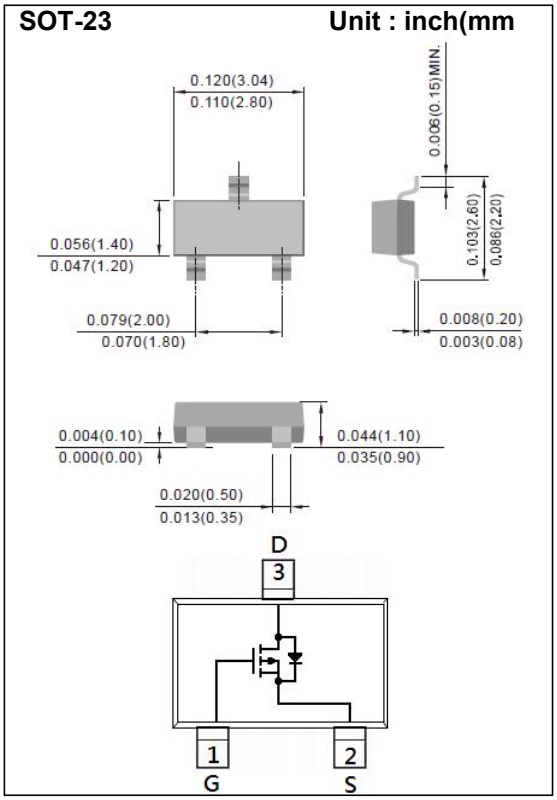
CAN CIRCLE SEMI

CSM2309S23

60V P-Channel Enhancement Mode MOSFET

Voltage	-60 V	Current	-2A



Features

- $R_{DS(ON)}$, V_{GS}@-10V, I_D@-1.9A<190mΩ
- $R_{DS(ON)}$, V_{GS}@-4.5V, I_D@-1.5A<210mΩ
- Advanced Trench Process Technology
- Specially Designed for Switch Load, PWM Application, etc

Mechanical Data

- Case: SOT-23 Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0003 ounces, 0.0084 grams

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

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_A=25°C	I_D	-2	A
Pulsed Drain Current (Note 1)		I_{DM}	-8	A
Power Dissipation	T_A=25°C	P_D	1.25	W
Single Pulse Avalanche Energy (Note 5)		E_{AS}	32	mJ
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55~150	°C
Typical Thermal resistance Junction to Ambient (Note 6)		$R_{\theta JA}$	100	°C/W

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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	-60	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250uA	-1.0	-1.88	-2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=-10V, I_D=-1.9A	-	140	190	mΩ
		V_{GS}=-4.5V, I_D=-1.5A	-	190	210	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-60V, V_{GS}=0V	-	-	-1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Dynamic (Note 7)						
Total Gate Charge	Q_g	V_{DS}=-30V, I_D=-1.9A, V_{GS}=-10V (Note 1,2)	-	8.3	-	nC
Gate-Source Charge	Q_{gs}		-	1.8	-	
Gate-Drain Charge	Q_{gd}		-	1.6	-	
Input Capacitance	Ciss	V_{DS}=-30V, V_{GS}=0V, f=1.0MHZ	-	430	-	pF
Output Capacitance	Coss		-	33	-	
Reverse Transfer Capacitance	Crss		-	29	-	
Turn-On Delay Time	$td_{(on)}$	V_{DD}=-30V, I_D=-1.0A, V_{GS}=-10V, R_G=6Ω (Note 1,2)	-	5.1	-	ns
Turn-On Rise Time	tr		-	20	-	
Turn-Off Delay Time	$td_{(off)}$		-	36	-	
Turn-Off Fall Time	tf		-	11	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	-	-	-1.5	A
Diode Forward Voltage	V_{SD}	I_S=-1.0A, V_{GS}=0V	-	-0.78	-1.0	V

NOTES :

1. Pulse width≤300us, Duty cycle≤2%
2. Essentially independent of operating temperature typical characteristics.
3. The maximum current rating is package limited.
4. Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial TJ =25°C.
5. The test condition is L=1mH, I_{AS}=8A, V_{DD}=25V, V_{GS}=10V
6. $R_{\Theta JA}$ 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.
7. Guaranteed by design, not subject to production testing.

