



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

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-12	0.018 @ $V_{GS} = -4.5$ V	-11.7
	0.022 @ $V_{GS} = -2.5$ V	-10.6
	0.029 @ $V_{GS} = -1.8$ V	-3.5

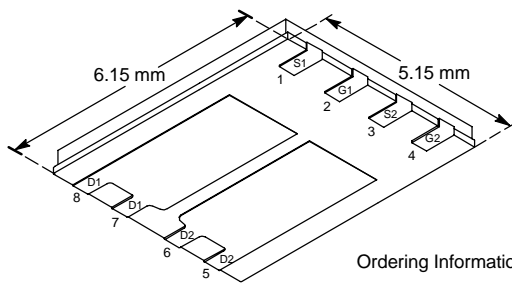
FEATURES

- TrenchFET® Power MOSFET
- New Low Thermal Resistance PowerPAK® Package with Low 1.07-mm Profile

APPLICATIONS

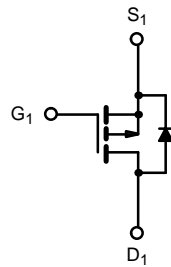
- Load Switch

PowerPAK SO-8

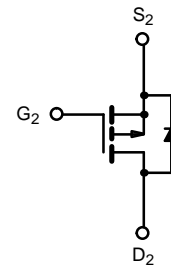


Ordering Information: Si7971DP-T1

Bottom View



P-Channel MOSFET



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter		Symbol	10 secs	Steady State	Unit
Drain-Source Voltage		V_{DS}	-12		V
Gate-Source Voltage		V_{GS}	± 8		
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	$T_A = 25^\circ\text{C}$	I_D	-11.7	-7.5	A
	$T_A = 70^\circ\text{C}$		-9.4	-6.0	
Pulsed Drain Current		I_{DM}	-30		
continuous Source Current (Diode Conduction) ^a		I_S	-2.9	-1.2	
Maximum Power Dissipation ^a	$T_A = 25^\circ\text{C}$	P_D	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 ^a	$t \leq 10$ sec	R_{thJA}	26	35	$^\circ\text{C/W}$
	Steady State		60	85	
Maximum Junction-to-Case (Drain)		R_{thJC}	3	3.7	

Notes

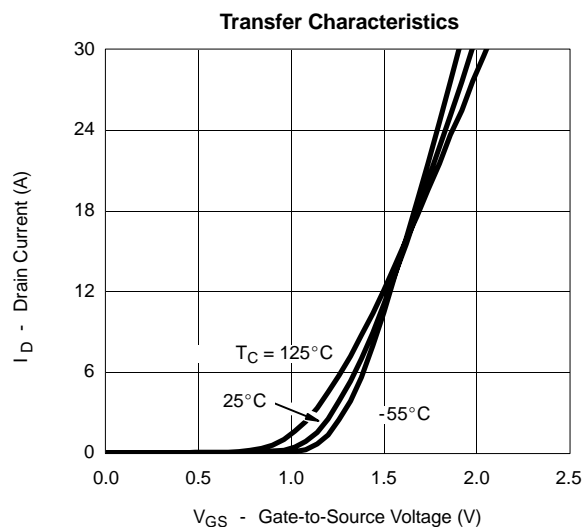
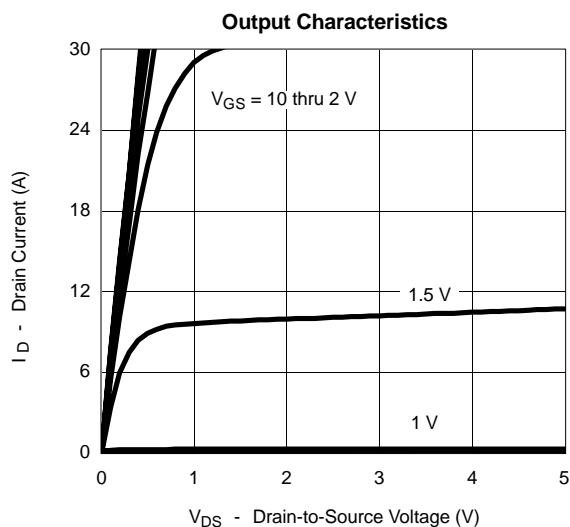
a. Surface Mounted on 1" x 1" FR4 Board.

SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -450 μA	-0.40		-1.0	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} = -9.6 V, V _{GS} = 0 V			-1	μA
		V _{DS} = -9.6 V, V _{GS} = 0 V, T _J = 55 °C			-5	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≤ -5 V, V _{GS} = -4.5 V	-30			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = -4.5 V, I _D = -11.7 A		0.014	0.018	Ω
		V _{GS} = -2.5 V, I _D = -10.6 A		0.018	0.022	
		V _{GS} = -1.8 V, I _D = -3.5 A		0.023	0.029	
Forward Transconductance ^a	g _{fs}	V _{DS} = -15 V, I _D = -11.7 A		37		S
Diode Forward Voltage ^a	V _{SD}	I _S = -2.9 A, V _{GS} = 0 V		-0.7	-1.2	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = -6 V, V _{GS} = -4.5 V, I _D = -11.7 A		39	60	nC
Gate-Source Charge	Q _{gs}			6.5		
Gate-Drain Charge	Q _{gd}			10		
Gate Resistance	R _g			9.4		Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = -6 V, R _L = 6 Ω I _D ≅ -1 A, V _{GEN} = -4.5 V, R _G = 6 Ω		38	60	ns
Rise Time	t _r			60	90	
Turn-Off Delay Time	t _{d(off)}			280	420	
Fall Time	t _f			210	320	
Source-Drain Reverse Recovery Time	t _{rr}		I _F = -2.9 A, di/dt = 100 A/μs		120	

Notes

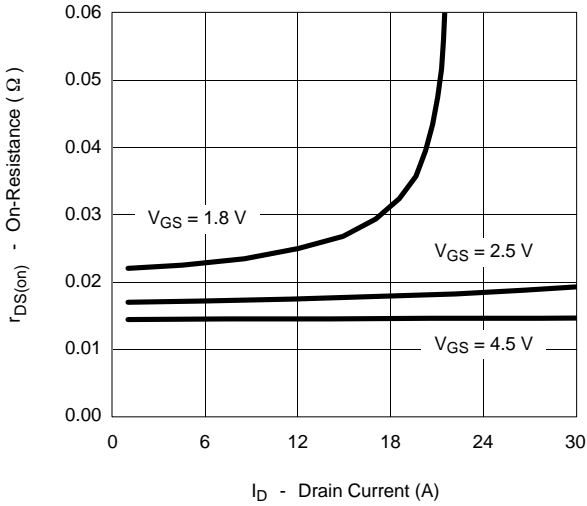
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

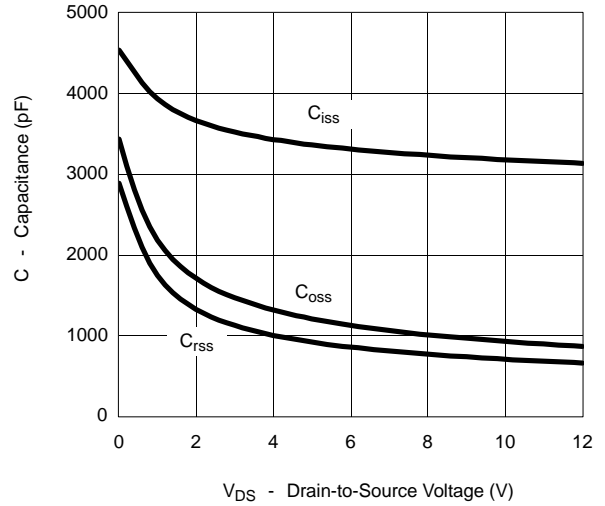


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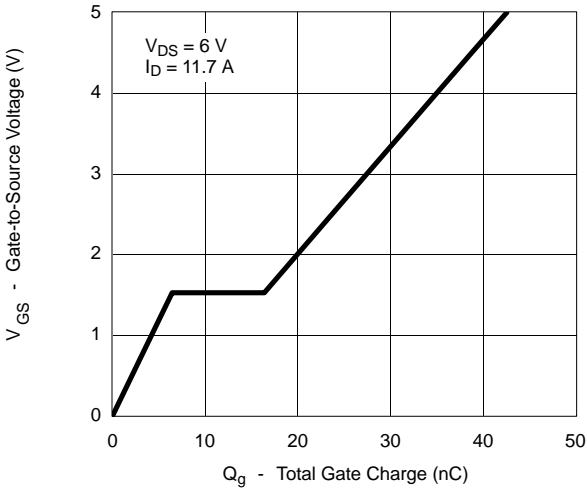
On-Resistance vs. Drain Current



