

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

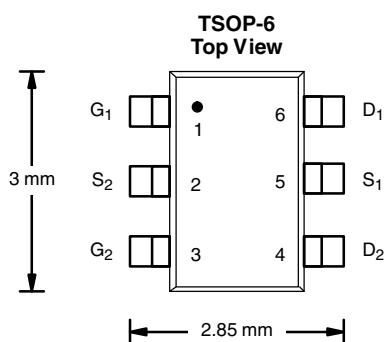
FEATURES

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



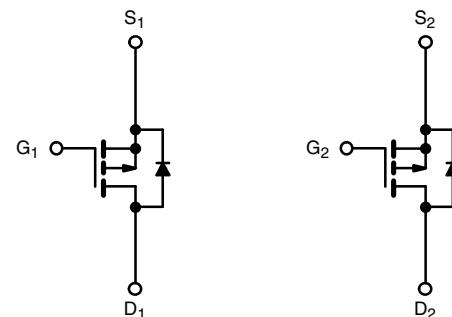
APPLICATIONS

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



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

Marking Code: MCxxx



P-Channel MOSFET

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ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)					
Parameter	Symbol	5 s	Steady State	Unit	
Drain-Source Voltage	V_{DS}		- 20		
Gate-Source Voltage	V_{GS}		± 8	V	
Continuous Drain Current ($T_J = 150$ °C) ^a	I_D	- 1.9	- 1.6	A	
		- 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	P_D	1.08	0.80	W	
		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	$t \leq 5$ s	97	115	°C/W	
	Steady State	132	155		
Maximum Junction-to-Foot (Drain)	R_{thJF}	78	95		

Note:

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

SPECIFICATIONS ($T_J = 25^\circ\text{C}$, unless otherwise noted)

