CHIPSUN 芯阳科技

CSN2103

N-Ch 100V Fast Switching MOSFETs

General Description

The CSN2103 is the highest performance trench N-ch MOSFETs with extreme high cell density , which provide excellent RDSON and gate charge for most of the synchronous buck converter applications .

The CSN2103 meet the RoHS and Green Product requirement with full function reliability approved.

Product Summery

Green

BVDSS	RDSON	ID
100V	75mΩ	3A

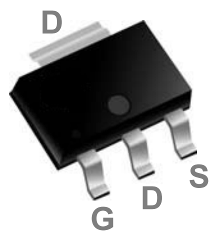
Applications

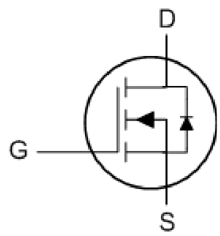
- High Frequency Point-of-Load Synchronous Buck Converter
- Networking DC-DC Power System
- Power Tool Application

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Green Device Available

SOT223 Pin Configuration





Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	3	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 10V[1]	2.4	A
I_{DM}	Pulsed Drain Current[2]	15	A
P_D@T_A=25℃	Total Power Dissipation[3]	2	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	---	85	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	24	℃/W

Rev A.01 D112311

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	100	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	0.082	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=3A	---	60	75	mΩ
		V_{GS}=4.5V , I_D=2A	---	65	82	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	1.2	1.6	2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4.8	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=55℃	---	---	-5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=3A	---	5.8	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.4	2.8	Ω
Q_g	Total Gate Charge (10V)	V_{DS}=80V , V_{GS}=10V , I_D=3A	---	40	56	nC
Q_{gs}	Gate-Source Charge		---	7.3	10.2	
Q_{gd}	Gate-Drain Charge		---	7	9.8	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=50V , V_{GS}=10V , R_G=3.3Ω I_D=3A	---	9.2	18.4	ns
T_r	Rise Time		---	22	40	
$T_{d(off)}$	Turn-Off Delay Time		---	41	82	
T_f	Fall Time		---	19.6	39	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	2400	3360	pF
C_{oss}	Output Capacitance		---	100	140	
C_{rss}	Reverse Transfer Capacitance		---	82	115	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	3	A
I_{SM}	Pulsed Source Current[2,4]		---	---	15	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	V
t_{rr}	Reverse Recovery Time	I_F=3A , dI/dt=100A/µs , T_J=25℃	---	41	---	nS
Q_{rr}	Reverse Recovery Charge		---	25	---	nC

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The power dissipation is limited by 150℃ junction temperature
4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

