

# CSM4406SOP8

## 30V N-Channel Enhancement Mode MOSFET

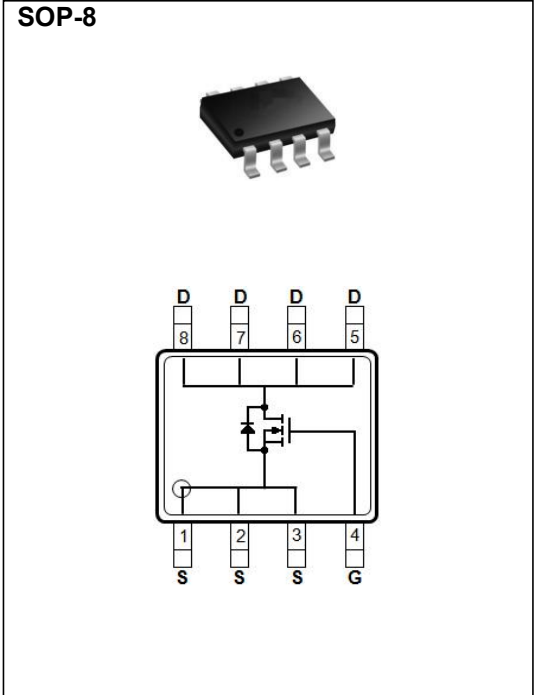
Voltage	30 V	Current	12 A
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### Features

- $R_{DS(ON)}$ ,  $V_{GS}@10V$ ,  $I_D@6A < 10m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@4.5V$ ,  $I_D@3A < 13m\Omega$
- High switching speed
- Improved dv/dt capability
- Low Gate Charge
- Low reverse transfer capacitance

### Mechanical Data

- Case : SOP-8 package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.0029 ounces, 0.083 grams



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

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		$V_{DS}$	30	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	
Continuous Drain Current (Note 4)	$T_A=25^\circ C$	$I_D$	12	A
	$T_A=70^\circ C$		10	
Pulsed Drain Current (Note 1)		$I_{DM}$	50	
Power Dissipation	$T_A=25^\circ C$	$P_D$	2.1	W
	$T_A=70^\circ C$		1.3	
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~150	$^\circ C$
Typical Thermal Resistance Junction to Ambient (Note 4,5)		$R_{\theta JA}$	59.5	$^\circ C/W$

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>Static</b>						
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	1.6	2.5	
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =6A	-	7.5	10	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A	-	11	13	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, 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
<b>Dynamic</b> (Note 6)						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15V, I <sub>D</sub> =12A, V <sub>GS</sub> =4.5V (Note 2,3)	-	6.9	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	2.7	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	1.8	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHZ	-	781	-	pF
Output Capacitance	C <sub>oss</sub>		-	158	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	92	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =15V, I <sub>D</sub> =12A, V <sub>GS</sub> =10V, R <sub>G</sub> =3.3Ω (Note 2,3)	-	5.4	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	86	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	20	-	
Turn-Off Fall Time	t <sub>f</sub>		-	10	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>	---	-	-	10	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V	-	0.7	1	V

NOTES :

1. Pulse width ≤ 300us, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub>=150°C. Ratings are based on low frequency and duty cycles to keep initial T<sub>J</sub>=25°C.
4. The maximum current rating is package limited.
5. 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.
6. Guaranteed by design, not subject to production testing.

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## TYPICAL CHARACTERISTIC CURVES