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

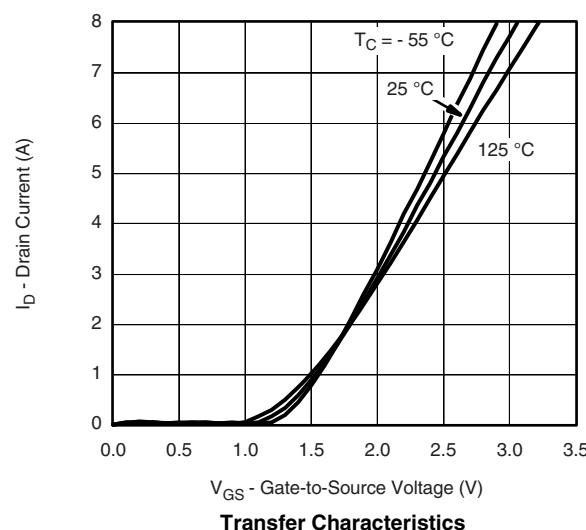
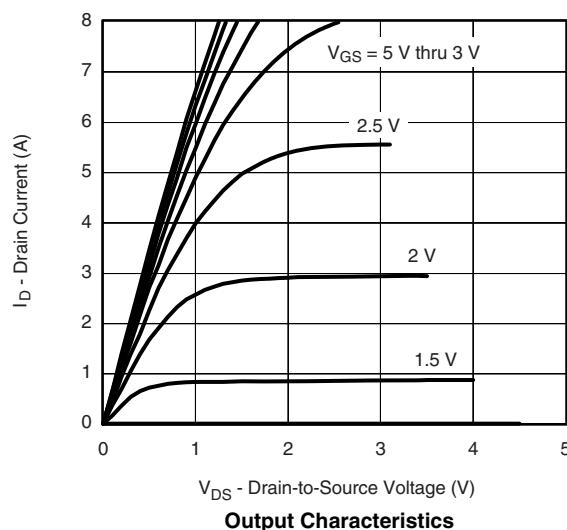
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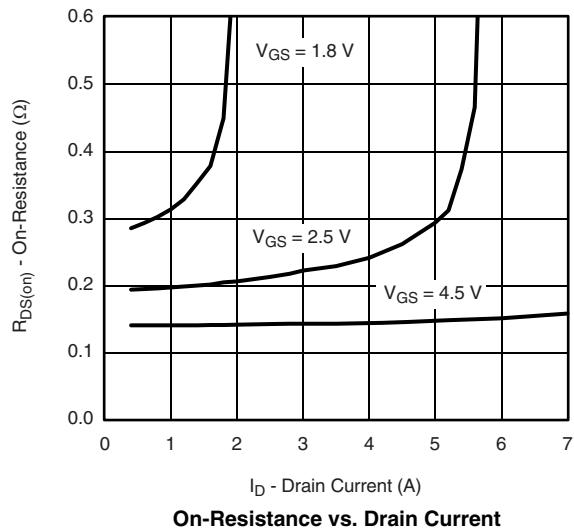
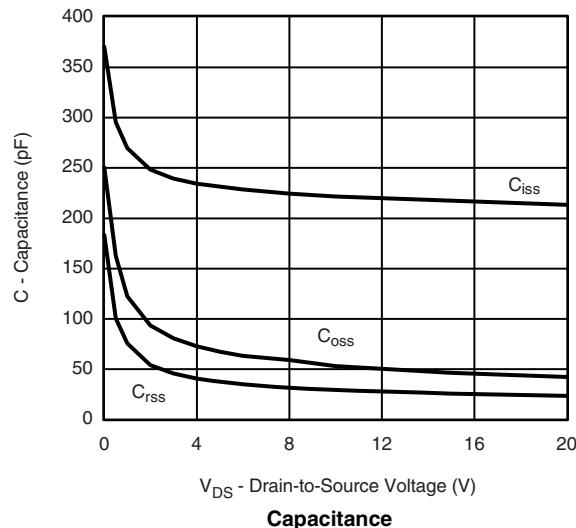
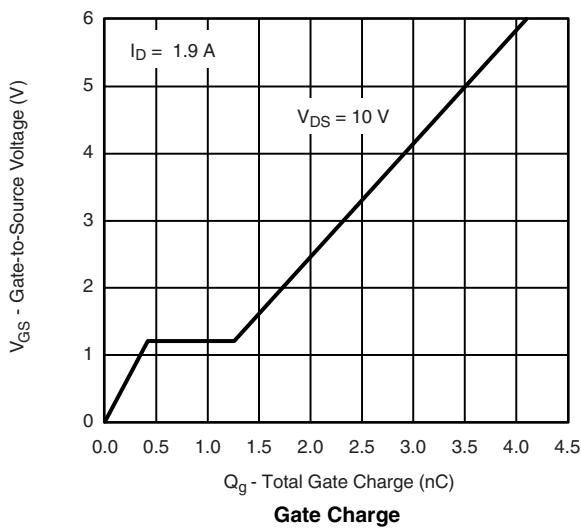
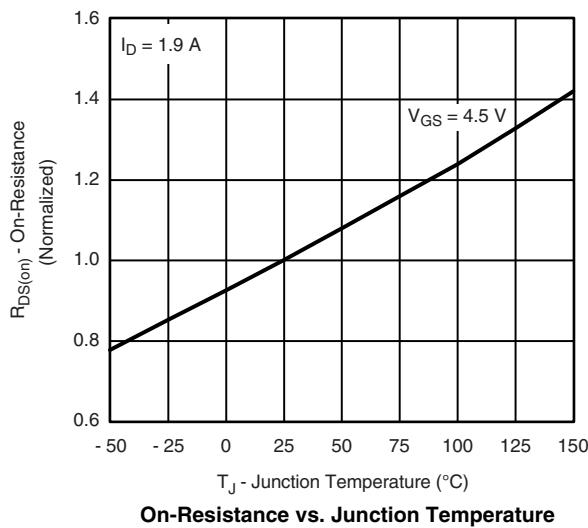
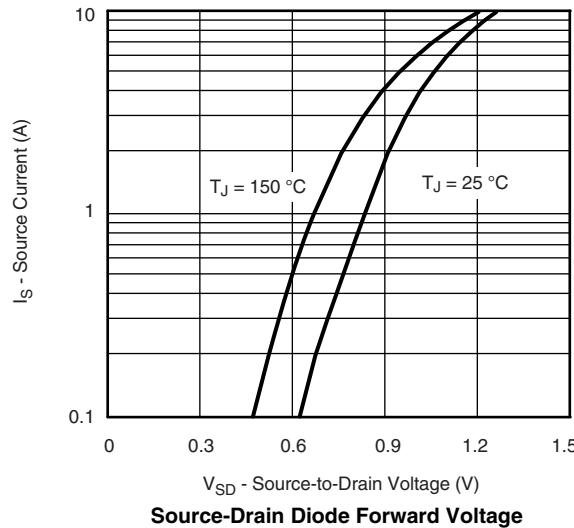
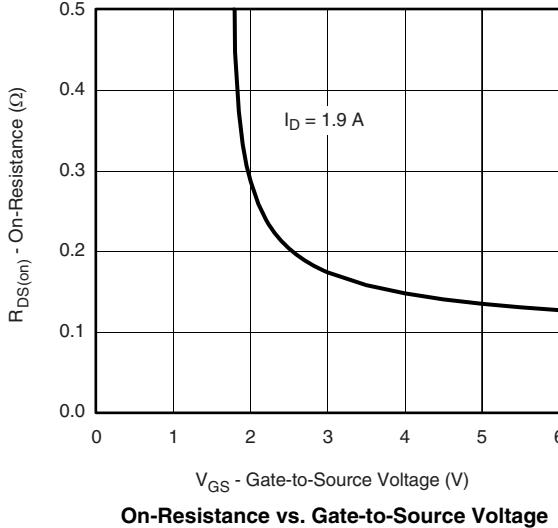
a. Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.

