

Dual P-Channel 12-V (D-S) MOSFET

PRODUCT SUMMARY		
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
- 12	0.015 at V _{GS} = - 4.5 V	- 12.8
	0.019 at V _{GS} = - 2.5 V	- 11.4
	0.024 at V _{GS} = - 1.8 V	- 10.1

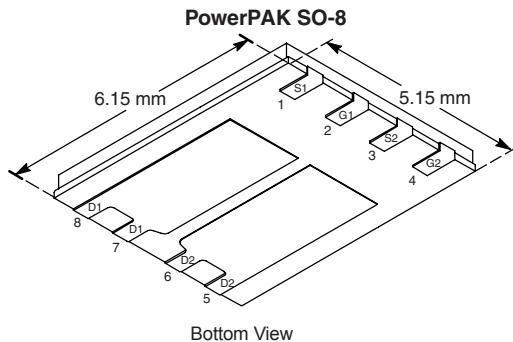
FEATURES

- Halogen-free According to IEC 61249-2-21 Available
- TrenchFET® Power MOSFET: 1.8 V Rated
- New Low Thermal Resistance PowerPAK® Package

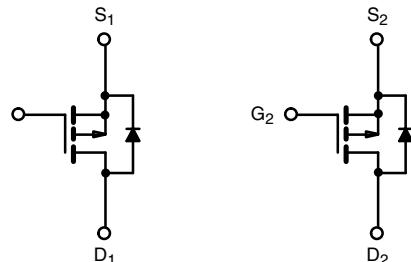


APPLICATIONS

- Load Switch



Ordering Information: Si7973DP-T1-E3 (Lead (Pb)-free)
Si7973DP-T1-GE3 (Lead (Pb)-free and Halogen-free)



P-Channel MOSFET

P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T _A = 25 °C, unless otherwise noted				
Parameter	Symbol	10 s	Steady State	Unit
Drain-Source Voltage	V _{DS}	- 12		V
Gate-Source Voltage	V _{GS}	± 8		
Continuous Drain Current (T _J = 150 °C) ^a	I _D	- 12.8	- 8.2	A
T _A = 70 °C		- 9.2	- 5.9	
Pulsed Drain Current	I _{DM}	- 30		
Continuous Source Current (Diode Conduction) ^a	I _S	- 2.9	- 1.2	
Maximum Power Dissipation ^a	P _D	3.5	1.4	W
T _A = 70 °C		1.9	0.8	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150		°C
Soldering Recommendations (Peak Temperature)		260		

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	t ≤ 10 s	R _{thJA}	26	°C/W
	Steady State		60	
Maximum Junction-to-Case (Drain)	Steady State	R _{thJC}	2.2	2.7