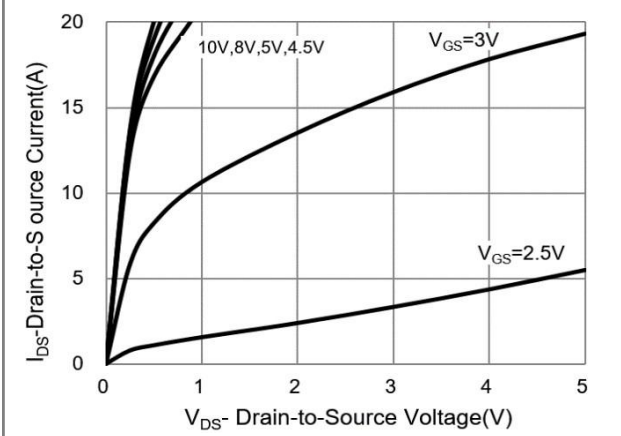


Fig.1 On-Region Characteristics

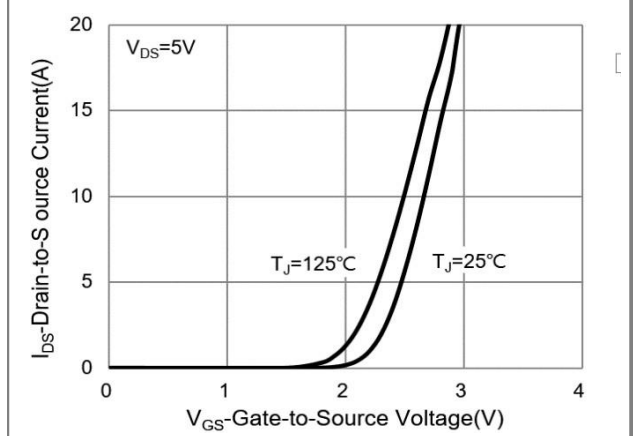


Fig.2 Transfer Characteristics

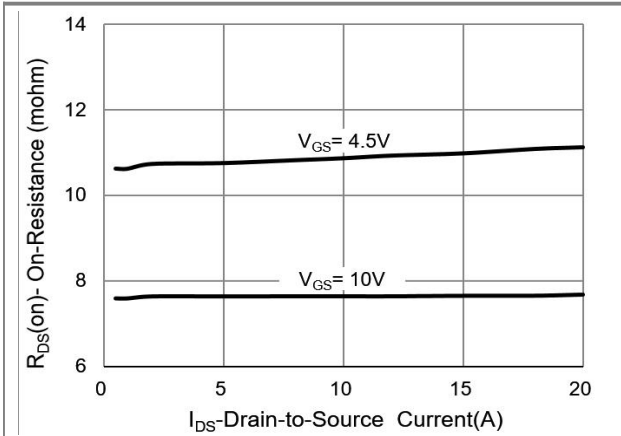


Fig.3 On-Resistance vs. Drain Current

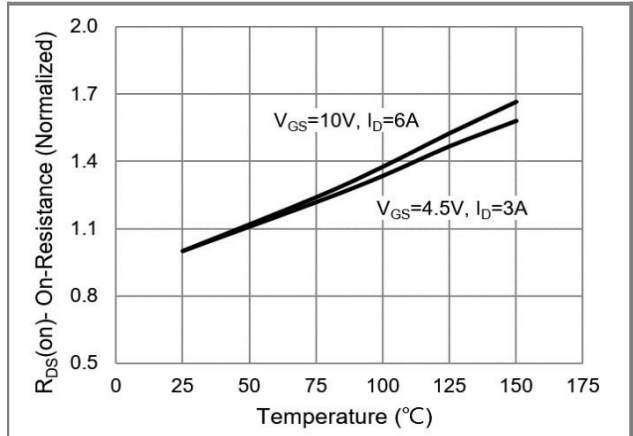


Fig.4 On-Resistance vs. Junction temperature

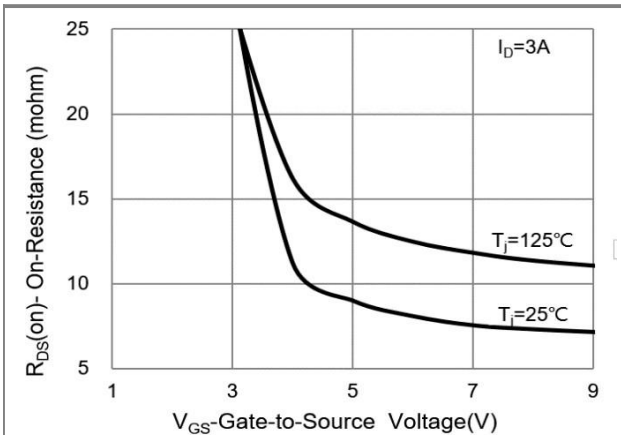


Fig.5 On-Resistance Variation with  $V_{GS}$

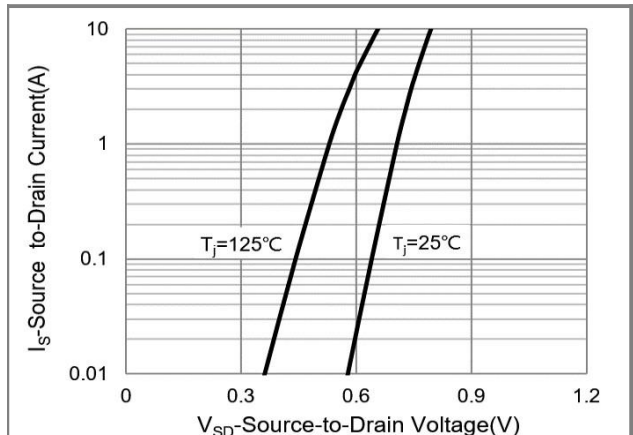


Fig.6 Body Diode Characteristics

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## TYPICAL CHARACTERISTIC CURVES

