



CST100N03Z N-Ch 30V Fast Switching MOSFETs

- ★ Super Low Gate Charge
- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology



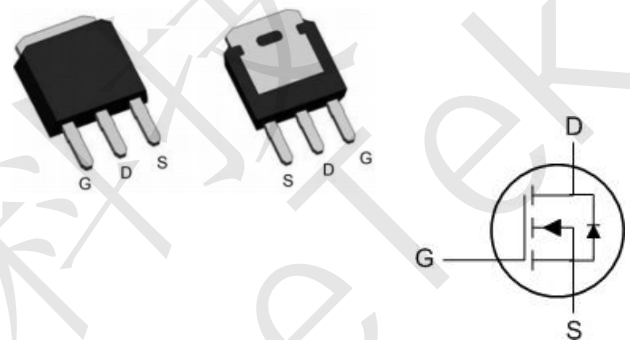
CST100N03Z Product Summary

BVDSS	RDSON	ID
30V	3.5mΩ	100A

CST100N03Z Description

The CST100N03Z is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications. The CST100N03Z meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

CST100N03Z TO251 Pin Configuration



CST100N03Z Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Symbol	Parameter	Max.	Units	
V _{DSS}	Drain-Source Voltage	30	V	
V _{GSS}	Gate-Source Voltage	±20	V	
I _D	Continuous Drain Current	T _C = 25°C	100	A
		T _C = 100°C	65	A
I _{DM}	Pulsed Drain Current ^{note1}	400	A	
E _{AS}	Single Pulsed Avalanche Energy ^{note2}	95	mJ	
P _D	Power Dissipation	80	W	
R _{θJC}	Thermal Resistance, Junction to Case	1.9	°C/W	
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to +175	°C	



CST100N03Z Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 30V, V _{GS} = 0V,	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.5	2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} = 10V, I _D = 30A	-	3.5	4.7	mΩ
		V _{GS} = 4.5V, I _D = 20A	-	5.5	10	
C _{iss}	Input Capacitance	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz	-	2100	-	pF
C _{oss}	Output Capacitance		-	326	-	pF
C _{rss}	Reverse Transfer Capacitance		-	282	-	pF
Q _g	Total Gate Charge		-	45	-	nC
Q _{gs}	Gate-Source Charge	V _{DS} = 15V, I _D = 30A, V _{GS} = 10V	-	3	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	15	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} = 15V, I _D = 30A, R _{GEN} = 3Ω, V _{GS} = 10V	-	21	-	ns
t _r	Turn-on Rise Time		-	32	-	ns
t _{d(off)}	Turn-off Delay Time		-	59	-	ns
t _f	Turn-off Fall Time		-	34	-	ns
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	50	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	200	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S = 30A	-	-	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F = 20A, dI/dt = 100A/μs	-	15	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	4	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J = 25°C, V_G = 10V, R_G = 25Ω, L = 0.5mH, I_{AS} = 18.4A

3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%



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Figure 1: Output Characteristics

