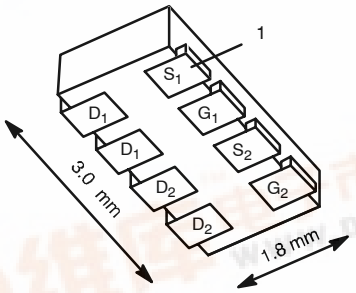
Dual N-Channel 2.5-V (G-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.075 @ V_{GS} = 4.5 V	±4.2
	0.134 @ V_{GS} = 2.5 V	±3.1

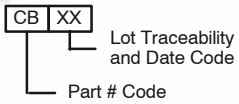
TrenchFET® Power MOSFETs 2.5-V Rated

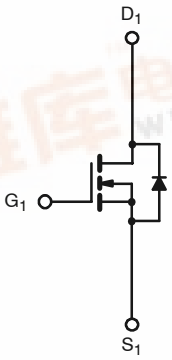
1206-8 ChipFET™



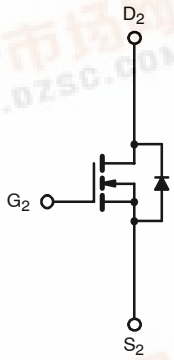
Bottom View

Marking Code





N-Channel MOSFET



N-Channel MOSFET

Ordering Information: Si5904DC-T1

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)					
Parameter		Symbol	5 secs	Steady State	Unit
Drain-Source Voltage		V_{DS}	20		V
Gate-Source Voltage		V_{GS}	±12		
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	±4.2	±3.1	A
	T_A = 85°C		±3.0	±2.2	
Pulsed Drain Current		I_{DM}	±10		
Continuous Source Current (Diode Conduction)[a]		I_S	1.8	0.9	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	2.1	1.1	W
	T_A = 85°C		1.1	0.6	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150		°C
Soldering Recommendations (Peak Temperature)[b, c]			260		

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient[a]	t ≤ 5 sec	R_{thJA}	50	60	°C/W
	Steady State		90	110	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	30	40	

Notes

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

b. See Reliability Manual for profile. The ChipFET is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection.

c. Rework Conditions: manual soldering with a soldering iron is not recommended for leadless components.

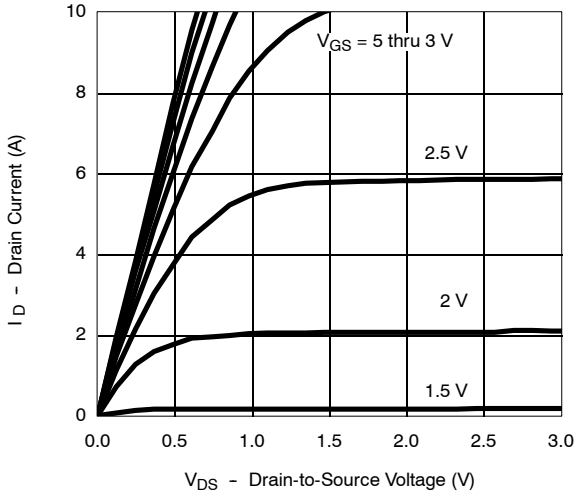
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	0.6			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±12 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16 V, V_{GS} = 0 V			1	μA
		V_{DS} = 16 V, V_{GS} = 0 V, T_J = 85°C			5	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 4.5 V	10			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 3.1 A		0.065	0.075	Ω
		V_{GS} = 2.5 V, I_D = 2.3 A		0.115	0.143	
Forward Transconductance[a]	g_{fs}	V_{DS} = 10 V, I_D = 3.1 A		8		S
Diode Forward Voltage[a]	V_{SD}	I_S = 0.9 A, V_{GS} = 0 V		0.8	1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 3.1 A		4	6	nC
Gate-Source Charge	Q_{gs}			0.6		
Gate-Drain Charge	Q_{gd}			1.3		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 10 V, R_L = 10 Ω I_D ≅ 1 A, V_{GEN} = 4.5 V, R_G = 6 Ω		12	18	ns
Rise Time	t_r			35	55	
Turn-Off Delay Time	$t_{d(off)}$			19	30	
Fall Time	t_f			9	15	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 0.9 A, di/dt = 100 A/μs		40	80	

