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New Product



SUM110P08-11

Vishay Siliconix

P-Channel 80-V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^b	Q_g (Typ)
- 80	0.0111 at $V_{GS} = -10$ V	- 110	113 nC

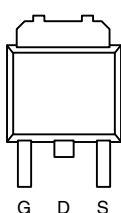
FEATURES

- TrenchFET® Power MOSFET



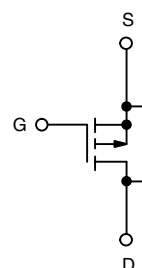
RoHS
COMPLIANT

TO-263



Top View

Drain Connected to Tab



P-Channel MOSFET

Ordering Information: SUM110P08-11 (Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	- 80	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 150$ °C)	I_D	$T_C = 25$ °C	110 ^a
		$T_C = 125$ °C	71
		$T_A = 25$ °C	23.5 ^{b, c}
		$T_A = 125$ °C	13.6 ^{b, c}
Pulsed Drain Current	I_{DM}	- 120	A
Continuous Source-Drain Diode Current	I_S	$T_C = 25$ °C	110 ^a
		$T_A = 25$ °C	- 9 ^{b, c}
Avalanche Current	I_{AS}	- 75	
Single-Pulse Avalanche Energy	E_{AS}	281	mJ
Maximum Power Dissipation	P_D	$T_C = 25$ °C	375
		$T_C = 125$ °C	125
		$T_A = 25$ °C	13.6 ^{b, c}
		$T_A = 125$ °C	4.5 ^{b, c}
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b, d}	R_{thJA}	8	11	°C/W
Maximum Junction-to-Case (Drain)	R_{thJC}	0.33	0.4	

Notes:

a. Package limited.

b. Surface Mounted on 1" x 1" FR4 board.

c. $t = 10$ sec.

d. Maximum under Steady State conditions is °C/W.

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SPECIFICATIONS T _J = 25 °C, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = - 250 μA	- 80			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = - 250 μA		- 85		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			7.0		
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 2		- 4	V
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 80 V, V _{GS} = 0 V			- 1	μA
		V _{DS} = - 80 V, V _{GS} = 0 V, T _J = 175 °C			- 500	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 10 V, V _{GS} = - 10 V	120			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = - 10 V, I _D = - 20 A		0.092	0.0111	Ω
Forward Transconductance ^a	g _{fs}	V _{DS} = - 15 V, I _D = - 20 A		80		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{DS} = - 40 V, V _{GS} = 0 V, f = 1 MHz		11500		pF
Output Capacitance	C _{oss}			790		
Reverse Transfer Capacitance	C _{rss}			700		
Total Gate Charge	Q _g	V _{DS} = - 40 V, V _{GS} = - 10 V, I _D = - 110 A		185	280	nC
Gate-Source Charge	Q _{gs}			40		
Gate-Drain Charge	Q _{gd}			45		
Gate Resistance	R _g	f = 1 MHz		3.6		Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 40 V, R _L = 0.36 Ω I _D ≡ - 110 A, V _{GEN} = - 10 V, R _g = 1 Ω		25	40	ns
Rise Time	t _r			410	620	
Turn-Off Delay Time	t _{d(off)}			145	220	
Fall Time	t _f			470	710	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			- 110	A
Pulse Diode Forward Current ^a	I _{SM}				- 120	
Body Diode Voltage	V _{SD}	I _S = - 20 A		- 0.8	- 1.5	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = - 20 A, di/dt = 100 A/μs, T _J = 25 °C		65	100	ns
Body Diode Reverse Recovery Charge	Q _{rr}			135	205	nC
Reverse Recovery Fall Time	t _a			43		ns
Reverse Recovery Rise Time	t _b			22		

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.

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.

