

## CSM620P2S23

### 60V P-Channel Enhancement Mode MOSFET

**Voltage**

**-60 V**

**Current**

**-2A**

#### Features

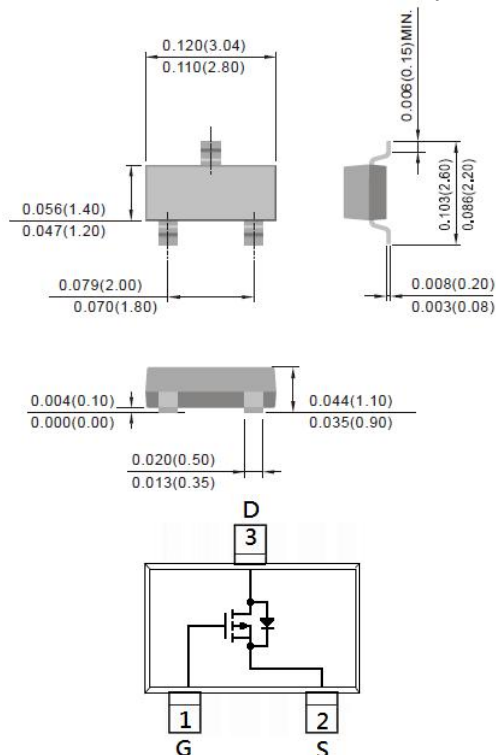
- $R_{DS(ON)}$ ,  $V_{GS}@-10V$ ,  $I_D@-1.9A < 190m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@-4.5V$ ,  $I_D@-1.5A < 210m\Omega$
- Advanced Trench Process Technology
- Specially Designed for Switch Load, PWM Application, etc

#### Mechanical Data

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

**SOT-23**

**Unit : inch(mm)**



### Maximum Ratings and Thermal Characteristics ( $T_A=25^{\circ}C$ unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V <sub>DS</sub>	-60	V
Gate-Source Voltage		V <sub>GS</sub>	±20	V
Continuous Drain Current	T <sub>A</sub> =25°C	I <sub>D</sub>	-2	A
Pulsed Drain Current (Note 1)		I <sub>DM</sub>	-8	A
Power Dissipation	T <sub>A</sub> =25°C	P <sub>D</sub>	1.25	W
Single Pulse Avalanche Energy (Note 5)		E <sub>AS</sub>	32	mJ
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55~150	°C
Typical Thermal resistance		R <sub>θJA</sub>	100	°C/W
- Junction to Ambient (Note 6)				

## CSM620P2S23

### 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	-60	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1.0	-1.88	-2.5	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-1.9A	-	140	190	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-1.5A	-	190	210	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V	-	-	-1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
Dynamic (Note 7)						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-30V, I <sub>D</sub> =-1.9A, V <sub>GS</sub> =-10V (Note 1,2)	-	8.3	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	1.8	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	1.6	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, f=1.0MHZ	-	430	-	pF
Output Capacitance	C <sub>oss</sub>		-	33	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	29	-	
Turn-On Delay Time	td <sub>(on)</sub>	V <sub>DD</sub> =-30V, I <sub>D</sub> =-1.0A, V <sub>GS</sub> =-10V, R <sub>G</sub> =6Ω (Note 1,2)	-	5.1	-	ns
Turn-On Rise Time	tr		-	20	-	
Turn-Off Delay Time	td <sub>(off)</sub>		-	36	-	
Turn-Off Fall Time	tf		-	11	-	
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	-	-0.78	-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 T<sub>J</sub>(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial T<sub>J</sub> =25°C.
5. The test condition is L=1mH, I<sub>AS</sub>=8A, V<sub>DD</sub>=25V, V<sub>GS</sub>=10V
6. 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<sup>2</sup> with 2oz.square pad of copper.
7. Guaranteed by design, not subject to production testing.

