



P-Channel 60-V (D-S) 175 °C MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^d
- 60	0.008 at $V_{GS} = - 10$ V	- 110
	0.0105 at $V_{GS} = - 4.5$ V	

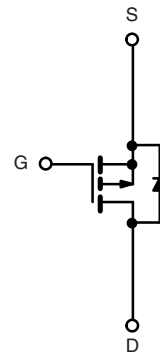
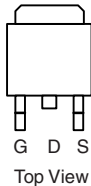
FEATURES

- TrenchFET[®] Power MOSFET
- Package with Low Thermal Resistance
- 100 % R_g Tested



RoHS*
COMPLIANT

TO-263



P-Channel MOSFET

Ordering Information: SUM110P06-08L
SUM110P06-08L-E3 (Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS $T_C = 25$ °C, unless otherwise noted				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V_{DS}	- 60	V	
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current ^d ($T_J = 175$ °C)	I_D	$T_C = 25$ °C	- 110	A
		$T_C = 125$ °C	- 75	
Pulsed Drain Current	I_{DM}	- 200		
Avalanche Current	I_{AS}	- 85		
Single Pulse Avalanche Energy ^d	E_{AS}	L = 0.1 mH	211	mJ
Maximum Power Dissipation			P_D	272 ^c
	$T_A = 25$ °C ^b	3.75 ^b		
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 175	°C	

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Limit	Unit
Junction-to-Ambient	PCB Mount ^d	R_{thJA}	40	°C/W
Junction-to-Case				

Notes:

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

* Pb containing terminations are not RoHS compliant, exemptions may apply.

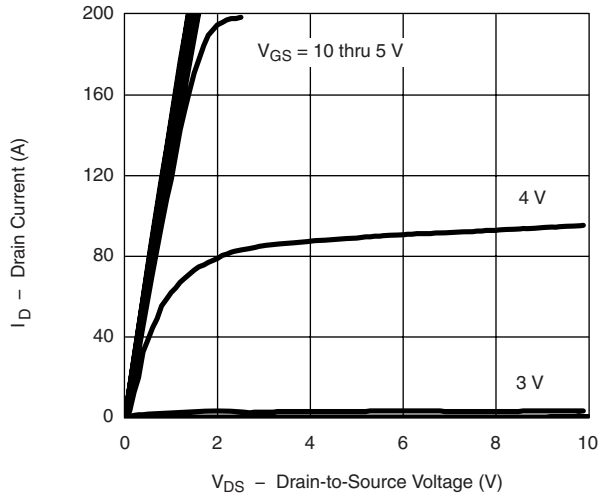
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}$, $I_D = -250\text{ }\mu\text{A}$	- 60			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250\text{ }\mu\text{A}$	- 1		- 3	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -60\text{ V}$, $V_{GS} = 0\text{ V}$			- 1	μA
		$V_{DS} = -60\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 125\text{ }^\circ\text{C}$			- 50	
		$V_{DS} = -60\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 175\text{ }^\circ\text{C}$			- 250	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = -5\text{ V}$, $V_{GS} = -10\text{ V}$	- 120			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = -10\text{ V}$, $I_D = -30\text{ A}$		0.0065	0.008	Ω
		$V_{GS} = -10\text{ V}$, $I_D = -30\text{ A}$, $T_J = 125\text{ }^\circ\text{C}$			0.0129	
		$V_{GS} = -10\text{ V}$, $I_D = -30\text{ A}$, $T_J = 175\text{ }^\circ\text{C}$			0.016	
		$V_{GS} = -4.5\text{ V}$, $I_D = -20\text{ A}$		0.0085	0.0105	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}$, $I_D = -50\text{ A}$	20			S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = -25\text{ V}$, $f = 1\text{ MHz}$		9200		pF
Output Capacitance	C_{oss}			975		
Reverse Transfer Capacitance	C_{rss}			760		
Total Gate Charge ^c	Q_g	$V_{DS} = -30\text{ V}$, $V_{GS} = -10\text{ V}$, $I_D = -110\text{ A}$		160	240	nC
Gate-Source Charge ^c	Q_{gs}			40		
Gate-Drain Charge ^c	Q_{gd}			36		
Gate Resistance	R_g	$f = 1\text{ MHz}$	1.5	3	4.5	Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = -30\text{ V}$, $R_L = 0.27\text{ }\Omega$ $I_D \cong -110\text{ A}$, $V_{GEN} = -10\text{ V}$, $R_G = 2.5\text{ }\Omega$		20	30	ns
Rise Time ^c	t_r			190	285	
Turn-Off Delay Time ^c	$t_{d(off)}$			140	210	
Fall Time ^c	t_f			300	450	
Source-Drain Diode Ratings and Characteristics $T_C = 25\text{ }^\circ\text{C}^b$						
Continuous Current	I_S				- 110	A
Pulsed Current	I_{SM}				- 200	
Forward Voltage ^a	V_{SD}	$I_F = -50\text{ A}$, $V_{GS} = 0\text{ V}$		- 1.0	- 1.5	V
Reverse Recovery Time	t_{rr}	$I_F = -50\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$		60	90	ns
Peak Reverse Recovery Charge	$I_{RM(REC)}$			- 3	- 4.5	A
Reverse Recovery Charge	Q_{rr}			0.09	0.2	μC

