

CSM212P4S23E

20V P-Channel Enhancement Mode MOSFET– ESD Protected

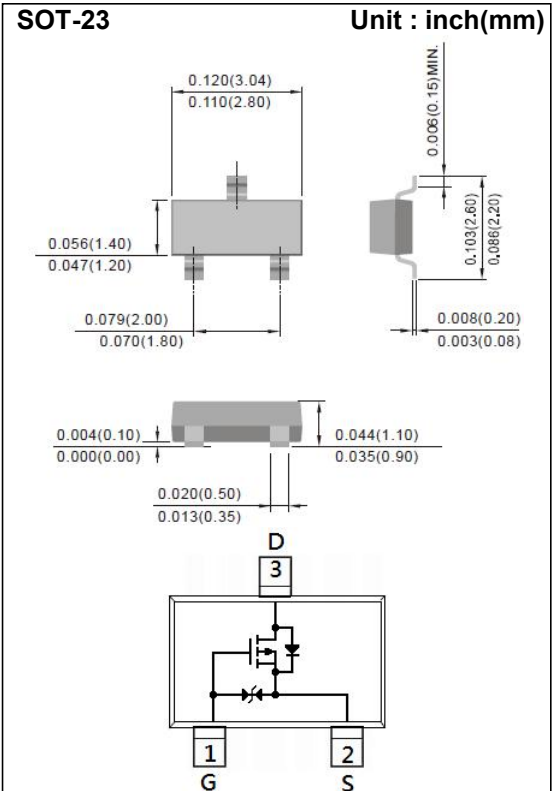
Voltage **-20 V** **Current** **-4.0A**

Features

- $R_{DS(ON)}$, $V_{GS}@-4.5V$, $I_D@-4.0A < 55m\Omega$
- $R_{DS(ON)}$, $V_{GS}@-2.5V$, $I_D@-2.8A < 70m\Omega$
- $R_{DS(ON)}$, $V_{GS}@-1.8V$, $I_D@-2.1A < 95m\Omega$
- Advanced Trench Process Technology

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	V
Continuous Drain Current		I _D	-4.0	A
Pulsed Drain Current		I _{DM}	-16	A
Power Dissipation	T _a =25°C	P _D	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		R _{θJA}	100	°C/W
- Junction to Ambient ^(Note 3)				

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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	-0.62	-1.2	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =-4.5V, I _D =-4.0A	-	50	55	mΩ
		V _{GS} =-2.5V, I _D =-2.8A	-	59	70	
		V _{GS} =-1.8V, I _D =-2.1A	-	74	95	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V	-	-0.01	-1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V	-	±10	±100	nA
Dynamic						
Total Gate Charge	Q _g	V _{DS} =-10V, I _D =-4.0A, V _{GS} =-4.5V (Note 1,2)	-	18	-	nC
Gate-Source Charge	Q _{gs}		-	2	-	
Gate-Drain Charge	Q _{gd}		-	7	-	
Input Capacitance	C _{iss}	V _{DS} =-10V, V _{GS} =0V, f=1.0MHZ	-	756	-	pF
Output Capacitance	C _{oss}		-	75	-	
Reverse Transfer Capacitance	C _{rss}		-	58	-	
Switching						
Turn-On Delay Time	t _{d(on)}	V _{DD} =-10V, I _D =-4.0A, V _{GS} =-4.5V, R _G =6Ω (Note 1,2)	-	5	-	ns
Turn-On Rise Time	t _r		-	61	-	
Turn-Off Delay Time	t _{d(off)}		-	70	-	
Turn-Off Fall Time	t _f		-	137	-	
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	-	0.76	-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

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TYPICAL CHARACTERISTIC CURVES

