



CST4953C Dual P-Ch 20V Fast Switching MOSFETs

CST4953C Features

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

CST4953C Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

CST4953C General Description

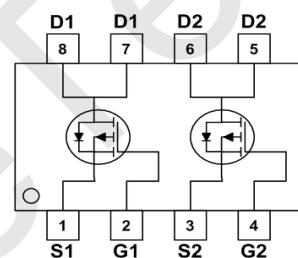
The CST4953C is the highest performance trench P-ch MOSFETs with extreme high cell density , which provide excellent RDSON and gate charge for most of the synchronous buck converter applications .

The CST4953C meet the RoHS and Green Product requirement with full function reliability approved.

CST4953C Product Summary

BVDSS	RDS(on)	ID
-20V	80mΩ	-3A

CST4953C SOP-8 Pin Configuration



CST4953C Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		-20	V
V_{GSS}	Gate-Source Voltage		± 12	V
I_D	Continuous Drain Current	$T_A = 25^\circ\text{C}$	-3.0	A
		$T_A = 100^\circ\text{C}$	-2.0	
I_{DM}	Pulsed Drain Current ^{note1}		-10	A
P_D	Power Dissipation	$T_A = 25^\circ\text{C}$	1	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		125	$^\circ\text{C}/\text{W}$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	$^\circ\text{C}$



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CST4953C Electrical Characteristics ($T_c=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(\text{BR})\text{DSS}}$	Drain-Source Breakdown Voltage	$V_{GS}=0\text{V}, I_D = -250\mu\text{A}$	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -20\text{V}, V_{GS} = 0\text{V},$	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS} = 0\text{V}, V_{GS} = \pm 12\text{V}$	-	-	± 100	nA
On Characteristics						
$V_{GS(\text{th})}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	-0.4	-0.7	-1.0	V
$R_{DS(\text{on})}$ note2	Static Drain-Source on-Resistance	$V_{GS} = -4.5\text{V}, I_D = -2.5\text{A}$	-	80	104	$\text{m}\Omega$
		$V_{GS} = -2.5\text{V}, I_D = -1.5\text{A}$	-	110	154	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = -10\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$	-	248	-	pF
C_{oss}	Output Capacitance		-	42	-	pF
C_{rss}	Reverse Transfer Capacitance		-	31	-	pF
Q_g	Total Gate Charge		-	2.9	-	nC
Q_{gs}	Gate-Source Charge		-	0.45	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	0.75	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = -10\text{V}, R_L = 5\Omega, R_{\text{GEN}} = 3\Omega, V_{GS} = -4.5\text{V}$	-	9.8	-	ns
t_r	Turn-on Rise Time		-	4.9	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	20.5	-	ns
t_f	Turn-off Fall Time		-	7	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_s	Maximum Continuous Drain to Source Diode Forward Current	-	-	-3.0	A	
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current	-	-	-10	A	
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0\text{V}, I_s = -2.5\text{A}$	-	-	-1.2	V

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

2. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$



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CST4953C Typical Performance Characteristics

Figure 1: Output Characteristics

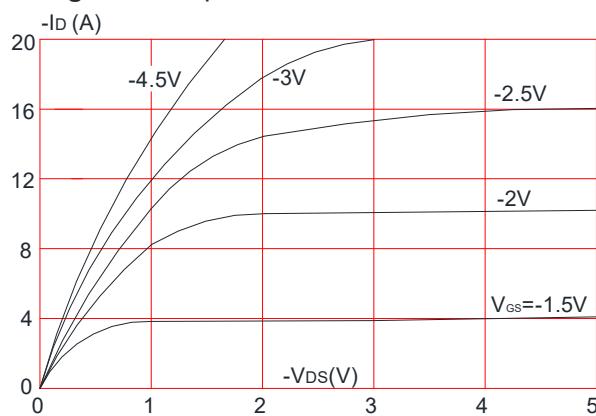


Figure 3: On-resistance vs. Drain Current
 $R_{DS(ON)}$ (mΩ)

