



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

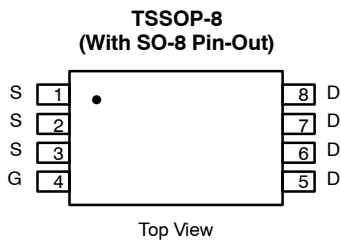
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-12	0.014 @ $V_{GS} = -4.5$ V	-8.6
	0.018 @ $V_{GS} = -2.5$ V	-7.6
	0.023 @ $V_{GS} = -1.8$ V	-6.7

FEATURES

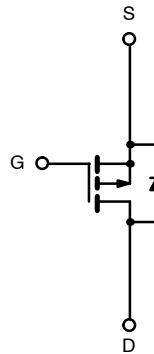
- TrenchFET® Power MOSFET
- SO-8 Pin-Out Compatible

APPLICATIONS

- Load Switch
 - Notebook PC
 - Tablet PC
 - PDA



Ordering Information: Si6405DQ-T1—E3 (Lead Free)



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	-8.6	-7.3	A
	$T_A = 70^\circ\text{C}$		-6.8	-5.8	
Pulsed Drain Current (10 μs Pulse Width)		I_{DM}	-40		
Continuous Source Current (Diode Conduction) ^a		I_S	-1.5	-1.0	W
Maximum Power Dissipation ^a	$T_A = 25^\circ\text{C}$	P_D	1.67	1.2	
	$T_A = 70^\circ\text{C}$		1.06	0.76	
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}	60	75	$^\circ\text{C}/\text{W}$
	Steady State		86	105	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	38	45	

Notes

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

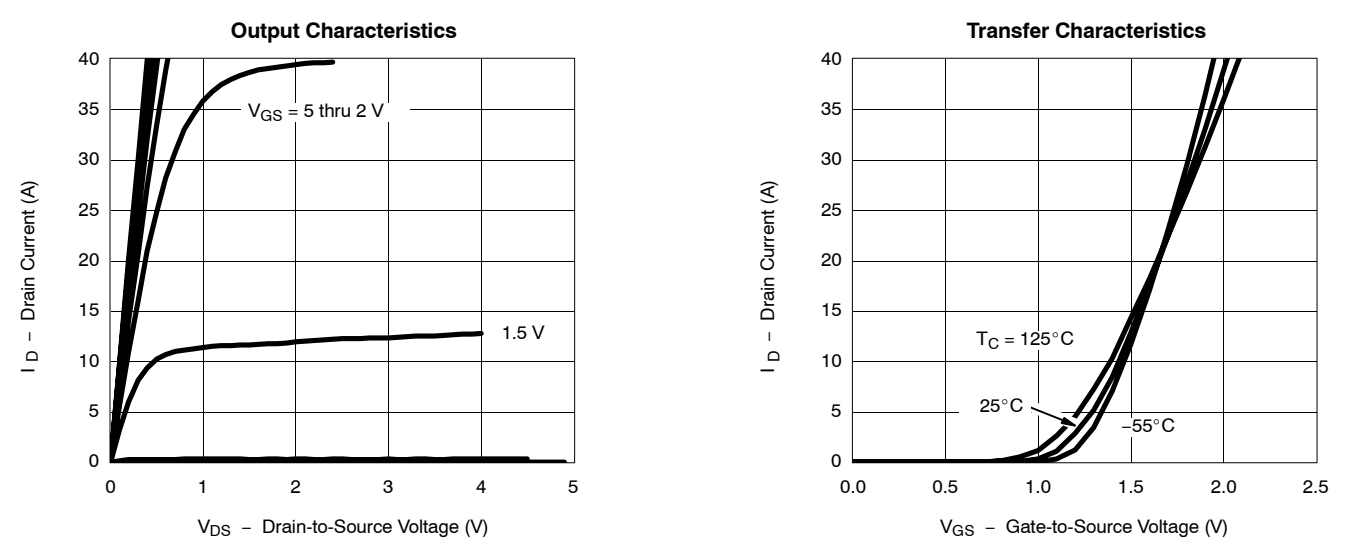


SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -300 μA	-0.40		-0.85	V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -12 V, V _{GS} = 0 V			-1	μA
		V _{DS} = -12 V, V _{GS} = 0 V, T _J = 70 °C			-10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = -5 V, V _{GS} = -4.5 V	20			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = -4.5 V, I _D = -8.6 A		0.011	0.014	Ω
		V _{GS} = -2.5 V, I _D = -7.6 A		0.0145	0.018	
		V _{GS} = -1.8 V, I _D = -6.7 A		0.0185	0.023	
Forward Transconductance ^a	g _{fs}	V _{DS} = -15 V, I _D = -8.6 A		35		S
Diode Forward Voltage ^a	V _{SD}	I _S = -1.5 A, V _{GS} = 0 V		-0.62	-1.1	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = -10 V, V _{GS} = -5 V, I _D = -8.6 A		42	65	nC
Gate-Source Charge	Q _{gs}			4.6		
Gate-Drain Charge	Q _{gd}			12.7		
Gate Resistance	R _g			4.3		Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = -10 V, R _L = 15 Ω I _D ≅ -1 A, V _{GEN} = -4.5 V, R _G = 6 Ω		50	75	ns
Rise Time	t _r			105	160	
Turn-Off Delay Time	t _{d(off)}			185	280	
Fall Time	t _f			135	205	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = -1.5 A, di/dt = 100 A/μs		100	150	

