

N-Channel 75 V (D-S) MOSFET

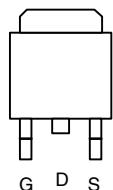
PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)	Q _g (Typ.)
75	0.007 at V _{GS} = 10 V	110 ^d	69

FEATURES

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


RoHS
COMPLIANT

TO-263

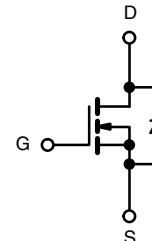


Top View

Ordering Information: SUM110N08-07P-E3 (Lead (Pb)-free)

APPLICATIONS

- Synchronous Rectification



N-Channel MOSFET

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	75	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current (T _J = 150 °C)	T _C = 25 °C	I _D	110 ^d
	T _C = 70 °C		103
Pulsed Drain Current	I _{DM}	180	A
Avalanche Current	I _{AS}	50	
Single Avalanche Energy ^a	E _{AS}	125	mJ
Maximum Power Dissipation ^a	T _C = 25 °C	P _D	208.3 ^b
	T _A = 25 °C ^c		3.75
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Limit	Unit
Junction-to-Ambient (PCB Mount) ^c	R _{thJA}	40	°C/W
Junction-to-Case (Drain)	R _{thJC}	0.6	

Notes:

- a. Duty cycle ≤ 1 %.
- b. See SOA curve for voltage derating.
- c. When mounted on 1" square PCB (FR-4 material).
- d. Package limited.

