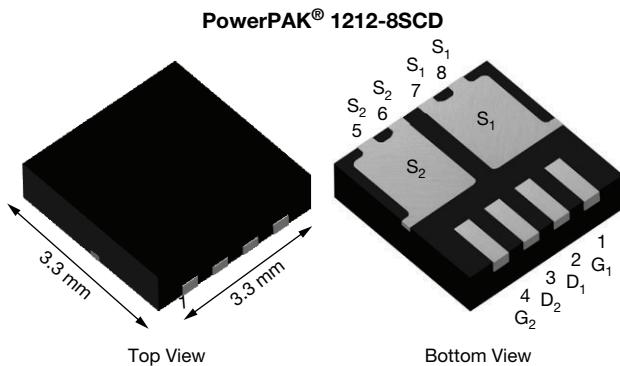


Common Drain Dual N-Channel 30 V (S1-S2) MOSFET



PRODUCT SUMMARY	
V_{S1S2} (V)	30
$R_{S1S2(on)}$ max. (Ω) at $V_{GS} = 10$ V	0.0031
$R_{S1S2(on)}$ max. (Ω) at $V_{GS} = 4.5$ V	0.0049
Q_g typ. (nC) ^g	12
I_{S1S2} (A) ^a	118
Configuration	Common drain

ORDERING INFORMATION	
Package	PowerPAK 1212-8SCD
Lead (Pb)-free and halogen-free	SiSF54DN-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}	+16 / -12	
Continuous drain current ($T_J = 150$ °C)	I_{S1S2}	118	A
		95	
		32 b, c	
		26 b, c	
Pulsed drain current ($t = 100$ µs, $V_{GS} = 10$ V)	I_{S1S2M}	250	
Maximum power dissipation	P_D	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) ^c		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)	Steady state	R_{thJC}	1.4	1.8

Notes

- $T_C = 25$ °C
- 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
- Single MOSFET



