction Temperature



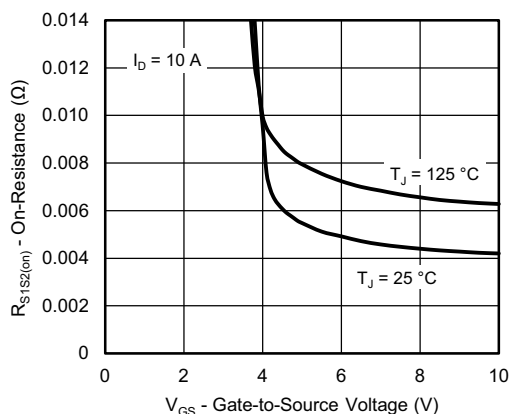
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



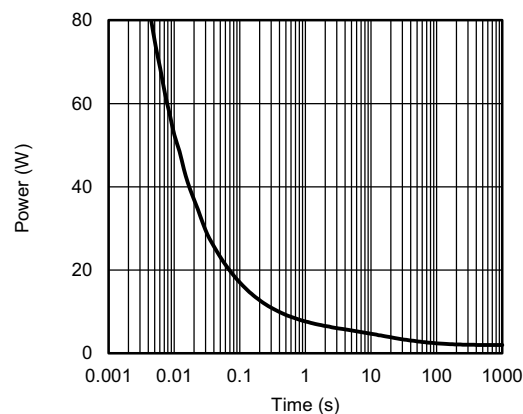
Source-Drain Diode Forward Voltage



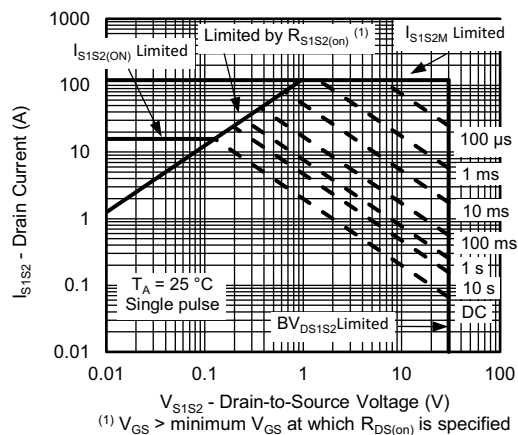
Threshold Voltage



On-Resistance vs. Gate-to-Source Voltage



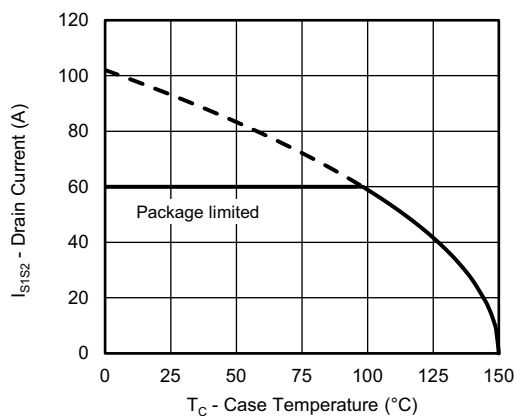
Single Pulse Power, Junction-to-Ambient



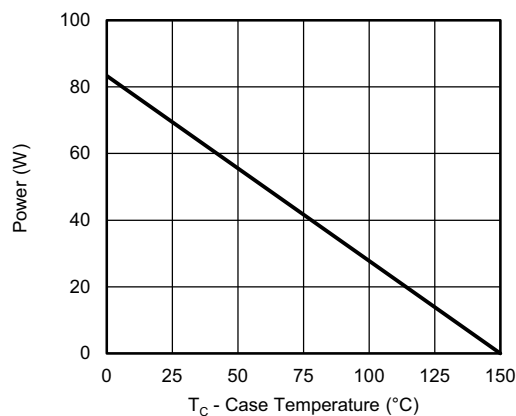
Safe Operating Area, Junction-to-Ambient



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



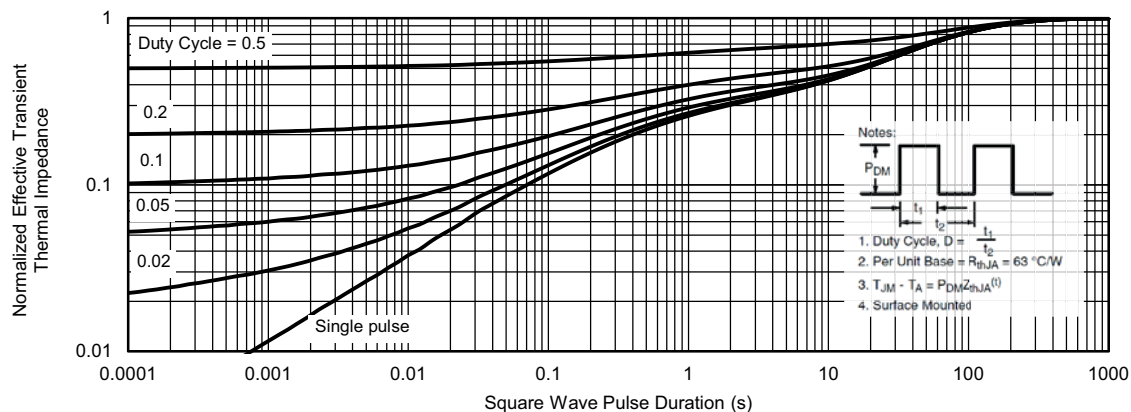
Current Derating ^a



Power, Junction-to-Case (Drain)

Note

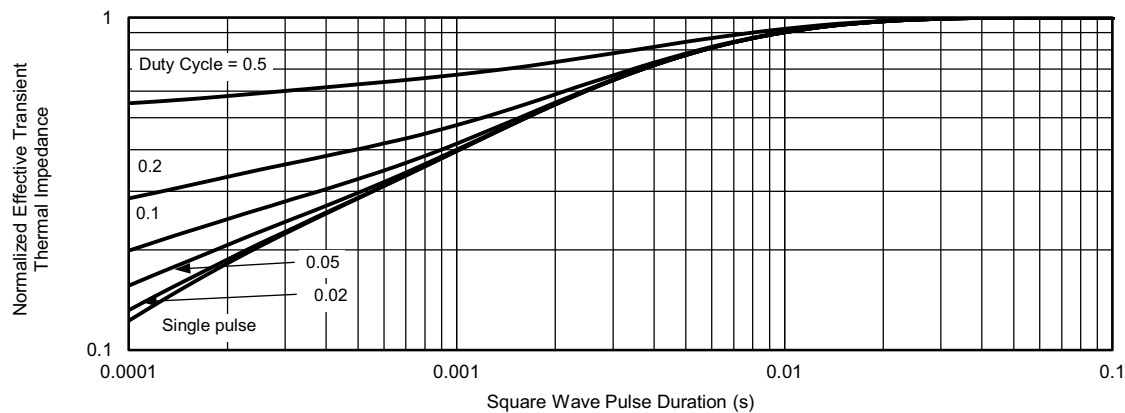
- a. The power dissipation P_D is based on T_J max. = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit



Normalized Thermal Transient Impedance, Junction-to-Ambient



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



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

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