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

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-12	0.0085 @ V_{GS} = -4.5 V	-9.5
	0.0106 @ V_{GS} = -2.5 V	-8.5
	0.014 @ V_{GS} = -1.8 V	-7.5

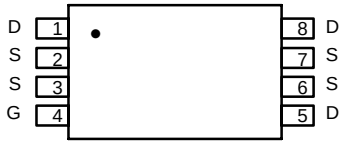
FEATURES

- TrenchFET® Power MOSFET

APPLICATIONS

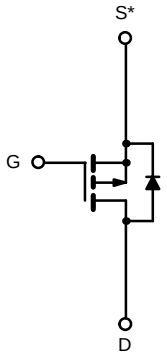
- Load Switch

TSSOP-8



Top View

Ordering Information: Si6423DQ
Si6423DQ-T1 (with Tape and Reel)



P-Channel MOSFET

* Source Pins 2, 3, 6 and 7 must be tied common.

ABSOLUTE MAXIMUM RATINGS (T_A = 25°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°C)[a]	T_A = 25°C	I_D	-9.5	-8.2	A
	T_A = 70°C		-8	-6.5	
Pulsed Drain Current (10 μs Pulse Width)		I_{DM}	-30		
Continuous Source Current (Diode Conduction)[a]		I_S	-1.35	-0.95	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	1.5	1.05	W
	T_A = 70°C		1.0	0.67	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150		°C

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient[a]	t ≤ 10 sec	R_{thJA}	60	83	°C/W
	Steady State		100	120	
Maximum Junction-to-Foot	Steady State	R_{thJF}	35	45	

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

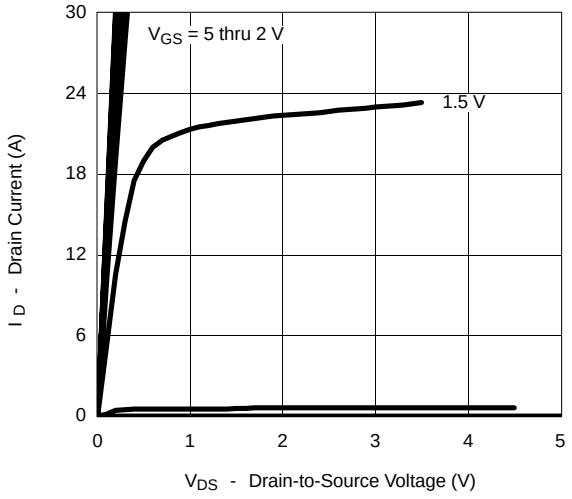
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -400 µA	-0.40		-0.8	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 = 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 = -9.5 A		0.0068	0.0085	Ω
		V_{GS} = -2.5 V, I_D = -8.5 A		0.0085	0.0106	
		V_{GS} = -1.8 V, I_D = -7.5 A		0.0112	0.014	
Forward Transconductance[a]	g_{fs}	V_{DS} = -15 V, I_D = -9.5 A		45		S
Diode Forward Voltage[a]	V_{SD}	I_S = -1.3 A, V_{GS} = 0 V		-0.58	-1.1	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = -6 V, V_{GS} = -5 V, I_D = -9.5 A		74	110	nC
Gate-Source Charge	Q_{gs}			9.0		
Gate-Drain Charge	Q_{gd}			19		
Gate Resistance	R_g			3.6		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		50	75	ns
Rise Time	t_r			75	110	
Turn-Off Delay Time	$t_{d(off)}$			270	400	
Fall Time	t_f			200	300	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = -1.3 A, di/dt = 100 A/µs		160	250	