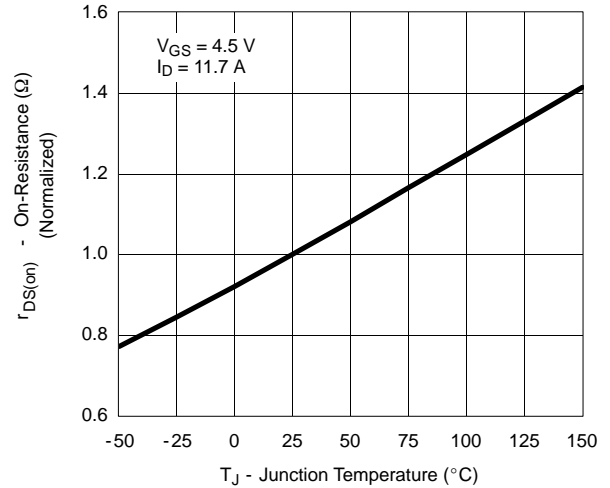
Capacitance



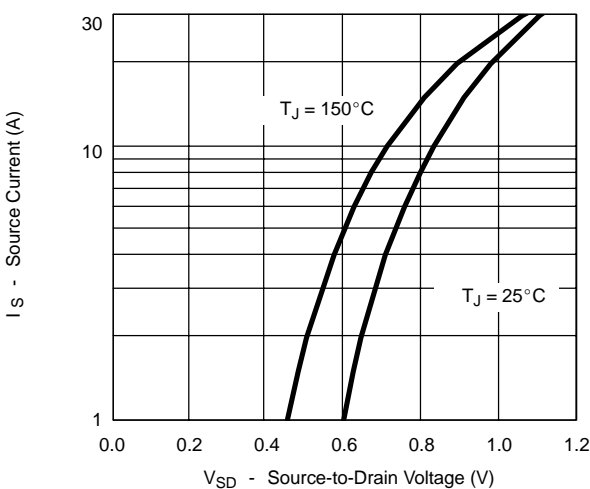
Gate Charge



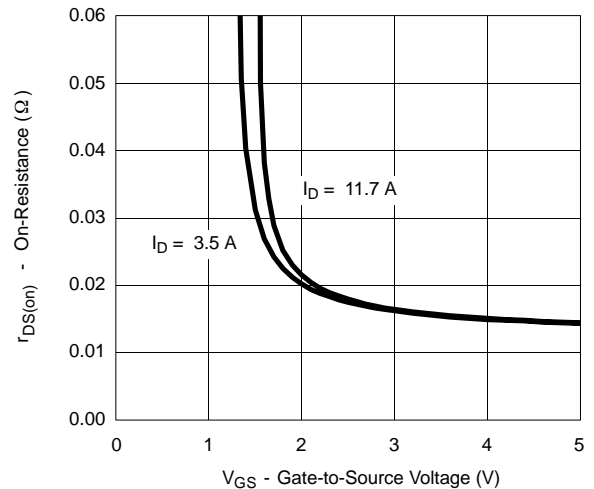
On-Resistance vs. Junction Temperature



