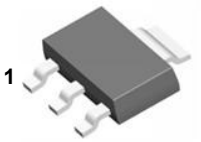
CAN CIRCLE SEMI

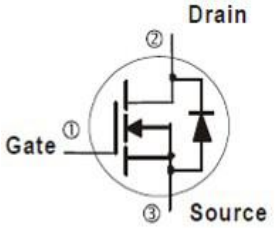
CSM1020N4S223

100V N-Channel Enhancement Mode MOSFET

Voltage	100 V	Current	4A

SOT-223





Features

- $R_{DS(ON)}$, V_{GS}@10V, I_D@2.5A<140mΩ
- $R_{DS(ON)}$, V_{GS}@6V, I_D@1A<180mΩ
- High switching speed
- Improved dv/dt capability
- Low Gate Charge
- Low reverse transfer capacitance

Mechanical Data

- Case : SOT-223 Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.043 ounces, 0.123 grams

Maximum Ratings and Thermal Characteristics (T_A=25 °C unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current (Note 4)	T_C=25°C	I_D	4	A
Pulsed Drain Current (Note 1)	T_C=25°C	I_{DM}	16	
Power Dissipation	T_C=25°C	P_D	8	W
Continuous Drain Current (Note 4)	T_A=25°C	I_D	3.1	A
Power Dissipation	T_A=25°C	P_D	3.1	W
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55~150	°C
Typical Thermal Resistance (Note 4,5)	Junction to Case	$R_{\theta JC}$	15.6	°C/W
	Junction to Ambient	$R_{\theta JA}$	40.3	

- Limited only By Maximum Junction Temperature

CAN CIRCLE SEMI

CSM1020N4S223

Electrical Characteristics (T_A=25°C unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	100	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	2	2.76	3.5	
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=2.5A	-	110	140	mΩ
		V_{GS}=6V, I_D=1A	-	120	180	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V	-	-	1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Dynamic (Note 6)						
Total Gate Charge	Q_g	V_{DS}=37.5V, I_D=5A, V_{GS}=10V (Note 2,3)	-	12	-	nC
Gate-Source Charge	Q_{gs}		-	3.1	-	
Gate-Drain Charge	Q_{gd}		-	2.2	-	
Input Capacitance	Ciss	V_{DS}=30V, V_{GS}=0V, f=1MHZ	-	707	-	pF
Output Capacitance	Coss		-	40	-	
Reverse Transfer Capacitance	Crss		-	16	-	
Turn-On Delay Time	$td_{(on)}$	V_{DS}=37.5V, R_L=7.5Ω, V_{GS}=10V, R_G=3Ω (Note 2,3)	-	6	-	ns
Turn-On Rise Time	t_r		-	27	-	
Turn-Off Delay Time	$td_{(off)}$		-	15	-	
Turn-Off Fall Time	t_f		-	7	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	-	-	5	A
Diode Forward Voltage	V_{SD}	I_S=1A, V_{GS}=0V	-	0.78	1	V

NOTES :

1. Pulse width≤300us, Duty cycle≤2%.
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J =25°C.
4. The maximum current rating is package limited.
5. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. Mounted on a 1 inch^2 with 2oz.square pad of copper.
6. Guaranteed by design, not subject to production testing.

