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Vishay/Siliconix
SI3981DV-T1-E3

For any questions, you can email us directly:
sales@integrated-circuit.com

Dual P-Channel 20 V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
- 20	0.185 at V_{GS} = - 4.5 V	- 1.9
	0.260 at V_{GS} = - 2.5 V	- 1.6
	0.385 at V_{GS} = - 1.8 V	- 0.7

FEATURES

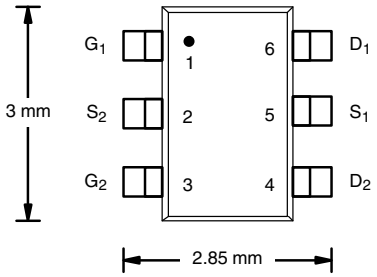
- TrenchFET® Power MOSFET
- Material categorization:
  For definitions of compliance please see www.vishay.com/doc?99912

Pb-free
RoHS COMPLIANT
HALOGEN FREE

APPLICATIONS

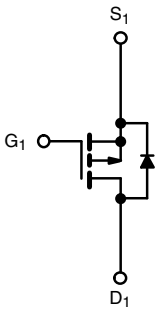
- Battery Switch for Portable Devices
- Computers
  - Bus Switch
  - Load Switch

TSOP-6
Top View

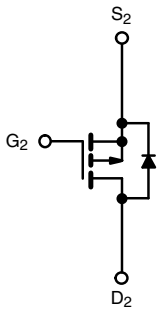


Ordering Information:
Si3981DV-T1-GE3 (Lead (Pb)-free and Halogen-free)

Marking Code: MCxxx



P-Channel MOSFET



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)					
Parameter		**Symbol**	**5 s**	**Steady State**	**Unit**
Drain-Source Voltage		V_{DS}	- 20		V
Gate-Source Voltage		V_{GS}	± 8		
Continuous Drain Current (T_J = 150 °C)[a]	T_A = 25 °C	I_D	- 1.9	- 1.6	A
	T_A = 70 °C		- 1.5	- 1.3	
Pulsed Drain Current		I_{DM}	- 8		
Continuous Source Current (Diode Conduction)[a]		I_S	- 1	- 0.72	
Maximum Power Dissipation[a]	T_A = 25 °C	P_D	1.08	0.80	W
	T_A = 70 °C		0.69	0.51	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150		°C

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Maximum Junction-to-Ambient[a]	t ≤ 5 s	R_{thJA}	97	115	°C/W
	Steady State		132	155	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	78	95	

Note:
a. Surface mounted on 1" x 1" FR4 board.

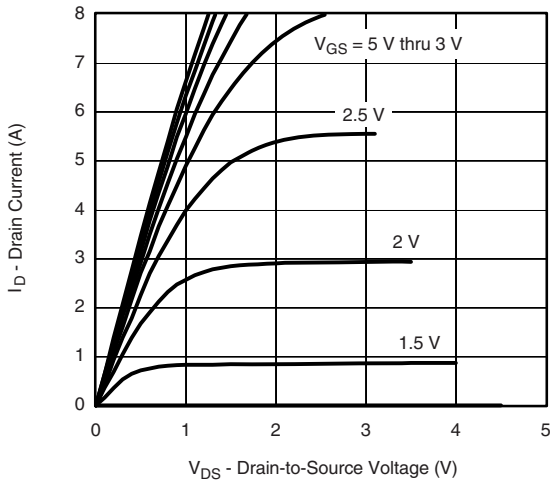
SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 0.40		- 1.1	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 8 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 20 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 20 V, V_{GS} = 0 V, T_J = 85 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = - 5 V, V_{GS} = - 4.5 V	- 5			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 4.5 V, I_D = - 1.9 A		0.146	0.185	Ω
		V_{GS} = - 2.5 V, I_D = - 1.6 A		0.210	0.260	
		V_{GS} = - 1.8 V, I_D = - 0.7 A		0.306	0.385	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 5 V, I_D = - 1.9 A		4		S
Diode Forward Voltage[a]	V_{SD}	I_S = - 1 A, V_{GS} = 0 V		- 0.84	- 1.1	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = - 10 V, V_{GS} = - 4.5 V, I_D = - 1.9 A		3.2	5	nC
Gate-Source Charge	Q_{gs}			0.42		
Gate-Drain Charge	Q_{gd}			0.84		
Gate Resistance	R_g	f = 1 MHz		6		Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 10 V, R_L = 10 Ω $I_D \cong$ - 1 A, V_{GEN} = - 4.5 V, R_g = 6 Ω		30	45	ns
Rise Time	t_r			50	85	
Turn-Off Delay Time	$t_{d(off)}$			45	85	
Fall Time	t_f			21	50	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = - 1 A, dI/dt = 100 A/µs		20	40	