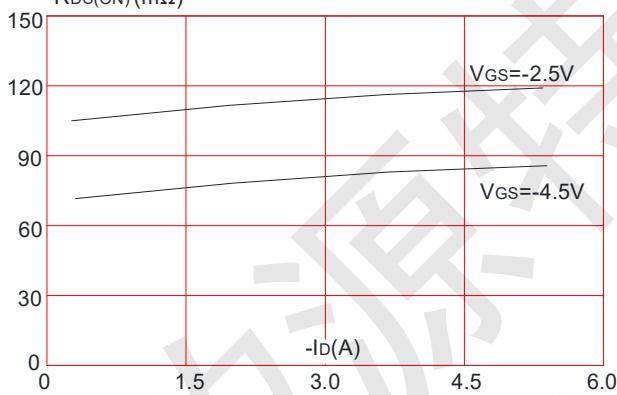


Figure 5: Gate Charge Characteristics

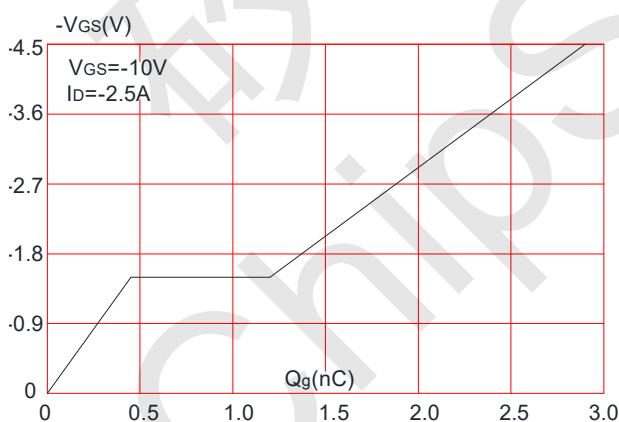


Figure 2: Typical Transfer Characteristics

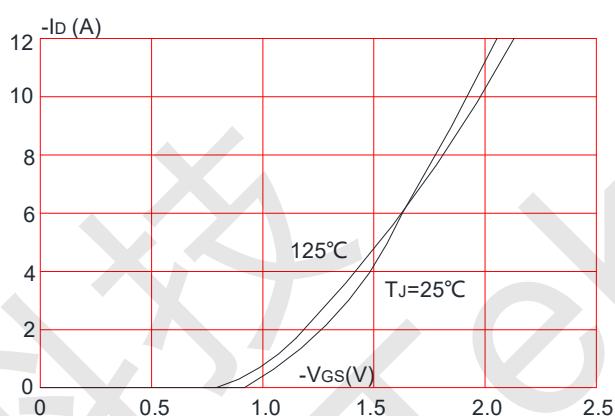


Figure 4: Body Diode Characteristics

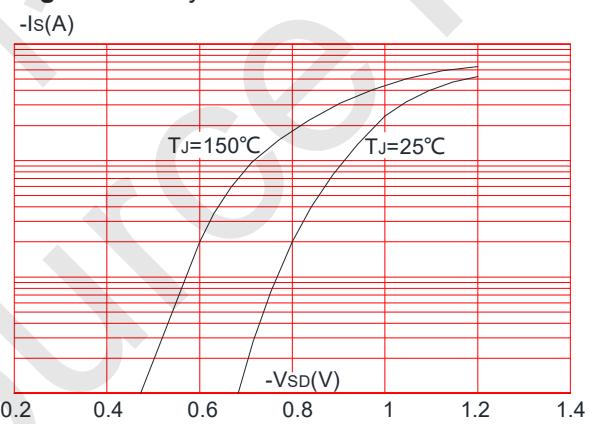
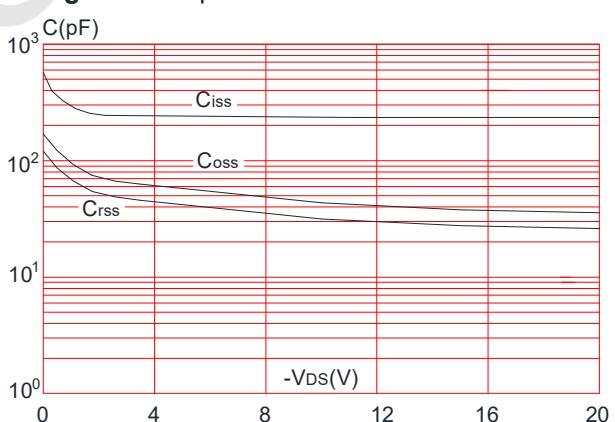