Notes

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

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

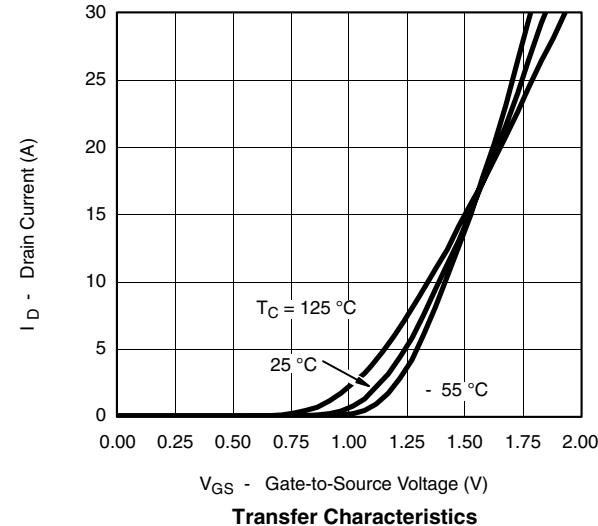
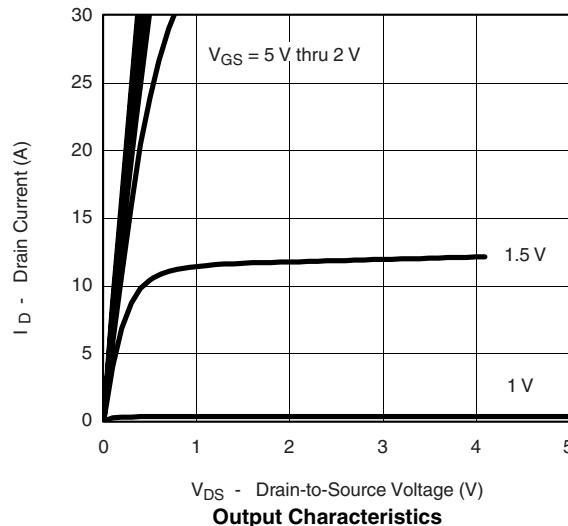
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$, $I_D = -600 \mu\text{A}$	-0.40		-1.0	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}$, $V_{GS} = \pm 8 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -12 \text{ V}$, $V_{GS} = 0 \text{ V}$		-1		μA
		$V_{DS} = -12 \text{ V}$, $V_{GS} = 0 \text{ V}$, $T_J = 85^\circ\text{C}$		-5		
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{DS} \leq -5 \text{ V}$, $V_{GS} = -4.5 \text{ V}$	-30			A
Drain-Source On-State Resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = -4.5 \text{ V}$, $I_D = -12.8 \text{ A}$		0.012	0.015	Ω
		$V_{GS} = -2.5 \text{ V}$, $I_D = -11.4 \text{ A}$		0.015	0.019	
		$V_{GS} = -1.8 \text{ V}$, $I_D = -4.2 \text{ A}$		0.019	0.024	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -6 \text{ V}$, $I_D = -12.8 \text{ A}$		35		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -2.9 \text{ A}$, $V_{GS} = 0 \text{ V}$		-0.8	-1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -6 \text{ V}$, $V_{GS} = -4.5 \text{ V}$, $I_D = -12.8 \text{ A}$		55	80	nC
Gate-Source Charge	Q_{gs}			8.1		
Gate-Drain Charge	Q_{gd}			15.4		
Gate Resistance	R_g	$f = 1 \text{ MHz}$		8		Ω
Turn-On Delay Time	$t_{d(\text{on})}$	$V_{DD} = -6 \text{ V}$, $R_L = 6 \Omega$ $I_D \approx -1 \text{ A}$, $V_{GEN} = -4.5 \text{ V}$, $R_g = 6 \Omega$		40	60	ns
Rise Time	t_r			72	110	
Turn-Off Delay Time	$t_{d(\text{off})}$			360	540	
Fall Time	t_f			260	390	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -2.9 \text{ A}$, $dl/dt = 100 \text{ A}/\mu\text{s}$		166	250	