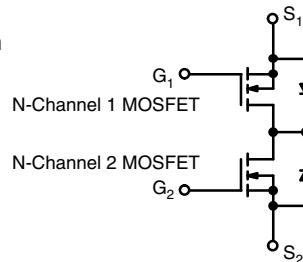
RoHS
COMPLIANT
HALOGEN
FREE

FEATURES

- TrenchFET® Gen V 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

APPLICATIONS

- Battery protection switch
- Bi-directional switch
- Load switch

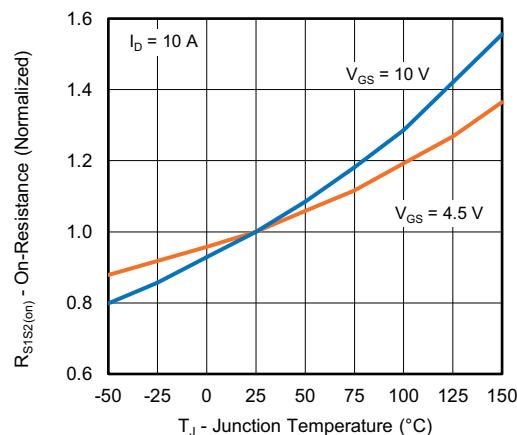
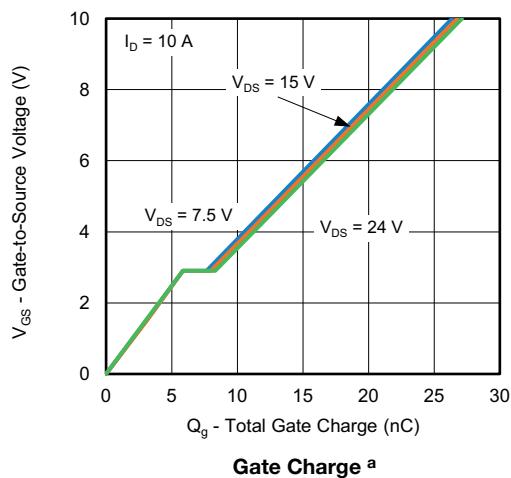
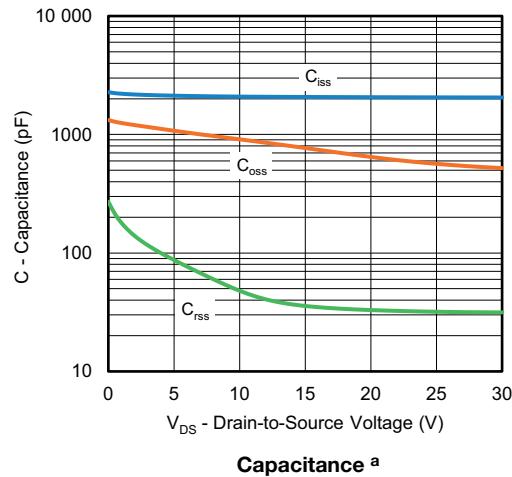
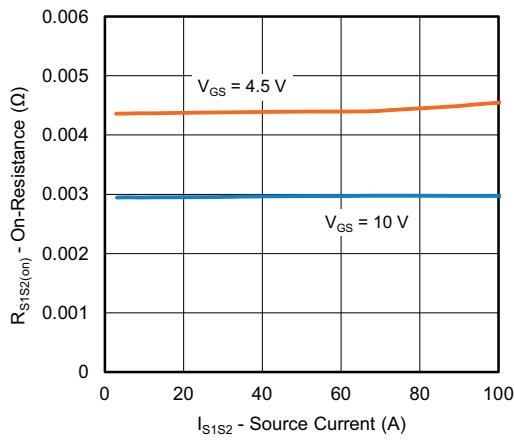
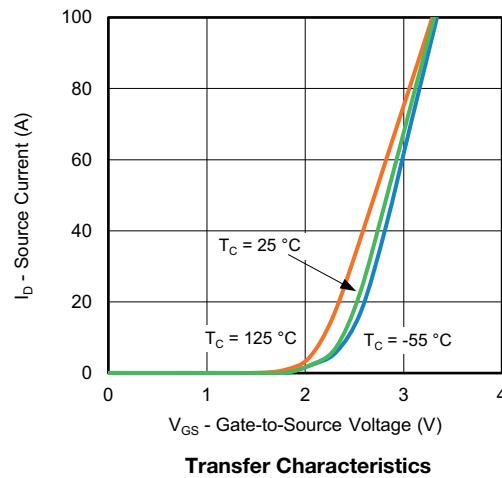
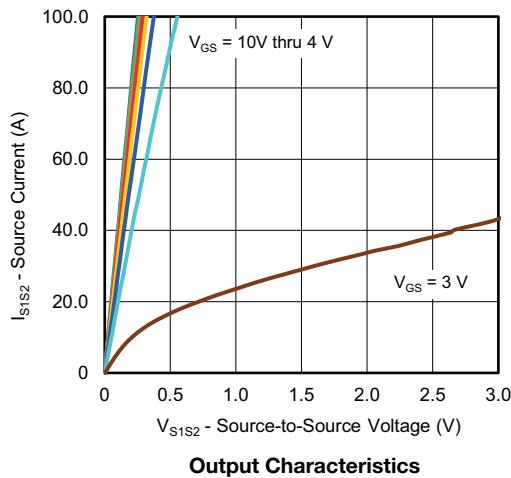


