



**Si5406DC**  
Vishay Siliconix

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

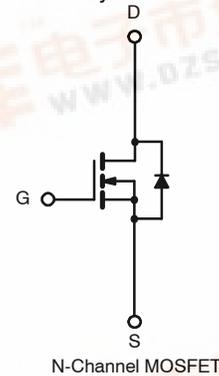
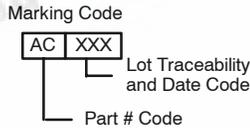
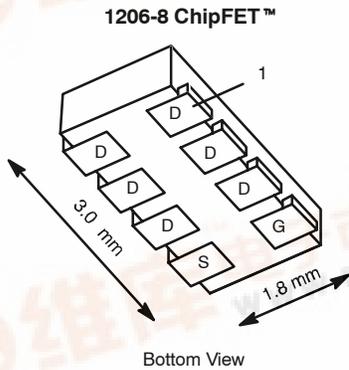
PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
12	0.020 @ $V_{GS} = 4.5$ V	9.5
	0.025 @ $V_{GS} = 2.5$ V	8.5

**FEATURES**

- TrenchFET® Power MOSFETS: 2.5-V Rated
- Low Thermal Resistance

**APPLICATIONS**

- Load/Power Switching for Cell Phones and Pagers
- PA Switch in Cellular Devices
- Battery Operated Systems



Ordering Information: Si5406DC-T1

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	5 secs	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	12		V	
Gate-Source Voltage	$V_{GS}$	$\pm 8$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	9.5	6.9	A
		$T_A = 85^\circ\text{C}$	6.8	4.9	
Pulsed Drain Current	$I_{DM}$	20			
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	2.1	1.1	W	
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	2.5		1.3
		$T_A = 85^\circ\text{C}$	1.3		0.7
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$	
Soldering Recommendations (Peak Temperature) <sup>b, c</sup>		260			

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	$t \leq 5$ sec	40	50	$^\circ\text{C/W}$
		Steady State	80	95	
Maximum Junction-to-Foot (Drain)	$R_{thJF}$	15	20		

Notes

- Surface Mounted on 1" x 1" FR4 Board.
- 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.
- Rework Conditions: manual soldering with a soldering iron is not recommended for leadless components.

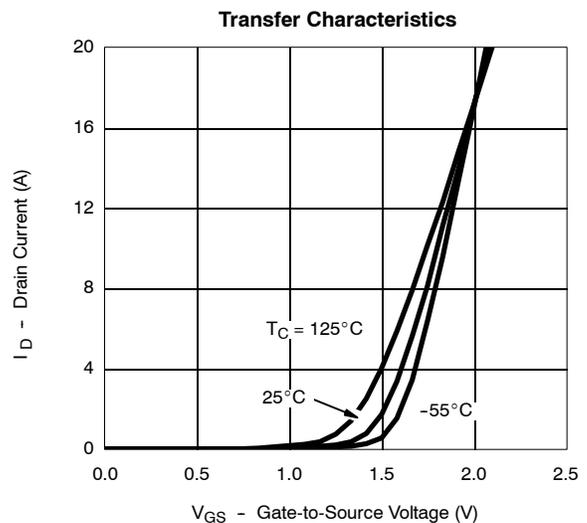
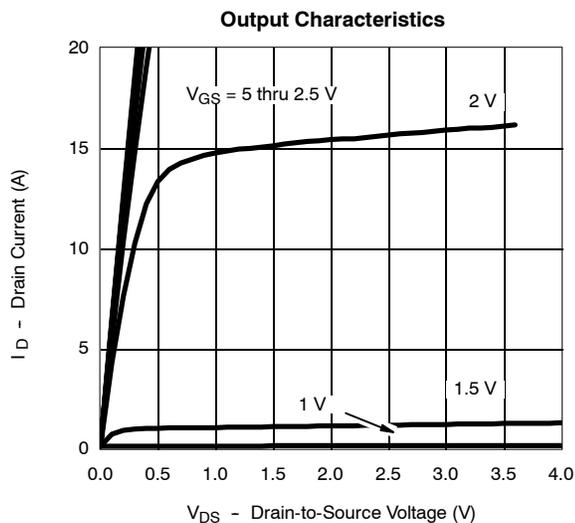


SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 1.2 mA	0.6			V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 8 V			± 100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 9.6 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 9.6 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C			5	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 4.5 V	20			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 6.9 A		0.017	0.020	Ω
		V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 2 A		0.021	0.025	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 6.9 A		30		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = 1.1 A, V <sub>GS</sub> = 0 V		0.7	1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 6 V, V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 6.9 A		13.7	20	nC
Gate-Source Charge	Q <sub>gs</sub>			2.3		
Gate-Drain Charge	Q <sub>gd</sub>			4.1		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 6 V, R <sub>L</sub> = 6 Ω I <sub>D</sub> ≅ 1 A, V <sub>GEN</sub> = 4.5 V, R <sub>G</sub> = 6 Ω		17	25	ns
Rise Time	t <sub>r</sub>			46	70	
Turn-Off Delay Time	t <sub>d(off)</sub>			54	80	
Fall Time	t <sub>f</sub>			29	45	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> = 1.1 A, di/dt = 100 A/μs		35	

