



New Product

Si7958DP  
Vishay Siliconix

## Dual N-Channel 40-V (D-S) MOSFET

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
40	0.0165 @ $V_{GS} = 10$ V	11.3
	0.020 @ $V_{GS} = 4.5$ V	10.3

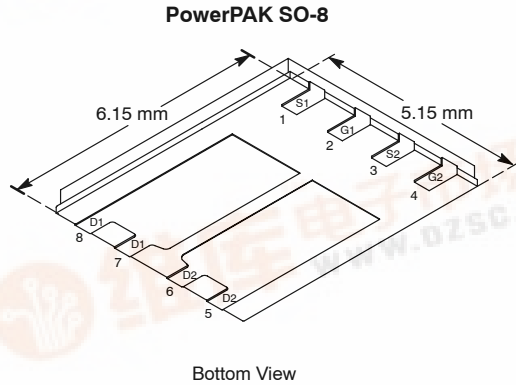
### FEATURES

- TrenchFET® Power MOSFET
- New Low Thermal Resistance PowerPAK® Package
- Dual MOSFET for Space Savings

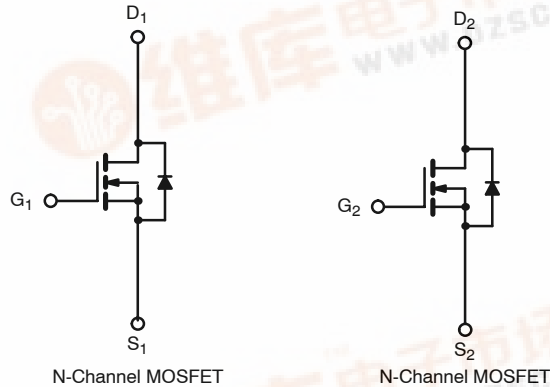
### APPLICATIONS

- Automotive\*
  - 12-V Boardnet
  - Motor Drives
  - High-Side Switch

\*Contact factory for automotive qualification



Ordering Information: Si7958DP-T1—E3 (Lead Free)



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	10 secs	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	40		V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	11.3	7.2	A
		$T_A = 70^\circ\text{C}$	9.0	5.8	
Pulsed Drain Current	$I_{DM}$	40			
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	2.9	1.2		
Single Avalanche Current	$I_{AS}$	35			
Single Avalanche Energy		$E_{AS}$	61		
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	3.5	1.4	W
		$T_A = 70^\circ\text{C}$	2.2	0.9	
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>	$R_{thJA}$	$t \leq 10$ sec	26	35	$^\circ\text{C/W}$
		Steady State	60	85	
Maximum Junction-to-Case (Drain)	$R_{thJC}$	2.2	2.7		

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



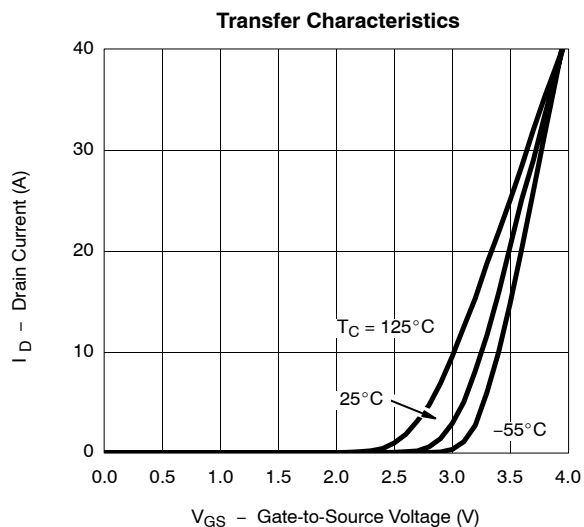
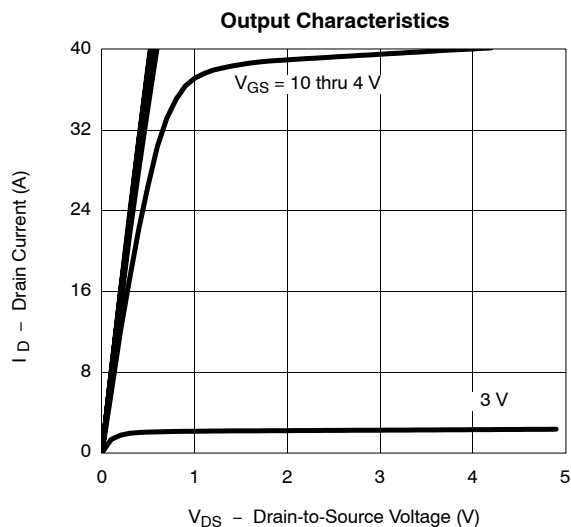
### SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)