SPECIFICATIONS ($T_J = 25^\circ\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V_{DS}	$V_{GS} = 0 \text{ V}$, $I_D = 1 \text{ mA}$	30	-	-	V
Gate-source threshold voltage	$V_{GS(\text{th})}$	$V_{S1S2} = V_{GS}$, $I_D = 250 \mu\text{A}$	1.1	-	2.2	
Gate-source leakage	I_{GSS}	$V_{S1S2} = 0 \text{ V}$, $V_{GS} = +16 \text{ V}$ / -12 V	-	-	± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{S1S2} = 24 \text{ V}$, $V_{GS} = 0 \text{ V}$	-	-	1	μA
		$V_{S1S2} = 24 \text{ V}$, $V_{GS} = 0 \text{ V}$, $T_J = 70^\circ\text{C}$	-	-	15	
Drain-source on-state resistance ^a	$R_{S1S2(\text{on})}$	$V_{GS} = 10 \text{ V}$, $I_{S1S2} = 7 \text{ A}$	-	0.0024	0.0031	Ω
		$V_{GS} = 4.5 \text{ V}$, $I_{S1S2} = 5 \text{ A}$	-	0.0039	0.0049	
Forward transconductance ^a	g_{fs}	$V_{S1S2} = 10 \text{ V}$, $I_{S1S2} = 35 \text{ A}$	-	100	-	S
Dynamic ^{b, c}						
Input capacitance	C_{iss}	$V_{DS} = 15 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$	-	2100	-	pF
Output capacitance	C_{oss}		-	740	-	
Reverse transfer capacitance	C_{rss}		-	35	-	
Total gate charge	Q_g	$V_{DS} = 15 \text{ V}$, $V_{GS} = 10 \text{ V}$, $I_D = 10 \text{ A}$	-	27	40	nC
			-	12	19	
Gate-source charge	Q_{gs}	$V_{DS} = 15 \text{ V}$, $V_{GS} = 4.5 \text{ V}$, $I_D = 10 \text{ A}$	-	6.0	-	
Gate-drain charge	Q_{gd}		-	2	-	
Gate resistance	R_g	$f = 1 \text{ MHz}$	0.12	0.6	1.2	Ω
Turn-on delay time	$t_{d(\text{on})}$	$V_{DD} = 15 \text{ V}$, $R_L = 1.5 \Omega$, $I_{S1S2} \geq 10 \text{ A}$, $V_{\text{GEN}} = 10 \text{ V}$, $R_g = 1 \Omega$	-	10	20	ns
Rise time	t_r		-	81	160	
Turn-off delay time	$t_{d(\text{off})}$		-	21	40	
Fall time	t_f		-	5	10	
Turn-on delay time	$t_{d(\text{on})}$	$V_{DD} = 15 \text{ V}$, $R_L = 1.5 \Omega$, $I_D \geq 10 \text{ A}$, $V_{\text{GEN}} = 4.5 \text{ V}$, $R_g = 1 \Omega$	-	19	40	
Rise time	t_r		-	83	160	
Turn-off delay time	$t_{d(\text{off})}$		-	22	45	
Fall time	t_f		-	10	20	
Drain-Source Body Diode Characteristics ^c						
Continuous source-drain diode current	I_{S1S2}	$T_C = 25^\circ\text{C}$	-	-	118	A
Pulse diode forward current	I_{S1S2M}		-	-	250	
Body diode reverse recovery time	t_{rr}	$I_F = 10 \text{ A}$, $\text{di/dt} = 100 \text{ A}/\mu\text{s}$, $T_J = 25^\circ\text{C}$	-	28	56	ns
Body diode reverse recovery charge	Q_{rr}		-	15	30	nC
Reverse recovery fall time	t_a		-	13	-	ns
Reverse recovery rise time	t_b		-	15	-	