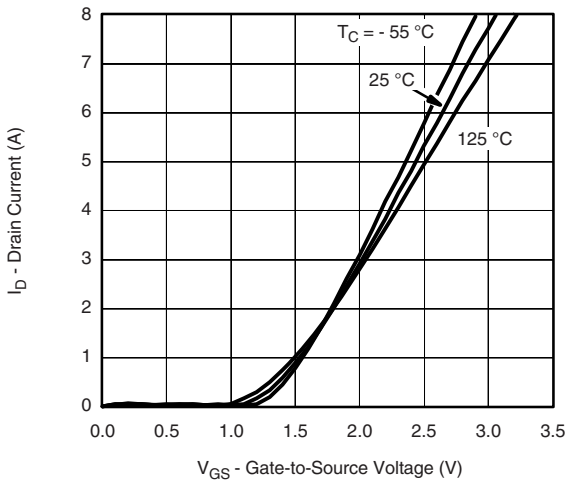
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

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)

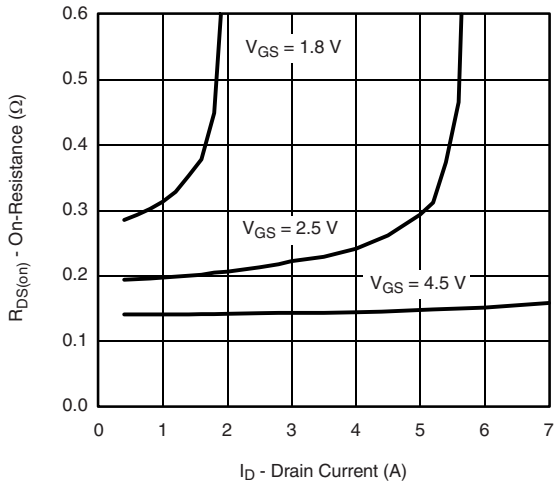


Output Characteristics

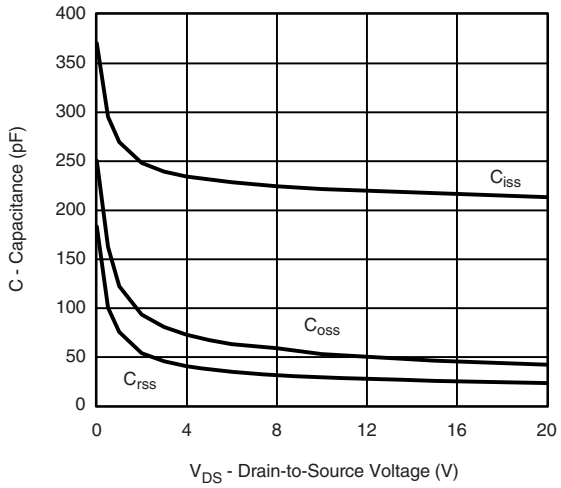


Transfer Characteristics

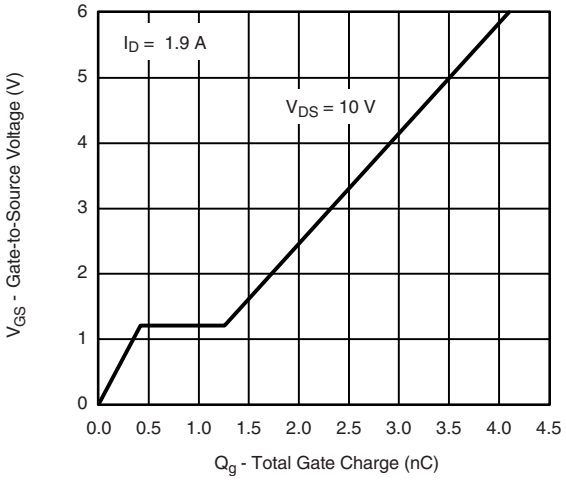
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



