



### CST30P03D P-Ch 30V Fast Switching MOSFETs

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

#### CST30P03D Product Summary

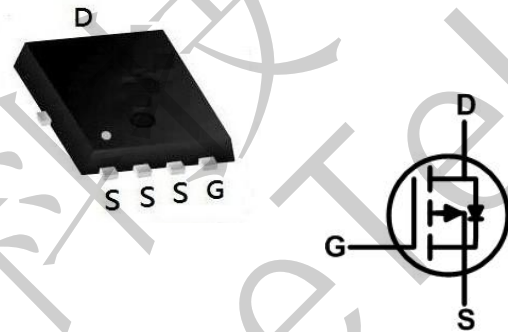
BVDSS	RDSON	ID
-30V	15mΩ	-30A

#### CST30P03D Description

The CST30P03D is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The CST30P03D meet the RoHS and Gree Product requirement 100% EAS guaranteed with full function reliability approved.

#### CST30P03D PDFN3333-8L Pin Configuration



#### CST30P03D Absolute Maximum Ratings (T<sub>A</sub> = 25°C, unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	-30	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	T <sub>C</sub> =25°C	-30
		T <sub>C</sub> =100°C	-15.8
Pulsed Drain Current <sup>1</sup>	I <sub>DM</sub>	-100	A
Single Pulse Avalanche Energy <sup>2</sup>	EAS	26.5	mJ
Total Power Dissipation	P <sub>D</sub>	22	W
	T <sub>C</sub> =25°C		
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C

#### CST30P03D Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient <sup>3</sup>	R <sub>θJA</sub>	79	°C/W
Thermal Resistance from Junction-to-Case	R <sub>θJC</sub>	5.7	°C/W



### CST30P03D P-Ch 30V Fast Switching MOSFETs

#### CST30P03D Electrical Characteristics ( $T_J = 25^\circ\text{C}$ , unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30	-	-	V
Gate-body Leakage current	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	$\pm 100$	nA
Zero Gate Voltage Drain Current	$T_J = 25^\circ\text{C}$	$V_{DS} = -30V, V_{GS} = 0V$	-	-	-1	$\mu A$
	$T_J = 100^\circ\text{C}$		-	-	-100	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.5	-2.5	V
Drain-Source On-Resistance <sup>4</sup>	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -10A$	-	15	20	m $\Omega$
		$V_{GS} = -4.5V, I_D = -6A$	-	22.5	30	
Forward Transconductance <sup>4</sup>	$g_{fs}$	$V_{DS} = -10V, I_D = -10A$	-	23.5	-	S
<b>Dynamic Characteristics<sup>5</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -15V, V_{GS} = 0V, f = 1\text{MHz}$	-	980	-	pF
Output Capacitance	$C_{oss}$		-	137	-	
Reverse Transfer Capacitance	$C_{rss}$		-	113	-	
Gate Resistance	$R_g$	$f = 1\text{MHz}$	-	10.5	-	$\Omega$
<b>Switching Characteristics<sup>5</sup></b>						
Total Gate Charge	$Q_g$	$V_{GS} = -10V, V_{DS} = -15V, I_D = -10A$	-	20	-	nC
Gate-Source Charge	$Q_{gs}$		-	3	-	
Gate-Drain Charge	$Q_{gd}$		-	5.5	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = -10V, V_{DD} = -15V, R_G = 3\Omega, I_D = -10A$	-	7.5	-	ns
Rise Time	$t_r$		-	16	-	
Turn-Off Delay Time	$t_{d(off)}$		-	49	-	
Fall Time	$t_f$		-	32	-	
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = -10A, dI_F/dt = 100A/\mu s$	-	21	-	ns
Body Diode Reverse Recovery Charge	$Q_{rr}$		-	12.5	-	nC
<b>Drain-Source Body Diode Characteristics</b>						
Diode Forward Voltage <sup>4</sup>	$V_{SD}$	$I_S = -10A, V_{GS} = 0V$	-	-	-1.2	V
Continuous Source Current	$T_C = 25^\circ\text{C}$	$I_S$	-	-	-30	A

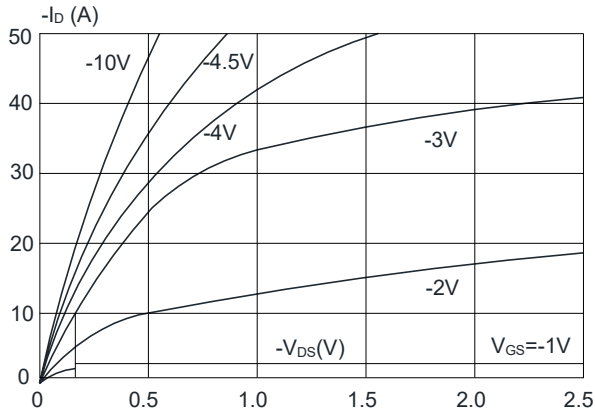
Note :

1. Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)} = 150^\circ\text{C}$ .
2. The EAS data shows Max. rating . The test condition is  $V_{DD} = -25V, V_{GS} = -10V, L = 0.1\text{mH}, I_{AS} = -23A$ .
3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$ .
5. This value is guaranteed by design hence it is not included in the production test.

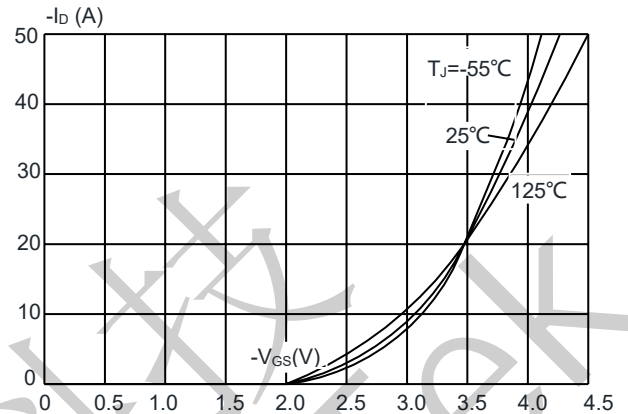


## CST30P03D Typical Performance Characteristics

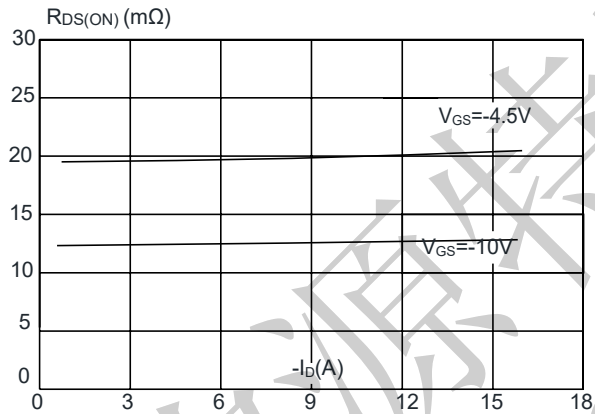
**Figure 1: Output Characteristics**



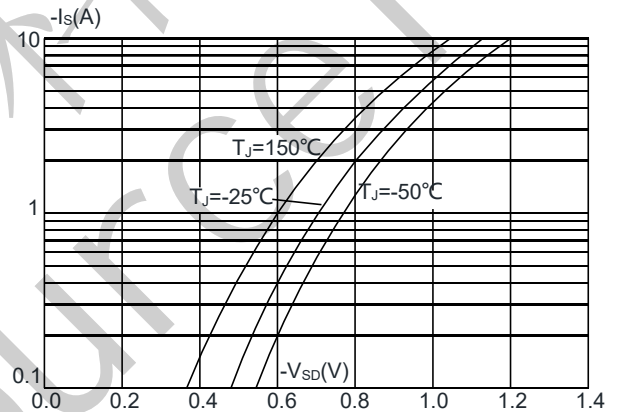
**Figure 2: Typical Transfer Characteristics**



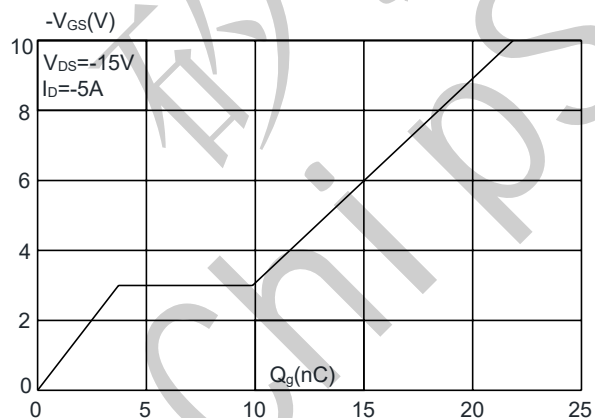
**Figure 3: On-resistance vs. Drain Current**



