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Vishay/Siliconix
SUM90P10-19-E3

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New Product

SUM90P10-19

Vishay Siliconix

P-Channel 100-V (D-S) MOSFET

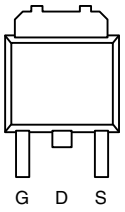
PRODUCT SUMMARY			
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)[a]	Q_g (Typ)
- 100	0.019 at V_{GS} = - 10 V	- 90	128 nC

FEATURES

- TrenchFET® Power MOSFET

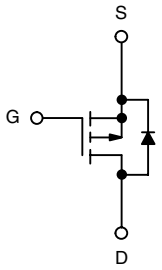
RoHS COMPLIANT

TO-263



Top View

Drain Connected to Tab



P-Channel MOSFET

Ordering Information: SUM90P10-19-E3 (Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted				
Parameter		**Symbol**	**Limit**	**Unit**
Drain-Source Voltage		V_{DS}	- 100	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 175 °C)	T_C = 25 °C	I_D	- 90	A
	T_C = 125 °C		- 52	
	T_A = 25 °C		- 17[b, c]	
	T_A = 125 °C		- 9.9[b, c]	
Pulsed Drain Current		I_{DM}	- 90	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	- 90	
	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 s	R_{thJA}	8	11	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	0.33	0.4	

Notes:
a. Based on T_C = 25 °C.
b. Surface Mounted on 1" x 1" FR4 Board.
c. t = 10 s.
d. Maximum under Steady State conditions is 40 °C/W.

New Product

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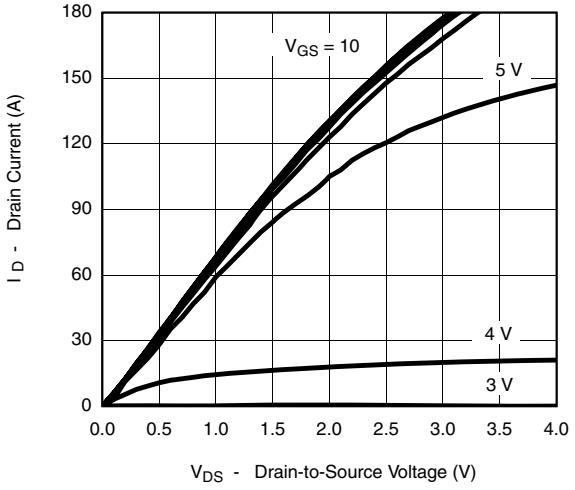
Vishay Siliconix

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	- 100			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = - 250 µA		- 111		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			7		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 2		- 4.5	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} = - 100 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 100 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	- 90			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = - 10 V, I_D = - 20 A		0.0155	0.019	Ω
Forward Transconductance[a]	g_{fs}	V_{DS} = - 15 V, I_D = - 20 A		70		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = - 50 V, V_{GS} = 0 V, f = 1 MHz		12000		pF
Output Capacitance	C_{oss}			700		
Reverse Transfer Capacitance	C_{rss}			1670		
Total Gate Charge	Q_g	V_{DS} = - 50 V, V_{GS} = - 10 V, I_D = - 90 A		218	330	nC
Gate-Source Charge	Q_{gs}			55		
Gate-Drain Charge	Q_{gd}			55		
Gate Resistance	R_g	f = 1 MHz		3.5		Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 50 V, R_L = 0.56 Ω $I_D \cong$ - 90 A, V_{GEN} = - 10 V, R_g = 1 Ω		30	50	ns
Rise Time	t_r			720	1100	
Turn-Off Delay Time	$t_{d(off)}$			125	190	
Fall Time	t_f			610	920	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			- 90	A
Pulse Diode Forward Current[a]	I_{SM}				- 250	
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		80	120	ns
Body Diode Reverse Recovery Charge	Q_{rr}			230	350	nC
Reverse Recovery Fall Time	t_a			62		ns
Reverse Recovery Rise Time	t_b			18		

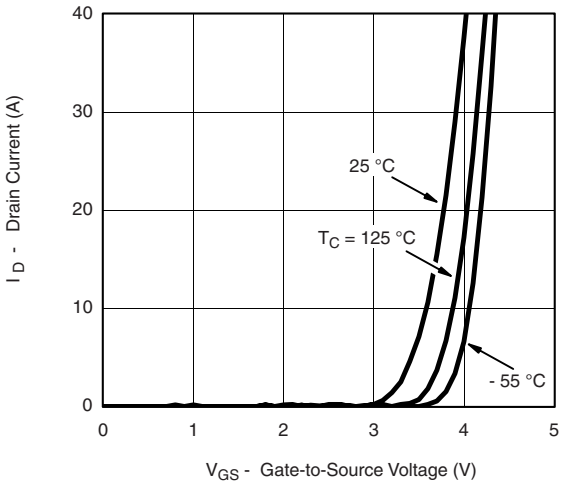
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

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.