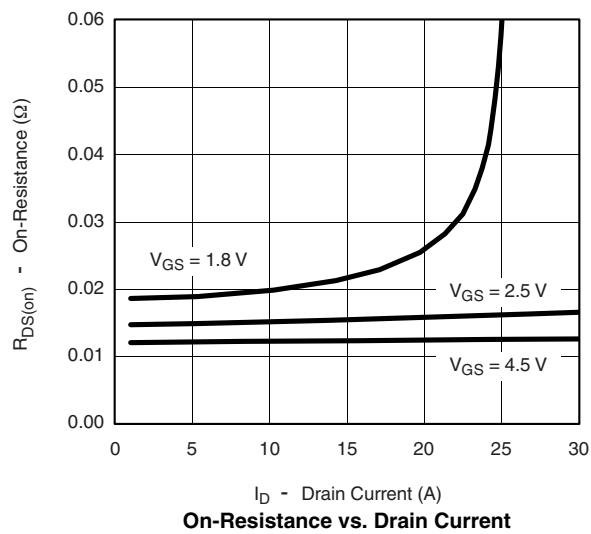
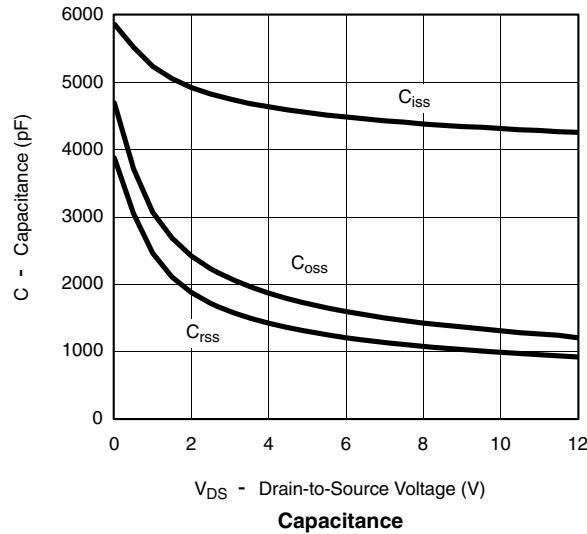
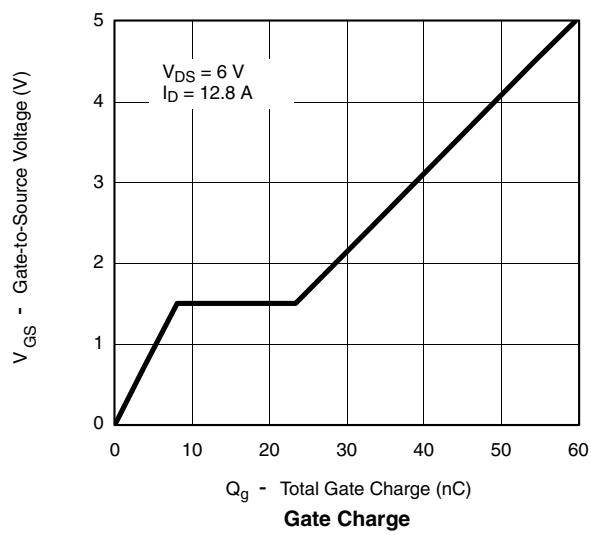
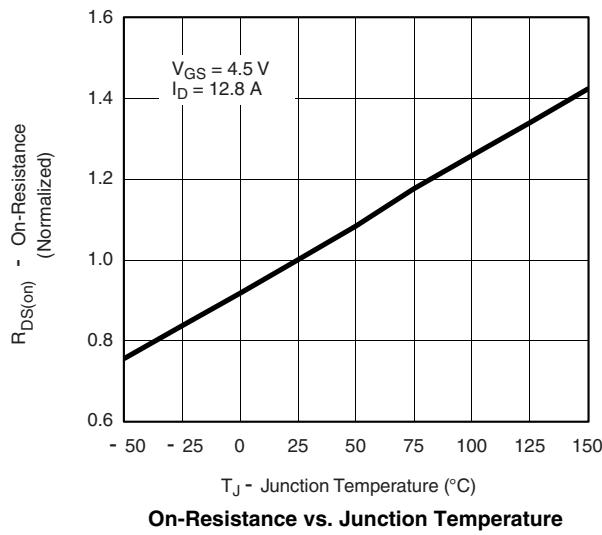
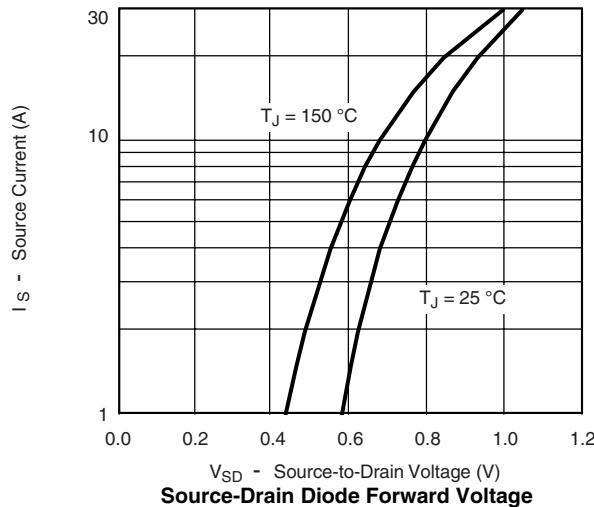
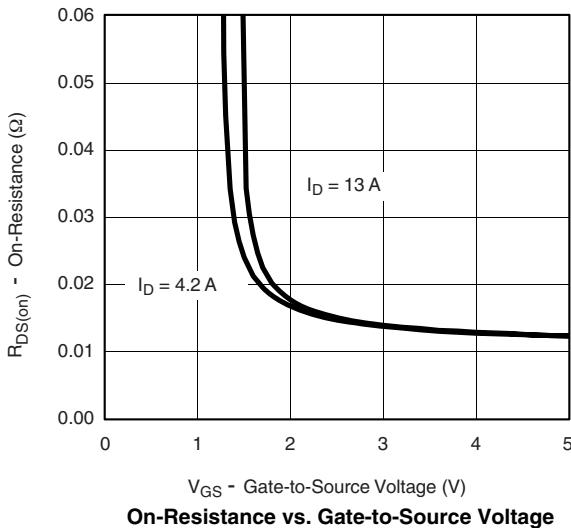
Notes