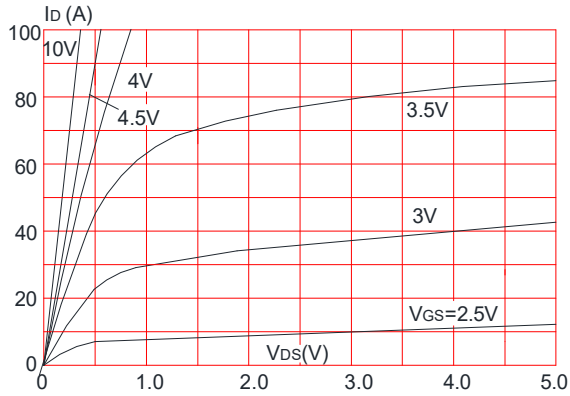


Figure 2: Typical Transfer Characteristics

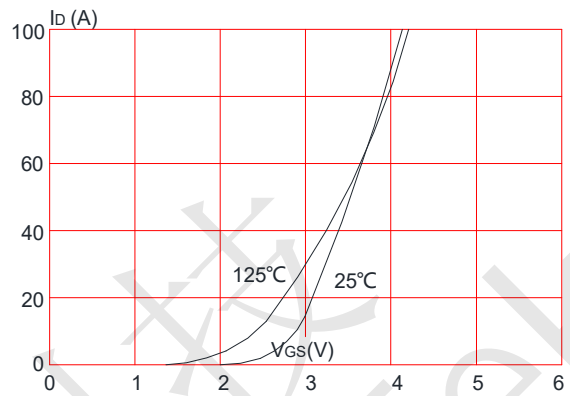


Figure 3: On-resistance vs. Drain Current

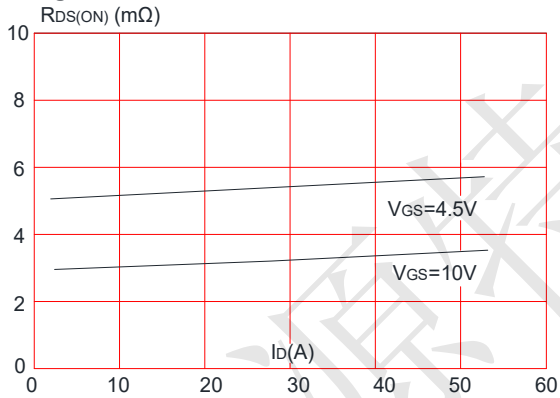


Figure 4: Body Diode Characteristics

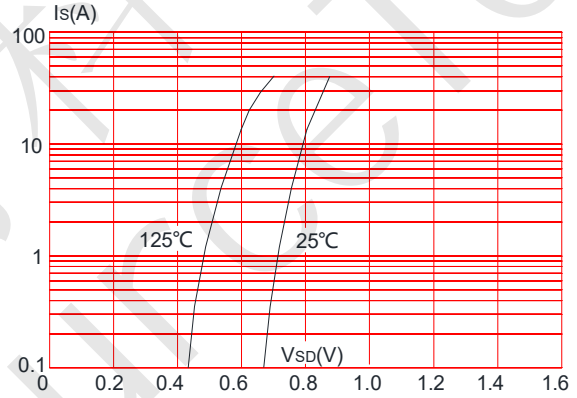


Figure 5: Gate Charge Characteristics

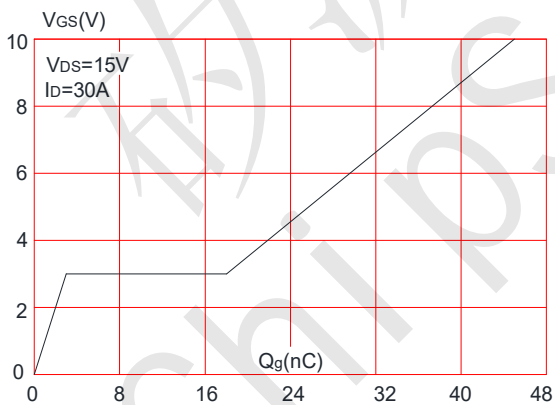
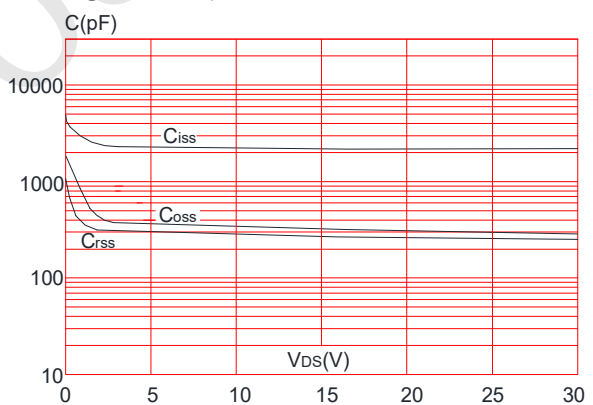


Figure 6: Capacitance Characteristics





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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

