

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	

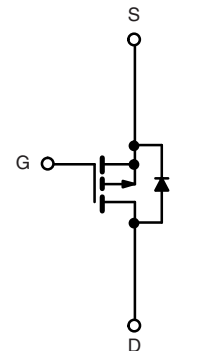
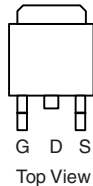
FEATURES

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



Available
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)	$T_C = 25$ °C	I_D	A
	$T_C = 125$ °C	- 110	
Pulsed Drain Current	I_{DM}	- 200	
Avalanche Current	I_{AS}	- 85	
Single Pulse Avalanche Energy ^d	$L = 0.1$ mH	E_{AS}	mJ
		211	
Maximum Power Dissipation	$T_C = 25$ °C	P_D	W
	$T_A = 25$ °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	R_{thJA}	40	°C/W
Junction-to-Case	R_{thJC}	0.55	

Notes:

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

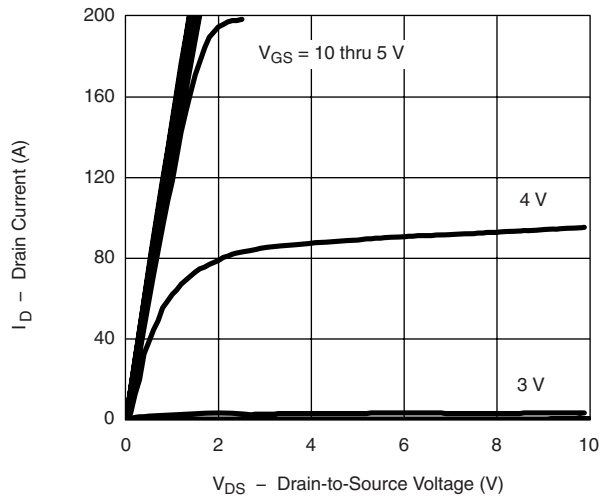
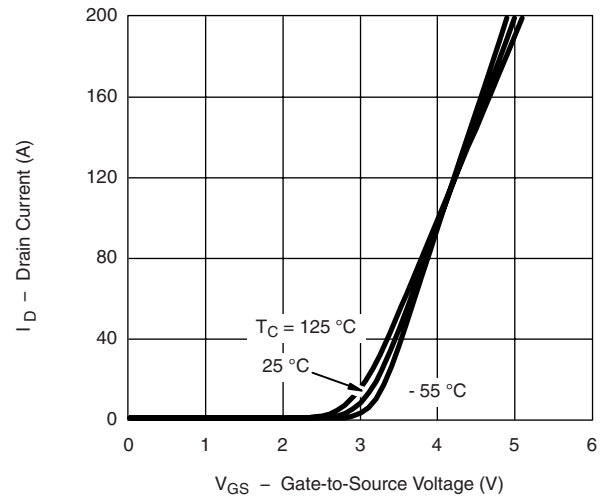
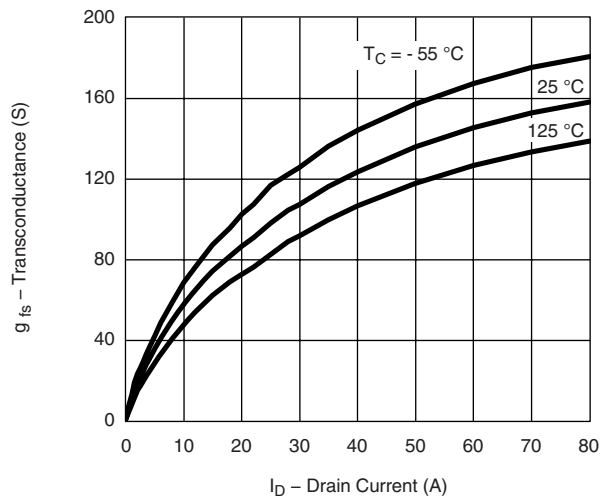
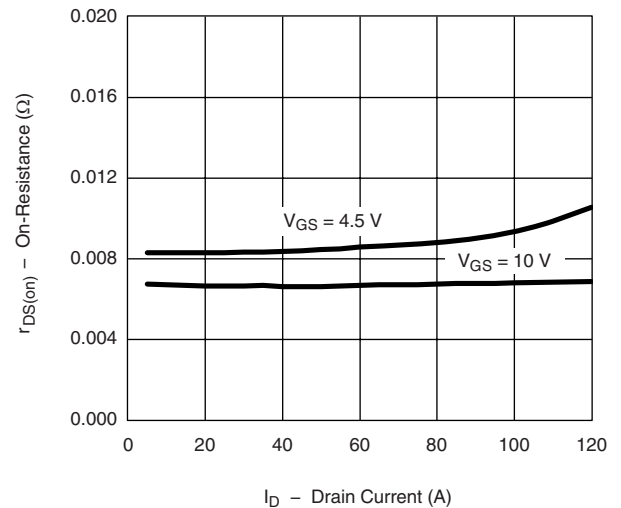
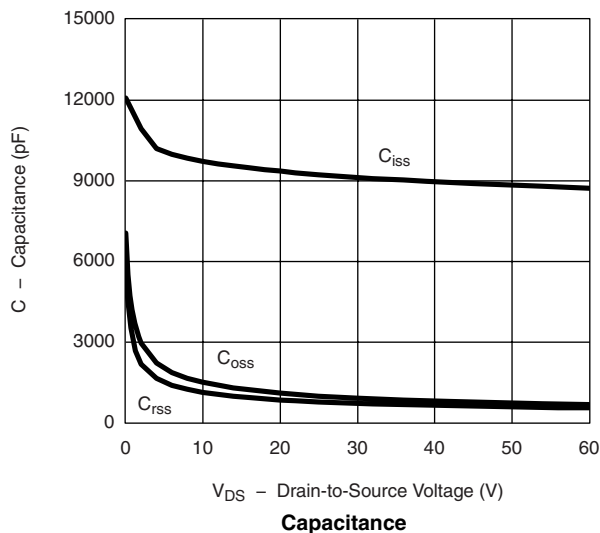
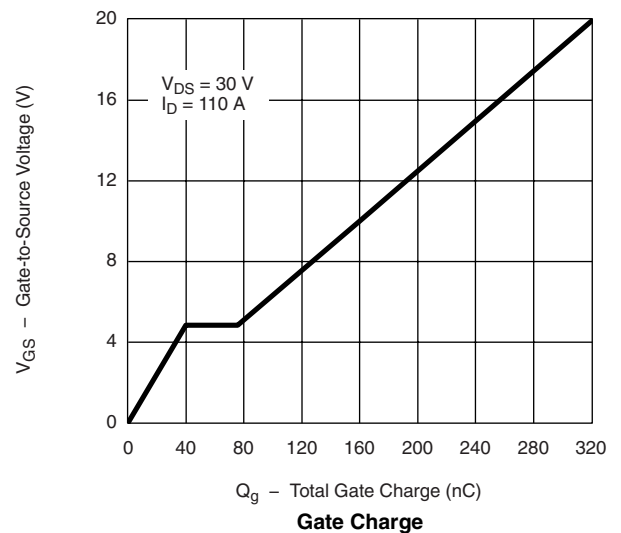
* Pb containing terminations are not RoHS compliant, exemptions may apply.