Notes

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

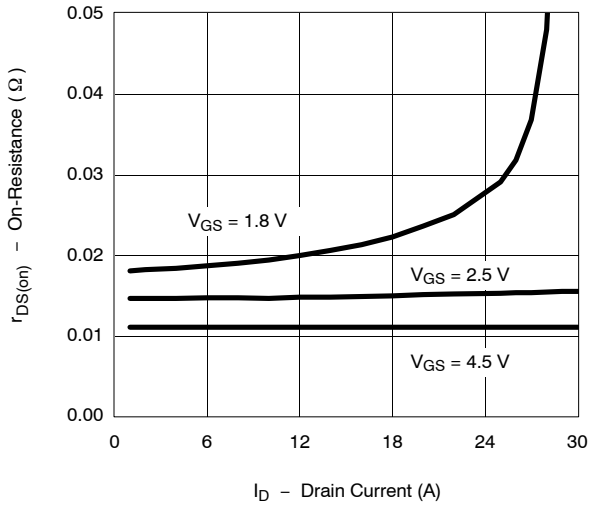
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



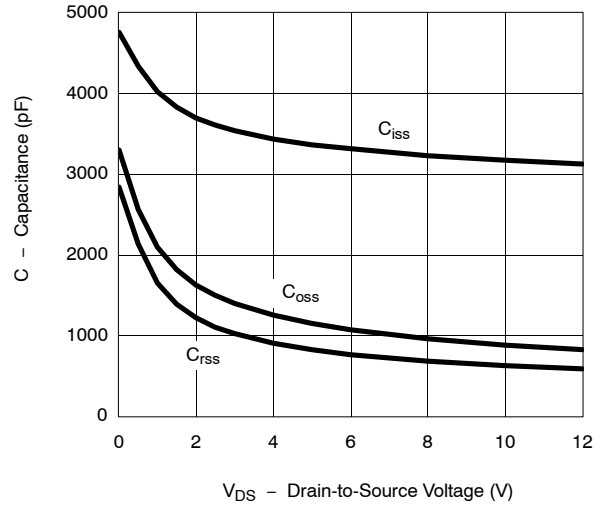


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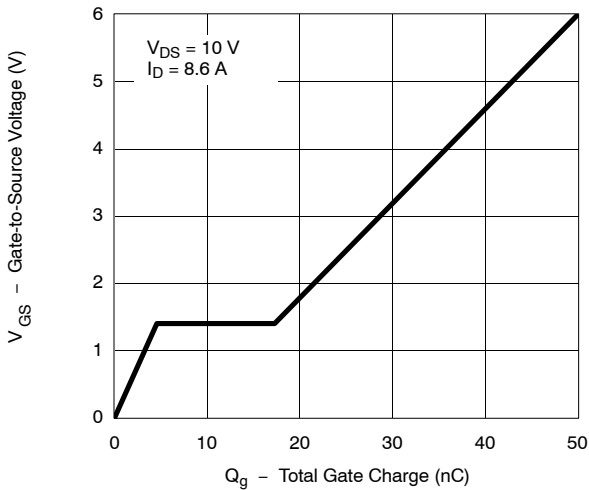
On-Resistance vs. Drain Current