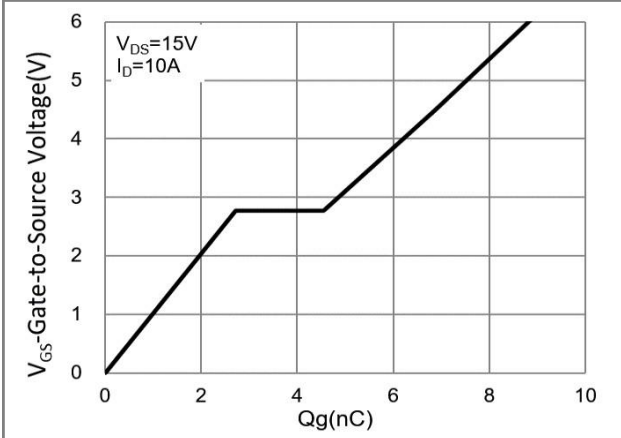


Fig.7 Gate-Charge Characteristics

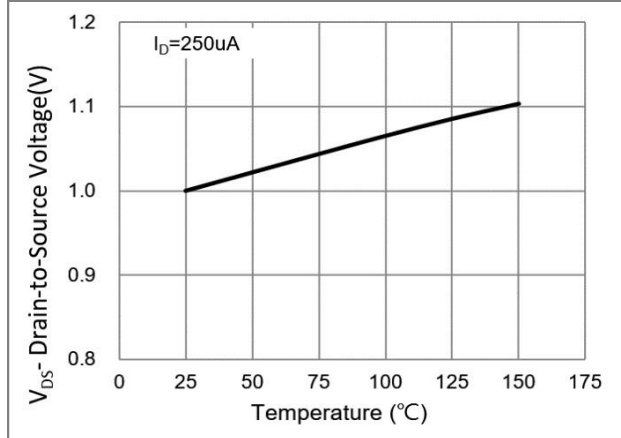


Fig.8 Breakdown Voltage Variation vs. Temperature

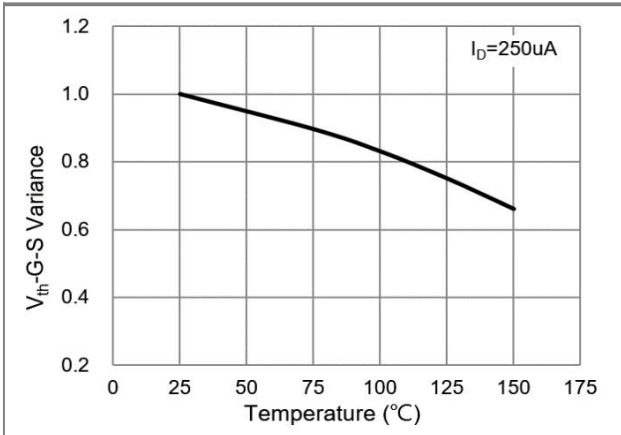


Fig.9 Threshold Voltage Variation with Temperature

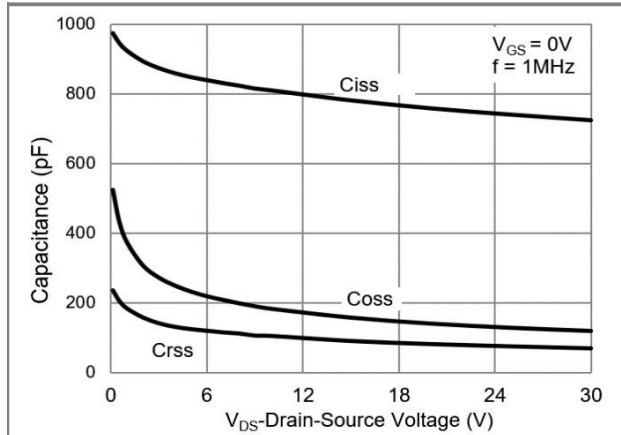


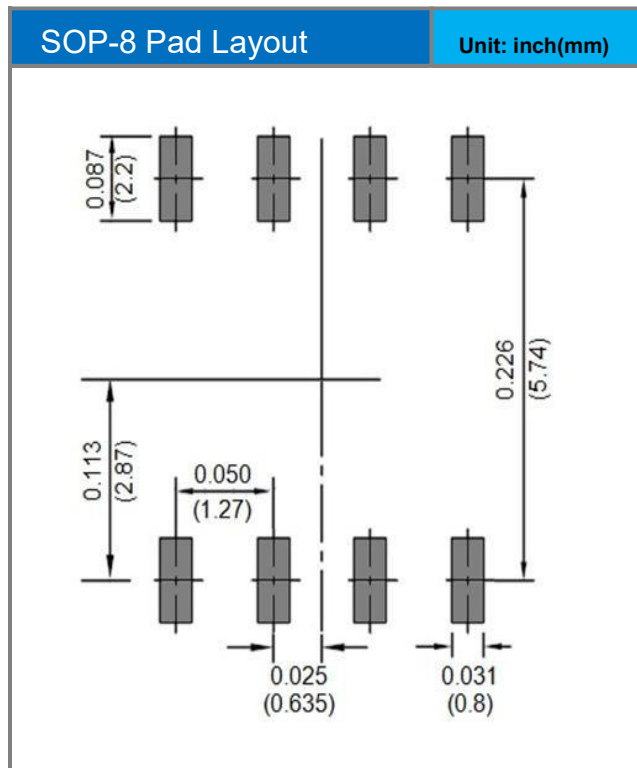