Notes:

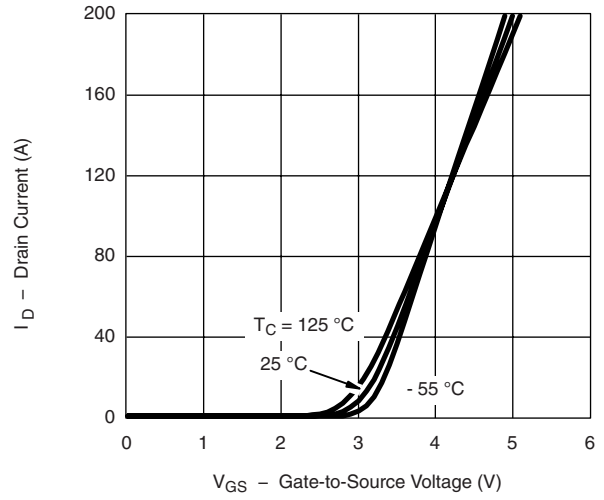
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

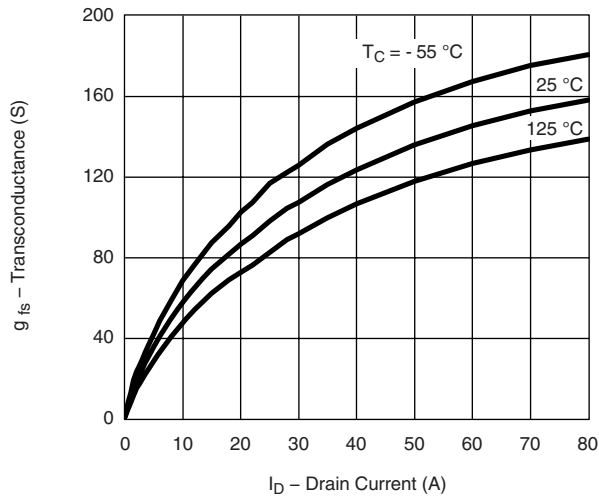
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