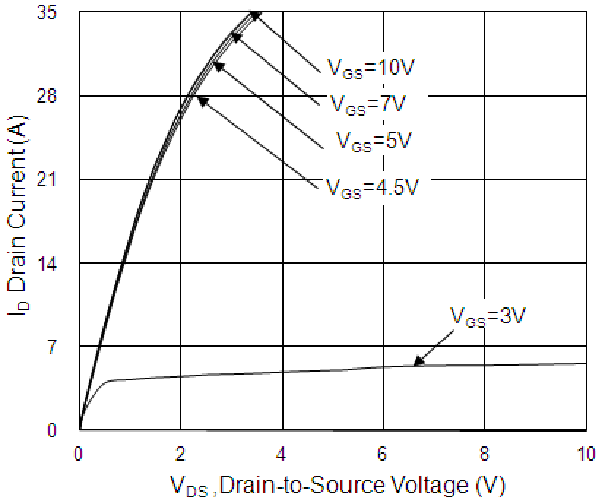


Fig.1 Typical Output Characteristics

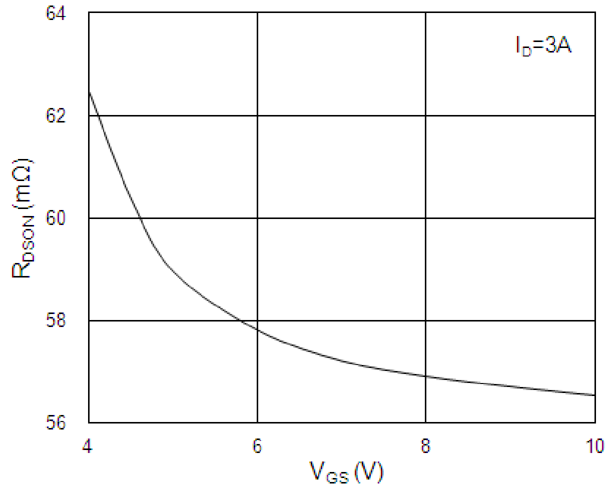


Fig.2 On-Resistance vs. Gate-Source

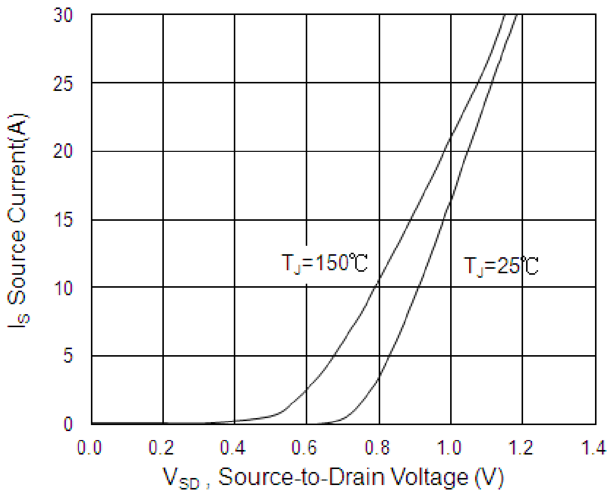


Fig.3 Forward Characteristics Of Reverse

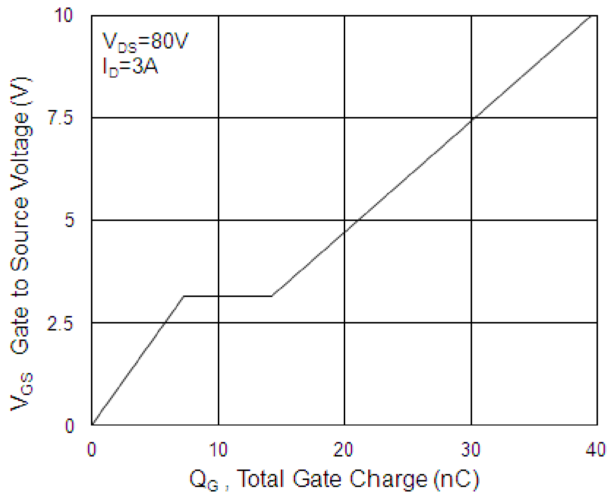


Fig.4 Gate-Charge Characteristics

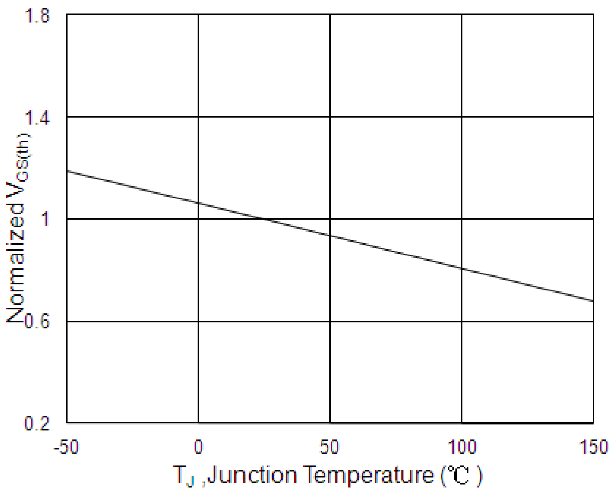


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

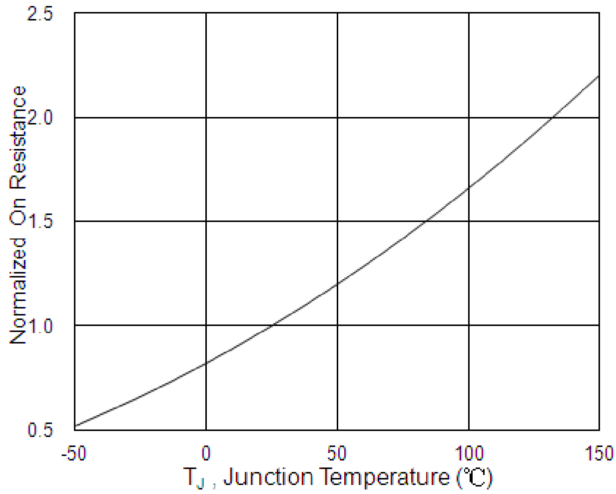