SPECIFICATIONS T _J = 25 °C, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = - 250 μA	- 60			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 1		- 3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 60 V, V _{GS} = 0 V			- 1	μA
		V _{DS} = - 60 V, V _{GS} = 0 V, T _J = 125 °C			- 50	
		V _{DS} = - 60 V, V _{GS} = 0 V, T _J = 175 °C			- 250	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = - 5 V, V _{GS} = - 10 V	- 120			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = - 10 V, I _D = - 30 A		0.0065	0.008	Ω
		V _{GS} = - 10 V, I _D = - 30 A, T _J = 125 °C			0.0129	
		V _{GS} = - 10 V, I _D = - 30 A, T _J = 175 °C			0.016	
		V _{GS} = - 4.5 V, I _D = - 20 A		0.0085	0.0105	
Forward Transconductance ^a	g _{fs}	V _{DS} = - 15 V, I _D = - 50 A	20			S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = - 25 V, f = 1 MHz		9200		pF
Output Capacitance	C _{oss}			975		
Reverse Transfer Capacitance	C _{rss}			760		
Total Gate Charge ^c	Q _g	V _{DS} = - 30 V, V _{GS} = - 10 V, I _D = - 110 A		160	240	nC
Gate-Source Charge ^c	Q _{gs}			40		
Gate-Drain Charge ^c	Q _{gd}			36		
Gate Resistance	R _g	f = 1 MHz	1.5	3	4.5	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = - 30 V, R _L = 0.27 Ω I _D ≅ - 110 A, V _{GEN} = - 10 V, R _G = 2.5 Ω		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 °C ^b						
Continuous Current	I _S				- 110	A
Pulsed Current	I _{SM}				- 200	
Forward Voltage ^a	V _{SD}	I _F = - 50 A, V _{GS} = 0 V		- 1.0	- 1.5	V
Reverse Recovery Time	t _{rr}	I _F = - 50 A, di/dt = 100 A/μs		60	90	ns
Peak Reverse Recovery Charge	I _{RM(REC)}			- 3	- 4.5	A
Reverse Recovery Charge	Q _{rr}				0.09	0.2