## CSM620P2S23

### TYPICAL CHARACTERISTIC CURVES

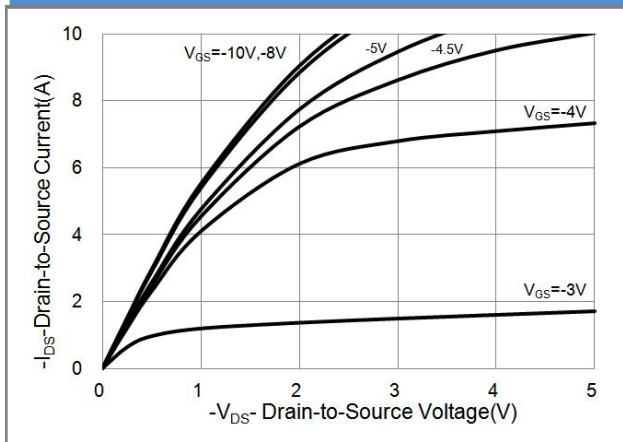


Fig.1 On-Region Characteristics

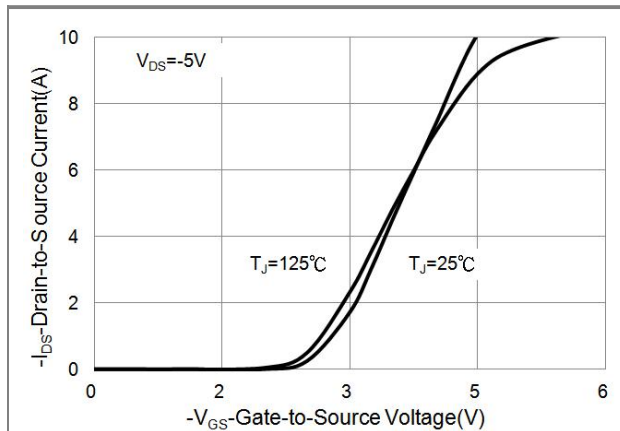


Fig.2 Transfer Characteristics

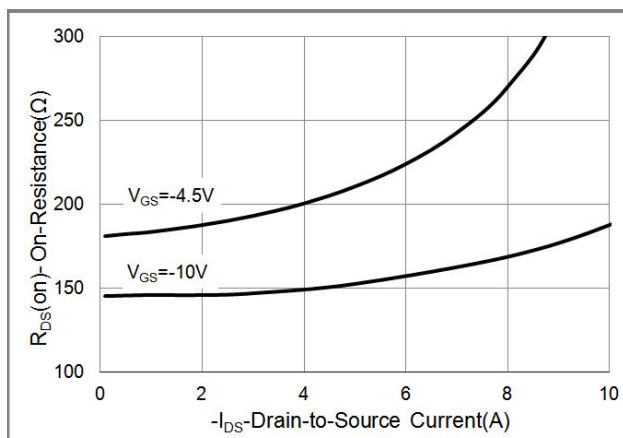


Fig.3 On-Resistance vs. Drain Current

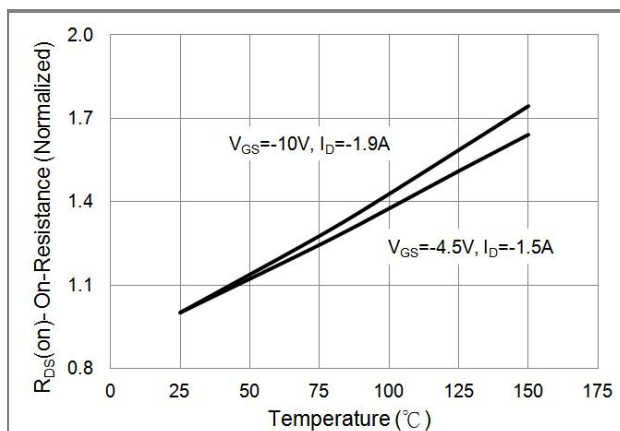


Fig.4 On-Resistance vs. Junction temperature

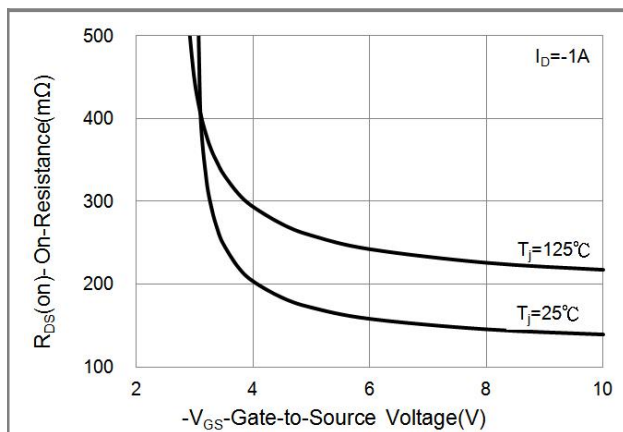


Fig.5 On-Resistance Variation with VGS.