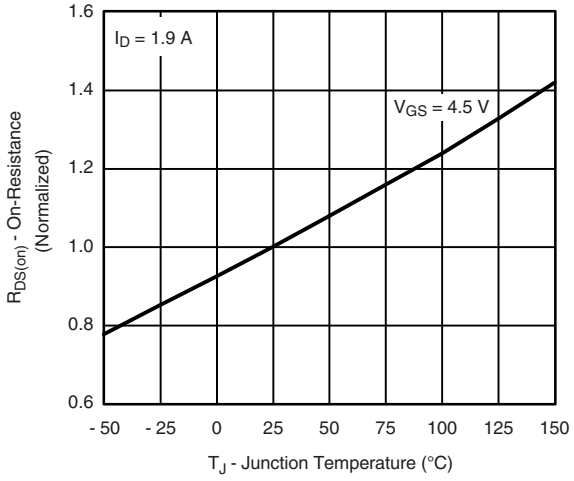
On-Resistance vs. Drain Current



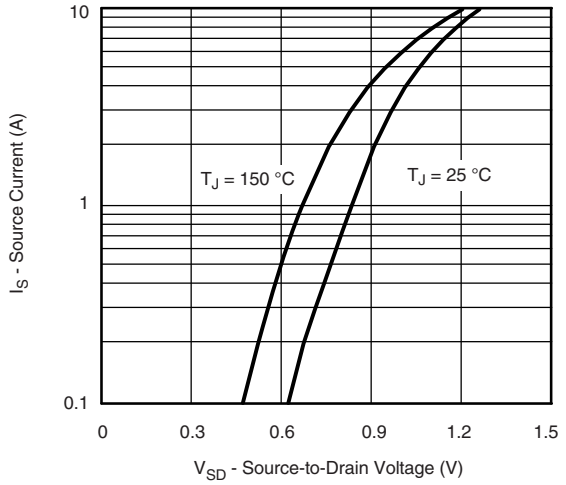
Capacitance



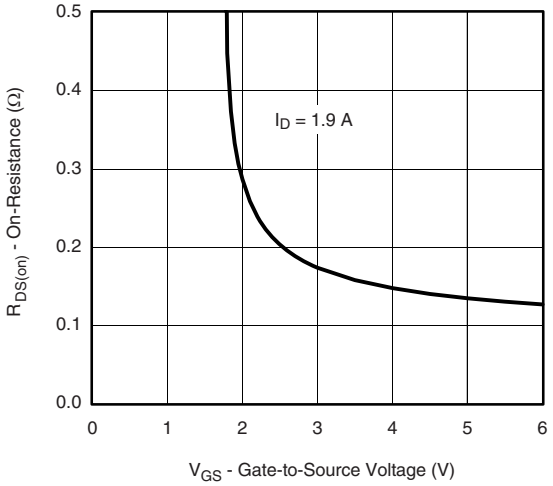
Gate Charge



On-Resistance vs. Junction Temperature

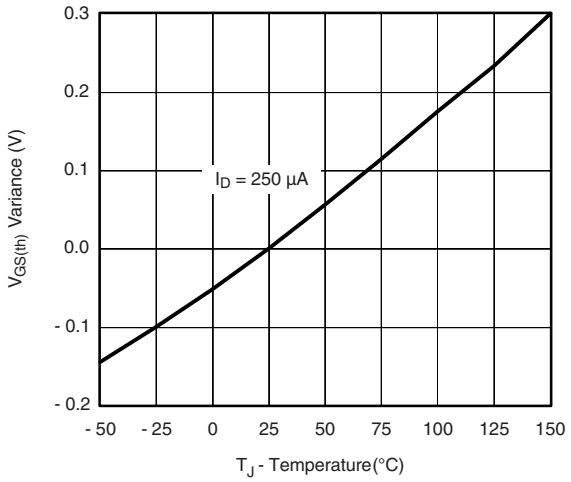


Source-Drain Diode Forward Voltage

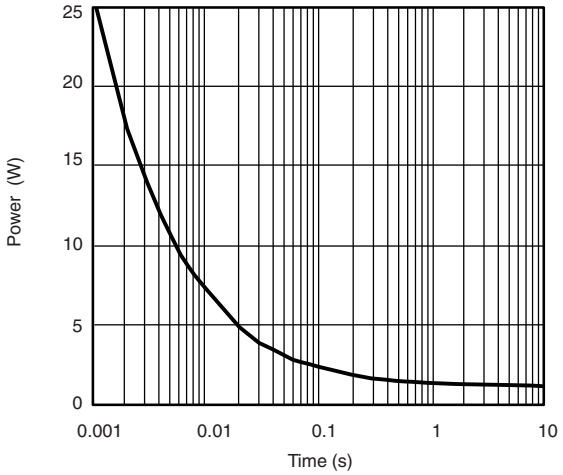


On-Resistance vs. Gate-to-Source Voltage

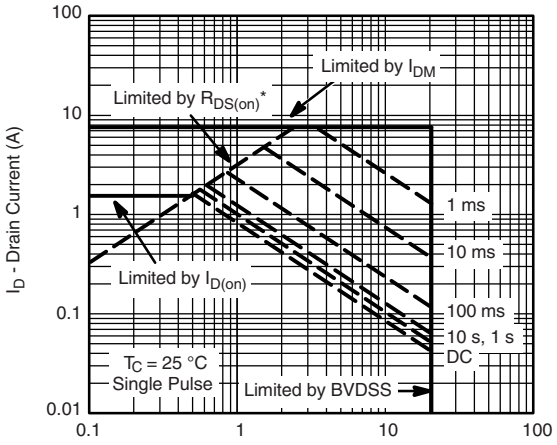
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Threshold Voltage