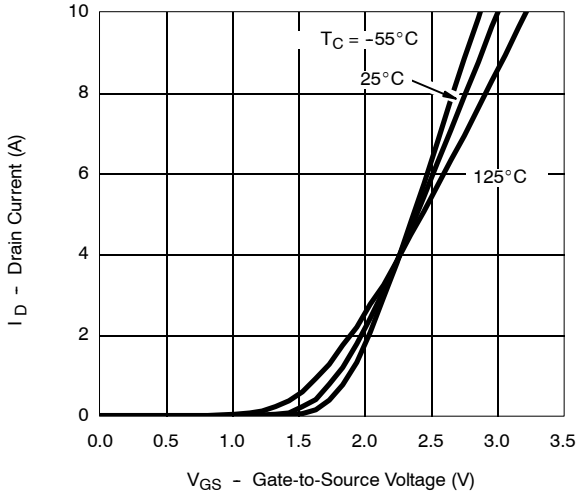
Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics

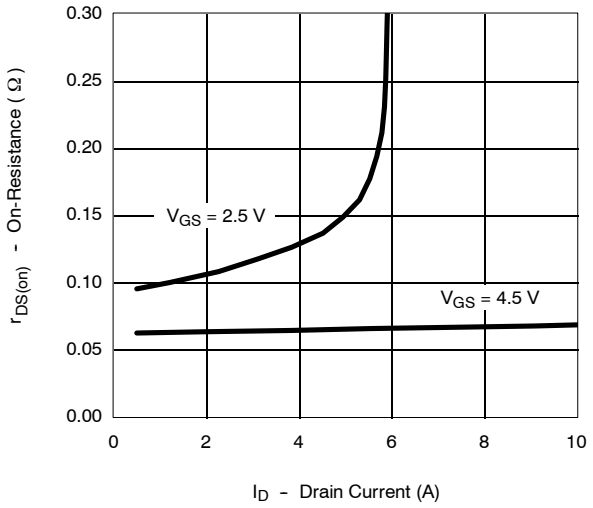


Transfer Characteristics

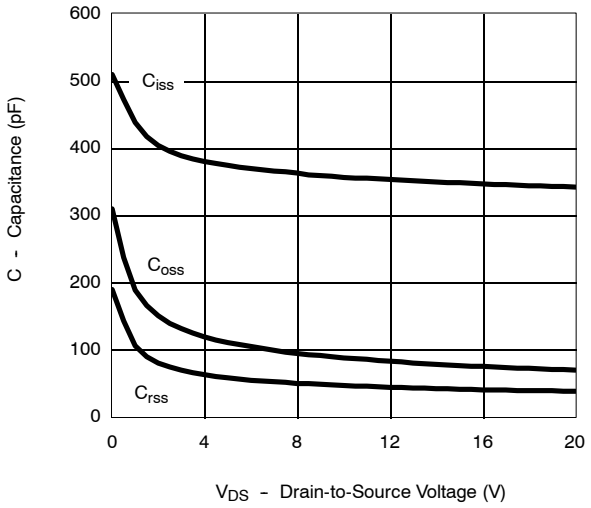


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