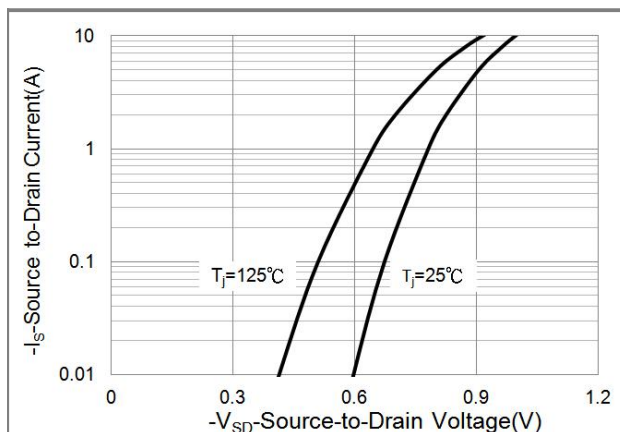


Fig.6 Body Diode Characteristics

## CSM620P2S23

### TYPICAL CHARACTERISTIC CURVES

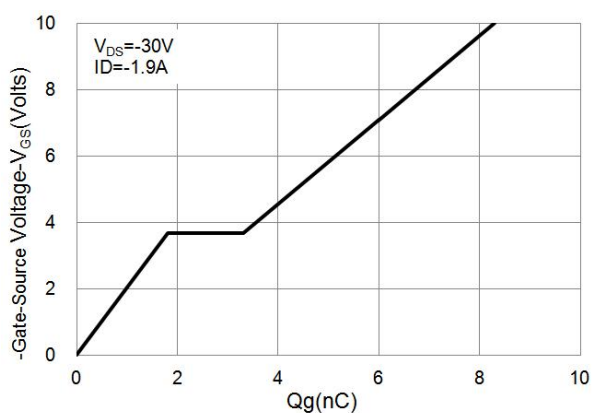


Fig.7 Gate-Charge Characteristics

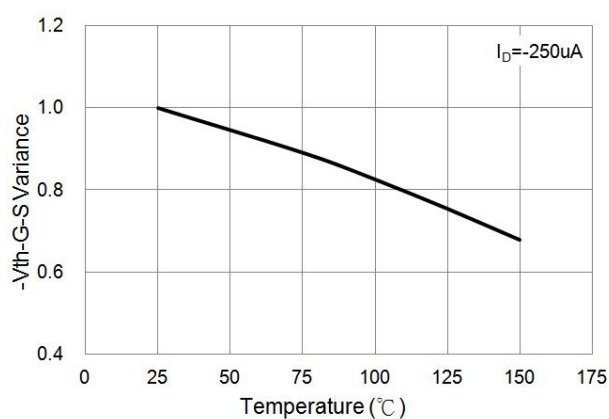


Fig.8 Threshold Voltage Variation with Temperature.

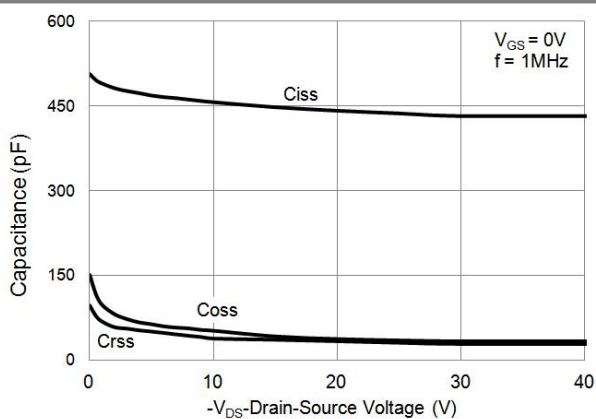


Fig.9 Capacitance vs. Drain-Source Voltage.