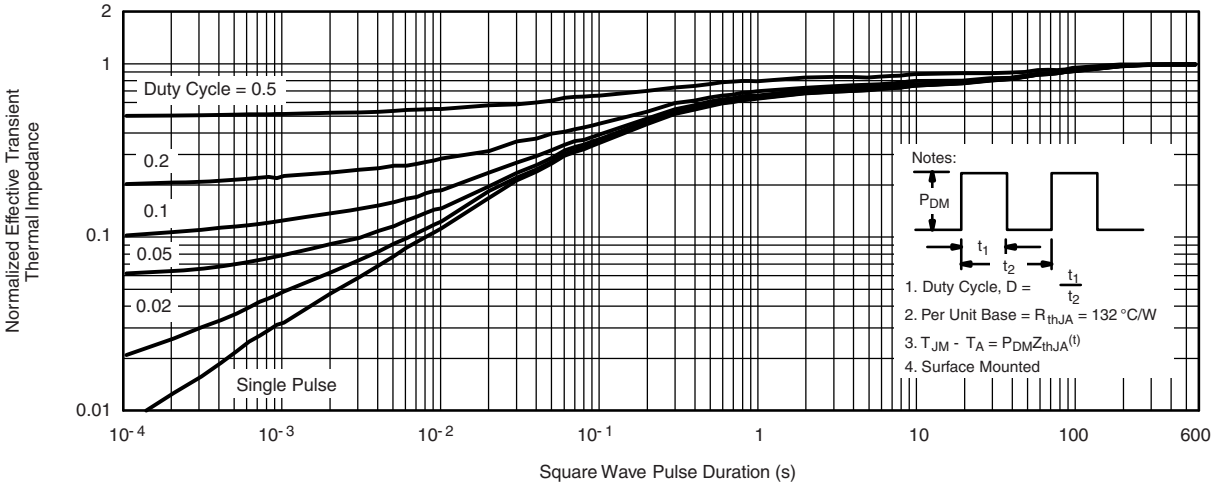


Single Pulse Power, Junction-to-Ambient



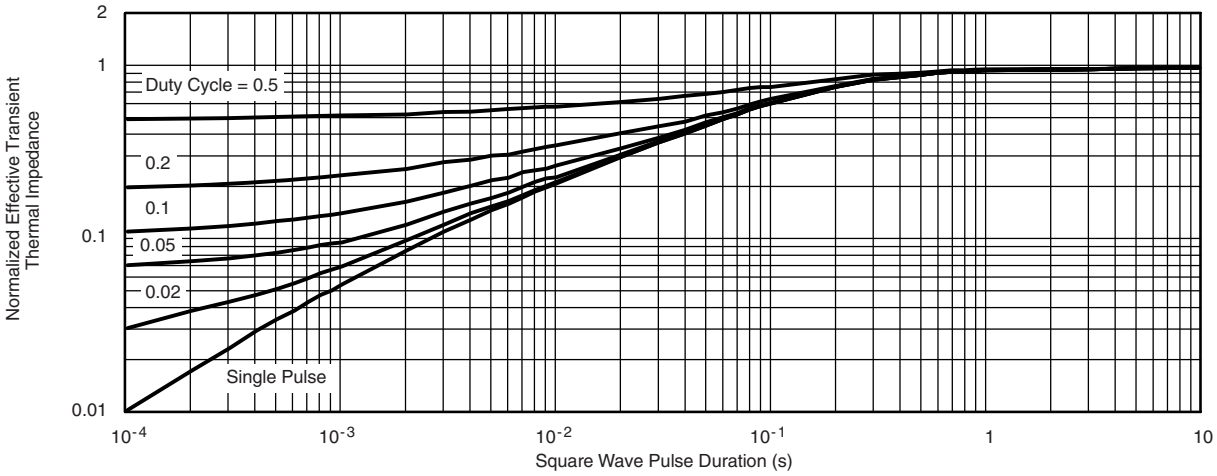
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Case



Normalized Thermal Transient Impedance, Junction-to-Ambient

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Foot

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