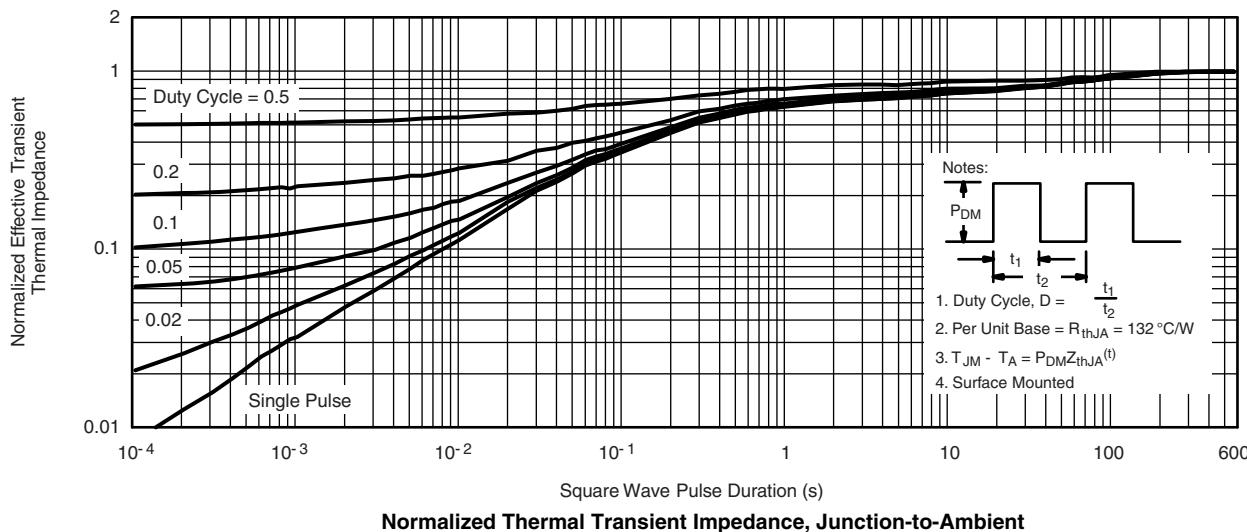
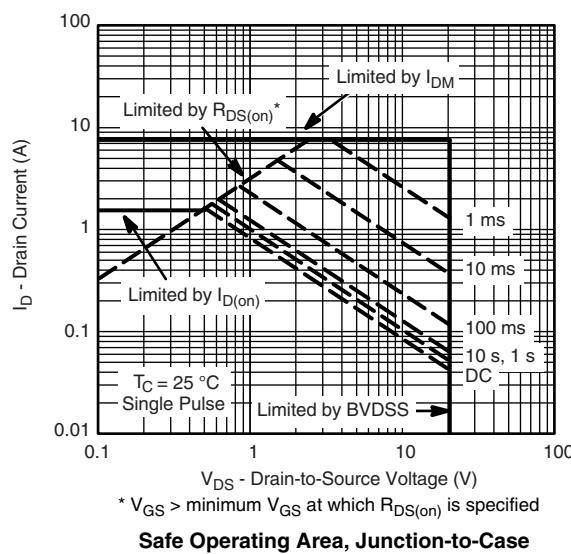
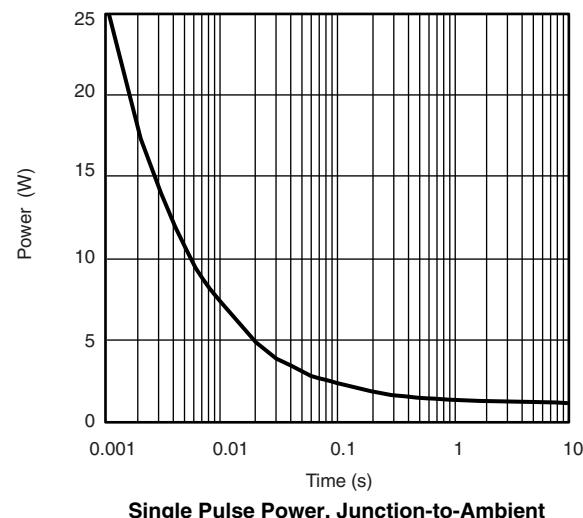
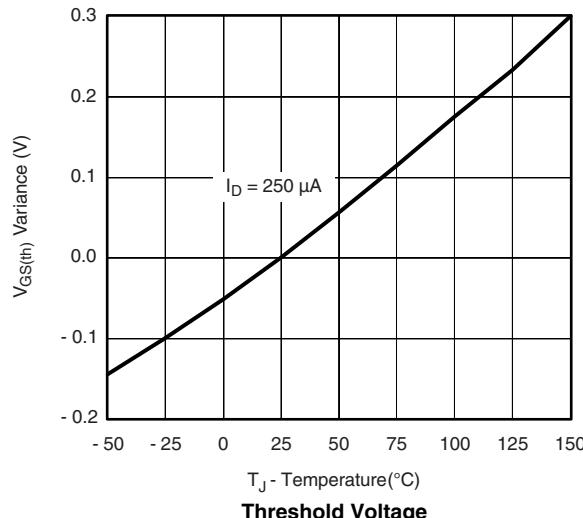
b. Guaranteed by design, not subject to production testing.