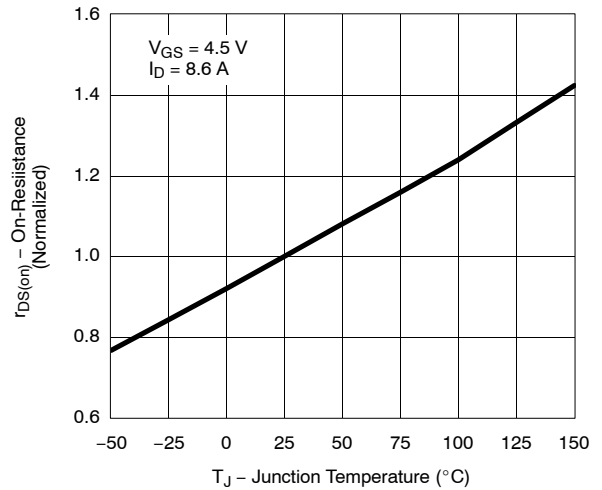
Capacitance



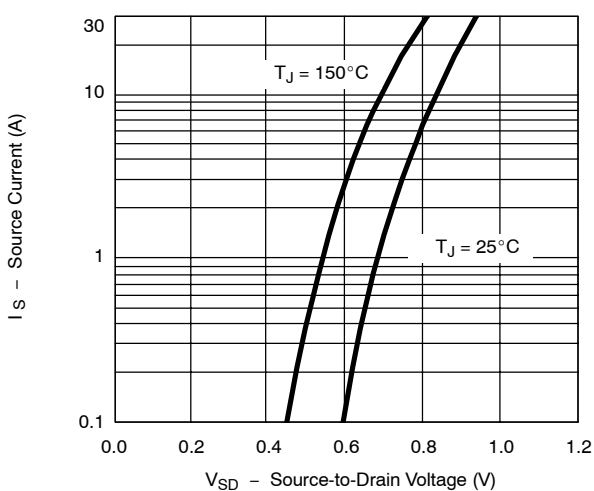
Gate Charge



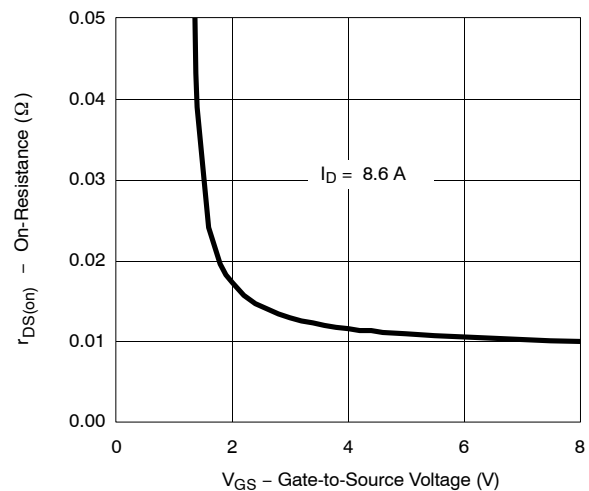
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

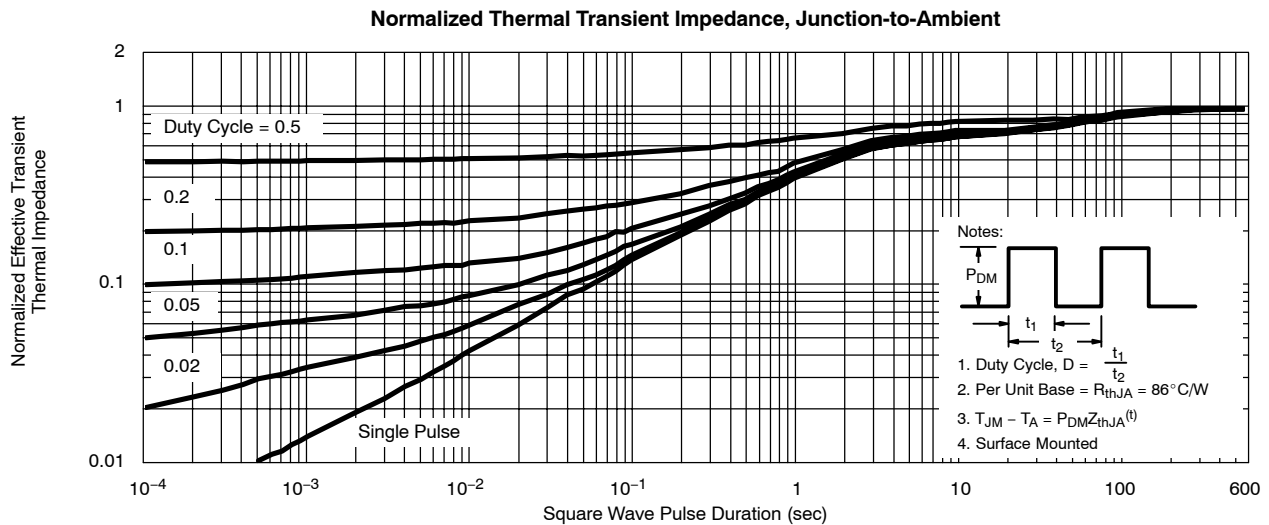
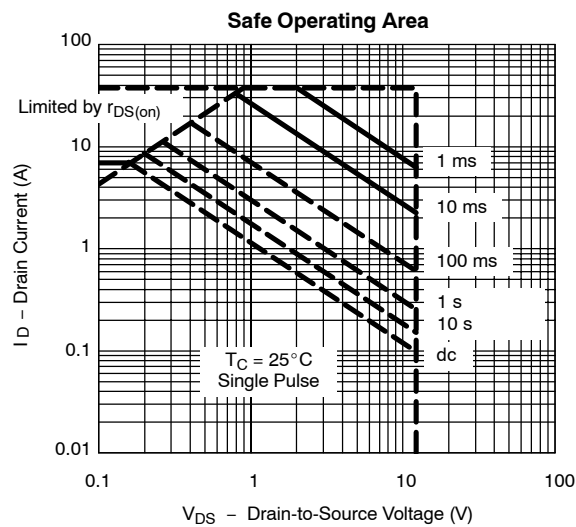
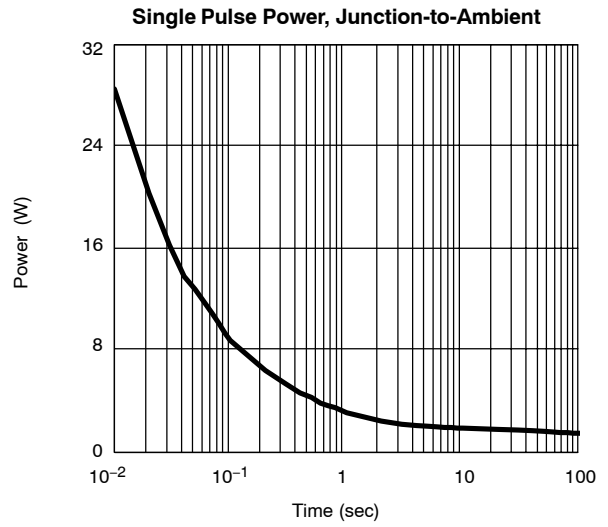
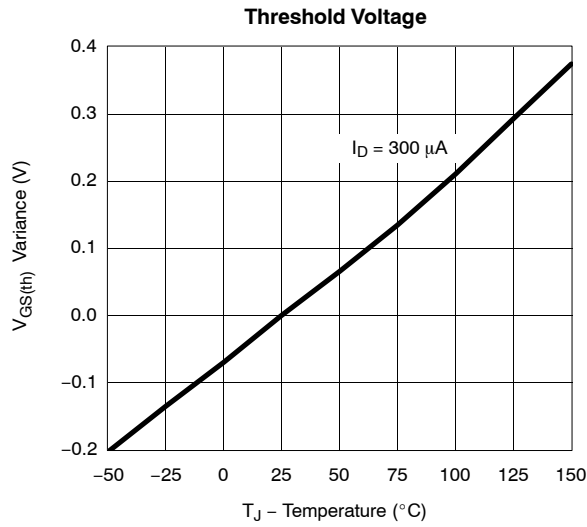