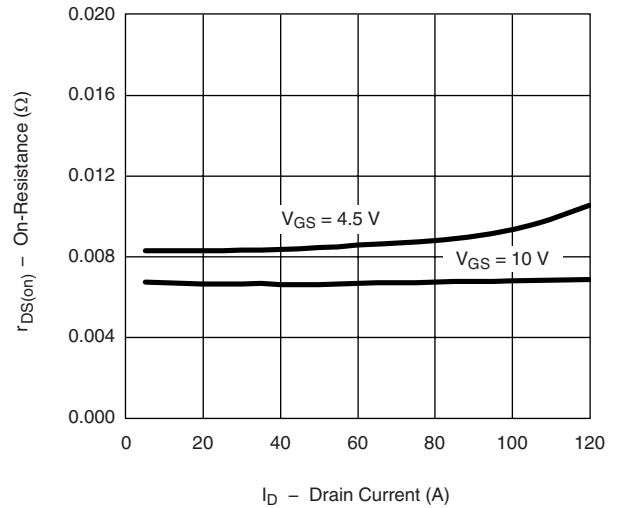
Output Characteristics



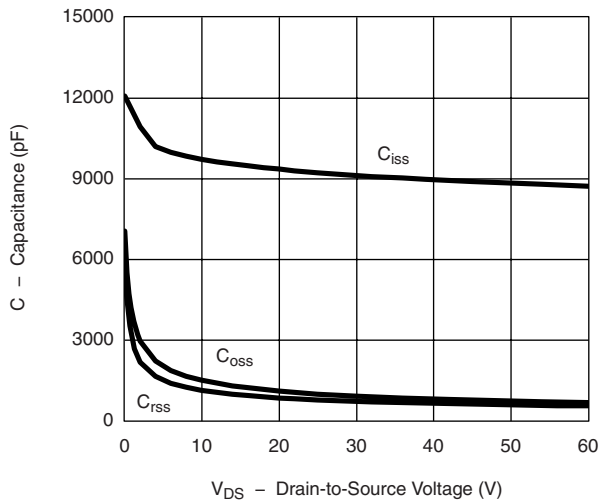
Transfer Characteristics



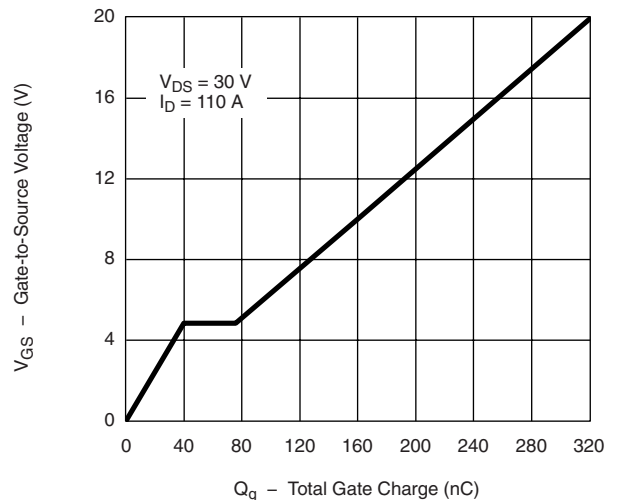
Transconductance



On-Resistance vs. Drain Current

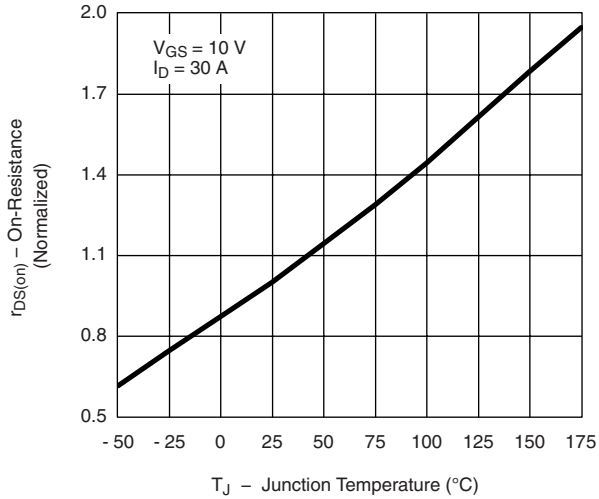


Capacitance

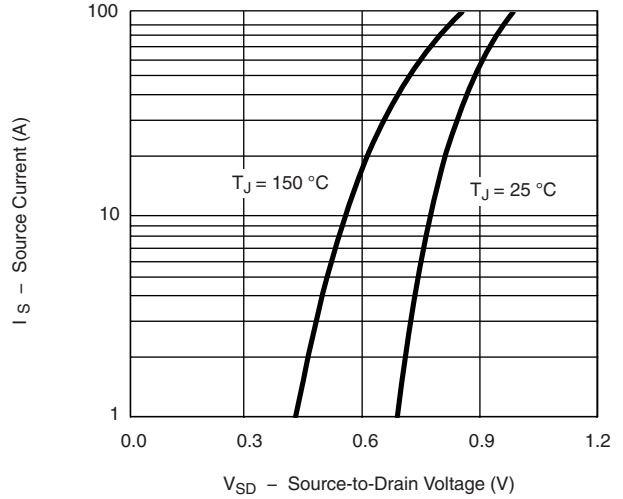


Gate Charge

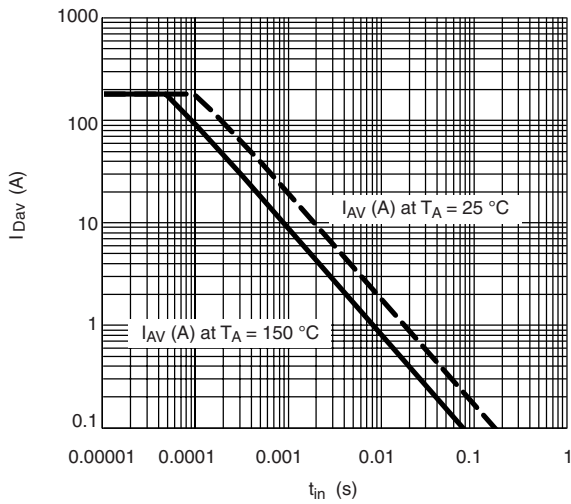
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



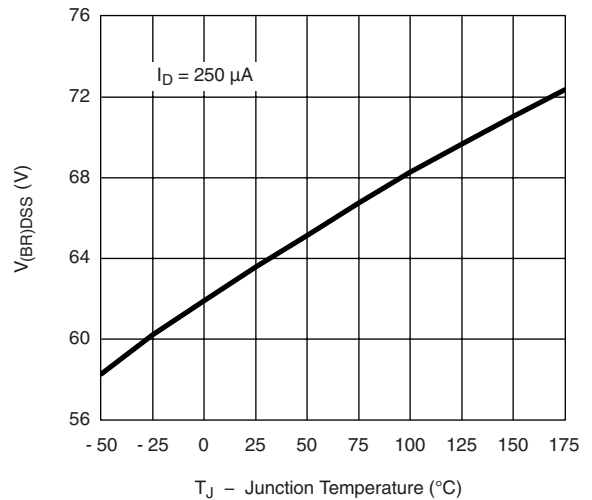
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