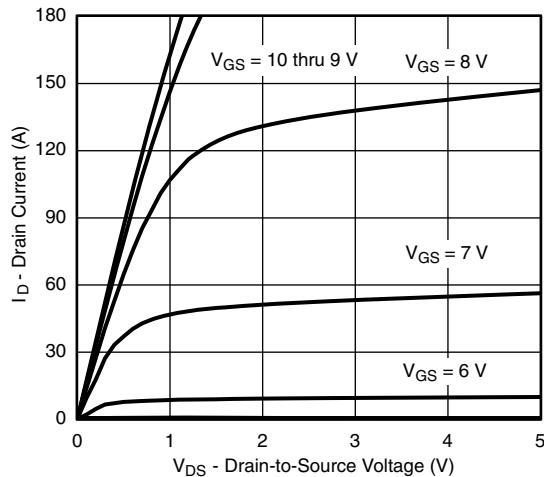
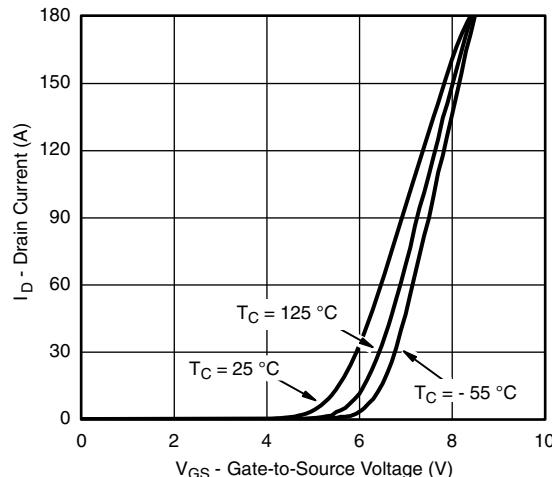
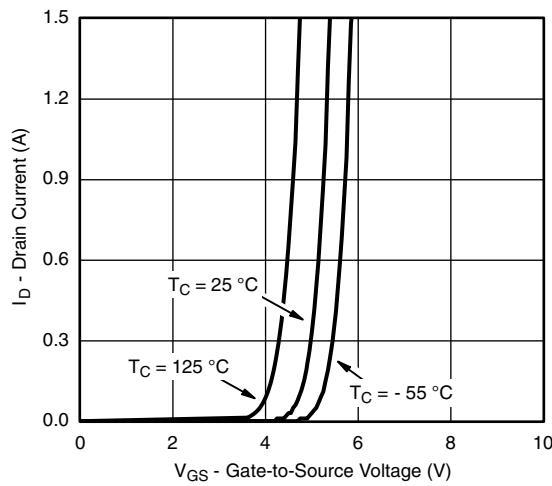
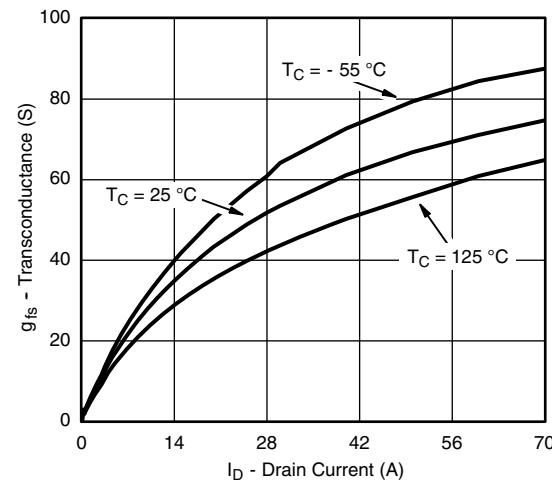
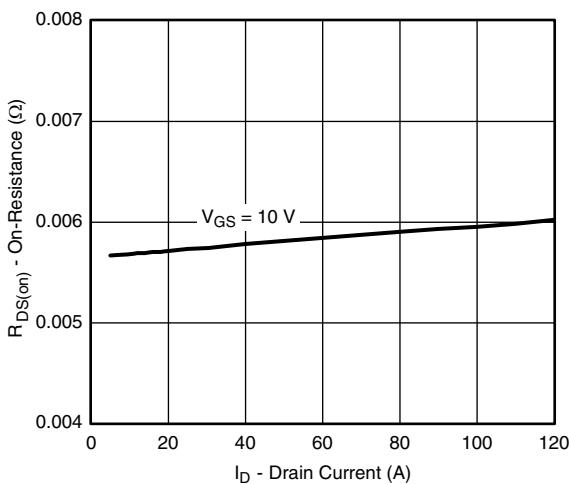
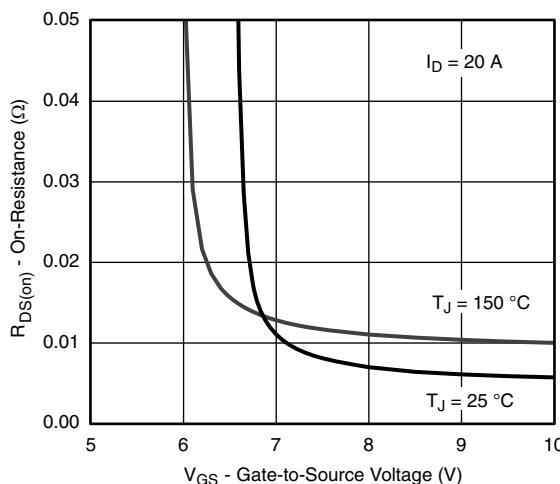
SPECIFICATIONS ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{DS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	75			V
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	2.5		4.5	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 250	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 75 \text{ V}, V_{GS} = 0 \text{ V}$			1	μA
		$V_{DS} = 75 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 125^\circ\text{C}$			50	
		$V_{DS} = 75 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 150^\circ\text{C}$			250	
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{DS} \geq 10 \text{ V}, V_{GS} = 10 \text{ V}$	70			A
Drain-Source On-State Resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = 10 \text{ V}, I_D = 20 \text{ A}$		0.0057	0.0070	Ω
		$V_{GS} = 10 \text{ V}, I_D = 20 \text{ A}, T_J = 125^\circ\text{C}$		0.0092	0.0112	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15 \text{ V}, I_D = 20 \text{ A}$		43		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{GS} = 0 \text{ V}, V_{DS} = 30 \text{ V}, f = 1 \text{ MHz}$		4250		pF
Output Capacitance	C_{oss}			580		
Reverse Transfer Capacitance	C_{rss}			230		
Total Gate Charge ^c	Q_g	$V_{DS} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 50 \text{ A}$		69	105	nC
Gate-Source Charge ^c	Q_{gs}			23		
Gate-Drain Charge ^c	Q_{gd}			21		
Gate Resistance	R_g	$f = 1 \text{ MHz}$		1.2	2.4	Ω
Turn-On Delay Time ^c	$t_{d(\text{on})}$	$V_{DD} = 30 \text{ V}, R_L = 0.6 \Omega$ $I_D \geq 50 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 1 \Omega$		17	30	ns
Rise Time ^c	t_r			5	10	
Turn-Off Delay Time ^c	$t_{d(\text{off})}$			22	40	
Fall Time ^c	t_f			6	15	
Source-Drain Diode Ratings and Characteristics $T_C = 25^\circ\text{C}^b$						
Continuous Current	I_S				110	A
Pulsed Current	I_{SM}				180	
Forward Voltage ^a	V_{SD}	$I_F = 20 \text{ A}, V_{GS} = 0 \text{ V}$		0.83	1.5	V
Reverse Recovery Time	t_{rr}	$I_F = 75 \text{ A}, dI/dt = 100 \text{ A}/\mu\text{s}$		65	100	ns
Peak Reverse Recovery Current	$I_{RM(\text{REC})}$			2.5	5	A
Reverse Recovery Charge	Q_{rr}			85	150	nC

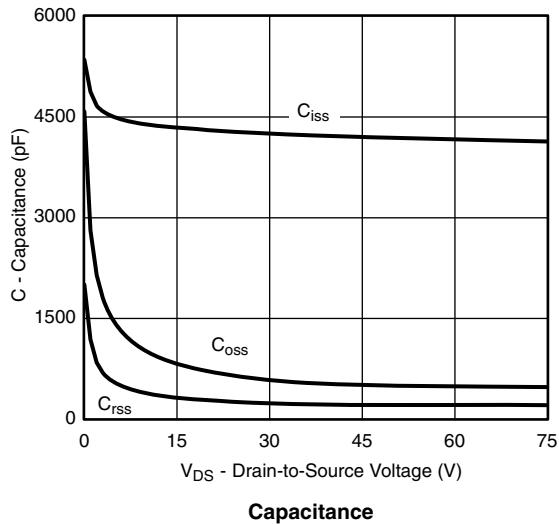
Notes:

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

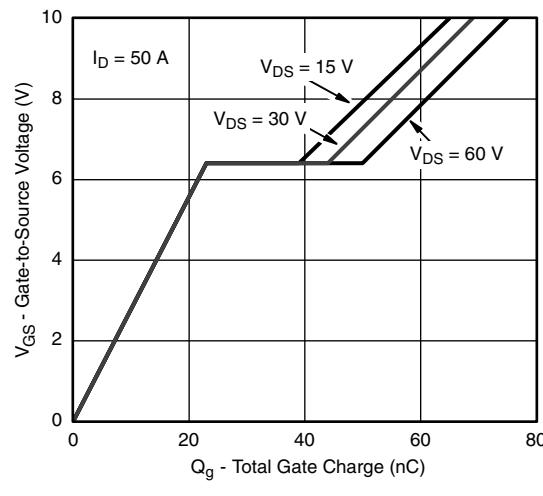
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Output Characteristics

Transfer Characteristics

Transfer Characteristics

Transconductance

On-Resistance vs. Drain Current

On-Resistance vs. Gate-to-Source Voltage

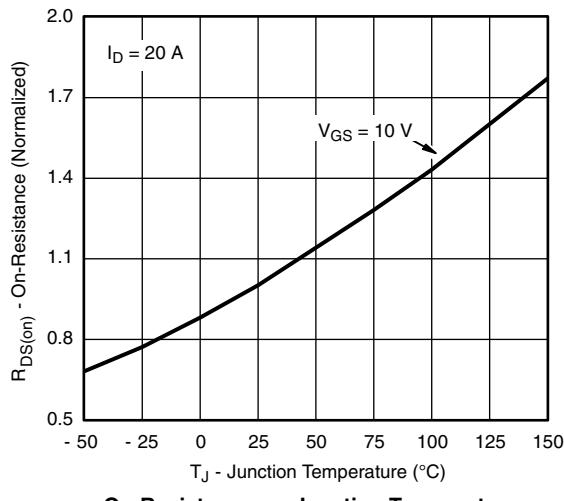
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