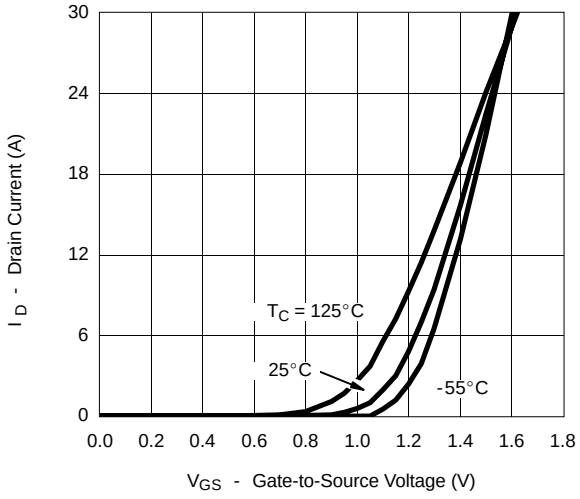
Notes
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics



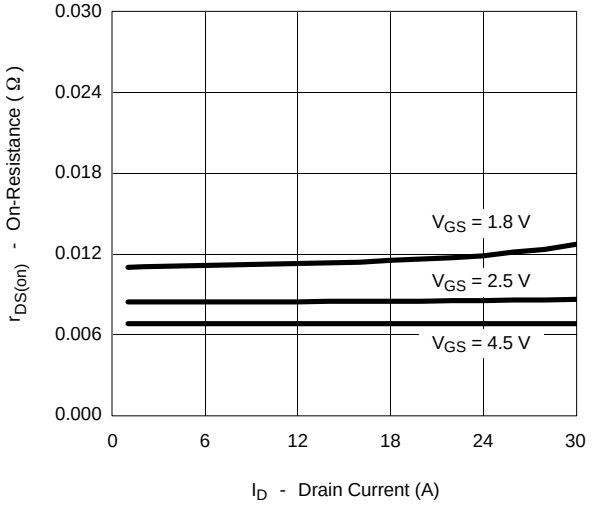
Transfer Characteristics



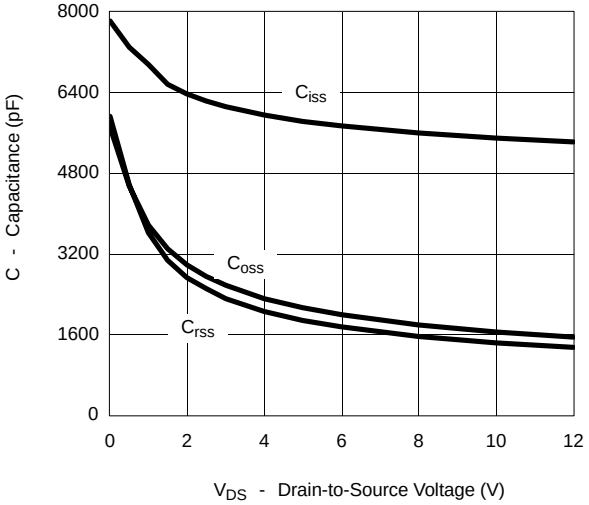
Document Number: 72257
S-31419—Rev. A, 07-Jul-03

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

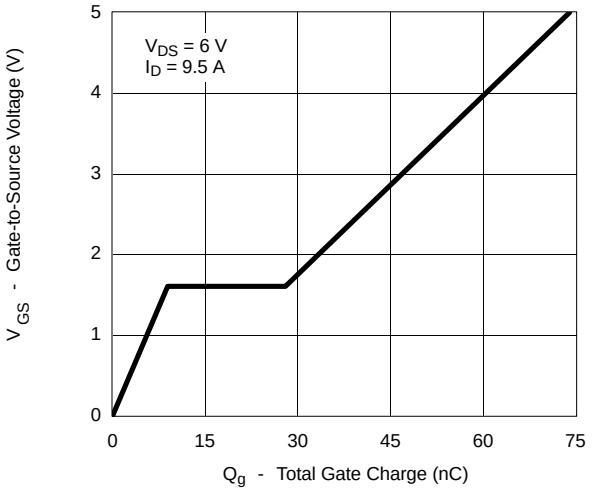
On-Resistance vs. Drain Current



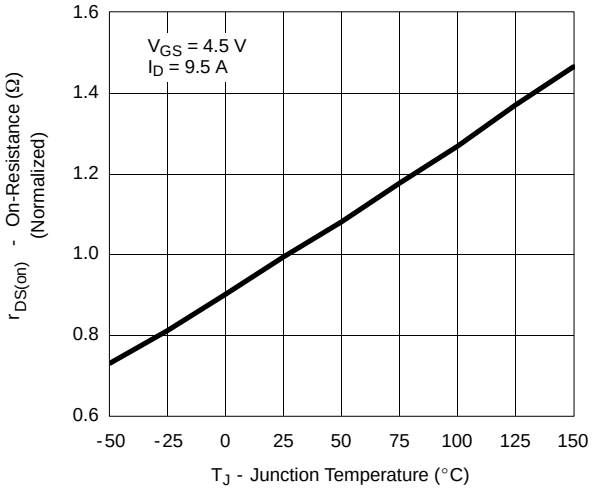
Capacitance



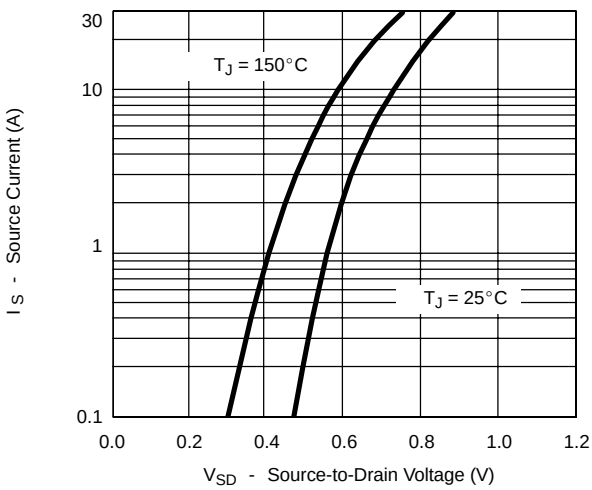
Gate Charge



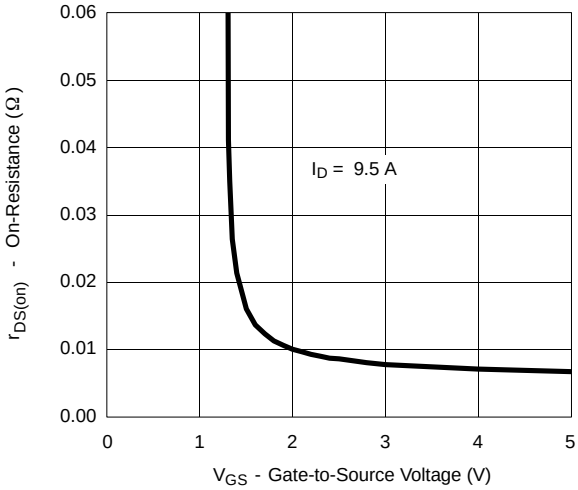
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

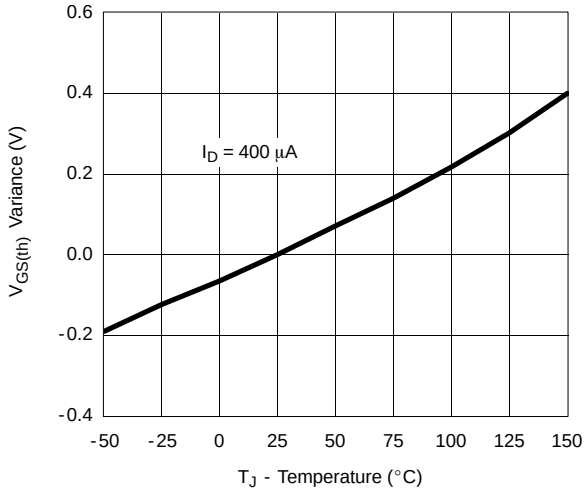


On-Resistance vs. Gate-to-Source Voltage

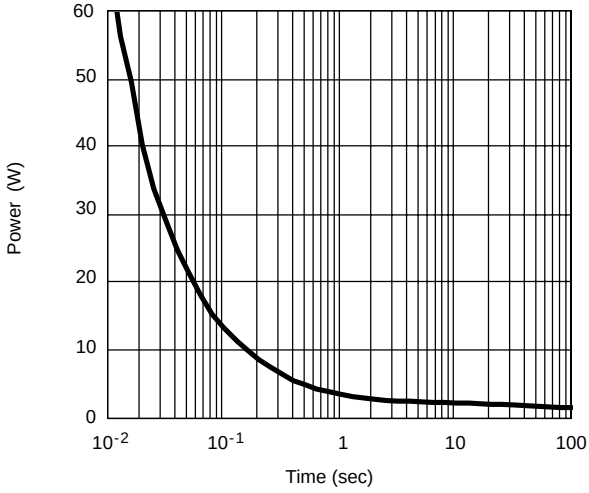


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

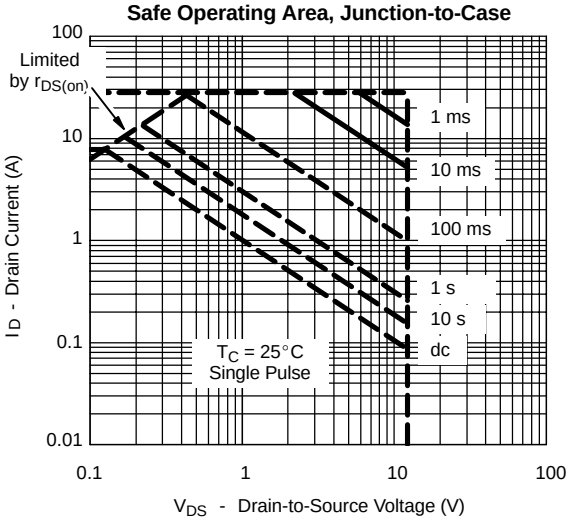
Threshold Voltage



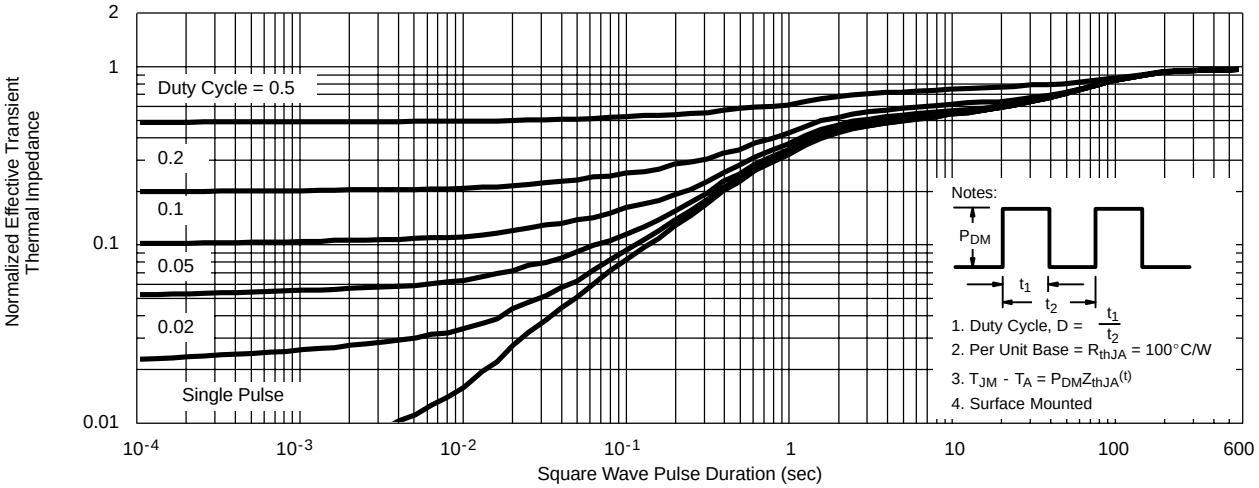
Single Pulse Power, Junction-to-Ambient



Safe Operating Area, Junction-to-Case



Normalized Thermal Transient Impedance, Junction-to-Ambient



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)