

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

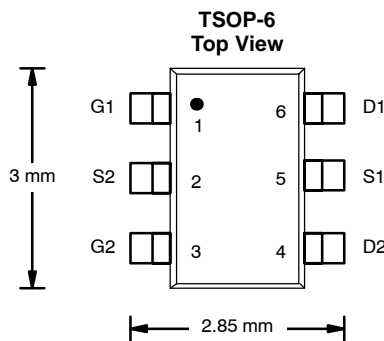
PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-20	0.110 @ $V_{GS} = -4.5$ V	-2.5
	0.145 @ $V_{GS} = -2.5$ V	-2.0
	0.220 @ $V_{GS} = -1.8$ V	-1.0

### FEATURES

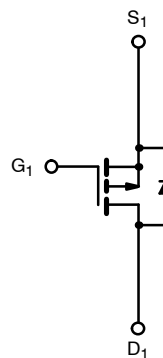
- TrenchFET® Power MOSFET
- Symmetrical Dual P-Channel

### APPLICATIONS

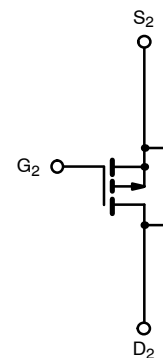
- Battery Switch For Portable Devices
- Computers
  - Bus Switch
  - Load Switch



Ordering Information: Si3983DV-T1—E3  
Marking Code: MDxxx



P-Channel MOSFET



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	5 secs	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	-20		V	
Gate-Source Voltage	$V_{GS}$	$\pm 8$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	-2.5	-2.1	A
		$T_A = 70^\circ\text{C}$	-2.0	-1.7	
Pulsed Drain Current	$I_{DM}$	-8			
Continuous Diode Current (Diode Conduction) <sup>a</sup>	$I_S$	-1.05	-0.75		
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	1.15	0.83	W
		$T_A = 70^\circ\text{C}$	0.73	0.53	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	$t \leq 5$ sec	93	110	$^\circ\text{C/W}$
		Steady State	130	150	
Maximum Junction-to-Foot (Drain)	$R_{thJF}$	90	90		

Notes

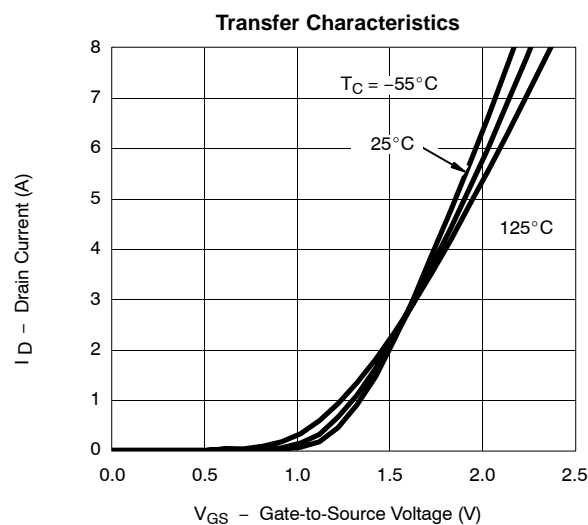
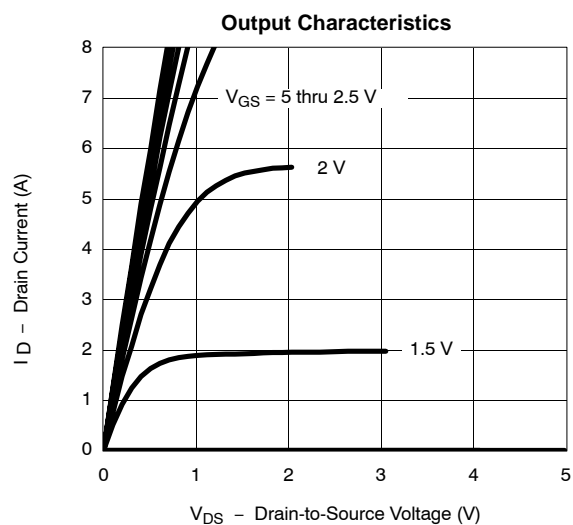
a. Surface Mounted on 1" x 1" FR4 Board.

**SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	-0.40		-1.1	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -20 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -20 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C			-10	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = -5 V, V <sub>GS</sub> = -4.5 V	-5			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -2.5 A		0.086	0.110	Ω
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -2.0 A		0.116	0.145	
		V <sub>GS</sub> = -1.8 V, I <sub>D</sub> = -1.0 A		0.170	0.220	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -5 V, I <sub>D</sub> = -2.5 A		6		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = -1.05 A, V <sub>GS</sub> = 0 V		-0.8	-1.1	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -10 V, V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -2.5 A		5	7.5	nC
Gate-Source Charge	Q <sub>gs</sub>			0.68		
Gate-Drain Charge	Q <sub>gd</sub>			1.30		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -10 V, R <sub>L</sub> = 10 Ω I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -4.5 V, R <sub>g</sub> = 6 Ω		28	45	ns
Rise Time	t <sub>r</sub>			55	85	
Turn-Off Delay Time	t <sub>d(off)</sub>			55	85	
Fall Time	t <sub>f</sub>			32	50	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> = -1.05 A, di/dt = 100 A/μs		25	

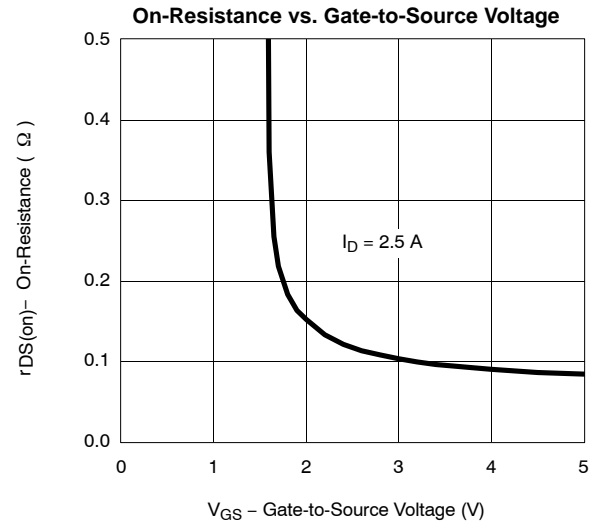
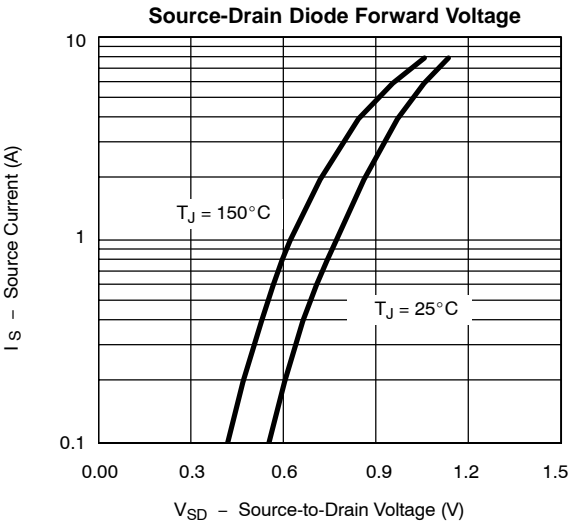
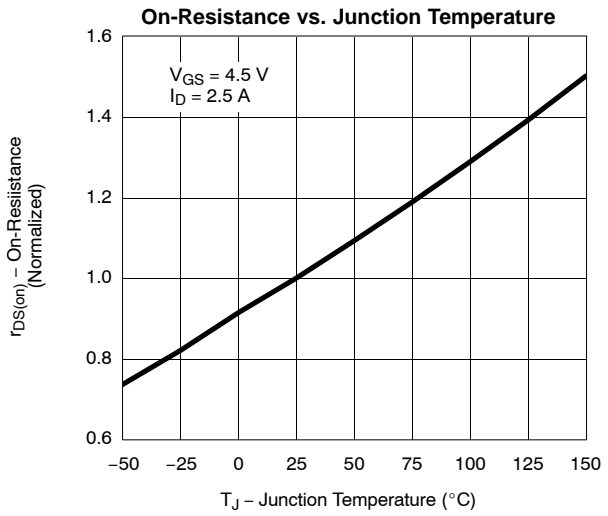
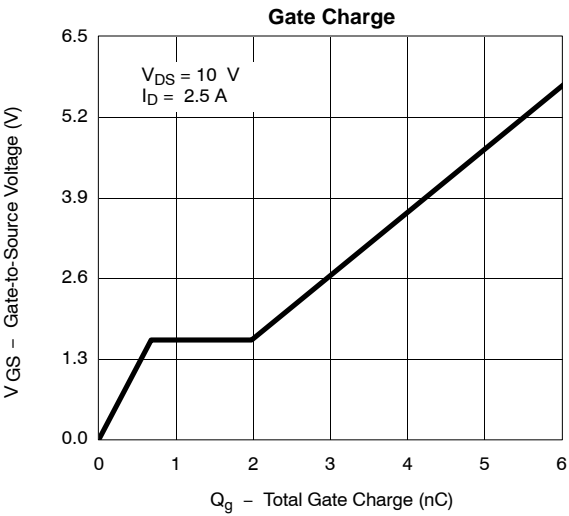
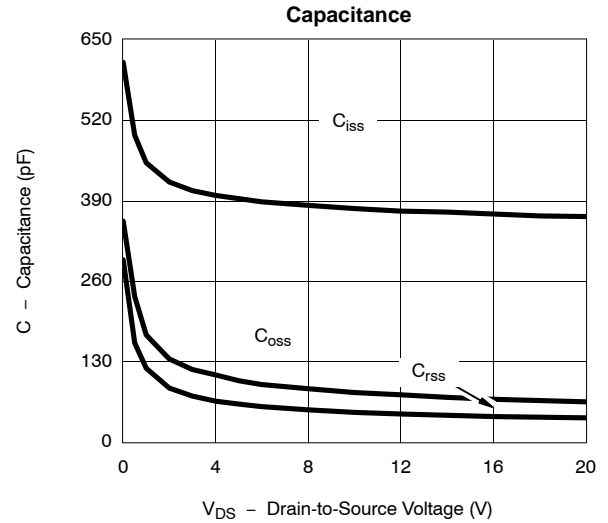
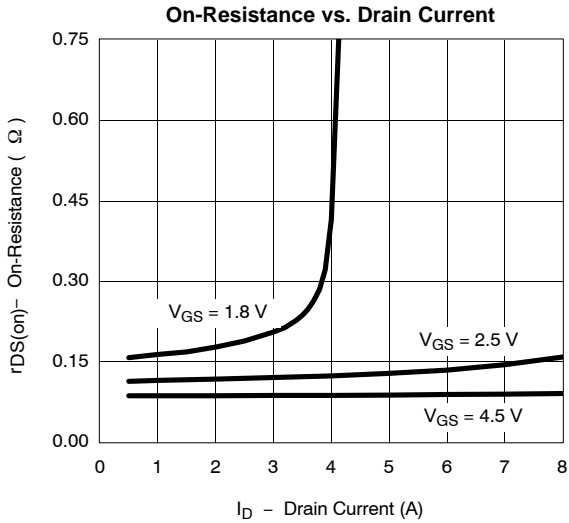
## Notes

