



N-Channel 100 V (D-S) MOSFET



Marking code: G9

PRODUCT SUMMARY					
V _{DS} (V)	100				
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 10 \text{ V}$	0.160				
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 7.5 \text{ V}$	0.167				
Q _g typ. (nC)	2.9				
I _D (A) ^a	2.17				
Configuration	Single				

FEATURES

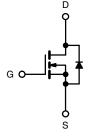
- TrenchFET® Gen IV power MOSFET
- 100 % R_g and UIS tested





APPLICATIONS

- DC/DC converters / boost converters
- · Load switch
- LED backlighting in LCD TVs
- · Power management for mobile computing



N-Channel MOSFET

ORDERING INFORMATION	
Package	SOT-23
Lead (Pb)-free and halogen-free	Si2122DS-T1-GE3

PARAMETER	SYMBOL	LIMIT	UNIT		
Drain-source voltage		V _{DS}	100	V	
Gate-source voltage		V _{GS}	± 20		
Continuous drain current (T _J = 150 °C)	T _C = 25 °C		2.17		
	T _C = 70 °C		1.74		
	T _A = 25 °C	I _D	1.65 ^{b, c}		
	T _A = 70 °C		1.32 ^{b, c}	A	
Pulsed drain current (t = 300 μs)	1	I _{DM}	8	_ ^	
Continuous source-drain diode current	T _C = 25 °C		2.0		
	T _A = 25 °C	I _S	1.1 ^{b, c}		
Single pulse avalanche current	L = 0.1 mH	I _{AS}	3		
Single pulse avalanche energy	L = 0.1 MH	E _{AS}	0.45	mJ	
Maximum power dissipation	T _C = 25 °C		1.6		
	T _C = 70 °C		1.0	□ w	
	T _A = 25 °C	P _D	0.96 ^{b, c}	VV	
	T _A = 70 °C		0.61 ^{b, c}		
Operating junction and storage temperature range		T _J , T _{stg}	-55 to +150	°C	

THERMAL RESISTANCE RATINGS						
PARAMETER		SYMBOL	TYPICAL	MAXIMUM	UNIT	
Maximum junction-to-ambient b, d	t ≤ 5 s	R _{thJA}	100	130	°C/W	
Maximum junction-to-foot (drain)	Steady state	R_{thJF}	60	75	C/W	

Notes

- a. Based on $T_C = 25\ ^{\circ}C$
- b. Surface mounted on 1" x 1" FR4 board
- c. t = 5 s
- d. Maximum under steady state conditions is 166 $^{\circ}\text{C/W}$



Vishay Siliconix

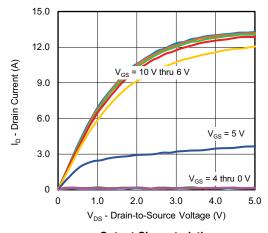
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static	1					
Drain-source breakdown voltage	V_{DS}	V _{GS} = 0 V, I _D = 250 μA	100	-	-	V
V _{DS} temperature coefficient	$\Delta V_{DS}/T_{J}$	I _D = 250μA	-	84	-	\//00
V _{GS(th)} temperature coefficient	$\Delta V_{GS(th)}/T_J$	I _D = 250 μA	-	-0.64	-	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
Zero gate voltage drain current		V _{DS} = 100 V, V _{GS} = 0 V	-	-	1	
	I _{DSS}	V _{DS} = 100 V, V _{GS} = 0 V, T _J = 55 °C	-	-	10	μA
Drain-source on-state resistance ^a	Б	$V_{GS} = 10 \text{ V}, I_D = 2.5 \text{ A}$	-	0.133	0.160	Ω
	R _{DS(on)}	V _{GS} = 7.5 V, I _D = 2 A	-	0.139	0.167	
Forward transconductance ^a	9 _{fs}	$V_{DS} = 50 \text{ V}, I_D = 2.5 \text{ A}$	-	7	-	S
Dynamic ^b				•		
Input capacitance	C _{iss}		-	210	-	pF
Output capacitance	C _{oss}	V _{DS} = 50 V, V _{GS} = 0 V, f = 1 MHz	-	28	-	
Reverse transfer capacitance	C _{rss}		-	6.2	-	
Total gate aboves	0	V _{DS} = 50 V, V _{GS} = 10 V, I _D = 2 A	-	3.8	6	nC
Total gate charge	Qg	V _{DS} = 50 V, V _{GS} = 4.5 V, I _D = 2 A	-	2.9	4.5	
Gate-source charge	Q _{gs}		-	1.3	-	
Gate-drain charge	Q _{gd}		-	0.6	-	
Gate resistance	R_g	f = 1 MHz	0.7	1.5	2.5	Ω
Turn-on delay time	t _{d(on)}		-	7	14	
Rise time	t _r	$V_{DD} = 50 \text{ V}, \ R_L = 25 \ \Omega$ $I_D = 2 \text{ A}, \ V_{GEN} = 10 \text{ V}, \ R_g = 1 \ \Omega$	-	4	8	
Turn-off delay time	t _{d(off)}		-	10	20	
Fall time	t _f		-	3	6	
Turn-on delay time	t _{d(on)}	$V_{DD} = 50 \text{ V}, \ R_L = 25 \ \Omega$ $I_D = 2 \text{ A}, \ V_{GEN} = 10 \text{ V}, \ R_g = 1 \ \Omega$	-	8	16	ns
Rise time	t _r		-	4	8	
Turn-off delay time	t _{d(off)}		-	10	20	
Fall time	t _f		-	3	6	
Drain-Source Body Diode Characterist	ics					
Continuous source-drain diode current	I _S	T _C = 25 °C -	-	2	۸	
Pulse diode forward current ^a	I _{SM}		-	-	8	A
Body diode voltage	V_{SD}	I _S = 1.3 A	-	0.85	1.2	V
Body diode reverse recovery time	t _{rr}	I _F = 1.3 A, di/dt = 100 A/μs, T _J = 25 °C	-	22	44	ns
Body diode reverse recovery charge	Q _{rr}		-	23	46	nC
Reverse recovery fall time	t _a		-	19	-	
Reverse recovery rise time	t _b		-	3	-	ns

