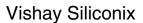
COMPLIANT





N-Channel 30 V (D-S) MOSFET with Schottky Diode

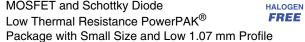
PRODUCT SUMMARY					
V _{DS} (V)	$R_{DS(on)}(\Omega)$	I _D (A) ^e	Q _g (Typ.)		
30	0.0062 at V _{GS} = 10 V	35	11.6 nC		
30	0.0087 at V _{GS} = 4.5 V	35	11.0110		

PowerPAK 1212-8 **Bottom View**

Ordering Information: SiS776DN-T1-GE3 (Lead (Pb)-free and Halogen-free)

FEATURES

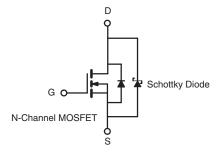
- Halogen-free According to IEC 61249-2-21 Definition
- SkyFET Monolithic TrenchFET® Power MOSFET and Schottky Diode



- 100 % R_g Tested
- 100 % UIS Tested
- Compliant to RoHS Directive 2002/95/EC

APPLICATIONS

- System Power
 - Low Side



Parameter	Symbol	Limit	Uni		
Drain-Source Voltage		V _{DS}	30	V	
Gate-Source Voltage		V _{GS}	± 20		
	T _C = 25 °C		35 ^e		
Continuous Dusin Comment (T., 150 °C)	T _C = 70 °C		35 ^e	A	
Continuous Drain Current (T _J = 150 °C)	T _A = 25 °C	I _D	18.3 ^{a, b}		
	T _A = 70 °C		14.5 ^{a, b}		
Pulsed Drain Current	•	I _{DM}	60		
Ocation of Ocate Projects Ocate	T _C = 25 °C		35 ^e		
Continuous Source-Drain Diode Current	T _A = 25 °C	I _S	5.4 ^{a, b}		
Single Pulse Avalanche Current	. 0.4	I _{AS}	20		
Single Pulse Avalanche Energy	L = 0.1 mH	E _{AS}	20	mJ	
	T _C = 25 °C		52		
Maximum Power Dissipation	T _C = 70 °C		33	w	
	T _A = 25 °C	P _D	3.8 ^{a, b}		
	T _A = 70 °C		2.4 ^{a, b}		
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 50 to 150	00	
Soldering Recommendations (Peak Temperature) ^{c, d}			260	°C	

- a. Surface mounted on 1" x 1" FR4 board.
- b. t = 10 s.
- c. See solder profile (www.vishay.com/doc?73257). The PowerPAK 1212-8 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.
- d. Rework conditions: manual soldering with a soldering iron is not recommended for leadless components.
- e. Package limited.

SiS776DN

Vishay Siliconix



THERMAL RESISTANCE RATINGS							
Parameter		Symbol	Typical	Maximum	Unit		
Maximum Junction-to-Ambient ^{a, b}	t ≤ 10 s	R _{thJA}	24	33	°C/W		
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	1.9	2.4	C/VV		

Notes:

- a. Surface mounted on 1" x 1" FR4 board.
- b. Maximum under steady state conditions is 81 $^{\circ}\text{C/W}.$

Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Static				<u> </u>	<u> </u>	
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0 \text{ V}, I_D = 1 \text{ mA}$	30			٧
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1.0		2.5	٧
Gate-Source Leakage	I _{GSS}				± 100	nA
Zero Gate Voltage Drain Current		V _{DS} = 30 V, V _{GS} = 0 V		0.030	0.30	mA
	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V, T _J = 100 °C		1.6	15	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 5 \text{ V}, V_{GS} = 10 \text{ V}$	30			Α
Drain-Source On-State Resistance ^a	Б	V _{GS} = 10 V, I _D = 10 A		0.0050	0.0062	
	R _{DS(on)}	V _{GS} = 4.5 V, I _D = 7 A		0.0072	0.0087	Ω
Forward Transconductance ^a	9 _{fs}	V _{DS} = 10 V, I _D = 10 A		40		S
Dynamic ^b						
Input Capacitance	C _{iss}			1360		pF
Output Capacitance	C _{oss}	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		340		
Reverse Transfer Capacitance	C _{rss}			117		
Total Cata Charge	Q_g	V _{DS} = 15 V, V _{GS} = 10 V, I _D = 10 A		24	36	
Total Gate Charge				11.6	17.5	~C
Gate-Source Charge	Q _{gs}	$V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_D = 10 \text{ A}$		3.5		nC
Gate-Drain Charge	Q _{gd}			3.6		
Gate Resistance	R _g	f = 1 MHz	0.4	1.5	3.0	Ω
Turn-On Delay Time	t _{d(on)}			18	35	
Rise Time	t _r	$V_{DD} = 15 \text{ V}, R_{I} = 1.5 \Omega$		11	22	
Turn-Off Delay Time	t _{d(off)}	$I_D \cong 10 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 1 \Omega$		20	40	
Fall Time	t _f			10	20	
Turn-On Delay Time	t _{d(on)}			11	22	ns
Rise Time	t _r	$V_{DD} = 15 \text{ V}, R_{L} = 1.5 \Omega$		10	20	
Turn-Off Delay Time	t _{d(off)}	$I_D \cong 10 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 1 \Omega$		20	40	
Fall Time	t _f			8	16	





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SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)								
Parameter	Symbol	Test Conditions		Тур.	Max.	Unit		
Drain-Source Body Diode Characteristics								
Continuous Source-Drain Diode Current	I _S	$T_C = 25 ^{\circ}C$			35	^		
Pulse Diode Forward Current ^a	I _{SM}				60	Α		
Body Diode Voltage	V_{SD}	I _S = 3 A		0.49	0.65	٧		
Body Diode Reverse Recovery Time	t _{rr}			19	35	ns		
Body Diode Reverse Recovery Charge	Q_{rr}	I _E = 10 A, dl/dt = 100 A/μs, T _I = 25 °C		8	15	nC		
Reverse Recovery Fall Time	t _a	1 F = 10 A, αι/αι = 100 A/μ3, 1 J = 20 0		8		ns		
Reverse Recovery Rise Time	t _b			11		115		

Notes:

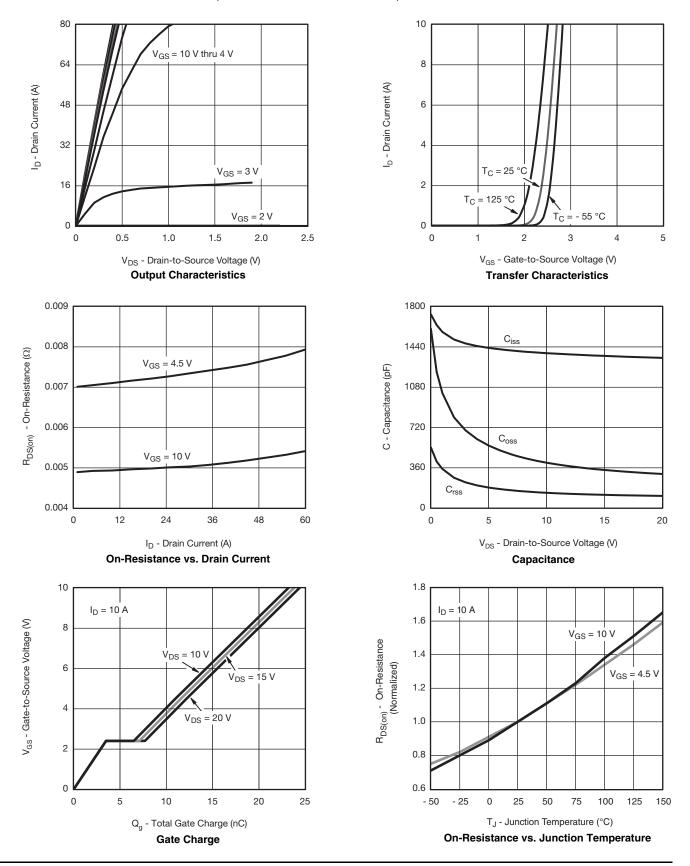
- a. Pulse test; pulse width \leq 300 $\mu s,$ duty cycle \leq 2 %.
- b. Guaranteed by design, not subject to production testing.

