深圳市矽源特科技有限公司
ShenZhen ChipSourceTek Technology Co.,Ltd.

CST3416 N-Ch 20V Fast Switching MOSFETs

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

CST3416 Product Summary

BVDSS	RDSON	ID
20V	17mΩ	6.0A

CST3416 Description

The CST3416 is the high cell density trenched N-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.

The CST3416 meet the RoHS and Green Product requirement with full function reliability approved.

CST3416 SOT23 Pin Configuration
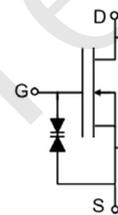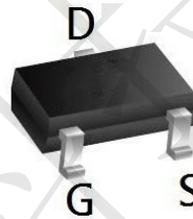
CST3416 Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 10	V
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ 4.5V[1]	6.0	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ 4.5V[1]	3.3	A
I_{DM}	Pulsed Drain Current[2]	20.4	A
P_D@T_A=25°C	Total Power Dissipation[3]	0.9	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

CST3416 Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	---	139	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	---	°C/W

CST3416 Electrical Characteristics (T$_J$=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V$_{(BR)DSS}$	Drain-Source Breakdown Voltage	V$_{GS}$=0V, I$_D$=250µA	20	-	-	V
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{DS}$=20V, V$_{GS}$=0V,	-	-	1	µA
I$_{GSS}$	Gate to Body Leakage Current	V$_{DS}$=0V, V$_{GS}$= ±10V	-	-	±10	uA
On Characteristics						
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$, I$_D$=250µA	0.4	0.7	1	V
R$_{DS(on)}$ note2	Static Drain-Source on-Resistance	V$_{GS}$=4.5V, I$_D$=5A	-	17	22	mΩ
		V$_{GS}$=2.5V, I$_D$=3A	-	26	36	
Dynamic Characteristics						
C$_{iss}$	Input Capacitance	V$_{DS}$=10V, V$_{GS}$=0V, f=1.0MHz	-	545	-	pF
C$_{oss}$	Output Capacitance		-	103	-	pF
C$_{rss}$	Reverse Transfer Capacitance		-	90	-	pF
Q$_g$	Total Gate Charge	V$_{DS}$=10V, I$_D$=5A, V$_{GS}$=4.5V	-	8	-	nC
Q$_{gs}$	Gate-Source Charge		-	2.5	-	nC
Q$_{gd}$	Gate-Drain("Miller") Charge		-	3	-	nC
Switching Characteristics						
t$_{d(on)}$	Turn-on Delay Time	V$_{DS}$=10V,R$_L$=1.5Ω, R$_{GEN}$=3Ω, V$_{GS}$=5V	-	0.5	-	ns
t$_r$	Turn-on Rise Time		-	1	-	ns
t$_{d(off)}$	Turn-off Delay Time		-	12	-	ns
t$_f$	Turn-off Fall Time		-	4	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I$_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	5	A
I$_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	20	A
V$_{SD}$	Drain to Source Diode Forward Voltage	V$_{GS}$=0V, I$_S$=5A	-	-	1.2	V