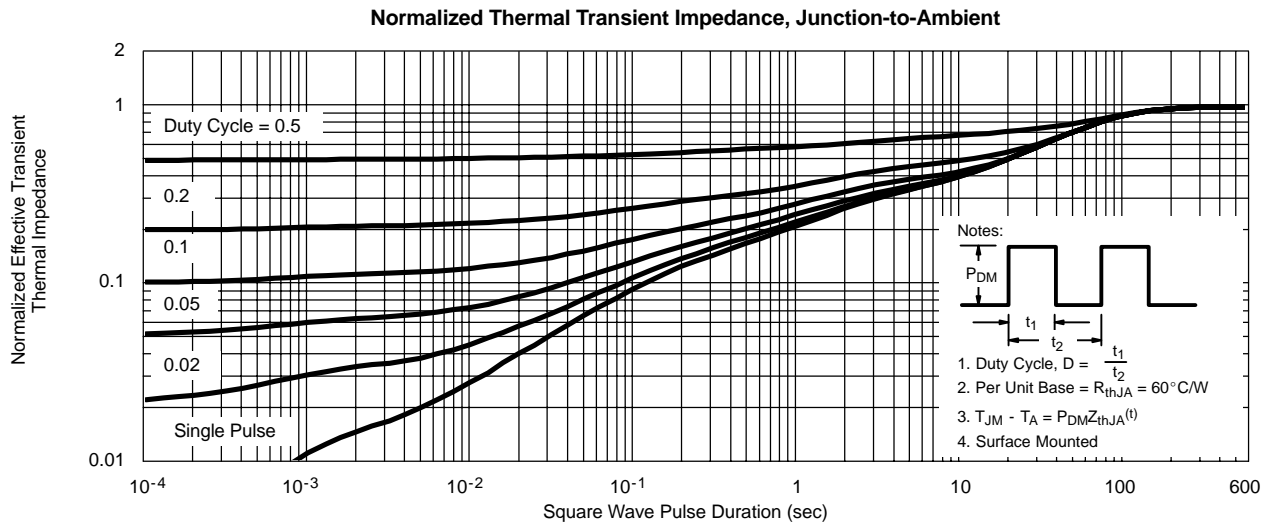
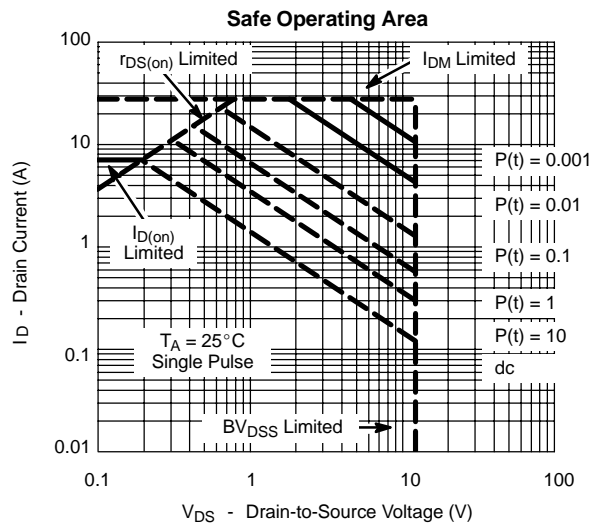
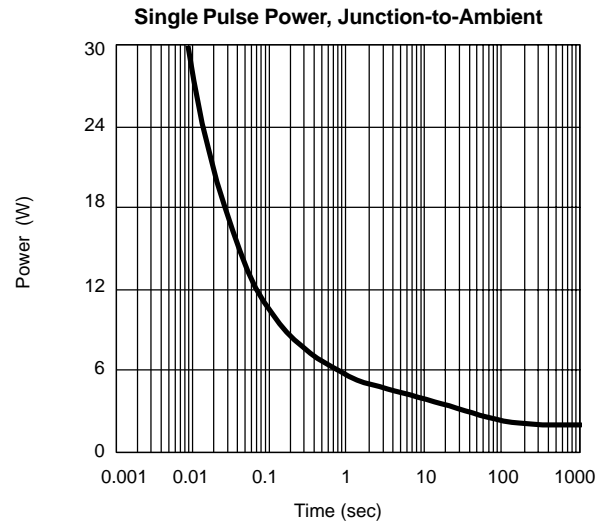
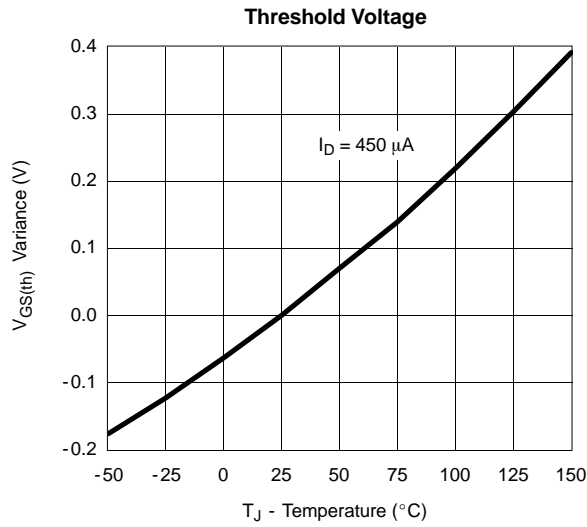
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