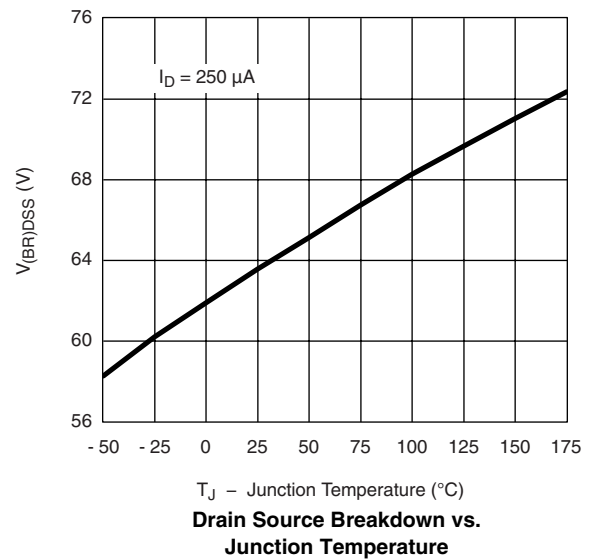
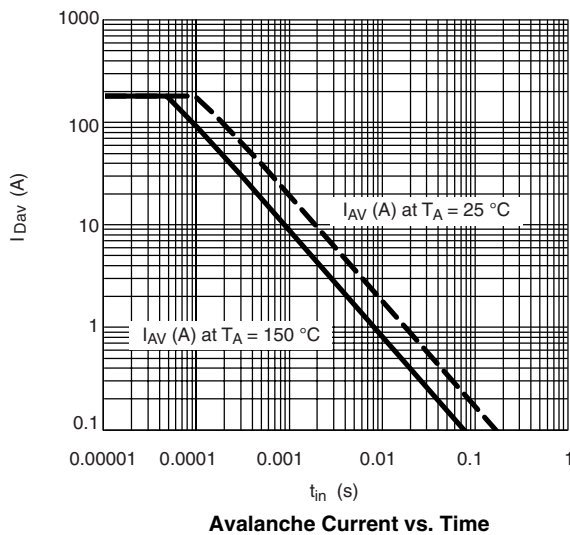
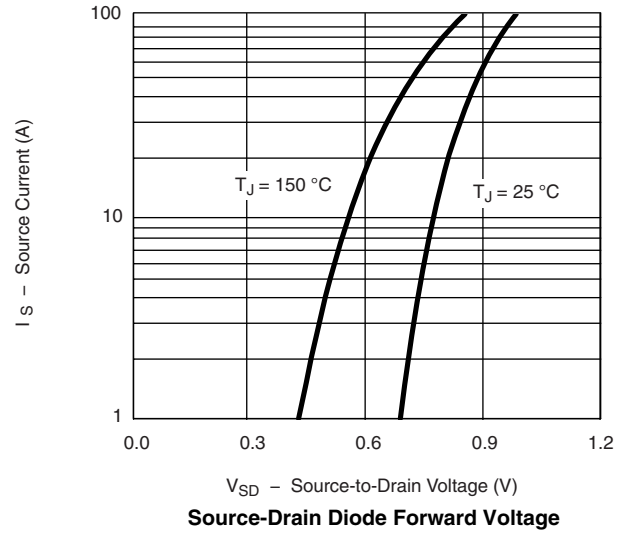
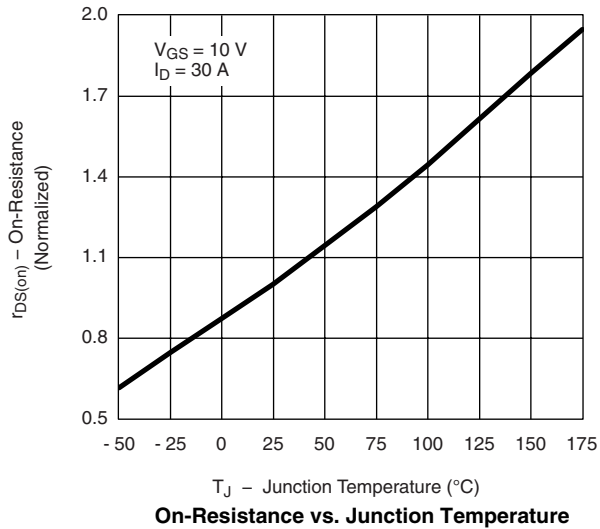
Notes:

- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, 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.