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

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

CST3416 Typical Performance Characteristics

Figure1: Output Characteristics
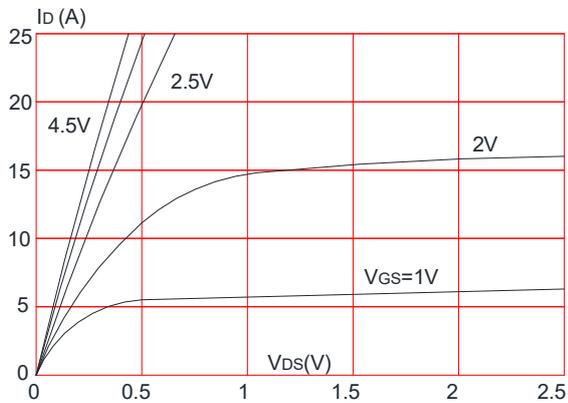
**Figure 2:** Typical Transfer Characteristics
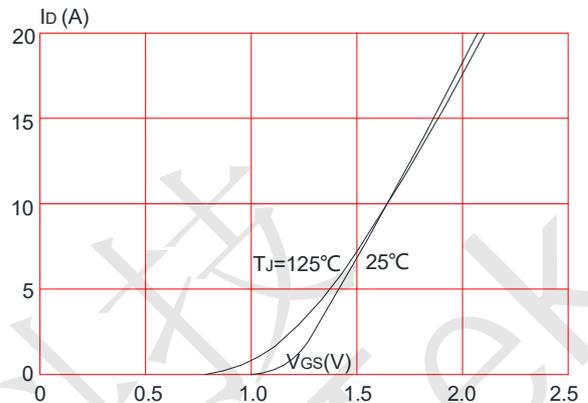
**Figure 3:** On-resistance vs. Drain Current
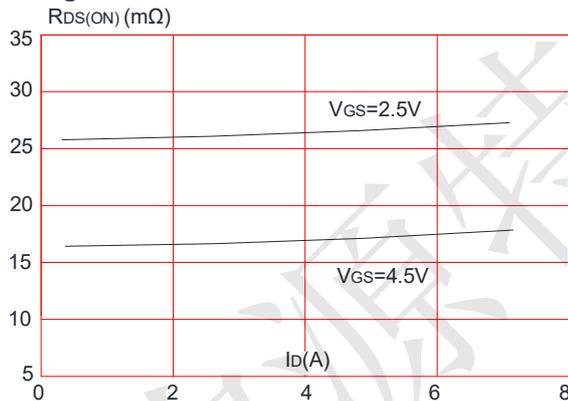
Figure 4: Body Diode Characteristics
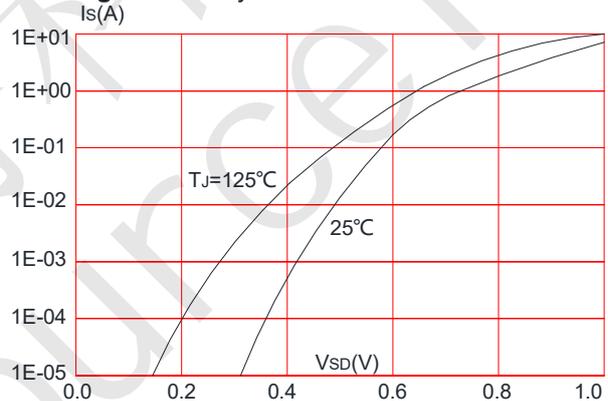
