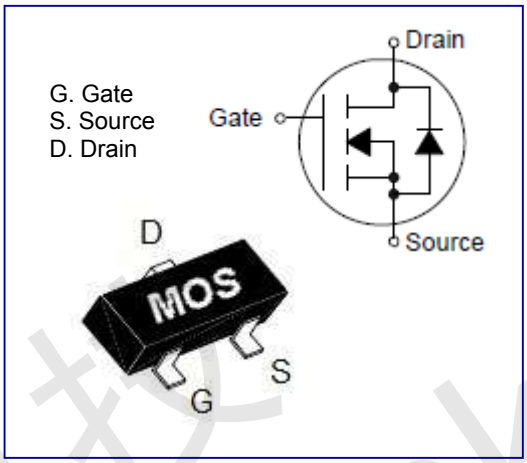
CST2300X

20V* N-Channel Enhancement-Mode MOSFET

General Description

- I_D=3.2.A
- $R_{DS(on)}$=48mΩ(Typ.)@V_{GS}=4.5V
- $R_{DS(on)}$=65mΩ(Typ.)@V_{GS}=2.5V
- $R_{DS(on)}$=90mΩ(Typ.)@V_{GS}=1.8V
- *Low Gate charge*
- *Fast switching speed*
- *High density cell design for ultra low On-Resistance*
- *Application:*
  - *-Switching applications*
  - *-Power management*
- *Lead free and green devices available*
- *Package: SOT23*



Absolute Maximum Ratings (T_A=25ºC unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	20*	V
Gate-Source Voltage		V_{GS}	±12	V
Drain Current [a]	T_C=25ºC	I_D	3.2	A
	T_C=70ºC		1.5	
Drain Current –Pulsed [a]		I_{DM}	9.6	A
Power Dissipation (T_C=25ºC)		P_D	0.90	W
Power Dissipation (T_C=75ºC)			0.50	
Storage Temperature Range		T_{STG}	-55 ~ +150	ºC
Operating Junction Temperature Range		T_J	-55 ~ +150	ºC
Thermal Resistance, Junction-to-Ambient1		$R_{\theta JA}$	125	ºC/W

Electrical Characteristics (T_A=25ºC unless otherwise noted)

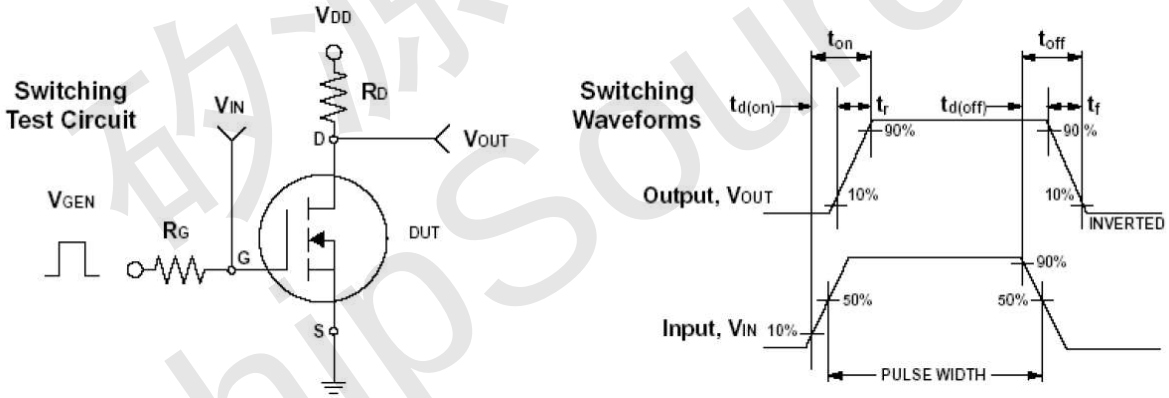
Parameter		Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V, I_D=250μA		20		V
Zero Gate Voltage Drain Current	T_J=25°C	I_{DSS}	V_{DS}=16V, V_{GS}=0V			1	μA
Gate-Body Leakage		I_{GSS}	V_{GS}=±12V, V_{DS}=0V			±100	nA
On Characteristics [a]							
Gate Threshold Voltage		$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.3		1.0	V
Drain-Source On-State Resistance		$R_{DS(on)}$	V_{GS}=4.5V, I_D=2.4A		48	60	mΩ
			V_{GS}=2.5V, I_D=2.0A		65	85	mΩ
			V_{GS}=1.8V, I_D=1.0A		90	125	mΩ
Forward Transconductance		gfs	V_{DS}=5V, I_D=1A				S

TEL: +86-0755-27595155 27595165
FAX: +86-0755-27594792
WEB:Http://www.ChipSourceTek.com
E-mail: Sales@ChipSourceTek.com Tony.Wang@ChipSourceTek.com