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	1		3	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 40 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 40 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C			5	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 10 V	30			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 11.3 A		0.013	0.0165	Ω
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 10.3 A		0.016	0.020	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 11.3 A		30		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = 2.9 A, V <sub>GS</sub> = 0 V		0.8	1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 11.3 A		50	75	nC
Gate-Source Charge	Q <sub>gs</sub>		8.8			
Gate-Drain Charge	Q <sub>gd</sub>		10.4			
Gate Resostamce	R <sub>g</sub>	f = 1 MHz		1.9		Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 20 V, R <sub>L</sub> = 20 Ω I <sub>D</sub> ≅ 1 A, V <sub>GEN</sub> = 10 V, R <sub>g</sub> = 6 Ω		17	30	ns
Rise Time	t <sub>r</sub>		17	30		
Turn-Off Delay Time	t <sub>d(off)</sub>		66	100		
Fall Time	t <sub>f</sub>		17	30		
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 2.9 A, di/dt = 100 A/μs		31	60	

**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)

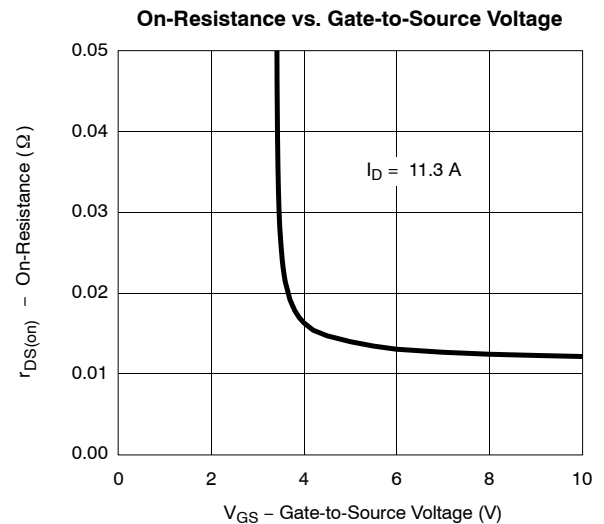
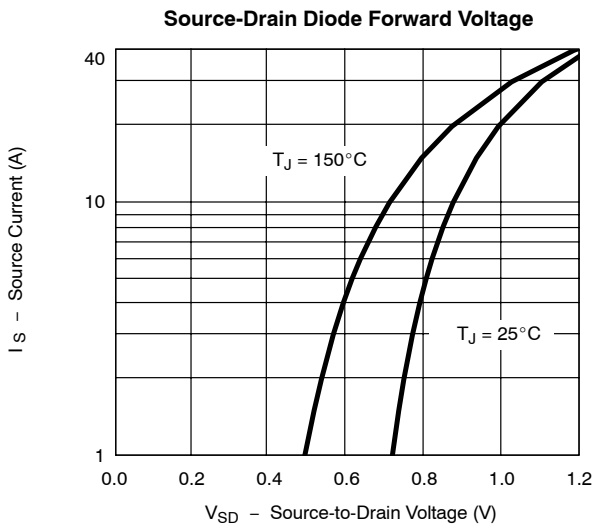
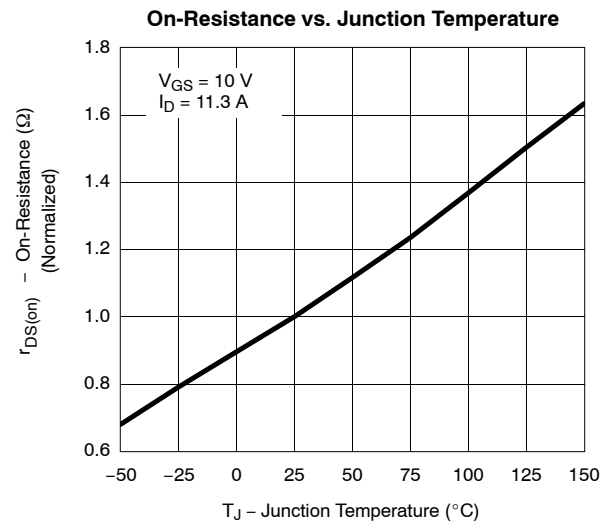
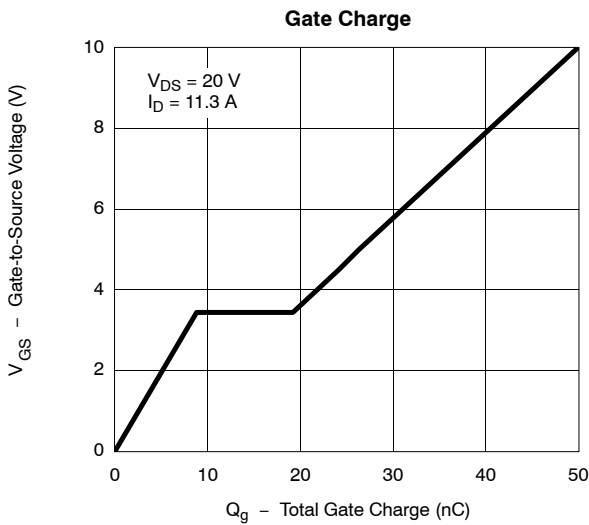
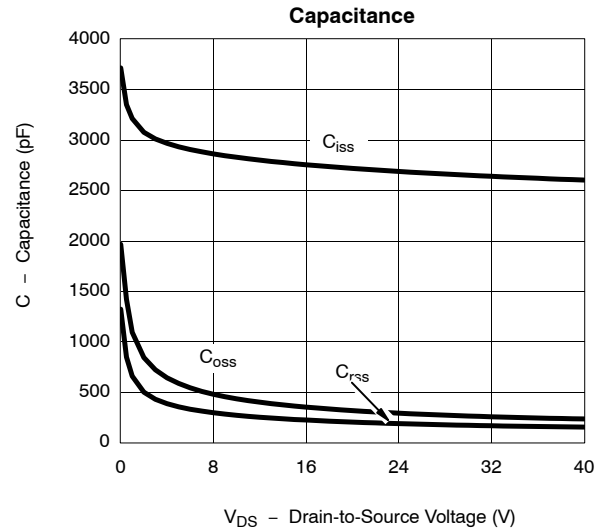
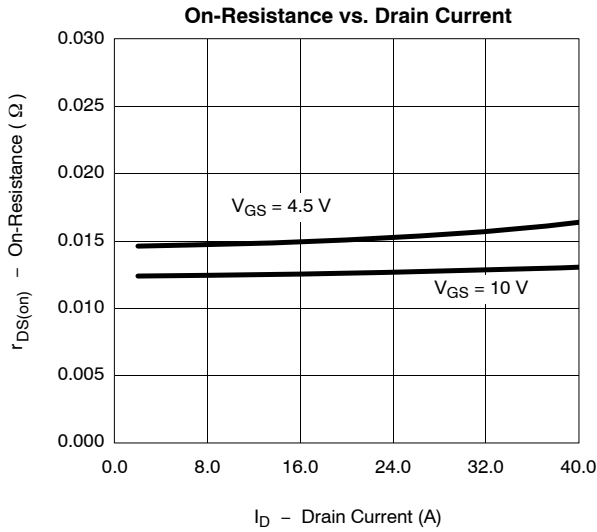