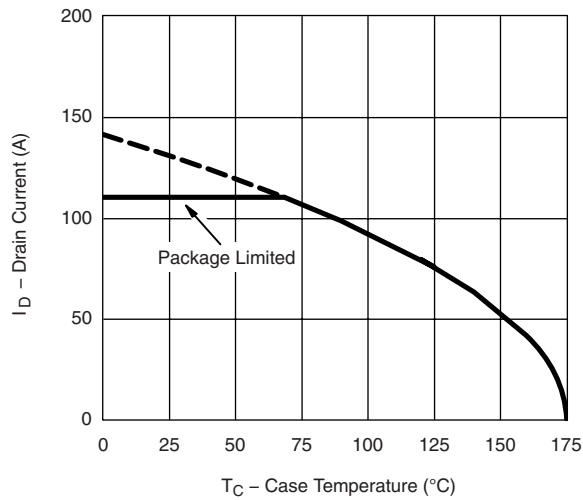
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

Output Characteristics

Transfer Characteristics

Transconductance

On-Resistance vs. Drain Current

Capacitance

Gate Charge

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

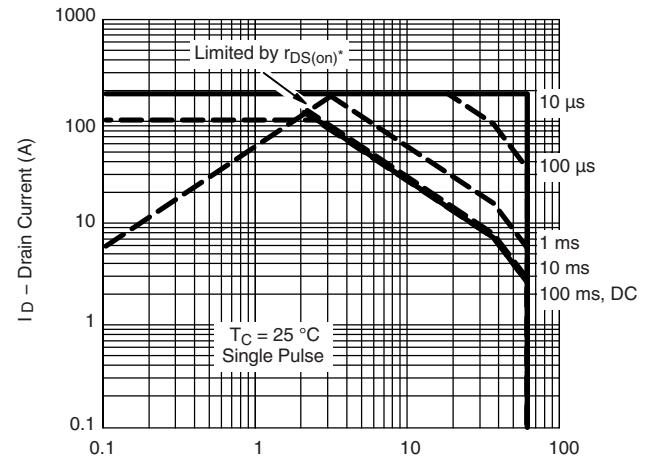




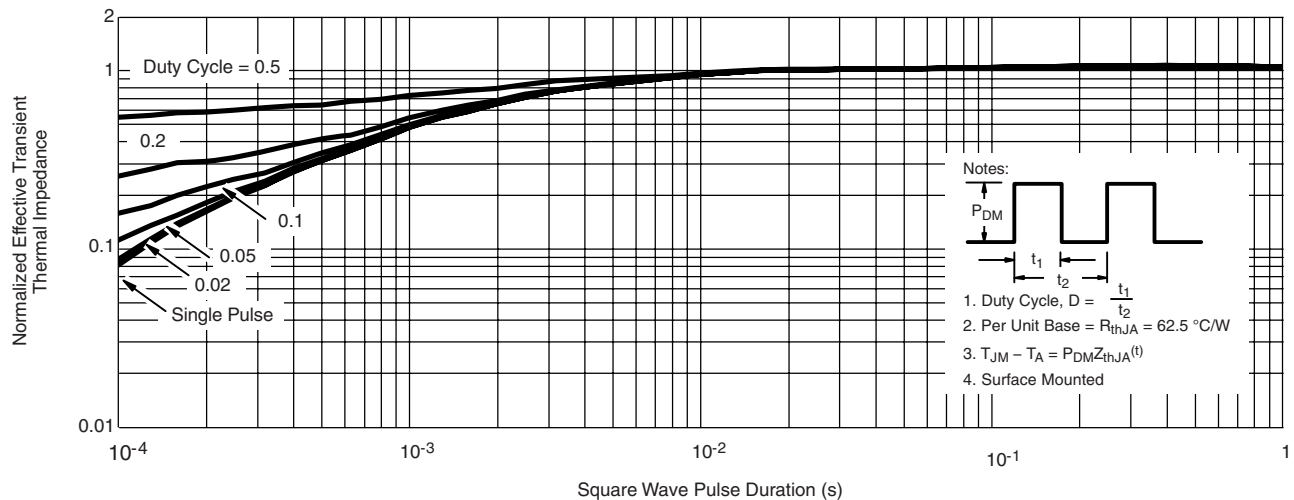
THERMAL RATINGS



Maximum Avalanche and Drain Current
vs. Case Temperature



V_{DS} - Drain-to-Source Voltage (V)
* $V_{GS} >$ minimum V_{GS} at which $r_{DS(on)}$ is specified
Safe Operating Area



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.