Fig.6 Normalized R_{DSON} vs. T_J

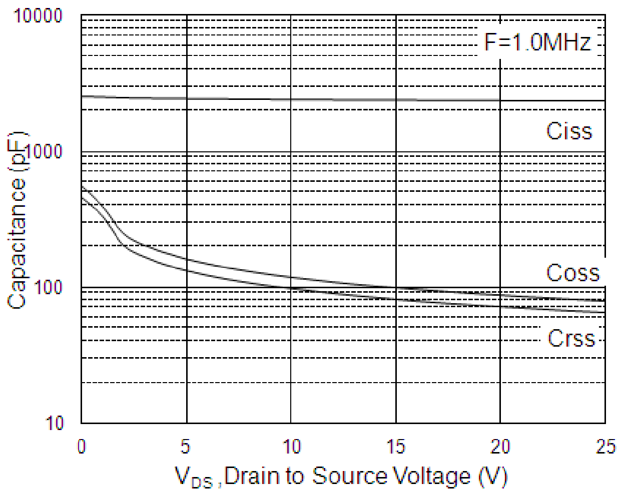


Fig.7 Capacitance

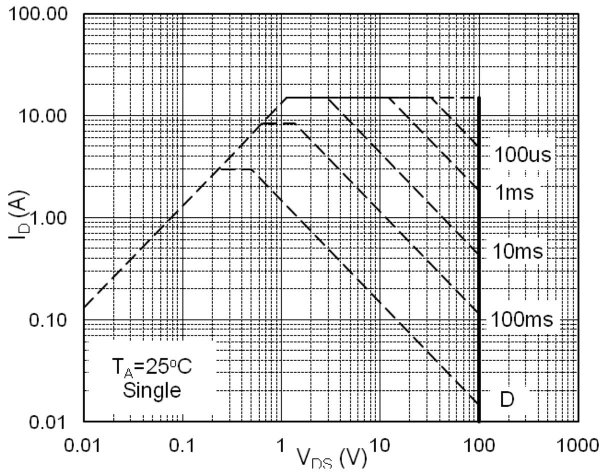


Fig.8 Safe Operating Area

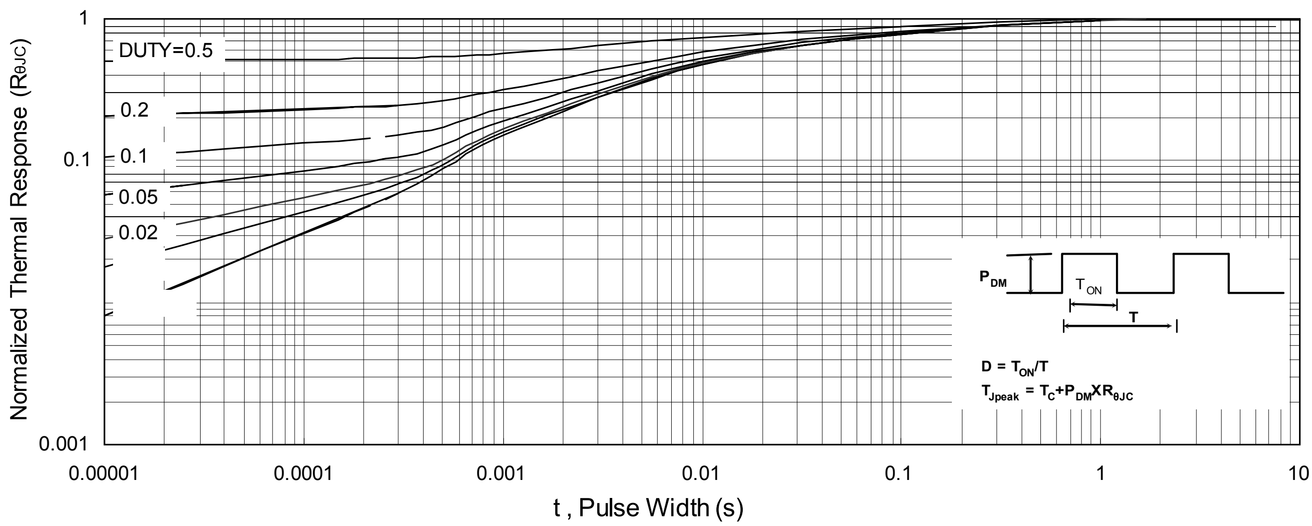


Fig.9 Normalized Maximum Transient Thermal Impedance

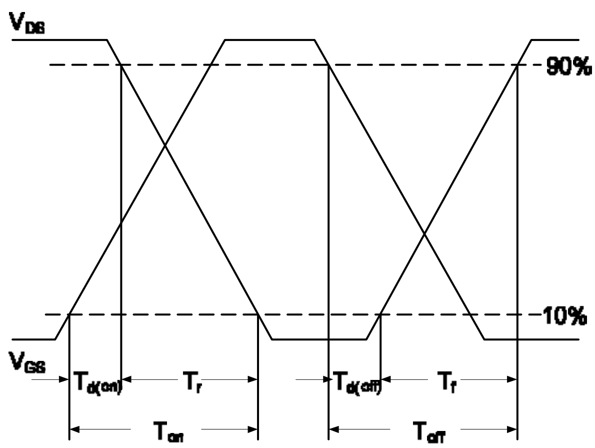


Fig.10 Switching Time Waveform

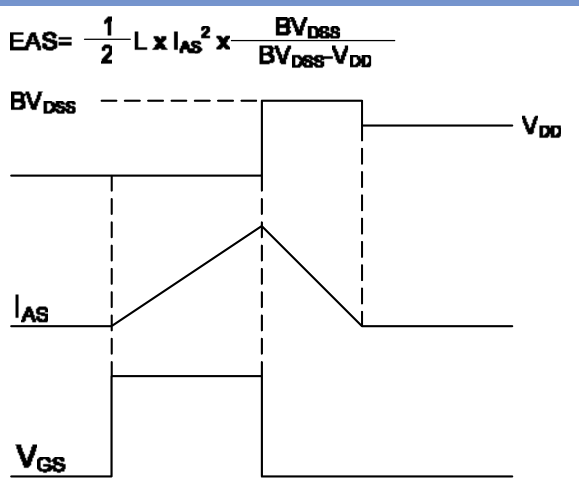
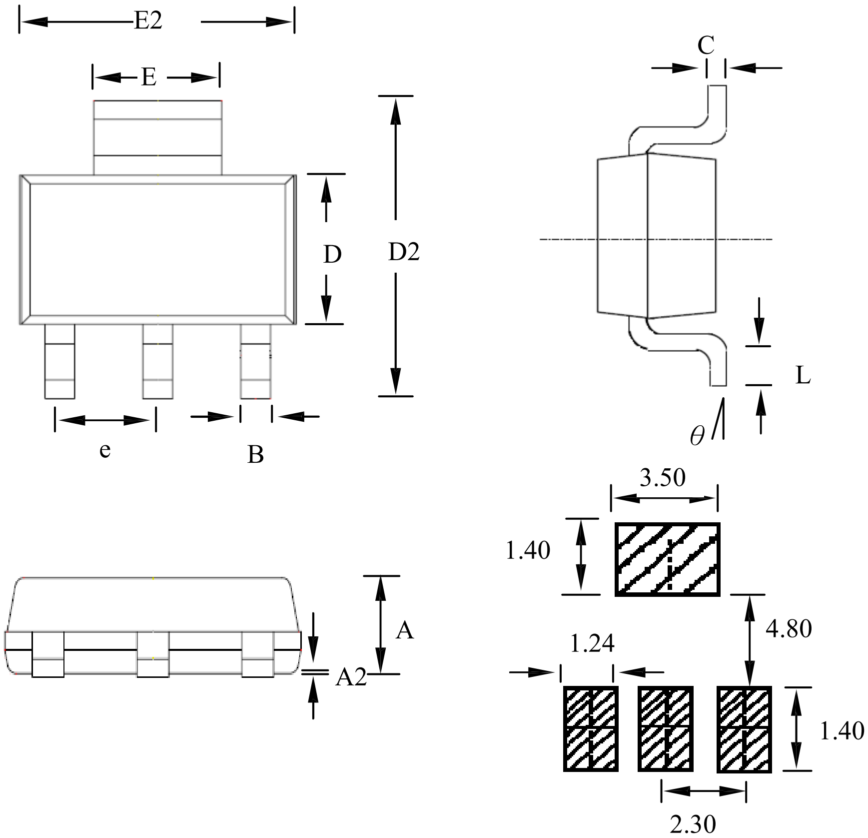


Fig.11 Unclamped Inductive Switching Waveform

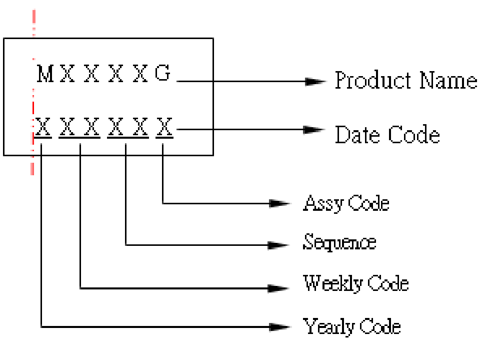
SOT-223 Outline



UNIT:mm

LAND PATTERN RECOMMENDATION

MARKING



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.50	--	1.80	0.059	--	0.071
A2	0.02	--	0.10	0.001	--	0.004
B	0.60	0.70	0.84	0.024	0.028	0.033
C	0.23	--	0.35	0.009	--	0.014
D	3.30	3.50	3.70	0.130	0.138	0.146
D2	6.70	--	7.30	0.264	--	0.287
E	2.90	3.00	3.10	0.114	0.118	0.122
E2	6.30	6.50	6.70	0.248	0.256	0.264
L	0.75	0.90	1.00	0.030	0.035	0.039
θ	0°	--	10°	0°	--	10°
e	--	2.30	--	--	0.091	--