On-Resistance vs. Gate-to-Source Voltage



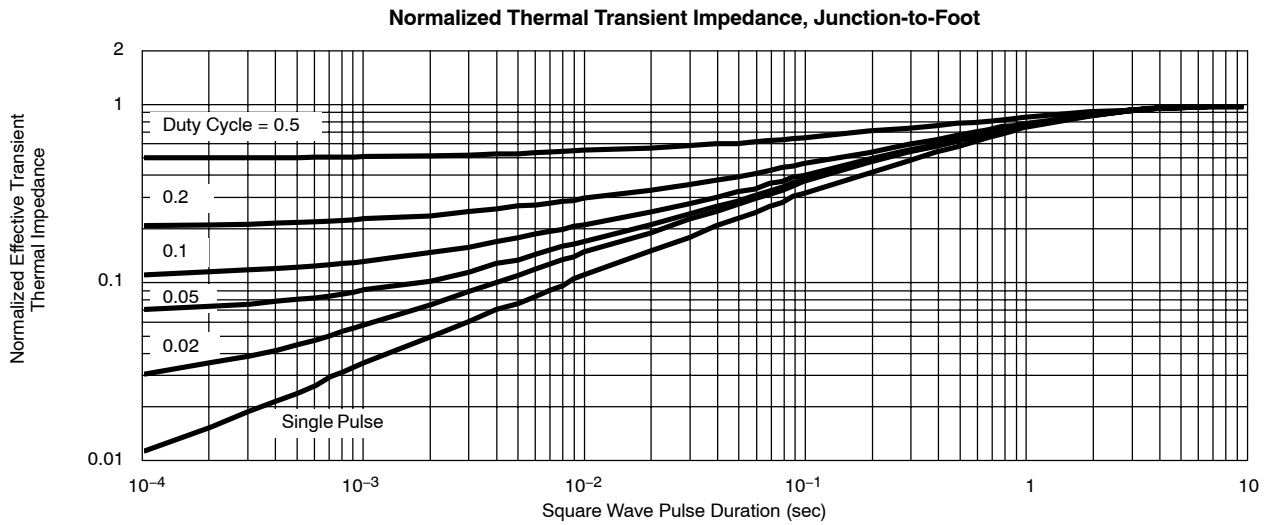


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





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