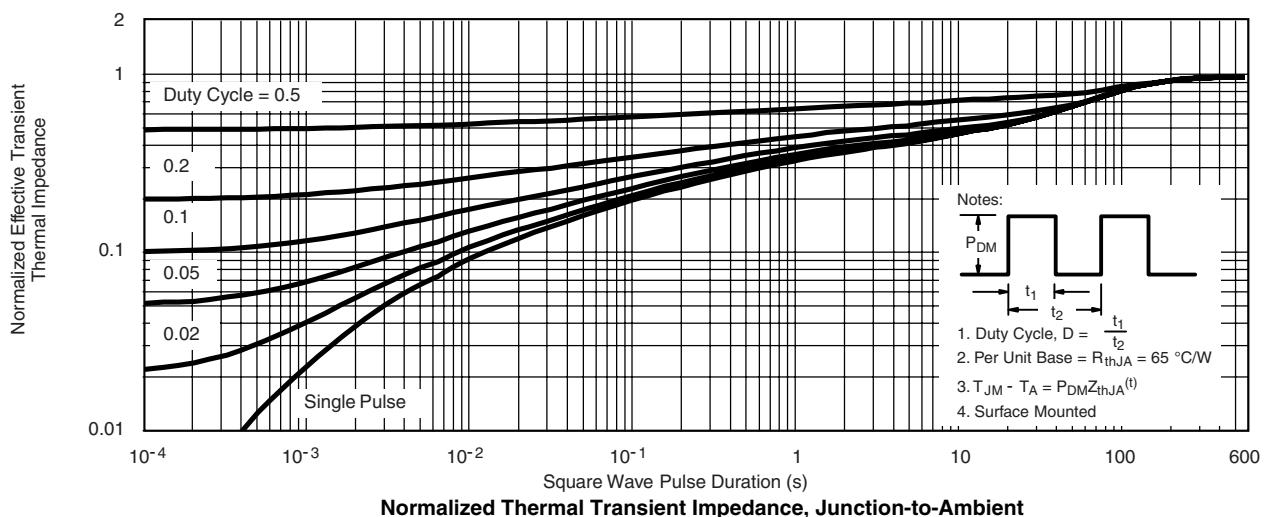
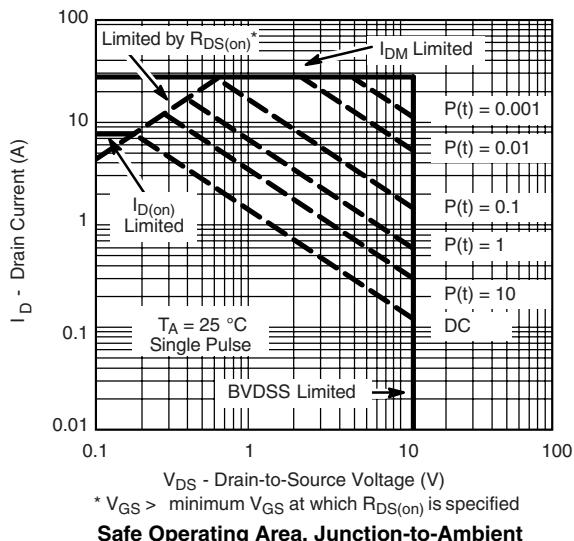
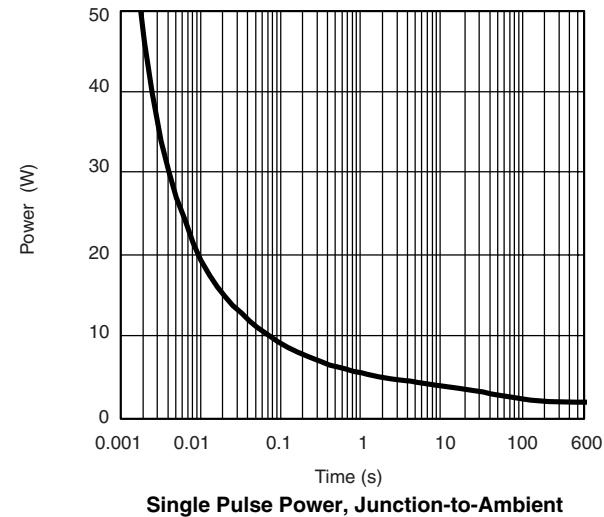
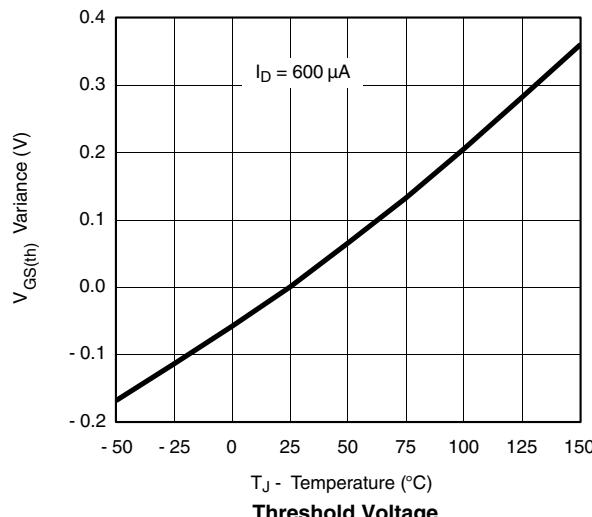
a. Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2 \%$.

