

CSM2312S23

20V N-Channel Enhancement Mode MOSFET

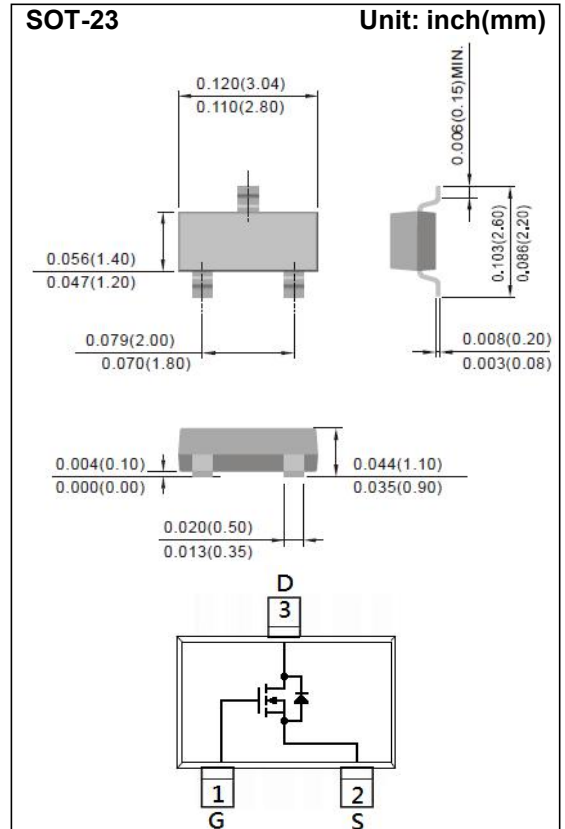
Voltage 20 V **Current** 6.0A

Features

- $R_{DS(ON)}$, $V_{GS}@4.5V$, $I_D@6.0A < 25m\Omega$
- $R_{DS(ON)}$, $V_{GS}@2.5V$, $I_D@4.8A < 36m\Omega$
- $R_{DS(ON)}$, $V_{GS}@1.8V$, $I_D@3.5A < 45m\Omega$
- 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



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

PARAMETER	SYMBOL	LIMIT	UNITS
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	
Continuous Drain Current	I_D	6.0	A
Pulsed Drain Current	I_{DM}	16.4	
Power Dissipation	$T_a=25^\circ C$	1.25	W
	Derate above 25°C	10	mW/°C
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~150	°C
Typical Thermal Resistance Junction to Ambient (Note 3)	$R_{\theta JA}$	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	20	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	0.4	0.66	1.2	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =6.0A	-	21	25	mΩ
		V _{GS} =2.5V, I _D =4.8A	-	30	36	
		V _{GS} =1.8V, I _D =3.5A	-	36	45	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V	-	-	1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
Dynamic (Note 5)						
Total Gate Charge	Q _g	V _{DS} =10V, I _D =6.0A, V _{GS} =4.5V (Note 1,2)	-	4.6	-	nC
Gate-Source Charge	Q _{gs}		-	0.8	-	
Gate-Drain Charge	Q _{gd}		-	1	-	
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHZ	-	350	-	pF
Output Capacitance	C _{oss}		-	40	-	
Reverse Transfer Capacitance	C _{rss}		-	29	-	
Turn-On Delay Time	t _{d(on)}	V _{DD} =10V, I _D =6.0A, V _{GS} =4.5V, R _G =6Ω (Note 1,2)	-	4	-	ns
Turn-On Rise Time	t _r		-	47	-	
Turn-Off Delay Time	t _{d(off)}		-	18	-	
Turn-Off Fall Time	t _f		-	10	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I _S	---	-	-	1.5	A
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =0V	-	0.75	1.2	V

NOTES :

1. Pulse width ≤ 300us, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature typical characteristics.
3. R_{θJA} 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.
5. Guaranteed by design, not subject to production testing.

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TYPICAL CHARACTERISTIC CURVES

