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SUM110P08-11

Vishay Siliconix

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

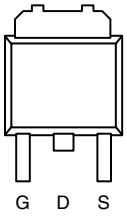
PRODUCT SUMMARY			
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)[b]	Q_g (Typ)
- 80	0.0111 at V_{GS} = - 10 V	- 110	113 nC

FEATURES

- TrenchFET® Power MOSFET

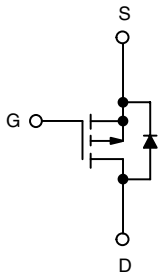
RoHS COMPLIANT

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)	T_C = 25 °C	I_D	110[a]	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	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	110[a]	
	T_A = 25 °C		- 9[b, c]	
Avalanche Current	L = 0.1 mH	I_{AS}	- 75	
Single-Pulse Avalanche Energy		E_{AS}	281	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	375	W
	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]	t ≤ 10 sec	R_{thJA}	8	11	°C/W
Maximum Junction-to-Case (Drain)	Steady State	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.

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	$\Delta V_{DS}/T_J$	I_D = - 250 µA		- 85		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			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]	$I_{D(on)}$	$V_{DS} \geq$ 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 $I_D \cong$ - 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		

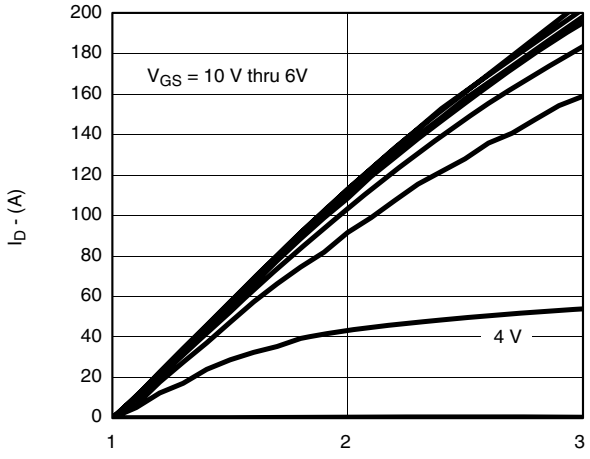
Notes:

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.

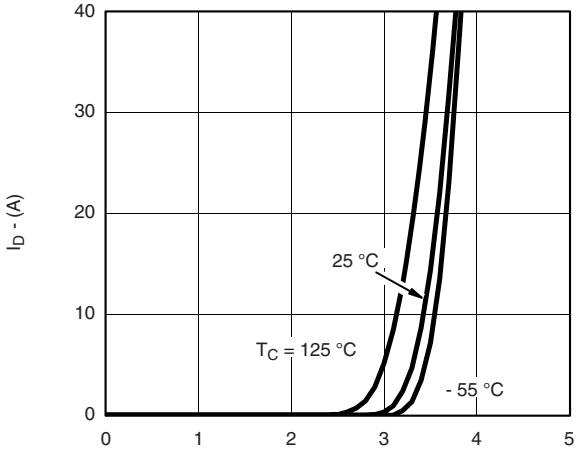
b. Guaranteed by design, not subject to production testing.

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.

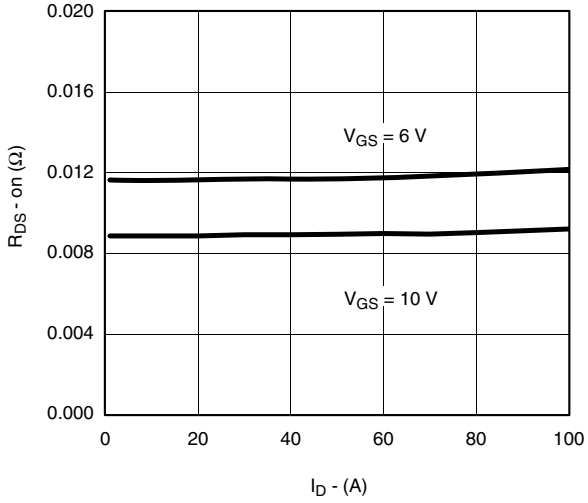
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