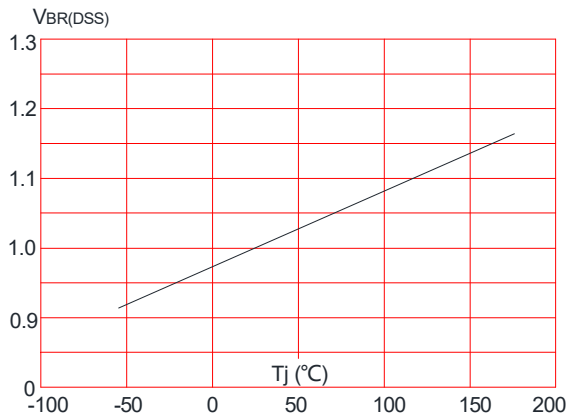


Figure 8: Normalized on Resistance vs. Junction Temperature

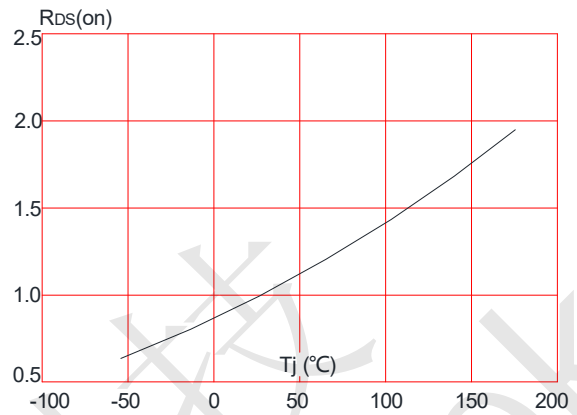


Figure 9: Maximum Safe Operating Area

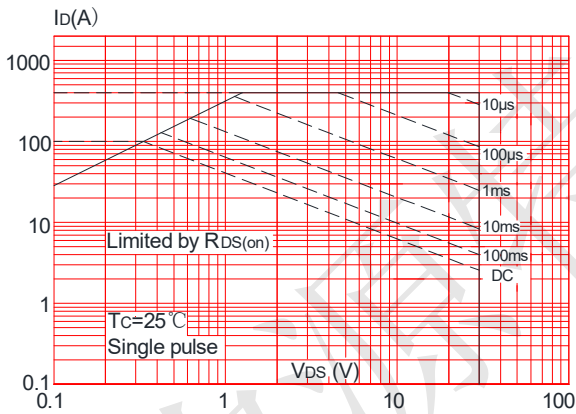


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

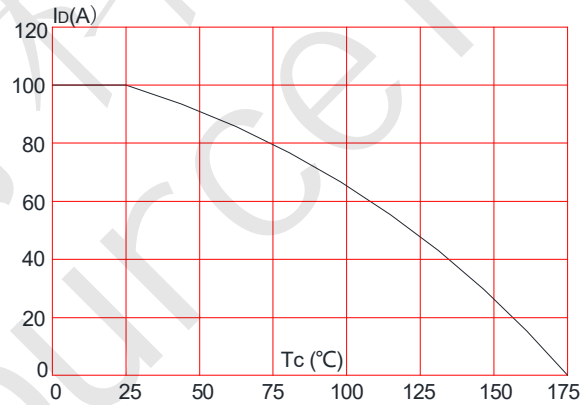
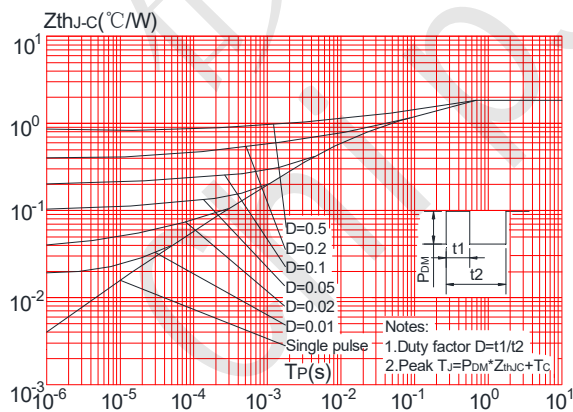