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

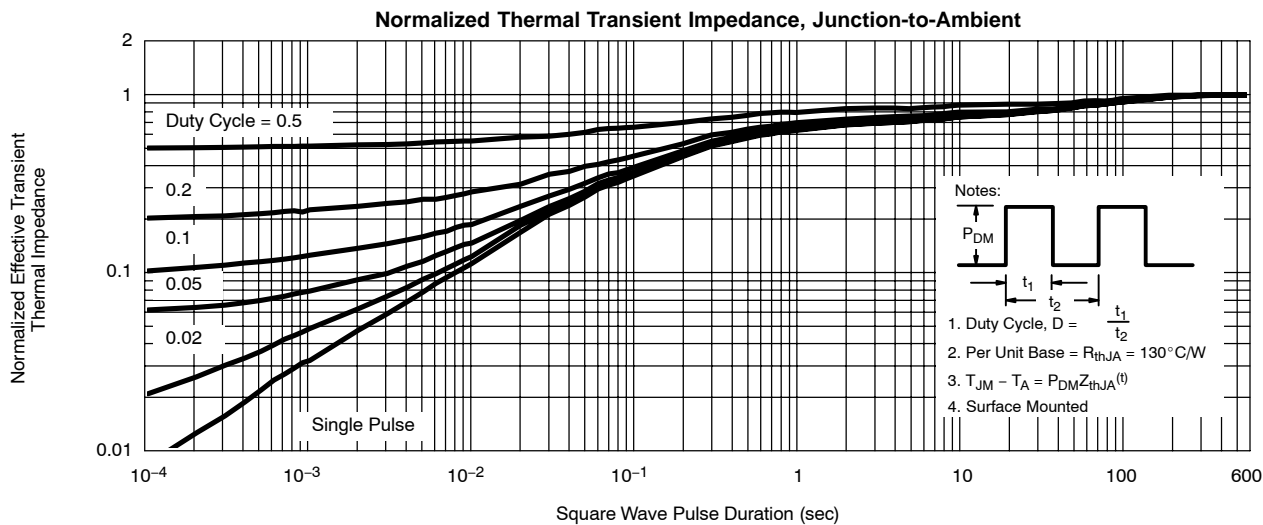
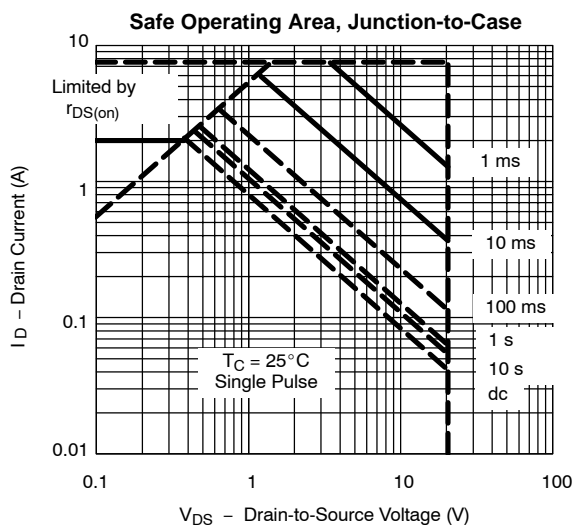
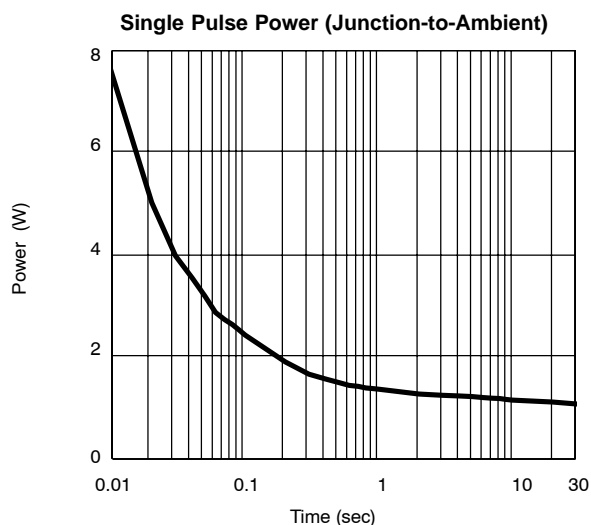
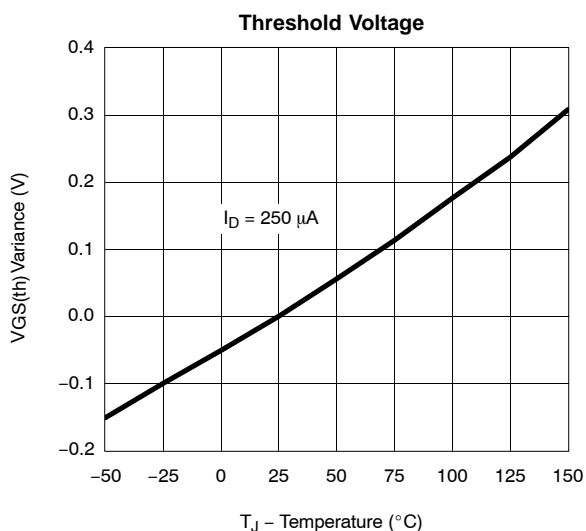
**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**