Figure 6: Capacitance Characteristics





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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

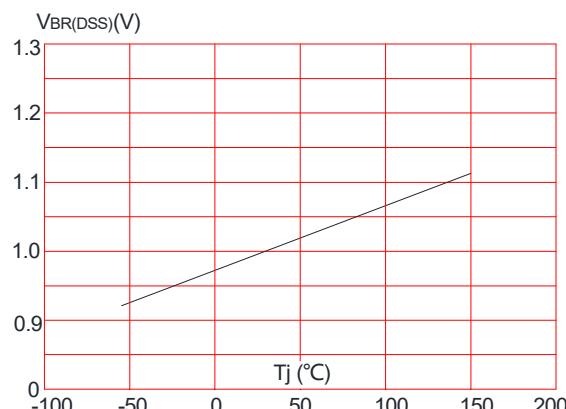


Figure 8: Normalized on Resistance vs. Junction Temperature

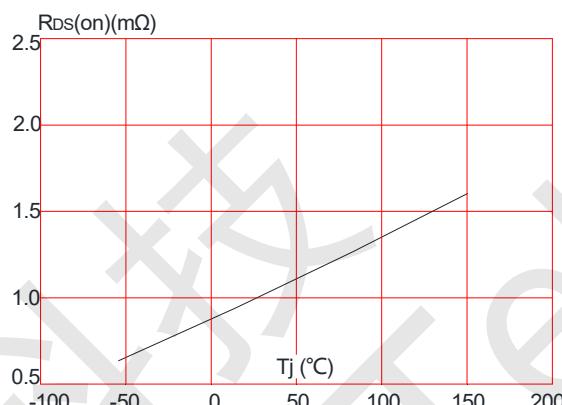


Figure 9: Maximum Safe Operating Area