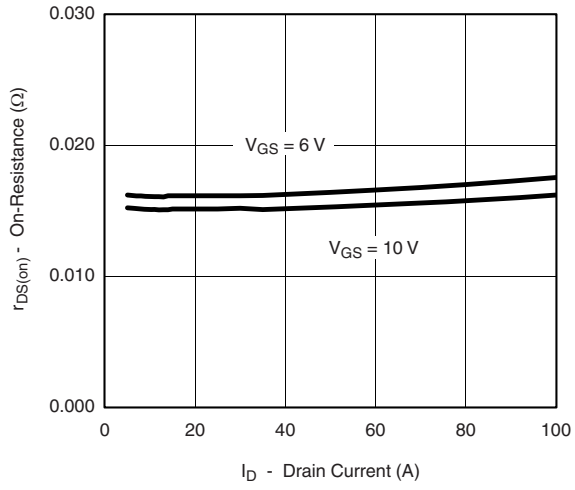
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



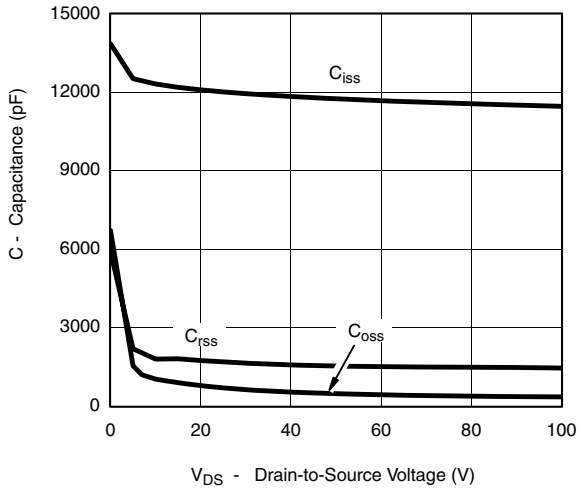
Output Characteristics



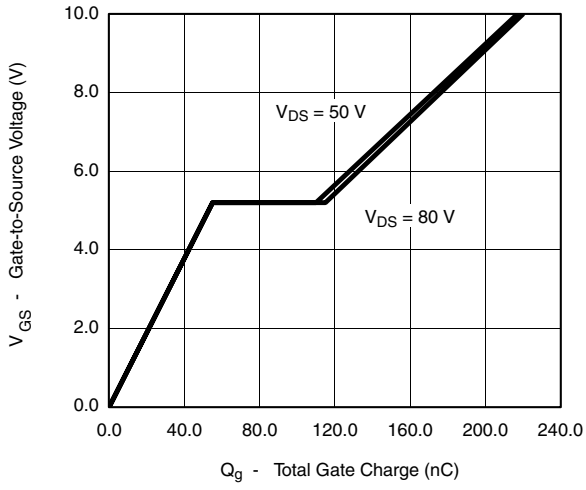
Transfer Characteristics



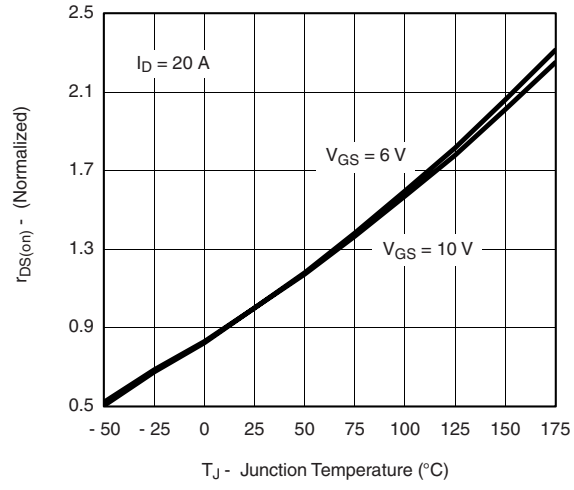
On-Resistance vs. Drain Current



Capacitance



Gate Charge



On-Resistance vs. Junction Temperature

New Product

