

## CSM2306S23

### 30V N-Channel Enhancement Mode MOSFET

**Voltage** 30 V **Current** 4.0A

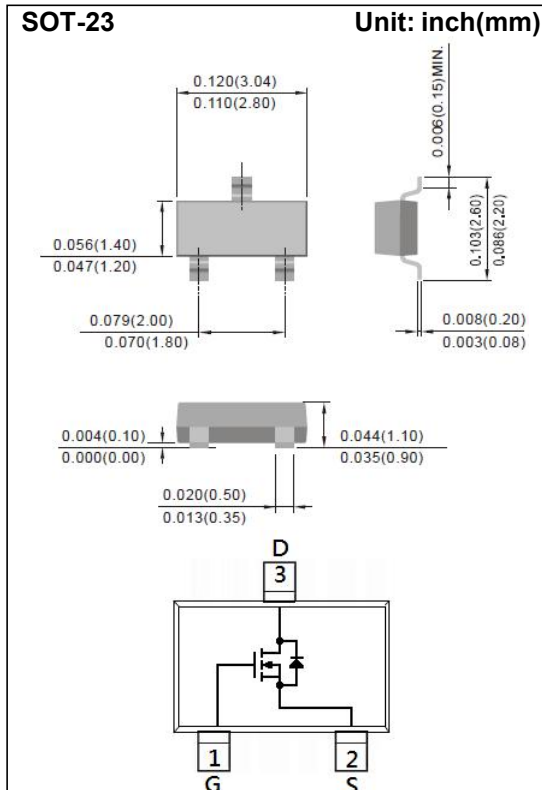
#### Features

- $R_{DS(ON)}$ ,  $V_{GS}@10V$ ,  $I_D@4.0A < 75m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@4.5V$ ,  $I_D@2.8A < 90m\Omega$
- Advanced Trench Process Technology
- High Density Cell Design For Ultra Low On-Resistance
- Very Low Leakage Current In Off Condition
- Specially Designed for Load Switch, PWM

#### Applications

#### 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 ( $T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		$V_{DS}$	30	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	V
Continuous Drain Current		$I_D$	4.0	A
Pulsed Drain Current		$I_{DM}$	17.6	A
Power Dissipation	$T_a=25^\circ\text{C}$	$P_D$	1.25	W
	Derate above $25^\circ\text{C}$		10	mW/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~150	$^\circ\text{C}$
Typical Thermal resistance Junction to Ambient (Note 3)		$R_{\theta JA}$	100	$^\circ\text{C/W}$

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## Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.0	1.37	2.1	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =4.0A	-	55	75	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.8A	-	71	90	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	-	0.01	1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =+20V, V <sub>DS</sub> =0V	-	+10	+100	nA
Dynamic						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15V, I <sub>D</sub> =4.0A, V <sub>GS</sub> =10V (Note 1,2)	-	5.8	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	1	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	1	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1.0MHZ	-	235	-	pF
Output Capacitance	C <sub>oss</sub>		-	36	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	24	-	
Switching						
Turn-On Delay Time	td <sub>(on)</sub>	V <sub>DD</sub> =15V, I <sub>D</sub> =4.0A, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω (Note 1,2)	-	3	-	ns
Turn-On Rise Time	tr		-	39	-	
Turn-Off Delay Time	td <sub>(off)</sub>		-	23	-	
Turn-Off Fall Time	tf		-	28	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>	---	-	-	1.5	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1.0A, V <sub>GS</sub> =0V	-	0.77	1.2	V

### NOTES :

1. Pulse width≤300us, Duty cycle≤2%
2. Essentially independent of operating temperature typical characteristics.
3. R<sub>θJA</sub> 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 FR-4 with 2oz. square pad of copper
4. The maximum current rating is package limited