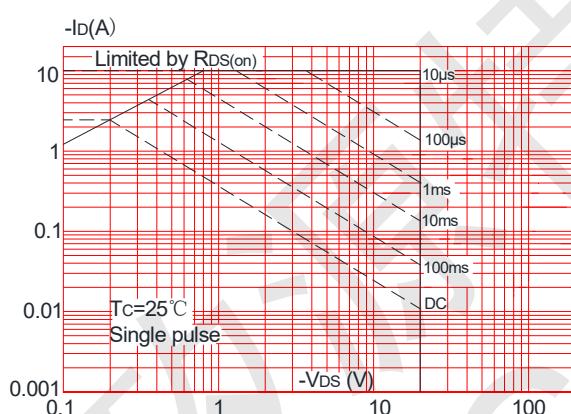


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

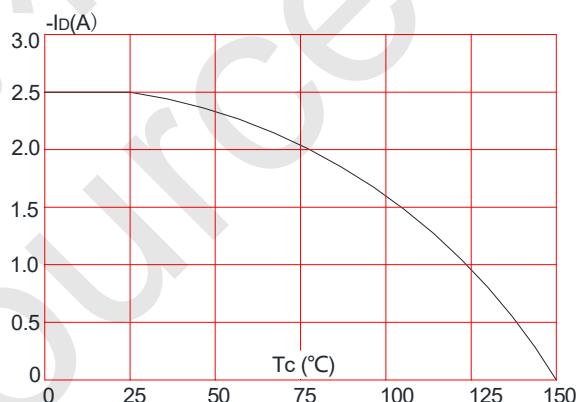
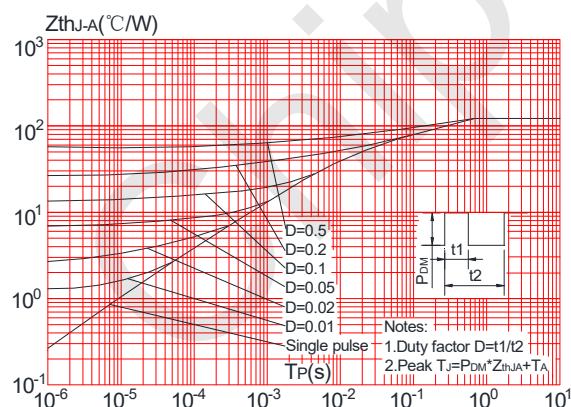
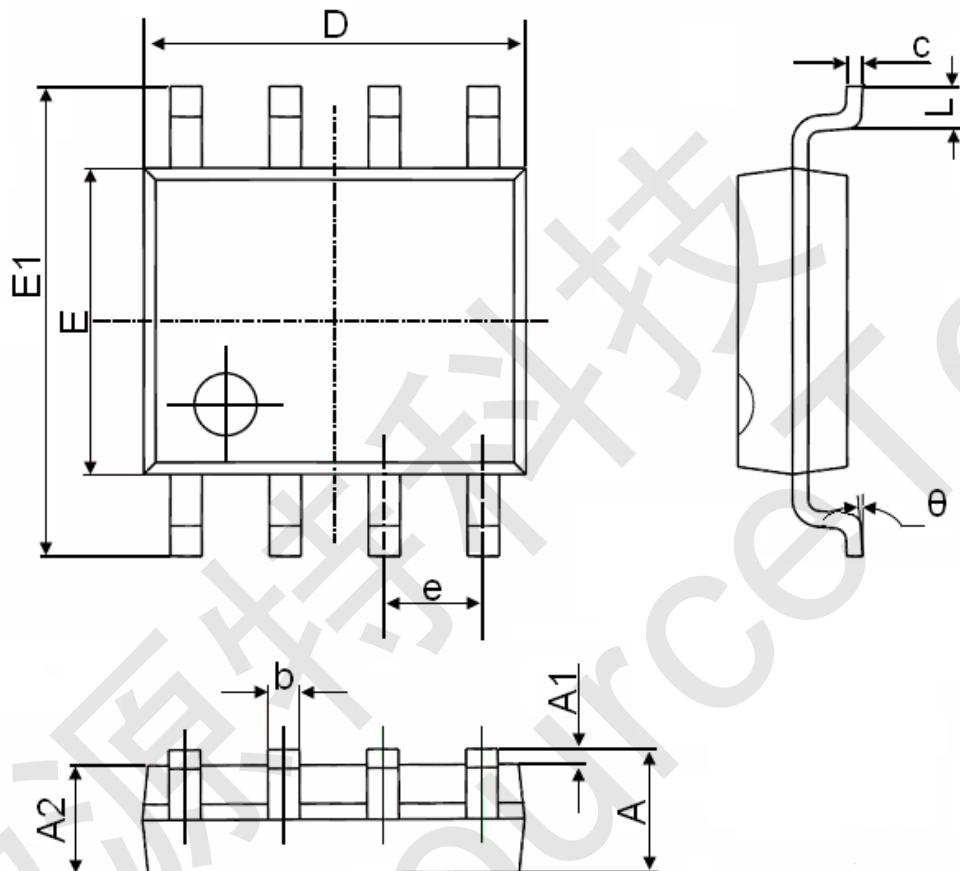


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient





CST4953C SOP-8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°