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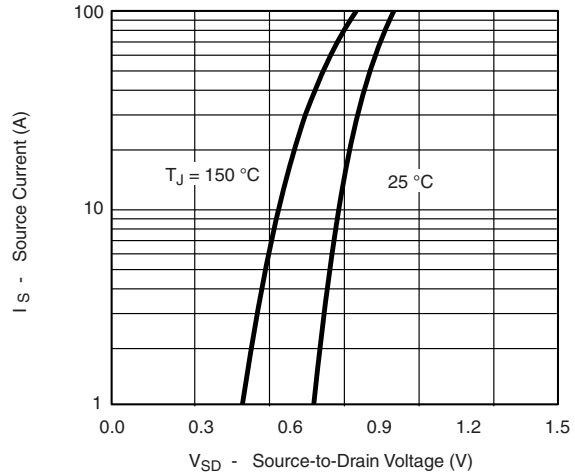
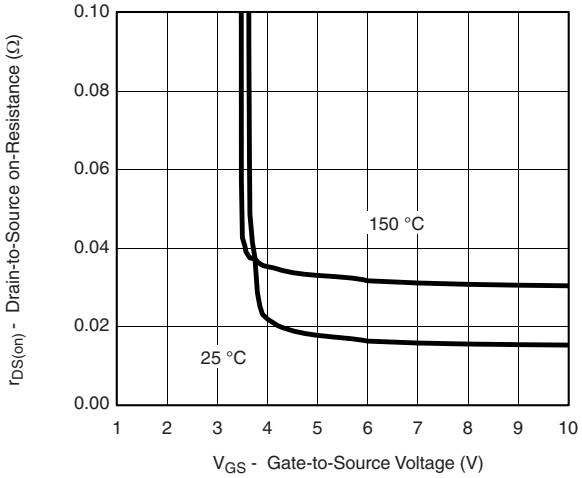
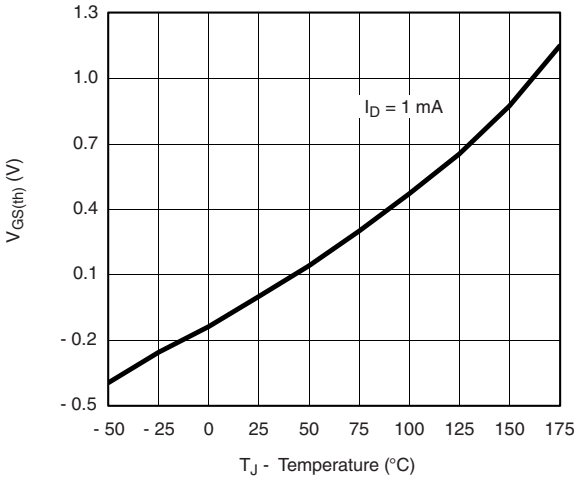
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



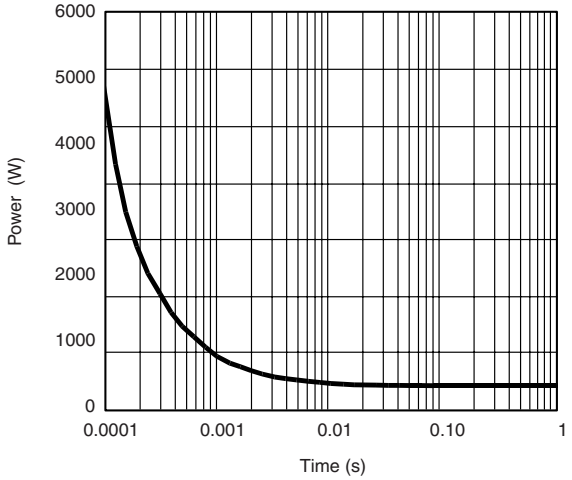
Source-Drain Diode Forward Voltage



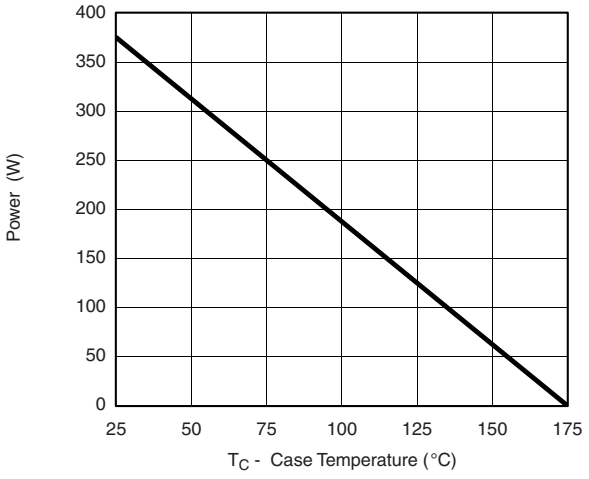
On-Resistance vs. Gate-to-Source Voltage