## CSM2306S23

### TYPICAL CHARACTERISTIC CURVES

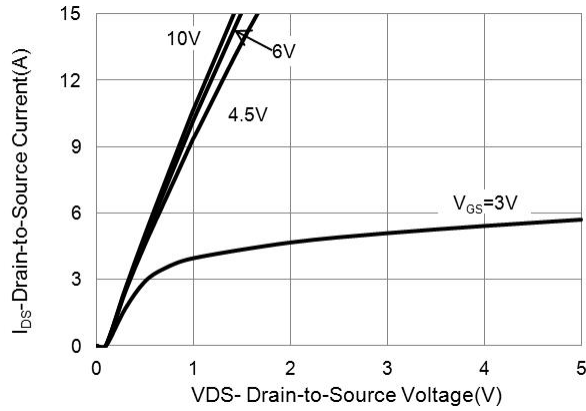


Fig.1 On-Region Characteristics

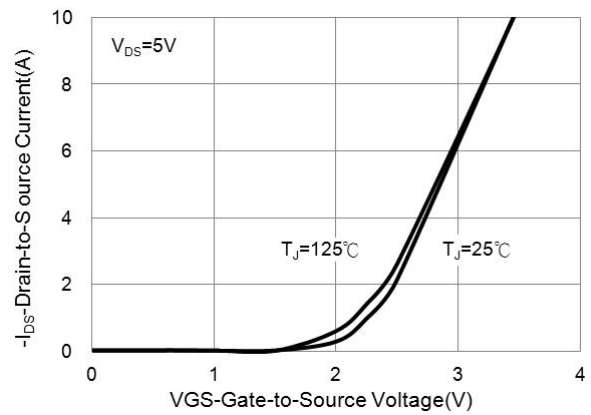


Fig.2 Transfer Characteristics

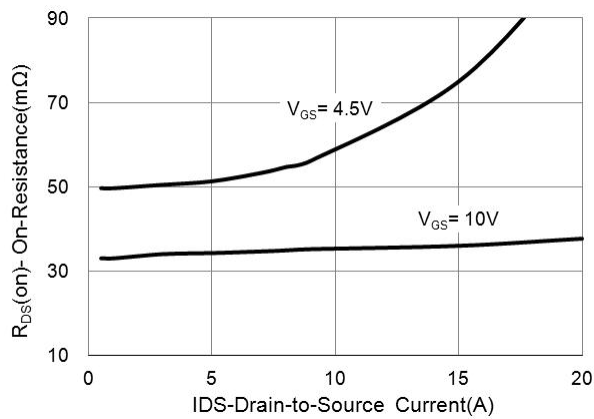


Fig.3 On-Resistance vs. Drain Current

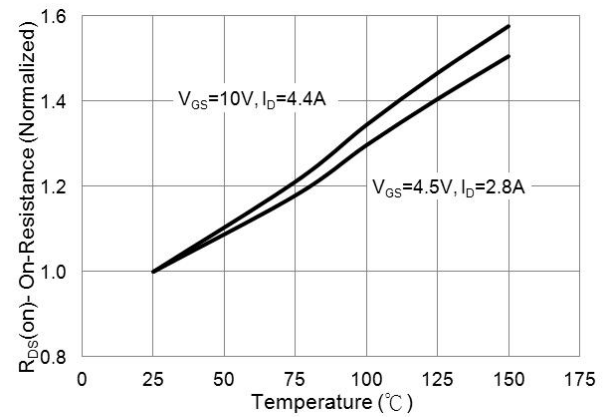


Fig.4 On-Resistance vs. Junction temperature

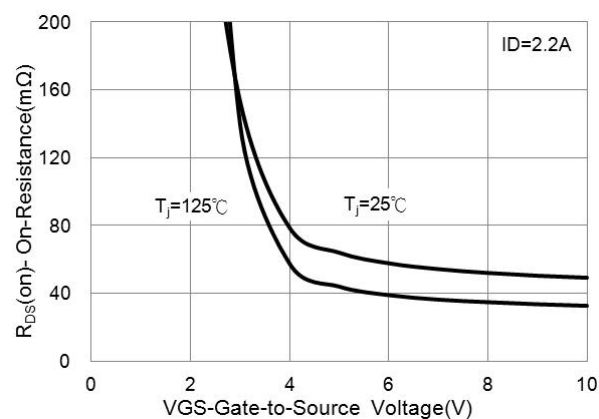


Fig.5 On-Resistance Variation with VGS.

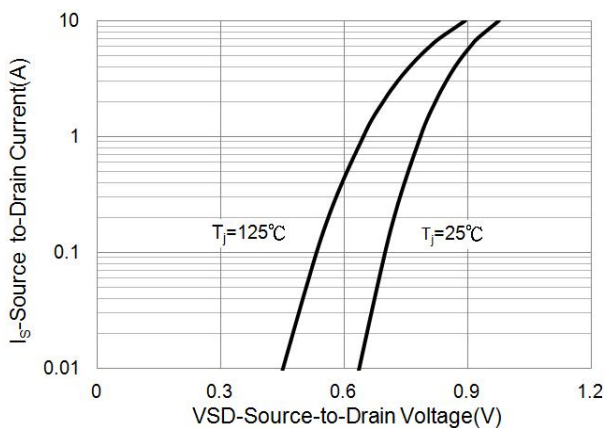


Fig.6 Body Diode Characteristics

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### TYPICAL CHARACTERISTIC CURVES

