

Dual P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ)
-30	0.020 @ $V_{GS} = -10$ V	-10.9	49
	0.031 @ $V_{GS} = -4.5$ V	-8.8	

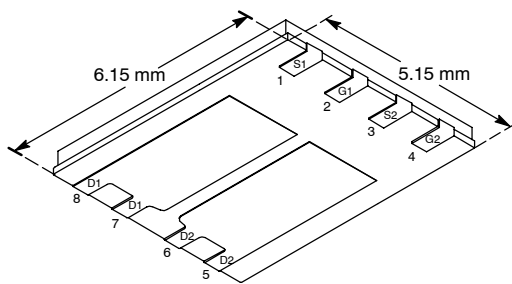
FEATURES

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

APPLICATIONS

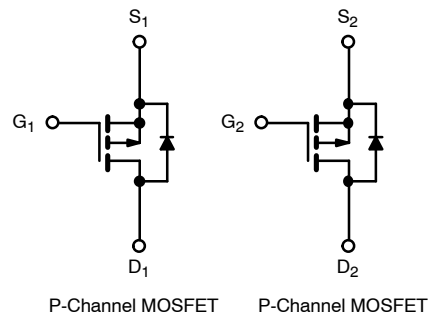
- Battery and Load Switching
 - Notebook PCs
 - Game Systems
 - Set-Top Boxer

PowerPAK SO-8



Bottom View

Ordering Information: Si7945DP-T1
Si7945DP-T1—E3 (Lead (Pb)-Free)



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}	-30		V	
Gate-Source Voltage	V_{GS}	± 20			
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	I_D	$T_A = 25^\circ\text{C}$	-10.9	-7.0	A
		$T_A = 70^\circ\text{C}$	-8.7	-5.6	
Pulsed Drain Current	I_{DM}	-30			
continuous Source Current (Diode Conduction) ^a	I_S	-2.9	-1.2		
Maximum Power Dissipation ^a	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 ^a	R_{thJA}	$t \leq 10$ sec	26	35	$^\circ\text{C}/\text{W}$
		Steady State	60	85	
Maximum Junction-to-Case (Drain)	R_{thJC}	2.5	3.1		

Notes

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

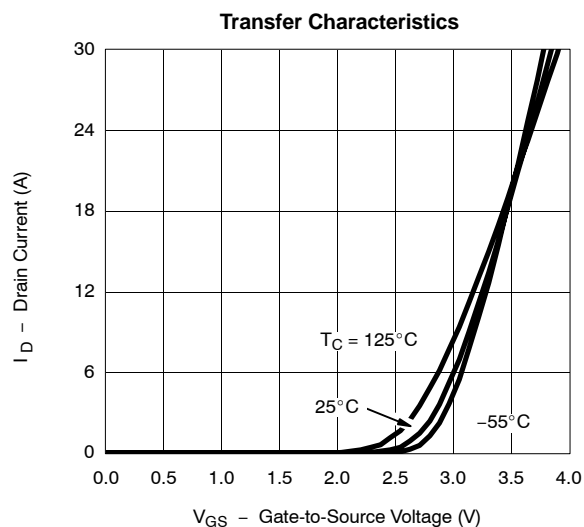
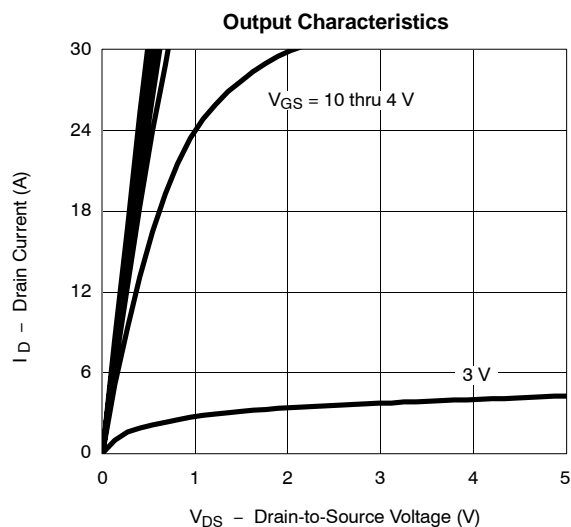
SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA	-1.0		-3.0	V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -30 V, V _{GS} = 0 V			-1	μA
		V _{DS} = -30 V, V _{GS} = 0 V, T _J = 55 °C			-5	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≤ -5 V, V _{GS} = -10 V	-30			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = -10 V, I _D = -10.9 A		0.016	0.020	Ω
		V _{GS} = -4.5 V, I _D = -8.8 A		0.025	0.031	
Forward Transconductance ^a	g _{fs}	V _{DS} = -15 V, I _D = -10.9 A		26		S
Diode Forward Voltage ^a	V _{SD}	I _S = -2.9 A, V _{GS} = 0 V		-0.8	-1.2	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = -15 V, V _{GS} = -10 V, I _D = -10.9 A		49	74	nC
Gate-Source Charge	Q _{gs}			7.3		
Gate-Drain Charge	Q _{gd}			13		
Turn-On Delay Time	t _{d(on)}	V _{DD} = -15 V, R _L = 15 Ω I _D ≅ -1 A, V _{GEN} = -10 V, R _g = 6 Ω		15	25	ns
Rise Time	t _r			15	25	
Turn-Off Delay Time	t _{d(off)}			130	200	
Fall Time	t _f			80	120	
Source-Drain Reverse Recovery Time	t _{rr}		I _F = -2.9 A, di/dt = 100 A/μs		85	