Drain-Source Diode Characteristics [a]						
Continuous Source Current	I_S	$V_G=V_D=0V$, Force Current	---	---	2.4	A
Pulsed Source Current	I_{SM}		---	---	9.6	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$, $I_S=1A$	---	---	1.3	V
Dynamic Characteristics [b]						
Input Capacitance	Ciss	$V_{DS}=10V$, $V_{GS}=0V$, F=1.0MHz	---			pF
Output Capacitance	Coss		---			pF
Reverse Transfer Capacitance	Crss		---			pF
Switching Characteristics [b]						
Total Gate Charge	Qg	$V_{DS}=10V$, $V_{GS}=4.5V$, $I_D=2.0A$	---			nC
Gate-Source Charge	Qgs		---			nC
Gate-Drain Charge	Qgd		---			nC
Turn-On Delay Time	Td(on)	$V_{DD}=10V$,$I_D=1.0A$, $V_{GEN}=4.5V$, $R_G=6\Omega$	---			ns
Rise Time	Tr		---			ns
Turn-Off Delay Time	Td(off)		---			ns
Fall Time	Tf		---			ns

Notes: a. Repetitive Rating: Pulsed width limited by maximum junction temperature.
b. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%. Essential independent of operating temperature.
c. Guaranteed by design, not subject to production testing.

Switching Time Test Circuit and Waveforms



Soldering Methods For Products

1. Storage environment : Temperature=10ºC ~ 35ºC, Humidity=65% ± 15%
2. Reflow soldering of surface mount devices

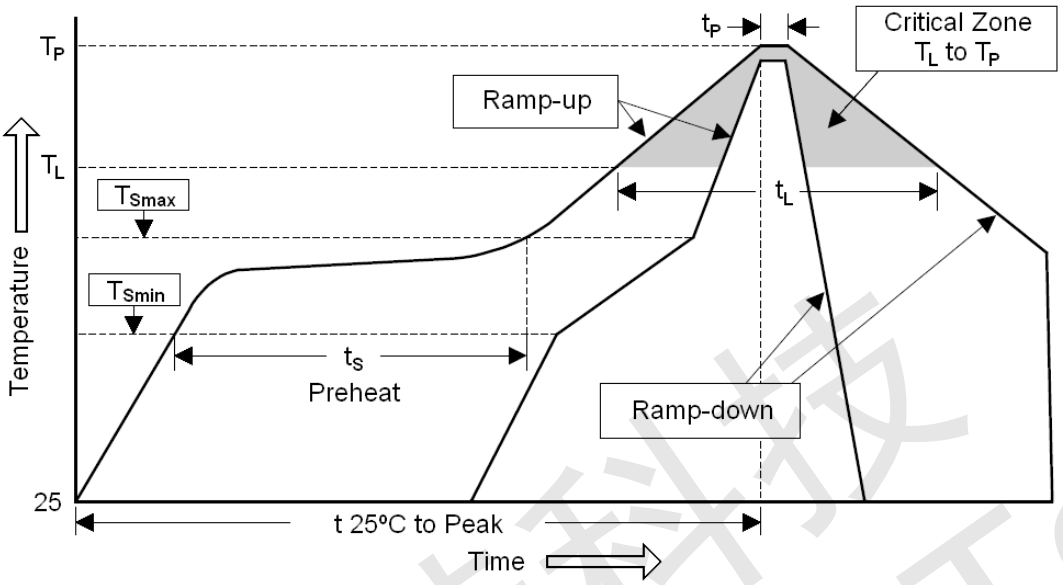


Figure : Temperature Profile

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	< 3ºC/sec	< 3ºC/sec
Preheat - Temperature Min (TSmin) - Temperature Max (TSmax) - Time (Min to Max) (ts)	 100ºC 150ºC 60 ~ 120 sec	 100ºC 200ºC 60 ~ 180 sec
TSmax to T_L - Ramp-up rate	 < 3ºC/sec	 < 3ºC/sec
Time maintained above: - Temperature (T_L) - Time (t_L)	 183ºC 60 ~ 150 sec	 217ºC 60 ~ 150 sec
Peak Temperature (T_P)	240ºC +0/-5ºC	260ºC +0/-5ºC
Time within 5ºC of actual Peak Temperature (t_P)	10 ~ 30 sec	20 ~ 40 sec
Ramp-down rate	< 6ºC/sec	< 6ºC/sec
Time 25ºC to Peak Temperature	< 6 minutes	< 8 minutes

3. Flow (wave) soldering (solder dipping)

Product	Peak Temperature	Dipping Time
Pb devices	245ºC ±5ºC	5sec ±1sec
Pb-Free devices	260ºC +0/-5ºC	5sec ±1sec

Notices:

- MOS 管电路是静电敏感元器件，且对生产环境要求较严，建议在存放及生产操作时一定要避免静电干扰，经锡炉或回焊炉的温度切勿超过 260 度。

TEL: +86-0755-27595155 27595165
FAX: +86-0755-27594792
WEB:Http://www.ChipSourceTek.com
E-mail: Sales@ChipSourceTek.com Tony.Wang@ChipSourceTek.com