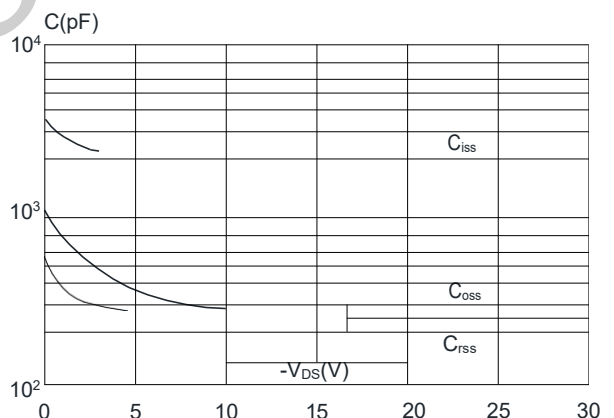
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**



**Figure 6: Capacitance Characteristics**





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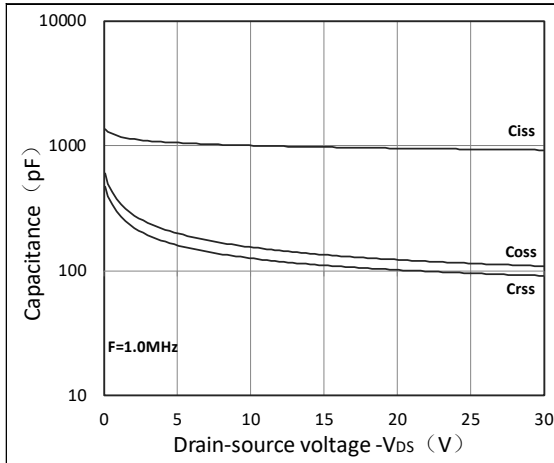