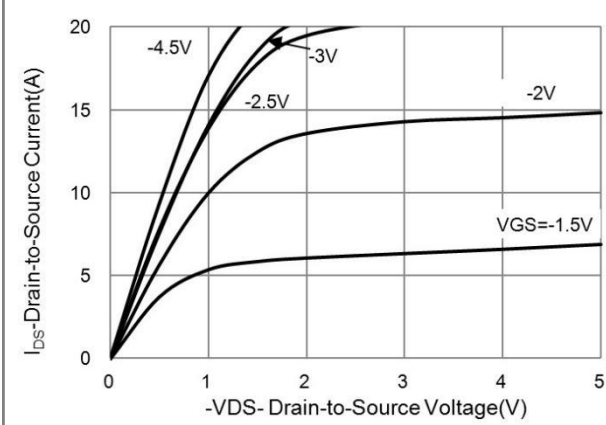


Fig.1 On-Region Characteristics

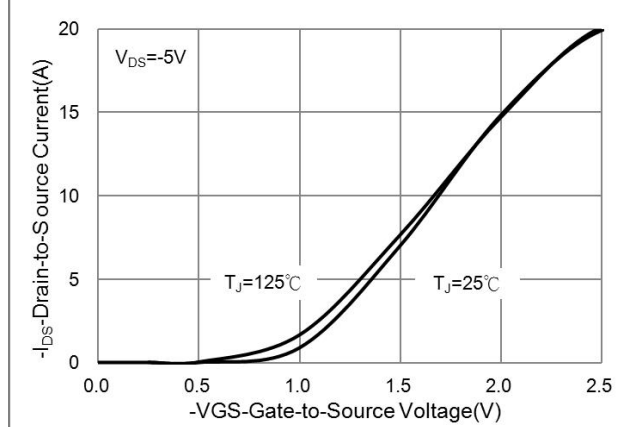


Fig.2 Transfer Characteristics

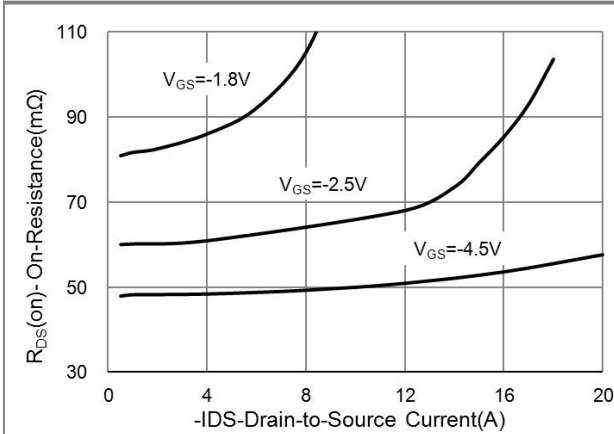


Fig.3 On-Resistance vs. Drain Current

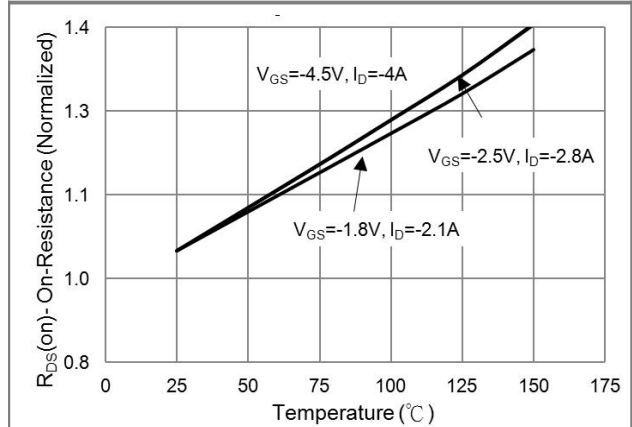


Fig.4 On-Resistance vs. Junction temperature

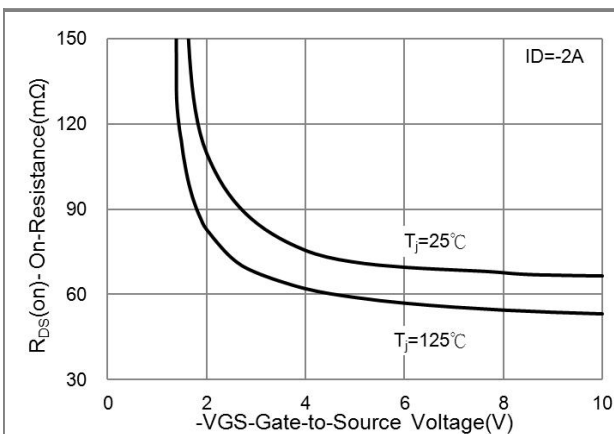


Fig.5 On-Resistance Variation with VGS.

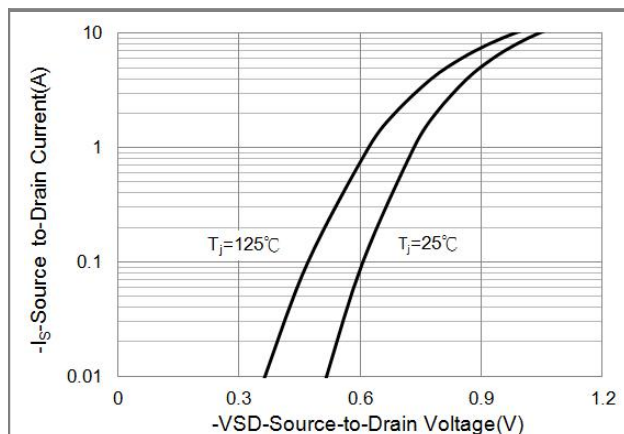


Fig.6 Body Diode Characteristics

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TYPICAL CHARACTERISTIC CURVES