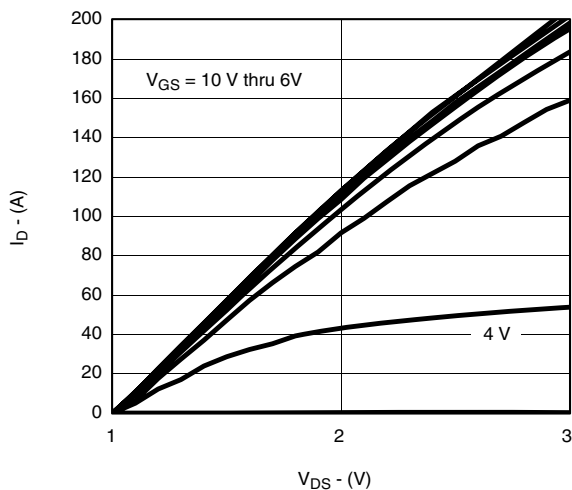
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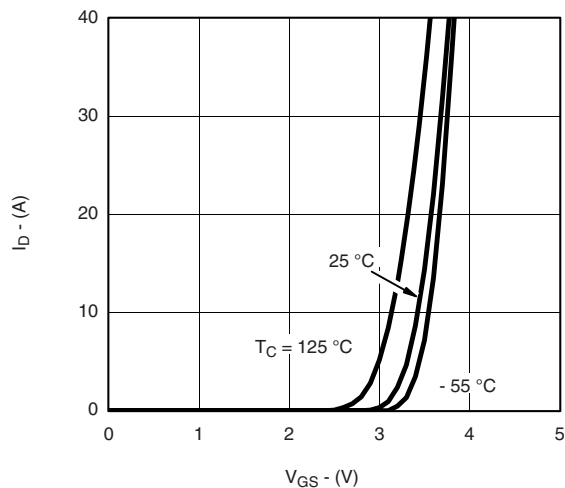
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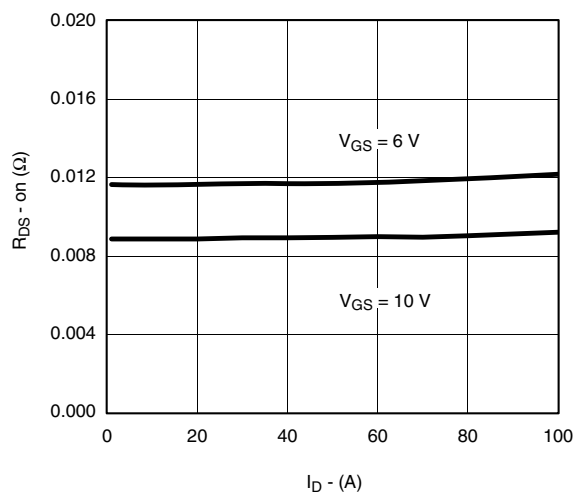
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