**Figure 5:** Gate Charge Characteristics
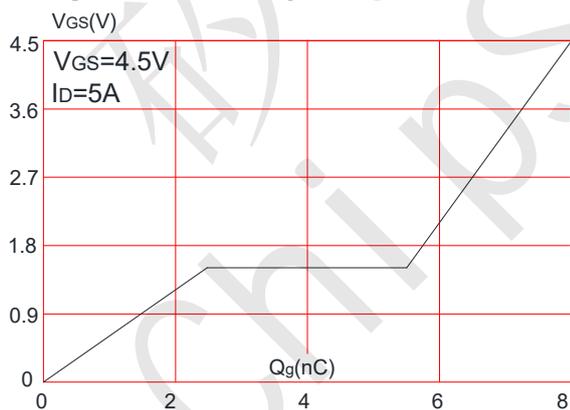
Figure 6: Capacitance Characteristics
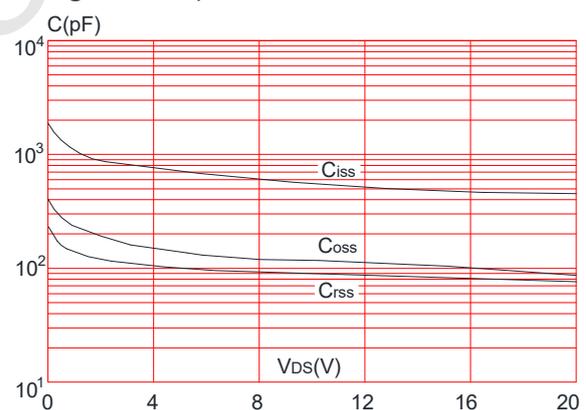
Figure 7: Normalized Breakdown Voltage vs. Junction Temperature
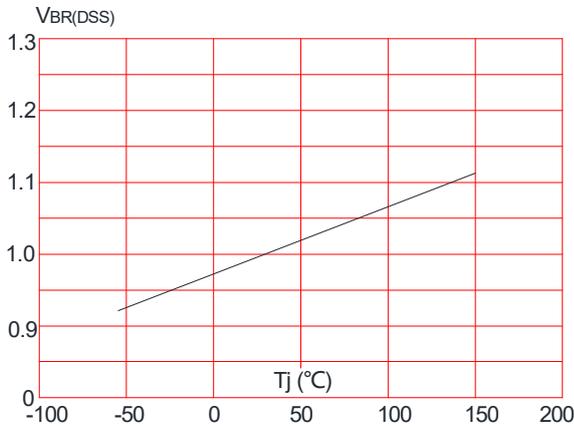
Figure 8: Normalized on Resistance vs. Junction Temperature
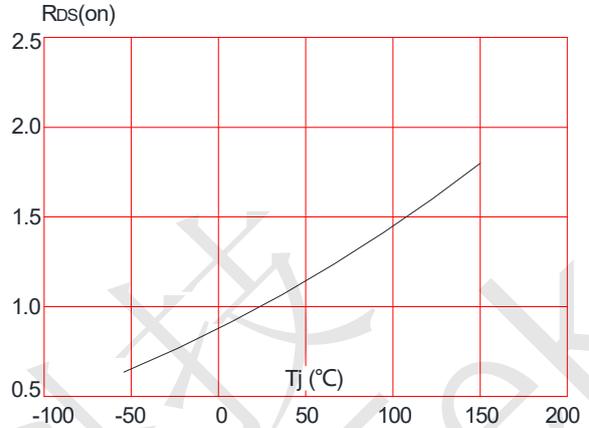
Figure 9: Maximum Safe Operating Area
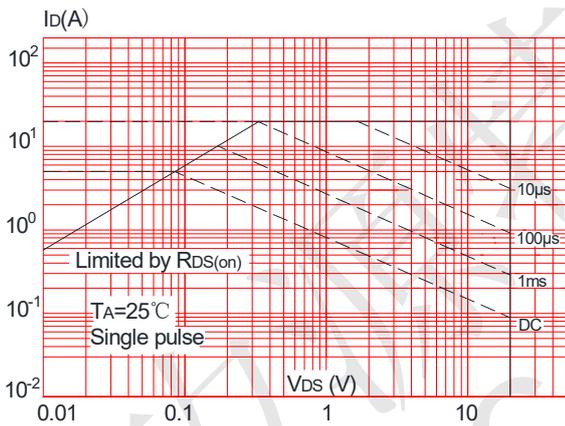
**Figure 10:** Maximum Continuous Drain Current vs. Ambient Temperature
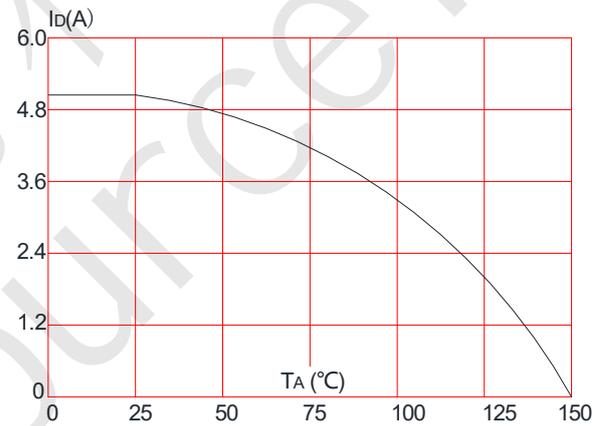