Notes

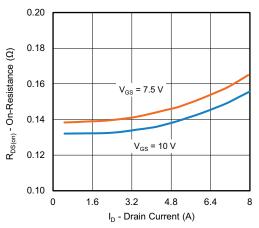
- a. Pulse test; pulse width \leq 300 μ s, duty cycle \leq 2 %
- b. Guaranteed by design, not subject to production testing

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.

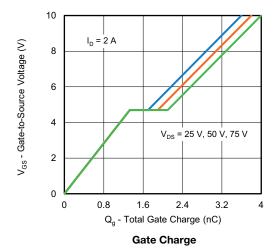


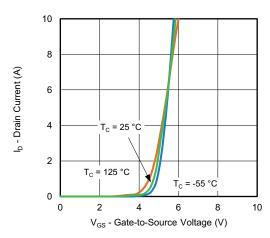


Output Characteristics

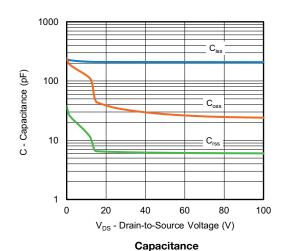


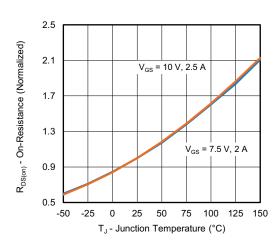
On-Resistance vs. Drain Current





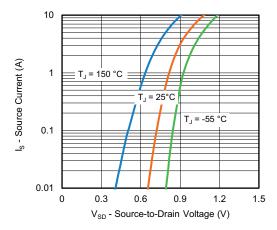
Transfer Characteristics



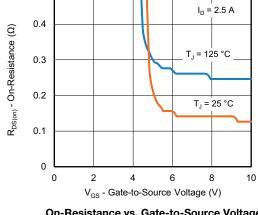


On-Resistance vs. Junction Temperature



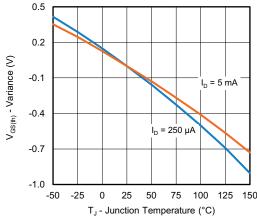


Source-Drain Diode Forward Voltage

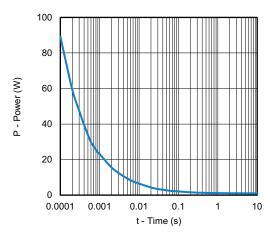


0.5

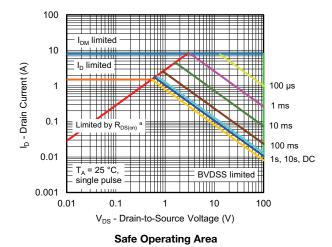
On-Resistance vs. Gate-to-Source Voltage



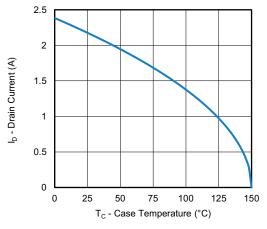
Threshold Voltage



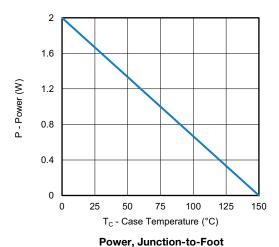
Single Pulse Power

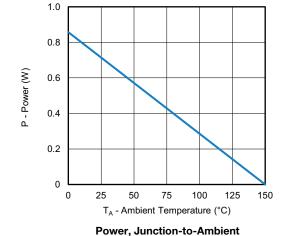






Current Derating a

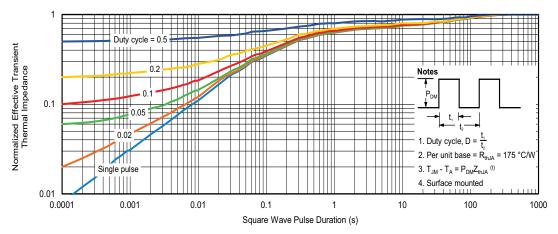




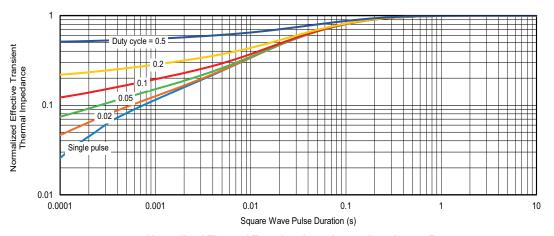
Note

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-Foot

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