Figure 7. Capacitance Characteristics

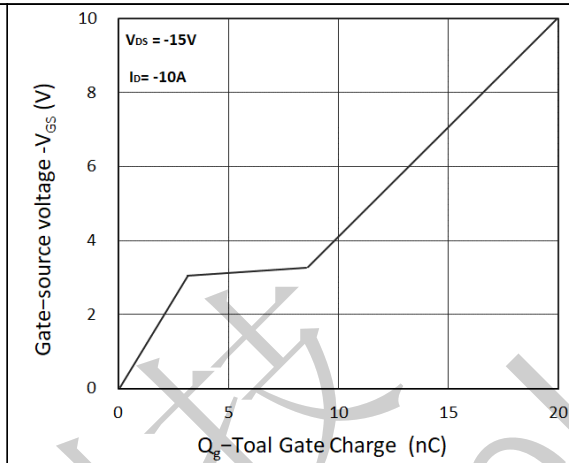


Figure 8. Gate Charge Characteristics

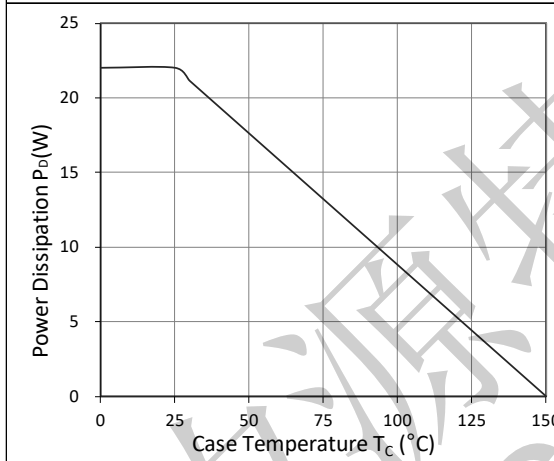


Figure 9. Power Dissipation

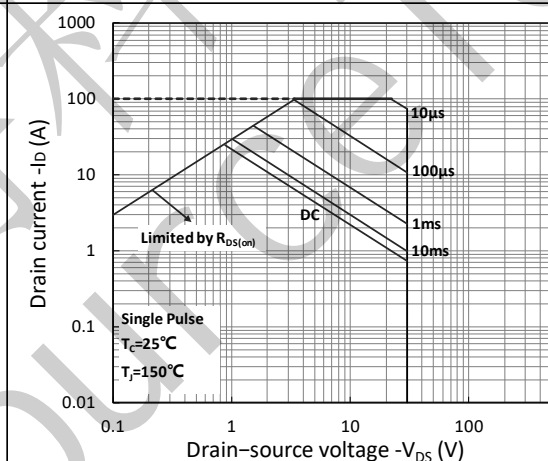


Figure 10. Safe Operating Area

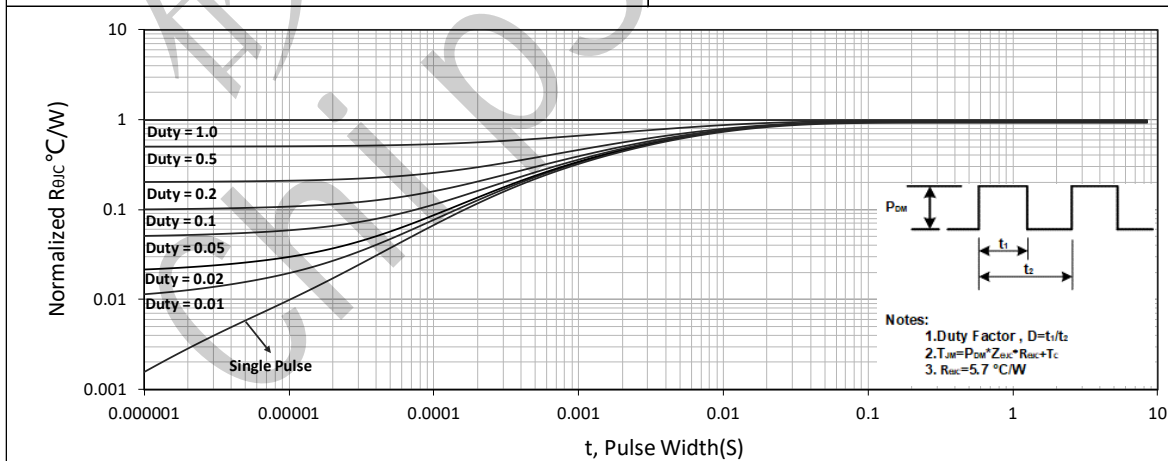
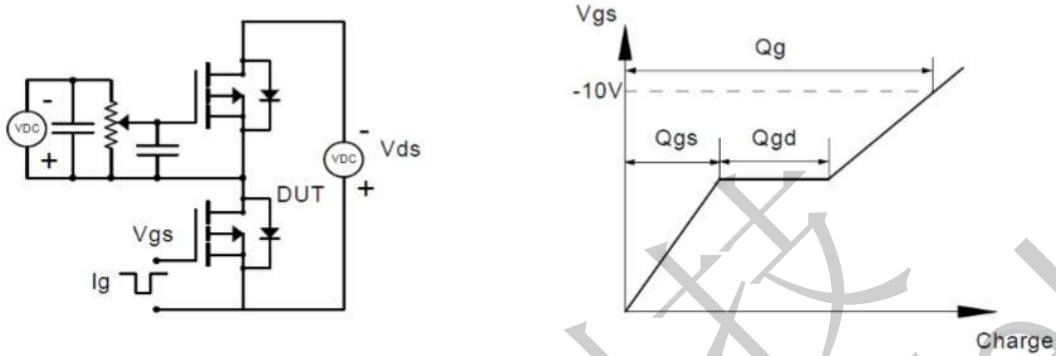