CSM1020N4S223

TYPICAL CHARACTERISTIC CURVES

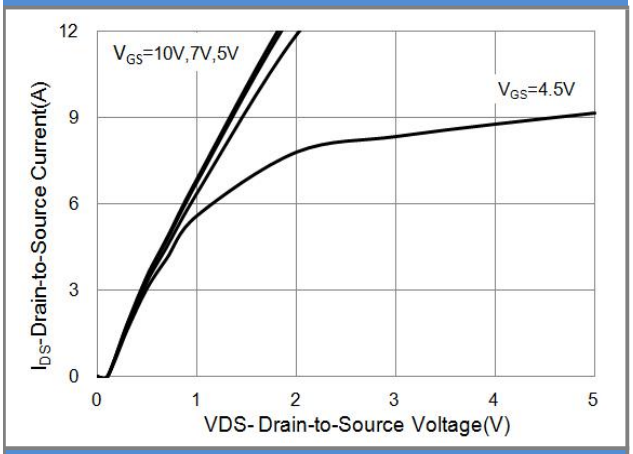


Fig.1 Output Characteristics

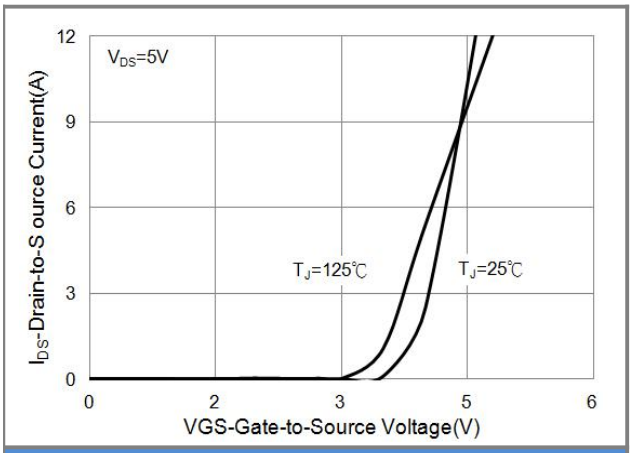


Fig.2 Transfer Characteristics

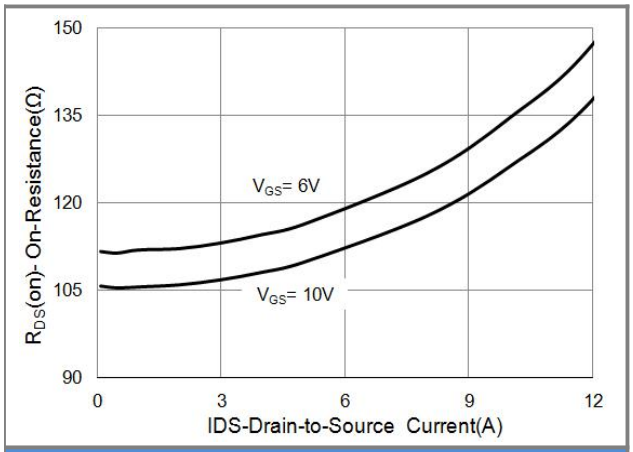


Fig.3 On-Resistance vs. Drain Current

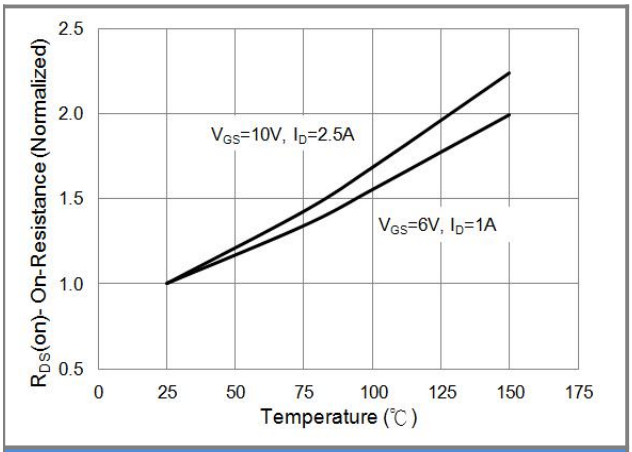


Fig.4 On-Resistance vs. Junction temperature

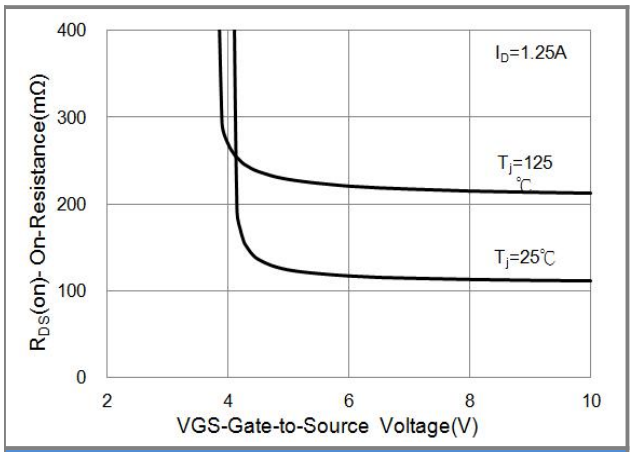


Fig.5 On-Resistance Variation with V_{GS}

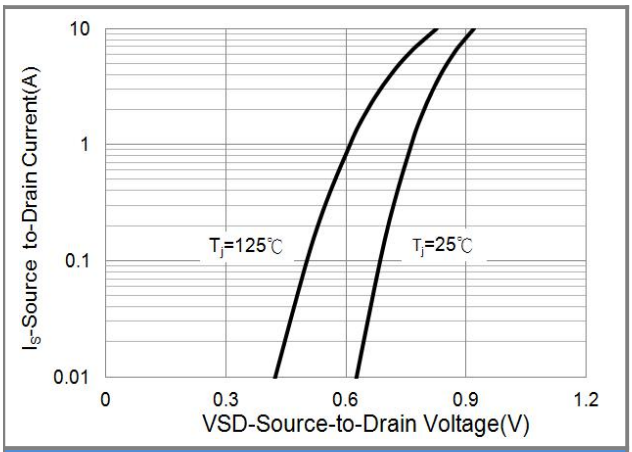


Fig.6 Source-Drain Diode Forward Voltage

CSM1020N4S223

TYPICAL CHARACTERISTIC CURVES

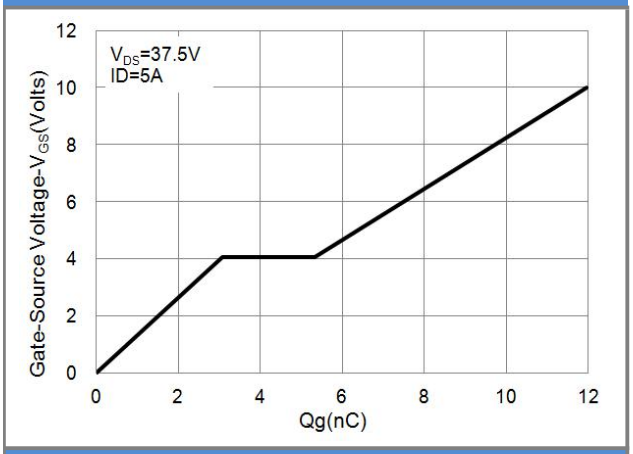


Fig.7 Gate-Charge Characteristics