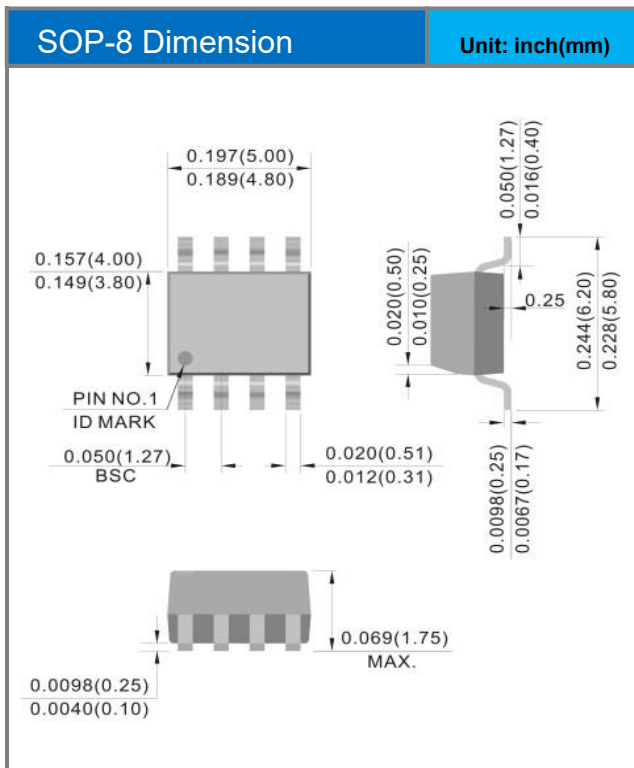
Fig.10 Capacitance vs. Drain-Source Voltage

# CSM4406SOP8

Part No Packing Code Version

Part No Packing Code	Package Type	Packing Type
CSM4406SOP8	SOP-8	3K / reel

## Packaging Information & Mounting Pad Layout



## **CSM4406SOP8**

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