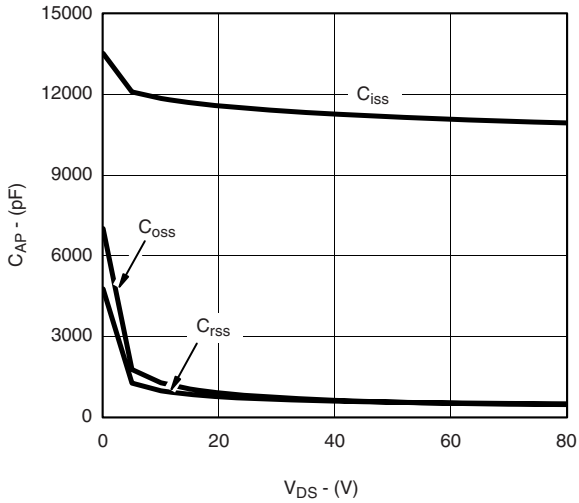
Output Characteristics



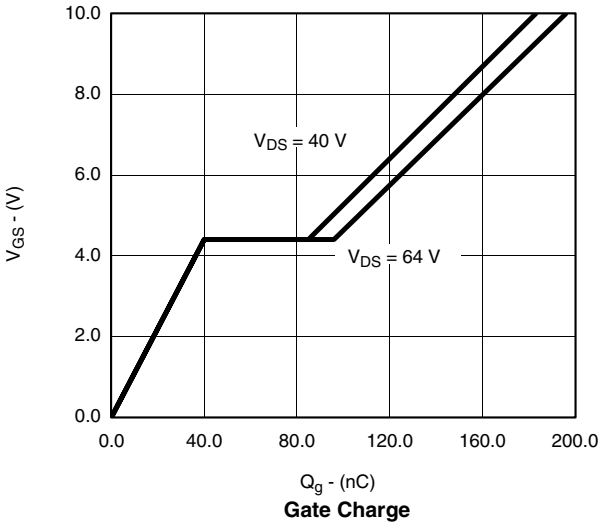
Transfer Characteristics



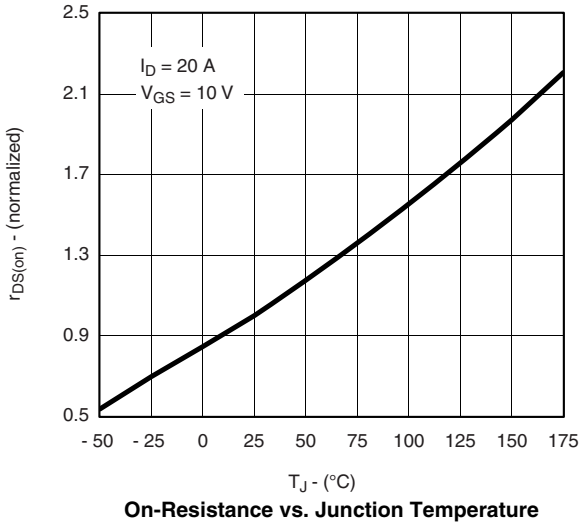
On-Resistance vs. Drain Current



Capacitance

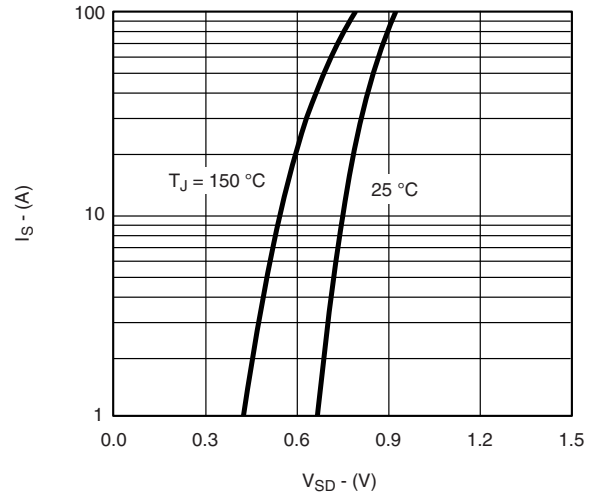


Gate Charge

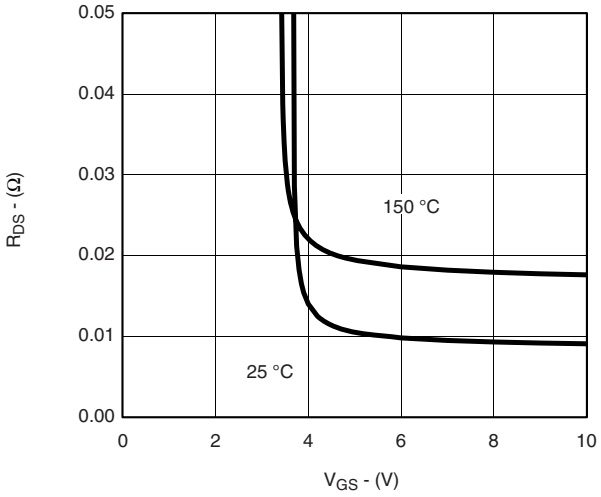


On-Resistance vs. Junction Temperature