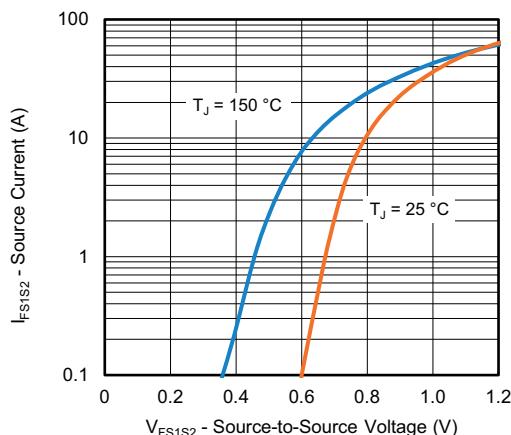
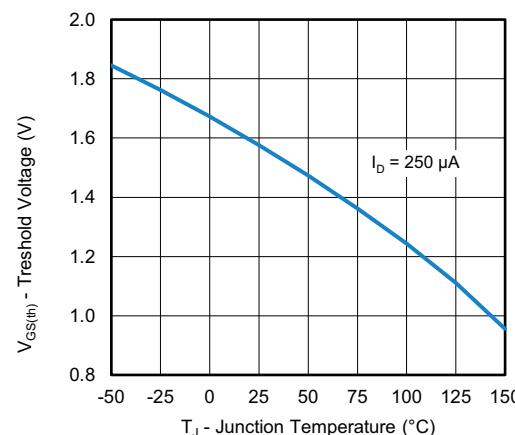
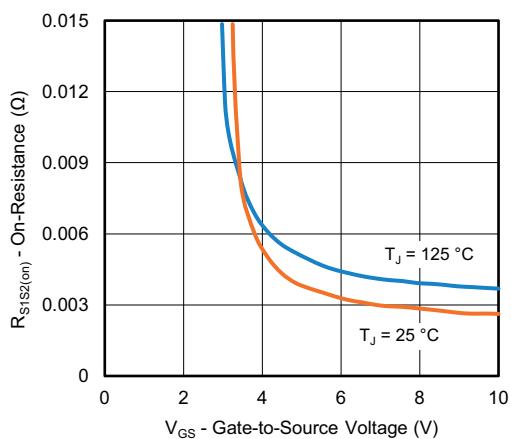
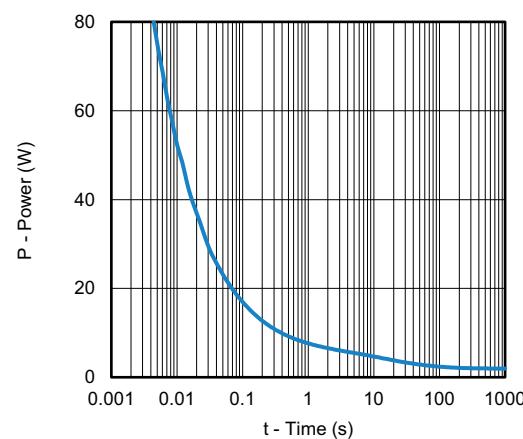
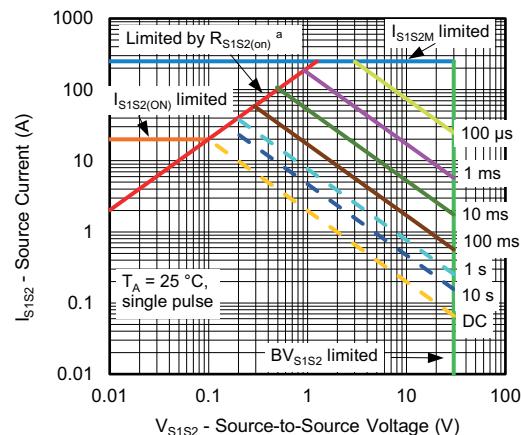
Notes

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

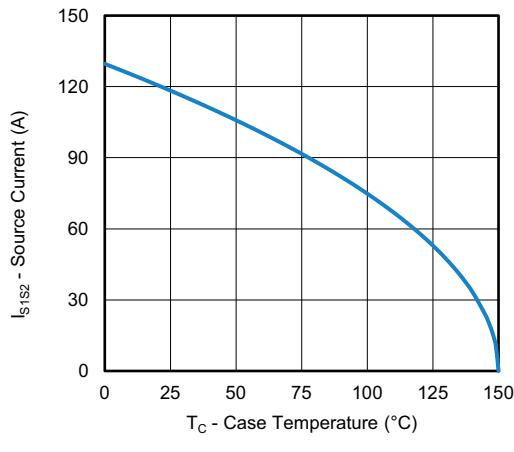
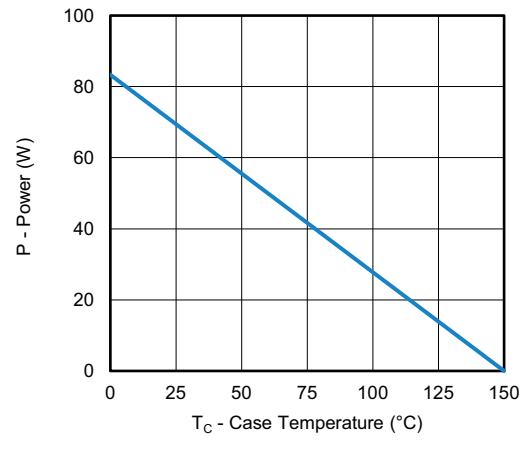
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Note