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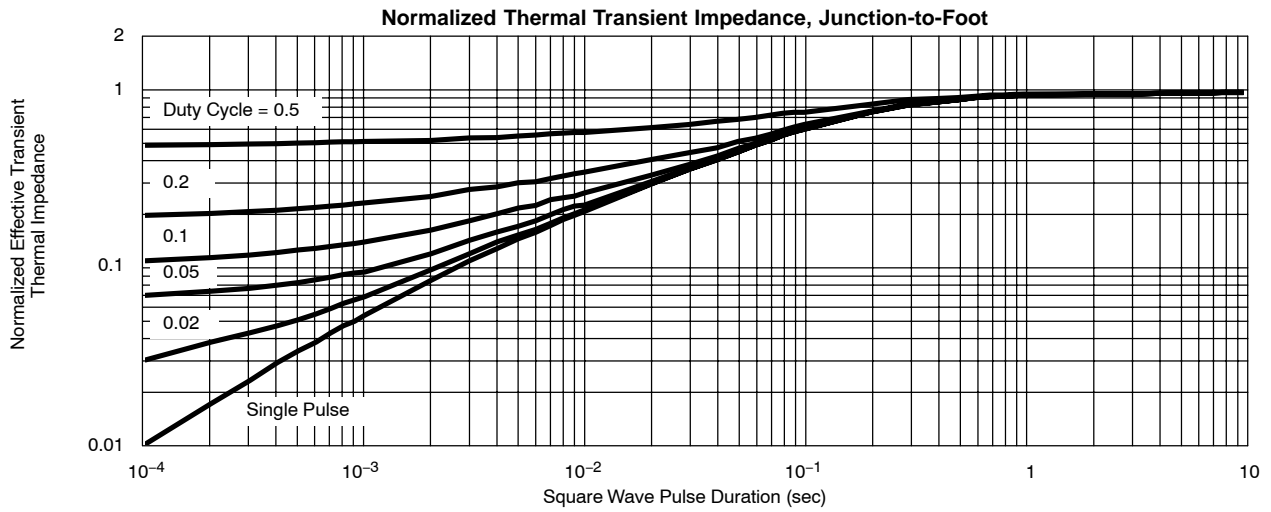


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**





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