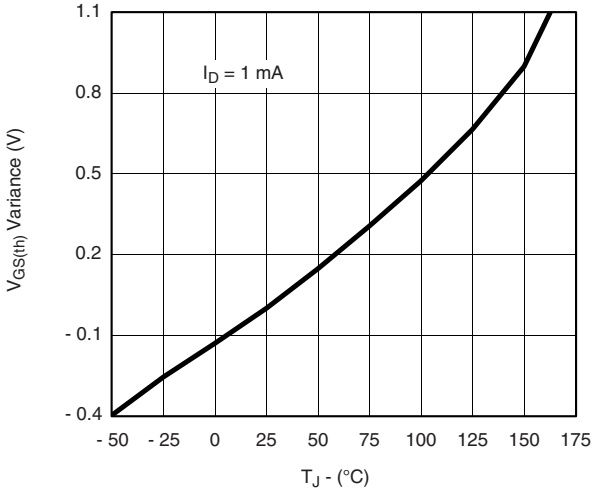
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



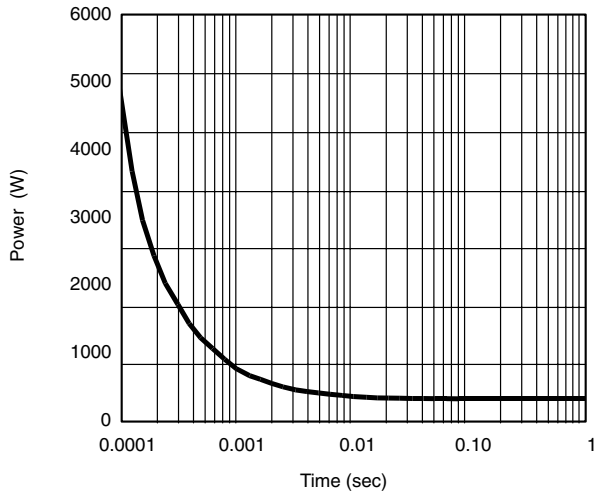
Source-Drain Diode Forward Voltage



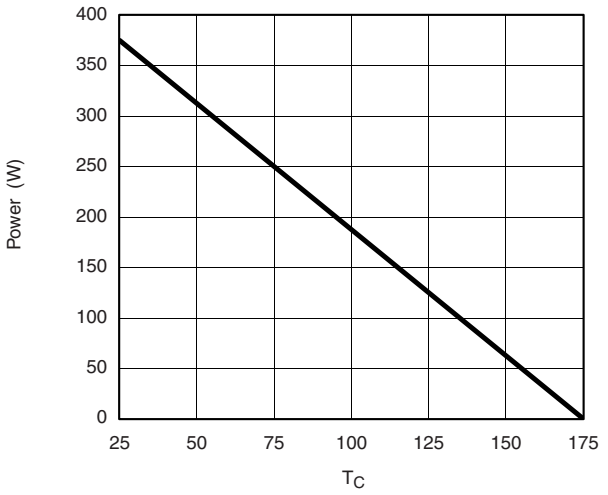
On-Resistance vs. Gate-to-Source Voltage



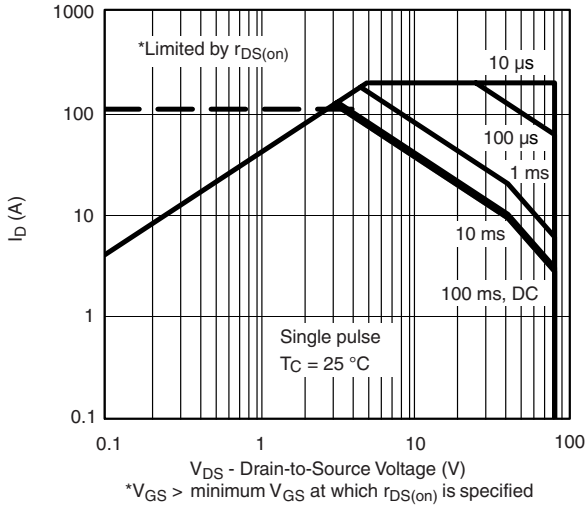
Threshold Voltage



Single Pulse Power, Junction-to-Case (T_C = 25 °C)