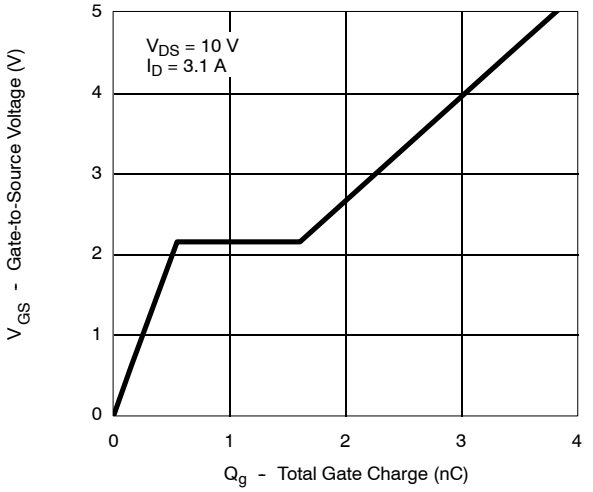
On-Resistance vs. Drain Current



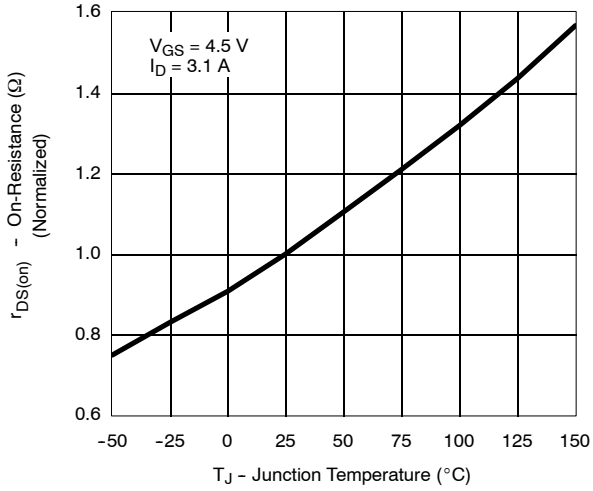
Capacitance



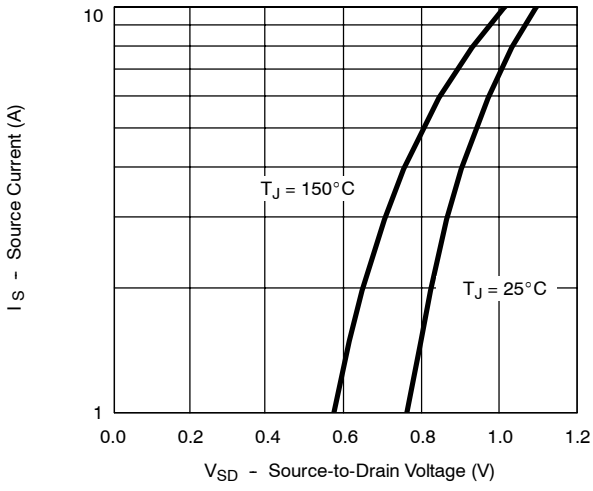
Gate Charge



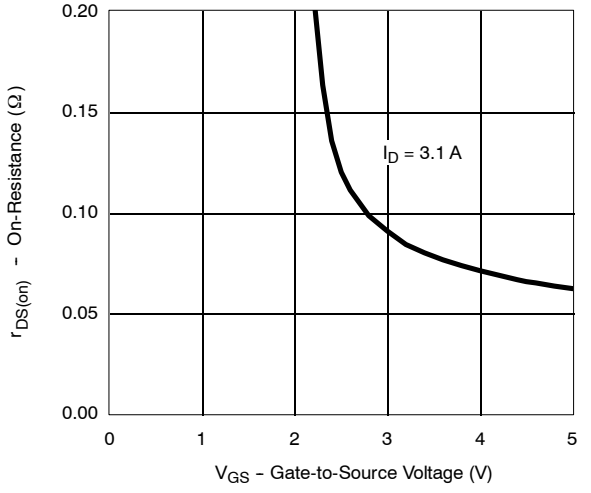
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