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case





CST100N03Z Test Circuit

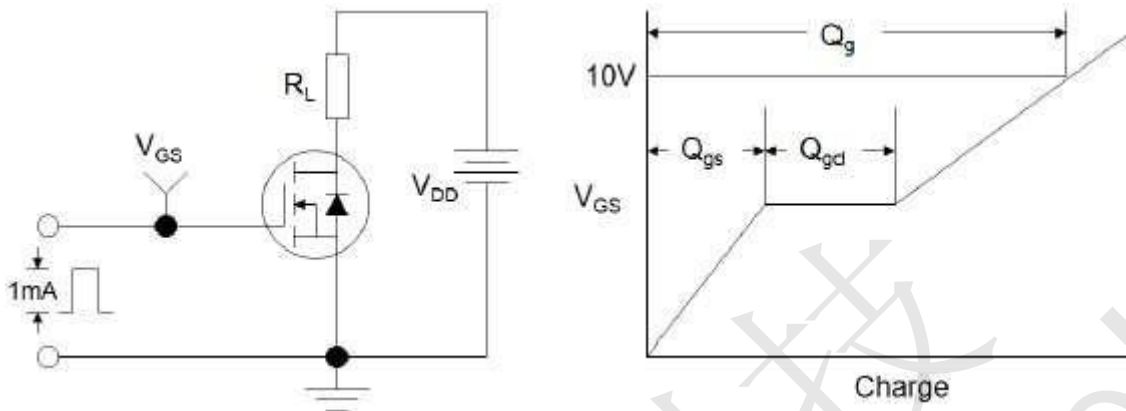


Figure1:Gate Charge Test Circuit & Waveform

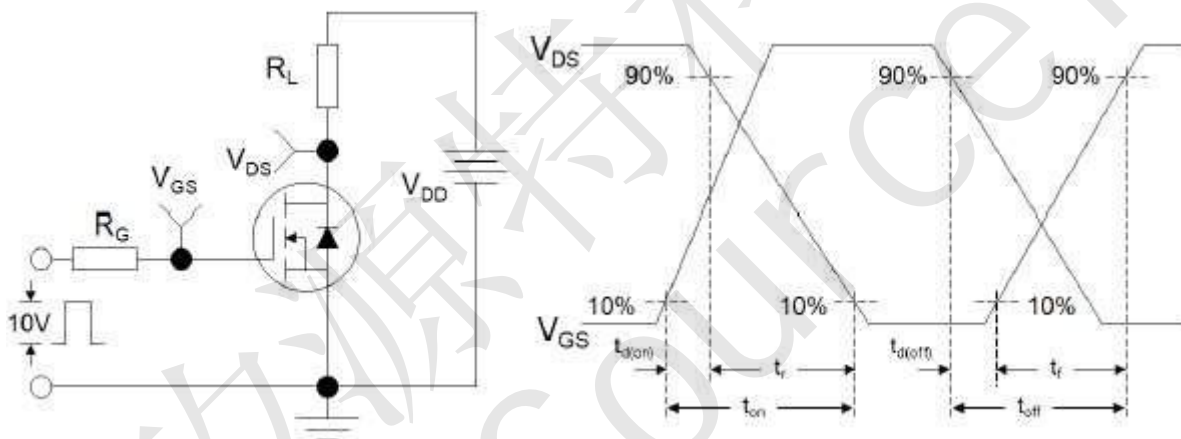


Figure 2: Resistive Switching Test Circuit & Waveforms

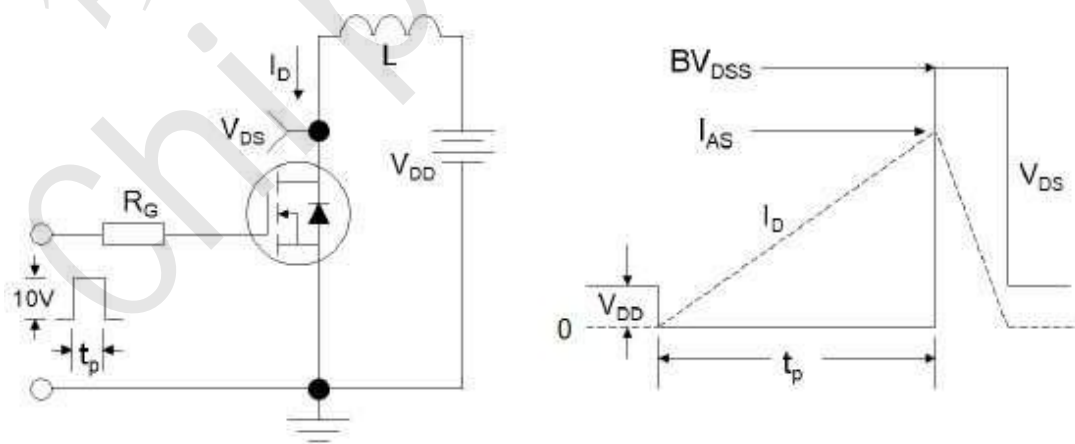


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



CST100N03Z Package Mechanical Data TO 251