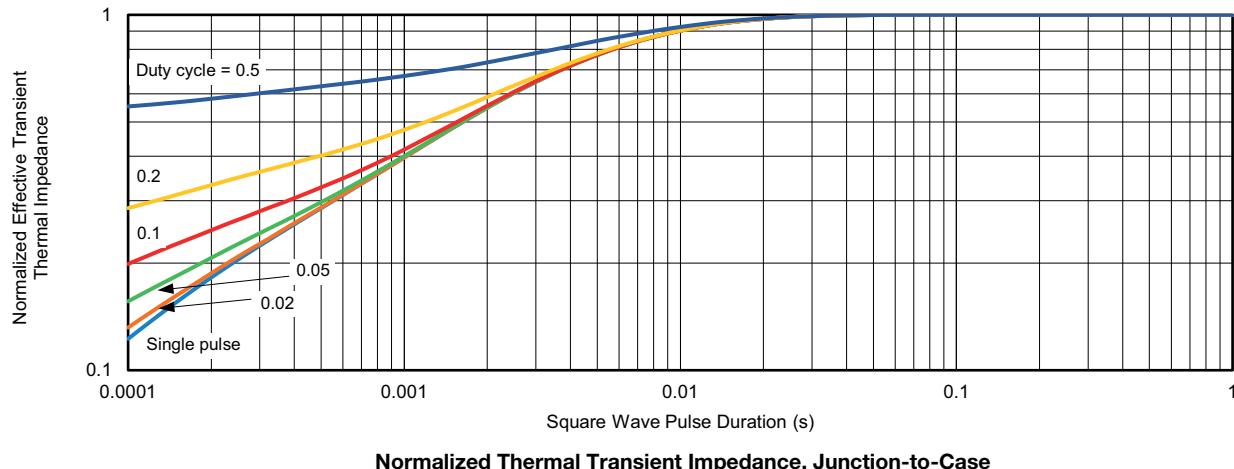
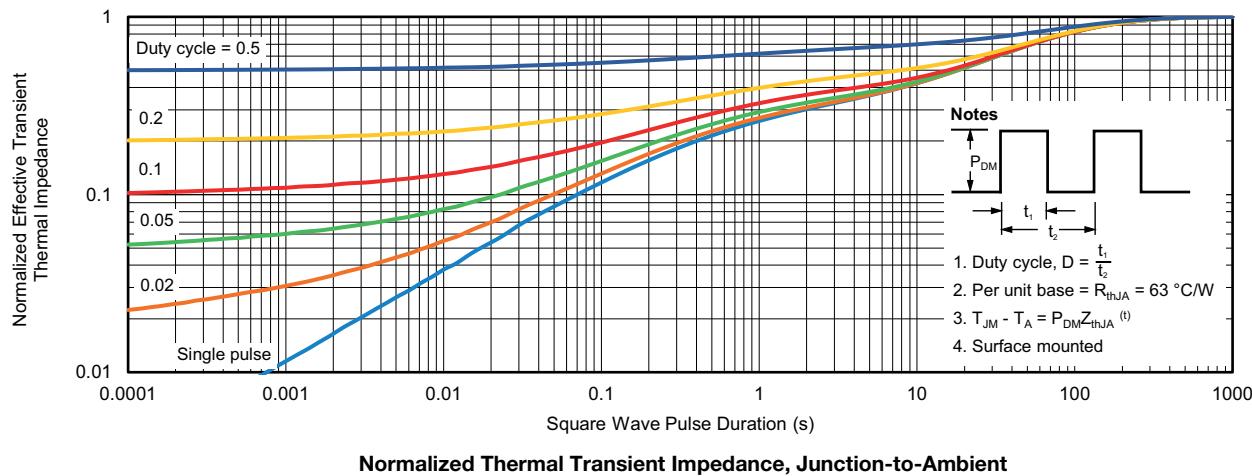
a. For one channel only

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
Note

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

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Current Derating ^a

Power, Junction-to-Case
Notes

- 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)


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