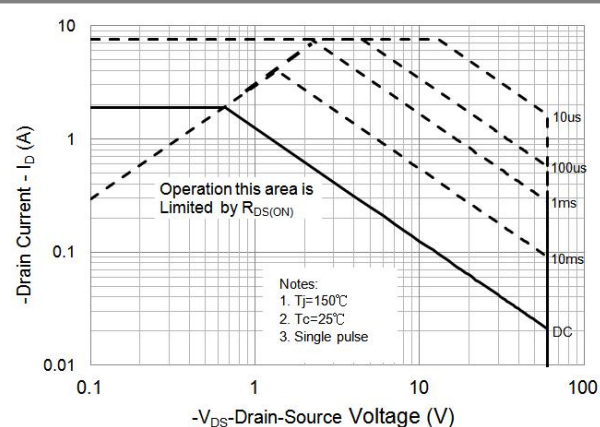


Fig.10 Maximum Safe Operating Area.

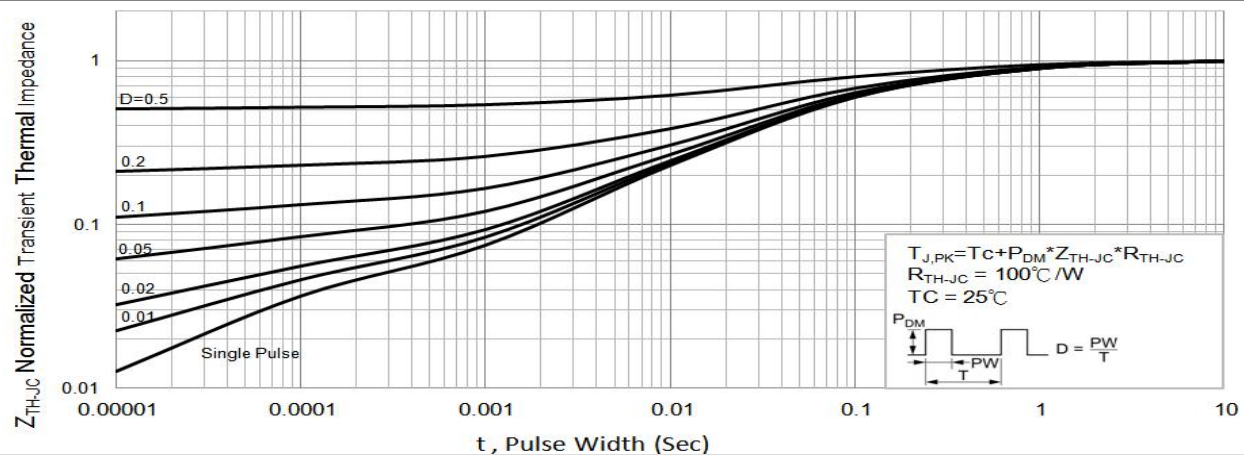


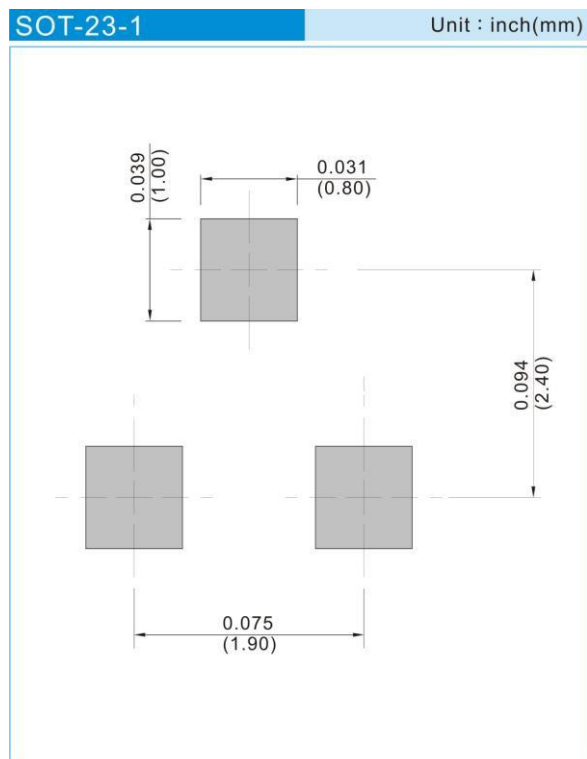
Fig.11 Normalized Transient Thermal Impedance vs. Pulse Width

## CSM620P2S23

### PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing type
CSM620P2S23	SOT-23	3K pcs / 7" reel

### MOUNTING PAD LAYOUT



## **CSM620P2S23**

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