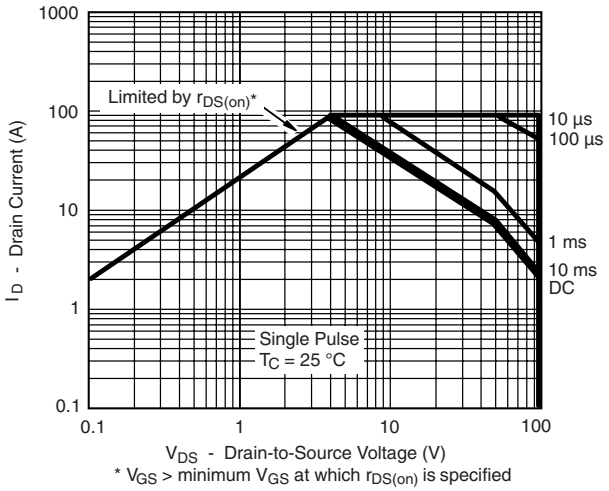
Threshold Voltage



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

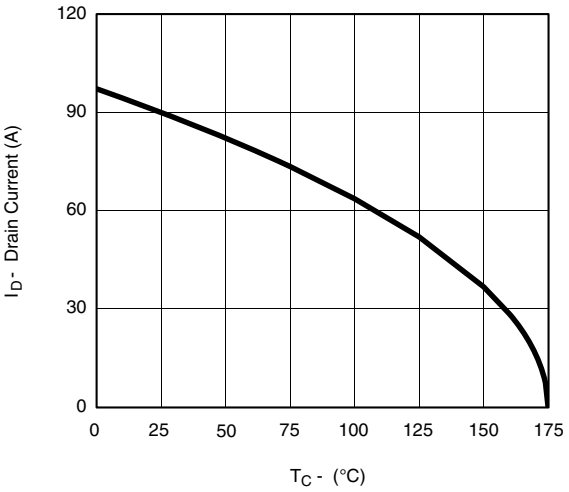


Power Derating, Junction-to-Case

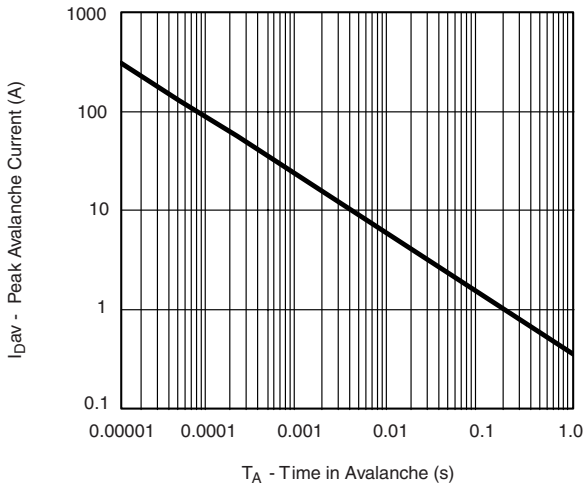


Safe Operating Area

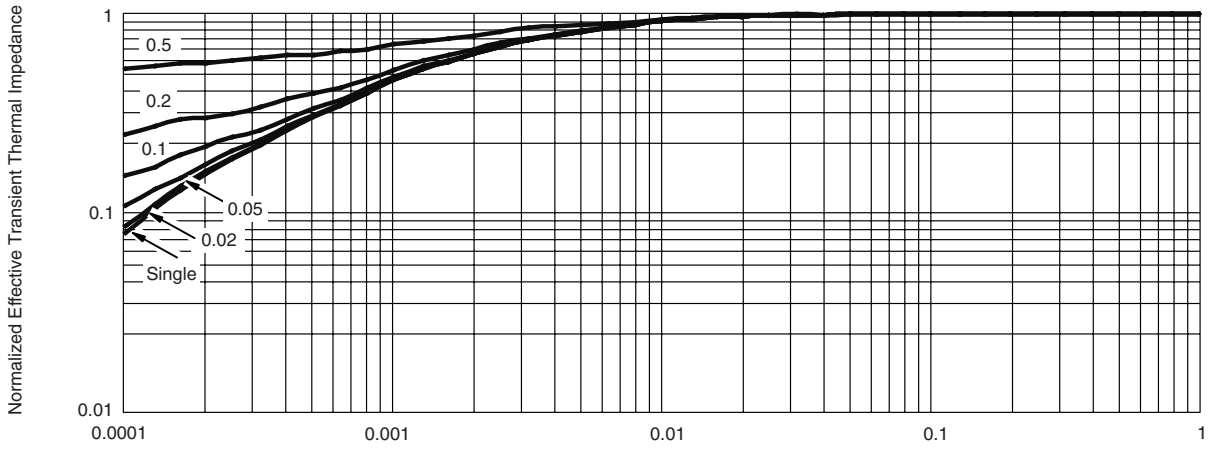
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Max Avalanche and Drain Current vs. Case Temperature



Avalanche Current vs. Time



Normalized Thermal Transient Impedance, Junction-to-Case

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