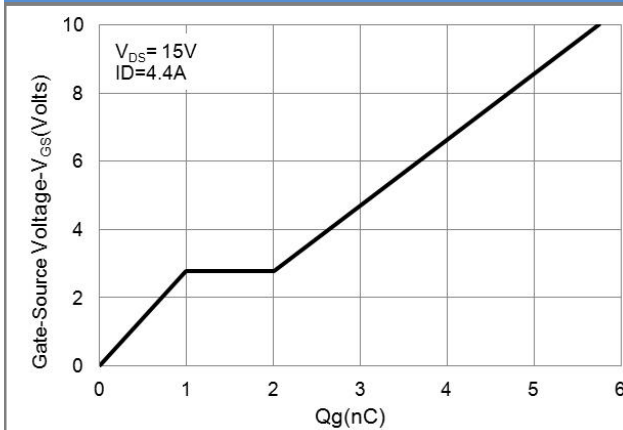


Fig.7 Gate-Charge Characteristics

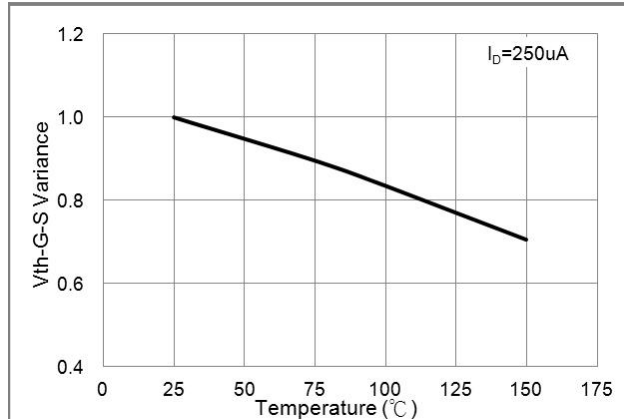


Fig.8 Threshold Voltage Variation with Temperature.

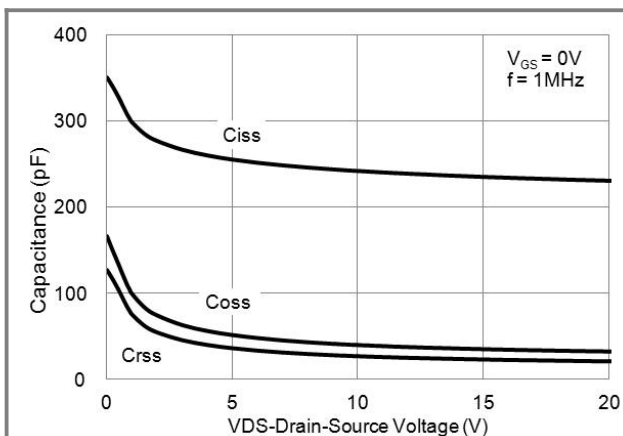


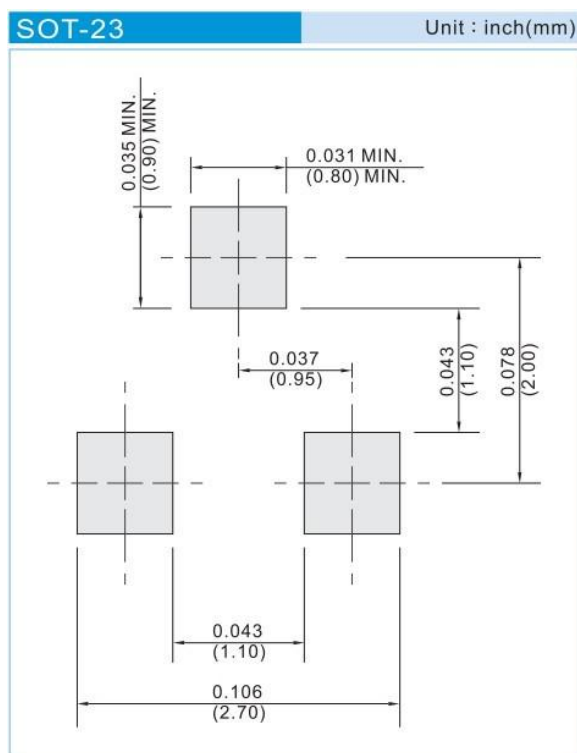
Fig.9 Capacitance vs. Drain-Source Voltage.

## CSM2306S23

### PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing type	Marking	Version
CSM2306S23	SOT-23	3K pcs / 7" reel		Halogen free

### MOUNTING PAD LAYOUT



## **CSM2306S23**

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