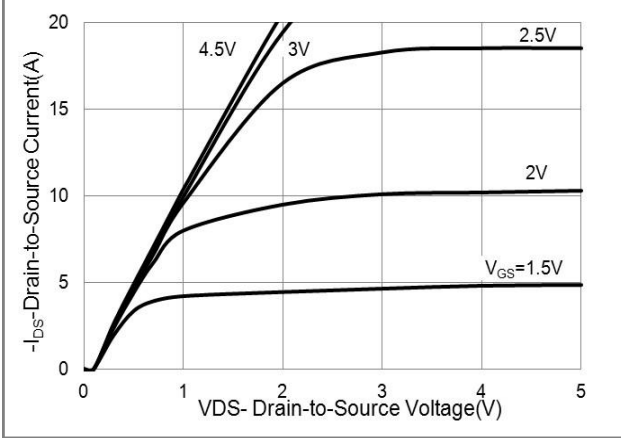


Fig.1 On-Region Characteristics

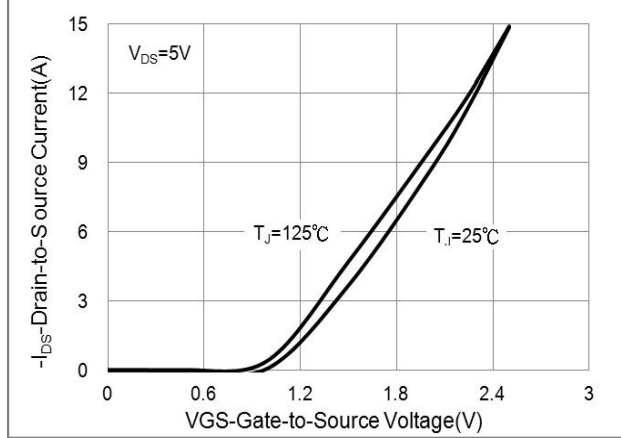


Fig.2 Transfer Characteristics

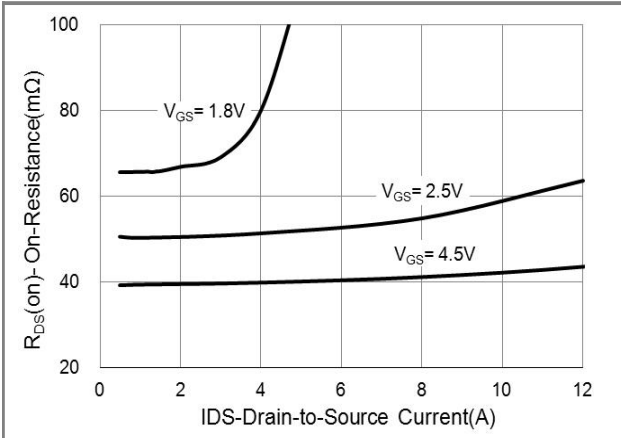


Fig.3 On-Resistance vs. Drain Current

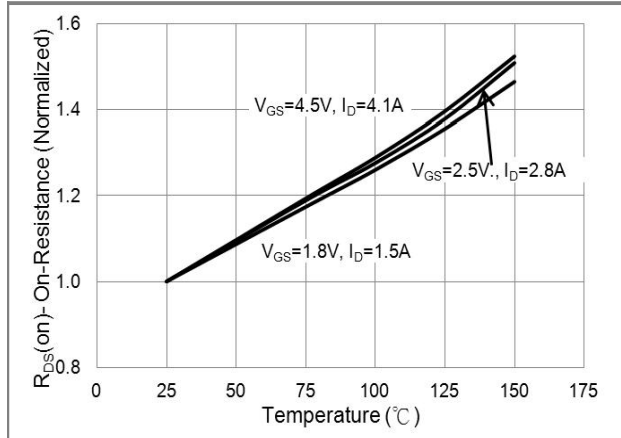


Fig.4 On-Resistance vs. Junction temperature

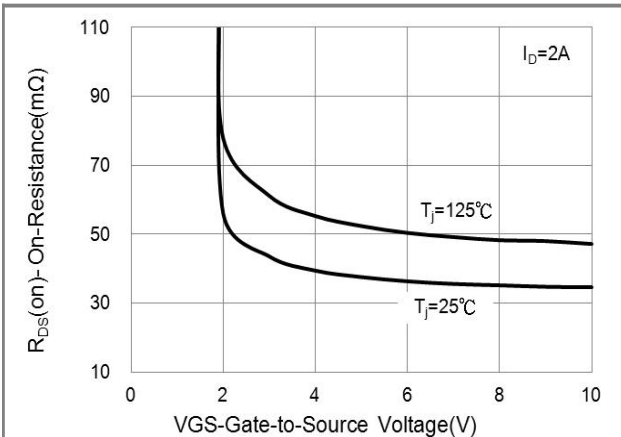


Fig.5 On-Resistance Variation with V_{GS}

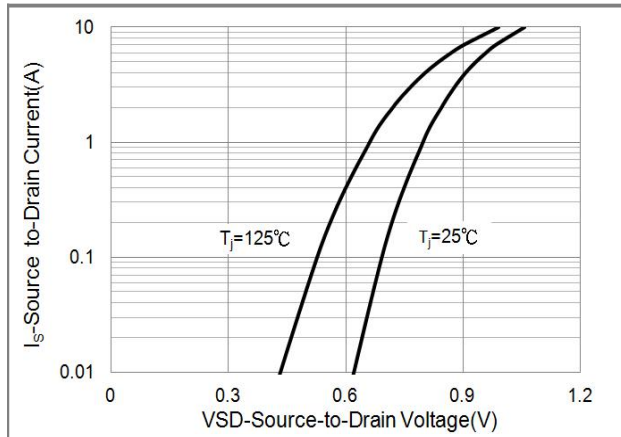


Fig.6 Body Diode Characteristics

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TYPICAL CHARACTERISTIC CURVES