CSM2309S23

TYPICAL CHARACTERISTIC CURVES

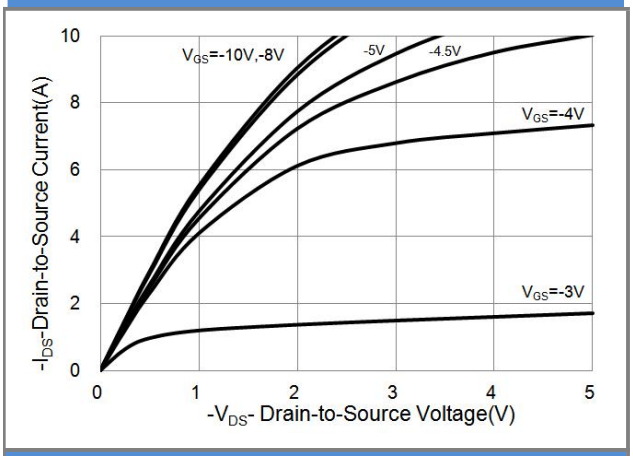


Fig.1 On-Region Characteristics

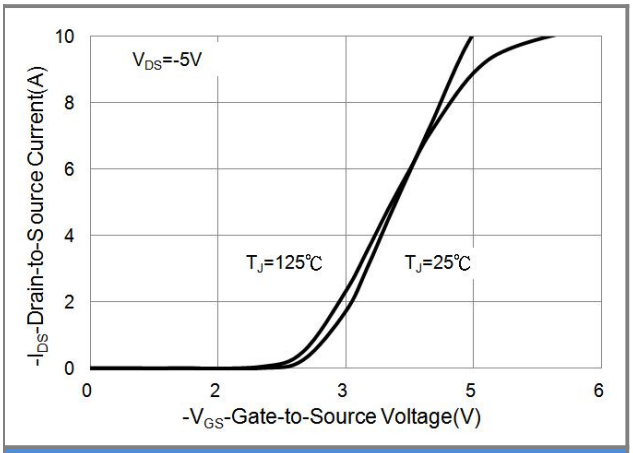


Fig.2 Transfer Characteristics

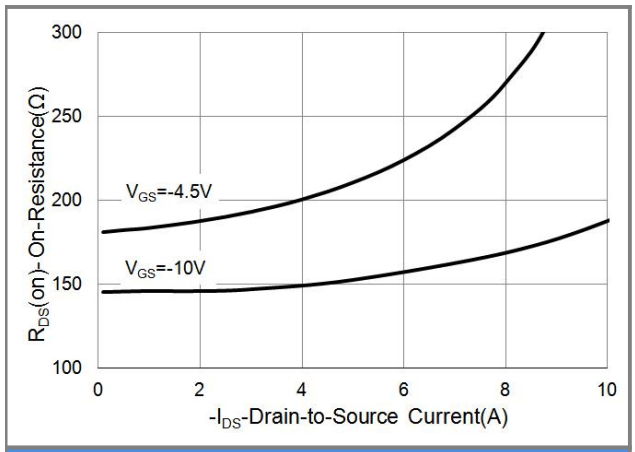


Fig.3 On-Resistance vs. Drain Current

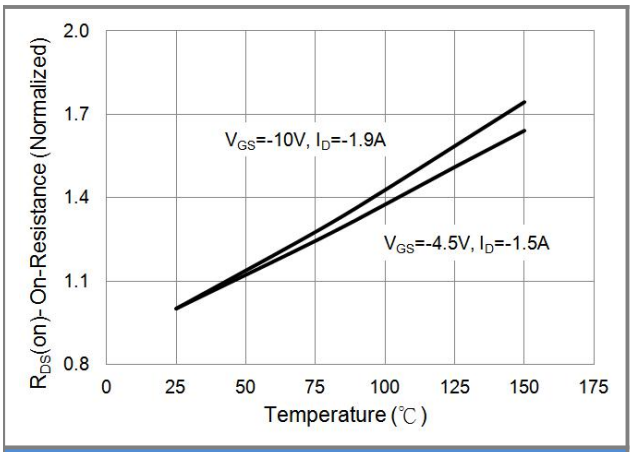


Fig.4 On-Resistance vs. Junction temperature

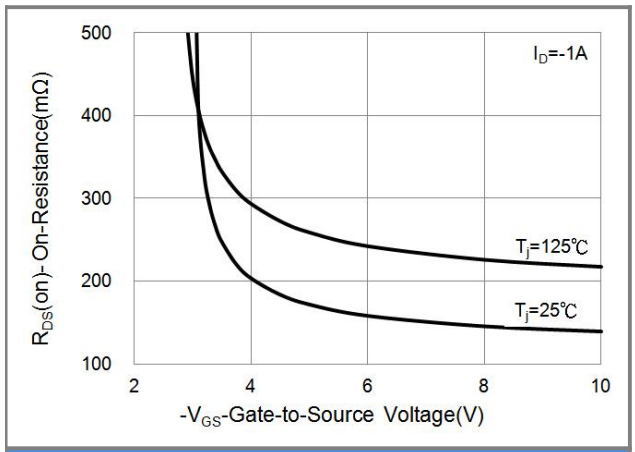


Fig.5 On-Resistance Variation with VGS.