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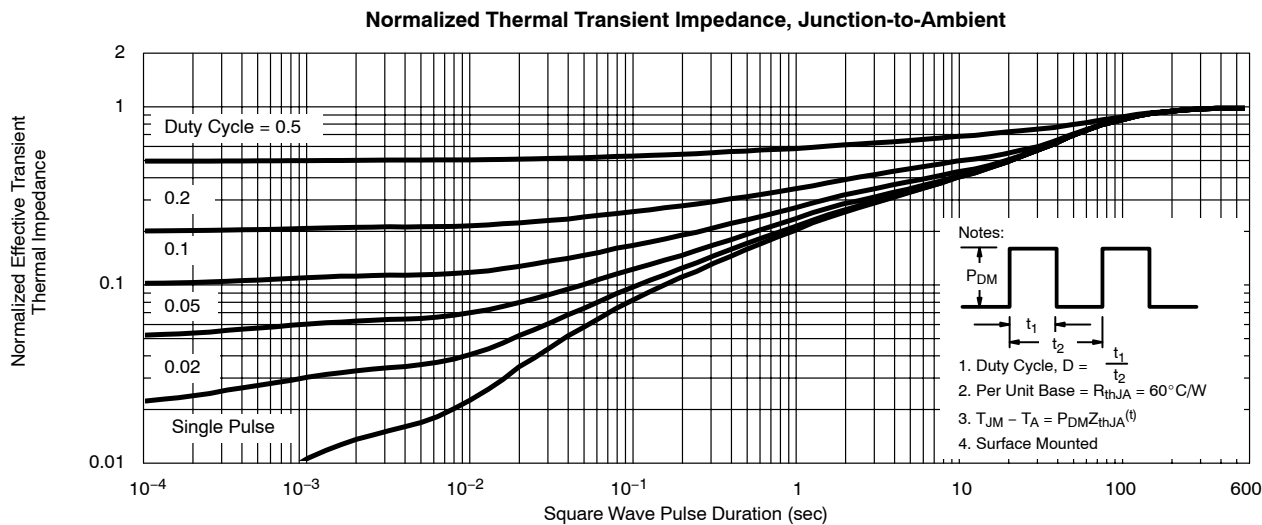
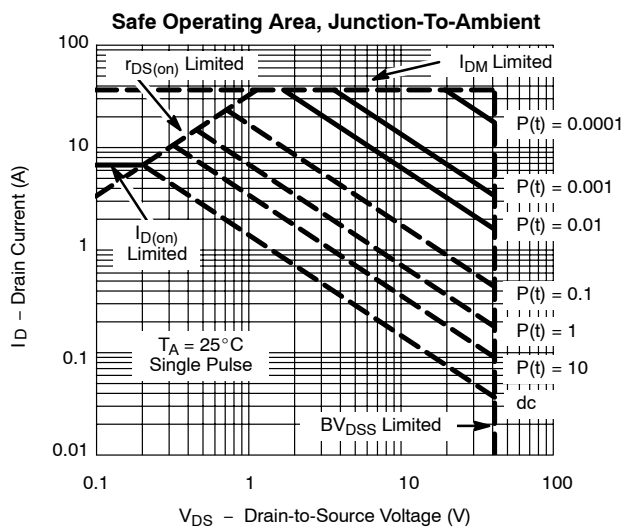
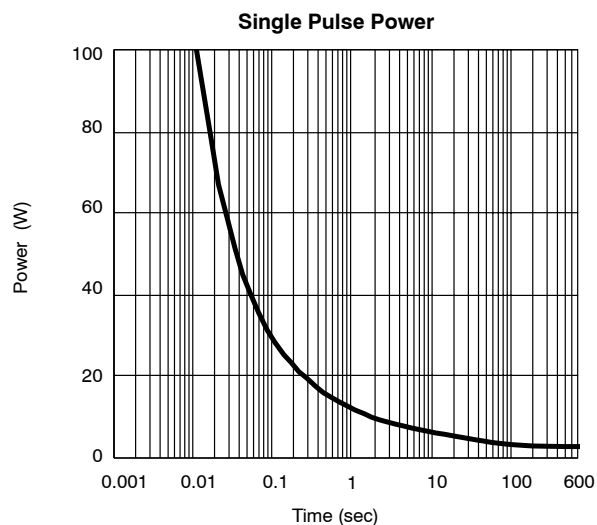
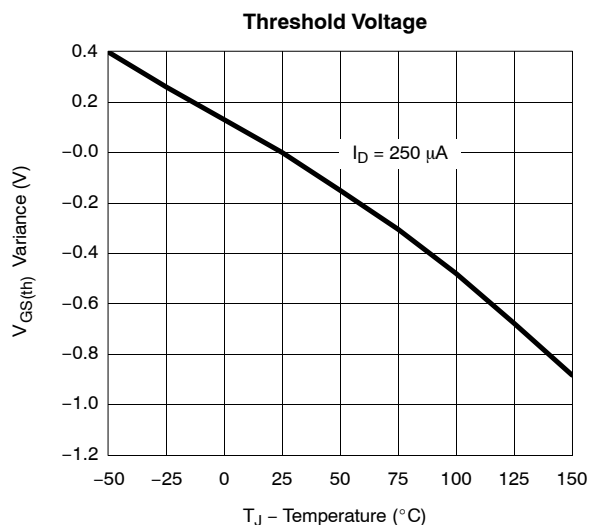
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