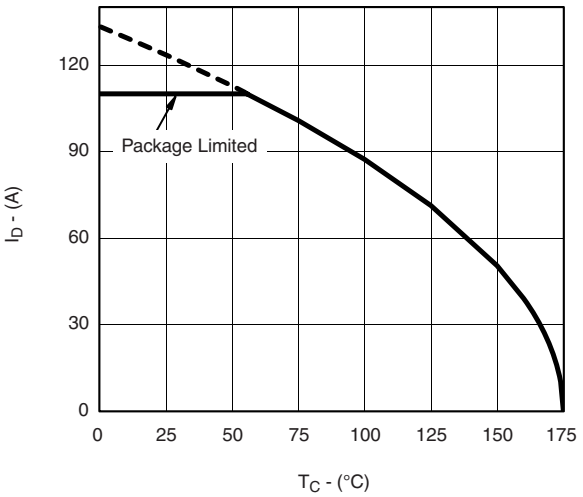
Power Derating (Junction-to-Case)



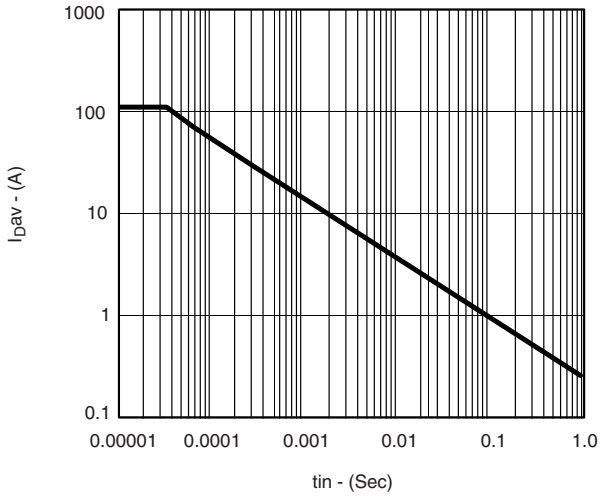
*V_{GS} > minimum V_{GS} at which $r_{DS(on)}$ is specified

Safe Operating Area

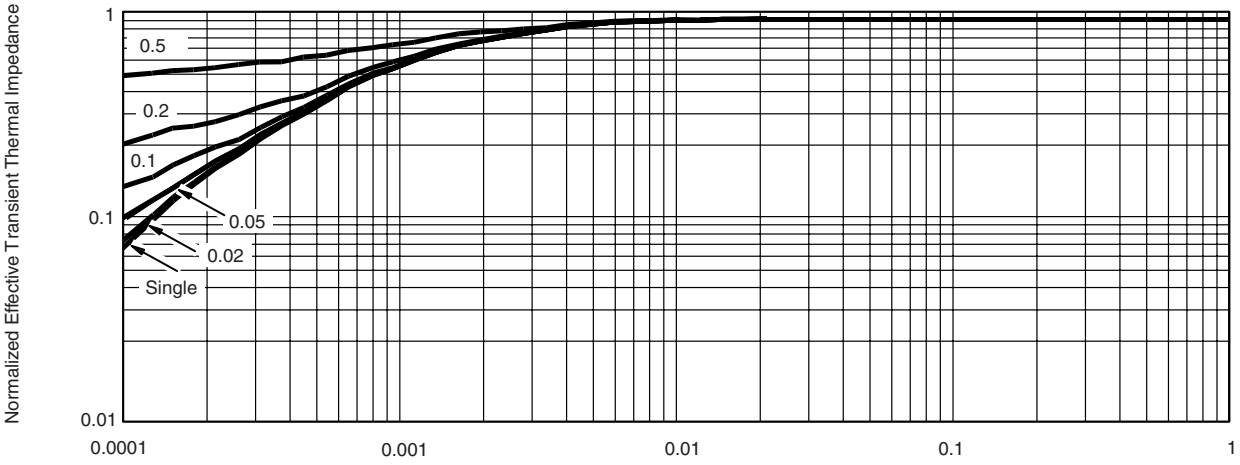
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Max Avalanche and Drain Current vs. Case Temperature



Avalanche Current vs. Time



Normalized Thermal Transient Impedance, Junction-to-Case

*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.

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