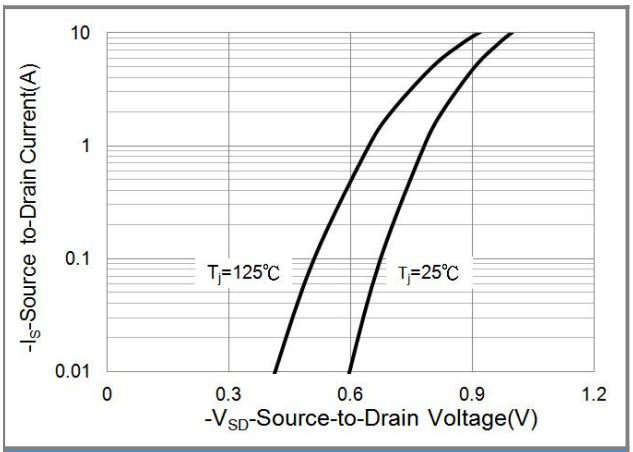


Fig.6 Body Diode Characteristics

TYPICAL CHARACTERISTIC CURVES

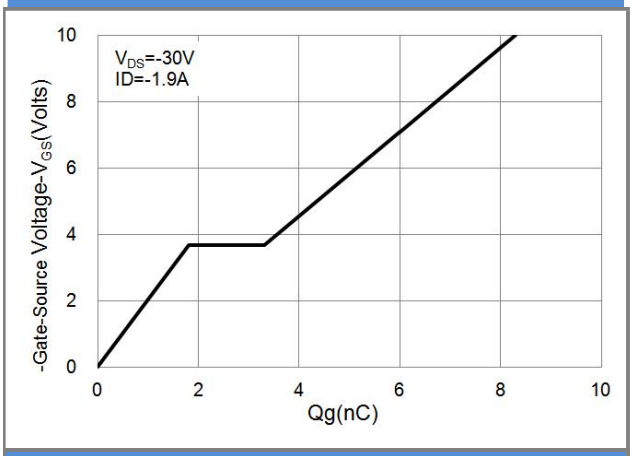


Fig.7 Gate-Charge Characteristics

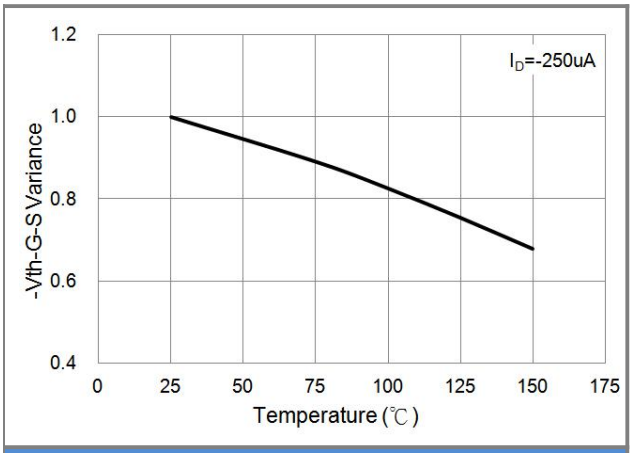


Fig.8 Threshold Voltage Variation with Temperature.

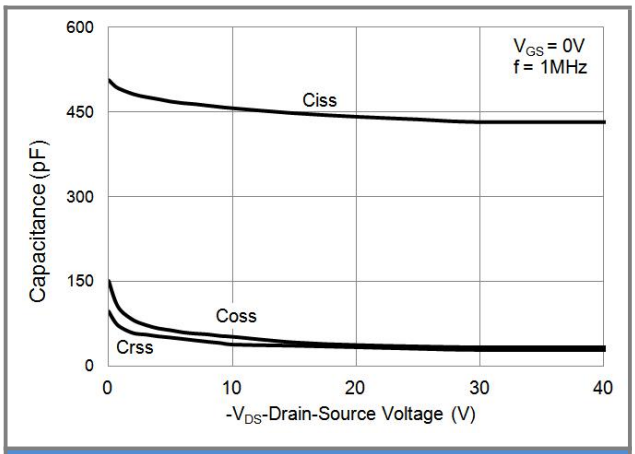


Fig.9 Capacitance vs. Drain-Source Voltage.

