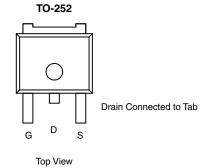


www.vishay.com

Vishay Siliconix

Automotive N-Channel 30 V (D-S) 175 °C MOSFET

PRODUCT SUMMARY					
V _{DS} (V)	30				
$R_{DS(on)}(\Omega)$ at $V_{GS} = 10 \text{ V}$	0.0034				
I _D (A)	100				
Configuration	Single				



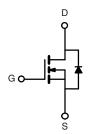
FEATURES

- TrenchFET® Power MOSFET
- 100 % R_g and UIS Tested
- AEC-Q101 Qualifiedd
- Material categorization:
 For definitions of compliance please see www.vishay.com/doc?99912





ROHS COMPLIANT HALOGEN FREE



N-Channel MOSFET

ORDERING INFORMATION	
Package	TO-252
Lead (Pb)-free and Halogen-free	SQD100N03-3m4-GE3

ABSOLUTE MAXIMUM RATING	S (T _C = 25 °C, unless	otherwise noted	i)	
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V _{DS}	30	V
Gate-Source Voltage		V _{GS}	± 20	V
Continuous Drain Current ^a	T _C = 25 °C	1	100	
	T _C = 125 °C	l _D	87	
Continuous Source Current (Diode Conduction) ^a		I _S	100	А
Pulsed Drain Current ^b		I _{DM}	160	
Single Pulse Avalanche Energy	L = 0.1 mH	I _{AS}	58	
Single Pulse Avalanche Current	L = U.1 MH	E _{AS}	168	mJ
Maximum Power Dissipation ^b	T _C = 25 °C	D	136	10/
	T _C = 125 °C	P _D	45	W
Operating Junction and Storage Temperatur	re Range	T _J , T _{stq}	- 55 to + 175	°C

THERMAL RESISTANCE RATINGS					
PARAMETER		SYMBOL	LIMIT	UNIT	
Junction-to-Ambient	PCB Mount ^c	R_{thJA}	50	°C/W	
Junction-to-Case (Drain)	p-Case (Drain)		1.1	C/VV	

Notes

- a. Package limited.
- b. Pulse test; pulse width \leq 300 μ s, duty cycle \leq 2 %.
- c. When mounted on 1" square PCB (FR-4 material).
- d. Parametric verification ongoing.



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SPECIFICATIONS (T _C = 25 °C, unless otherwise noted)								
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT	
Static								
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$		30	-	-	V	
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} =	- V _{GS} , I _D = 250 μA	2.5	3.0	3.5	V	
Gate-Source Leakage	I _{GSS}	V _{DS} =	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$		-	± 100	nA	
		$V_{GS} = 0 V$	V _{DS} = 30 V	-	-	1		
Zero Gate Voltage Drain Current	I _{DSS}	$V_{GS} = 0 V$	V _{DS} = 30 V, T _J = 125 °C	-	-	50	μΑ	
		$V_{GS} = 0 V$	V _{DS} = 30 V, T _J = 175 °C	-	-	150	1	
On-State Drain Current ^a	I _{D(on)}	V _{GS} = 10 V	$V_{DS} \ge 5 V$	50	-	-	Α	
		V _{GS} = 10 V	I _D = 20 A	-	0.0028	0.0034		
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V	I _D = 20 A, T _J = 125 °C	-	-	0.0051	Ω	
		V _{GS} = 10 V	I _D = 20 A, T _J = 175 °C	-	-	0.0060]	
Forward Transconductanceb	9 _{fs}	V_{DS}	= 20 V, I _D = 20 A	-	108	-	S	
Dynamic ^b								
Input Capacitance	C _{iss}			-	5879	7349		
Output Capacitance	C _{oss}	$V_{GS} = 0 V$	$V_{GS} = 0 \text{ V}$ $V_{DS} = 15 \text{ V}, f = 1 \text{ MHz}$	-	942	1178	pF	
Reverse Transfer Capacitance	C _{rss}			-	413	516		
Total Gate Charge ^c	Qg			-	82.7	124		
Gate-Source Charge ^c	Q _{gs}	V _{GS} = 10 V	$V_{DS} = 15 \text{ V}, I_{D} = 50 \text{ A}$	-	23.8	-	nC	
Gate-Drain Charge ^c	Q_{gd}			-	14.1	-		
Gate Resistance	R_g	f = 1 MHz		0.9	1.86	2.8	Ω	
Turn-On Delay Time ^c	t _{d(on)}	$V_{DD} = 15 \text{ V}, \text{ R}_L = 0.3 \Omega$ $I_D \cong 50 \text{ A}, \text{ V}_{GEN} = 10 \text{ V}, \text{ R}_g = 1 \Omega$		-	13	20		
Rise Time ^c	t _r			-	10	15	ns	
Turn-Off Delay Time ^c	t _{d(off)}			-	37	56		
Fall Time ^c	t _f			-	10	15		
Source-Drain Diode Ratings and Characteristics ^b								
Pulsed Current ^a	I _{SM}			-	-	160	Α	
Forward Voltage	V _{SD}	I _F = 30 A, V _{GS} = 0 V		-	0.84	1.2	V	

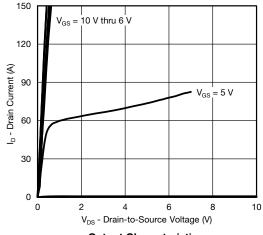
Notes

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

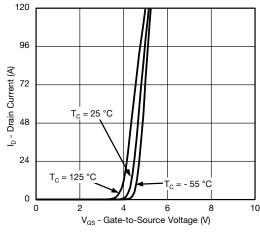
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



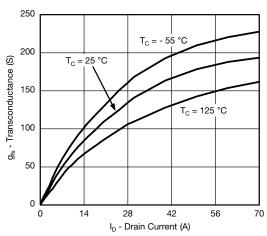
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



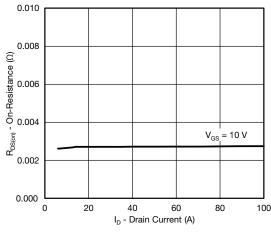




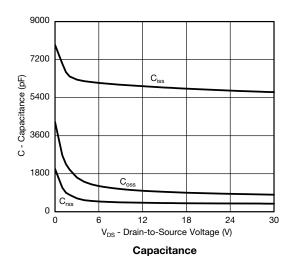
Transfer Characteristics

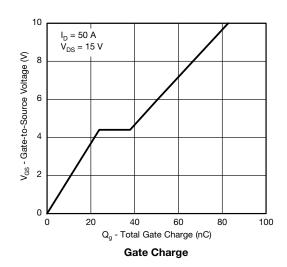


Transconductance



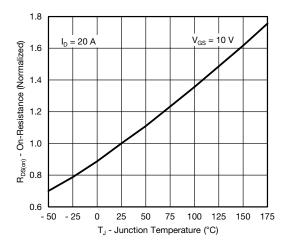
On-Resistance vs. Drain Current



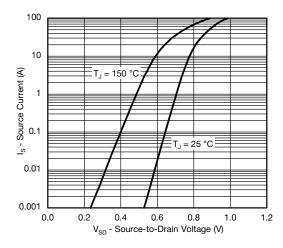




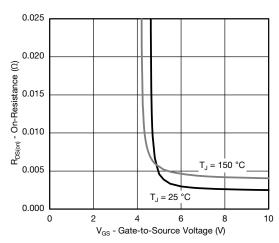
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



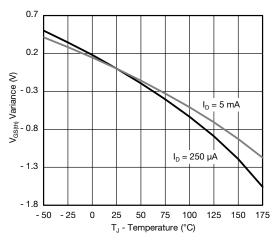
On-Resistance vs. Junction Temperature



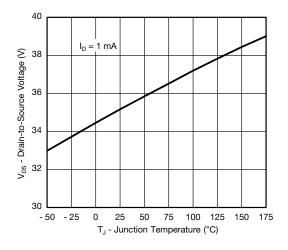
Source Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

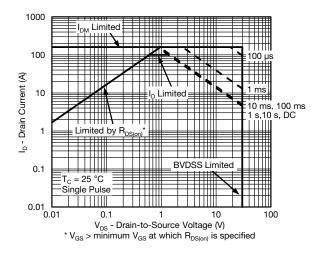


Threshold Voltage

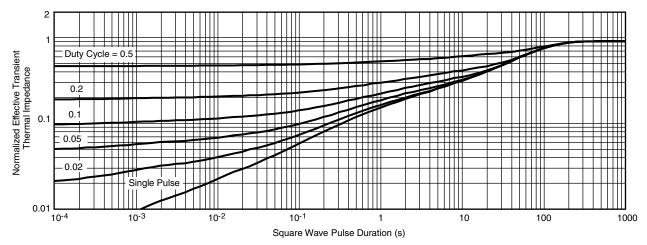


Drain Source Breakdown vs. Junction Temperature

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



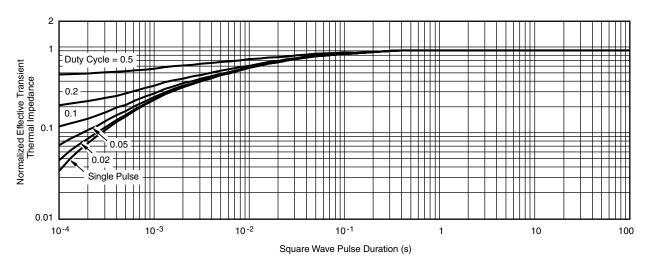
Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient

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THERMAL RATINGS (T_A = 25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Case

Note

- The characteristics shown in the two graphs
- Normalized Transient Thermal Impedance Junction-to-Ambient (25 °C)
- Normalized Transient Thermal Impedance Junction-to-Case (25 °C) are given for general guidelines only to enable the user to get a "ball park" indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see www.vishay.com/ppg262549.





TO-252AA Case Outline





	MILLIN	METERS	INC	HES	
DIM.	MIN.	MAX.	MIN.	MAX.	
Α	2.18	2.38	0.086	0.094	
A1	-	0.127	-	0.005	
b	0.64	0.88	0.025	0.035	
b2	0.76	1.14	0.030	0.045	
b3	4.95	5.46	0.195	0.215	
С	0.46	0.61	0.018	0.024	
C2	0.46	0.89	0.018	0.035	
D	5.97	6.22	0.235	0.245	
D1	4.10	-	0.161	-	
Е	6.35	6.73	0.250	0.265	
E1	4.32	-	0.170	-	
Н	9.40	10.41	0.370	0.410	
е	2.28	BSC	0.090	BSC	
e1	4.56	BSC	0.180 BSC		
L	1.40	1.78	0.055	0.070	
L3	0.89	1.27	0.035	0.050	
L4	-	1.02	-	0.040	
L5	1.01	1.52	0.040	0.060	
ECN: T13-0592-Rev. A, 02-Sep-13					

DWG: 6019

Note

• Dimension L3 is for reference only.



RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads Dimensions in Inches/(mm)

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