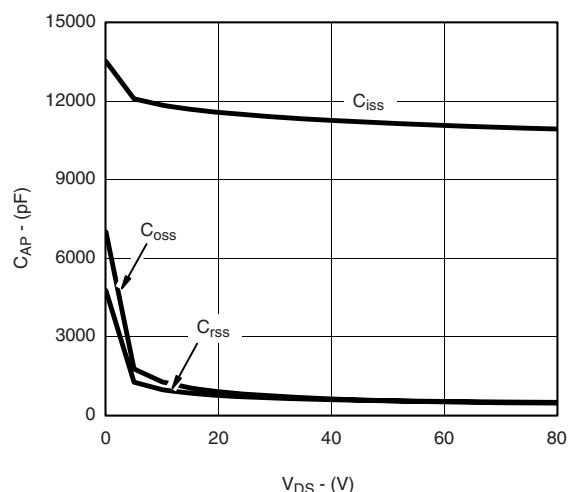
Output Characteristics



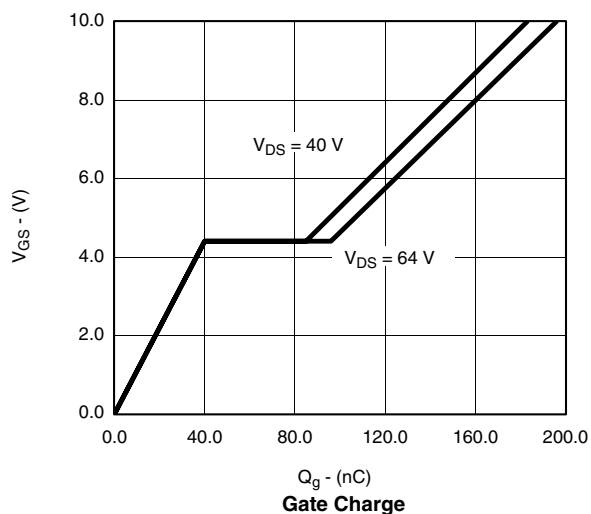
Transfer Characteristics



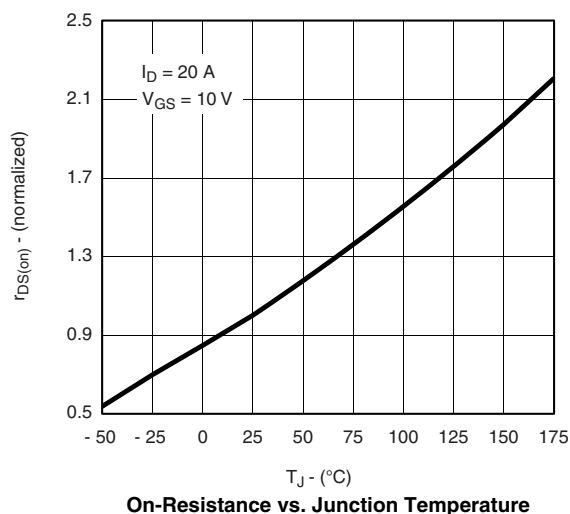
On-Resistance vs. Drain Current



Capacitance



Gate Charge



On-Resistance vs. Junction Temperature

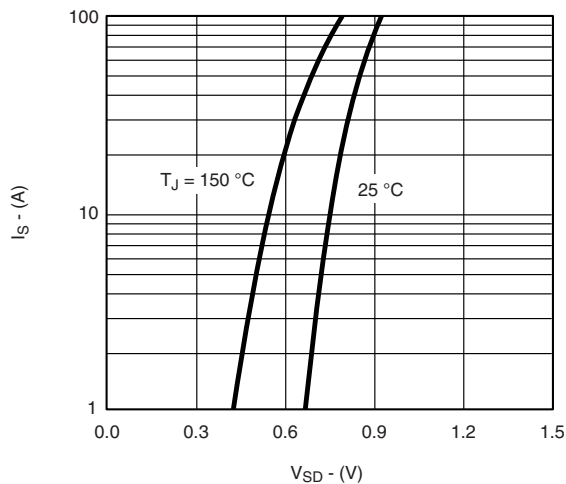
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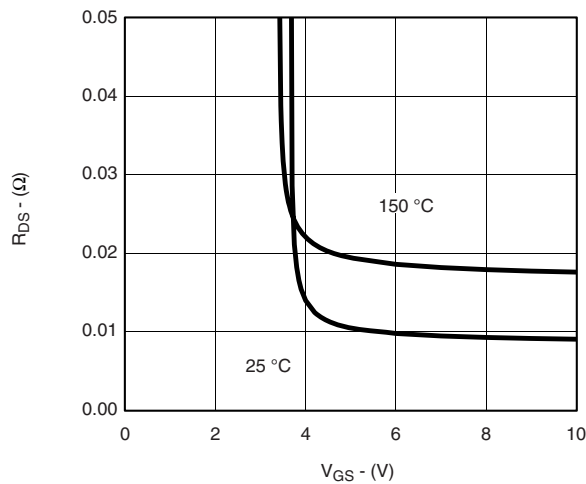
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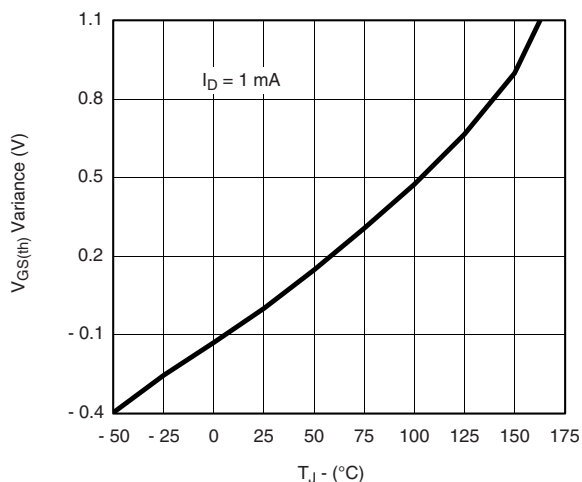
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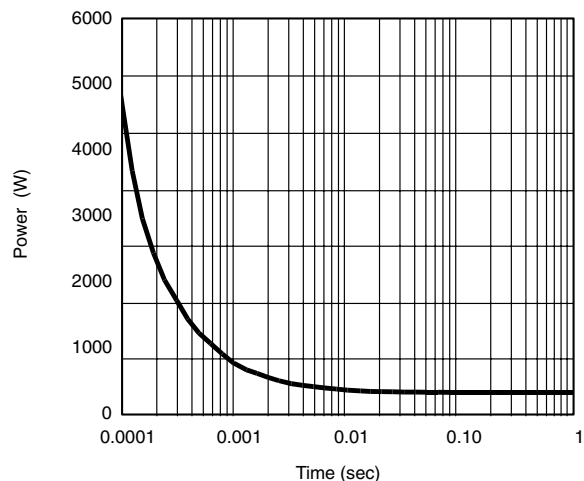
Source-Drain Diode Forward Voltage



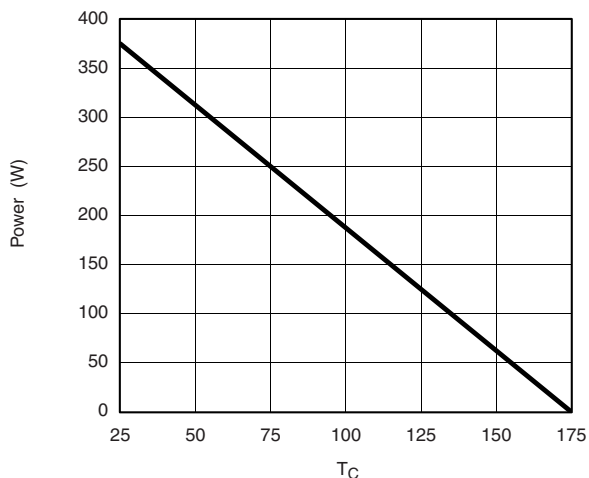
On-Resistance vs. Gate-to-Source Voltage



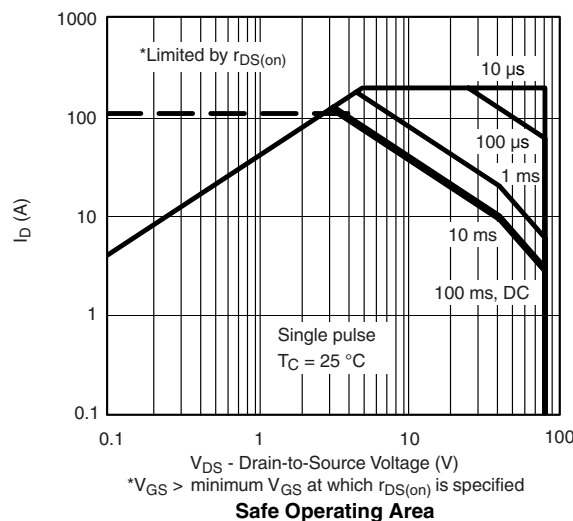
Threshold Voltage



Single Pulse Power, Junction-to-Case ($T_C = 25^\circ\text{C}$)



Power Derating (Junction-to-Case)