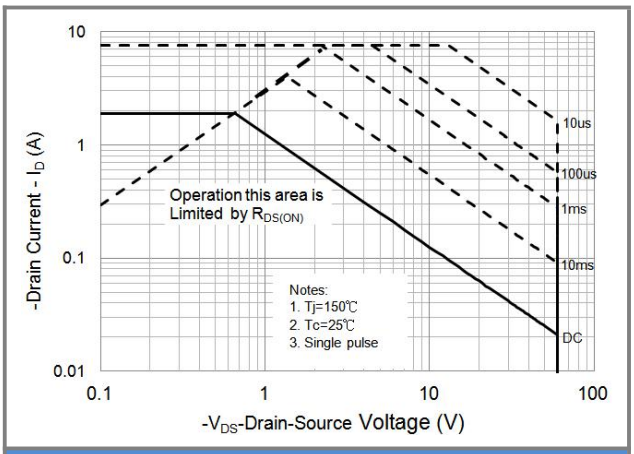


Fig.10 Maximum Safe Operating Area.

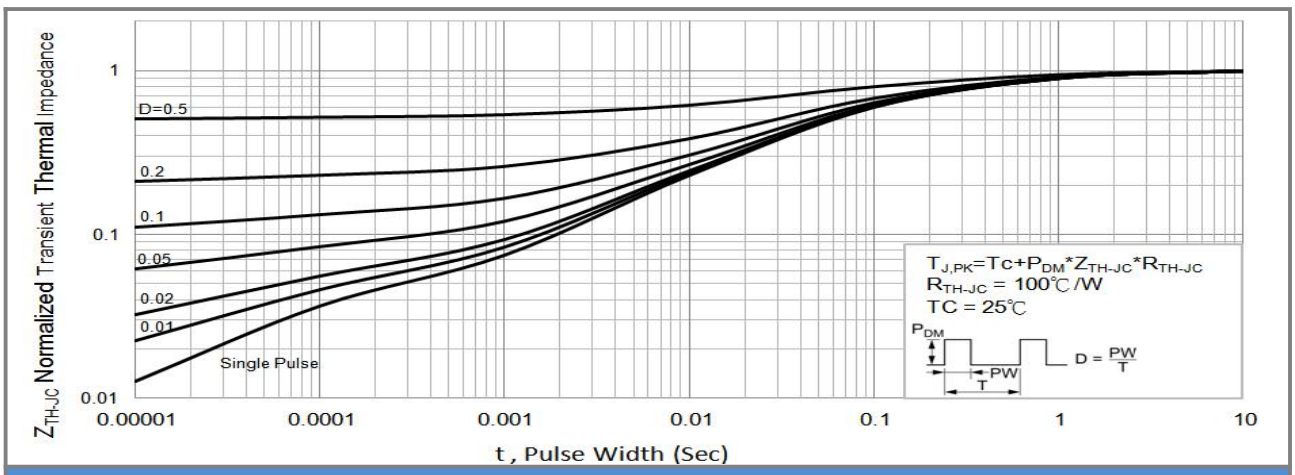
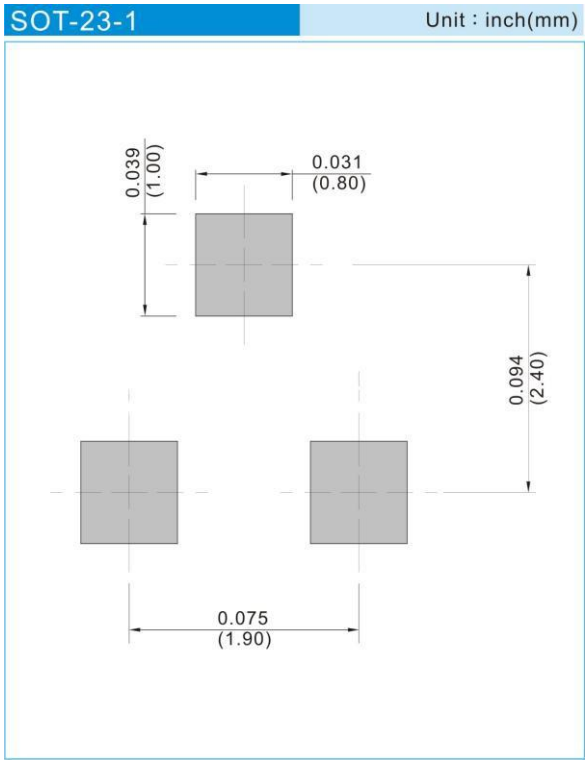


Fig.11 Normalized Transient Thermal Impedance vs. Pulse Width

PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing type
CSM2309S23	SOT-23	3K pcs / 7” reel

MOUNTING PAD LAYOUT



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