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.

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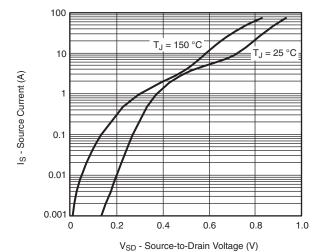
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



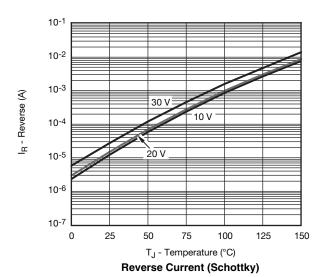




TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

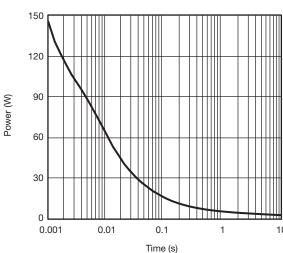


Source-Drain Diode Forward Voltage

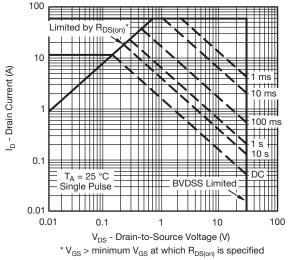


0.05 0.04 0.04 0.03 0.00 0.00 0.00 0.00 0.01

On-Resistance vs. Gate-to-Source Voltage



Single Pulse Power, Junction-to-Ambient

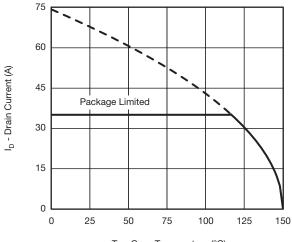


Safe Operating Area, Junction-to-Ambient

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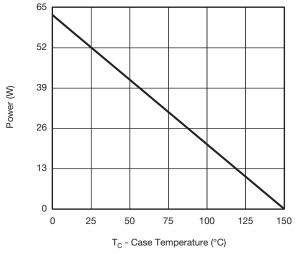
VISHAY

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

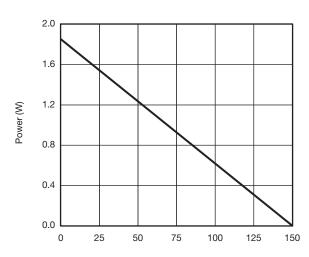


T_C - Case Temperature (°C)

Current Derating*



Power Derating, Junction-to-Case



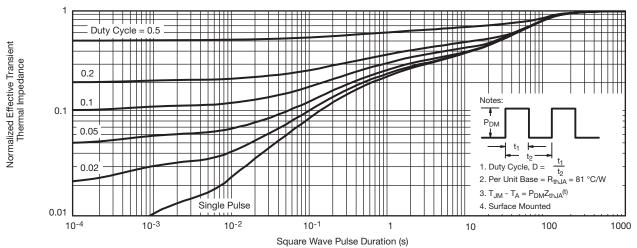
T_A - Ambient Temperature (°C)

Power, Junction-to-Ambient

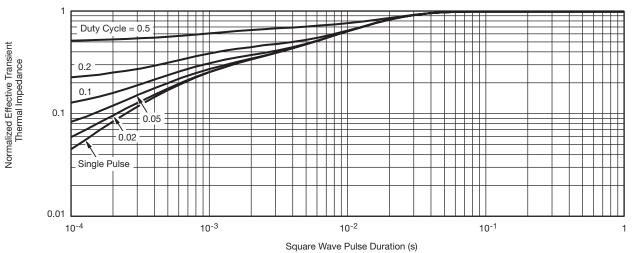
^{*} The power dissipation P_D is based on $T_{J(max)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package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



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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