Safe Operating Area

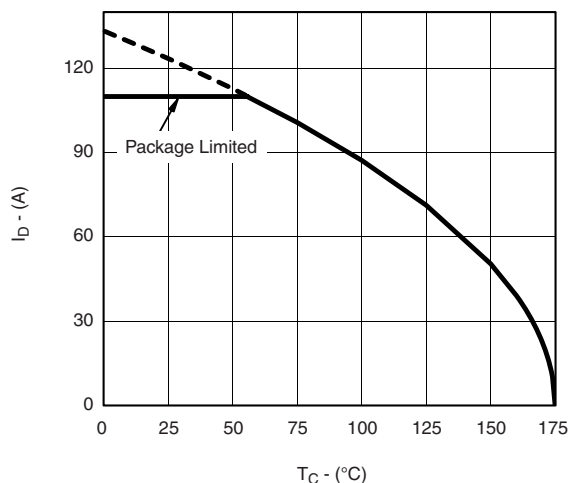
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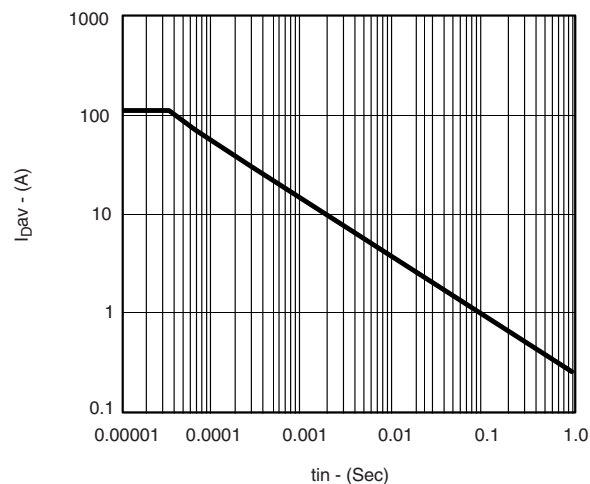
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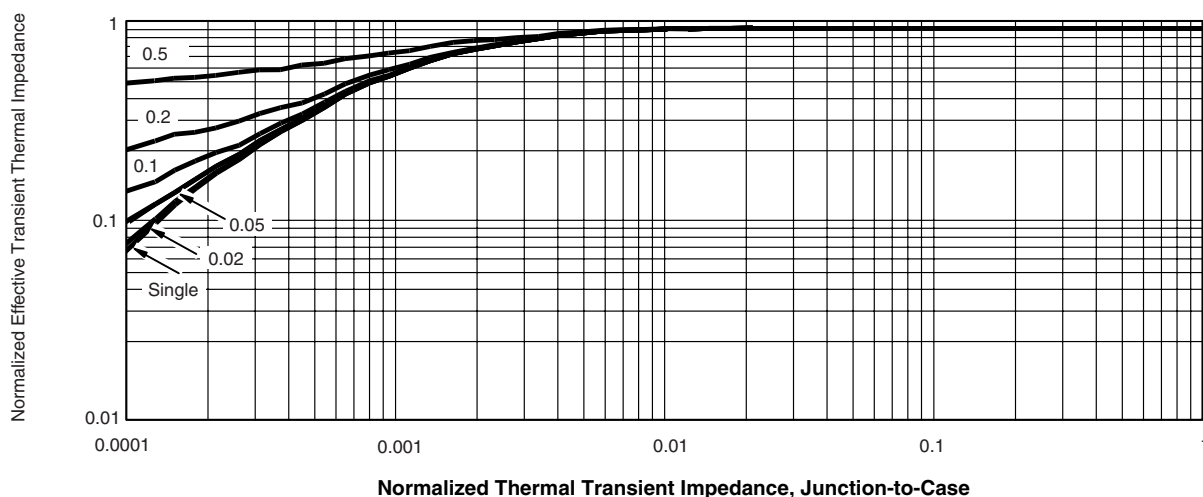
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



**Max Avalanche and Drain Current
vs. Case Temperature**



Avalanche Current vs. Time



*The power dissipation P_D is based on $T_{J(max)} = 175$ °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.

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?73472>.



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