Figure 11. Normalized Maximum Transient Thermal Impedance

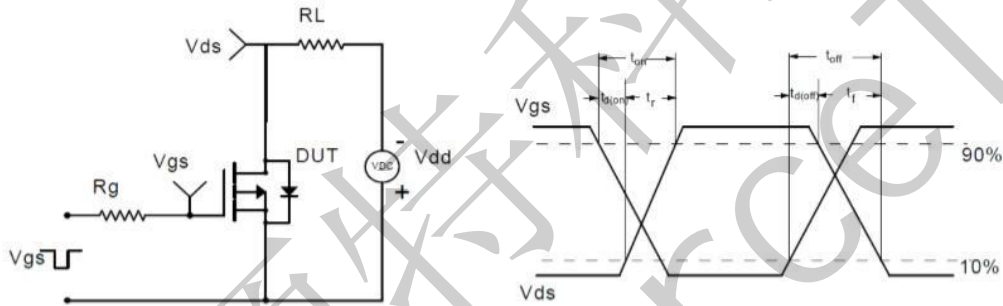


## CST30P03D Test Circuit

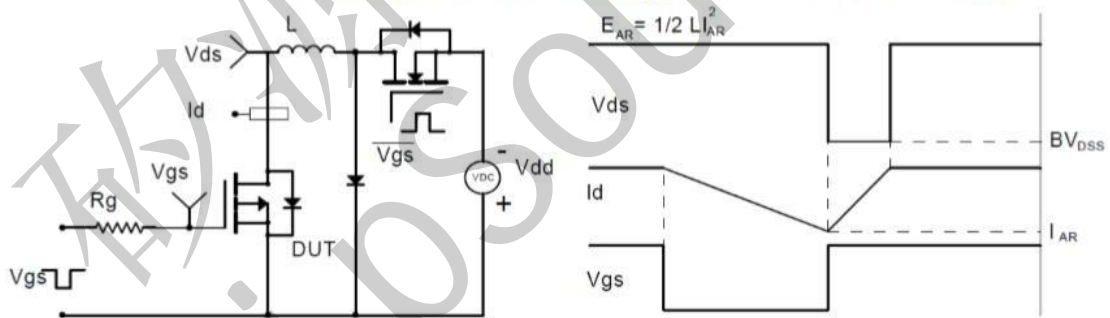
### Gate Charge Test Circuit & Waveform



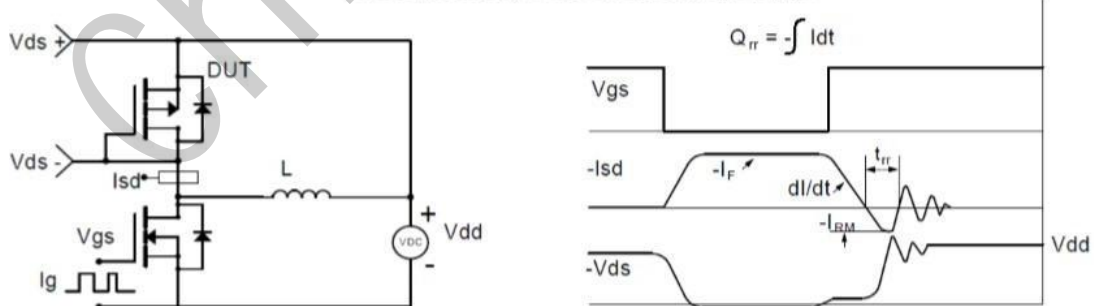
### Resistive Switching Test Circuit & Waveforms



### Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

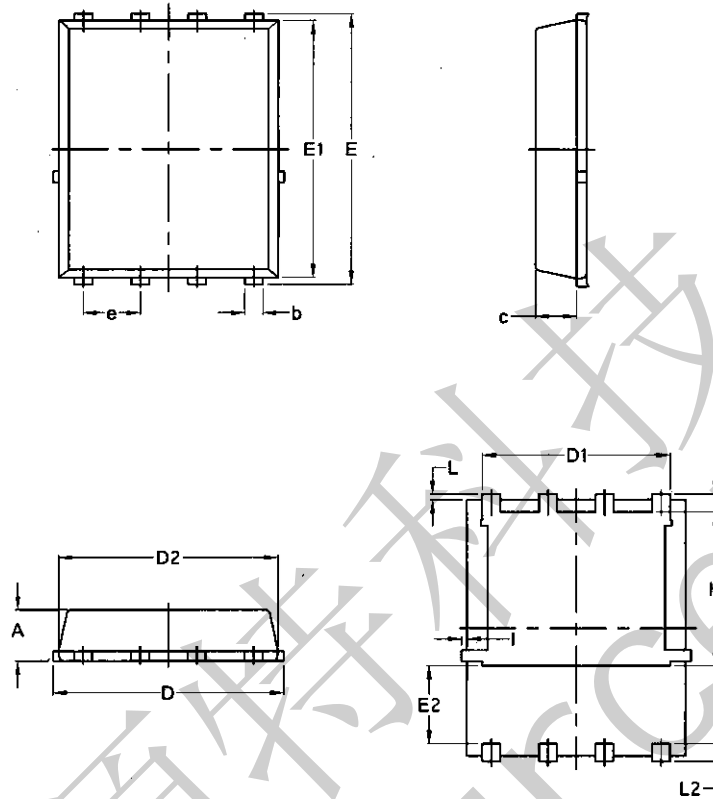


### Diode Recovery Test Circuit & Waveforms





CST30P03D Package Mechanical Data-PDFN3\*3-8L-Single



COMMON DIMENSIONS

(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.70	0.80	0.90
A1	0.00	0.03	0.05
b	0.24	0.30	0.35
c	0.10	0.15	0.20
D	3.25	3.32	3.40
D1	3.05	3.15	3.25
D2	2.40	2.50	2.60
E	3.00	3.10	3.20
E1	1.35	1.45	1.55
e	0.65 BSC.		
H	3.20	3.30	3.40
L	0.30	0.40	0.50
L1	0.10	0.15	0.20
L2	1.13 REF.		