Notes

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

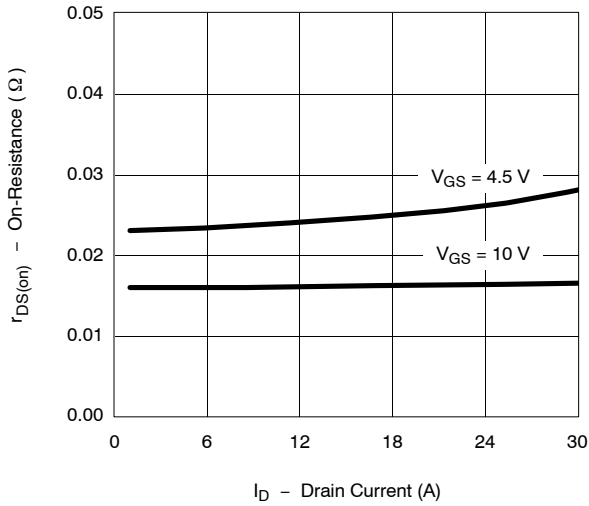
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

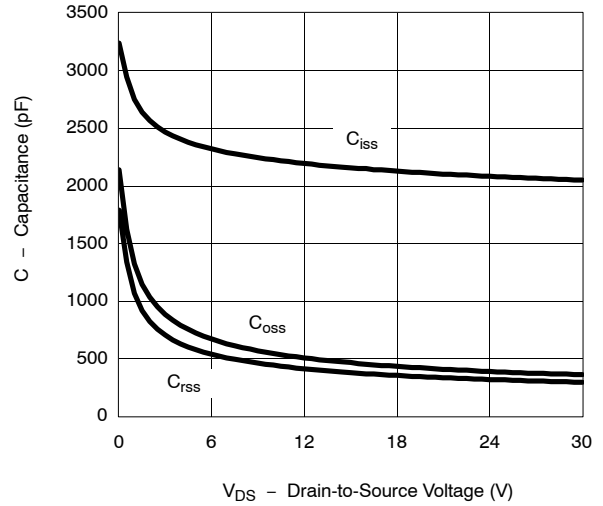


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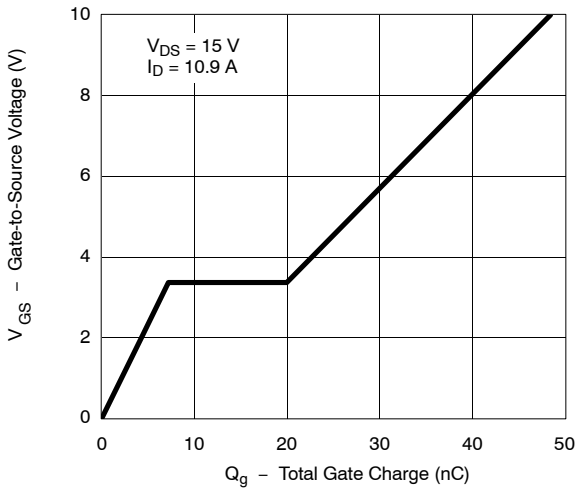
On-Resistance vs. Drain Current