**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Notes:
1.Duty factor D=t1/t2
2.Peak TJ=PDM*ZthJC+TA
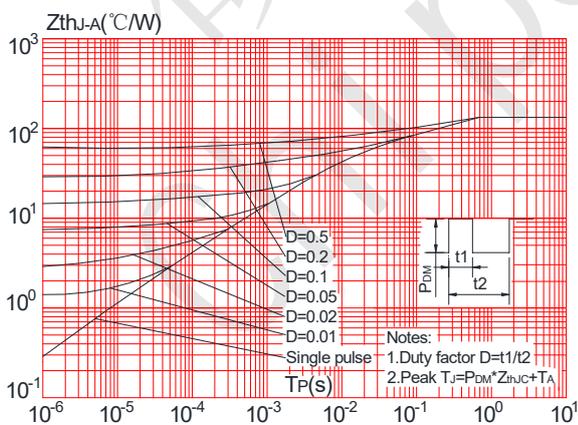
CST3416 Package Mechanical Data-SOT-23
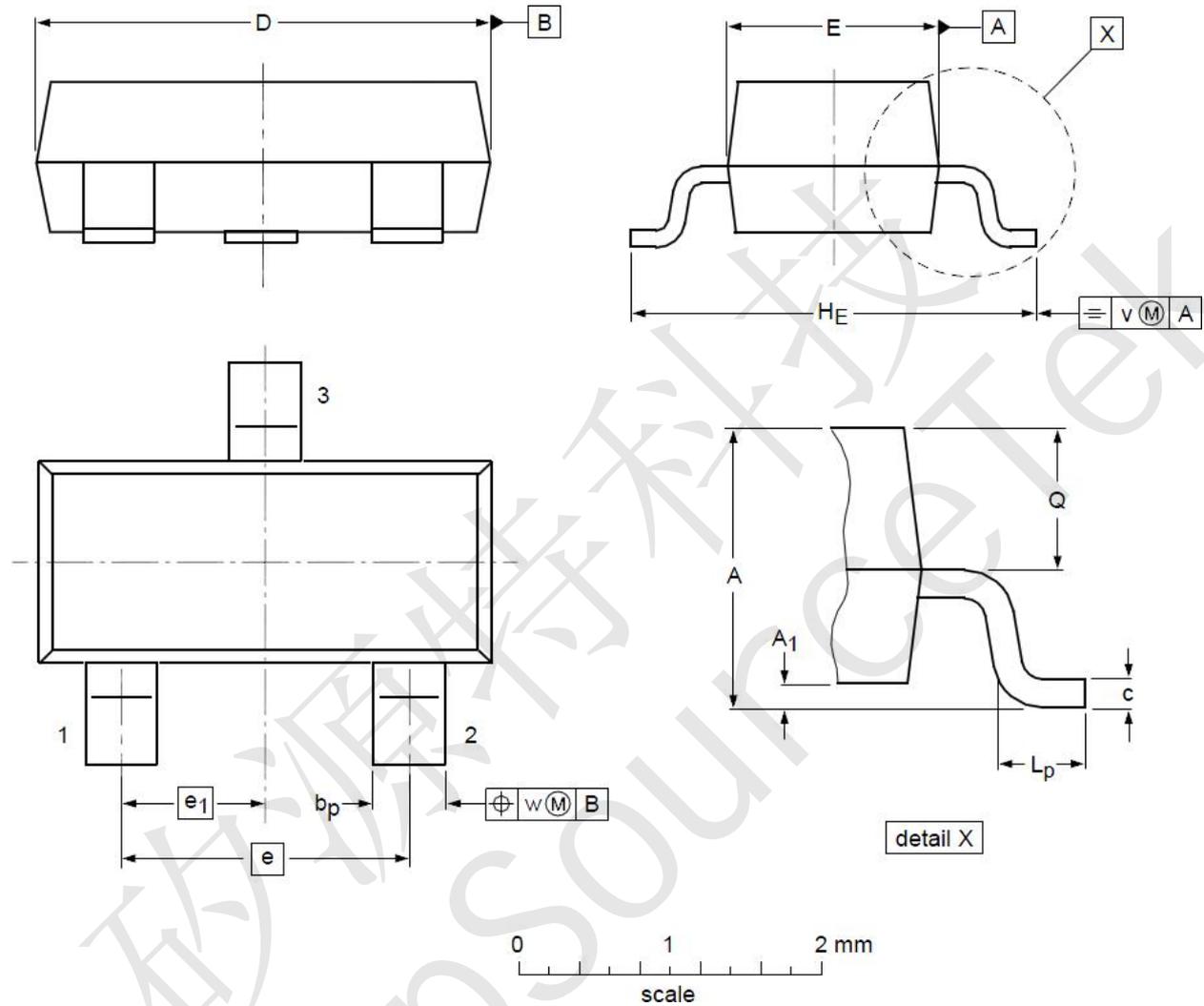
DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.01	1.15	A_1	0.01	0.05	0.10
b_p	0.30	0.42	0.50	c	0.08	0.13	0.15
D	2.80	2.92	3.00	E	1.20	1.33	1.40
e	--	1.90	--	e_1	--	0.95	--
H_E	2.25	2.40	2.55	L_p	0.30	0.42	0.50
Q	0.45	0.49	0.55	v	--	0.20	--
w	--	0.10	--				