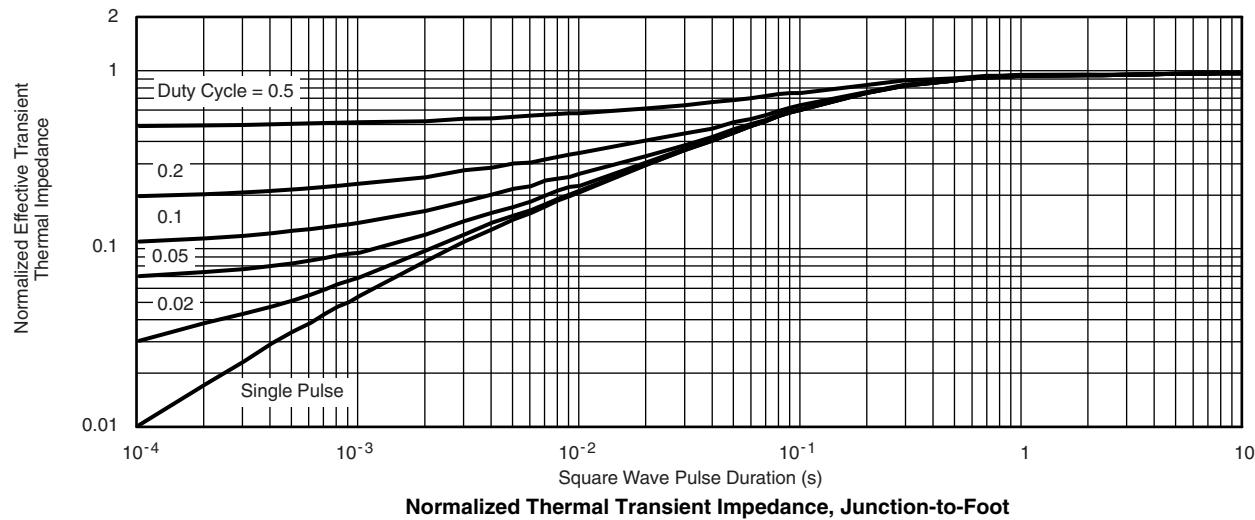
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



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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)


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