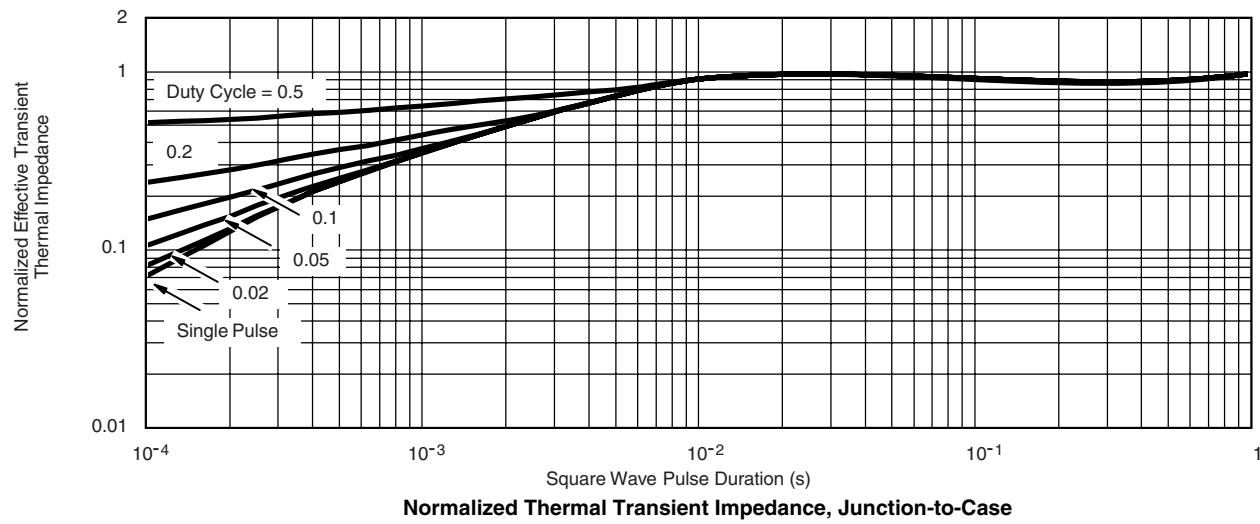
b. Guaranteed by design, not subject to production testing.

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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