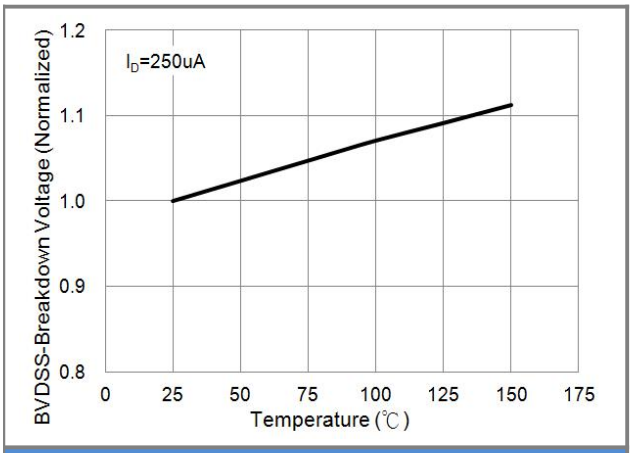


Fig.8 Breakdown Voltage Variation vs. Temperature

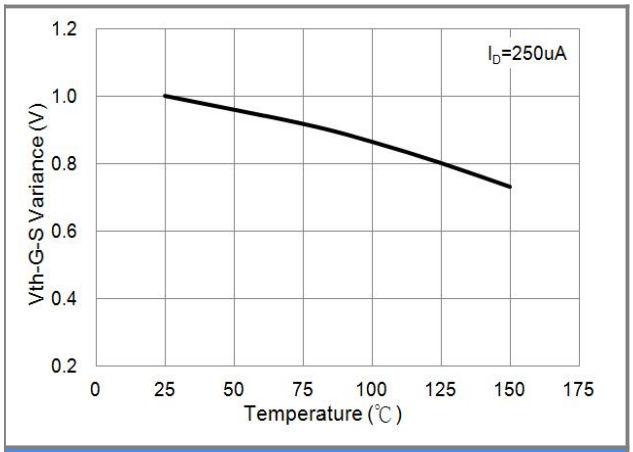


Fig.9 Threshold Voltage Variation with Temperature

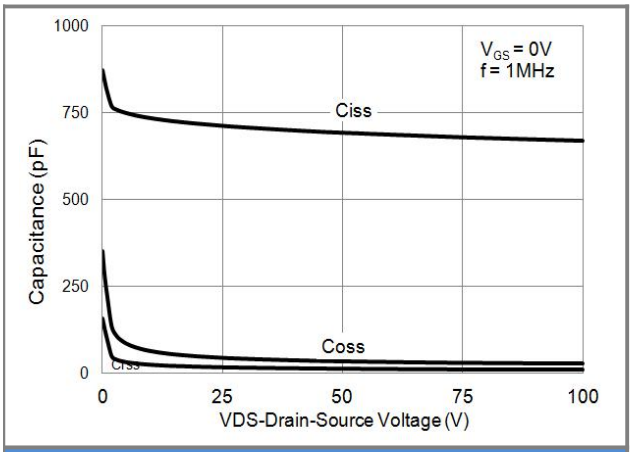


Fig.10 Capacitance vs. Drain-Source Voltage

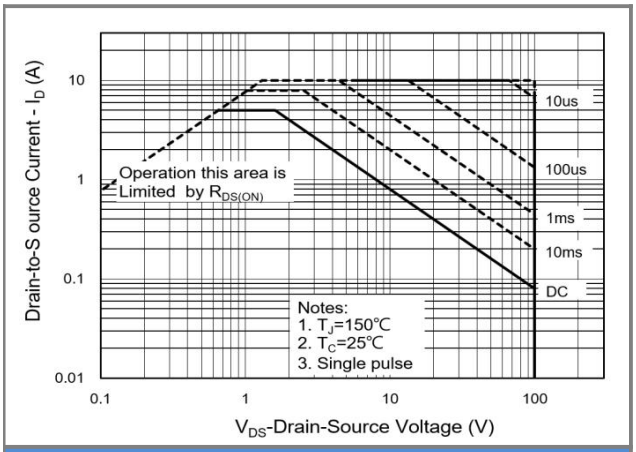


Fig.11 Maximum Safe Operating Area

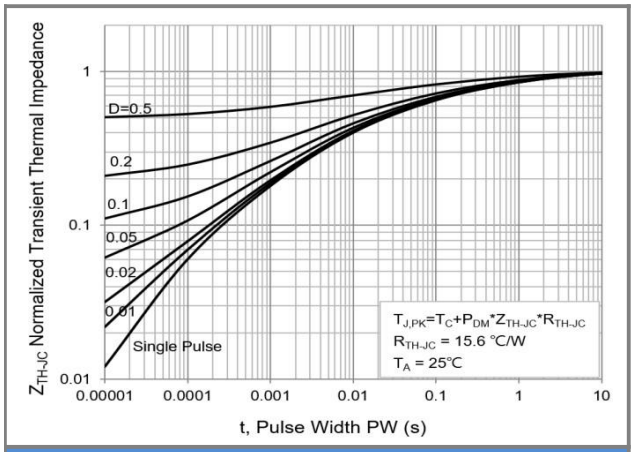


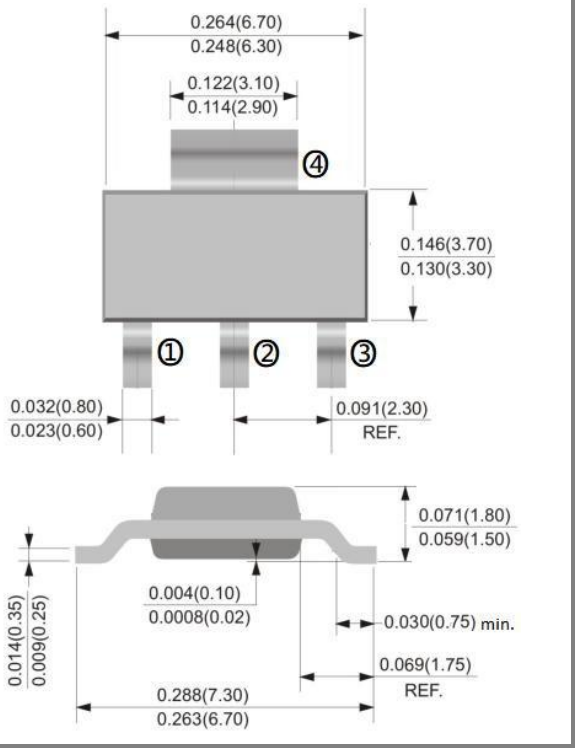
Fig.12 Normalized Transient Thermal Impedance

CAN CIRCLE SEMI

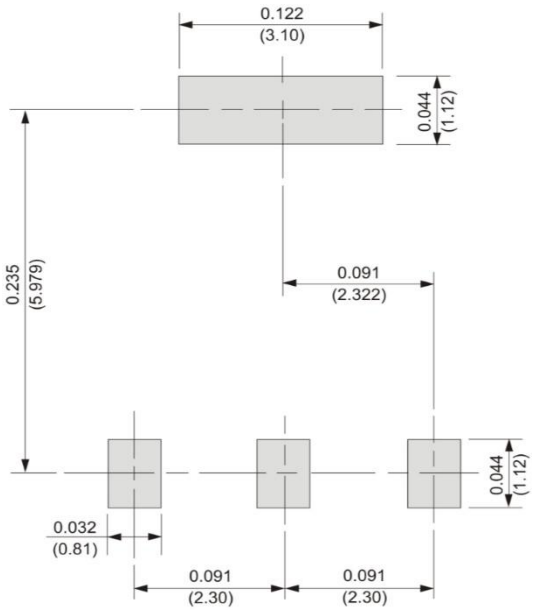
CSM1020N4S223

Packaging Information & Mounting Pad Layout

SOT-223 Dimension — Unit: inch(mm)



SOT-223 Pad Layout — Unit: inch(mm)



Part No Packing Code Version

Part No Packing Code	Package Type	Packing Type
CSM1020N4S223	SOT-223	1,000pcs / 13” reel

Notice

Specifications of the products displayed herein are subject to change without notice. CCS or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in CCS terms and conditions of sale for such products, CCS assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of CCS products including liability or warranties relating to fitness for a particular purpose, merchant ability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications.

Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify CCS for any damages resulting from such improper use or sale.