**Notes**

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

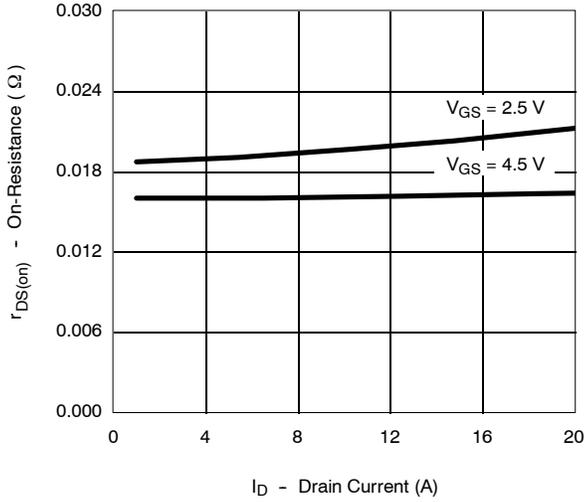
**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**



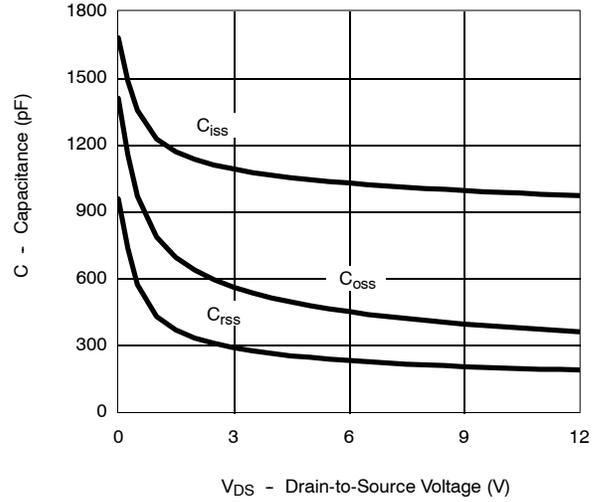


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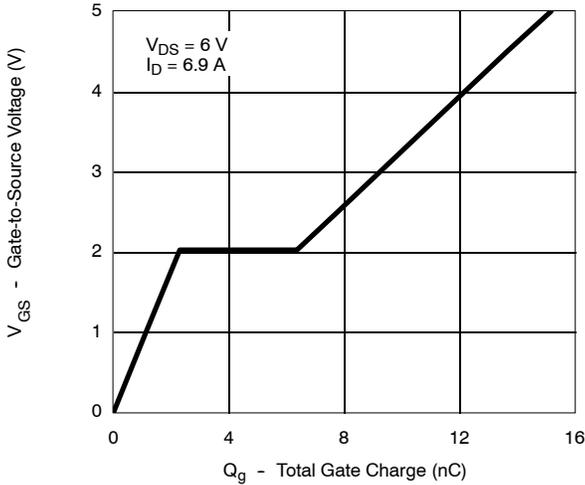
**On-Resistance vs. Drain Current**



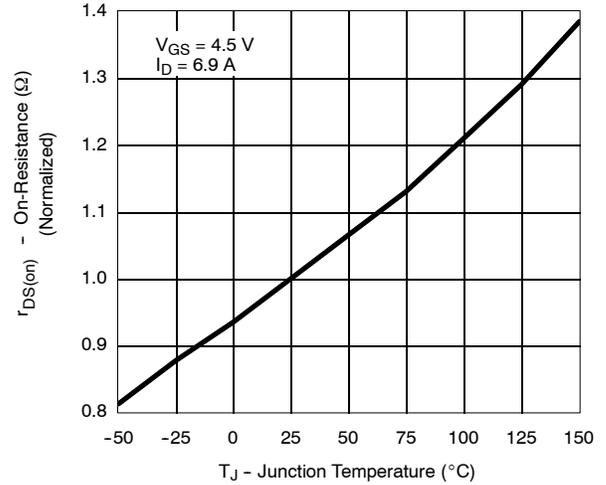
**Capacitance**



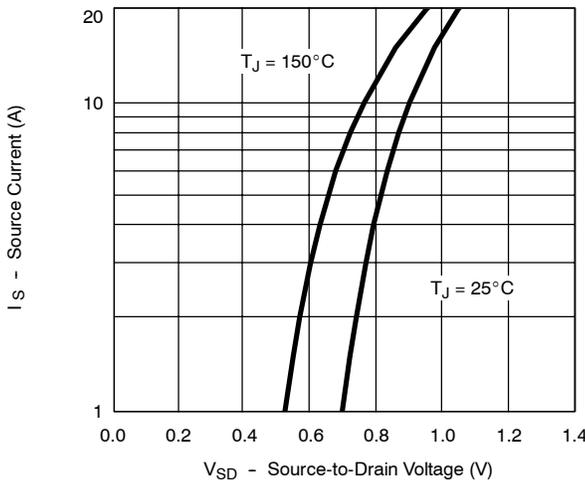
**Gate Charge**



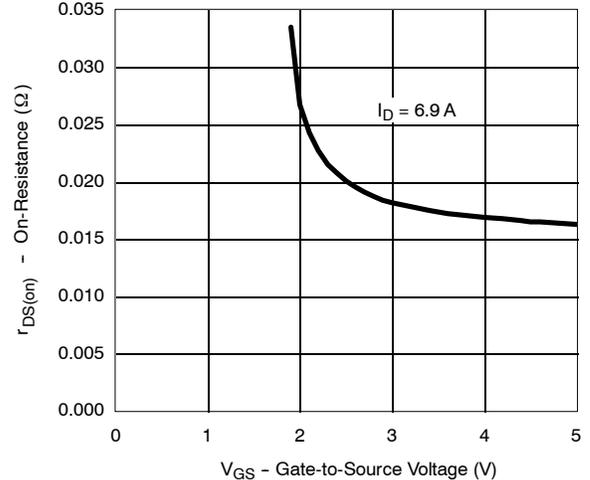
**On-Resistance vs. Junction Temperature**



**Source-Drain Diode Forward Voltage**



**On-Resistance vs. Gate-to-Source Voltage**





**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