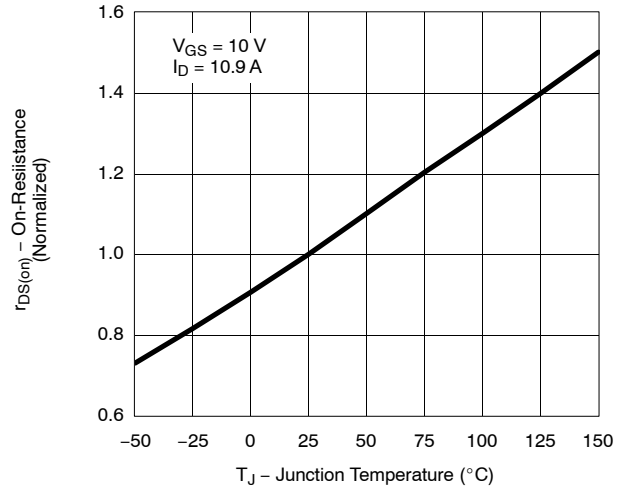
Capacitance



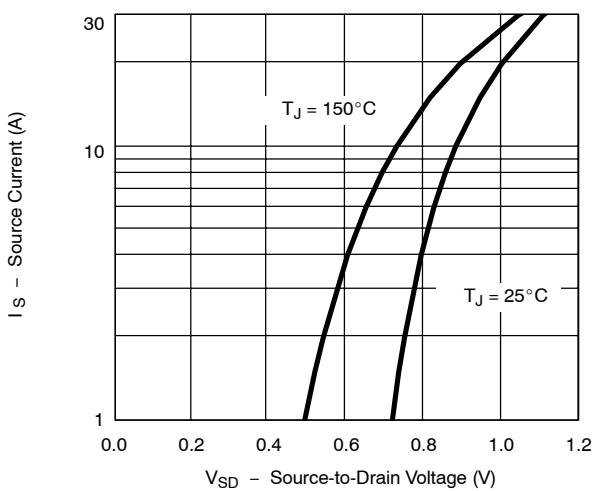
Gate Charge



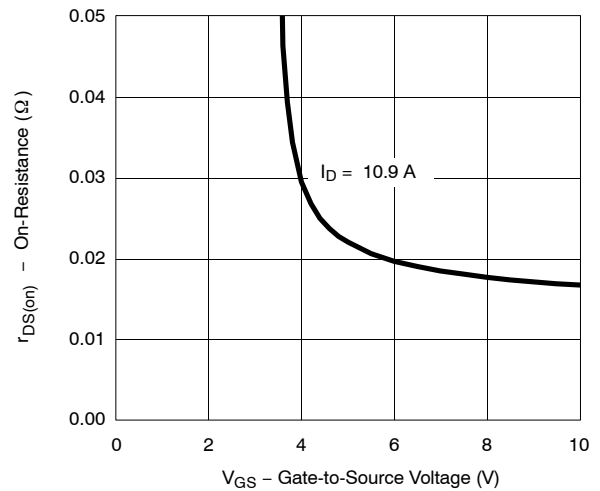
On-Resistance vs. Junction Temperature



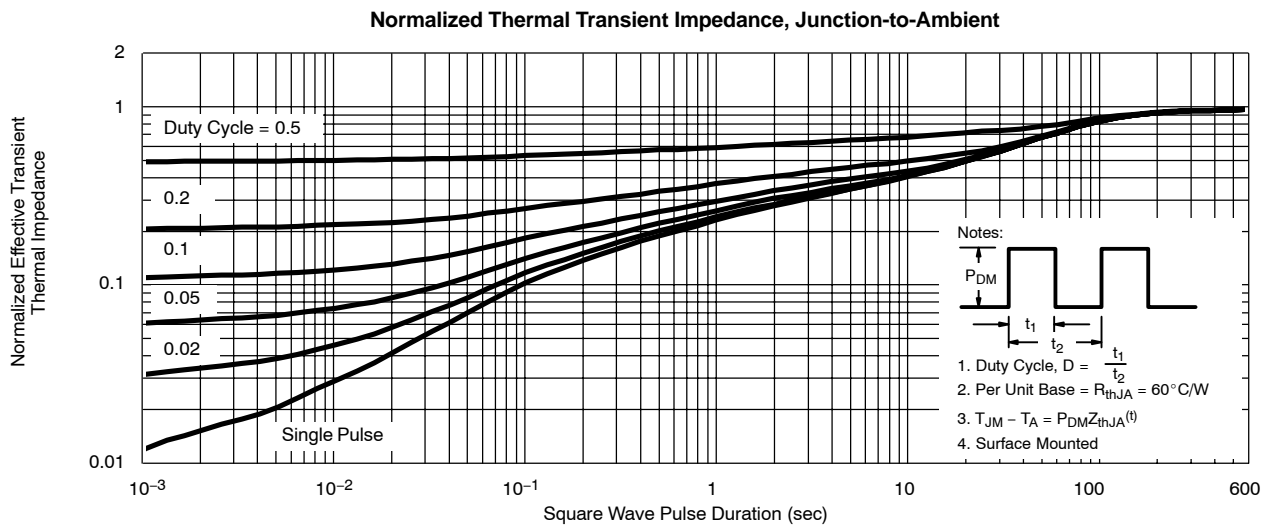
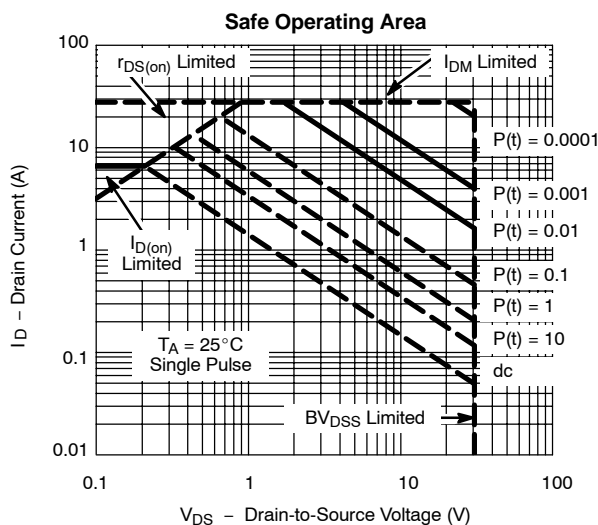
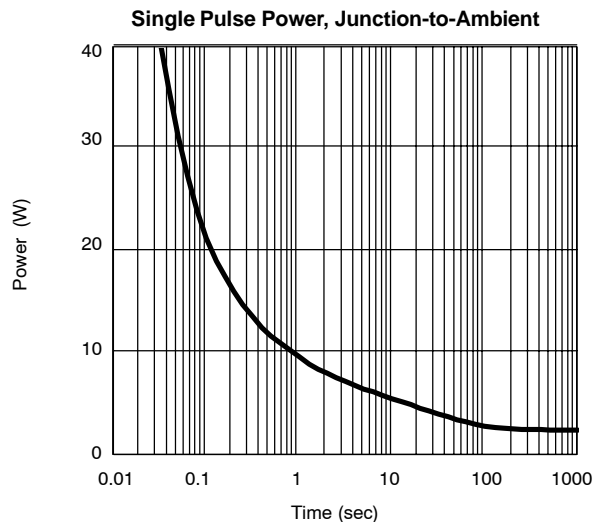
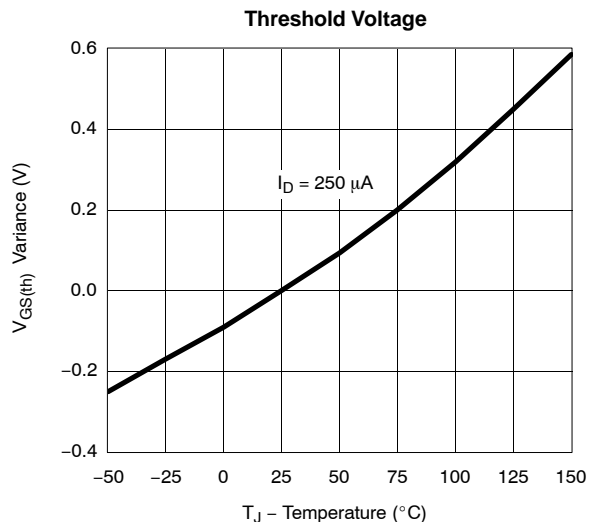
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

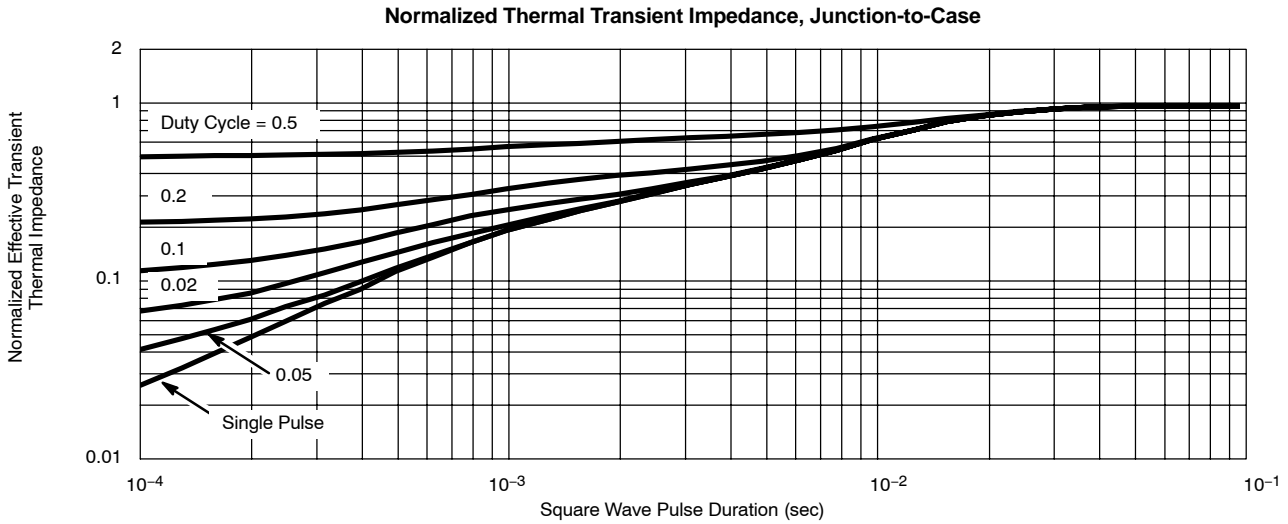


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



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