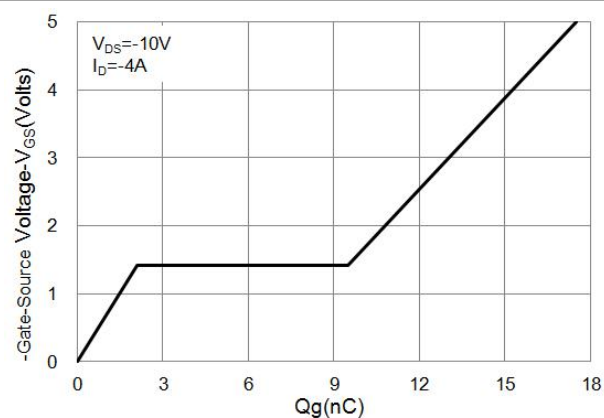


Fig.7 Gate-Charge Characteristics

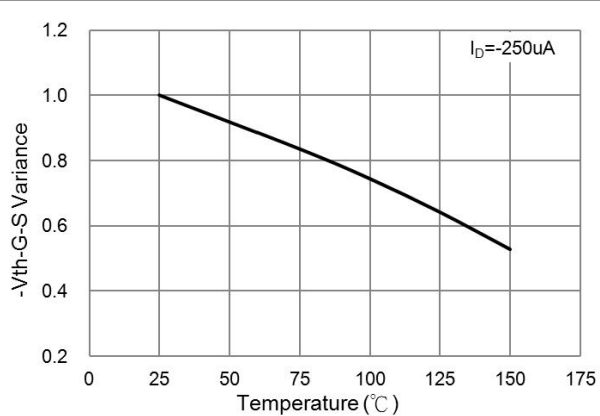


Fig.8 Threshold Voltage Variation with Temperature.

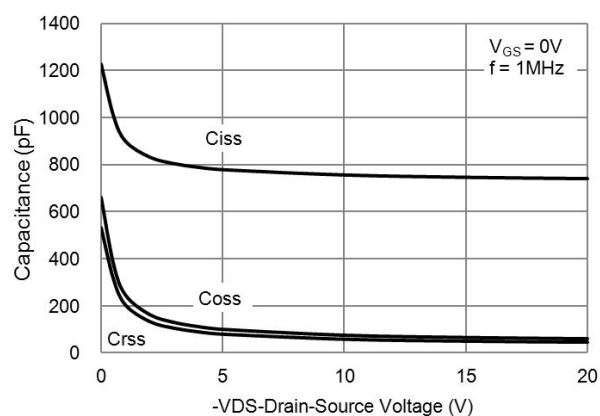


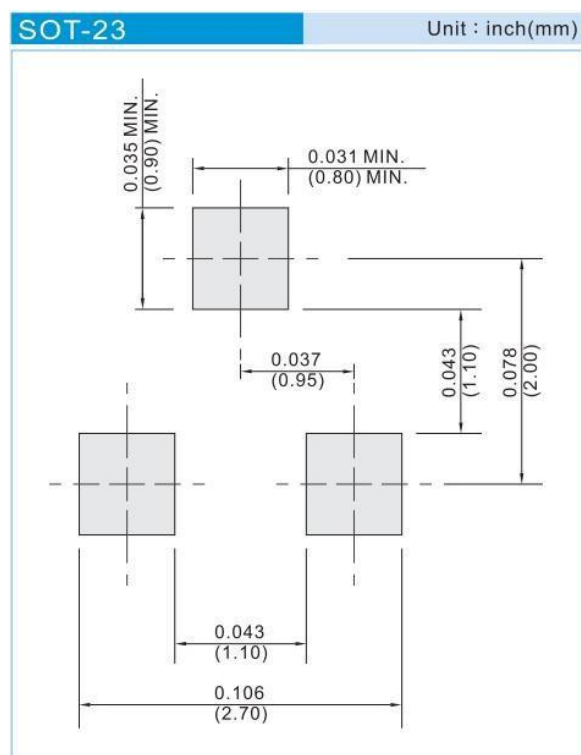
Fig.9 Capacitance vs. Drain-Source Voltage.

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PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing type
CSM212P4S23E	SOT-23	3K pcs / 7" reel

MOUNTING PAD LAYOUT



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