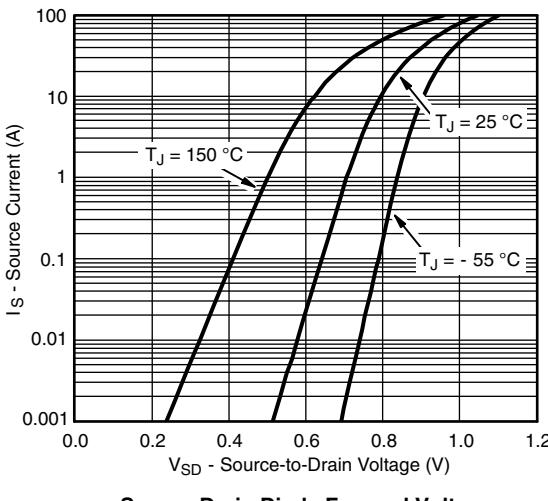
Capacitance



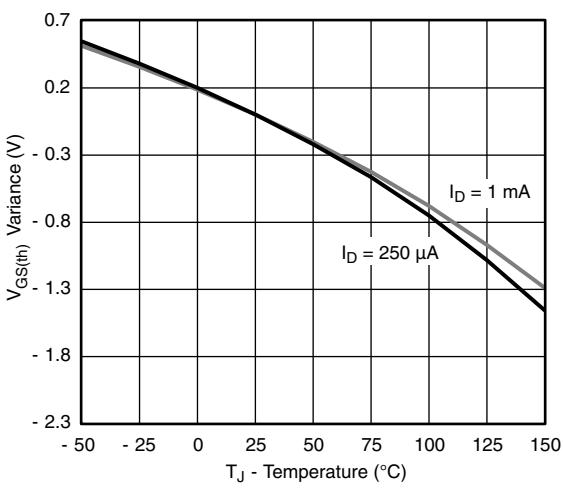
Gate Charge



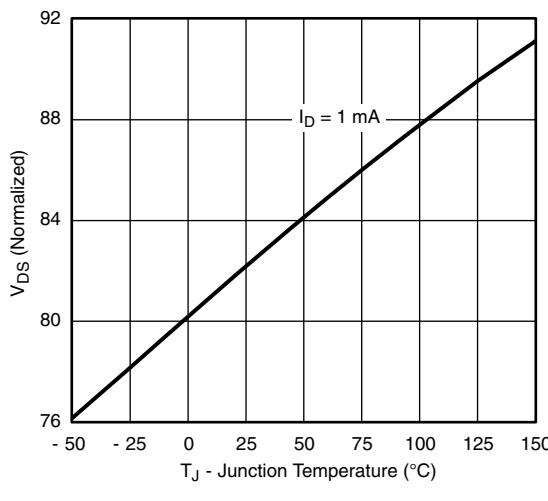
On-Resistance vs. Junction Temperature



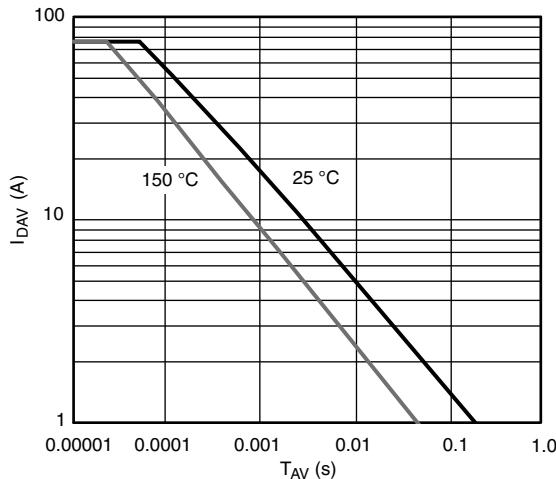
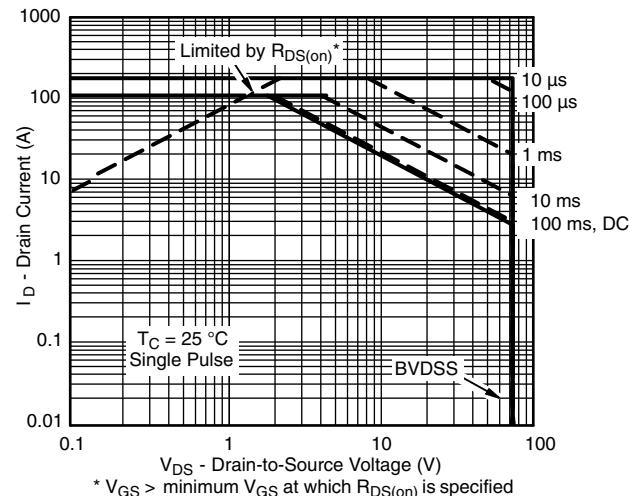
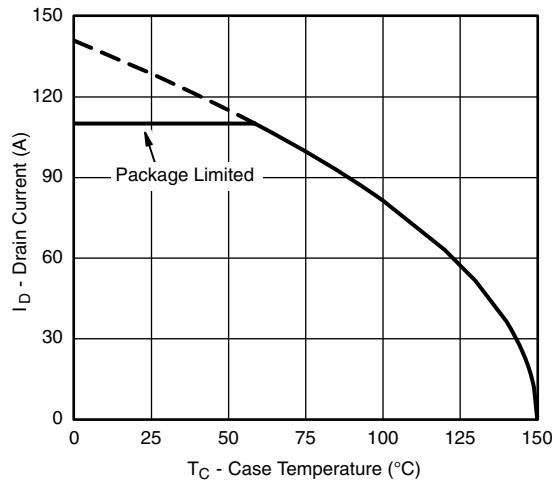
Source-Drain Diode Forward Voltage



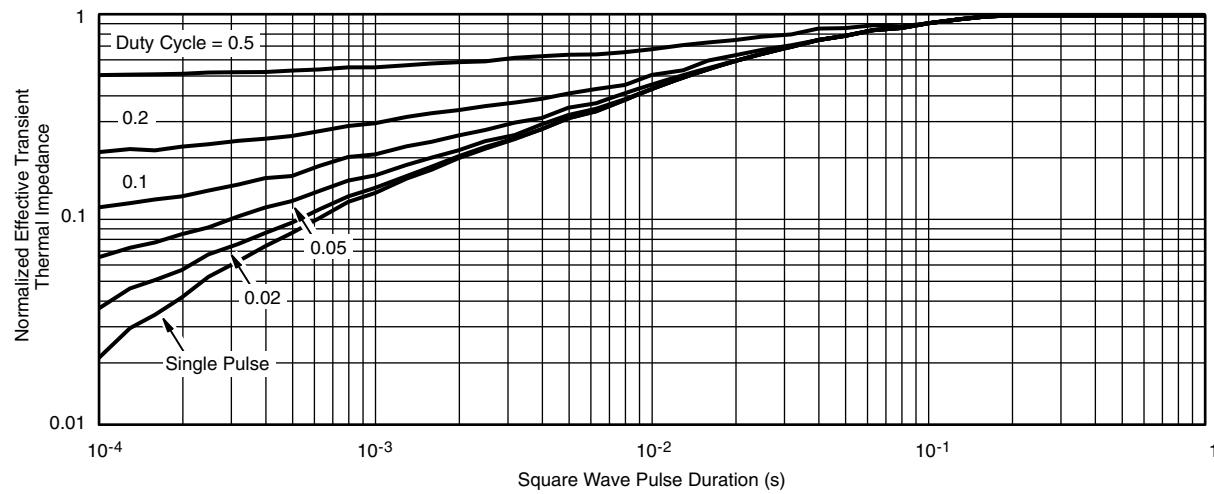
Threshold Voltage



Drain Source Breakdown vs. Junction Temperature

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Single Pulse Avalanche Current Capability vs. Time

Safe Operating Area, Junction-to-Case

Current Derating*, Junction-to-Case

* 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-Case

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/ppg?68637.

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.