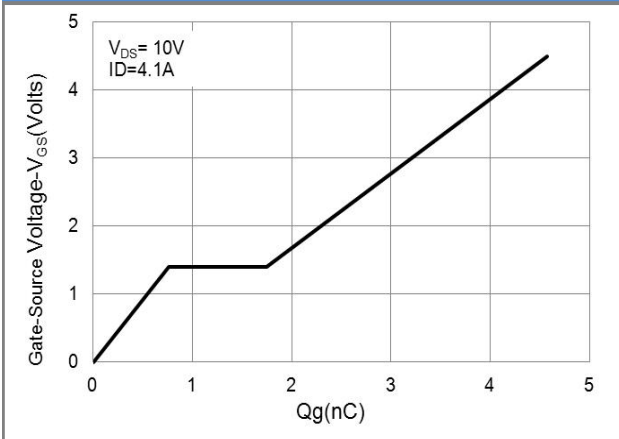


Fig.7 Gate-Charge Characteristics

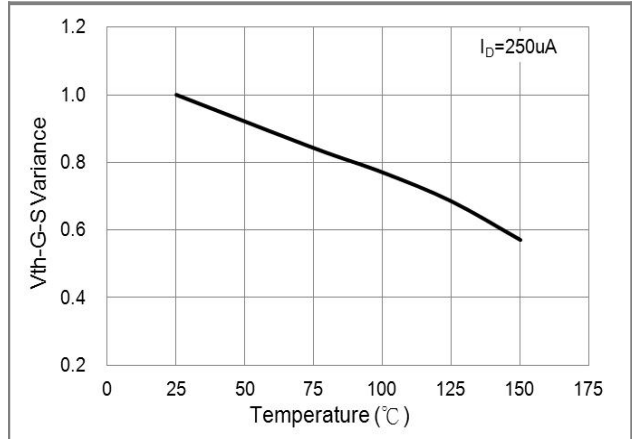


Fig.8 Threshold Voltage Variation with Temperature

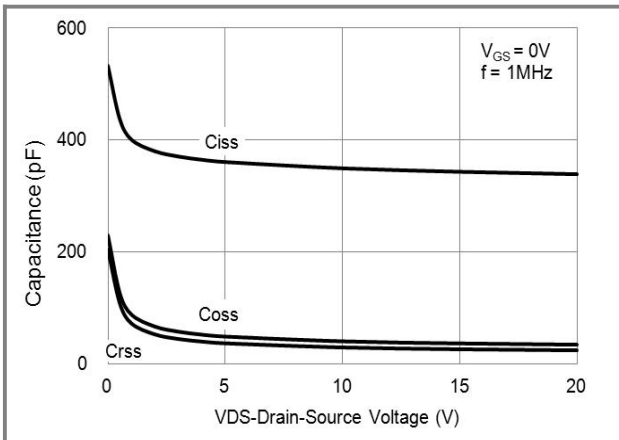


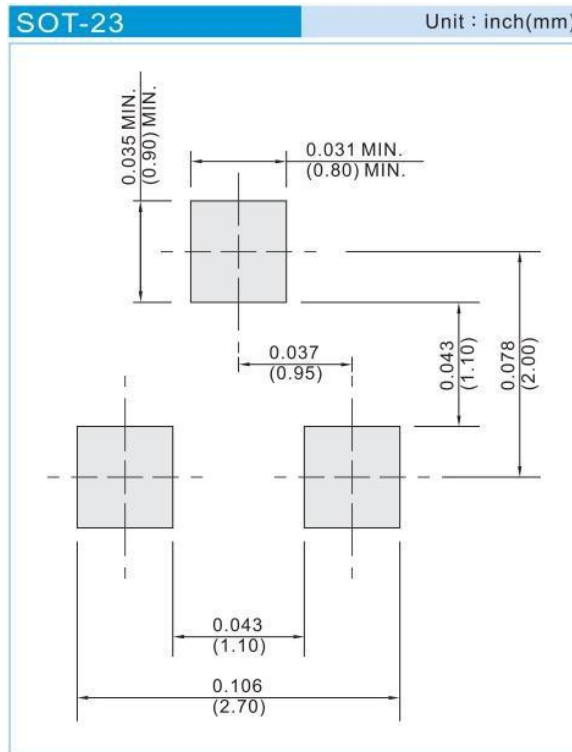
Fig.9 Capacitance vs. Drain-Source Voltage

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Part No Packing Code Version

Part No Packing Code	Package Type	Packing Type
CSM2312S23	SOT-23	3K pcs / 7" reel

Mounting Pad Layout



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