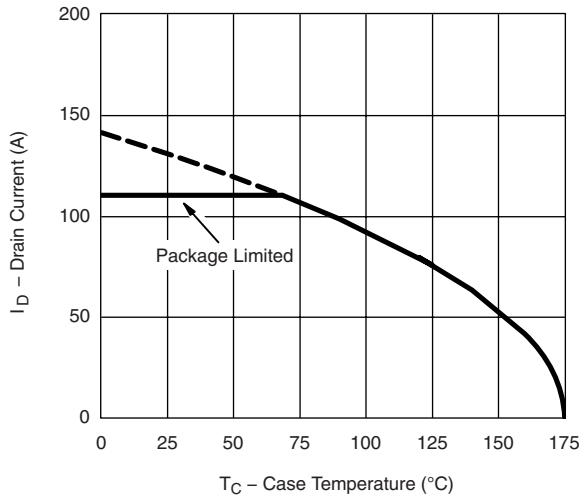


Avalanche Current vs. Time

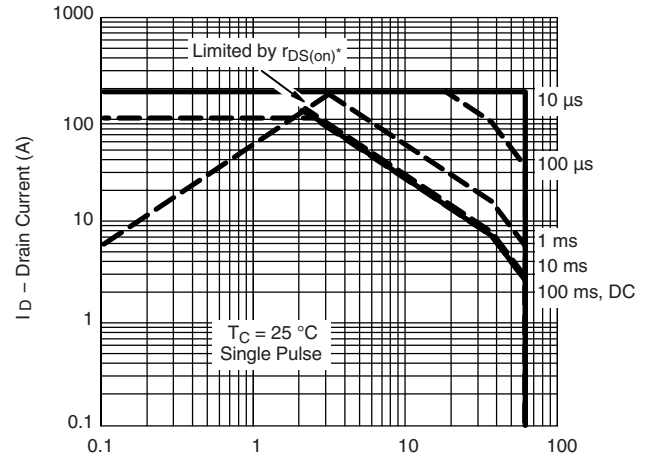


Drain Source Breakdown vs. Junction Temperature

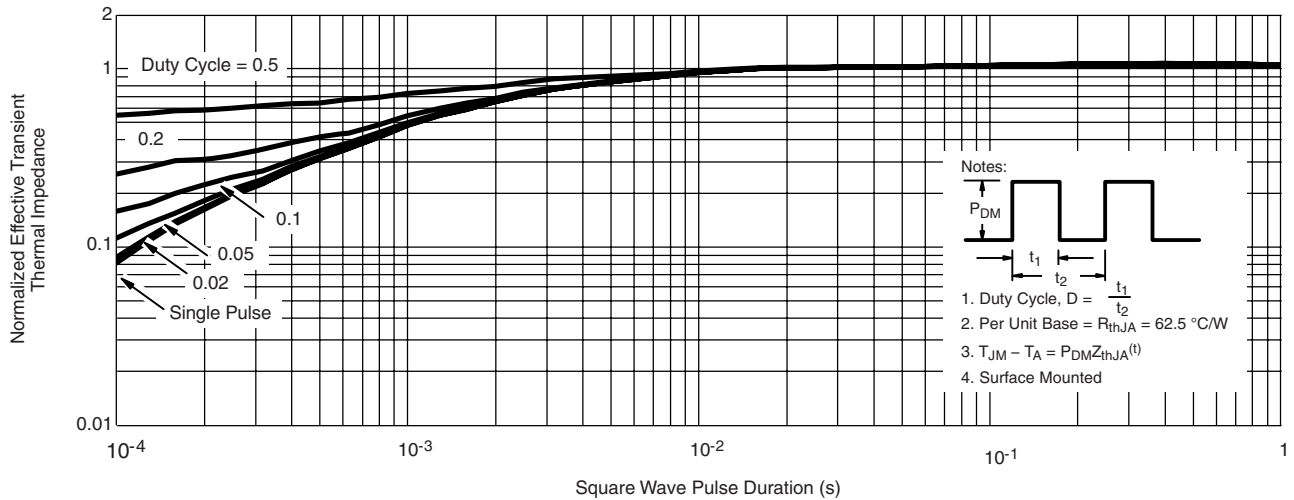
THERMAL RATINGS



Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area
 $V_{GS} > \text{minimum } V_{GS} \text{ at which } r_{DS(on)} \text{ is specified}$



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 <http://www.vishay.com/ppg?73045>.



Disclaimer

All product specifications and data are subject to change without notice.

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 herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

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.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Vishay:](#)

[SUM110P06-08L-E3](#)