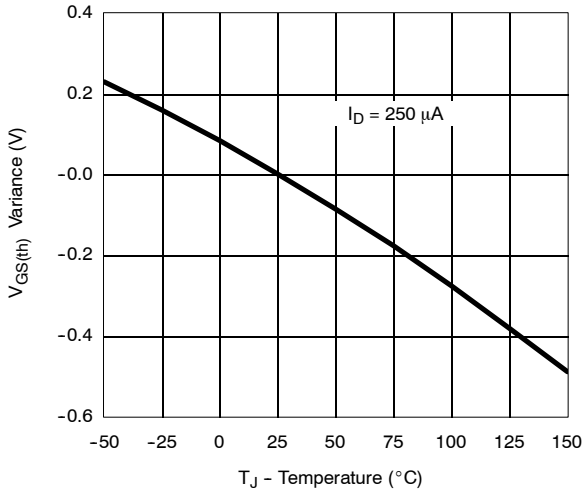


On-Resistance vs. Gate-to-Source Voltage

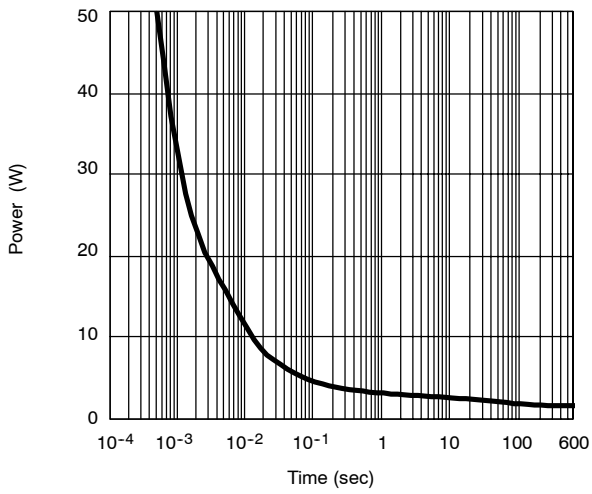


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

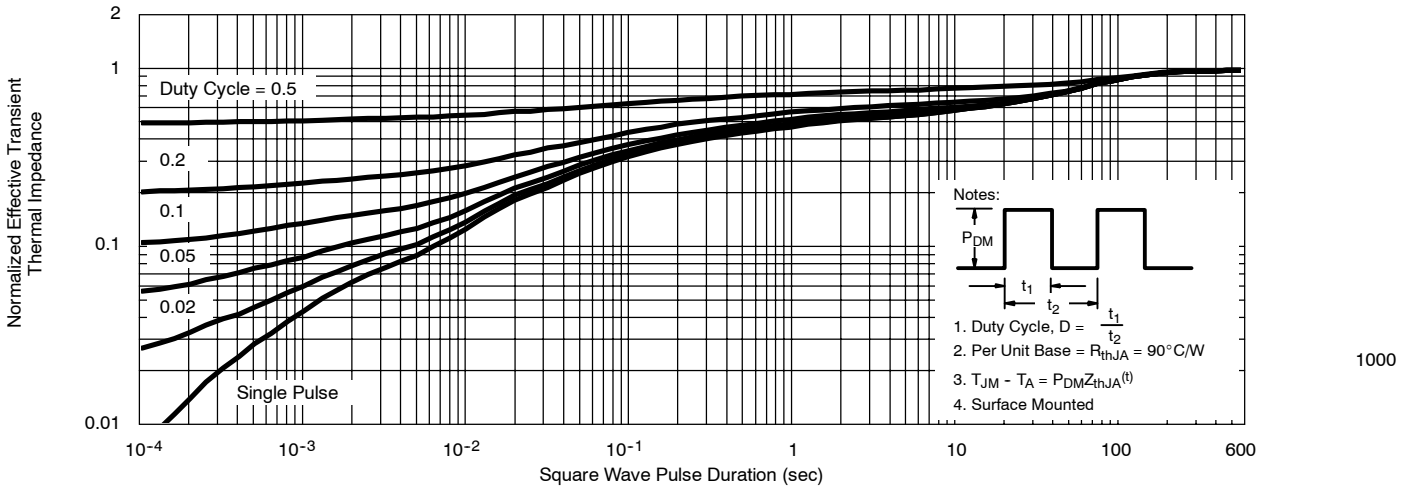
Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot